MEASUREMENT REPORT

FCC PART 15C / RSS-247 WLAN 802.11b/g/n

FCC ID:	2AN2O-S6MAXV
IC:	23317-S6MAXV
APPLICANT:	Beijing Roborock Technology Co., Ltd.
Application Type:	Certification
Product:	Robotic Vacuum Cleaner
Model No.:	roborock S6 MaxV
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.247)
IC Rule(s):	RSS-247 Issue 2, RSS-GEN Issue 5
Test Procedure(s):	ANSI C63.10-2013, KDB 558074 D01v05r02
Test Date:	December 13, 2019~January 15,2020

Reviewed By: oscar shi
(Oscar Shi)

Approved By: Robin Wu
(Robin Wu)

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
1912WSU006-U1	Rev. 01	Initial Report	02-27-2020	Valid

CONTENTS

Description Page

General Information

Applicant:	Beijing Roborock Technology Co., Ltd.
Applicant Address:	Floor 6, Suite 6016, 6017, 6018, Building C, Kangjian Baosheng Plaza, No.8 Heiquan Road, Haidian District, Beijing, P.R. China
Manufacturer:	Beijing Roborock Technology Co., Ltd.
Manufacturer Address:	Floor 6, Suite 6016, 6017, 6018, Building C, Kangjian Baosheng Plaza, No.8 Heiquan Road, Haidian District, Beijing, P.R. China
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- **MRT facility is a FCC accredited (MRT Designation No. CN1166) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications, Radio and SAR testing.**

1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	Robotic Vacuum Cleaner
Model No.:	roborock S6 MaxV
Wi-Fi Specification:	802.11b/g/n-HT20/n-HT40
Docking station:	CDZ11RR 100~240V/50-60Hz CDZ12RR 100~240V/50-60Hz

Note:

The enclosure is available in various colours.

This report includes the Cleaner second source (docking station, motor, battery pack, wiring harness,switch,etc) 15.209 Radiated Emission and 15.207 Conducted Emission test items; It verified that they are identical in main and RF circuits (i.e. Wi-Fi Module).

Product Specification Subjective to this Report

Frequency Range:	802.11b/g/n-HT20: 2412MHz ~ 2462MHz 802.11n-HT40: 2422 ~ 2452MHz
Channel Number:	802.11b/g/n-HT20: 11 802.11n-HT40: 7
Type of Modulation:	802.11b: DSSS 802.11g/n: OFDM
Data Rate:	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 72.2Mbps
Maximum Conducted Output Power:	802.11b: 11.75dBm 802.11g: 22.62dBm 802.11n-HT20: 21.65dBm 802.11n-HT40: 22.93dBm
Antenna Type:	PCB Antenna
Antenna Gain:	3.21dBi

2.2. Working Frequencies for this report

802.11b/g/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz	--	--

802.11n-HT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz
06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	--	--	--	--

2.3. Test Mode

Test Mode	Mode 1: Transmit by 802.11b (1Mbps)
	Mode 2: Transmit by 802.11g (54Mbps)
	Mode 3: Transmit by 802.11n-HT20 (MCS0)
	Mode 4: Transmit by 802.11n-HT40 (MCS0)

2.4. Description of Test Software

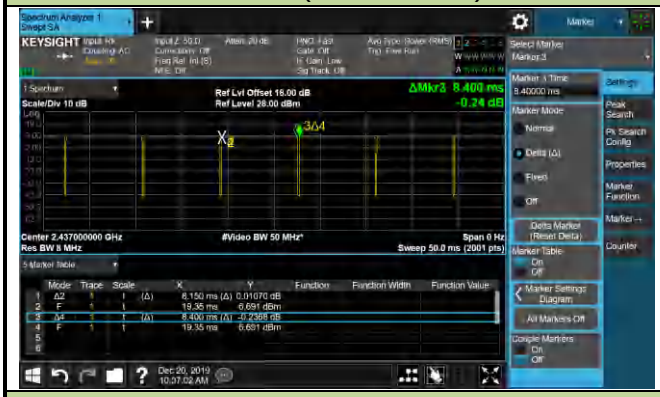
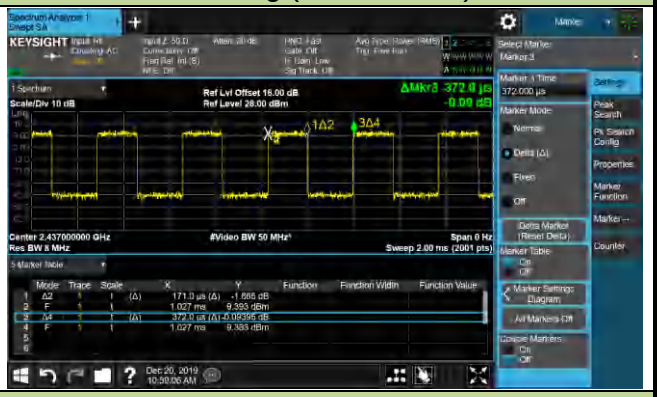
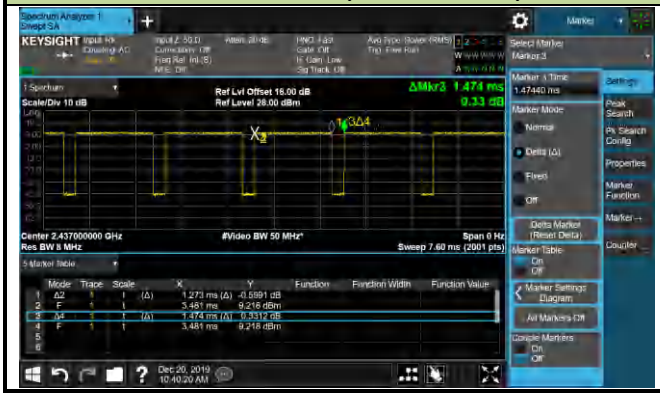
The test utility software used during testing was “QRCT3”, and the version was 3.0.268.0.

Power parameter values refer to operation description.

2.5. Duty Cycle

The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Test Mode	Duty Cycle
802.11b	97.02%
802.11g	45.97%
802.11n-HT20	86.36%
802.11n-HT40	75.68%

<table>
<tr><th colspan="2">Duty Cycle (T = Transmission Duration)</th></tr>
<tr><td>802.11b (T = 8.150ms)</td><td>802.11g (T = 0.171ms)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>802.11n-HT20 (T = 1.273ms)</td><td>802.11n-HT40 (T = 0.6308ms)</td></tr>
<tr><td>  </td><td>  </td></tr>
</table>

2.6. Test Configuration

The unit was tested per the guidance of ANSI C63.10-2013, which is used as the reference of appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.7. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.8. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

RSP-100 Issue 12 Section 5

The product shall meet the labelling requirements set out in RSS-Gen and the applicable standards. In addition to complying with the applicable RSSs and RSP-100, each unit of a product model (i.e. of a radio apparatus) shall meet the labelling requirements set out in this section prior to being marketed in Canada or imported into Canada.

If the dimensions of the product are extremely small or it is not practical to place the label or marking on the product, and if electronic labelling cannot be implemented, the label shall be placed in a prominent location in the user manual supplied with the product, as agreed upon with ISED prior to the certification application. The user manual may be in an electronic format; if it is not supplied to the user, the user manual must be readily available.

3. DESCRIPTION of TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013) and were used in the measurement.

Deviation from measurement procedure…….....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment which determined the worst-case emission. Once the worst-case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst-case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, which produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antenna of the unit is permanently attached.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2020/04/15
Two-Line V-Network	R&S	ENV 216	MRTSUE06002	1 year	2020/06/13
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2020/06/13
Thermohygrometer	Testo	608-H1	MRTSUE06404	1 year	2020/08/08
Shielding Room	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Radiated Emissions - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2020/08/01
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2020/09/03
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2020/03/31
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2020/10/13
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2020/12/16
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2020/08/08
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2020/04/30

Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Keysight	N9038A	MRTSUE06125	1 year	2020/08/01
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2020/10/13
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2020/10/27
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2020/12/16
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2020/12/15
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2020/04/30

Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2020/04/15
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06452	1 year	2020/07/11
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2020/04/15
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2020/11/17
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2020/06/30
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2020/06/30
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2020/06/13
Audio Analyzer	Agilent	U8903B	MRTSUE06143	1 year	2020/06/13
Modulation Analyzer	HP	8901A	MRTSUE06098	1 year	2020/10/10
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2020/11/07
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2020/11/07
Thermohygrometer	testo	608-H1	MRTSUE06401	1 year	2020/08/08

Software	Version	Function
EMI Software	V3	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement - SR2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz~150kHz: 3.84dB 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~300MHz: 4.07dB 300MHz~1GHz: 3.63dB 1GHz~18GHz: 4.16dB Vertical: 30MHz~300MHz: 4.18dB 300MHz~1GHz: 3.60dB 1GHz~18GHz: 4.76dB
Radiated Emission Measurement - AC2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~300MHz: 3.75dB 300MHz~1GHz: 3.53dB 1GHz~18GHz: 4.28dB Vertical: 30MHz~300MHz: 3.86dB 300MHz~1GHz: 3.53dB 1GHz~18GHz: 4.33dB

7. TEST RESULT

7.1. Summary

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	RSS-247 [5.2]	6dB Bandwidth	≥ 500kHz	Conducted	Pass	Section 7.2
N/A	RSS-Gen [6.7]	99% Bandwidth	N/A		Pass	
15.247(b)(3)	RSS-247 [5.4(d)]	Output Power	≤ 1Watt & EIRP ≤ 4Watt		Pass	Section 7.3
15.247(e)	RSS-247 [5.2]	Power Spectral Density	≤ 8dBm / 3kHz		Pass	Section 7.4
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	≥ 20dBc (Peak)		Pass	Section 7.5
15.205 15.209	RSS-247 [5.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 7.6&7.7
15.207	RSS-Gen [8.8]	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.8

Notes:

1) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
2) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

7.2. Occupied Bandwidth Measurement

7.2.1.Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

7.2.2.Test Procedure used

ANSI C63.10-2013 - Section 11.8 (6dB bandwidth)

ANSI C63.10-2013 - Section 6.9.3 (99% bandwidth)

7.2.3.Test Setting

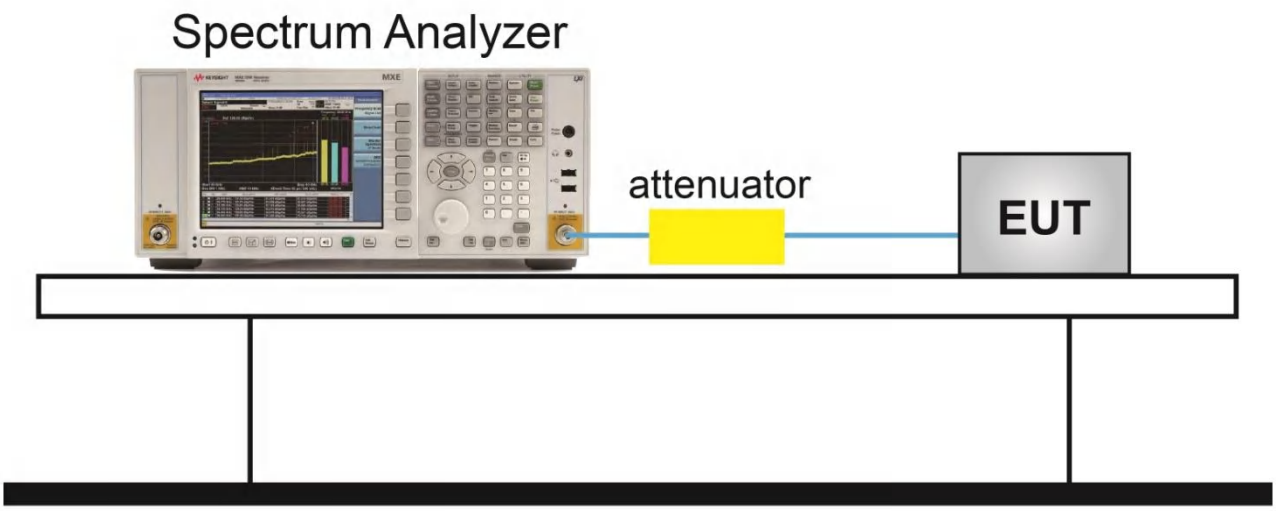
For 6dB bandwidth

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. VBW ≥ 3 × RBW
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace was allowed to stabilize

For 99% bandwidth

1. Span = 1.5 times to 5 times the OBW
2. Set RBW = 1% to 5% the OBW
3. VBW ≥ 3 × RBW
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace was allowed to stabilize

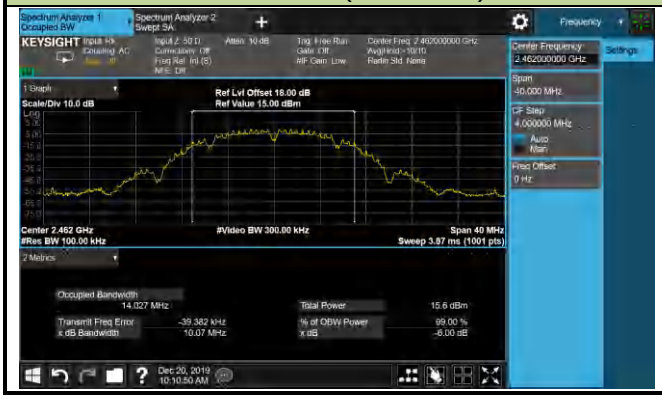
7.2.4.Test Setup

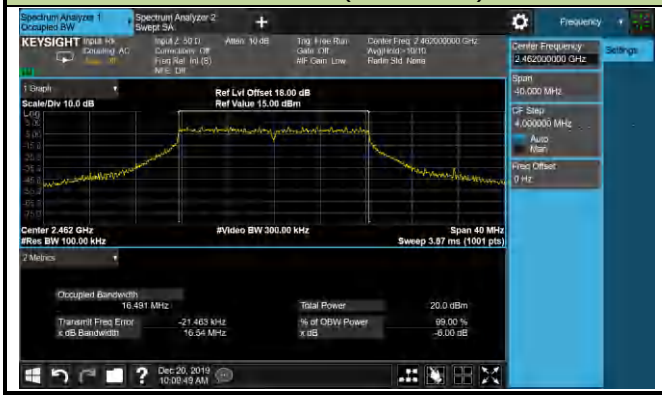


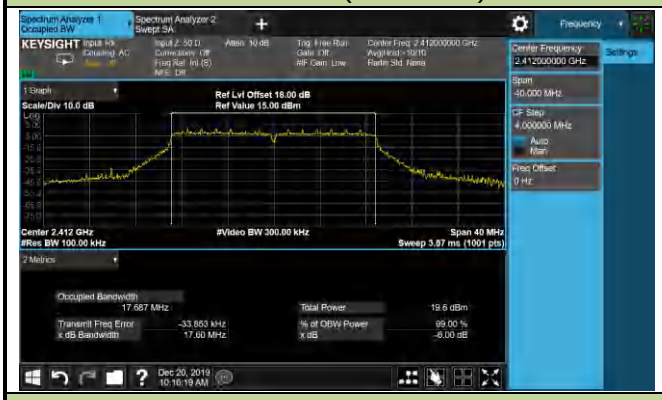
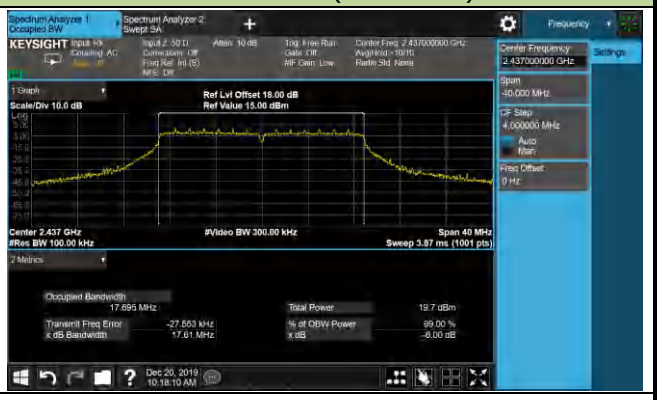
7.2.5.Test Result

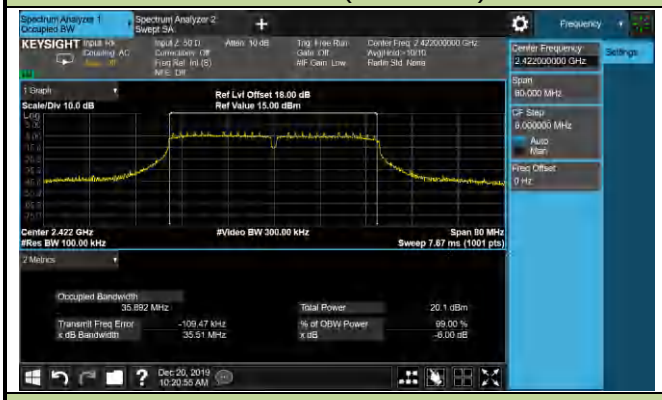
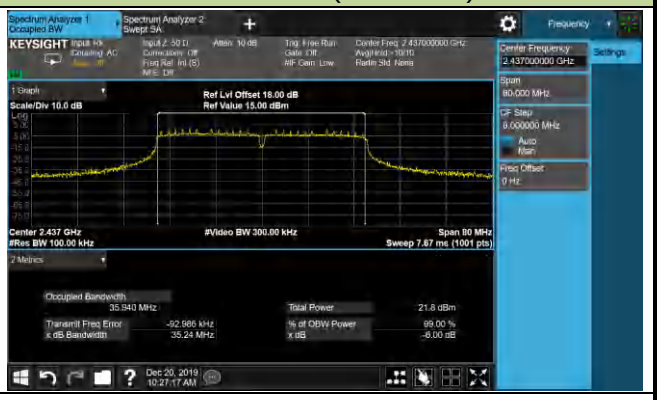
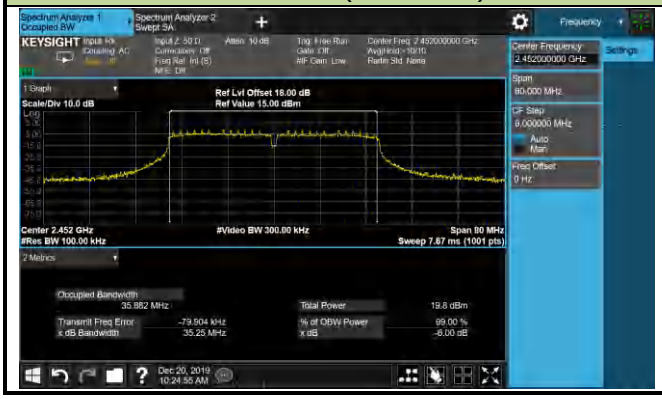
Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Yuri Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/12/20

Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	99% Bandwidth (MHz)	Result
802.11b	1Mbps	01	2412	10.06	≥ 0.5	14.047	Pass
802.11b	1Mbps	06	2437	10.07	≥ 0.5	14.054	Pass
802.11b	1Mbps	11	2462	10.07	≥ 0.5	14.049	Pass
802.11g	54Mbps	01	2412	16.51	≥ 0.5	16.676	Pass
802.11g	54Mbps	06	2437	16.53	≥ 0.5	16.658	Pass
802.11g	54Mbps	11	2462	16.54	≥ 0.5	16.668	Pass
802.11n-HT20	MCS0	01	2412	17.60	≥ 0.5	17.851	Pass
802.11n-HT20	MCS0	06	2437	17.61	≥ 0.5	17.869	Pass
802.11n-HT20	MCS0	11	2462	17.62	≥ 0.5	17.882	Pass
802.11n-HT40	MCS0	03	2422	35.51	≥ 0.5	36.112	Pass
802.11n-HT40	MCS0	06	2437	35.24	≥ 0.5	36.213	Pass
802.11n-HT40	MCS0	09	2452	35.25	≥ 0.5	36.111	Pass

802.11b 6dB Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11g 6dB Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11n-HT20 6dB Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11n-HT40 6dB Bandwidth	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

802.11b 99% Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11g 99% Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11n-HT20 99% Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11n-HT40 99% Bandwidth	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

7.3. Output Power Measurement

7.3.1.Test Limit

The maximum conducted output power shall be exceeded 1 Watt (30dBm) and the E.I.R.P shall not exceed 4 Watt (36dBm).

7.3.2.Test Procedure Used

ANSI C63.10 - Section 11.9.1.3

ANSI C63.10 - Section 11.9.2.3.2

7.3.3.Test Setting

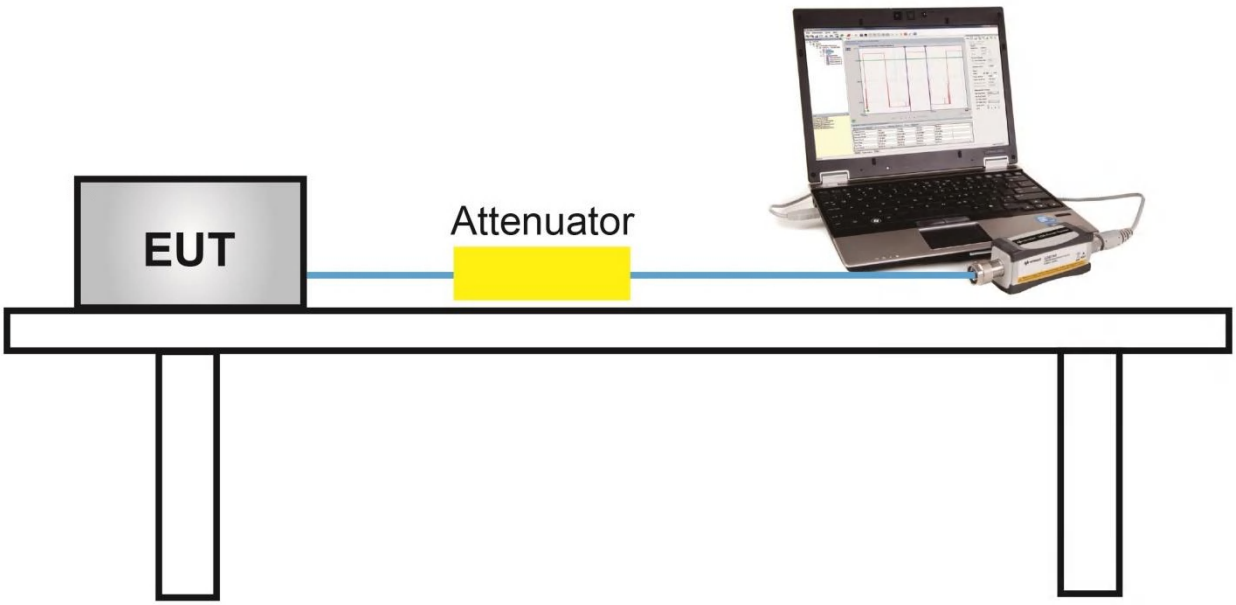
Method PKPM1 (Peak Power Measurement)

Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The pulse sensor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was less than or equal to 50MHz.

Method AVGPM-G (Measurement using a gated RF average-reading power meter)

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

7.3.4.Test Setup



7.3.5.Test Result

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (gray marker) for final test of each channel.

Test Mode	Bandwidth (MHz)	Channel No.	Frequency (MHz)	Data Rate / MCS	Average Power (dBm)
802.11b	20	6	2437	1Mbps	8.23
				5.5Mbps	7.87
				11Mbps	7.57
802.11g	20	6	2437	6Mbps	12.14
				24Mbps	12.71
				54Mbps	13.11
802.11n	20	6	2437	MCS0	13.14
				MCS3	12.73
				MCS7	12.46
802.11n	40	6	2437	MCS0	14.62
				MCS3	14.24
				MCS7	14.01

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Yuri Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/12/20

Test Result of Peak Output Power

Test Mode	Data Rate / MCS	Channel No.	Freq. (MHz)	Peak Power (dBm)	Limit (dBm)	E.I.R.P (dBm)	E.I.R.P Limit (dBm)	Result
11b	1Mbps	01	2412	11.75	≤ 30.00	14.96	≤ 36.00	Pass
11b	1Mbps	06	2437	11.12	≤ 30.00	14.33	≤ 36.00	Pass
11b	1Mbps	11	2462	11.55	≤ 30.00	14.76	≤ 36.00	Pass
11g	54Mbps	01	2412	22.62	≤ 30.00	25.83	≤ 36.00	Pass
11g	54Mbps	06	2437	21.89	≤ 30.00	25.10	≤ 36.00	Pass
11g	54Mbps	11	2462	21.45	≤ 30.00	24.66	≤ 36.00	Pass
11n-HT20	MCS0	01	2412	21.65	≤ 30.00	24.86	≤ 36.00	Pass
11n-HT20	MCS0	06	2437	21.47	≤ 30.00	24.68	≤ 36.00	Pass
11n-HT20	MCS0	11	2462	21.16	≤ 30.00	24.37	≤ 36.00	Pass
11n-HT40	MCS0	03	2422	21.21	≤ 30.00	24.42	≤ 36.00	Pass
11n-HT40	MCS0	06	2437	22.93	≤ 30.00	26.14	≤ 36.00	Pass
11n-HT40	MCS0	09	2452	21.32	≤ 30.00	24.53	≤ 36.00	Pass

Note: E.I.R.P (dBm) = Peak Power (dBm) + Antenna Gain (dBi), Antenna Gain = 3.21 dBi.

Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate / MCS	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)	E.I.R.P (dBm)	E.I.R.P Limit (dBm)	Result
11b	1Mbps	01	2412	8.63	≤ 30.00	11.84	≤ 36.00	Pass
11b	1Mbps	06	2437	8.23	≤ 30.00	11.44	≤ 36.00	Pass
11b	1Mbps	11	2462	8.67	≤ 30.00	11.88	≤ 36.00	Pass
11g	54Mbps	01	2412	13.82	≤ 30.00	17.03	≤ 36.00	Pass
11g	54Mbps	06	2437	13.11	≤ 30.00	16.32	≤ 36.00	Pass
11g	54Mbps	11	2462	12.48	≤ 30.00	15.69	≤ 36.00	Pass
11n-HT20	MCS0	01	2412	12.98	≤ 30.00	16.19	≤ 36.00	Pass
11n-HT20	MCS0	06	2437	13.14	≤ 30.00	16.35	≤ 36.00	Pass
11n-HT20	MCS0	11	2462	12.80	≤ 30.00	16.01	≤ 36.00	Pass
11n-HT40	MCS0	03	2422	12.14	≤ 30.00	15.35	≤ 36.00	Pass
11n-HT40	MCS0	06	2437	14.62	≤ 30.00	17.83	≤ 36.00	Pass
11n-HT40	MCS0	09	2452	12.57	≤ 30.00	15.78	≤ 36.00	Pass

Note: E.I.R.P (dBm) = Average Power (dBm) + Antenna Gain (dBi), Antenna Gain = 3.21 dBi.

7.4. Power Spectral Density Measurement

7.4.1.Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

The same method of determining the conducted output power shall be used to determine the power spectral density.

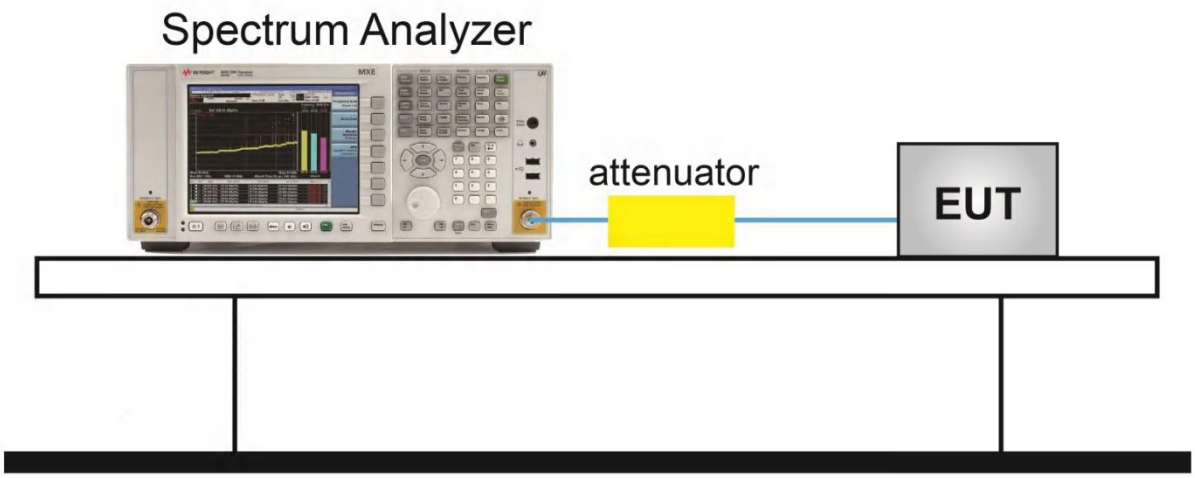
7.4.2.Test Procedure Used

ANSI C63.10 Section 11.10.5

7.4.3.Test Setting

1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = 1.5 times the DTS channel bandwidth
3. RBW = 3kHz
4. VBW = 10kHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

7.4.4.Test Setup



7.4.5.Test Result

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Yuri Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/12/20

Test Mode	Data Rate	Channel No.	Freq. (MHz)	PK PSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
11b	1Mbps	1	2412	-12.88	≤ 8.00	Pass
11b	1Mbps	6	2437	-13.52	≤ 8.00	Pass
11b	1Mbps	11	2462	-13.08	≤ 8.00	Pass
11g	54Mbps	1	2412	-11.44	≤ 8.00	Pass
11g	54Mbps	6	2442	-12.08	≤ 8.00	Pass
11g	54Mbps	11	2472	-13.01	≤ 8.00	Pass
11n-HT20	MCS0	1	2412	-11.92	≤ 8.00	Pass
11n-HT20	MCS0	6	2442	-12.07	≤ 8.00	Pass
11n-HT20	MCS0	11	2472	-12.03	≤ 8.00	Pass
11n-HT40	MCS0	3	2422	-14.68	≤ 8.00	Pass
11n-HT40	MCS0	6	2442	-11.98	≤ 8.00	Pass
11n-HT40	MCS0	9	2462	-14.28	≤ 8.00	Pass

802.11b - PK PSD	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11g - PK PSD	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11n-HT20 - PK PSD	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
	
Channel 11 (2462MHz)	
	

802.11n-HT40 - PK PSD	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

7.5. Conducted Band Edge and Out-of-Band Emissions

7.5.1.Test Limit

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

7.5.2.Test Procedure Used

ANSI C63.10 - Section 11.11

7.5.3.Test Settitng

Reference level measurement

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to ≥ 1.5 times the DTS bandwidth
3. Set the RBW = 100 kHz
4. Set the VBW ≥ 3 x RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize

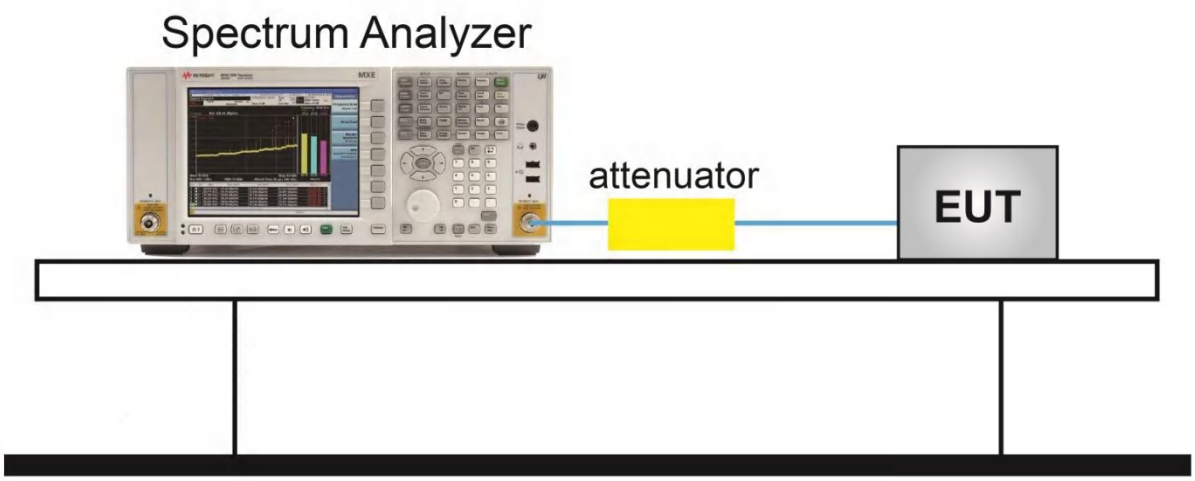
Emission level measurement

1. Set the center frequency and span to encompass frequency range to be measured
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

Test Notes

1. RBW was set to 1.3MHz rather than 100 kHz in order to increase the measurement speed; meanwhile, the VBW was set to 4MHz instead of 300 kHz.
2. The display line shown in the following plots denotes the limit at 20dB below the fundamental emission level measured in a 100 kHz bandwidth. However, since the traces in the following plots are measured with a 1.3 MHz RBW, the display line may not necessarily appear to be 20 dB below the level of the fundamental measured in a 1.3 MHz bandwidth.
3. For plots showing conducted spurious emissions near the limit, the frequencies were investigated with a reduced RBW to ensure that no emissions were present.

7.5.4.Test Setup

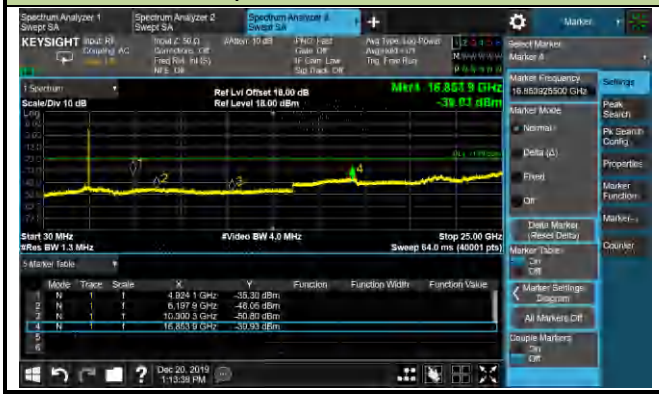


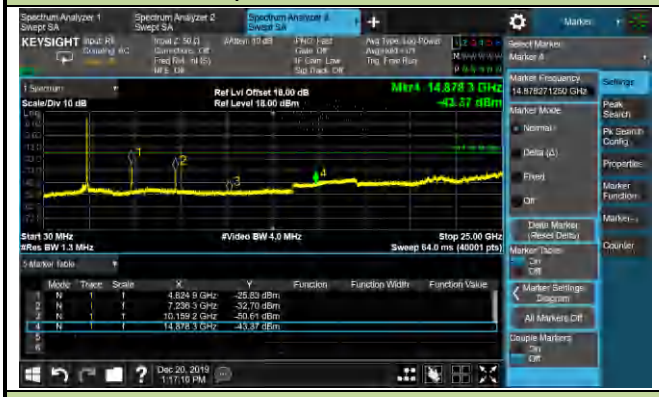
7.5.5.Test Result

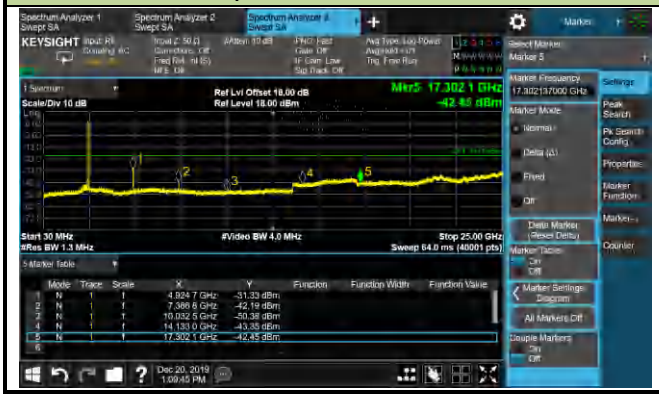
Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Yuri Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/12/20

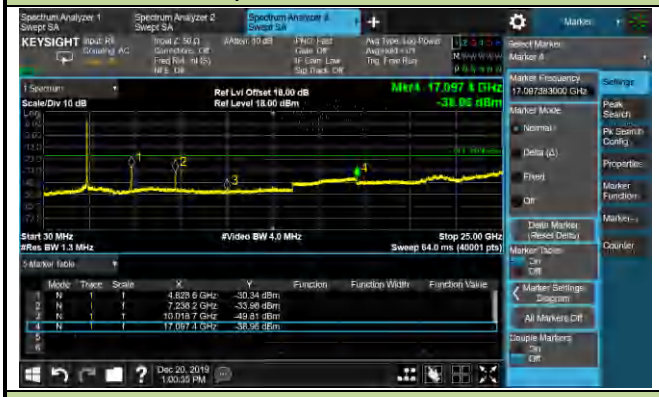
Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	Limit	Result
802.11b	1Mbps	01	2412	20dBc	Pass
802.11b	1Mbps	06	2437	20dBc	Pass
802.11b	1Mbps	11	2462	20dBc	Pass
802.11g	54Mbps	01	2412	20dBc	Pass
802.11g	54Mbps	06	2437	20dBc	Pass
802.11g	54Mbps	11	2462	20dBc	Pass
802.11n-HT20	MCS0	01	2412	20dBc	Pass
802.11n-HT20	MCS0	06	2437	20dBc	Pass
802.11n-HT20	MCS0	11	2462	20dBc	Pass
802.11n-HT40	MCS0	03	2422	20dBc	Pass
802.11n-HT40	MCS0	06	2437	20dBc	Pass
802.11n-HT40	MCS0	09	2452	20dBc	Pass

802.11b Out-of-Band Emissions	
Channel 01 (2412MHz)	
100kHz PSD Reference Level	Low Band Edge
	
Spurious Emission	
	Note: The Value of the Display Line is -21.02dBm
Channel 06 (2437MHz)	
100kHz PSD Reference Level	Spurious Emission
	
Note: The Value of the Display Line is -21.59dBm	

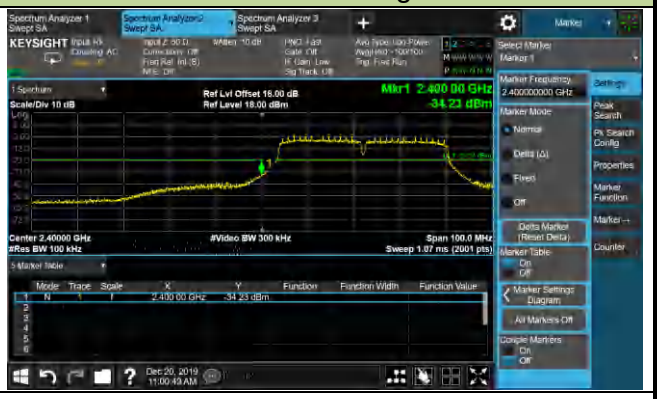
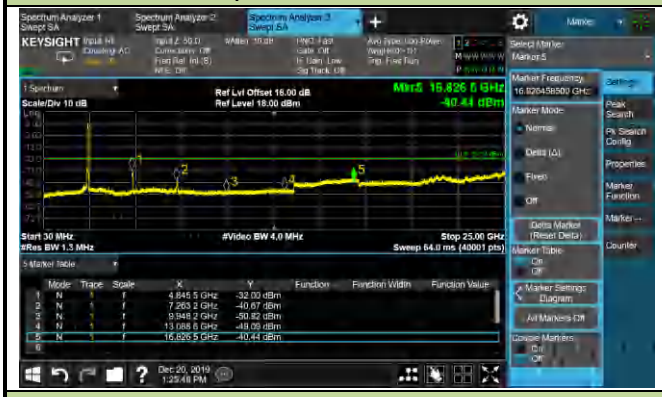
802.11b Out-of-Band Emissions	
Channel 11 (2462MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	Note: The Value of the Display Line is -21.29dBm

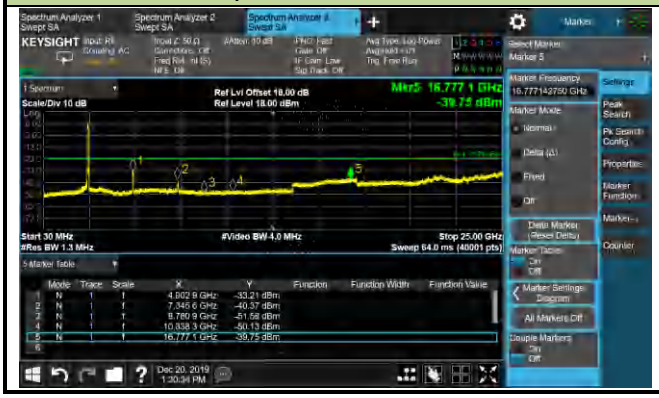
802.11g Out-of-Band Emissions	
Channel 01 (2412MHz)	
100kHz PSD Reference Level	Low Band Edge
	
Spurious Emission	
	Note: The Value of the Display Line is -16.88dBm
Channel 06 (2437MHz)	
100kHz PSD Reference Level	Spurious Emission
	
Note: The Value of the Display Line is -18.35dBm	

802.11g Out-of-Band Emissions	
Channel 11 (2462MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	Note: The Value of the Display Line is -19.13dBm

802.11n-HT20 Out-of-Band Emissions	
Channel 01 (2412MHz)	
100kHz PSD Reference Level	Low Band Edge
	
Spurious Emission	
	Note: The Value of the Display Line is -19.04dBm
Channel 06 (2437MHz)	
100kHz PSD Reference Level	Spurious Emission
	
Note: The Value of the Display Line is -18.78dBm	

802.11n-HT20 Out-of-Band Emissions	
Channel 11 (2462MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	Note: The Value of the Display Line is -19.21dBm

802.11n-HT40 Out-of-Band Emissions	
Channel 03 (2422MHz)	
100kHz PSD Reference Level	Low Band Edge
	
Spurious Emission	
	Note: The Value of the Display Line is -21.57dBm
Channel 06 (2437MHz)	
100kHz PSD Reference Level	Spurious Emission
	
Note: The Value of the Display Line is -19.27dBm	

802.11n-HT40 Out-of-Band Emissions	
Channel 09 (2452MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	Note: The Value of the Display Line is -21.70dBm

7.6. Radiated Spurious Emission Measurement

7.6.1.Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in below table. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

RSS Gen 8.9 Transmitter emission limits General field strength limits at frequencies above 30 MHz		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3
RSS Gen 8.9 Transmitter emission limits General field strength limits at frequencies below 30 MHz		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
9 - 490 kHz[Note 1]	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements

employing a linear average detector.

7.6.2.Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

ANSI C63.10 Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10 Section 6.6 (Standard test method above 1GHz)

7.6.3.Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

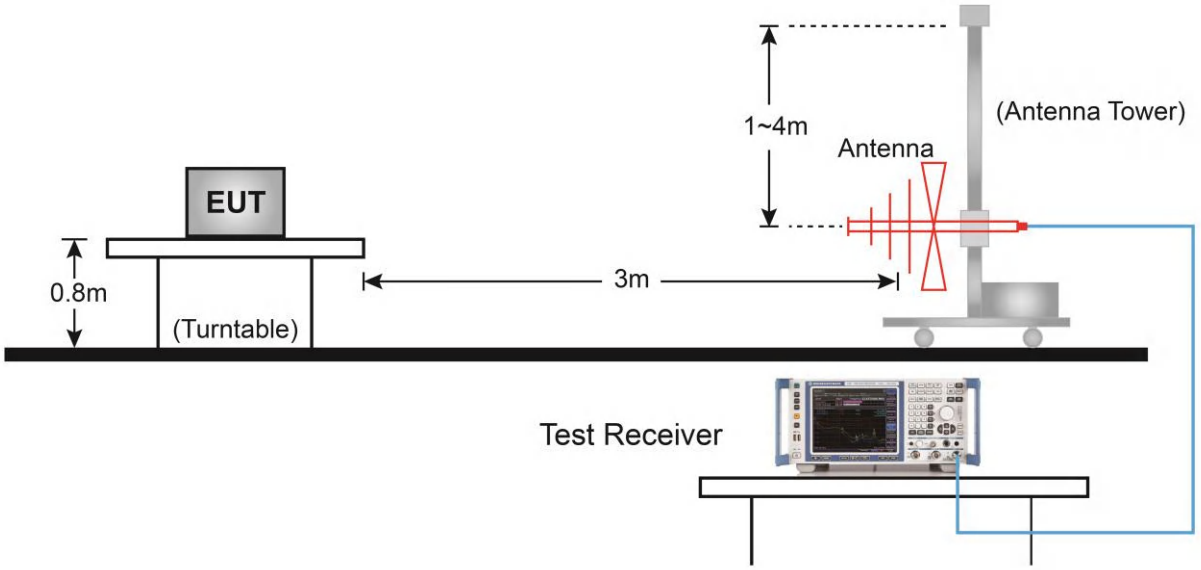
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

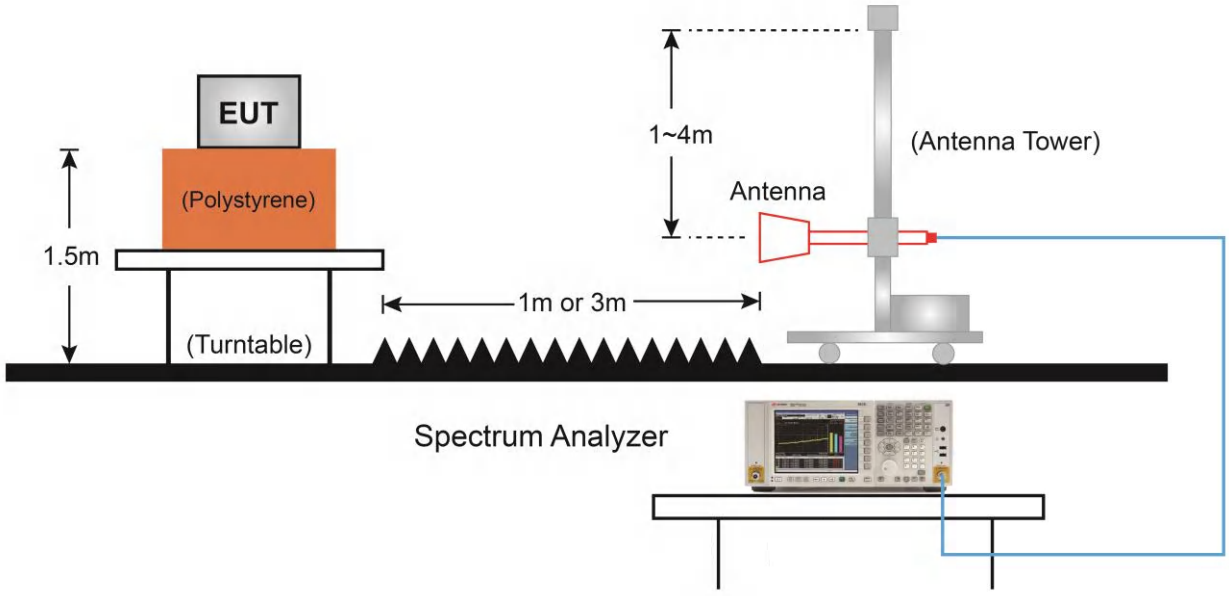
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle ≥ 98%, set VBW = 10 Hz.
   If the EUT duty cycle is < 98%, set VBW ≥ 1/T. T is the minimum transmission duration.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

7.6.4.Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



7.6.5.Test Result : Main source

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11b	Test Channel:	01
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4824.0	46.4	6.0	52.4	54.0	-1.6	Average	Horizontal
	4825.0	48.3	6.1	54.4	74.0	-19.6	Peak	Horizontal
*	5989.5	38.2	7.8	46.0	77.2	-31.2	Peak	Horizontal
*	6584.5	38.5	9.8	48.3	77.2	-28.9	Peak	Horizontal
	7511.0	38.5	11.9	50.4	74.0	-23.6	Peak	Horizontal
	4825.0	44.3	6.1	50.4	74.0	-23.6	Peak	Vertical
*	5564.5	38.0	7.2	45.2	77.2	-32.0	Peak	Vertical
*	6729.0	37.4	9.7	47.1	77.2	-30.1	Peak	Vertical
	7596.0	37.4	11.8	49.2	74.0	-24.8	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (97.2dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11b	Test Channel:	06
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4873.9	46.4	5.9	52.3	54.0	-1.7	Average	Horizontal
	4876.0	47.6	5.9	53.5	74.0	-20.5	Peak	Horizontal
*	5930.0	36.4	7.8	44.2	76.8	-32.6	Peak	Horizontal
*	6525.0	36.6	9.6	46.2	76.8	-30.6	Peak	Horizontal
	7579.0	37.4	11.6	49.0	74.0	-25.0	Peak	Horizontal
	4876.0	41.7	5.9	47.6	74.0	-26.4	Peak	Vertical
*	5955.5	36.6	7.6	44.2	76.8	-32.6	Peak	Vertical
*	6652.5	37.0	9.7	46.7	76.8	-30.1	Peak	Vertical
	7366.5	35.4	11.9	47.3	74.0	-26.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (96.8dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11b	Test Channel:	11
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4924.0	46.5	6.1	52.6	54.0	-1.4	Average	Horizontal
	4927.0	47.3	6.1	53.4	74.0	-20.6	Peak	Horizontal
*	5972.5	37.0	7.7	44.7	76.3	-31.6	Peak	Horizontal
*	6559.0	36.6	9.6	46.2	76.3	-30.1	Peak	Horizontal
	7485.5	36.8	11.8	48.6	74.0	-25.4	Peak	Horizontal
	4927.0	43.4	6.1	49.5	74.0	-24.5	Peak	Vertical
*	6236.0	36.6	8.3	44.9	76.3	-31.4	Peak	Vertical
*	7137.0	37.1	11.3	48.4	76.3	-27.9	Peak	Vertical
	8284.5	38.2	12.2	50.4	74.0	-23.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (96.3dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11g	Test Channel:	01
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4825.0	55.1	6.1	61.2	74.0	-12.8	Peak	Horizontal
	4825.8	46.9	6.1	53.0	54.0	-1.0	Average	Horizontal
*	5649.5	37.6	7.1	44.7	86.3	-41.6	Peak	Horizontal
*	7213.5	50.0	11.5	61.5	86.3	-24.8	Peak	Horizontal
	8199.5	37.3	12.4	49.7	74.0	-24.3	Peak	Horizontal
	4825.0	49.2	6.1	55.3	74.0	-18.7	Peak	Vertical
	4825.6	39.0	6.1	45.1	54.0	-8.9	Average	Vertical
*	6397.5	37.3	8.8	46.1	86.3	-40.2	Peak	Vertical
*	7239.0	47.9	11.5	59.4	86.3	-26.9	Peak	Vertical
	8191.0	36.9	12.4	49.3	74.0	-24.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (106.3dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11g	Test Channel:	06
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4867.5	51.6	5.9	57.5	74.0	-16.5	Peak	Horizontal
	4867.6	40.1	5.9	46.0	54.0	-8.0	Average	Horizontal
*	5700.5	37.3	7.2	44.5	85.5	-41.0	Peak	Horizontal
*	6508.0	37.4	9.7	47.1	85.5	-38.4	Peak	Horizontal
	7307.0	54.1	11.7	65.8	74.0	-8.2	Peak	Horizontal
	7307.0	41.1	11.7	52.8	54.0	-1.2	Average	Horizontal
	4867.5	47.7	5.9	53.6	74.0	-20.4	Peak	Vertical
	4867.5	39.7	5.9	45.6	54.0	-8.4	Average	Vertical
*	5751.5	37.6	7.4	45.0	85.5	-40.5	Peak	Vertical
*	6584.5	37.7	9.8	47.5	85.5	-38.0	Peak	Vertical
	7315.5	47.7	11.6	59.3	74.0	-14.7	Peak	Vertical
	7315.5	40.1	11.6	51.7	54.0	-2.3	Average	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (105.5dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11g	Test Channel:	11
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4923.8	46.8	6.1	52.9	54.0	-1.1	Average	Horizontal
	4927.0	56.0	6.1	62.1	74.0	-11.9	Peak	Horizontal
*	5683.5	37.2	7.3	44.5	84.6	-40.1	Peak	Horizontal
*	6491.0	38.2	9.4	47.6	84.6	-37.0	Peak	Horizontal
	7383.5	48.1	11.8	59.9	74.0	-14.1	Peak	Horizontal
	7387.5	38.0	11.8	49.8	54.0	-4.2	Average	Horizontal
	4927.0	48.7	6.1	54.8	74.0	-19.2	Peak	Vertical
	4928.6	39.6	6.1	45.7	54.0	-8.3	Average	Vertical
*	5794.0	36.6	7.5	44.1	84.6	-40.5	Peak	Vertical
*	6287.0	37.8	8.4	46.2	84.6	-38.4	Peak	Vertical
	7383.5	44.3	11.8	56.1	74.0	-17.9	Peak	Vertical
	7385.0	35.9	11.8	47.7	54.0	-6.3	Average	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (104.6dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11n-HT20	Test Channel:	01
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4825.0	53.8	6.1	59.9	74.0	-14.1	Peak	Horizontal
	4825.0	41.6	6.1	47.7	54.0	-6.3	Average	Horizontal
*	6508.0	36.4	9.7	46.1	84.0	-37.9	Peak	Horizontal
*	7239.0	53.3	11.5	64.8	84.0	-19.2	Peak	Horizontal
	8276.0	37.5	12.3	49.8	74.0	-24.2	Peak	Horizontal
	4816.5	45.2	5.9	51.1	74.0	-22.9	Peak	Vertical
*	6550.5	37.3	9.5	46.8	84.0	-37.2	Peak	Vertical
*	7239.0	43.1	11.5	54.6	84.0	-29.4	Peak	Vertical
	8352.5	36.8	12.3	49.1	74.0	-24.9	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (104.0dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11n-HT20	Test Channel:	06
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4867.4	42.0	5.9	47.9	54.0	-6.1	Average	Horizontal
	4867.5	53.6	5.9	59.5	74.0	-14.5	Peak	Horizontal
*	5921.5	36.7	7.8	44.5	83.8	-39.3	Peak	Horizontal
*	6669.5	37.2	9.7	46.9	83.8	-36.9	Peak	Horizontal
	7307.0	52.4	11.7	64.1	74.0	-9.9	Peak	Horizontal
	7310.0	41.3	11.7	53.0	54.0	-1.0	Average	Horizontal
	4876.0	47.5	5.9	53.4	74.0	-20.6	Peak	Vertical
	4876.0	38.5	5.9	44.4	54.0	-9.6	Average	Vertical
*	5853.5	37.7	7.7	45.4	83.8	-38.4	Peak	Vertical
*	6346.5	38.2	8.8	47.0	83.8	-36.8	Peak	Vertical
	7315.5	48.6	11.6	60.2	74.0	-13.8	Peak	Vertical
	7315.5	39.8	11.6	51.4	54.0	-2.6	Average	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (103.8dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11n-HT20	Test Channel:	11
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4918.5	56.2	6.1	62.3	74.0	-11.7	Peak	Horizontal
	4918.5	45.9	6.1	52.0	54.0	-2.0	Average	Horizontal
*	5624.0	36.7	7.0	43.7	83.6	-39.9	Peak	Horizontal
*	6576.0	37.2	9.7	46.9	83.6	-36.7	Peak	Horizontal
	7375.0	47.4	11.9	59.3	74.0	-14.7	Peak	Horizontal
	7375.0	36.5	11.9	48.4	54.0	-5.6	Average	Horizontal
	4918.5	47.5	6.1	53.6	74.0	-20.4	Peak	Vertical
	4918.5	36.8	6.1	42.9	54.0	-11.1	Average	Vertical
*	5802.5	36.8	7.5	44.3	83.6	-39.3	Peak	Vertical
*	6533.5	37.7	9.5	47.2	83.6	-36.4	Peak	Vertical
	7383.5	42.4	11.8	54.2	74.0	-19.8	Peak	Vertical
	7383.5	32.0	11.8	43.8	54.0	-10.2	Average	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (103.6dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11n-HT40	Test Channel:	03
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4842.0	50.1	5.9	56.0	74.0	-18.0	Peak	Horizontal
	4846.6	40.8	5.9	46.7	54.0	-7.3	Average	Horizontal
*	5649.5	35.9	7.1	43.0	81.6	-38.6	Peak	Horizontal
*	6593.0	36.8	9.8	46.6	81.6	-35.0	Peak	Horizontal
	7256.0	48.7	11.7	60.4	74.0	-13.6	Peak	Horizontal
	7257.0	38.5	11.7	50.2	54.0	-3.8	Average	Horizontal
	4842.0	45.8	5.9	51.7	74.0	-22.3	Peak	Vertical
*	6227.5	36.3	8.3	44.6	81.6	-37.0	Peak	Vertical
*	6567.5	36.8	9.6	46.4	81.6	-35.2	Peak	Vertical
	7273.0	40.9	11.7	52.6	74.0	-21.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (101.6dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11n-HT40	Test Channel:	06
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4876.0	54.1	5.9	60.0	74.0	-14.0	Peak	Horizontal
	4876.6	44.4	5.9	50.3	54.0	-3.7	Average	Horizontal
*	5581.5	34.8	7.3	42.1	81.0	-38.9	Peak	Horizontal
*	6261.5	35.4	8.6	44.0	81.0	-37.0	Peak	Horizontal
	7315.5	52.0	11.6	63.6	74.0	-10.4	Peak	Horizontal
	7318.6	40.8	11.6	52.4	54.0	-1.6	Average	Horizontal
	4876.0	46.7	5.9	52.6	74.0	-21.4	Peak	Vertical
	4876.0	35.5	5.9	41.4	54.0	-12.6	Average	Vertical
*	5751.5	36.9	7.4	44.3	81.0	-36.7	Peak	Vertical
*	6406.0	36.4	8.9	45.3	81.0	-35.7	Peak	Vertical
	7315.5	45.1	11.6	56.7	74.0	-17.3	Peak	Vertical
	7316.9	35.4	11.6	47.0	54.0	-7.0	Average	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (101.0dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Kyrie Xie	Relative Humidity	54%
Test Site	AC1	Test Date	2019/12/24
Test Mode:	802.11n-HT40	Test Channel:	09
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4884.5	54.2	5.9	60.1	74.0	-13.9	Peak	Horizontal
*	5921.5	36.1	7.8	43.9	80.4	-36.5	Peak	Horizontal
*	6525.0	36.9	9.6	46.5	80.4	-33.9	Peak	Horizontal
	7324.0	53.8	11.5	65.3	74.0	-8.7	Peak	Horizontal
	7325.4	39.5	11.5	51.0	54.0	-3	Average	Horizontal
	4876.0	47.5	5.9	53.4	74.0	-20.6	Peak	Vertical
	4876.0	35.8	5.9	41.7	54.0	-12.3	Average	Vertical
*	6015.0	36.6	7.9	44.5	80.4	-35.9	Peak	Vertical
*	6533.5	37.4	9.5	46.9	80.4	-33.5	Peak	Vertical
	7332.5	45.1	11.7	56.8	74.0	-17.2	Peak	Vertical
	7332.5	35.1	11.7	46.8	54.0	-7.2	Average	Vertical

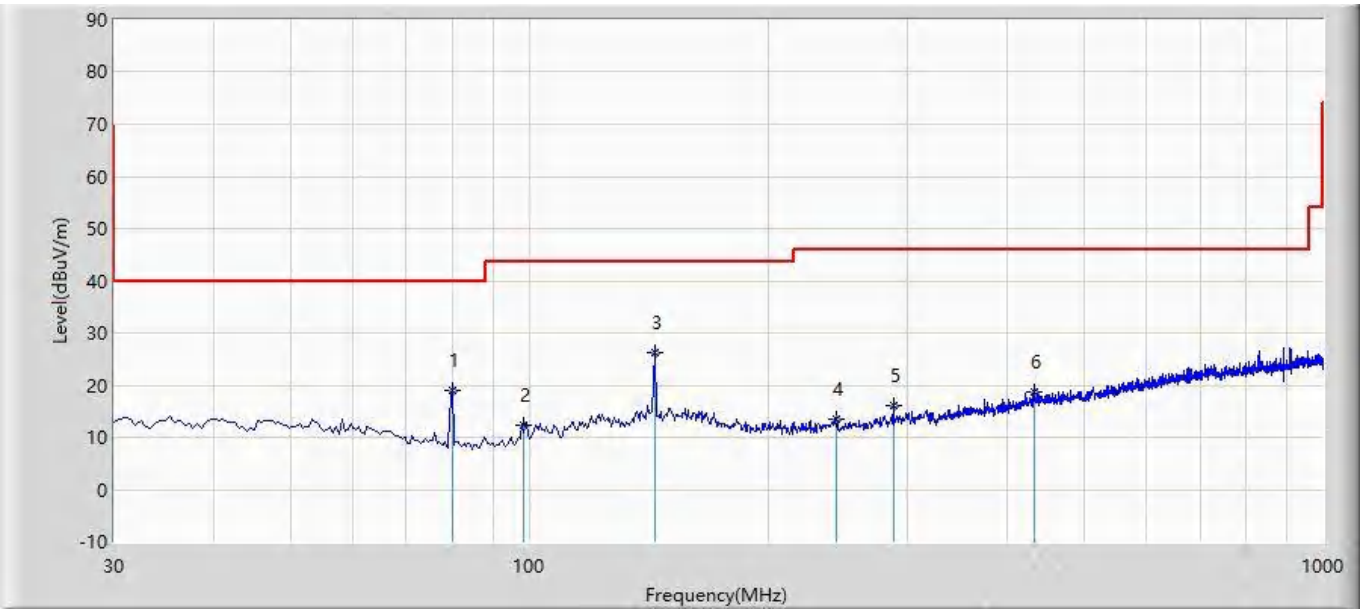
Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (100.4dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

The Worst Case of Radiated Emission below 1GHz:

Site: AC1	Time: 2019/12/25 - 15:44
Limit: FCC_Part15.209_RSE(3m)	Engineer: Jason Gao
Probe: AC1_VULB 9168 _20-2000MHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Worst Case Mode: Transmit by 802.11b at Channel 2412MHz	



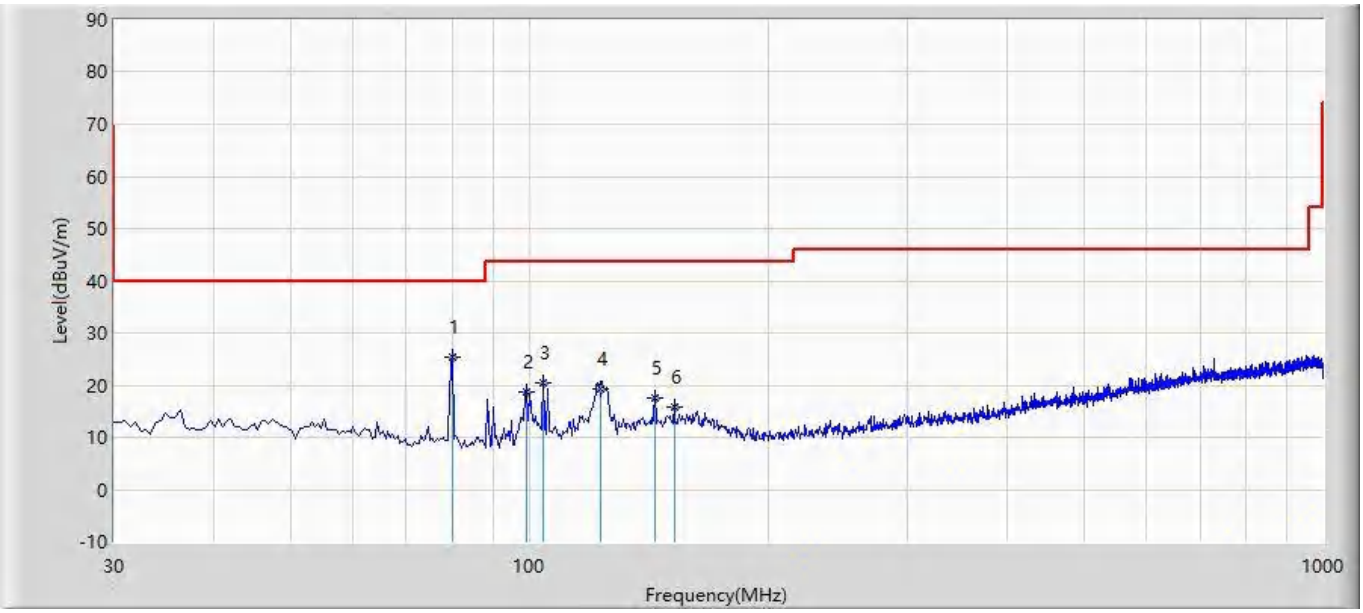
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			79.955	19.025	8.890	-20.975	40.000	10.135	QP
2			98.385	12.271	1.370	-31.229	43.500	10.901	QP
3		*	143.975	26.125	11.300	-17.375	43.500	14.824	QP
4			243.400	13.375	0.500	-32.625	46.000	12.875	QP
5			288.020	16.011	1.970	-29.989	46.000	14.041	QP
6			432.065	18.590	1.200	-27.410	46.000	17.390	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

Site: AC1	Time: 2019/12/25 - 15:44
Limit: FCC_Part15.209_RSE(3m)	Engineer: Jason Gao
Probe: AC1_VULB 9168 _20-2000MHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Worst Case Mode: Transmit by 802.11b at Channel 2412MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	79.955	25.435	15.300	-14.565	40.000	10.135	QP
2			99.355	18.696	7.720	-24.804	43.500	10.976	QP
3			104.205	20.556	9.100	-22.944	43.500	11.456	QP
4			123.120	19.188	5.800	-24.312	43.500	13.388	QP
5			143.975	17.615	2.790	-25.885	43.500	14.824	QP
6			152.220	15.846	0.600	-27.654	43.500	15.246	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

7.6.6. Test Result : Second source

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11b	Test Channel:	01
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4824.0	57.4	-10.7	46.7	54.0	-7.3	Average	Horizontal
	4825.0	64.4	-10.6	53.8	74.0	-20.2	Peak	Horizontal
	8352.5	49.9	-6.8	43.1	74.0	-30.9	Peak	Horizontal
*	9721.0	50.0	-5.8	44.2	77.2	-33.0	Peak	Horizontal
*	10214.0	51.0	-5.4	45.6	77.2	-31.6	Peak	Horizontal
	4825.0	59.8	-10.6	49.2	74.0	-24.8	Peak	Vertical
	5046.0	51.7	-10.5	41.2	74.0	-32.8	Peak	Vertical
*	9678.5	49.3	-6.0	43.3	77.2	-33.9	Peak	Vertical
*	9993.0	49.9	-5.4	44.5	77.2	-32.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (97.2dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11b	Test Channel:	06
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4873.7	54.3	-10.5	43.8	54.0	-10.2	Average	Horizontal
	4876.0	64.1	-10.5	53.6	74.0	-20.4	Peak	Horizontal
	7307.0	57.7	-8.4	49.3	74.0	-24.7	Peak	Horizontal
*	8777.5	49.5	-6.4	43.1	76.8	-33.7	Peak	Horizontal
*	10214.0	49.6	-5.4	44.2	76.8	-32.6	Peak	Horizontal
	4867.5	60.2	-10.6	49.6	74.0	-24.4	Peak	Vertical
	7307.0	55.1	-8.4	46.7	74.0	-27.3	Peak	Vertical
*	9602.0	50.8	-6.0	44.8	76.8	-32.0	Peak	Vertical
*	9959.0	51.2	-5.5	45.7	76.8	-31.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (96.8dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11b	Test Channel:	11
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4927.0	62.4	-10.6	51.8	74.0	-22.2	Peak	Horizontal
	7698.0	51.7	-7.4	44.3	74.0	-29.7	Peak	Horizontal
*	8811.5	51.7	-6.3	45.4	76.3	-30.9	Peak	Horizontal
*	9891.0	51.0	-5.8	45.2	76.3	-31.1	Peak	Horizontal
	4927.0	59.2	-10.6	48.6	74.0	-25.4	Peak	Vertical
	7579.0	51.4	-7.6	43.8	74.0	-30.2	Peak	Vertical
*	9678.5	49.8	-6.0	43.8	76.3	-32.5	Peak	Vertical
*	10333.0	51.0	-5.5	45.5	76.3	-30.8	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (96.3dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11g	Test Channel:	01
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4815.6	53.6	-10.8	42.8	54.0	-11.2	Average	Horizontal
	4816.5	70.3	-10.7	59.6	74.0	-14.4	Peak	Horizontal
	5122.5	52.4	-10.9	41.5	74.0	-32.5	Peak	Horizontal
*	7239.0	71.2	-8.1	63.1	86.3	-23.2	Peak	Horizontal
*	10350.0	49.2	-5.4	43.8	86.3	-42.5	Peak	Horizontal
	4264.0	52.6	-11.2	41.4	74.0	-32.6	Peak	Vertical
	4825.0	67.6	-10.6	57.0	74.0	-17.0	Peak	Vertical
	4826.5	52.6	-10.7	41.9	54.0	-12.1	Average	Vertical
*	7230.5	66.8	-8.3	58.5	86.3	-27.8	Peak	Vertical
*	12840.5	50.5	-3.5	47.0	86.3	-39.3	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (106.3dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11g	Test Channel:	06
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4867.5	70.1	-10.6	59.5	74.0	-14.5	Peak	Horizontal
	4873.7	61.6	-10.5	51.1	54.0	-2.9	Average	Horizontal
	7307.0	66.7	-8.4	58.3	74.0	-15.7	Peak	Horizontal
	7308.2	56.3	-8.4	47.9	54.0	-6.1	Average	Horizontal
*	9857.0	48.9	-6.0	42.9	85.5	-42.6	Peak	Horizontal
*	10307.5	48.6	-5.5	43.1	85.5	-42.4	Peak	Horizontal
	4876.0	66.6	-10.5	56.1	74.0	-17.9	Peak	Vertical
	4876.3	56.6	-10.5	46.1	54.0	-7.9	Average	Vertical
	7306.6	51.0	-8.4	42.6	54.0	-11.4	Peak	Vertical
	7307.0	62.2	-8.4	53.8	74.0	-20.2	Peak	Vertical
*	9772.0	51.0	-5.8	45.2	85.5	-40.3	Peak	Vertical
*	10316.0	49.9	-5.4	44.5	85.5	-41.0	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (105.5dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11g	Test Channel:	11
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4923.5	57.2	-10.6	46.6	54.0	-7.4	Average	Horizontal
	4927.0	69.0	-10.6	58.4	74.0	-15.6	Peak	Horizontal
	7391.0	58.6	-8.2	50.4	54.0	-3.6	Average	Horizontal
	7392.0	68.0	-8.2	59.8	74.0	-14.2	Peak	Horizontal
*	9653.0	51.0	-6.0	45.0	84.6	-39.6	Peak	Horizontal
*	9993.0	49.5	-5.4	44.1	84.6	-40.5	Peak	Horizontal
	4927.0	66.3	-10.6	55.7	74.0	-18.3	Peak	Vertical
	4928.1	55.9	-10.6	45.3	54.0	-8.7	Average	Vertical
	7375.0	60.6	-8.1	52.5	74.0	-21.5	Peak	Vertical
*	9670.0	50.6	-6.0	44.6	84.6	-40.0	Peak	Vertical
*	10214.0	50.4	-5.4	45.0	84.6	-39.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (104.6dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11n-20MHz	Test Channel:	01
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4823.7	62.5	-10.7	51.8	54.0	-2.2	Average	Horizontal
	4825.0	71.9	-10.6	61.3	74.0	-12.7	Peak	Horizontal
	4986.5	51.6	-10.5	41.1	74.0	-32.9	Peak	Horizontal
*	7239.0	67.8	-8.1	59.7	84.0	-24.3	Peak	Horizontal
*	8811.5	49.8	-6.3	43.5	84.0	-40.5	Peak	Horizontal
	4825.0	66.4	-10.6	55.8	74.0	-18.2	Peak	Vertical
	4826.2	57.9	-10.7	47.2	54.0	-6.8	Average	Vertical
	5088.5	52.4	-10.7	41.7	74.0	-32.3	Peak	Vertical
*	7247.5	64.8	-8.2	56.6	84.0	-27.4	Peak	Vertical
*	10214.0	50.0	-5.4	44.6	84.0	-39.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (104dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11n-20MHz	Test Channel:	06
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4876.0	70.7	-10.5	60.2	74.0	-13.8	Peak	Horizontal
	4877.3	60.0	-10.5	49.5	54.0	-4.5	Average	Horizontal
	7307.0	71.9	-8.4	63.5	74.0	-10.5	Peak	Horizontal
	7310.7	57.3	-8.4	48.9	54.0	-5.1	Average	Horizontal
*	9712.5	49.6	-5.8	43.8	83.8	-40.0	Peak	Horizontal
*	10061.0	51.0	-5.7	45.3	83.8	-38.5	Peak	Horizontal
	4867.5	66.7	-10.6	56.1	74.0	-17.9	Peak	Vertical
	4868.3	55.9	-10.6	45.3	54.0	-8.7	Average	Vertical
	7298.5	64.5	-8.4	56.1	74.0	-17.9	Peak	Vertical
	7299.3	53.6	-8.4	45.2	54.0	-8.8	Average	Vertical
*	9823.0	51.2	-5.7	45.5	83.8	-38.3	Peak	Vertical
*	10460.5	50.5	-5.2	45.3	83.8	-38.5	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (103.8dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11n-20MHz	Test Channel:	11
Remark:	3. Average measurement was not performed if peak level lower than average limit. 4. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4925.5	59.3	-10.6	48.7	54.0	-5.3	Average	Horizontal
	4927.0	68.9	-10.6	58.3	74.0	-15.7	Peak	Horizontal
	7392.0	67.4	-8.2	59.2	74.0	-14.8	Peak	Horizontal
	7393.5	56.3	-8.2	48.1	54.0	-5.9	Average	Horizontal
*	9772.0	51.5	-5.8	45.7	83.6	-37.9	Peak	Horizontal
*	10358.5	50.1	-5.5	44.6	83.6	-39.0	Peak	Horizontal
	4918.5	65.1	-10.7	54.4	74.0	-19.6	Peak	Vertical
	4919.3	56.9	-10.7	46.2	54.0	-7.8	Average	Vertical
	7375.0	60.1	-8.1	52.0	74.0	-22.0	Peak	Vertical
	7376.3	50.0	-8.1	41.9	54.0	-12.1	Average	Vertical
*	9942.0	51.3	-5.5	45.8	83.6	-37.8	Peak	Vertical
*	10401.0	50.3	-5.1	45.2	83.6	-38.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (103.6dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11n-40MHz	Test Channel:	03
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4842.0	68.4	-10.8	57.6	74.0	-16.4	Peak	Horizontal
	4842.6	60.8	-10.8	50.0	54.0	-4.0	Average	Horizontal
	7273.0	67.2	-8.3	58.9	74.0	-15.1	Peak	Horizontal
	7274.0	59.6	-8.3	51.3	54.0	-2.7	Average	Horizontal
*	9763.5	50.7	-5.8	44.9	81.6	-36.7	Peak	Horizontal
*	10197.0	50.3	-5.6	44.7	81.6	-36.9	Peak	Horizontal
	4833.5	64.0	-10.7	53.3	74.0	-20.7	Peak	Vertical
	4834.6	55.3	-10.7	44.6	54.0	-9.4	Average	Vertical
	7264.5	60.2	-8.3	51.9	74.0	-22.1	Peak	Vertical
	7265.3	52.3	-8.3	44.0	54.0	-10.0	Average	Vertical
*	9908.0	50.4	-5.7	44.7	81.6	-36.9	Peak	Vertical
*	10214.0	49.1	-5.4	43.7	81.6	-37.9	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (101.6dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11n-40MHz	Test Channel:	06
Remark:	3. Average measurement was not performed if peak level lower than average limit. 4. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4850.5	71.1	-10.8	60.3	74.0	-13.7	Peak	Horizontal
	4854.5	63.2	-10.7	52.5	54.0	-1.5	Average	Horizontal
	7284.5	61.0	-8.4	52.6	54.0	-1.4	Average	Horizontal
	7290.0	76.0	-8.4	67.6	74.0	-6.4	Peak	Horizontal
*	9899.5	50.9	-5.7	45.2	81.0	-35.8	Peak	Horizontal
*	10316.0	49.4	-5.4	44.0	81.0	-37.0	Peak	Horizontal
	4859.0	67.7	-10.7	57.0	74.0	-17.0	Peak	Vertical
	4860.3	61.0	-10.7	50.3	54.0	-3.7	Average	Vertical
	7273.0	66.8	-8.3	58.5	74.0	-15.5	Peak	Vertical
	7274.6	60.8	-8.3	52.5	54.0	-1.5	Average	Vertical
*	9721.0	49.8	-5.8	44.0	81.0	-37.0	Peak	Vertical
*	10069.5	50.7	-5.8	44.9	81.0	-36.1	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (101dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product	Robotic Vacuum Cleaner	Temperature	25°C
Test Engineer	Jason Gao	Relative Humidity	54%
Test Site	AC1	Test Date	2020/1/15
Test Mode:	802.11n-40MHz	Test Channel:	09
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4883.5	60.9	-10.5	50.4	54.0	-3.6	Average	Horizontal
	4884.5	68.1	-10.5	57.6	74.0	-16.4	Peak	Horizontal
	7321.5	55.0	-8.4	46.6	54.0	-7.4	Average	Horizontal
	7332.5	68.6	-8.3	60.3	74.0	-13.7	Peak	Horizontal
*	9984.5	50.4	-5.4	45.0	80.4	-35.4	Peak	Horizontal
*	10214.0	48.9	-5.4	43.5	80.4	-36.9	Peak	Horizontal
	4876.0	63.4	-10.5	52.9	74.0	-21.1	Peak	Vertical
	7324.0	60.9	-8.4	52.5	74.0	-21.5	Peak	Vertical
*	9551.0	50.2	-5.9	44.3	80.4	-36.1	Peak	Vertical
*	10010.0	50.8	-5.5	45.3	80.4	-35.1	Peak	Vertical

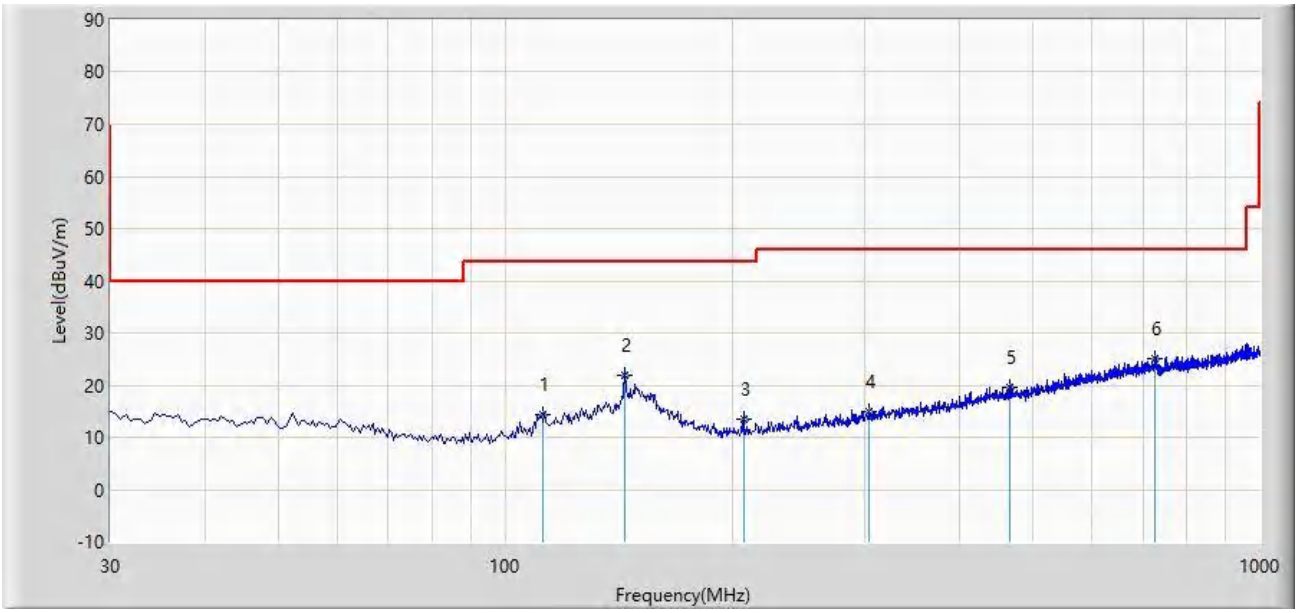
Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (100.4dBμV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

The Worst Case of Radiated Emission below 1GHz:

Site: AC1	Time: 2020/01/15 - 00:17
Limit: FCC_Part15.209_RSE(3m)	Engineer: Jason Gao
Probe: AC1_VULB 9168 _20-2000MHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: By 120V/60Hz
Worst Case Mode: Transmit by 802.11b at Channel 2437MHz (With CDZ12RR Adapter)	



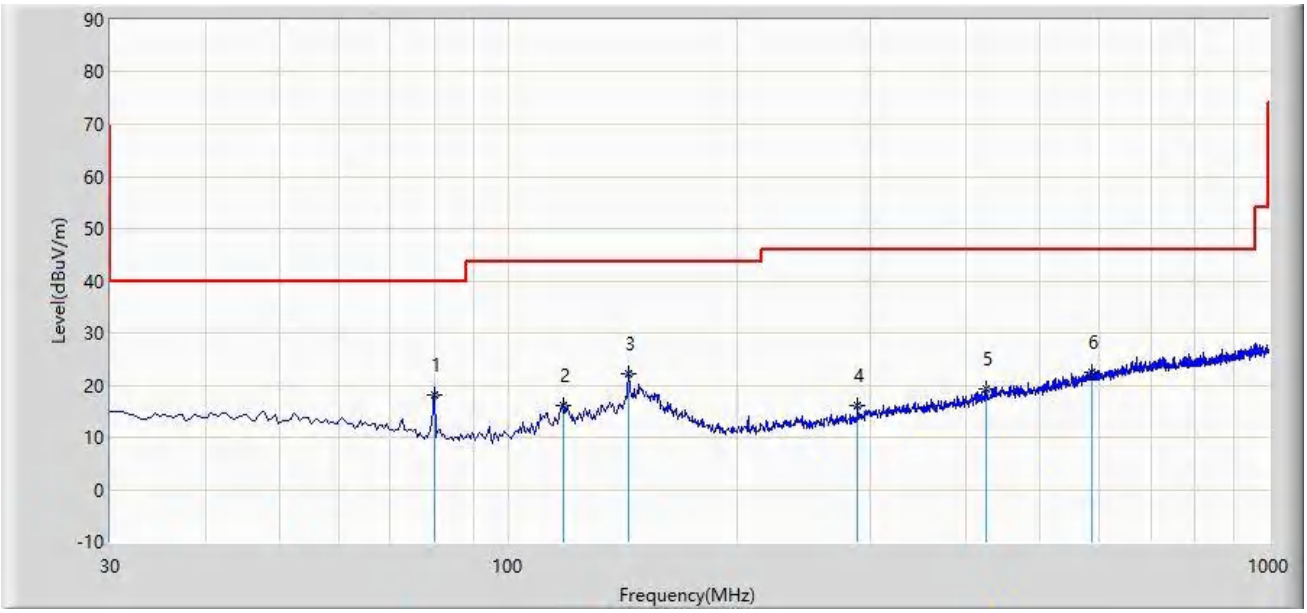
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			112.450	14.317	1.700	-29.183	43.500	12.617	QP
2			143.975	21.974	6.820	-21.526	43.500	15.154	QP
3			207.025	13.360	1.650	-30.140	43.500	11.710	QP
4			304.025	15.032	0.100	-30.968	46.000	14.931	QP
5			465.530	19.593	0.960	-26.407	46.000	18.633	QP
6		*	726.945	25.088	1.900	-20.912	46.000	23.188	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

Site: AC1	Time: 2020/01/15 - 00:20
Limit: FCC_Part15.209_RSE(3m)	Engineer: Jason Gao
Probe: AC1_VULB 9168 _20-2000MHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: By 120V/60Hz
Worst Case Mode: Transmit by 802.11b at Channel 2437MHz (with CDZ12RR Adaptor)	



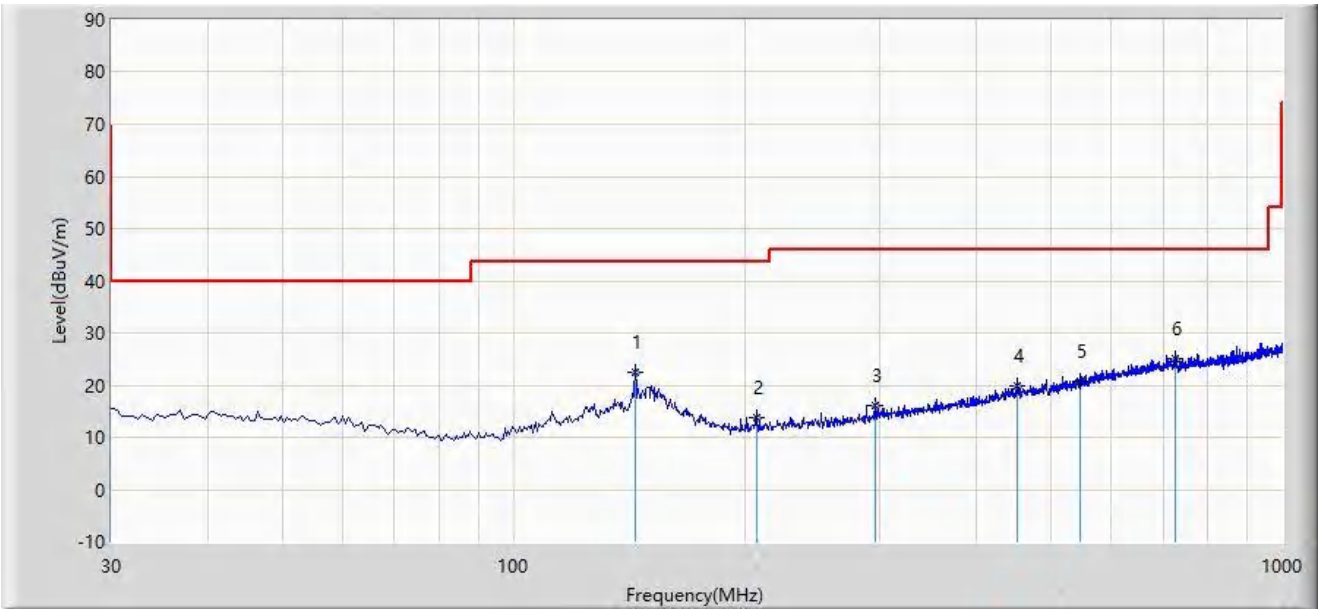
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			79.955	18.052	7.690	-21.948	40.000	10.362	QP
2			118.270	16.051	2.760	-27.449	43.500	13.291	QP
3		*	143.975	22.034	6.880	-21.466	43.500	15.154	QP
4			288.020	16.113	1.580	-29.887	46.000	14.533	QP
5			424.790	19.157	1.340	-26.843	46.000	17.817	QP
6			584.840	22.531	1.670	-23.469	46.000	20.862	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

Site: AC1	Time: 2020/01/14 - 23:58
Limit: FCC_Part15.209_RSE(3m)	Engineer: Jason Gao
Probe: AC1_VULB 9168 _20-2000MHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: By 120V/60Hz
Worst Case Mode: Transmit by 802.11b at Channel 2437MHz (With CDZ11RR Adaptor)	



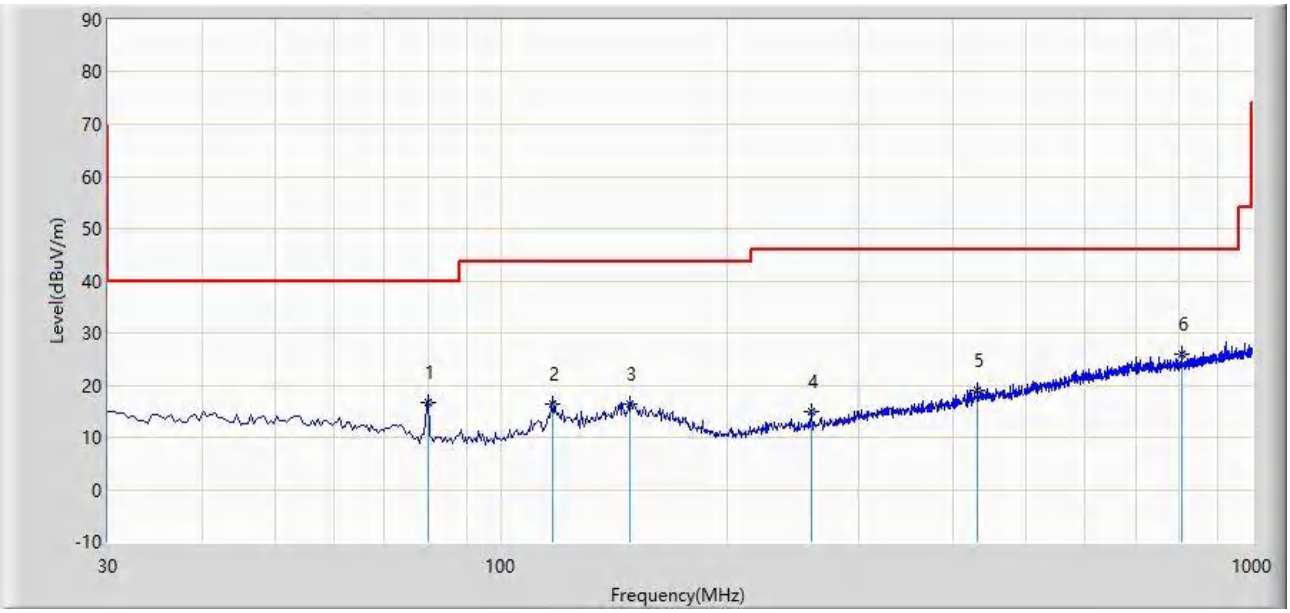
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			143.975	22.394	7.240	-21.106	43.500	15.154	QP
2			207.025	13.850	2.140	-29.650	43.500	11.710	QP
3			295.295	16.056	1.340	-29.944	46.000	14.716	QP
4			451.465	19.951	1.500	-26.049	46.000	18.451	QP
5			545.555	20.741	0.680	-25.259	46.000	20.062	QP
6		*	725.005	24.962	1.800	-21.038	46.000	23.163	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

Site: AC1	Time: 2020/01/15 - 00:09
Limit: FCC_Part15.209_RSE(3m)	Engineer: Jason Gao
Probe: AC1_VULB 9168 _20-2000MHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: By 120V/60Hz
Worst Case Mode: Transmit by 802.11b at Channel 2437MHz (With CDZ11RR Adaptor)	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			79.955	16.602	6.240	-23.398	40.000	10.362	QP
2			117.300	16.457	3.280	-27.043	43.500	13.176	QP
3			148.340	16.244	0.780	-27.256	43.500	15.464	QP
4			258.920	14.912	1.300	-31.088	46.000	13.613	QP
5			430.610	19.076	1.120	-26.924	46.000	17.956	QP
6		*	806.000	25.956	1.870	-20.044	46.000	24.086	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

7.7. Radiated Restricted Band Edge Measurement

7.7.1.Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1] 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41	--	--	--

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

For RSS-Gen Section 8.10 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 8.10 of RSS-Gen, must also comply with the radiated emission limits specified in Section 8.9.

Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.009 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.525225	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	--
8.37625 - 8.38675	1718.8 -1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 -2390	
12.51975 - 12.52025	2483.5 -2500	
12.57675 - 12.57725	2655 - 2900	
13.36 -13.41	3260 - 3267	
16.42 - 16.423	3332 -3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 - 138		

All out of band emissions appearing in a restricted band as specified in Section 8.10 of the RSS-Gen must not exceed the limits shown in Table per Section 8.9.

RSS-Gen Section 8.9		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.7.2.Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

ANSI C63.10 Section 6.6 (Standard test method above 1GHz)

7.7.3.Test Setting

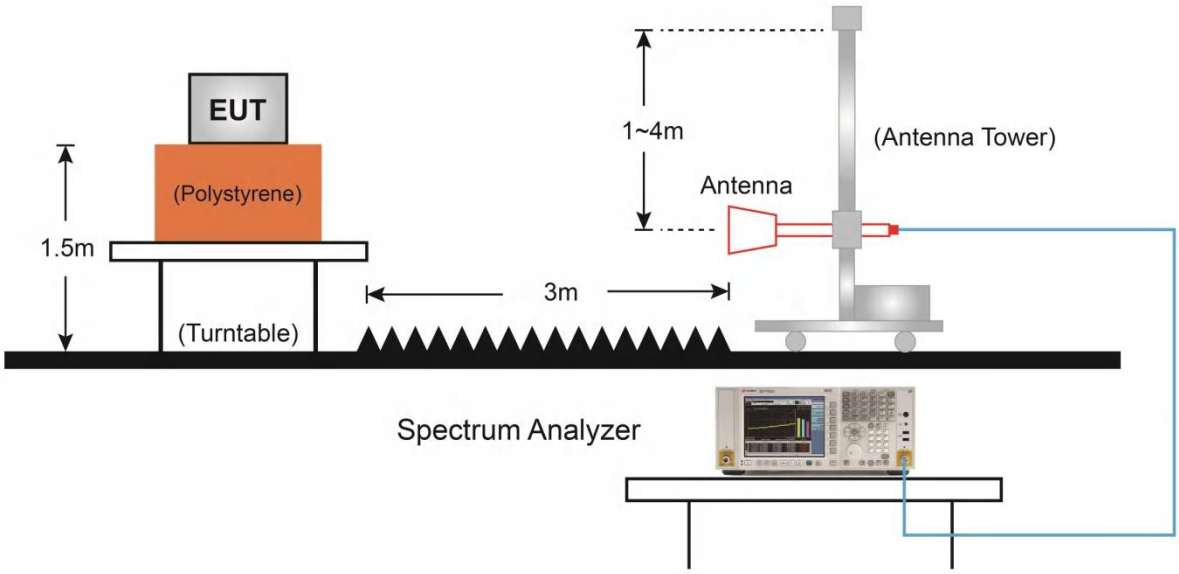
Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Field Strength Measurements

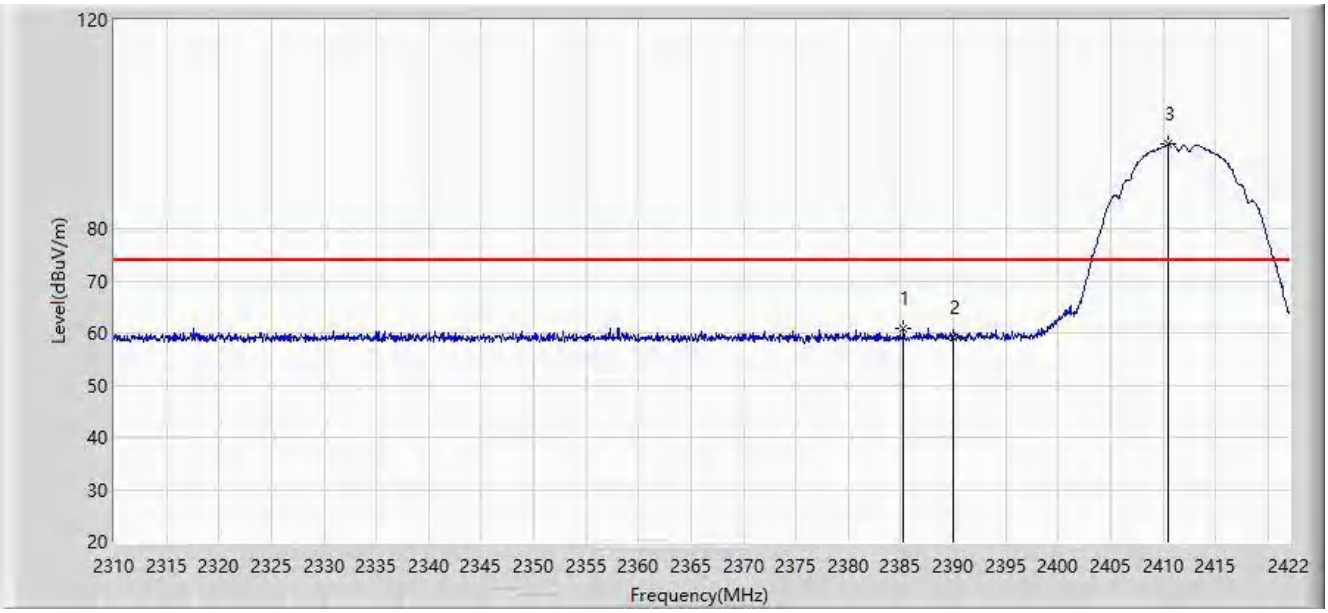
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to “Voltage” regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

7.7.4.Test Setup



7.7.5.Test Result

Site: AC1	Time: 2019/12/19 - 03:58
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at channel 2412MHz	

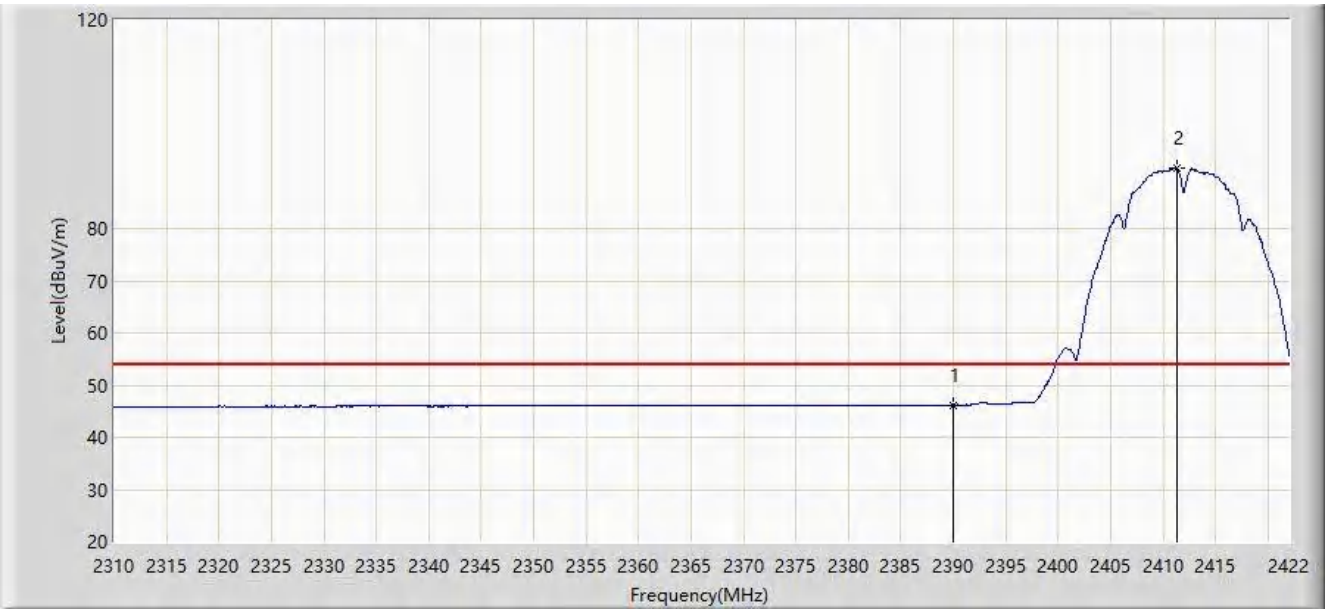


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2385.264	60.850	28.777	-13.150	74.000	32.074	PK
2			2390.000	59.140	27.068	-14.860	74.000	32.072	PK
3		*	2410.464	96.088	64.008	N/A	N/A	32.081	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2019/12/19 - 04:07
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at channel 2412MHz	

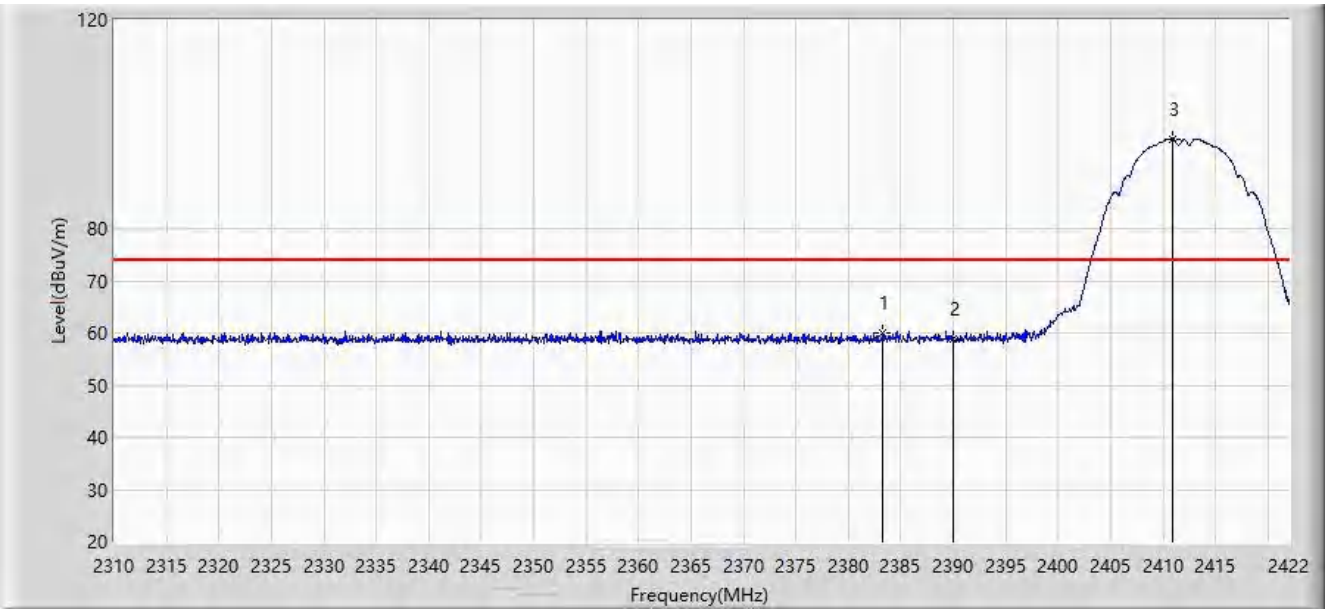


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.226	14.154	-7.774	54.000	32.072	AV
2		*	2411.304	91.735	59.653	N/A	N/A	32.082	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/19 - 04:07
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at channel 2412MHz	

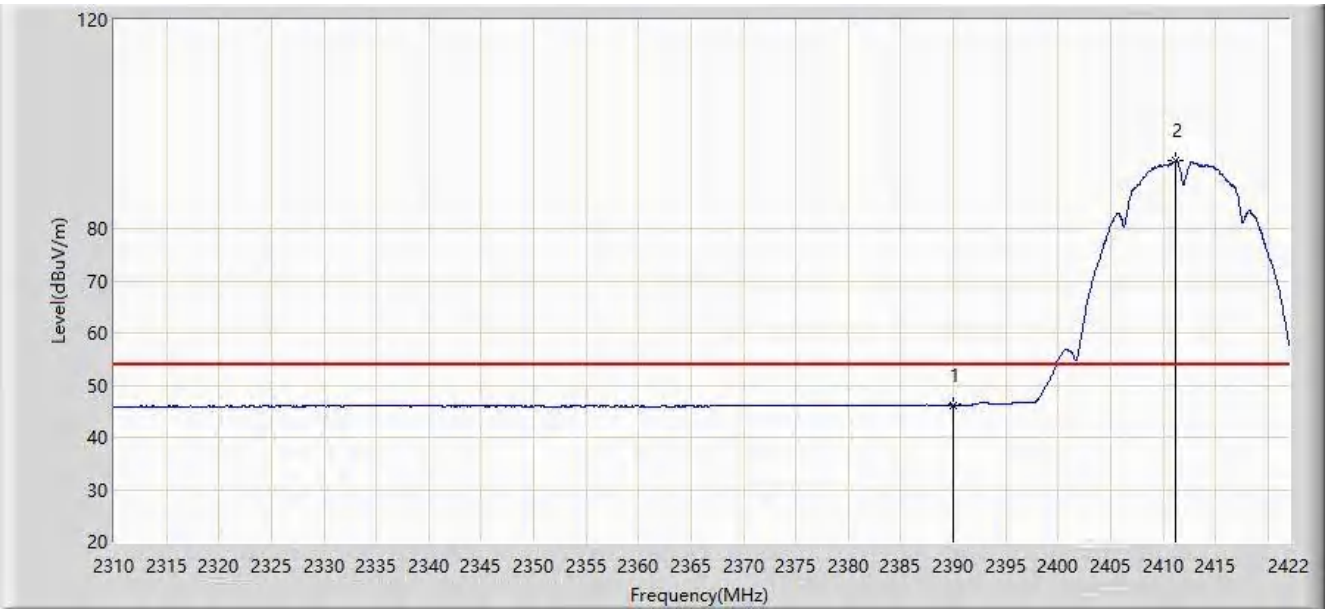


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2383.304	60.104	28.030	-13.896	74.000	32.074	PK
2			2390.000	58.936	26.864	-15.064	74.000	32.072	PK
3		*	2410.968	97.214	65.133	N/A	N/A	32.081	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/19 - 04:08
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at channel 2412MHz	

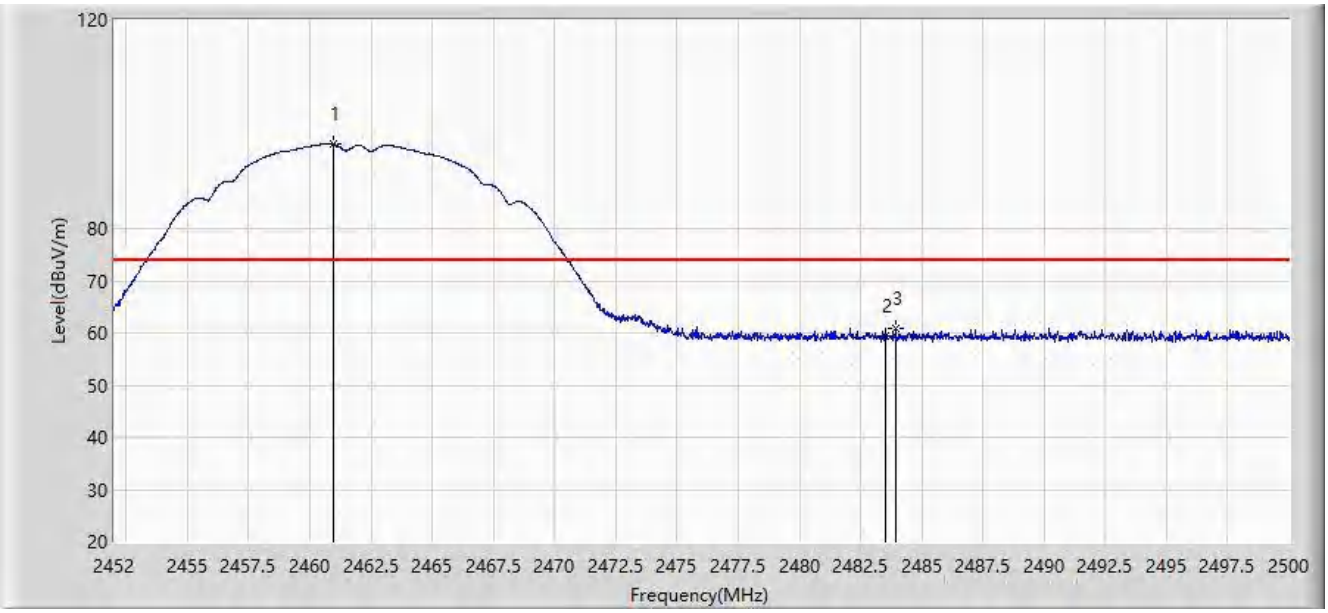


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.194	14.122	-7.806	54.000	32.072	AV
2		*	2411.136	92.899	60.818	N/A	N/A	32.081	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/19 - 16:56
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at channel 2462MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.952	96.251	64.171	N/A	N/A	32.080	PK
2			2483.500	59.392	27.355	-14.608	74.000	32.037	PK
3			2483.944	60.920	28.884	-13.080	74.000	32.036	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

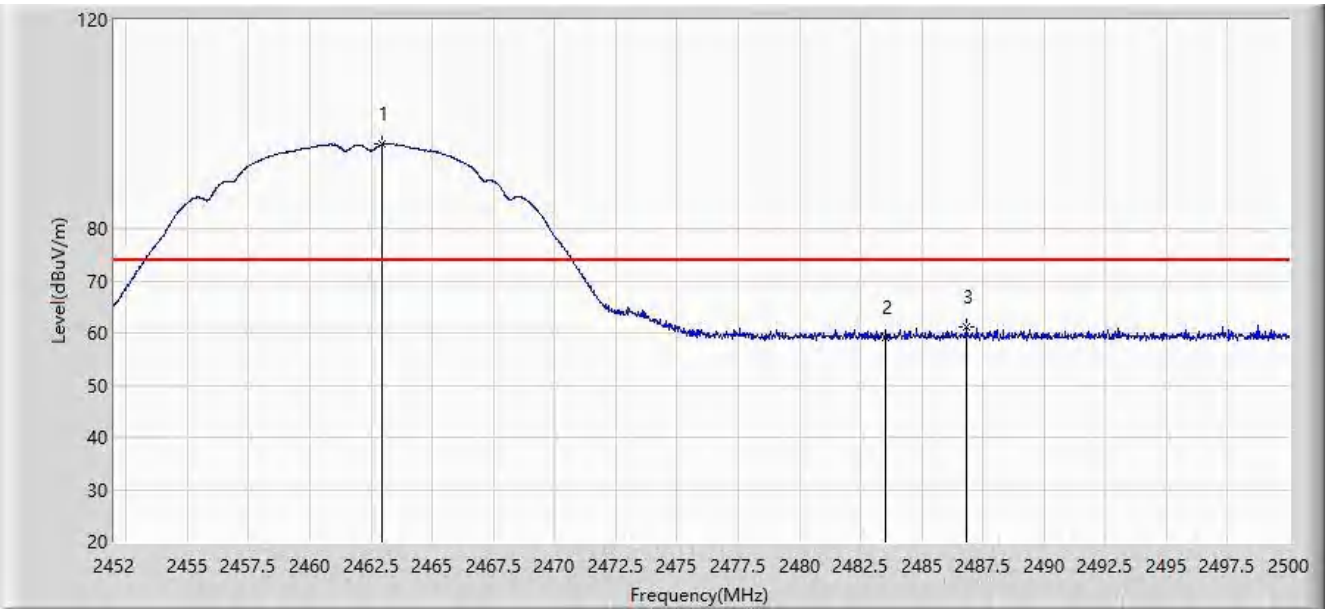
Site: AC1	Time: 2019/12/19 - 17:10
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.312	92.004	59.924	N/A	N/A	32.080	AV
2			2483.500	46.240	14.203	-7.760	54.000	32.037	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/19 - 17:14
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at channel 2462MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2462.944	96.098	64.019	N/A	N/A	32.079	PK
2			2483.500	59.211	27.174	-14.789	74.000	32.037	PK
3			2486.800	61.183	29.152	-12.817	74.000	32.031	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

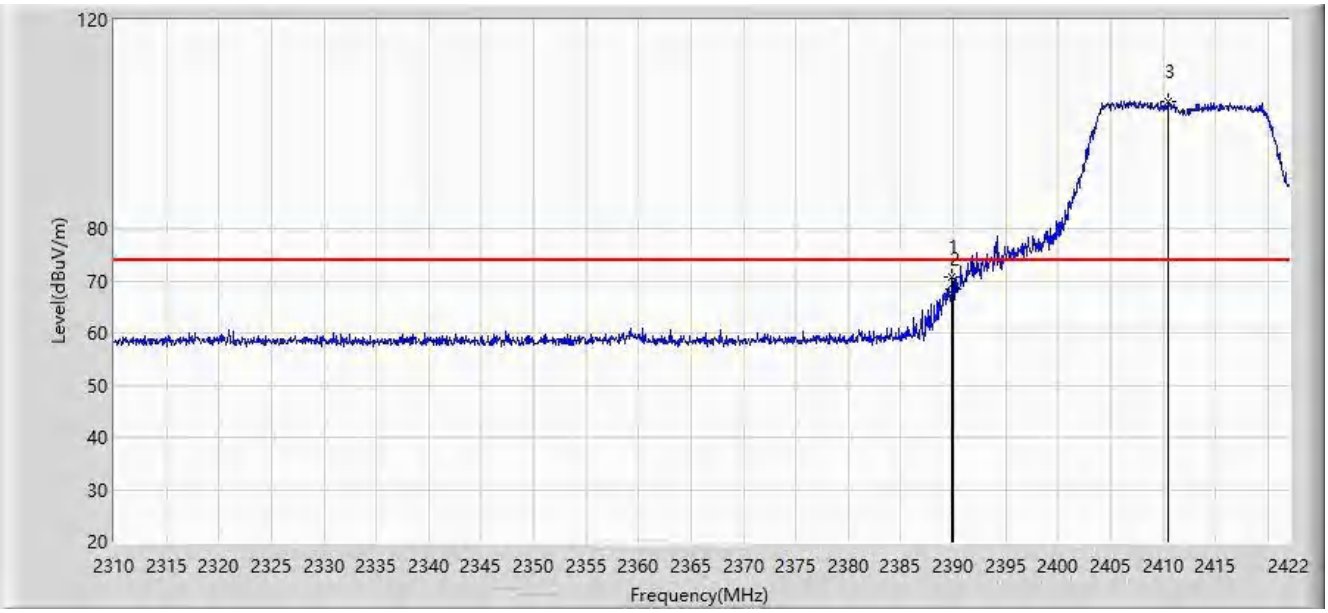
Site: AC1	Time: 2019/12/19 - 17:17
Limit: FCC_Part15_Band Edge(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.120	91.896	59.816	N/A	N/A	32.080	AV
2			2483.500	46.270	14.233	-7.730	54.000	32.037	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:03
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2412MHz	

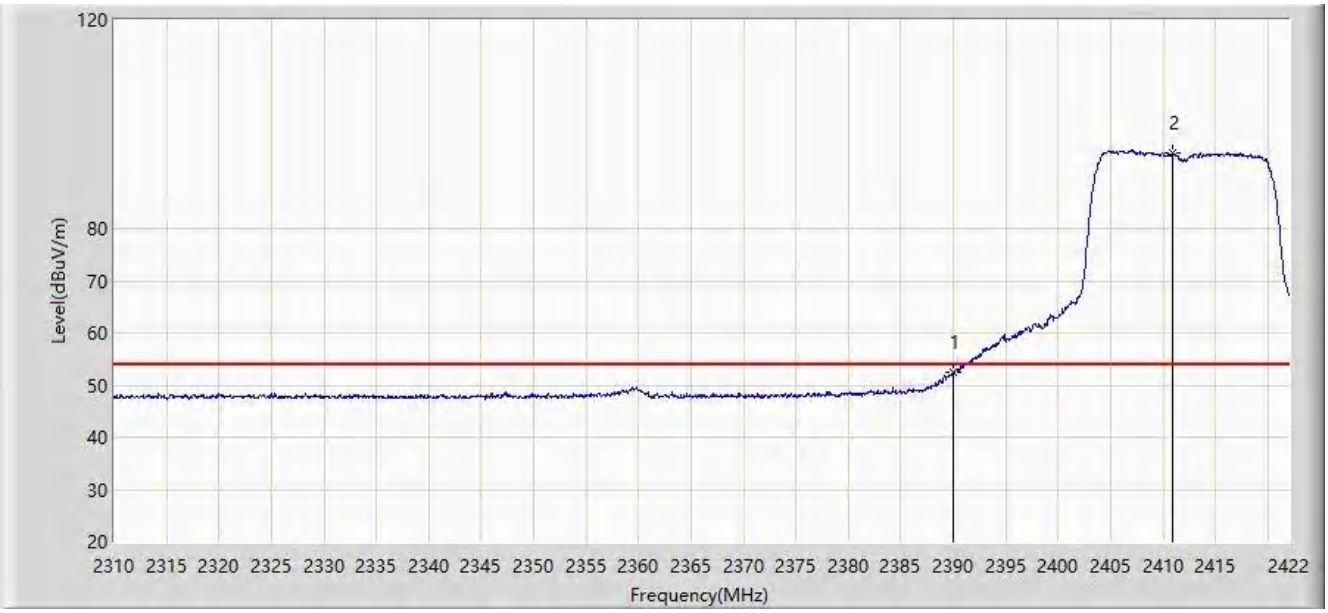


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.912	70.727	38.655	-3.273	74.000	32.072	PK
2			2390.000	68.406	36.334	-5.594	74.000	32.072	PK
3		*	2410.520	104.472	72.391	N/A	N/A	32.081	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:04
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2412MHz	

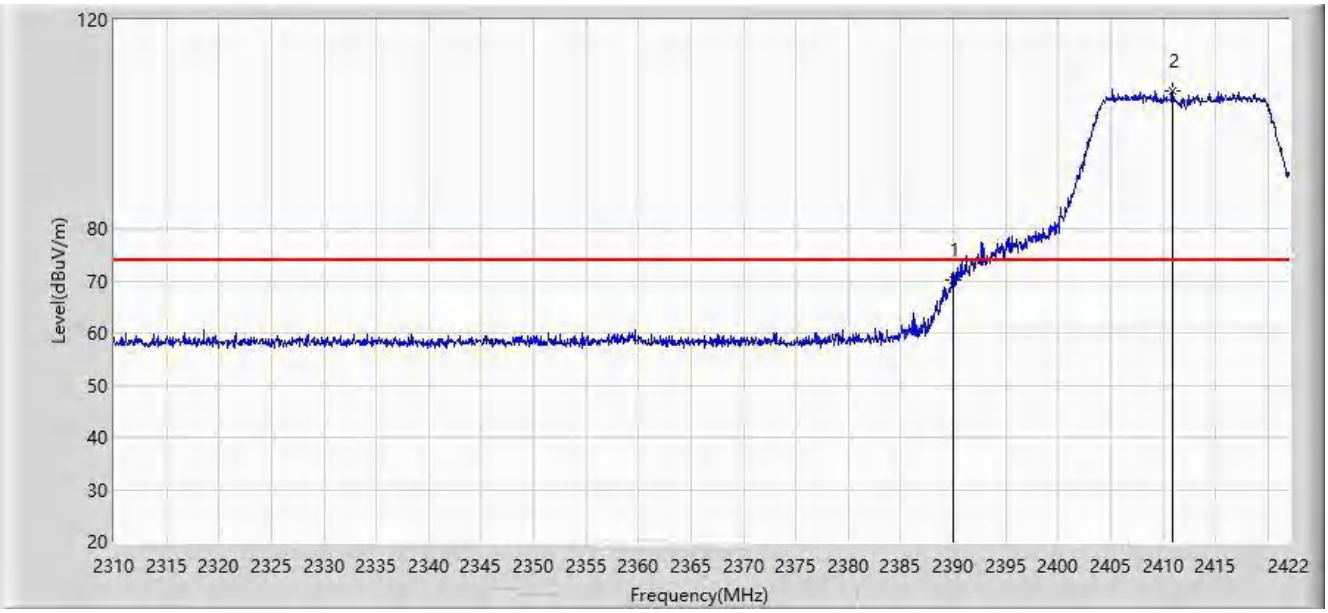


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	52.329	20.257	-1.671	54.000	32.072	AV
2		*	2410.912	94.405	62.324	N/A	N/A	32.081	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:02
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2412MHz	

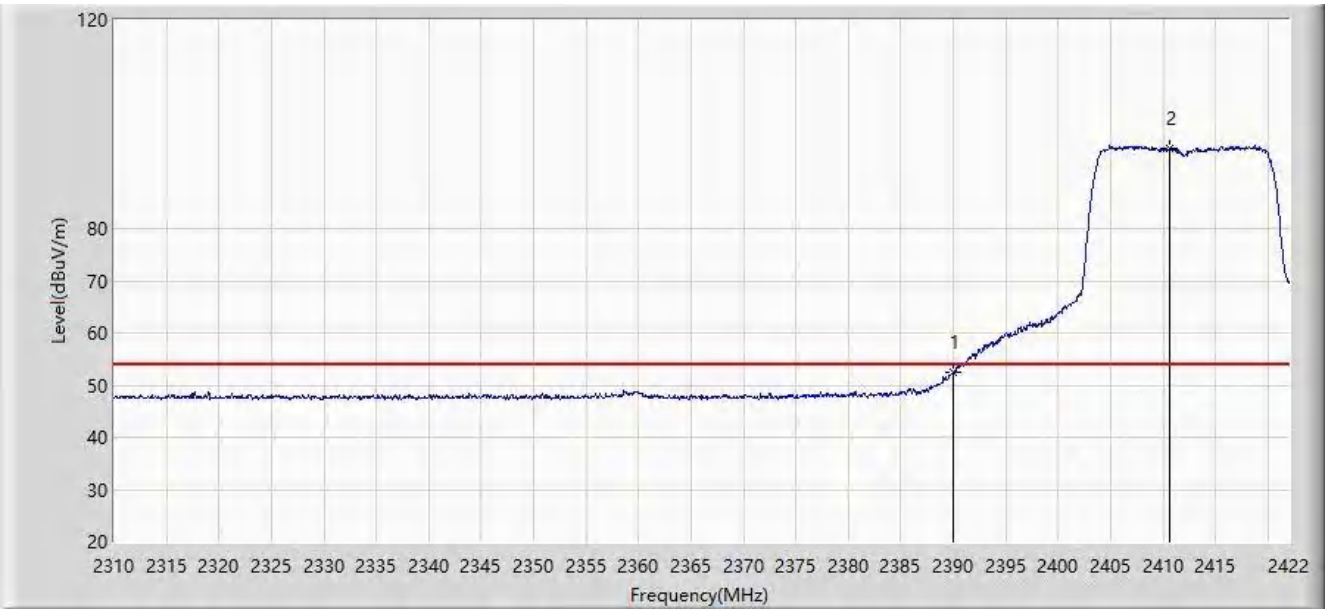


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	70.117	38.045	-3.883	74.000	32.072	PK
2		*	2410.856	106.264	74.183	N/A	N/A	32.080	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:02
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2412MHz	

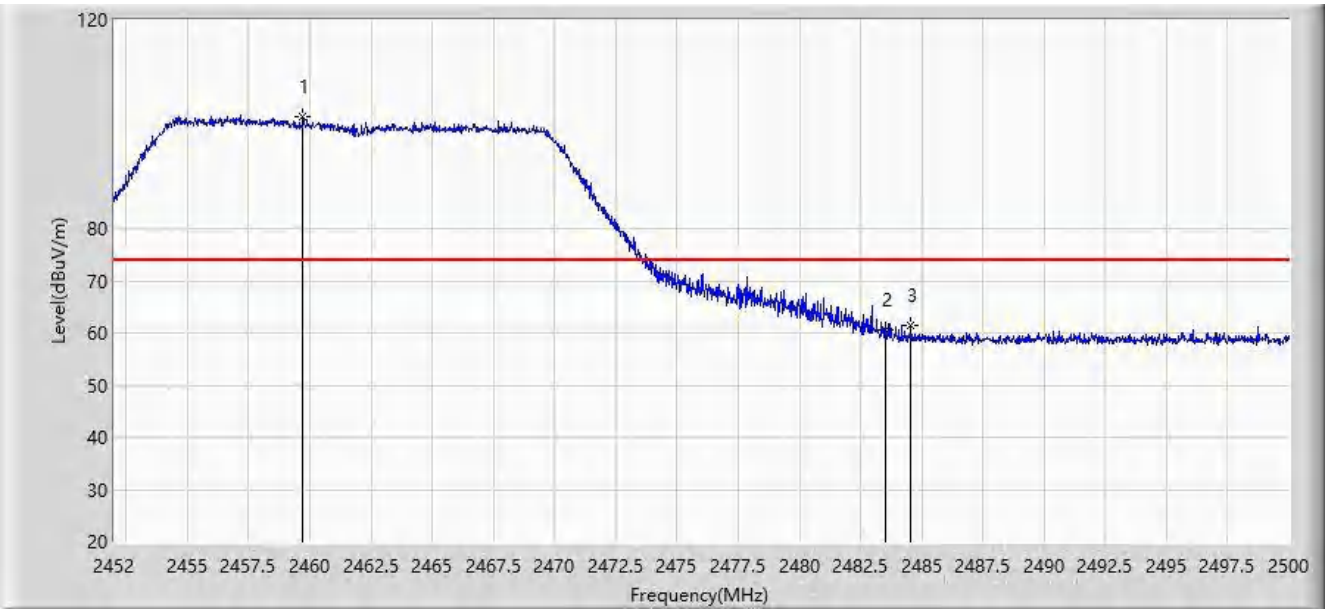


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	52.325	20.253	-1.675	54.000	32.072	AV
2		*	2410.632	95.398	63.317	N/A	N/A	32.081	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:07
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2462MHz	

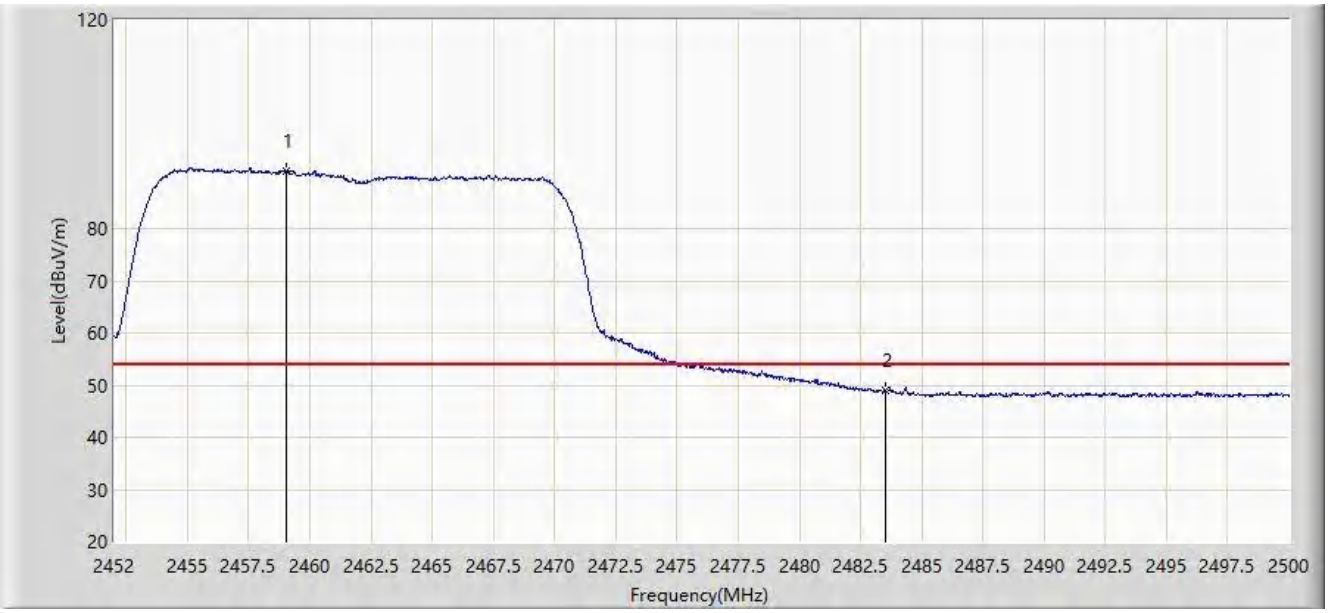


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2459.728	101.391	69.311	N/A	N/A	32.080	PK
2			2483.500	60.484	28.447	-13.516	74.000	32.037	PK
3			2484.568	61.482	29.447	-12.518	74.000	32.035	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:08
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2462MHz	

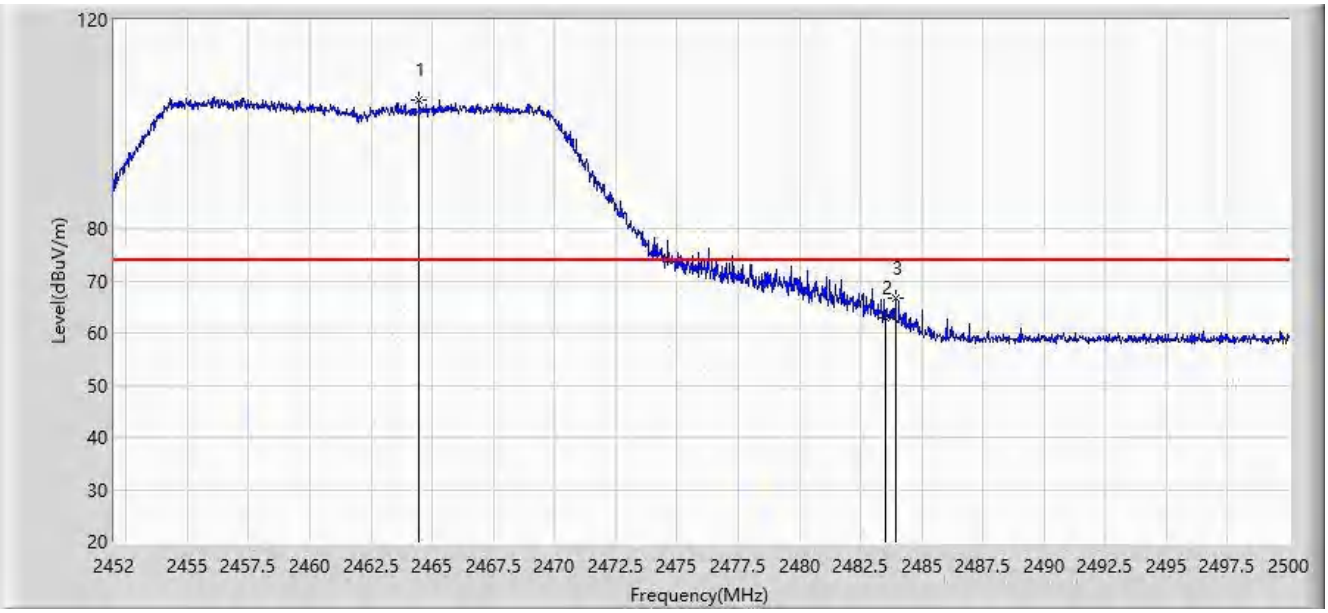


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2459.056	91.038	58.959	N/A	N/A	32.080	AV
2			2483.500	48.935	16.898	-5.065	54.000	32.037	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:09
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2462MHz	

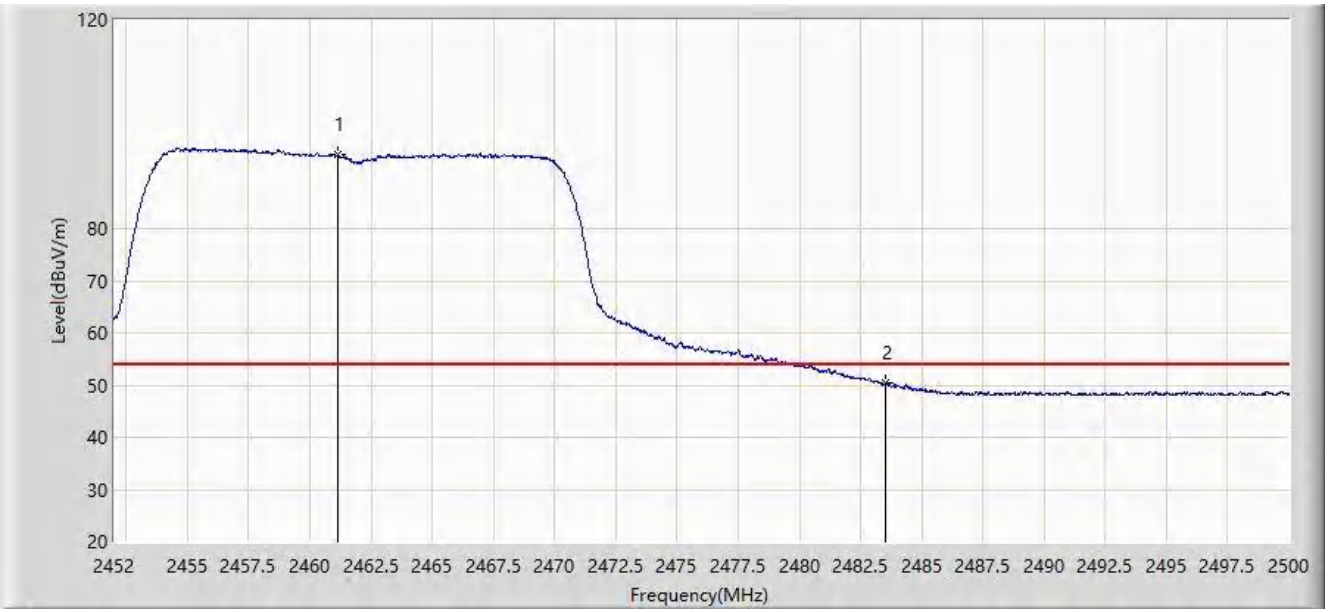


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2464.480	104.646	72.571	N/A	N/A	32.075	PK
2			2483.500	62.838	30.801	-11.162	74.000	32.037	PK
3			2483.944	66.723	34.687	-7.277	74.000	32.036	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:10
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2462MHz	

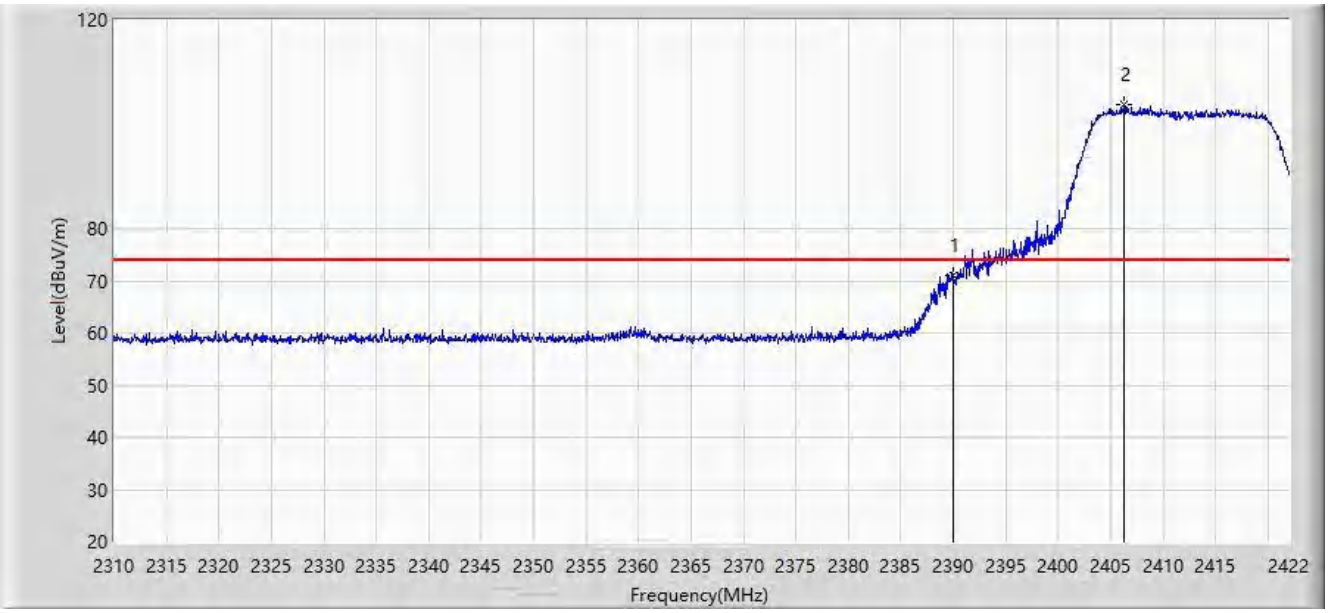


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.168	94.153	62.073	N/A	N/A	32.081	AV
2			2483.500	50.303	18.266	-3.697	54.000	32.037	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:15
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at channel 2412MHz	

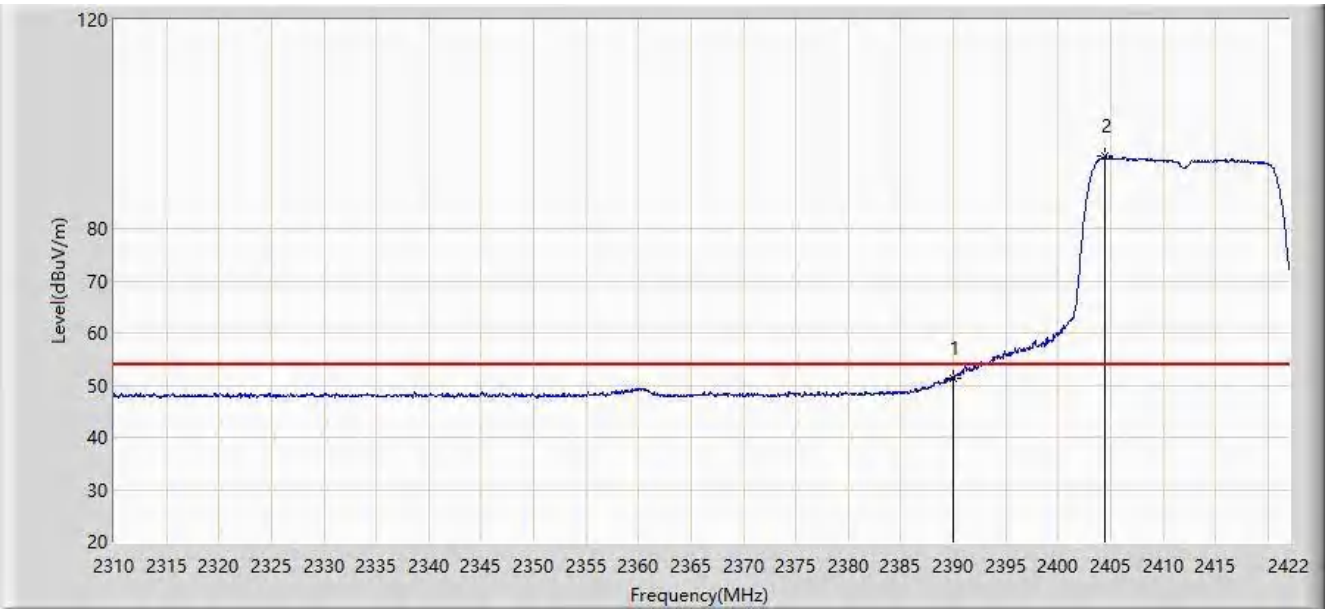


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	71.110	39.038	-2.890	74.000	32.072	PK
2		*	2406.320	103.747	71.669	N/A	N/A	32.078	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:17
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at channel 2412MHz	

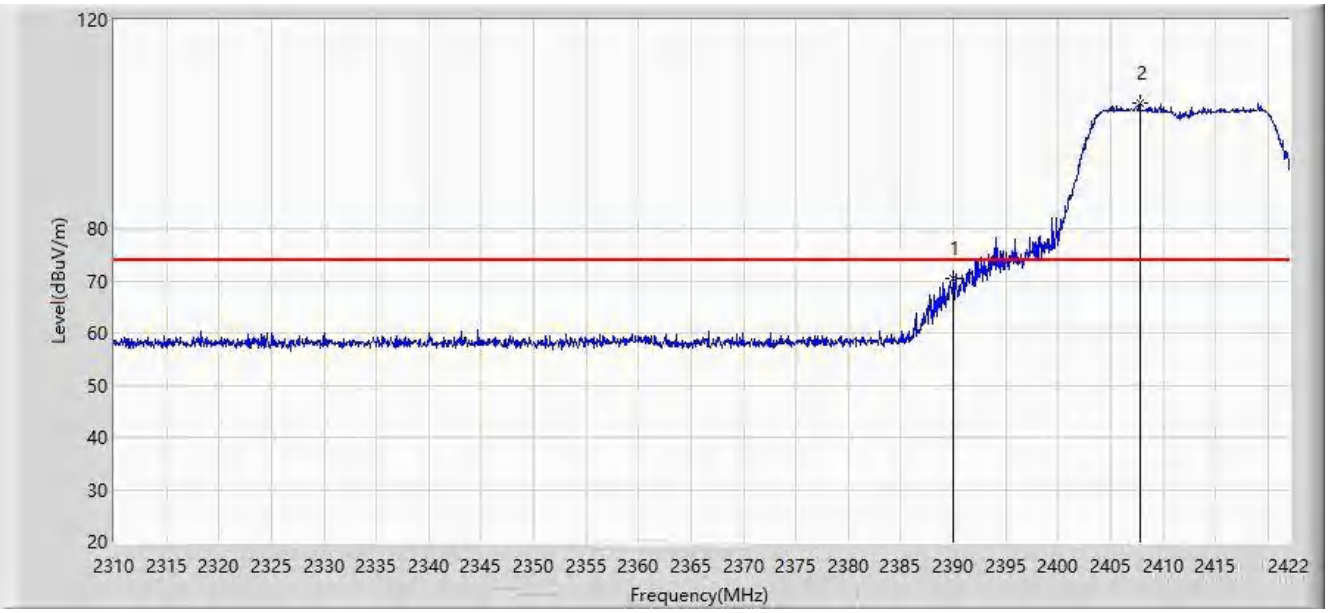


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	51.372	19.300	-2.628	54.000	32.072	AV
2		*	2404.472	93.824	61.747	N/A	N/A	32.077	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:12
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at channel 2412MHz	

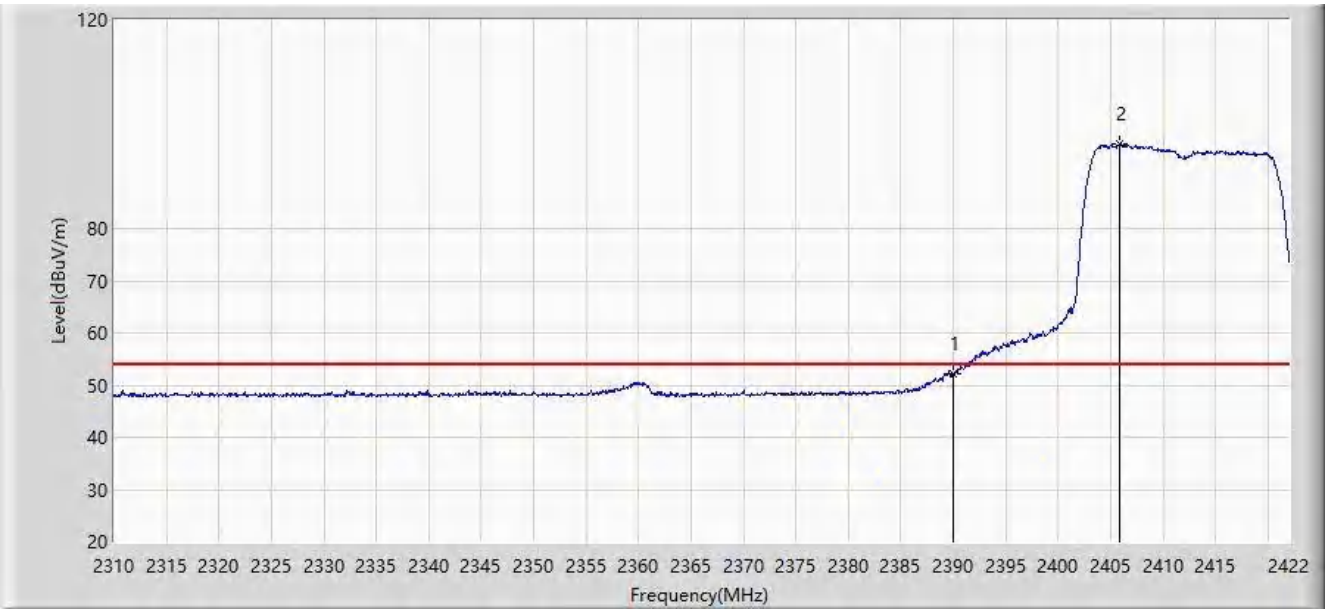


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	70.416	38.344	-3.584	74.000	32.072	PK
2		*	2407.776	104.007	71.928	N/A	N/A	32.079	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:13
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at channel 2412MHz	

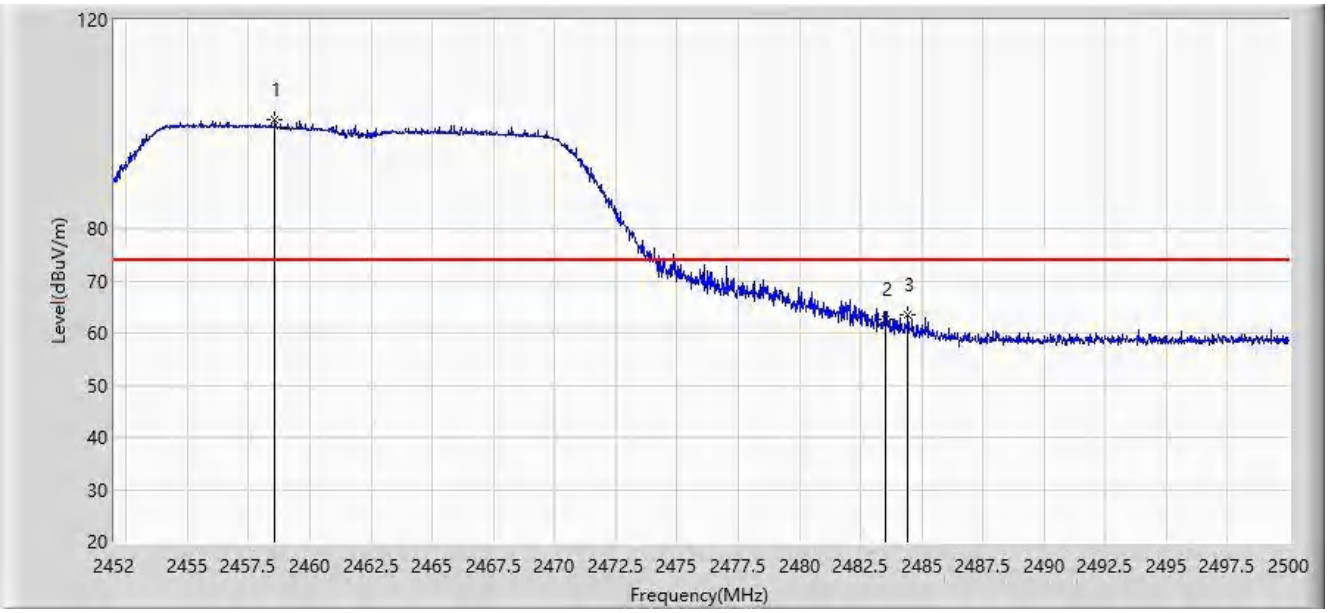


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	52.164	20.092	-1.836	54.000	32.072	AV
2		*	2405.928	96.148	64.070	N/A	N/A	32.077	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:17
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

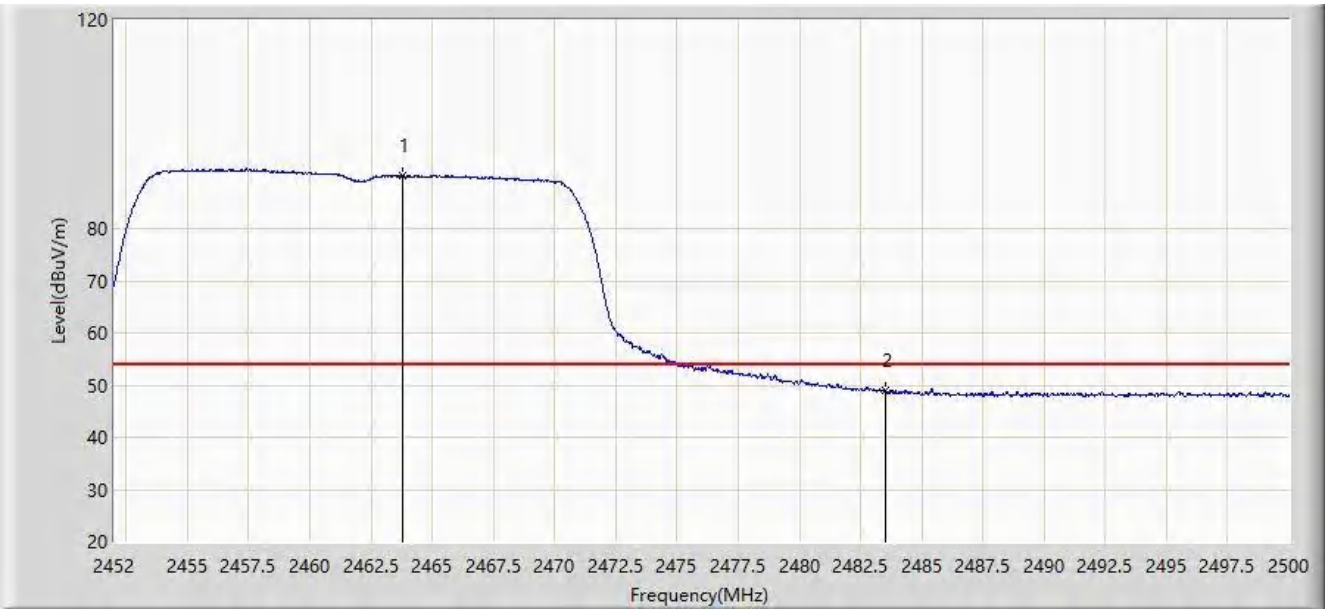


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2458.576	101.014	68.935	N/A	N/A	32.079	PK
2			2483.500	62.637	30.600	-11.363	74.000	32.037	PK
3			2484.448	63.453	31.418	-10.547	74.000	32.035	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:19
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

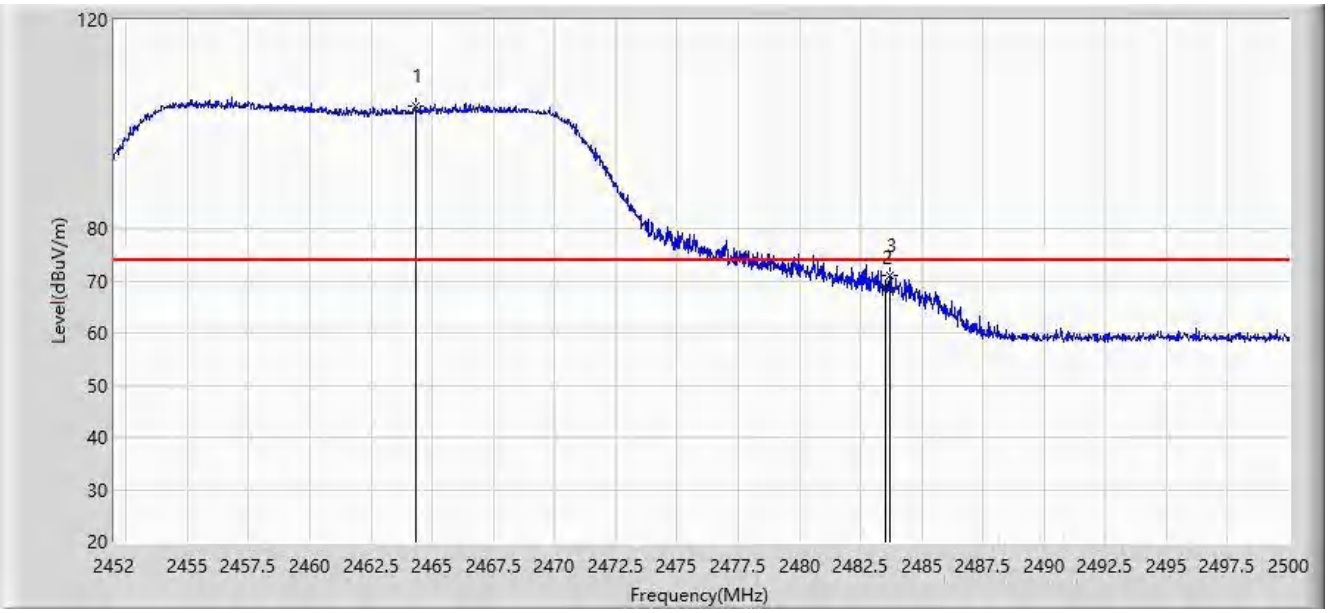


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2463.808	90.047	57.970	N/A	N/A	32.077	AV
2			2483.500	49.041	17.004	-4.959	54.000	32.037	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:20
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

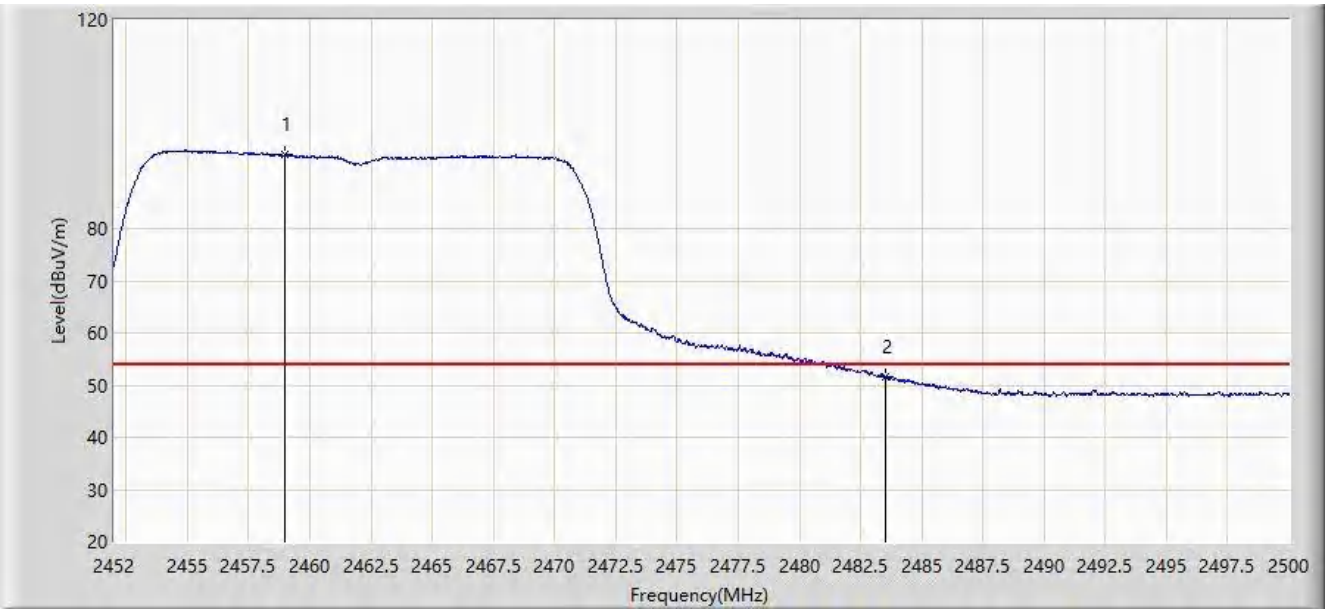


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2464.312	103.572	71.496	N/A	N/A	32.075	PK
2			2483.500	68.557	36.520	-5.443	74.000	32.037	PK
3			2483.728	71.045	39.008	-2.955	74.000	32.036	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:22
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

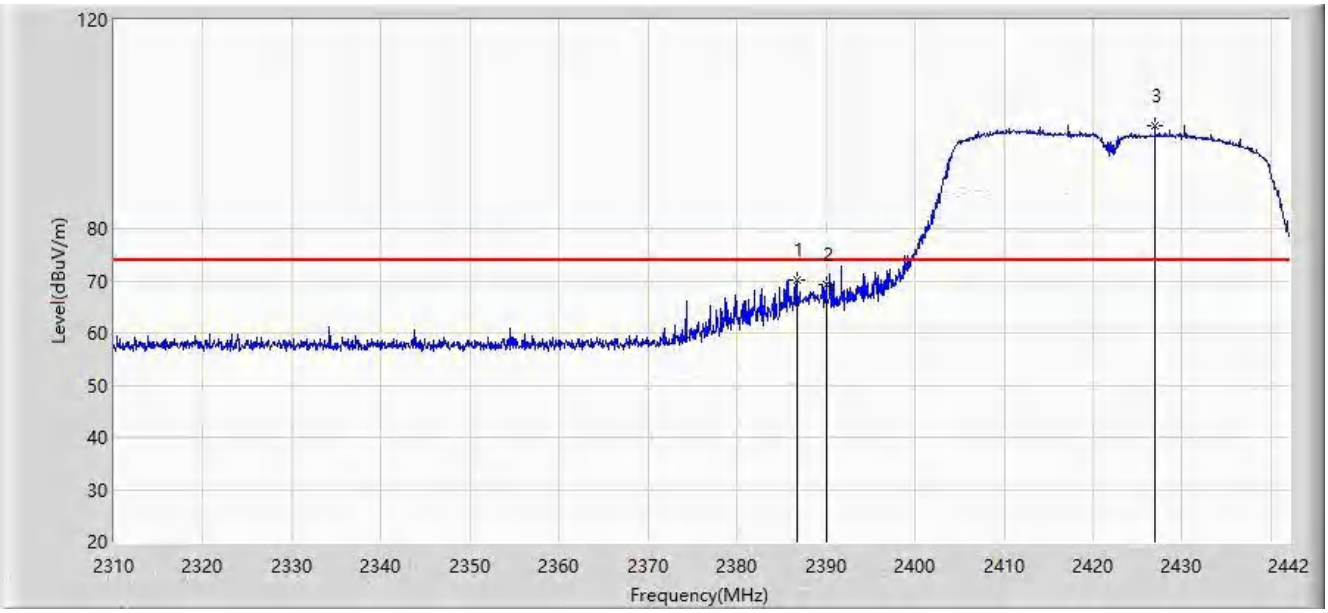


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2458.984	94.083	62.004	N/A	N/A	32.079	AV
2			2483.500	51.614	19.577	-2.386	54.000	32.037	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:26
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT40 at channel 2422MHz	

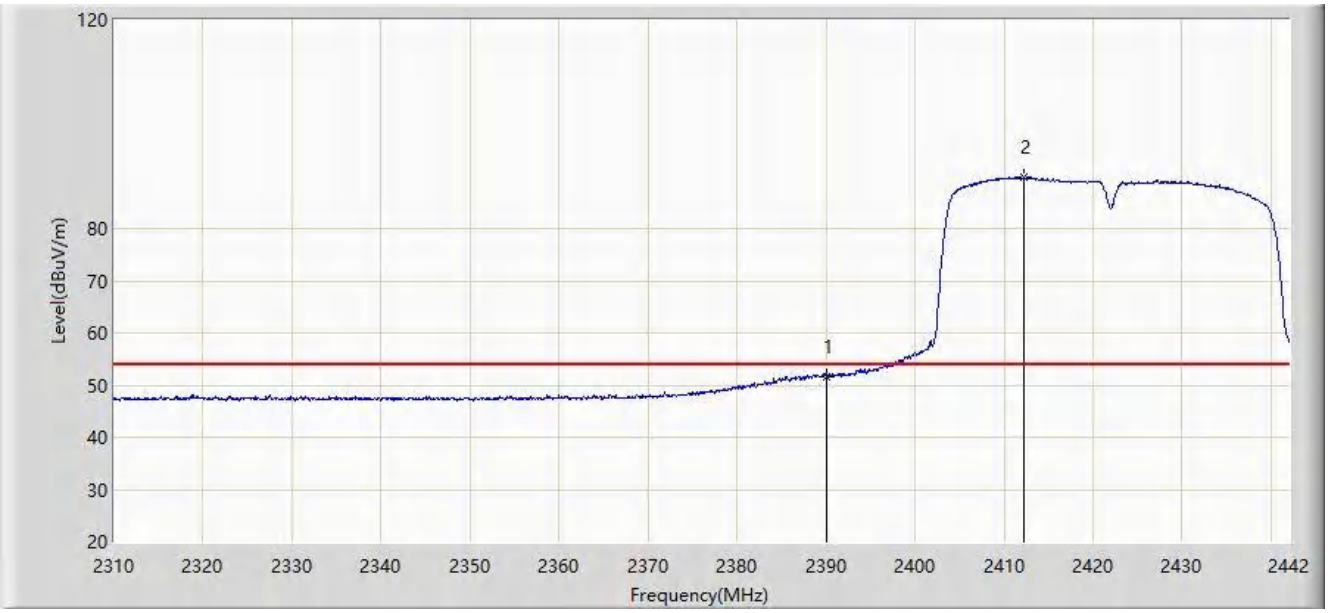


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2386.692	70.084	38.011	-3.916	74.000	32.073	PK
2			2390.000	69.276	37.204	-4.724	74.000	32.072	PK
3		*	2426.952	99.636	67.513	N/A	N/A	32.123	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:28
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT40 at channel 2422MHz	

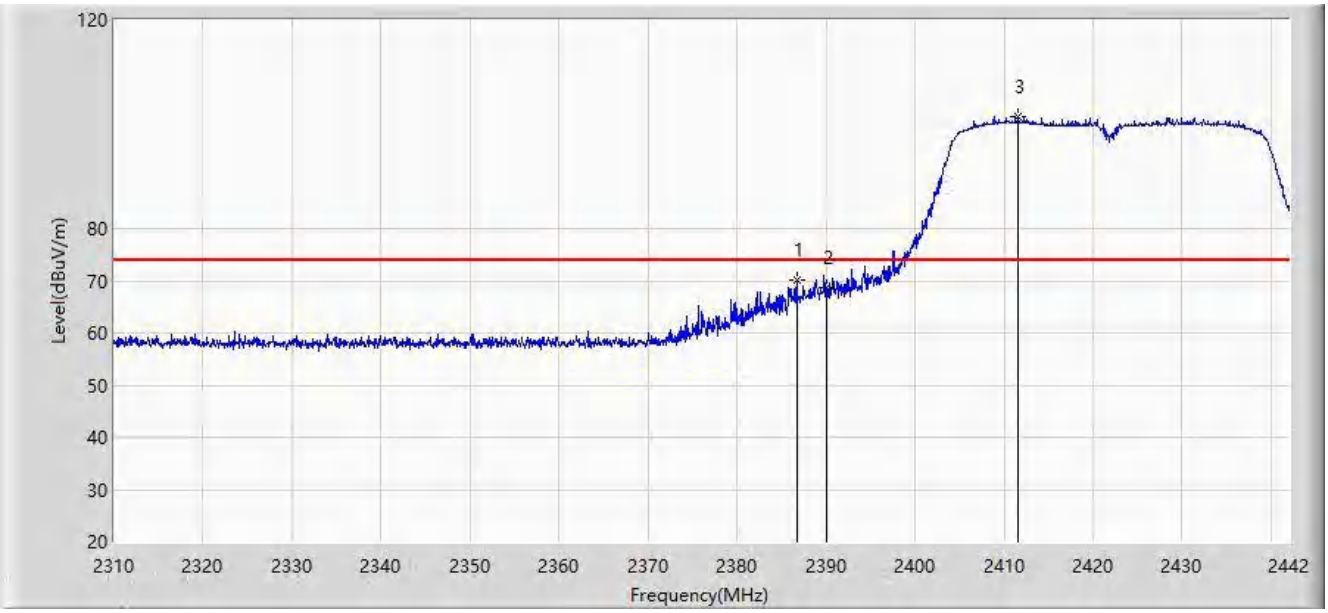


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	51.718	19.646	-2.282	54.000	32.072	AV
2		*	2412.234	89.737	57.653	N/A	N/A	32.084	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:24
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT40 at channel 2422MHz	

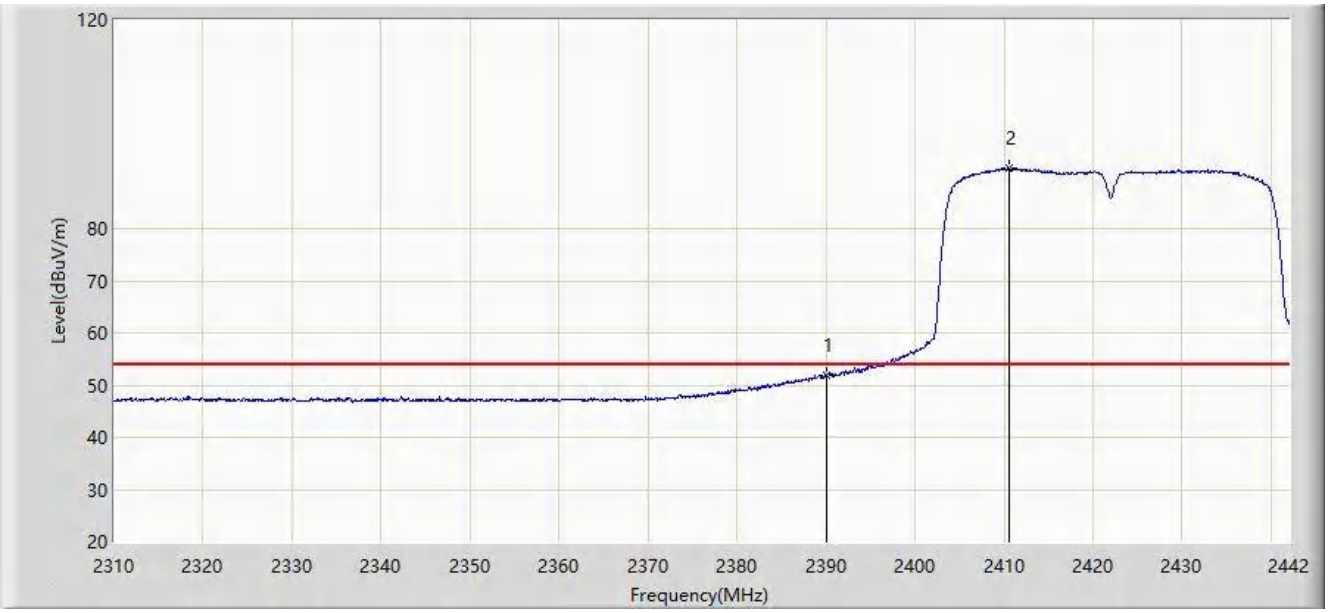


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2386.692	70.145	38.072	-3.855	74.000	32.073	PK
2			2390.000	68.633	36.561	-5.367	74.000	32.072	PK
3		*	2411.640	101.551	69.468	N/A	N/A	32.082	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/24 - 23:25
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT40 at channel 2422MHz	

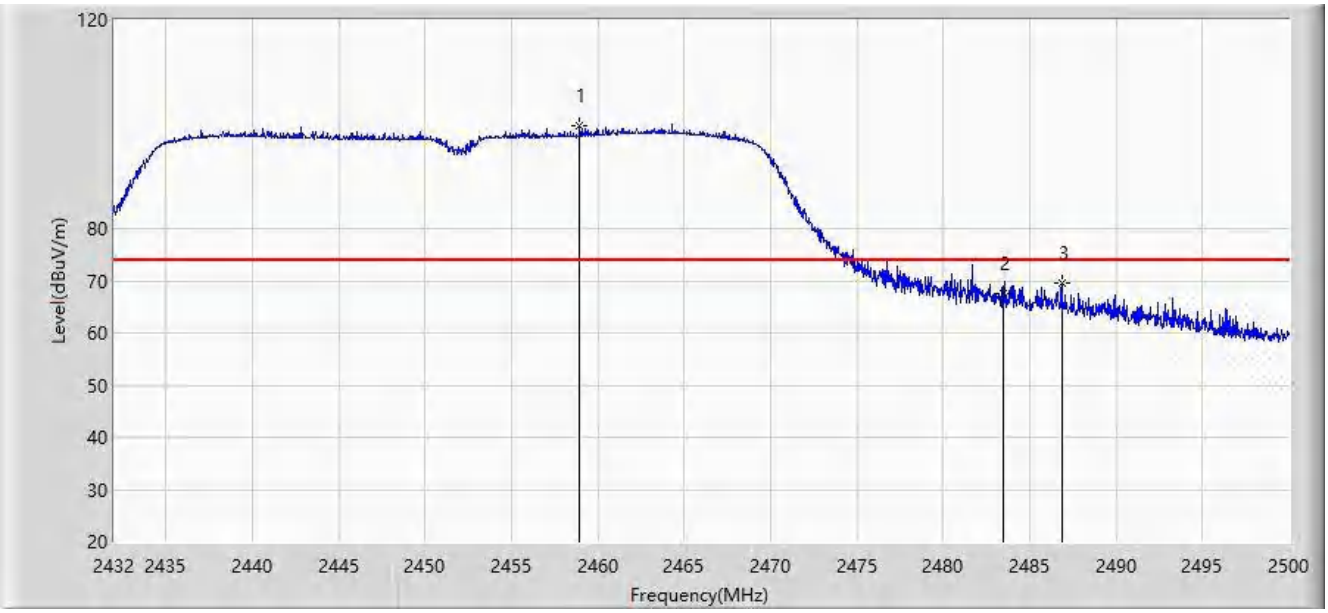


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	51.939	19.867	-2.061	54.000	32.072	AV
2		*	2410.650	91.673	59.592	N/A	N/A	32.081	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/19 - 19:25
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT40 at channel 2452MHz	

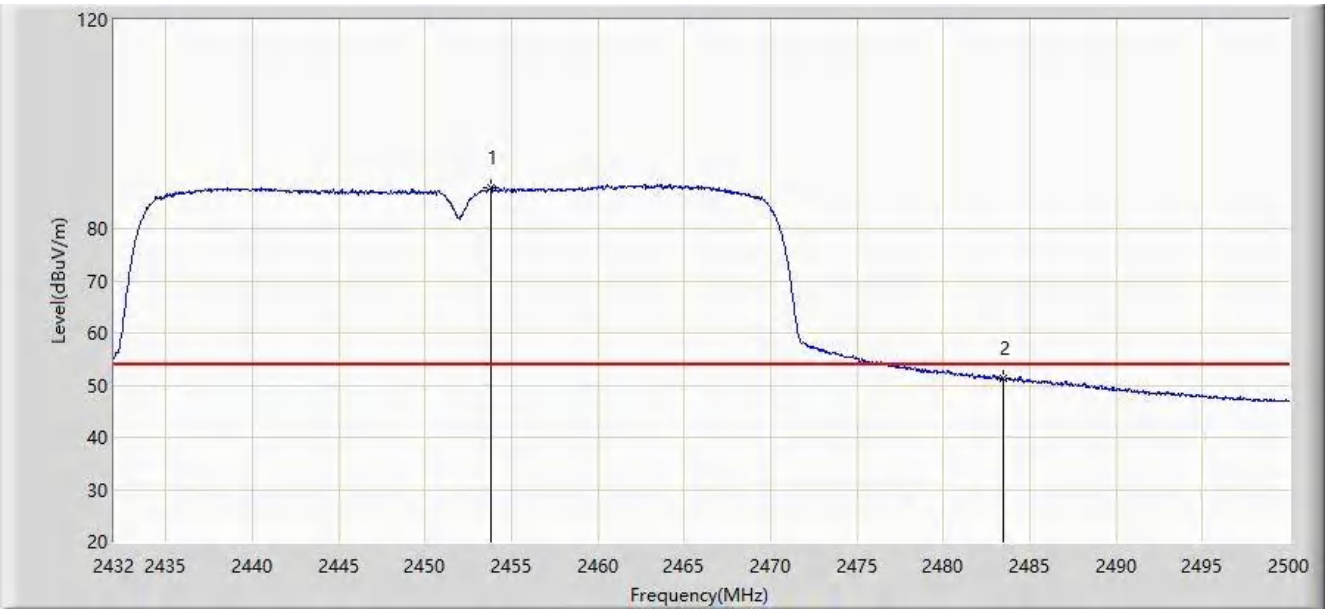


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2458.962	99.674	67.595	N/A	N/A	32.079	PK
2			2483.500	67.435	35.398	-6.565	74.000	32.037	PK
3			2486.842	69.429	37.398	-4.571	74.000	32.031	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/19 - 19:26
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT40 at channel 2452MHz	

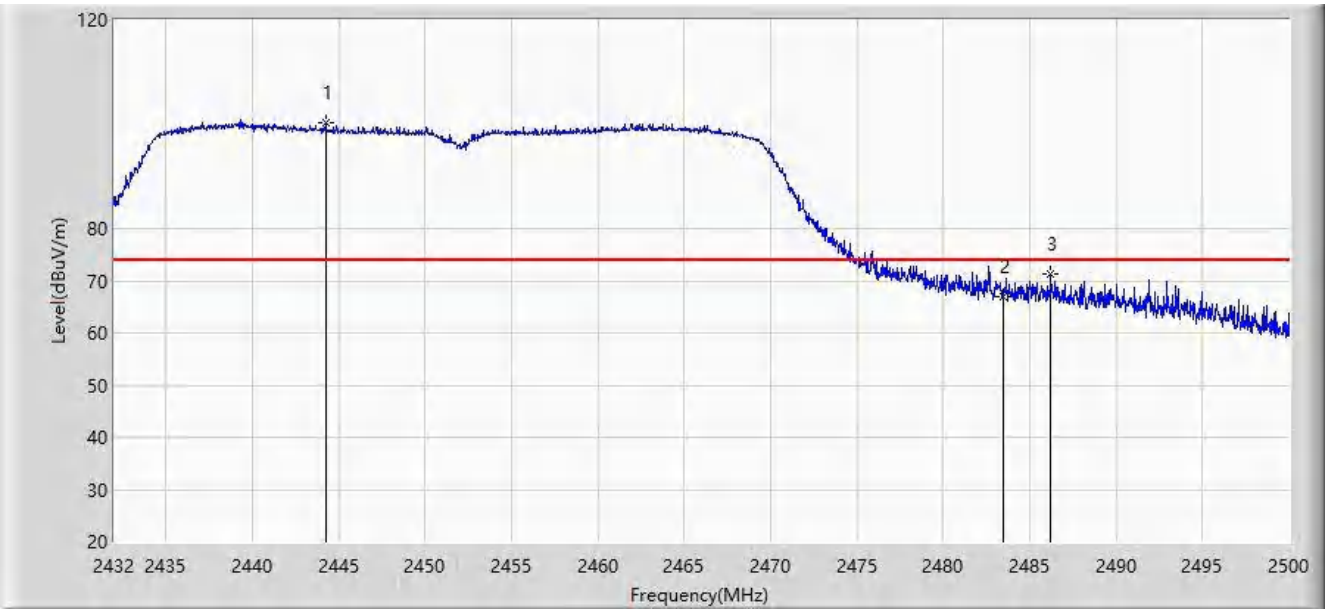


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2453.828	87.867	55.790	N/A	N/A	32.077	AV
2			2483.500	51.275	19.238	-2.725	54.000	32.037	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/19 - 19:25
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT40 at channel 2452MHz	

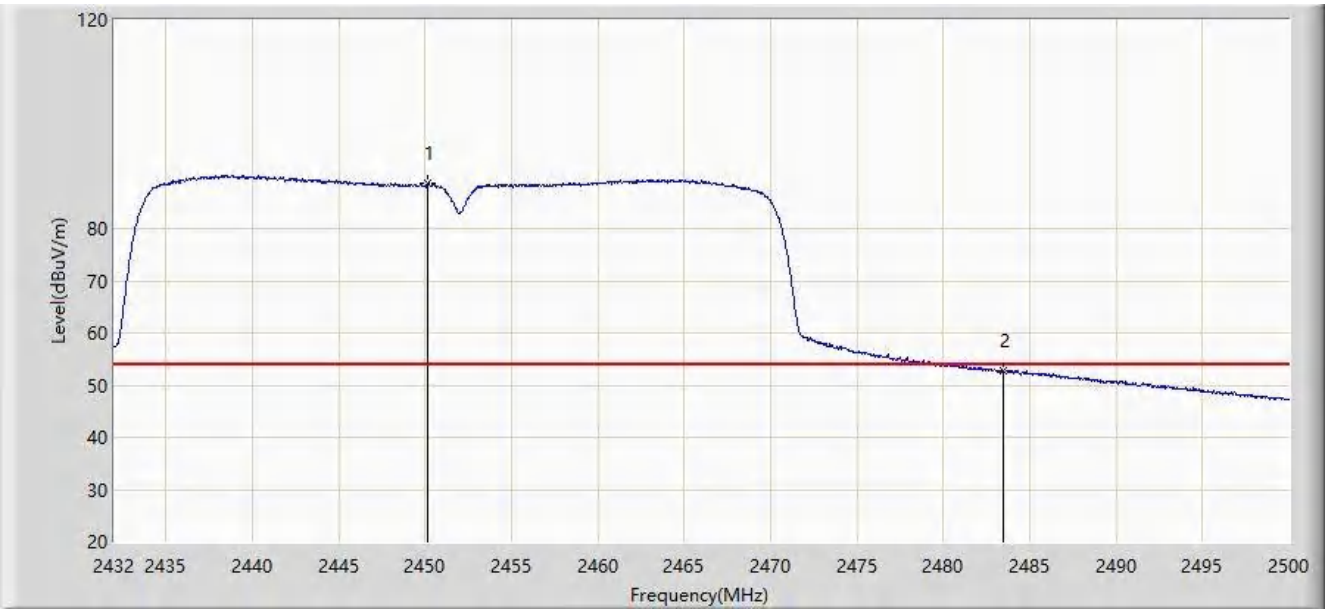


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2444.274	100.351	68.275	N/A	N/A	32.076	PK
2			2483.500	67.094	35.057	-6.906	74.000	32.037	PK
3			2486.230	71.185	39.153	-2.815	74.000	32.032	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2019/12/19 - 19:24
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT40 at channel 2452MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2450.190	88.661	56.585	N/A	N/A	32.076	AV
2			2483.500	52.835	20.798	-1.165	54.000	32.037	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

7.8. AC Conducted Emissions Measurement

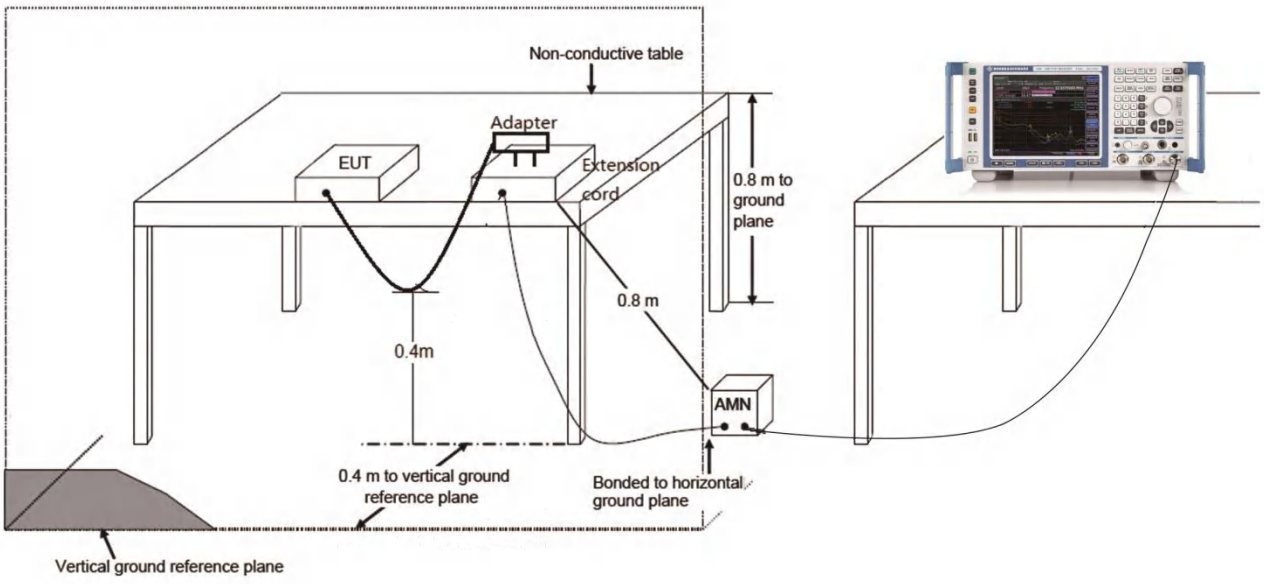
7.8.1.Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 to 56Note 1	56 to 46Note 1
0.50 - 5.0	56	46
5.0 - 30	60	50

RSS-GEN 8.8 AC power-line conducted emissions limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 to 56Note 1	56 to 46Note 1
0.50 - 5.0	56	46
5.0 - 30	60	50

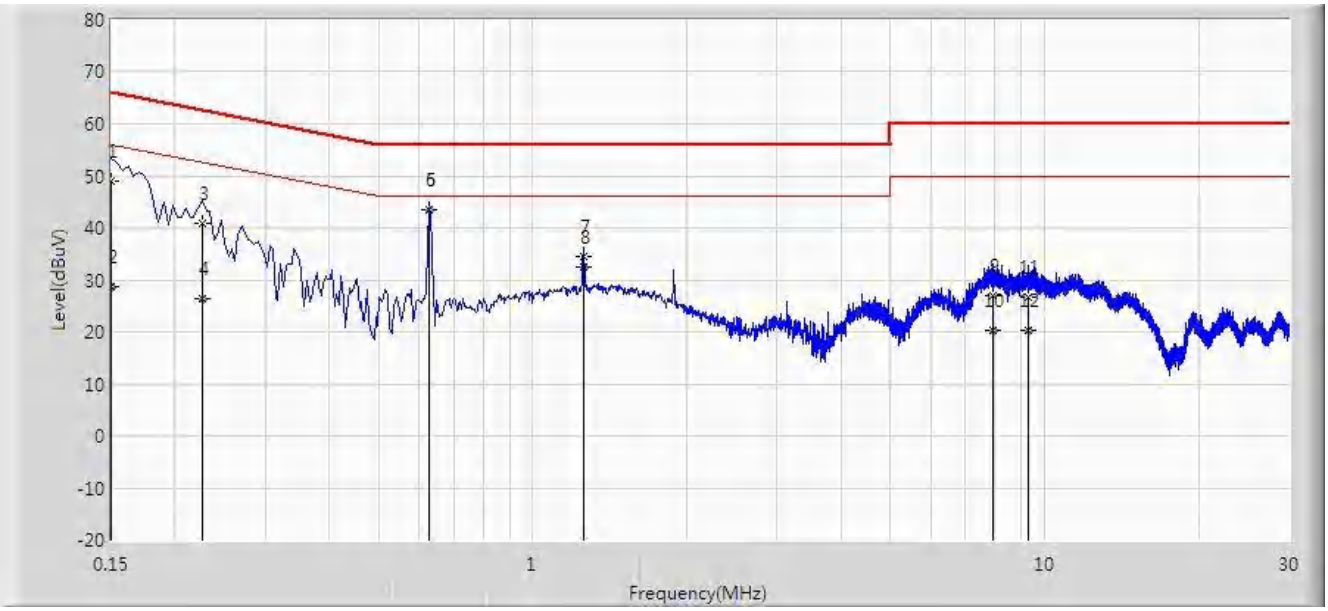
Note 1: The level decreases linearly with the logarithm of the frequency.

7.8.2.Test Setup



7.8.3.Test Result Main source

Site: SR2	Time: 2019/12/13 - 13:38
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Robotic Vacuum Cleaner+	Power: AC 120V/60Hz
Test mode: Transmit by 802.11b at channel 2412MHz（ With CDZ11RR Adaptor）	

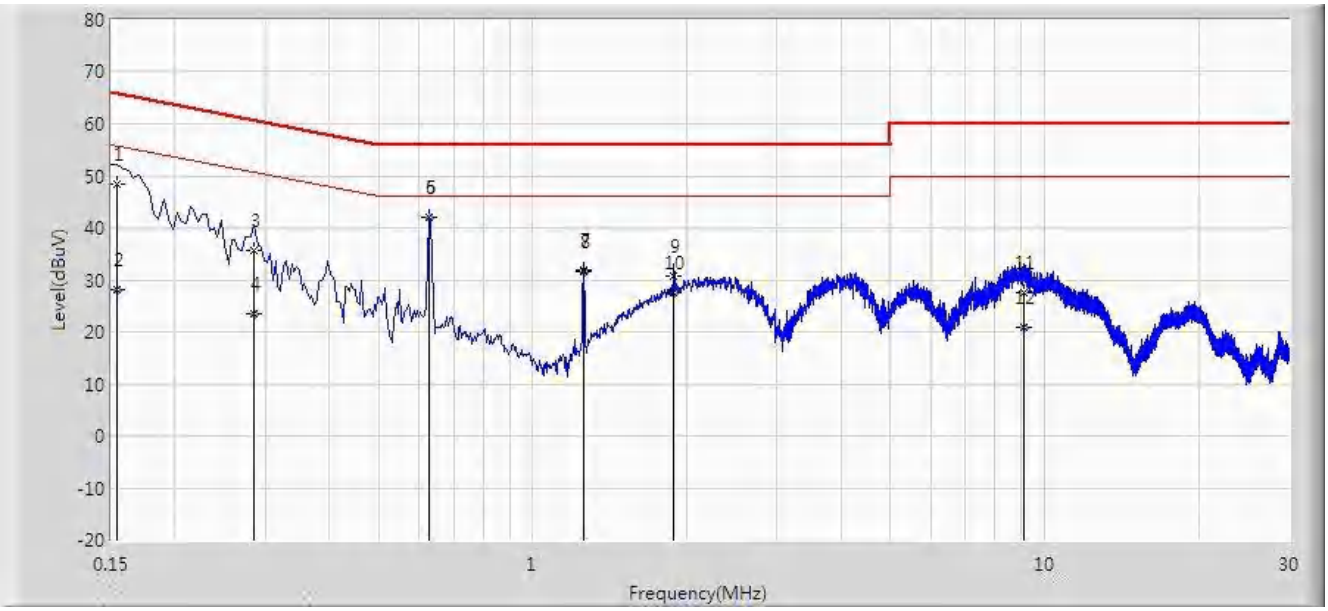


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.150	48.908	37.739	-17.092	66.000	11.168	QP
2			0.150	28.738	17.569	-27.262	56.000	11.168	AV
3			0.226	40.943	30.999	-21.653	62.595	9.944	QP
4			0.226	26.479	16.535	-26.117	52.595	9.944	AV
5			0.626	43.593	33.491	-12.407	56.000	10.101	QP
6		*	0.626	43.337	33.235	-2.663	46.000	10.101	AV
7			1.254	34.571	24.672	-21.429	56.000	9.900	QP
8			1.254	32.458	22.559	-13.542	46.000	9.900	AV
9			7.910	27.073	16.904	-32.927	60.000	10.169	QP
10			7.910	20.203	10.033	-29.797	50.000	10.169	AV
11			9.294	26.545	16.389	-33.455	60.000	10.155	QP
12			9.294	20.174	10.018	-29.826	50.000	10.155	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2019/12/13 - 13:55
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test mode: Transmit by 802.11b at channel 2412MHz （ With CDZ11RR Adaptor）	



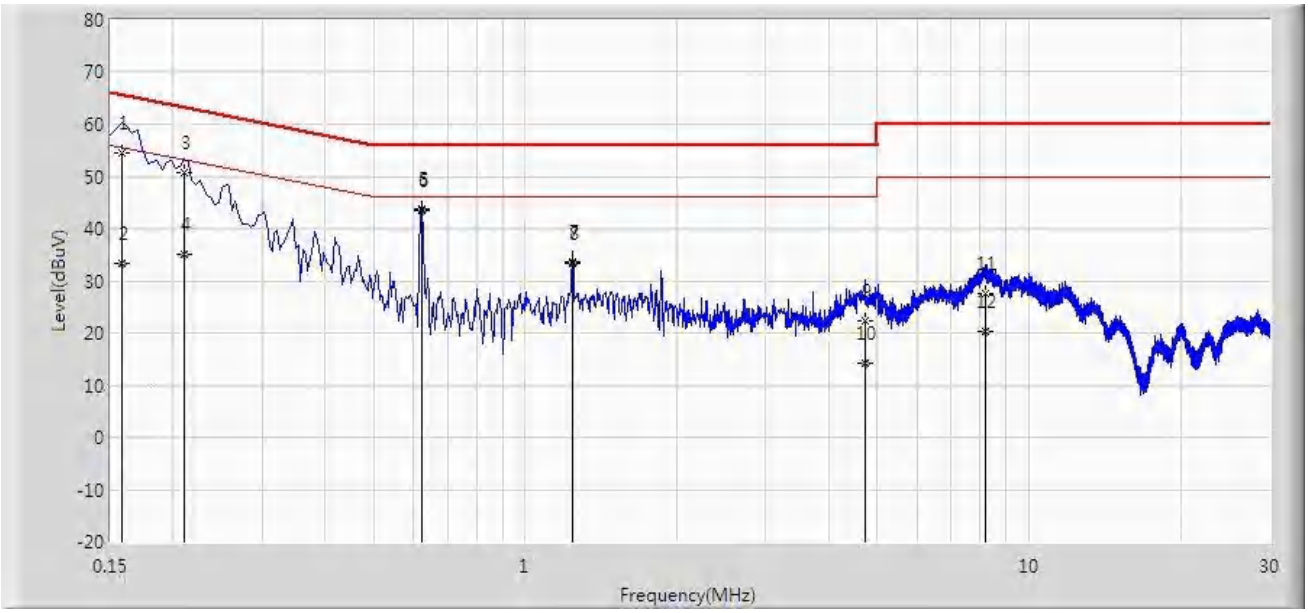
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	48.490	37.774	-17.292	65.781	10.716	QP
2			0.154	28.007	17.291	-27.774	55.781	10.716	AV
3			0.286	35.748	25.721	-24.891	60.640	10.027	QP
4			0.286	23.408	13.381	-27.232	50.640	10.027	AV
5			0.626	42.132	32.016	-13.868	56.000	10.117	QP
6		*	0.626	42.003	31.886	-3.997	46.000	10.117	AV
7			1.254	31.880	21.981	-24.120	56.000	9.900	QP
8			1.254	31.738	21.839	-14.262	46.000	9.900	AV
9			1.882	30.867	20.990	-25.133	56.000	9.877	QP
10			1.882	27.578	17.701	-18.422	46.000	9.877	AV
11			9.118	27.540	17.358	-32.460	60.000	10.182	QP
12			9.118	20.846	10.664	-29.154	50.000	10.182	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

7.8.4. Test Result Second source

Site: SR2	Time: 2020/01/13 - 16:36
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test mode: Transmit by 802.11b at channel 2412MHz （ With CDZ11RR Adaptor）	

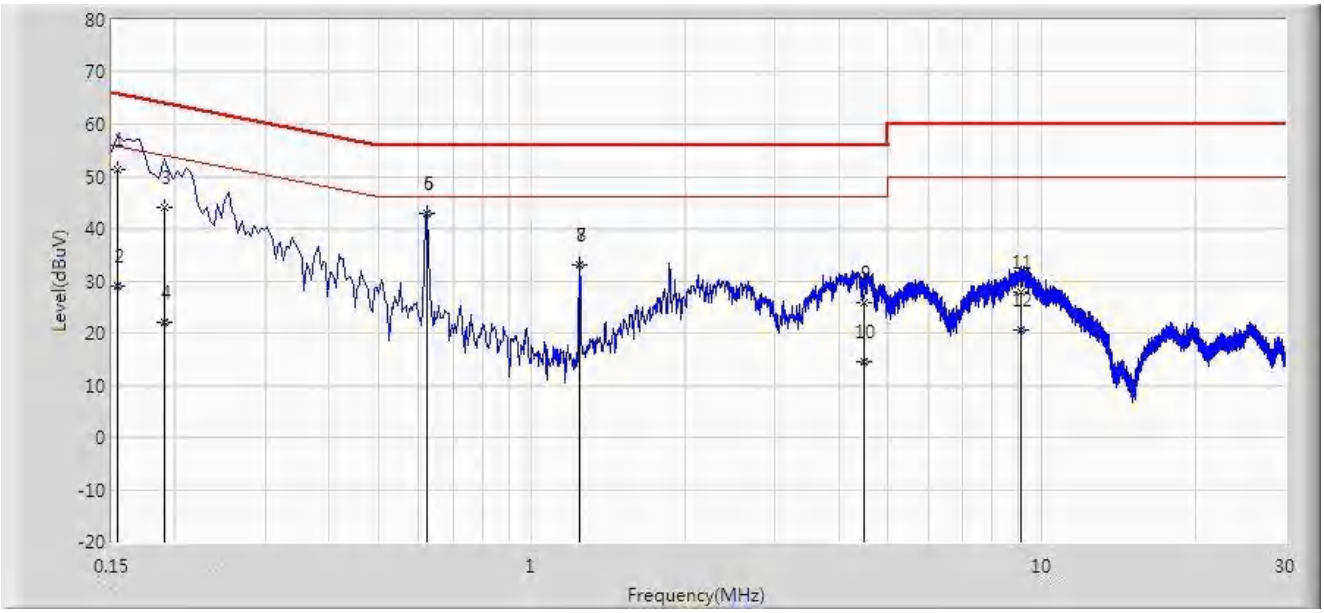


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.158	54.552	44.241	-11.016	65.568	10.311	QP
2			0.158	33.473	23.162	-22.095	55.568	10.311	AV
3			0.210	50.623	40.654	-12.583	63.205	9.969	QP
4			0.210	35.028	25.059	-18.177	53.205	9.969	AV
5			0.622	43.730	33.627	-12.270	56.000	10.103	QP
6		*	0.622	43.613	33.509	-2.387	46.000	10.103	AV
7			1.242	33.703	23.803	-22.297	56.000	9.900	QP
8			1.242	33.193	23.293	-12.807	46.000	9.900	AV
9			4.734	22.440	12.426	-33.560	56.000	10.014	QP
10			4.734	14.133	4.119	-31.867	46.000	10.014	AV
11			8.178	27.648	17.479	-32.352	60.000	10.169	QP
12			8.178	20.212	10.043	-29.788	50.000	10.169	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2020/01/13 - 16:43
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test mode: Transmit by 802.11b at channel 2412MHz （With CDZ11RR Adaptor）	

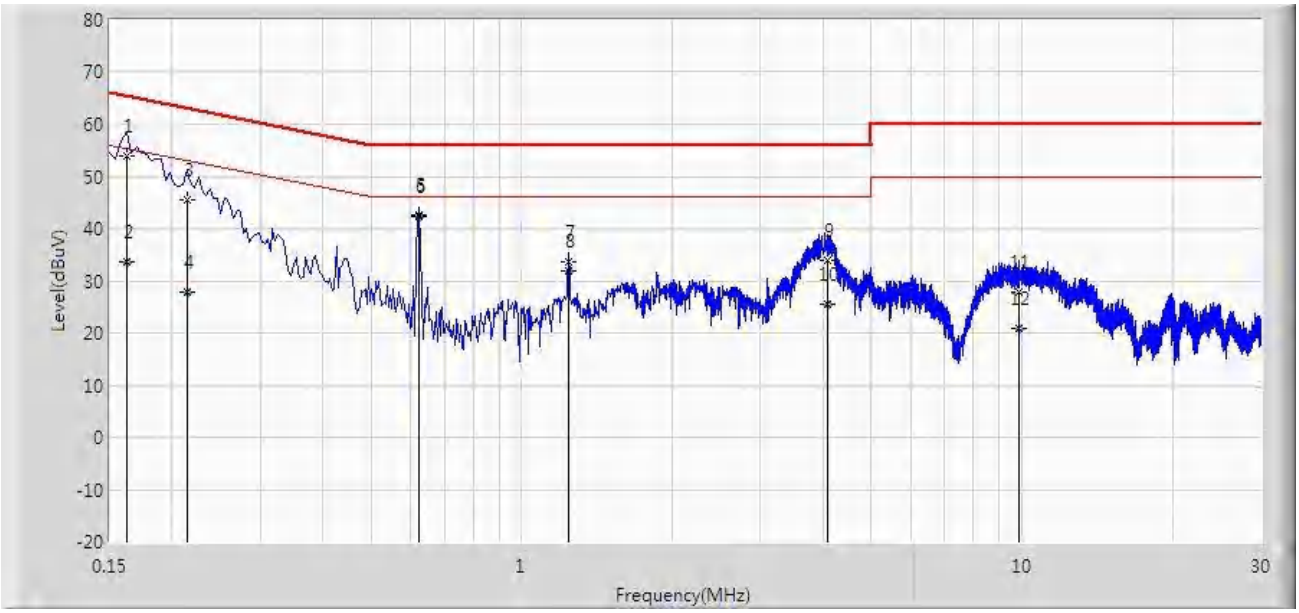


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	51.195	40.455	-14.587	65.781	10.740	QP
2			0.154	28.870	18.130	-26.912	55.781	10.740	AV
3			0.190	44.055	34.026	-19.981	64.037	10.029	QP
4			0.190	21.902	11.873	-32.135	54.037	10.029	AV
5			0.622	42.838	32.734	-13.162	56.000	10.103	QP
6		*	0.622	42.809	32.705	-3.191	46.000	10.103	AV
7			1.242	32.992	23.092	-23.008	56.000	9.900	QP
8			1.242	33.025	23.125	-12.975	46.000	9.900	AV
9			4.498	25.889	15.898	-30.111	56.000	9.990	QP
10			4.498	14.547	4.556	-31.453	46.000	9.990	AV
11			9.102	27.697	17.534	-32.303	60.000	10.163	QP
12			9.102	20.438	10.276	-29.562	50.000	10.163	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2020/01/13 - 16:31
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test mode: Transmit by 802.11b at channel 2412MHz （With CDZ12RR Adaptor）	

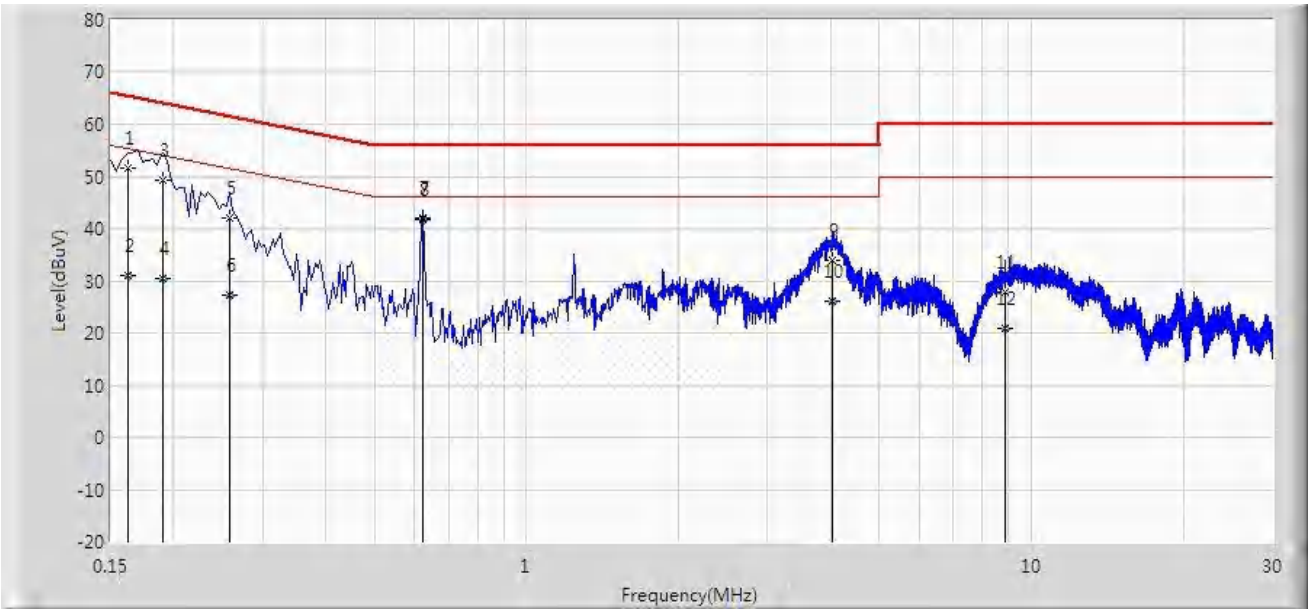


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.162	53.796	43.718	-11.564	65.361	10.078	QP
2			0.162	33.538	23.460	-21.823	55.361	10.078	AV
3			0.214	45.435	35.447	-17.613	63.049	9.988	QP
4			0.214	27.784	17.796	-25.265	53.049	9.988	AV
5			0.622	42.569	32.450	-13.431	56.000	10.119	QP
6		*	0.622	42.309	32.190	-3.691	46.000	10.119	AV
7			1.242	33.676	23.776	-22.324	56.000	9.900	QP
8			1.242	31.996	22.096	-14.004	46.000	9.900	AV
9			4.098	33.783	23.806	-22.217	56.000	9.978	QP
10			4.098	25.464	15.486	-20.536	46.000	9.978	AV
11			9.858	27.683	17.522	-32.317	60.000	10.161	QP
12			9.858	20.737	10.576	-29.263	50.000	10.161	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2020/01/13 - 16:48
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Robotic Vacuum Cleaner	Power: AC 120V/60Hz
Test mode: Transmit by 802.11b at channel 2412MHz （With CDZ12RR Adaptor）	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.162	51.479	41.382	-13.882	65.361	10.097	QP
2			0.162	31.141	21.044	-24.220	55.361	10.097	AV
3			0.190	49.193	39.164	-14.844	64.037	10.029	QP
4			0.190	30.380	20.351	-23.657	54.037	10.029	AV
5			0.258	42.089	32.119	-19.406	61.496	9.970	QP
6			0.258	27.380	17.409	-24.116	51.496	9.970	AV
7			0.622	42.029	31.926	-13.971	56.000	10.103	QP
8		*	0.622	41.739	31.636	-4.261	46.000	10.103	AV
9			4.034	33.864	23.898	-22.136	56.000	9.967	QP
10			4.034	25.999	16.032	-20.001	46.000	9.967	AV
11			8.894	27.747	17.594	-32.253	60.000	10.153	QP
12			8.894	20.848	10.695	-29.152	50.000	10.153	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

8. CONCLUSION

The data collected relate only the item(s) tested and show that the unit is compliance with Part 15C of the FCC rules and ISED rules.

The End

Appendix A - Test Setup Photograph

Refer to “1912WSU006-UT” file.

Appendix B - EUT Photograph

Refer to “1912WSU006-UE” file.