MEASUREMENT REPORT

FCC PART 15.247 / RSS-247 Bluetooth-LE

Applicant:	Redpine Signals Inc
Address:	2107 N.First Street, Suite 540, San Jose, CA 95131-2019, USA
Product:	Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module
Model No.:	M4SB
Brand Name:	Redpine Signals
FCC Rule Part(s):	Part15 Subpart C (Section 15.247)
Test Procedure(s):	ANSI C63.10-2013
Test Date:	February 28 ~ March 03, 2020

Reviewed By: (Jame Yuan)

Approved By: (Robin Wu)

Revision History

Report No.	Version	Description	Issue Date	Note
1912RSU024-U4	Rev. 01	Initial Report	03-19-2020	Valid

Note: This module was used in portable host and changed the antenna, so we only evaluated the radiated spurious emissions item.

CONTENTS

Description Page

General Information

Applicant:	Redpine Signals Inc
Applicant Address:	2107 N.First Street, Suite 540, San Jose, CA 95131-2019, USA
Manufacturer:	Redpine Signals Inc
Manufacturer Address:	2107 N.First Street, Suite 540, San Jose, CA 95131-2019, USA
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 registered (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.**

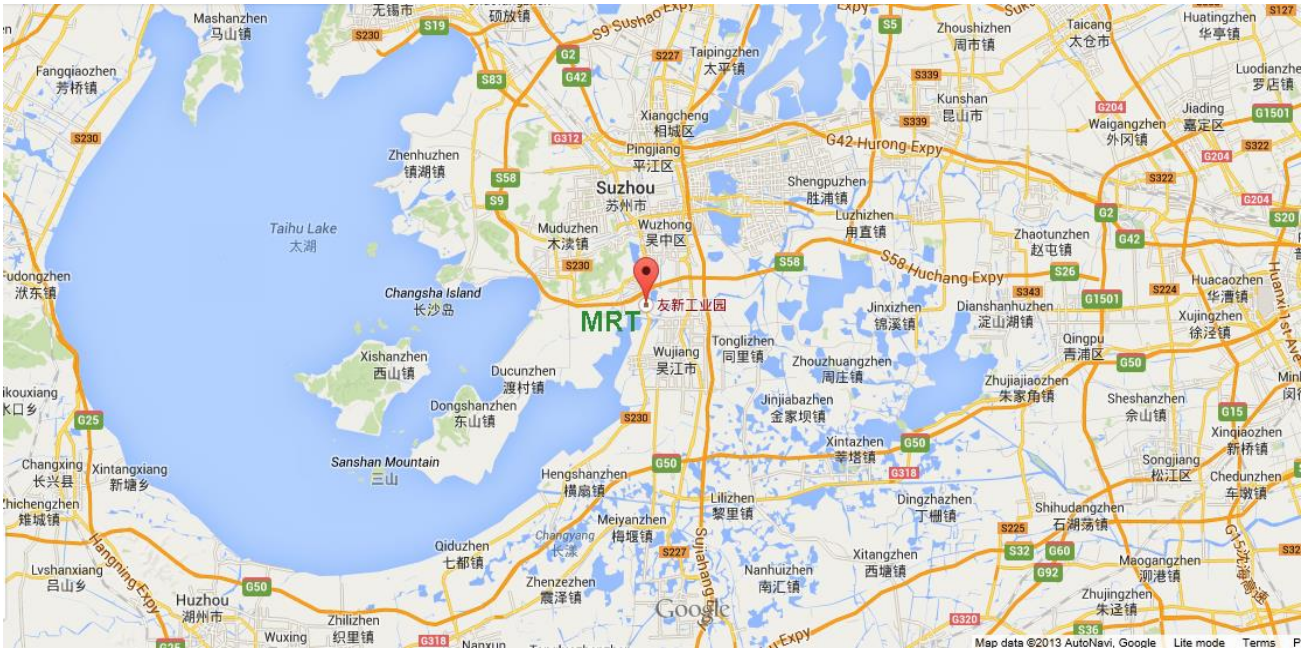
1. INTRODUCTION

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 and 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:	Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module
Model No.:	M4SB
Brand Name:	Redpine Signals
Wi-Fi Specification:	802.11b/g/n
Bluetooth Version:	v5.0 (single mode only for BLE)

2.2. Product Specification Subjective to this Report

Frequency Range:	2402 ~ 2480MHz
Channel Number:	40
Type of modulation:	GFSK
Data Rate:	Up to 2Mbps
Antenna Type:	Copper Antenna
Antenna Gain:	-1.78dBi

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

2.3. Description of Host

Host Name.:	Kanega Watch
Model No.:	KANEGA002
Brand Name:	UnaliWear
Contain two modules	
Module 1#:	FCC ID: 2AM4C-HL7800M IC: 25867-HL7800M
Module 2#:	FCC ID: XF6-M4SB IC: 8407A-M4SB

Note: BLE & LTE CAT M1 can transmit simultaneously.

2.4. Working Frequencies for this Report

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz
03	2408 MHz	04	2410 MHz	05	2412 MHz
06	2414 MHz	07	2416 MHz	08	2418 MHz
09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz
15	2432 MHz	16	2434 MHz	17	2436 MHz
18	2438 MHz	19	2440 MHz	20	2442 MHz
21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz
27	2456 MHz	28	2458 MHz	29	2460 MHz
30	2462 MHz	31	2464 MHz	32	2466 MHz
33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz
39	2480 MHz	--	--	--	--

2.5. Test Mode

Test Mode	Mode 1: Transmit by Bluetooth-LE (1Mbps)
	Mode 2: Transmit by Bluetooth-LE (2Mbps)

2.6. EMI Suppression Device(s)/Modifications

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

2.7. Description of Test Software

N/A

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

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

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

3.2. 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, 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. TEST EQUIPMENT CALIBRATION DATE

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	MRTSUE06597	1 year	2020/12/17
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	MRTSUE06597	1 year	2020/12/17
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

Software	Version	Function
EMI Software	V3	EMI Test Software

5. 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.

Radiated Emission Measurement - AC1
Measurement 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
Measurement 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

6. TEST RESULT

6.1. Summary

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
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 6.2 Section 6.3

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.

6.2. Radiated Spurious Emission Measurement

6.2.1.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 (μV/m)	Measured Distance (m)
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

6.2.2.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)

6.2.3.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

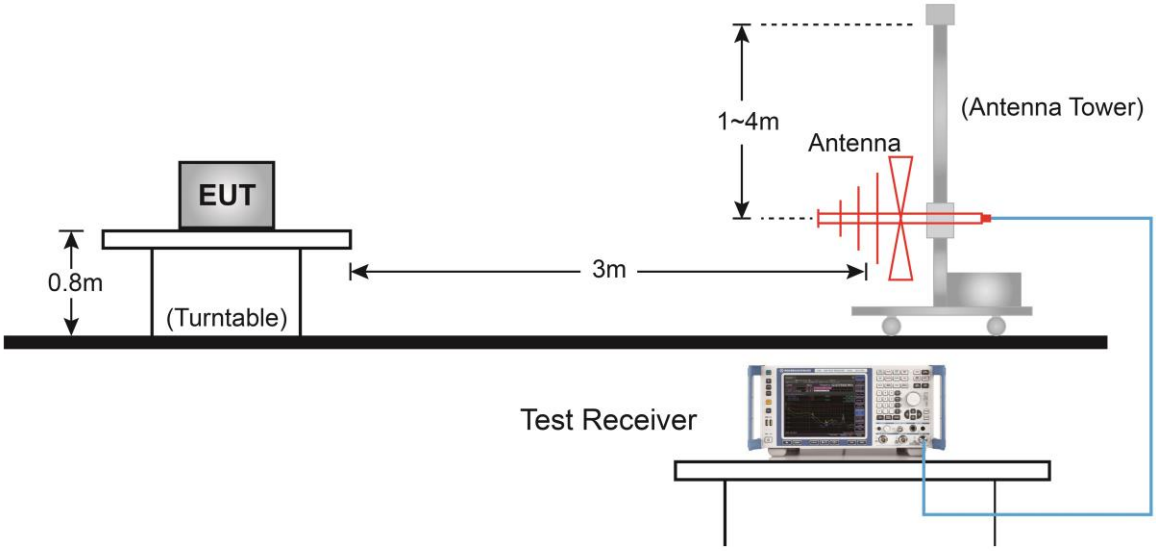
Average Measurements above 1GHz (Method VB)

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 ≥ 98%, set VBW = 10Hz

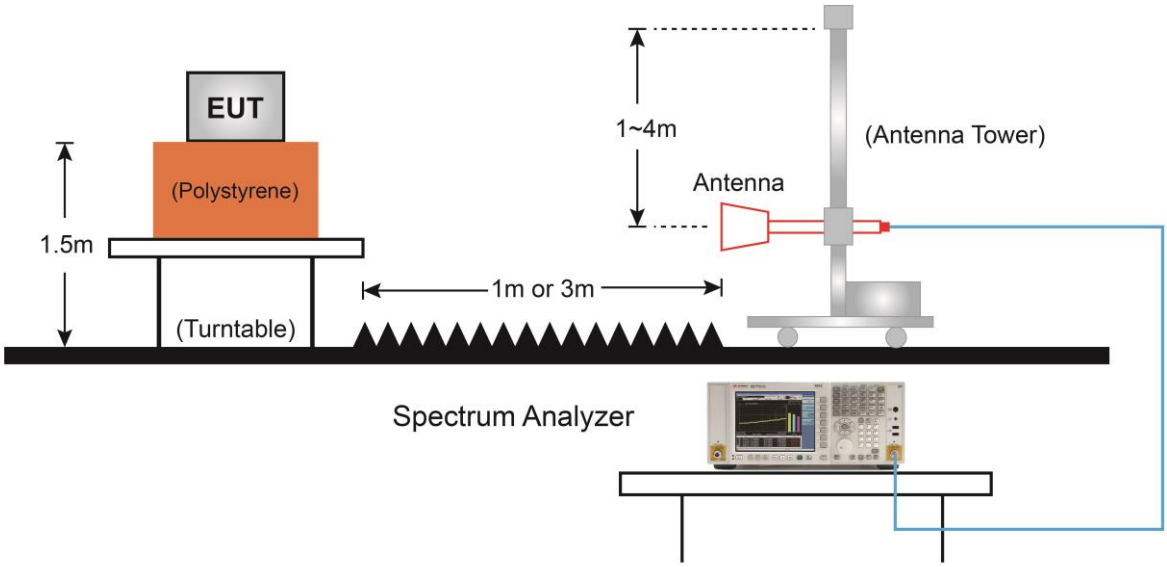
   If the EUT duty cycle is < 98%, set VBW ≥ 1/T. T is the minimum transmission duration
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.2.4.Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.2.5.Test Result

Product	Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Temperature	25℃
Test Engineer	Tyler Yuan	Relative Humidity	54%
Test Site	AC1	Test Date	2020/02/29
Test Mode	Bluetooth-LE (1Mbps)	Test Channel	00
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
	4808.0	37.3	4.2	41.5	74.0	-32.5	Peak	Horizontal
	5046.0	37.8	4.5	42.3	74.0	-31.7	Peak	Horizontal
*	6083.0	36.7	7.0	43.7	74.0	-30.3	Peak	Horizontal
*	6967.0	33.4	10.5	43.9	74.0	-30.1	Peak	Horizontal
	4629.5	37.7	3.5	41.2	74.0	-32.8	Peak	Vertical
	5071.5	37.1	4.5	41.6	74.0	-32.4	Peak	Vertical
*	6202.0	36.0	7.1	43.1	74.0	-30.9	Peak	Vertical
*	6992.5	33.2	10.7	43.9	74.0	-30.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (79.0dBμV/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	Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Temperature	25℃
Test Engineer	Tyler Yuan	Relative Humidity	54%
Test Site	AC1	Test Date	2020/02/29
Test Mode	Bluetooth-LE (1Mbps)	Test Channel	19
Remark	1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands. 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
	4808.0	37.2	4.2	41.4	74.0	-32.6	Peak	Horizontal
	4995.0	37.6	4.0	41.6	74.0	-32.4	Peak	Horizontal
*	6482.5	34.8	8.5	43.3	74.0	-30.7	Peak	Horizontal
*	7026.5	33.4	10.8	44.2	74.0	-29.8	Peak	Horizontal
	4799.5	37.3	4.3	41.6	74.0	-32.4	Peak	Vertical
	5020.5	37.4	4.3	41.7	74.0	-32.3	Peak	Vertical
*	6083.0	36.0	7.0	43.0	74.0	-31.0	Peak	Vertical
*	7069.0	33.4	11.5	44.9	74.0	-29.1	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (82.9dBμV/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	Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Temperature	25℃
Test Engineer	Tyler Yuan	Relative Humidity	54%
Test Site	AC1	Test Date	2020/02/29
Test Mode	Bluetooth-LE (1Mbps)	Test Channel	39
Remark	1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands. 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
	4799.5	37.6	4.3	41.9	74.0	-32.1	Peak	Horizontal
	4986.5	37.9	4.0	41.9	74.0	-32.1	Peak	Horizontal
*	6261.5	36.1	7.2	43.3	74.0	-30.7	Peak	Horizontal
*	6567.5	34.4	8.9	43.3	74.0	-30.7	Peak	Horizontal
	4842.0	37.6	4.0	41.6	74.0	-32.4	Peak	Vertical
	4986.5	38.4	4.0	42.4	74.0	-31.6	Peak	Vertical
*	5777.0	37.0	5.7	42.7	74.0	-31.3	Peak	Vertical
*	7128.5	32.6	11.7	44.3	74.0	-29.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (85.8dBμV/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	Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Temperature	25℃
Test Engineer	Tyler Yuan	Relative Humidity	54%
Test Site	AC1	Test Date	2020/02/29
Test Mode	Bluetooth-LE (2Mbps)	Test Channel	00
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	37.4	4.0	41.4	74.0	-32.6	Peak	Horizontal
	4893.0	37.6	4.1	41.7	74.0	-32.3	Peak	Horizontal
*	6567.5	34.8	8.9	43.7	74.0	-30.3	Peak	Horizontal
*	7094.5	33.1	11.8	44.9	74.0	-29.1	Peak	Horizontal
	4850.5	38.1	3.8	41.9	74.0	-32.1	Peak	Vertical
	4927.0	37.2	4.3	41.5	74.0	-32.5	Peak	Vertical
*	6108.5	36.8	6.9	43.7	74.0	-30.3	Peak	Vertical
*	6975.5	33.7	10.6	44.3	74.0	-29.7	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (81.1dBμV/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	Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Temperature	25℃
Test Engineer	Tyler Yuan	Relative Humidity	54%
Test Site	AC1	Test Date	2020/02/29
Test Mode	Bluetooth-LE (2Mbps)	Test Channel	19
Remark	1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands. 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
	4791.0	37.3	4.4	41.7	74.0	-32.3	Peak	Horizontal
	4986.5	38.2	4.0	42.2	74.0	-31.8	Peak	Horizontal
*	6159.5	36.4	6.8	43.2	74.0	-30.8	Peak	Horizontal
*	7137.0	31.9	11.7	43.6	74.0	-30.4	Peak	Horizontal
	4893.0	38.4	4.1	42.5	74.0	-31.5	Peak	Vertical
	4995.0	37.8	4.0	41.8	74.0	-32.2	Peak	Vertical
*	5819.5	37.6	5.8	43.4	74.0	-30.6	Peak	Vertical
*	6448.5	34.9	8.4	43.3	74.0	-30.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (82.8dBμV/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	Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Temperature	25℃
Test Engineer	Tyler Yuan	Relative Humidity	54%
Test Site	AC1	Test Date	2020/02/29
Test Mode	Bluetooth-LE (2Mbps)	Test Channel	39
Remark	1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

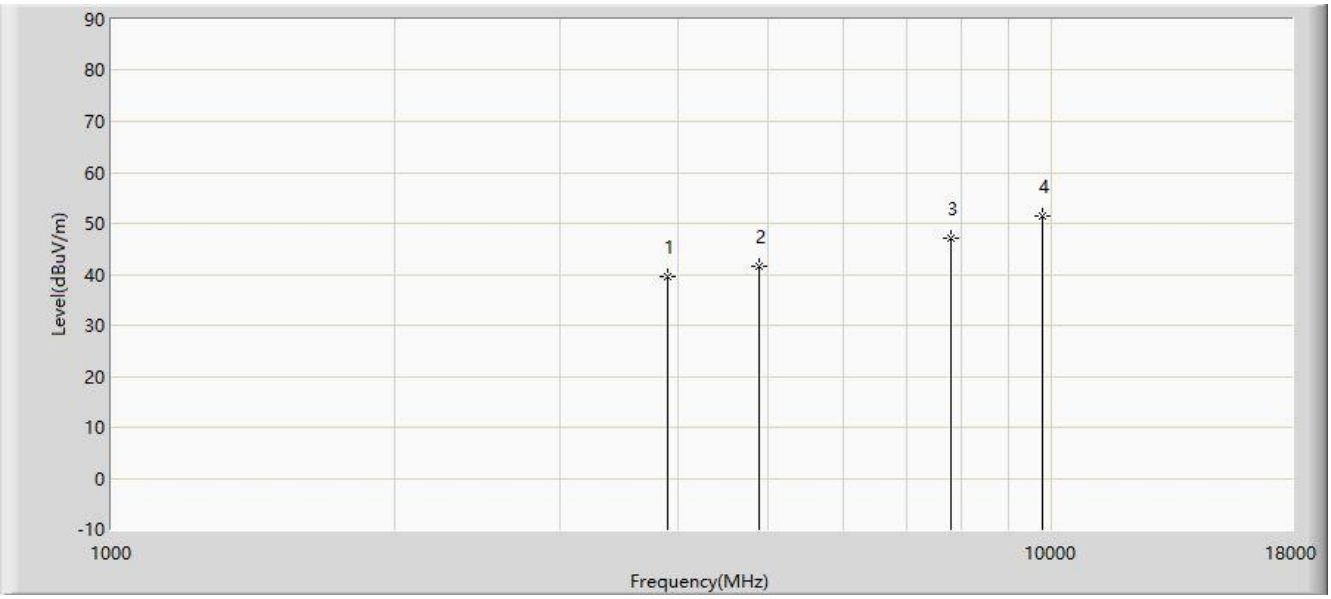
Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4808.0	37.7	4.2	41.9	74.0	-32.1	Peak	Horizontal
	4918.5	37.3	4.2	41.5	74.0	-32.5	Peak	Horizontal
*	6006.5	36.5	6.4	42.9	74.0	-31.1	Peak	Horizontal
*	7137.0	34.0	11.7	45.7	74.0	-28.3	Peak	Horizontal
	4748.5	37.8	3.9	41.7	74.0	-32.3	Peak	Vertical
	4995.0	38.2	4.0	42.2	74.0	-31.8	Peak	Vertical
*	6686.5	34.6	9.2	43.8	74.0	-30.2	Peak	Vertical
*	7154.0	32.6	11.6	44.2	74.0	-29.8	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (84.9dBμV/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)

Test Mode	BLE Transmit & LTE CAT M1 Transmit	Temperature & Relative Humidity	25℃ & 54%
Test Engineer	Bruce Wang	Polarity	Horizontal
Test Site	AC1	Test Date	2020/02/29
Remark	There is the ambient noise within frequency range 9kHz~1GHz and 18GHz~25GHz, the permissible value is not show in the report.		



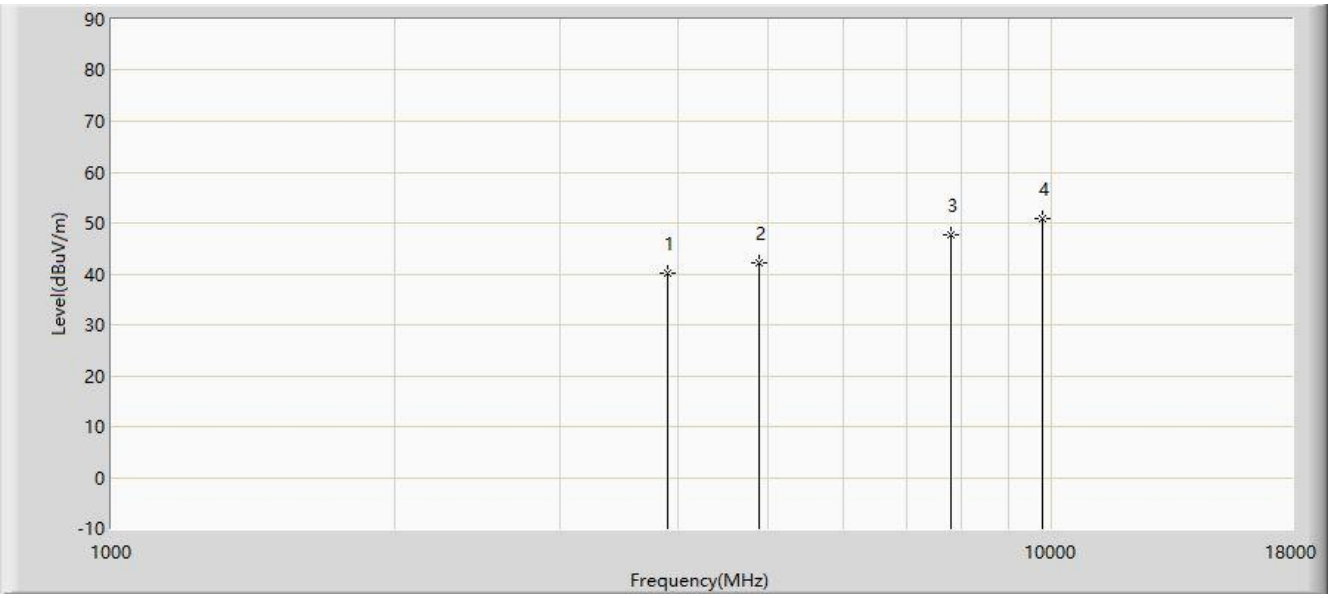
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		3910.000	39.473	34.960	-34.527	74.000	4.513	PK
2		4892.000	41.464	33.794	-32.536	74.000	7.670	PK
3		7820.000	47.040	33.258	-26.96	74.000	13.782	PK
4	*	9784.000	51.359	32.093	-22.641	74.000	19.266	PK

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

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

Note 2: Worst-case Mode: BLE (1Mbps) Channel 2446MHz & LTE CAT M1 Band 13 Channel 782MHz.

Test Mode	BLE Transmit & LTE CAT M1 Transmit	Temperature & Relative Humidity	25℃ & 54%
Test Engineer	Bruce Wang	Polarity	Horizontal
Test Site	AC1	Test Date	2020/02/29
Remark:	There is the ambient noise within frequency range 9kHz~1GHz and 18GHz~25GHz, the permissible value is not show in the report.		



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		3910.000	40.056	35.543	-33.944	74.000	4.513	PK
2		4892.000	42.036	34.366	-31.964	74.000	7.670	PK
3		7820.000	47.795	34.013	-26.205	74.000	13.782	PK
4	*	9784.000	50.989	31.723	-23.011	74.000	19.266	PK

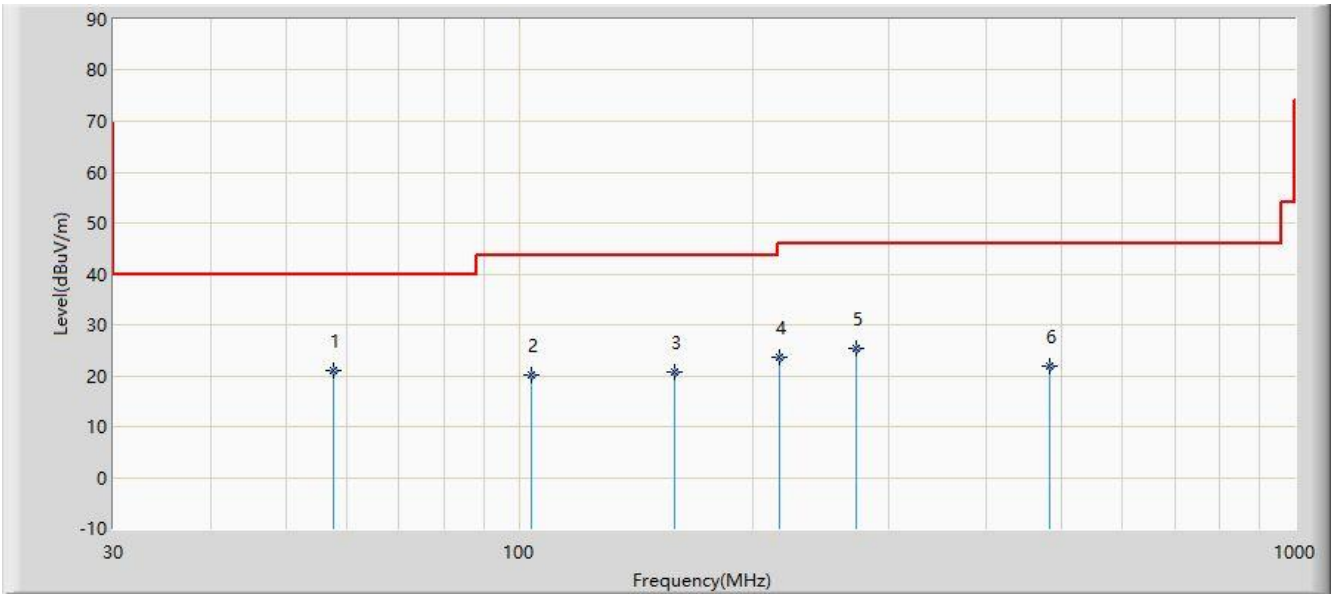
Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Note 2: Worst-case Mode: BLE (1Mbps) Channel 2446MHz & LTE CAT M1 Band 13 Channel 782MHz.

The Worst Case of Radiated Emission below 1GHz:

Site: AC1	Time: 2020/03/03 - 09:57
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: VULB 9168 _20-2000MHz	Polarity: Horizontal
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE(1Mbps) at Channel 2402MHz	



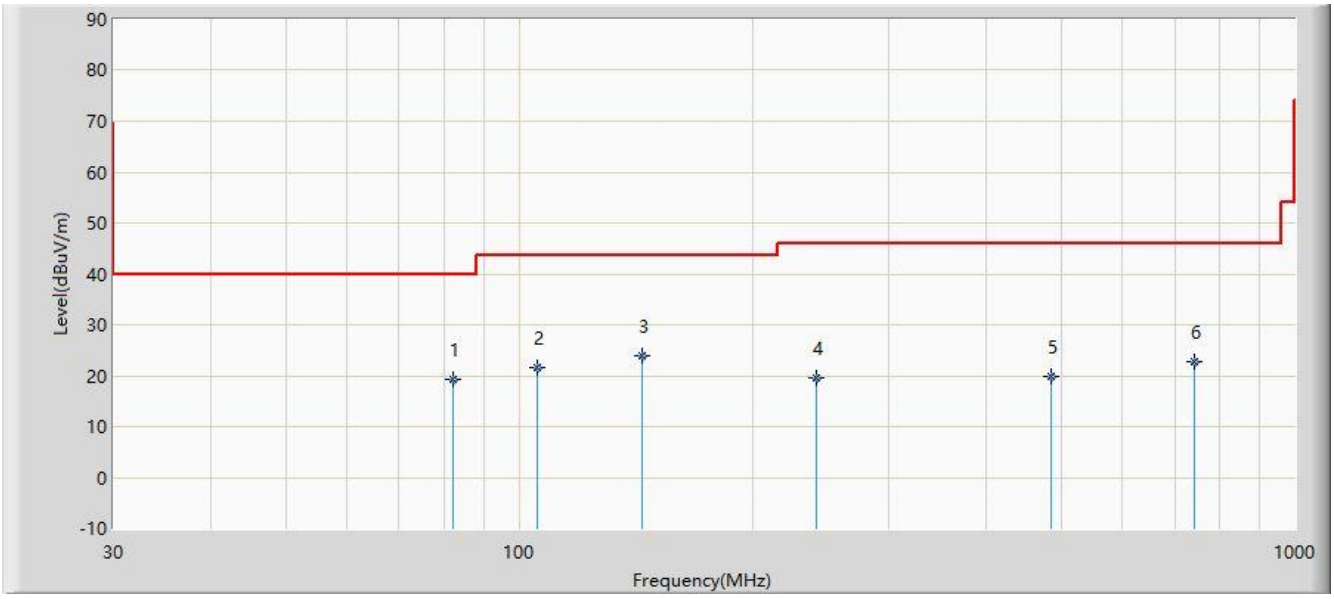
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	57.645	21.145	7.380	-18.855	40.000	13.765	QP
2		103.720	20.184	8.502	-23.316	43.500	11.682	QP
3		159.010	20.683	5.088	-22.817	43.500	15.595	QP
4		216.240	23.554	11.399	-22.446	46.000	12.155	QP
5		272.015	25.231	11.176	-20.769	46.000	14.054	QP
6		482.020	21.776	2.902	-24.224	46.000	18.874	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: 2020/03/03 - 10:10
Limit: FCC_Part15.209_RSE(3m)	Engineer: Kyrie Xie
Probe: VULB 9168 _20-2000MHz	Polarity: Vertical
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE(1Mbps) at Channel 2402MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		82.380	19.402	9.056	-20.598	40.000	10.346	QP
2		105.660	21.492	9.616	-22.008	43.500	11.876	QP
3	*	143.975	23.783	8.629	-19.717	43.500	15.154	QP
4		241.945	19.626	6.323	-26.374	46.000	13.303	QP
5		484.930	19.864	0.932	-26.136	46.000	18.932	QP
6		741.495	22.742	-0.645	-23.258	46.000	23.387	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.

6.3. Radiated Restricted Band Edge Measurement

6.3.1.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 - 156.52525	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 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 (μV/m)	Measured Distance (m)
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

6.3.2.Test Procedure Used

ANSI C63.10 - Section 6.3 (General Requirements)

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

6.3.3.Test Setting

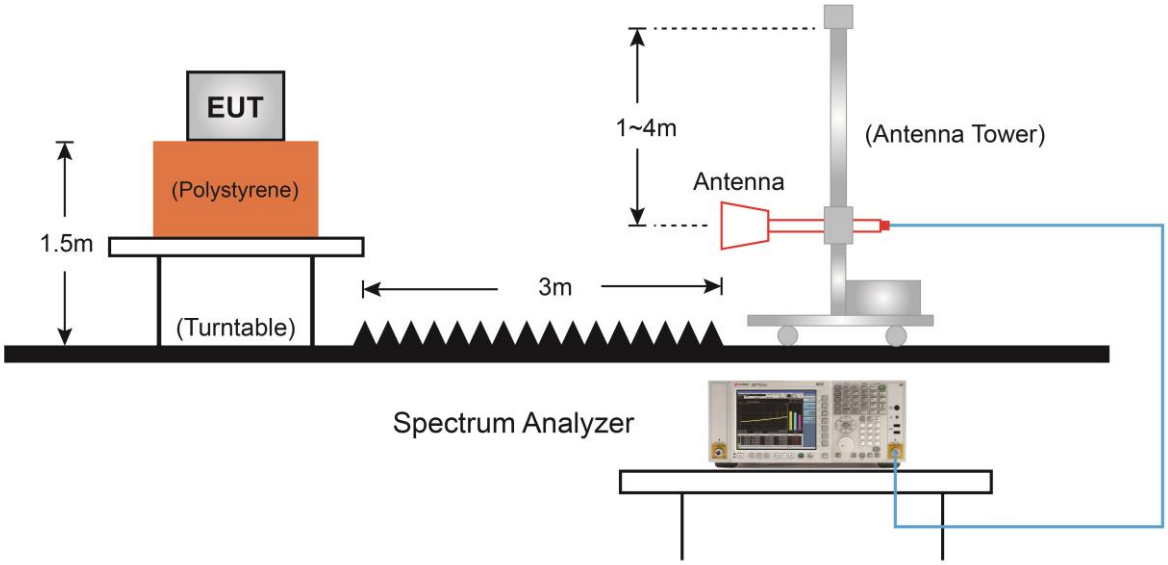
Peak Field Strength Measurements

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

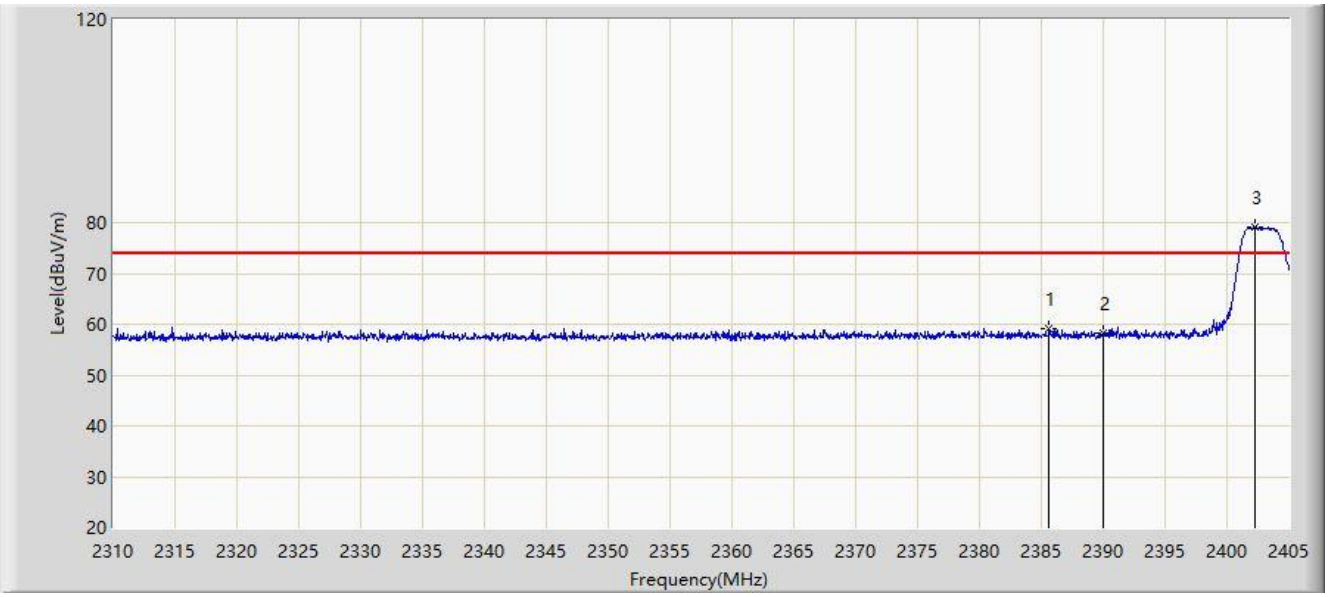
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle ≥ 98%, set VBW = 10Hz
4. If the EUT duty cycle is < 98%, set VBW ≥ 1/T. T is the minimum transmission duration
5. Detector = Peak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

6.3.4.Test Setup



6.3.5.Test Result

Site: AC1	Time: 2020/02/28 - 09:44
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(1Mbps) at Channel 2402MHz	

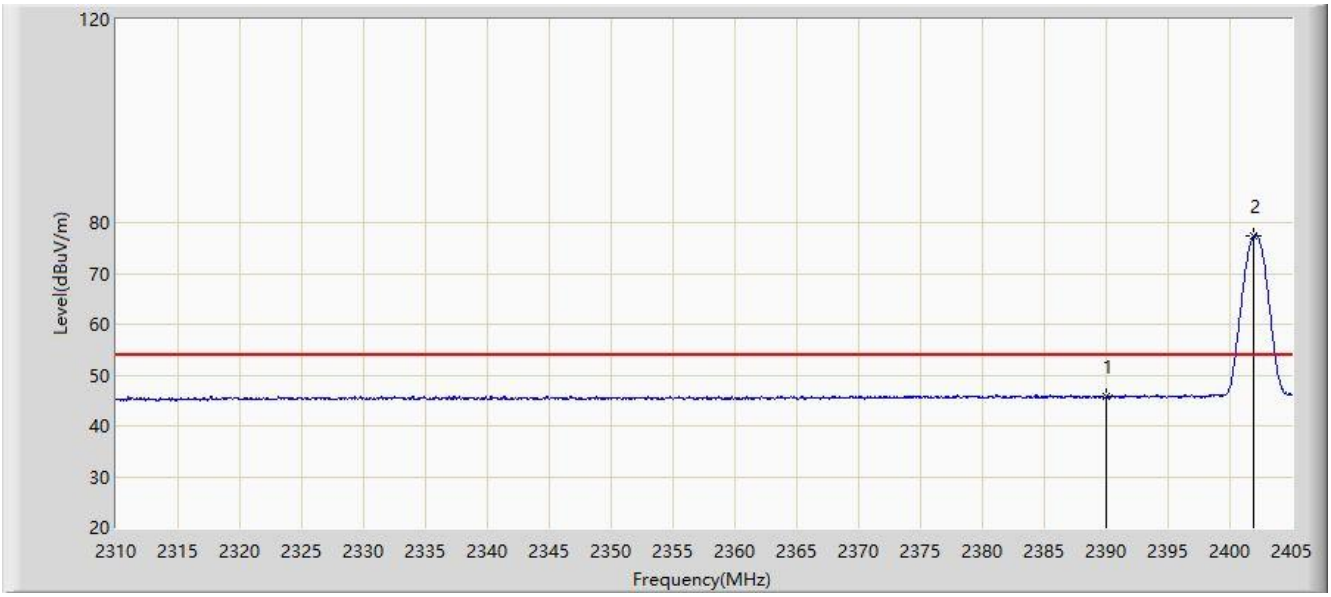


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2385.620	59.065	26.584	-14.935	74.000	32.480	PK
2			2390.000	58.182	25.697	-15.818	74.000	32.485	PK
3		*	2402.292	79.018	46.504	N/A	N/A	32.514	PK

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

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

Site: AC1	Time: 2020/02/28 - 10:50
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(1Mbps) at Channel 2402MHz	

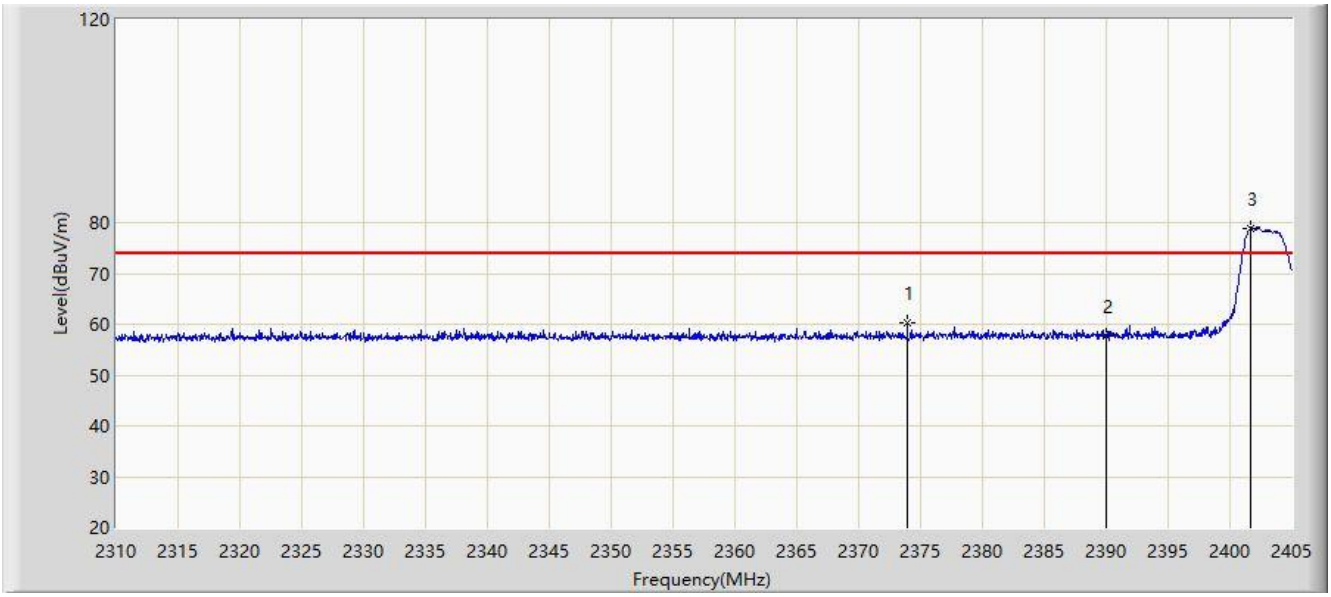


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	45.661	13.176	-8.339	54.000	32.485	AV
2		*	2401.913	77.304	44.791	N/A	N/A	32.513	AV

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

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

Site: AC1	Time: 2020/02/28 - 10:52
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(1Mbps) at Channel 2402MHz	

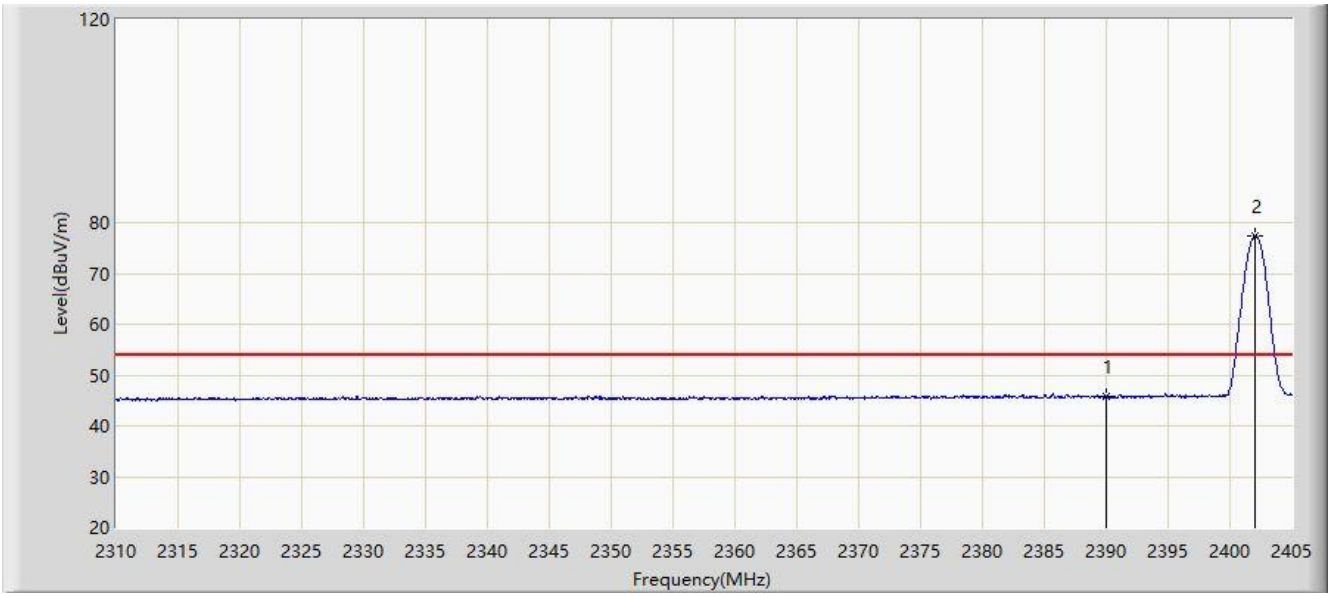


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2373.935	60.206	27.714	-13.794	74.000	32.491	PK
2			2390.000	57.800	25.315	-16.200	74.000	32.485	PK
3		*	2401.675	78.916	46.404	N/A	N/A	32.512	PK

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

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

Site: AC1	Time: 2020/02/28 - 10:58
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(1Mbps) at Channel 2402MHz	

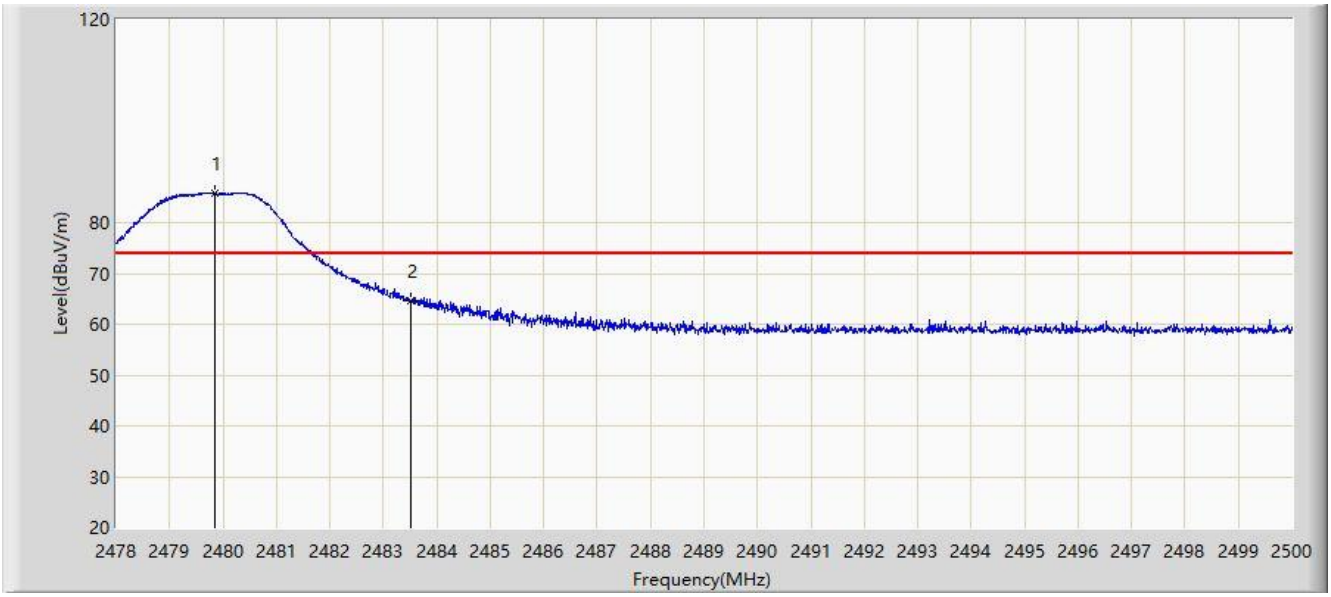


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	45.741	13.256	-8.259	54.000	32.485	AV
2		*	2402.008	77.342	44.829	N/A	N/A	32.513	AV

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

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

Site: AC1	Time: 2020/02/28 - 11:06
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(1Mbps) at Channel 2480MHz	

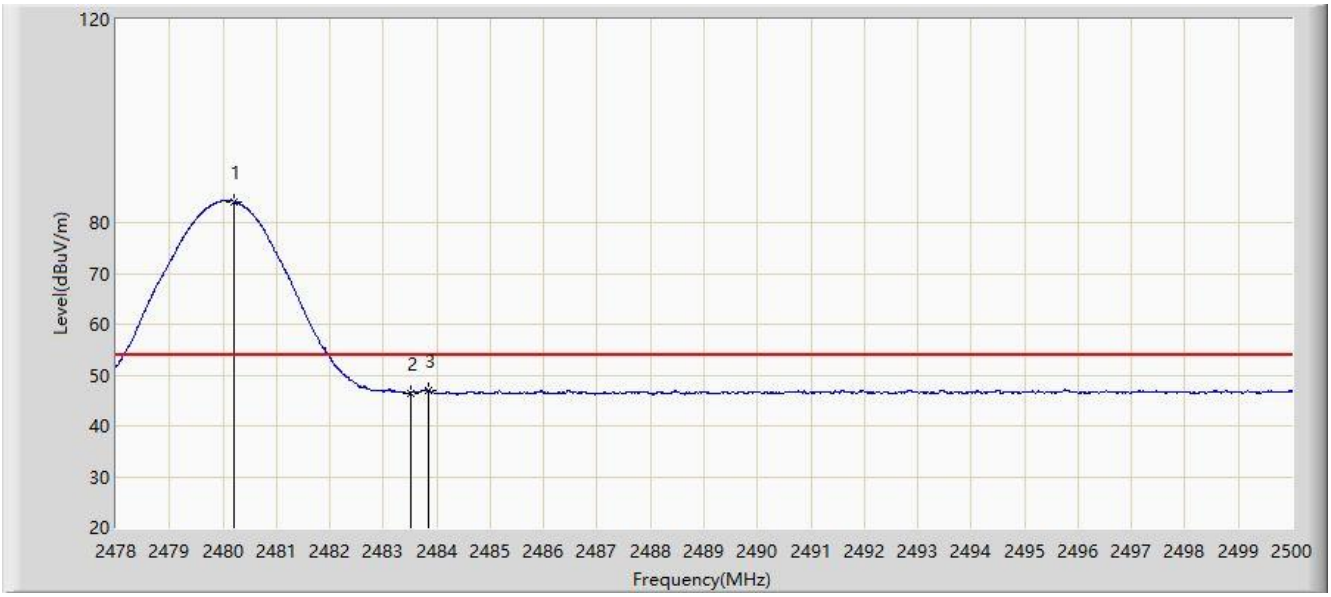


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.837	85.753	53.370	N/A	N/A	32.383	PK
2			2483.500	64.771	32.396	-9.229	74.000	32.375	PK

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

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

Site: AC1	Time: 2020/02/28 - 11:33
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(1Mbps) at Channel 2480MHz	

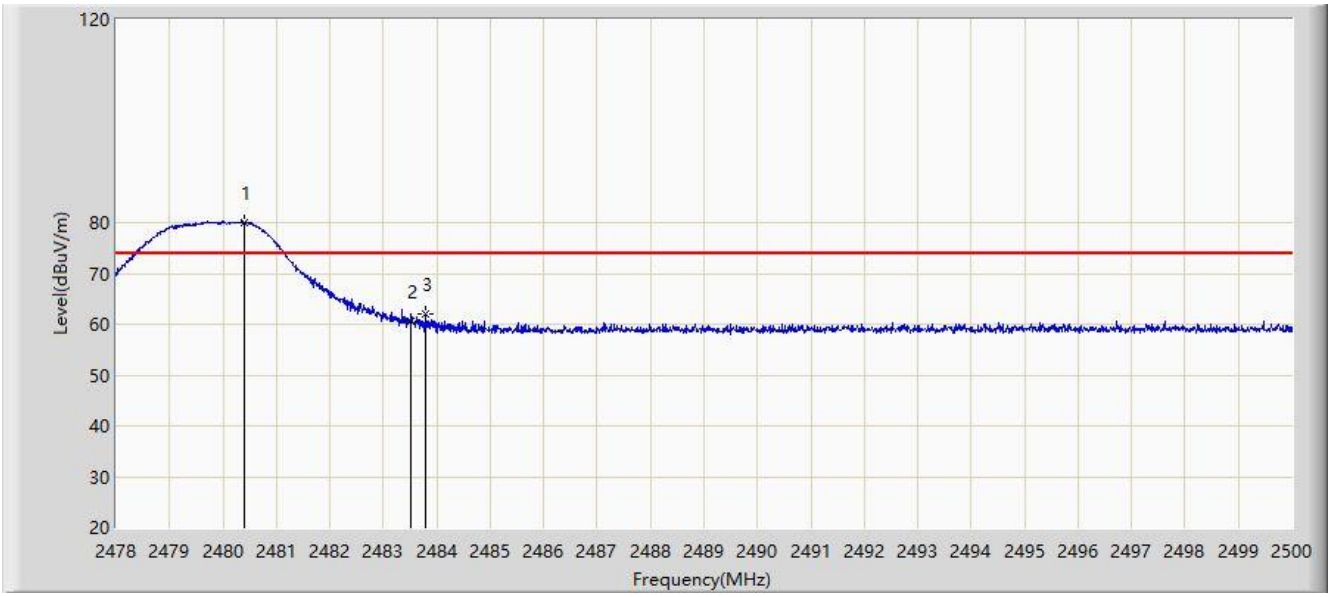


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.211	84.162	51.780	N/A	N/A	32.382	AV
2			2483.500	46.494	14.119	-7.506	54.000	32.375	AV
3			2483.841	46.978	14.604	-7.022	54.000	32.374	AV

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

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

Site: AC1	Time: 2020/02/28 - 11:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(1Mbps) at Channel 2480MHz	

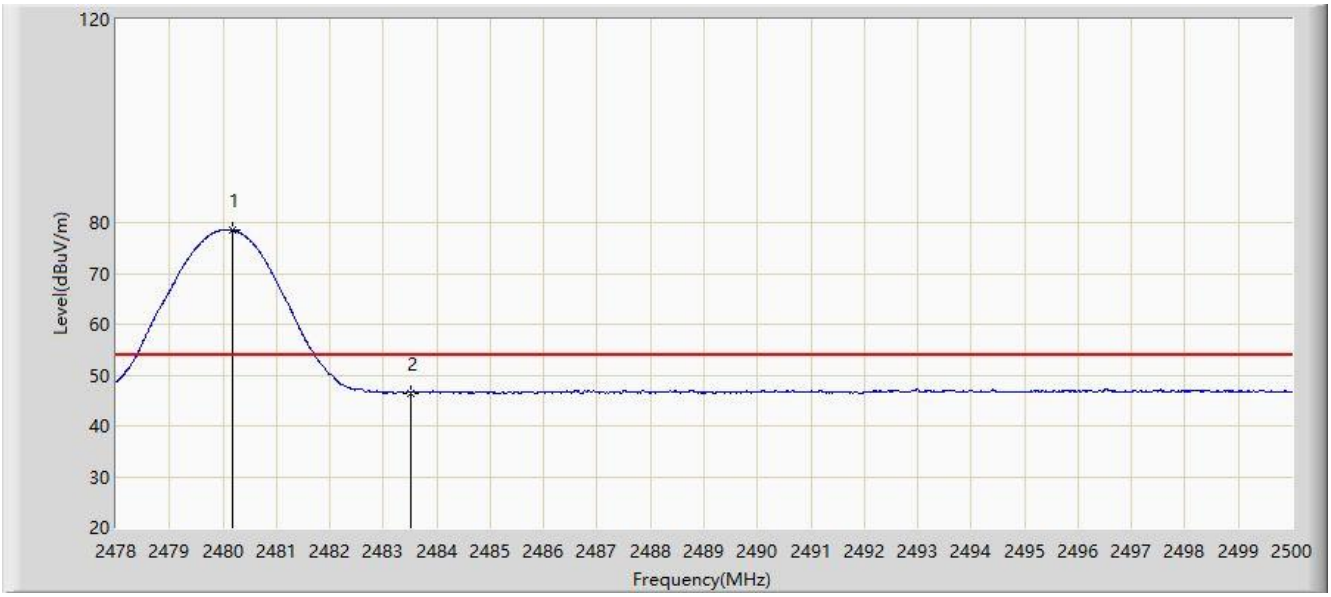


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.398	80.143	47.761	N/A	N/A	32.382	PK
2			2483.500	60.670	28.295	-13.330	74.000	32.375	PK
3			2483.797	61.916	29.542	-12.084	74.000	32.374	PK

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

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

Site: AC1	Time: 2020/02/28 - 11:48
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(1Mbps) at Channel 2480MHz	

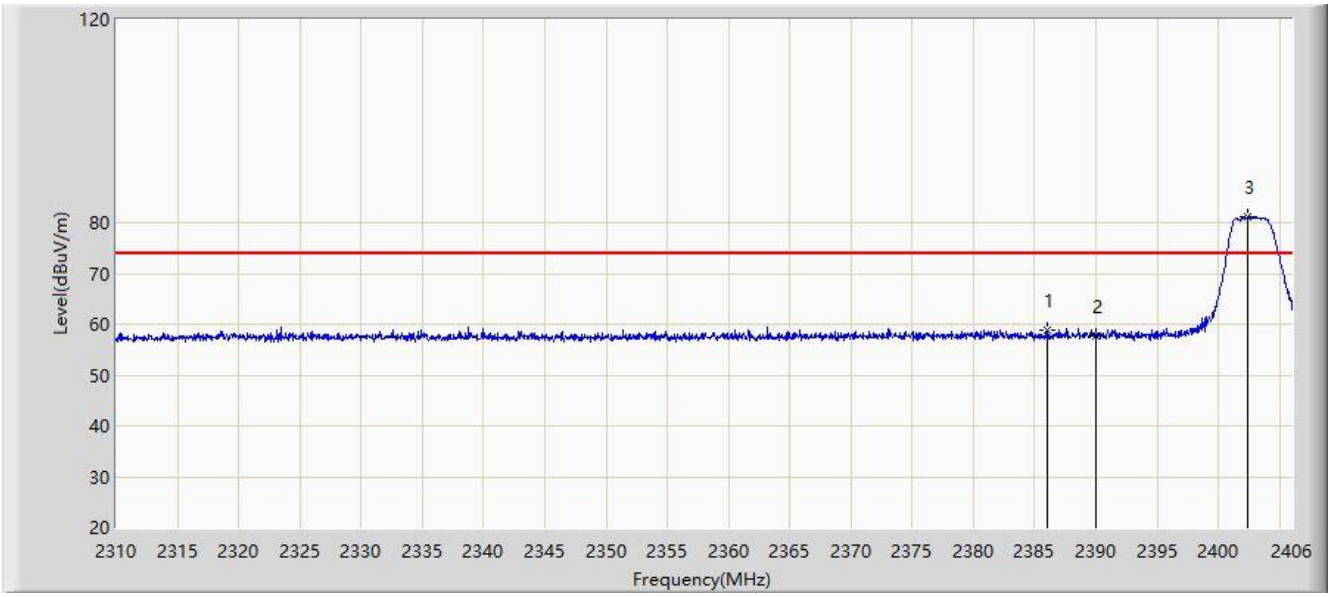


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.178	78.555	46.173	N/A	N/A	32.382	AV
2			2483.500	46.503	14.128	-7.497	54.000	32.375	AV

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

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

Site: AC1	Time: 2020/02/28 - 13:17
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(2Mbps) at Channel 2402MHz	

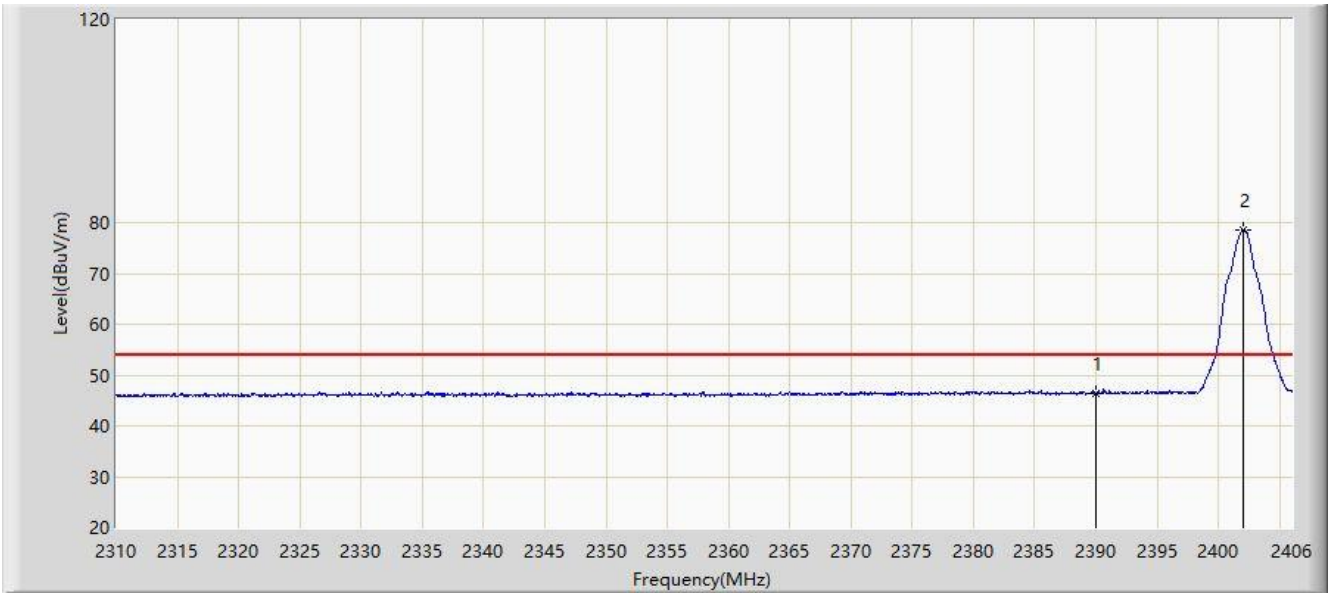


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2385.984	58.873	26.392	-15.127	74.000	32.481	PK
2			2390.000	57.823	25.338	-16.177	74.000	32.485	PK
3		*	2402.448	81.057	48.542	N/A	N/A	32.515	PK

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

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

Site: AC1	Time: 2020/02/28 - 13:29
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(2Mbps) at Channel 2402MHz	

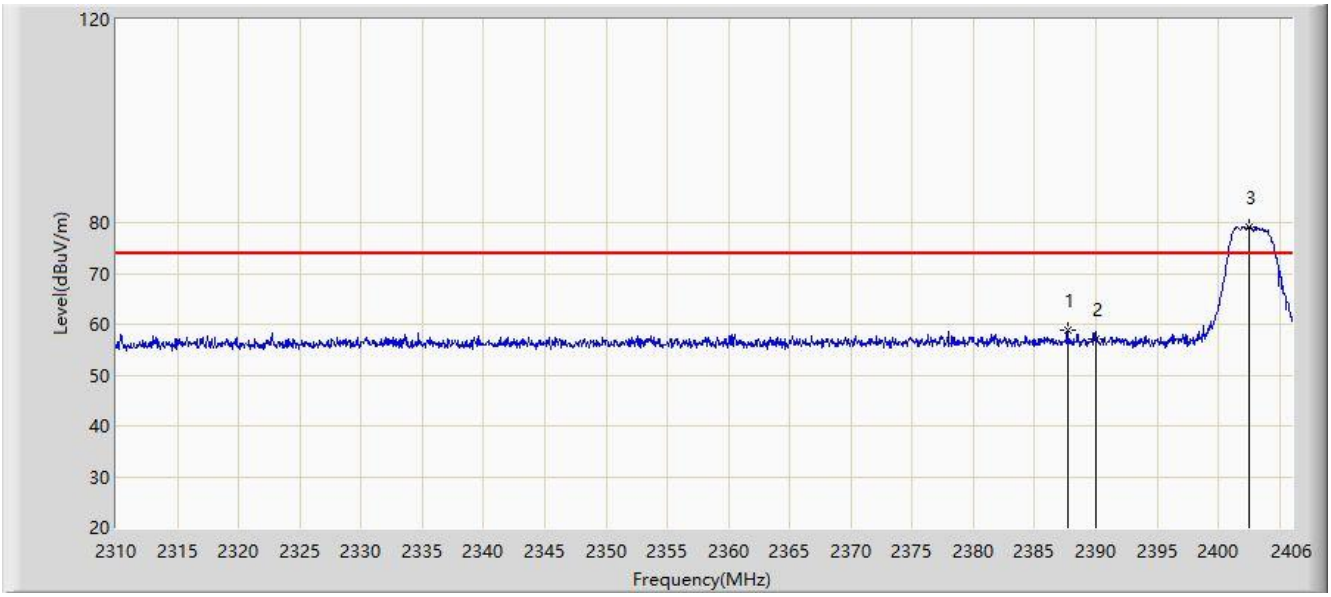


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.368	13.883	-7.632	54.000	32.485	AV
2		*	2402.064	78.557	46.043	N/A	N/A	32.514	AV

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

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

Site: AC1	Time: 2020/02/28 - 13:39
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(2Mbps) at Channel 2402MHz	

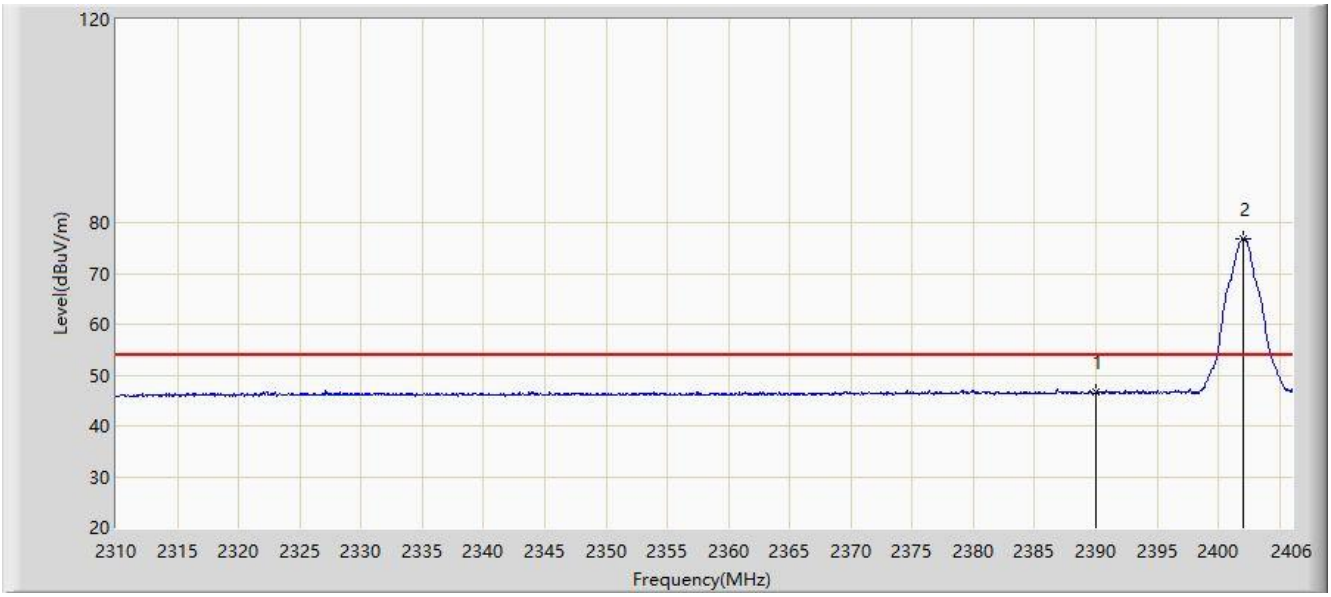


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2387.664	58.776	26.293	-15.224	74.000	32.483	PK
2			2390.000	57.239	24.754	-16.761	74.000	32.485	PK
3		*	2402.496	79.180	46.665	N/A	N/A	32.515	PK

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

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

Site: AC1	Time: 2020/02/28 - 13:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(2Mbps) at Channel 2402MHz	

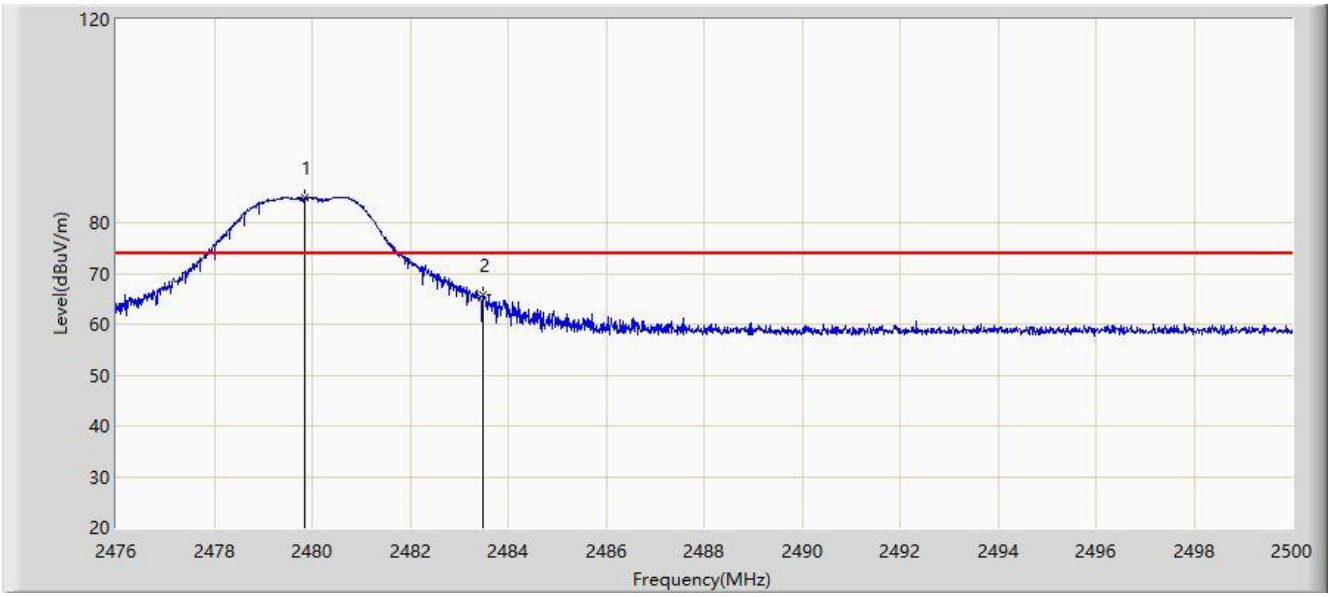


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.607	14.136	-7.393	54.000	32.471	AV
2		*	2402.064	76.929	44.422	N/A	N/A	32.508	AV

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

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

Site: AC1	Time: 2020/02/28 - 13:46
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(2Mbps) at Channel 2480MHz	

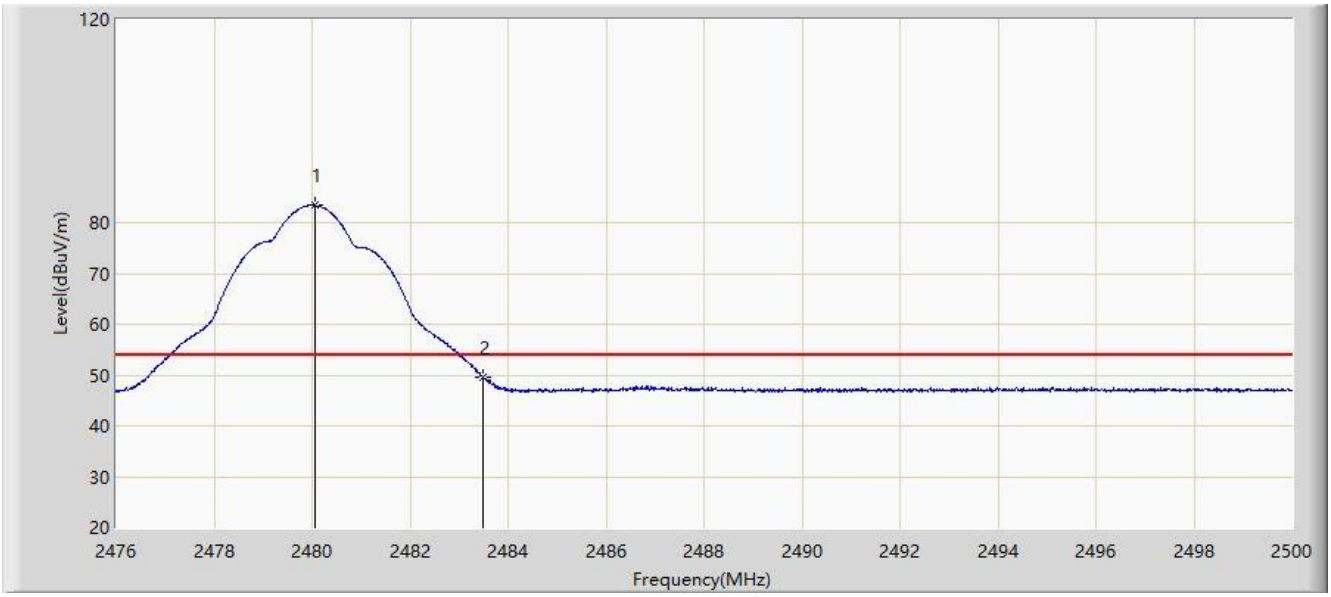


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.864	84.858	52.475	N/A	N/A	32.383	PK
2			2483.500	65.670	33.295	-8.330	74.000	32.375	PK

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

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

Site: AC1	Time: 2020/02/28 - 13:57
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(2Mbps) at Channel 2480MHz	

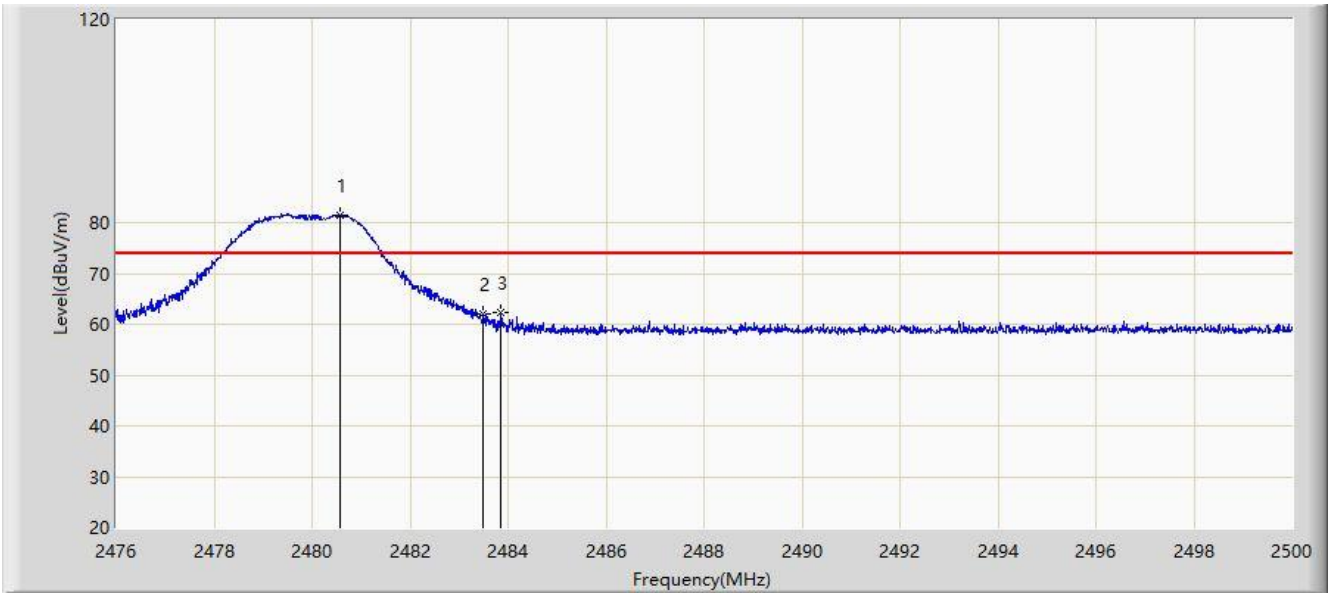


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.056	83.354	50.971	N/A	N/A	32.383	AV
2			2483.500	49.684	17.309	-4.316	54.000	32.375	AV

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

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

Site: AC1	Time: 2020/02/28 - 14:02
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(2Mbps) at Channel 2480MHz	

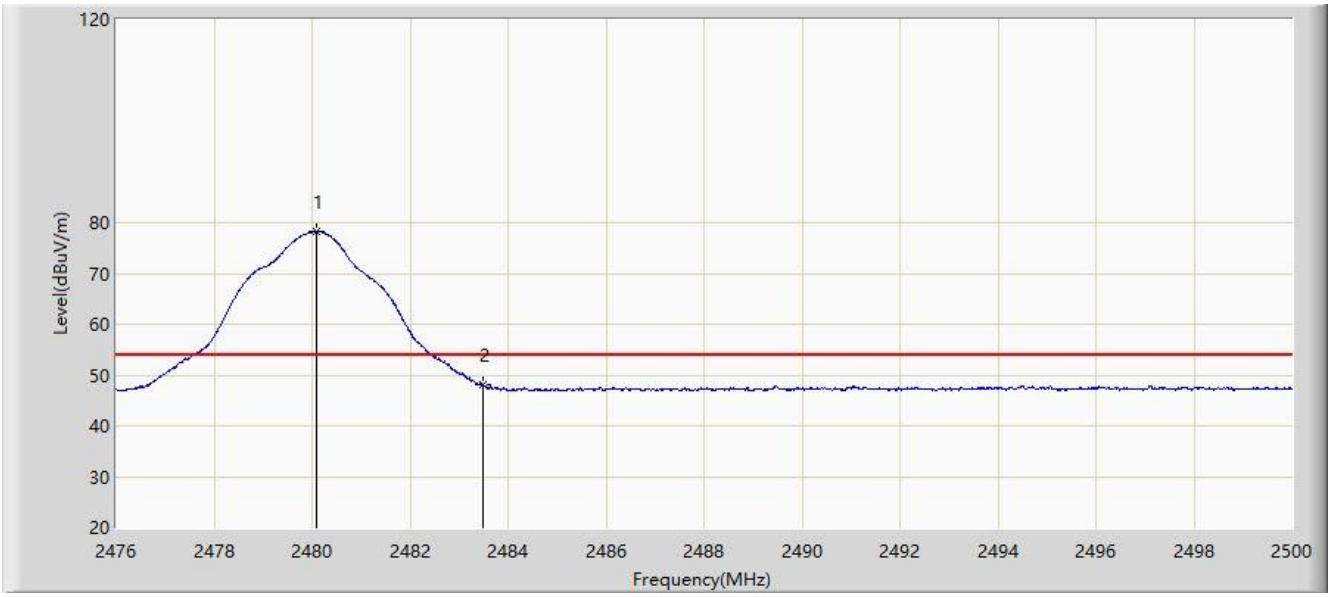


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.584	81.563	49.182	N/A	N/A	32.381	PK
2			2483.500	62.141	29.766	-11.859	74.000	32.375	PK
3			2483.860	62.292	29.918	-11.708	74.000	32.374	PK

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

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

Site: AC1	Time: 2020/02/28 - 14:07
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Single Band SIP Module, Small Form Factor Single Band 802.11b/g/n, Bluetooth 5.0, Zigbee Module	Power: By Battery
Test Mode: Transmit by Bluetooth-LE(2Mbps) at Channel 2480MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.092	78.248	45.866	N/A	N/A	32.382	AV
2			2483.500	47.980	15.605	-6.020	54.000	32.375	AV

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

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

7. CONCLUSION

The data collected relate only the item(s) tested and show that the unit is in compliance with radiated spurious emissions of FCC Part 15C and RSS-247 rules.

The End

Appendix A - Test Setup Photograph

Refer to “1912RSU024-UT” file.

Appendix B - EUT Photograph

Refer to “1912RSU024-UE” file.