



MEASUREMENT REPORT

FCC PART 15.247 & IC RSS-247 WLAN 802.11b/g/n

FCC ID: VPYLBEE5ZZ1PJ
IC: 772C-LBEE5ZZ1PJ
APPLICANT: Murata Manufacturing Co., Ltd.

Application Type: CLASS II PERMISSIVE CHANGE
Product: W-LAN + Bluetooth Module
Model No.: 1PJ
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: May 05 ~ 23, 2019

Reviewed By:

(Kevin Guo)

Approved By:

(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.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
1904WSU022-U3	Rev. 01	Initial report	05-24-2019	Valid

Note: This report is prepared for FCC Class II permissive change supplement to MRT original "1808WSU011-U3" report adding a PIFA antenna and adding related data.

CONTENTS

Description	Page
§2.1033 General Information	5
1. INTRODUCTION	6
1.1. Scope	6
1.2. MRT Test Location	6
2. PRODUCT INFORMATION	7
2.1. Feature of Equipment under Test	7
2.2. Product Specification Subjective to this Report.....	7
2.3. Operation Frequency / Channel List	8
2.4. Test Mode	8
2.5. Description of Test Software	8
2.6. Device Capabilities	9
2.7. Test Configuration	9
2.8. EMI Suppression Device(s)/Modifications.....	9
2.9. Labeling Requirements	9
3. DESCRIPTION OF TEST	10
3.1. Evaluation Procedure	10
3.2. AC Line Conducted Emissions	10
3.3. Radiated Emissions	11
4. ANTENNA REQUIREMENTS	12
5. TEST EQUIPMENT CALIBRATION DATE	13
6. MEASUREMENT UNCERTAINTY	15
7. TEST RESULT	16
7.1. Summary	16
7.2. Output Power Measurement	17
7.2.1. Test Limit	17
7.2.2. Test Procedure Used	17
7.2.3. Test Setting	17
7.2.4. Test Setup	17
7.2.5. Test Result	18
7.3. Radiated Spurious Emission Measurement	20
7.3.1. Test Limit	20
7.3.2. Test Procedure Used	20

7.3.3.	Test Setting.....	20
7.3.4.	Test Setup.....	22
7.3.5.	Test Result.....	23
7.4.	Radiated Restricted Band Edge Measurement.....	37
7.4.1.	Test Limit	37
7.4.2.	Test Procedure Used	40
7.4.3.	Test Setting.....	40
7.4.4.	Test Setup.....	41
7.4.5.	Test Result.....	42
8.	CONCLUSION.....	74
	Appendix A – Test Setup Photograph.....	75
	Appendix B – EUT Photograph.....	76

§2.1033 General Information

Applicant:	Murata Manufacturing Co., Ltd.
Applicant Address:	10-1, Higashikotari 1-chome, Nagaokakyo-shi, Kyoto 617-8555, Japan
Manufacturer:	Murata Manufacturing Co., Ltd.
Manufacturer Address:	10-1, Higashikotari 1-chome, Nagaokakyo-shi, Kyoto 617-8555, Japan
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering

Test Facility / Accreditations

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

- MRT facility is a FCC registered (MRT Reg. No. 893164) 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 Industry Canada Certification and Engineering Bureau.

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. Feature of Equipment under Test

Product Name:	W-LAN + Bluetooth Module
Model No.:	1PJ
Brand Name:	Murata
Work Voltage	DC 3.3V
Wi-Fi Specification	802.11a/b/g/n/ac
Bluetooth Specification	V5.0 dual mode

2.2. Product Specification Subjective to this Report

Frequency Range	802.11b/g/n-HT20/ac-HT20: 2412 ~ 2462MHz 802.11n-HT40: 2422 ~ 2452MHz
Channel Number:	802.11b/g/n-HT20/ac-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 150Mbps
Antenna type	PIFA Antenna
Antenna Gain	3.29dBi

Note: For other features of this EUT, test report will be issued separately.

2.3. Operation Frequency / Channel List

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	--	--	--	--

2.4. Test Mode

Test Mode	Mode 1: Transmit by 802.11b
	Mode 2: Transmit by 802.11g
	Mode 3: Transmit by 802.11n-HT20
	Mode 4: Transmit by 802.11n-HT40

2.5. Description of Test Software

The test utility software used during testing was “QCARCT”, and the version was “v3.0.210.0”.

Power Parameter Value:

Test Mode	Test Frequency (MHz)	Power Parameter Value	Test Mode	Test Frequency (MHz)	Power Parameter Value
11b	2412	18.0	11n-HT20	2412	17.5
	2437	17.5		2437	17.5
	2462	17.5		2462	17.5
11g	2412	17.5	11n-HT40	2422	16.0
	2437	17.0		2437	16.5
	2462	17.0		2452	15.0

2.6. Device Capabilities

This device contains the following capabilities:

5GHz WLAN (NII), 2.4GHz WLAN (DTS), Bluetooth v5.0 (DTS / DSS)

2.7. Test Configuration

The device was tested per the guidance of ANSI C63.10-2013. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.8. EMI Suppression Device(s)/Modifications

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

2.9. 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 11 Section 3

The manufacturer, importer or distributor shall meet the labelling requirements set out in this section for every unit:

- (i) prior to marketing in Canada, for products manufactured in Canada
- (ii) prior to importation into Canada, for imported products

For information regarding the e-labelling option, see Notice 2014–DRS1003. The label for the certified product represents the manufacturer's or importer's compliance with Innovation, Science and Economic Development Canada's (ISED) regulatory requirements.

Please see attachment for IC label and label location.

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 of the device.

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 whichever 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 1-25GHz 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, whichever 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 device uses a unique connector.

Antenna Type	Antenna connector Type
PIFA Antenna	IPEX connector

Conclusion:

The device 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	2019/06/14
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2019/06/14
Thermohygrometer	Testo	608-H1	MRTSUE06404	1 year	2019/08/14
Shielding Anechoic Chamber	MIX-BEP	Chamber-SR2	MRTSUE06214	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	2019/08/13
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2019/09/25
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2019/11/09
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2020/03/31
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2019/10/19
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2019/12/17
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2019/11/16
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2019/06/12
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2019/08/14
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06213	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	2019/08/13
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2019/11/09
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2019/10/19
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2019/11/09
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2019/12/17
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2019/11/16
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2019/06/12
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2019/12/13
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	2019/07/19
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2019/11/16
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2019/07/19
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2019/07/05
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2019/11/16
Thermohygrometer	testo	608-H1	MRTSUE06401	1 year	2019/08/14

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% ($U=2U_c(y)$): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement – AC1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB
Radiated Emission Measurement – AC2
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz ~ 1GHz: 3.86dB 1GHz ~ 25GHz: 4.33dB

7. TEST RESULT

7.1. Summary

FCC Part Section(s)	IC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(b)(3)	RSS-247 [5.4(4)]	Output Power	Refer to section 7.2.1	Conducted	PASS	Section 7.2
15.205 15.209	RSS-247 [5.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Refer to section 7.3.1 & 7.4.1	Radiated	PASS	Section 7.3 Section 7.4

Notes:

- 1) The correction factor was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the power meter 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. Output Power Measurement

7.2.1. Test Limit

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

7.2.2. Test Procedure Used

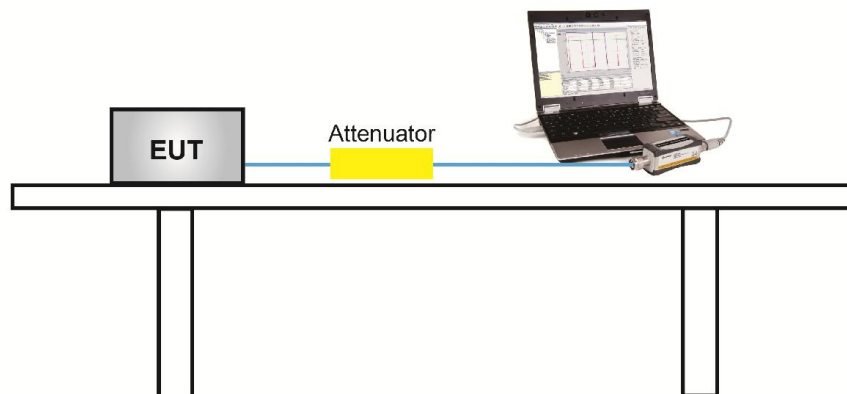
ANSI C63.10-2013 - Section 11.9.2.3.2 Method AVGPM-G

7.2.3. Test Setting

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.

7.2.4. Test Setup



7.2.5. 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.

Output power at various data rates:

Test Mode	Bandwidth (MHz)	Channel No.	Frequency (MHz)	Data Rate / MCS	Average Power (dBm)
802.11b	20	06	2437	1Mbps	18.42
				5.5Mbps	18.07
				11Mbps	17.77
802.11g	20	06	2437	6Mbps	18.05
				24Mbps	17.72
				54Mbps	17.34
802.11n	20	06	2437	MCS0	17.72
				MCS3	17.28
				MCS7	16.93
802.11n	40	06	2437	MCS0	16.54
				MCS3	16.21
				MCS7	15.78

Product	W-LAN + Bluetooth Module	Temperature	23°C
Test Engineer	Dandy Li	Relative Humidity	54%
Test Site	TR3	Test Date	2019/05/08

Test Mode	Data Rate / MCS	Channel No.	Freq. (MHz)	Average Power (dBm)	Power Limit (dBm)	Max EIRP (dBm)	EIRP Limit (dBm)	Result
11b	1Mbps	01	2412	18.77	≤ 30.00	22.06	≤ 36.00	Pass
11b	1Mbps	06	2437	18.42	≤ 30.00	21.71	≤ 36.00	Pass
11b	1Mbps	11	2462	18.34	≤ 30.00	21.63	≤ 36.00	Pass
11g	6Mbps	01	2412	17.76	≤ 30.00	21.05	≤ 36.00	Pass
11g	6Mbps	06	2437	18.05	≤ 30.00	21.34	≤ 36.00	Pass
11g	6Mbps	11	2462	17.57	≤ 30.00	20.86	≤ 36.00	Pass
11n-HT20	MCS0	01	2412	17.66	≤ 30.00	20.95	≤ 36.00	Pass
11n-HT20	MCS0	06	2437	17.72	≤ 30.00	21.01	≤ 36.00	Pass
11n-HT20	MCS0	11	2462	17.69	≤ 30.00	20.98	≤ 36.00	Pass
11n-HT40	MCS0	03	2422	16.83	≤ 30.00	20.12	≤ 36.00	Pass
11n-HT40	MCS0	06	2437	16.54	≤ 30.00	19.83	≤ 36.00	Pass
11n-HT40	MCS0	09	2452	16.67	≤ 30.00	19.96	≤ 36.00	Pass

Note: Max EIRP (dBm) = Average Power (dBm) + Antenna Gain (dBi), Antenna Gain (dBi) = 3.29dBi.

7.3. Radiated Spurious Emission Measurement

7.3.1. 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

7.3.2. 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)

7.3.3. 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
> 1000 MHz	1 MHz

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

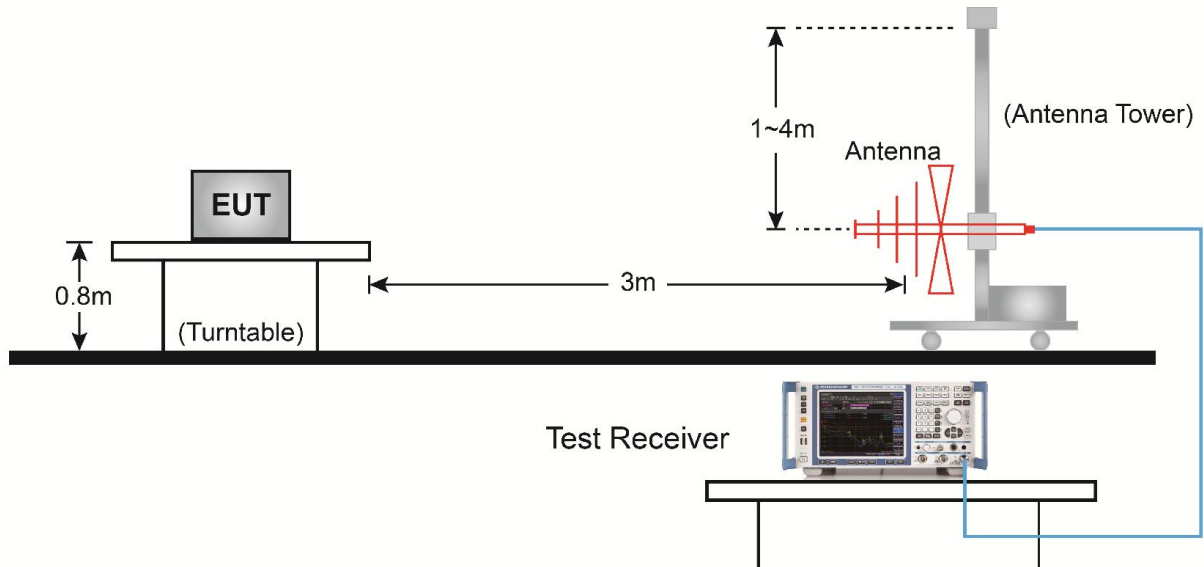
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

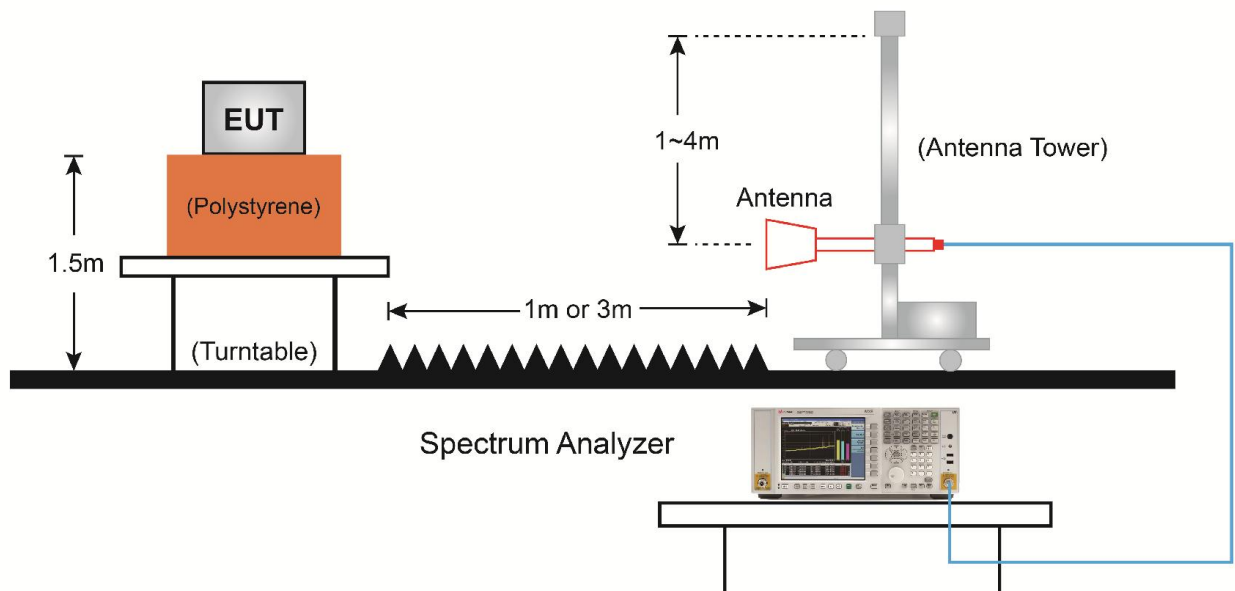
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW = 10 Hz.
If the EUT duty cycle is $< 98\%$, set VBW $\geq 1/T$. T is the minimum transmission duration.
4.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

7.3.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



7.3.5. Test Result

Product	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	3949.5	36.8	2.3	39.1	74.0	-34.9	Peak	Horizontal
	4791.0	34.8	5.4	40.2	74.0	-33.8	Peak	Horizontal
*	5879.0	36.9	7.4	44.3	79.2	-34.9	Peak	Horizontal
*	9721.0	31.7	15.4	47.1	79.2	-32.1	Peak	Horizontal
	3915.5	37.4	2.3	39.7	74.0	-34.3	Peak	Vertical
	4578.5	33.8	4.5	38.3	74.0	-35.7	Peak	Vertical
*	5836.5	35.0	7.4	42.4	79.2	-36.8	Peak	Vertical
*	6465.5	35.9	9.3	45.2	79.2	-34.0	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (109.2dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	4876.0	35.7	5.7	41.4	74.0	-32.6	Peak	Horizontal
	5394.5	36.2	6.5	42.7	74.0	-31.3	Peak	Horizontal
*	6210.5	36.1	8.2	44.3	78.5	-34.2	Peak	Horizontal
*	6907.5	35.8	10.2	46.0	78.5	-32.5	Peak	Horizontal
	4196.0	36.9	3.0	39.9	74.0	-34.1	Peak	Vertical
	4782.5	35.5	5.4	40.9	74.0	-33.1	Peak	Vertical
*	5904.5	36.6	7.4	44.0	78.5	-34.5	Peak	Vertical
*	6958.5	35.6	10.5	46.1	78.5	-32.4	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (108.5dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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	37.2	5.8	43.0	74.0	-31.0	Peak	Horizontal
	7443.0	33.3	11.9	45.2	74.0	-28.8	Peak	Horizontal
*	9874.0	33.9	16.1	50.0	78.4	-28.4	Peak	Horizontal
*	10520.0	33.1	17.1	50.2	78.4	-28.2	Peak	Horizontal
	5029.0	35.8	6.1	41.9	74.0	-32.1	Peak	Vertical
	7604.5	36.9	11.8	48.7	74.0	-25.3	Peak	Vertical
*	9602.0	34.0	15.0	49.0	78.4	-29.4	Peak	Vertical
*	9925.0	33.9	16.0	49.9	78.4	-28.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (108.4dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	4816.5	36.3	5.6	41.9	74.0	-32.1	Peak	Horizontal
	7400.5	36.0	11.7	47.7	74.0	-26.3	Peak	Horizontal
*	8777.5	35.0	13.3	48.3	80.3	-32.0	Peak	Horizontal
*	9959.0	34.3	16.0	50.3	80.3	-30.0	Peak	Horizontal
	5105.5	36.7	6.4	43.1	74.0	-30.9	Peak	Vertical
	7553.5	35.6	11.9	47.5	74.0	-26.5	Peak	Vertical
*	9899.5	33.2	16.1	49.3	80.3	-31.0	Peak	Vertical
*	10307.5	34.0	16.6	50.6	80.3	-29.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (110.3dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	7443.0	34.1	11.9	46.0	74.0	-28.0	Peak	Horizontal
	8140.0	34.9	12.5	47.4	74.0	-26.6	Peak	Horizontal
*	9899.5	34.3	16.1	50.4	79.8	-29.4	Peak	Horizontal
*	10358.5	34.4	16.8	51.2	79.8	-28.6	Peak	Horizontal
	4748.5	36.2	5.4	41.6	74.0	-32.4	Peak	Vertical
	7502.5	35.1	12.0	47.1	74.0	-26.9	Peak	Vertical
*	9780.5	34.3	15.8	50.1	79.8	-29.7	Peak	Vertical
*	10358.5	33.4	16.8	50.2	79.8	-29.6	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (109.8dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	4026.0	36.8	2.6	39.4	74.0	-34.6	Peak	Horizontal
	5029.0	35.3	6.1	41.4	74.0	-32.6	Peak	Horizontal
*	5887.5	35.0	7.5	42.5	79.9	-37.4	Peak	Horizontal
*	6533.5	35.2	9.6	44.8	79.9	-35.1	Peak	Horizontal
	5071.5	35.3	6.4	41.7	74.0	-32.3	Peak	Vertical
	7502.5	35.2	12.0	47.2	74.0	-26.8	Peak	Vertical
*	9831.5	33.0	16.1	49.1	79.9	-30.8	Peak	Vertical
*	10163.0	34.2	16.5	50.7	79.9	-29.2	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (109.9dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	4289.5	35.8	3.5	39.3	74.0	-34.7	Peak	Horizontal
	4825.0	36.6	5.5	42.1	74.0	-31.9	Peak	Horizontal
*	5989.5	35.6	7.4	43.0	80.6	-37.6	Peak	Horizontal
*	6992.5	35.5	10.6	46.1	80.6	-34.5	Peak	Horizontal
	4077.0	35.7	2.6	38.3	74.0	-35.7	Peak	Vertical
	4723.0	35.9	5.1	41.0	74.0	-33.0	Peak	Vertical
*	5760.0	34.6	7.2	41.8	80.6	-38.8	Peak	Vertical
*	6848.0	36.3	10.0	46.3	80.6	-34.3	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (110.6dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	4068.5	36.9	2.7	39.6	74.0	-34.4	Peak	Horizontal
	4978.0	35.6	6.0	41.6	74.0	-32.4	Peak	Horizontal
*	5904.5	36.0	7.4	43.4	80.6	-37.2	Peak	Horizontal
*	6304.0	36.1	8.3	44.4	80.6	-36.2	Peak	Horizontal
	4043.0	37.2	2.7	39.9	74.0	-34.1	Peak	Vertical
	4961.0	36.0	5.9	41.9	74.0	-32.1	Peak	Vertical
*	6074.5	35.4	7.7	43.1	80.6	-37.5	Peak	Vertical
*	6822.5	34.2	9.7	43.9	80.6	-36.7	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (110.6dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	4162.0	36.6	3.1	39.7	74.0	-34.3	Peak	Horizontal
	4986.5	35.7	6.0	41.7	74.0	-32.3	Peak	Horizontal
*	6261.5	35.7	8.3	44.0	80.8	-36.8	Peak	Horizontal
*	7026.5	35.6	10.9	46.5	80.8	-34.3	Peak	Horizontal
	3805.0	38.2	1.9	40.1	74.0	-33.9	Peak	Vertical
	5063.0	35.3	6.4	41.7	74.0	-32.3	Peak	Vertical
*	5964.0	36.2	7.4	43.6	80.8	-37.2	Peak	Vertical
*	7103.0	35.9	11.4	47.3	80.8	-33.5	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (110.8dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	3915.5	34.9	2.3	37.2	74.0	-36.8	Peak	Horizontal
	4731.5	35.9	5.2	41.1	74.0	-32.9	Peak	Horizontal
*	8692.5	35.5	13.2	48.7	77.1	-28.4	Peak	Horizontal
*	10180.0	34.2	16.3	50.5	77.1	-26.6	Peak	Horizontal
	4034.5	36.5	2.7	39.2	74.0	-34.8	Peak	Vertical
	5012.0	35.4	6.1	41.5	74.0	-32.5	Peak	Vertical
*	6210.5	35.6	8.2	43.8	77.1	-33.3	Peak	Vertical
*	7018.0	36.0	10.8	46.8	77.1	-30.3	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (107.1dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	4247.0	36.8	3.3	40.1	74.0	-33.9	Peak	Horizontal
	5012.0	35.6	6.1	41.7	74.0	-32.3	Peak	Horizontal
*	5700.5	36.0	6.9	42.9	77.7	-34.8	Peak	Horizontal
*	7001.0	36.1	10.6	46.7	77.7	-31.0	Peak	Horizontal
	4060.0	36.6	2.7	39.3	74.0	-34.7	Peak	Vertical
	5046.0	35.2	6.2	41.4	74.0	-32.6	Peak	Vertical
*	6185.0	35.0	7.8	42.8	77.7	-34.9	Peak	Vertical
*	6797.0	34.4	9.7	44.1	77.7	-33.6	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (107.7dBμV/m) or 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	W-LAN + Bluetooth Module	Temperature	26°C
Test Engineer	Dandy Li	Relative Humidity	56%
Test Site	AC1	Test Date	2019/05/07
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
	4357.5	36.1	3.8	39.9	74.0	-34.1	Peak	Horizontal
	4842.0	36.1	5.5	41.6	74.0	-32.4	Peak	Horizontal
*	6202.0	36.5	8.1	44.6	75.4	-30.8	Peak	Horizontal
*	6984.0	34.9	10.7	45.6	75.4	-29.8	Peak	Horizontal
	4332.0	36.5	3.6	40.1	74.0	-33.9	Peak	Vertical
	5097.0	36.2	6.4	42.6	74.0	-31.4	Peak	Vertical
*	6253.0	36.1	8.2	44.3	75.4	-31.1	Peak	Vertical
*	6984.0	36.1	10.7	46.8	75.4	-28.6	Peak	Vertical

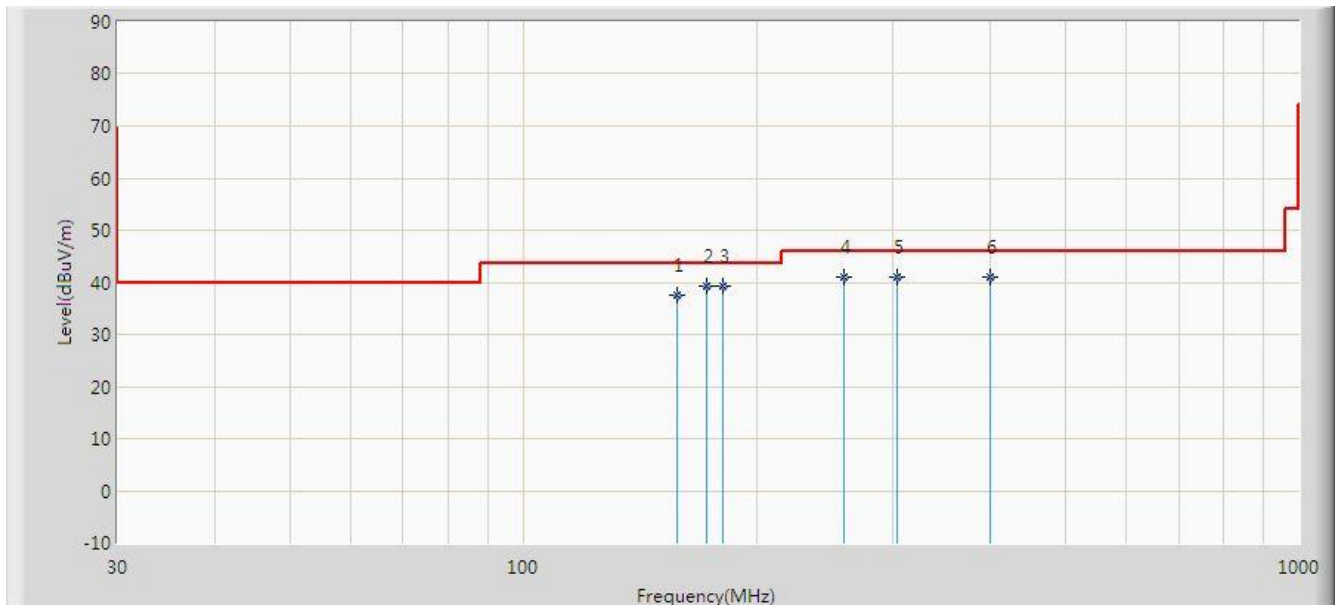
Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (105.4dBμV/m) or 15.209 which is higher.

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: AC2	Time: 2019/05/23 - 15:01
Limit: FCC_Part15.209_RSE(3m)	Engineer: Dandy Li
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Worst case Mode: Transmit by 802.11g at channel 2437MHz	



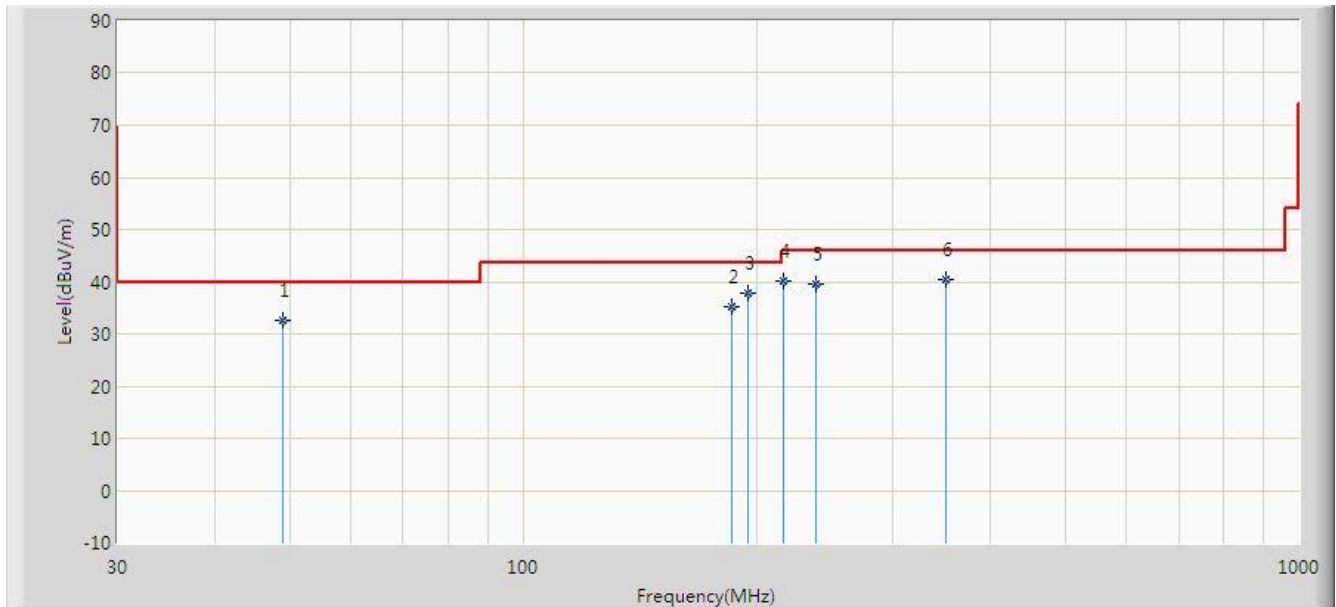
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			158.040	37.434	27.837	-6.066	43.500	9.597	QP
2		*	172.105	39.375	29.181	-4.125	43.500	10.194	QP
3			181.320	39.327	28.483	-4.173	43.500	10.844	QP
4			259.405	40.948	27.301	-5.052	46.000	13.646	QP
5			304.025	41.096	26.687	-4.904	46.000	14.408	QP
6			400.055	41.012	24.611	-4.988	46.000	16.401	QP

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + 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: AC2	Time: 2019/05/23 - 15:01
Limit: FCC_Part15.209_RSE(3m)	Engineer: Dandy Li
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Worst case Mode: Transmit by 802.11g at channel 2437MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			48.915	32.572	17.717	-7.428	40.000	14.855	QP
2			186.170	35.192	23.907	-8.308	43.500	11.285	QP
3			195.385	37.869	25.953	-5.631	43.500	11.915	QP
4			216.725	40.072	27.696	-5.928	46.000	12.376	QP
5			238.065	39.492	26.353	-6.508	46.000	13.139	QP
6		*	350.100	40.373	24.804	-5.627	46.000	15.568	QP

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + 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.

7.4. Radiated Restricted Band Edge Measurement

7.4.1. 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)
0.090 - 0.110	149.9 - 150.5	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	334.5 - 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]	Magnetic field strength (H-Field) [uA/m]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	6.37/F(F in kHz)	--	300
0.490 - 1.705	63.7/F(F in kHz)	--	30
1.705 - 30	0.08	--	30
30 - 88	--	100	3
88 - 216	--	150	3
216 - 960	--	200	3
Above 960	--	500	3

7.4.2. Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

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

7.4.3. 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

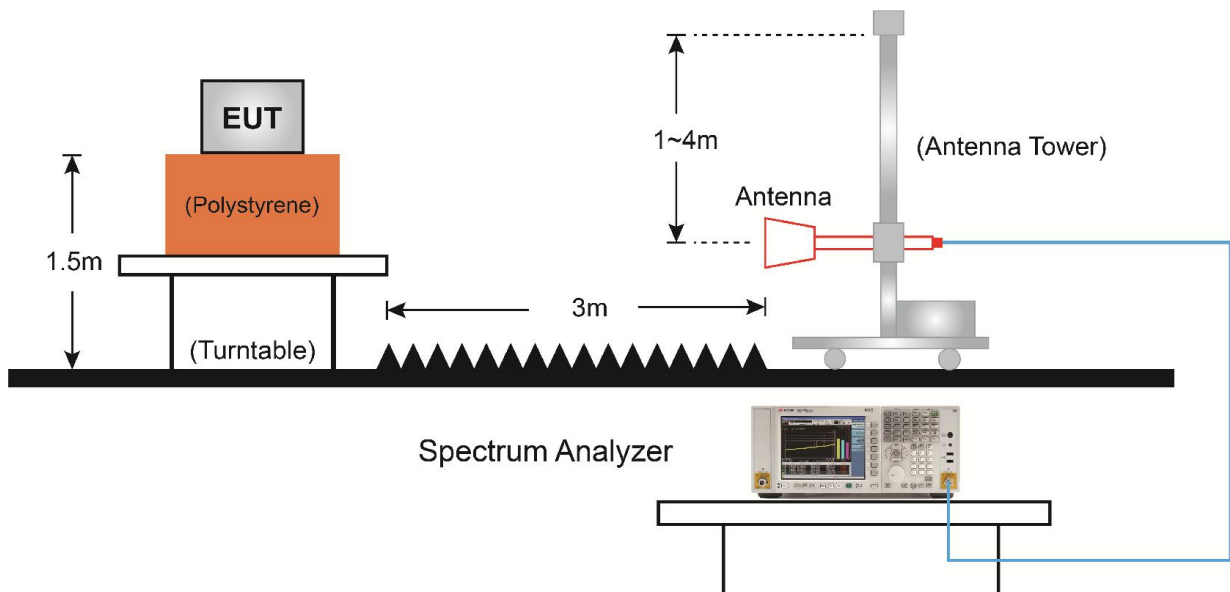
Average Measurements above 1GHz (Method VB)

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 $\geq 98\%$, set VBW = 10 Hz.

If the EUT duty cycle is $< 98\%$, set $\text{VBW} \geq 1/T$. T is the minimum transmission duration.

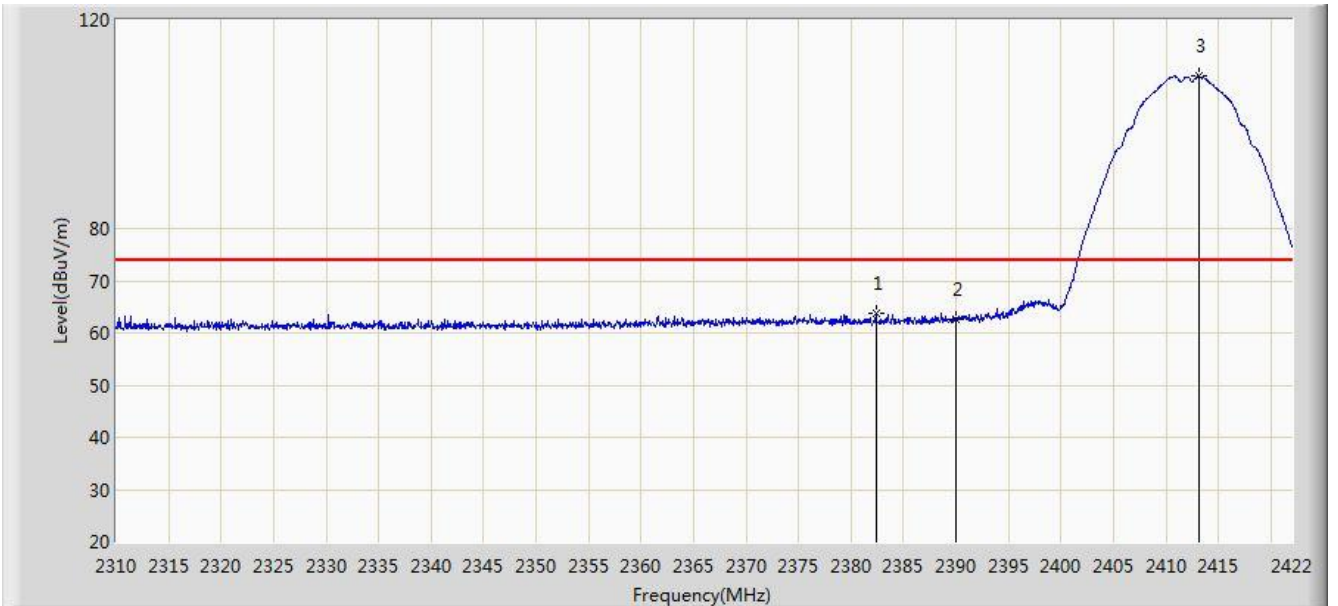
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

7.4.4. Test Setup



7.4.5. Test Result

Site: AC1	Time: 2019/05/05 - 14:53
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11b at channel 2412MHz	

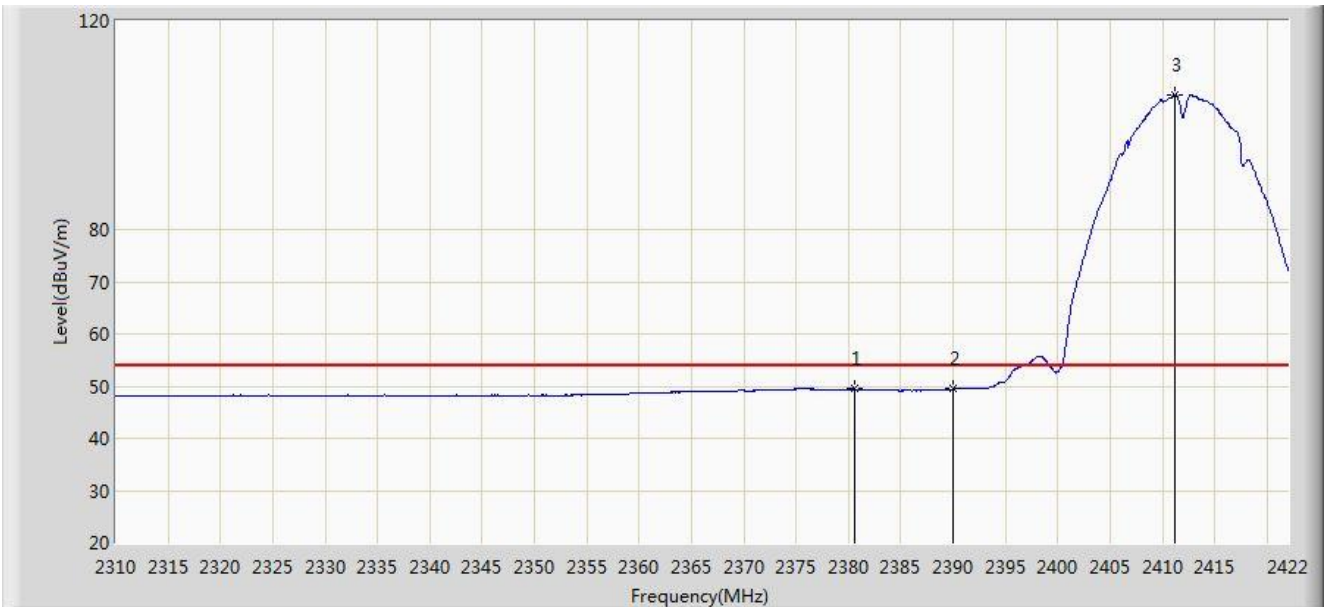


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2382.352	63.903	31.476	-10.097	74.000	32.427	PK
2			2390.000	62.588	30.175	-11.412	74.000	32.413	PK
3		*	2413.096	109.177	76.794	N/A	N/A	32.383	PK

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

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

Site: AC1	Time: 2019/05/05 - 14:57
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11b at channel 2412MHz	

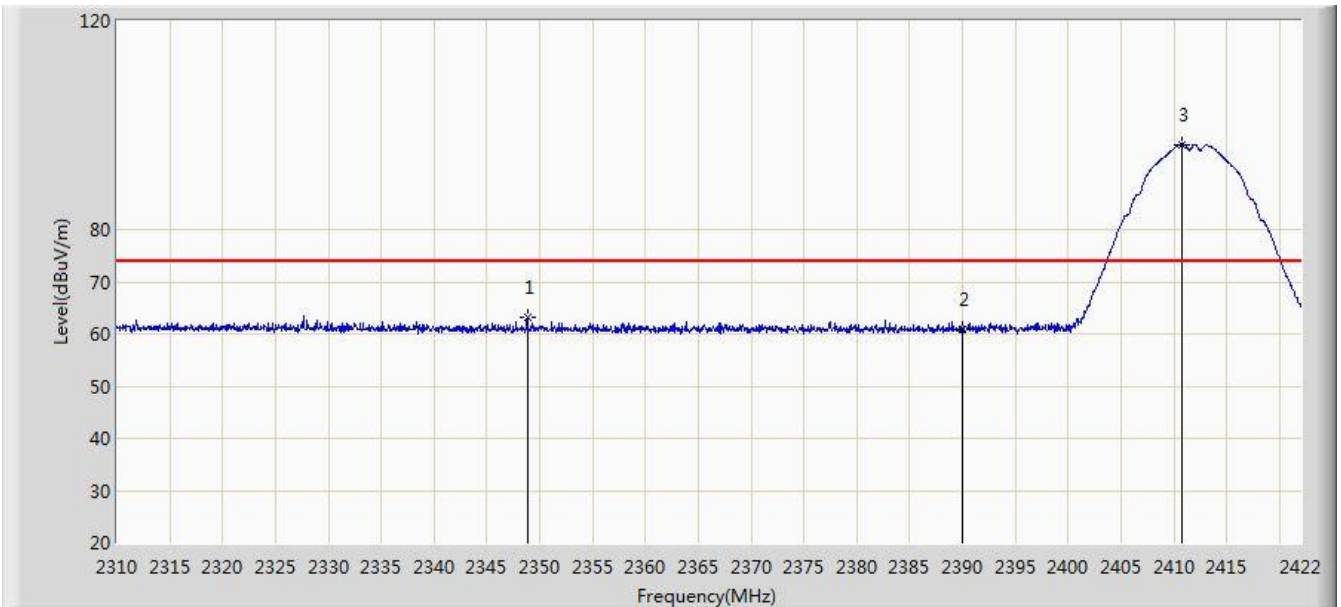


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2380.560	49.523	17.093	-4.477	54.000	32.430	AV
2			2390.000	49.455	17.042	-4.545	54.000	32.413	AV
3		*	2411.136	105.907	73.522	N/A	N/A	32.385	AV

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

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

Site: AC1	Time: 2019/05/05 - 15:07
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11b at channel 2412MHz	

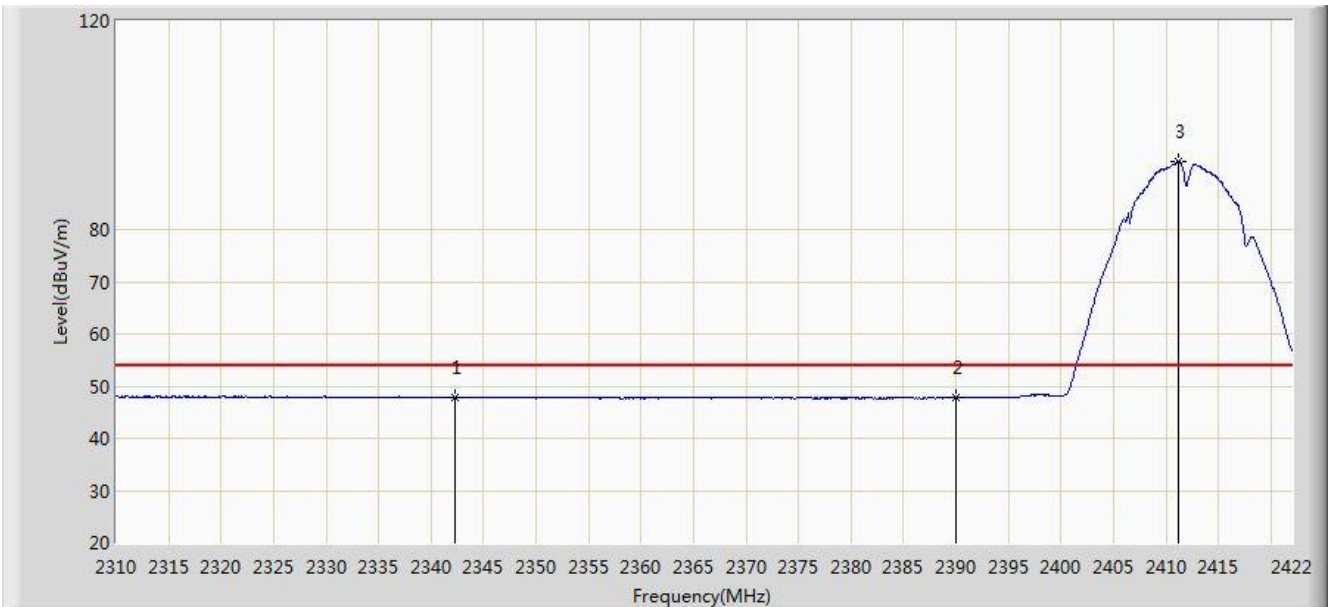


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2348.808	63.047	30.530	-10.953	74.000	32.517	PK
2			2390.000	60.968	28.555	-13.032	74.000	32.413	PK
3		*	2410.744	96.363	63.977	N/A	N/A	32.386	PK

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

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

Site: AC1	Time: 2019/05/05 - 15:12
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11b at channel 2412MHz	

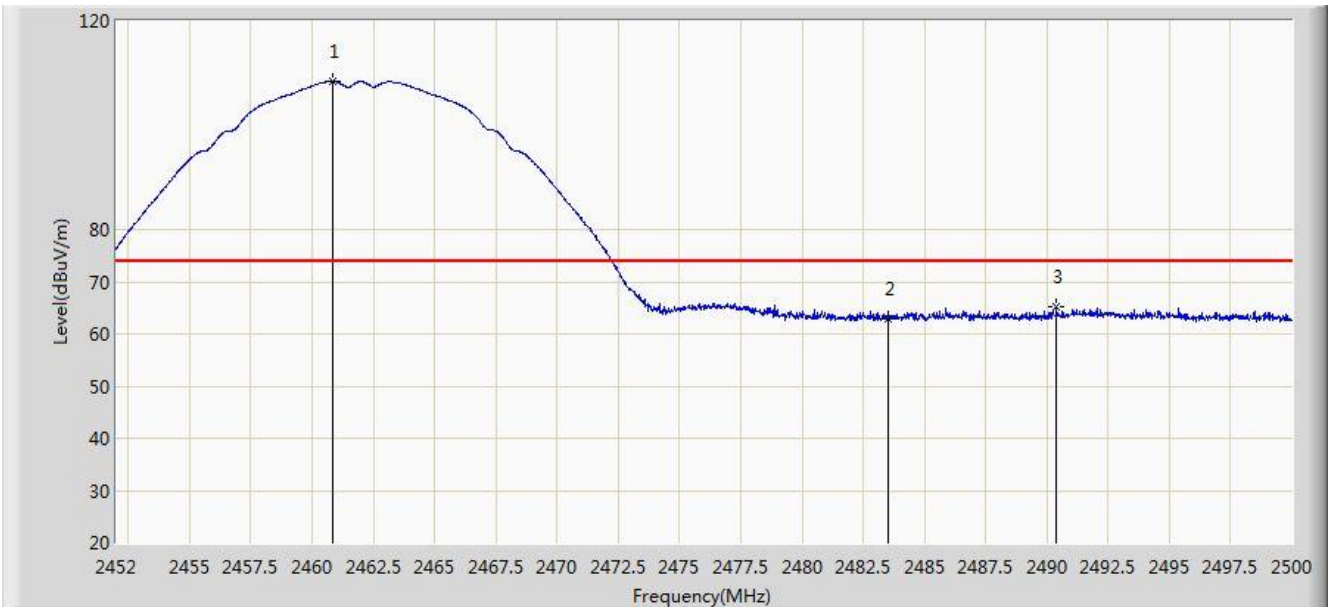


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2342.256	47.824	15.281	-6.176	54.000	32.543	AV
2			2390.000	47.758	15.345	-6.242	54.000	32.413	AV
3		*	2411.136	93.025	60.640	N/A	N/A	32.385	AV

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

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

Site: AC1	Time: 2019/05/05 - 15:15
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11b at channel 2462MHz	

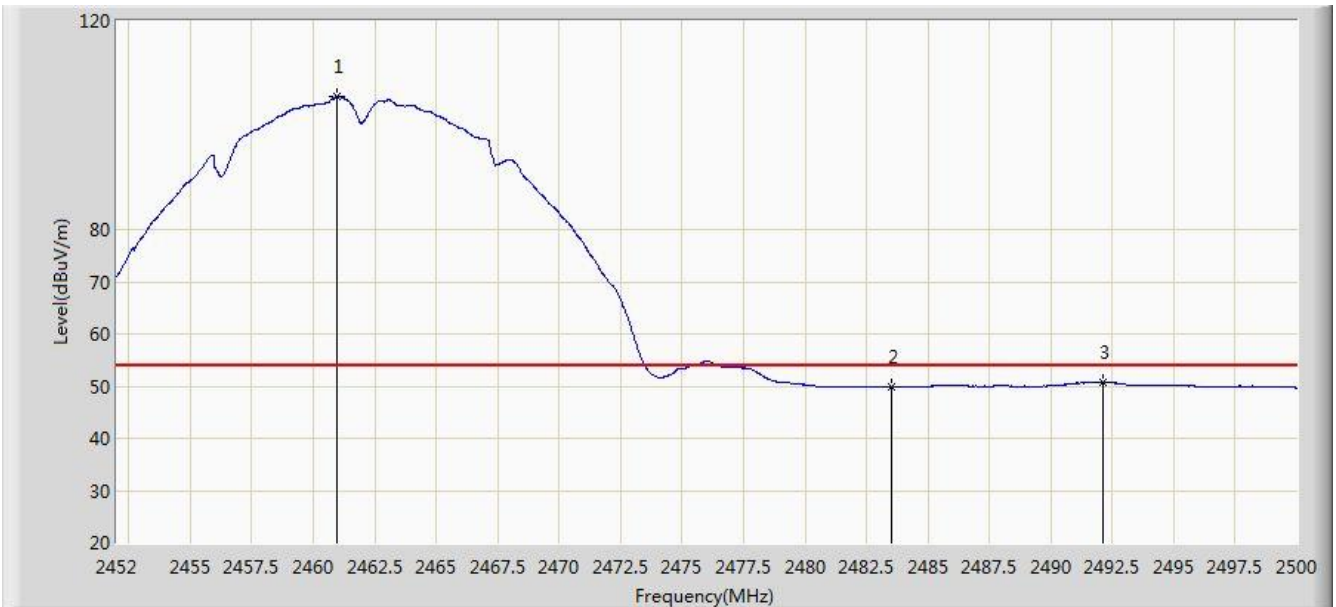


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.832	108.406	76.042	N/A	N/A	32.364	PK
2			2483.500	62.972	30.557	-11.028	74.000	32.416	PK
3			2490.400	65.241	32.812	-8.759	74.000	32.429	PK

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

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

Site: AC1	Time: 2019/05/05 - 15:27
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11b at channel 2462MHz	

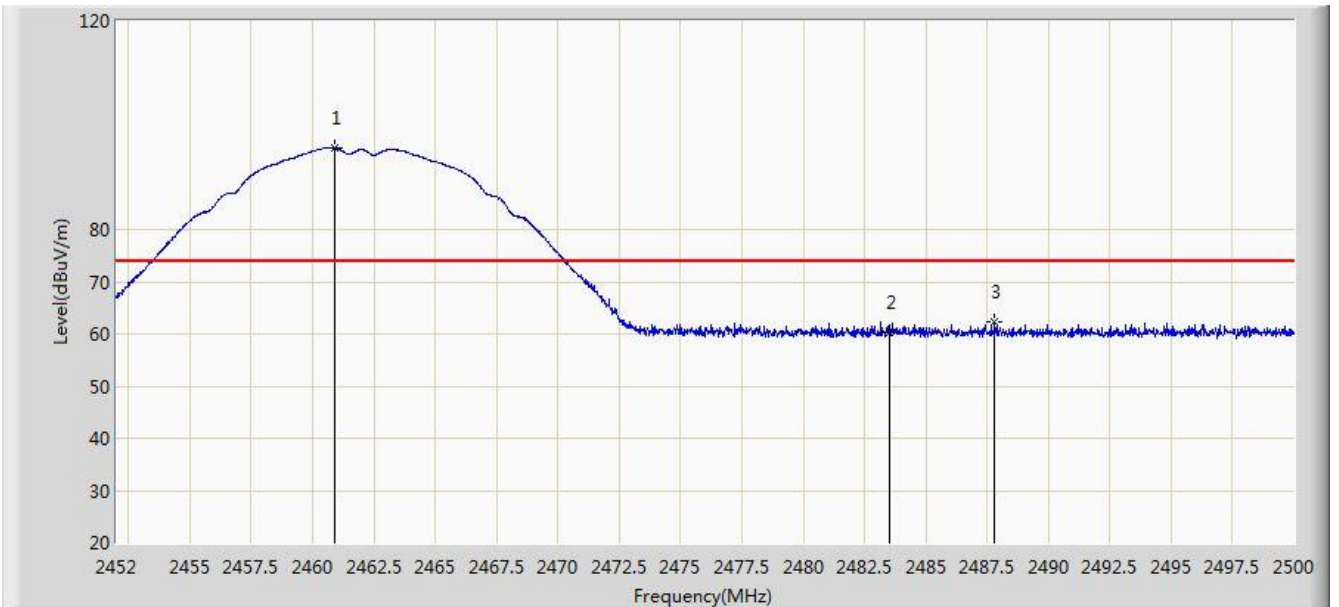


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.976	105.493	73.129	N/A	N/A	32.364	AV
2			2483.500	49.833	17.418	-4.167	54.000	32.416	AV
3			2492.128	50.670	18.237	-3.330	54.000	32.432	AV

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

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

Site: AC1	Time: 2019/05/05 - 15:30
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11b at channel 2462MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.904	95.670	63.306	N/A	N/A	32.364	PK
2			2483.500	60.187	27.772	-13.813	74.000	32.416	PK
3			2487.808	62.287	29.863	-11.713	74.000	32.424	PK

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

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

Site: AC1	Time: 2019/05/05 - 15:35
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11b at channel 2462MHz	

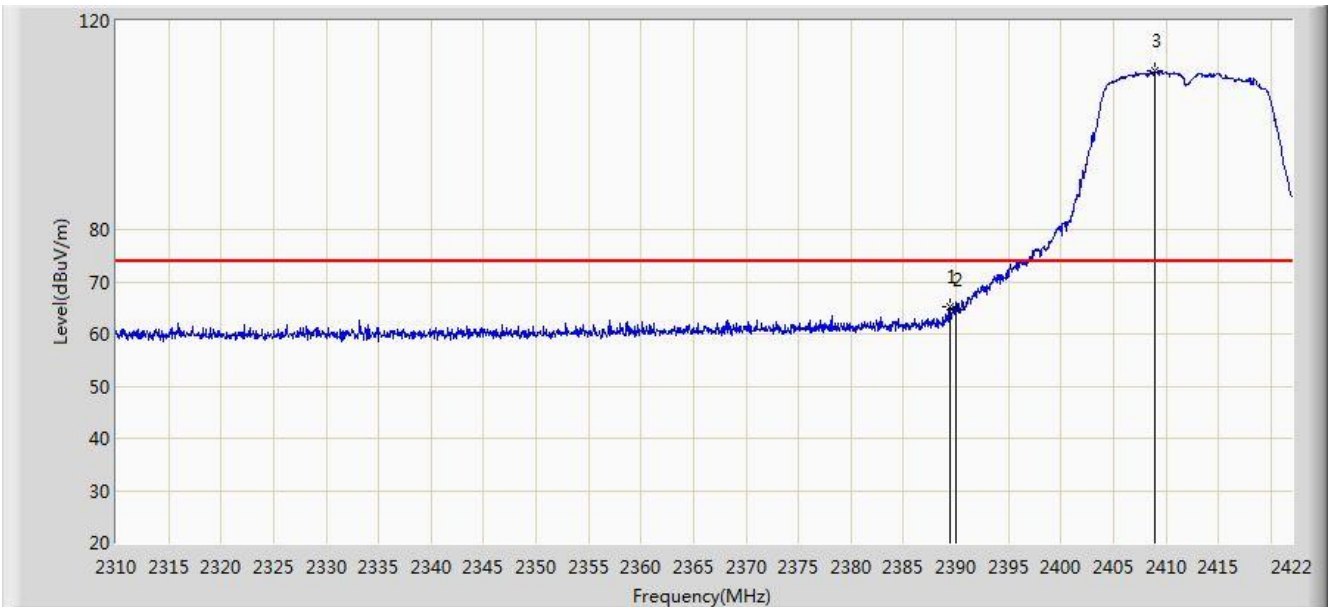


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.216	92.372	60.007	N/A	N/A	32.365	AV
2			2483.500	48.027	15.612	-5.973	54.000	32.416	AV
3			2491.528	48.113	15.682	-5.887	54.000	32.431	AV

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

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

Site: AC1	Time: 2019/05/05 - 15:40
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11g at channel 2412MHz	

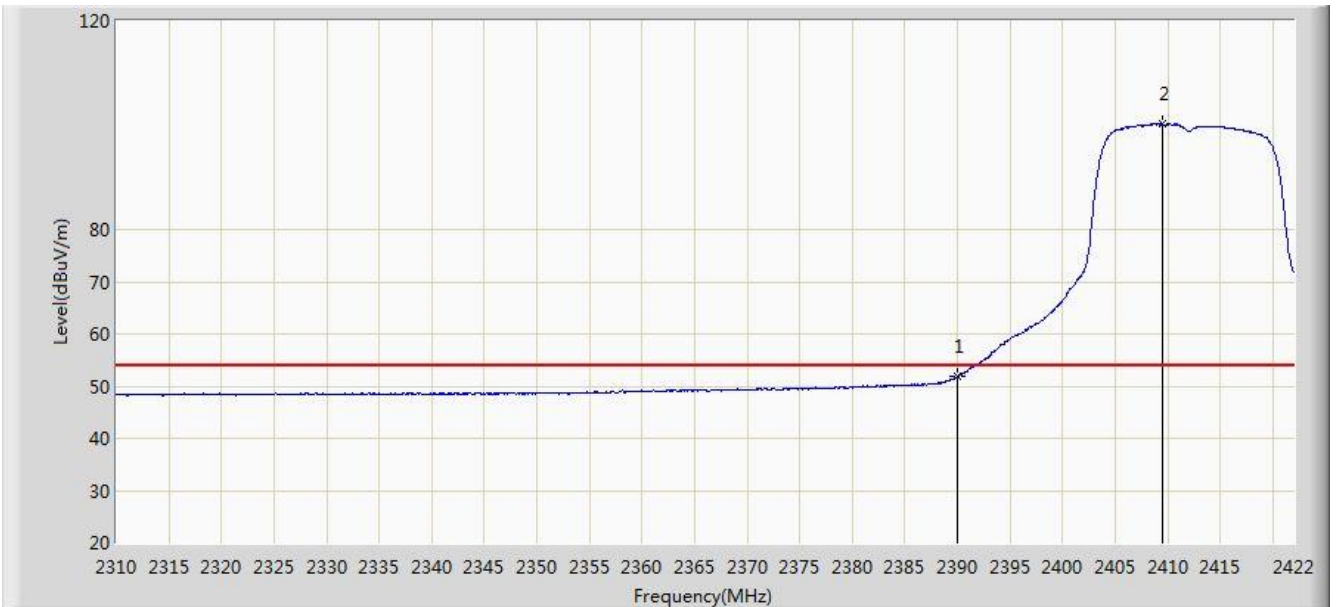


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.408	65.322	32.908	-8.678	74.000	32.413	PK
2			2390.000	64.502	32.089	-9.498	74.000	32.413	PK
3		*	2409.008	110.309	77.921	N/A	N/A	32.387	PK

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

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

Site: AC1	Time: 2019/05/05 - 16:10
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11g at channel 2412MHz	

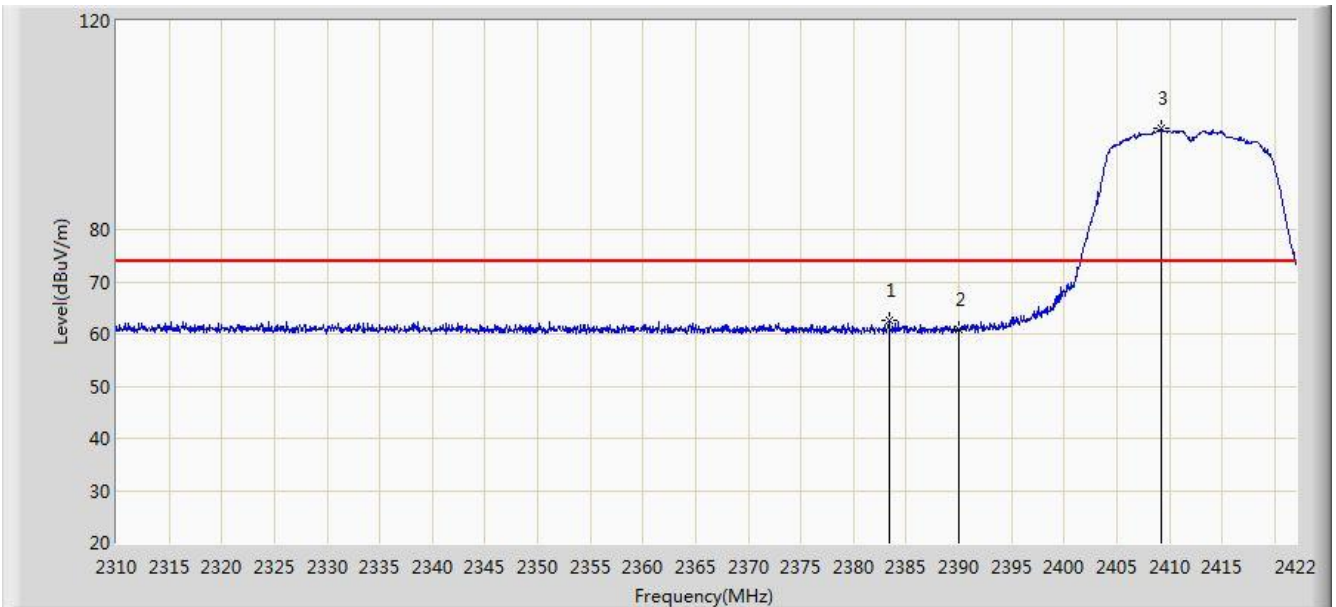


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	51.777	19.364	-2.223	54.000	32.413	AV
2		*	2409.456	100.368	67.981	N/A	N/A	32.387	AV

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

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

Site: AC1	Time: 2019/05/05 - 16:11
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11g at channel 2412MHz	

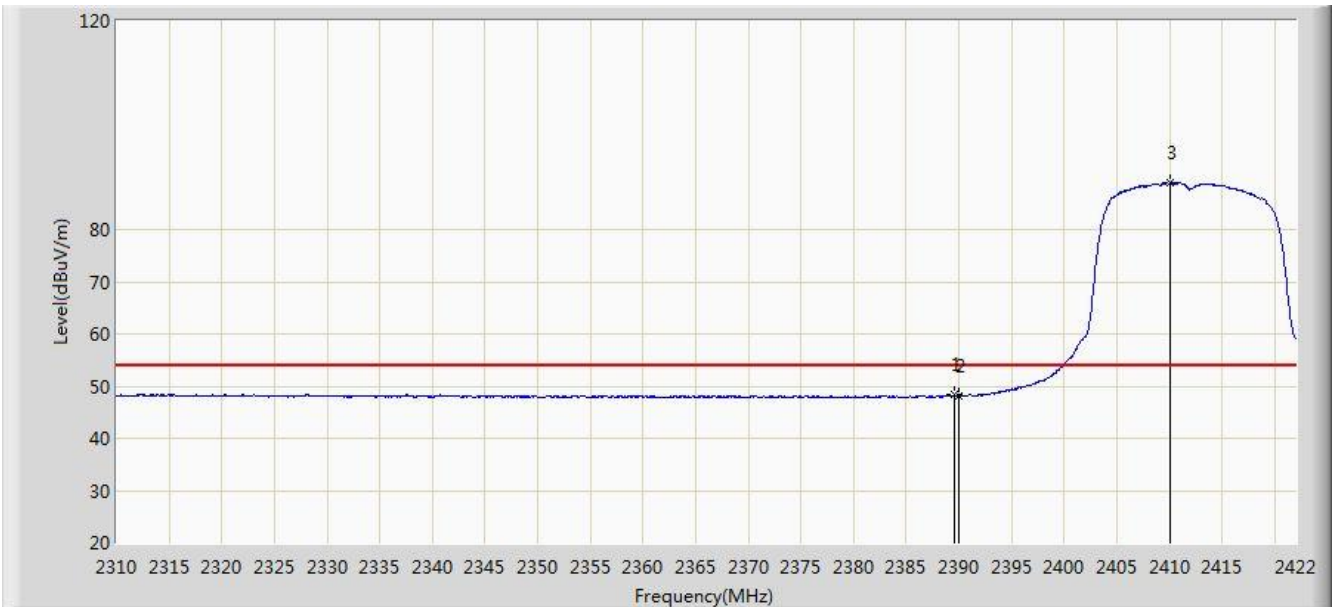


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2383.360	62.559	30.134	-11.441	74.000	32.425	PK
2			2390.000	60.900	28.487	-13.100	74.000	32.413	PK
3		*	2409.232	99.338	66.951	N/A	N/A	32.388	PK

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

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

Site: AC1	Time: 2019/05/05 - 16:16
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11g at channel 2412MHz	

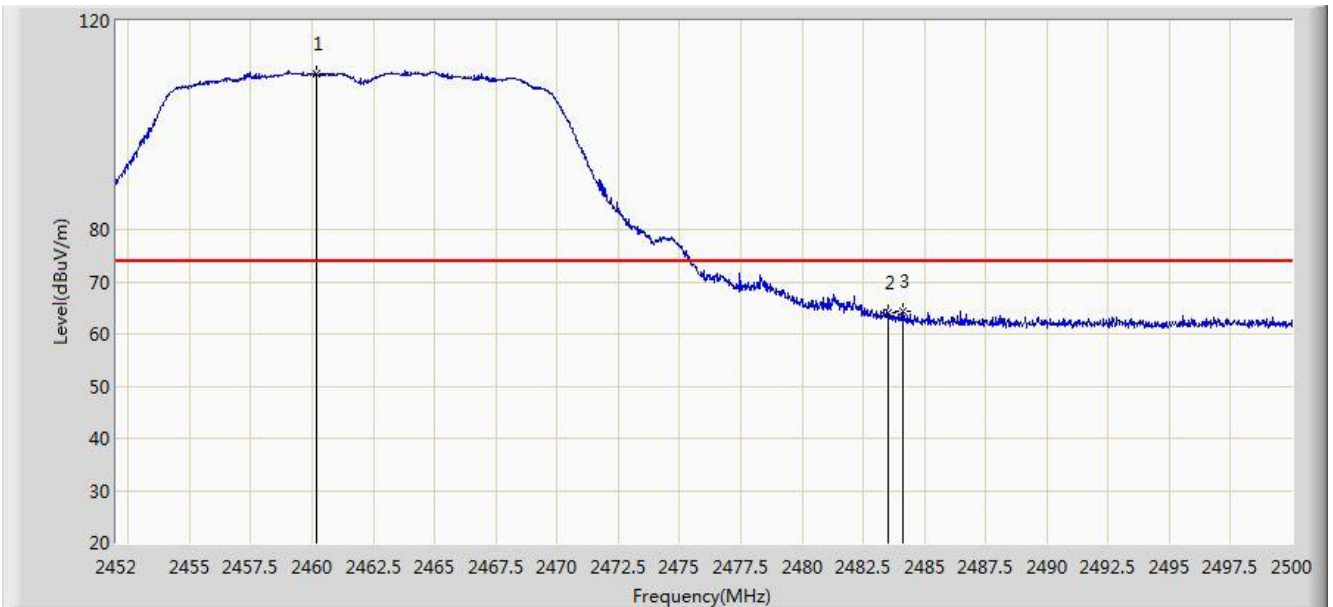


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.632	48.272	15.859	-5.728	54.000	32.414	AV
2			2390.000	48.079	15.666	-5.921	54.000	32.413	AV
3		*	2410.128	89.072	56.686	N/A	N/A	32.386	AV

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

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

Site: AC1	Time: 2019/05/06 - 06:30
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11g at channel 2462MHz	

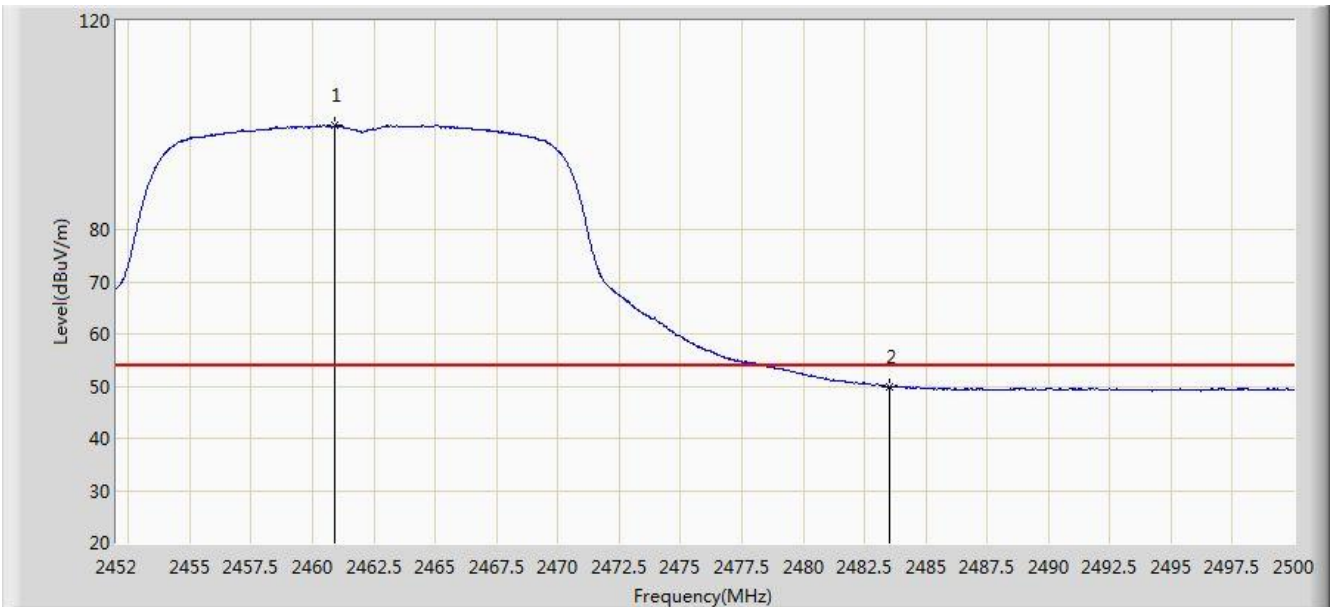


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.208	109.930	77.567	N/A	N/A	32.363	PK
2			2483.500	64.001	31.586	-9.999	74.000	32.416	PK
3			2484.136	64.423	32.006	-9.577	74.000	32.417	PK

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

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

Site: AC1	Time: 2019/05/06 - 06:34
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11g at channel 2462MHz	

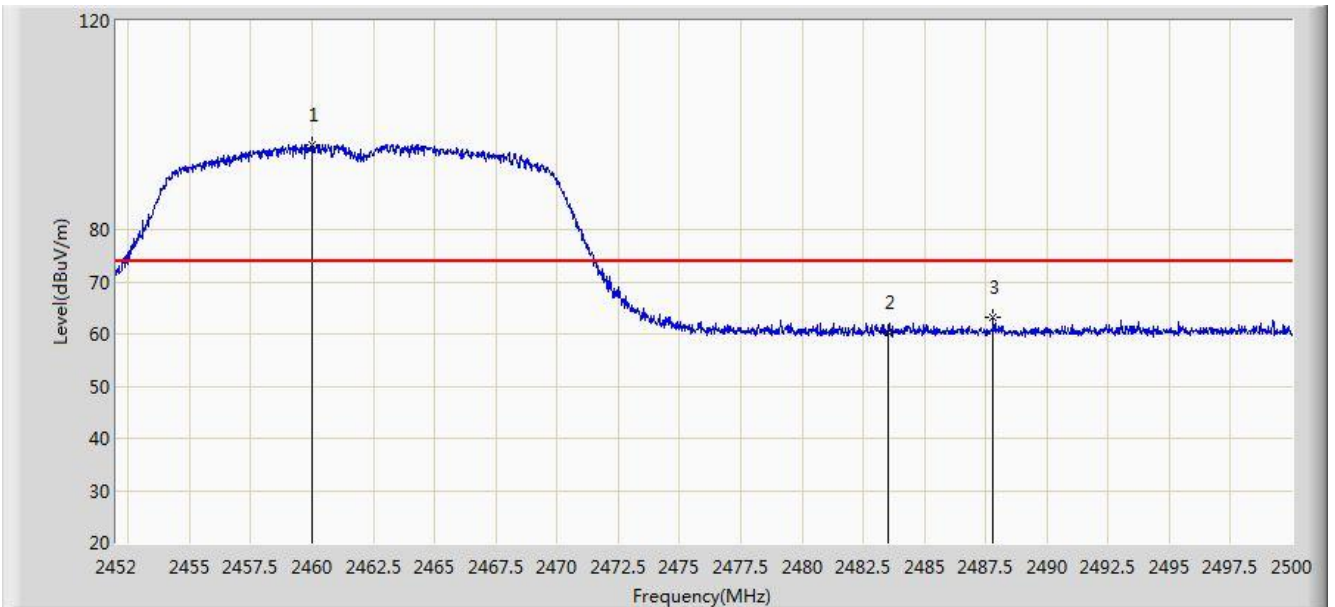


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.928	99.873	67.509	N/A	N/A	32.364	AV
2			2483.500	49.930	17.515	-4.070	54.000	32.416	AV

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

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

Site: AC1	Time: 2019/05/06 - 06:36
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11g at channel 2462MHz	

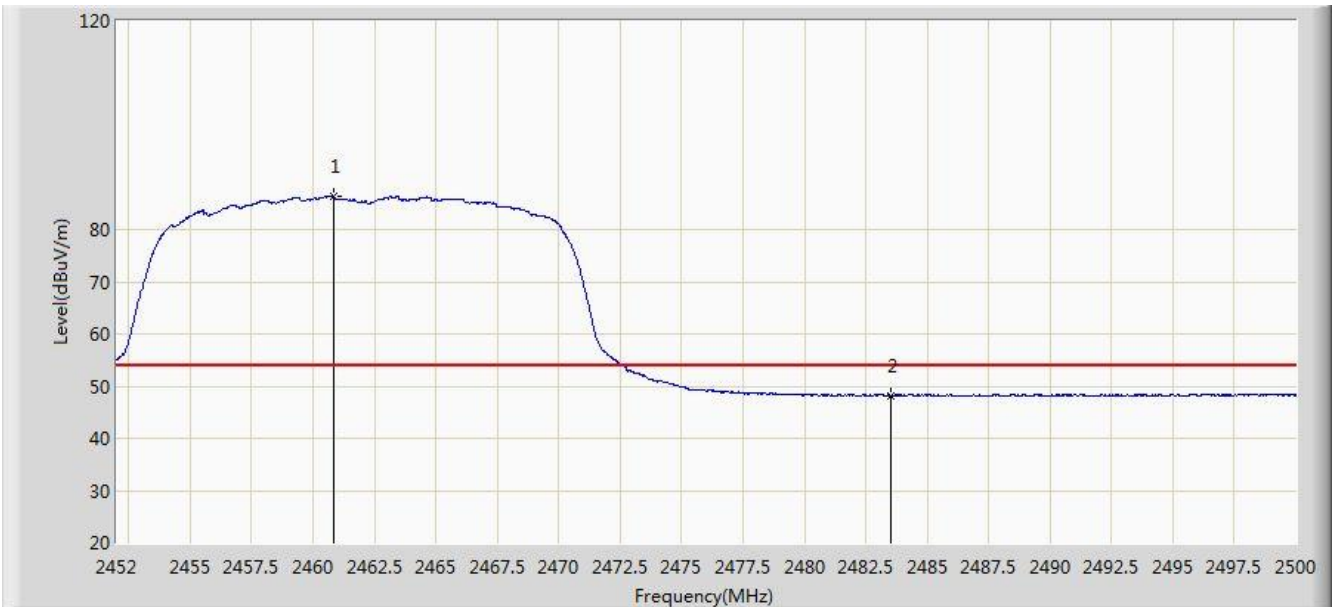


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2459.992	96.257	63.894	N/A	N/A	32.363	PK
2			2483.500	60.318	27.903	-13.682	74.000	32.416	PK
3			2487.808	63.200	30.776	-10.800	74.000	32.424	PK

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

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

Site: AC1	Time: 2019/05/06 - 06:37
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11g at channel 2462MHz	

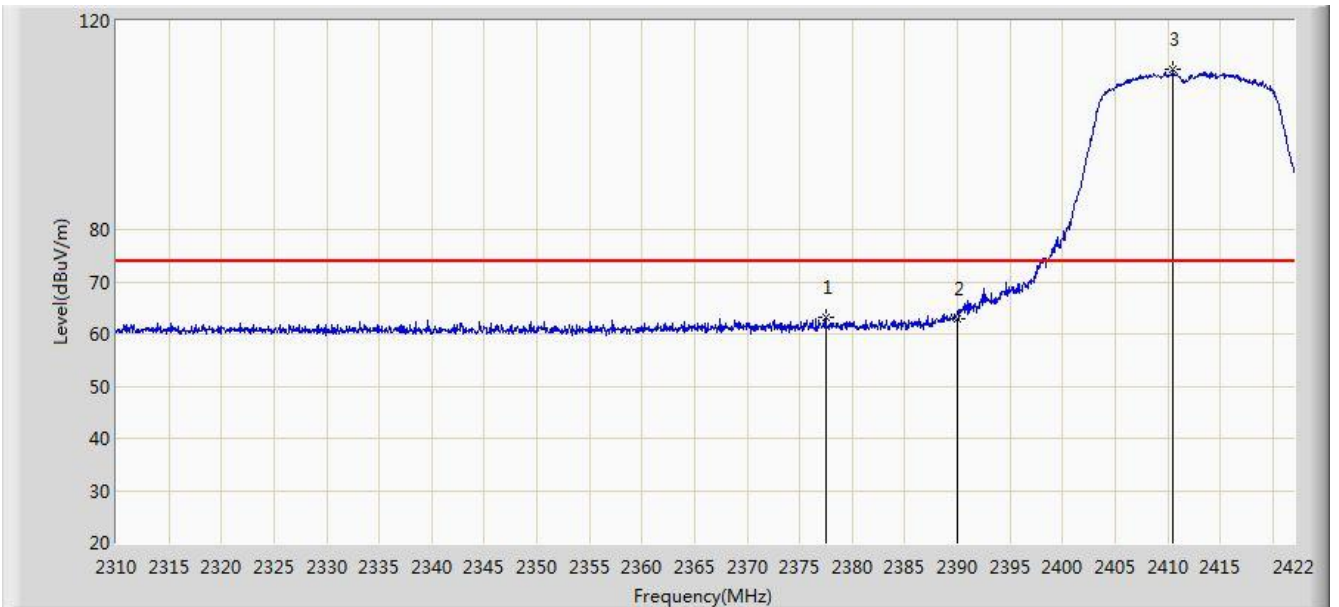


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.856	86.323	53.959	N/A	N/A	32.364	AV
2			2483.500	48.164	15.749	-5.836	54.000	32.416	AV

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

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

Site: AC1	Time: 2019/05/06 - 06:37
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT20 at channel 2412MHz	

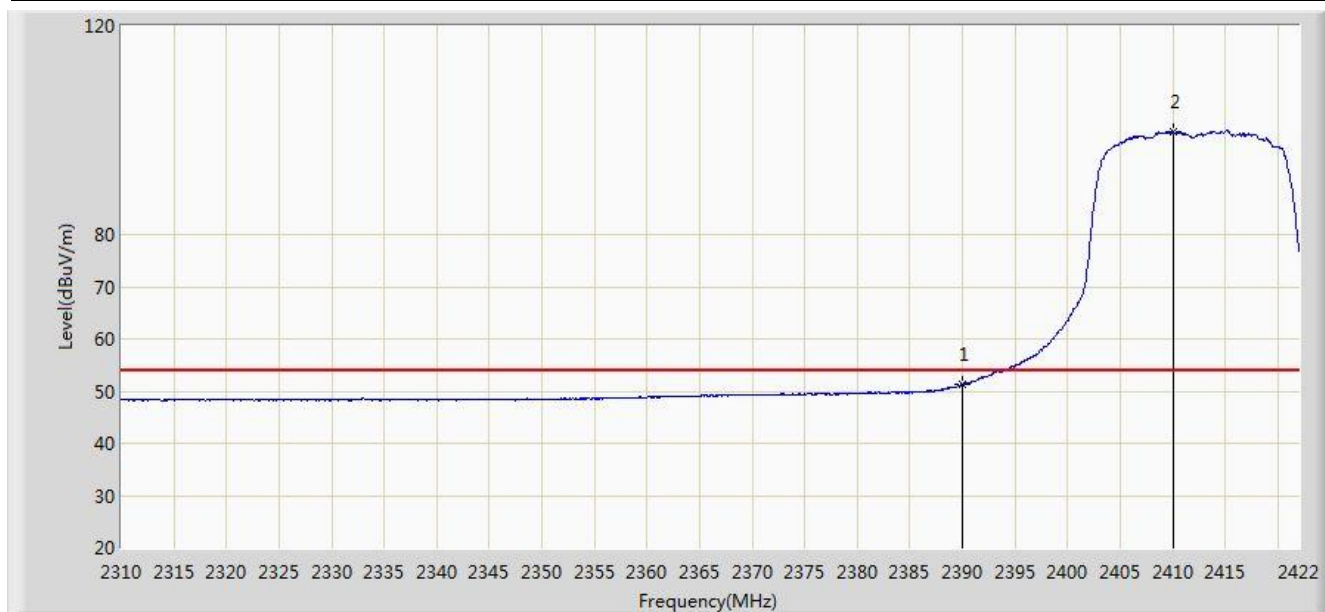


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2377.480	63.321	30.885	-10.679	74.000	32.435	PK
2			2390.000	62.994	30.581	-11.006	74.000	32.413	PK
3		*	2410.520	110.581	78.195	N/A	N/A	32.385	PK

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

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

Site: AC1	Time: 2019/05/06 - 06:40
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT20 at channel 2412MHz	

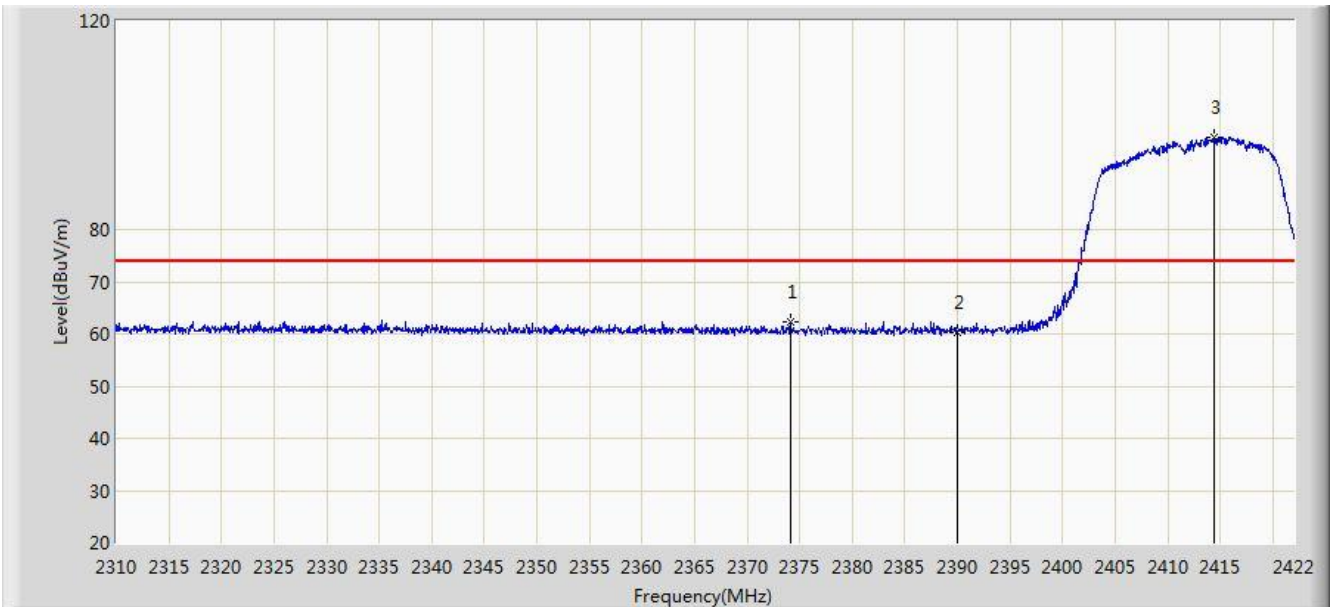


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	51.305	18.892	-2.695	54.000	32.413	AV
2		*	2410.072	99.702	67.316	N/A	N/A	32.387	AV

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

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

Site: AC1	Time: 2019/05/06 - 06:41
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT20 at channel 2412MHz	

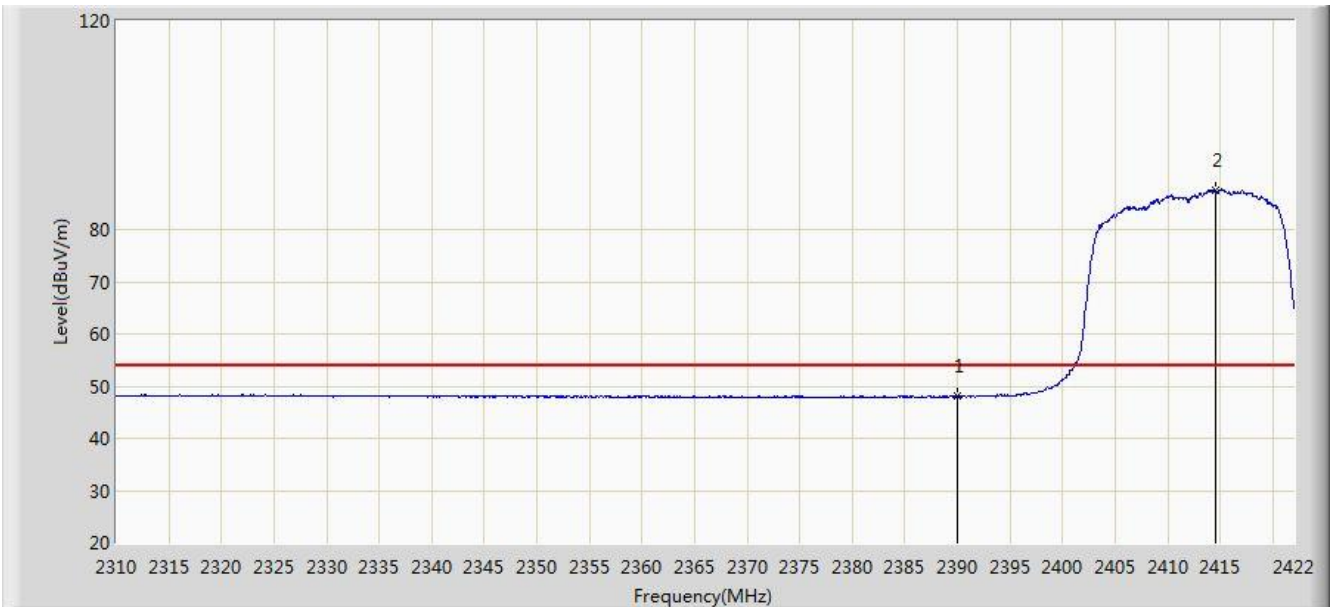


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2374.120	62.405	29.962	-11.595	74.000	32.443	PK
2			2390.000	60.264	27.851	-13.736	74.000	32.413	PK
3		*	2414.440	97.606	65.225	N/A	N/A	32.381	PK

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

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

Site: AC1	Time: 2019/05/06 - 06:44
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT20 at channel 2412MHz	

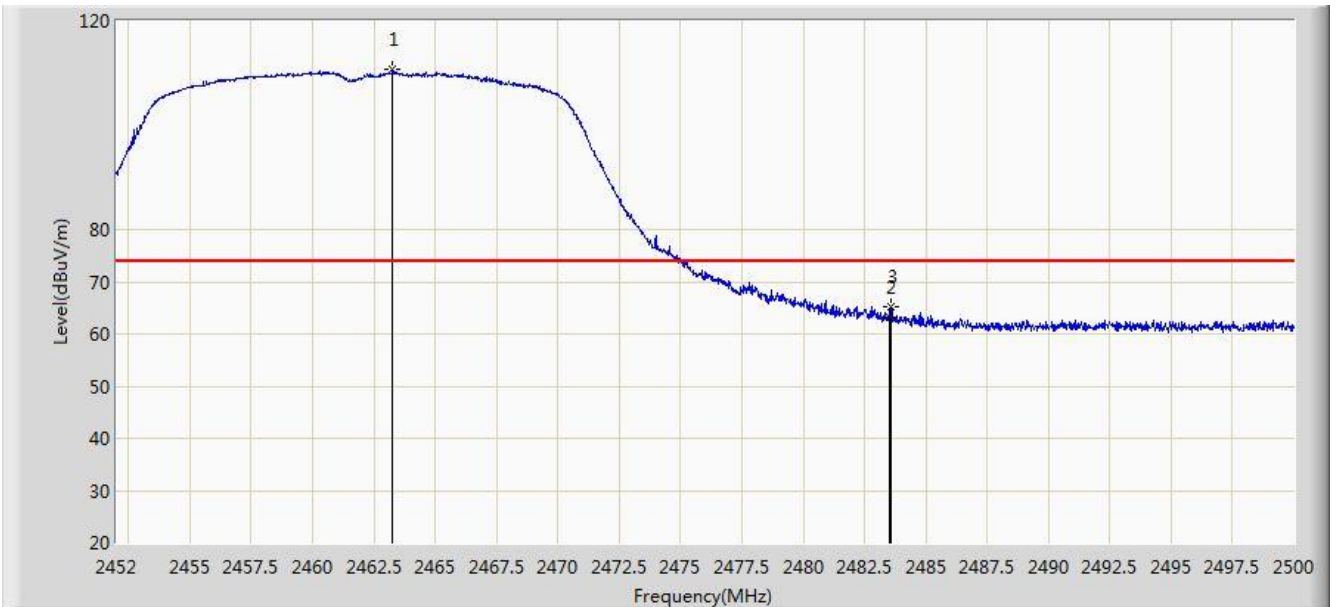


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	48.108	15.695	-5.892	54.000	32.413	AV
2		*	2414.496	87.583	55.202	N/A	N/A	32.381	AV

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

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

Site: AC1	Time: 2019/05/06 - 06:45
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

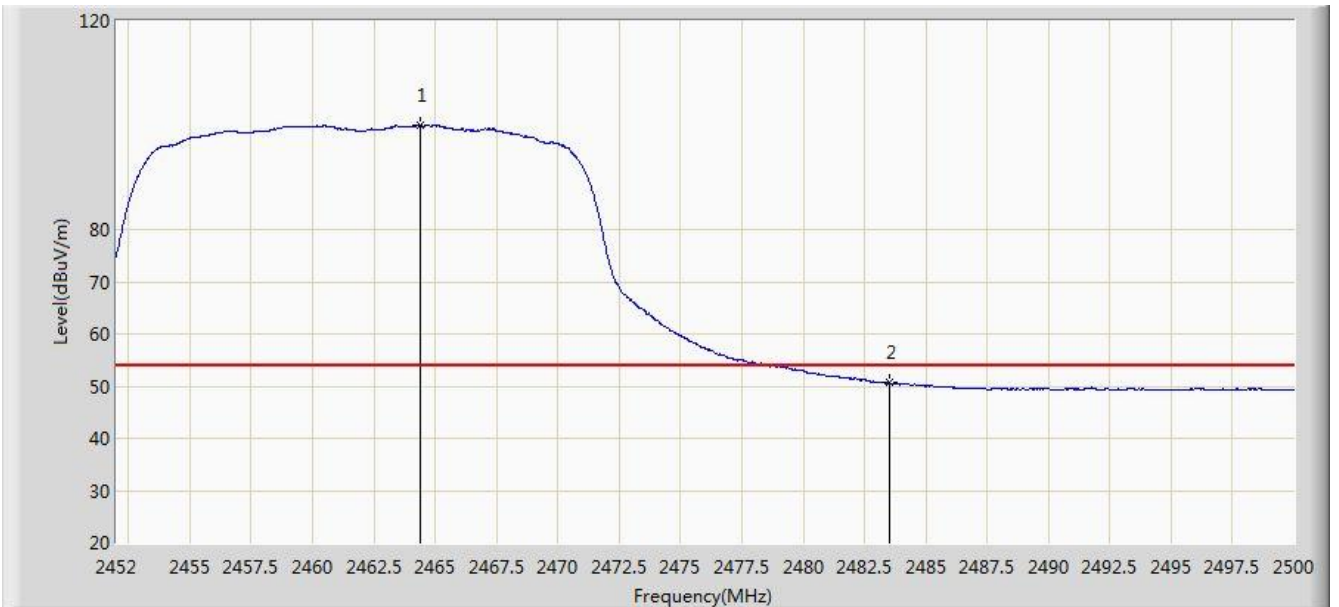


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2463.256	110.824	78.456	N/A	N/A	32.369	PK
2			2483.500	63.179	30.764	-10.821	74.000	32.416	PK
3			2483.560	65.292	32.876	-8.708	74.000	32.416	PK

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

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

Site: AC1	Time: 2019/05/06 - 06:49
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

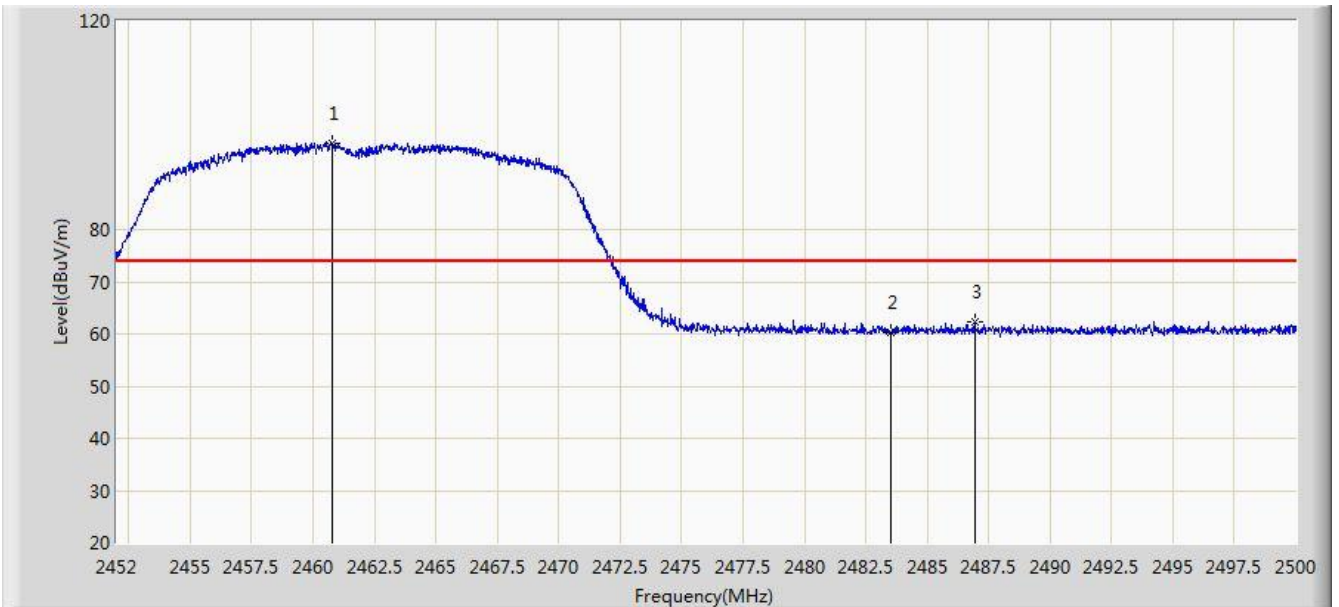


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2464.384	99.986	67.615	N/A	N/A	32.371	AV
2			2483.500	50.584	18.169	-3.416	54.000	32.416	AV

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

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

Site: AC1	Time: 2019/05/06 - 06:49
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

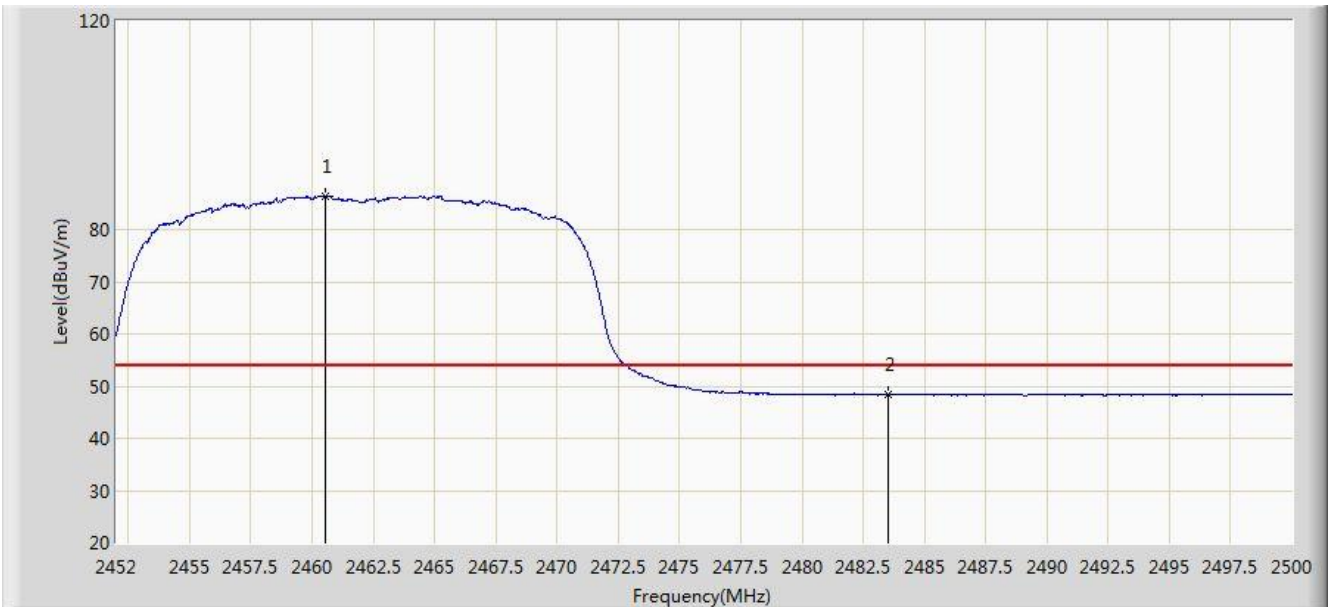


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.760	96.622	64.258	N/A	N/A	32.364	PK
2			2483.500	60.191	27.776	-13.809	74.000	32.416	PK
3			2486.920	62.317	29.895	-11.683	74.000	32.422	PK

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

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

Site: AC1	Time: 2019/05/06 - 06:51
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

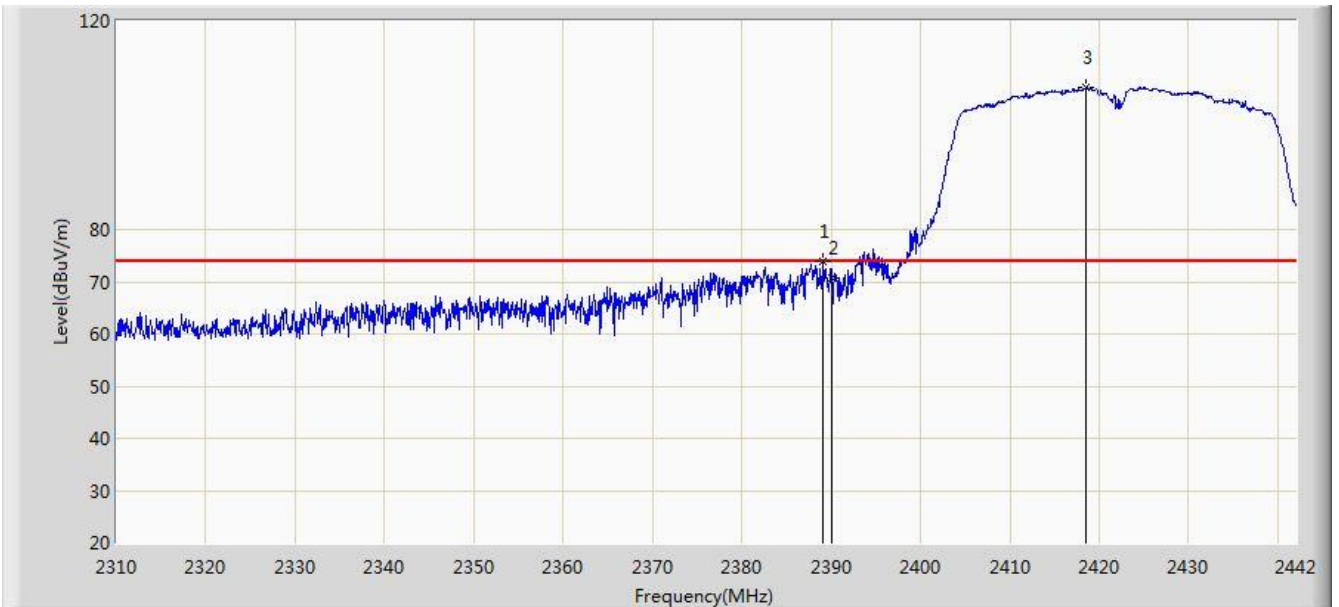


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.544	86.358	53.994	N/A	N/A	32.364	AV
2			2483.500	48.279	15.864	-5.721	54.000	32.416	AV

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

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

Site: AC1	Time: 2019/05/07 - 01:56
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT40 at channel 2422MHz	

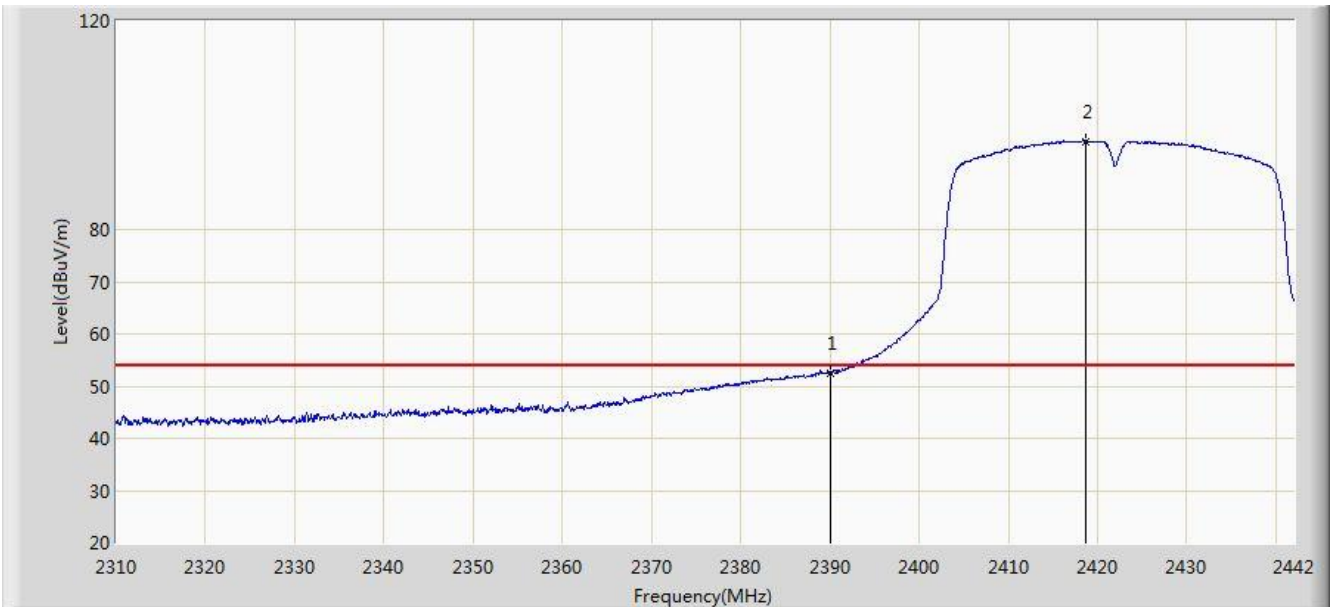


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.134	73.893	41.479	-0.107	74.000	32.414	PK
2			2390.000	70.589	38.176	-3.411	74.000	32.413	PK
3		*	2418.504	107.119	74.742	N/A	N/A	32.376	PK

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

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

Site: AC1	Time: 2019/05/07 - 02:02
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT40 at channel 2422MHz	

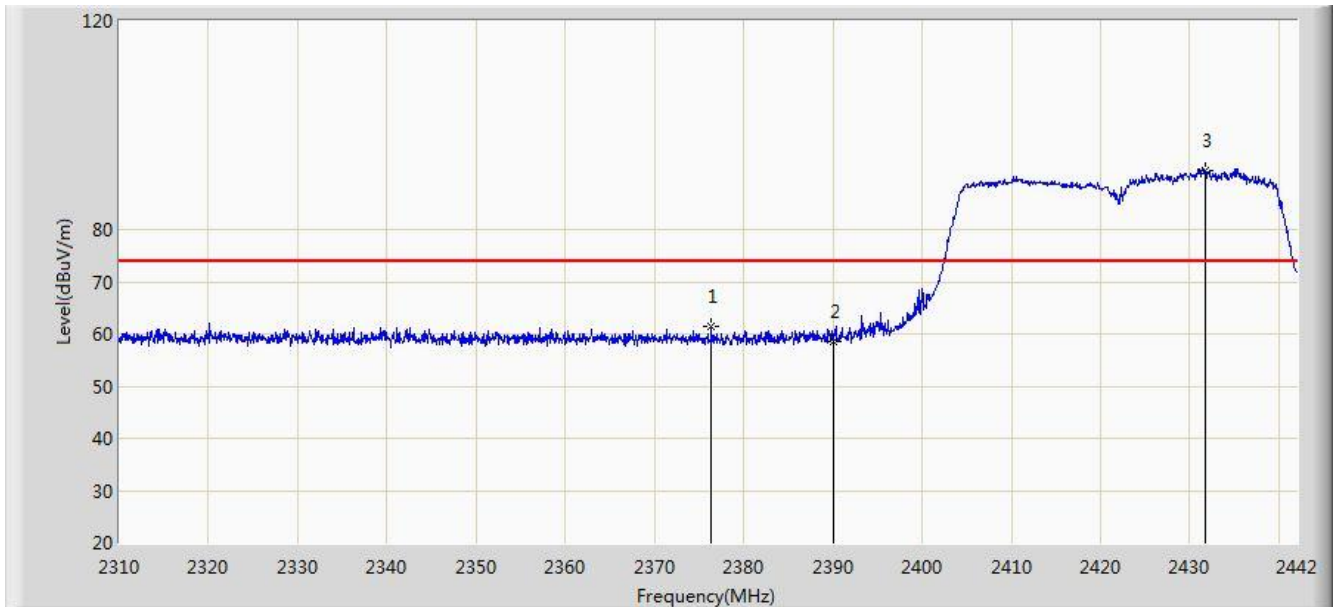


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	52.565	20.152	-1.435	54.000	32.413	AV
2		*	2418.702	96.866	64.489	N/A	N/A	32.377	AV

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

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

Site: AC1	Time: 2019/05/07 - 02:03
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT40 at channel 2422MHz	

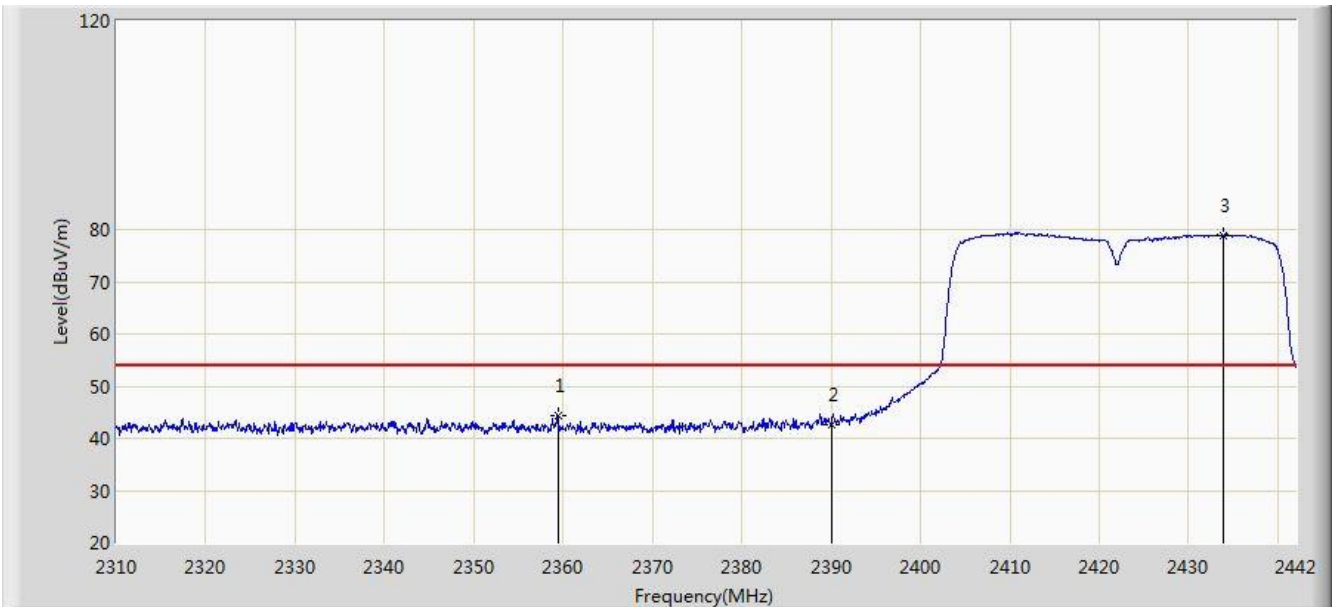


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2376.396	61.552	29.114	-12.448	74.000	32.438	PK
2			2390.000	58.658	26.245	-15.342	74.000	32.413	PK
3		*	2431.704	91.317	58.957	N/A	N/A	32.360	PK

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

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

Site: AC1	Time: 2019/05/07 - 02:05
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT40 at channel 2422MHz	

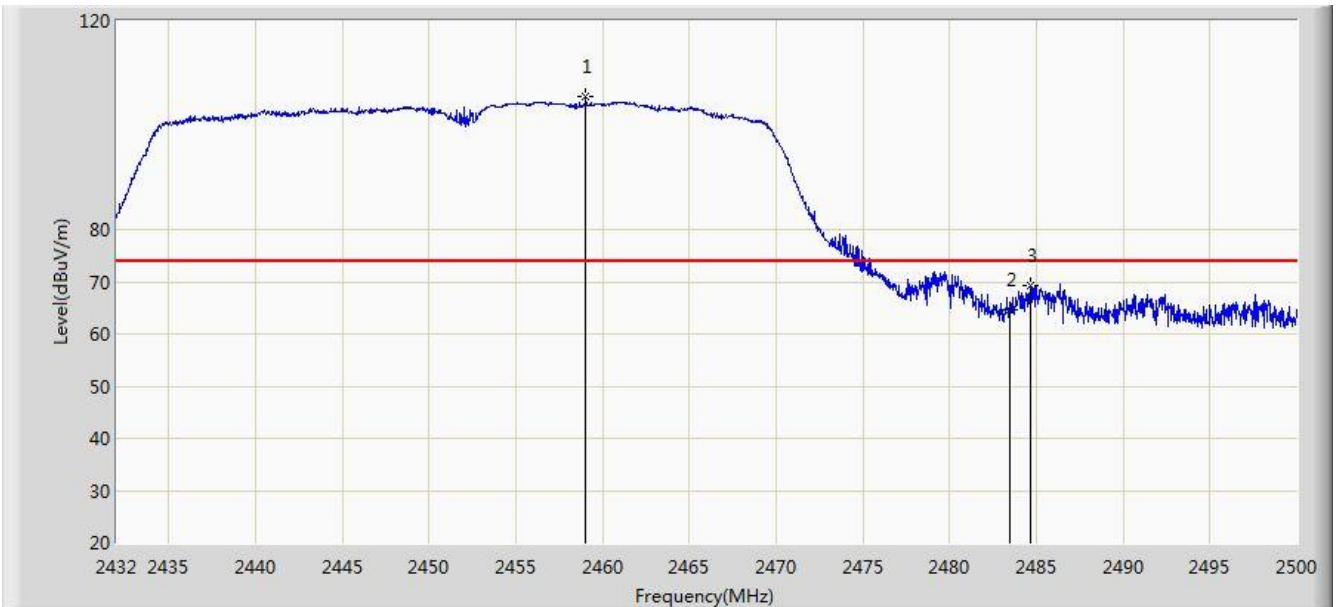


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2359.434	44.274	11.798	-9.726	54.000	32.476	AV
2			2390.000	42.714	10.301	-11.286	54.000	32.413	AV
3		*	2433.948	78.854	46.498	N/A	N/A	32.357	AV

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

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

Site: AC1	Time: 2019/05/06 - 07:05
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT40 at channel 2452MHz	

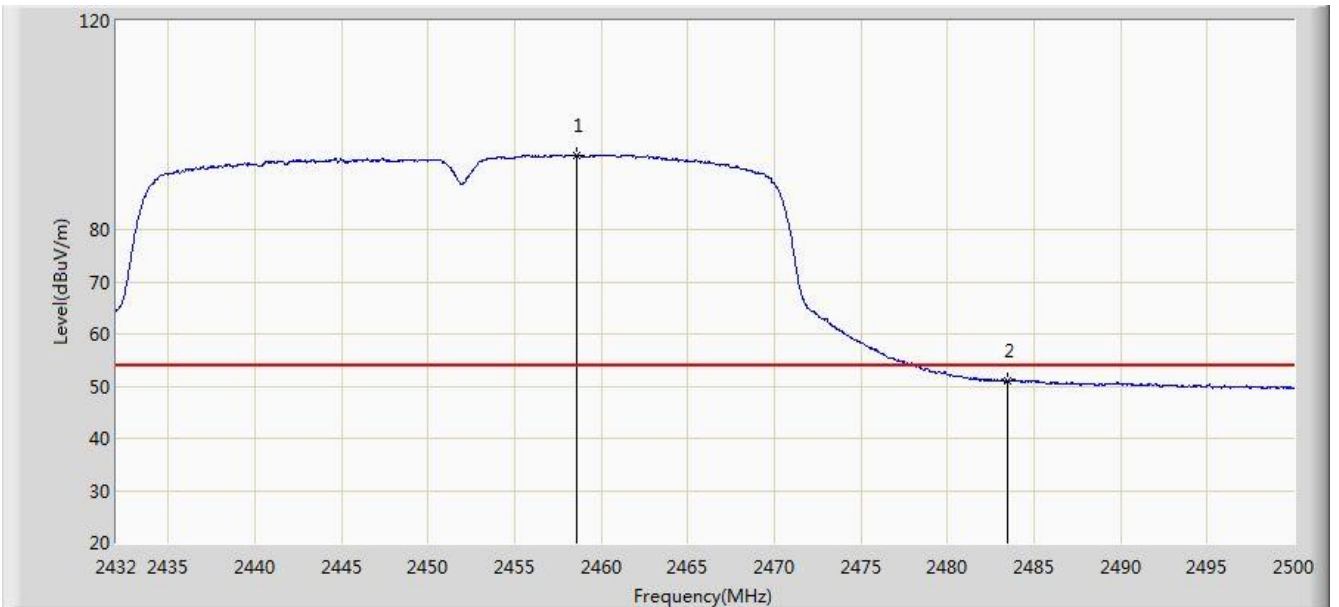


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2459.030	105.427	73.066	N/A	N/A	32.361	PK
2			2483.500	64.747	32.332	-9.253	74.000	32.416	PK
3			2484.666	69.331	36.913	-4.669	74.000	32.418	PK

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

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

Site: AC1	Time: 2019/05/06 - 07:08
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT40 at channel 2452MHz	

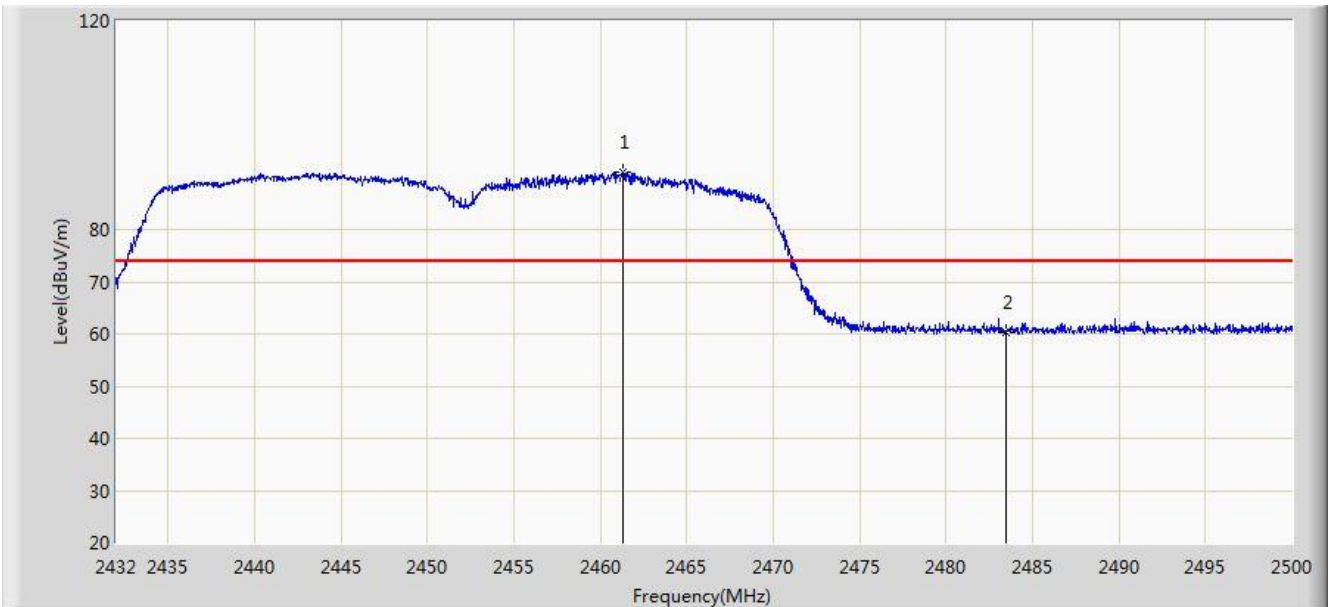


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2458.622	94.296	61.936	N/A	N/A	32.360	AV
2			2483.500	51.063	18.648	-2.937	54.000	32.416	AV

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

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

Site: AC1	Time: 2019/05/06 - 07:08
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT40 at channel 2452MHz	

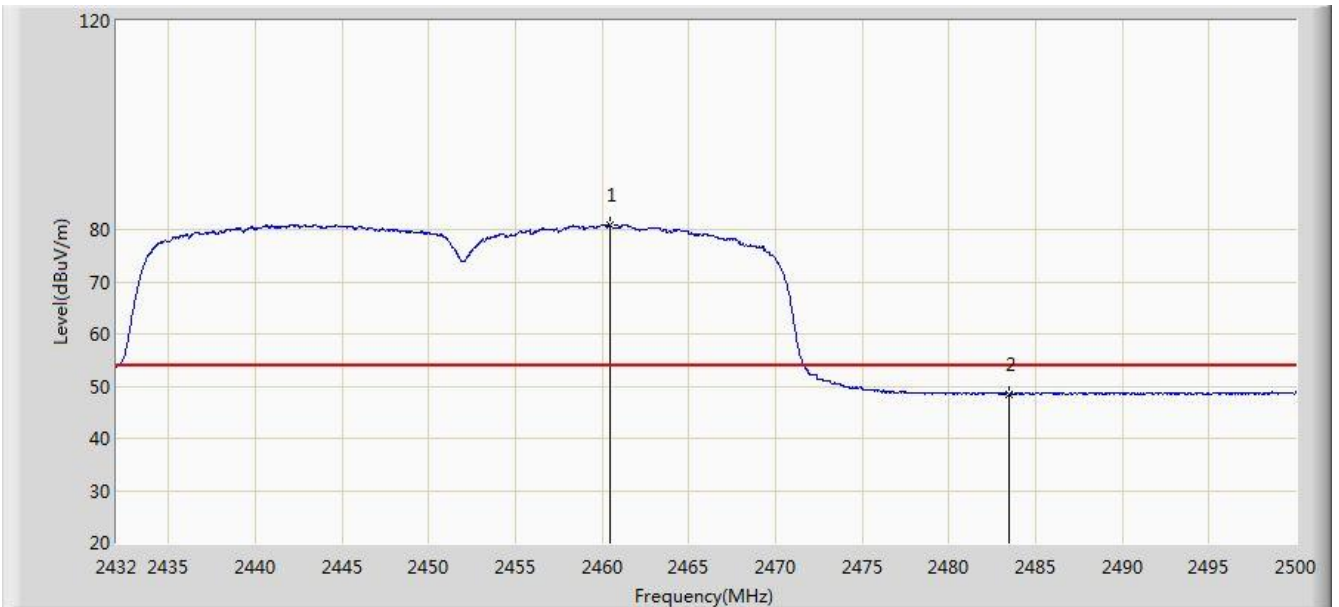


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.342	91.011	58.646	N/A	N/A	32.365	PK
2			2483.500	60.401	27.986	-13.599	74.000	32.416	PK

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

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

Site: AC1	Time: 2019/05/06 - 07:11
Limit: FCC_Part15.209_RSE(3m)	Engineer: Cloud Guo
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: W-LAN + Bluetooth Module	Power: DC 3.3V
Test Mode: Transmit by 802.11n-HT40 at channel 2452MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.424	80.931	48.568	N/A	N/A	32.363	AV
2			2483.500	48.531	16.116	-5.469	54.000	32.416	AV

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

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

8. CONCLUSION

The data collected relate only the item(s) tested and show that the **W-LAN + Bluetooth Module** is in compliance with Part 15C of the FCC Rules & IC Rules.

_____ The End _____

Appendix A – Test Setup Photograph

Refer to “1904WSU022-UT” file.

Appendix B – EUT Photograph

Refer to “1904WSU022-UE” file.