MEASUREMENT REPORT

FCC PART 15 Subpart C ZigBee

FCC ID:	Q9DAPINP303
APPLICANT:	Hewlett Packard Enterprise Company
Application Type:	Certification
Product:	ACCESS POINT
Model No.:	APINP303
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 D01v05
Test Date:	September 04, 2018 ~ October 19, 2018

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

Revision History

Report No.	Version	Description	Issue Date	Note
1810TW0101-U2	Rev. 01	Initial Report	10-19-2018	Valid

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§2.1033 General Information

Applicant:	Hewlett Packard Enterprise Company
Applicant Address:	6280 America Center Drive, San Jose, CA 95002
Manufacturer:	Hewlett Packard Enterprise Company
Manufacturer Address:	6280 America Center Drive, San Jose, CA 95002
Test Site:	MRT Technology (Taiwan) Co., Ltd
Test Site Address:	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)
MRT FCC Registration No.:	153292
Test Device Serial No.:	Conducted Sample S/N: CNGHKGX006 Radiated Sample S/N: CNGHKGX006

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. 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.**

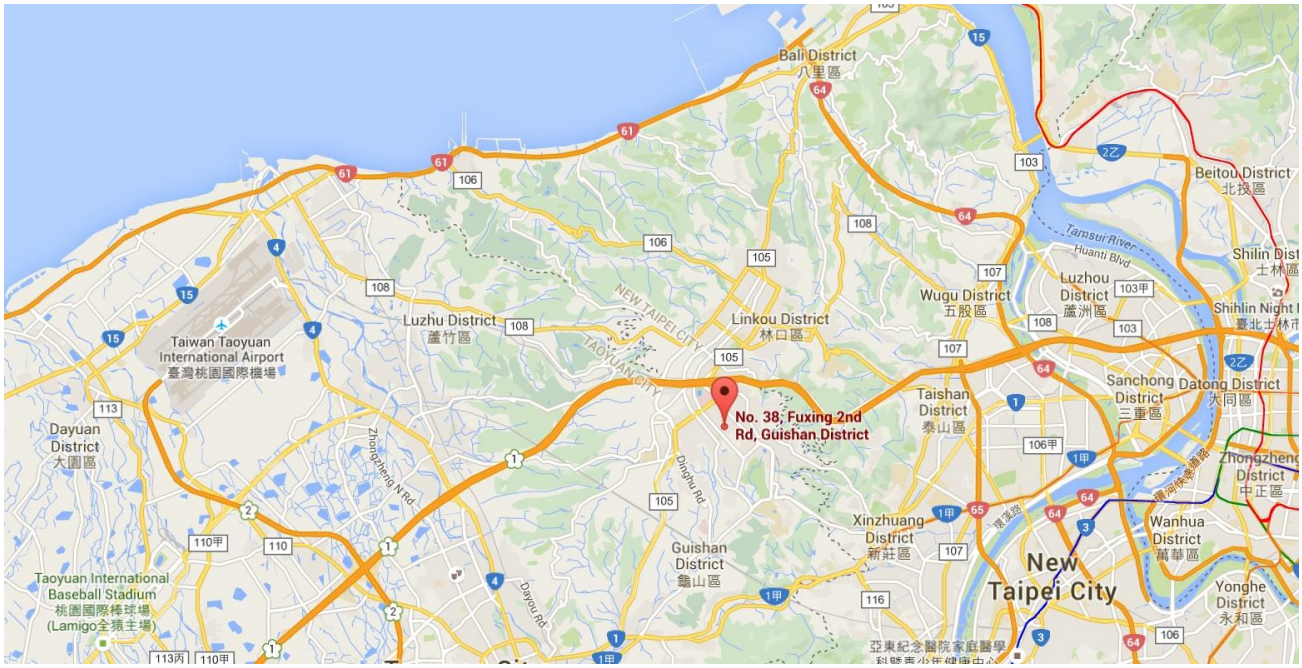
1. INTRODUCTION

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 Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the 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. Equipment Description

Product Name	ACCESS POINT
Model No.	APINP303
Brand Name:	aruba a Hewlett Packard Enterprise company , Hewlett Packard Enterprise
Wi-Fi Specification:	802.11a/b/g/n/ac
Bluetooth Specification:	v4.2 single mode
ZigBee Specification:	802.15.4
Software Version:	v1.0
Operating Temperature:	0 ~ 40 °C
Power Type:	POE input or AC adapter input
Operating Environment:	Indoor Use
Components	
Adapter	Part No.: SDI40-48-U-P7R-C2 Model No.: ATS048T-A480 Input Power: 100 - 240V ~ 50/60Hz, 1.2A Output Power: 48VDC/1A

Note: The applicant provide one POE adapter (Manufacturer: MICROSEMI) for approval testing, it is not for sale.

2.2. Product Specification Subjective to this Report

Frequency Range:	2405 ~ 2480 MHz
Channel Number:	16
Type of Modulation:	O-QPSK

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
11	2405 MHz	12	2410 MHz	13	2415 MHz
14	2420 MHz	15	2425 MHz	16	2430 MHz
17	2435 MHz	18	2440 MHz	19	2445 MHz
20	2450 MHz	21	2455 MHz	22	2460 MHz
23	2465 MHz	24	2470 MHz	25	2475 MHz
26	2480 MHz	--	--	--	--

2.4. Description of Available Antennas

Antenna Type	Frequency Band (GHz)	TX Paths	Max Peak Gain (dBi)	Beam-Forming Directional Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For PSD
Wi-Fi Internal Antenna						
PCB	2.4	2	2.1	3.01	2.1	5.11
	5	2	5.9	3.01	5.9	8.91
Bluetooth/ZigBee Internal Antenna						
PCB	2.4	1	4.5	--		

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 $N_{ANT} \leq 4$;

Note 2: The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac, not include 802.11a/b/g.

2.5. Test Software

The test utility software used during testing was “Telnet”.

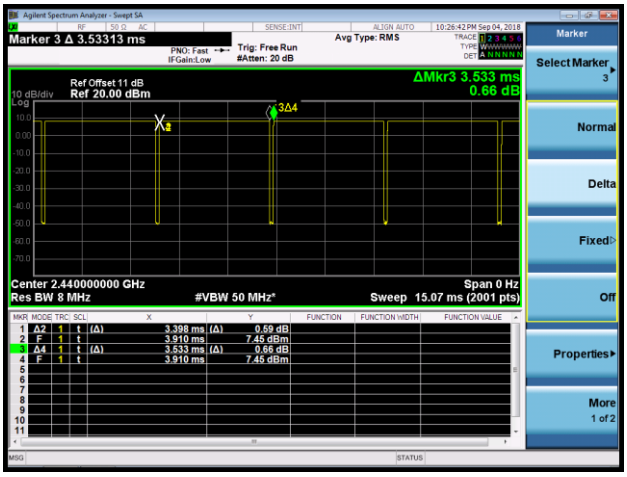
Test Mode	Test Frequency (MHz)	Power Parameter Value
ZigBee	2405	8.0
	2440	8.0
	2475	8.0
	2480	2.0

2.6. Device Capabilities

This device contains the following capabilities:

802.11a/b/g/n/ac Wi-Fi & BT v4.2 single mode & ZigBee

Note: The maximum achievable duty cycle was determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz per the guidance of Section11.6 of ANSI C63.10. 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:

Duty Cycle (T_{on}=3.398ms, Duty Cycle=96.18%)	--
	--

2.7. Test Configuration

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

2.8. EMI Suppression Device(s)/Modifications

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

2.9. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

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

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 D01v05 were used in the measurement.

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

3.2. AC Line Conducted Emissions

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

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

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

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

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.
For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.
Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, which produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

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

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

Conclusion:

The unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2019/3/20
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2019/3/20
8-Wire ISN (T8)	R&S	ENY81	MRTTWA00018	1 year	2019/4/24
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2019/5/14
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2019/6/07

Radiated Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Acitve Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2019/4/24
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2019/5/22
Broadband Hornantenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2019/4/24
Breitband Hornantenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2019/4/23
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2019/4/23
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2019/4/23
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2019/3/19
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2019/7/30
Antenna Cable	HUBERSUHNER	SF106	MRTTWE00010	1 year	2019/5/18
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00032	1 year	2019/5/21

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2019/7/30
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00014	1 year	2019/4/24
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00032	1 year	2019/5/21

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 - SR2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB
Spurious Emissions, Conducted - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.78dB
Output Power - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.13dB
Power Spectrum Density - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.15dB
Occupied Bandwidth - TR3
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.28%

7. TEST RESULT

7.1. Summary

Product Name: **ACCESS POINT**

FCC ID: **Q9DAPINP303**

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		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

Note:

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 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.

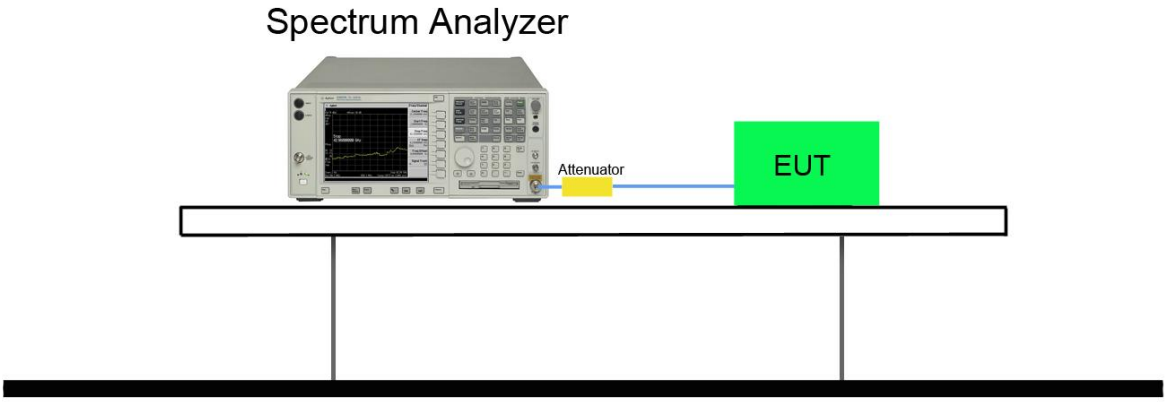
7.2.2.Test Procedure used

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



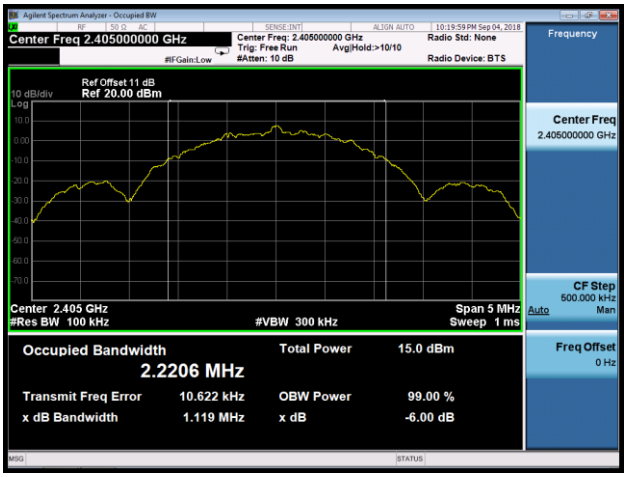
7.2.5.Test Result

Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	60%
Test Site	TR3	Test Date	2018/09/04 ~ 2018/10/19

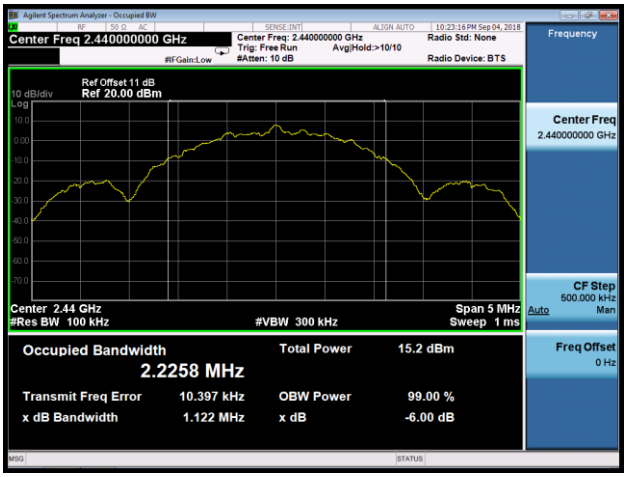
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
802.15.4	O-QPSK	11	2405	1.12	≥ 0.5	Pass
802.15.4	O-QPSK	18	2440	1.12	≥ 0.5	Pass
802.15.4	O-QPSK	26	2480	1.13	≥ 0.5	Pass

802.15.4 6dB Bandwidth

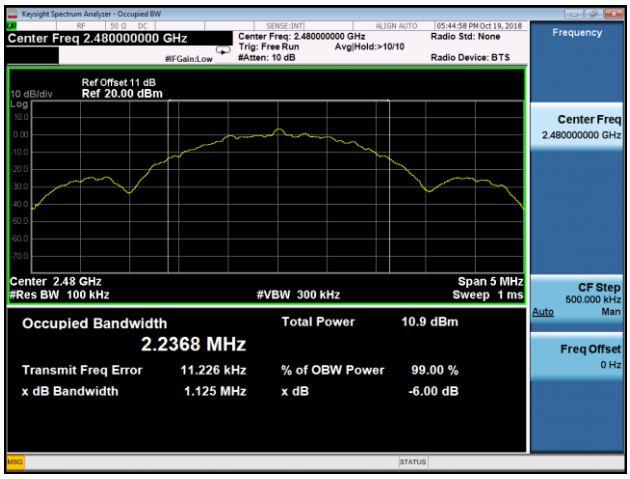
Channel 11 (2405MHz)



Channel 18 (2440MHz)



Channel 26 (2480MHz)



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7.3. Output Power Measurement

7.3.1.Test Limit

The maximum conducted output power shall be exceed 1 Watt (30dBm).

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

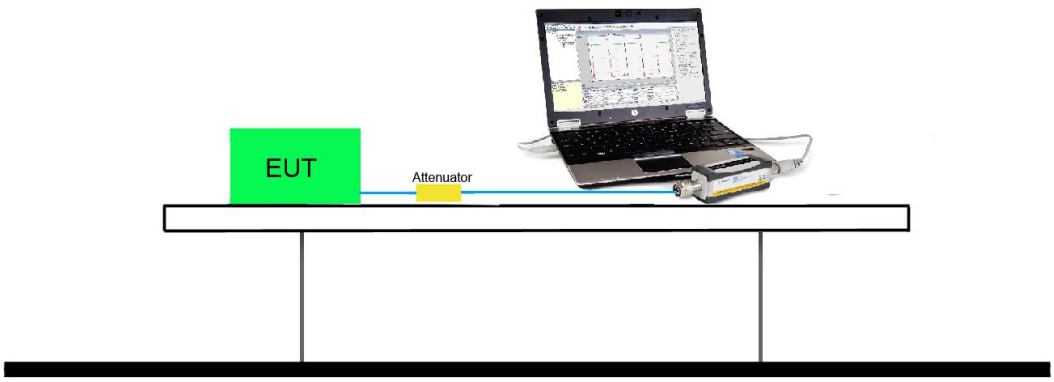
Peak Power Measurement

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

Measurement using a gated RF average-reading power meter

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

7.3.4.Test Setup



7.3.5.Test Result of Output Power

Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	60%
Test Site	TR3	Test Date	2018/09/04 ~ 2018/10/19

Test Result of Peak Output Power

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result
802.15.4	O-QPSK	11	2405	7.32	≤ 30.0	Pass
802.15.4	O-QPSK	18	2440	7.44	≤ 30.0	Pass
802.15.4	O-QPSK	26	2480	2.62	≤ 30.0	Pass

Note: E.I.R.P (dBm) = Peak Power (dBm) + Antenna Gain (dBi) = 7.44 dBm + 4.5 dBi = 11.94 dBm.

Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	Result
802.15.4	O-QPSK	11	2405	7.11	≤ 30.0	Pass
802.15.4	O-QPSK	18	2440	7.24	≤ 30.0	Pass
802.15.4	O-QPSK	26	2480	2.54	≤ 30.0	Pass

Note: E.I.R.P (dBm) = Average Power (dBm) + Antenna Gain (dBi) = 7.24 dBm + 4.5 dBi = 11.74 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.

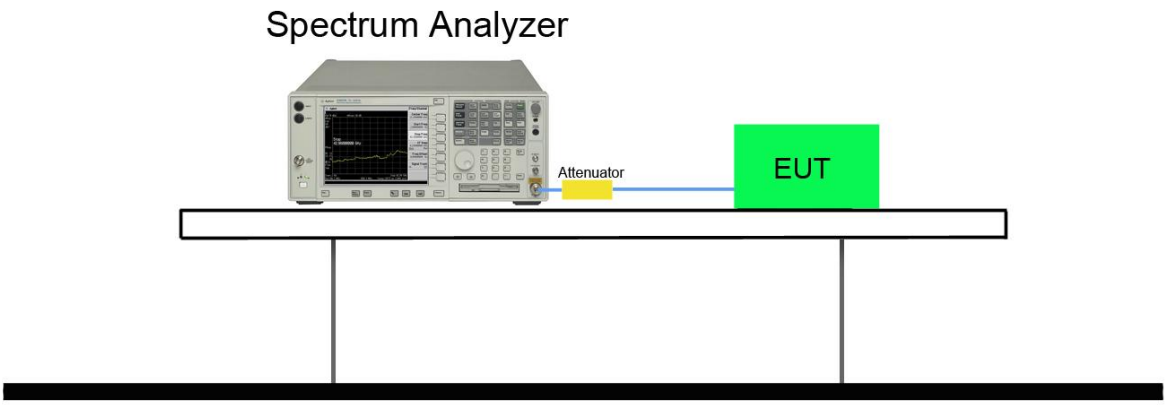
7.4.2.Test Procedure Used

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



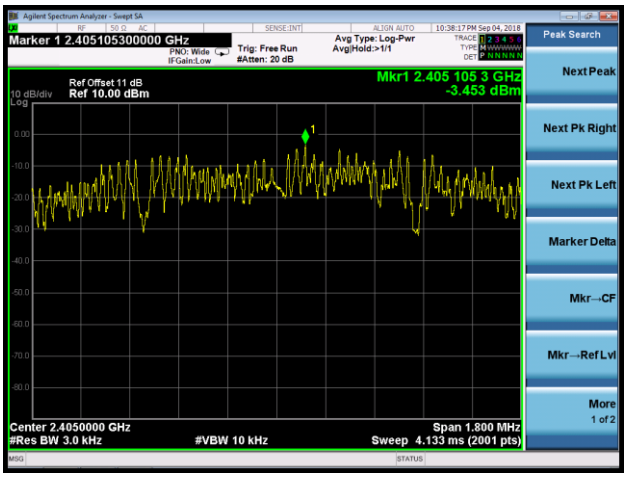
7.4.5.Test Result

Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	60%
Test Site	TR3	Test Date	2018/09/04 ~ 2018/10/19

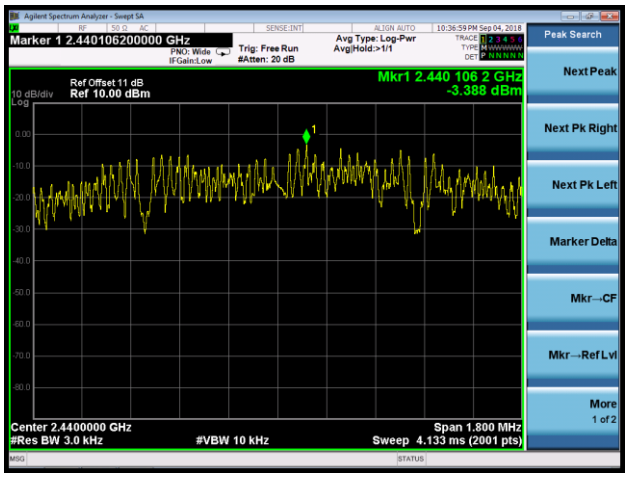
Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	PK PSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
802.15.4	O-QPSK	11	2405	-3.45	≤ 8.00	Pass
802.15.4	O-QPSK	18	2440	-3.39	≤ 8.00	Pass
802.15.4	O-QPSK	26	2480	-8.04	≤ 8.00	Pass

802.15.4 Power Density

Channel 11 (2405MHz)



Channel 18 (2440MHz)



Channel 26 (2480MHz)

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

7.5.1.Test Limit

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

7.5.2.Test Procedure Used

ANSI C63.10 Section 11.11

7.5.3.Test Settitng

Reference level measurement

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

Emission level measurement

1. Start frequency was set to 30MHz and stop frequency was set to 25GHz (separated into two plots per channel)
2. RBW = 1.3MHz
3. VBW = 4MHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple

7. The trace was allowed to stabilize

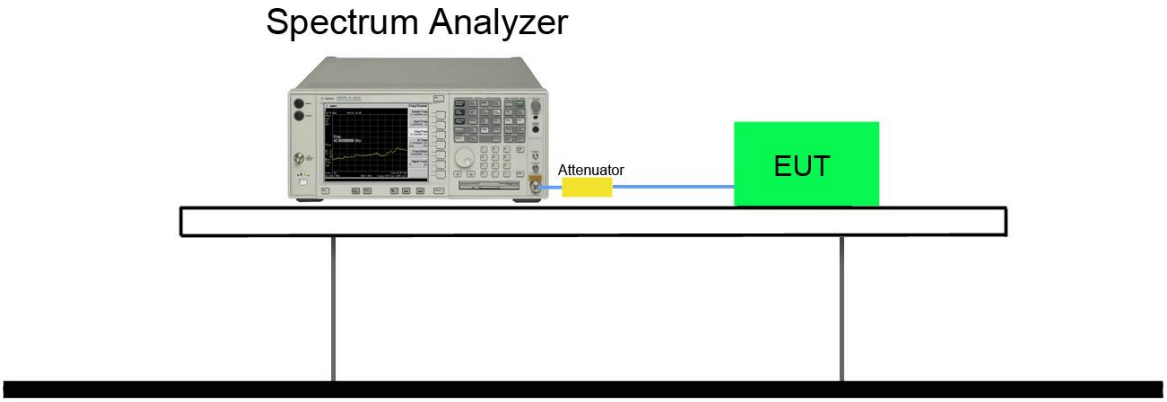
Test Notes

1. RBW was set to 1.3MHz rather than 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 1MHz RBW, the display line may not necessarily appear to be 20dB below the level of the fundamental in a 1MHz 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	24°C
Test Engineer	Kevin Ker	Relative Humidity	60%
Test Site	TR3	Test Date	2018/09/04 ~ 2018/10/19

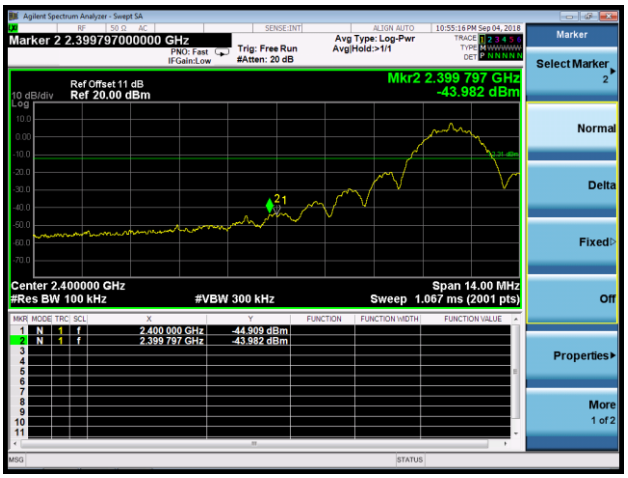
Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	Limit	Result
802.15.4	O-QPSK	11	2405	20dBc	Pass
802.15.4	O-QPSK	18	2440	20dBc	Pass
802.15.4	O-QPSK	26	2480	20dBc	Pass

802.15.4 Out-of-Band Emissions

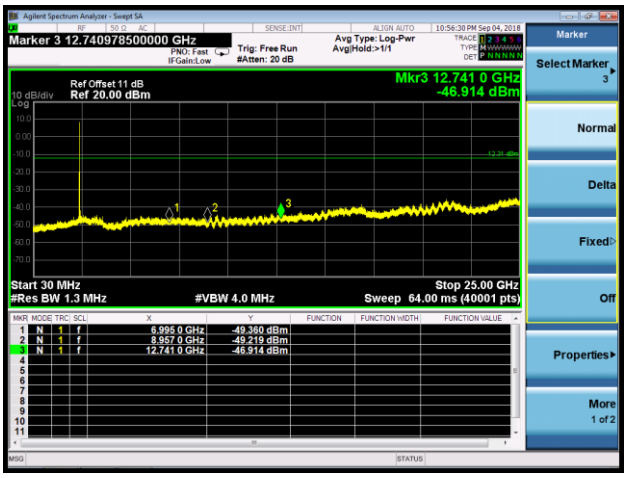
Channel 11 (2405MHz)

100kHz PSD Reference Level

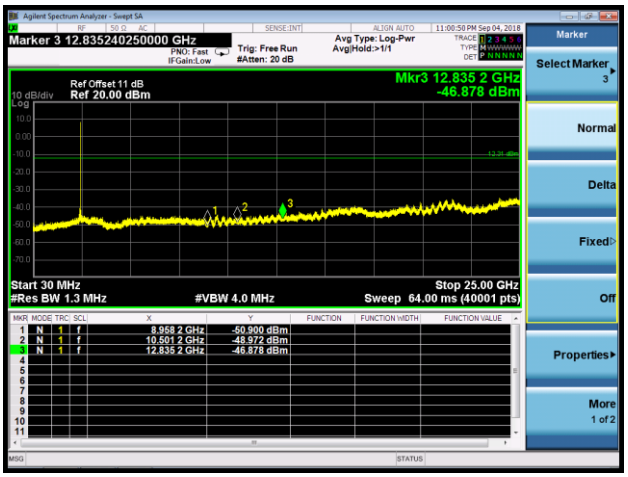
Low Band Edge

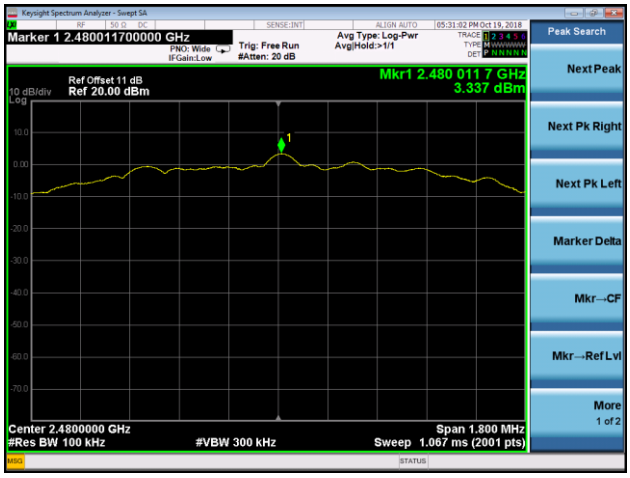
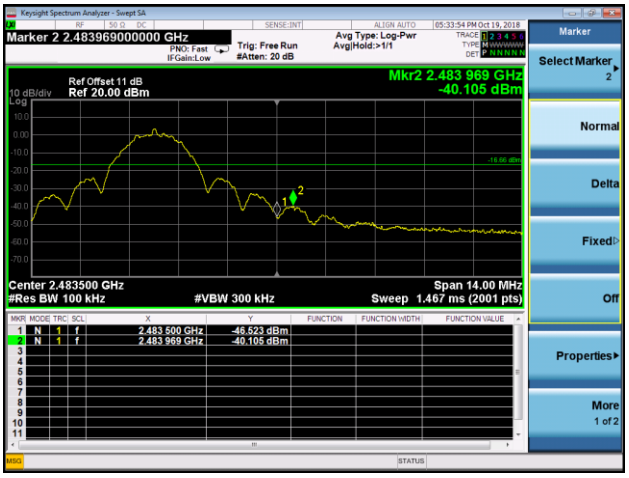
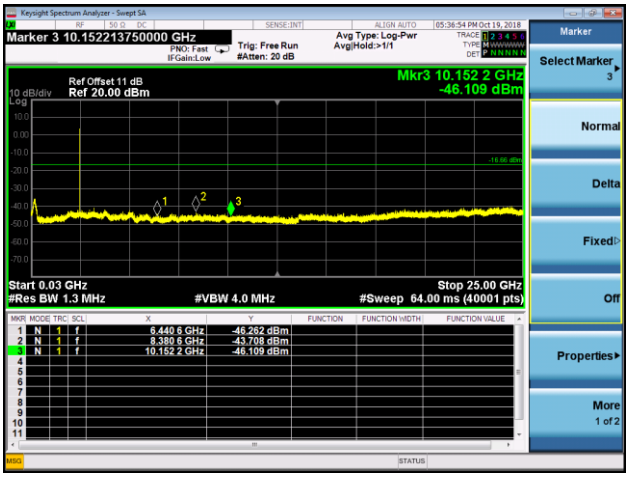


Spurious Emission



Note: The Value of the Display Line is -12.31dBm

Channel 18 (2440MHz)	
100kHz PSD Reference Level	**Spurious Emission**
	
Note: The Value of the Display Line is -12.31dBm	

Channel 26 (2480MHz)	
100kHz PSD Reference Level	**High Band Edge**
	
Spurious Emission	
	Note: The Value of the Display Line is -16.66dBm

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 or average
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

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

Average Measurements above 1GHz (Method VB)

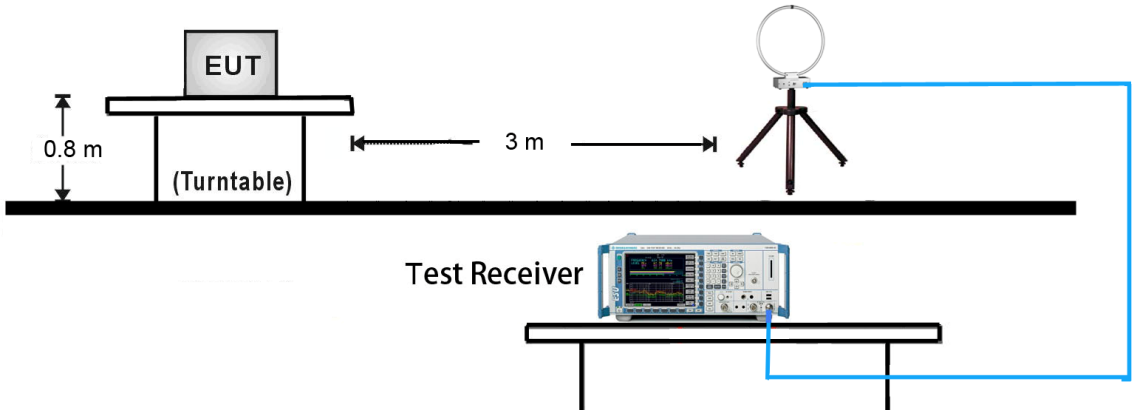
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle ≥ 98%, set VBW = 10 Hz.

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

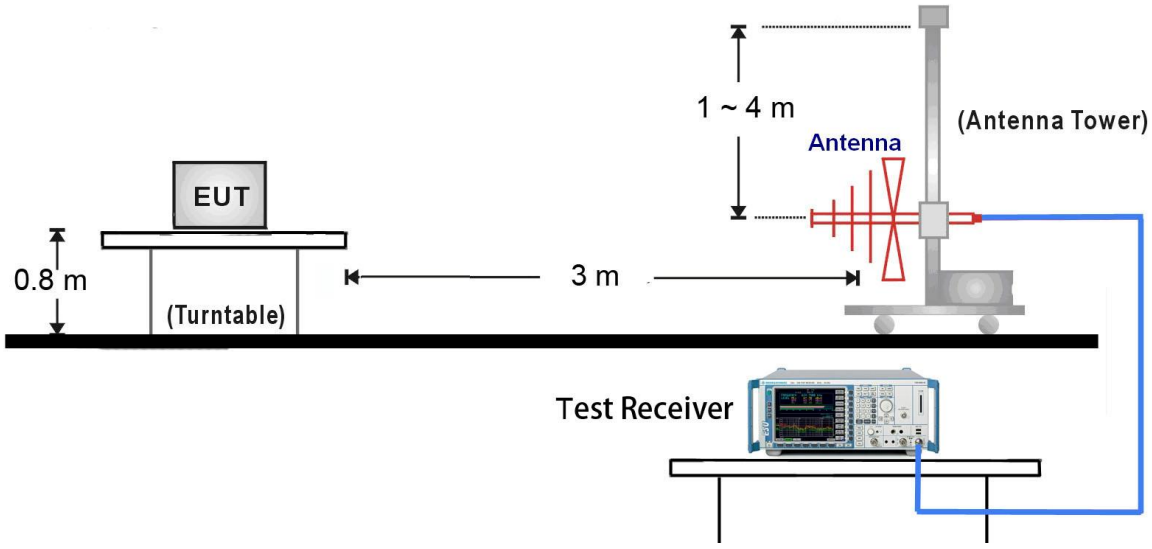
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

7.6.4.Test Setup

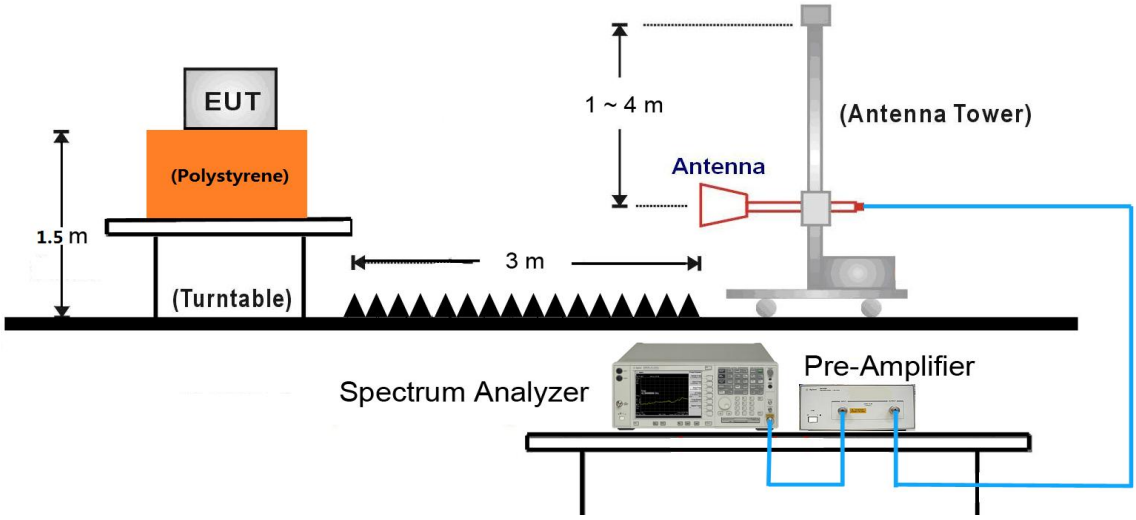
9kHz ~ 30MHz Test Setup:



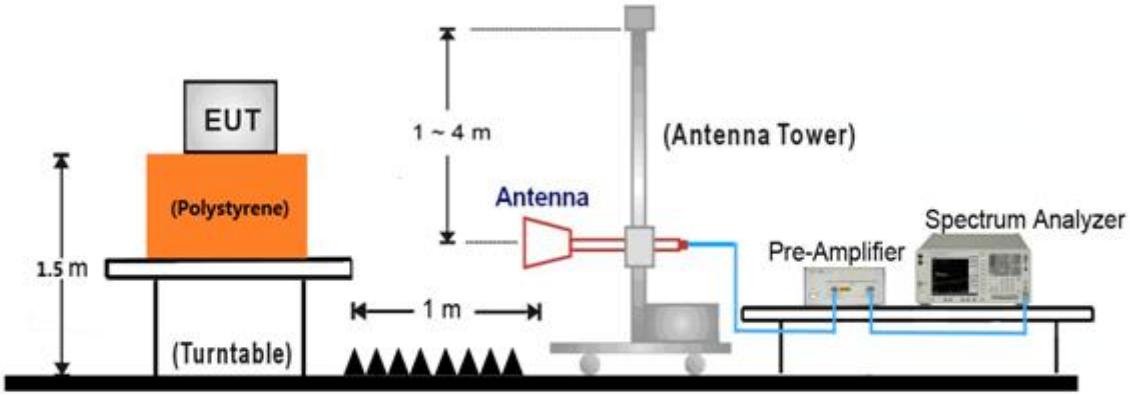
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:



18GHz ~25GHz Test Setup:



7.6.5.Test Result

Product	ACCESS POINT	Temperature	25°C
Test Engineer	Kevin Ker	Relative Humidity	58%
Test Site	AC1	Test Date	2018/09/13
Test Mode:	802.15.4	Test Channel:	11
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	8735.0	31.2	13.9	45.1	81.7	-36.6	Peak	Horizontal
*	9865.5	31.3	16.0	47.3	81.7	-34.4	Peak	Horizontal
	11123.5	31.2	18.6	49.9	74.0	-24.1	Peak	Horizontal
	15790.0	33.2	20.4	53.6	74.0	-20.4	Peak	Horizontal
*	8769.0	32.6	13.9	46.5	81.7	-35.2	Peak	Vertical
*	9882.5	34.0	15.6	49.7	81.7	-32.0	Peak	Vertical
	10979.0	31.8	18.5	50.2	74.0	-23.8	Peak	Vertical
	15858.0	33.1	20.4	53.5	74.0	-20.5	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (101.69dBμV/m) or FCC 15.209 which is higher.

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

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

Product	ACCESS POINT	Temperature	25°C
Test Engineer	Kevin Ker	Relative Humidity	58%
Test Site	AC1	Test Date	2018/09/13
Test Mode:	802.15.4	Test Channel:	18
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
*	8777.5	31.4	14.9	46.3	82.8	-36.5	Peak	Horizontal
*	9908.0	31.6	17.4	48.9	82.8	-33.9	Peak	Horizontal
	11098.0	29.4	20.0	49.4	74.0	-24.6	Peak	Horizontal
	11948.0	28.8	20.2	49.1	74.0	-24.9	Peak	Horizontal
*	8820.0	31.7	14.9	46.6	82.8	-36.2	Peak	Vertical
*	9695.5	31.3	16.3	47.5	82.8	-35.3	Peak	Vertical
	10911.0	29.9	20.0	49.9	74.0	-24.1	Peak	Vertical
	11727.0	28.6	20.6	49.2	74.0	-24.8	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (102.78dBμV/m) or FCC 15.209 which is higher.

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

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

Product	ACCESS POINT	Temperature	25°C
Test Engineer	Kevin Ker	Relative Humidity	58%
Test Site	AC1	Test Date	2018/10/19
Test Mode:	802.15.4	Test Channel:	26
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
	3992.0	38.3	3.2	41.6	74.0	-32.4	Peak	Horizontal
	4825.0	37.8	5.9	43.7	74.0	-30.3	Peak	Horizontal
*	5751.5	37.2	7.4	44.6	75.4	-23.6	Peak	Horizontal
*	6448.5	37.0	9.7	46.7	75.4	-21.5	Peak	Horizontal
	4128.0	37.8	3.8	41.6	74.0	-32.4	Peak	Vertical
	4961.0	38.1	6.1	44.1	74.0	-29.9	Peak	Vertical
*	6015.0	36.4	7.9	44.2	75.4	-24.0	Peak	Vertical
*	6882.0	36.7	10.6	47.3	75.4	-20.9	Peak	Vertical

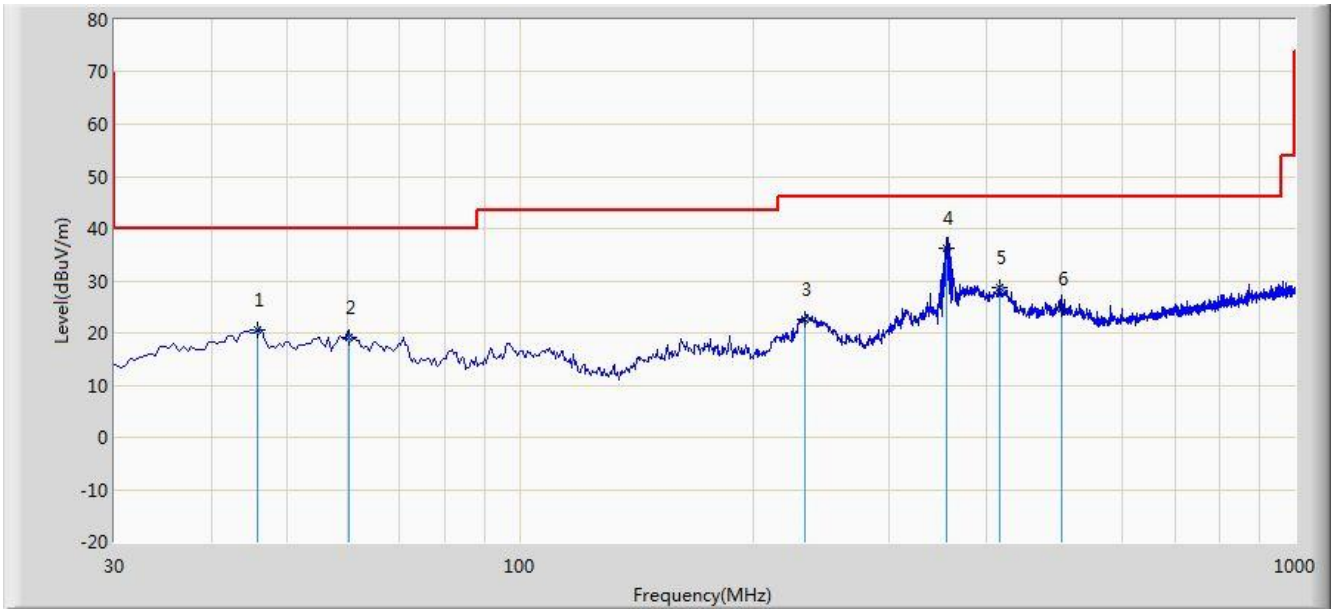
Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (95.37dBμV/m) or FCC 15.209 which is higher.

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

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

The Worst Case of Radiated Emission below 1GHz:

Site: AC1	Time: 2018/09/21 - 14:47
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Worst Case Mode: Transmit by 802.15.4 at Channel 2405MHz	



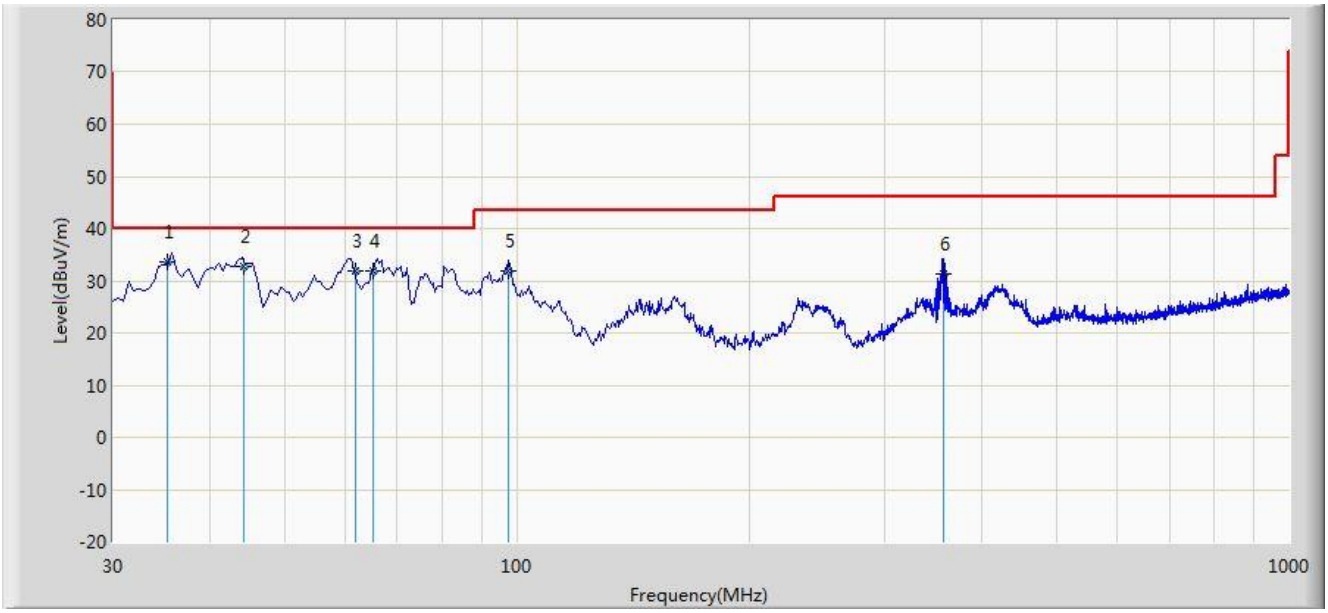
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			45.960	20.471	5.362	-19.529	40.000	15.109	QP
2			60.145	19.038	5.054	-20.962	40.000	13.983	QP
3			233.085	22.519	9.082	-23.481	46.000	13.438	QP
4		*	355.145	36.376	20.140	-9.624	46.000	16.236	QP
5			416.152	28.772	11.478	-17.228	46.000	17.293	QP
6			500.430	24.716	6.040	-21.284	46.000	18.675	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: 2018/09/21 - 14:49
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Worst Case Mode: Transmit by 802.15.4 at Channel 2405MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	35.280	33.678	20.588	-6.322	40.000	13.090	QP
2			44.256	32.758	17.970	-7.242	40.000	14.787	QP
3			61.744	31.806	18.081	-8.194	40.000	13.725	QP
4			65.040	31.751	19.088	-8.249	40.000	12.663	QP
5			97.480	31.893	19.070	-11.607	43.500	12.823	QP
6			356.540	31.433	15.175	-14.567	46.000	16.258	QP

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

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

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

7.7. Radiated Restricted Band Edge Measurement

7.7.1.Test Limit

For 15.205 requirement:

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

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

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

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

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

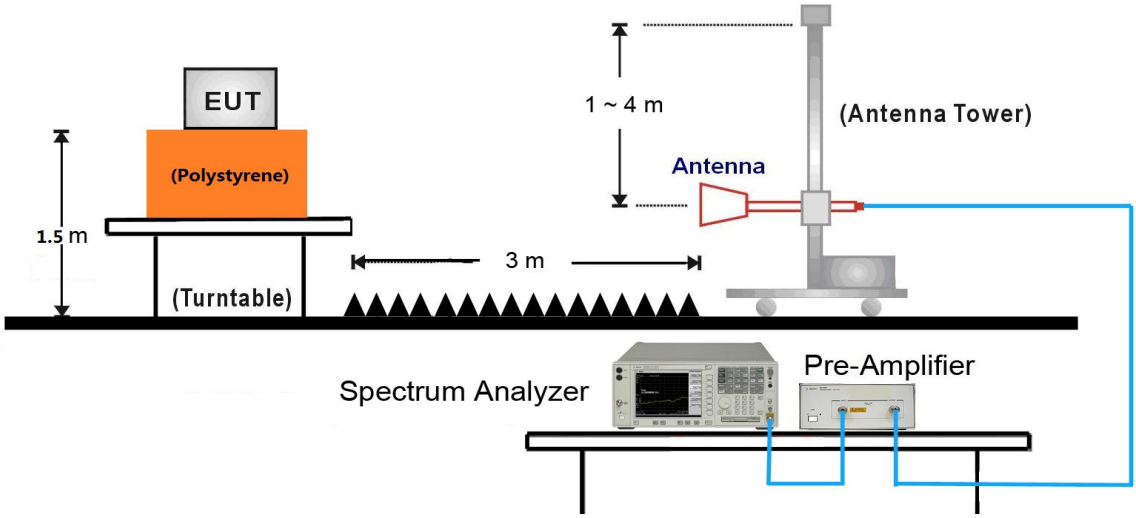
Peak Field Strength Measurements

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

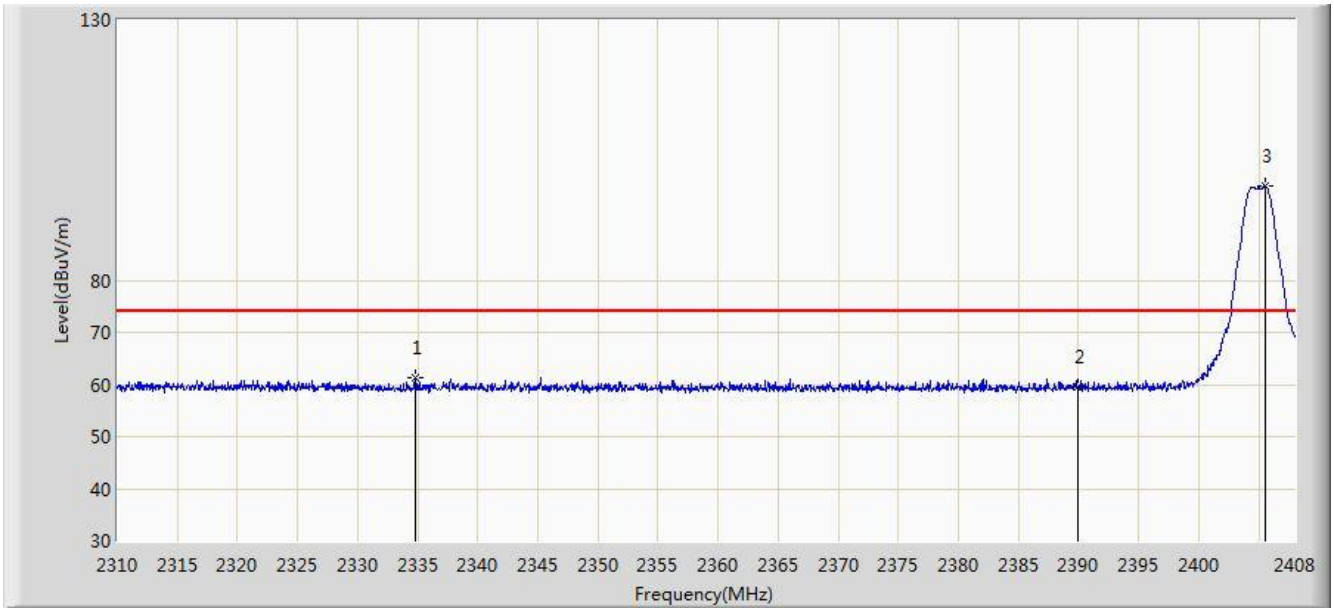
7.7.4.Test Setup



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

7.7.5.Test Result

Site: AC1	Time: 2018/09/13 - 06:56
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2405MHz	

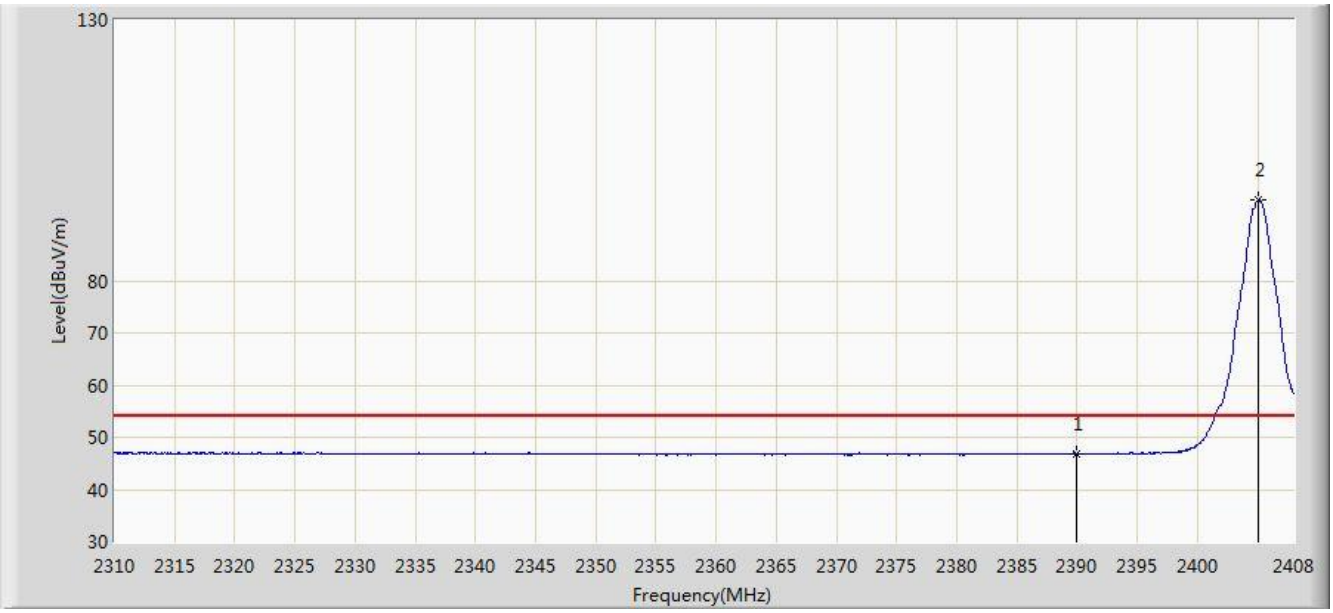


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2334.794	61.277	28.569	-12.723	74.000	32.707	PK
2			2390.000	59.655	27.080	-14.345	74.000	32.575	PK
3		*	2405.501	98.043	65.488	24.043	74.000	32.555	PK

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

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

Site: AC1	Time: 2018/09/13 - 06:57
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2405MHz	

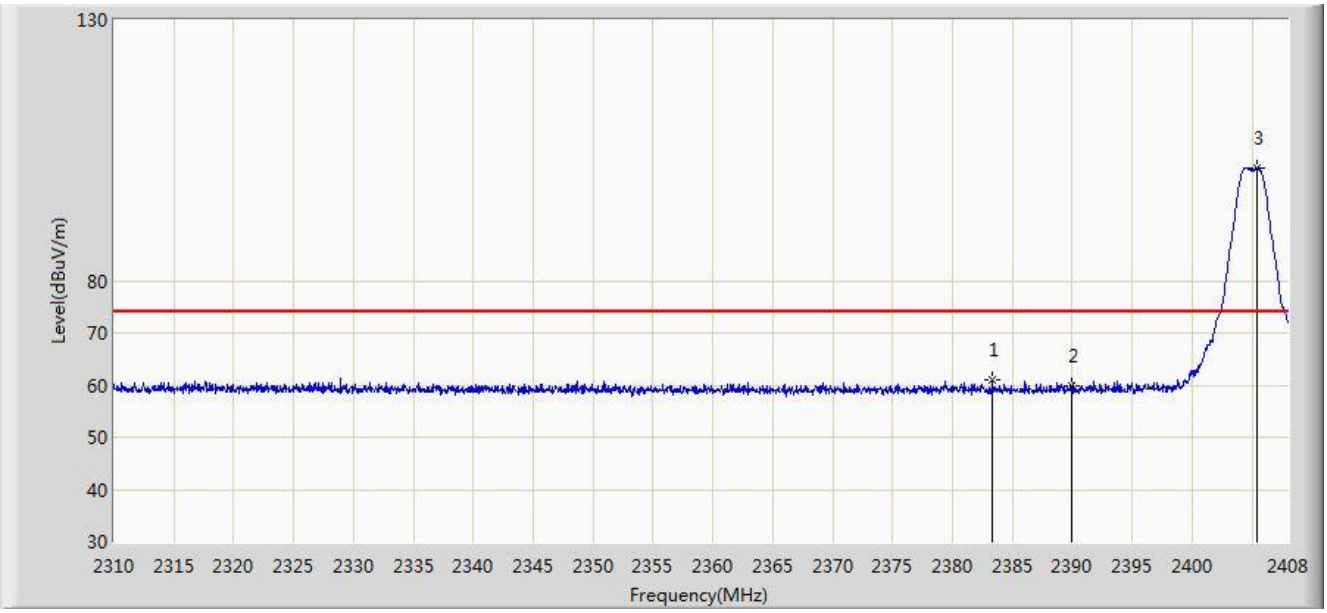


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.871	14.296	-7.129	54.000	32.575	AV
2		*	2405.011	95.396	62.840	41.396	54.000	32.556	AV

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

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

Site: AC1	Time: 2018/09/13 - 06:58
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2405MHz	

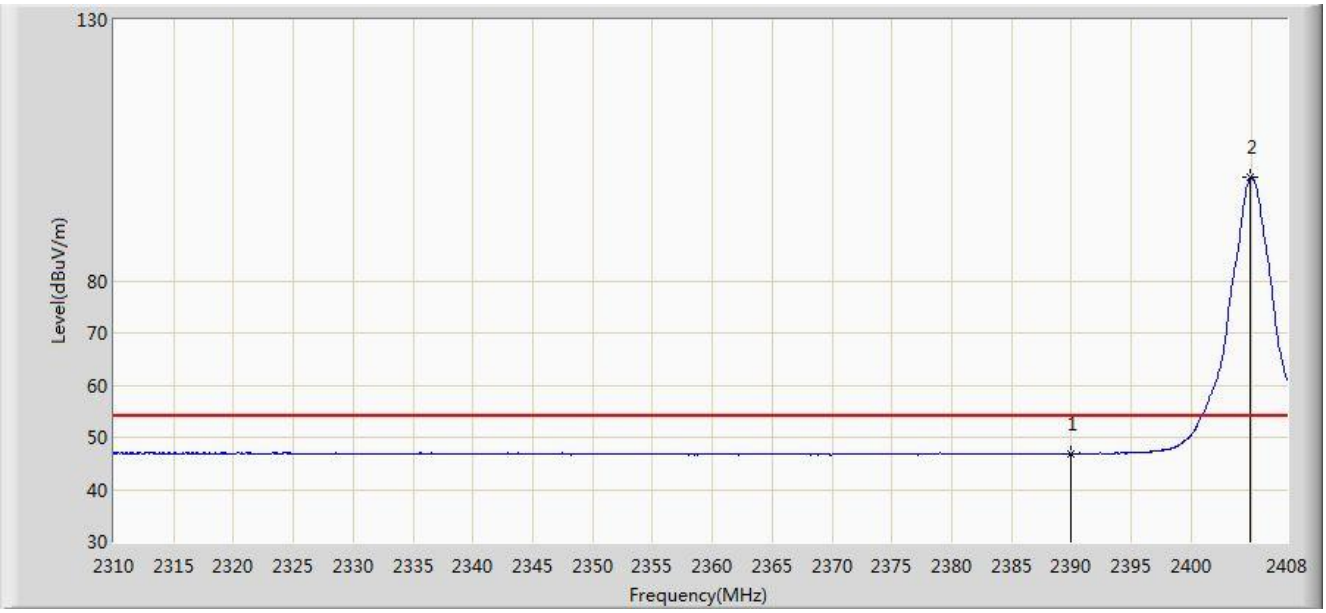


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2383.304	61.092	28.506	-12.908	74.000	32.586	PK
2			2390.000	59.863	27.288	-14.137	74.000	32.575	PK
3		*	2405.452	101.693	69.138	27.693	74.000	32.555	PK

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

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

Site: AC1	Time: 2018/09/13 - 06:59
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2405MHz	

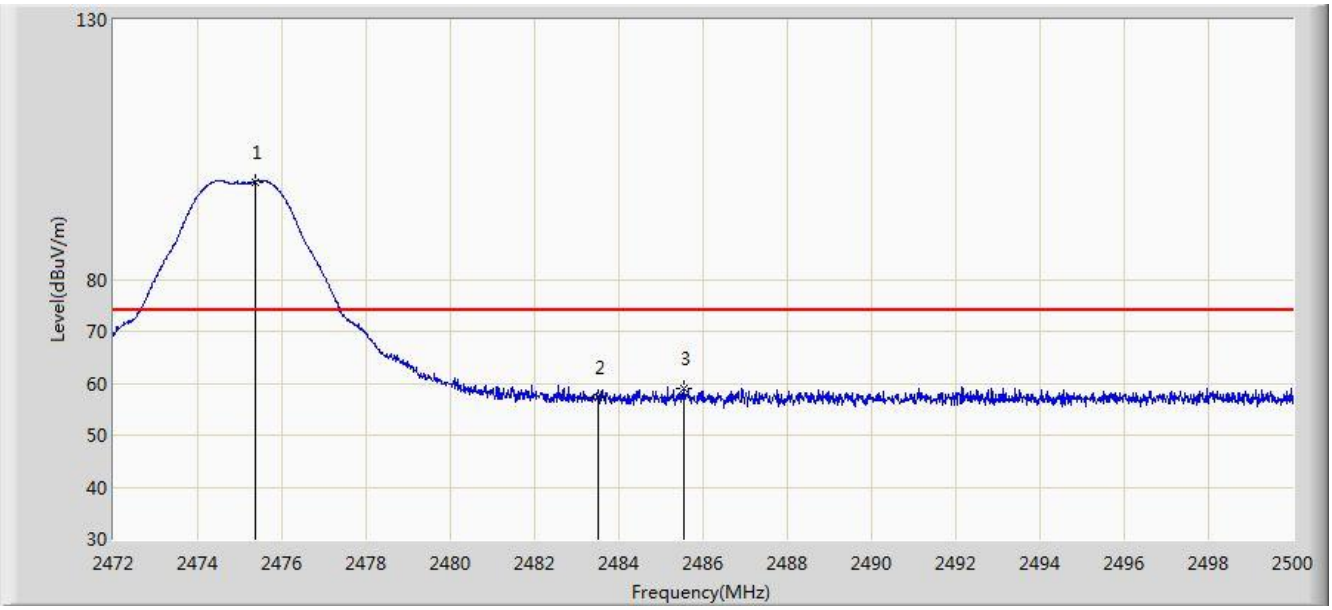


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.790	14.215	-7.210	54.000	32.575	AV
2		*	2404.962	99.764	67.208	45.764	54.000	32.555	AV

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

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

Site: AC1	Time: 2018/09/13 - 09:13
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2475MHz	

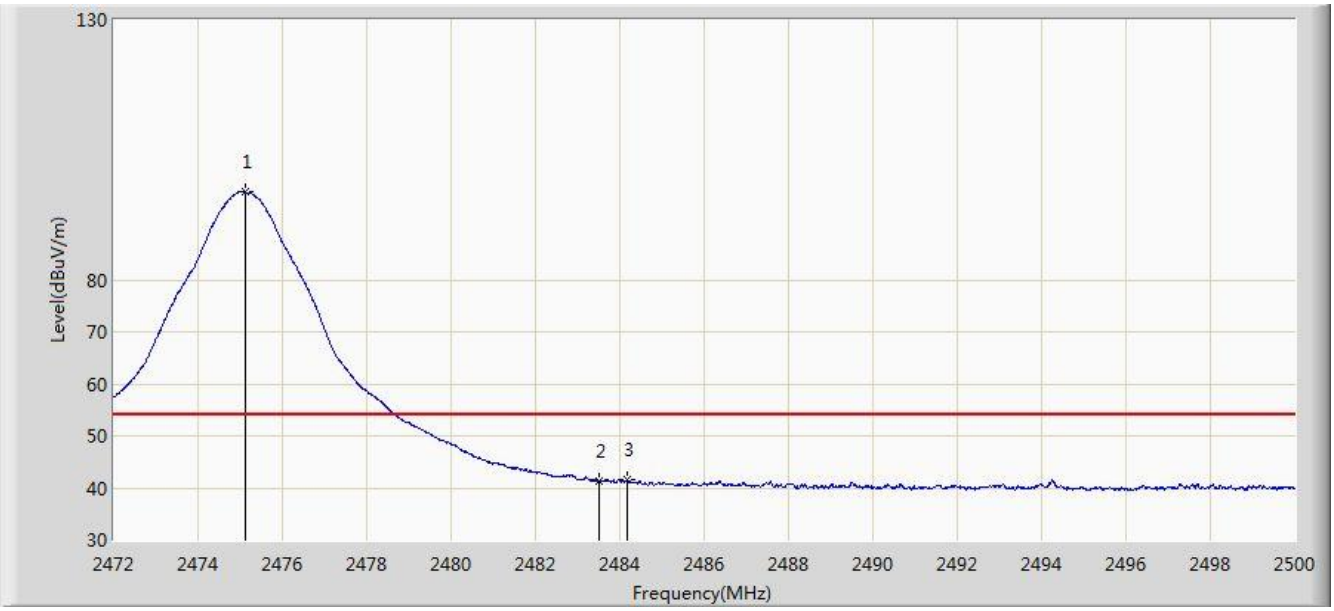


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2475.360	98.793	66.237	24.793	74.000	32.556	PK
2			2483.500	57.145	24.564	-16.855	74.000	32.580	PK
3			2485.552	59.127	26.540	-14.873	74.000	32.587	PK

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

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

Site: AC1	Time: 2018/09/13 - 09:20
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2475MHz	

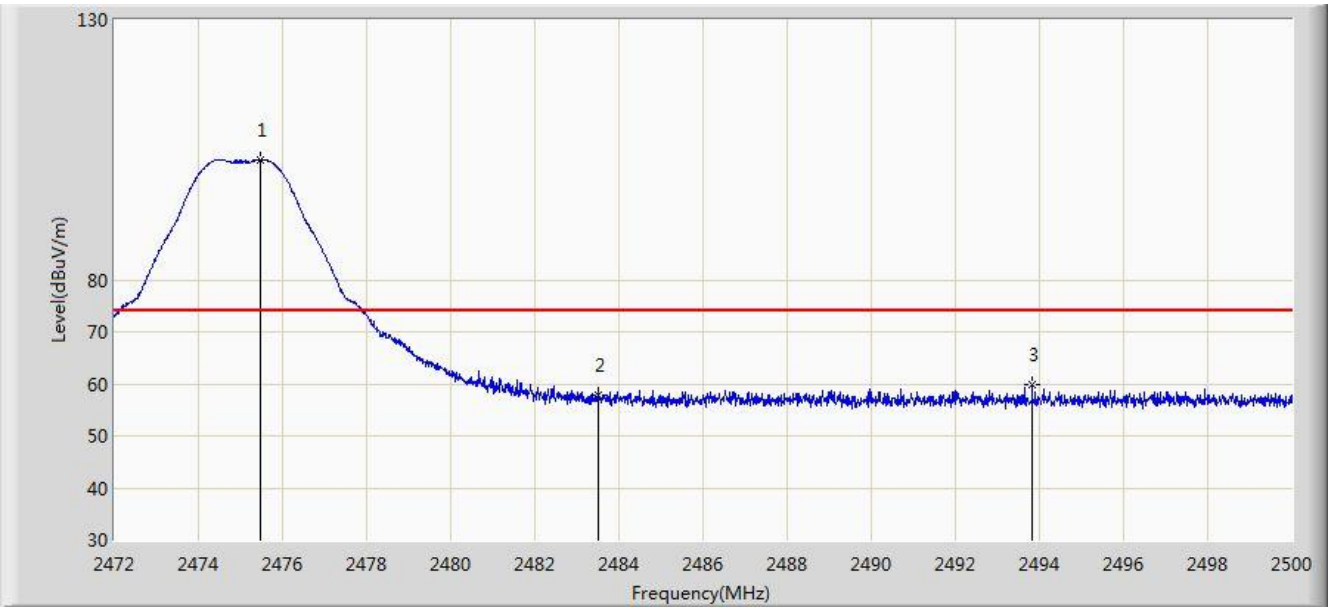


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2475.122	96.948	64.393	42.948	54.000	32.555	AV
2			2483.500	41.290	8.709	-12.710	54.000	32.580	AV
3			2484.180	41.525	8.942	-12.475	54.000	32.582	AV

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

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

Site: AC1	Time: 2018/09/13 - 09:22
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2475MHz	

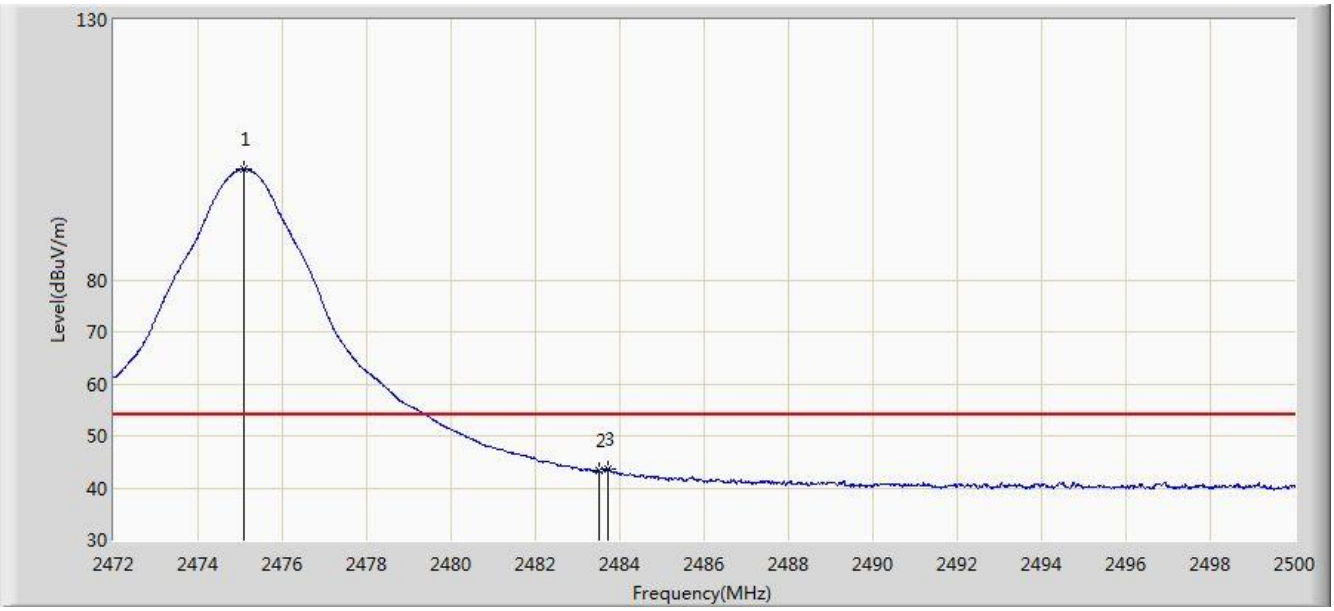


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2475.486	103.129	70.573	29.129	74.000	32.557	PK
2			2483.500	57.869	25.288	-16.131	74.000	32.580	PK
3			2493.826	59.797	27.186	-14.203	74.000	32.611	PK

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

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

Site: AC1	Time: 2018/09/13 - 09:24
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2475MHz	

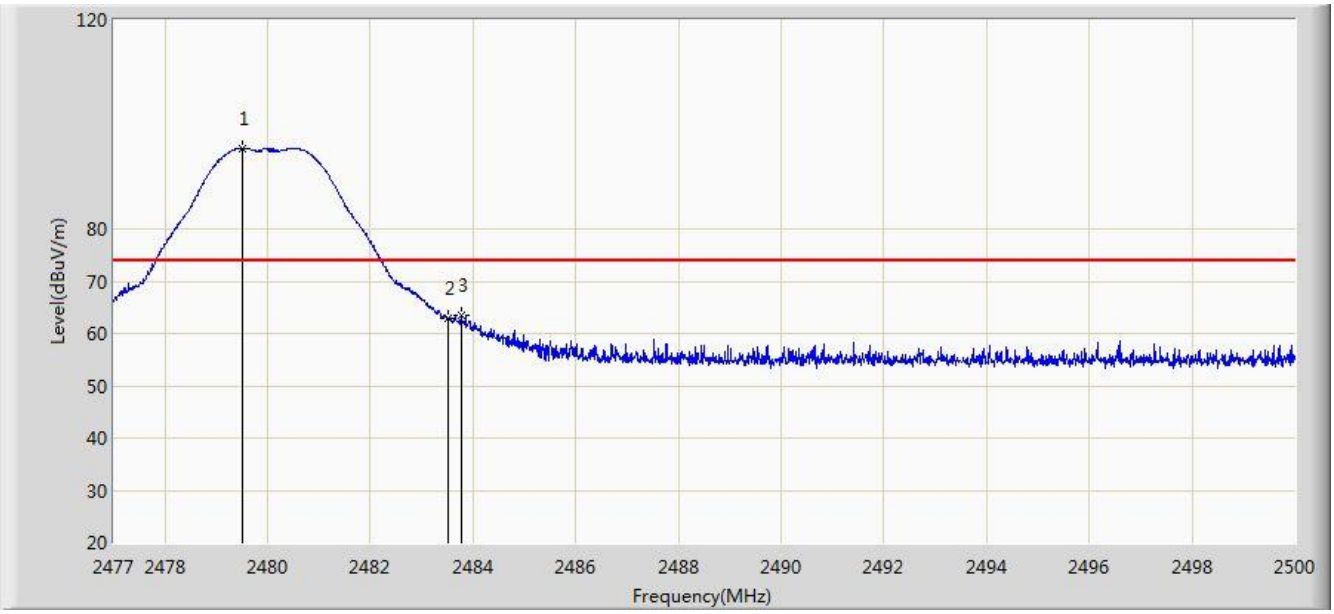


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2475.080	101.287	68.732	47.287	54.000	32.555	AV
2			2483.500	43.224	10.643	-10.776	54.000	32.580	AV
3			2483.704	43.562	10.981	-10.438	54.000	32.582	AV

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

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

Site: AC1	Time: 2018/10/18 - 20:20
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2480MHz	

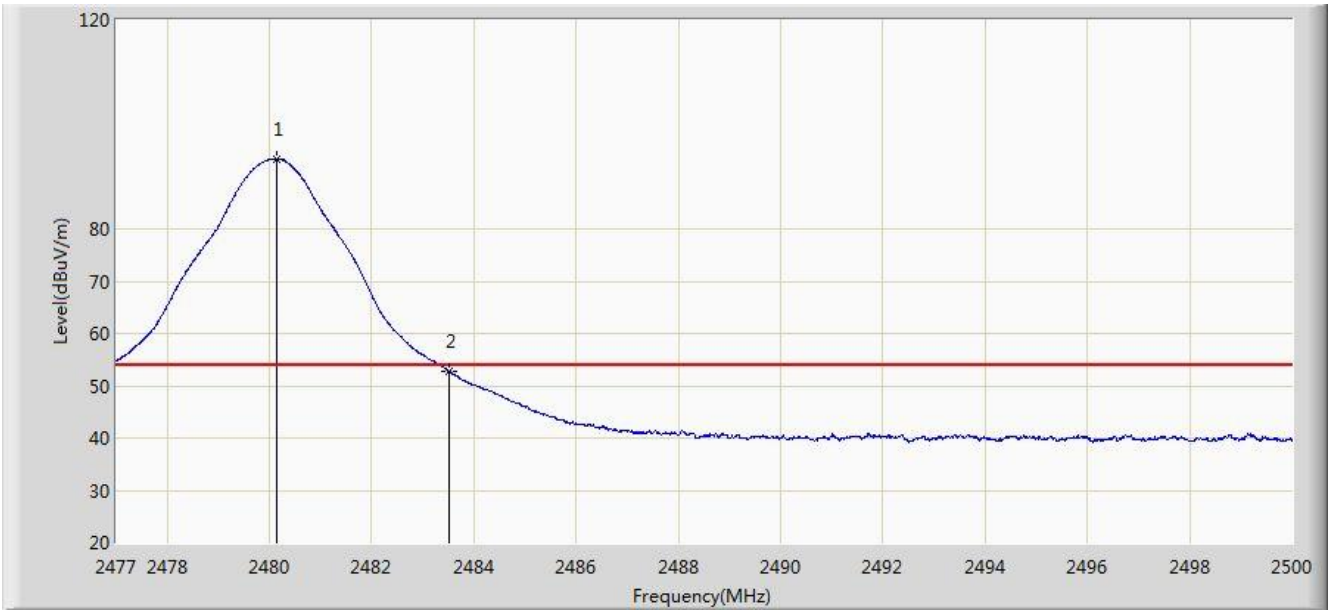


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.496	95.374	63.051	21.374	74.000	32.323	PK
2			2483.500	62.978	30.639	-11.022	74.000	32.340	PK
3			2483.762	63.348	31.008	-10.652	74.000	32.340	PK

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

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

Site: AC1	Time: 2018/10/18 - 20:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Horizontal
EUT: AP303P	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2480MHz	

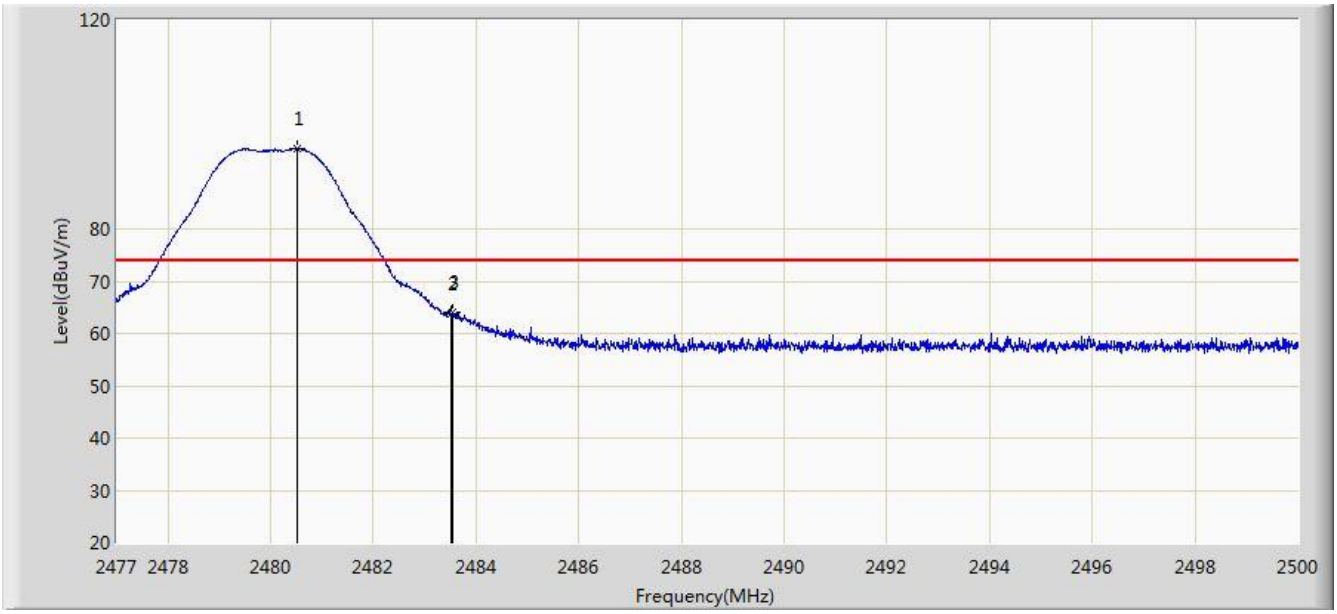


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.139	93.378	61.052	39.378	54.000	32.326	AV
2			2483.500	52.818	20.479	-1.182	54.000	32.340	AV

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

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

Site: AC1	Time: 2018/10/18 - 20:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Vertical
EUT: AP303P	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2480MHz	

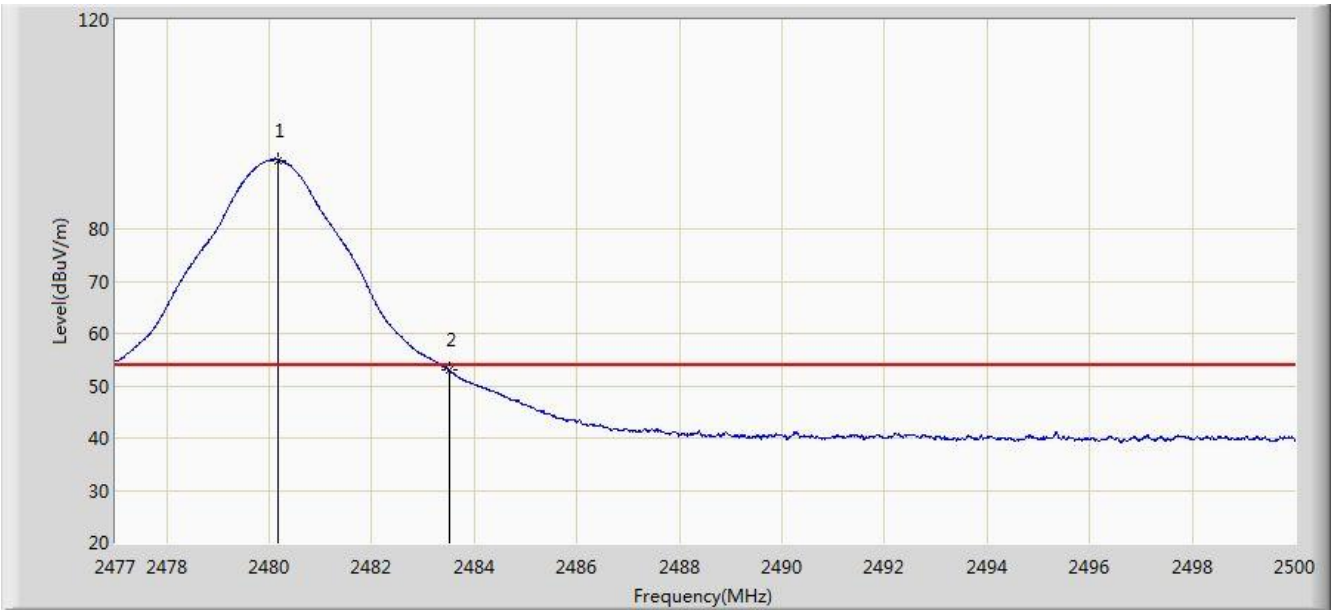


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.508	95.318	62.991	21.318	74.000	32.327	PK
2			2483.500	63.695	31.356	-10.305	74.000	32.340	PK
3			2483.543	63.934	31.595	-10.066	74.000	32.340	PK

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

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

Site: AC1	Time: 2018/10/18 - 20:25
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Vertical
EUT: AP303P	Power: AC 120V/60Hz
Test Mode: Transmit by ZigBee at channel 2480MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.174	93.183	60.857	39.183	54.000	32.326	AV
2			2483.500	52.946	20.607	-1.054	54.000	32.340	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

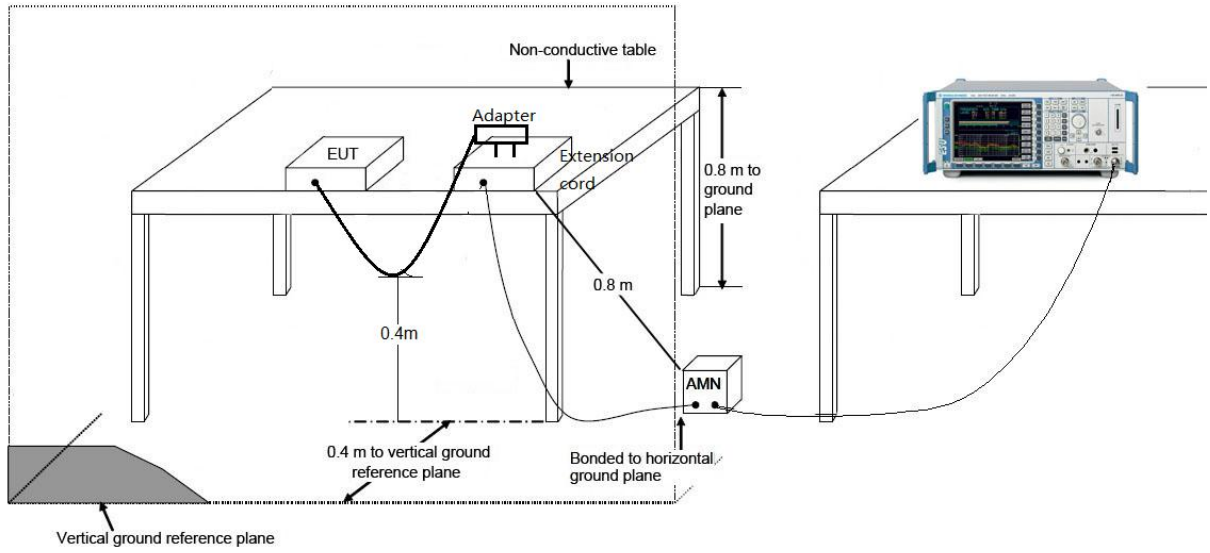
7.8.1.Test Limit

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.

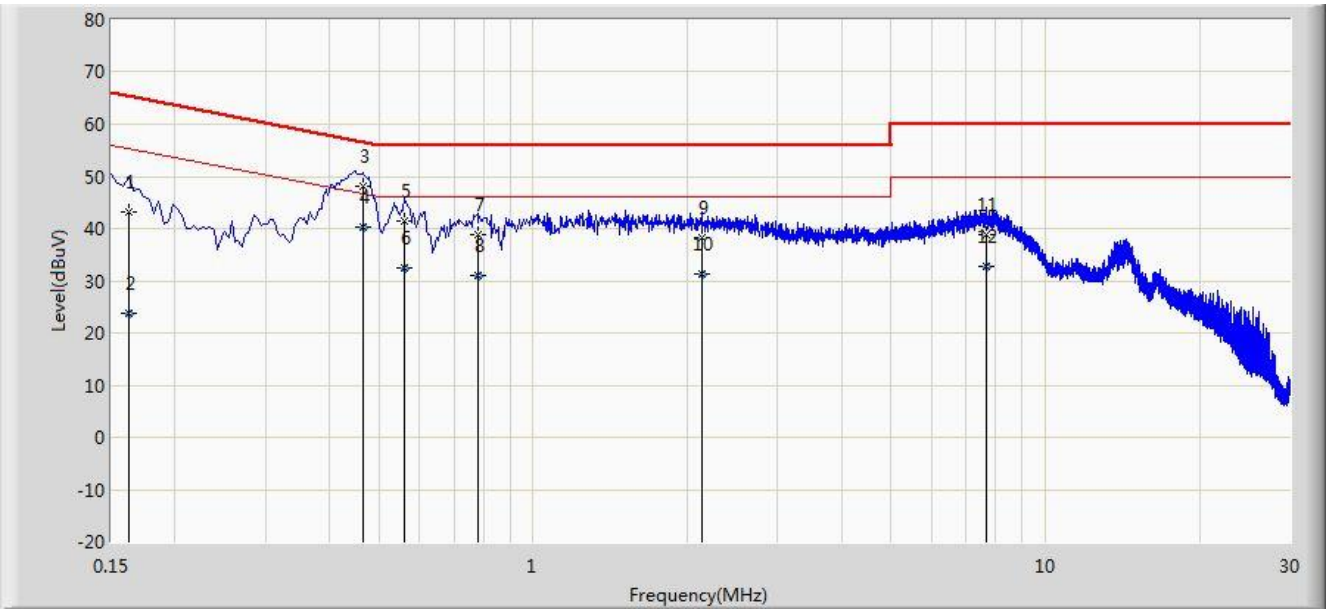
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

7.8.2.Test Setup



7.8.3.Test Result

Site: SR2	Time: 2018/09/23 - 12:25
Limit: FCC_Part15.207_CE	Engineer: Kevin Ker
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: ACCESS POINT	Power: AC 120V/60Hz
Worst Case Mode: Transmit by ZigBee at channel 2405MHz	

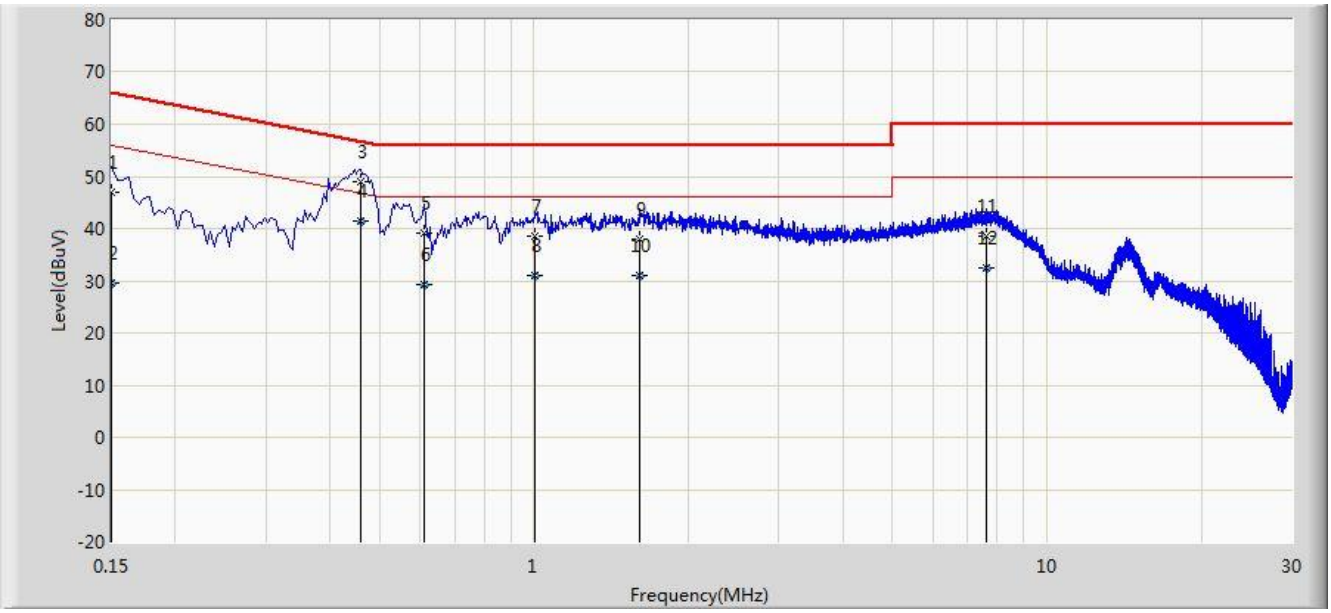


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.162	43.220	33.123	-22.140	65.361	10.097	QP
2			0.162	23.730	13.633	-31.631	55.361	10.097	AV
3			0.466	48.061	37.922	-8.524	56.585	10.139	QP
4		*	0.466	40.290	30.151	-6.295	46.585	10.139	AV
5			0.562	41.558	31.423	-14.442	56.000	10.135	QP
6			0.562	32.531	22.396	-13.469	46.000	10.135	AV
7			0.778	38.827	28.804	-17.173	56.000	10.022	QP
8			0.778	31.085	21.063	-14.915	46.000	10.022	AV
9			2.130	38.150	28.282	-17.850	56.000	9.868	QP
10			2.130	31.384	21.516	-14.616	46.000	9.868	AV
11			7.670	38.882	28.721	-21.118	60.000	10.161	QP
12			7.670	32.853	22.692	-17.147	50.000	10.161	AV

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

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

Site: SR2	Time: 2018/09/23 - 12:30
Limit: FCC_Part15.207_CE	Engineer: Kevin Ker
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: ACCESS POINT	Power: AC 120V/60Hz
Worst Case Mode: Transmit by ZigBee at channel 2405MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.150	46.822	35.679	-19.178	66.000	11.142	QP
2			0.150	29.579	18.437	-26.421	56.000	11.142	AV
3			0.458	48.980	38.824	-7.749	56.729	10.156	QP
4		*	0.458	41.524	31.369	-5.204	46.729	10.156	AV
5			0.610	39.258	29.132	-16.742	56.000	10.126	QP
6			0.610	29.395	19.269	-16.605	46.000	10.126	AV
7			1.002	38.475	28.566	-17.525	56.000	9.909	QP
8			1.002	30.886	20.978	-15.114	46.000	9.909	AV
9			1.610	37.995	28.109	-18.005	56.000	9.887	QP
10			1.610	31.094	21.207	-14.906	46.000	9.887	AV
11			7.626	38.545	28.368	-21.455	60.000	10.177	QP
12			7.626	32.484	22.306	-17.516	50.000	10.177	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 **ACCESS POINT** is in compliance with Part 15C of the FCC rules.

The End

Appendix A – Test Setup Photograph

Refer to 1810TW0101-UT file.

Appendix B – EUT Photograph

Refer to 1810TW0101-UE file.