MEASUREMENT REPORT

FCC PART 15.247 Bluetooth-LE

FCC ID:	Q9DAPIN0504505
APPLICANT:	Hewlett Packard Enterprise Company
Application Type:	Certification
Product:	ACCESS POINT
Model No.:	APIN0504, APIN0505
Brand Name:	aruba a Hewlett Packard Enterprise company, Hewlett Packard Enterprise
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part15 Subpart C (Section 15.247)
Test Procedure(s):	ANSI C63.10-2013, KDB 558074 D01v05r02
Test Date:	June 03 ~ July 14, 2019

Reviewed By: Paddy Chen
(Paddy Chen)

Approved By: Chenz Ker
(Chenz Ker)

Testing Laboratory
3261

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

Revision History

Report No.	Version	Description	Issue Date	Note
1906TW0102-U1	Rev. 01	Initial report	07-15-2019	Invalid
1906TW0102-U1	Rev. 02	Update antenna port plot	10-01-2019	Valid

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Description Page

§2.1033 General Information

Applicant:	Hewlett Packard Enterprise Company
Applicant Address:	3333 Scott Blvd, Santa Clara, CA 94089, USA
Manufacturer:	Hewlett Packard Enterprise Company
Manufacturer Address:	3333 Scott Blvd, Santa Clara, CA 94089, USA
Test Site:	MRT Technology (Taiwan) Co., Ltd
Test Site Address:	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)
Test Device Serial No.:	APIN0504 S/N: DB1959001E
	APIN0505 S/N: DB19590032

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Fuxing Rd., Taoyuan, Taiwan (R.O.C)

- **MRT facility is a FCC registered (Reg. No. 291082 and 153292) test facility with the site description report on file and is designated by the FCC as an Accredited Test Film.**
- **MRT facility is an IC registered (MRT Reg. No. 21723-1) test laboratory with the site description on file at Industry Canada.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (TAF) under the American Association for Laboratory Accreditation Program (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC, Industry Taiwan, EU and TELEC Rules.**

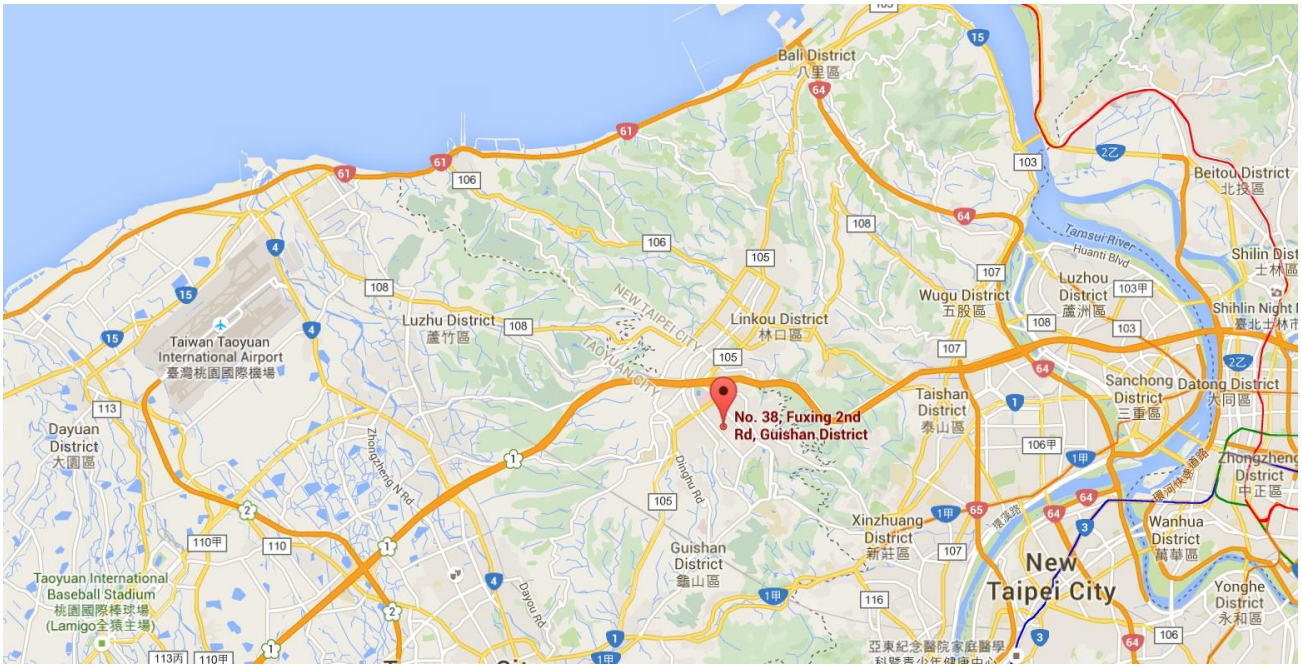
1. INTRODUCTION

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 Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



2. PRODUCT INFORMATION

2.1. Feature of Equipment under Test

Product Name:	ACCESS POINT
Model No.:	APIN0504, APIN0505
Brand Name:	aruba a Hewlett Packard Enterprise company , Hewlett Packard Enterprise
Wi-Fi Specification:	802.11a/b/g/n/ac/ax
Bluetooth Specification:	v4.2 single mode
Zigbee Specification:	802.15.4
Software Version:	F.1.00
Operating Temperature:	0 ~ 50 °C
Power Type:	AC Adapter or POE input
Operating Environment:	Indoor Use

Note: The difference between models is that EUT use different antenna and appearance, APIN0504 use external antennas, but APIN0505 use internal antenna, other hardware and software are the same. Besides, each model has its own power parameter value.

2.2. Product Specification Subjective to this Report

Bluetooth Frequency:	2402~2480MHz
Bluetooth Version:	v4.2 single mode
Type of modulation:	GFSK
Data Rate:	1Mbps

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

2.3. 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	--	--	--	--

2.4. Test Configuration

The unit 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.

2.5. EMI Suppression Device(s)/Modifications

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

2.6. Description of Available Antennas

APIN0504

Antenna No.	Directionality	Frequency Band (GHz)	Model No.	Max Peak Gain (dBi)	BF Dir Gain (dBi)	CDD Dir Gain (dBi)	
						For Power	For PSD
Wi-Fi External Antenna List (2.4GHz 2*2 MIMO, 5GHz 2*2 MIMO)							
1	Omni	2.4	AP-ANT-1W	3.8	6.81	3.8	6.81
		5		5.8	8.81	5.8	8.81
2	Omni	2.4	AP-ANT-13B	2.3	5.31	2.3	5.31
		5		4.0	7.01	4.0	7.01
3	Omni	2.4	AP-ANT-19	3.0	6.01	3.0	6.01
		5		**6.0**	9.01	6.0	9.01
4	Omni	2.4	AP-ANT-20W	**2.0**	5.01	2.0	5.01
		5		**2.0**	5.01	2.0	5.01
5	Omni	2.4	AP-ANT-40	**4.0**	7.01	4.0	7.01
		5		5.0	8.01	5.0	8.01
6 (Note 3)	Directional	2.4	AP-ANT-25A	5.0	5.0	5.0	8.01
		5		5.0	5.0	5.0	8.01
7 (Note 3)	Directional	2.4	AP-ANT-28	**7.5**	7.5	7.5	10.51
		5		**7.5**	7.5	7.5	10.51
Bluetooth & ZigBee Internal Antenna							
PCB		2.4		3.3			

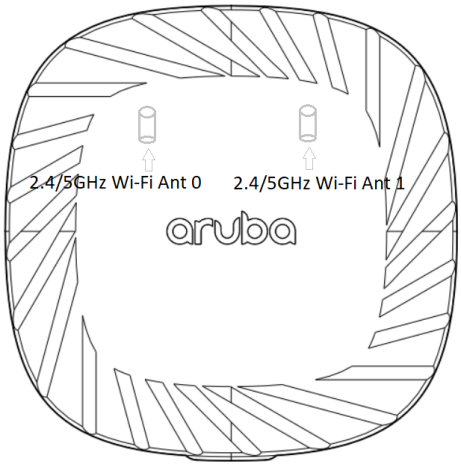
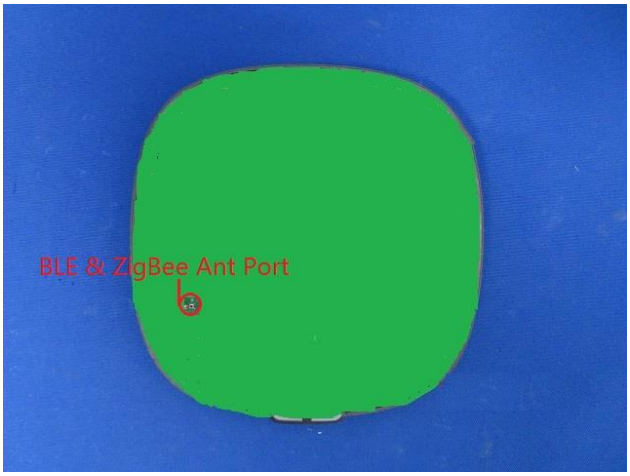
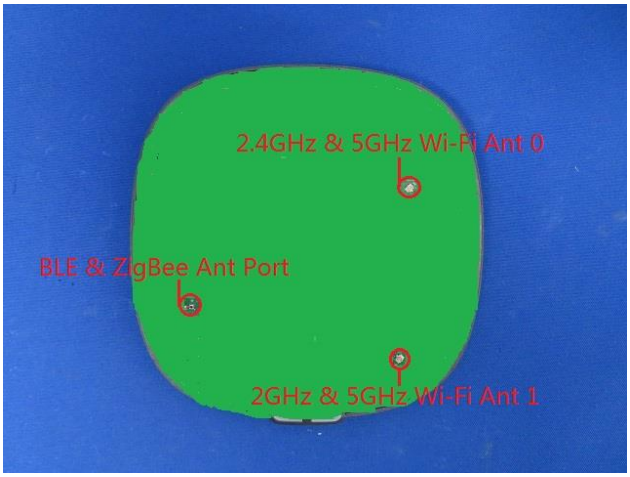
APIN0505

Directionality	Frequency Band (GHz)	Max Peak Gain (dBi)	BF Dir Gain (dBi)	CDD Dir Gain (dBi)	
				For Power	For PSD
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)					
Omni	2.4	4.29	7.08	4.29	7.08
Omni	5	5.63	8.64	5.63	8.64
Bluetooth & ZigBee Internal Antenna					
PCB	2.4	3.3			

Note:

1. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.
   For CDD transmissions, directional gain is calculated as follows, N_{ANT} = 2, N_{SS} = 1.
   If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.
   - For power spectral density (PSD) measurements on all devices,
     Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;
   - For power measurements on IEEE 802.11 devices,
     Array Gain = 0 dB for N_{ANT} ≤ 4;
2. The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac/ax, not include 802.11a/b/g. Directional gain = G_{ANT} + Array Gain, BF Gain was declared by the applicant.
3. Two type antennas are cross polarized, the detail refer to antenna specification.
4. For APIN0504, low gain antenna AP-ANT-20W was selected to perform all RF testing that can got maximum power setting. High gain Omni antenna AP-ANT-19 & AP-ANT-40 and directional antenna AP-ANT-28 were selected to perform radiated spurious emission and band edge testing. High gain antenna power setting will be reduced according to difference value of antenna gain declared by applicant.
5. For APIN0505, its directional gain was declared by the applicant, the detail refers to antenna specification.

2.7. Description of Antenna RF Port

Antenna RF Port				
--	2.4GHz RF Port		5GHz RF Port	
Software Control Port	Ant 0	Ant 1	Ant 0	Ant 1
APIN0504				
				
APIN0505				
				

2.8. Description of Test Software

The test utility software used during testing was “telnet.exe”.

Detail power setting refer to operation description.

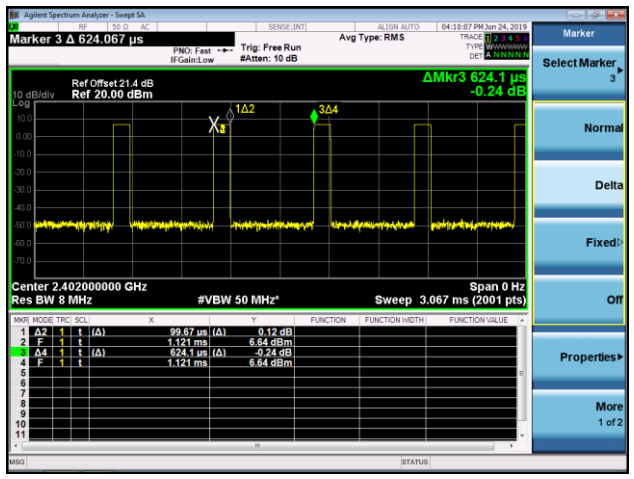
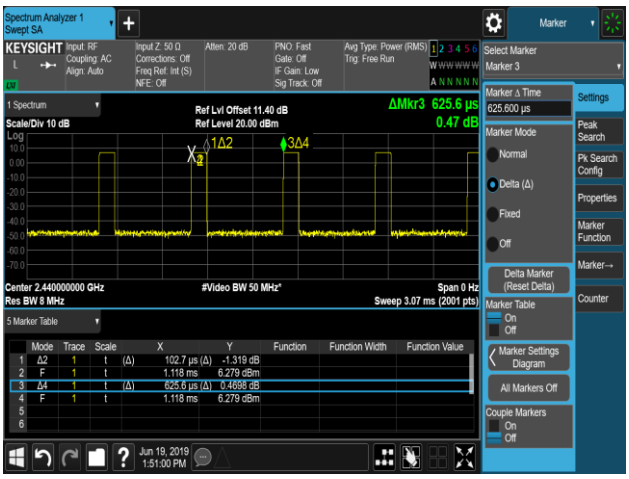
2.9. Device Capabilities

This device contains the following capabilities:

802.11a/b/g/n/ac/ax Wi-Fi, Bluetooth v4.2 single mode and ZigBee devices.

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

Model No.	Test Mode	Duty Cycle
APIN0504	BLE	15.97%
APIN0505	BLE	16.42%

Duty Cycle (T = Transmission Duration)	
APIN0504 (T = 99.67us)	**APIN0505 (T = 102.7us)**
	

2.10. 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.

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 the guidance provided in KDB 558074 D01v05r02 were used in the measurement.

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

3.2. AC Line Conducted Emissions

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

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

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

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

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the Antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable. For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive Antenna height using a broadband Antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn Antennas were used. For frequencies below 30MHz, a calibrated loop Antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband Antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive Antenna height was noted for each frequency found.

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

For APIN0505

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

For APIN0504

- The antenna of the unit uses a reversed SMA connector.

Conclusion:

The unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Two-Line V-Network	R&S	ENV 216	MRTTWA00019	1 year	2020/03/25
Two-Line V-Network	R&S	ENV 216	MRTTWA00020	1 year	2020/04/25
8-Wire ISN (T8)	R&S	ENY81	MRTTWA00018	1 year	2020/04/23
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2020/05/29
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2020/05/30

Radiated Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Acitve Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2020/04/29
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2020/06/04
Broadband Horn antenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2020/04/22
Breitband Horn antenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2020/04/23
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2020/04/24
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2020/04/24
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2020/03/26
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2020/03/25
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2019/10/30
Antenna Cable	HUBERSUHNER	SF106	MRTTWE00010	1 year	2020/04/22
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00032	1 year	2020/05/30

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00014	1 year	2020/04/22
Wideband Radio Communication Taster	R&S	CMW 500	MRTTWA00041	1 year	2020/01/28
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2019/10/30
EXA Signal Analyzer	KEYSIGHT	N9010B	MRTTWA00074	1 year	2020/07/11
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2020/03/26
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2020/05/30

Software	Version	Function
e3	9.160520a	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
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 2.53dB
Radiated Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.25dB 1GHz ~ 40GHz: 4.45dB

7. TEST RESULT

7.1. Summary

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

Notes:

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

7.2. 6dB Bandwidth Measurement

7.2.1.Test Limit

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

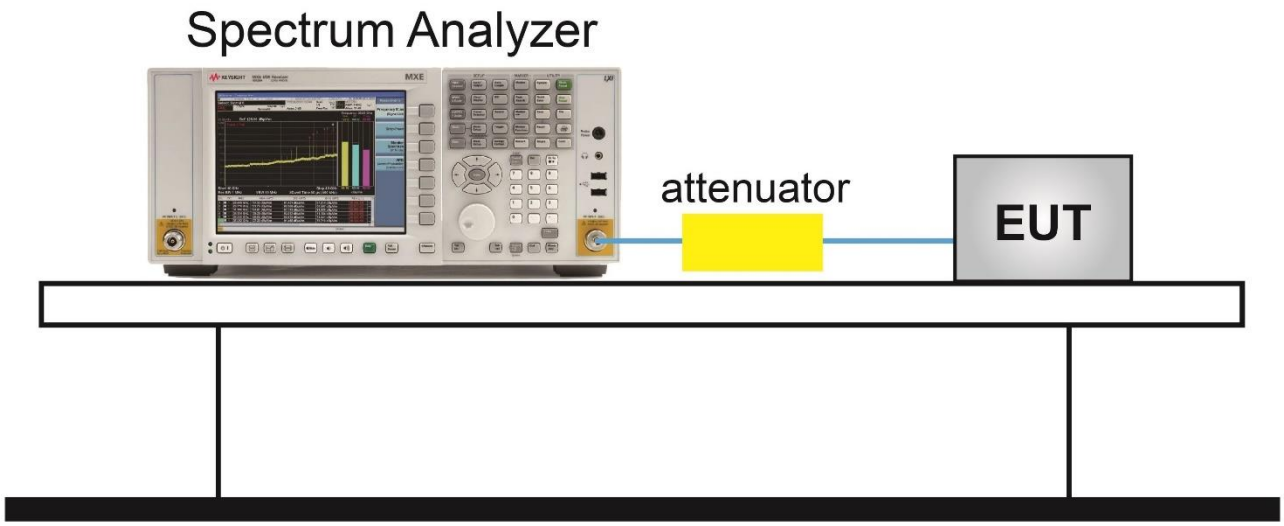
7.2.2.Test Procedure used

ANSI C63.10-2013 Section 11.8

7.2.3.Test Setting

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

7.2.4.Test Setup



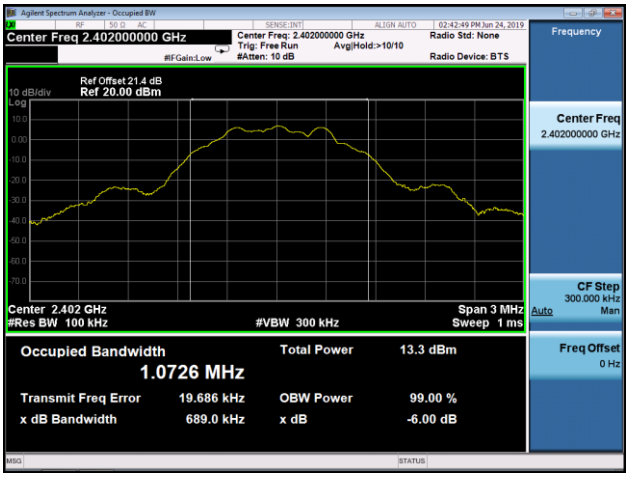
7.2.5.Test Result

Product	ACCESS POINT	Temperature	27°C
Test Engineer	Kevin Ker	Relative Humidity	65%
Test Site	SR2	Test Date	2019/06/24
Model No.	APIN0504	Test Item	6dB Bandwidth

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
BLE	1	00	2402	0.69	≥ 0.5	Pass
BLE	1	19	2440	0.69	≥ 0.5	Pass
BLE	1	39	2480	0.69	≥ 0.5	Pass

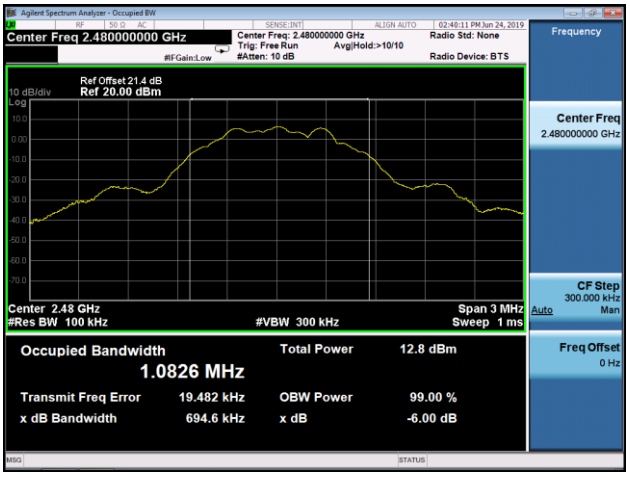
BLE 6dB Bandwidth

Channel 00 (2402MHz)



Channel 19 (2440MHz)

Channel 39 (2480MHz)

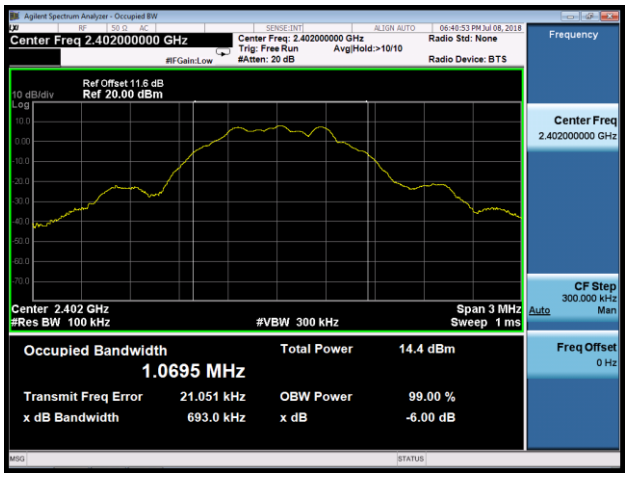


Product	ACCESS POINT	Temperature	27°C
Test Engineer	Kevin Ker	Relative Humidity	65%
Test Site	SR2	Test Date	2019/07/08
Model No.	APIN0505	Test Item	6dB Bandwidth

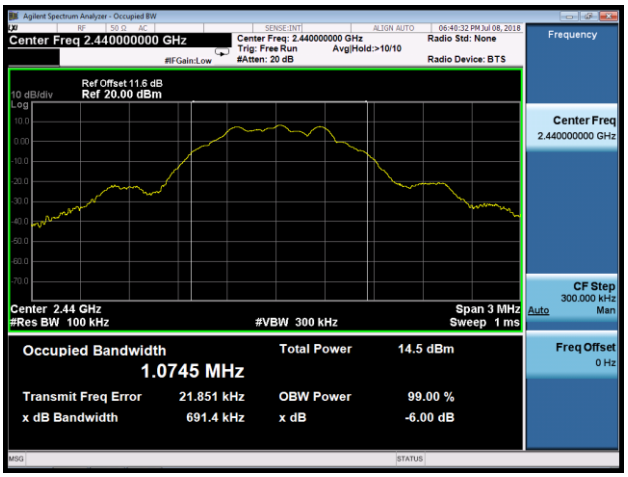
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
BLE	1	00	2402	0.69	≥ 0.5	Pass
BLE	1	19	2440	0.69	≥ 0.5	Pass
BLE	1	39	2480	0.69	≥ 0.5	Pass

BLE 6dB Bandwidth

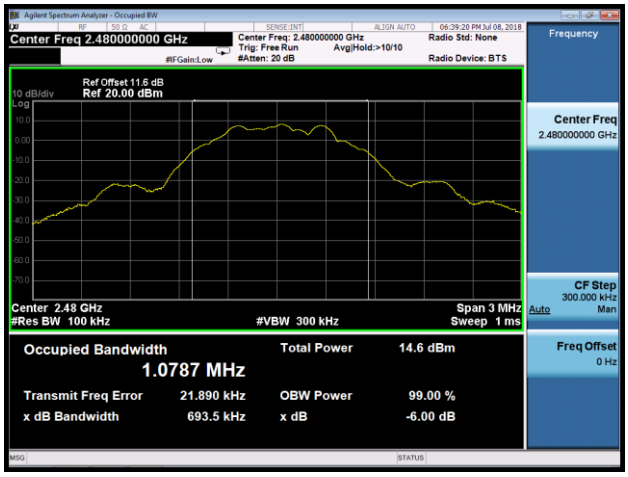
Channel 00 (2402MHz)



Channel 19 (2440MHz)



Channel 39 (2480MHz)



7.3. Output Power Measurement

7.3.1.Test Limit

The maximum out power shall be less 1 Watt (30dBm).

The conducted output power limit specified in paragraph FCC Part 15.247(b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs FCC Part 15.247(b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.3.2.Test Procedure Used

ANSI C63.10 Section 11.9.1.3

ANSI C63.10 Section 11.9.2.3

7.3.3.Test Setting

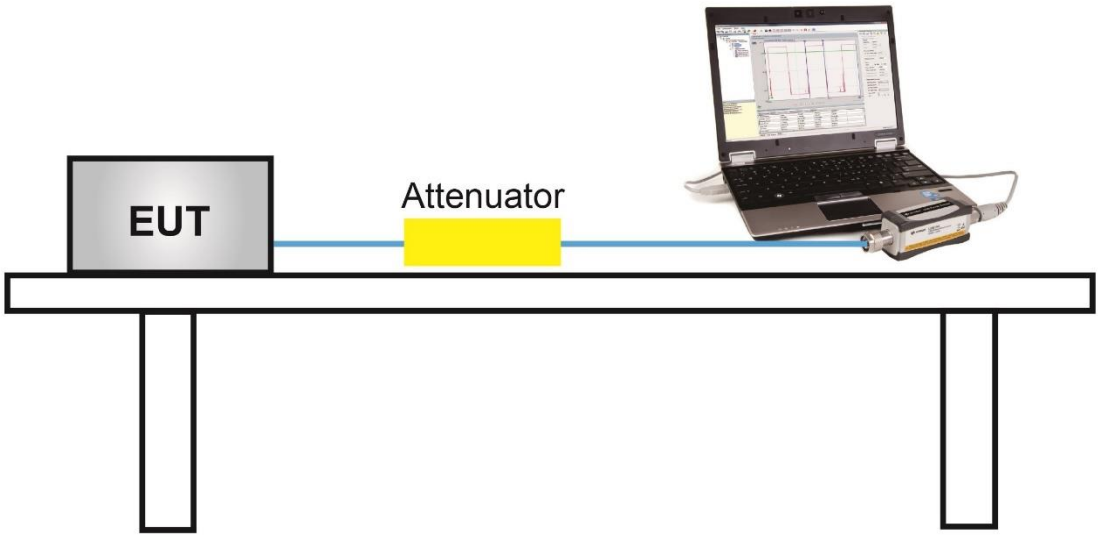
Method PKPM1 (Peak Power Measurement of Signals with DTS BW ≤ 50MHz)

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

Average Power Measurement

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

7.3.4.Test Setup



7.3.5.Test Result of Output Power

Product	ACCESS POINT	Temperature	27°C
Test Engineer	Kevin Ker	Relative Humidity	65%
Test Site	SR2	Test Date	2019/06/24
Model No.	APIN0504	Test Item	Output Power

Test Result of Peak Output Power

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result
BLE	1	00	2402	7.02	≤ 30.00	Pass
BLE	1	19	2440	6.83	≤ 30.00	Pass
BLE	1	39	2480	6.42	≤ 30.00	Pass

Note: E.I.R.P (dBm) = Max Peak Power (dBm) + Antenna Gain (dBi) = 7.02 dBm + 3.30 dBi = 10.32 dBm.

Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	Result
BLE	1	00	2402	6.77	≤ 30.00	Pass
BLE	1	19	2440	6.55	≤ 30.00	Pass
BLE	1	39	2480	6.15	≤ 30.00	Pass

Note: E.I.R.P (dBm) = Max Average Power (dBm) + Antenna Gain (dBi) = 6.77 dBm + 3.30 dBi = 10.07 dBm.

Product	ACCESS POINT	Temperature	27°C
Test Engineer	Kevin Ker	Relative Humidity	65%
Test Site	SR2	Test Date	2019/06/24
Model No.	APIN0505	Test Item	Output Power

Test Result of Peak Output Power

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result
BLE	1	00	2402	7.35	≤ 30.00	Pass
BLE	1	19	2440	7.31	≤ 30.00	Pass
BLE	1	39	2480	7.14	≤ 30.00	Pass

Note: E.I.R.P (dBm) = Max Peak Power (dBm) + Antenna Gain (dBi) = 7.35 dBm + 3.30 dBi = 10.65 dBm.

Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	Result
BLE	1	00	2402	7.07	≤ 30.00	Pass
BLE	1	19	2440	7.05	≤ 30.00	Pass
BLE	1	39	2480	6.90	≤ 30.00	Pass

Note: E.I.R.P (dBm) = Max Average Power (dBm) + Antenna Gain (dBi) = 7.07 dBm + 3.30 dBi = 10.37 dBm.

7.4. Power Spectral Density Measurement

7.4.1.Test Limit

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

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

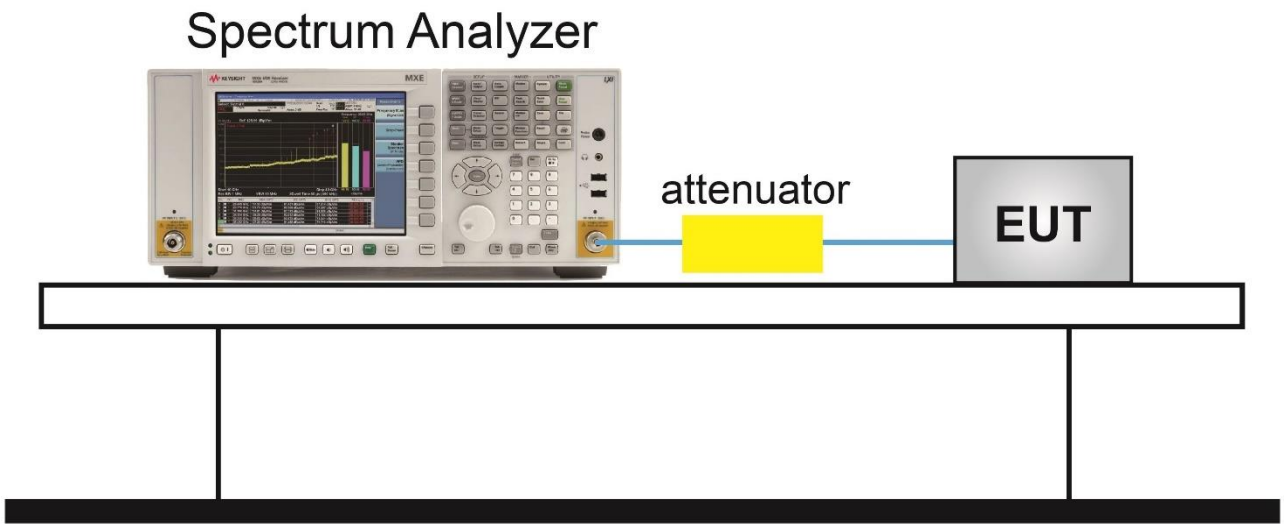
7.4.2.Test Procedure Used

ANSI C63.10 Section 11.10.2

7.4.3.Test Setting

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

7.4.4.Test Setup



7.4.5.Test Result

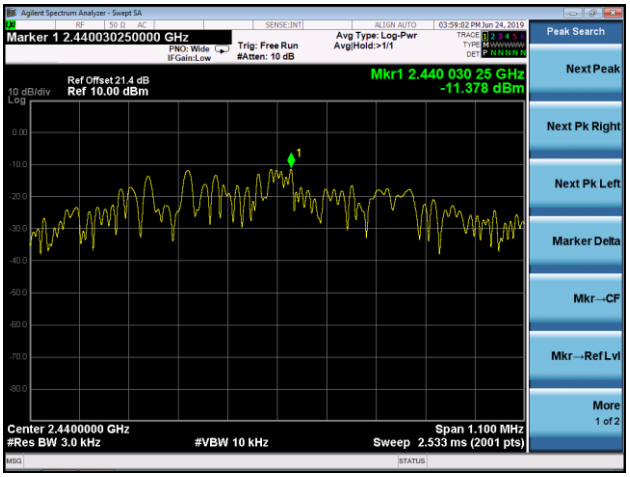
Product	ACCESS POINT	Temperature	27°C
Test Engineer	Kevin Ker	Relative Humidity	65%
Test Site	SR2	Test Date	2019/06/24
Model No.	APIN0504	Test Item	Power Spectral Density

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
BLE	1	00	2402	-11.25	≤ 8.00	Pass
BLE	1	19	2440	-11.38	≤ 8.00	Pass
BLE	1	39	2480	-11.79	≤ 8.00	Pass

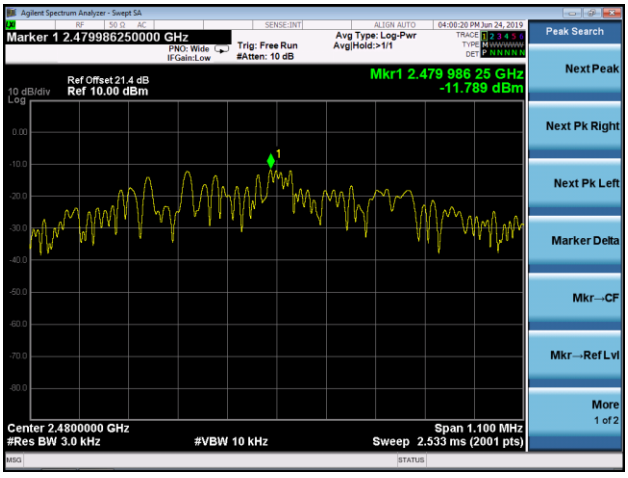
BLE PSD

Channel 00 (2402MHz)

Channel 19 (2440MHz)



Channel 39 (2480MHz)

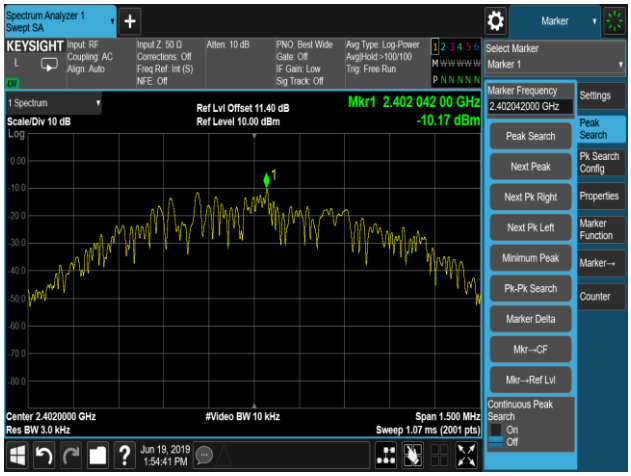


Product	ACCESS POINT	Temperature	27°C
Test Engineer	Kevin Ker	Relative Humidity	65%
Test Site	SR2	Test Date	2019/06/19
Model No.	APIN0505	Test Item	Power Spectral Density

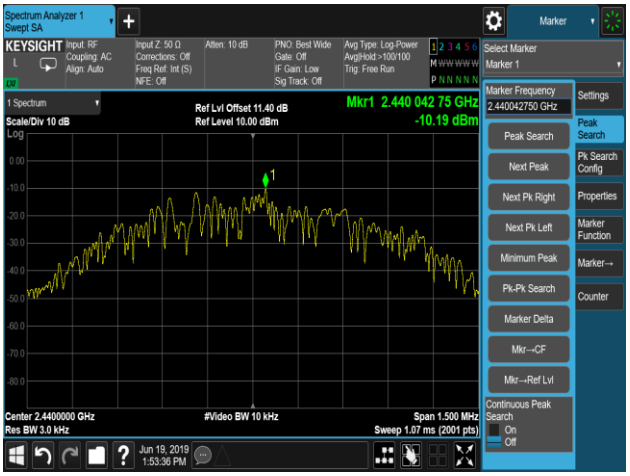
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
BLE	1	00	2402	-10.17	≤ 8.00	Pass
BLE	1	19	2440	-10.19	≤ 8.00	Pass
BLE	1	39	2480	-10.38	≤ 8.00	Pass

BLE PSD

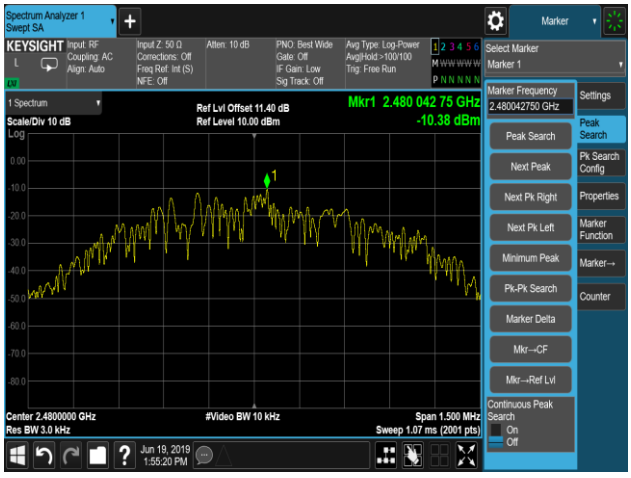
Channel 00 (2402MHz)



Channel 19 (2440MHz)



Channel 39 (2480MHz)



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

7.5.1.Test Limit

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

7.5.2.Test Procedure Used

ANSI C63.10 Section 11.11

7.5.3.Test Settitng

1. Reference level measurement

a) Set instrument center frequency to DTS channel center frequency

b) Set the span to ≥ 1.5 times the DTS bandwidth

c) Set the RBW = 100 kHz

d) Set the VBW ≥ 3 x RBW

e) Detector = peak

f) Sweep time = auto couple

g) Trace mode = max hold

h) Allow trace to fully stabilize

2. Emission level measurement

a) Start frequency was set to 30MHz and stop frequency was set to 25GHz (separated into two plots per channel)

b) RBW = 1.3MHz

c) VBW = 4MHz

d) Detector = Peak

e) Trace mode = max hold

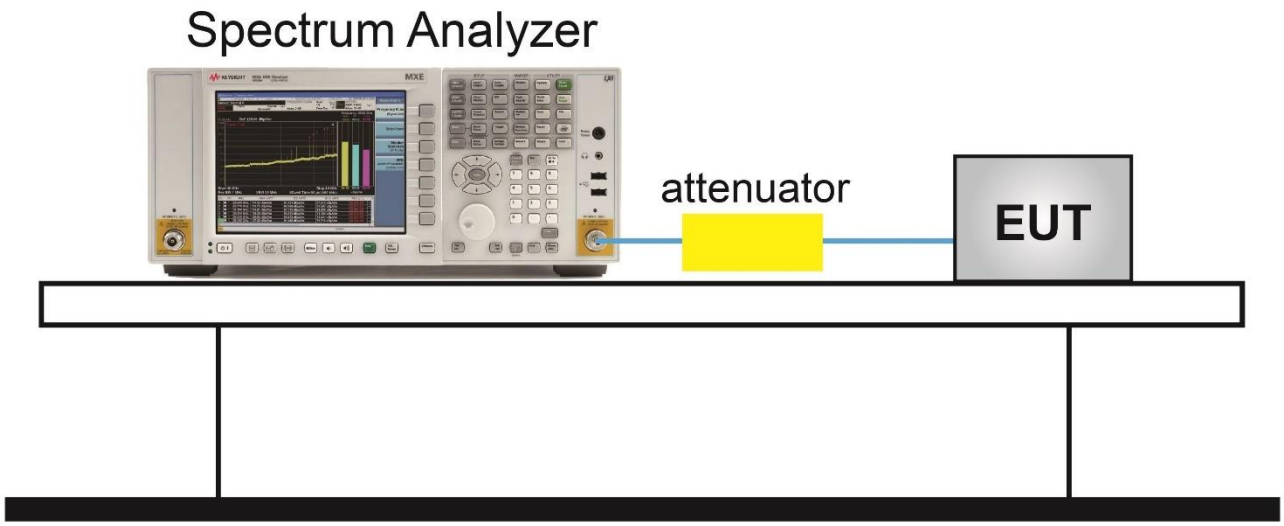
f) Sweep time = auto couple

g) The trace was allowed to stabilize

Test Notes

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

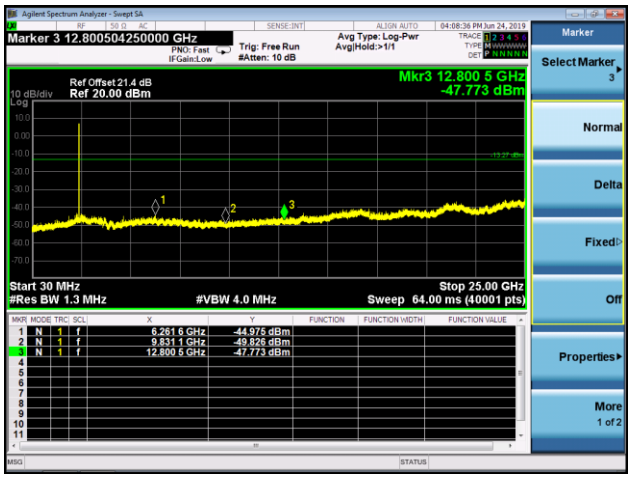
7.5.4.Test Setup

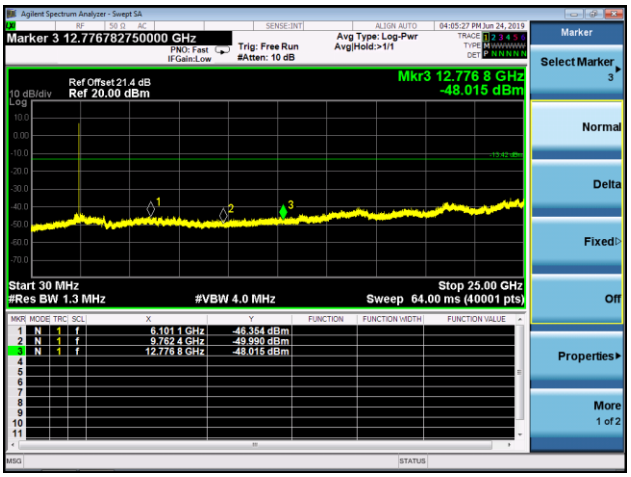
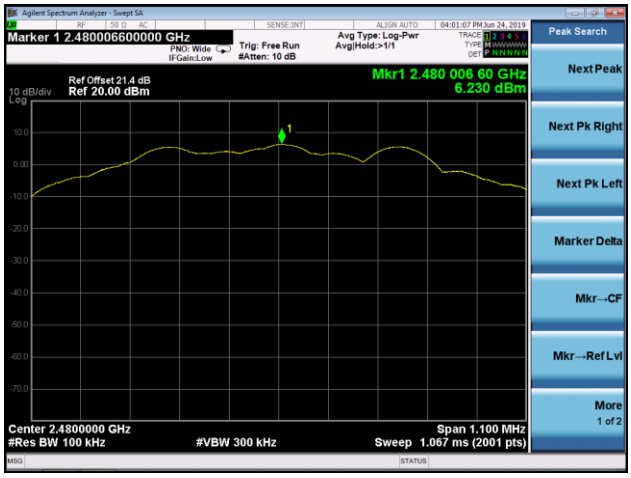
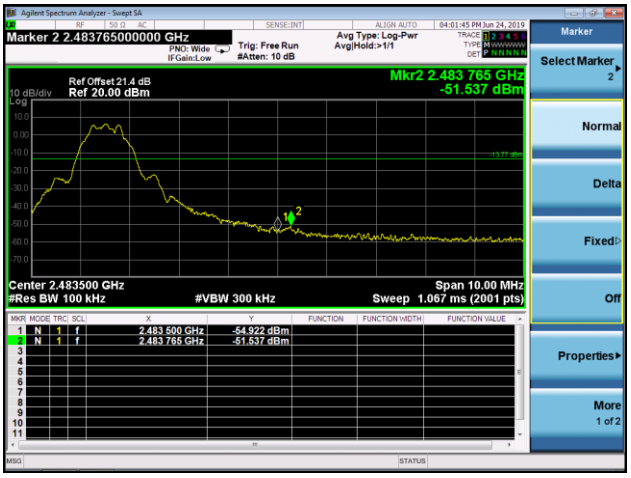
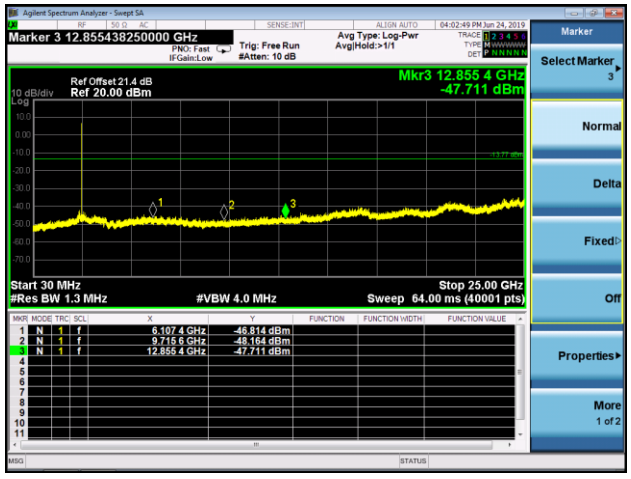


7.5.5.Test Result

Product	ACCESS POINT	Temperature	27°C
Test Engineer	Kevin Ker	Relative Humidity	65%
Test Site	SR2	Test Date	2019/06/24
Model No.	APIN0504	Test Item	Conducted Band Edge and Out-of-Band Emissions

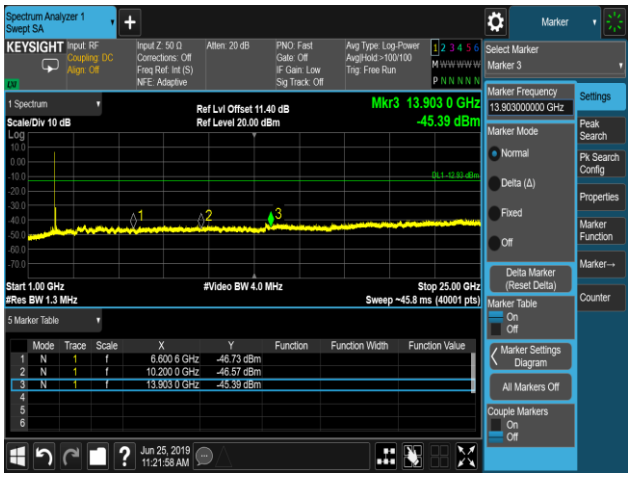
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Limit	Result
BLE	1	00	2402	20dBc	Pass
BLE	1	19	2440	20dBc	Pass
BLE	1	39	2480	20dBc	Pass

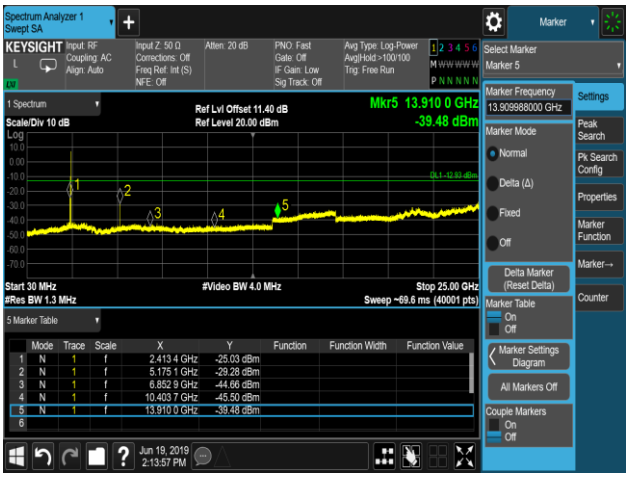
BLE Out-of-Band Emissions	
Channel 00 (2402MHz)	
100kHz PSD reference Level	Low Band Edge
	
Spurious Emission 30MHz ~ 25GHz	
	Note: The Value of the Display Line is -13.27dBm

Channel 19 (2440MHz)	
100kHz PSD reference Level	Spurious Emission 30MHz ~ 25GHz
	
Note: The Value of the Display Line is -13.42dBm	
Channel 39 (2480MHz)	
100kHz PSD reference Level	High Band Edge
	
Spurious Emission 30MHz ~ 25GHz	
	Note: The Value of the Display Line is -13.77dBm

Product	ACCESS POINT	Temperature	27°C
Test Engineer	Kevin Ker	Relative Humidity	65%
Test Site	SR2	Test Date	2019/06/19
Model No.	APIN0505	Test Item	Conducted Band Edge and Out-of-Band Emissions

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Limit	Result
BLE	1	00	2402	20dBc	Pass
BLE	1	19	2440	20dBc	Pass
BLE	1	39	2480	20dBc	Pass

<table>
<tr><td colspan="2">BLE Out-of-Band Emissions</td></tr>
<tr><td colspan="2">Channel 00 (2402MHz)</td></tr>
<tr><td>100kHz PSD reference Level</td><td>Low Band Edge</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Spurious Emission 30MHz ~ 25GHz</td><td></td></tr>
<tr><td> 
</td><td>Note: The Value of the Display Line is -12.93dBm</td></tr>
</table>

<table>
<tr><th colspan="2">Channel 19 (2440MHz)</th></tr>
<tr><th>100kHz PSD reference Level</th><th>Spurious Emission 30MHz ~ 25GHz</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">Note: The Value of the Display Line is -12.93dBm</td></tr>
<tr><th colspan="2">Channel 39 (2480MHz)</th></tr>
<tr><th>100kHz PSD reference Level</th><th>High Band Edge</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><th>Spurious Emission 30MHz ~ 25GHz</th><td></td></tr>
<tr><td> 
</td><td>Note: The Value of the Display Line is -12.92dBm</td></tr>
</table>

7.6. Radiated Spurious Emission Measurement

7.6.1.Test Limit

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

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

7.6.2.Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

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

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

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

7.6.3.Test Setting

Table 1 - RBW as a function of frequency

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

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest

2. Span was set greater than 1MHz

3. RBW = as specified in Table 1

4. Detector = CISPR quasi-peak

5. Sweep time = auto couple

6. Trace was allowed to stabilize

Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest

2. RBW = 1MHz

3. VBW = 3MHz

4. Detector = peak

5. Sweep time = auto couple

6. Trace mode = max hold

7. Trace was allowed to stabilize

Average Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest

2. RBW = 1MHz

3. VBW; If the EUT is configured to transmit with duty cycle ≥ 98%, set VBW = 10 Hz.

If the EUT duty cycle is < 98%, set VBW ≥ 1/T. T is the minimum transmission duration.

4. Detector = Peak

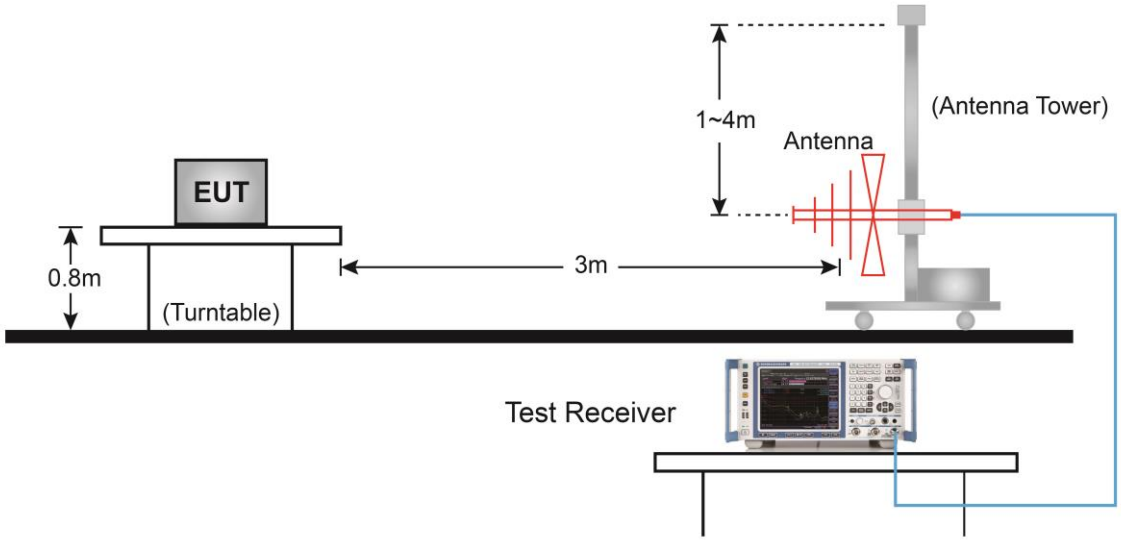
5. Sweep time = auto

6. Trace mode = max hold

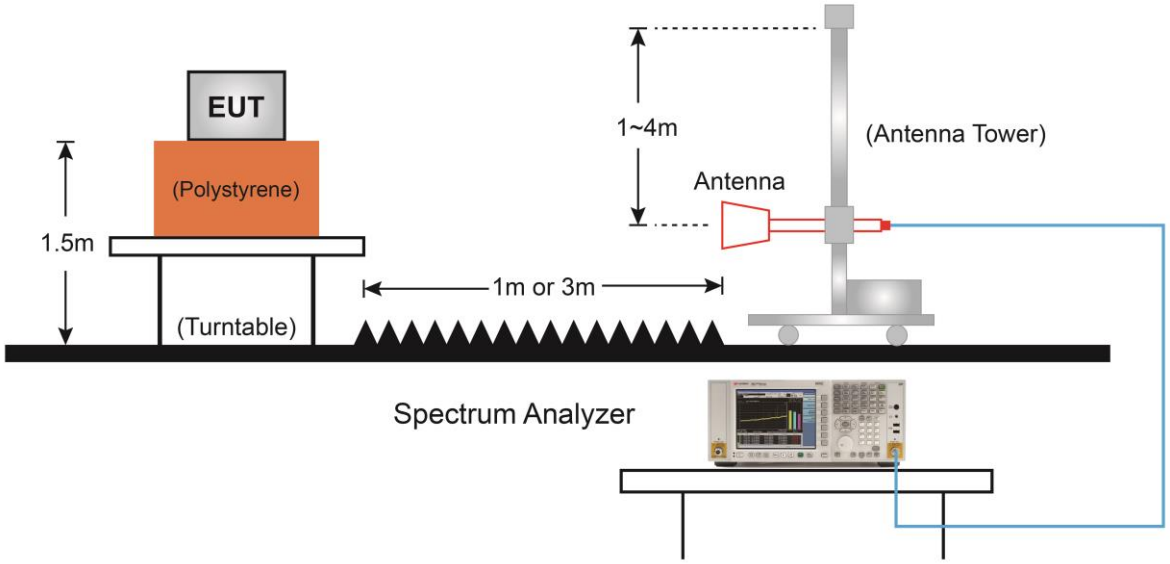
7. Trace was allowed to stabilize

7.6.4.Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



Note: This item was performed with the BLE antenna connected.

7.6.5.Test Result

Product	ACCESS POINT	Temperature	26°C
Test Engineer	Kevin Ker	Relative Humidity	56%
Test Site	AC1	Test Date	2019/06/25
Model No.	APIN0504	Test Channel	00
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
*	5785.5	38.4	5.3	43.7	74.0	-30.3	Peak	Horizontal
*	6057.5	38.6	6.4	45.0	74.0	-29.0	Peak	Horizontal
	7655.5	35.6	12.8	48.4	54.0	-5.6	Peak	Horizontal
	8216.5	35.9	13.0	48.9	54.0	-5.1	Peak	Horizontal
*	5802.5	37.8	5.3	43.1	74.0	-30.9	Peak	Vertical
*	6253.0	36.4	7.3	43.7	74.0	-30.3	Peak	Vertical
	7570.5	35.0	12.7	47.7	54.0	-6.3	Peak	Vertical
	8182.5	35.1	13.0	48.1	54.0	-5.9	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (90.1dBμV/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	ACCESS POINT	Temperature	26°C
Test Engineer	Kevin Ker	Relative Humidity	56%
Test Site	AC1	Test Date	2019/06/25
Model No.	APIN0504	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
*	6261.5	37.7	7.3	45.0	74.0	-29.0	Peak	Horizontal
*	6601.5	37.2	9.1	46.3	74.0	-27.7	Peak	Horizontal
	7400.5	34.9	12.4	47.3	54.0	-6.7	Peak	Horizontal
	8216.5	35.7	13.0	48.7	54.0	-5.3	Peak	Horizontal
*	5811.0	38.0	5.4	43.4	74.0	-30.6	Peak	Vertical
*	6499.5	36.1	8.5	44.6	74.0	-29.4	Peak	Vertical
	7468.5	37.0	12.6	49.6	54.0	-4.4	Peak	Vertical
	8165.5	35.9	13.0	48.9	54.0	-5.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (92.2dBμV/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	ACCESS POINT	Temperature	26°C
Test Engineer	Kevin Ker	Relative Humidity	56%
Test Site	AC1	Test Date	2019/06/25
Model No.	APIN0504	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
*	5743.0	37.3	5.1	42.4	74.0	-31.6	Peak	Horizontal
*	6100.0	34.7	6.6	41.3	74.0	-32.7	Peak	Horizontal
	7468.5	34.4	12.6	47.0	54.0	-7.0	Peak	Horizontal
	8327.0	34.6	13.1	47.7	54.0	-6.3	Peak	Horizontal
*	6074.5	36.7	6.4	43.1	74.0	-30.9	Peak	Vertical
*	6729.0	35.1	9.8	44.9	74.0	-29.1	Peak	Vertical
	7536.5	33.8	12.7	46.5	54.0	-7.5	Peak	Vertical
	8191.0	34.8	13.0	47.8	54.0	-6.2	Peak	Vertical

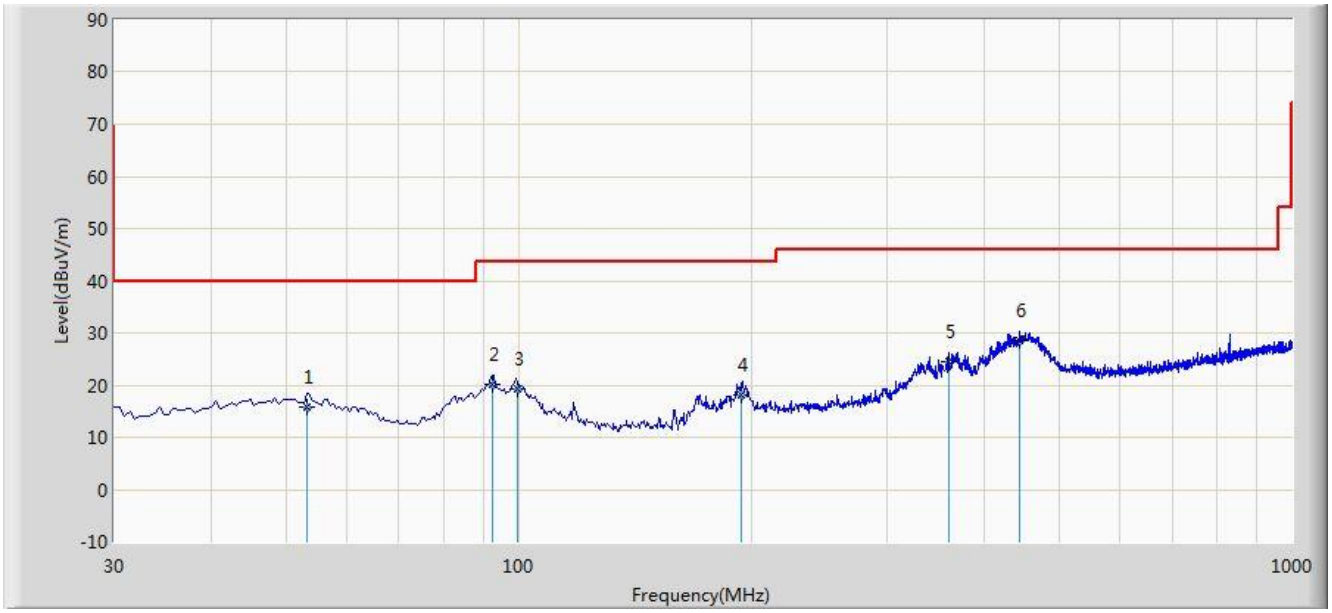
Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (93.0dBμV/m) or 15.209 which is higher.

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

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

The Worst Case of Radiated Emission below 1GHz:

Site: AC1	Time: 2019/07/13 - 11:56
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: VULB9168_20-2000MHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Worse Case Mode: Transmit by BLE at channel 2402MHz	



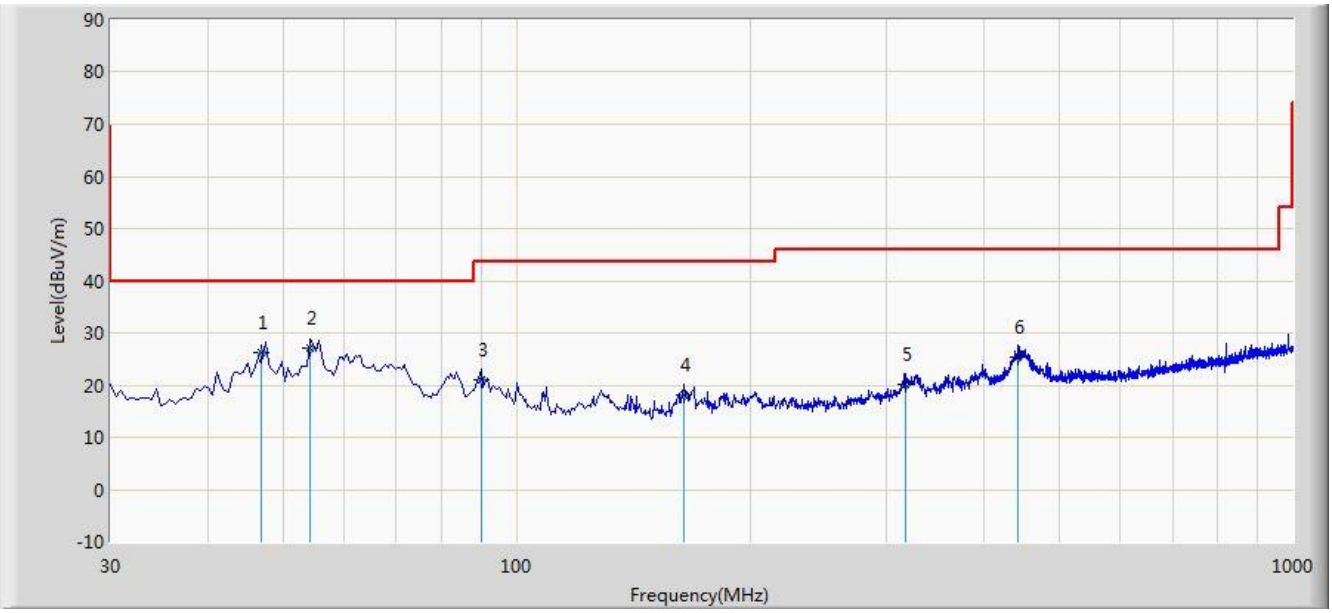
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			53.190	15.942	-5.352	-24.058	40.000	21.293	QP
2			92.598	20.248	2.696	-23.252	43.500	17.551	QP
3			99.490	19.275	0.232	-24.225	43.500	19.043	QP
4			194.100	18.033	-0.801	-25.467	43.500	18.834	QP
5		*	359.860	24.510	1.056	-21.490	46.000	23.455	QP
6			444.180	28.481	4.052	-17.519	46.000	24.429	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. Besides, there is a comparison data of both open-field test site and alternative test site semi-Anechoic chamber according to KDB 414788 D01 radiated test site v01r01, this comparison result was very similar.

Site: AC1	Time: 2019/07/13 - 11:59
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: VULB9168_20-2000MHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Worse Case Mode: Transmit by BLE at channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	47.000	26.170	4.413	-13.830	40.000	21.757	QP
2			54.190	27.214	6.093	-12.786	40.000	21.121	QP
3			90.140	20.931	3.911	-22.569	43.500	17.020	QP
4			164.165	18.021	1.763	-25.479	43.500	16.257	QP
5			317.290	20.232	-1.835	-25.768	46.000	22.067	QP
6			442.190	25.444	1.037	-20.556	46.000	24.408	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. Besides, there is a comparison data of both open-field test site and alternative test site semi-Anechoic chamber according to KDB 414788 D01 radiated test site v01r01, this comparison result was very similar.

Product	ACCESS POINT	Temperature	26°C
Test Engineer	Kevin Ker	Relative Humidity	56%
Test Site	AC1	Test Date	2019/06/24
Model No.	APIN0505	Test Channel	00
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
*	6253.0	38.0	7.3	45.3	80.9	-35.6	Peak	Horizontal
*	6916.0	35.6	10.8	46.4	80.9	-34.5	Peak	Horizontal
	7434.5	34.9	12.5	47.4	54.0	-6.6	Peak	Horizontal
	8242.0	35.6	13.0	48.6	54.0	-5.4	Peak	Horizontal
*	5828.0	38.4	5.4	43.8	80.9	-37.1	Peak	Vertical
*	6380.5	36.6	7.9	44.5	80.9	-36.4	Peak	Vertical
	7630.0	34.8	12.8	47.6	54.0	-6.4	Peak	Vertical
	8199.5	34.8	13.0	47.8	54.0	-6.2	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (100.9dBμV/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	ACCESS POINT	Temperature	26°C
Test Engineer	Kevin Ker	Relative Humidity	56%
Test Site	AC1	Test Date	2019/06/24
Model No.	APIN0505	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
*	6023.5	37.3	6.2	43.5	80.7	-37.2	Peak	Horizontal
*	6814.0	36.0	10.3	46.3	80.7	-34.4	Peak	Horizontal
	7604.5	34.6	12.8	47.4	54.0	-6.6	Peak	Horizontal
	8242.0	34.8	13.0	47.8	54.0	-6.2	Peak	Horizontal
*	5777.0	38.5	5.2	43.7	80.7	-37.0	Peak	Vertical
*	6346.5	37.1	7.8	44.9	80.7	-35.8	Peak	Vertical
	7426.0	36.3	12.5	48.8	54.0	-5.2	Peak	Vertical
	8327.0	36.1	13.1	49.2	54.0	-4.8	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (100.7dBμV/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	ACCESS POINT	Temperature	26°C
Test Engineer	Kevin Ker	Relative Humidity	56%
Test Site	AC1	Test Date	2019/06/24
Model No.	APIN0505	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
*	6015.0	37.9	6.2	44.1	80.6	-36.5	Peak	Horizontal
*	6457.0	37.2	8.3	45.5	80.6	-35.1	Peak	Horizontal
	7332.5	35.0	12.2	47.2	54.0	-6.8	Peak	Horizontal
	8182.5	35.9	13.0	48.9	54.0	-5.1	Peak	Horizontal
*	5896.0	38.4	5.7	44.1	80.6	-36.5	Peak	Vertical
*	6465.5	37.3	8.3	45.6	80.6	-35.0	Peak	Vertical
	7596.0	36.6	12.8	49.4	54.0	-4.6	Peak	Vertical
	8174.0	35.7	13.0	48.7	54.0	-5.3	Peak	Vertical

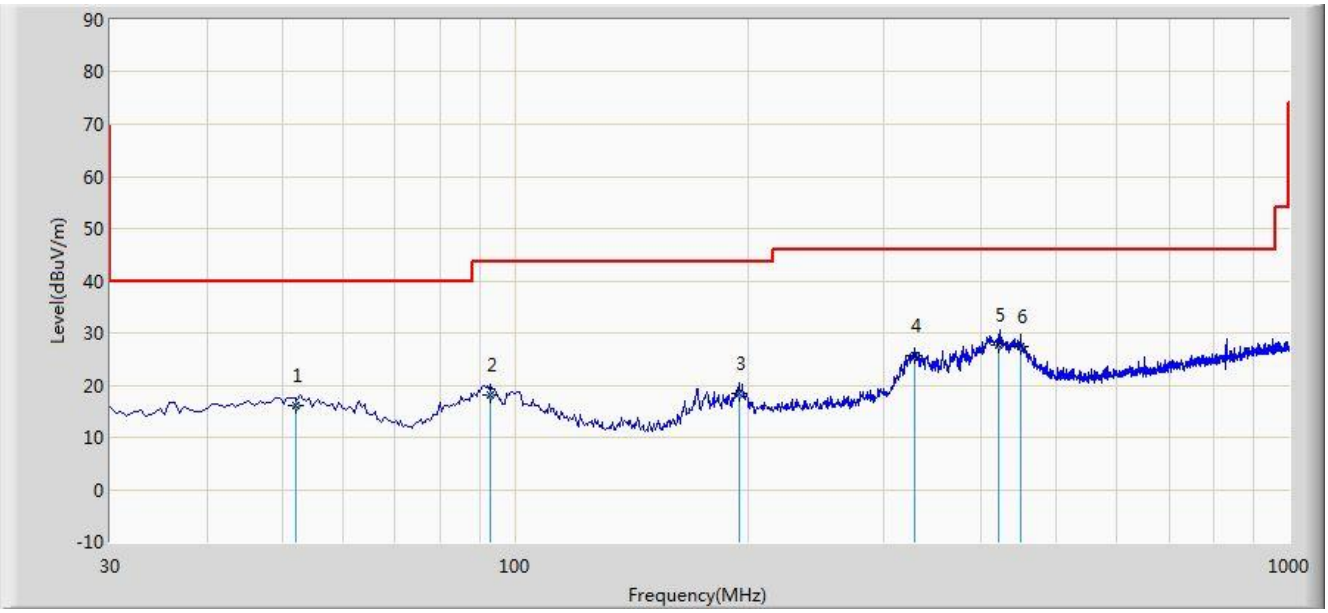
Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (100.6dBμV/m) or 15.209 which is higher.

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

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

The Worst Case of Radiated Emission below 1GHz:

Site: AC1	Time: 2019/07/13 - 12:15
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: VULB9168_20-2000MHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Worse Case Mode: Transmit by BLE at channel 2402MHz	



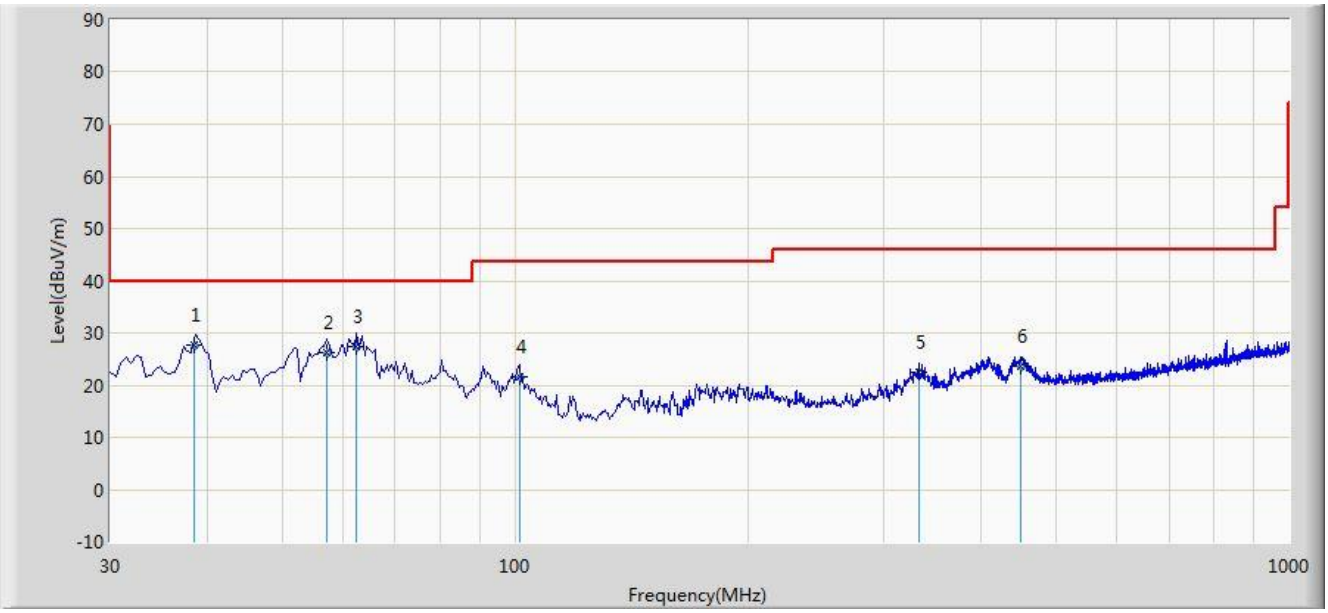
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	52.160	15.961	-5.509	-24.039	40.000	21.470	QP
2			93.000	17.978	0.340	-25.522	43.500	17.639	QP
3			194.700	18.371	-0.495	-25.129	43.500	18.866	QP
4			328.960	25.555	3.038	-20.445	46.000	22.517	QP
5			422.000	27.758	3.565	-18.242	46.000	24.193	QP
6			450.000	27.372	2.882	-18.628	46.000	24.490	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. Besides, there is a comparison data of both open-field test site and alternative test site semi-Anechoic chamber according to KDB 414788 D01 radiated test site v01r01, this comparison result was very similar.

Site: AC1	Time: 2019/07/13 - 12:16
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: VULB9168_20-2000MHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Worse Case Mode: Transmit by BLE at channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	38.490	27.562	7.357	-12.438	40.000	20.205	QP
2			57.260	26.249	5.662	-13.751	40.000	20.587	QP
3			62.359	27.465	8.400	-12.535	40.000	19.065	QP
4			101.298	21.685	2.524	-21.815	43.500	19.161	QP
5			332.590	22.527	-0.131	-23.473	46.000	22.657	QP
6			451.260	23.714	-0.814	-22.286	46.000	24.528	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. Besides, there is a comparison data of both open-field test site and alternative test site semi-Anechoic chamber according to KDB 414788 D01 radiated test site v01r01, this comparison result was very similar.

7.7. Radiated Restricted Band Edge Measurement

7.7.1.Test Limit

For 15.205 requirement:

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

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

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

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

7.7.2.Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

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

7.7.3.Test Setting

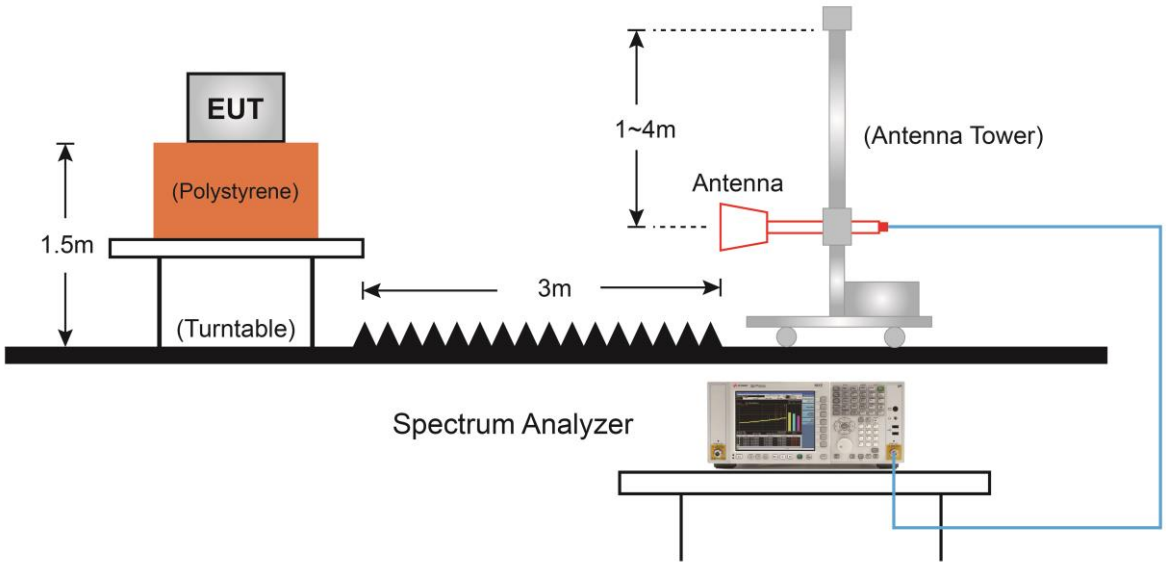
Peak Field Strength Measurements

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

Average Field Strength Measurements

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

7.7.4.Test Setup

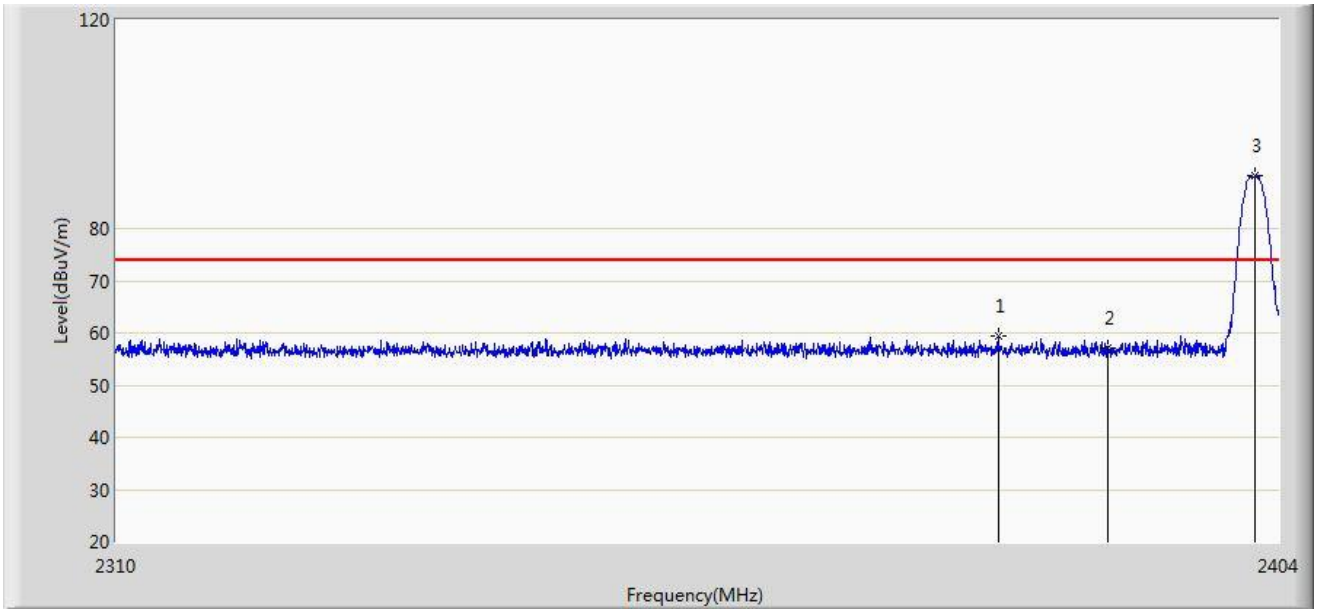


Note: This item was performed with the BLE antenna connected.

7.7.5.Test Result

For APIN0504

Site: AC1	Time: 2019/06/25 - 21:36
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2402MHz	

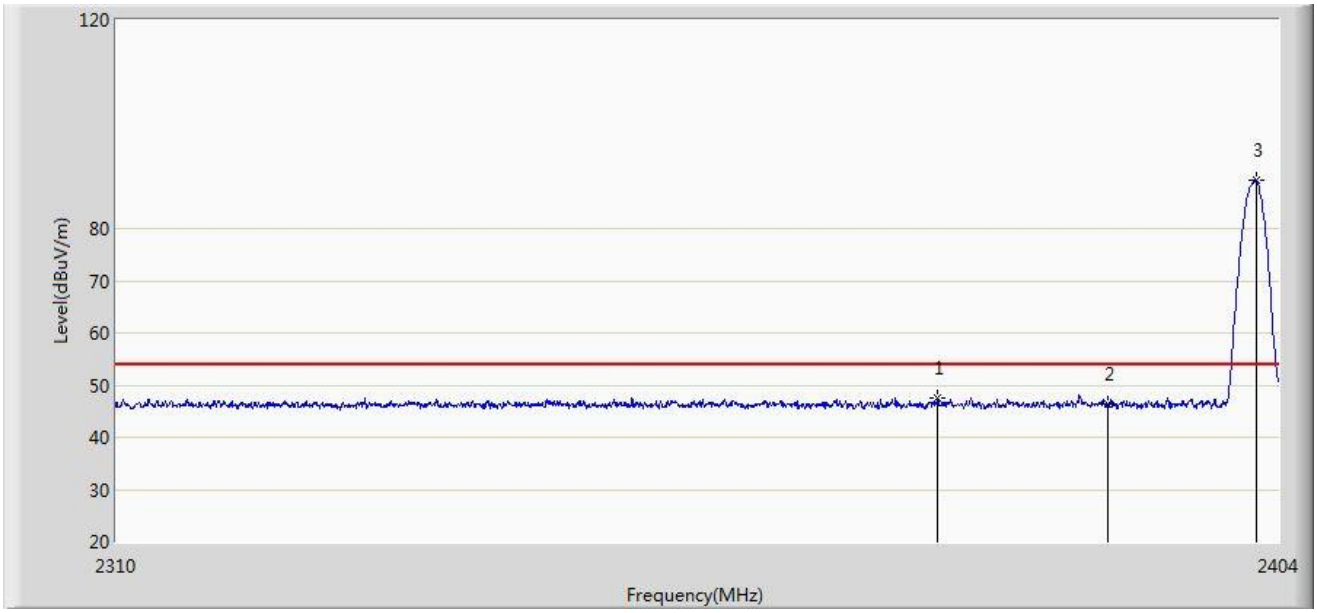


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2381.017	59.475	26.995	-14.525	74.000	32.480	PK
2			2390.000	57.203	24.685	-16.797	74.000	32.518	PK
3		*	2402.026	90.089	57.521	N/A	N/A	32.568	PK

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

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

Site: AC1	Time: 2019/06/25 - 21:37
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2402MHz	

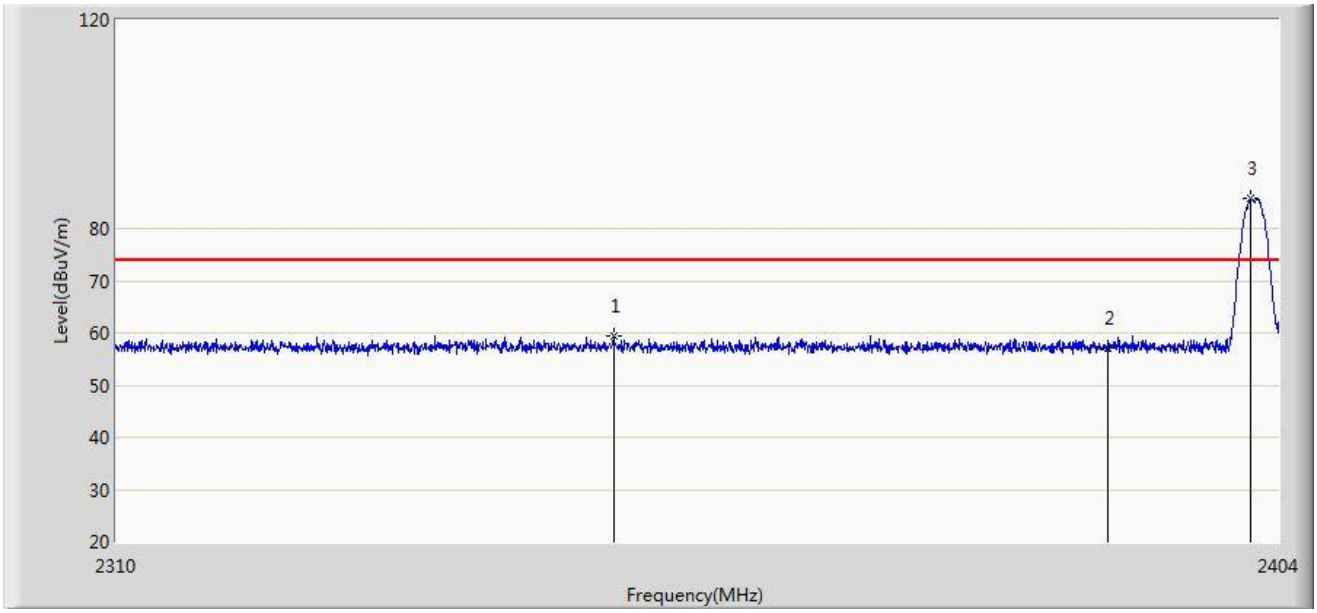


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2376.082	47.530	15.071	-6.470	54.000	32.459	AV
2			2390.000	46.352	13.834	-7.648	54.000	32.518	AV
3		*	2402.176	89.205	56.636	N/A	N/A	32.570	AV

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

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

Site: AC1	Time: 2019/06/25 - 21:37
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2402MHz	

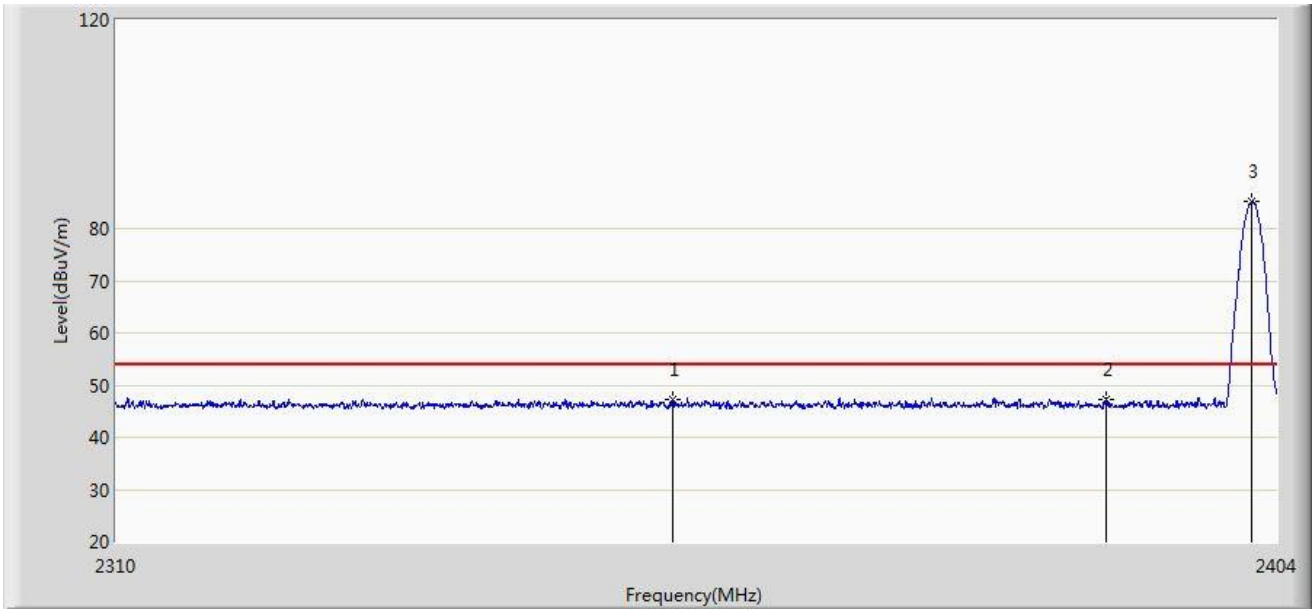


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2349.809	59.330	26.981	-14.670	74.000	32.349	PK
2			2390.000	57.074	24.556	-16.926	74.000	32.518	PK
3		*	2401.744	85.717	53.150	N/A	N/A	32.567	PK

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

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

Site: AC1	Time: 2019/06/25 - 21:38
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2402MHz	

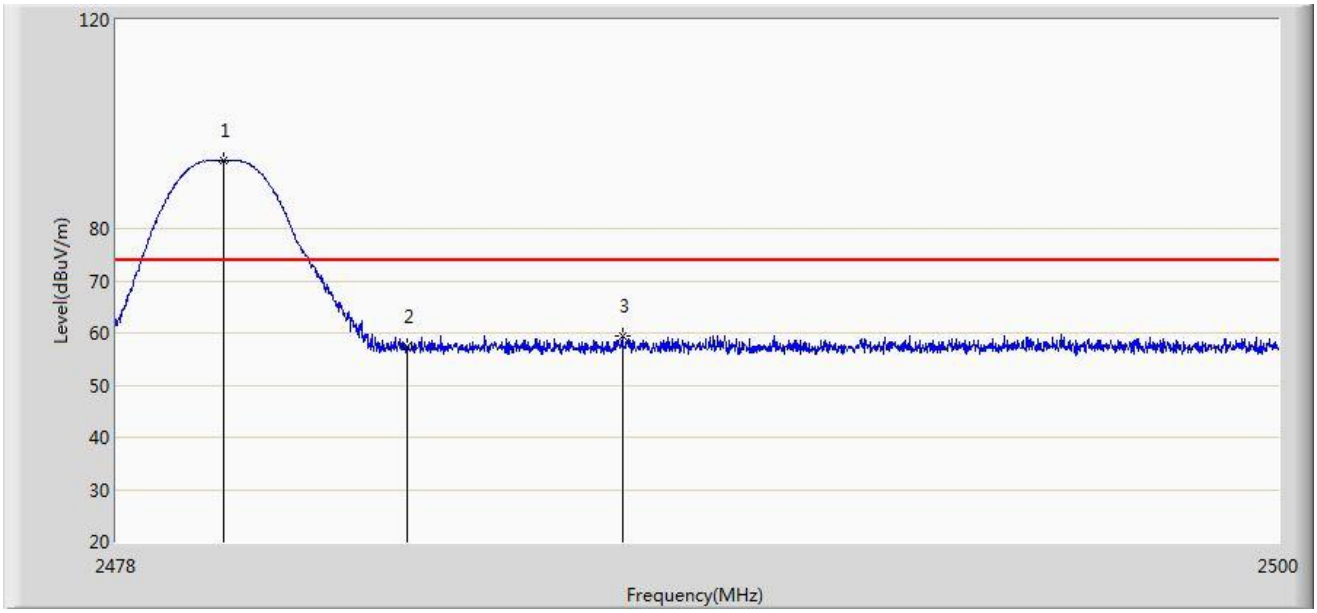


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2354.603	47.191	14.821	-6.809	54.000	32.370	AV
2			2390.000	47.219	14.701	-6.781	54.000	32.518	AV
3		*	2401.979	85.086	52.518	N/A	N/A	32.568	AV

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

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

Site: AC1	Time: 2019/06/25 - 21:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2480MHz	

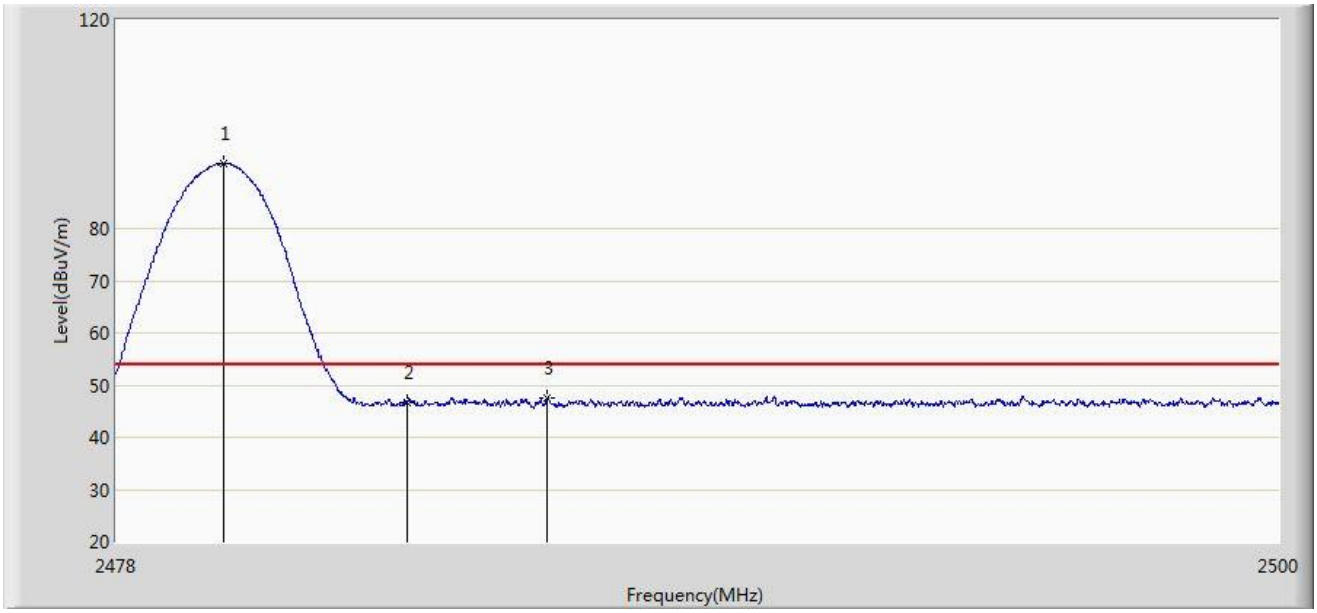


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.035	92.982	60.086	N/A	N/A	32.896	PK
2			2483.500	57.256	24.345	-16.744	74.000	32.911	PK
3			2487.559	59.549	26.621	-14.451	74.000	32.928	PK

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

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

Site: AC1	Time: 2019/06/25 - 21:42
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2480MHz	

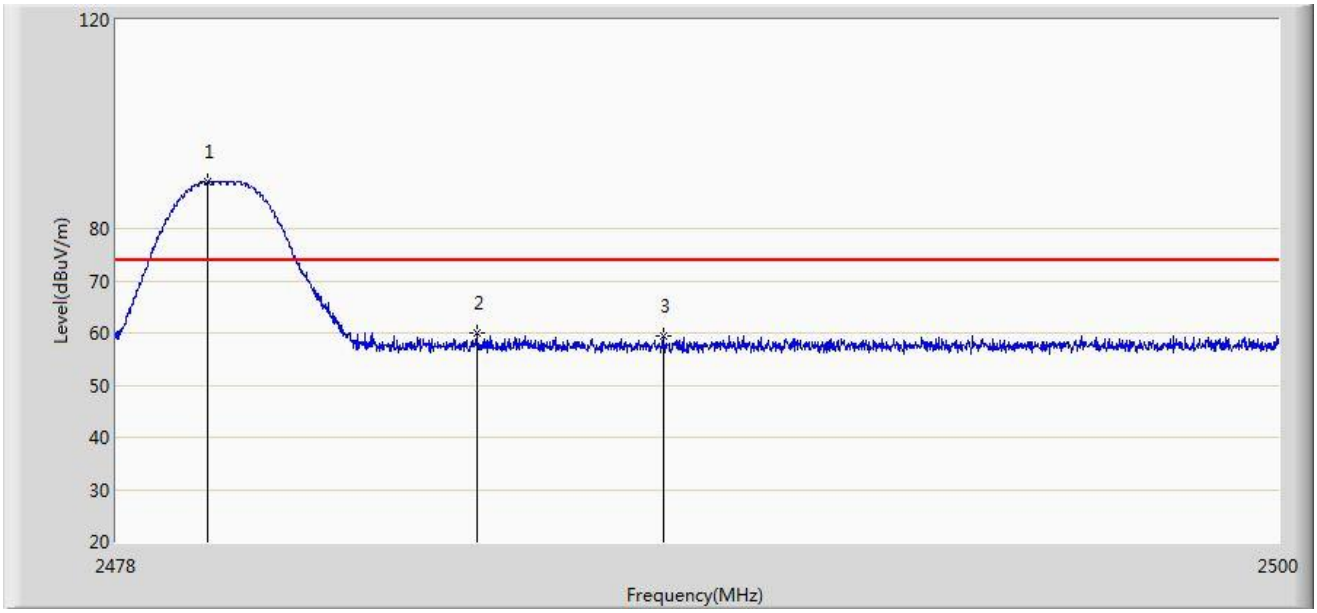


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.035	92.539	59.643	N/A	N/A	32.896	AV
2			2483.500	46.661	13.750	-7.339	54.000	32.911	AV
3			2486.151	47.505	14.583	-6.495	54.000	32.922	AV

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

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

Site: AC1	Time: 2019/06/25 - 21:43
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2480MHz	

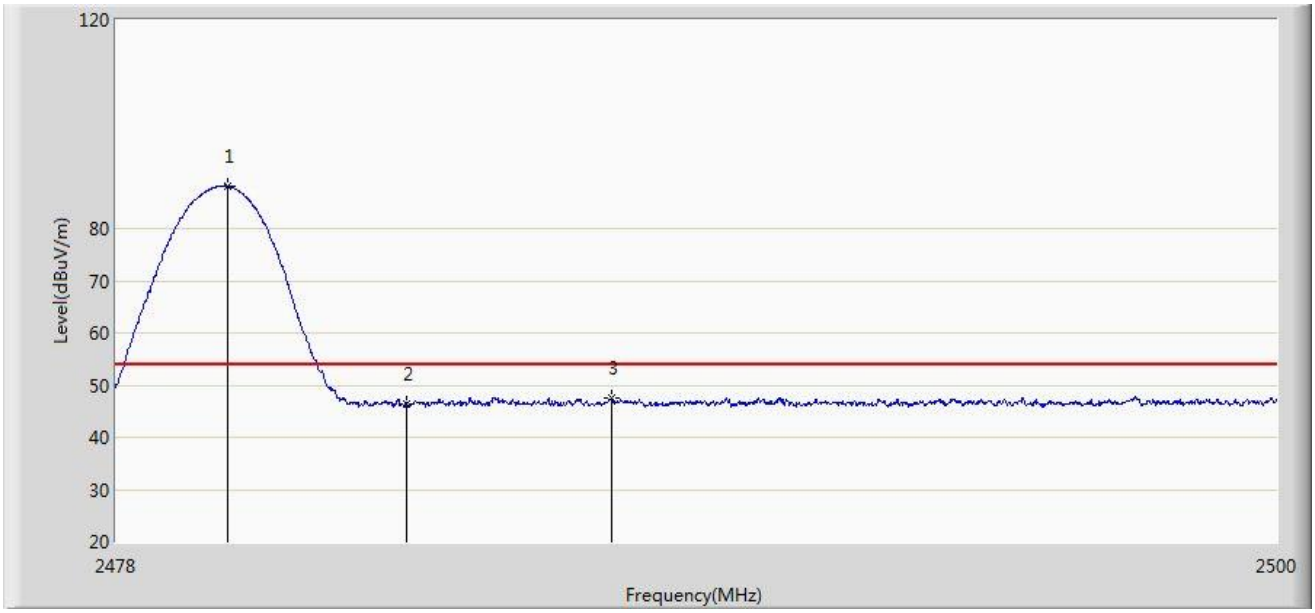


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.738	89.101	56.206	N/A	N/A	32.895	PK
2			2484.809	59.979	27.063	-14.021	74.000	32.916	PK
3			2488.329	59.325	26.394	-14.675	74.000	32.931	PK

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

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

Site: AC1	Time: 2019/06/25 - 21:46
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2480MHz	



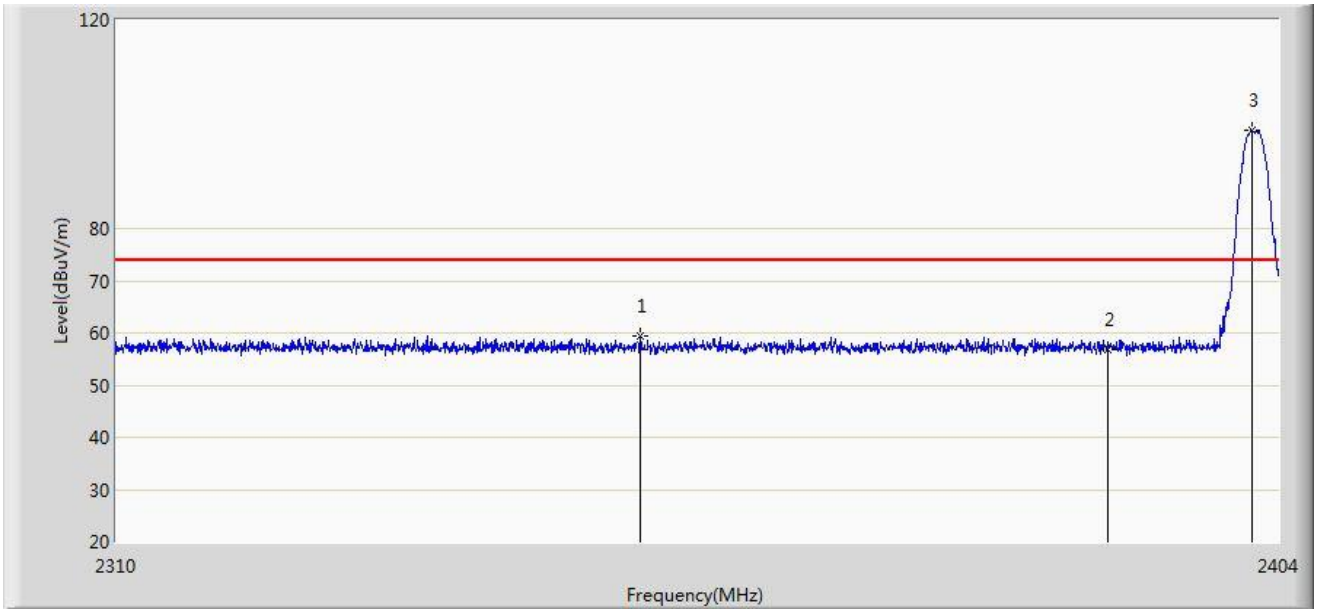
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.101	88.208	55.311	N/A	N/A	32.896	AV
2			2483.500	46.257	13.346	-7.743	54.000	32.911	AV
3			2487.372	47.536	14.609	-6.464	54.000	32.927	AV

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

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

For APIN0505

Site: AC1	Time: 2019/06/24 - 22:33
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2402MHz	

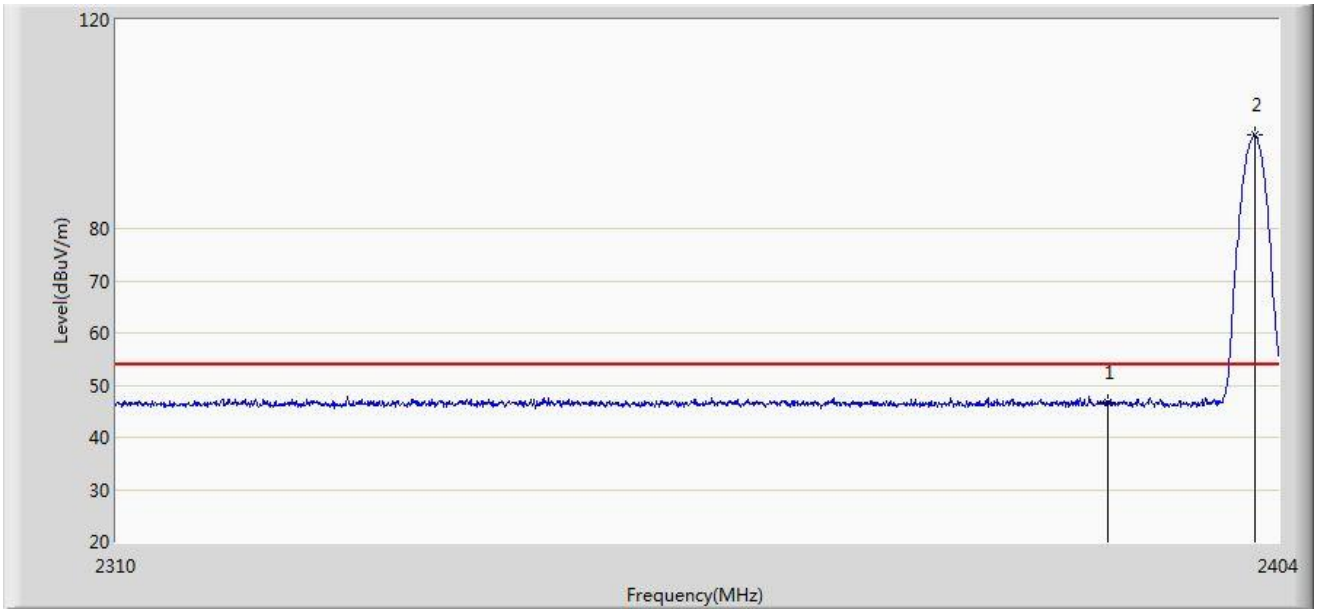


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2351.971	59.447	27.088	-14.553	74.000	32.359	PK
2			2390.000	56.912	24.394	-17.088	74.000	32.518	PK
3		*	2401.838	98.740	66.172	N/A	N/A	32.568	PK

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

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

Site: AC1	Time: 2019/06/24 - 22:58
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2402MHz	

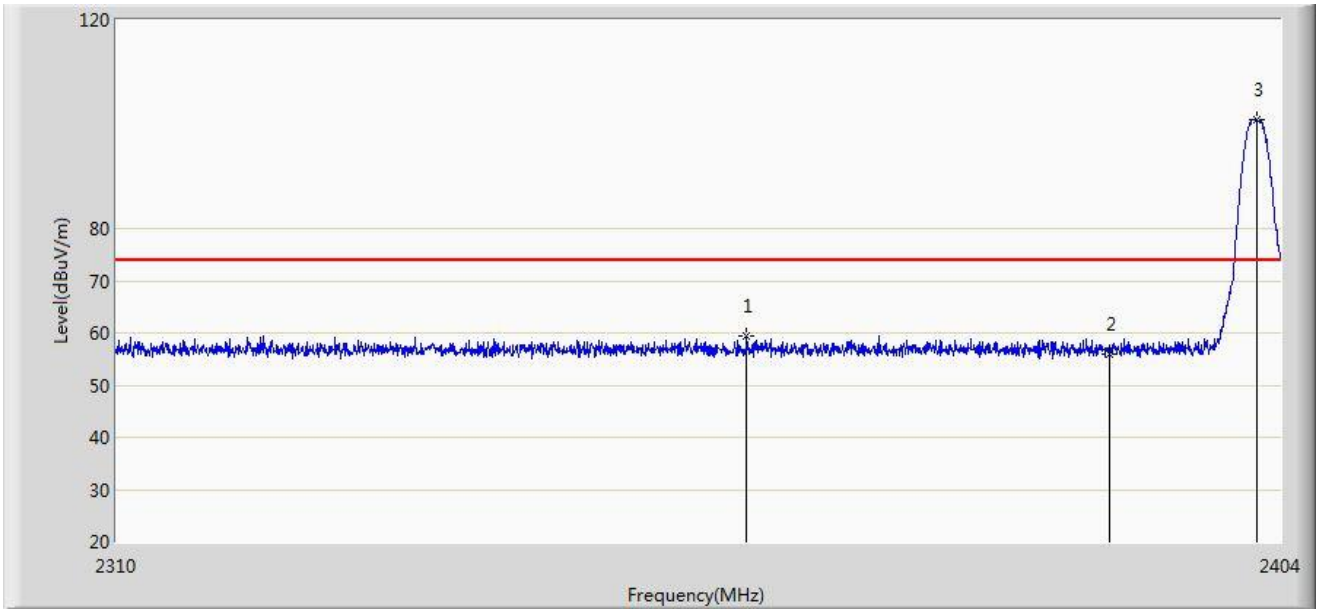


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.586	14.068	-7.414	54.000	32.518	AV
2		*	2402.026	97.930	65.362	N/A	N/A	32.568	AV

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

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

Site: AC1	Time: 2019/06/24 - 22:59
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2402MHz	

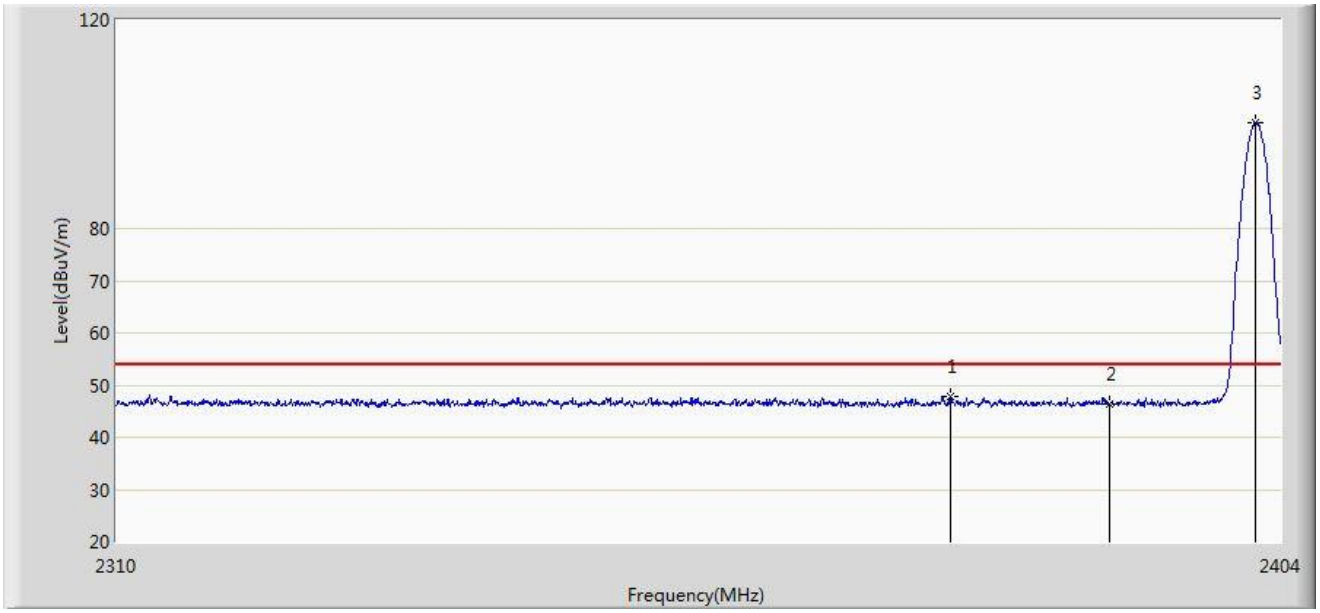


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2360.478	59.485	27.091	-14.515	74.000	32.394	PK
2			2390.000	55.952	23.434	-18.048	74.000	32.518	PK
3		*	2402.026	100.921	68.353	N/A	N/A	32.568	PK

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

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

Site: AC1	Time: 2019/06/24 - 22:59
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2402MHz	

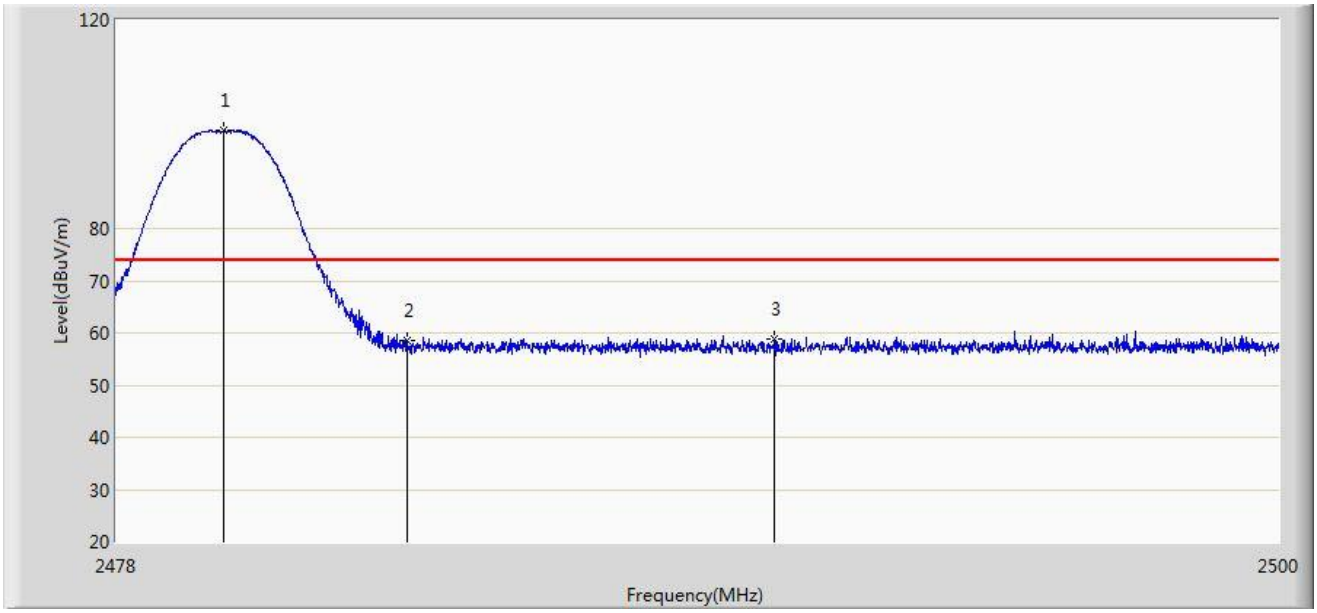


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2376.975	47.866	15.403	-6.134	54.000	32.463	AV
2			2390.000	46.422	13.904	-7.578	54.000	32.518	AV
3		*	2401.932	100.304	67.736	N/A	N/A	32.568	AV

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

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

Site: AC1	Time: 2019/06/24 - 23:02
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2480MHz	

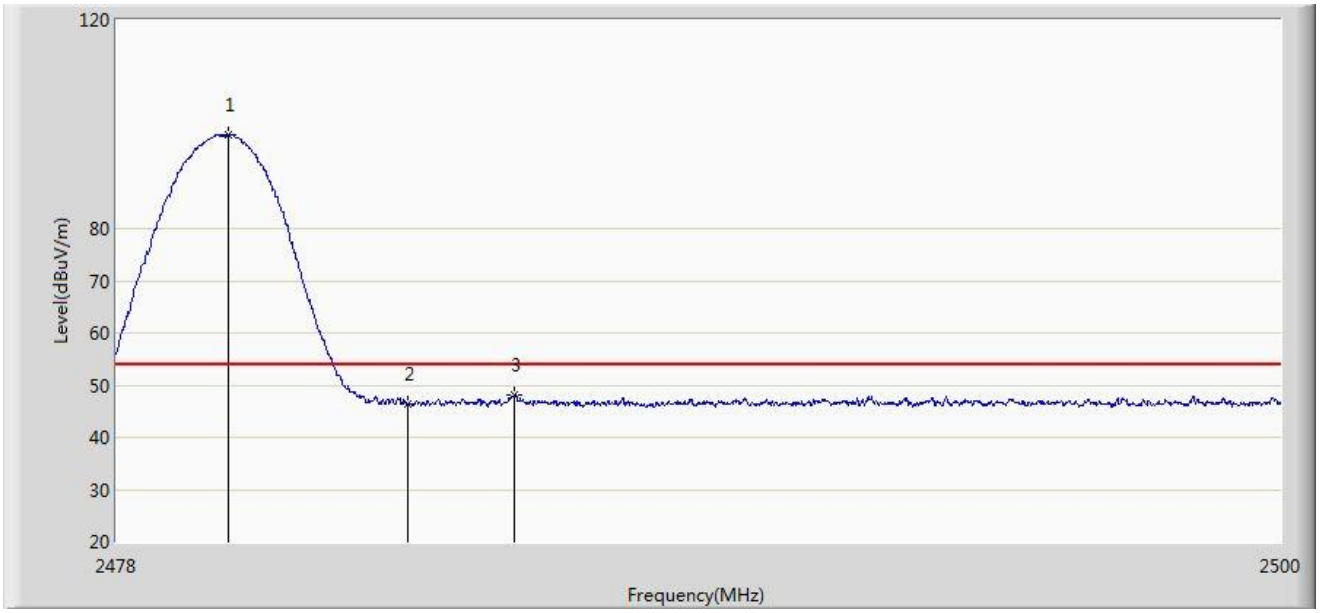


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.035	98.761	65.865	N/A	N/A	32.896	PK
2			2483.500	58.683	25.772	-15.317	74.000	32.911	PK
3			2490.441	58.935	25.995	-15.065	74.000	32.940	PK

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

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

Site: AC1	Time: 2019/06/24 - 23:04
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2480MHz	

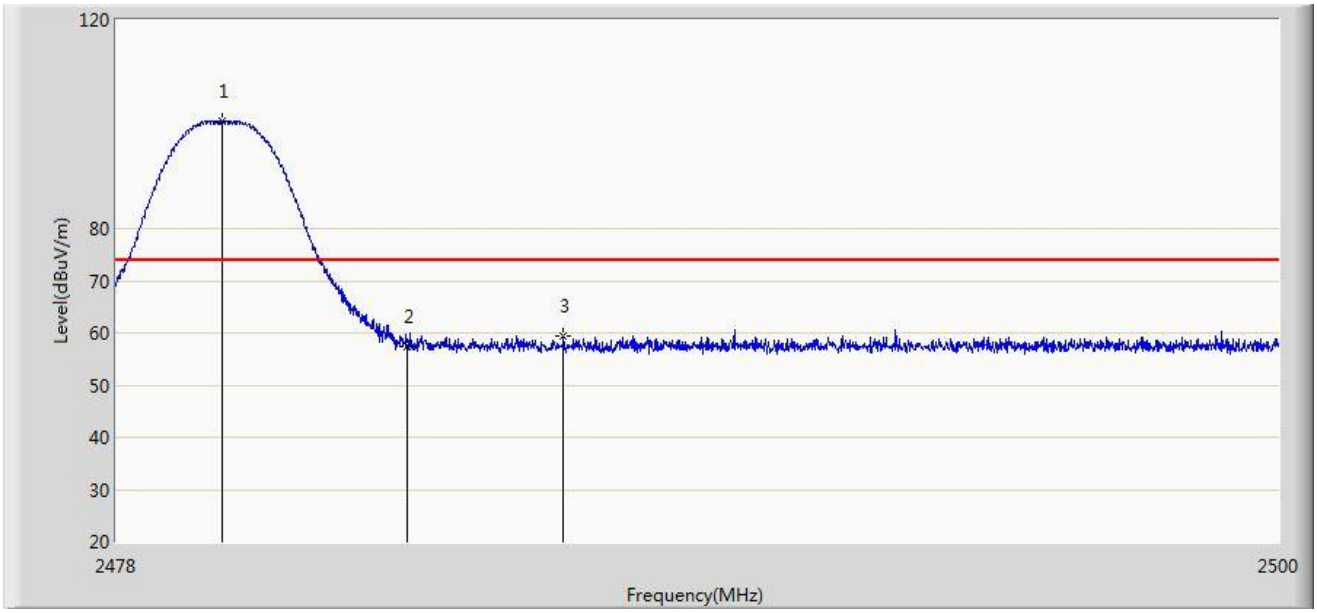


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.101	97.966	65.069	N/A	N/A	32.896	AV
2			2483.500	46.404	13.493	-7.596	54.000	32.911	AV
3			2485.491	48.132	15.213	-5.868	54.000	32.919	AV

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

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

Site: AC1	Time: 2019/06/24 - 23:05
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2480MHz	

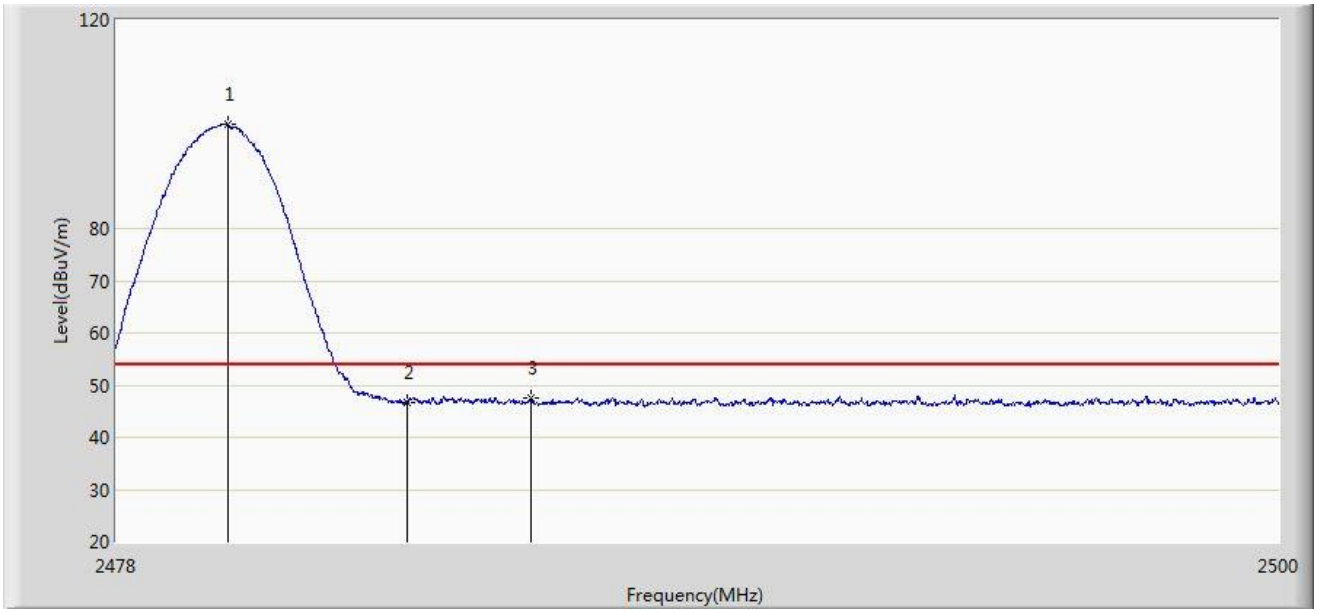


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.013	100.602	67.706	N/A	N/A	32.896	PK
2			2483.500	57.299	24.388	-16.701	74.000	32.911	PK
3			2486.448	59.458	26.535	-14.542	74.000	32.923	PK

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

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

Site: AC1	Time: 2019/06/24 - 23:05
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by BLE at channel 2480MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.101	99.885	66.988	N/A	N/A	32.896	AV
2			2483.500	46.598	13.687	-7.402	54.000	32.911	AV
3			2485.832	47.549	14.628	-6.451	54.000	32.920	AV

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

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

7.8. AC Conducted Emissions Measurement

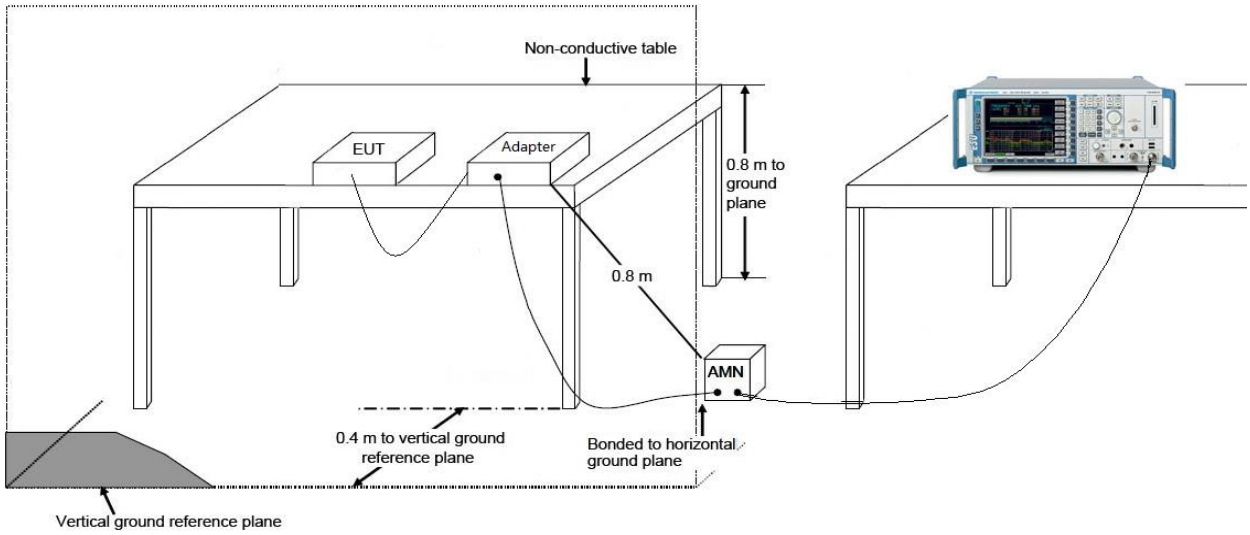
7.8.1.Test Limit

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

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

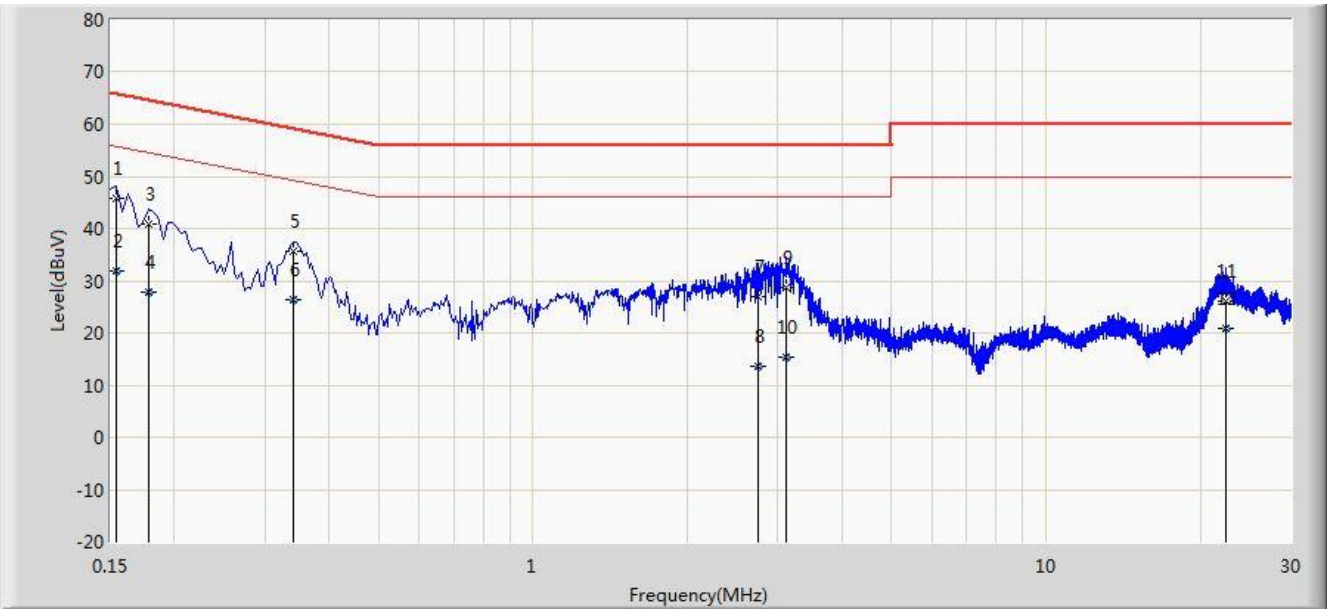
7.8.2.Test Setup



7.8.3.Test Result

For APIN0504

Site: SR2	Time: 2019/07/10 - 11:35
Limit: FCC_Part15.207_CE_AC Power	Engineer: Kevin Ker
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode 1	

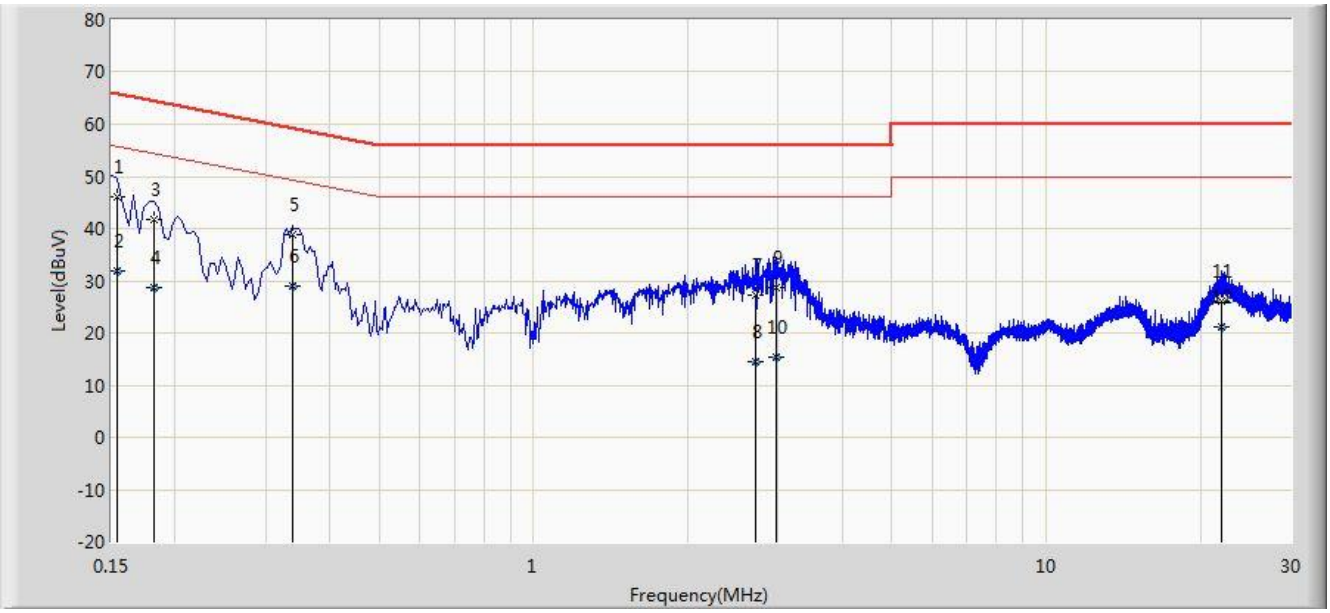


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.154	45.802	35.063	-19.979	65.781	10.740	QP
2			0.154	31.826	21.086	-23.955	55.781	10.740	AV
3			0.178	40.761	30.703	-23.817	64.578	10.058	QP
4			0.178	27.766	17.708	-26.813	54.578	10.058	AV
5			0.342	35.672	25.634	-23.483	59.155	10.038	QP
6			0.342	26.300	16.262	-22.854	49.155	10.038	AV
7			2.742	27.022	17.173	-28.978	56.000	9.849	QP
8			2.742	13.717	3.869	-32.283	46.000	9.849	AV
9			3.118	28.742	18.883	-27.258	56.000	9.858	QP
10			3.118	15.423	5.565	-30.577	46.000	9.858	AV
11			22.430	26.023	15.860	-33.977	60.000	10.163	QP
12			22.430	20.807	10.645	-29.193	50.000	10.163	AV

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

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

Site: SR2	Time: 2019/07/10 - 11:40
Limit: FCC_Part15.207_CE_AC Power	Engineer: Kevin Ker
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode 1	



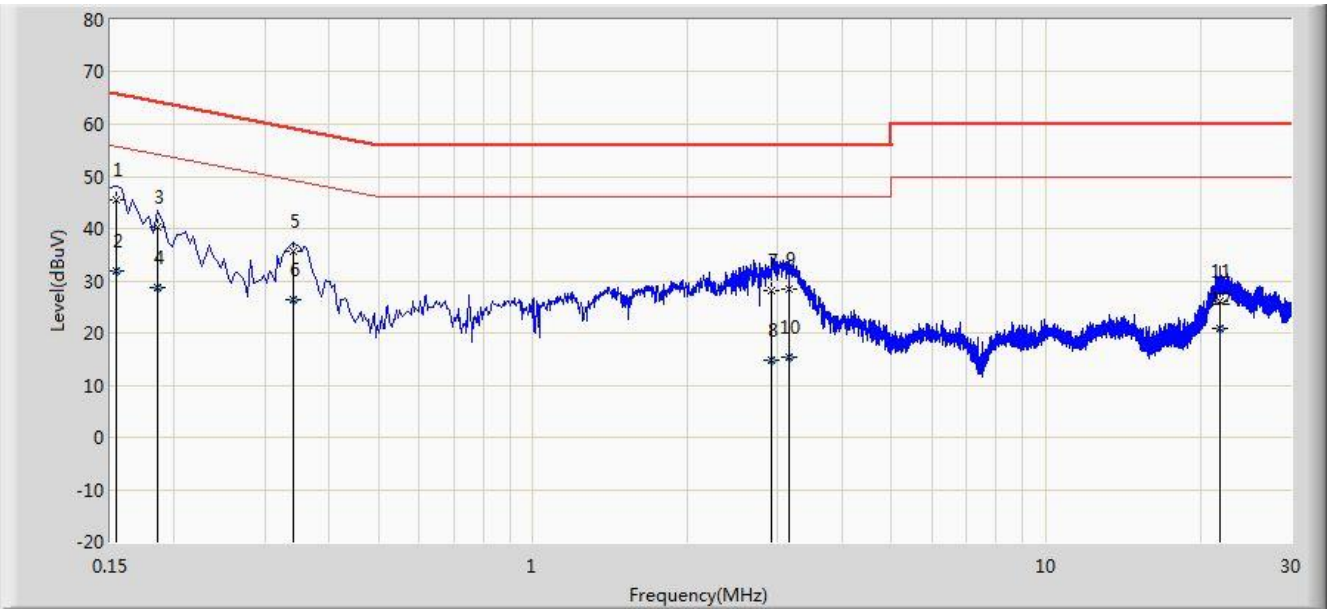
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.154	46.023	35.307	-19.758	65.781	10.716	QP
2			0.154	31.934	21.218	-23.847	55.781	10.716	AV
3			0.182	41.688	31.646	-22.706	64.394	10.042	QP
4			0.182	28.602	18.559	-25.792	54.394	10.042	AV
5			0.338	38.722	28.656	-20.530	59.252	10.066	QP
6			0.338	29.051	18.986	-20.201	49.252	10.066	AV
7			2.710	27.110	17.255	-28.890	56.000	9.855	QP
8			2.710	14.564	4.709	-31.436	46.000	9.855	AV
9			2.982	28.553	18.688	-27.447	56.000	9.866	QP
10			2.982	15.432	5.566	-30.568	46.000	9.866	AV
11			21.930	26.207	15.979	-33.793	60.000	10.228	QP
12			21.930	21.057	10.829	-28.943	50.000	10.228	AV

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

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

For APIN0505

Site: SR2	Time: 2019/07/10 - 11:45
Limit: FCC_Part15.207_CE_AC Power	Engineer: Kevin Ker
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode 1	

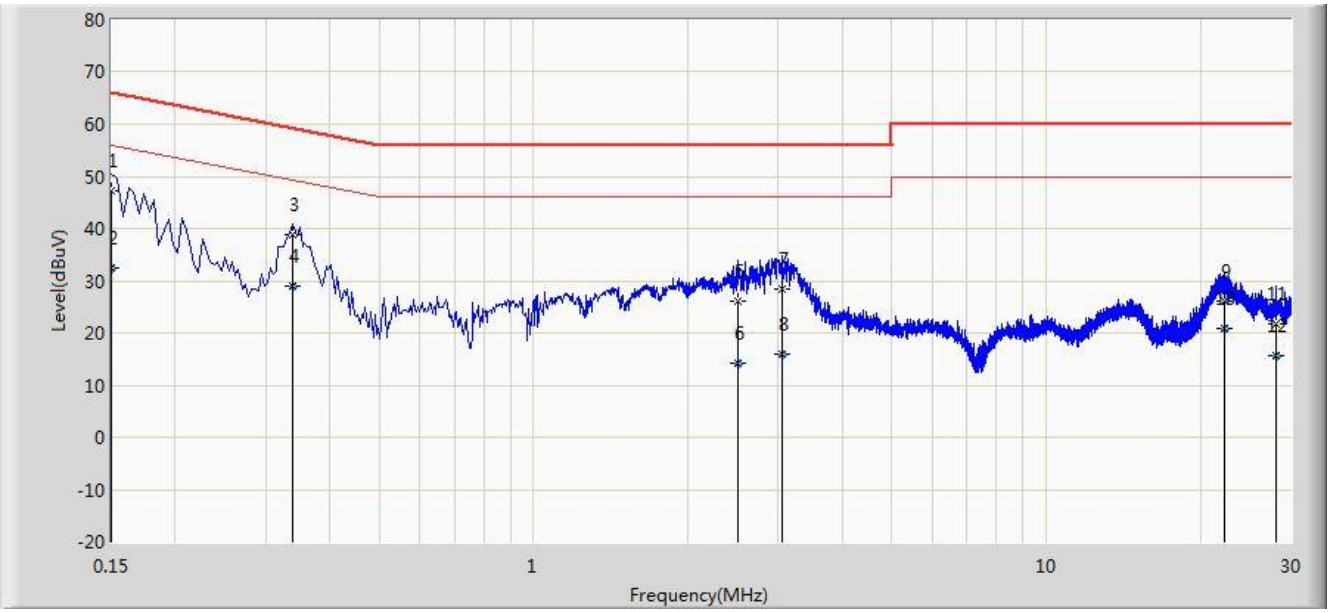


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.154	45.601	34.862	-20.180	65.781	10.740	QP
2			0.154	31.901	21.161	-23.881	55.781	10.740	AV
3			0.186	40.268	30.229	-23.946	64.213	10.039	QP
4			0.186	28.644	18.606	-25.569	54.213	10.039	AV
5			0.342	35.703	25.665	-23.452	59.155	10.038	QP
6			0.342	26.254	16.216	-22.901	49.155	10.038	AV
7			2.918	28.223	18.371	-27.777	56.000	9.852	QP
8			2.918	14.824	4.972	-31.176	46.000	9.852	AV
9			3.150	28.526	18.670	-27.474	56.000	9.857	QP
10			3.150	15.218	5.362	-30.782	46.000	9.857	AV
11			21.886	26.092	15.916	-33.908	60.000	10.176	QP
12			21.886	20.912	10.735	-29.088	50.000	10.176	AV

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

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

Site: SR2	Time: 2019/07/10 - 11:49
Limit: FCC_Part15.207_CE_AC Power	Engineer: Kevin Ker
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.150	47.316	36.174	-18.684	66.000	11.142	QP
2			0.150	32.574	21.432	-23.426	56.000	11.142	AV
3			0.338	38.718	28.653	-20.534	59.252	10.066	QP
4			0.338	29.010	18.945	-20.242	49.252	10.066	AV
5			2.498	25.996	16.135	-30.004	56.000	9.861	QP
6			2.498	14.161	4.300	-31.839	46.000	9.861	AV
7			3.046	28.547	18.680	-27.453	56.000	9.867	QP
8			3.046	15.922	6.055	-30.078	46.000	9.867	AV
9			22.294	26.093	15.878	-33.907	60.000	10.215	QP
10			22.294	20.993	10.778	-29.007	50.000	10.215	AV
11			28.078	21.638	11.237	-38.362	60.000	10.401	QP
12			28.078	15.745	5.344	-34.255	50.000	10.401	AV

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

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

8. CONCLUSION

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

The End

Appendix A - Test Setup Photograph

Refer to “1906TW0102-UT” file.

Appendix B - EUT Photograph

Refer to “1906TW0102-UE” file.