FCC TEST REPORT

For

Voice-Controlled Intelligent Shopper

Model Number: 999.11000610

FCC ID: 2AHU499911000610

Report Number : WT168002091

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection National Digital Electronic Product Testing Center
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Test report declaration

Applicant	:	SEARS Brands Management Corporation
Address	:	3333 Beverly Road, DC-159B, Hoffman Estates, IL 60179
EUT Description	:	Voice-Controlled Intelligent Shopper
Model No	:	999.11000610
FCC ID	:	2AHU499911000610

Test Standards:

FCC Part 15 (October 1, 2015 Edition)

ANSI C63.10: 2013

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 and the energy emitted by the sample EUT tested as described in this report is in compliance with FCC Rules Part 15.207, 15.209 and 15.247.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	(Chen Qichun)	Date:	Apr.22,2016
Checked by:	(Yang Dongping)	Date:	Apr.22,2016
Approved by:	(Lin Bin)	Date:	Apr.22,2016

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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
6dB DTS bandwidth measurement	15.247 (a) (2)	Pass
Maximum conducted (average) output power	15.247 (b)	Pass
Maximum Power Spectral Density Level	15.247 (e)	Pass
Conducted Band Edges and Spurious	15.247 (d)	Pass
Radiated Band Edges and Spurious	15.247 (d) 15.209 15.205	Pass
Conducted emission test for AC power port	15.207	Pass
Antenna Requirement	15.203 15.247 (b)	Pass

Remark: “ N/A” means “ Not applicable.”

2. GENERAL INFORMATION

2.1. Report information

2.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

2.1.2. The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

2.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at No.4 TongFa Road, Xili Town, Nanshan District, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number are 806614 (3m anechoic chamber), 446246 (10m anechoic chamber) and 994606 (10m anechoic chamber).

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is 11177A-1.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is UA 50303686-0003.

2.3. Measurement Uncertainty

Conducted Emission

9kHz~30MHz 3.5dB

Radiated Emission

30MHz~1000MHz 4.5dB

1GHz~25GHz 4.6dB

3. PRODUCT DESCRIPTION

3.1. EUT Description

Description	:	Voice-Controlled Intelligent Shopper
Model Number	:	999.11000610
Rated Input	:	DC 5V
Power supply	:	AC adaptor (built-in a 3.7V lithium battery)
Operate Frequency	:	2.412GHz~2.462GHz
Antenna Designation	:	Chips antenna (Integrated)
Antenna Gain	:	1.0dBi
AC adaptor	:	M/N: GQ07-050100-AU
		Input: AC 100-240V, 50/60Hz, 0.3A Max
		Output: DC 5V, 1.0A

Table 2 Working Frequency List

Channel	Center Frequency(MHz)	Channel	Center Frequency(MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AHU499911000610, filing to comply with Section 15.207，15.209，15.247 of the FCC Part 15, Subpart C Rules.

3.3. Block Diagram of EUT Configuration

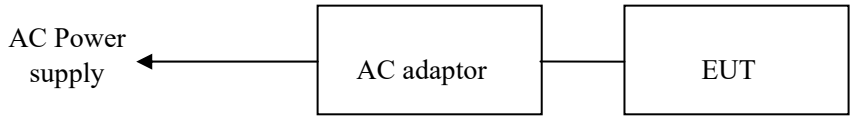

Figure 1 EUT setup

3.4. Operating Condition of EUT

Worst-case mode and channel used for power line conducted emissions was the mode and channel with the highest output power.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y, Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Date Rate	Channel
Maximum Peak Conducted Power	802.11b 1 Mbps 802.11g 6 Mbps 802.11n HT20 MCS0	Channel 1, 6, 11
6dB DTS bandwidth Power Spectral Density	802.11b 1 Mbps 802.11g 6 Mbps 802.11n HT20 MCS0	Channel 1, 6, 11
Spurious Emission	802.11b 1 Mbps 802.11g 6 Mbps 802.11n HT20 MCS0	Channel 1, 6, 11
Band Edge	802.11b 1 Mbps 802.11g 6 Mbps 802.11n HT20 MCS0	Channel 1, 11
Conducted emission test for AC power port	Worst-case mode	--

3.5. Support Equipment List

Table 3 Support Equipment List

Name	Model No	S/N	Manufacturer	FCC Approval
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3.6. Test Conditions

Date of test：Apr.13, 2016-Apr.21, 2016

Date of EUT Receive：Apr.10, 2016

Temperature: 24-21℃

Relative Humidity: 44-52%

3.7. Special Accessories

Not available for this EUT intended for grant.

3.8. Equipment Modifications

Not available for this EUT intended for grant.

4. TEST EQUIPMENT USED

Table 4 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB3319	EMI Test Receiver	Rohde & Schwarz	ESCS30	Dec.10,2015	1 Year
SB4357	AMN	Rohde & Schwarz	ENV216	Sep.25,2015	1 Year
SB8501/09	EMI Test Receiver	Rohde & Schwarz	ESU40	Mar.23, 2016	1 Year
SB3345	Loop Antenna	SCHWARZBECK	FMZB1516	Jan.07, 2016	1 Year
SB9060	Spectrum analyzer	Rohde & Schwarz	FSQ40	May.13, 2015	1 Year
SB3955	Broadband antenna	SCHWARZBECK	VULB9163	Jan.07, 2016	1 Year
SB8501/01	Horn Antenna	Rohde & Schwarz	HF907	Mar.21, 2016	1 Year
SB8501/10	Horn Antenna	Rohde & Schwarz	3160-09	Mar.28, 2014	3 Years
SB8501/17	Preamplifier	Rohde & Schwarz	SCU-18	Mar.21, 2016	1 Year
SB8501/16	Preamplifier	Rohde & Schwarz	SCU-26	Mar.21, 2016	1 Year

5. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

5.1. LIMITS

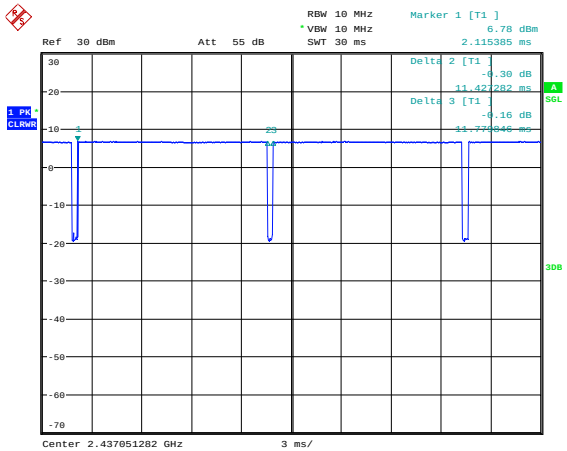
None; for reporting purposes only.

5.2. Test Procedure

Reference to KDB558074 D01 DTS Meas Guidance v03r05, Zero-Span Spectrum Analyzer Method.

5.3. Test Data

Mode	ON Time (ms) T	Period (ms)	Duty Cycle %	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
802.11b	11.427	11.780	97.0	0.3	0.1
802.11g	1.891	2.099	90.1	0.9	1
802.11n HT20	1.763	1.995	88.4	1.1	1



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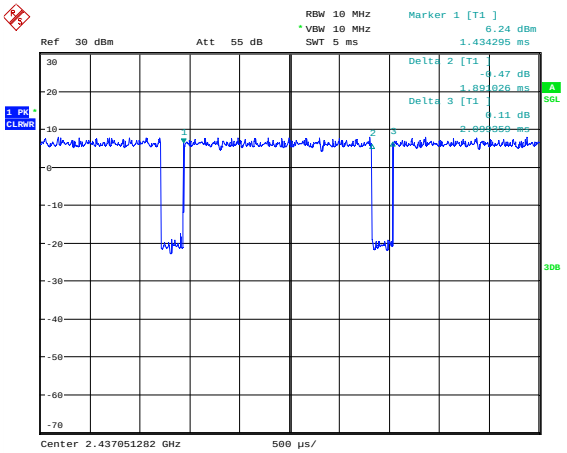

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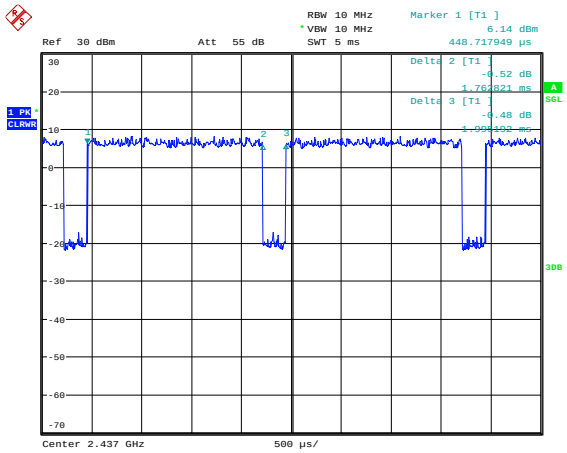

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6. 6DB BANDWIDTH MEASUREMENT

6.1. Limits of 6dB Bandwidth Measurement

CFR 47 (FCC) part 15.247 (a) (2)

6.2. Test Procedure

Reference to KDB558074 D01 DTS Meas Guidance v03r05,

The transmitter output was connected to the spectrum analyzer.

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 x RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

f) Allow the trace to stabilize.

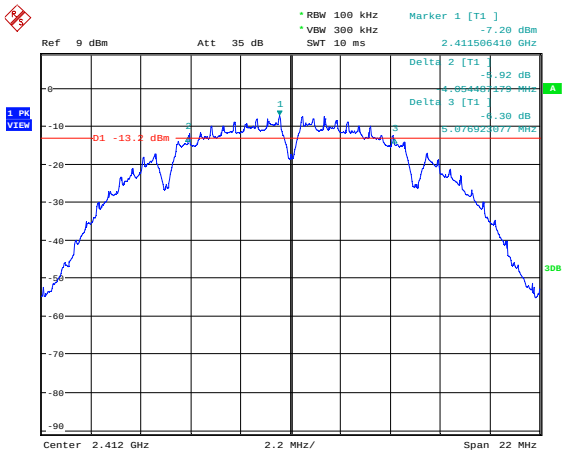
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

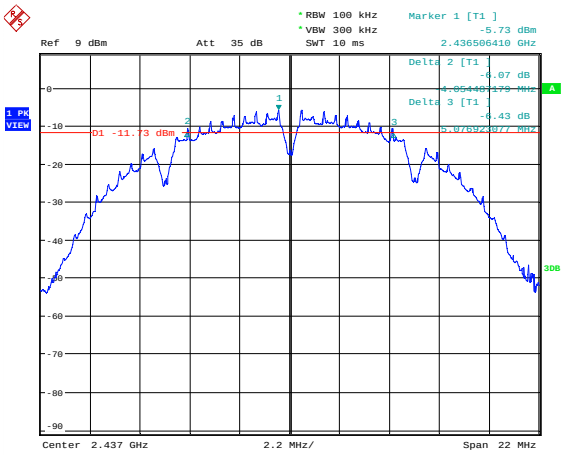
6.3. Test Setup

6.4. Test Data

Table 5 6dB Bandwidth Test Data (802.11b)

CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	results
Channel 1	9.131	Pass
Channel 6	9.314	Pass
Channel 11	9.131	Pass





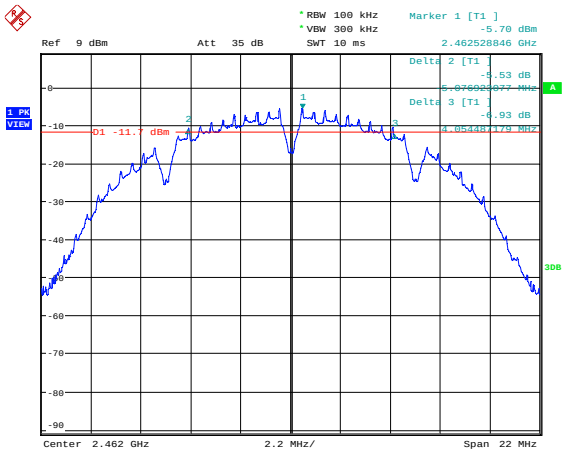
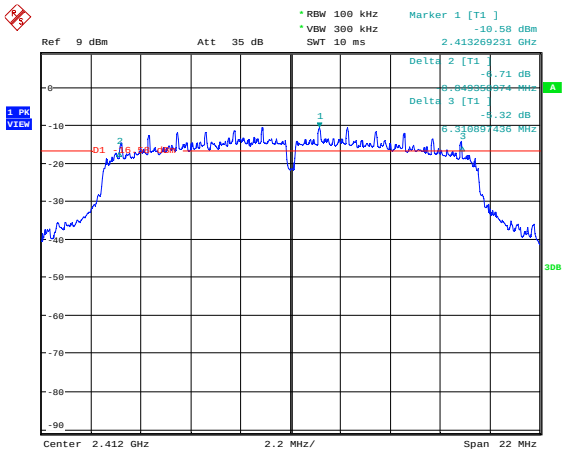


Table 6 6dB Bandwidth Test Data (802.11g)

CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	results
Channel 1	15.160	Pass
Channel 6	15.160	Pass
Channel 11	15.125	Pass



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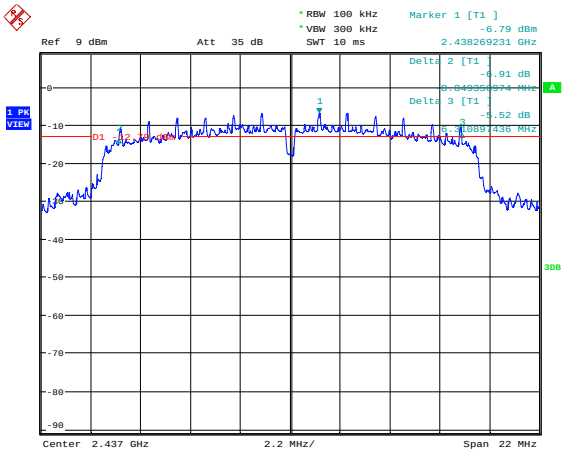

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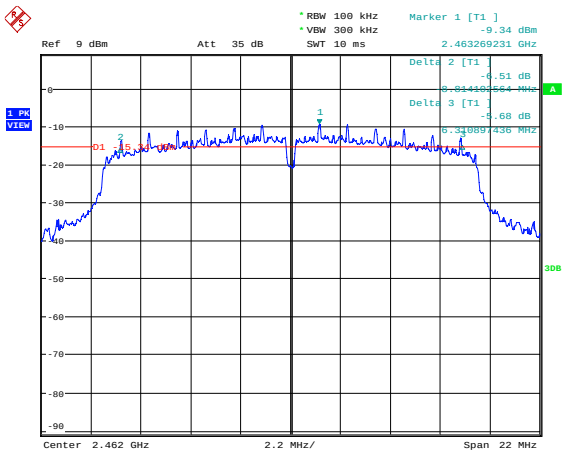

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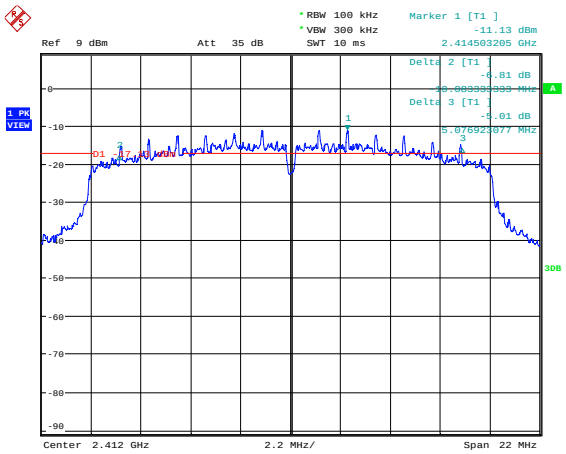
Table 7 6dB Bandwidth Test Data (802.11n HT20)

CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	results
Channel 1	15.160	Pass
Channel 6	15.160	Pass
Channel 11	15.160	Pass



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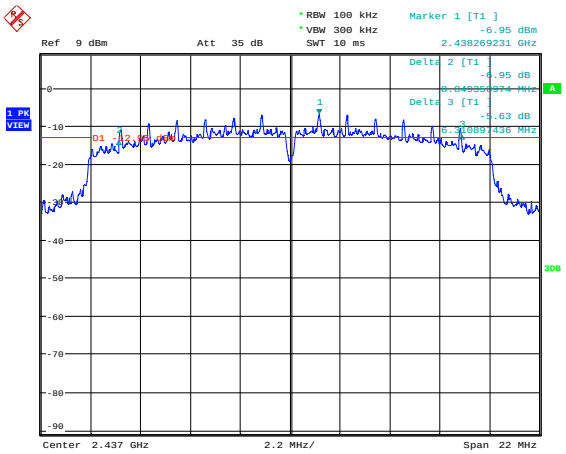

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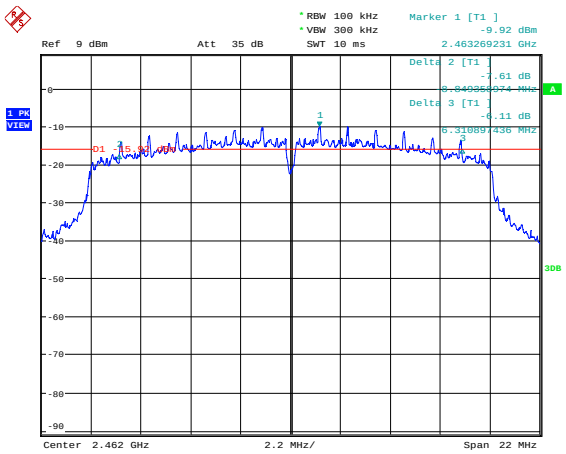

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7. MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER

7.1. Limits of Maximum conducted (average) output power Measurement

CFR 47 (FCC) part 15.247 (b)

7.2. Test Procedure

Reference to KDB558074 D01 DTS Meas Guidance v03r05,

The transmitter output was connected to the RF power meter.

a) Using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

1) The EUT is configured to transmit continuously, or to transmit with a constant duty factor.

2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.

3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

b) If the transmitter does not transmit continuously, measure the duty cycle (x) of the transmitter output signal as described in Section 6.0.

c) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

d) Adjust the measurement in dBm by adding 10log (1/x), where x is the duty cycle to the measurement result.

7.3. Test Data

Table 8 Maximum Conducted (average) Output Power Test Data

Model	Channel	Duty Factor (dB)	Maximum Conducted (average) Output Power (dBm)	Limit (dBm)	Result
802.11b	Channel 1	0.3	3.7	30	Pass
802.11b	Channel 6	0.3	5.0	30	Pass
802.11b	Channel 11	0.3	4.2	30	Pass
802.11g	Channel 1	0.9	2.1	30	Pass
802.11g	Channel 6	0.9	5.3	30	Pass
802.11g	Channel 11	0.9	2.9	30	Pass
802.11n	Channel 1	1.1	1.1	30	Pass
802.11n	Channel 6	1.1	4.9	30	Pass
802.11n	Channel 11	1.1	2.6	30	Pass

8. MAXIMUM POWER SPECTRAL DENSITY LEVEL MEASUREMENT

8.1. Limits of Maximum Power Spectral Density Level Measurement

CFR 47 (FCC) part 15.247 (e)

8.2. Test Procedure

Reference to KDB558074 D01 DTS Meas Guidance v03r05,

The transmitter output was connected to the spectrum analyzer.

a) Set analyzer center frequency to DTS channel center frequency.

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

c) Set the RBW to: RBW = 3 kHz.

d) Set the VBW = 10 kHz.

e) Detector = peak.

f) Sweep time = auto couple.

g) Trace mode = max hold.

h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum amplitude level within the RBW.

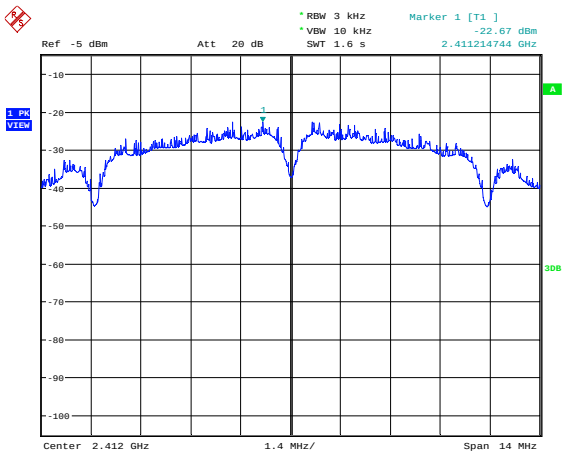
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

8.3. Test Data

Table 9 Maximum Power Spectral Density Level Test Data

Model	Channel	PSD (dBm)	Limit (dBm)	Result
802.11b	Channel 1	-22.6	8	Pass
802.11b	Channel 6	-21.4	8	Pass
802.11b	Channel 11	-20.7	8	Pass
802.11g	Channel 1	-26.8	8	Pass
802.11g	Channel 6	-22.8	8	Pass
802.11g	Channel 11	-25.6	8	Pass
802.11n	Channel 1	-26.4	8	Pass
802.11n	Channel 6	-22.3	8	Pass
802.11n	Channel 11	-25.7	8	Pass

802.11b



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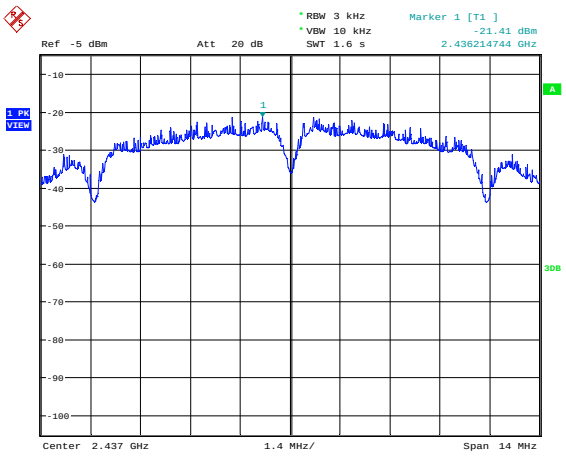

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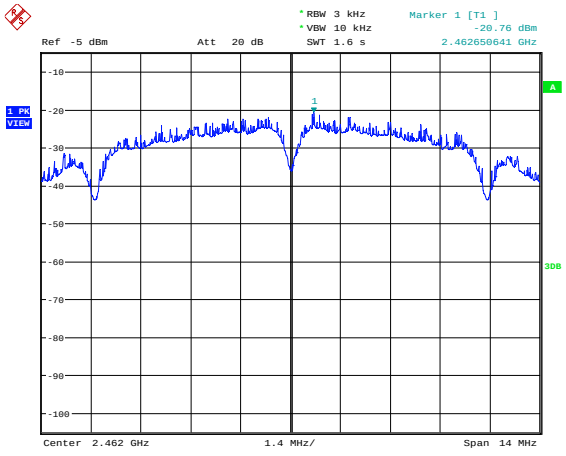

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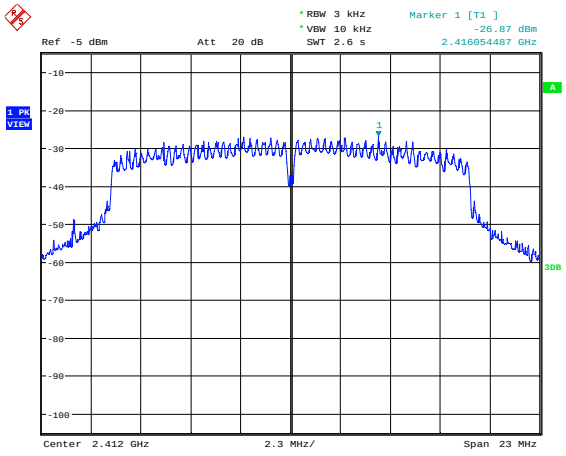
802.11g



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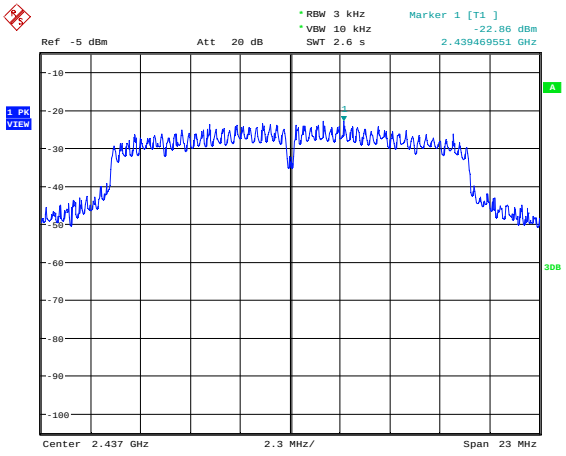

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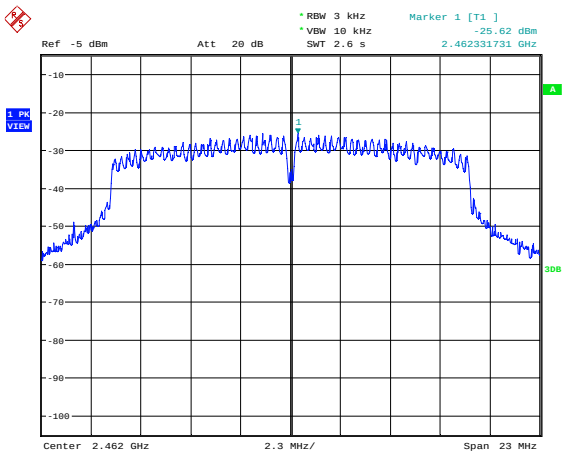

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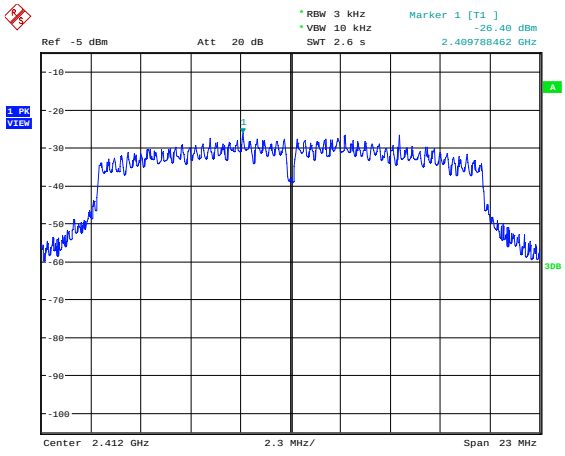
802.11n HT20



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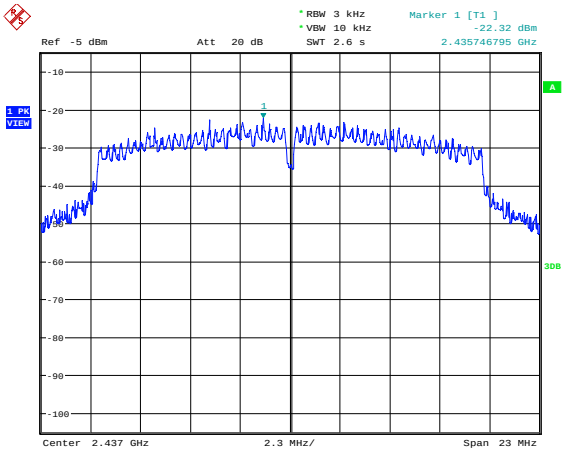

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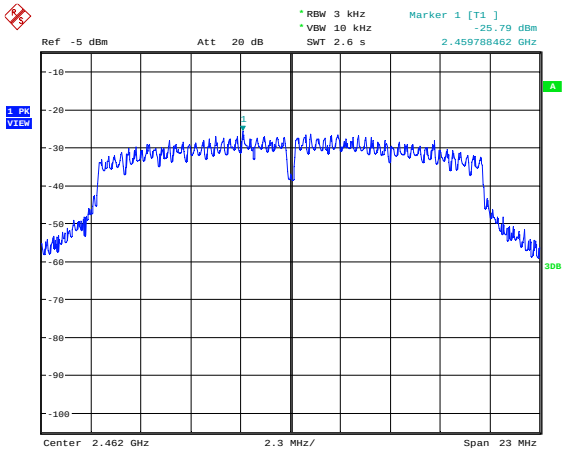

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9. CONDUCTED BANDEDGE AND SPURIOUS MEASURMENT

9.1. Limits of Conducted Band Edge and Spurious Measurement

CFR 47 (FCC) part 15.247 (d)

9.2. Test Procedure

Reference to KDB558074 D01 DTS Meas Guidance v03r05,

The transmitter output was connected to the spectrum analyzer.

Establish a reference level by using the following procedure:

a) Set instrument center frequency to DTS channel center frequency.

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

c) Set the RBW = 100 kHz.

d) Set the VBW ≥ 3 x RBW.

e) Detector = peak.

f) Sweep time = auto couple.

g) Trace mode = max hold.

h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum PSD level.

Emission level measurement

a) Set the center frequency and span to encompass frequency range to be measured.

b) Set the RBW = 100 kHz.

c) Set the VBW ≥ 3 x RBW.

d) Detector = peak.

e) Ensure that the number of measurement points ≥ span/RBW

f) Sweep time = auto couple.

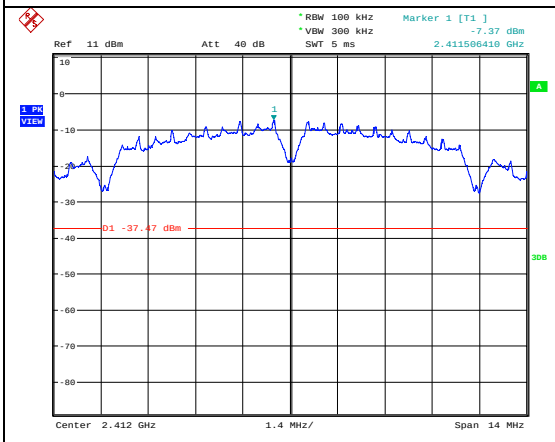
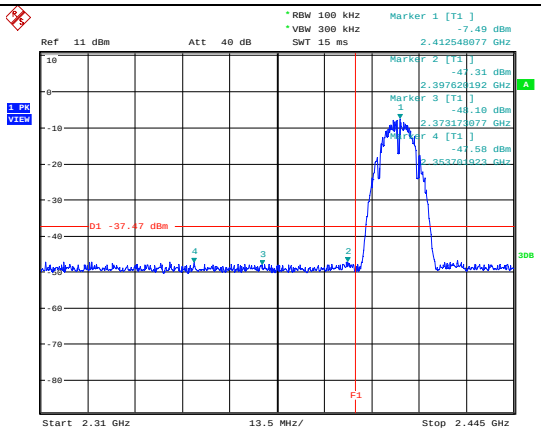
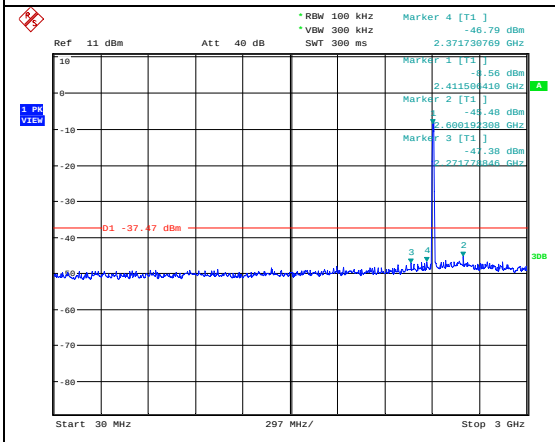
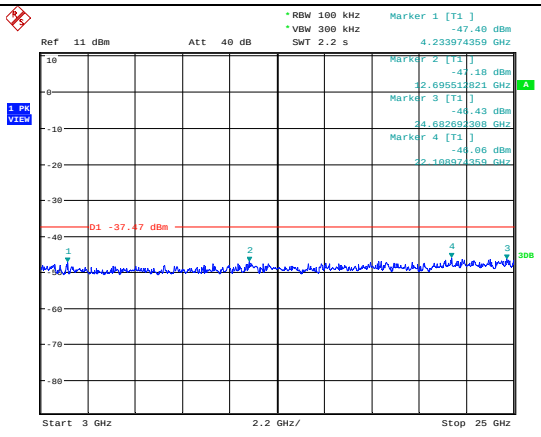
g) Trace mode = max hold.

h) Allow trace to fully stabilize.

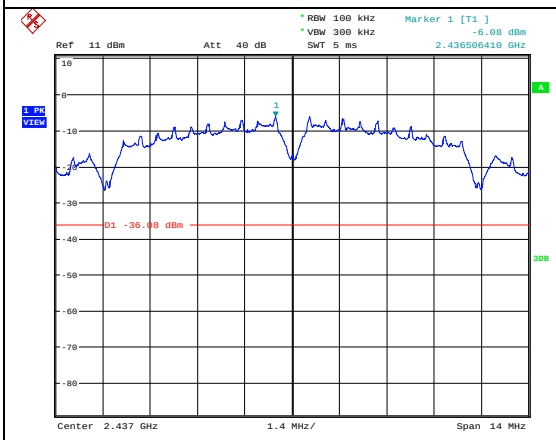
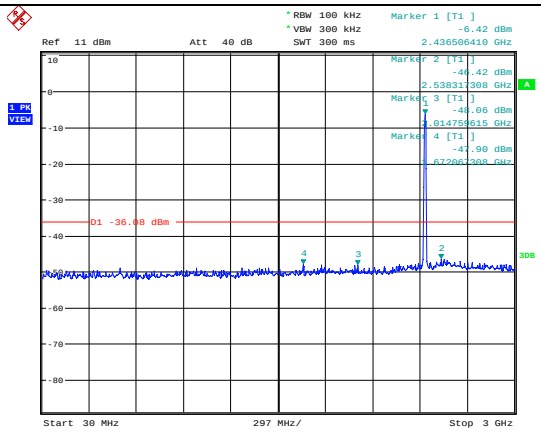
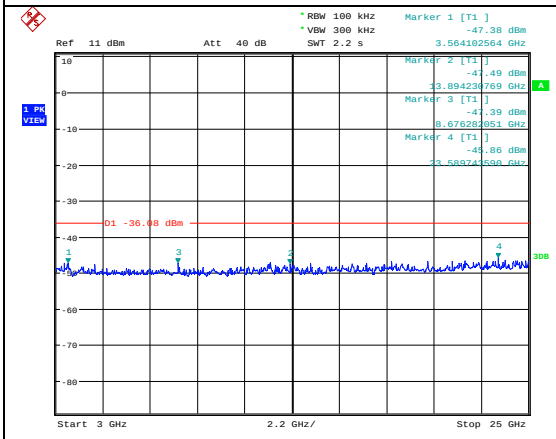
i) Use the peak marker function to determine the maximum amplitude level.

9.3. Test Data

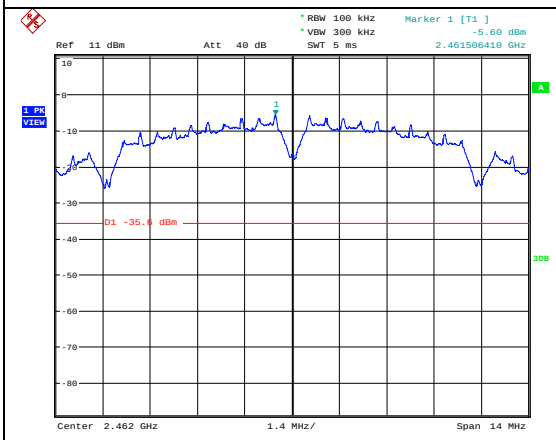
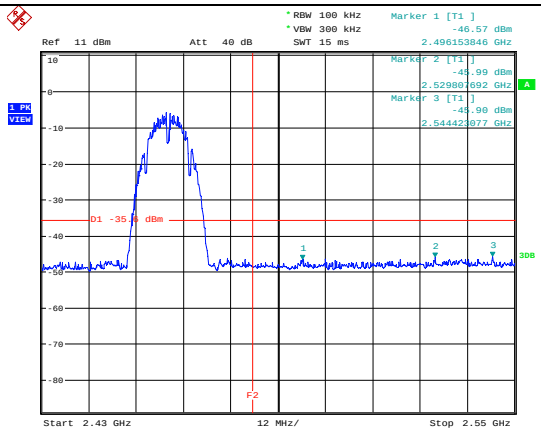
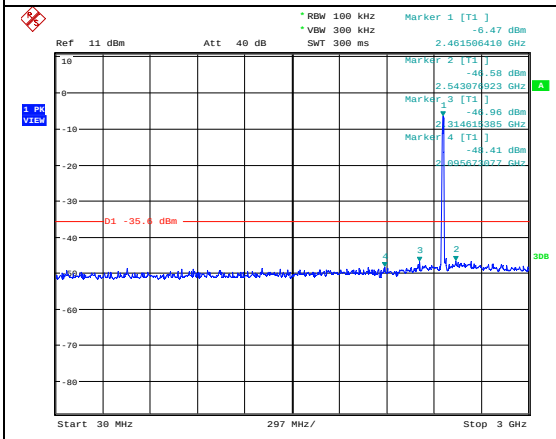
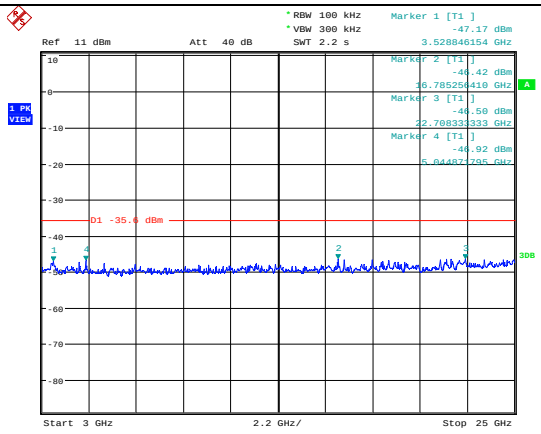
802.11b Low Channel

Pref	Lower Edge
	
30MHz-3GHz	3GHz-25GHz
	

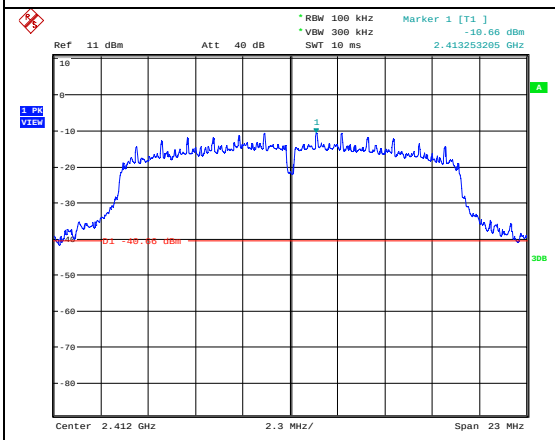
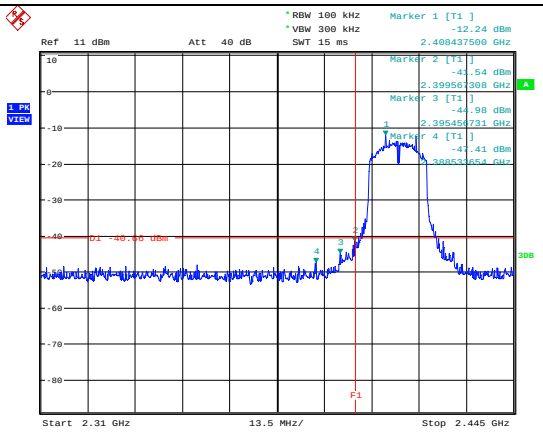
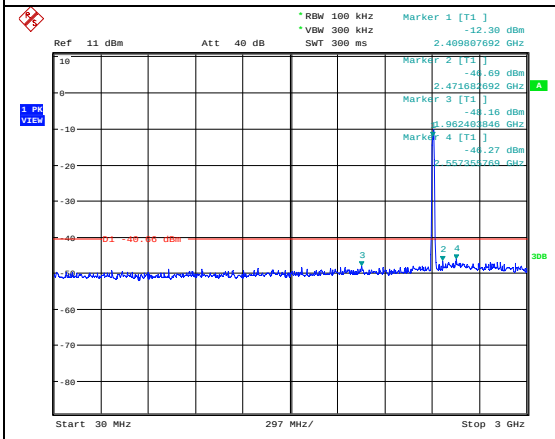
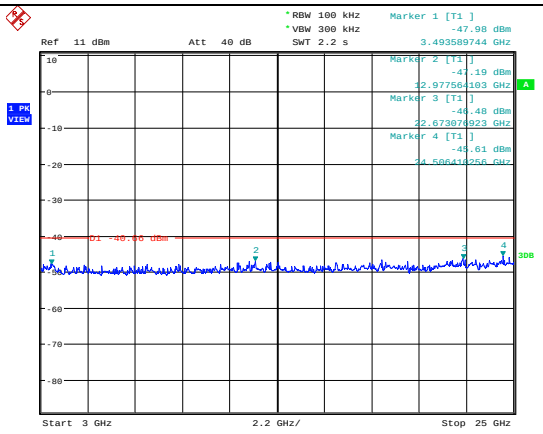
802.11b Mid Channel

Pref	30MHz-3GHz
	
3GHz-25GHz	
	

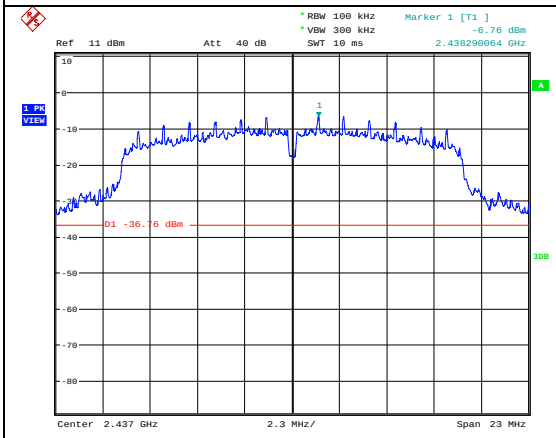
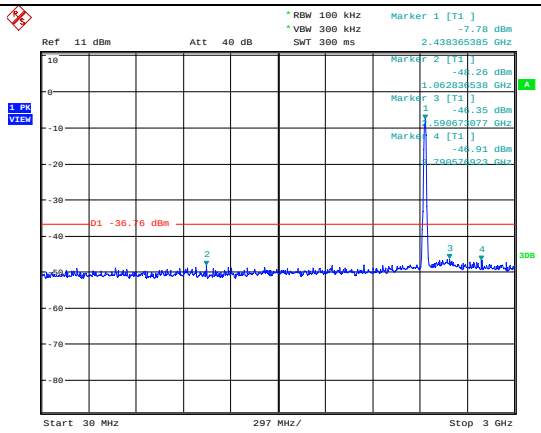
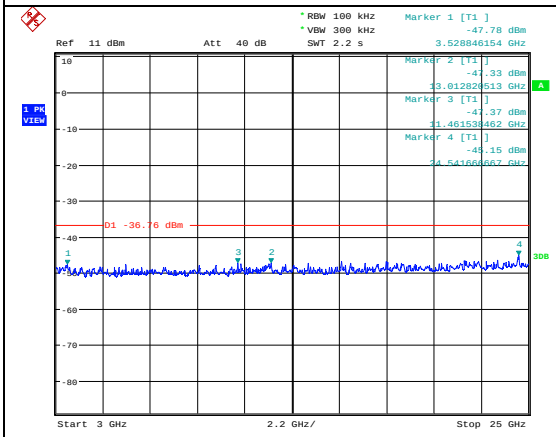
802.11b High Channel

Pref	Upper Edge
 Date: 14.APR.2016 17:15:36	 Date: 14.APR.2016 17:19:25
30MHz-3GHz	**3GHz-25GHz**
 Date: 14.APR.2016 17:16:36	 Date: 14.APR.2016 17:17:59

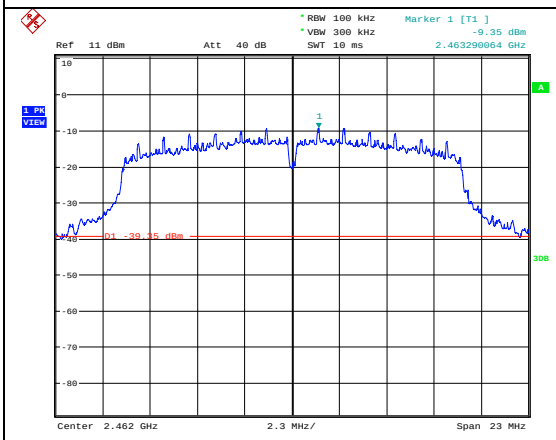
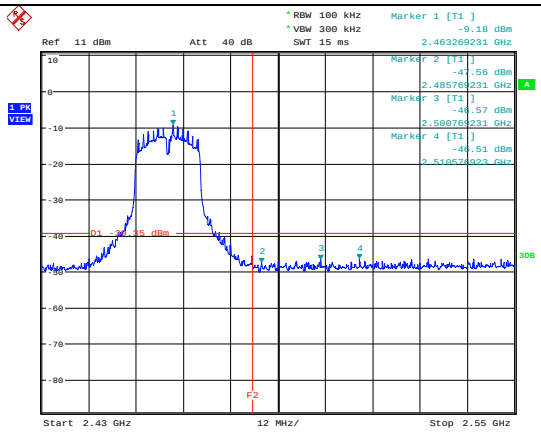
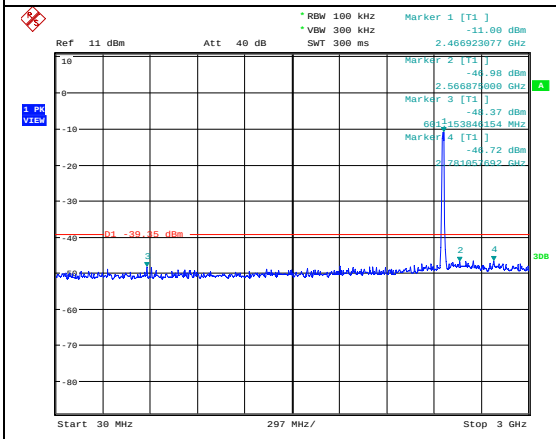
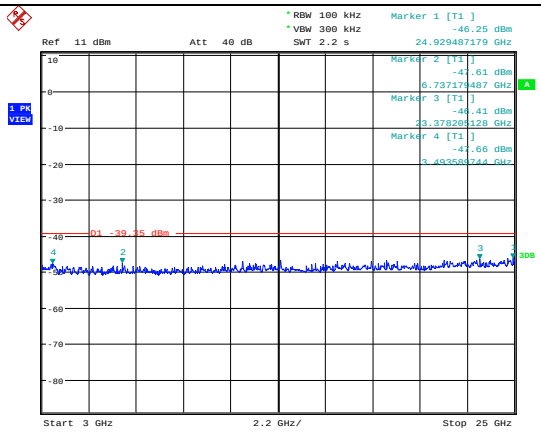
802.11g Low Channel

Pref	Lower Edge
 Date: 14.APR.2016 16:42:56	 Date: 14.APR.2016 16:50:37
30MHz-3GHz	3GHz-25GHz
 Date: 14.APR.2016 16:43:54	 Date: 14.APR.2016 16:44:46

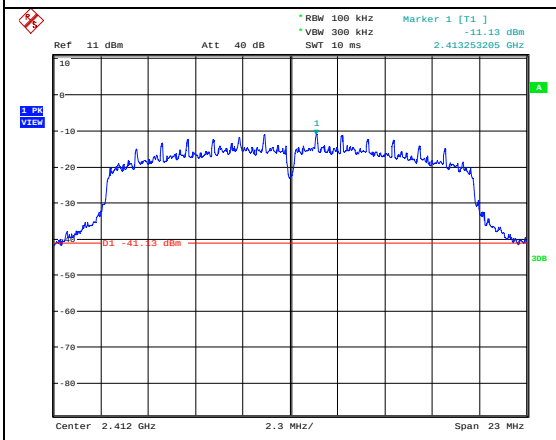
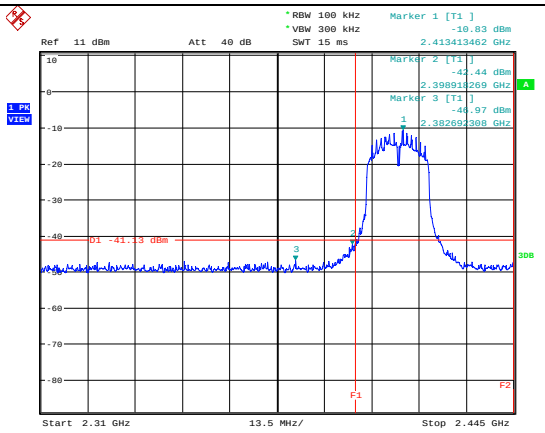
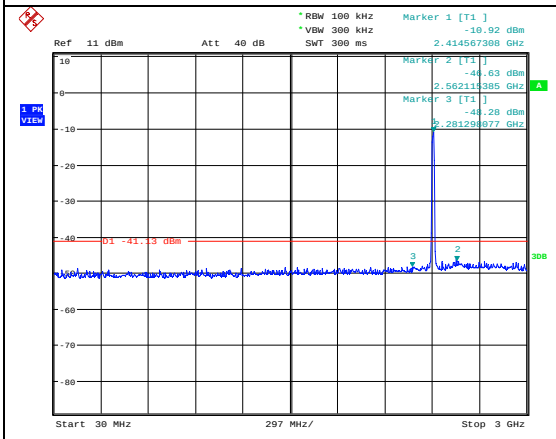
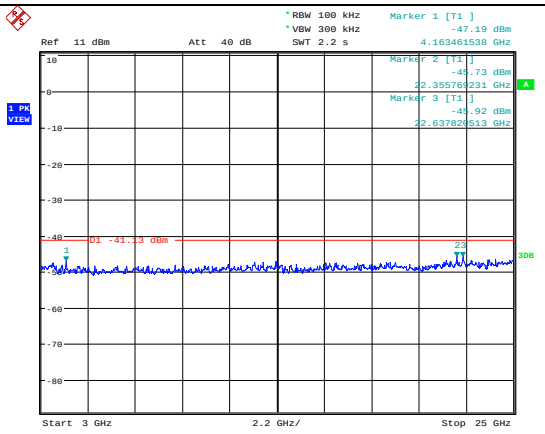
802.11g Mid Channel

Pref	30MHz-3GHz
 Date: 14.APR.2016 16:38:08	 Date: 14.APR.2016 16:40:04
3GHz-25GHz	
 Date: 14.APR.2016 16:41:36	

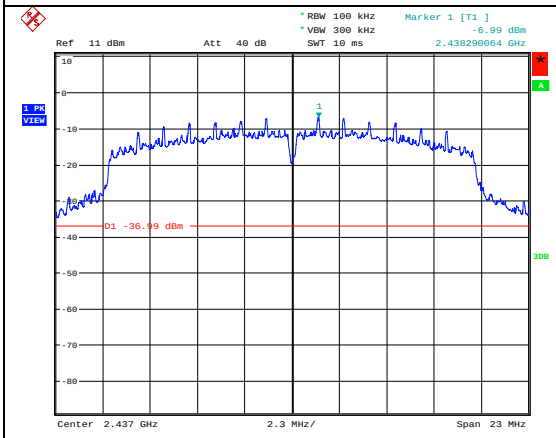
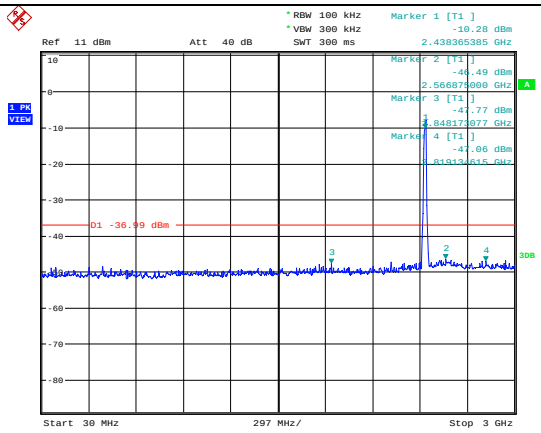
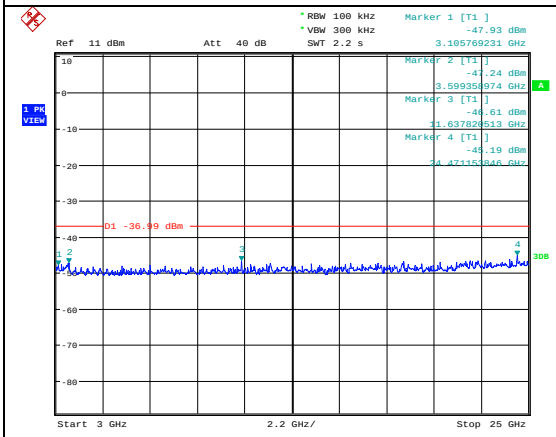
802.11g High Channel

Pref	Upper Edge
	
30MHz-3GHz	3GHz-25GHz
	

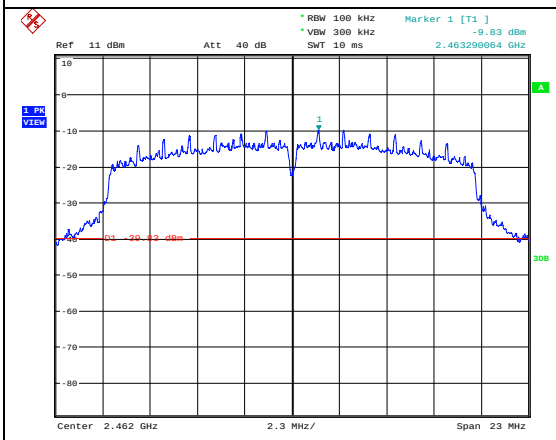
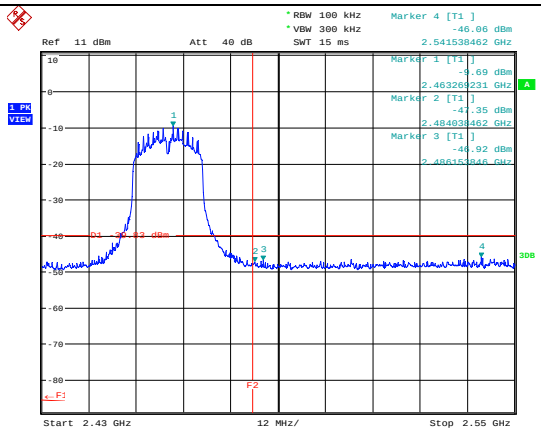
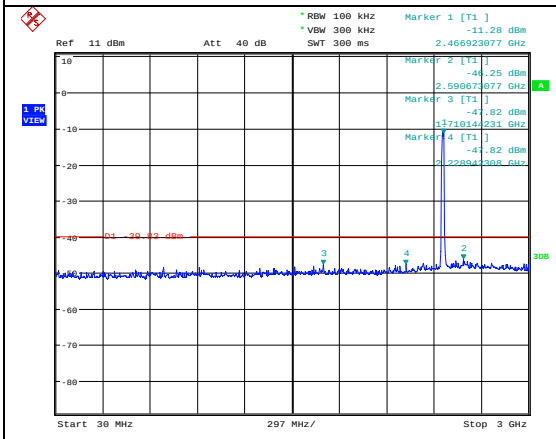
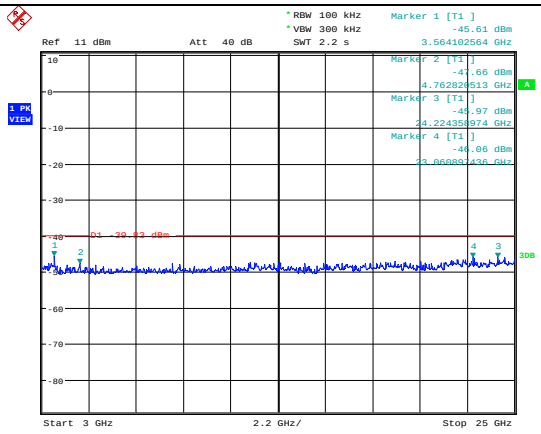
802.11n HT20 Low Channel

Pref	Lower Edge
 Date: 14.APR.2016 15:57:18	 Date: 14.APR.2016 16:03:11
30MHz-3GHz	3GHz-25GHz
 Date: 14.APR.2016 15:59:58	 Date: 14.APR.2016 16:01:16

802.11n HT20 Mid Channel

Pref	30MHz-3GHz
	
3GHz-25GHz	
	

802.11n HT20 High Channel

Pref	Upper Edge
 Date: 14.APR.2016 16:09:39	 Date: 14.APR.2016 16:29:04
30MHz-25GHz	3GHz-25GHz
 Date: 14.APR.2016 16:15:00	 Date: 14.APR.2016 16:13:02

10. RADIATED BAND EDGE AND SPURIOUS MEASUREMENT

10.1. Limits of Radiated Band Edge And Spurious Measurement

CFR 47 (FCC) part 15.247 (d) and 558074 D01 DTS Meas Guidance v03r05

10.2. TEST PROCEDURE

1. The testing follows the guidelines in ANSI C63.10: 2013 and Reference to KDB558074 D01 DTS Meas Guidance v03r05.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.

3. For measurement below 1GHz, the EUT was placed on a turntable with 0.8 meter above ground. For measurement above 1 GHz, test at FAR, the EUT is placed on a non-conductive table, which is 1.5 meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

6. Use the following spectrum analyzer settings:

(1) Span shall wide enough to fully capture the emission being measured;

(2) Set RBW=100 kHz for f < 1 GHz; VBW >= RBW; Sweep = auto; Detector function = peak; Trace = max hold;

(3) Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement.

Set RBW = 1 MHz, and 1/T (on time) for average measurement.

10.3. Test Data

Table 10 Radiated Emission Test Data (9kHz-30MHz)

Model No.: 999.11000610

Test mode: TX, Worst-case

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
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For radiated emission from 9kHz to 30MHz, the pre-scan result was lower than limit greater than 20dB, no emission reported.

Table 11 Radiated Emission Test Data (30MHz-1GHz)

Model No.: 999.11000610

Test mode: TX, Worst-case

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
55.650	Horizontal	0.9	13.0	16.0	29.9	40.0	X	QP
71.209	Horizontal	0.9	8.7	10.0	19.6	40.0	X	QP
87.879	Horizontal	1.1	10.3	9.8	21.2	40.0	X	QP
94.757	Horizontal	1.1	11.9	10.7	23.7	43.5	X	QP
312.735	Horizontal	2.1	13.1	13.9	29.1	46.0	X	QP
360.012	Horizontal	2.3	14.3	10.2	26.8	46.0	X	QP
38.635	Vertical	0.7	12.3	12.6	25.6	40.0	X	QP
43.602	Vertical	0.7	13.6	13.8	28.1	40.0	X	QP
56.365	Vertical	0.9	13.0	23.4	37.3	40.0	X	QP
68.905	Vertical	0.9	10.7	20.9	32.5	40.0	X	QP
91.771	Vertical	1.2	11.9	21.1	34.2	43.5	X	QP
193.286	Vertical	1.7	10.6	11.6	23.9	43.5	X	QP

Table 12 Radiated Emission Test Data (1GHz-18GHz)

Model No.: 999.11000610

Test mode: TX, 802.11b, Low Channel

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
4823.976	Horizontal	-39.4	34.0	57.4	52.0	74	X	Harmonics PK
4823.976	Horizontal	-39.4	34.0	54.4	49.0	54	X	Harmonics AV
4018.485	Horizontal	-39.3	32.9	54.2	47.8	74	X	PK
4018.485	Horizontal	-39.3	32.9	46.9	40.5	54	X	AV
6432.974	Horizontal	-34.5	34.8	49.4	49.7	74	X	PK
6432.974	Horizontal	-34.5	34.8	42.7	43.0	54	X	AV
4823.980	Vertical	-39.4	34.0	57.2	51.8	74	X	Harmonics PK
4823.980	Vertical	-39.4	34.0	54.2	48.8	54	X	Harmonics AV
4018.490	Vertical	-39.3	32.9	57.7	51.3	74	X	Harmonics PK
4018.490	Vertical	-39.3	32.9	48.7	42.3	54	X	Harmonics AV
6431.975	Vertical	-34.5	34.8	53.3	53.6	74	X	Harmonics PK
6431.975	Vertical	-34.5	34.8	49.3	49.6	54	X	Harmonics AV

Table 13 Radiated Emission Test Data (1GHz-18GHz)

Model No.: 999.11000610

Test mode: TX, 802.11b, Mid Channel

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
6498.634	Vertical	-34.6	34.8	54.2	54.4	74	X	PK
6498.634	Vertical	-34.6	34.8	46.8	47.0	54	X	AV
4873.980	Vertical	-39.4	34.0	58.7	53.3	74	X	Harmonics PK
4873.980	Vertical	-39.4	34.0	55.0	49.6	54	X	Harmonics AV
4060.654	Vertical	-39.3	32.9	57.6	51.2	74	X	PK
4060.654	Vertical	-39.3	32.9	51.9	45.5	54	X	AV
7814.704	Vertical	-37.7	36.2	46.2	44.7	74	X	PK
7814.704	Vertical	-37.7	36.2	36.1	34.6	54	X	AV
6498.633	Horizontal	-34.6	34.8	52.9	53.1	74	X	PK
6498.633	Horizontal	-34.6	34.8	45.0	45.2	54	X	AV
4873.972	Horizontal	-39.4	34.0	60.6	55.2	74	X	Harmonics PK
4873.972	Horizontal	-39.4	34.0	57.6	52.2	54	X	Harmonics AV
4060.647	Horizontal	-39.3	32.9	54.4	48.0	74	X	PK
4060.647	Horizontal	-39.3	32.9	47.2	40.8	54	X	AV
7814.699	Horizontal	-37.7	36.2	45.8	44.3	74	X	PK
7814.699	Horizontal	-37.7	36.2	36.1	34.6	54	X	AV

Table 14 Radiated Emission Test Data (1GHz-18GHz)

Model No.: 999.11000610

Test mode: TX, 802.11b, High Channel

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
4923.987	Horizontal	-39.6	34.0	59.5	53.9	74	X	Harmonics PK
4923.987	Horizontal	-39.6	34.0	55.5	49.9	54	X	Harmonics AV
4104.832	Horizontal	-39.3	32.9	54.6	48.2	74	X	PK
4104.832	Horizontal	-39.3	32.9	46.6	40.2	54	X	AV
6565.307	Horizontal	-35.1	34.8	52.3	52.0	74	X	PK
6565.307	Horizontal	-35.1	34.8	44.1	43.8	54	X	AV
4923.980	Vertical	-39.6	34.0	57.2	51.6	74	X	Harmonics PK
4923.980	Vertical	-39.6	34.0	52.1	46.5	54	X	Harmonics AV
4104.835	Vertical	-39.3	32.9	57.7	51.3	74	X	PK
4104.835	Vertical	-39.3	32.9	51.6	45.2	54	X	AV
6565.310	Vertical	-35.1	34.8	54.0	53.7	74	X	PK
6565.310	Vertical	-35.1	34.8	47.1	46.8	54	X	AV

Table 15 Radiated Emission Test Data (1GHz-18GHz)

Model No.: 999.11000610

Test mode: TX, 802.11g, Low Channel

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
4018.471	Horizontal	-39.3	32.9	54.6	48.2	74	X	PK
4018.471	Horizontal	-39.3	32.9	43.0	36.6	54	X	AV
4823.977	Horizontal	-39.4	34.0	55.3	49.9	74	X	Harmonics PK
4823.977	Horizontal	-39.4	34.0	42.5	37.1	54	X	Harmonics AV
6432.863	Horizontal	-34.5	34.8	49.6	49.9	74	X	PK
6432.863	Horizontal	-34.5	34.8	35.8	36.1	54	X	AV
4018.507	Vertical	-39.3	32.9	58.2	51.8	74	X	PK
4018.507	Vertical	-39.3	32.9	48.1	41.7	54	X	AV
6432.870	Vertical	-34.5	34.8	49.9	50.2	74	X	PK
6432.870	Vertical	-34.5	34.8	36.4	36.7	54	X	AV
4823.722	Vertical	-39.4	34.0	54.7	49.3	74	X	Harmonics PK
4823.722	Vertical	-39.4	34.0	41.8	36.4	54	X	Harmonics AV

Table 16 Radiated Emission Test Data (1GHz-18GHz)

Model No.: 999.11000610

Test mode: TX, 802.11g, Mid Channel

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
4060.960	Horizontal	-39.3	32.9	54.9	48.5	74	X	PK
4060.960	Horizontal	-39.3	32.9	44.0	37.6	54	X	AV
4874.000	Horizontal	-39.4	34.0	57.5	52.1	74	X	Harmonics PK
4874.000	Horizontal	-39.4	34.0	45.8	40.4	54	X	Harmonics AV
6498.631	Horizontal	-34.6	34.8	52.4	52.6	74	X	PK
6498.631	Horizontal	-34.6	34.8	43.9	44.1	54	X	AV
4874.231	Horizontal	-39.4	34.0	58.6	53.2	74	X	PK
4874.231	Horizontal	-39.4	34.0	45.5	40.1	54	X	AV
7311.000	Horizontal	-38.1	35.6	53.0	50.5	74	X	Harmonics PK
7311.000	Horizontal	-38.1	35.6	39.1	36.6	54	X	Harmonics AV
4060.950	Vertical	-39.3	32.9	59.0	52.6	74	X	PK
4060.950	Vertical	-39.3	32.9	48.4	42.0	54	X	AV
6498.579	Vertical	-34.6	34.8	53.7	53.9	74	X	PK
6498.579	Vertical	-34.6	34.8	46.3	46.5	54	X	AV
4873.725	Vertical	-39.4	34.0	57.5	52.1	74	X	Harmonics PK
4873.725	Vertical	-39.4	34.0	45.6	40.2	54	X	Harmonics AV
7311.000	Vertical	-38.1	35.6	53.9	51.4	74	X	Harmonics PK
7311.000	Vertical	-38.1	35.6	40.1	37.6	54	X	Harmonics AV

Table 17 Radiated Emission Test Data (1GHz-18GHz)

Model No.: 999.11000610

Test mode: TX, 802.11g, High Channel

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
4923.979	Vertical	-39.6	34.0	55.4	49.8	74	X	Harmonics PK
4923.979	Vertical	-39.6	34.0	42.7	37.1	54	X	Harmonics AV
4103.829	Vertical	-39.3	32.9	58.2	51.8	74	X	PK
4103.829	Vertical	-39.3	32.9	47.6	41.2	54	X	AV
6565.305	Vertical	-35.1	34.8	50.1	49.8	74	X	PK
6565.305	Vertical	-35.1	34.8	36.6	36.3	54	X	AV
4923.983	Horizontal	-39.6	34.0	55.5	49.9	74	X	Harmonics PK
4923.983	Horizontal	-39.6	34.0	42.8	37.2	54	X	Harmonics AV
4103.990	Horizontal	-39.3	32.9	54.5	48.1	74	X	PK
4103.990	Horizontal	-39.3	32.9	42.3	35.9	54	X	AV
6565.304	Horizontal	-35.1	34.8	50.2	49.9	74	X	PK
6565.304	Horizontal	-35.1	34.8	36.3	36.0	54	X	AV

Table 18 Radiated Emission Test Data (1GHz-18GHz)

Model No.: 999.11000610

Test mode: TX, 802.11n, Low Channel

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
6431.970	Vertical	-34.5	34.8	53.4	53.7	74	X	PK
6431.970	Vertical	-34.5	34.8	45.2	45.5	54	X	AV
4018.711	Vertical	-39.3	32.9	58.3	51.9	74	X	PK
4018.711	Vertical	-39.3	32.9	47.4	41.0	54	X	AV
4823.982	Vertical	-39.4	34.0	53.7	48.3	74	X	Harmonics PK
4823.982	Vertical	-39.4	34.0	39.8	34.4	54	X	Harmonics AV
9766.500	Vertical	-35.6	37.1	55.7	57.2	74	X	PK
9766.500	Vertical	-35.6	37.1	43.6	45.1	54	X	AV
14664.000	Vertical	-34.0	40.4	52.9	59.3	74	X	PK
14664.000	Vertical	-34.0	40.4	38.8	45.2	54	X	AV
6431.980	Horizontal	-34.5	34.8	50.6	50.9	74	X	PK
6431.980	Horizontal	-34.5	34.8	40.3	40.6	54	X	AV
4018.701	Horizontal	-39.3	32.9	56.1	49.7	74	X	PK
4018.701	Horizontal	-39.3	32.9	44.6	38.2	54	X	AV
4823.988	Horizontal	-39.4	34.0	55.5	50.1	74	X	Harmonics PK
4823.988	Horizontal	-39.4	34.0	41.5	36.1	54	X	Harmonics AV
9766.500	Horizontal	-35.6	37.1	52.0	53.5	74	X	PK
9766.500	Horizontal	-35.6	37.1	37.8	39.3	54	X	AV
14664.000	Horizontal	-34.0	40.4	51.0	57.4	74	X	PK
14664.000	Horizontal	-34.0	40.4	38.8	45.2	54	X	AV

Table 19 Radiated Emission Test Data (1GHz-18GHz)

Model No.: 999.11000610

Test mode: TX, 802.11n, Mid Channel

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dB μ V)	Emission Level dB (μ V/m)	Limits dB (μ V/m)	EUT axes	Note
4873.981	Horizontal	-39.4	34.0	56.8	51.4	74	X	Harmonics PK
4873.981	Horizontal	-39.4	34.0	41.9	36.5	54	X	Harmonics AV
4060.647	Horizontal	-39.3	32.9	54.2	47.8	74	X	PK
4060.647	Horizontal	-39.3	32.9	42.6	36.2	54	X	AV
6498.634	Horizontal	-34.6	34.8	53.4	53.6	74	X	PK
6498.634	Horizontal	-34.6	34.8	40.4	40.6	54	X	AV
5436.411	Horizontal	-38.4	34.3	54.3	50.2	74	X	PK
5436.411	Horizontal	-38.4	34.3	43.6	39.5	54	X	AV
7314.508	Horizontal	-38.1	35.6	53.3	50.8	74	X	Harmonics PK
7314.508	Horizontal	-38.1	35.6	40.8	38.3	54	X	Harmonics AV
11605.551	Horizontal	-35.7	37.4	52.5	54.2	74	X	PK
11605.551	Horizontal	-35.7	37.4	39.1	40.8	54	X	AV
4060.701	Vertical	-39.3	32.9	58.9	52.5	74	X	PK
4060.701	Vertical	-39.3	32.9	47.7	41.3	54	X	AV
4873.981	Vertical	-39.4	34.0	55.9	50.5	74	X	Harmonics PK
4873.981	Vertical	-39.4	34.0	41.7	36.3	54	X	Harmonics AV
6498.641	Vertical	-34.6	34.8	54.0	54.2	74	X	PK
6498.641	Vertical	-34.6	34.8	45.7	45.9	54	X	AV
5697.173	Vertical	-38.4	34.4	51.3	47.3	74	X	PK
5697.173	Vertical	-38.4	34.4	38.9	34.9	54	X	AV
7314.655	Vertical	-38.1	35.6	54.6	52.1	74	X	Harmonics PK
7314.655	Vertical	-38.1	35.6	42.1	39.6	54	X	Harmonics AV
11958.701	Vertical	-35.3	37.5	50.2	52.4	74	X	PK
11958.701	Vertical	-35.3	37.5	41.4	43.6	54	X	AV

Table 20 Radiated Emission Test Data (1GHz-18GHz)

Model No.: 999.11000610

Test mode: TX, 802.11n, High Channel

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
6565.305	Horizontal	-35.1	34.8	52.3	52.0	74	X	PK
6565.305	Horizontal	-35.1	34.8	43.1	42.8	54	X	AV
4103.830	Horizontal	-39.3	32.9	54.3	47.9	74	X	PK
4103.830	Horizontal	-39.3	32.9	42.7	36.3	54	X	AV
4923.698	Horizontal	-39.6	34.0	53.9	48.3	74	X	Harmonics PK
4923.980	Horizontal	-39.6	34.0	40.4	34.8	54	X	Harmonics AV
13720.000	Horizontal	-34.5	39.0	53.5	58.0	74	X	PK
13720.000	Horizontal	-34.5	39.0	39.7	44.2	54	X	AV
9757.000	Horizontal	-35.5	37.1	54.7	56.3	74	X	PK
9757.000	Horizontal	-35.5	37.1	42.6	44.2	54	X	AV
6565.304	Vertical	-35.1	34.8	56.2	55.9	74	X	PK
6565.304	Vertical	-35.1	34.8	46.6	46.3	54	X	AV
4103.873	Vertical	-39.3	32.9	57.3	50.9	74	X	PK
4103.873	Vertical	-39.3	32.9	46.6	40.2	54	X	AV
4923.988	Vertical	-39.6	34.0	52.6	47.0	74	X	Harmonics PK
4923.988	Vertical	-39.6	34.0	39.2	33.6	54	X	Harmonics AV
13720.000	Vertical	-34.5	39.0	53.1	57.6	74	X	PK
13720.000	Vertical	-34.5	39.0	39.7	44.2	54	X	AV
9757.000	Vertical	-35.5	37.1	52.6	54.2	74	X	PK
9757.000	Vertical	-35.5	37.1	37.6	39.2	54	X	AV

Note: 1. Emission level(dBuV/m)=Reading Value(dBuV) + Correction Factor(dB)+Antenna Factor (dB/m)

2. Correction Factor(dB) = Cable Factor (dB)+Amplifier Factor(dB)

3. No other spurious and harmonic emissions were reported greater than listed emissions above table.

Table 21 Radiated Emission Test Data (18GHz-25GHz)

Model No.: 999.11000610

Test mode: TX, Worst-case

Frequency (MHz)	Polarization	Correction Factor (dB)	Antenna Factor (dB/m)	Reading Value (dBμV)	Emission Level dB (μV/m)	Limits dB (μV/m)	EUT axes	Note
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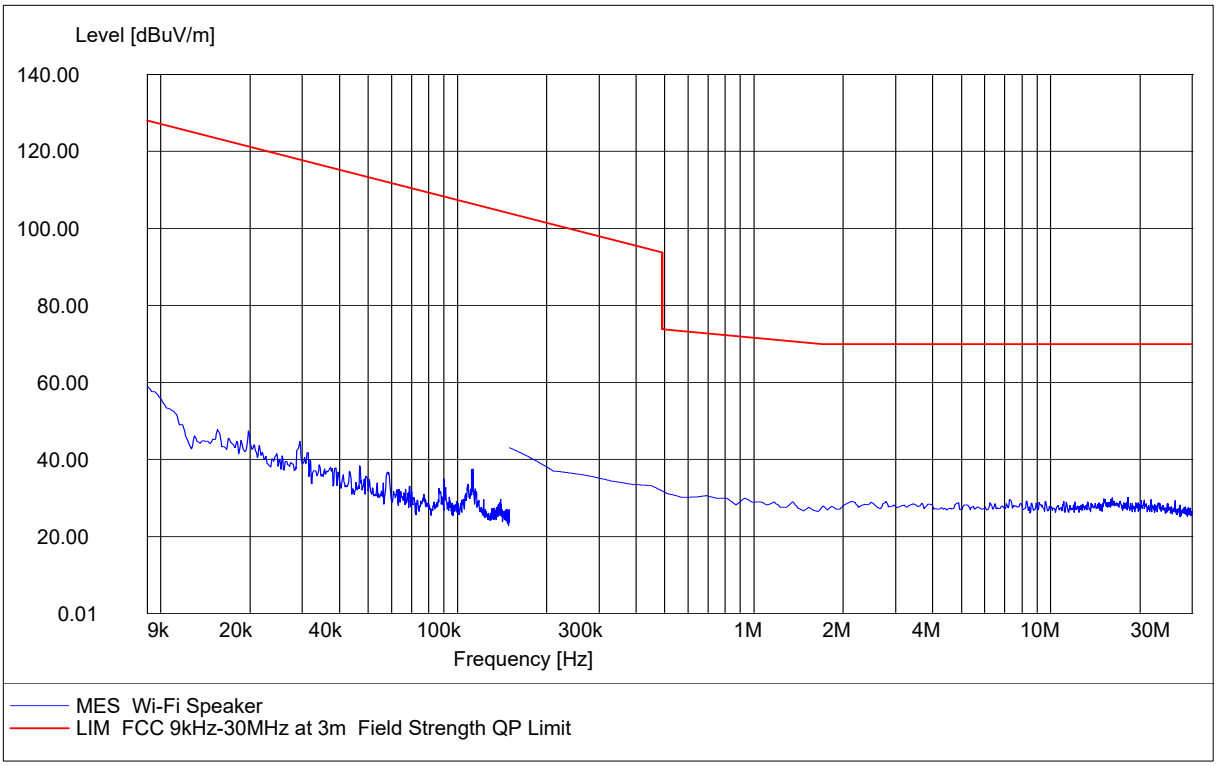
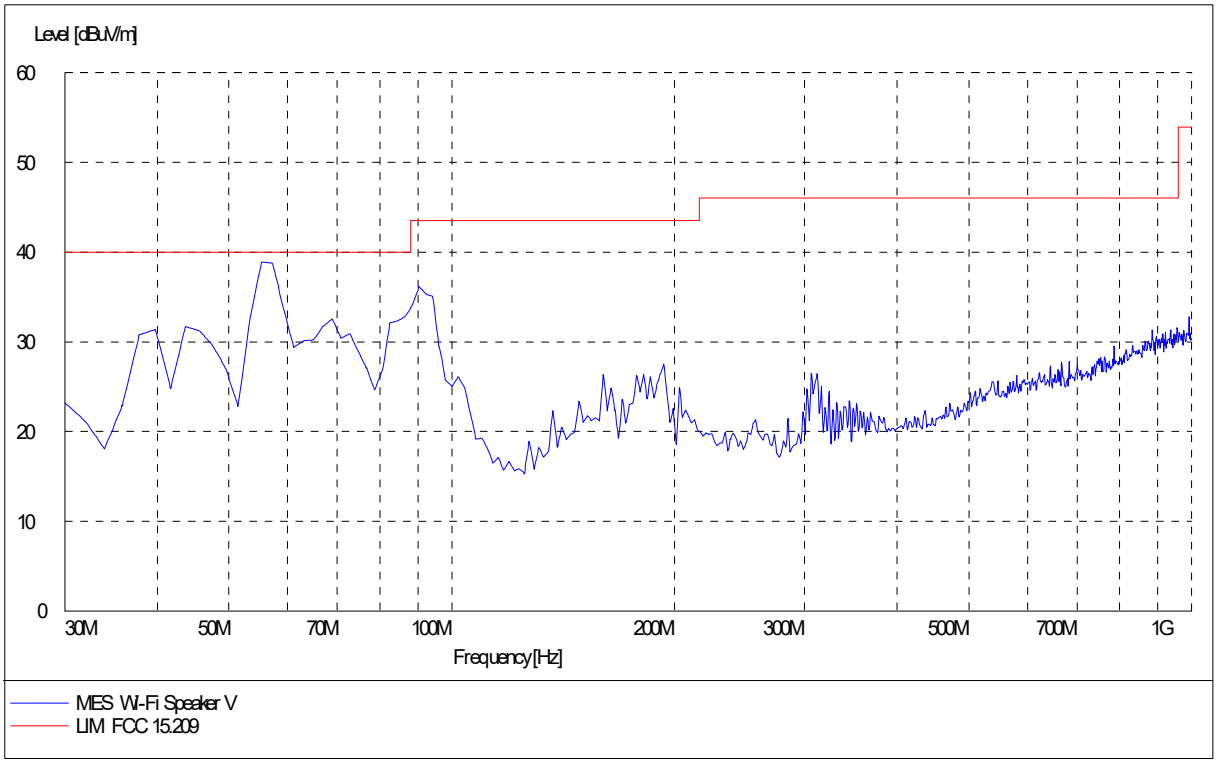
No spurious and harmonic emissions were found at 18-25GHz.

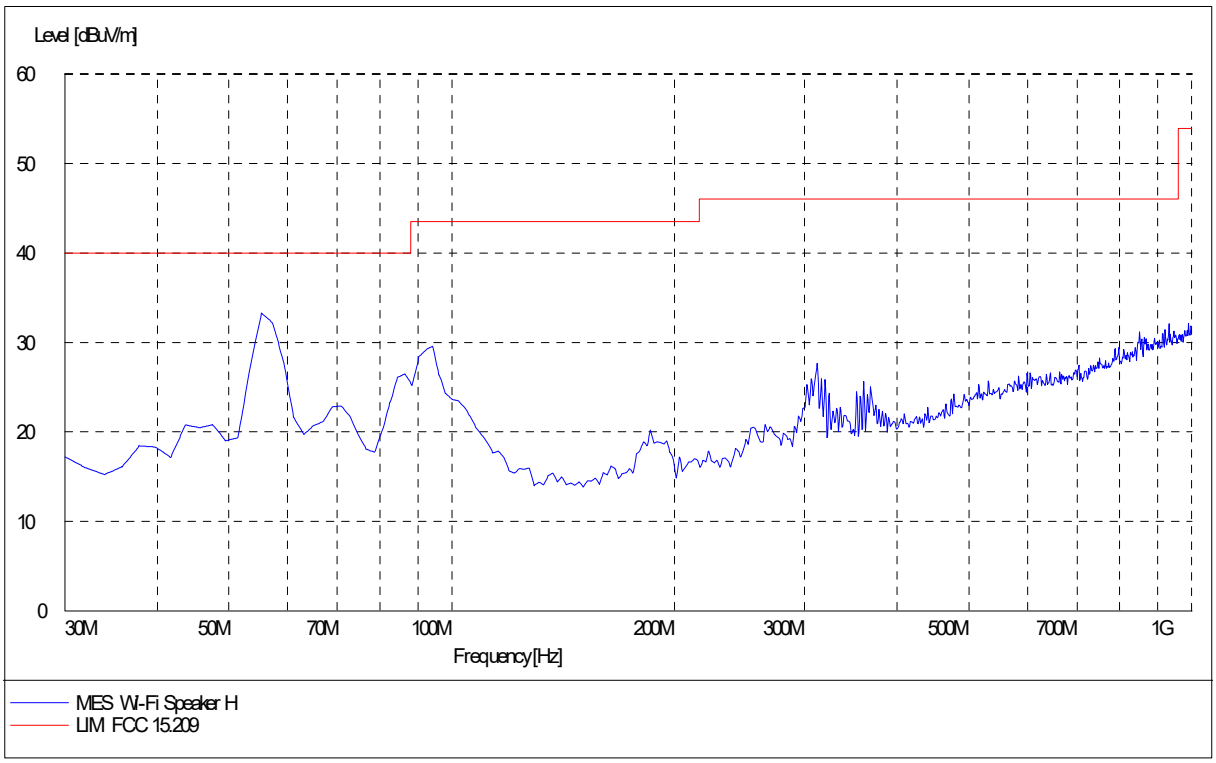
9kHz-30Hz



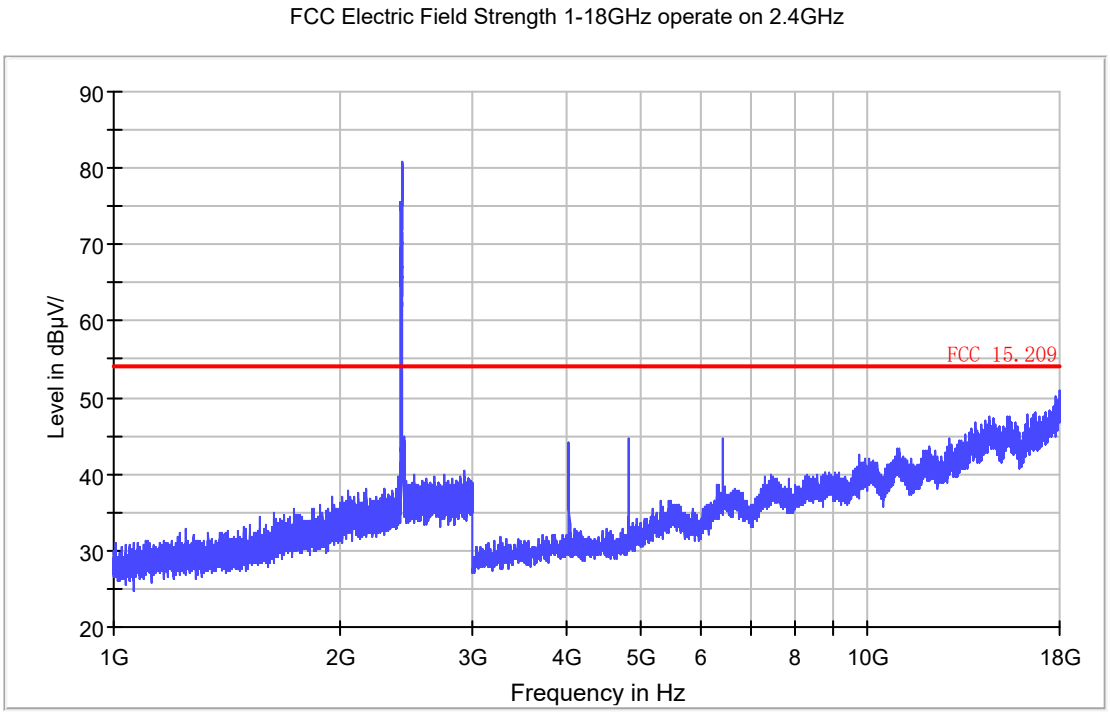
Below 1GHz, Vertical



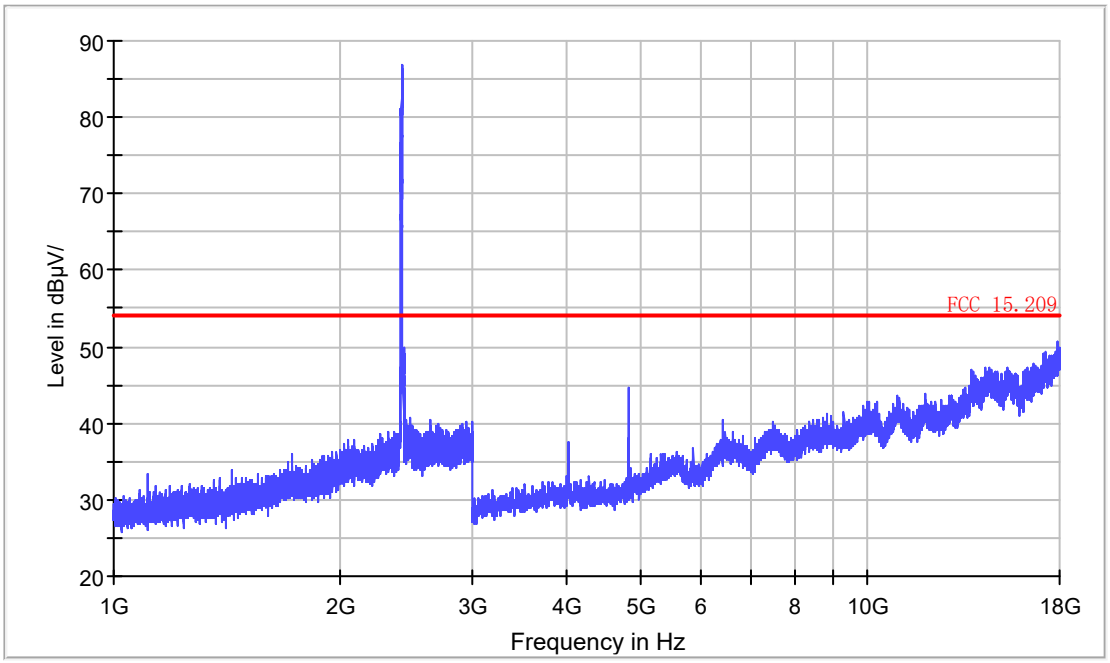
Below 1GHz, Horizontal



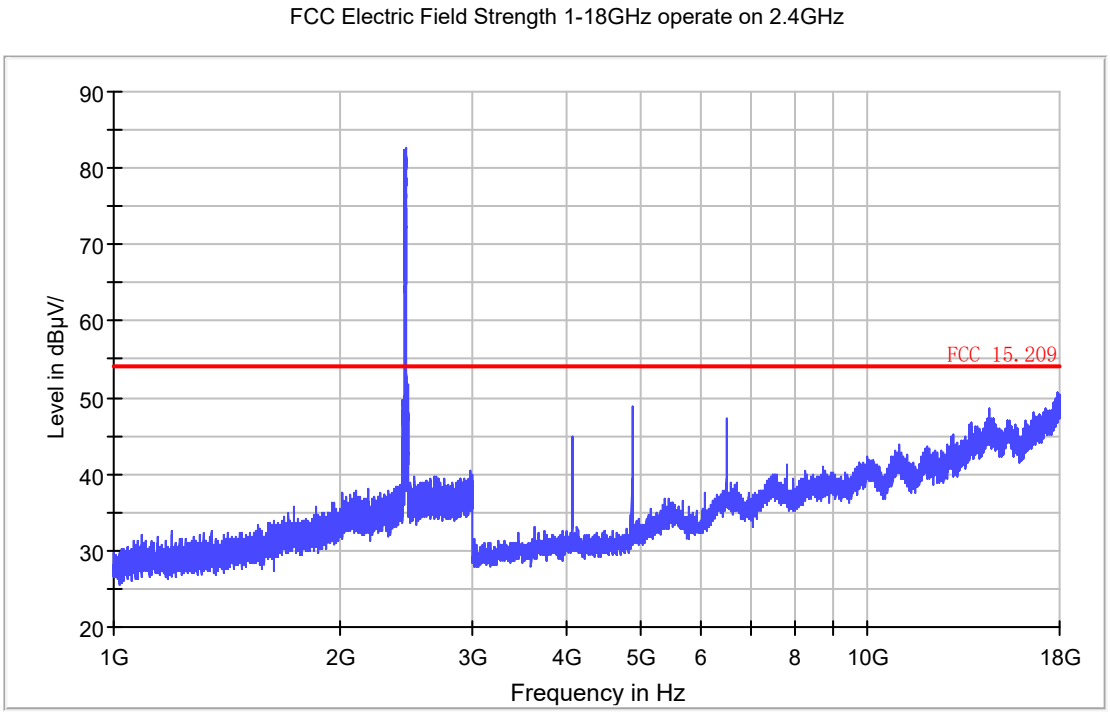
1G-18GHz, Vertical, 802.11b, Low channel



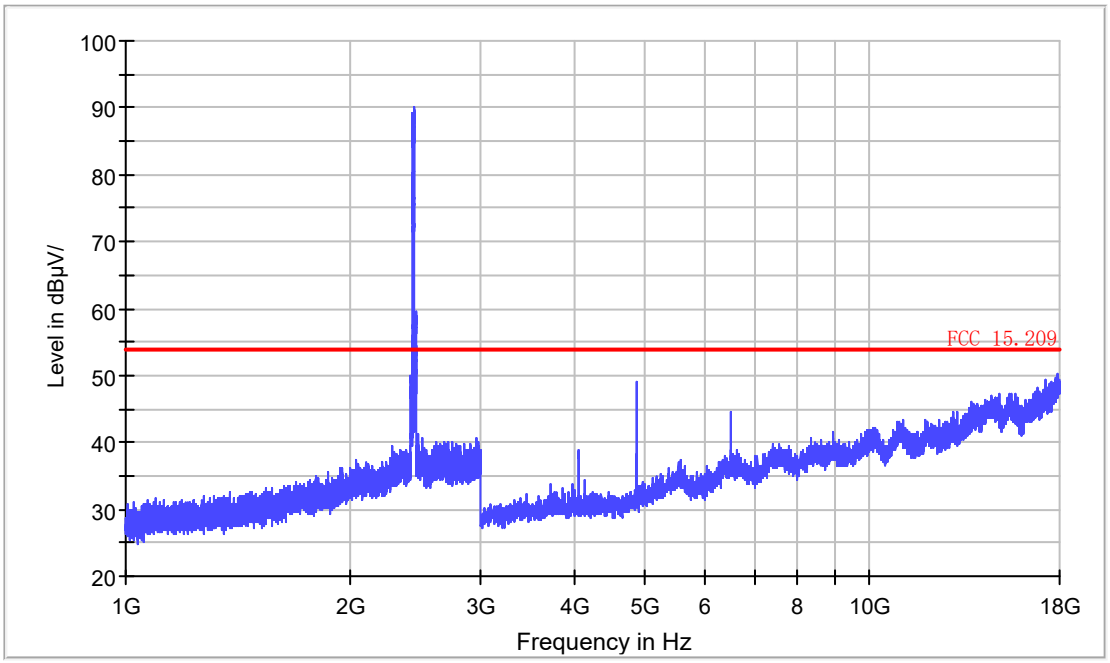
1G-18GHz, Horizontal, 802.11b, Low channel



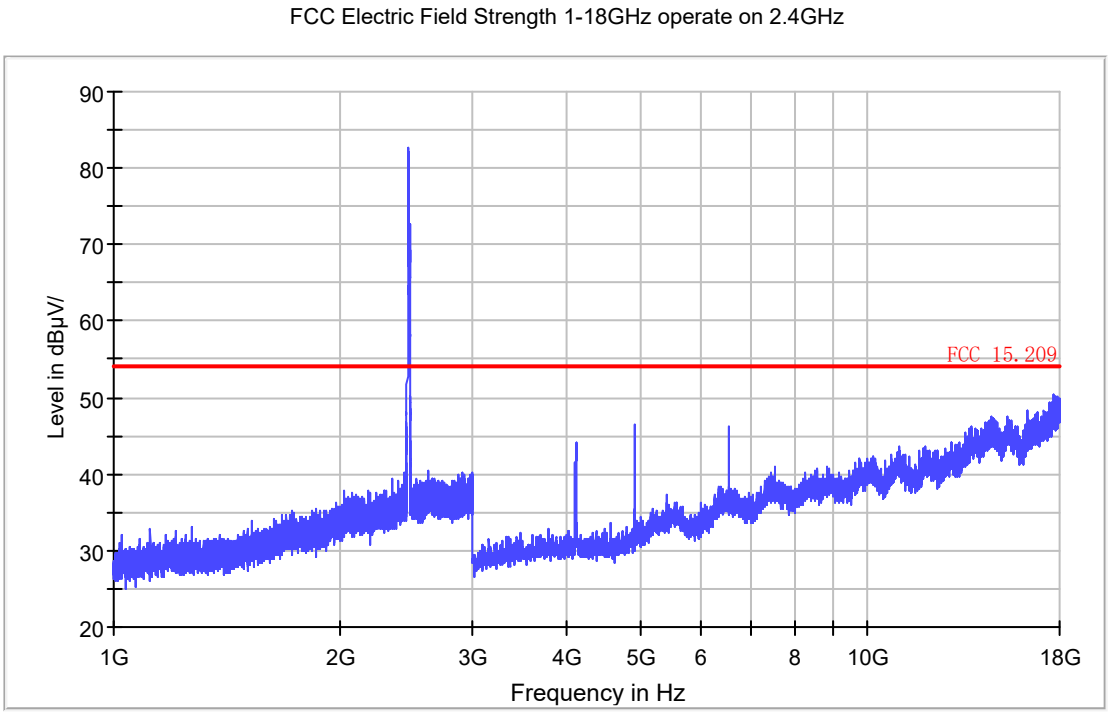
1G-18GHz, Vertical, 802.11b, Mid channel



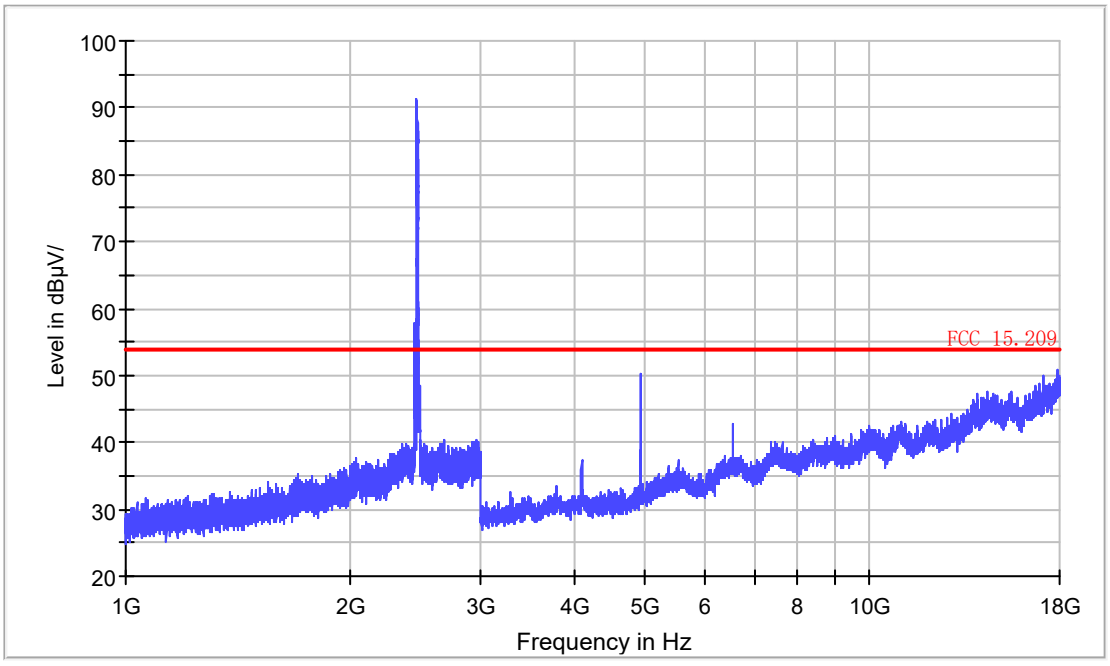
1G-18GHz, Horizontal, 802.11b, Mid channel



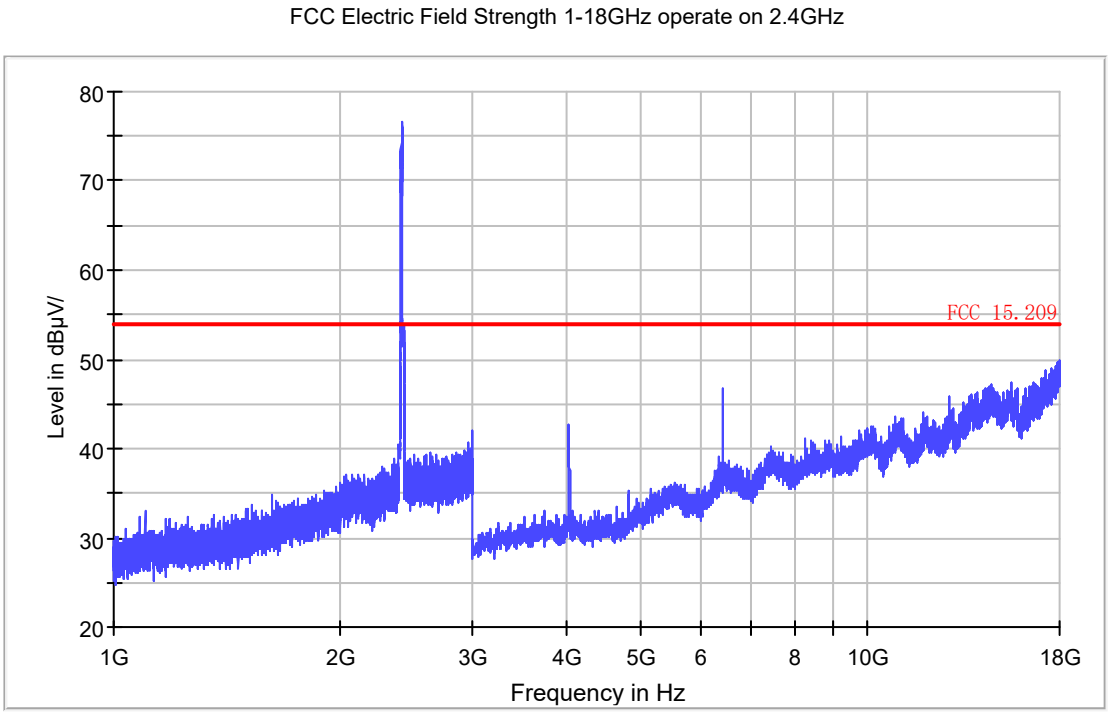
1G-18GHz, Vertical, 802.11b, High channel



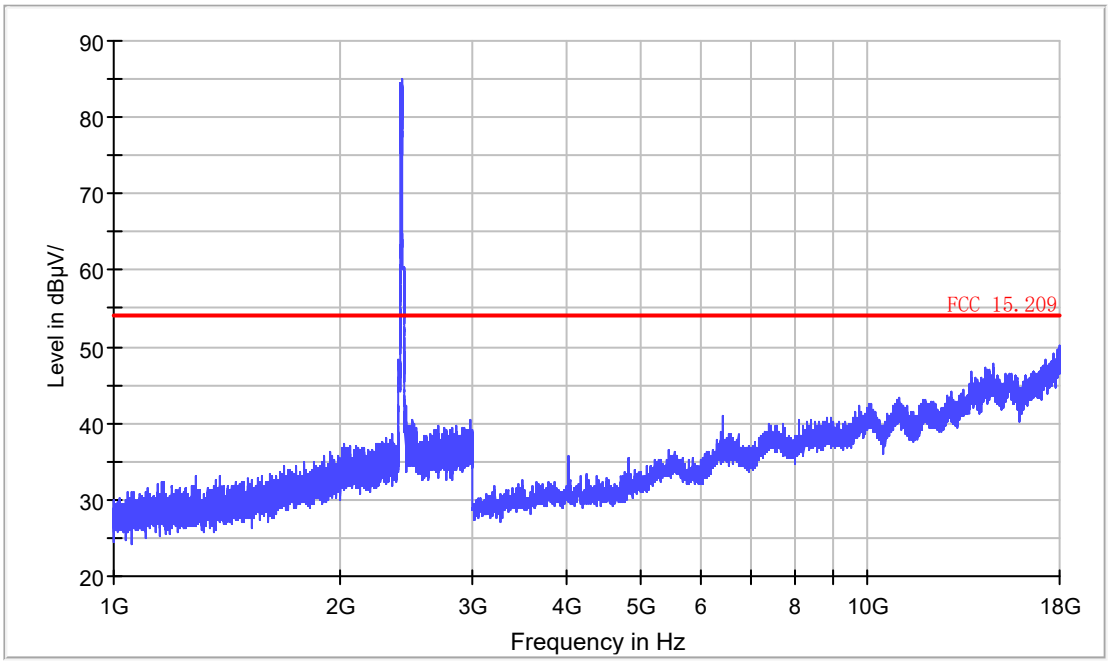
1G-18GHz, Horizontal, 802.11b, High channel



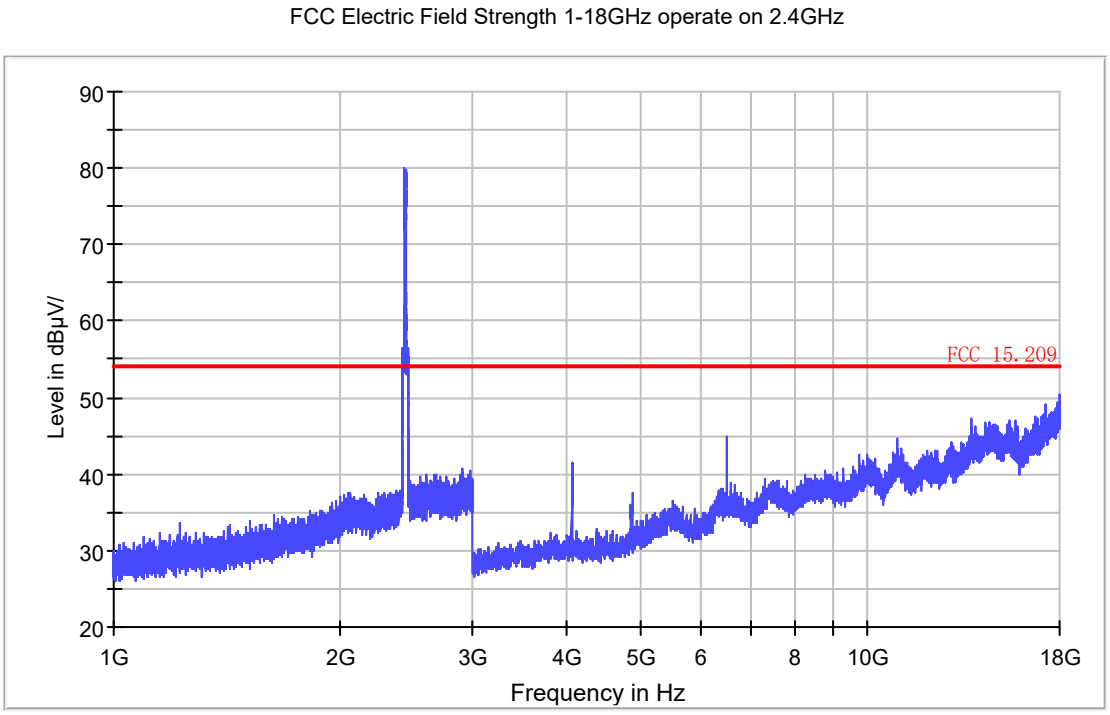
1G-18GHz, Vertical, 802.11g, Low channel



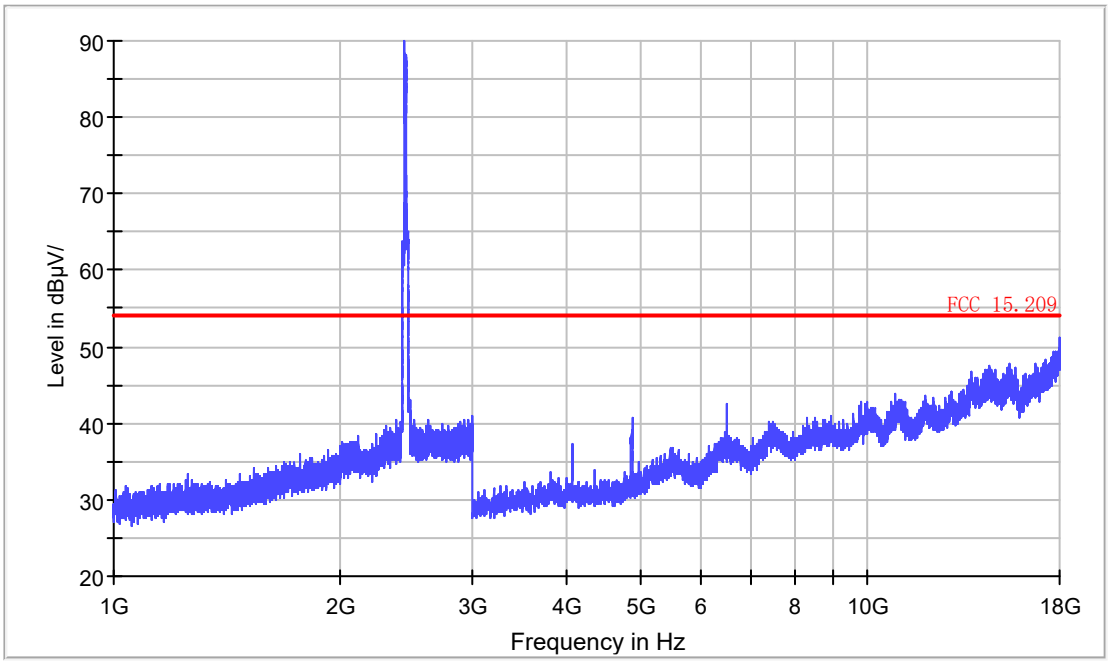
1G-18GHz, Horizontal, 802.11g, Low channel



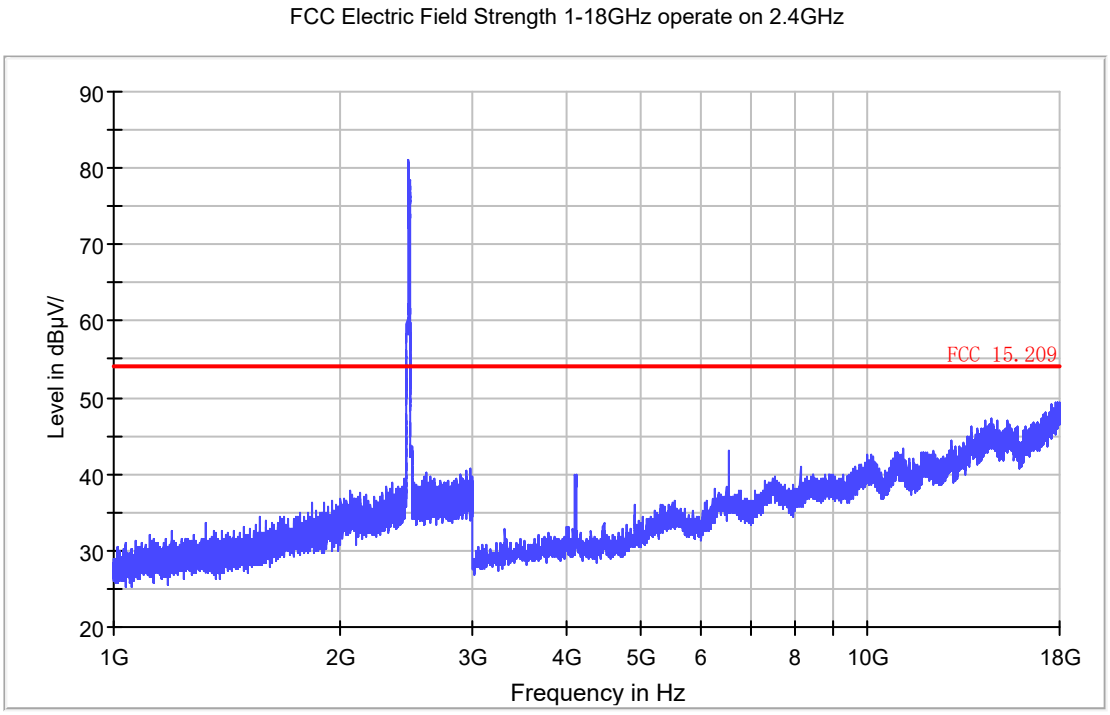
1G-18GHz, Vertical, 802.11g, Mid channel



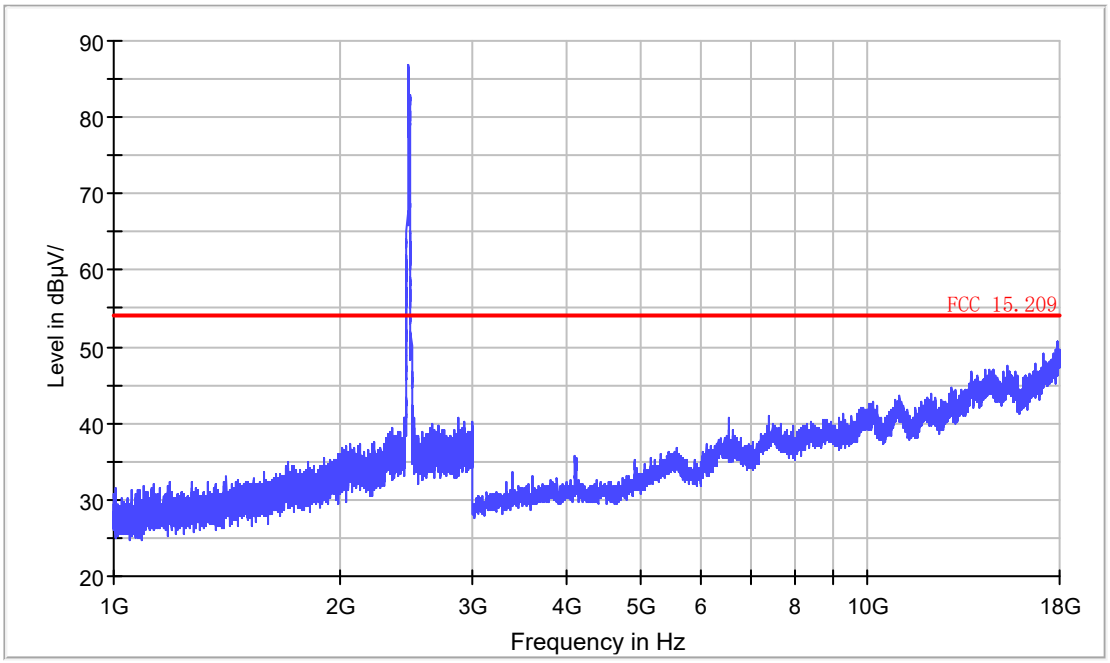
1G-18GHz, Horizontal, 802.11g, Mid channel



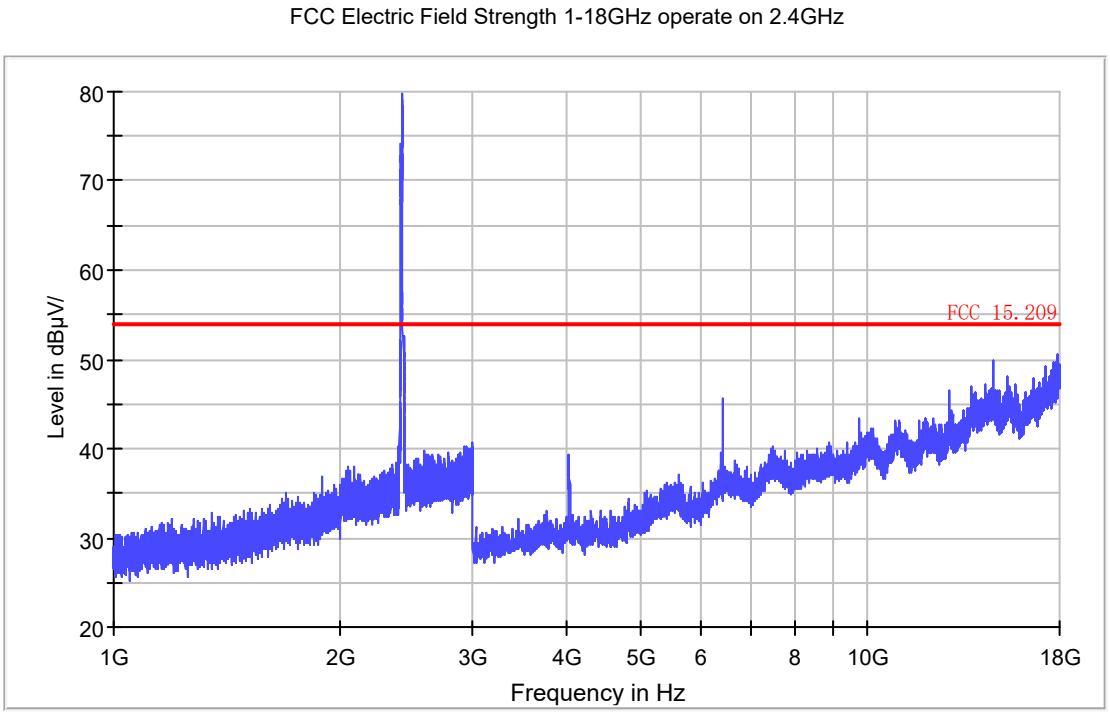
1G-18GHz, Vertical, 802.11g, High channel



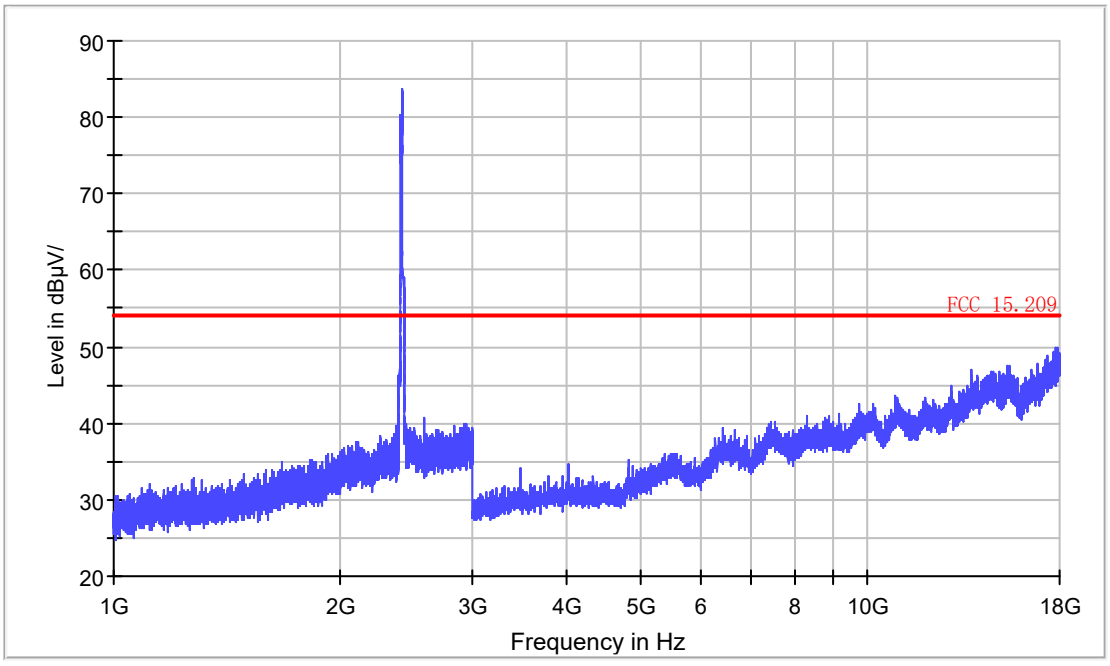
1G-18GHz, Horizontal, 802.11g, High channel



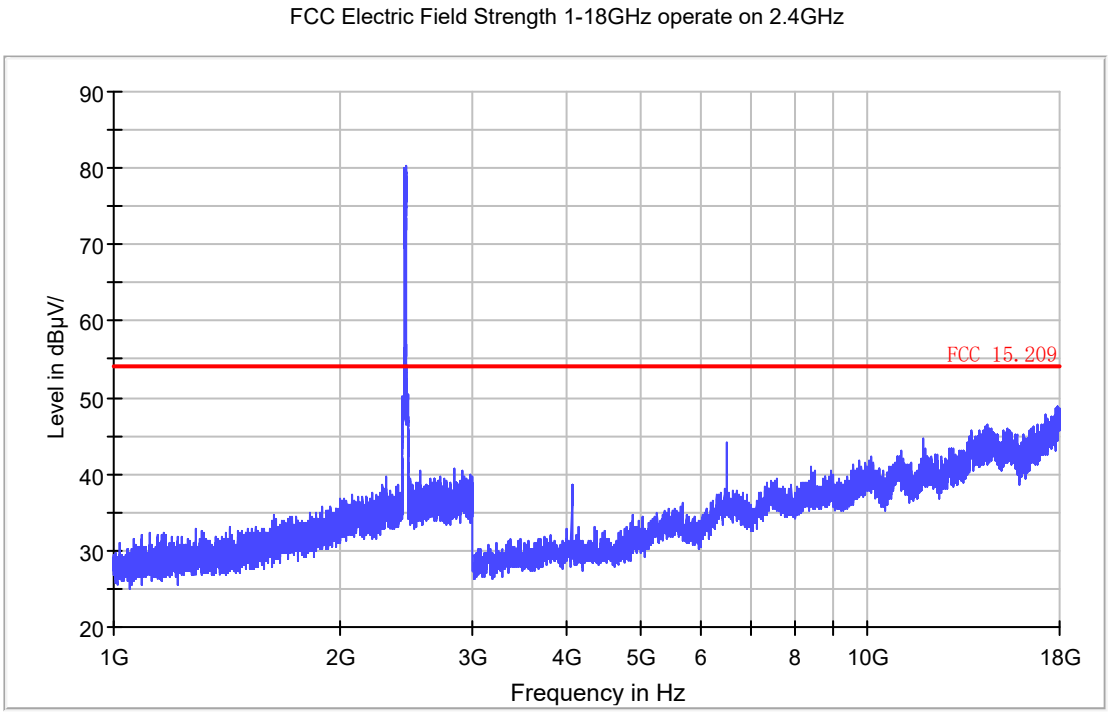
1G-18GHz, Vertical, 802.11n HT20, Low channel



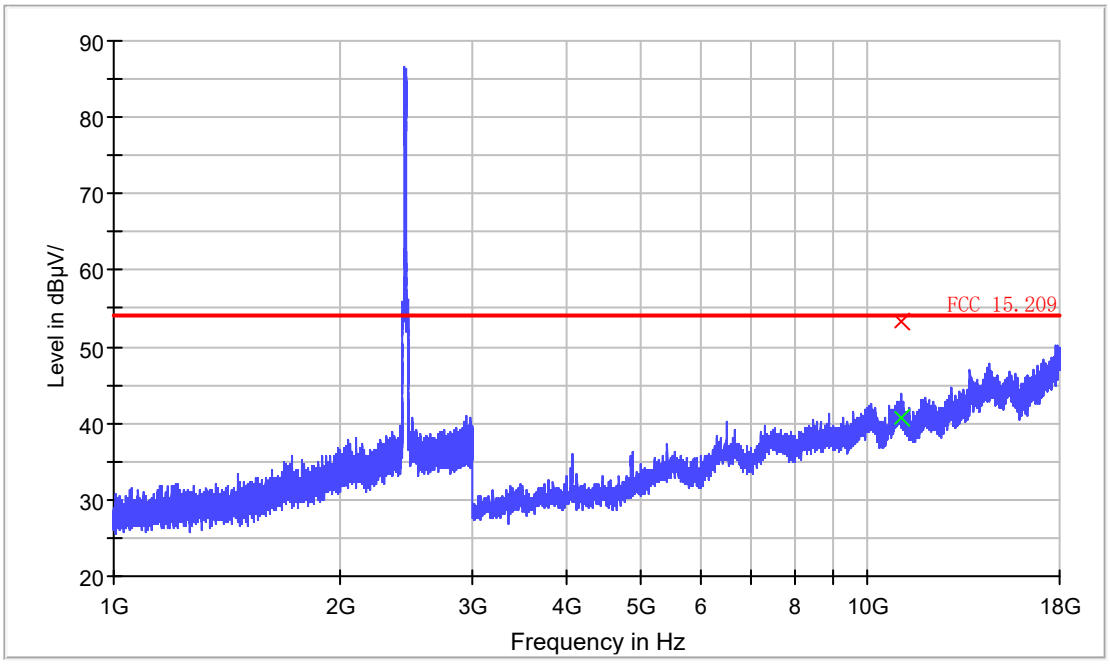
1G-18GHz, Horizontal, 802.11n HT20, Low channel



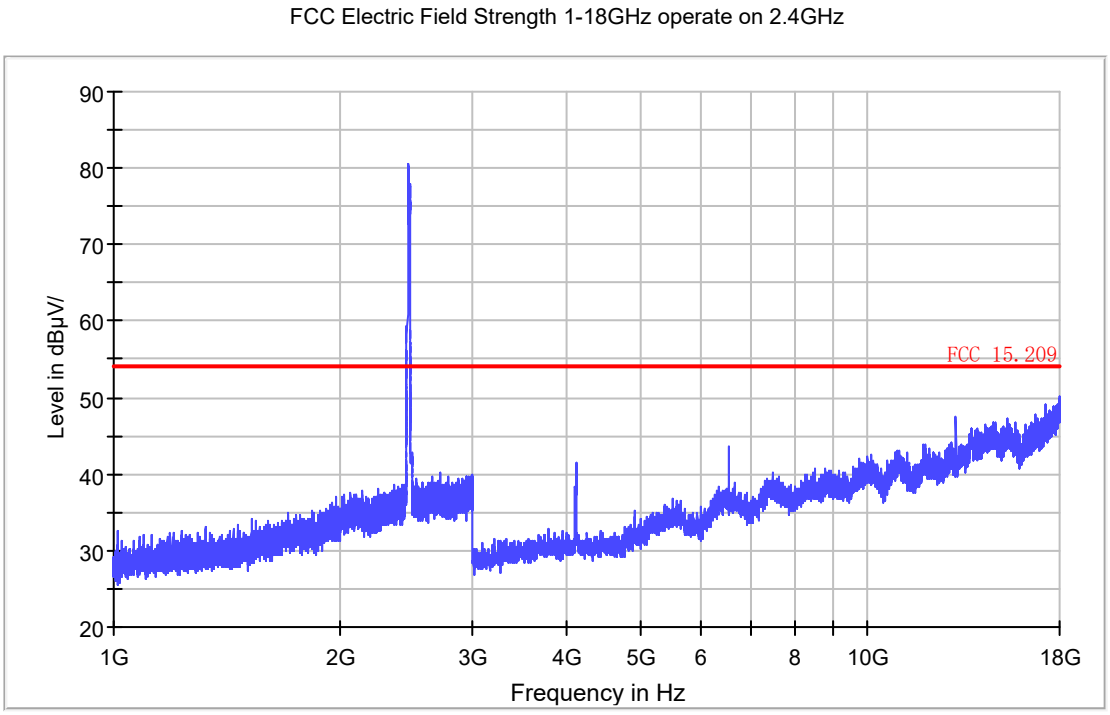
1G-18GHz, Vertical, 802.11n HT20, Mid channel



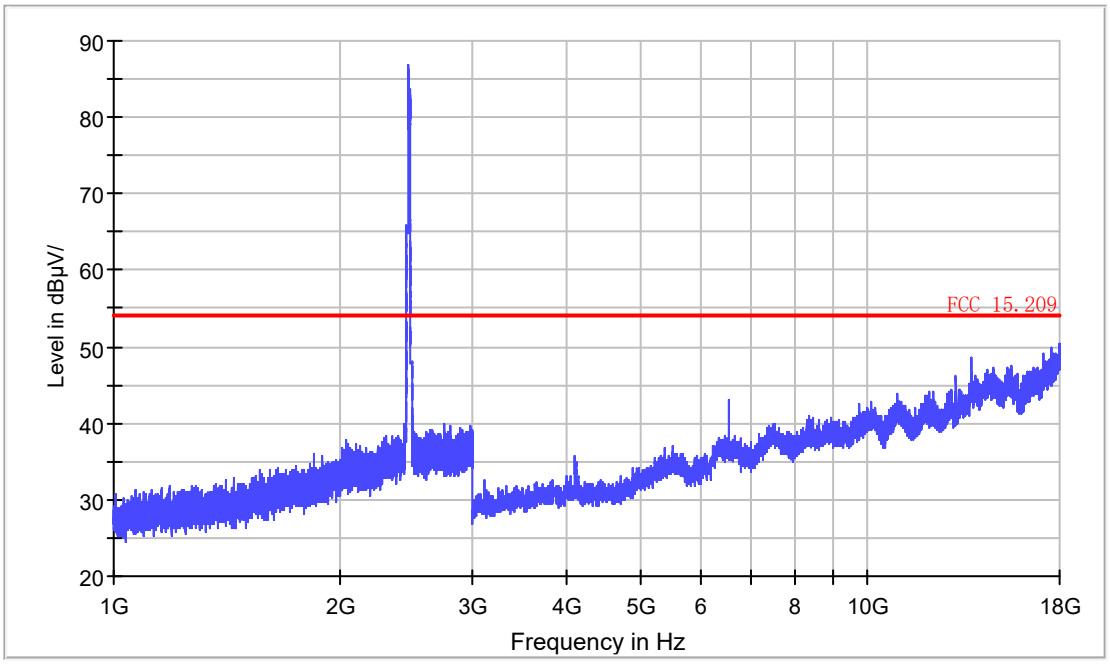
1G-18GHz, Horizontal, 802.11n HT20, Mid channel



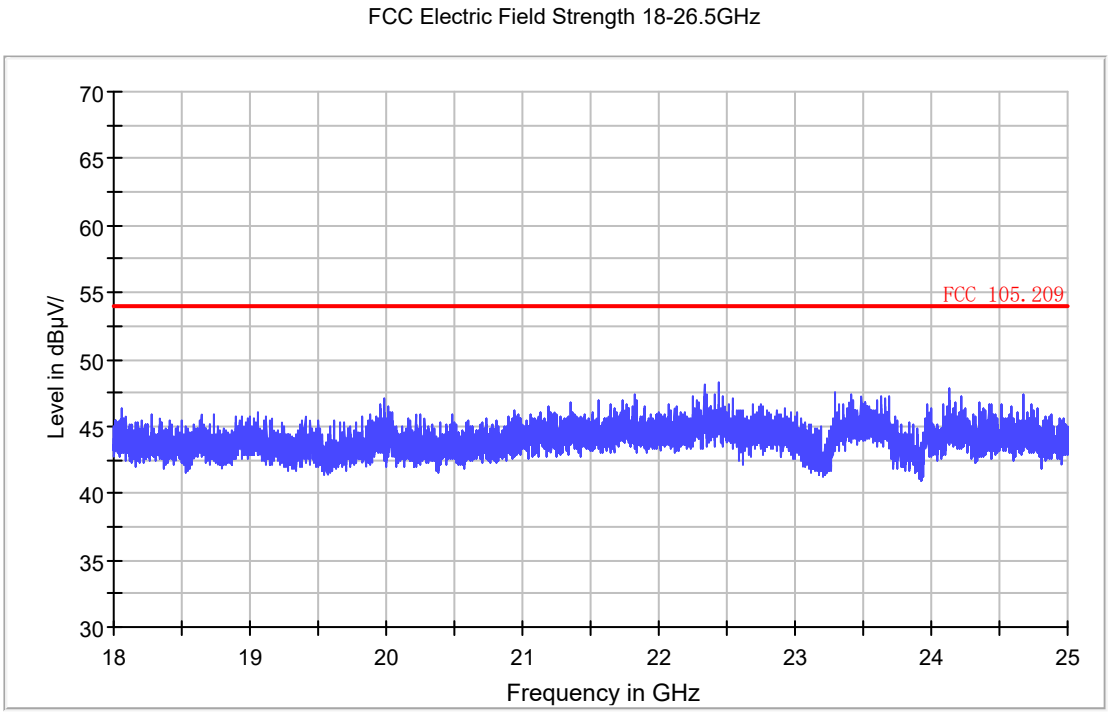
1G-18GHz, Vertical, 802.11n HT20, High channel



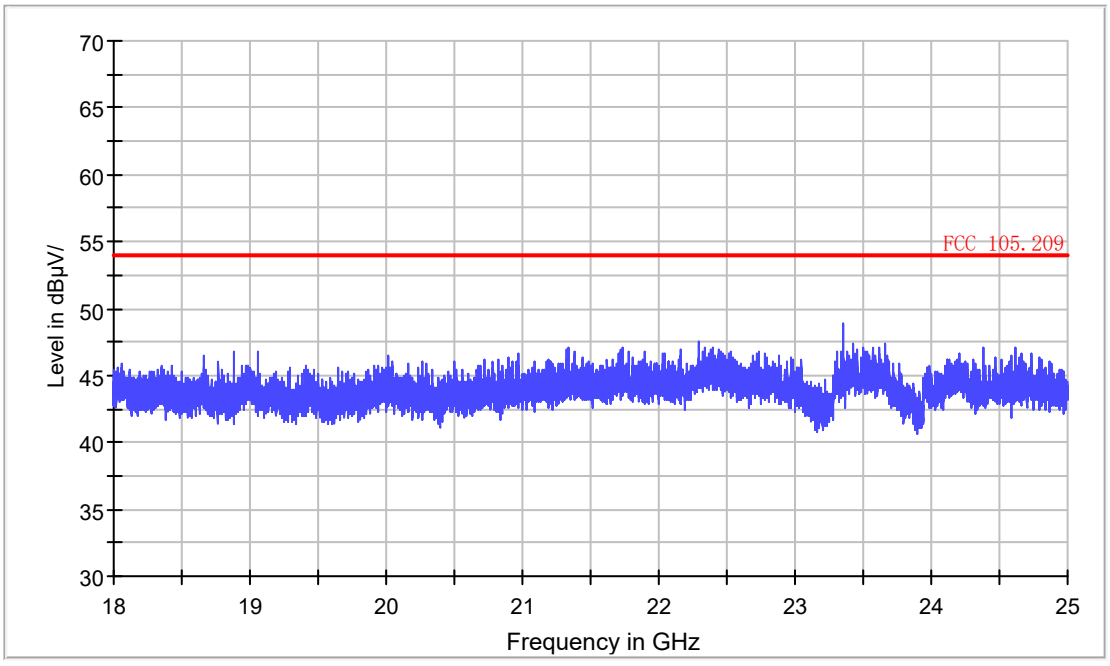
1G-18GHz, Horizontal, 802.11n HT20, High channel



18G-25GHz, Vertical

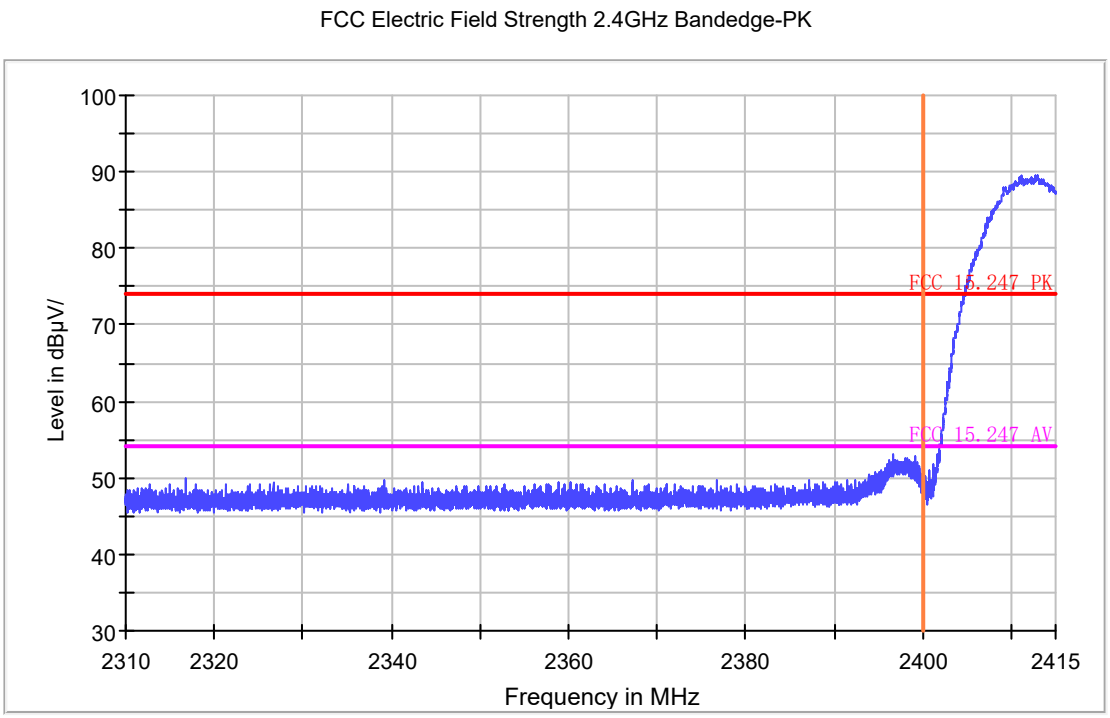


18G-25GHz, Horizontal

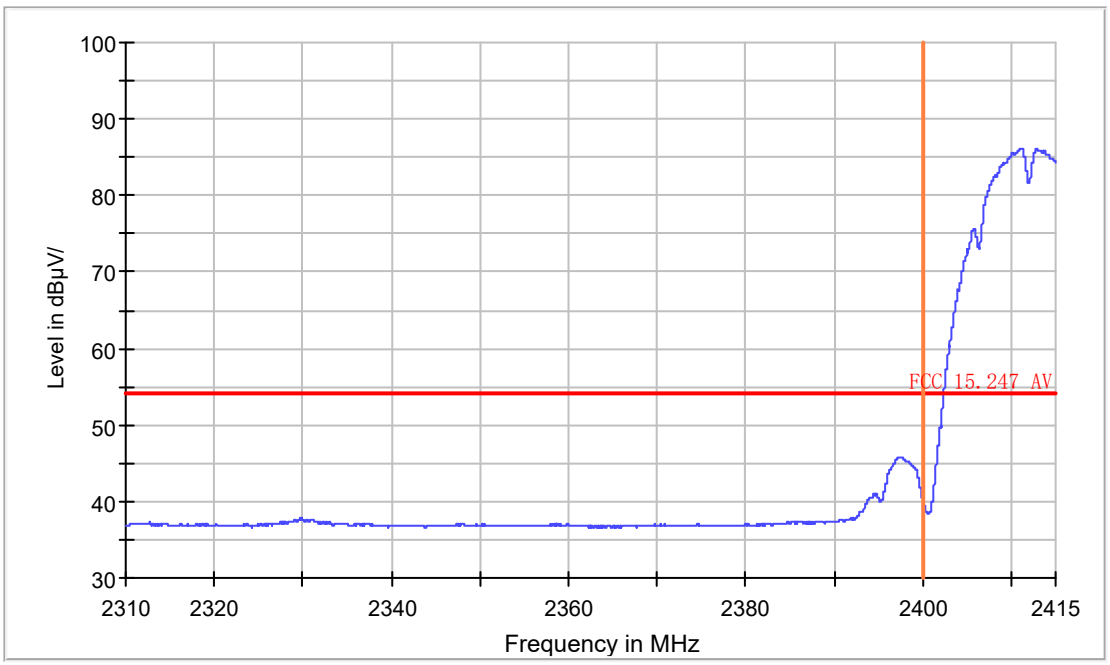


Band Edge

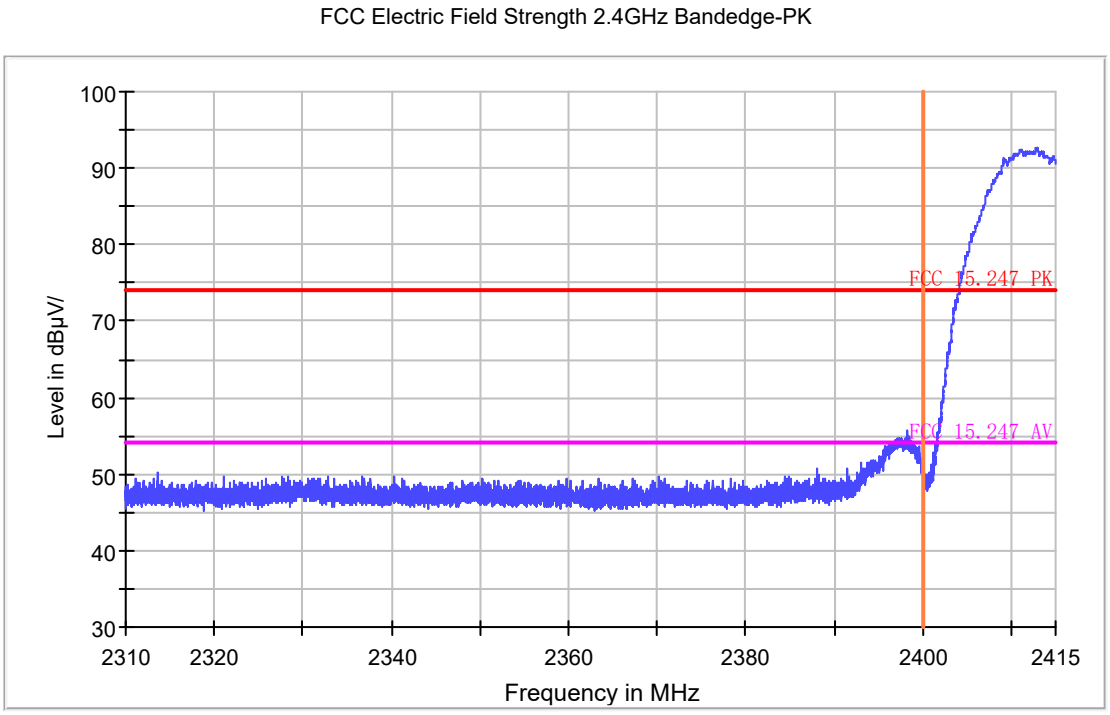
Vertical, 802.11b, Low channel, PK



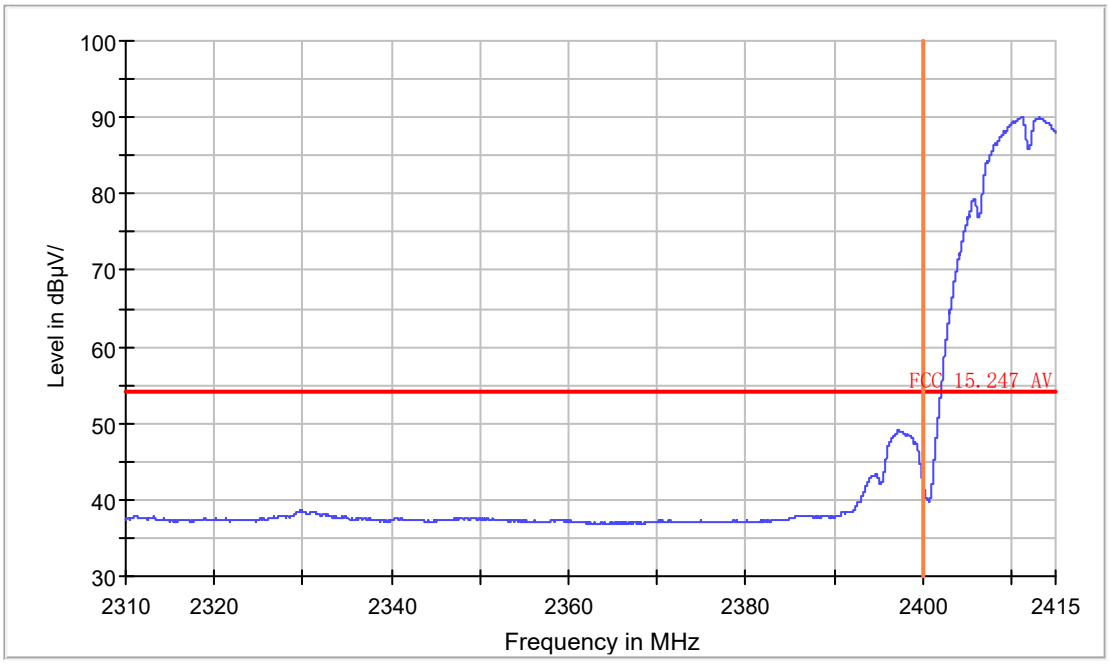
Vertical, 802.11b, Low channel, AV



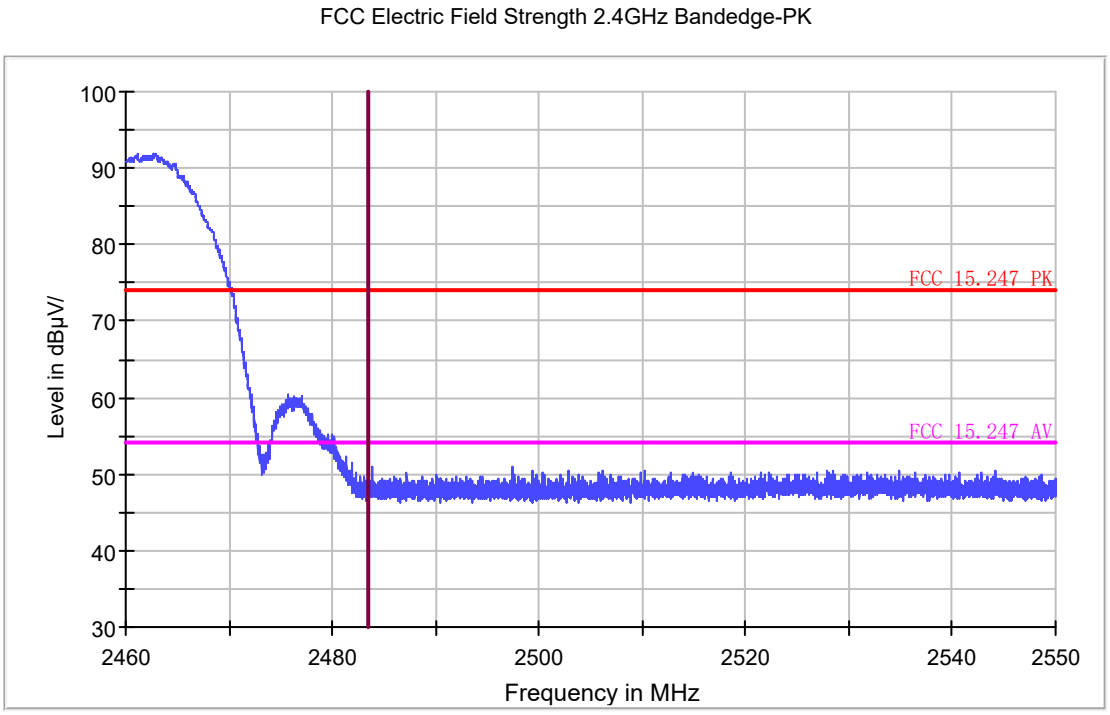
Horizontal, 802.11b, Low channel, PK



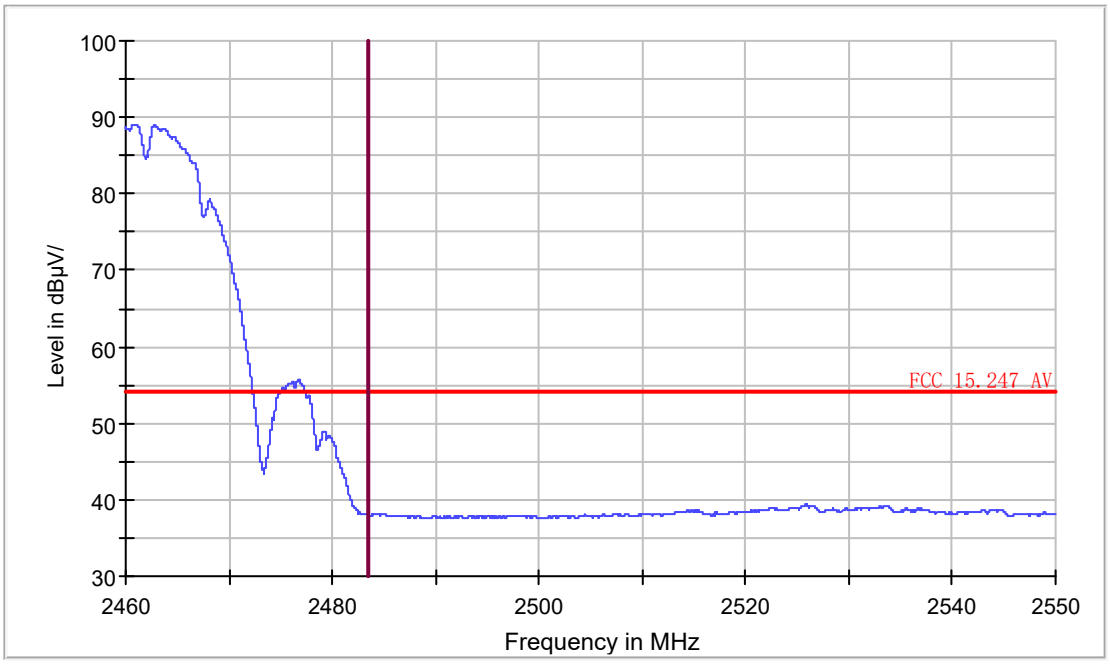
Horizontal, 802.11b, Low channel, AV



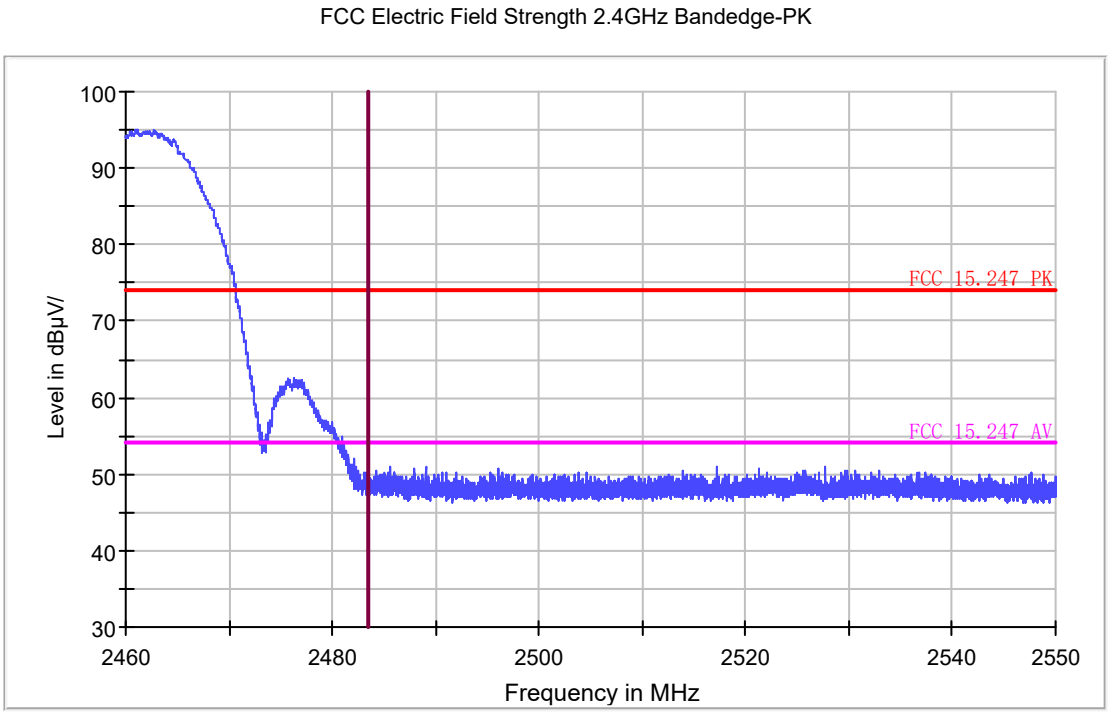
Vertical, 802.11b, High channel, PK



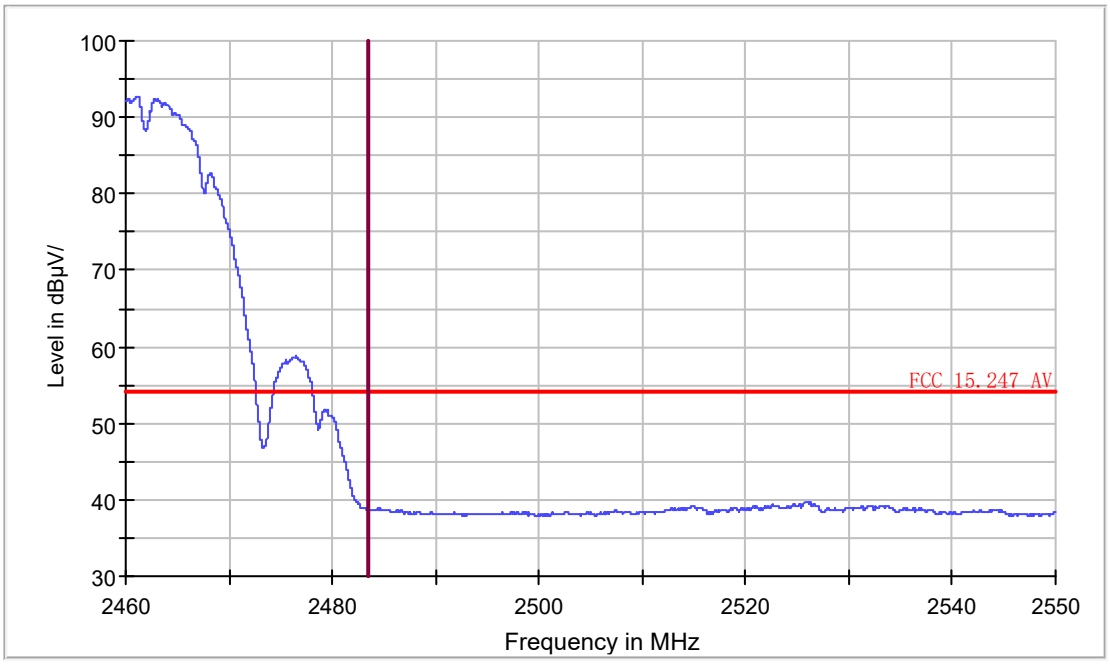
Vertical, 802.11b, High channel, AV



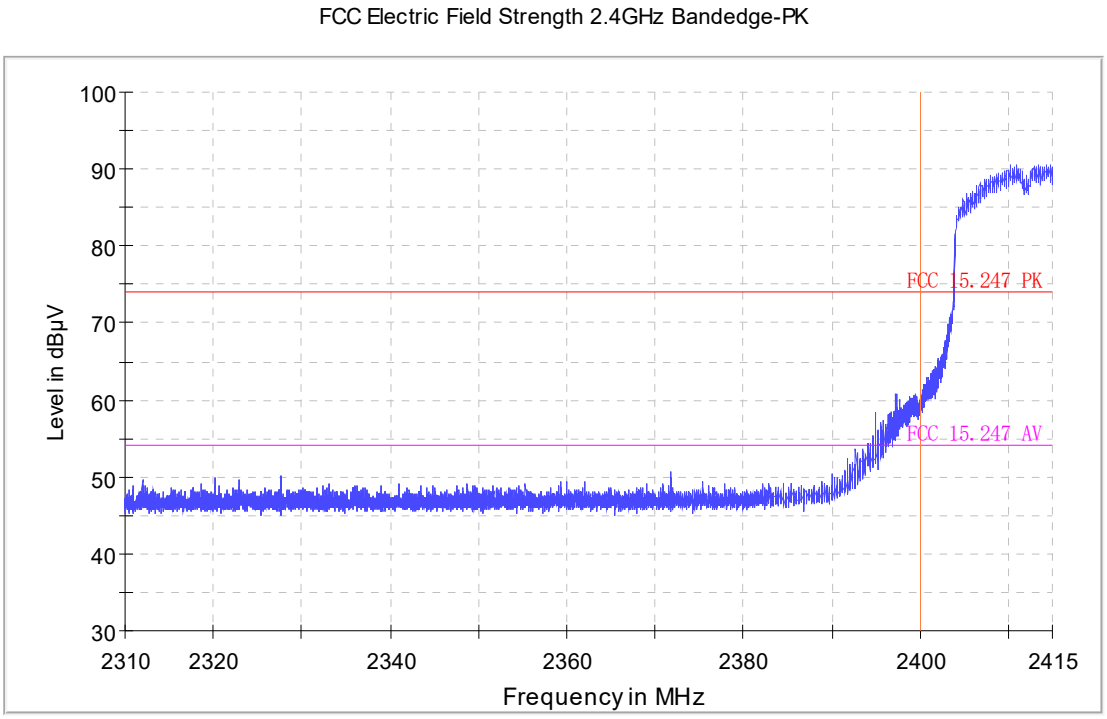
Horizontal, 802.11b, High channel, PK



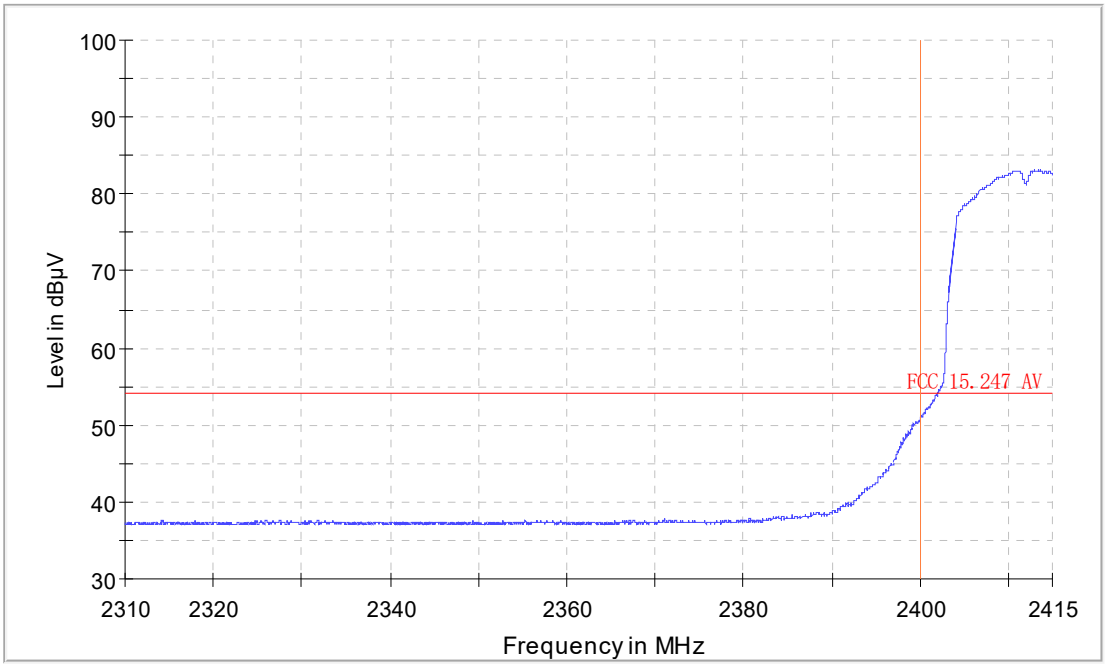
Horizontal, 802.11b, High channel, AV



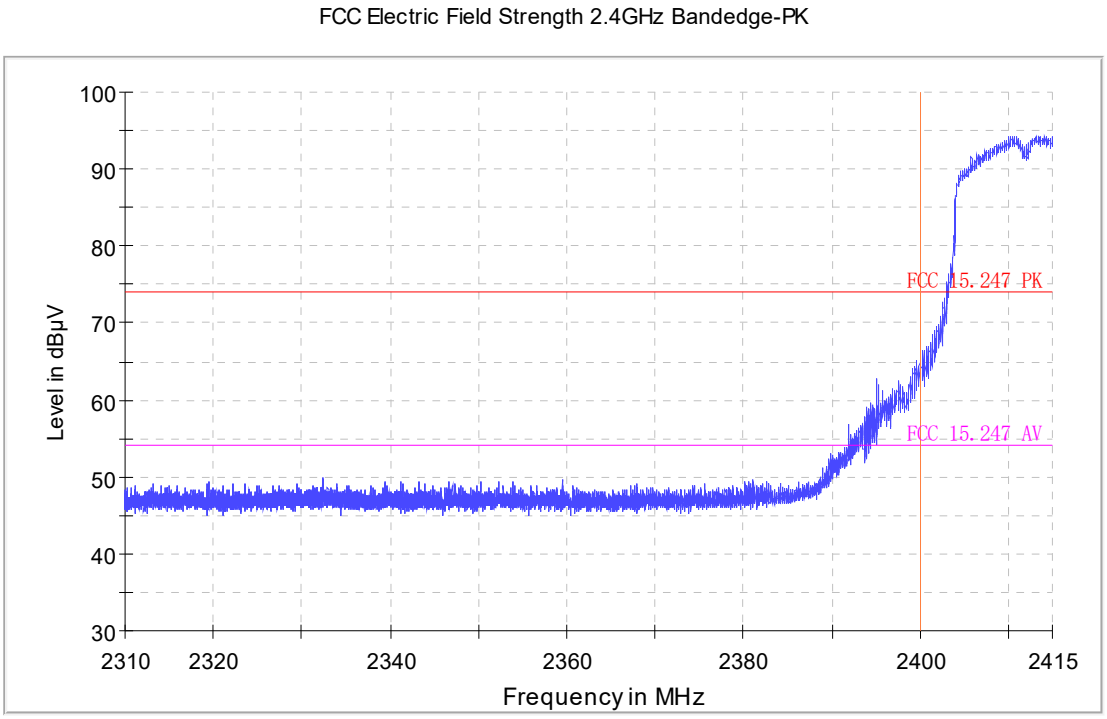
Vertical, 802.11g, Low channel, PK



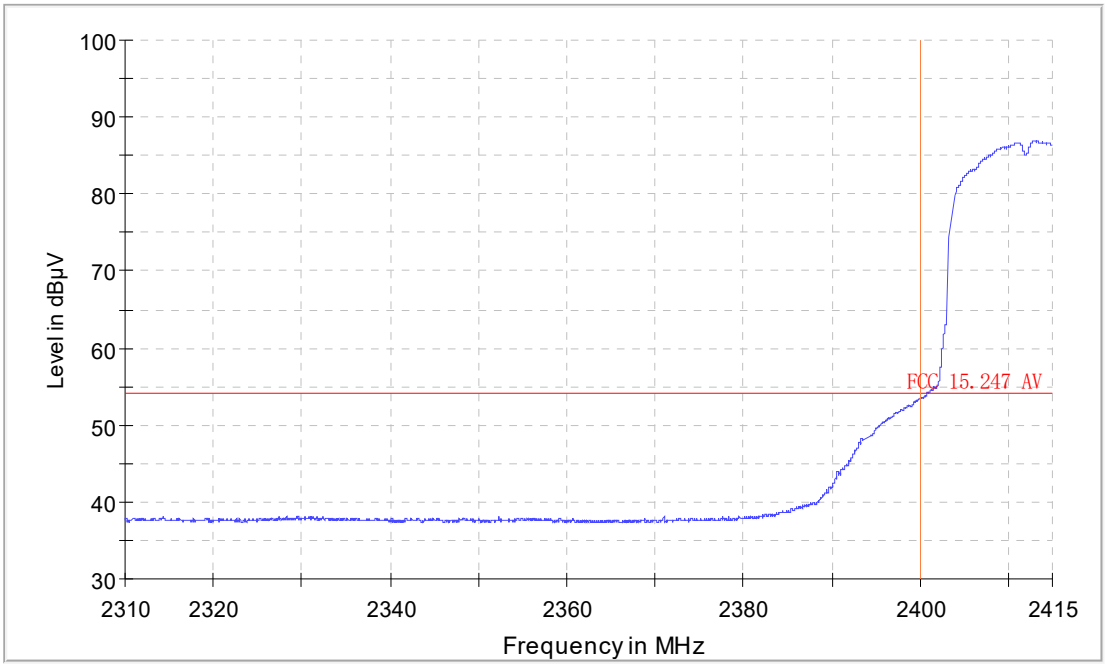
Vertical, 802.11g, Low channel, AV



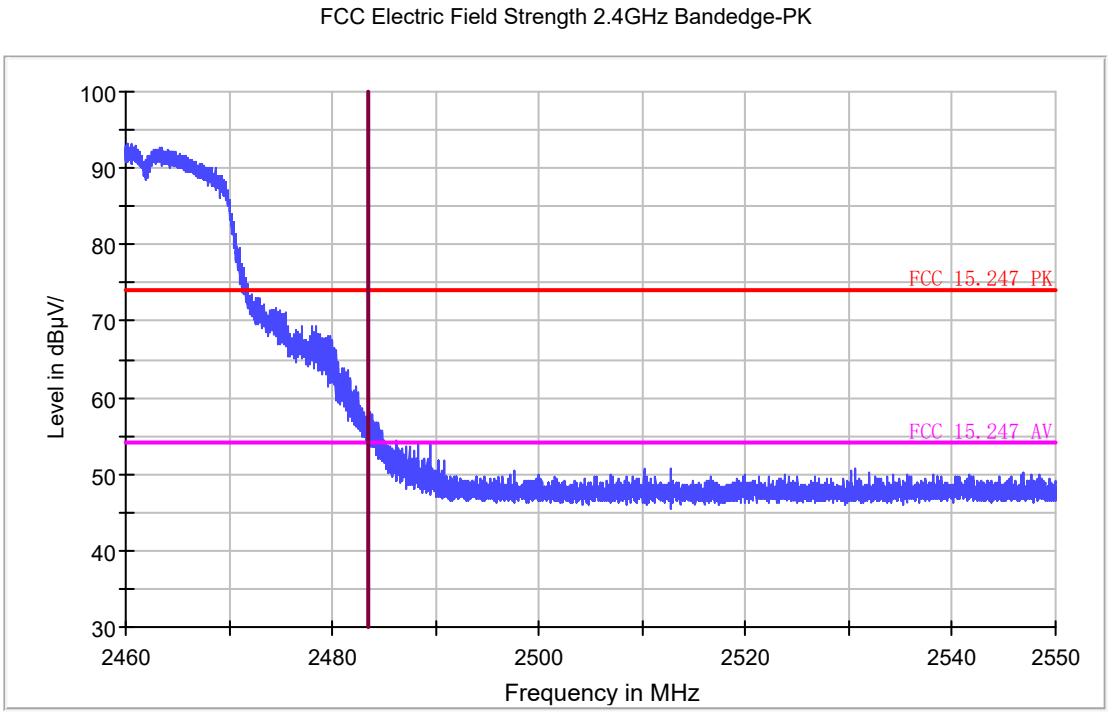
Horizontal, 802.11g, Low channel, PK



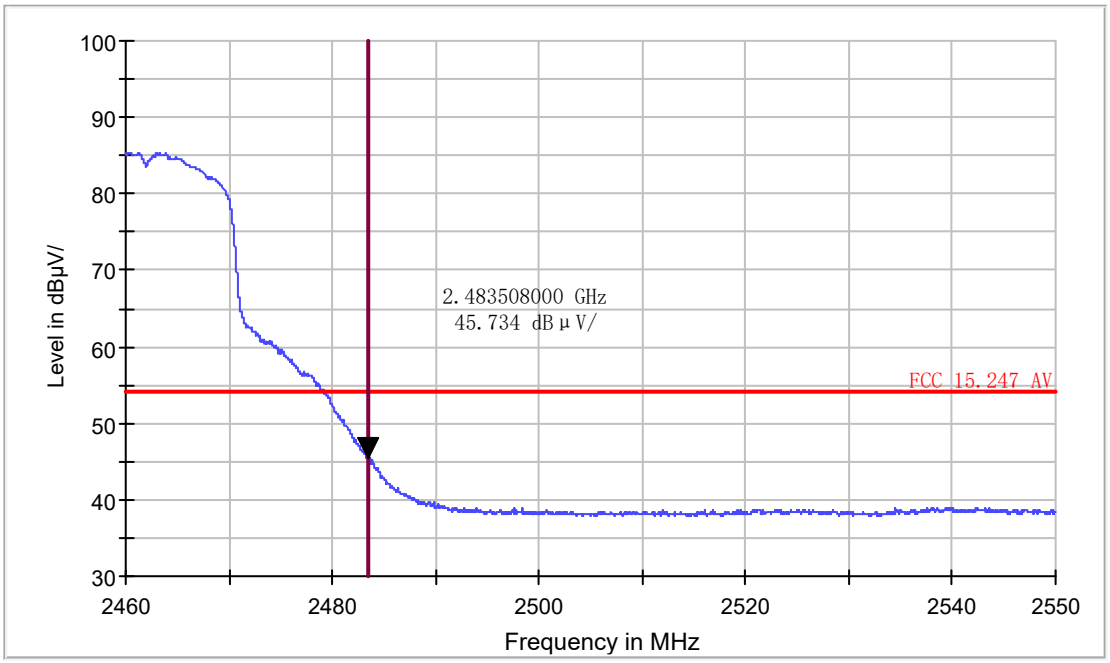
Horizontal, 802.11g, Low channel, AV



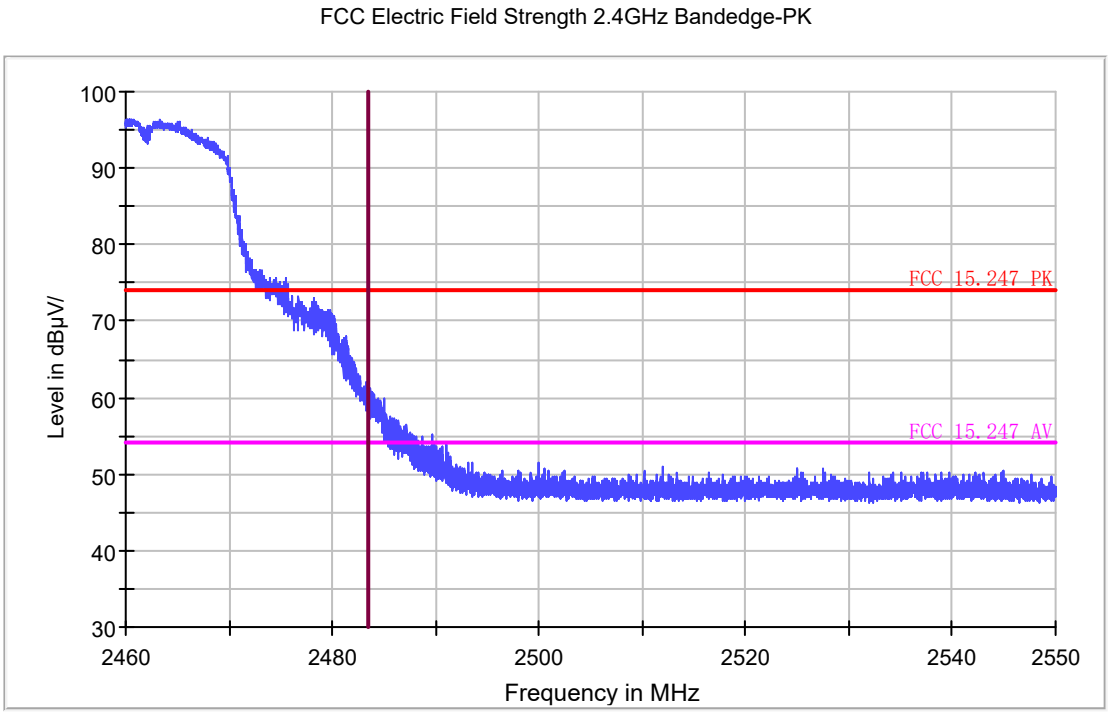
Vertical, 802.11g, High channel, PK



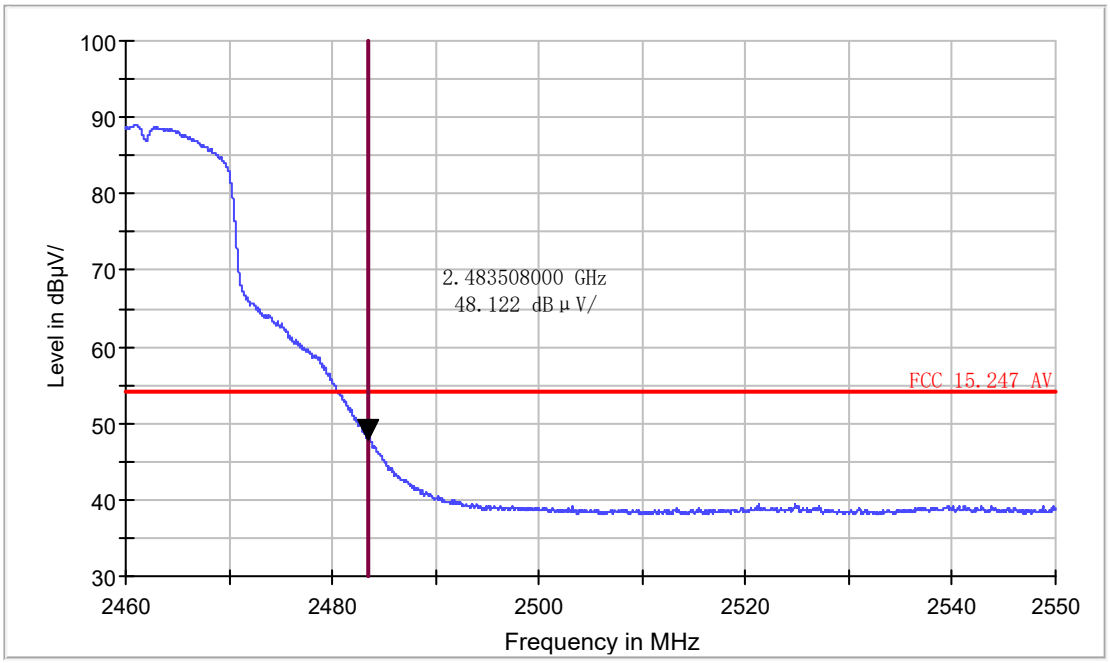
Vertical, 802.11g, High channel, AV



Horizontal, 802.11g, High channel, PK



Horizontal, 802.11g, High channel, AV



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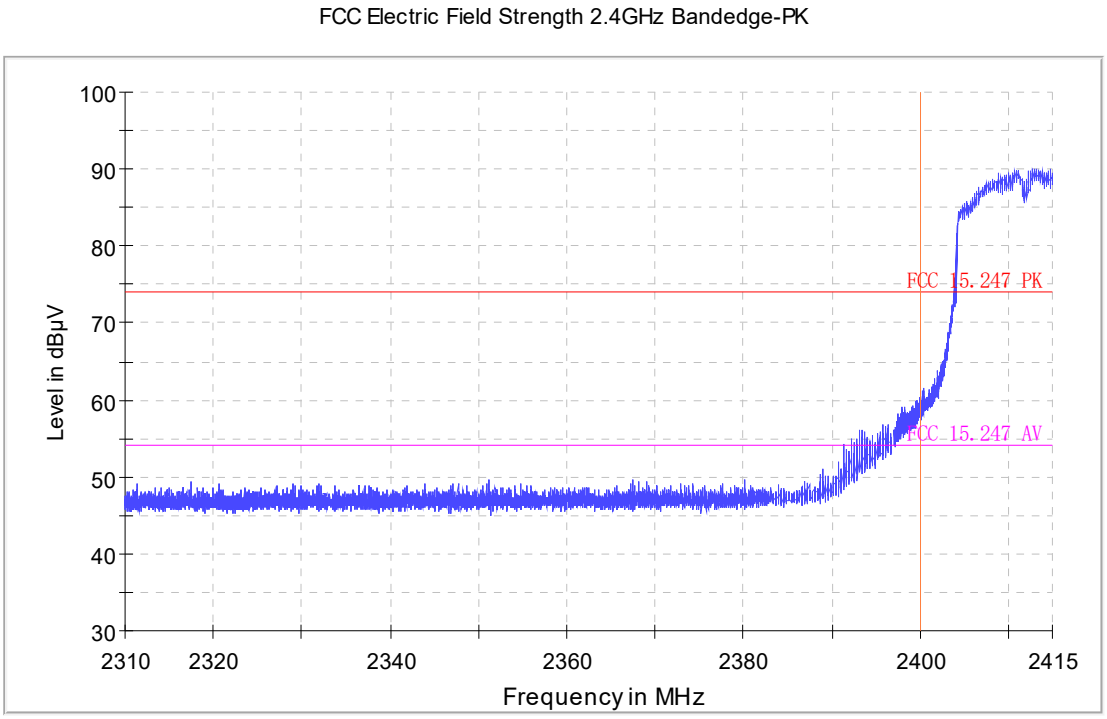

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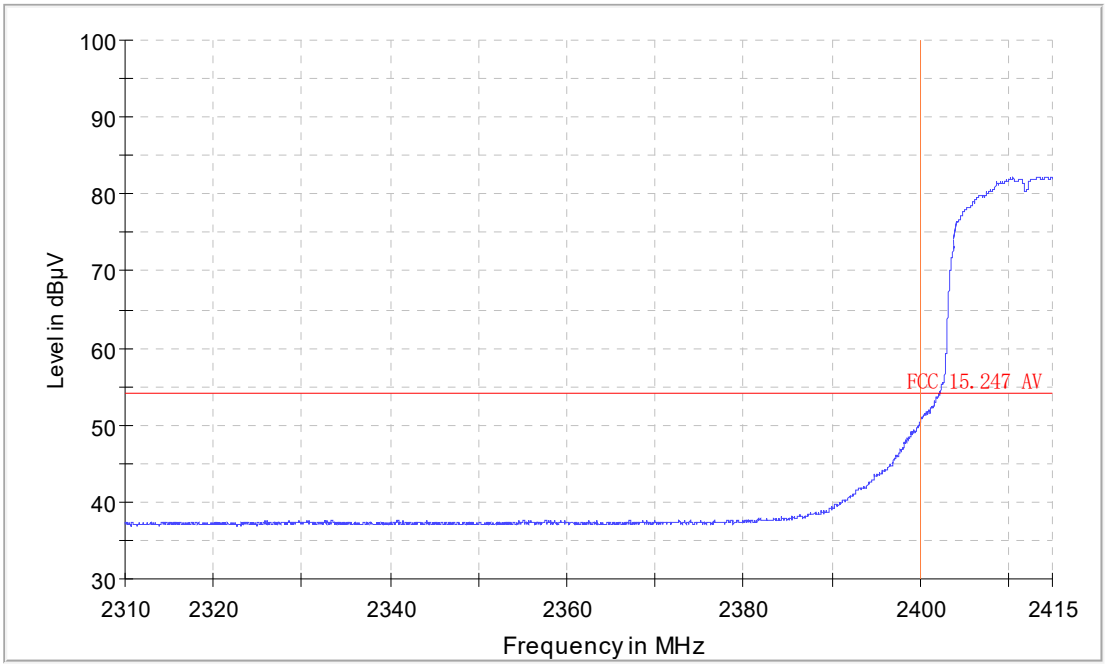

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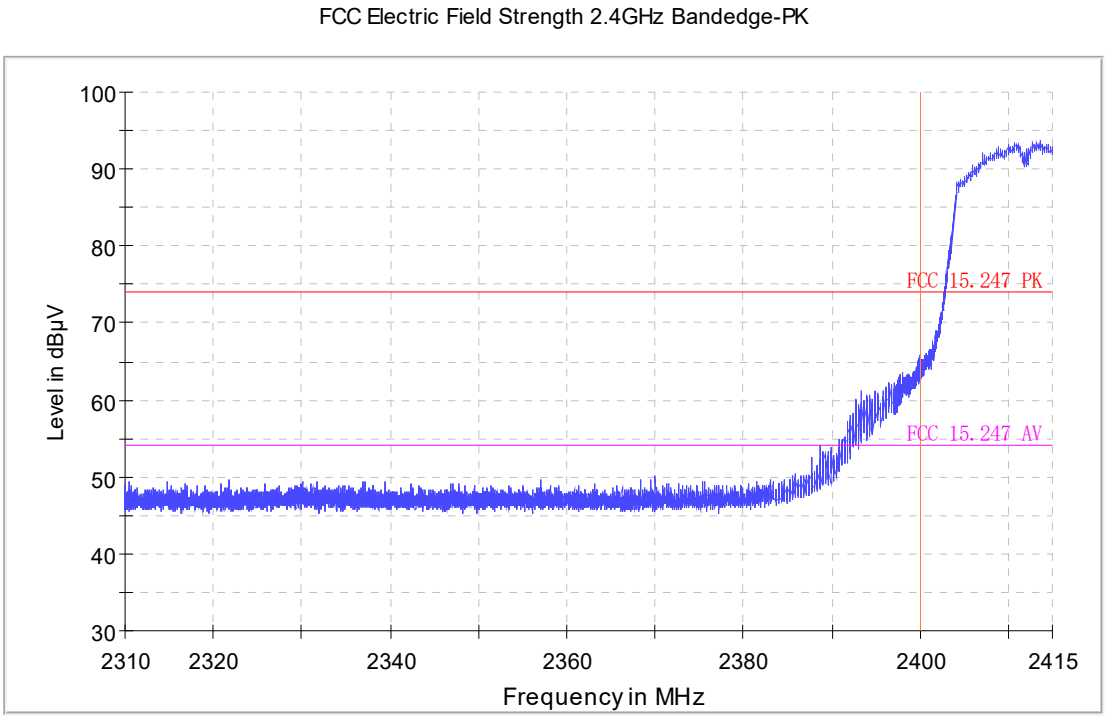

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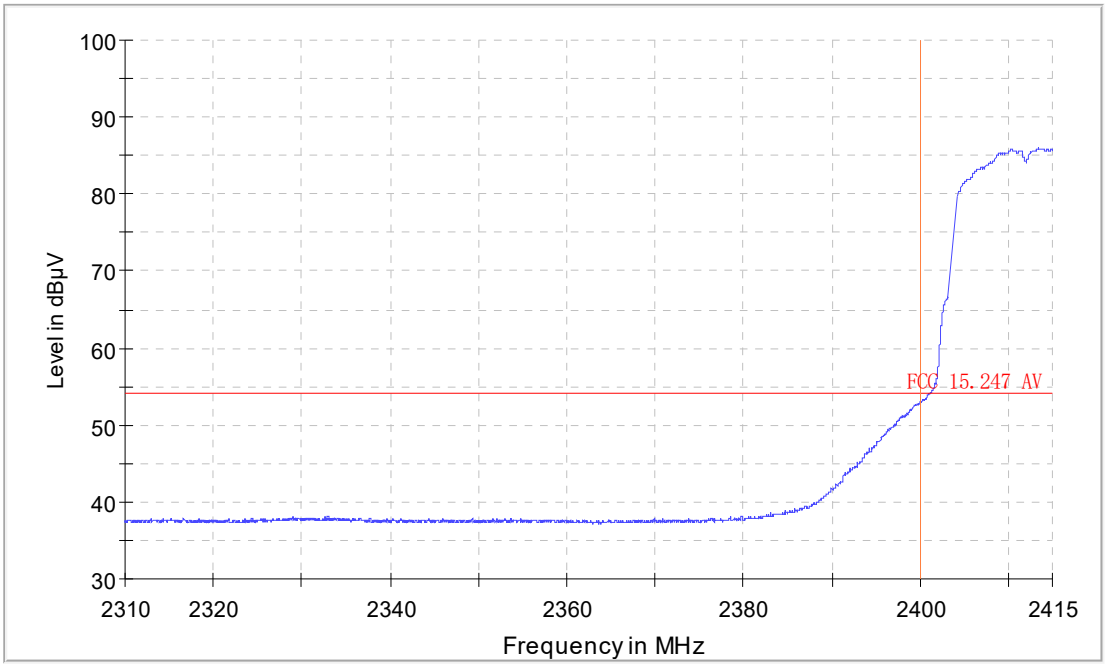

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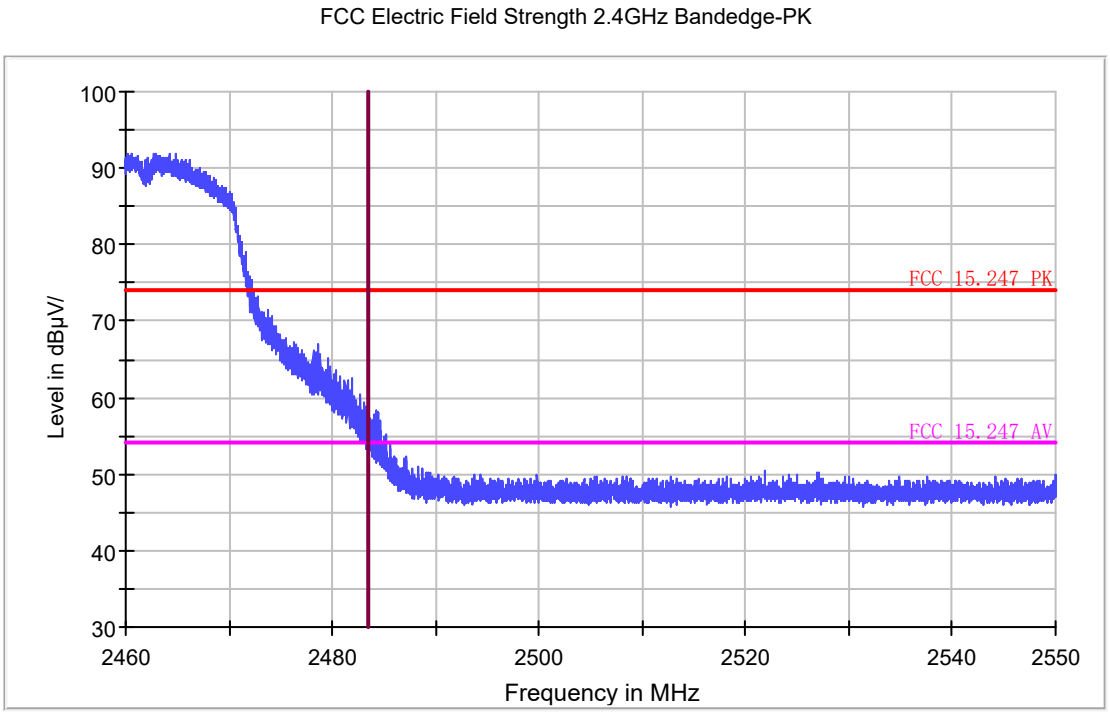

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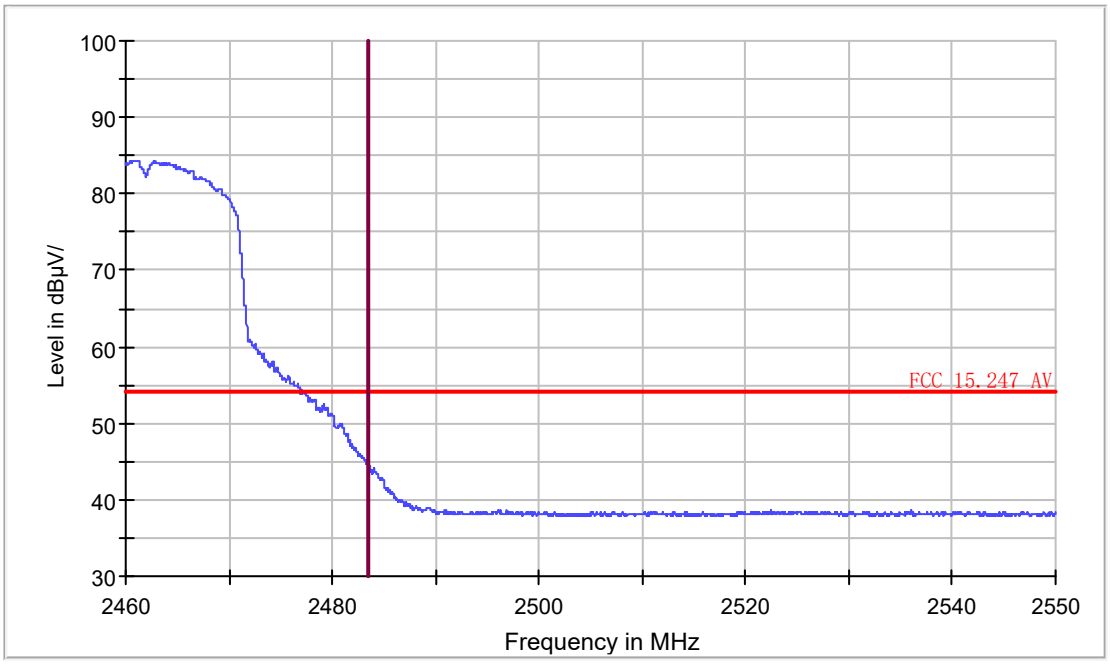
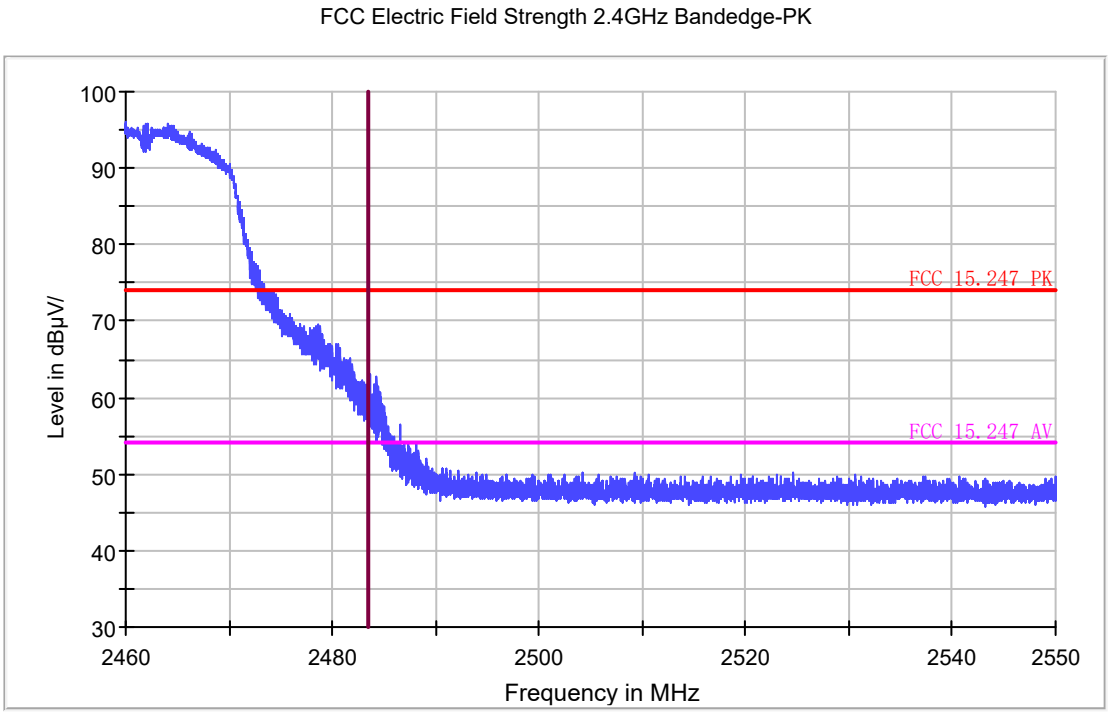
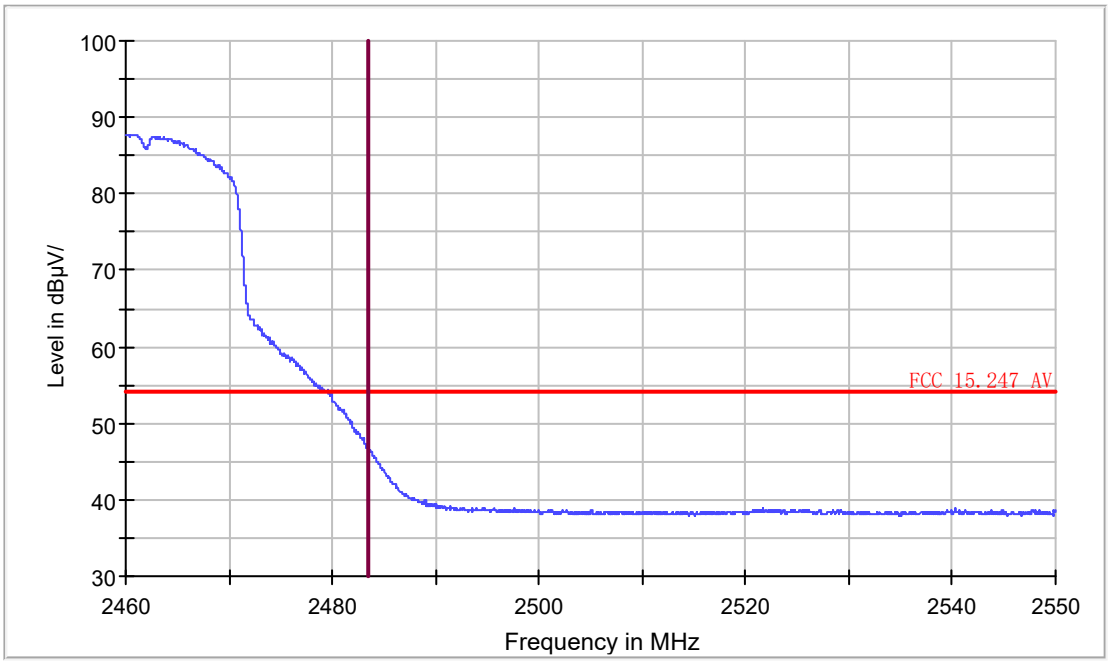


Horizontal, 802.11n HT20, High channel, PK



Horizontal, 802.11n HT20, High channel, AV



11. CONDUCTED EMISSION TEST FOR AC POWER PORT MEASUREMENT

11.1. Test Standard and Limit

11.1.1. Test Standard

FCC Part 15 15.207

11.1.2. Test Limit

Table 22 Conducted Disturbance Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

* Decreasing linearly with logarithm of the frequency

* The lower limit shall apply at the transition frequency.

11.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.). An EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

The bandwidth of EMI test receiver is set at 9kHz.

11.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

11.4.Test Data

The emissions don’ t show in below are too low against the limits. Refer to the test curves.

Table 23 Conducted Disturbance Test Data

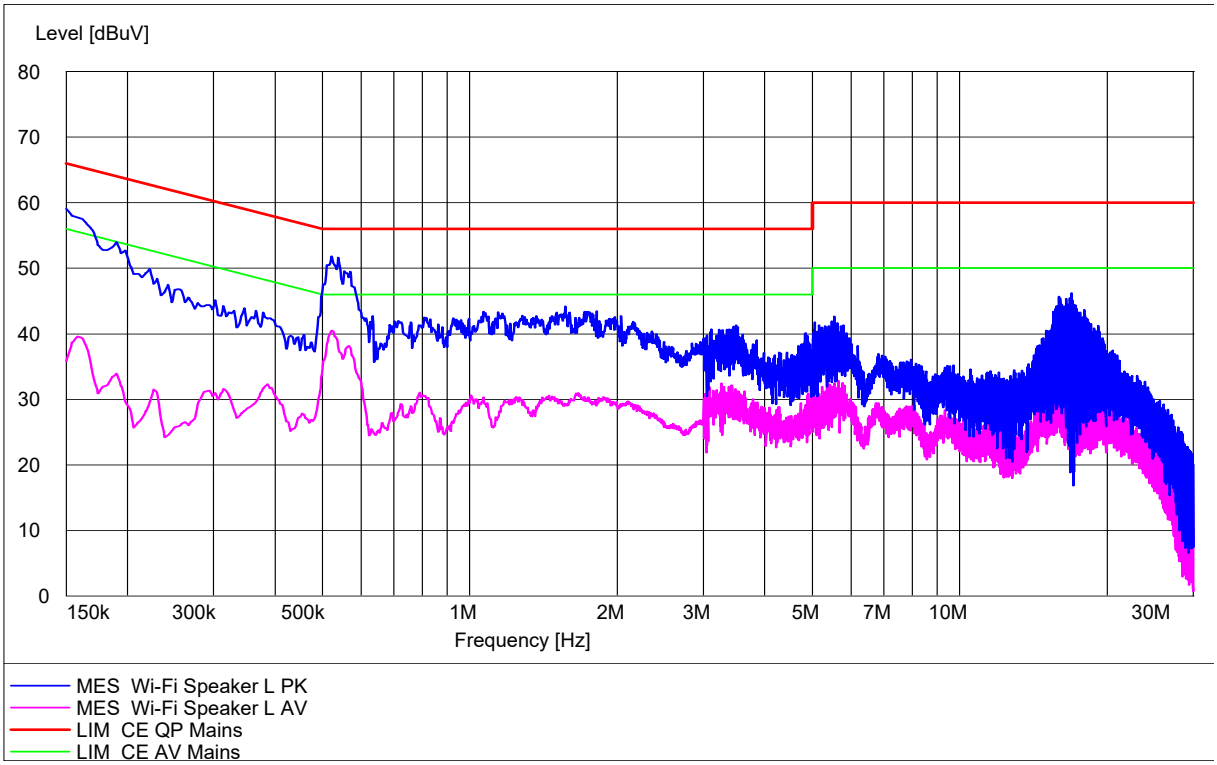
Model No.: Test mode: TX, Worst-case							
Line							
Frequency MHz	QP		AV		QP	AV	Factor (dB)
	Level (dBuV)	Limit (dBuV)	Level (dBuV)	Limit (dBuV)	Reading (dBuV)	Reading (dBuV)	
0.158	50.5	65.6	37.3	55.6	40.8	27.6	9.7
0.190	45.0	64.0	31.5	54.0	35.3	21.8	9.7
0.522	47.2	56	40.6	46	37.4	30.8	9.8
0.566	43.9	56	37.1	46	34.1	27.3	9.8
1.070	38.1	56	30.0	46	28.3	20.2	9.8
1.654	36.8	56	30.8	46	27.0	21.0	9.8
Neutral							
Frequency MHz	QP		AV		QP	AV	Factor (dB)
	Level (dBuV)	Limit (dBuV)	Level (dBuV)	Limit (dBuV)	Reading (dBuV)	Reading (dBuV)	
0.158	48.3	65.6	34.2	55.6	38.6	24.5	9.7
0.514	44.9	56	34.9	46	35.1	25.1	9.8
0.562	40.7	56	30.6	46	30.9	20.8	9.8
1.070	39.1	56	26.4	46	29.3	16.6	9.8
1.554	38.3	56	25.5	46	28.5	15.7	9.8
1.758	38.1	56	25.7	46	28.3	15.9	9.8

REMARKS: 1. Emission level(dBuV)=Read Value(dBuV) + Correction Factor(dB)

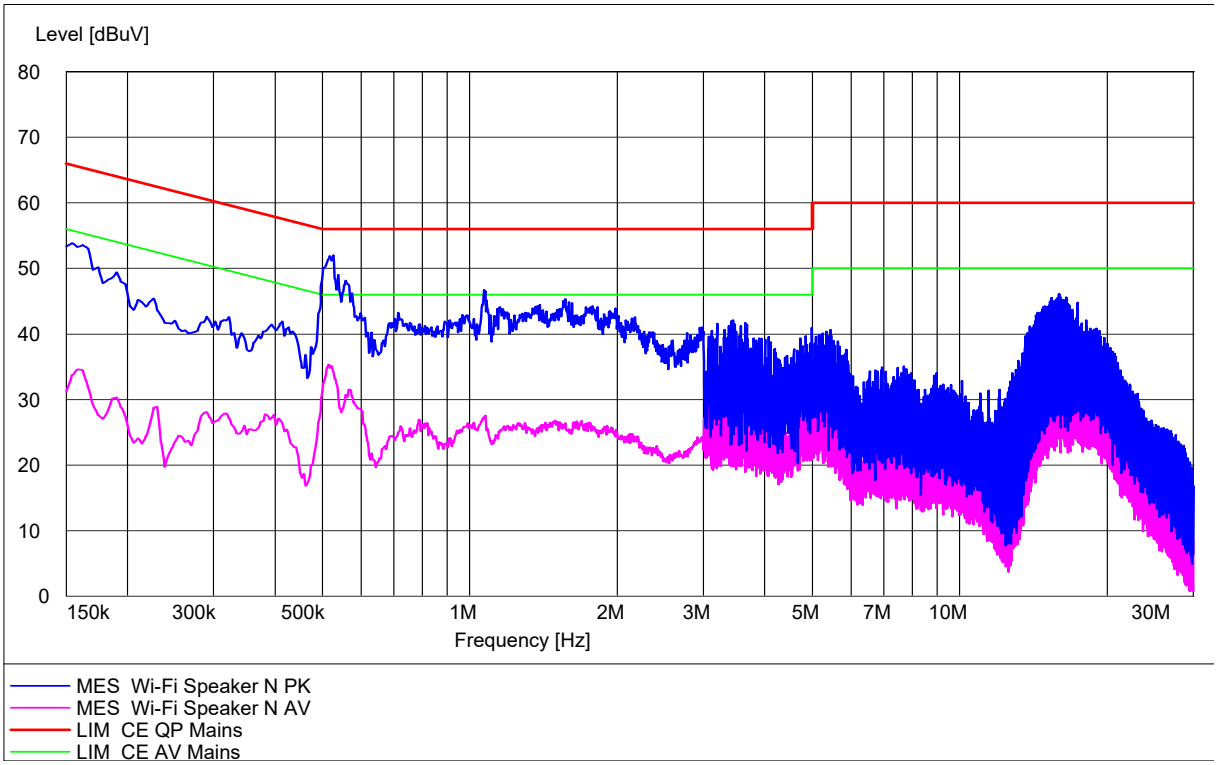
2. Correction Factor(dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)

3. The other emission levels were very low against the limit.

Line



Neutral



12. ANTENNA REQUIREMENTS

12.1. Applicable requirements

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. 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 FCC rule.

12.2. Antenna Connector

The EUT has not external antenna connector and built in monopole antenna which is integrated inside the enclosure.

12.3. Antenna Gain

The antenna gain of EUT is less than 6 dBi.