802.11g Out-of-Band Emissions
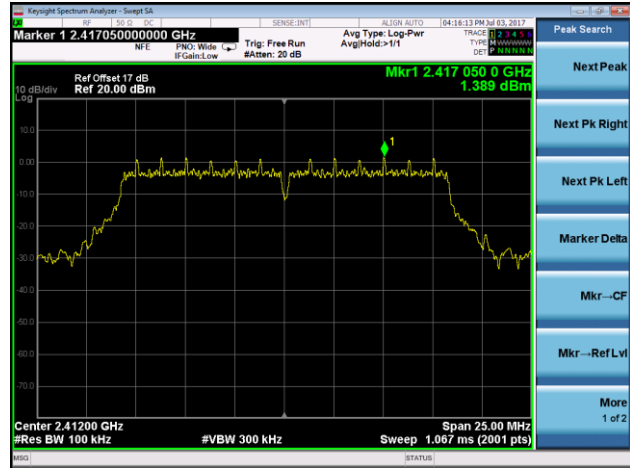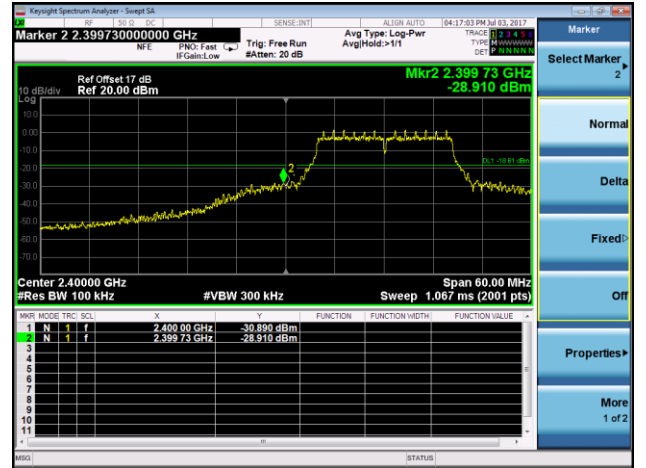
Channel 01 (2412MHz)

100kHz PSD reference Level	Low Band Edge

Spurious Emission	

Channel 06 (2437MHz)

100kHz PSD reference Level	Spurious Emission

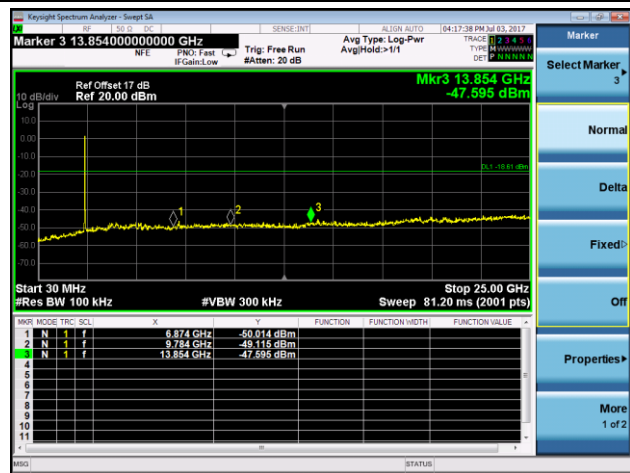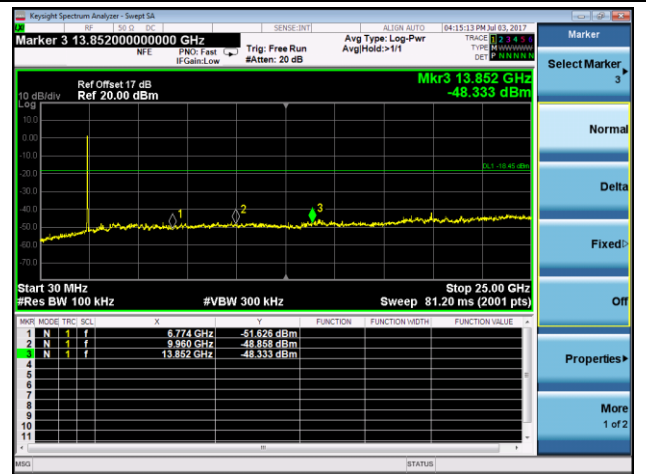| Channel 11 (2462MHz)	
100kHz PSD reference Level	**High Band Edge**
Spurious Emission	
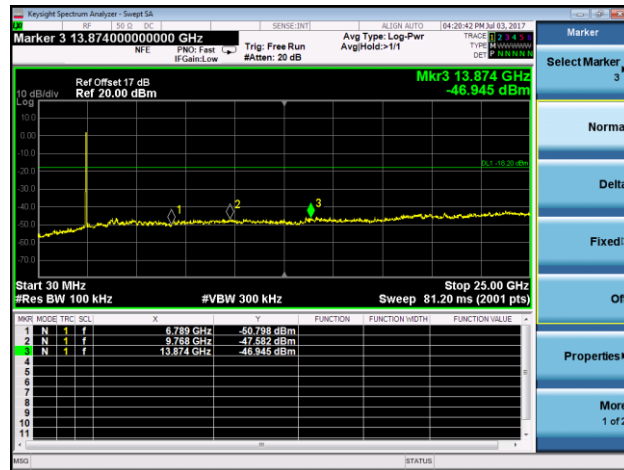
802.11n-HT20 Out-of-Band Emissions
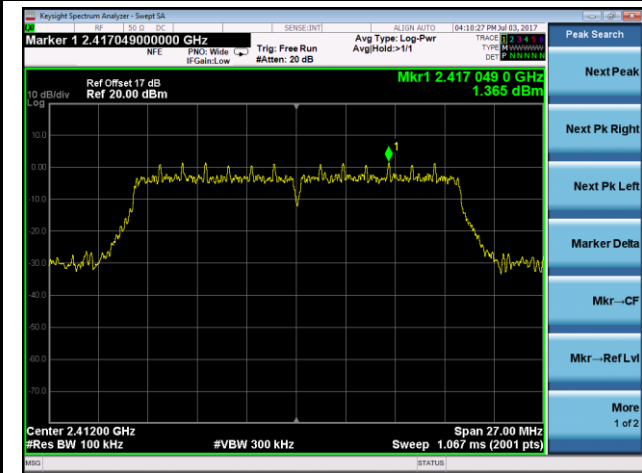
Channel 01 (2412MHz)

100kHz PSD reference Level	Low Band Edge
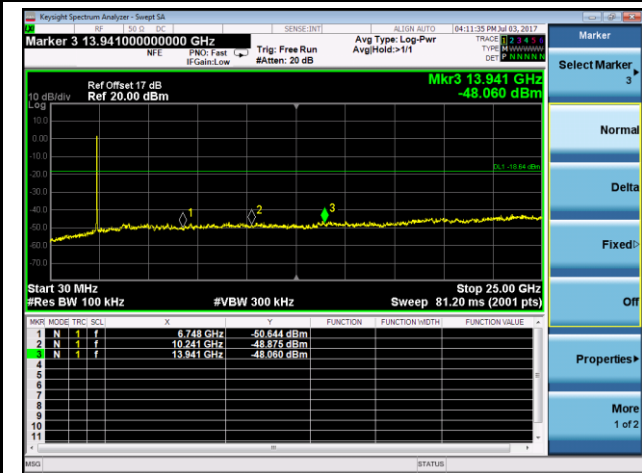
Spurious Emission	

Channel 06 (2437MHz)

100kHz PSD reference Level	Spurious Emission
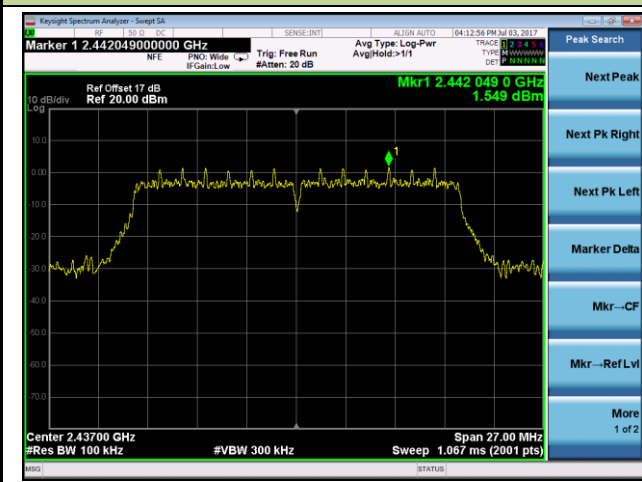
Channel 11 (2462MHz)	
100kHz PSD reference Level	**High Band Edge**
Spurious Emission	
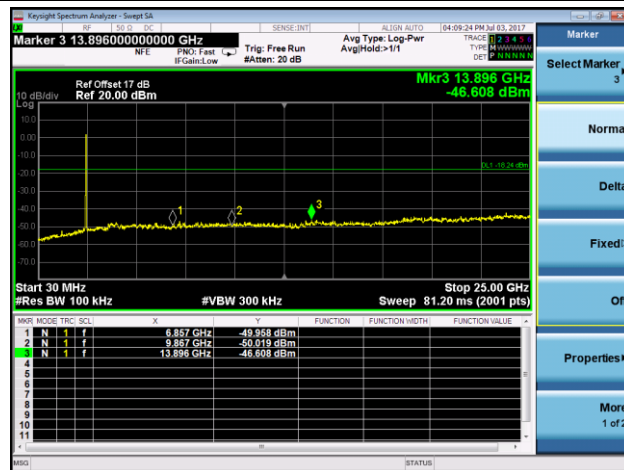
7.6. Radiated Spurious Emission Measurement

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 [V/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

KDB 558074 D01v04 - Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v04 - Section 12.2.4 (peak power measurements)

KDB 558074 D01v04 - Section 12.2.5 (average power measurements)

7.6.3. Test Setting

Peak Field Strength Measurements

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

RBW = as specified in Table 1

VBW = 3MHz

Detector = peak

Sweep time = auto couple

Trace mode = max hold

Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

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

RBW = 1MHz

VBW ≥ 1/T

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

Detector = Peak

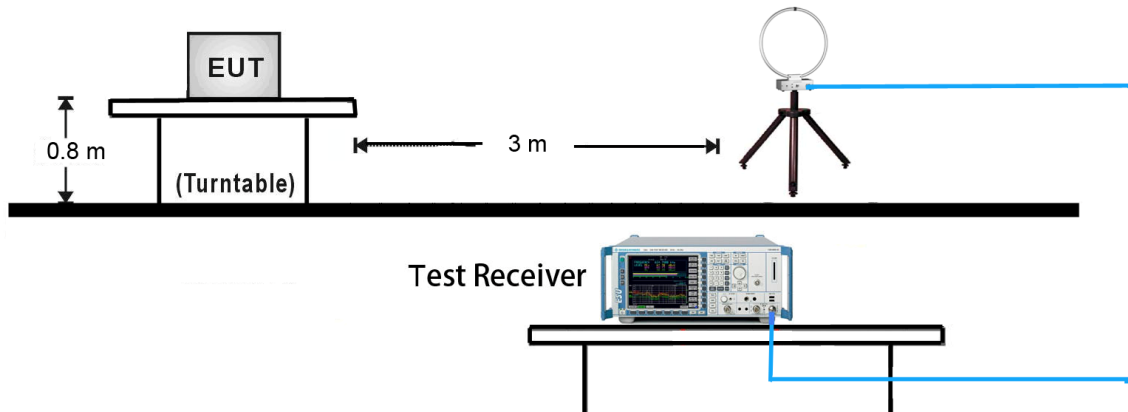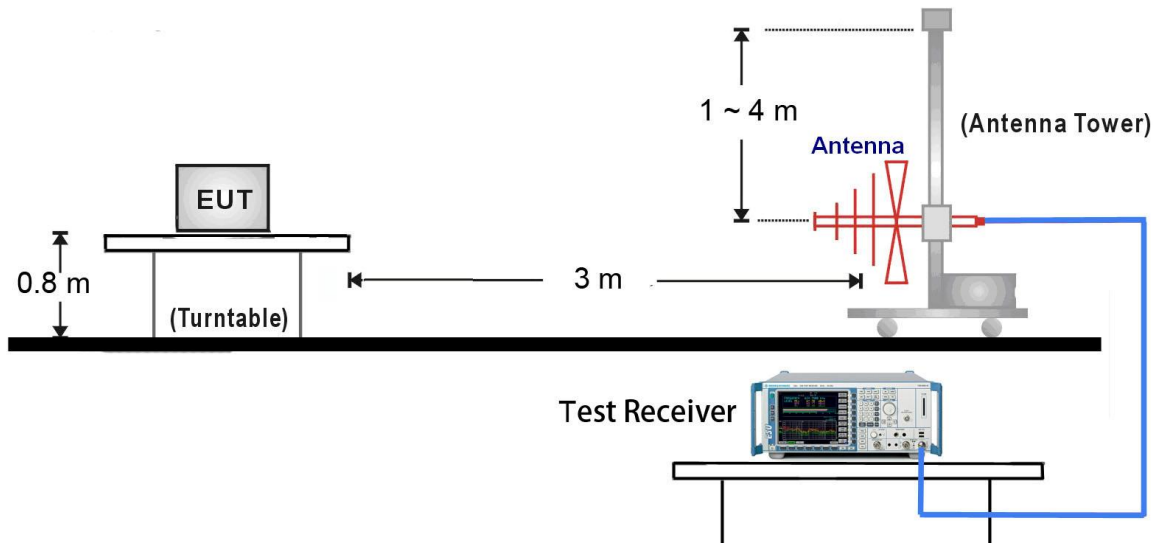Sweep time = auto

Trace mode = max hold

Allow max hold to run for at least 50 times (1/duty cycle) traces

7.6.4.Test Setup

9kHz ~ 30MHz Test Setup:

30MHz ~ 1GHz Test Setup:

<u>1GHz ~ 18GHz Test Setup:</u>
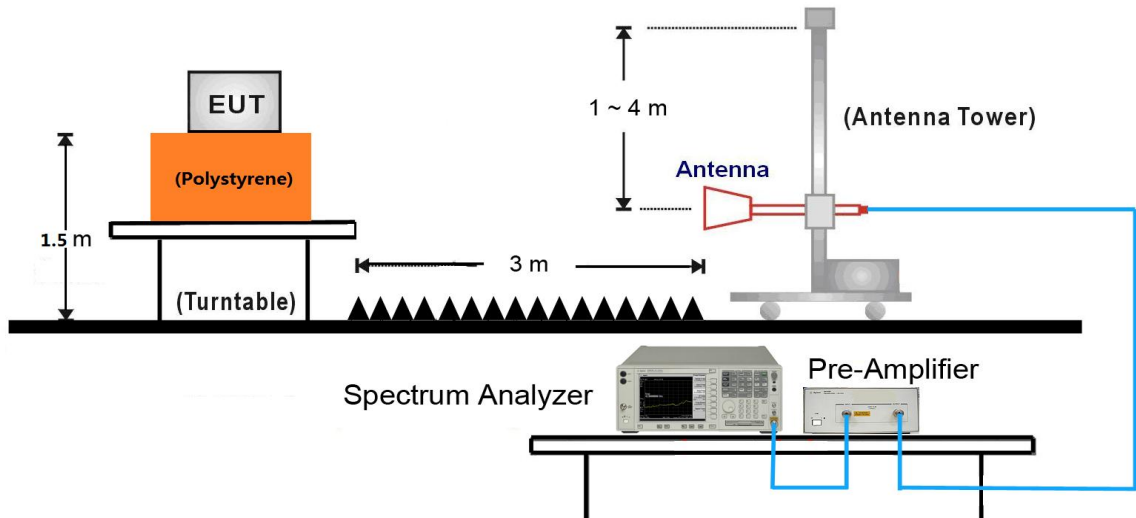
<u>18GHz ~25GHz Test Setup:</u>
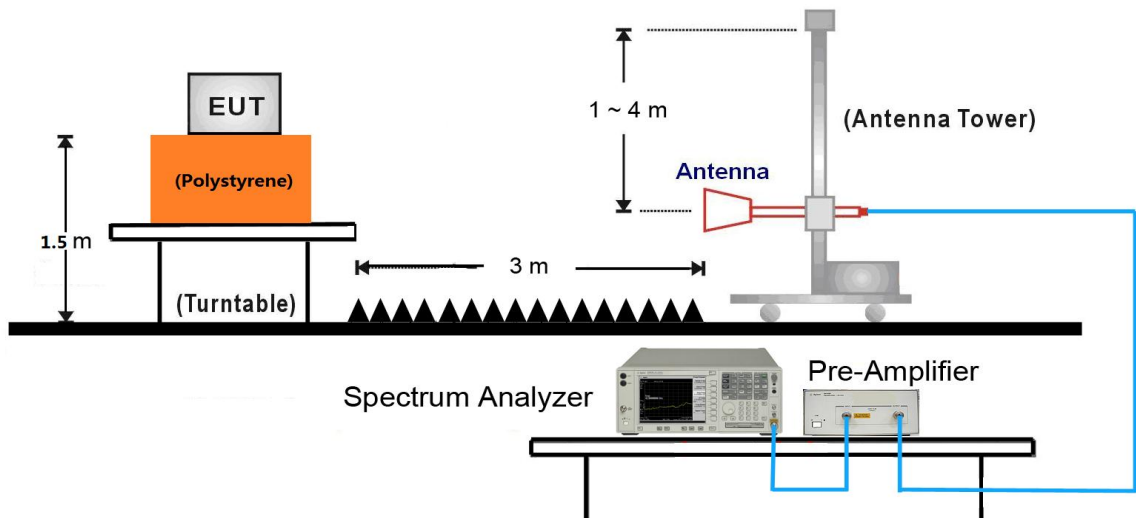
7.6.5.Test Result

Test Mode:	802.11b	Test Site:	AC1
Test Channel:	01	Test Engineer:	Bruce Wang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	4825.0	54.0	2.7	56.7	74.0	-17.3	Peak	Horizontal
	4825.0	50.2	2.7	52.9	54.0	-1.1	Average	Horizontal
	7494.0	33.5	11.0	44.5	74.0	-29.5	Peak	Horizontal
*	8718.0	31.9	11.4	43.3	76.1	-32.8	Peak	Horizontal
*	9721.0	33.6	12.3	45.9	76.1	-30.2	Peak	Horizontal
	4824.1	50.2	2.6	52.8	54.0	-1.2	Average	Vertical
	4825.0	56.7	2.7	59.4	74.0	-14.6	Peak	Vertical
	7536.5	34.0	11.0	45.0	74.0	-29.0	Peak	Vertical
*	8913.5	31.2	11.9	43.1	76.1	-33.0	Peak	Vertical
*	9848.5	33.0	13.3	46.3	76.1	-29.8	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (96.1dBµV/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)

Test Mode:	802.11b	Test Site:	AC1
Test Channel:	06	Test Engineer:	Bruce Wang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	4876.0	47.9	2.6	50.5	74.0	-23.5	Peak	Horizontal
	7460.0	32.6	11.1	43.7	74.0	-30.3	Peak	Horizontal
*	8905.0	31.9	12.0	43.9	76.8	-32.9	Peak	Horizontal
*	10129.0	32.5	13.6	46.1	76.8	-30.7	Peak	Horizontal
	4874.1	51.0	2.6	53.6	54.0	-0.4	Average	Vertical
	4876.0	51.5	2.6	54.1	74.0	-19.9	Peak	Vertical
	7553.5	33.3	10.9	44.2	74.0	-29.8	Peak	Vertical
*	8590.5	32.2	11.0	43.2	76.8	-33.6	Peak	Vertical
*	9653.0	32.3	12.5	44.8	76.8	-32.0	Peak	Vertical

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

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

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

Test Mode:	802.11b		Test Site:	AC1
Test Channel:	11		Test Engineer:	Bruce Wang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.			

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4927.0	47.9	2.6	50.5	74.0	-23.5	Peak	Horizontal
	7655.5	33.4	10.6	44.0	74.0	-30.0	Peak	Horizontal
*	8582.0	32.9	11.0	43.9	77.2	-33.3	Peak	Horizontal
*	9636.0	32.9	12.9	45.8	77.2	-31.4	Peak	Horizontal
	4924.1	49.3	2.6	51.9	54.0	-2.1	Average	Vertical
	4927.0	50.2	2.6	52.8	74.0	-21.2	Peak	Vertical
	7519.5	32.7	10.9	43.6	74.0	-30.4	Peak	Vertical
*	8684.0	32.2	11.2	43.4	77.2	-33.8	Peak	Vertical
*	10146.0	32.5	13.8	46.3	77.2	-30.9	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (97.2dBμV/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)

Test Mode:	802.11g			Test Site:	AC1
Test Channel:	01			Test Engineer:	Bruce Wang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.				

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	4824.4	39.3	2.7	42.0	54.0	-12.0	Average	Horizontal
	4825.0	52.0	2.7	54.7	74.0	-19.3	Peak	Horizontal
	7519.5	37.0	8.3	45.3	74.0	-28.7	Peak	Horizontal
*	8786.0	35.4	8.9	44.3	77.2	-32.9	Peak	Horizontal
*	9780.5	34.9	11.4	46.3	77.2	-30.9	Peak	Horizontal
	4824.4	35.3	2.7	38.0	54.0	-16.0	Average	Vertical
	4825.0	48.9	2.7	51.6	74.0	-22.4	Peak	Vertical
	7579.0	35.0	8.2	43.2	74.0	-30.8	Peak	Vertical
*	8650.0	35.6	8.8	44.4	77.2	-32.8	Peak	Vertical
*	9806.0	35.1	11.5	46.6	77.2	-30.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (97.2dBµV/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)

Test Mode:	802.11g	Test Site:	AC1
Test Channel:	06	Test Engineer:	Bruce Wang
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
	4874.5	39.3	2.7	42.0	54.0	-12.0	Average	Horizontal
	4876.0	52.2	2.7	54.9	74.0	-19.1	Peak	Horizontal
	7570.5	34.9	8.2	43.1	74.0	-30.9	Peak	Horizontal
*	8735.0	35.0	8.9	43.9	77.5	-33.6	Peak	Horizontal
*	9814.5	35.3	11.6	46.9	77.5	-30.6	Peak	Horizontal
	4874.4	36.3	2.7	39.0	54.0	-15.0	Average	Vertical
	4876.0	49.6	2.7	52.3	74.0	-21.7	Peak	Vertical
	7536.5	35.1	8.3	43.4	74.0	-30.6	Peak	Vertical
*	8828.5	35.2	9.1	44.3	77.5	-33.2	Peak	Vertical
*	9772.0	34.9	11.4	46.3	77.5	-31.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (97.5dBµV/m) or 15.209 which is higher.

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

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

Test Mode:	802.11g	Test Site:	AC1
Test Channel:	11	Test Engineer:	Bruce Wang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4918.5	51.2	2.8	54.0	74.0	-20.0	Peak	Horizontal
	4922.1	38.5	2.8	41.3	54.0	-12.7	Average	Horizontal
	7596.0	35.7	8.1	43.8	74.0	-30.2	Peak	Horizontal
*	8650.0	35.2	8.8	44.0	77.9	-33.9	Peak	Horizontal
*	10120.5	34.9	11.6	46.5	77.9	-31.4	Peak	Horizontal
	4924.4	36.8	2.8	39.6	54.0	-14.4	Average	Vertical
	4927.0	50.2	2.8	53.0	74.0	-21.0	Peak	Vertical
	7485.5	36.1	8.2	44.3	74.0	-29.7	Peak	Vertical
*	8556.5	35.7	8.6	44.3	77.9	-33.6	Peak	Vertical
*	9831.5	34.8	11.6	46.4	77.9	-31.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (97.9dBμV/m) or 15.209 which is higher.

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

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

Test Mode:	802.11n-HT20	Test Site:	AC1
Test Channel:	01	Test Engineer:	Bruce Wang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	4824.1	38.4	2.7	41.1	54.0	-12.9	Average	Horizontal
	4825.0	52.1	2.7	54.8	74.0	-19.2	Peak	Horizontal
	7587.5	35.3	8.2	43.5	74.0	-30.5	Peak	Horizontal
*	8811.5	35.3	9.0	44.3	75.7	-31.4	Peak	Horizontal
*	9797.5	35.2	11.5	46.7	75.7	-29.0	Peak	Horizontal
	4816.5	48.1	2.7	50.8	74.0	-23.2	Peak	Vertical
	4824.1	34.9	2.7	37.6	54.0	-16.4	Average	Vertical
	7375.0	35.6	7.9	43.5	74.0	-30.5	Peak	Vertical
*	8752.0	34.9	9.0	43.9	75.7	-31.8	Peak	Vertical
*	9814.5	33.8	11.6	45.4	75.7	-30.3	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (95.7dBµV/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)

Test Mode:	802.11n-HT20	Test Site:	AC1
Test Channel:	06	Test Engineer:	Bruce Wang
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
	4874.1	38.8	2.7	41.5	54.0	-12.5	Average	Horizontal
	4876.0	53.6	2.7	56.3	74.0	-17.7	Peak	Horizontal
	7485.5	35.3	8.2	43.5	74.0	-30.5	Peak	Horizontal
*	8641.5	34.8	8.8	43.6	76.1	-32.5	Peak	Horizontal
*	9976.0	34.5	11.4	45.9	76.1	-30.2	Peak	Horizontal
	4874.1	35.5	2.7	38.2	54.0	-15.8	Average	Vertical
	4876.0	48.3	2.7	51.0	74.0	-23.0	Peak	Vertical
	7494.0	35.0	8.2	43.2	74.0	-30.8	Peak	Vertical
*	8726.5	34.9	9.0	43.9	76.1	-32.2	Peak	Vertical
*	9814.5	34.0	11.6	45.6	76.1	-30.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (96.1dBμV/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)

Test Mode:	802.11n-HT20	Test Site:	AC1
Test Channel:	11	Test Engineer:	Bruce Wang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4918.5	51.7	2.8	54.5	74.0	-19.5	Peak	Horizontal
	4924.1	38.2	2.8	41.0	54.0	-13.0	Average	Horizontal
	7570.5	35.2	8.2	43.4	74.0	-30.6	Peak	Horizontal
*	8811.5	36.0	9.0	45.0	76.7	-31.7	Peak	Horizontal
*	9755.0	34.6	11.4	46.0	76.7	-30.7	Peak	Horizontal
	4924.1	36.4	2.8	39.2	54.0	-14.8	Average	Vertical
	4927.0	50.2	2.8	53.0	74.0	-21.0	Peak	Vertical
	7502.5	35.1	8.3	43.4	74.0	-30.6	Peak	Vertical
*	8828.5	35.3	9.1	44.4	76.7	-32.3	Peak	Vertical
*	9772.0	34.9	11.4	46.3	76.7	-30.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (96.7dBμV/m) or 15.209 which is higher.
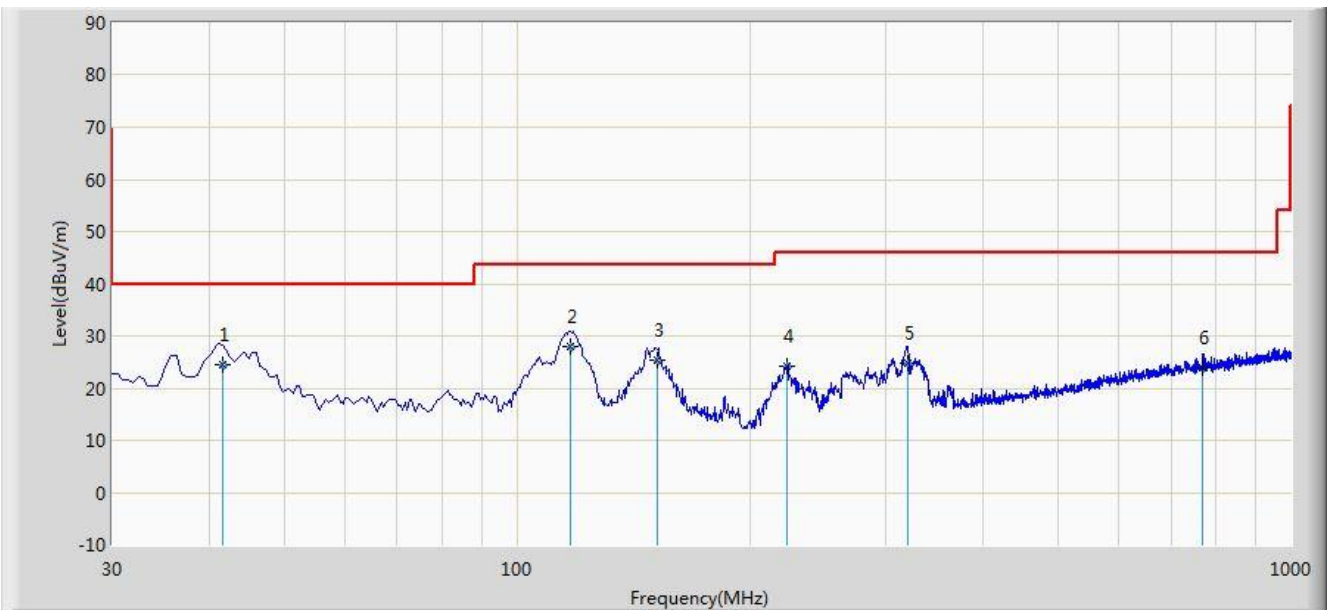
Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

The worst case of Radiated Emission below 1GHz:

Site: AC1	Time: 2017/07/07 - 20:24
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: VULB 9168_20-2000MHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz

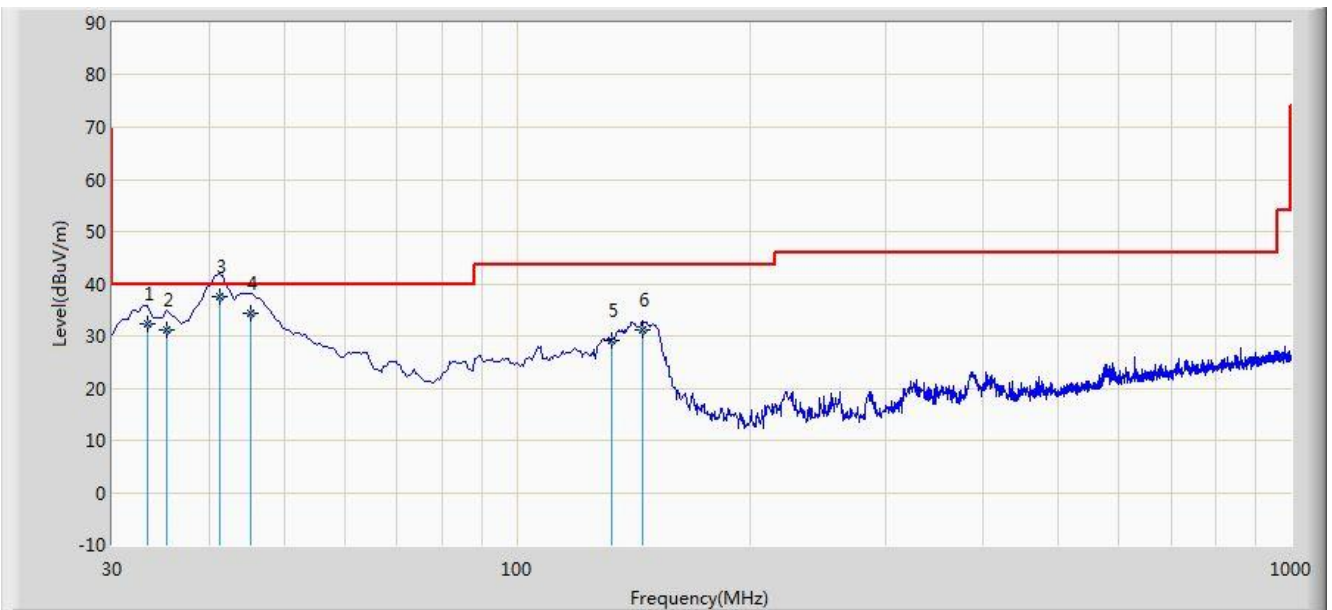**Note: There is the worst case within frequency range 30MHz~1GHz.**

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			41.640	24.567	10.140	-15.433	40.000	14.427	QP
2		*	117.250	28.083	15.260	-15.417	43.500	12.823	QP
3			152.140	25.398	10.210	-18.102	43.500	15.188	QP
4			223.150	24.109	12.010	-21.891	46.000	12.099	QP
5			319.450	24.858	10.020	-21.142	46.000	14.838	QP
6			768.170	23.962	1.023	-22.038	46.000	22.939	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: 2017/07/07 - 20:27
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Note: There is the worst case within frequency range 30MHz~1GHz.	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			33.349	32.194	18.450	-7.806	40.000	13.744	QP
2			35.330	31.300	17.410	-8.700	40.000	13.890	QP
3		*	41.225	37.448	23.000	-2.552	40.000	14.448	QP
4			45.220	34.333	20.150	-5.667	40.000	14.184	QP
5			132.820	29.156	15.203	-14.344	43.500	13.953	QP
6			145.580	31.090	16.210	-12.410	43.500	14.880	QP

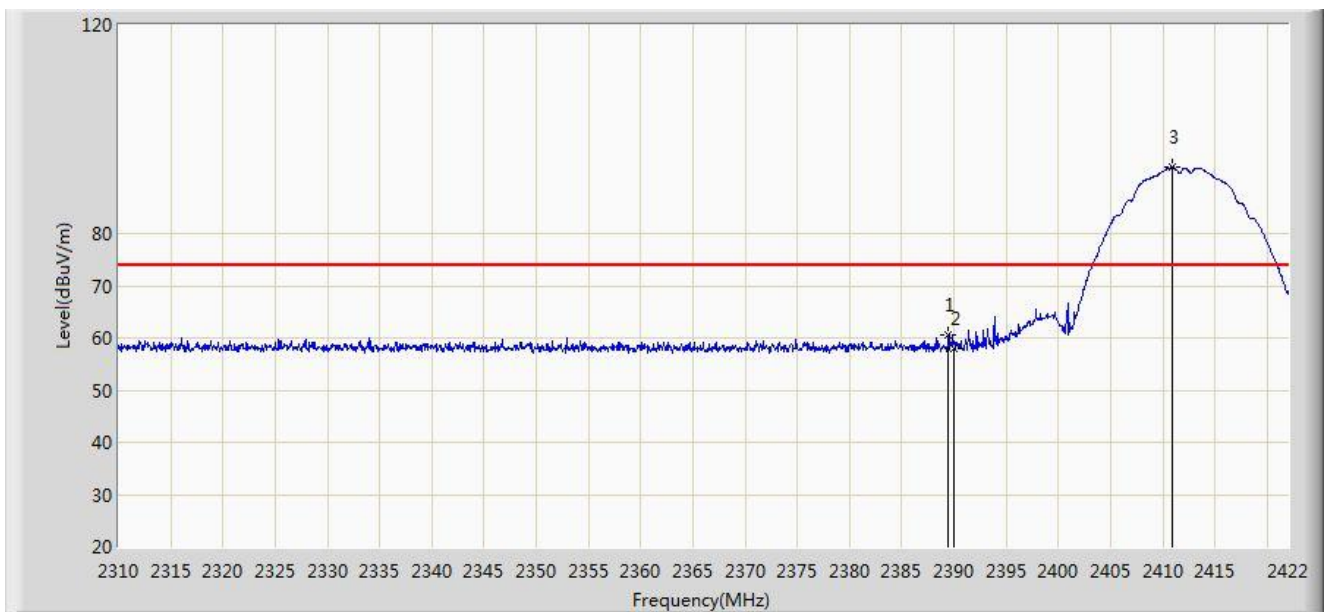Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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 Result

|	
Site: AC1	Time: 2017/07/04 - 05:09
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2412MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.464	60.610	29.406	-13.390	74.000	31.204	PK
2			2390.000	58.037	26.834	-15.963	74.000	31.203	PK
3		*	2410.912	92.700	61.529	N/A	N/A	31.171	PK

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

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

| Site: AC1	Time: 2017/07/04 - 05:13
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2412MHz	
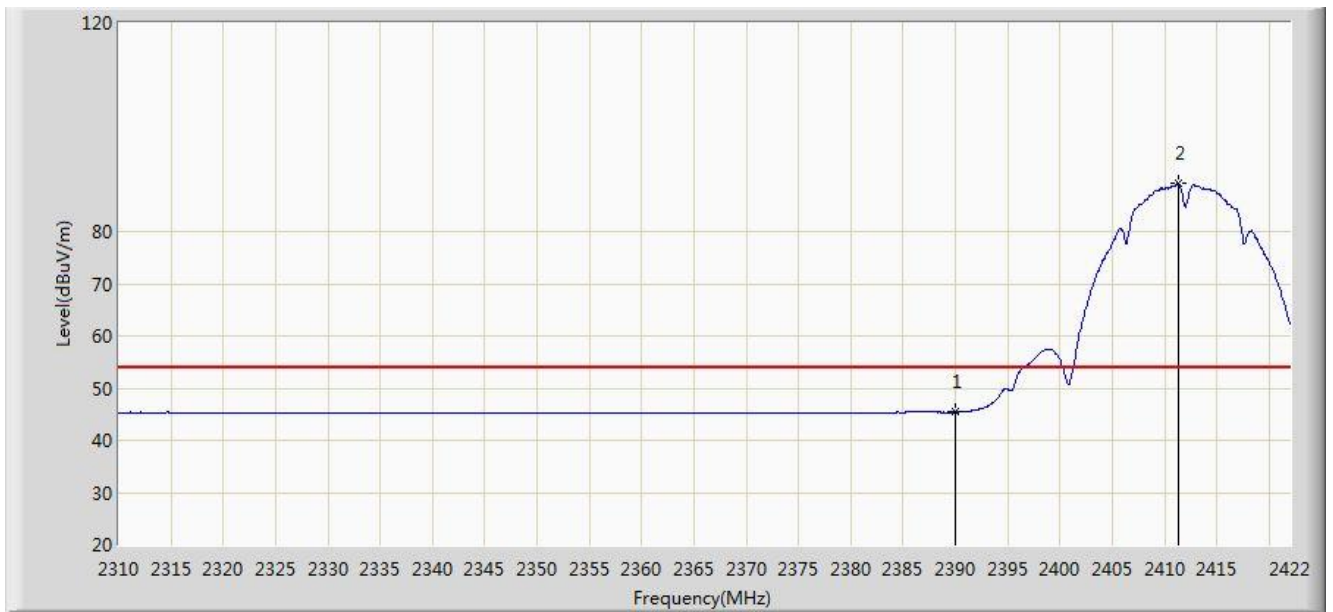
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	45.380	14.177	-8.620	54.000	31.203	AV
2		*	2411.304	89.190	58.019	N/A	N/A	31.171	AV

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

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

| Site: AC1	Time: 2017/07/04 - 05:14
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2412MHz	
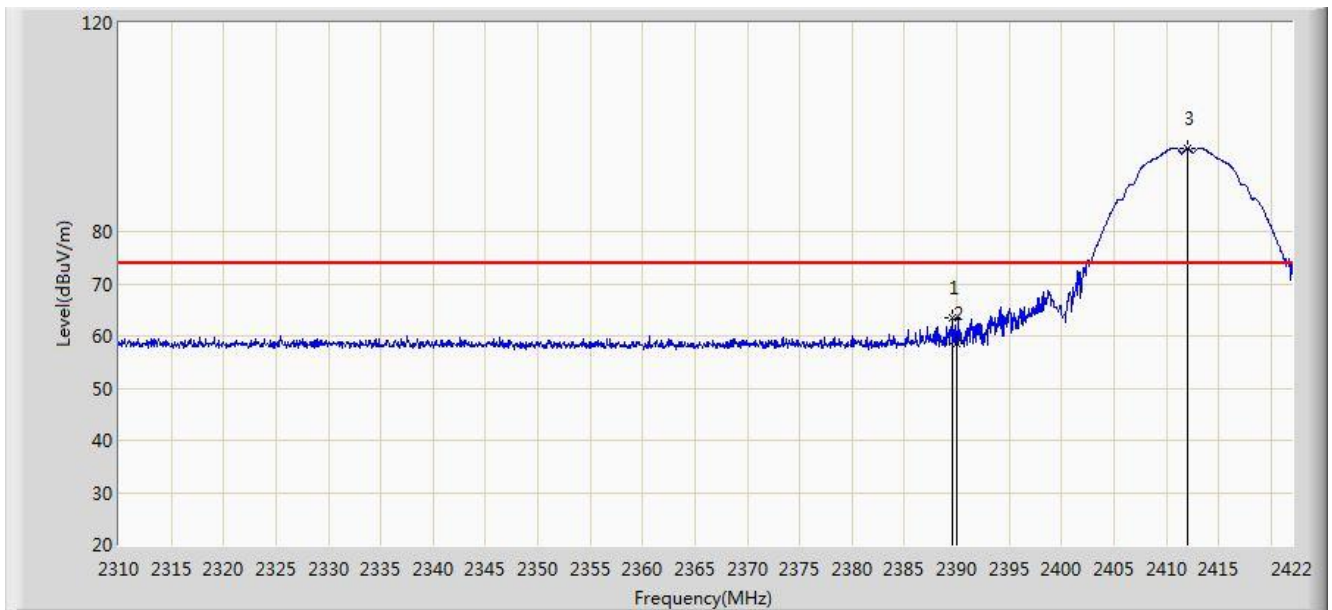
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.632	63.526	32.323	-10.474	74.000	31.204	PK
2			2390.000	58.657	27.454	-15.343	74.000	31.203	PK
3		*	2411.976	96.055	64.885	N/A	N/A	31.170	PK

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

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

| Site: AC1	Time: 2017/07/04 - 05:17
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2412MHz	
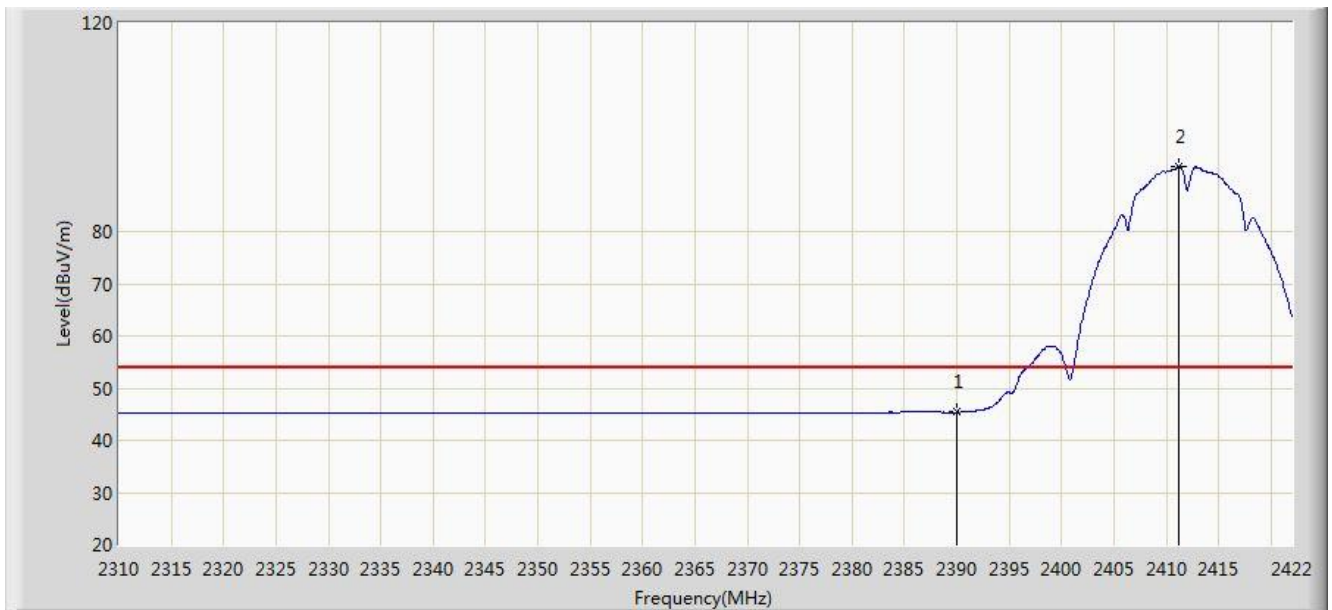
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	45.365	14.162	-8.635	54.000	31.203	AV
2		*	2411.248	92.589	61.418	N/A	N/A	31.171	AV

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

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

Site: AC1	Time: 2017/07/04 - 05:18
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz	
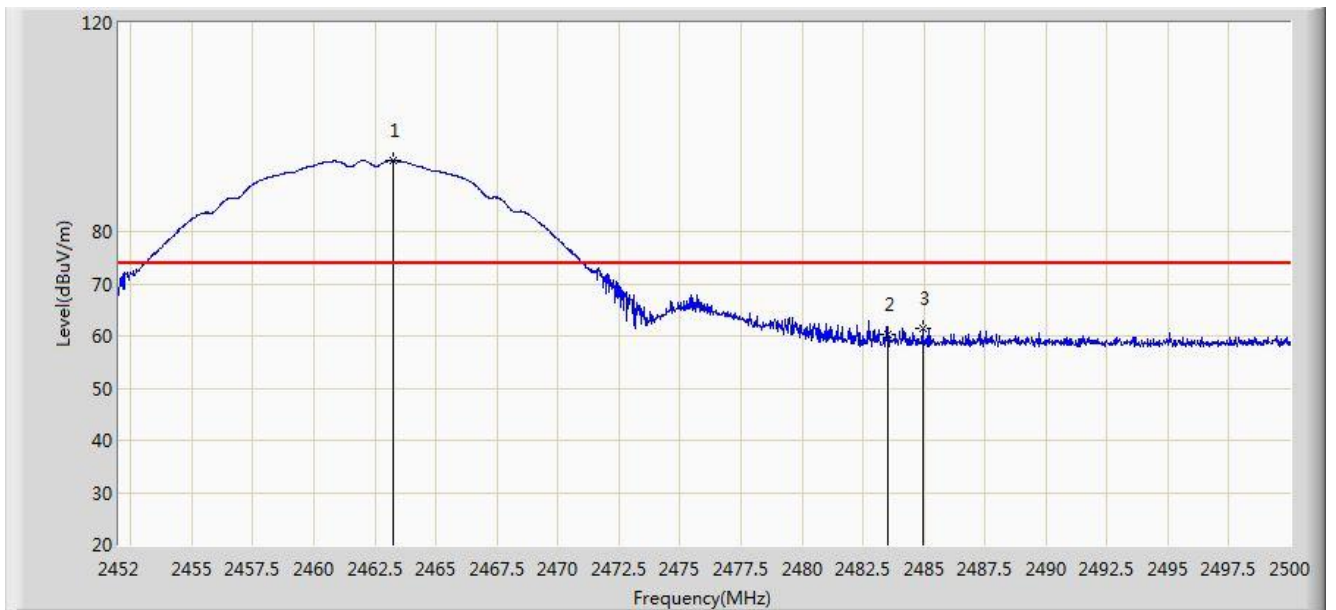
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2463.256	93.570	62.432	N/A	N/A	31.138	PK
2			2483.500	60.277	29.084	-13.723	74.000	31.194	PK
3			2484.952	61.536	30.339	-12.464	74.000	31.197	PK

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

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

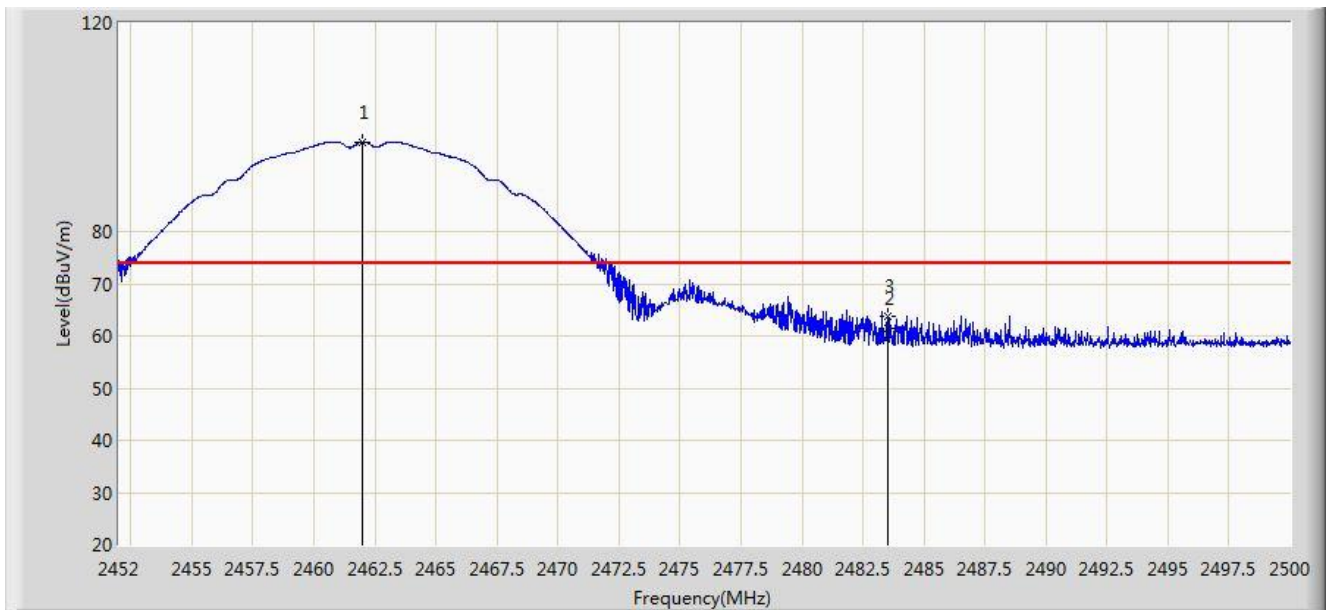| Site: AC1	Time: 2017/07/04 - 05:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.240	90.041	58.907	N/A	N/A	31.134	AV
2			2483.500	45.527	14.334	-8.473	54.000	31.194	AV

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

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

Site: AC1	Time: 2017/07/04 - 05:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.984	97.197	66.062	N/A	N/A	31.135	PK
2			2483.500	61.527	30.334	-12.473	74.000	31.194	PK
3			2483.536	63.848	32.655	-10.152	74.000	31.194	PK

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

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

| Site: AC1	Time: 2017/07/04 - 05:23
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.240	93.756	62.622	N/A	N/A	31.134	AV
2			2483.500	45.561	14.368	-8.439	54.000	31.194	AV

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

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

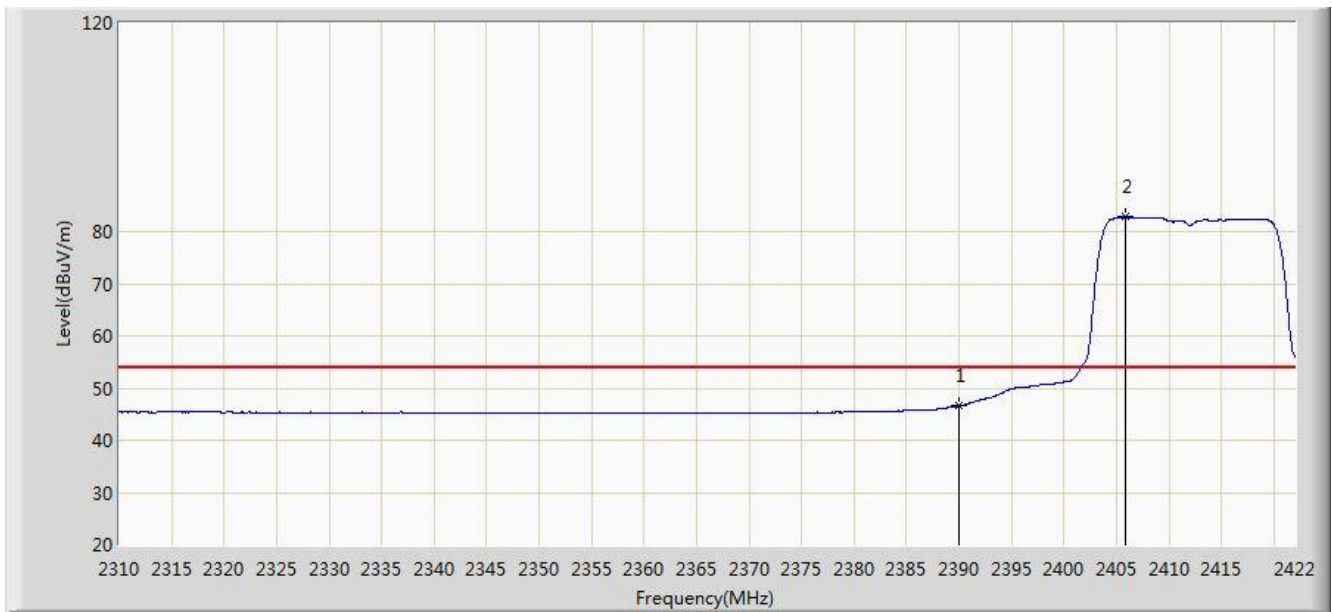| Site: AC1	Time: 2017/07/04 - 05:24
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at Channel 2412MHz	
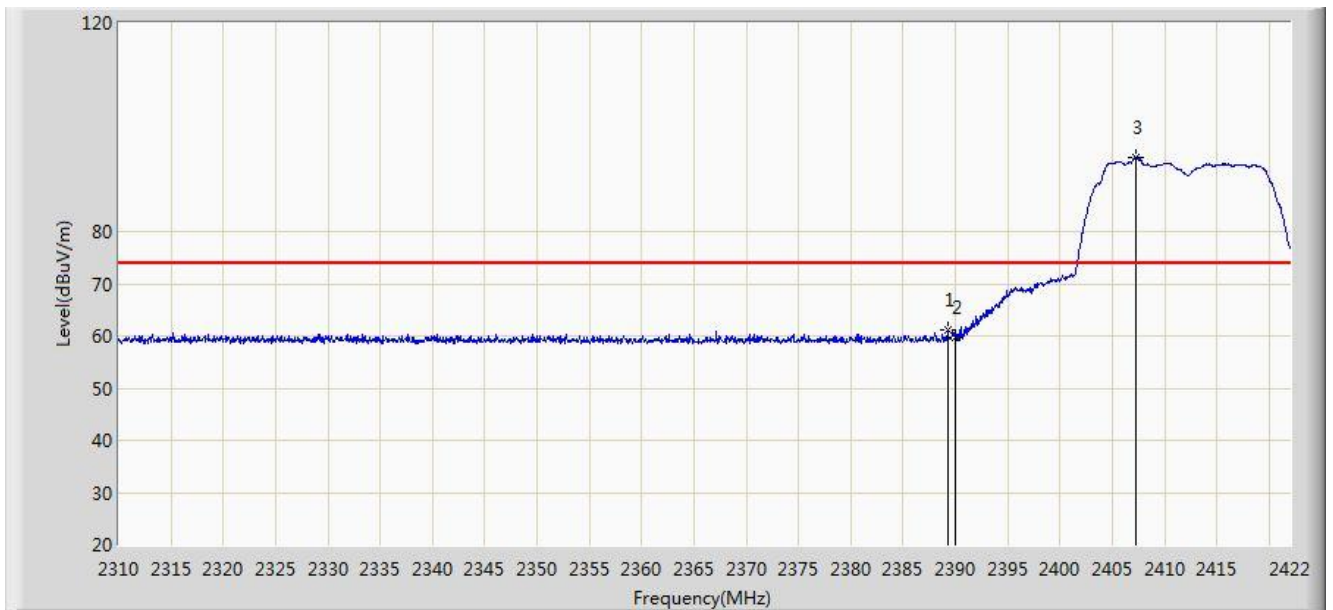
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.240	61.259	30.055	-12.741	74.000	31.204	PK
2			2390.000	59.848	28.645	-14.152	74.000	31.203	PK
3		*	2407.272	94.303	63.126	N/A	N/A	31.177	PK

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

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

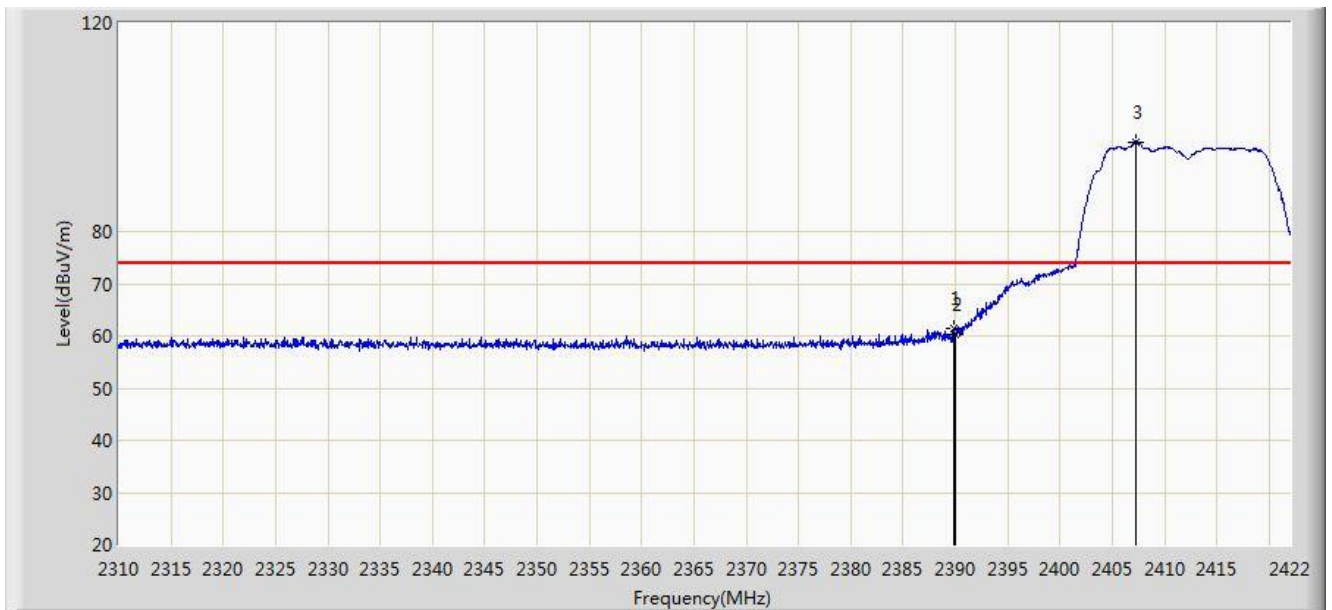| Site: AC1	Time: 2017/07/04 - 05:47
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at Channel 2412MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.618	15.415	-7.382	54.000	31.203	AV
2		*	2405.816	82.823	51.644	N/A	N/A	31.179	AV

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

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

| Site: AC1	Time: 2017/07/04 - 05:47
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at Channel 2412MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.856	61.351	30.148	-12.649	74.000	31.203	PK
2			2390.000	60.332	29.129	-13.668	74.000	31.203	PK
3		*	2407.272	97.242	66.065	N/A	N/A	31.177	PK

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

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

| Site: AC1	Time: 2017/07/04 - 05:49
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at Channel 2412MHz	
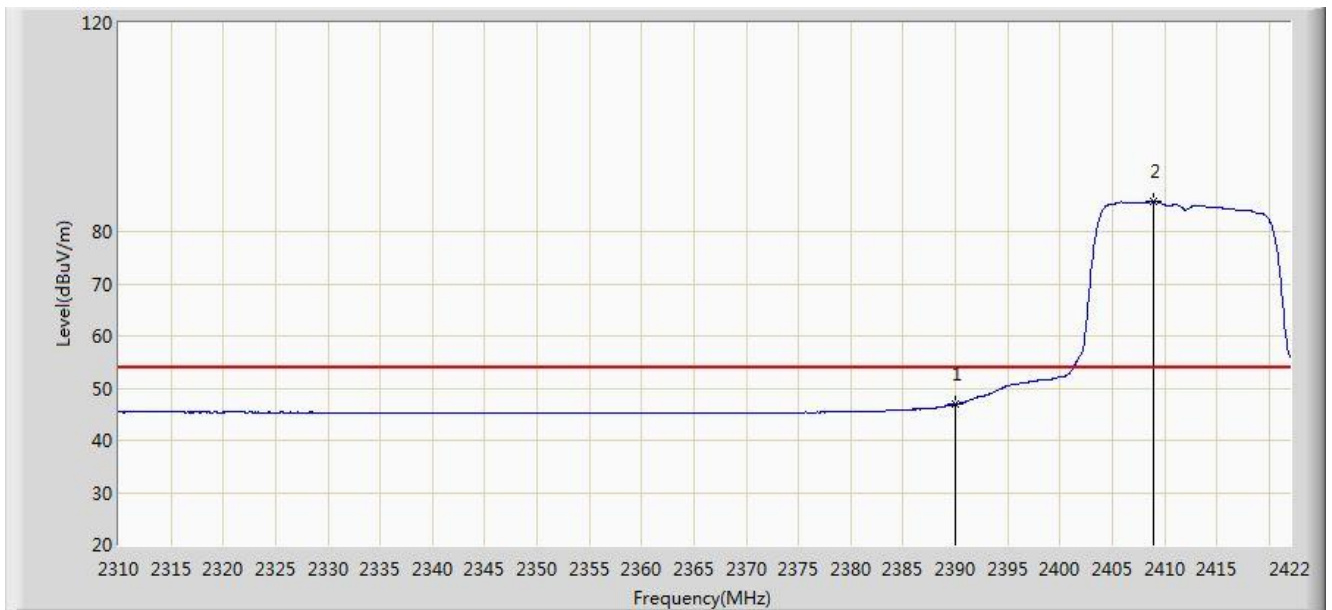
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.899	15.696	-7.101	54.000	31.203	AV
2		*	2409.008	85.771	54.597	N/A	N/A	31.174	AV

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

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

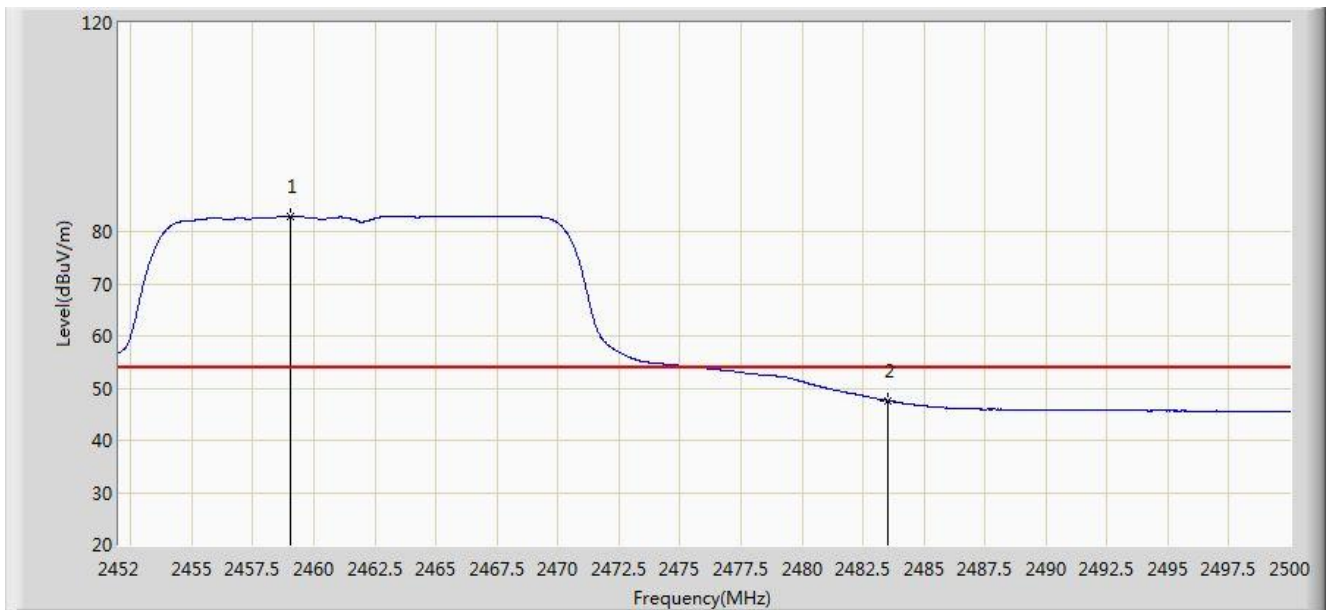| Site: AC1	Time: 2017/07/04 - 05:50
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at Channel 2462MHz	
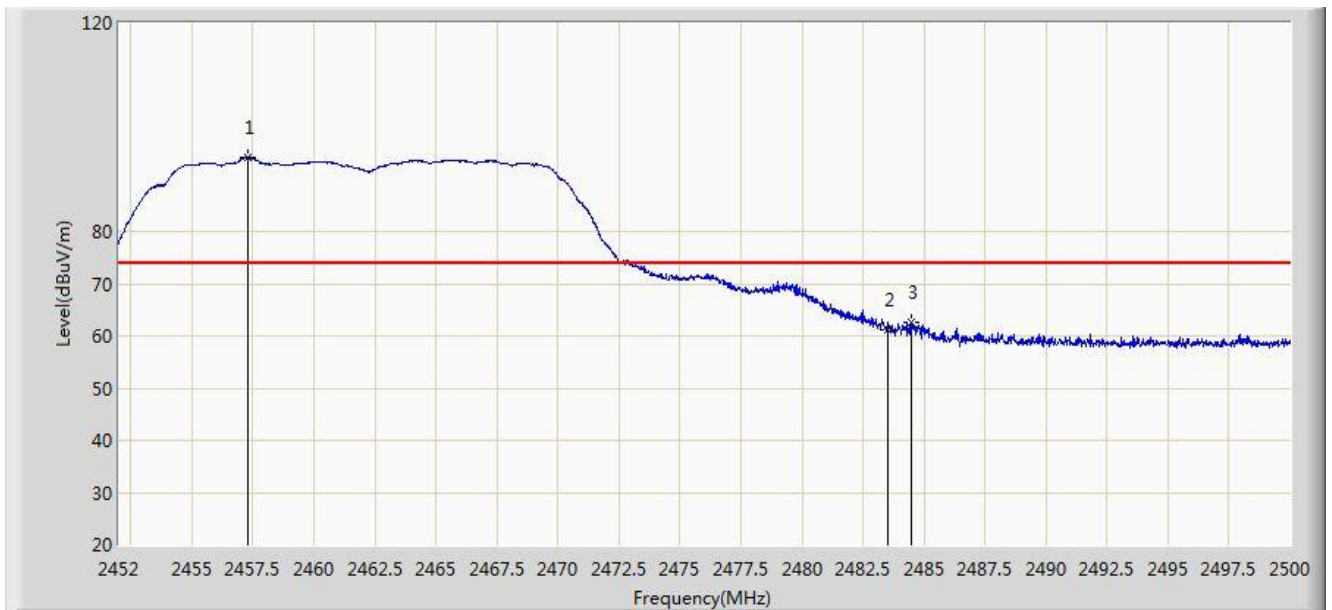
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2457.280	94.219	63.092	N/A	N/A	31.127	PK
2			2483.500	61.245	30.052	-12.755	74.000	31.194	PK
3			2484.472	62.566	31.370	-11.434	74.000	31.196	PK

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

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

Site: AC1	Time: 2017/07/04 - 05:52
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at Channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2459.032	82.989	51.859	N/A	N/A	31.130	AV
2			2483.500	47.600	16.407	-6.400	54.000	31.194	AV

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

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

| Site: AC1	Time: 2017/07/04 - 05:52
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at Channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2457.256	97.896	66.769	N/A	N/A	31.127	PK
2			2483.500	65.622	34.429	-8.378	74.000	31.194	PK
3			2483.536	66.419	35.226	-7.581	74.000	31.194	PK

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

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

| Site: AC1	Time: 2017/07/04 - 05:54
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at Channel 2462MHz	
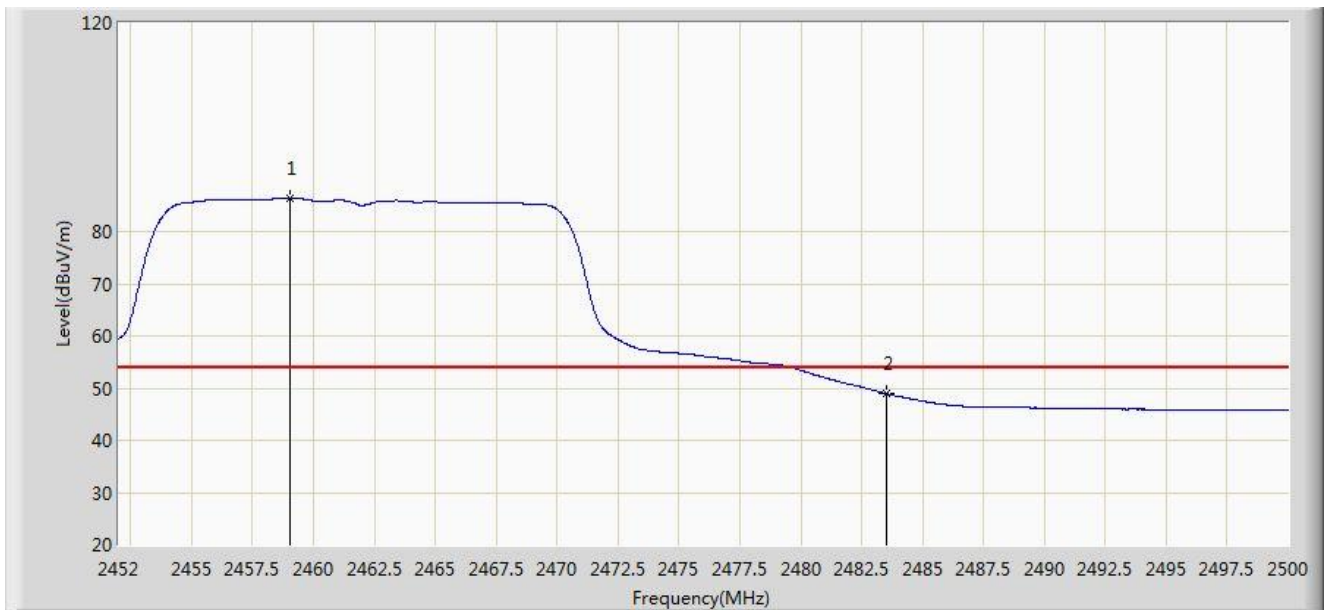
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2459.008	86.466	55.336	N/A	N/A	31.130	AV
2			2483.500	48.986	17.793	-5.014	54.000	31.194	AV

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

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

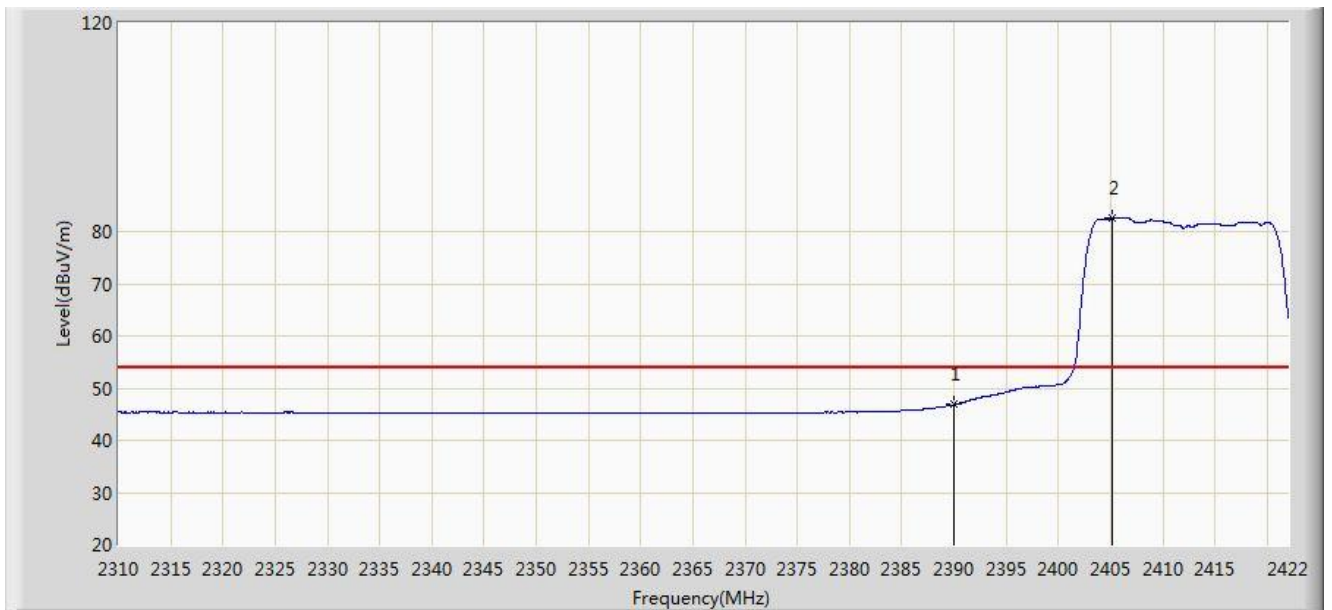| Site: AC1	Time: 2017/07/04 - 05:55
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at Channel 2412MHz	
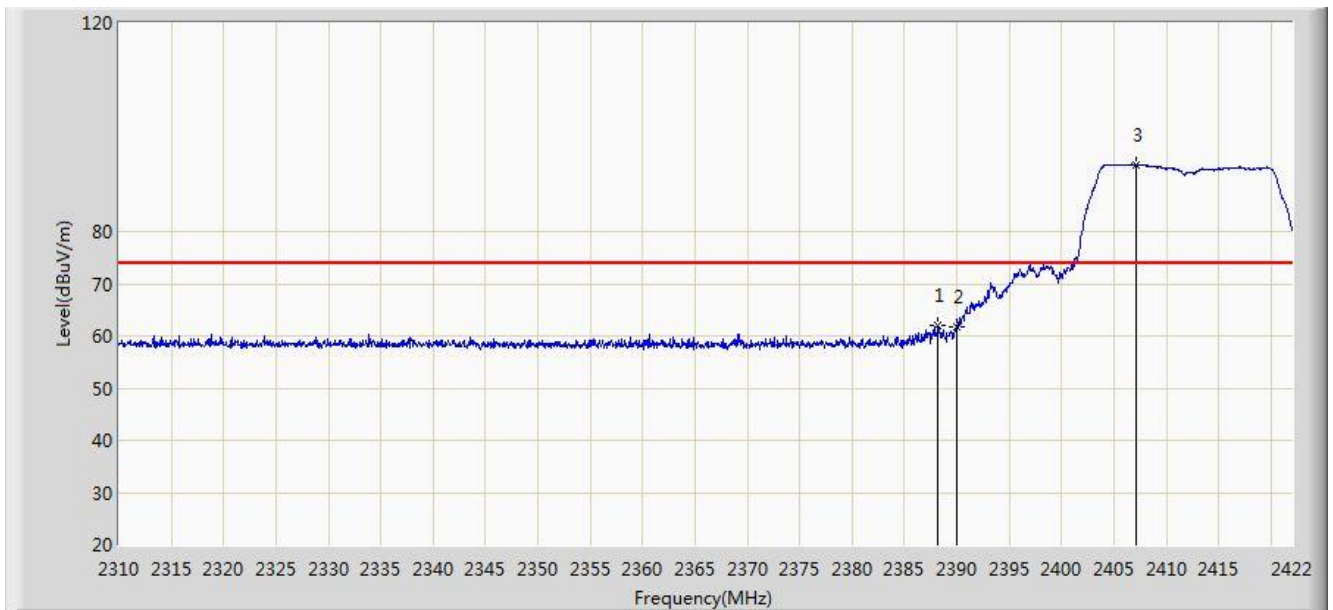
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2388.232	62.109	30.903	-11.891	74.000	31.206	PK
2			2390.000	61.632	30.429	-12.368	74.000	31.203	PK
3		*	2407.104	92.873	61.696	N/A	N/A	31.177	PK

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

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

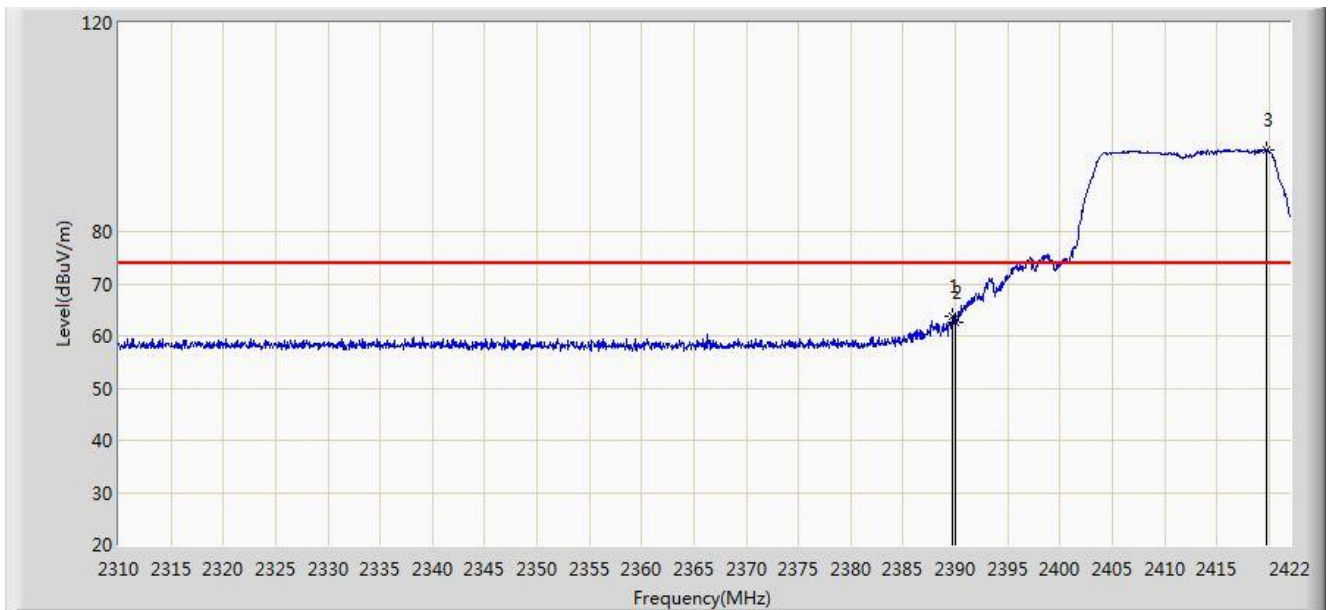| Site: AC1	Time: 2017/07/04 - 05:58
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at Channel 2412MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.829	15.626	-7.171	54.000	31.203	AV
2		*	2405.144	82.630	51.450	N/A	N/A	31.180	AV

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

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

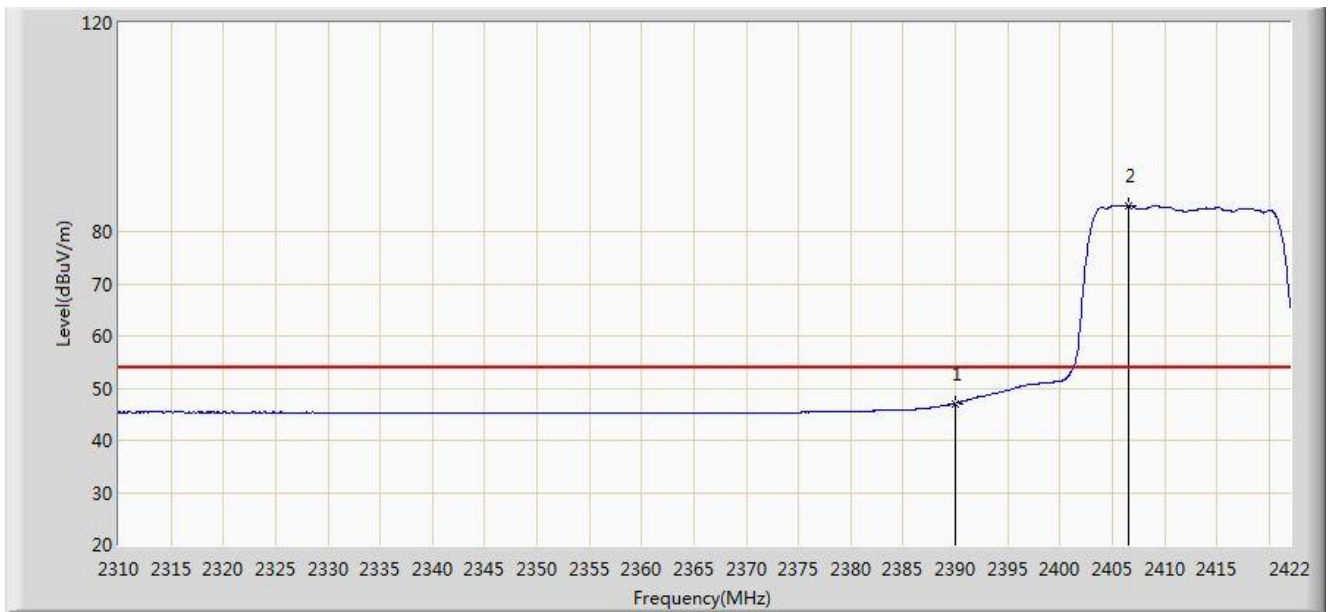| Site: AC1	Time: 2017/07/04 - 05:58
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at Channel 2412MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.744	63.706	32.503	-10.294	74.000	31.203	PK
2			2390.000	62.672	31.469	-11.328	74.000	31.203	PK
3		*	2419.704	95.671	64.515	N/A	N/A	31.157	PK

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

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

Site: AC1	Time: 2017/07/04 - 06:00
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at Channel 2412MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	47.044	15.841	-6.956	54.000	31.203	AV
2		*	2406.600	84.999	53.821	N/A	N/A	31.177	AV

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

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

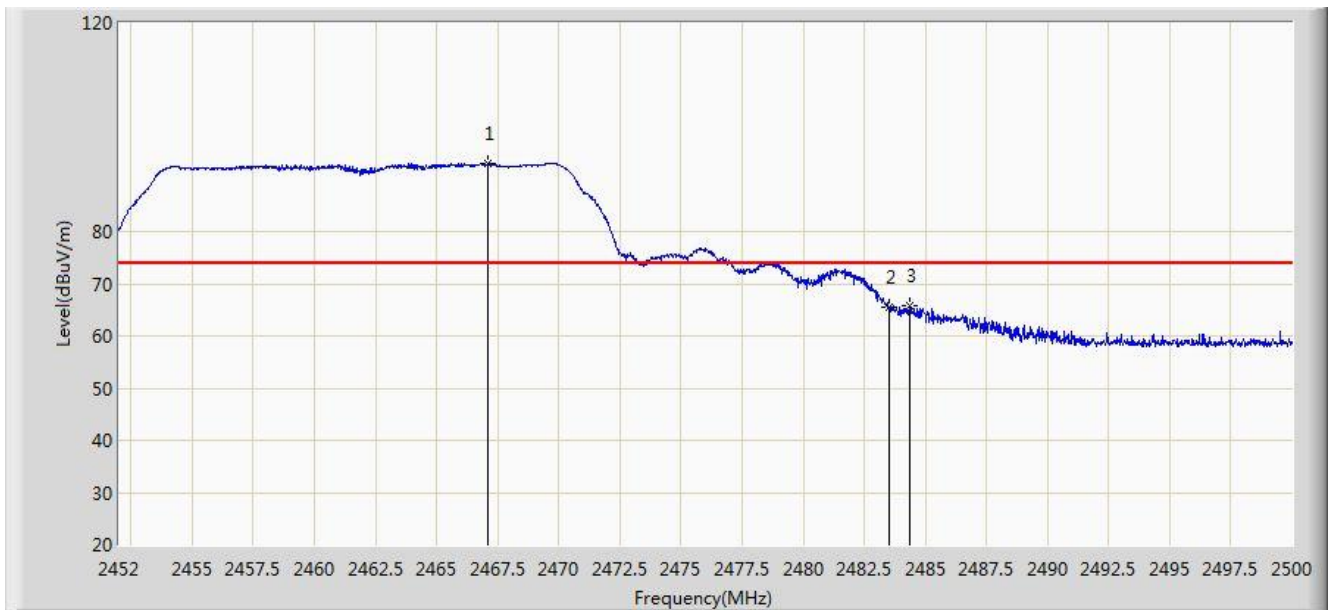| Site: AC1	Time: 2017/07/04 - 06:00
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at Channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2467.072	93.043	61.895	N/A	N/A	31.148	PK
2			2483.500	65.511	34.318	-8.489	74.000	31.194	PK
3			2484.352	65.799	34.603	-8.201	74.000	31.195	PK

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

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

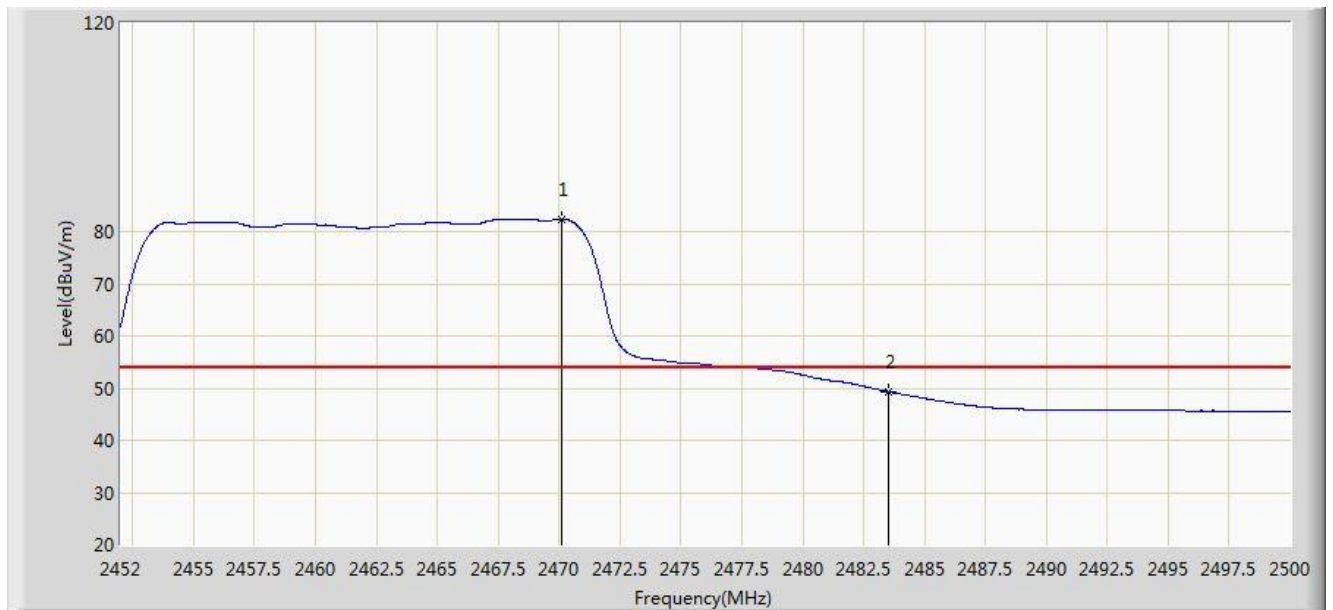| Site: AC1	Time: 2017/07/04 - 06:03
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at Channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2470.096	82.454	51.298	N/A	N/A	31.156	AV
2			2483.500	49.327	18.134	-4.673	54.000	31.194	AV

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

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

| Site: AC1	Time: 2017/07/04 - 06:03
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at Channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2458.865	96.726	65.596	N/A	N/A	31.130	PK
2			2483.500	67.964	36.771	-6.036	74.000	31.194	PK
3			2483.656	68.751	37.557	-5.249	74.000	31.194	PK

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

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

Site: AC1	Time: 2017/07/04 - 06:04
Limit: FCC_Part15.209_RE(3m)	Engineer: Bruce Wang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11n-HT20 at Channel 2462MHz	
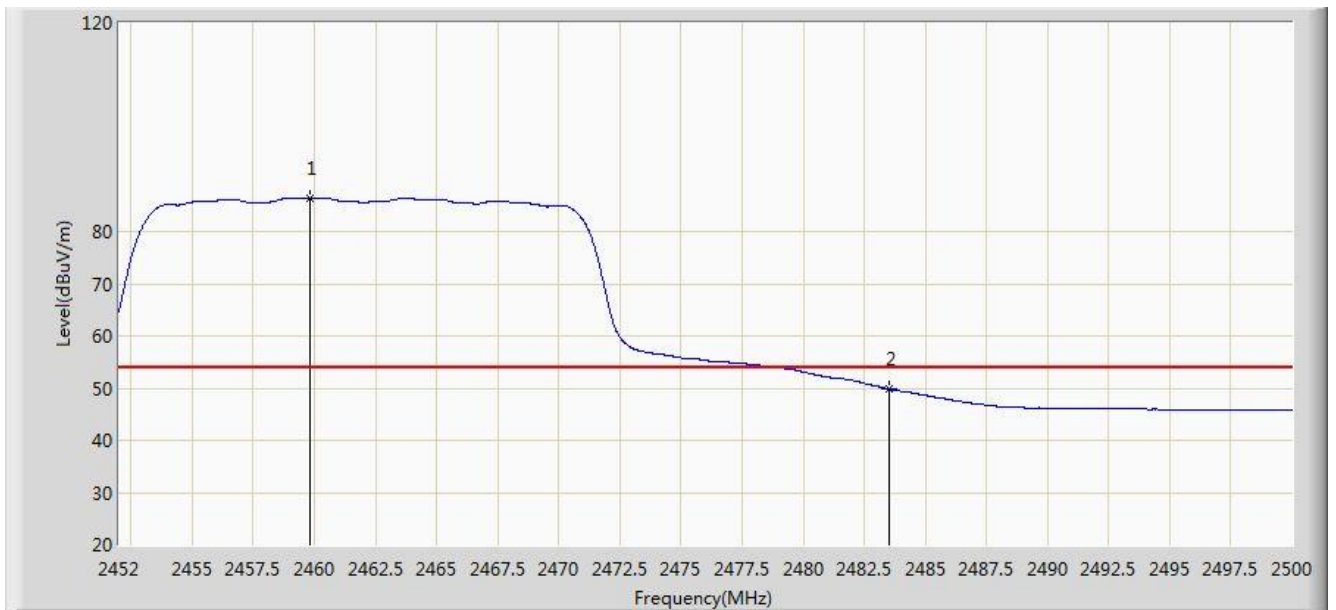
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2459.800	86.389	55.258	N/A	N/A	31.131	AV
2			2483.500	49.861	18.668	-4.139	54.000	31.194	AV

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

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)
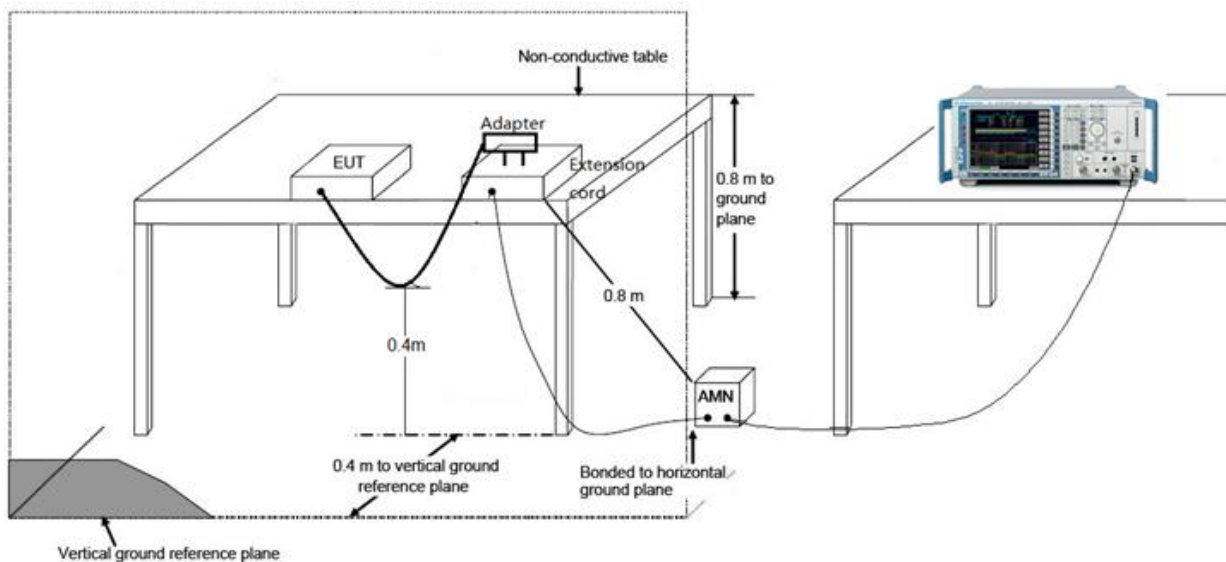
7.8. AC Conducted Emissions Measurement

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.

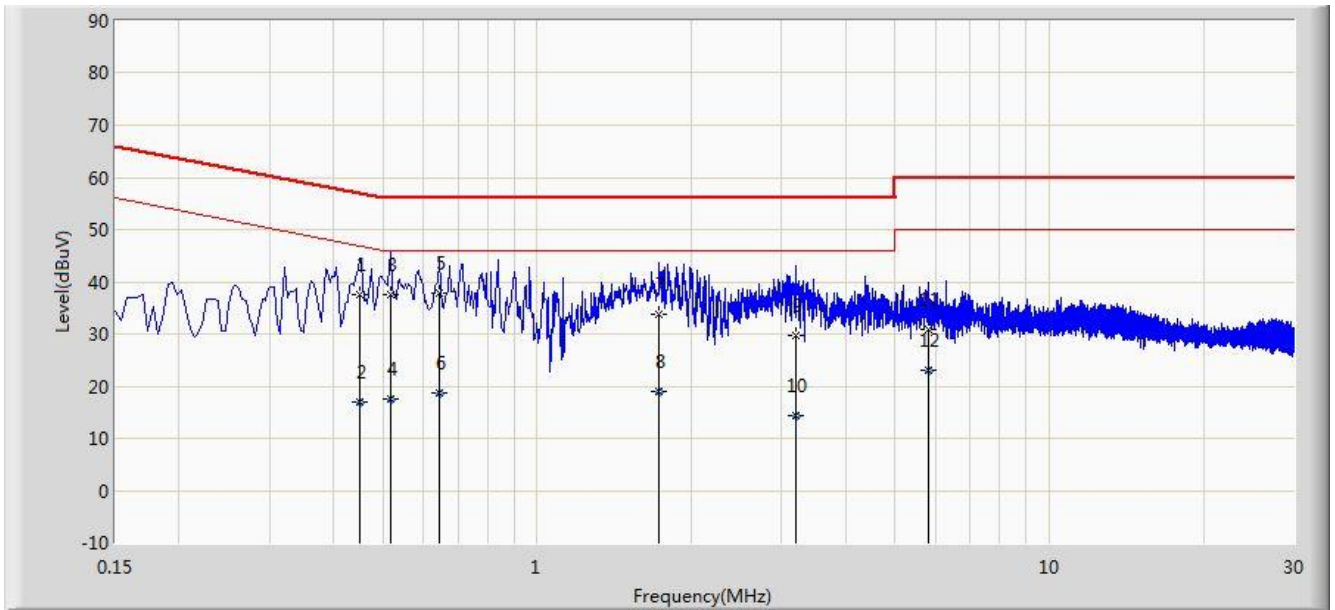Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

7.8.2. Test Setup

7.8.3.Test Result

| Site: SR2	Time: 2017/07/03 - 15:50
Limit: FCC_Part15.207_CE_AC Power	Engineer: Bacon Dong
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Mode 1	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.450	37.570	27.444	-19.305	56.875	10.126	QP
2			0.450	16.880	6.753	-29.996	46.875	10.126	AV
3			0.518	37.650	27.494	-18.350	56.000	10.156	QP
4			0.518	17.596	7.440	-28.404	46.000	10.156	AV
5		*	0.646	37.740	27.649	-18.260	56.000	10.091	QP
6			0.646	18.615	8.524	-27.385	46.000	10.091	AV
7			1.730	33.765	23.885	-22.235	56.000	9.880	QP
8			1.730	19.127	9.247	-26.873	46.000	9.880	AV
9			3.194	29.814	19.949	-26.186	56.000	9.866	QP
10			3.194	14.479	4.614	-31.521	46.000	9.866	AV
11			5.786	30.876	20.777	-29.124	60.000	10.099	QP
12			5.786	23.039	12.940	-26.961	50.000	10.099	AV

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

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

Site: SR2	Time: 2017/07/03 - 15:54
Limit: FCC_Part15.207_CE_AC Power	Engineer: Bacon Dong
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: WI-FI Smart Plug	Power: AC 120V/60Hz
Test Mode: Mode 1	
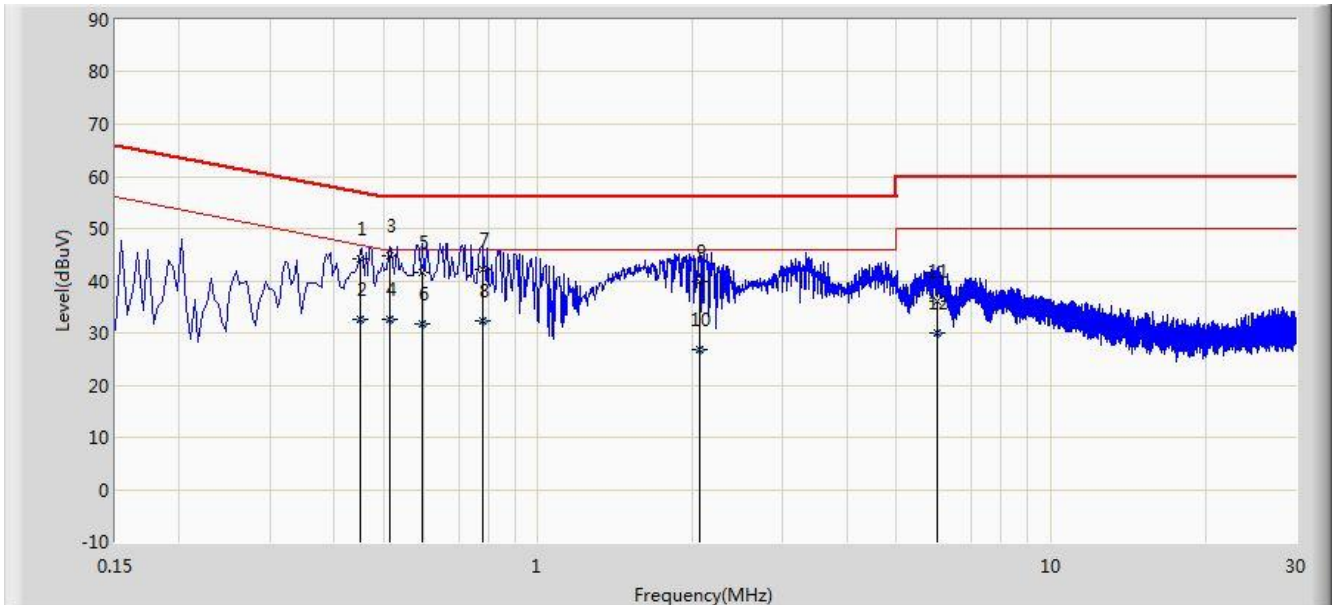
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.450	44.306	34.156	-12.569	56.875	10.150	QP
2			0.450	32.638	22.488	-14.237	46.875	10.150	AV
3		*	0.514	44.685	34.509	-11.315	56.000	10.176	QP
4			0.514	32.580	22.404	-13.420	46.000	10.176	AV
5			0.594	41.667	31.532	-14.333	56.000	10.134	QP
6			0.594	31.758	21.623	-14.242	46.000	10.134	AV
7			0.778	42.210	32.178	-13.790	56.000	10.032	QP
8			0.778	32.183	22.151	-13.817	46.000	10.032	AV
9			2.070	39.730	29.858	-16.270	56.000	9.872	QP
10			2.070	26.812	16.939	-19.188	46.000	9.872	AV
11			5.994	36.132	25.999	-23.868	60.000	10.133	QP
12			5.994	29.932	19.799	-20.068	50.000	10.133	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 **WI-FI Smart Plug FCC ID:**

VBA-EF311WFUL is in compliance with Part 15C of the FCC Rules and IC Rule.

———————— The End ————————