

802.11g Out-of-Band Emissions

Channel 01 (2412MHz)

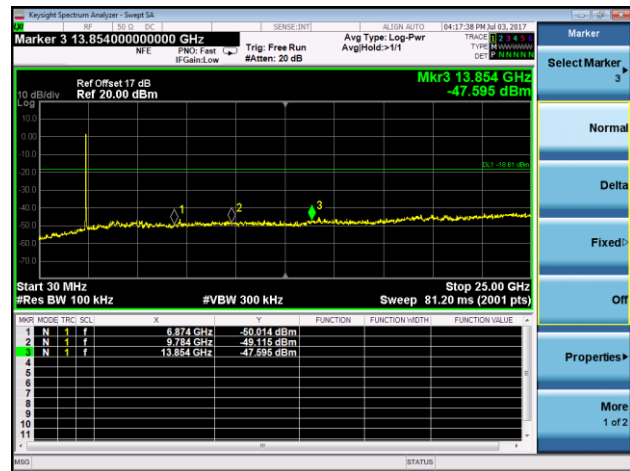
100kHz PSD reference Level



Low Band Edge



Spurious Emission

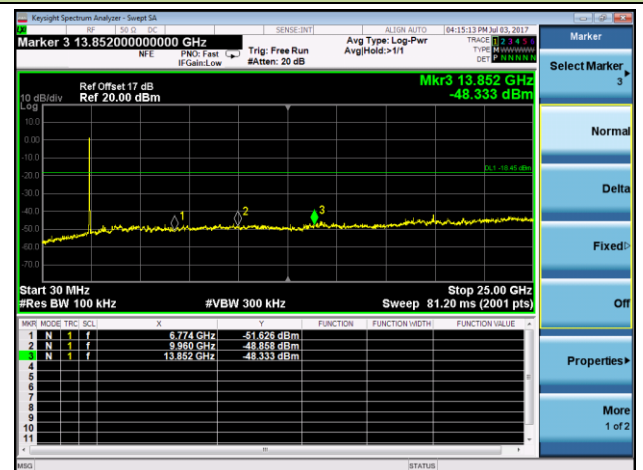


Channel 06 (2437MHz)

100kHz PSD reference Level



Spurious Emission



Channel 11 (2462MHz)

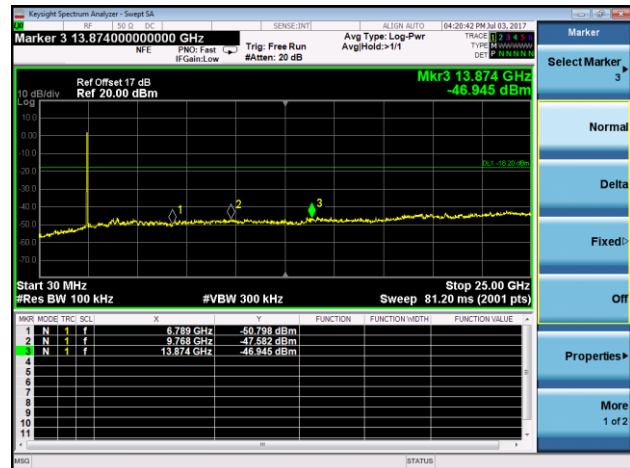
100kHz PSD reference Level



High Band Edge



Spurious Emission



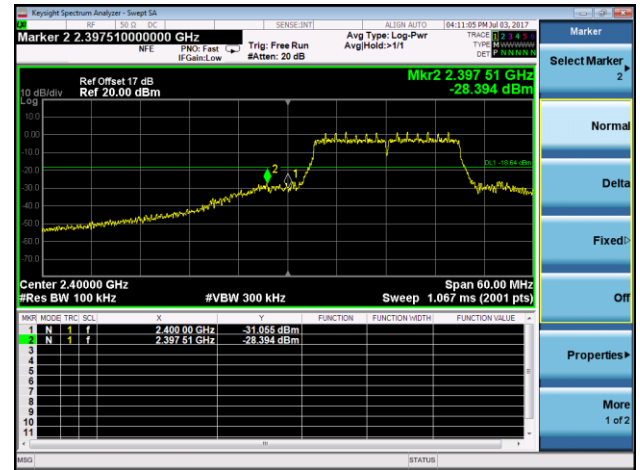
802.11n-HT20 Out-of-Band Emissions

Channel 01 (2412MHz)

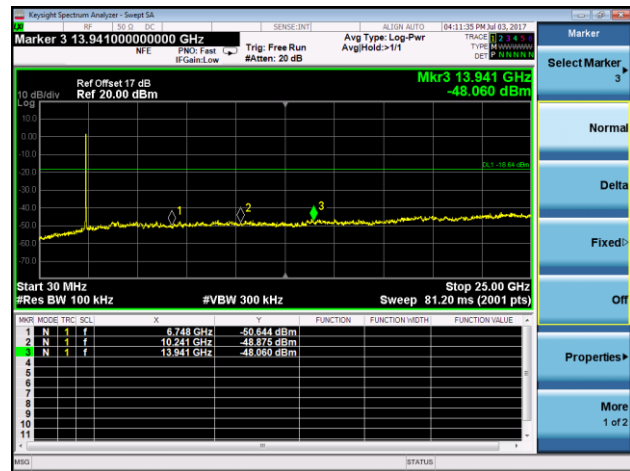
100kHz PSD reference Level



Low Band Edge

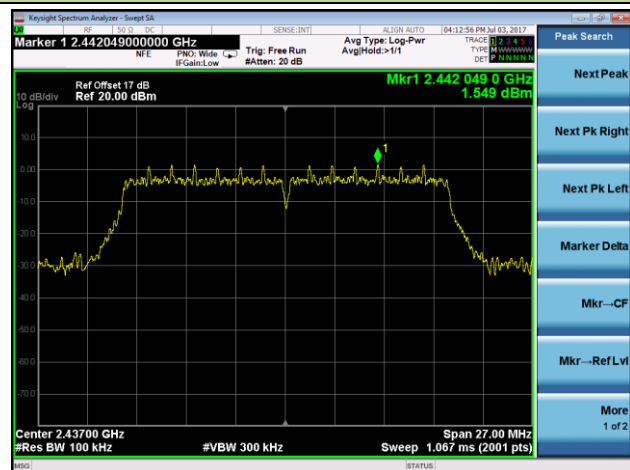


Spurious Emission

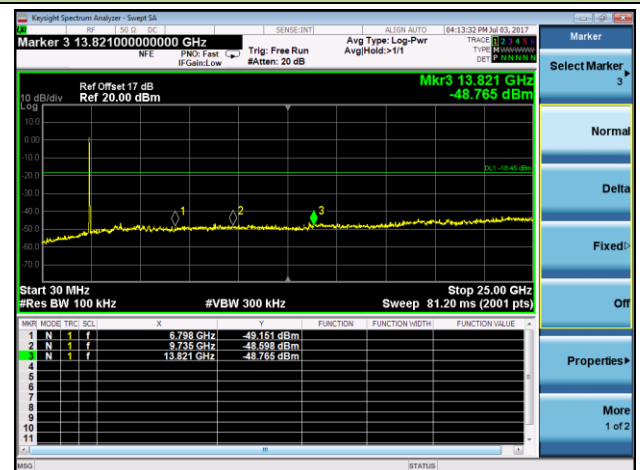


Channel 06 (2437MHz)

100kHz PSD reference Level

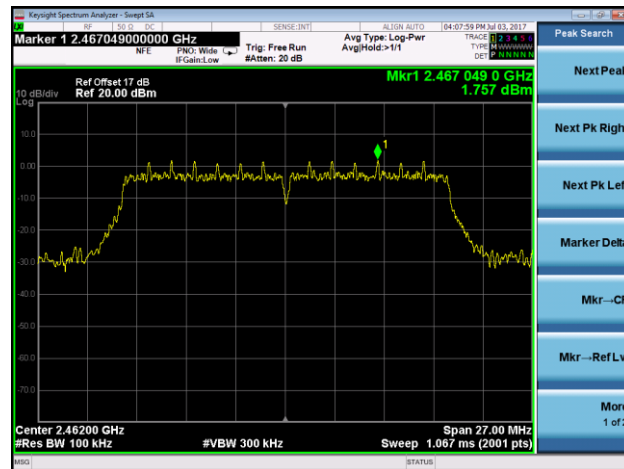


Spurious Emission



Channel 11 (2462MHz)

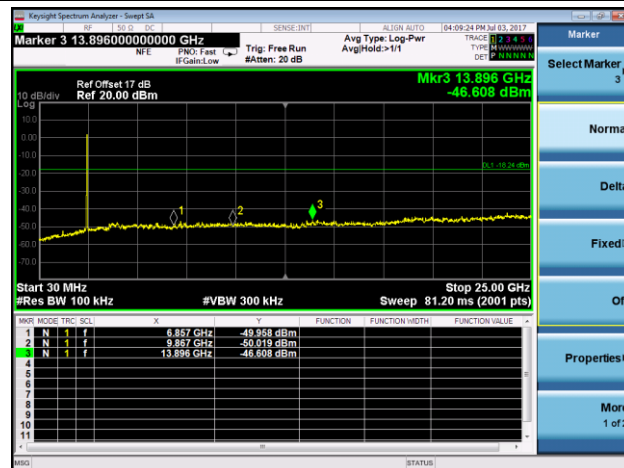
100kHz PSD reference Level



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 $\geq 1/T$

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

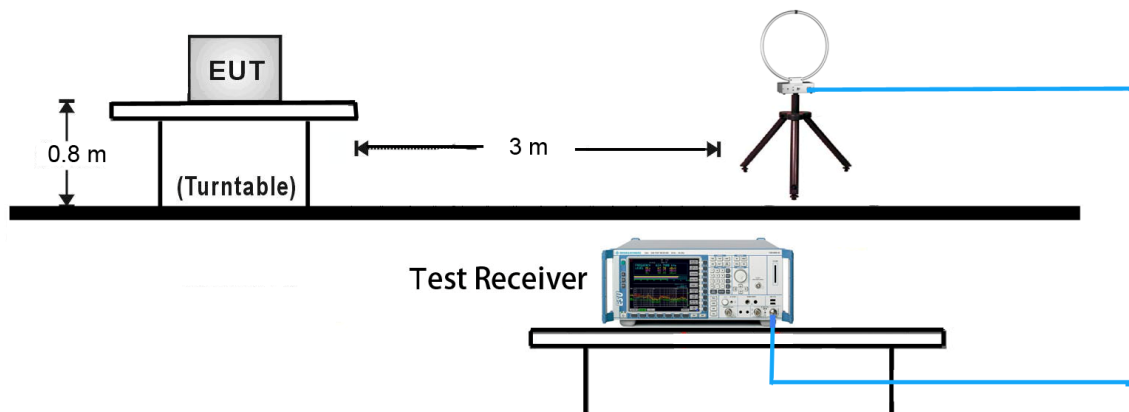
Sweep time = auto

Trace mode = max hold

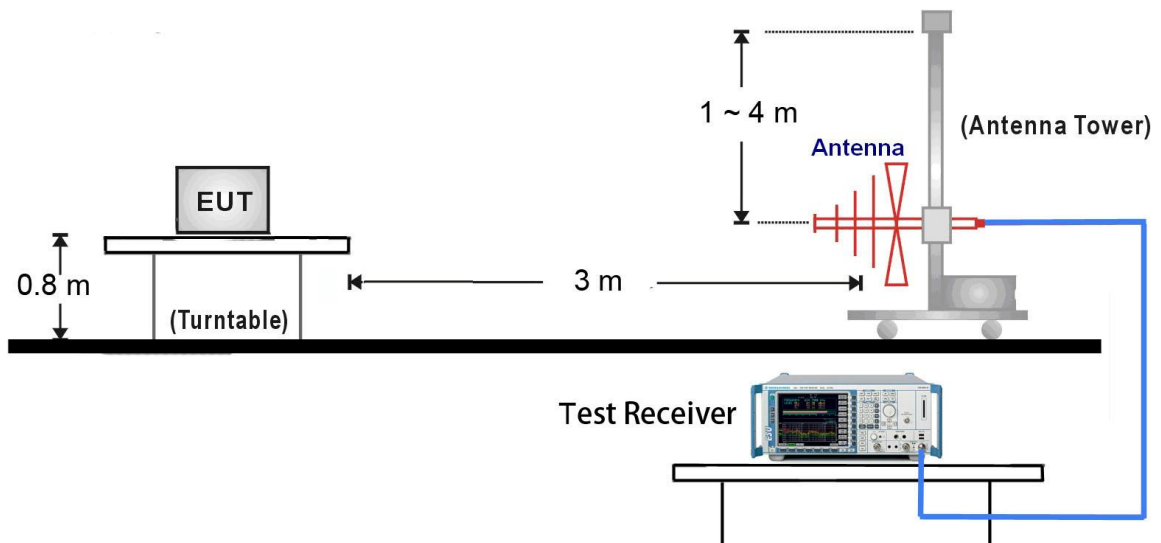
Allow max hold to run for at least 50 times (1/duty cycle) traces

7.6.4.Test Setup

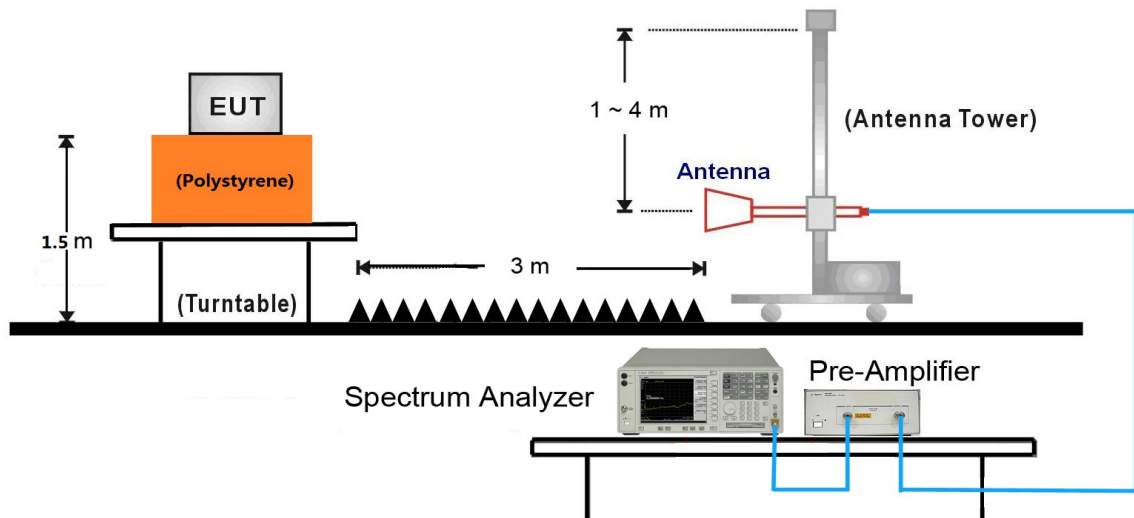
9kHz ~ 30MHz Test Setup:



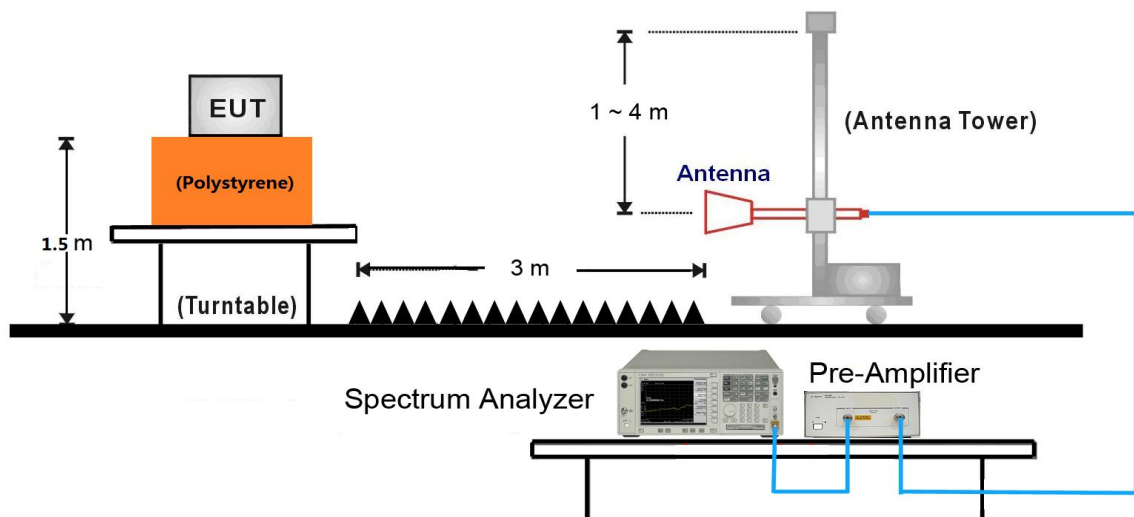
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:



18GHz ~25GHz Test Setup:



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

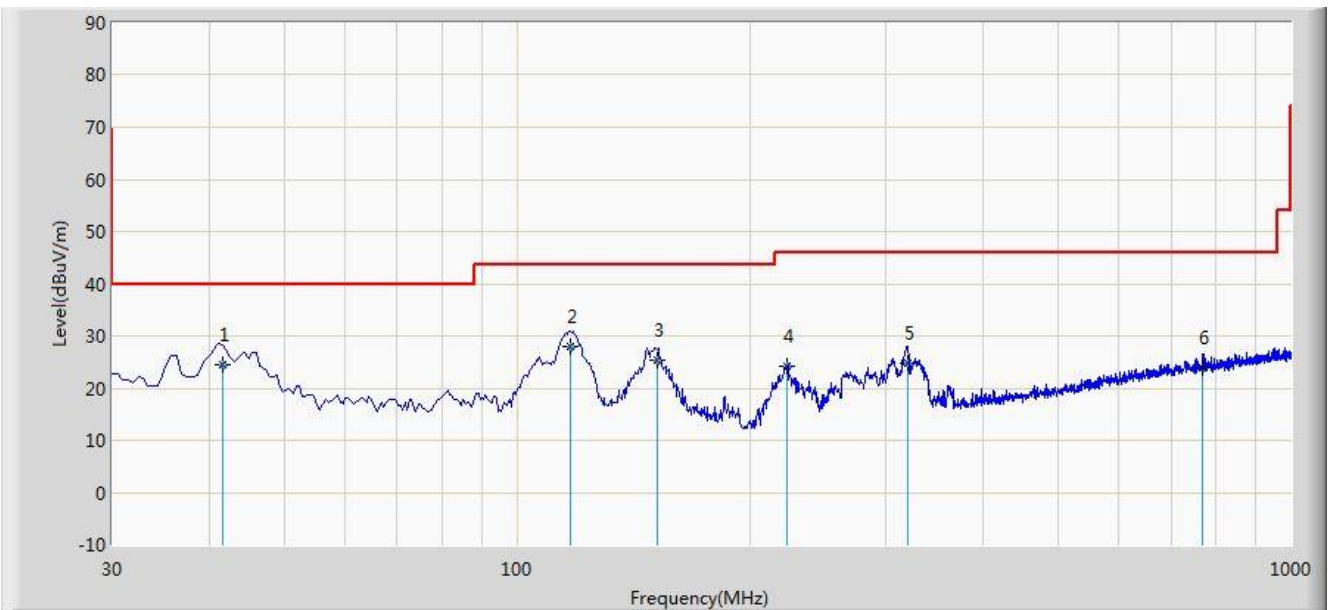
Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (96.7dBμV/m) or 15.209 which is higher.

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.	



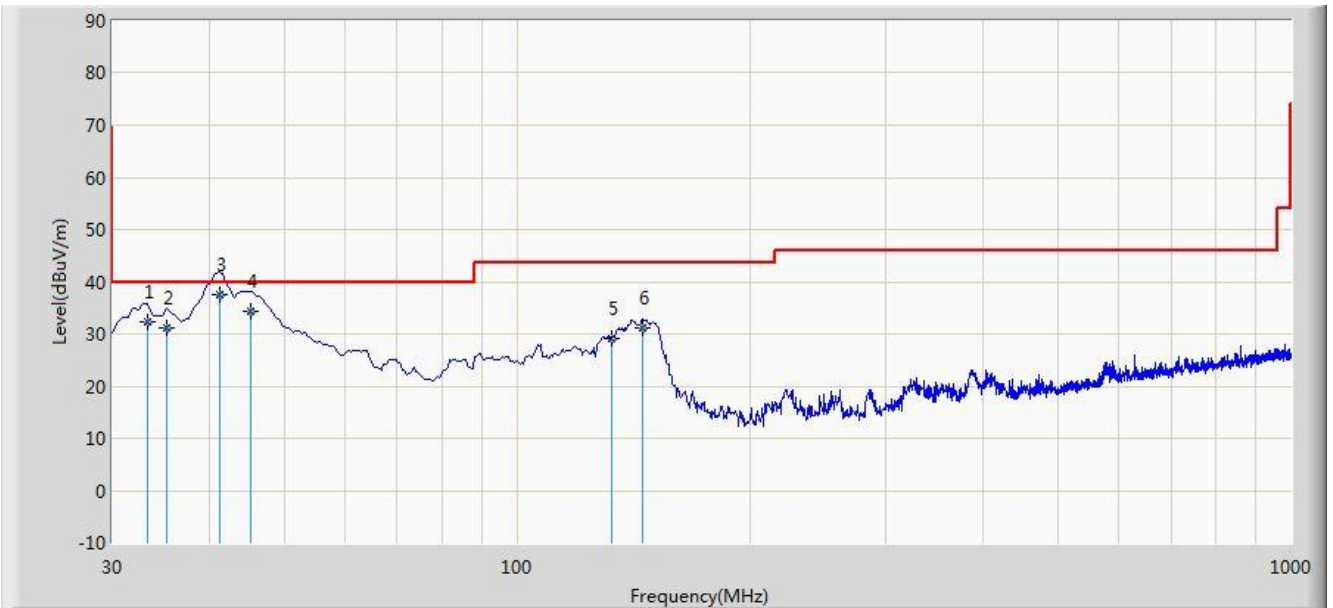
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			41.640	24.567	10.140	-15.433	40.000	14.427	QP
2		*	117.250	28.083	15.260	-15.417	43.500	12.823	QP
3			152.140	25.398	10.210	-18.102	43.500	15.188	QP
4			223.150	24.109	12.010	-21.891	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 (dBuV/m) = Reading Level (dBuV) + Factor (dB)

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

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

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

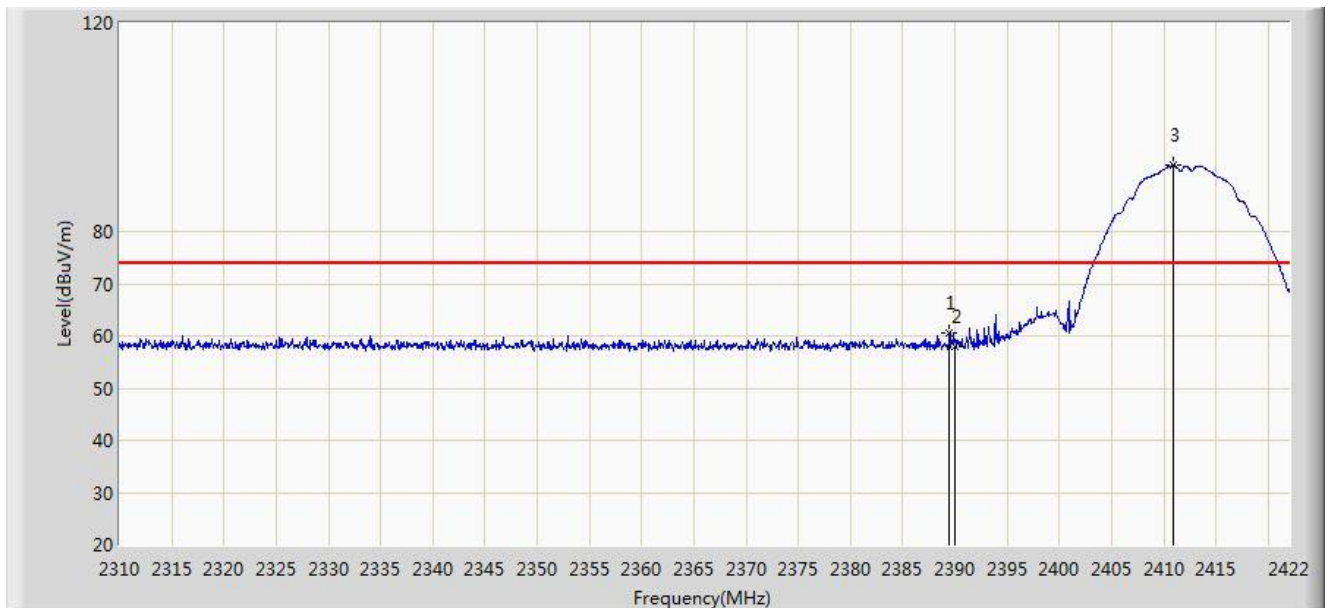
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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

7.7. 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	

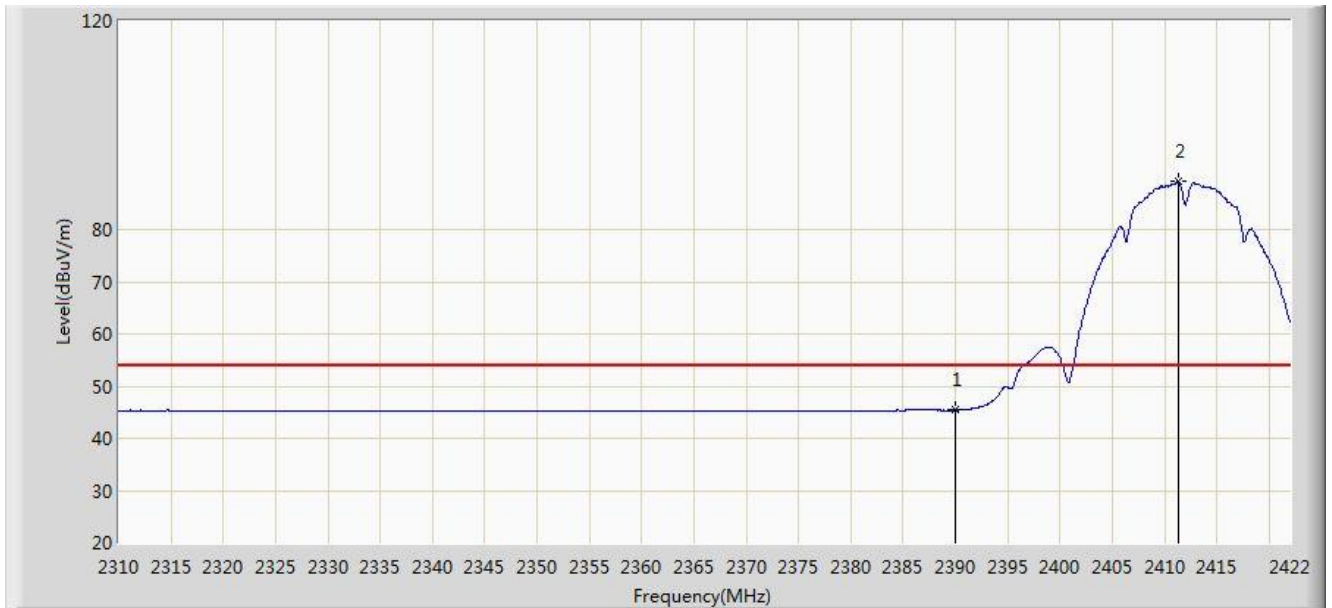


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.464	60.610	29.406	-13.390	74.000	31.204	PK
2			2390.000	58.037	26.834	-15.963	74.000	31.203	PK
3		*	2410.912	92.700	61.529	N/A	N/A	31.171	PK

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	

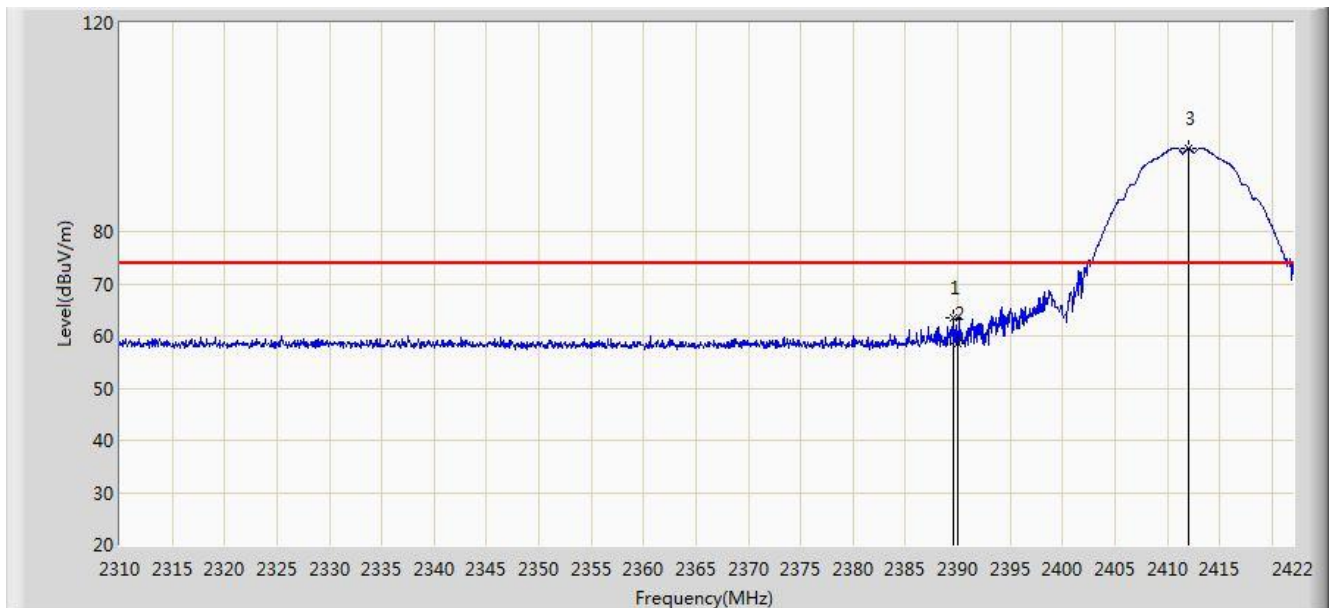


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	45.380	14.177	-8.620	54.000	31.203	AV
2		*	2411.304	89.190	58.019	N/A	N/A	31.171	AV

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

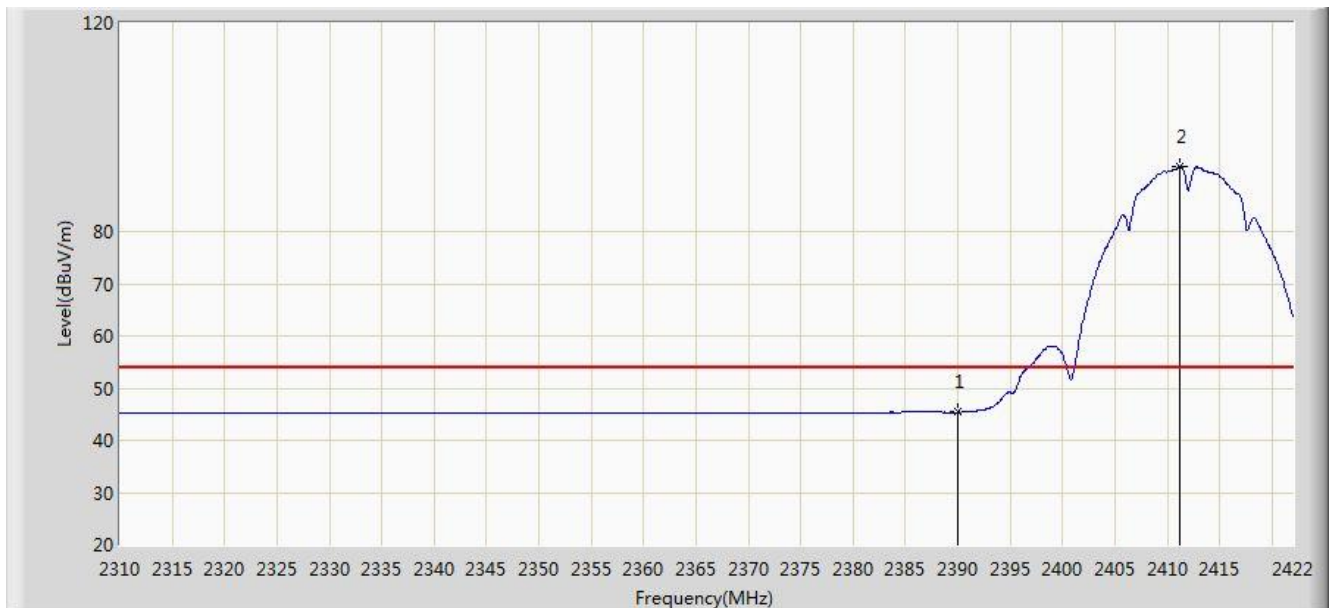


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.632	63.526	32.323	-10.474	74.000	31.204	PK
2			2390.000	58.657	27.454	-15.343	74.000	31.203	PK
3		*	2411.976	96.055	64.885	N/A	N/A	31.170	PK

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	

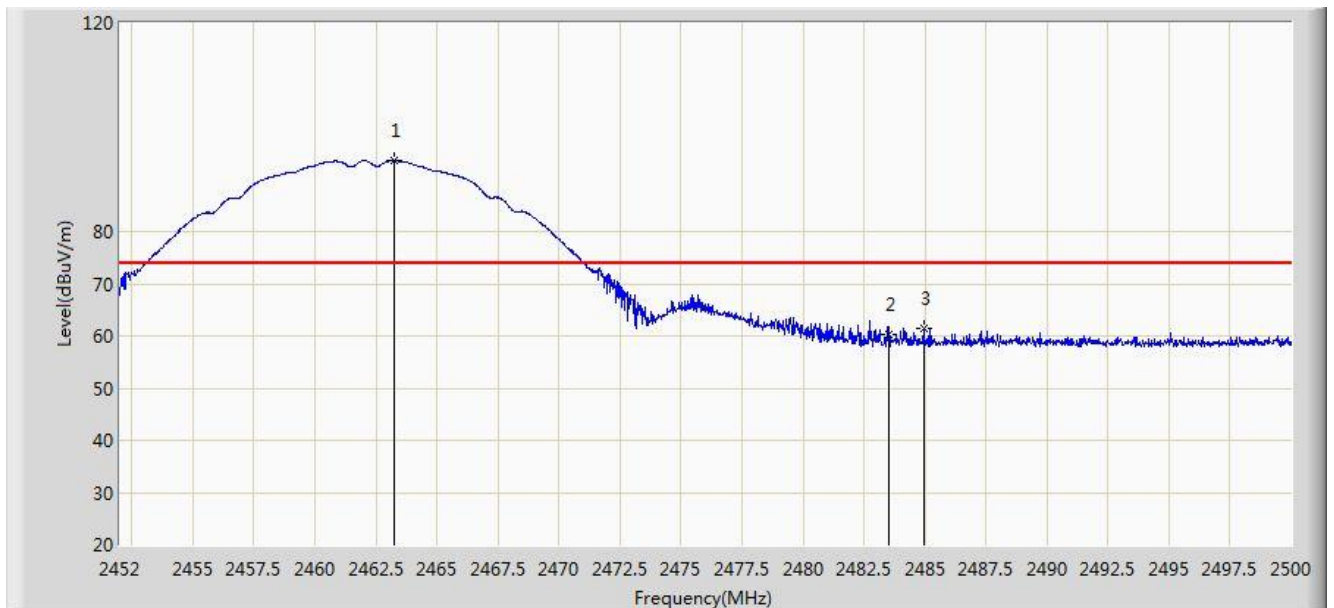


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	45.365	14.162	-8.635	54.000	31.203	AV
2		*	2411.248	92.589	61.418	N/A	N/A	31.171	AV

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

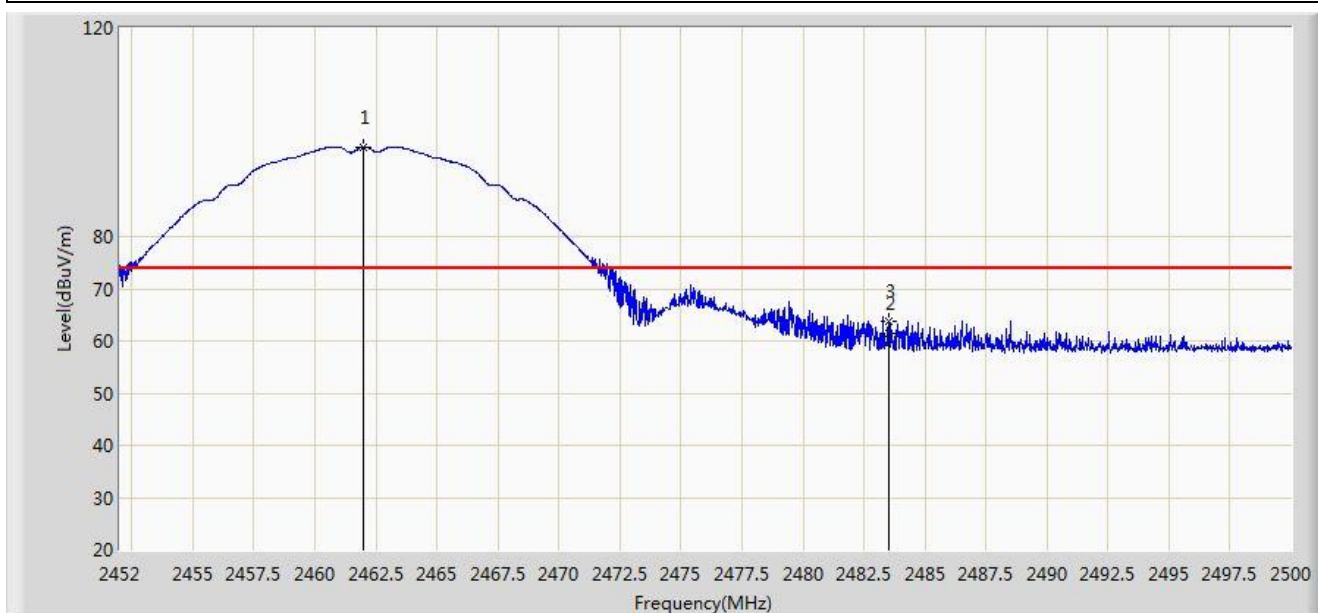


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.240	90.041	58.907	N/A	N/A	31.134	AV
2			2483.500	45.527	14.334	-8.473	54.000	31.194	AV

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	

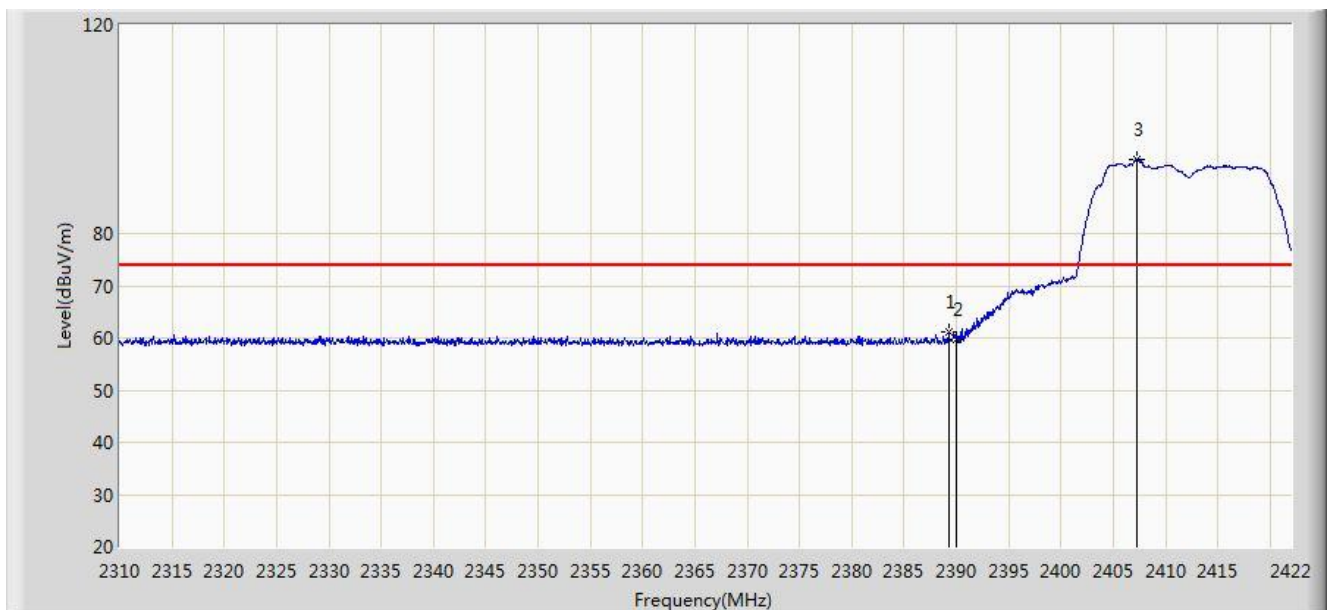


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.240	93.756	62.622	N/A	N/A	31.134	AV
2			2483.500	45.561	14.368	-8.439	54.000	31.194	AV

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

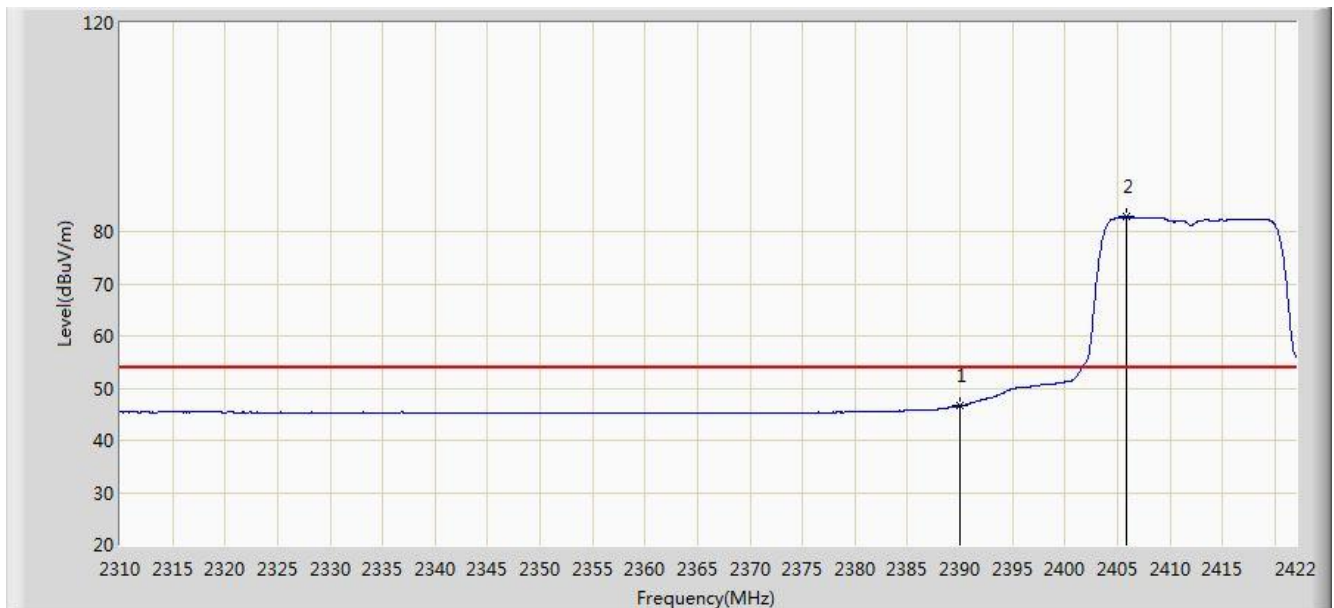


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.240	61.259	30.055	-12.741	74.000	31.204	PK
2			2390.000	59.848	28.645	-14.152	74.000	31.203	PK
3		*	2407.272	94.303	63.126	N/A	N/A	31.177	PK

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	

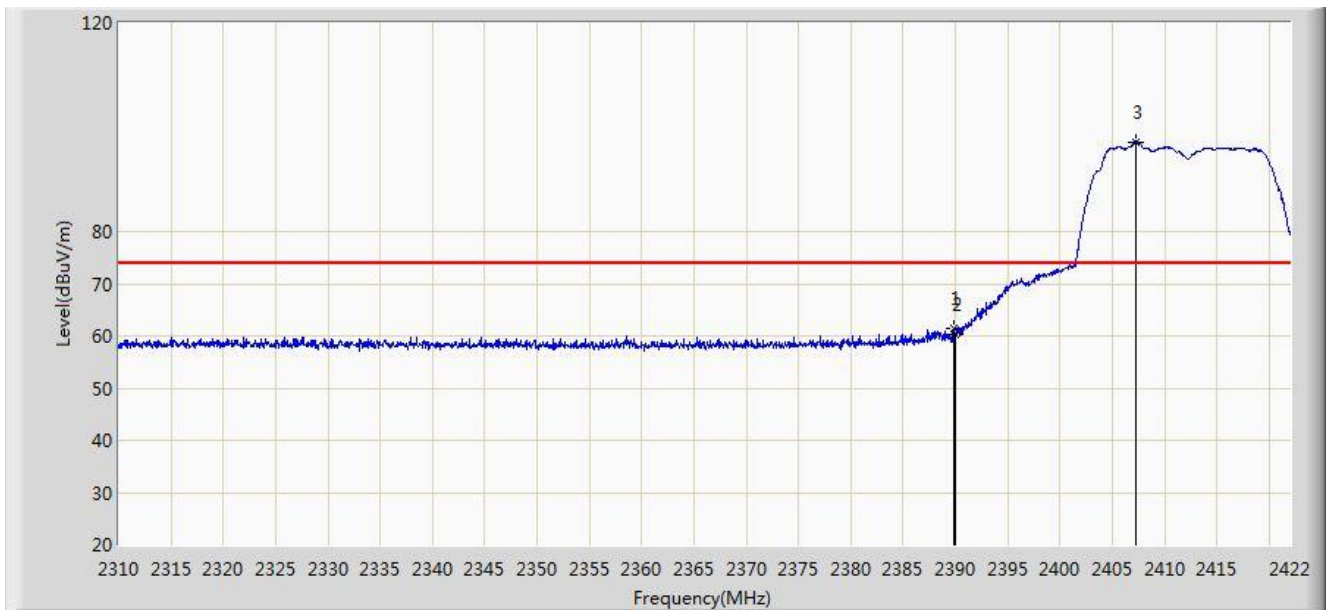


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.618	15.415	-7.382	54.000	31.203	AV
2		*	2405.816	82.823	51.644	N/A	N/A	31.179	AV

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

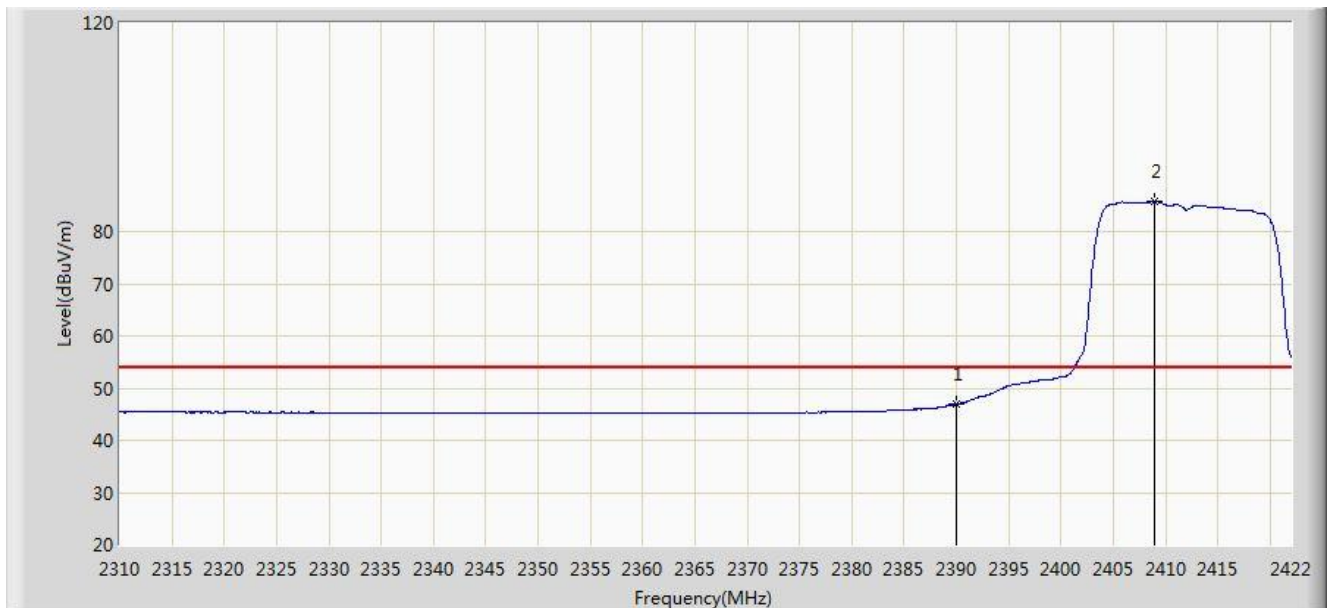


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.856	61.351	30.148	-12.649	74.000	31.203	PK
2			2390.000	60.332	29.129	-13.668	74.000	31.203	PK
3		*	2407.272	97.242	66.065	N/A	N/A	31.177	PK

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	

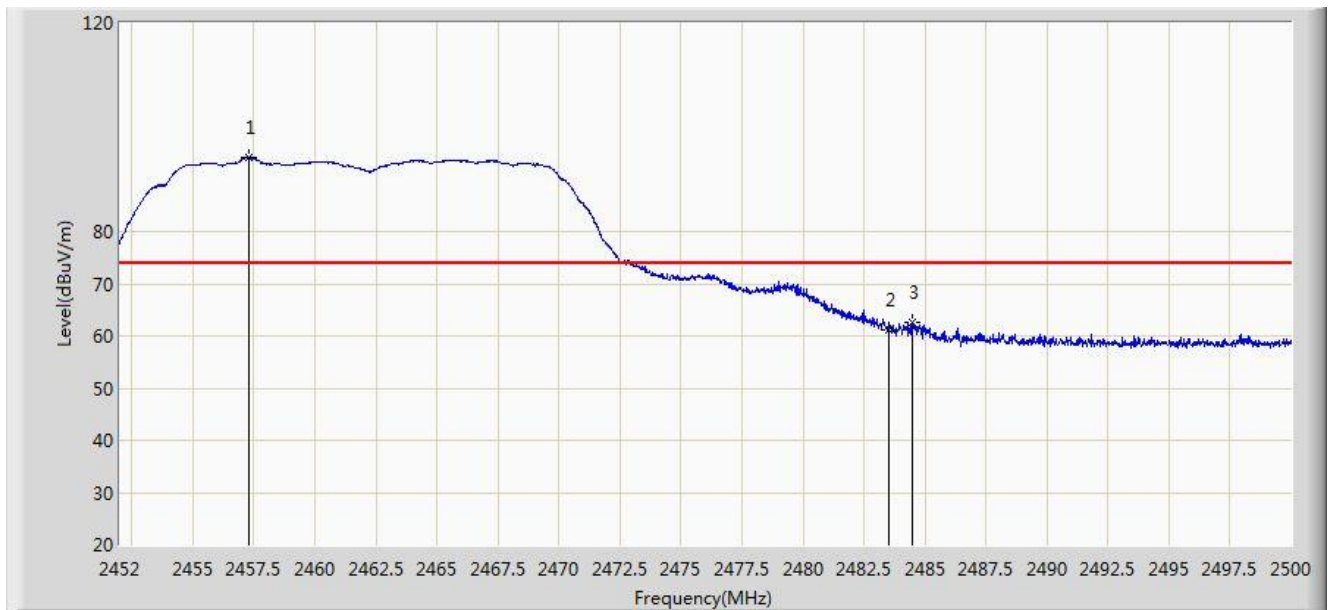


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.899	15.696	-7.101	54.000	31.203	AV
2		*	2409.008	85.771	54.597	N/A	N/A	31.174	AV

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

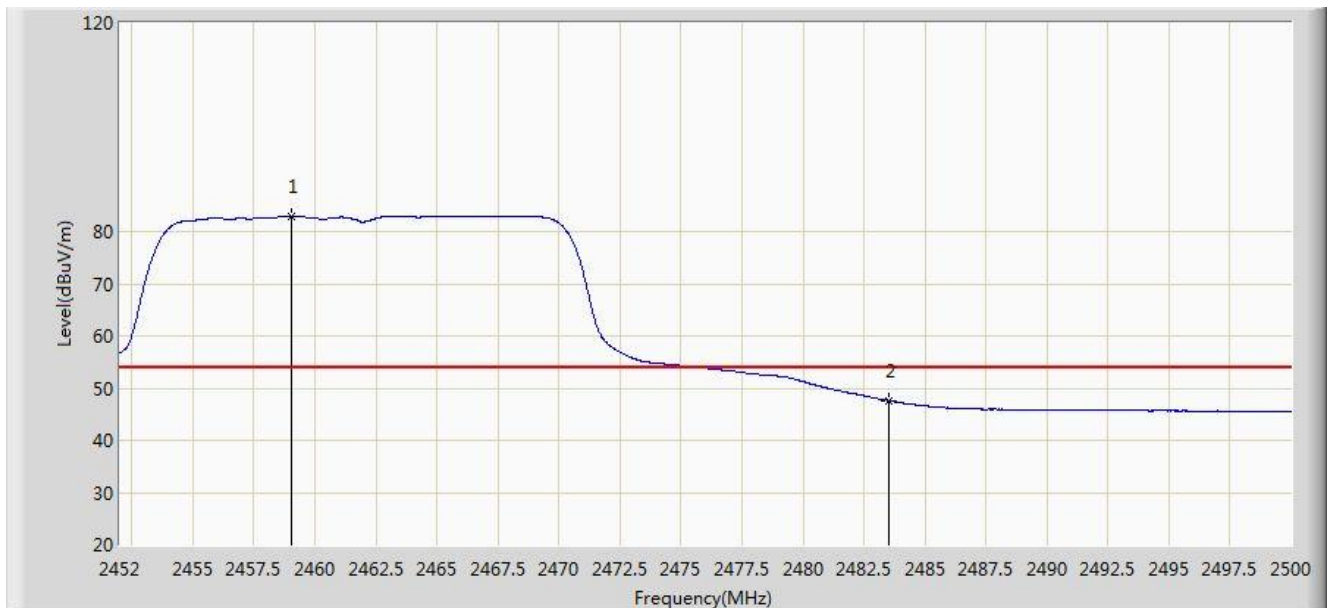


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2457.280	94.219	63.092	N/A	N/A	31.127	PK
2			2483.500	61.245	30.052	-12.755	74.000	31.194	PK
3			2484.472	62.566	31.370	-11.434	74.000	31.196	PK

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 (dBuV/m) = Reading Level (dBuV) + 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	

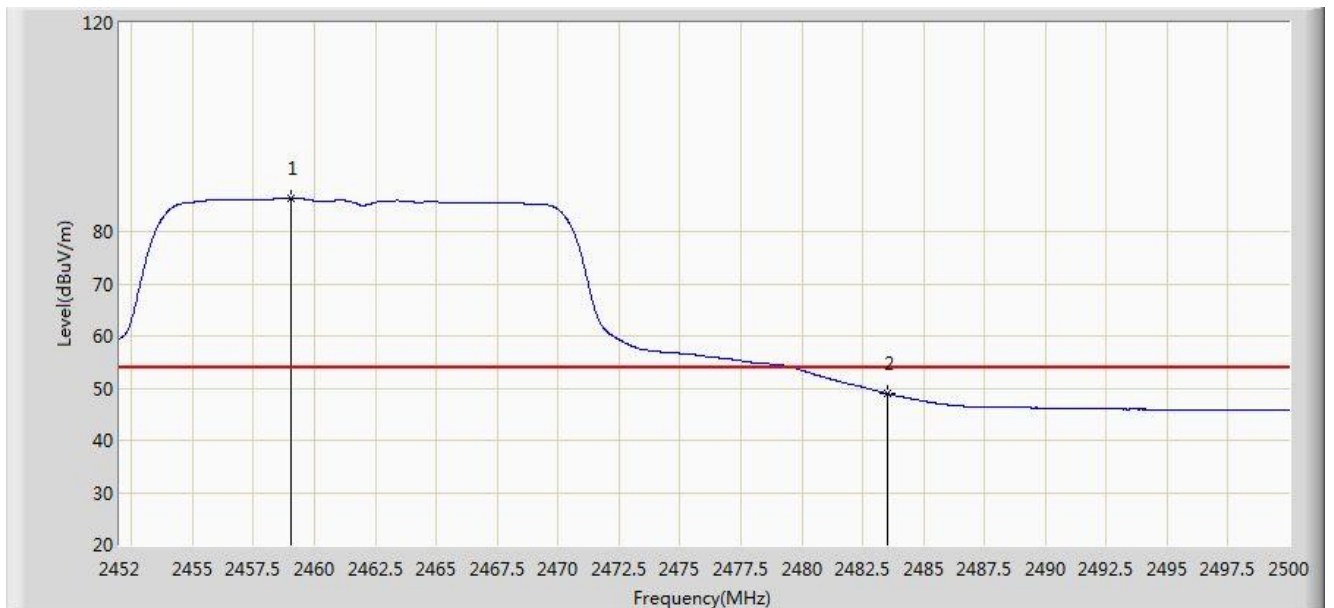


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2457.256	97.896	66.769	N/A	N/A	31.127	PK
2			2483.500	65.622	34.429	-8.378	74.000	31.194	PK
3			2483.536	66.419	35.226	-7.581	74.000	31.194	PK

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	

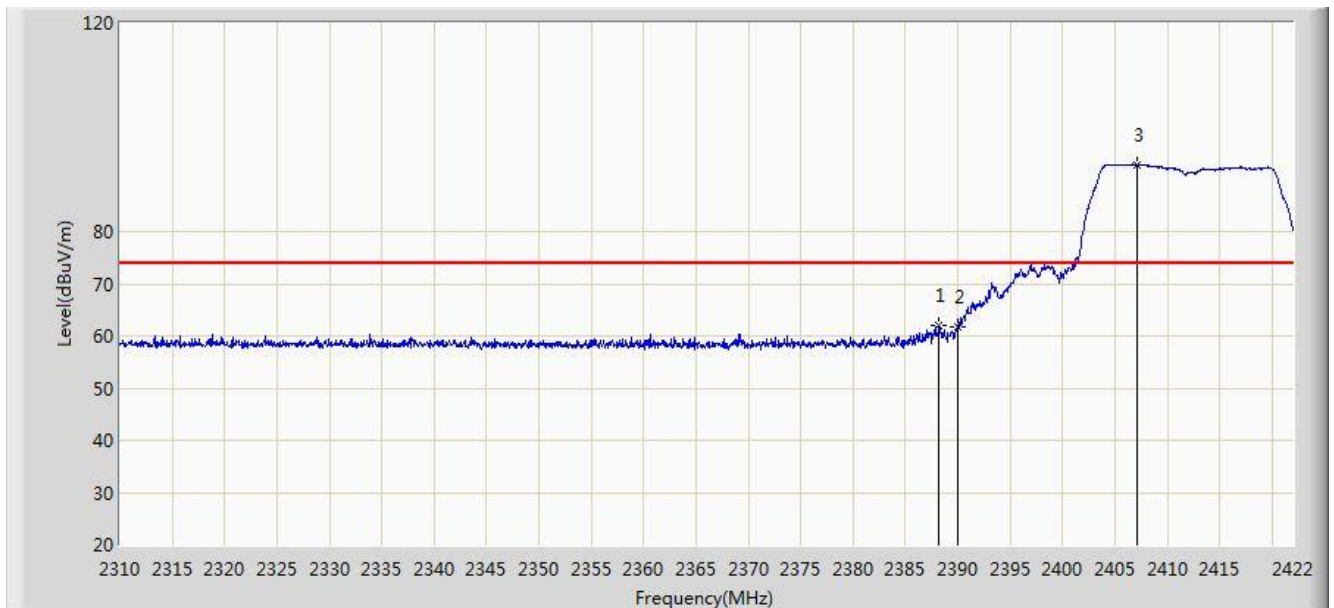


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2459.008	86.466	55.336	N/A	N/A	31.130	AV
2			2483.500	48.986	17.793	-5.014	54.000	31.194	AV

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

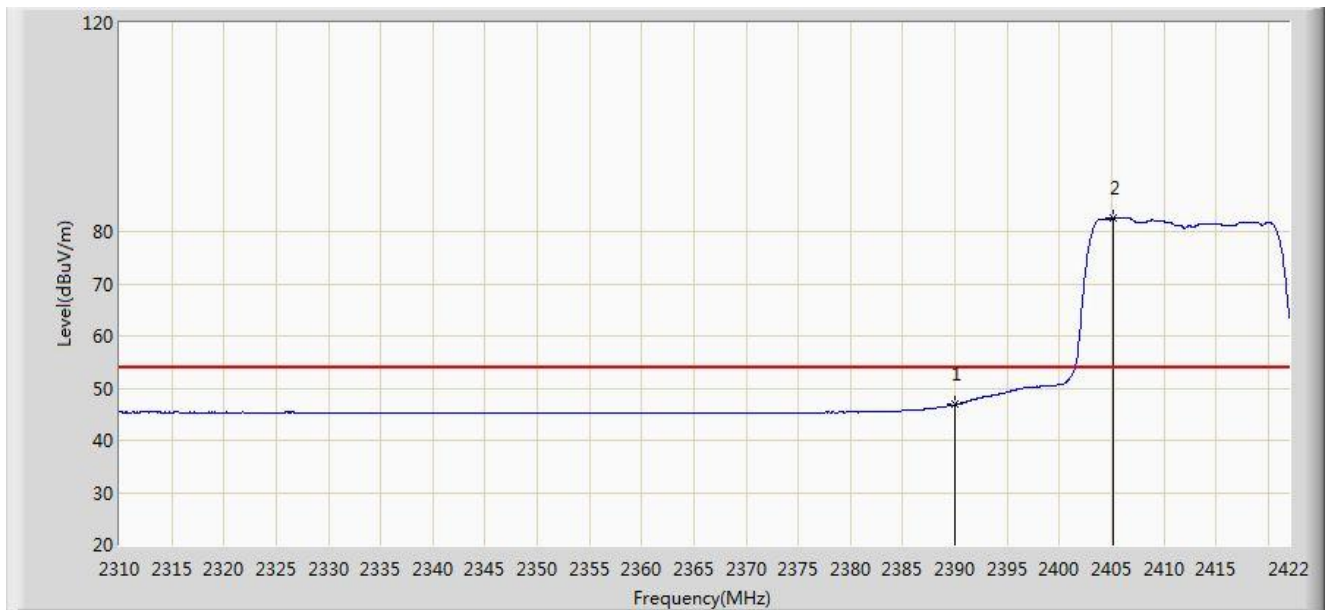


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2388.232	62.109	30.903	-11.891	74.000	31.206	PK
2			2390.000	61.632	30.429	-12.368	74.000	31.203	PK
3		*	2407.104	92.873	61.696	N/A	N/A	31.177	PK

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	

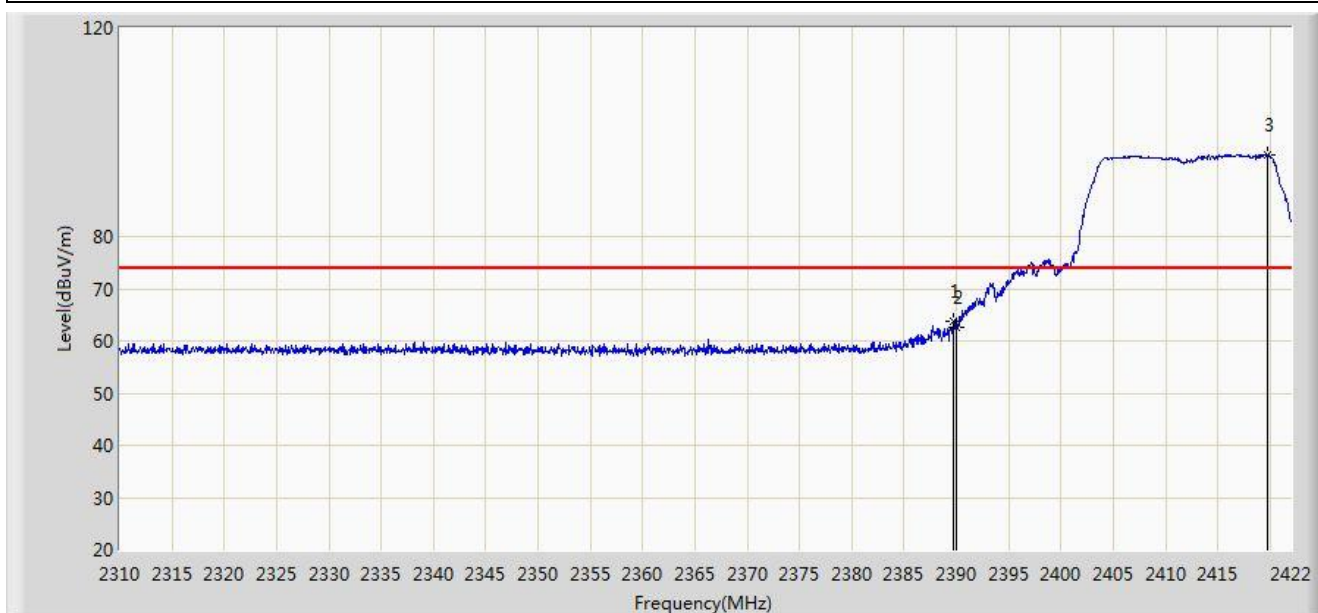


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.829	15.626	-7.171	54.000	31.203	AV
2		*	2405.144	82.630	51.450	N/A	N/A	31.180	AV

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

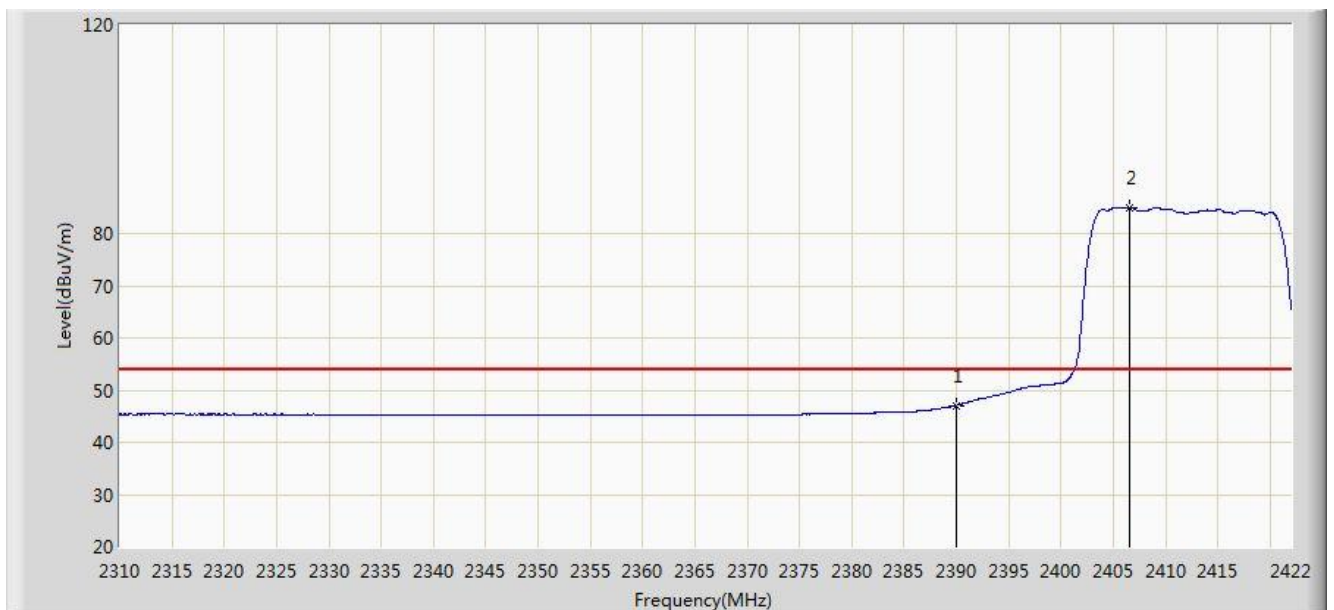


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.744	63.706	32.503	-10.294	74.000	31.203	PK
2			2390.000	62.672	31.469	-11.328	74.000	31.203	PK
3		*	2419.704	95.671	64.515	N/A	N/A	31.157	PK

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	

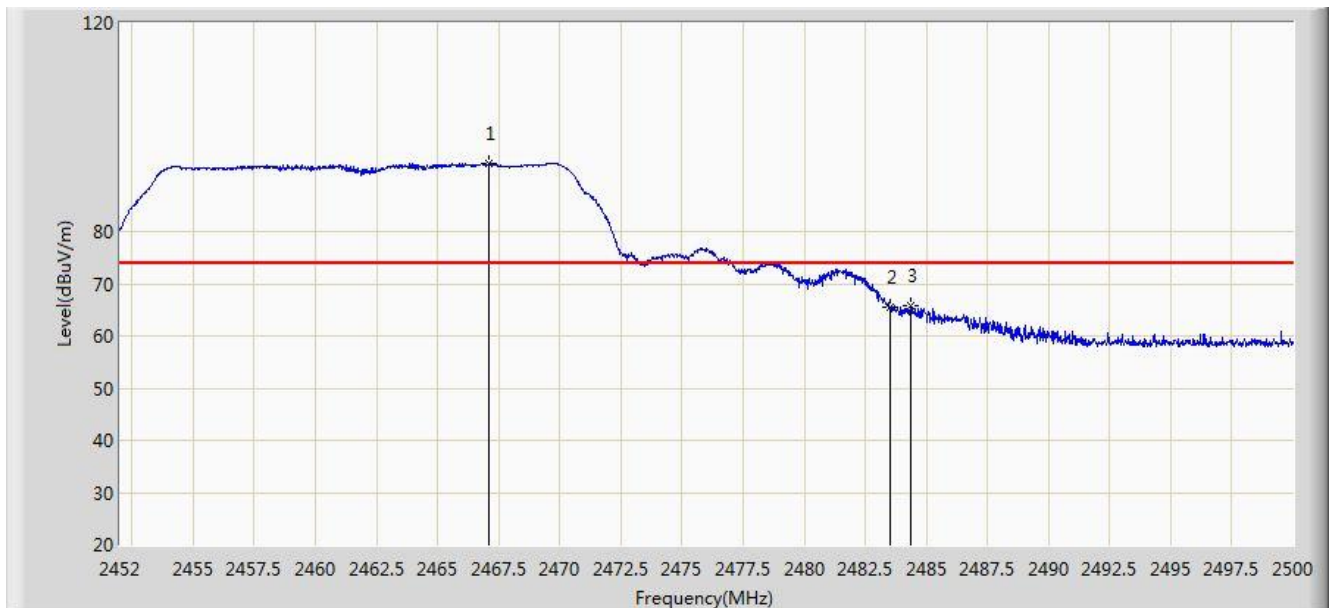


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	47.044	15.841	-6.956	54.000	31.203	AV
2		*	2406.600	84.999	53.821	N/A	N/A	31.177	AV

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

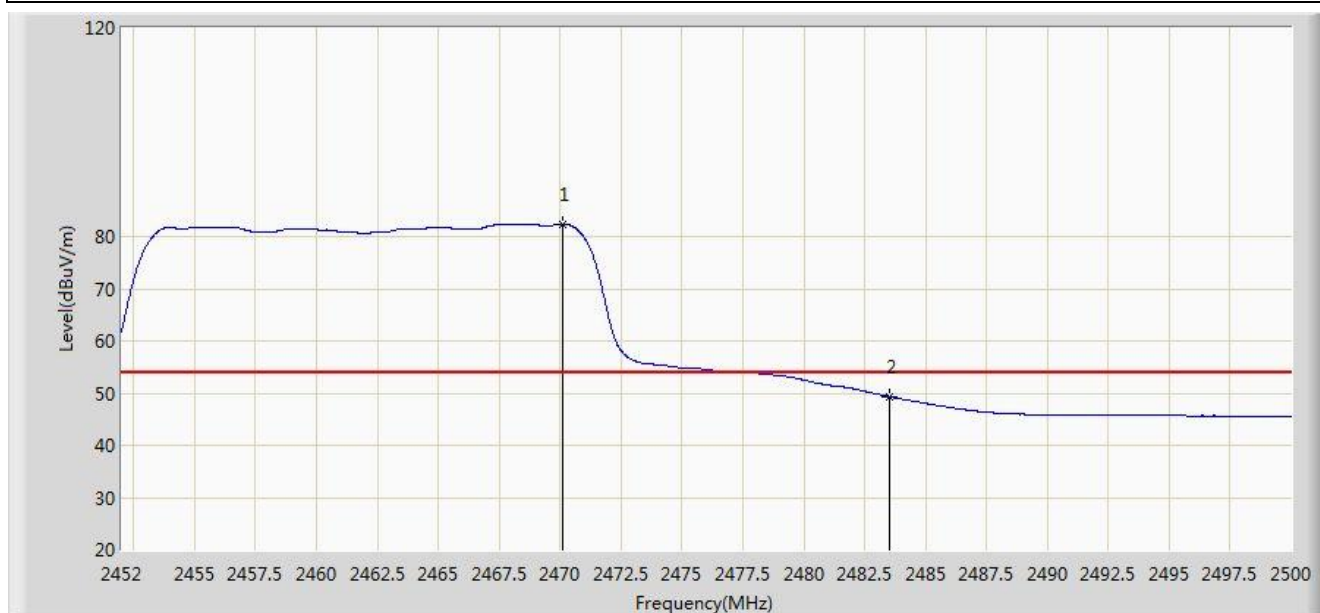


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2467.072	93.043	61.895	N/A	N/A	31.148	PK
2			2483.500	65.511	34.318	-8.489	74.000	31.194	PK
3			2484.352	65.799	34.603	-8.201	74.000	31.195	PK

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 (dBuV/m) = Reading Level (dBuV) + 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	

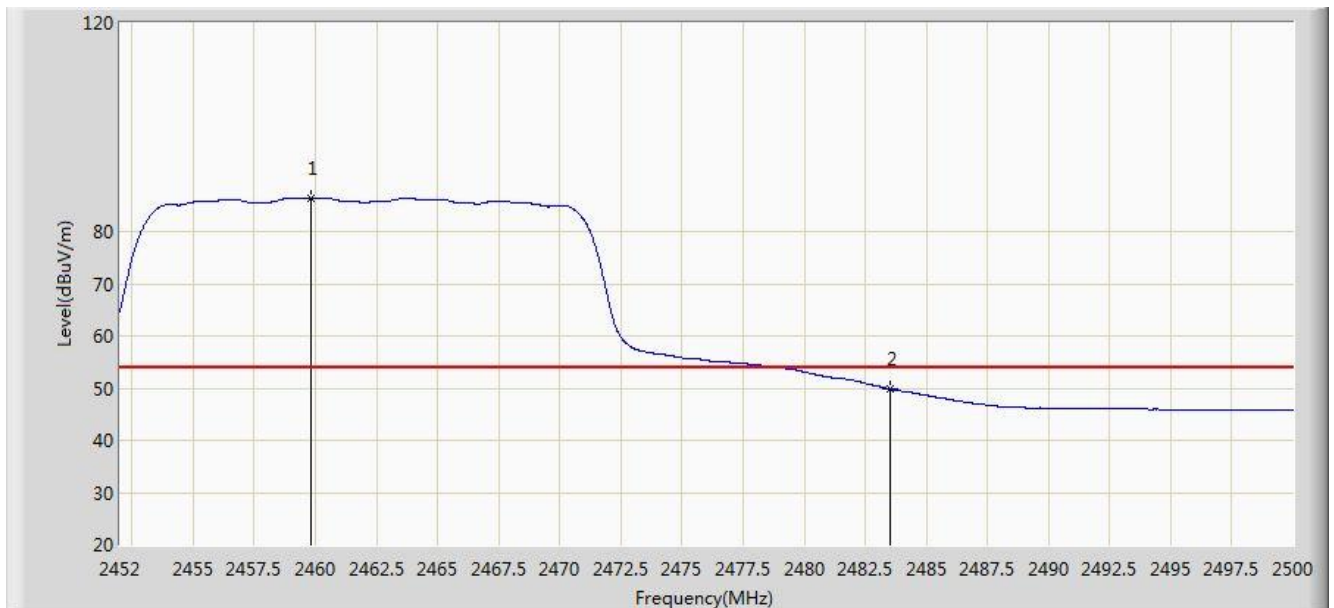


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2458.865	96.726	65.596	N/A	N/A	31.130	PK
2			2483.500	67.964	36.771	-6.036	74.000	31.194	PK
3			2483.656	68.751	37.557	-5.249	74.000	31.194	PK

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 (dBuV/m) = Reading Level (dBuV) + Factor (dB)

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

7.8. AC Conducted Emissions Measurement

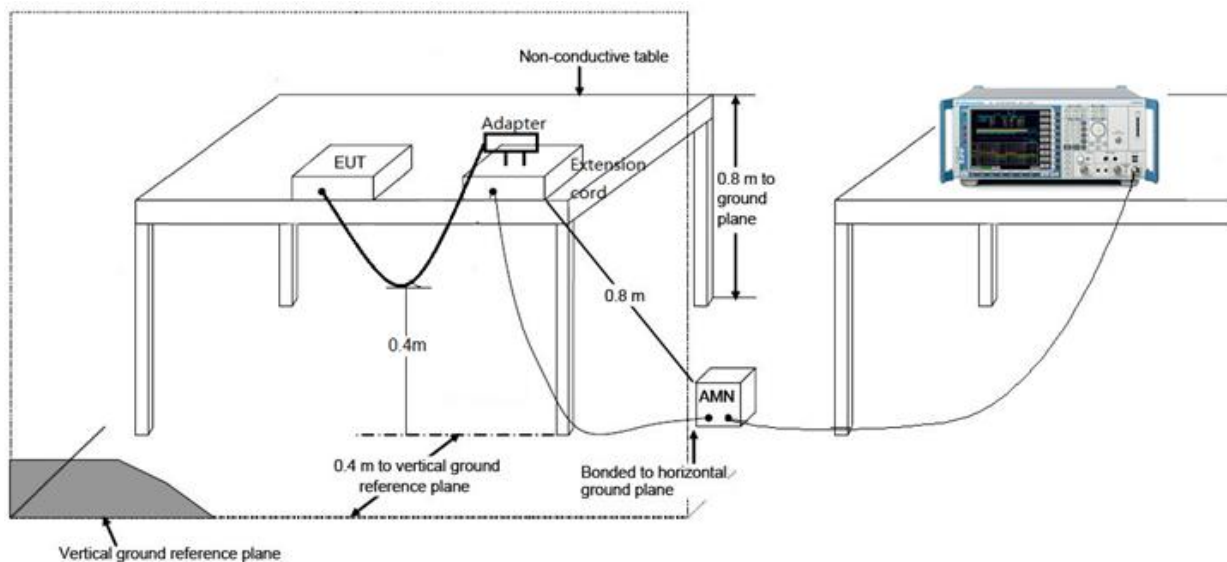
7.8.1. Test Limit

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.

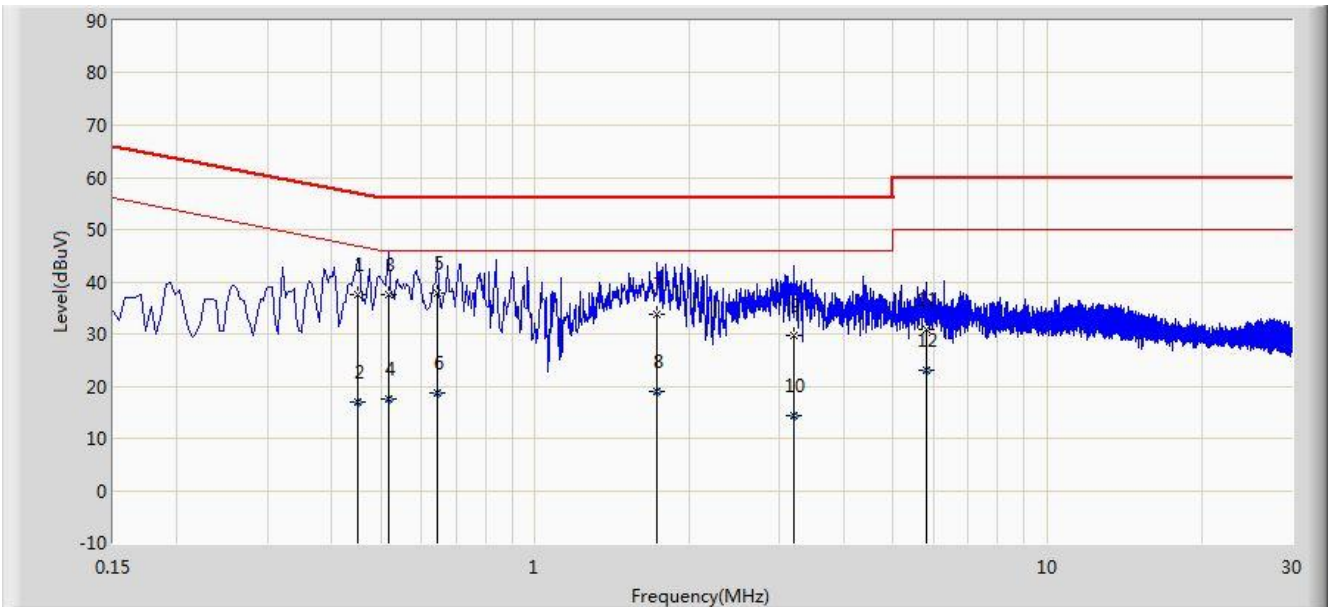
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

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	

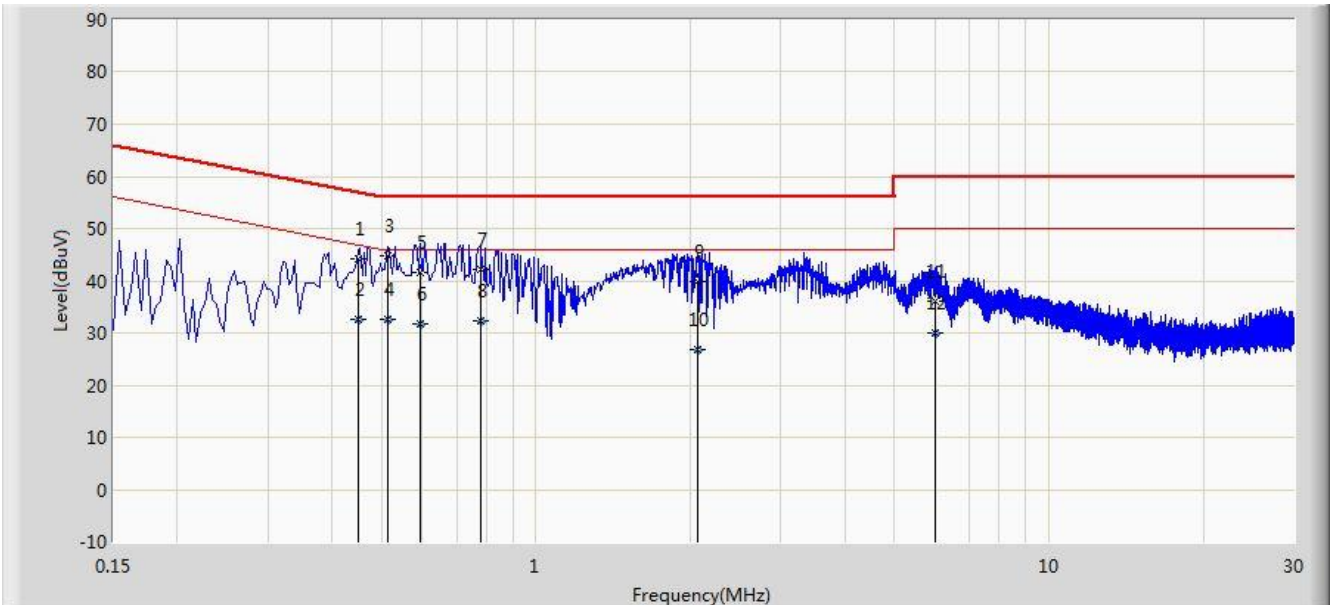


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.450	37.570	27.444	-19.305	56.875	10.126	QP
2			0.450	16.880	6.753	-29.996	46.875	10.126	AV
3			0.518	37.650	27.494	-18.350	56.000	10.156	QP
4			0.518	17.596	7.440	-28.404	46.000	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