FCC Part 15C
Measurement and Test Report

For

AsiaRF Co., Ltd.

3F., No.176, Yongzhen Road, Yonghe District, New Taipei City 234, Taiwan

FCC ID: TKZAWUHN2405-2

FCC Rules:	FCC Part 15C
Product Description:	WiFi USB Dongle
Tested Model:	AWUHN2405-2
Report No.:	STR13048165I-1
Tested Date:	2013-05-21 to 2013-06-14
Issued Date:	2013-06-21
Tested By:	Seven Song / Engineer
Reviewed By:	Lahm Peng / EMC Manager
Approved & Authorized By:	Jandy so / PSQ Manager

Prepared By:

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	AisaRF Co., Ltd.
Address of applicant:	3F., No.176, Yongzhen Road, Yonghe Distict, New Taipei City 234, Taiwan
Manufacturer:	AisaRF Co., Ltd.
Address of manufacturer:	3F., No.176, Yongzhen Road, Yonghe Distict, New Taipei City 234, Taiwan

General Description of EUT	
Product Name:	WiFi USB Dongle
Trade Name:	/
Model No.:	AWUHN2405-2
Rated Voltage:	DC 5V
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20) 2422-2452MHz for 802.11n(HT40)
RF Output Power:	26.81 dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels	11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	4.0 dBi
Lowest Internal Frequency	40MHz
Device Category:	Mobile Device

1.2 Test Standards

The following report is prepared on behalf of the AsiaRF Co., Ltd. in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. The public notice KDB 558074 for digital transmission systems shall be performed also.

1.4 Test Facility

- **FCC – Registration No.: 994117**
  SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

- **Industry Canada (IC) Registration No.: 7673A**
  The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**
  Shenzhen SEM.Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11b	2412MHz, 2437MHz, 2462MHz
TM2	802.11g	2412MHz, 2437MHz, 2462MHz
TM3	802.11n-HT20	2412MHz, 2437MHz, 2462MHz
TM4	802.11n-HT40	2422MHz, 2437MHz, 2452MHz

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	4.5	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Note Book	SAMSUNG	R20	/

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 15.203; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	RF Output Power	Compliant
§ 15.209(a)(d)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

3. Antenna Requirement

3.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2 Evaluation Information

This product has an integral antenna, fulfill the requirement of this section.

4. Power Spectral Density

4.1 Standard Applicable

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2013-05-07	2014-05-06
Attenuator	ATTEN	ATS100-4-20	/	2013-05-07	2014-05-06

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

4.3 Test Procedure

According to the KDB 558074, the test method of power spectral density as below:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 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.

4.4 Environmental Conditions

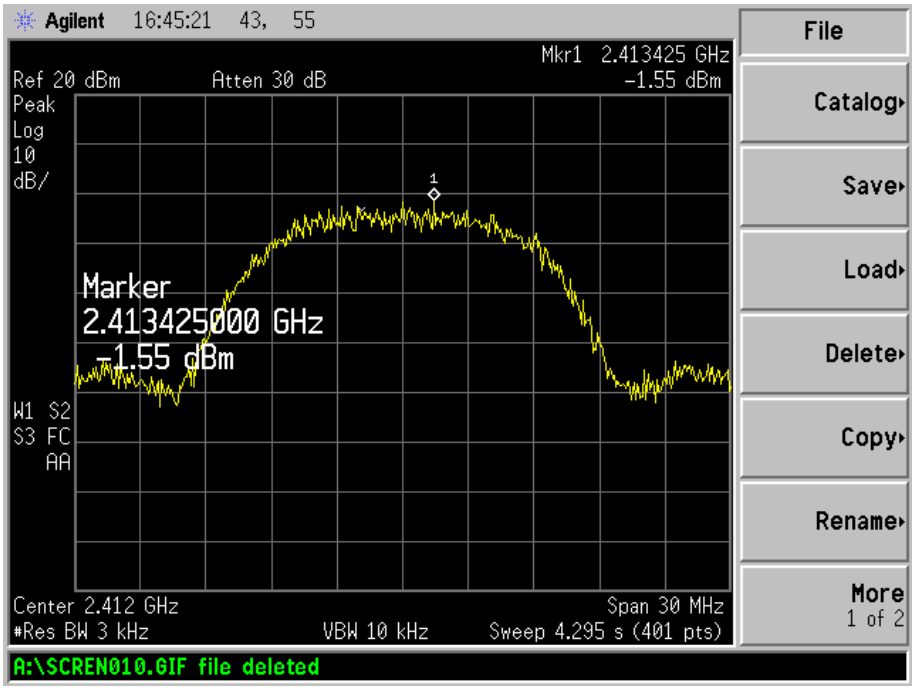
Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots

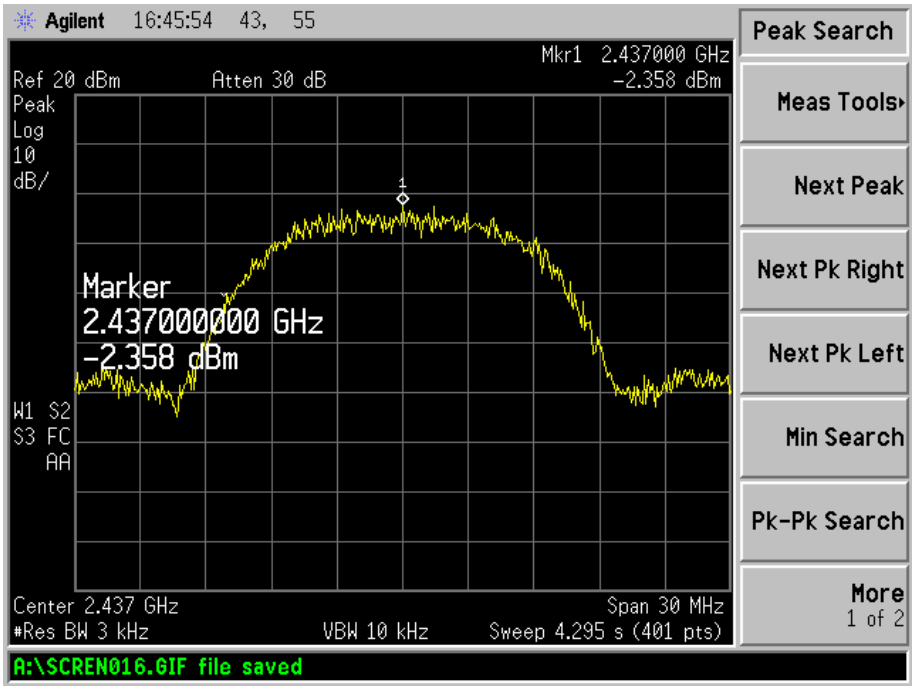
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
802.11b	2412	-1.55	8
	2437	-2.358	8
	2462	-3.348	8
802.11g	2412	-3.389	8
	2437	-4.347	8
	2462	-5.427	8
802.11n HT20	2412	-3.209	8
	2437	-4.358	8
	2462	-5.206	8
802.11n HT40	2422	-3.559	8
	2437	-4.189	8
	2452	-5.036	8

Please refer to the following test plots:

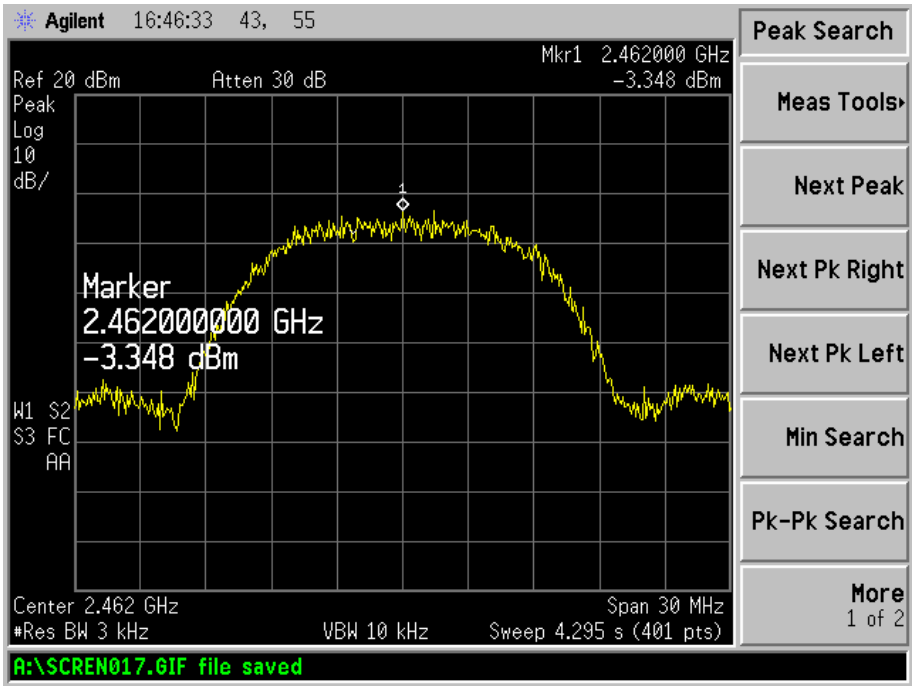
802.11b-Low Channel



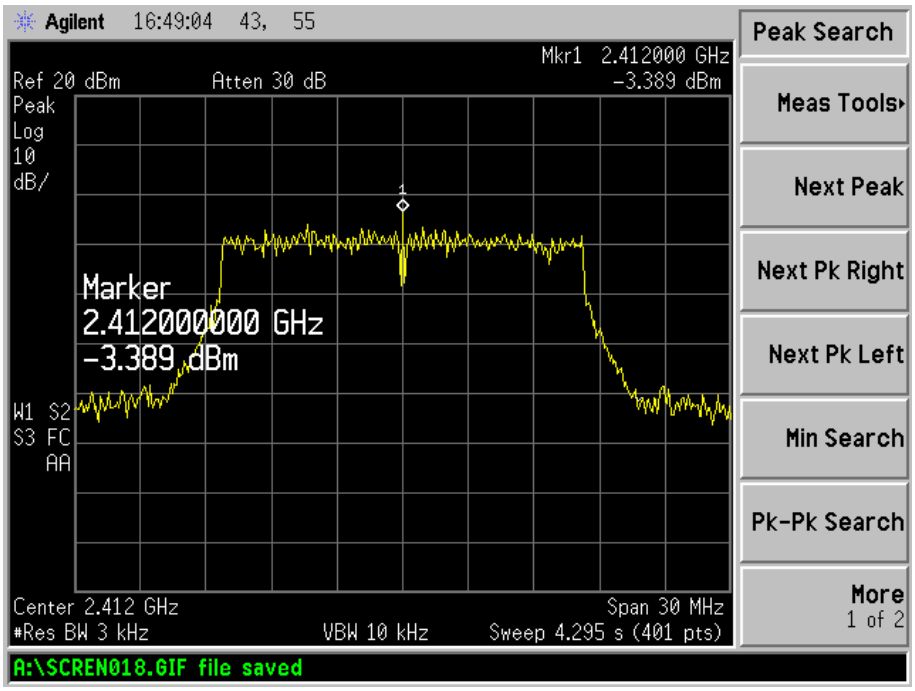
802.11b-Middle Channel



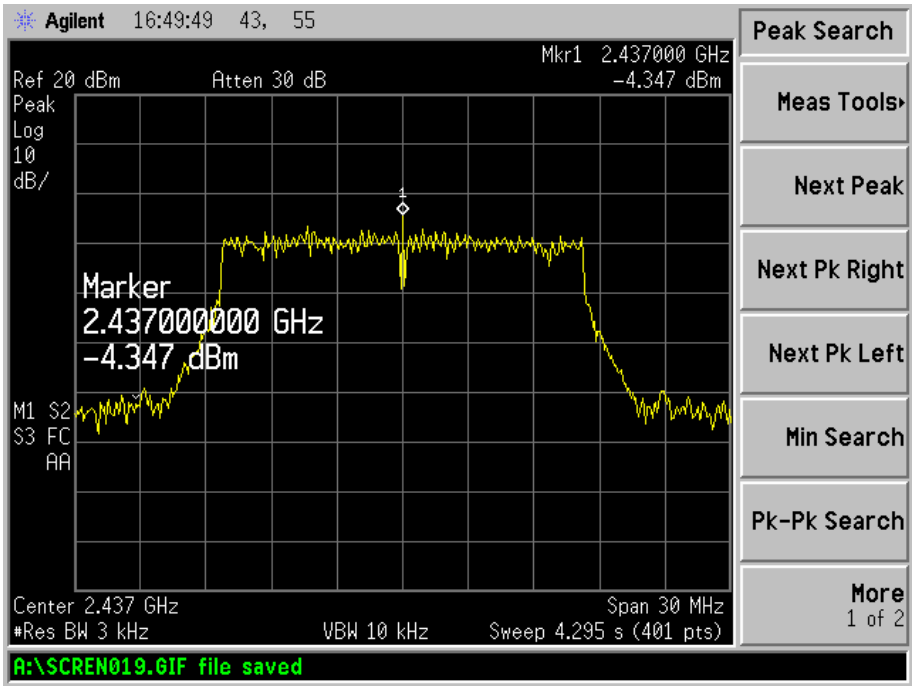
802.11b-High Channel



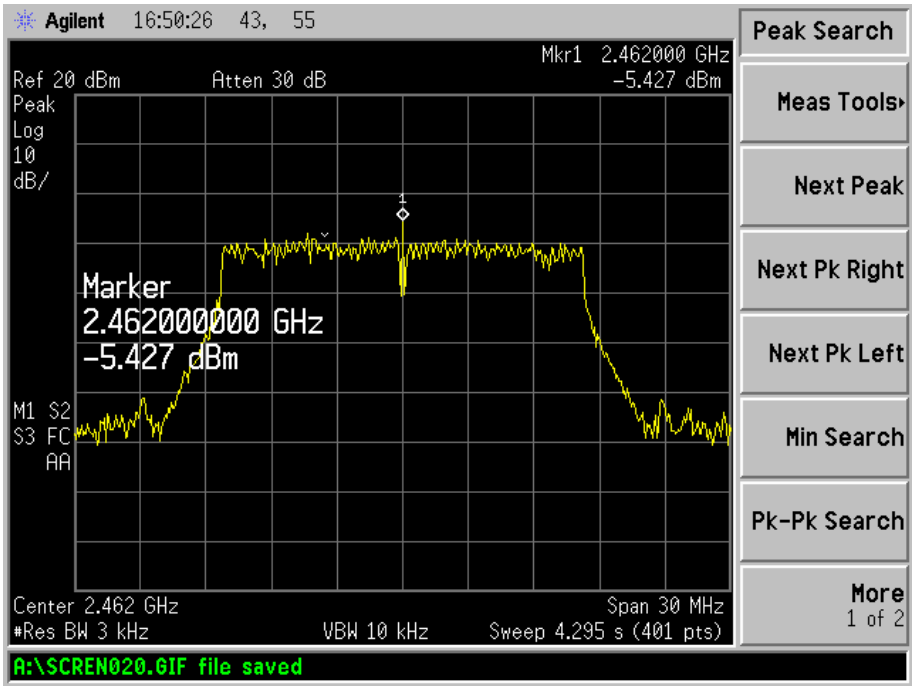
802.11g-Low Channel



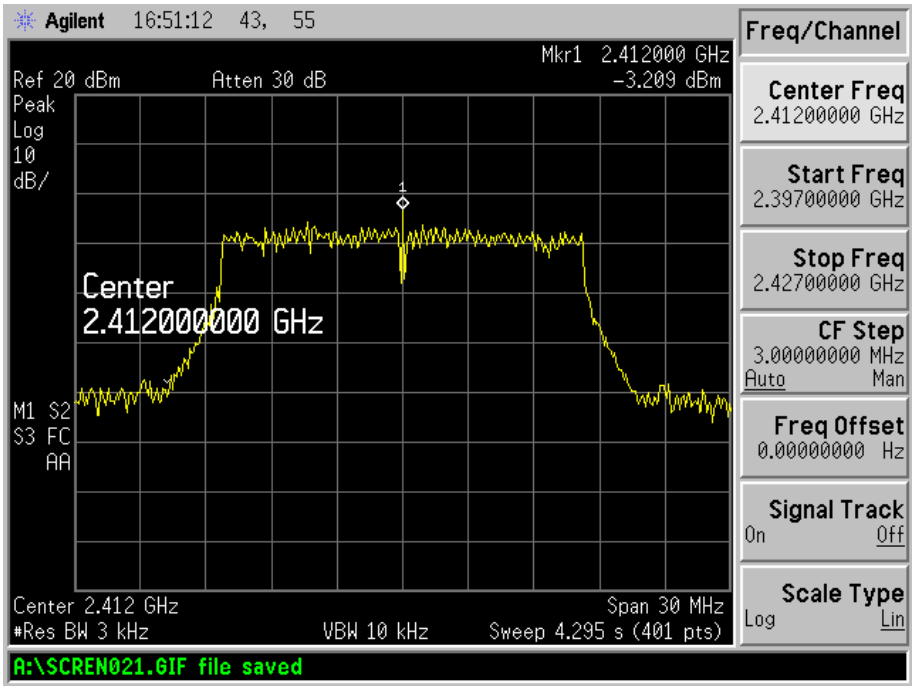
802.11g-Middle Channel



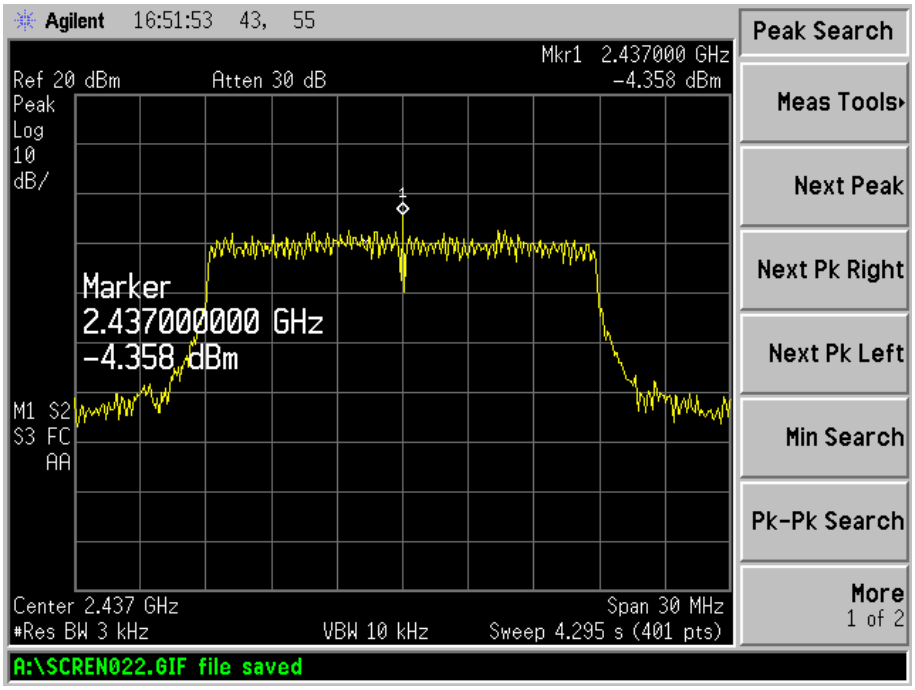
802.11g-High Channel



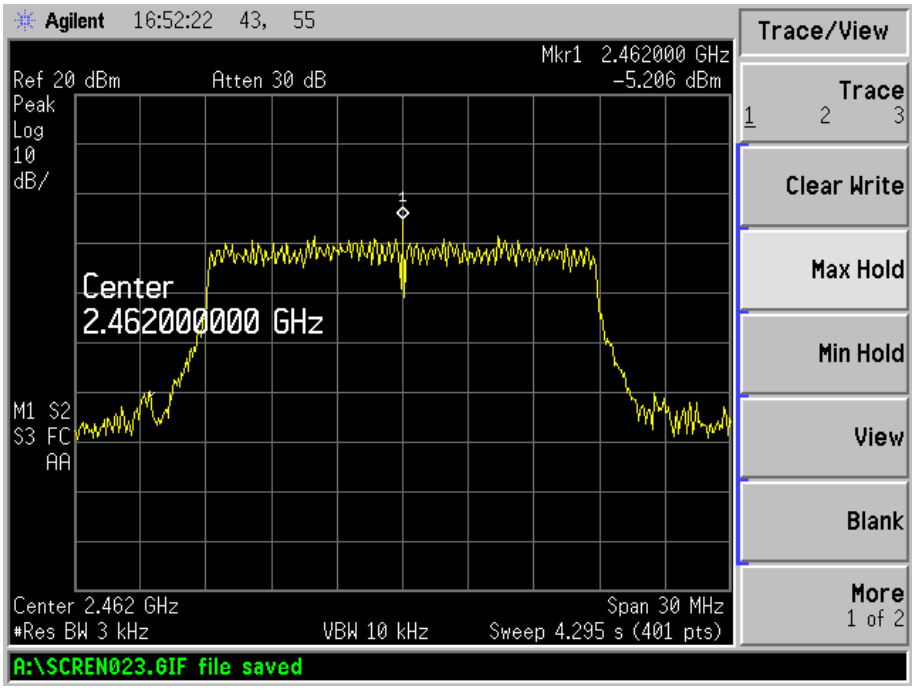
802.11n-HT20-Low Channel



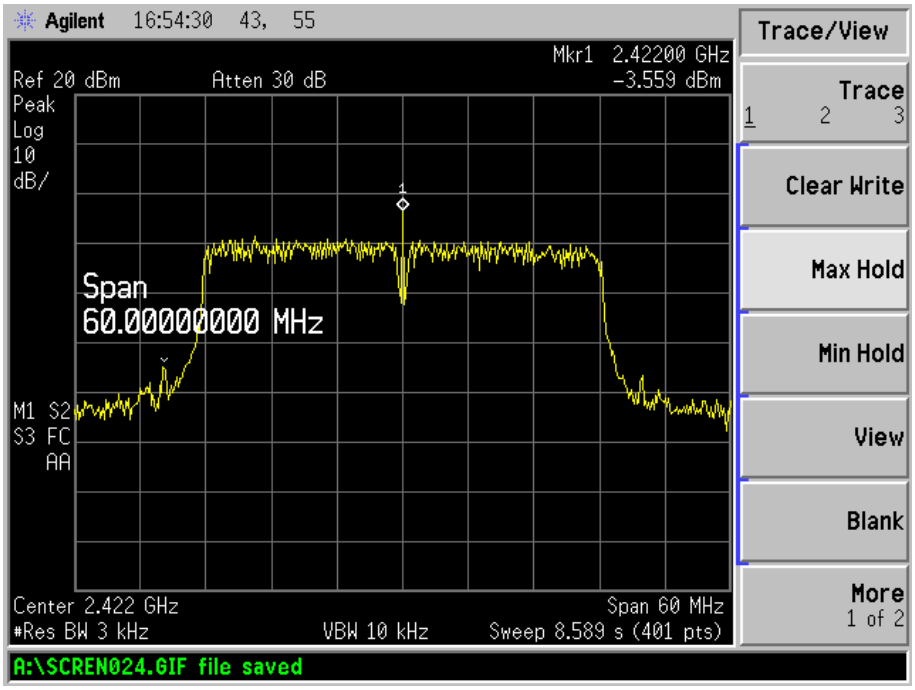
802.11n-HT20-Middle Channel



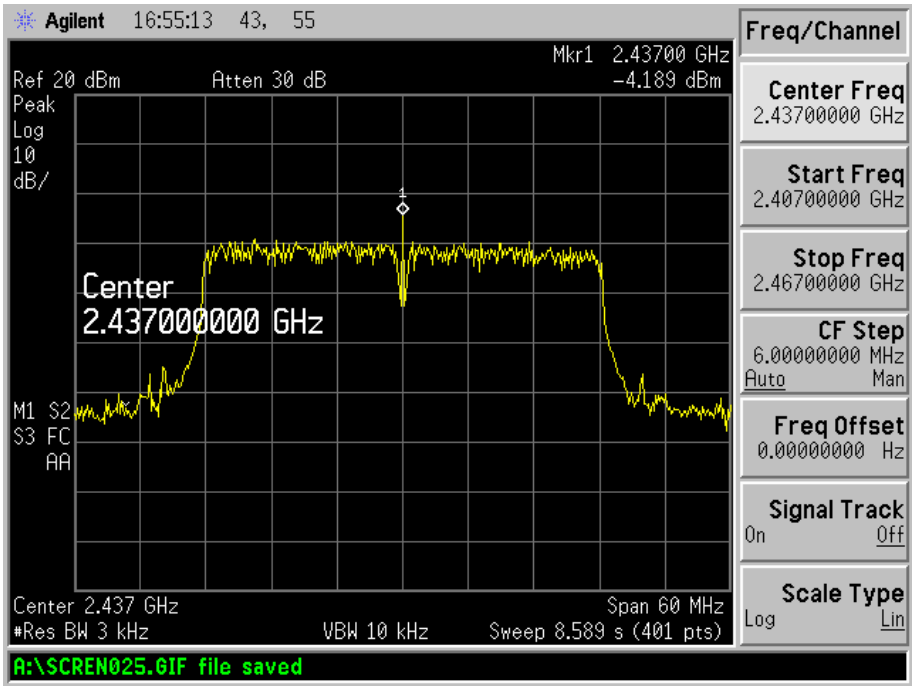
802.11n-HT20-High Channel



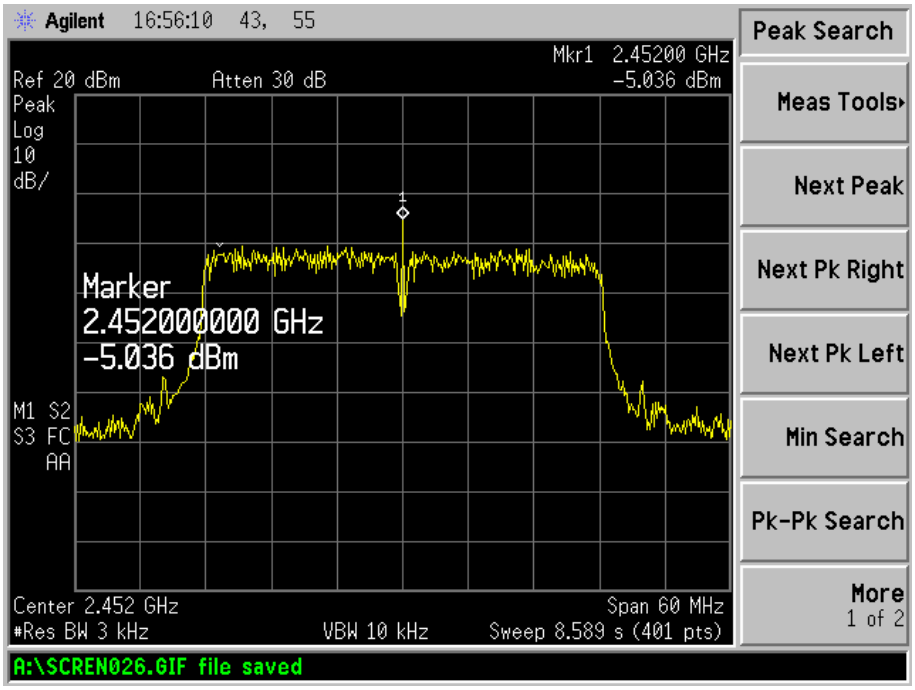
802.11n-HT40-Low Channel



802.11n-HT20-Middle Channel



802.11n-HT20-High Channel



5. 6dB Bandwidth

5.1 Standard Applicable

According to 15.247(a)(2). Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2013-05-07	2014-05-06
Attenuator	ATTEN	ATS100-4-20	/	2013-05-07	2014-05-06

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

5.3 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set resolution bandwidth (RBW) = 1-5% or DTS BW, not to exceed 100 kHz.
3. Set the video bandwidth (VBW) ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission..

5.4 Environmental Conditions

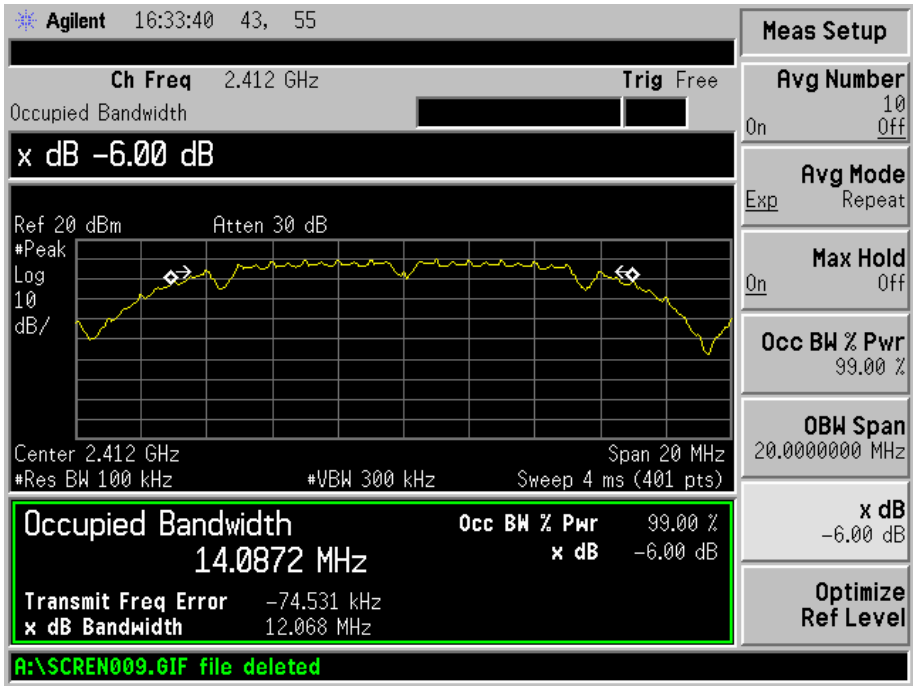
Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

5.5 Summary of Test Results/Plots

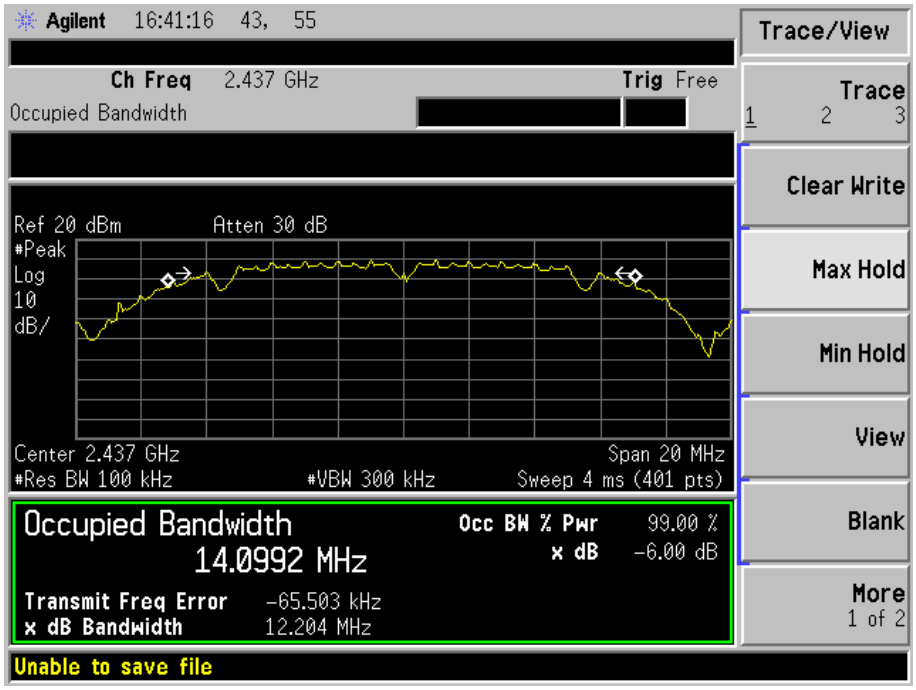
Test Mode	Test Channel MHz	6 dB Bandwidth kHz	Limit kHz
802.11b	2412	12068	500
	2437	12204	500
	2462	12032	500
802.11g	2412	16520	500
	2437	16542	500
	2462	16544	500
802.11n-HT20	2412	17742	500
	2437	17697	500
	2462	17748	500
802.11n-HT40	2422	36334	500
	2437	36482	500
	2452	36415	500

Please refer to the following test plots:

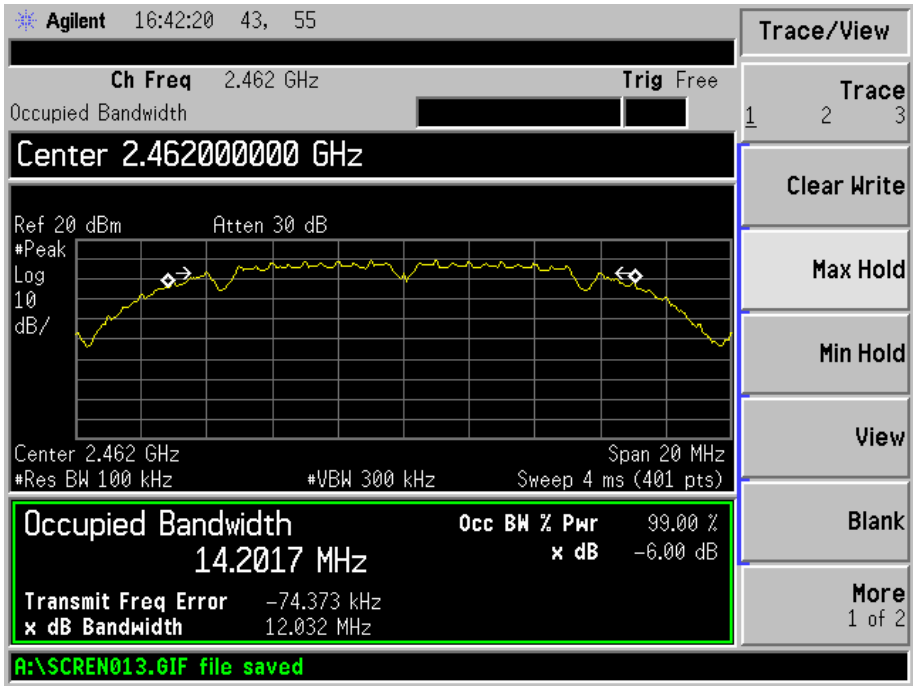
802.11b-Low Channel



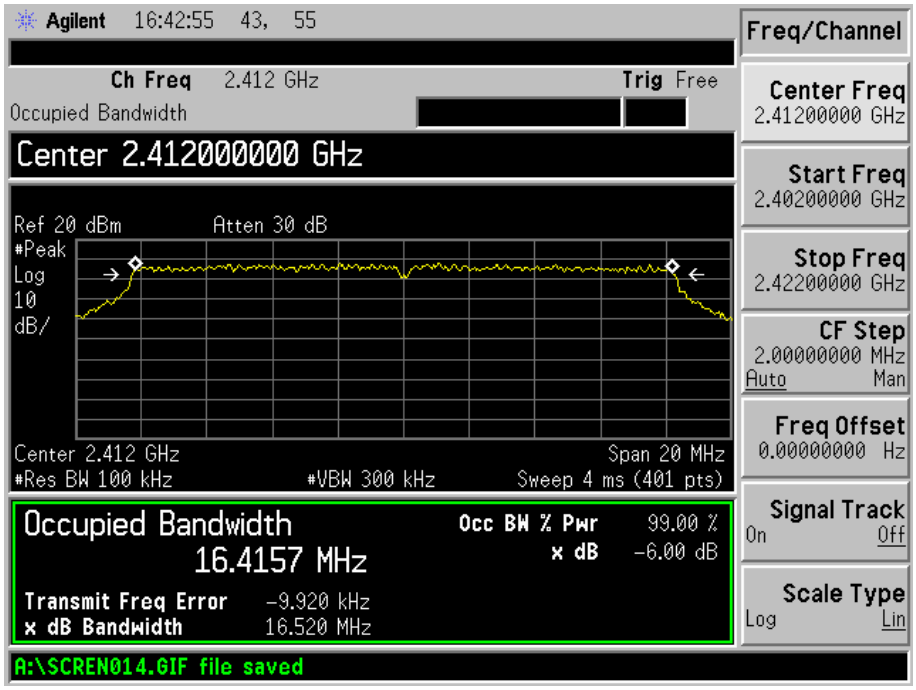
802.11b-Middle Channel



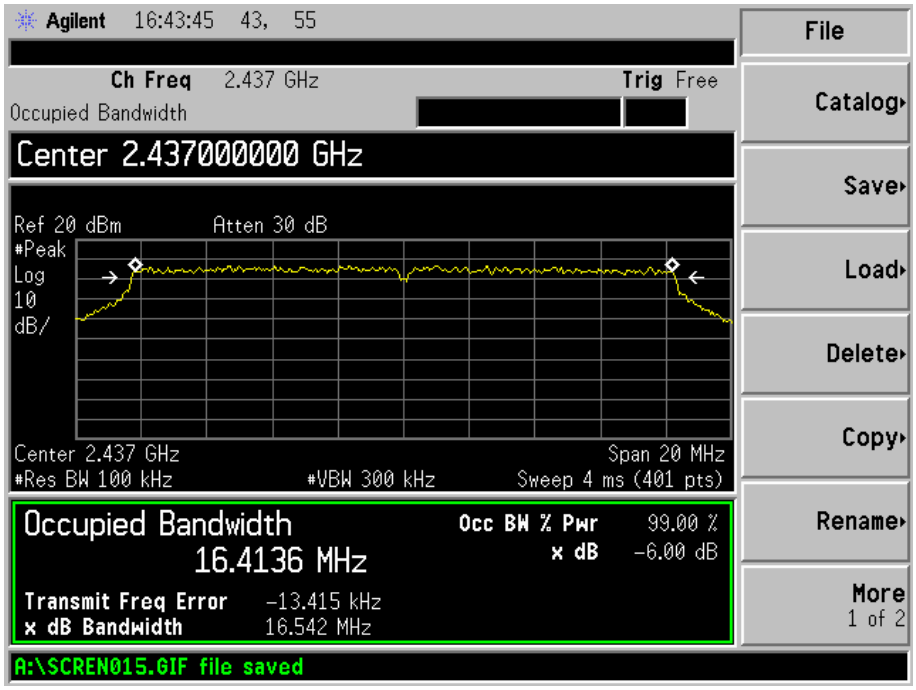
802.11b-High Channel



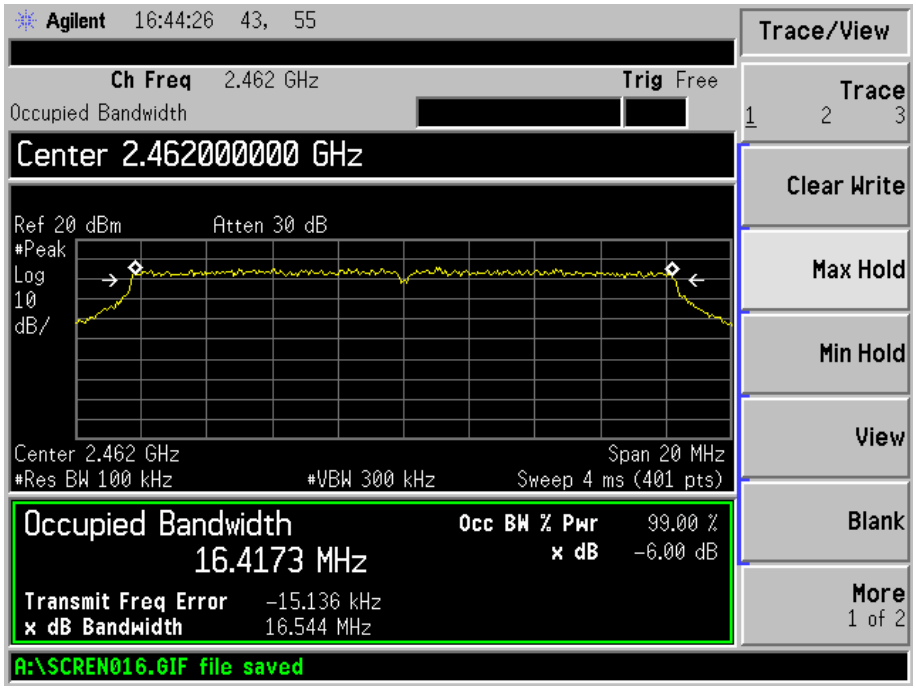
802.11g-Low Channel



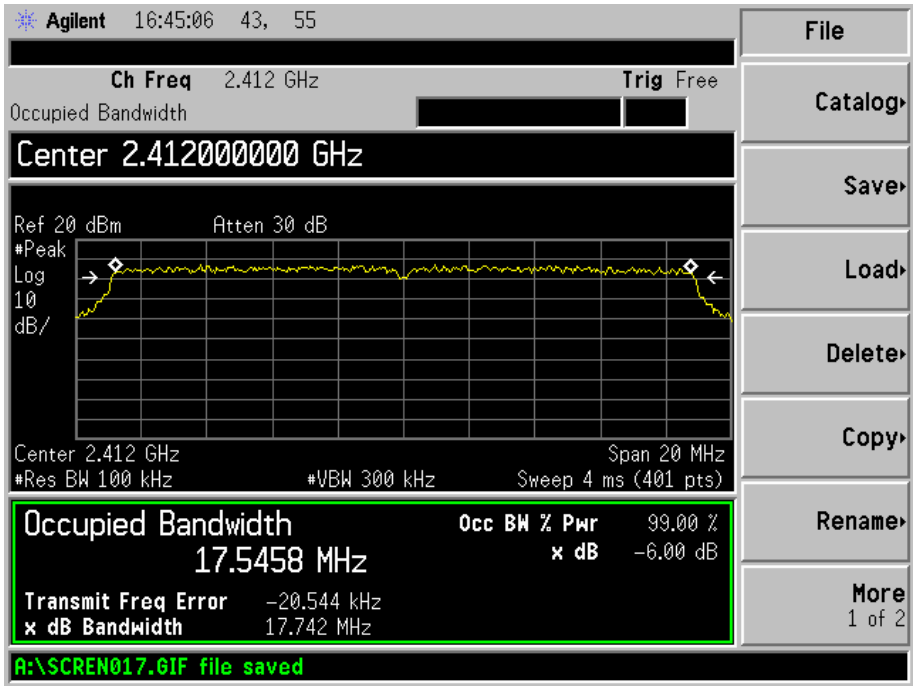
802.11g-Middle Channel



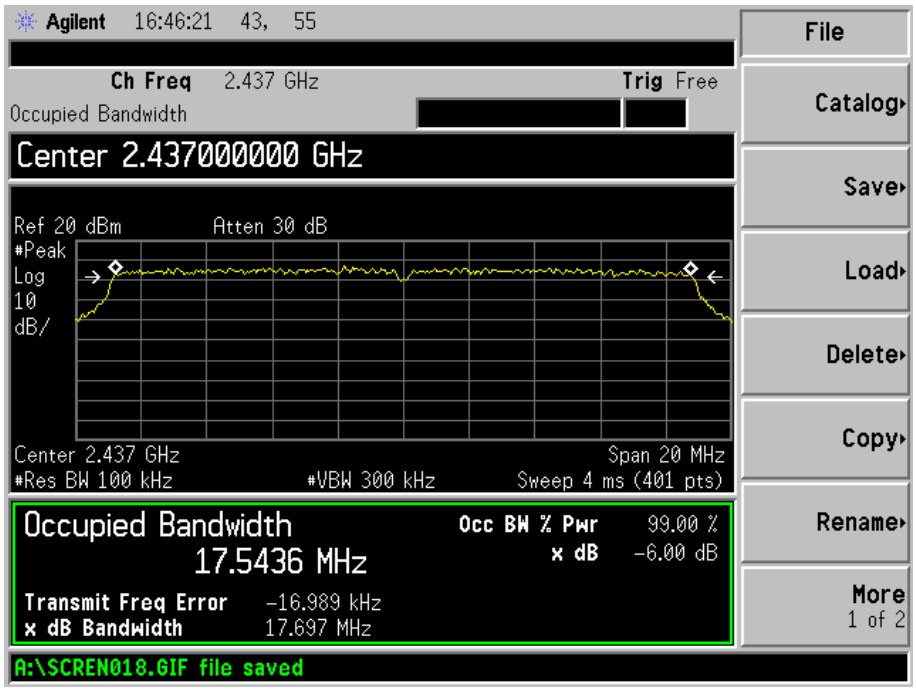
802.11g-High Channel



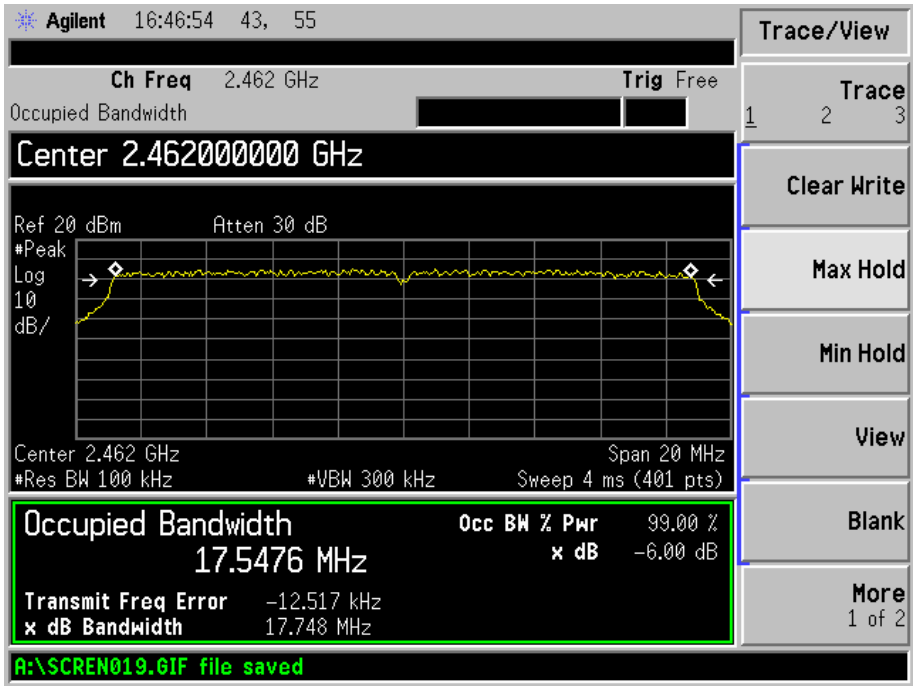
802.11n-HT20-Low Channel



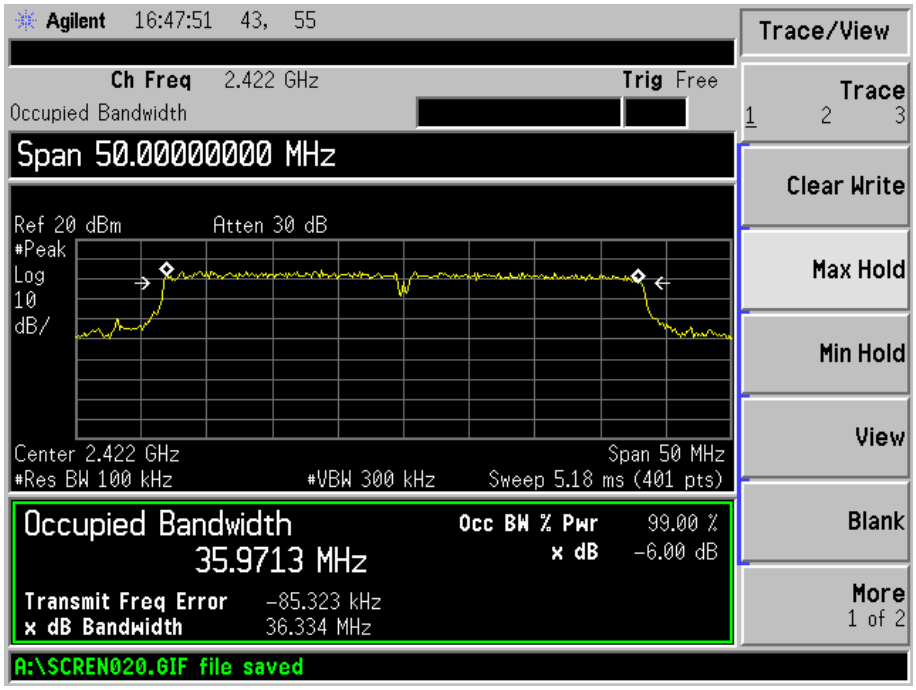
802.11n-HT20-Middle Channel



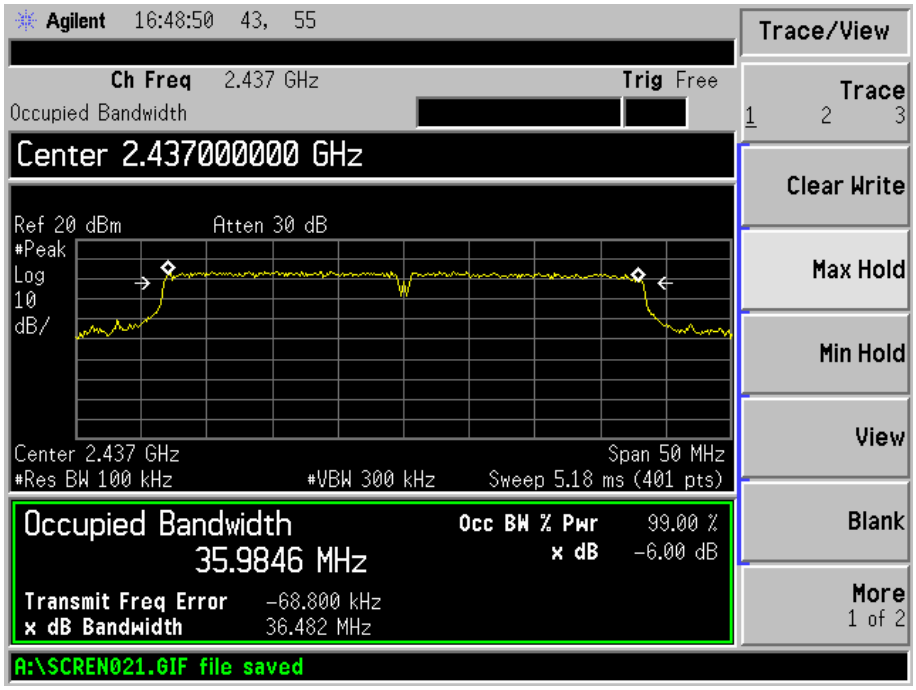
802.11n-HT20-High Channel



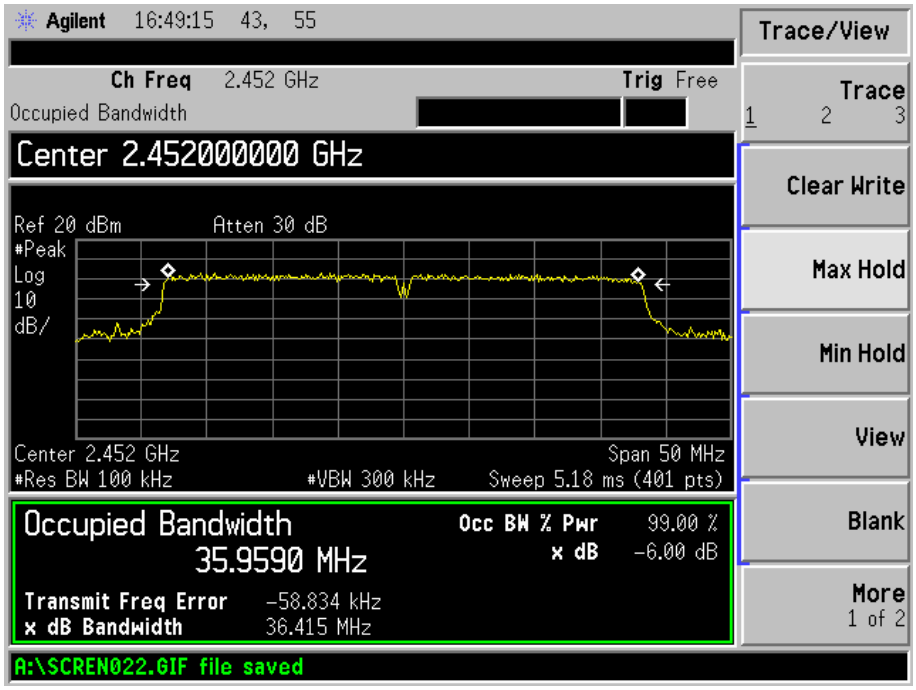
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel



802.11n-HT40-High Channel



6. RF Output Power

6.1 Standard Applicable

According to 15.247(b)(3). For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

6.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2013-05-07	2014-05-06
Attenuator	ATTEN	ATS100-4-20	/	2013-05-07	2014-05-06

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

6.3 Test Procedure

According to section 15.247(b)-power output of the KDB-558074 D01 V02 (2012), 8.1.2 Option 2 (channel integration method) this procedure should only be used when the maximum available RBW of the spectrum/signal analyzer is less than the DTS bandwidth.

1. Set the RBW = maximum available (at least 1 MHz).
2. Set the VBW = 3 x RBW or maximum available setting (must be ≥ RBW).
3. Set the span to fully encompass the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the spectrum analyzer's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some analyzers, this may require a manual override to ensure use of peak detector).

6.4 Environmental Conditions

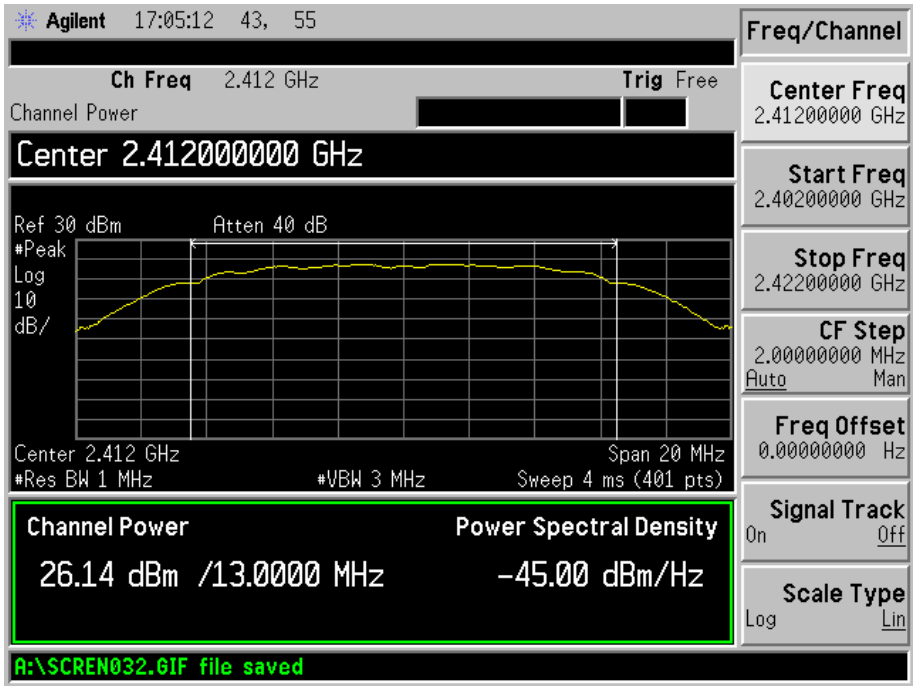
Temperature:	27° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

6.5 Summary of Test Results/Plots

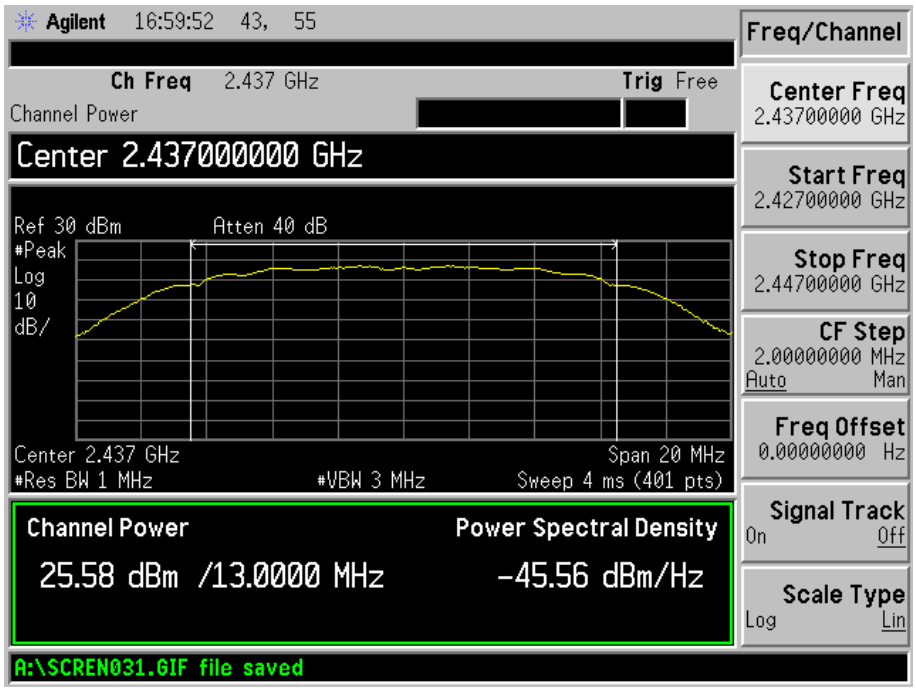
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b _short 1Mbps	2412	26.14	411.15	1000
	2437	25.58	361.41	1000
	2462	24.31	269.77	1000
802.11b _short 11Mbps	2412	25.74	374.97	1000
	2437	26.08	405.51	1000
	2462	25.02	317.69	1000
802.11b _long 1Mbps	2412	25.67	368.98	1000
	2437	25.07	321.37	1000
	2462	24.15	260.02	1000
802.11b _long 11Mbps	2412	26.81	479.73	1000
	2437	26.15	412.10	1000
	2462	25.23	333.43	1000
802.11g_6Mbps	2412	26.27	423.64	1000
	2437	25.15	327.34	1000
	2462	24.01	251.77	1000
802.11g_54Mbps	2412	25.05	319.89	1000
	2437	25.51	355.63	1000
	2462	24.42	276.69	1000
802.11n HT20_MCS0	2412	26.26	422.67	1000
	2437	26.46	442.59	1000
	2462	24.42	276.69	1000
802.11n HT20_MCS7	2412	26.17	414.00	1000
	2437	25.61	363.92	1000
	2462	24.40	275.42	1000
802.11n HT40_MCS0	2422	24.33	271.02	1000
	2437	24.00	251.19	1000
	2452	23.05	201.84	1000
802.11n HT40_MCS7	2422	24.30	269.15	1000
	2437	23.95	248.31	1000
	2452	23.05	201.84	1000

Pleas24.00e refer to the following test plots:

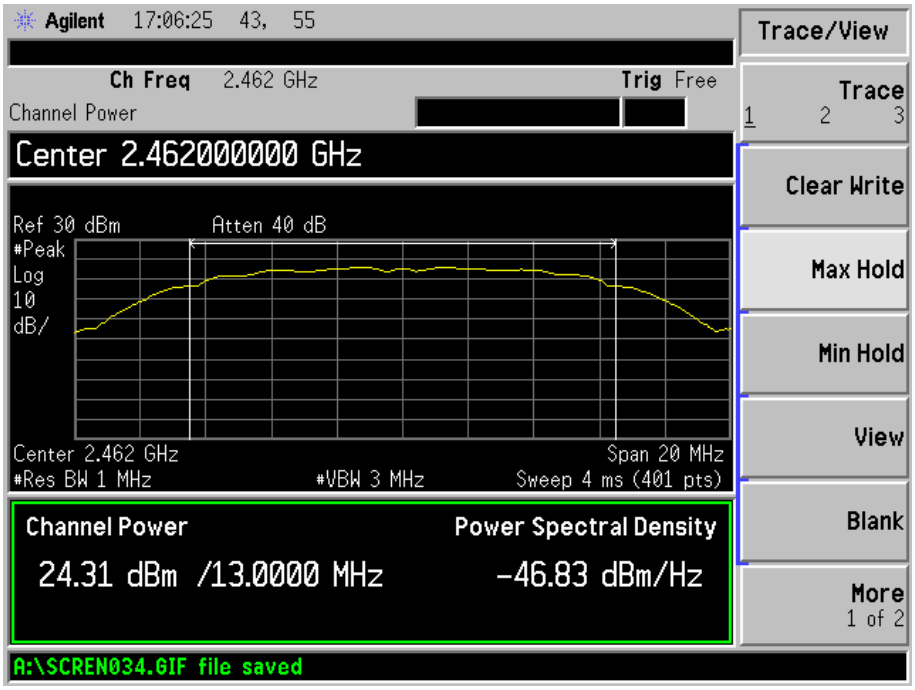
802.11b-short 1Mbps-Low Channel



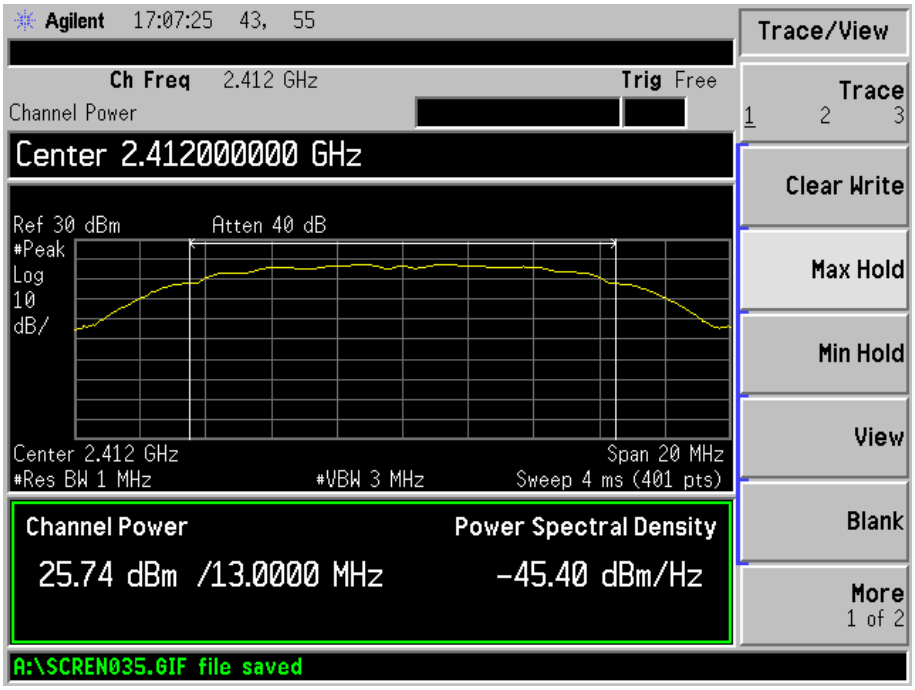
802.11b - short 1Mbps-Middle Channel



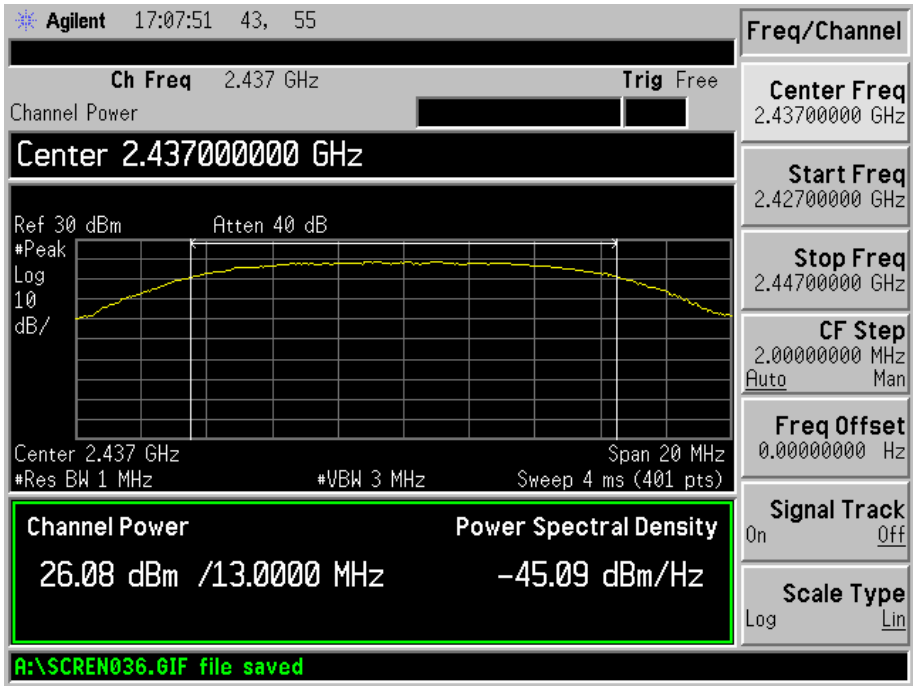
802.11b - short 1Mpbs-High Channel



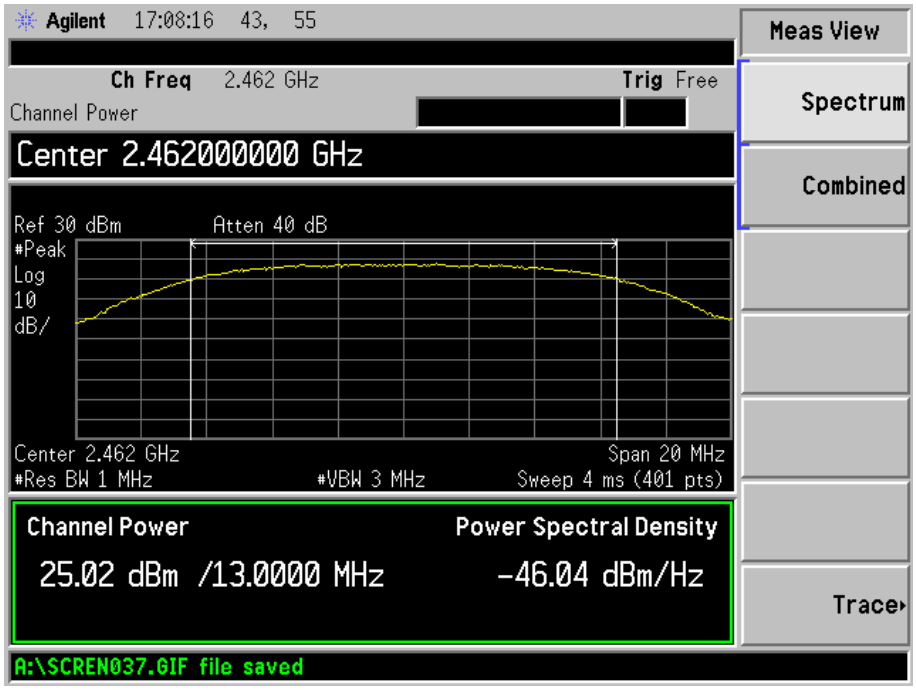
802.11- short 11Mbps-Low Channel



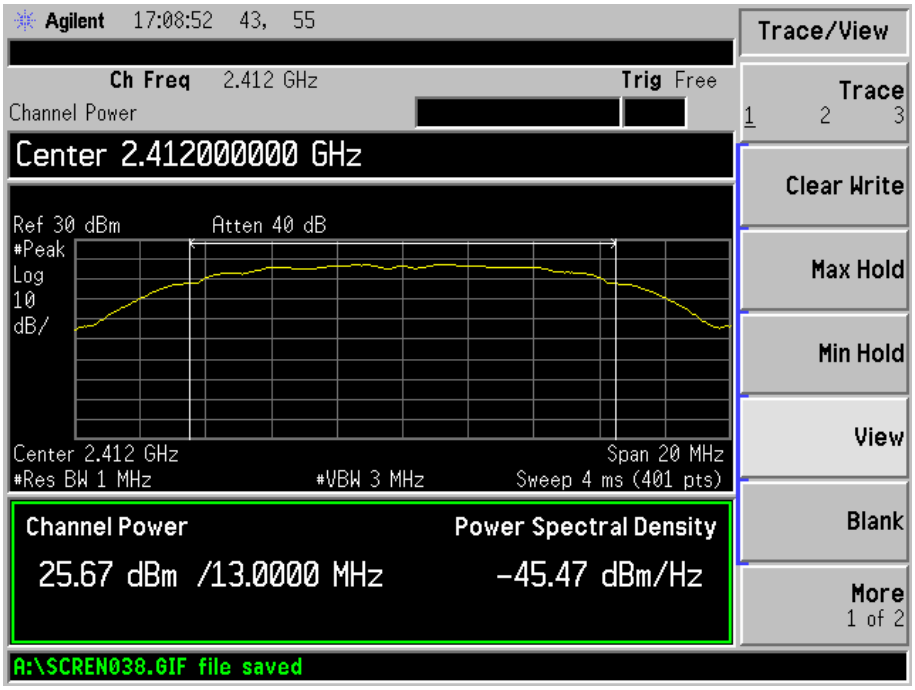
802.11b - short 11Mbps-Middle Channel



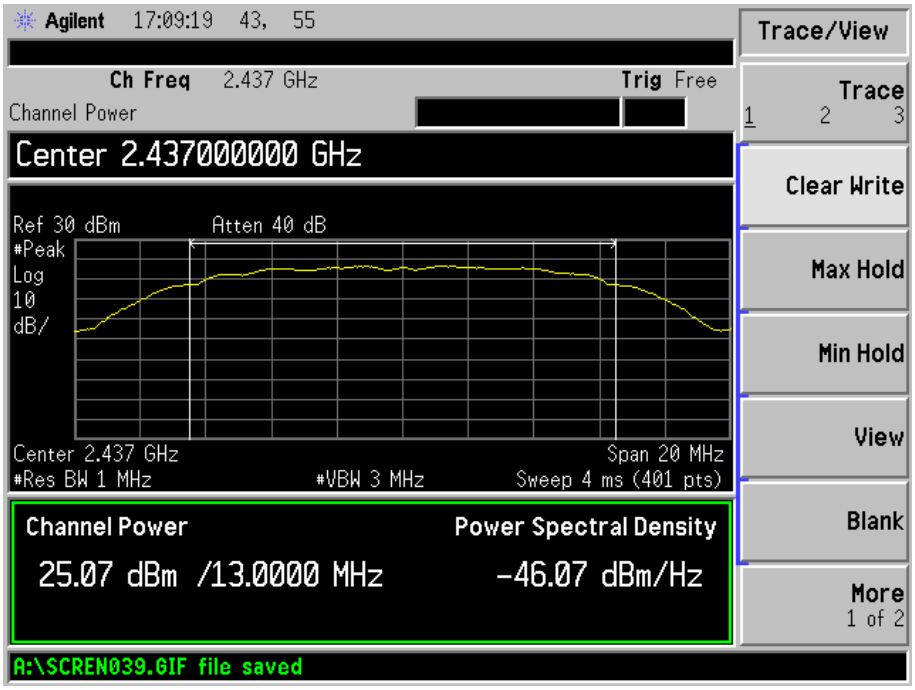
802.11b - short 11Mpbs-High Channel



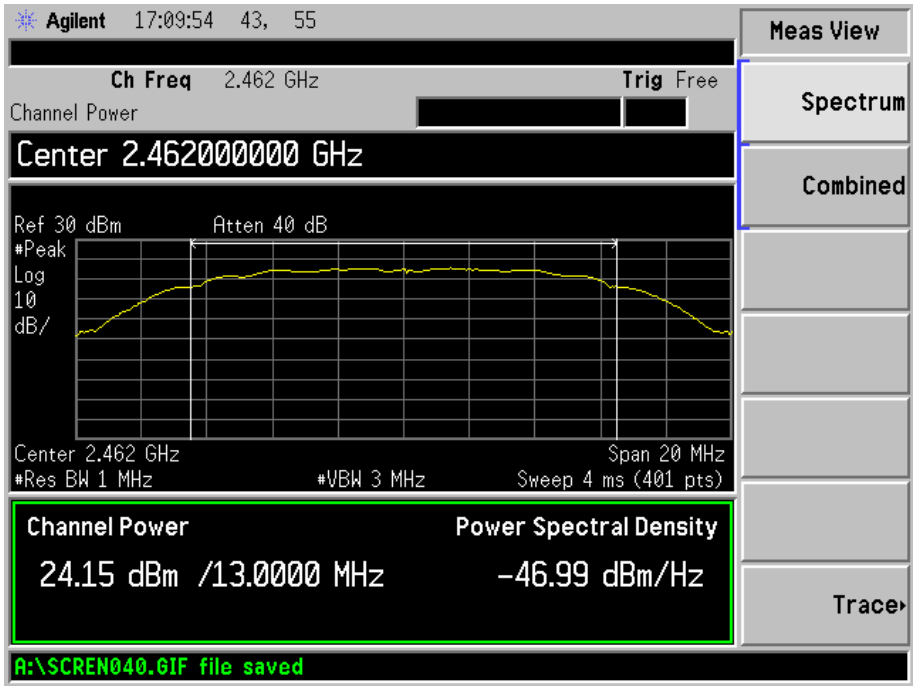
802.11b-long 1Mbps-Low Channel



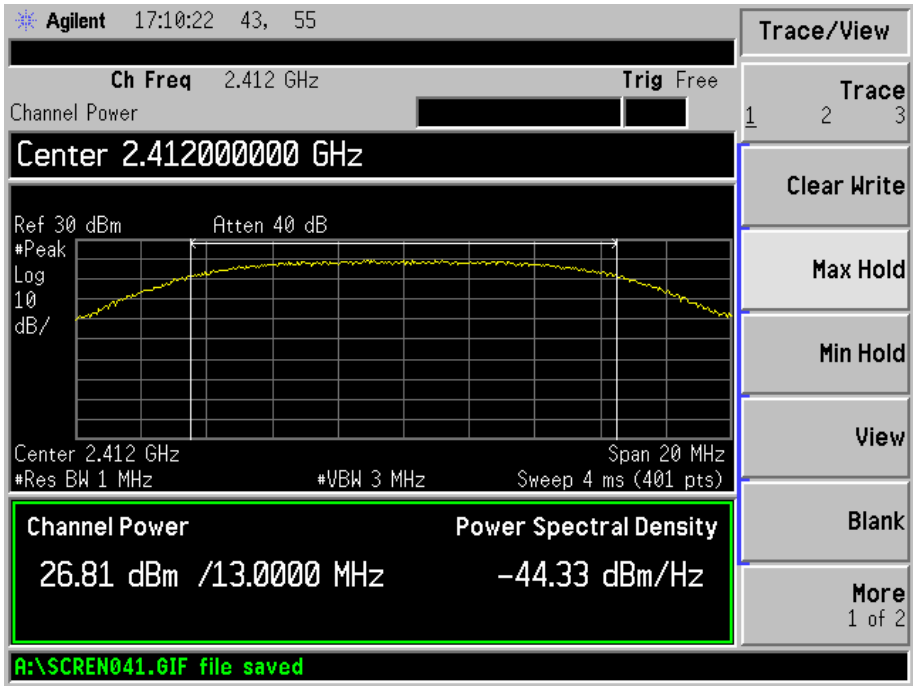
802.11b - short 1Mbps-Middle Channel



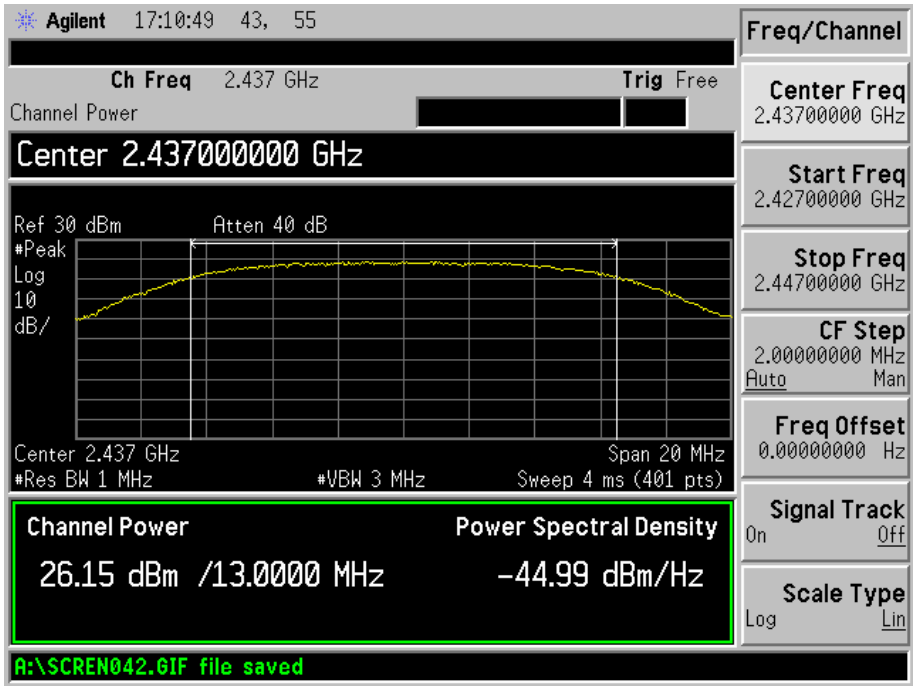
802.11b - short 1Mpbs-High Channel



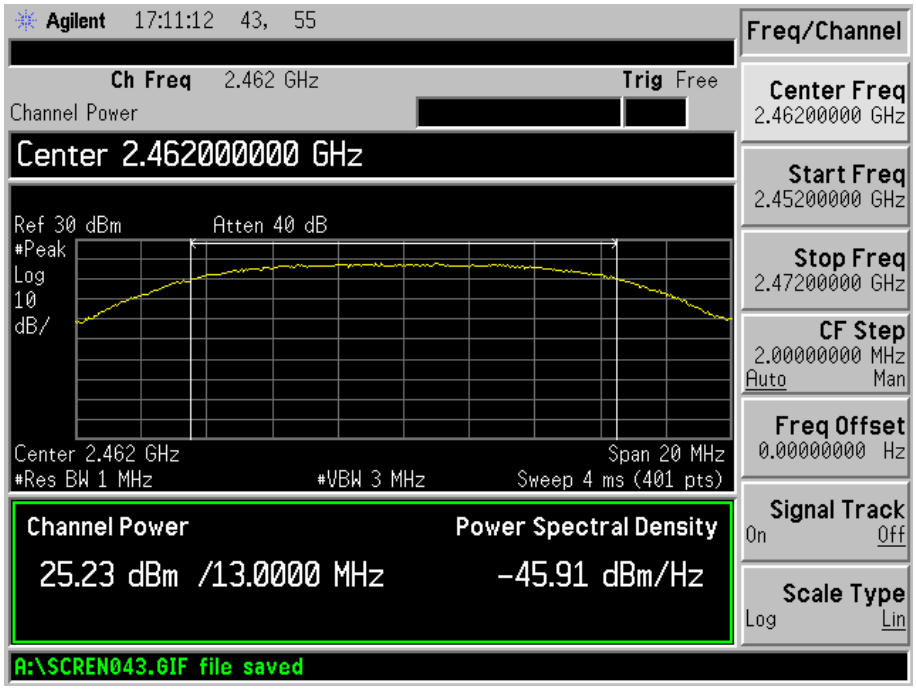
802.11- short 11Mbps-Low Channel



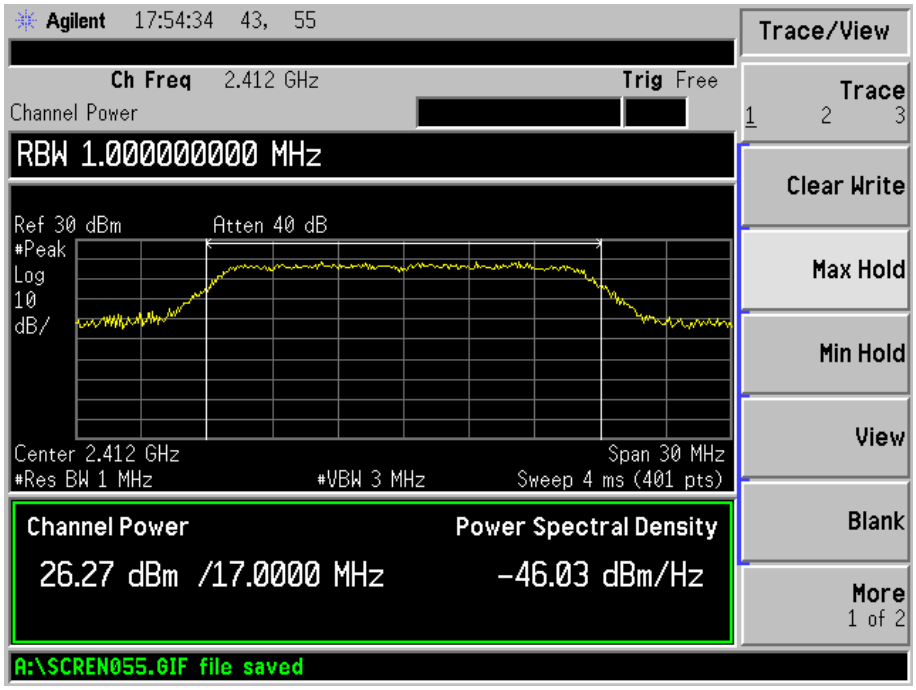
802.11b - short 11Mbps-Middle Channel



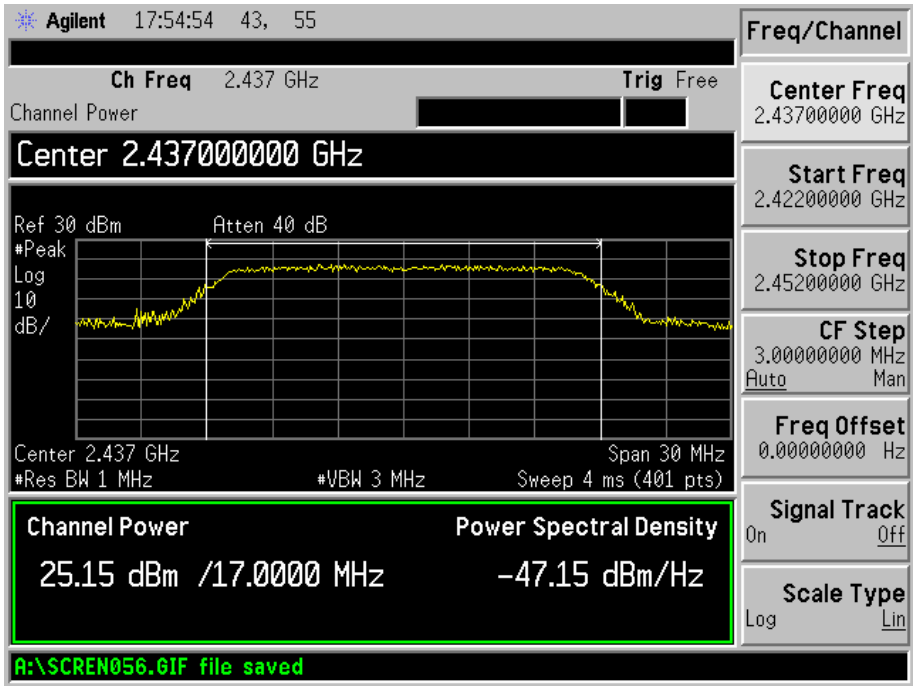
802.11b - short 11Mpbs-High Channel



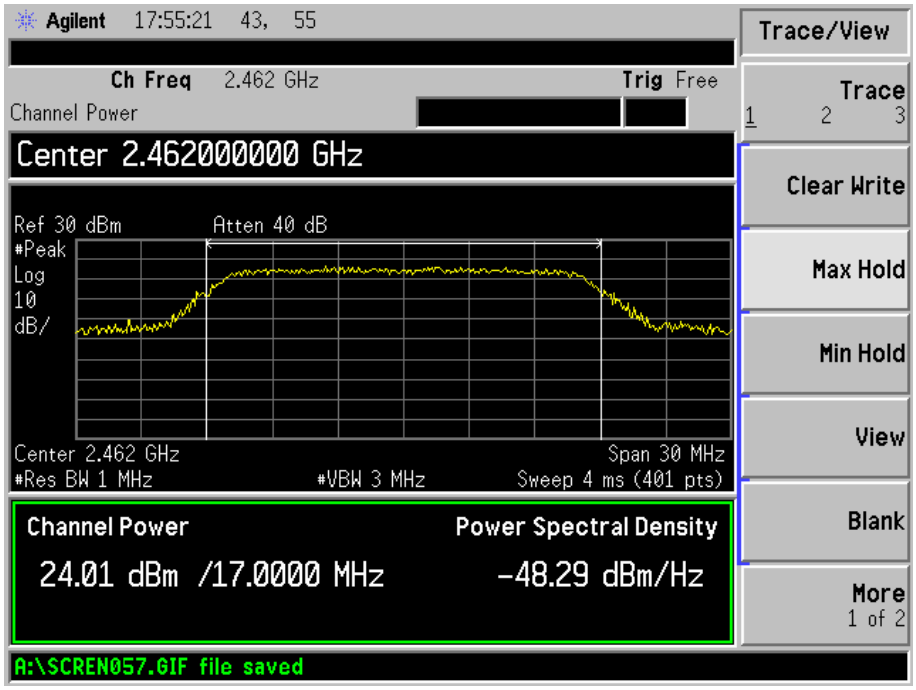
802.11g-6Mbps-Low Channel



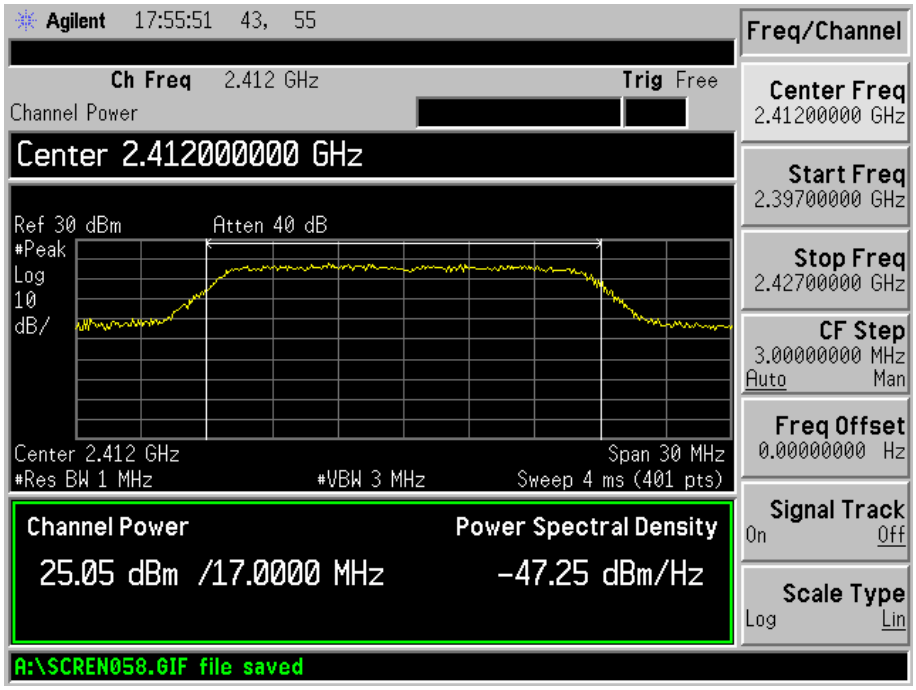
802.11g-6Mbps-Middle Channel



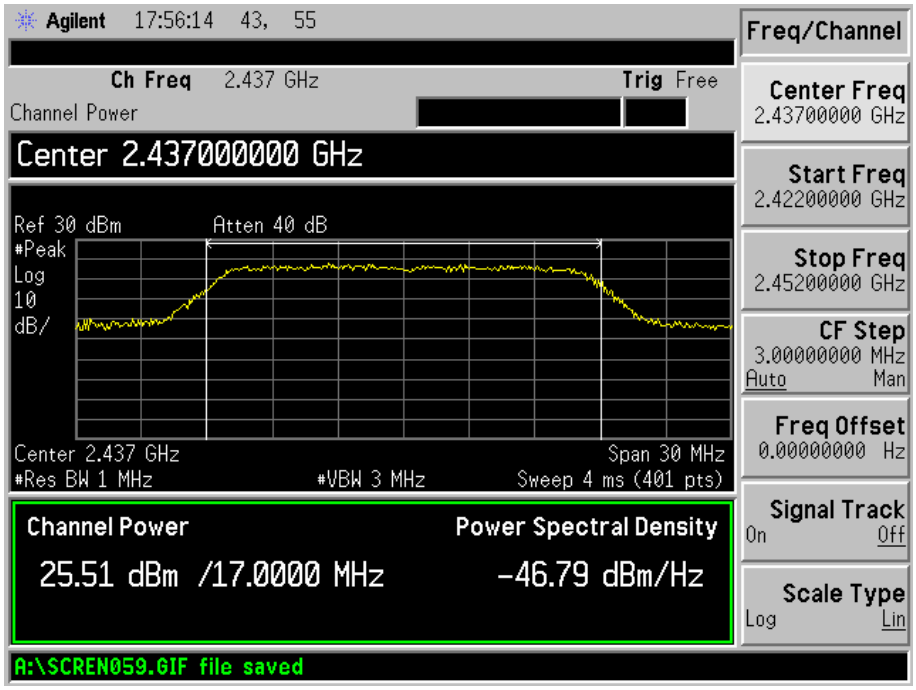
802.11g-6Mpbs-High Channel



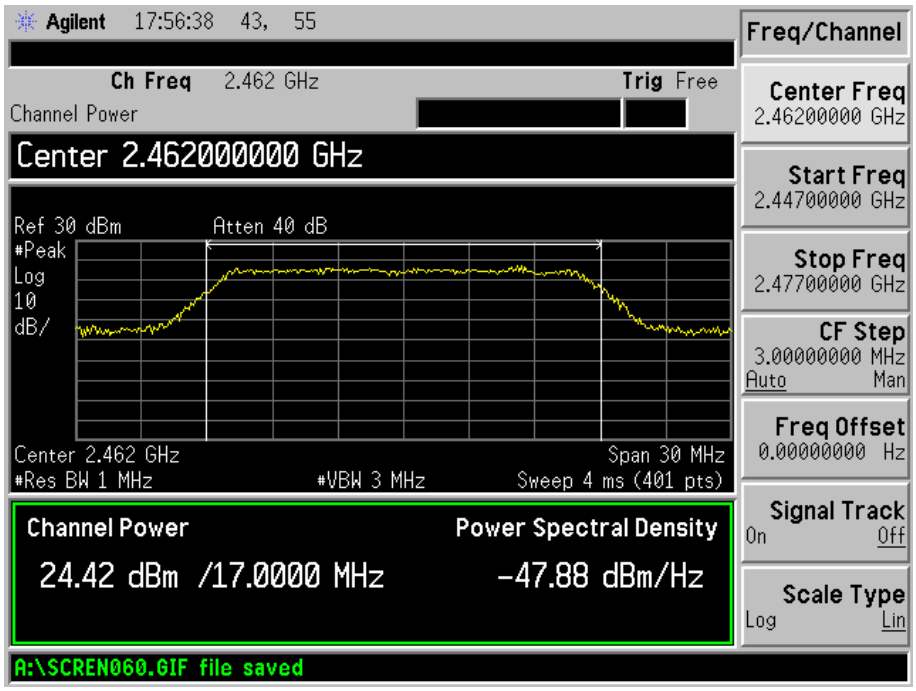
802.11g-54Mbps-Low Channel



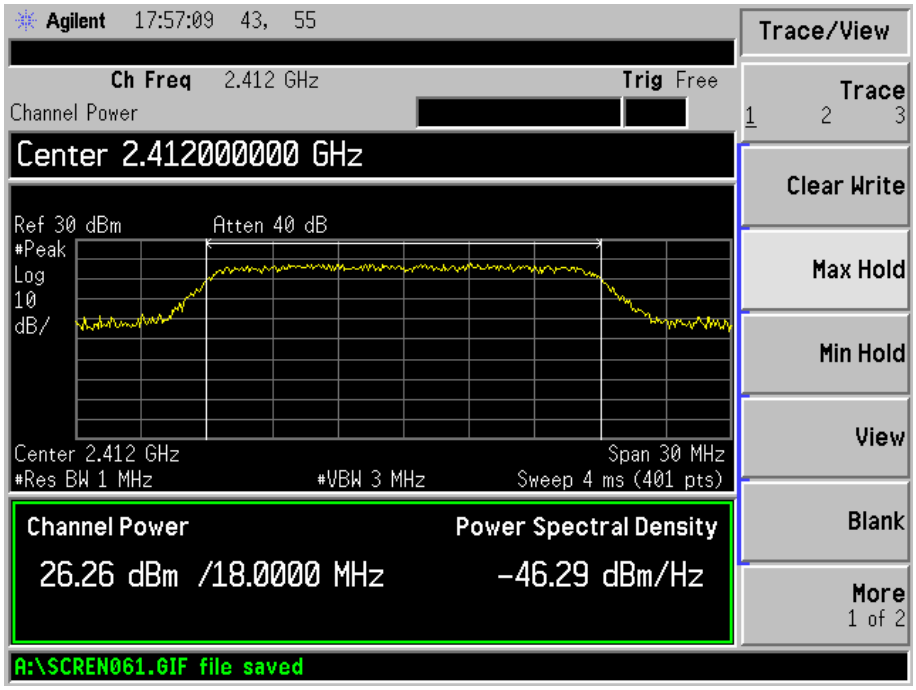
802.11g-54Mbps-Middle Channel



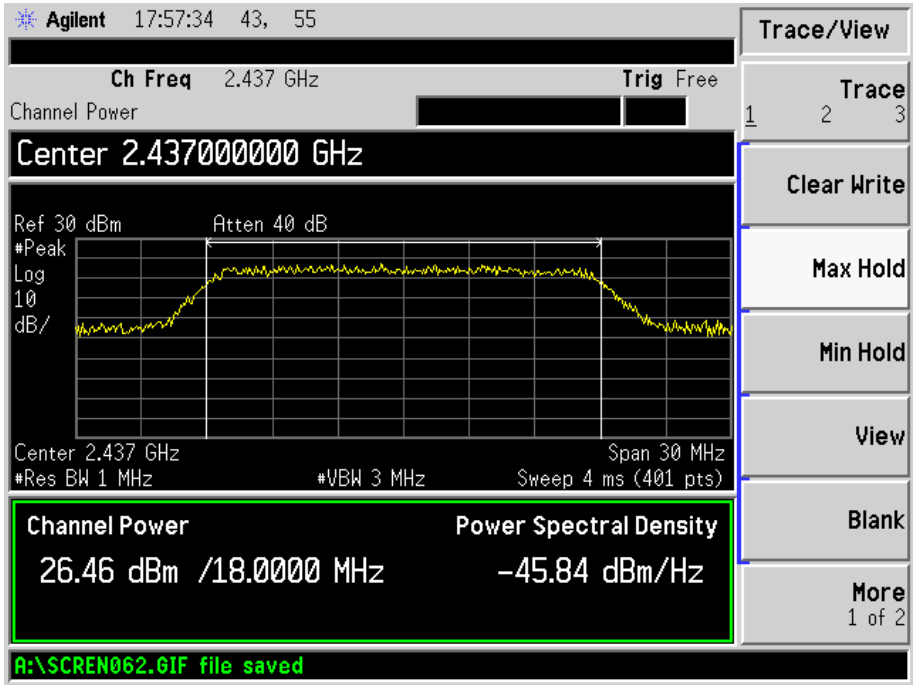
802.11g-54Mpbs-High Channel



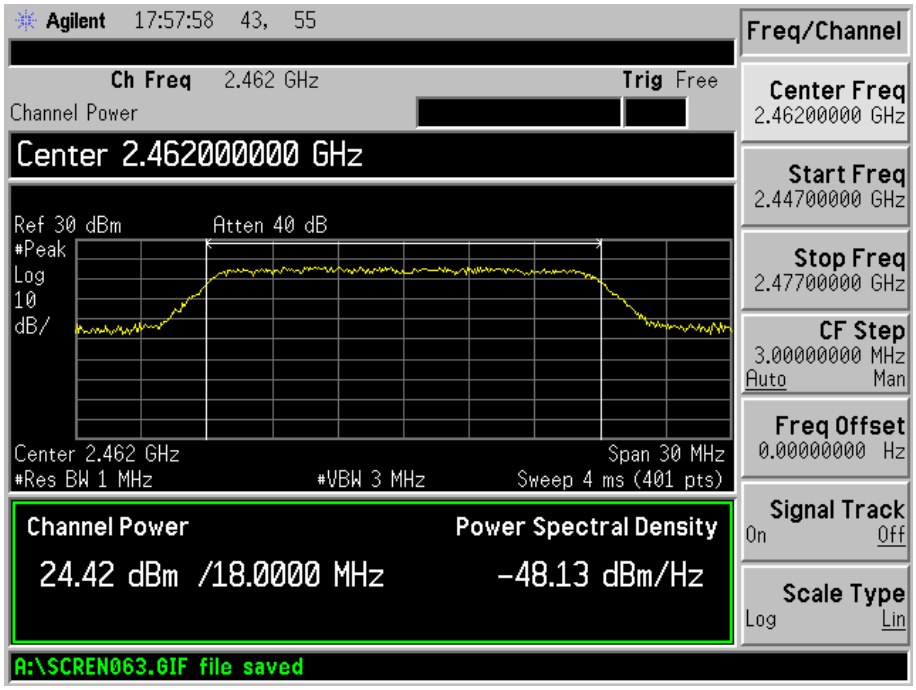
802.11n-HT20-MCS0-Low Channel



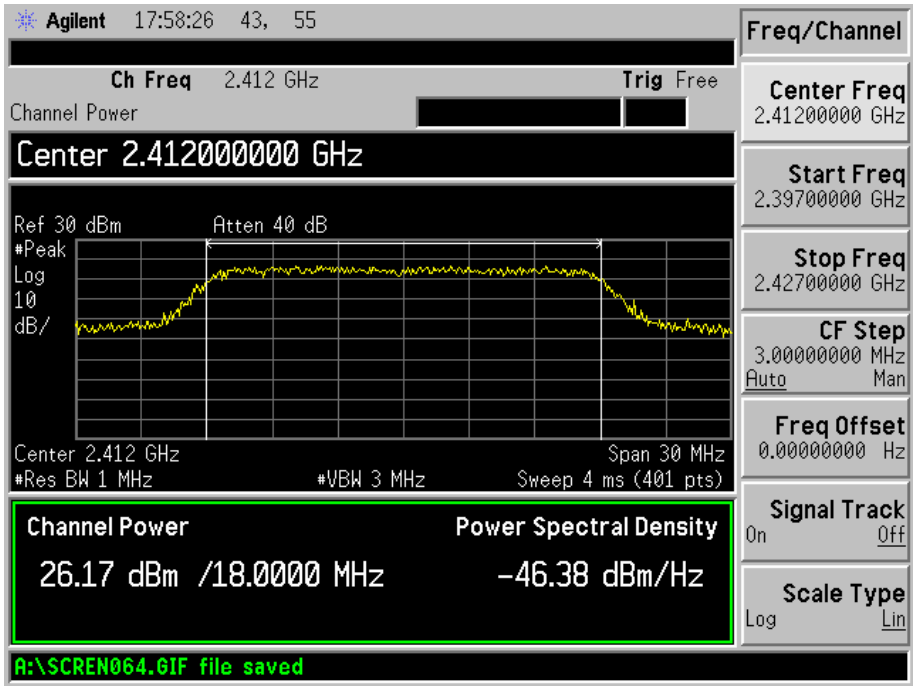
802.11n-HT20-MCS0-Middle Channel



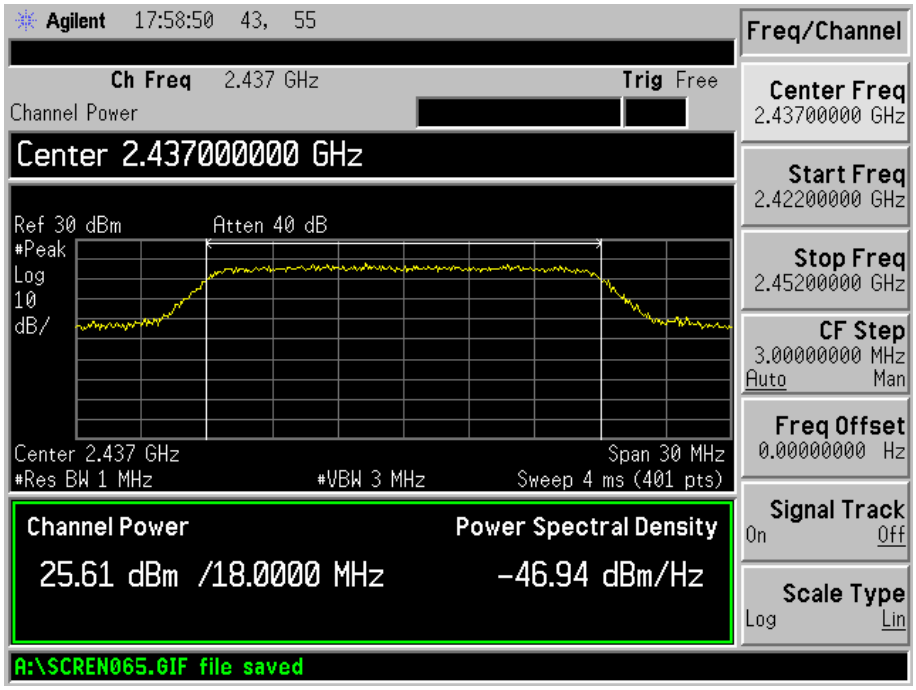
802.11n-HT20-MCS0-High Channel



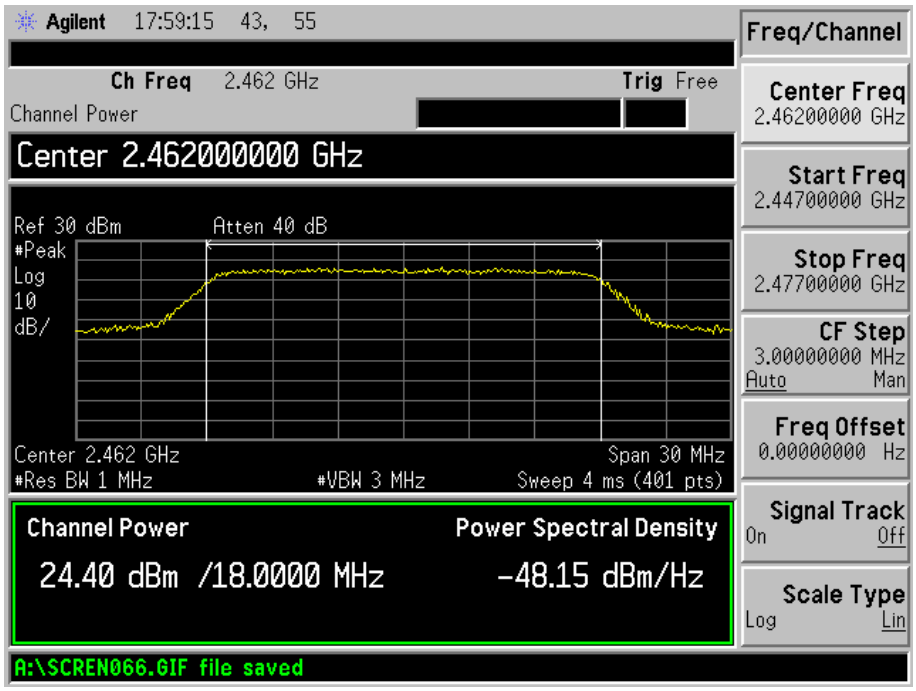
802.11n-HT20-MCS7-Low Channel



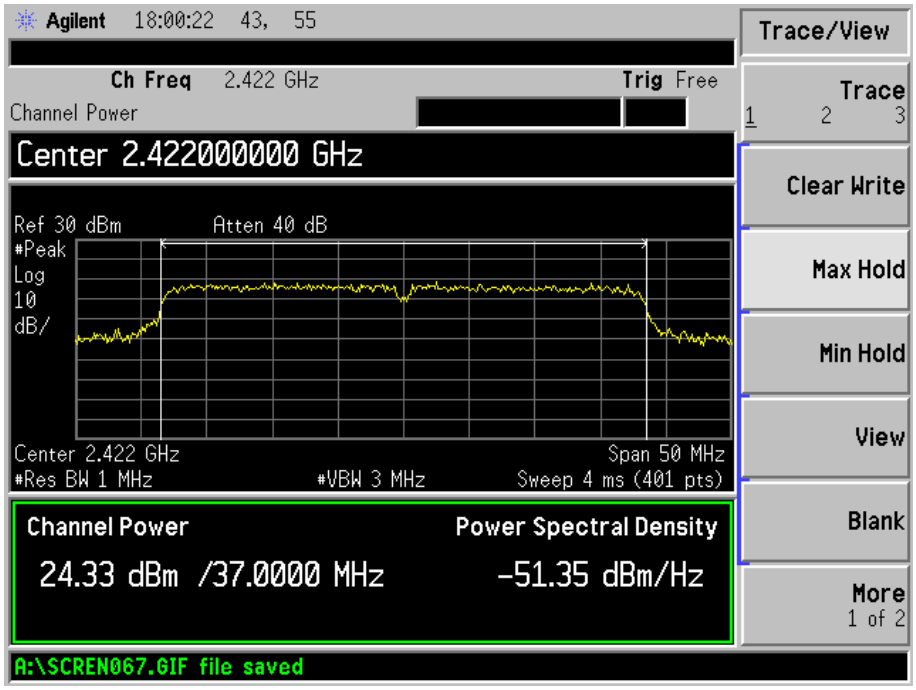
802.11n-HT20-MCS7-Middle Channel



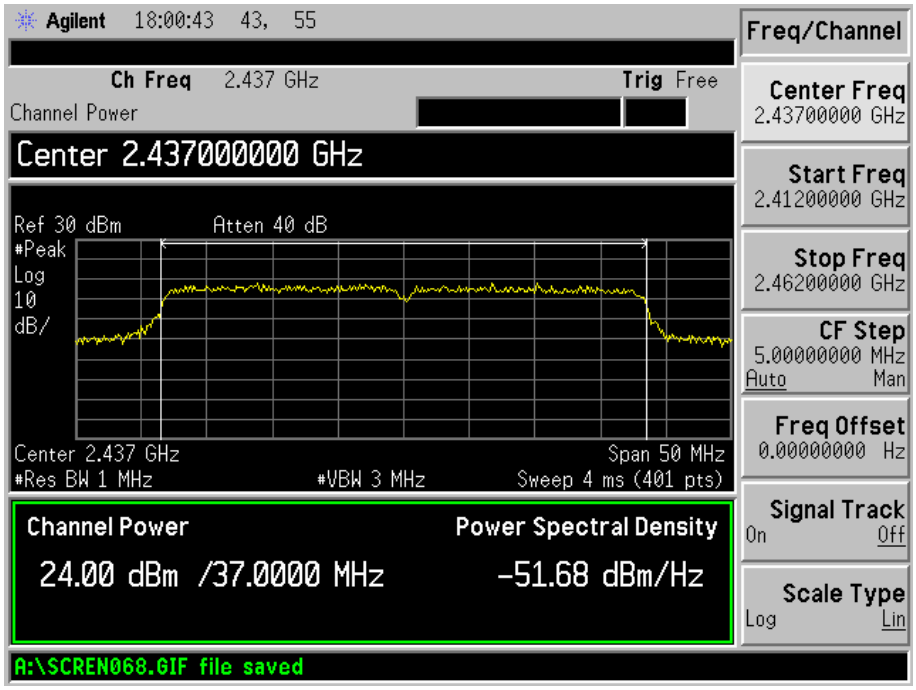
802.11n-HT20-MCS7-High Channel



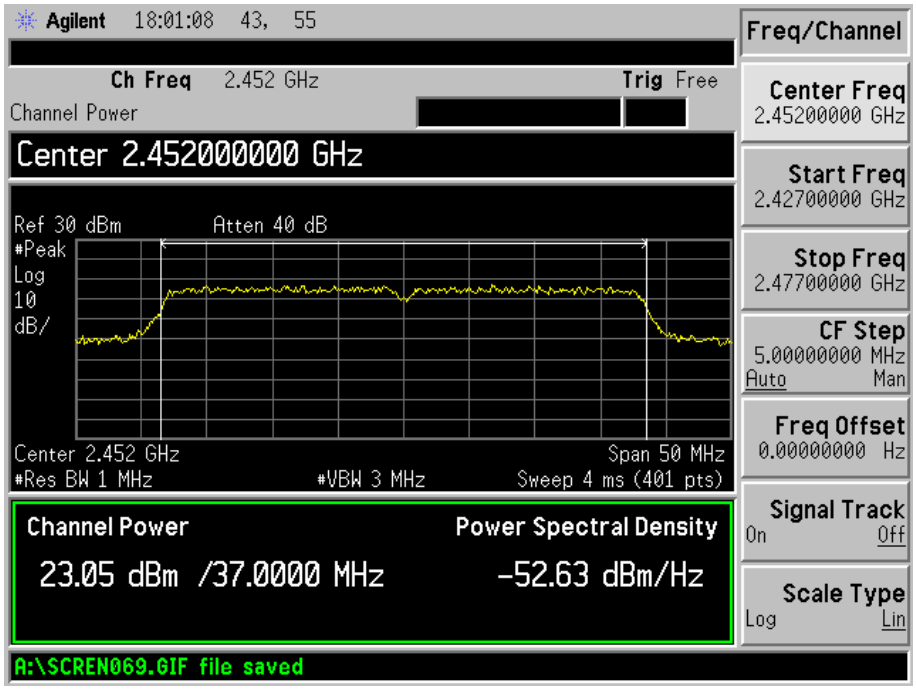
802.11n-HT40-MCS0-Low Channel



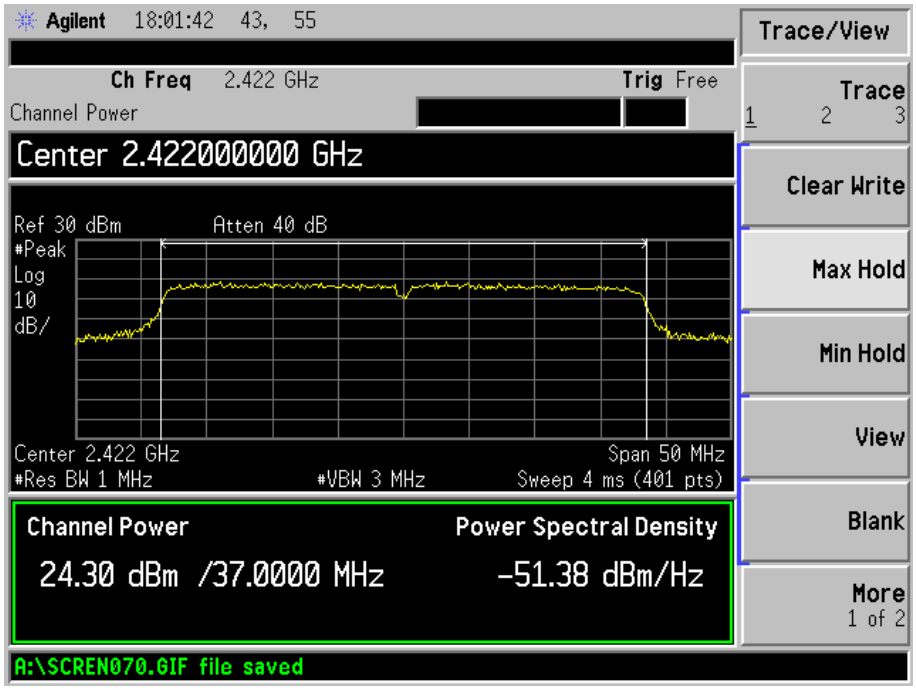
802.11n-HT40-MCS0-Middle Channel



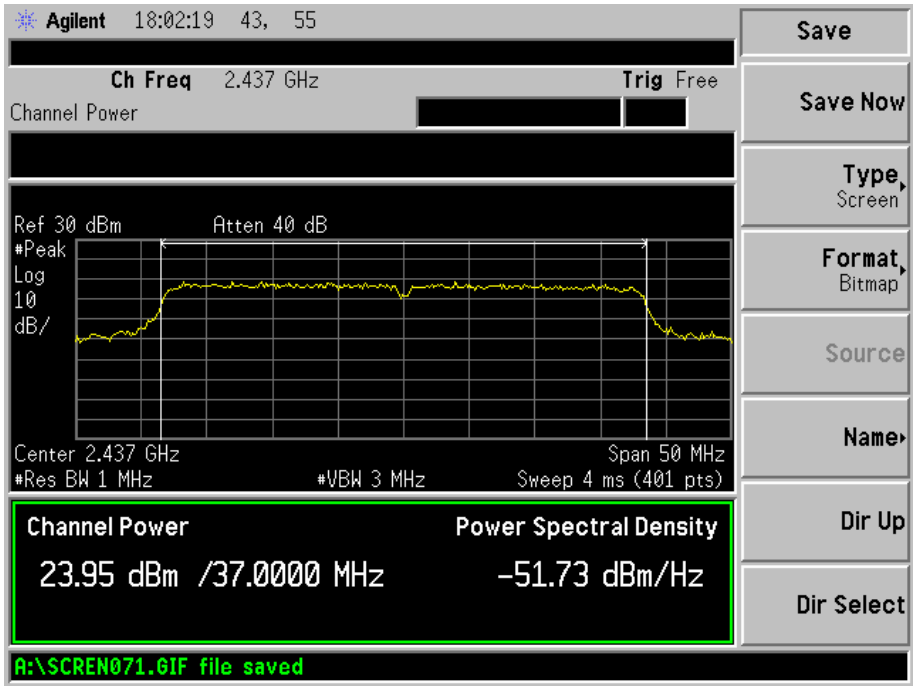
802.11n-HT40-MCS0-High Channel



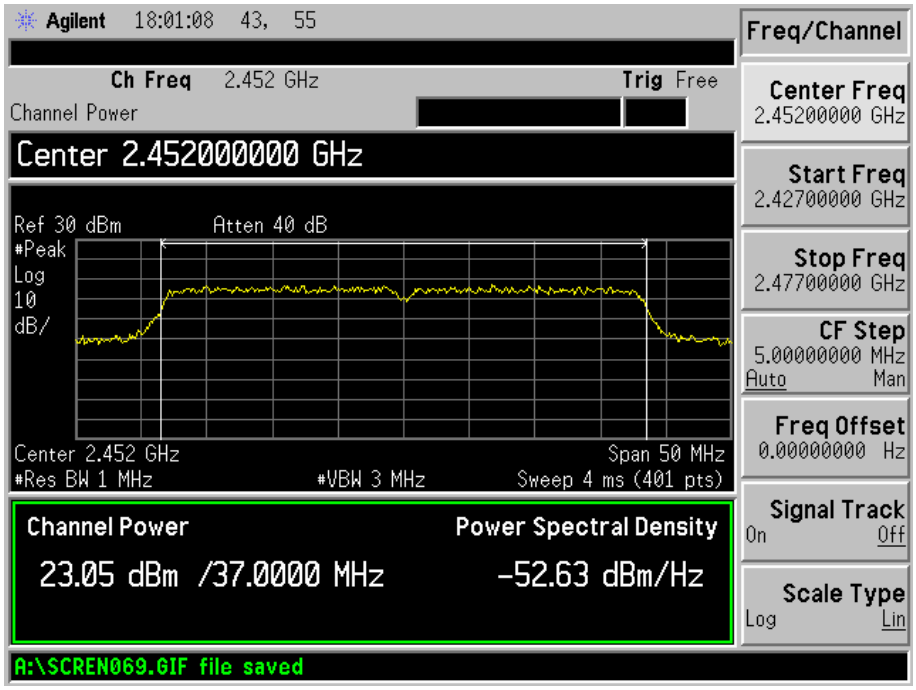
802.11n-HT40-MCS7-Low Channel



802.11n-HT40-MCS7-Middle Channel



802.11n-HT40-MCS7-High Channel



7. Field Strength of Spurious Emissions

7.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ±5.10 dB.

7.2 Standard Applicable

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

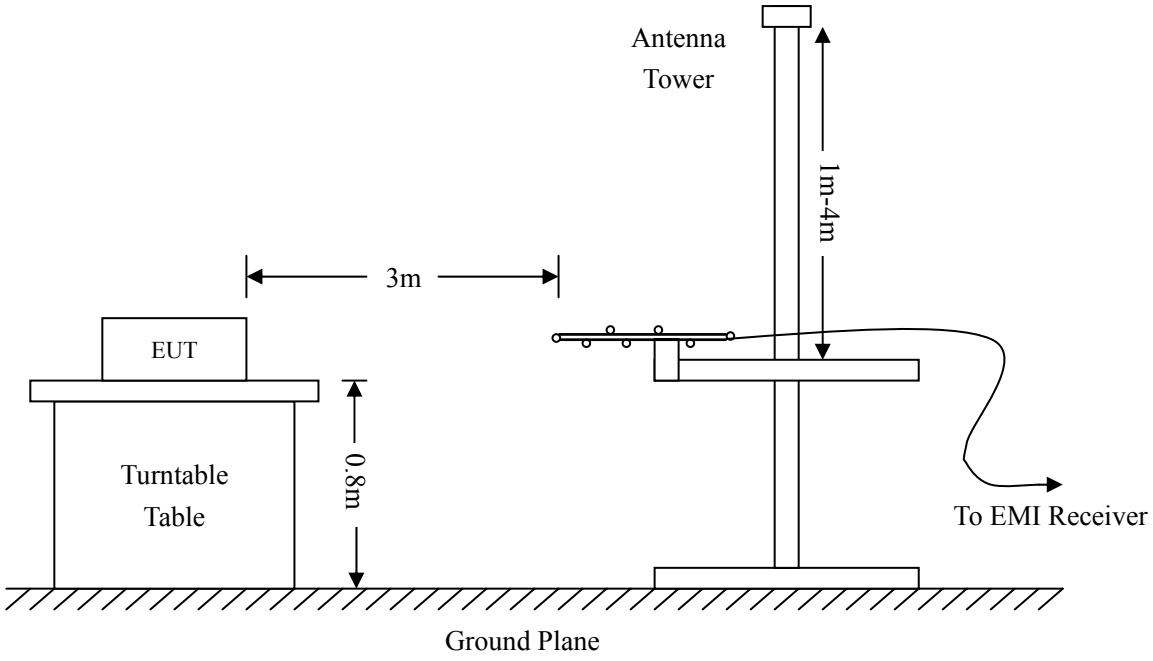
7.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2013-05-07	2014-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2013-05-07	2014-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2013-05-07	2014-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2013-05-07	2014-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2013-04-20	2014-04-19
Horn Antenna	ETS	3117	00086197	2013-04-20	2014-04-19
Horn Antenna	ETS	3116B	00088203	2013-04-20	2014-04-19

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

7.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.



7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15 Limit

7.6 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

7.7 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst margin of:

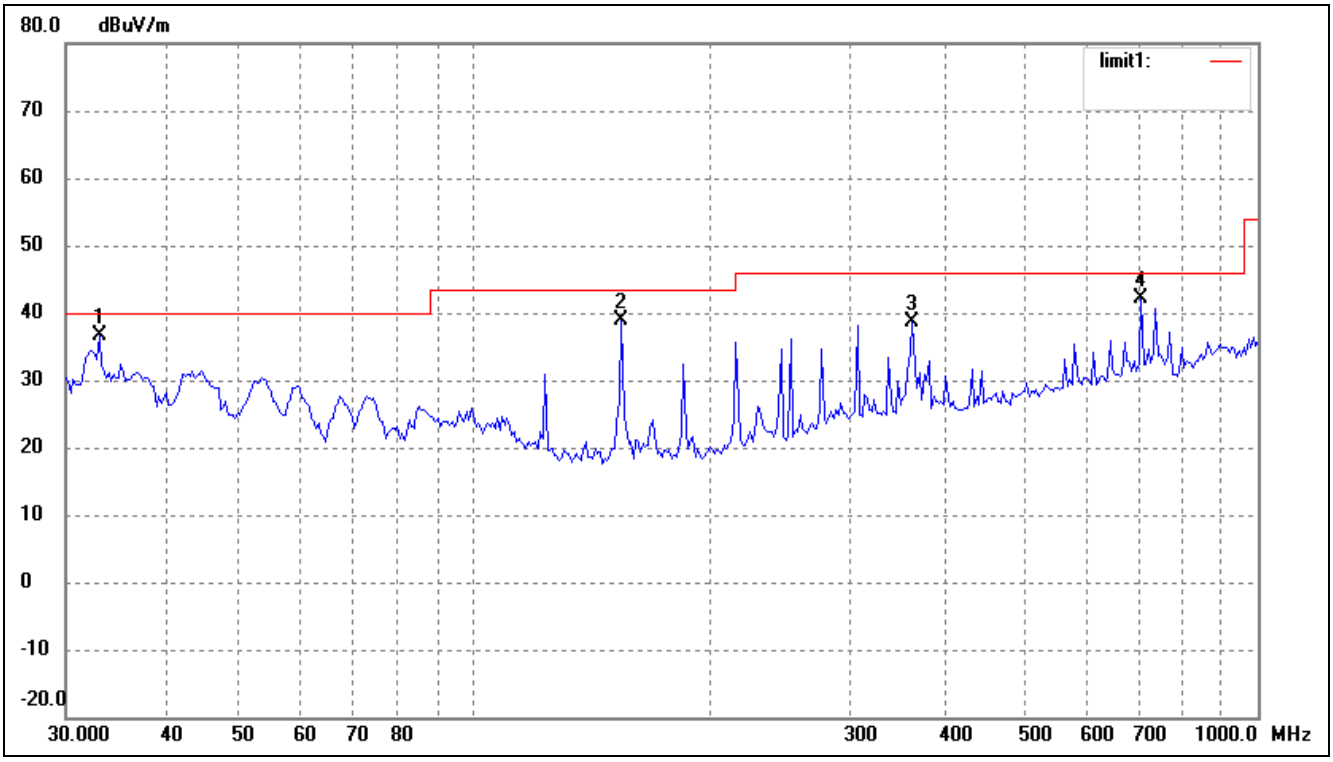
-2.23 dB at **153.7385 MHz** in the **Horizontal** polarization for **802.11n-HT20-High Channel**, **30MHz** to **25 GHz**, **3 Meters**

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

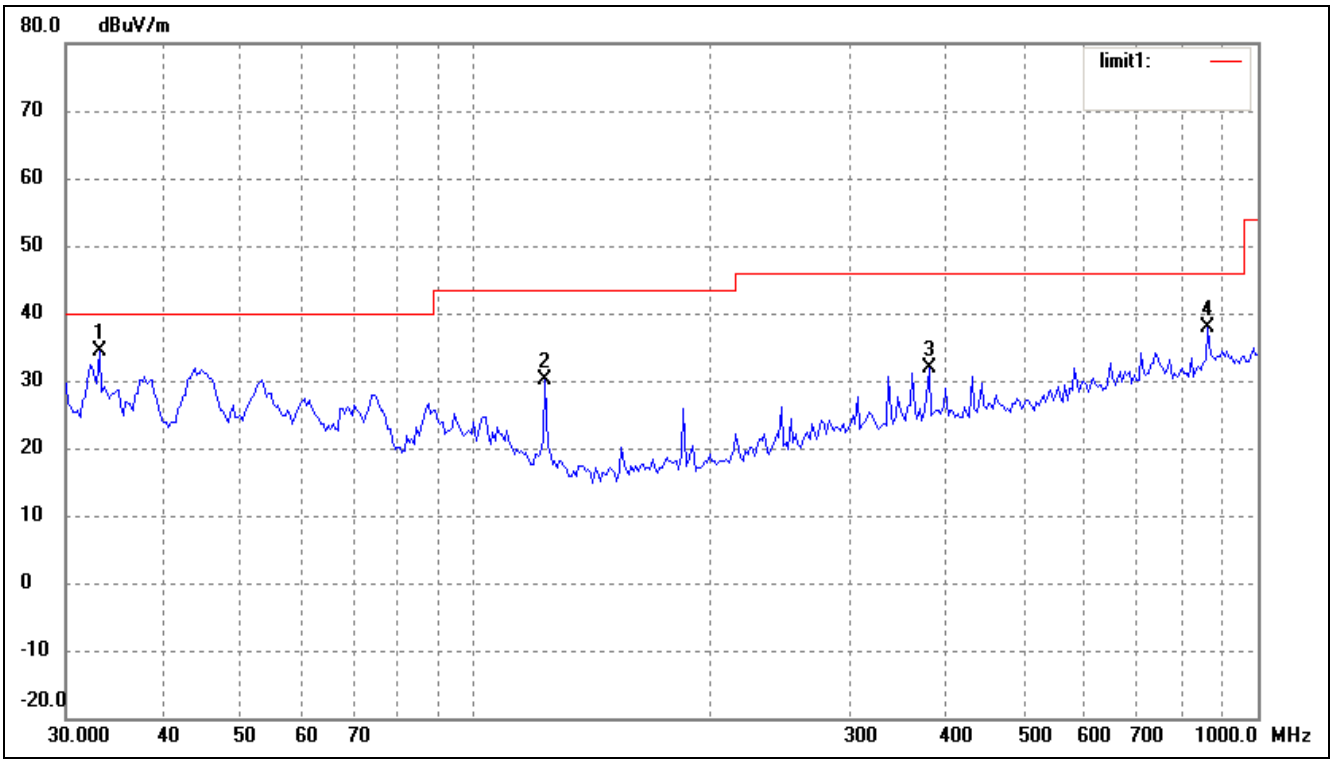
EUT: *WiFi USB Dongle*
Tested Model: *AWUHN2405-2*
Operating Condition: *802.11b Transmitting Low Channel-2412MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.0950	28.05	8.56	36.61	40.00	-3.39	264	100	peak
2	153.7385	35.26	3.59	38.85	43.50	-4.65	113	200	peak
3	361.7139	27.93	10.69	38.62	46.00	-7.38	287	100	peak
4	709.1823	26.03	16.15	42.18	46.00	-3.82	185	200	peak

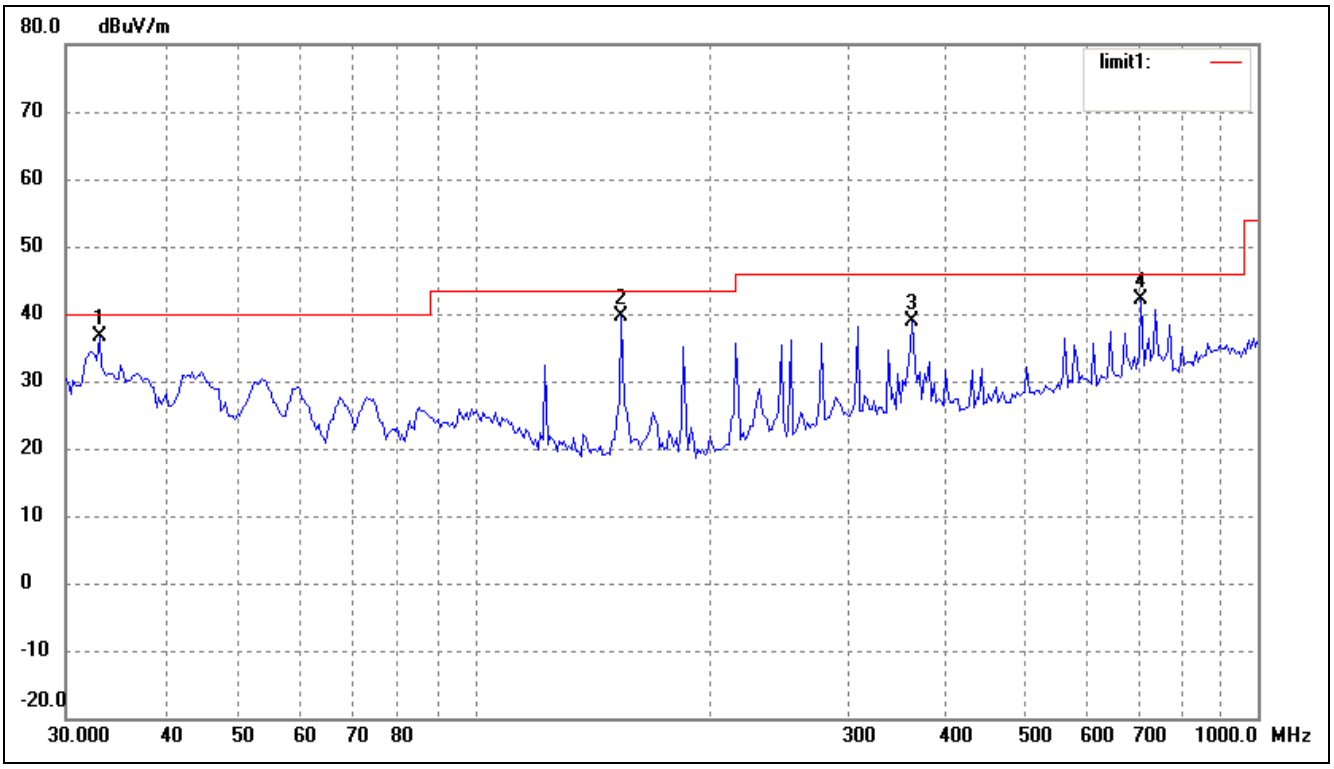
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.0950	25.90	8.56	34.46	40.00	-5.54	240	100	peak
2	122.8340	25.41	4.66	30.07	43.50	-13.43	187	100	peak
3	379.9141	21.31	10.62	31.93	46.00	-14.07	220	100	peak
4	863.0562	19.52	18.27	37.79	46.00	-8.21	359	100	peak

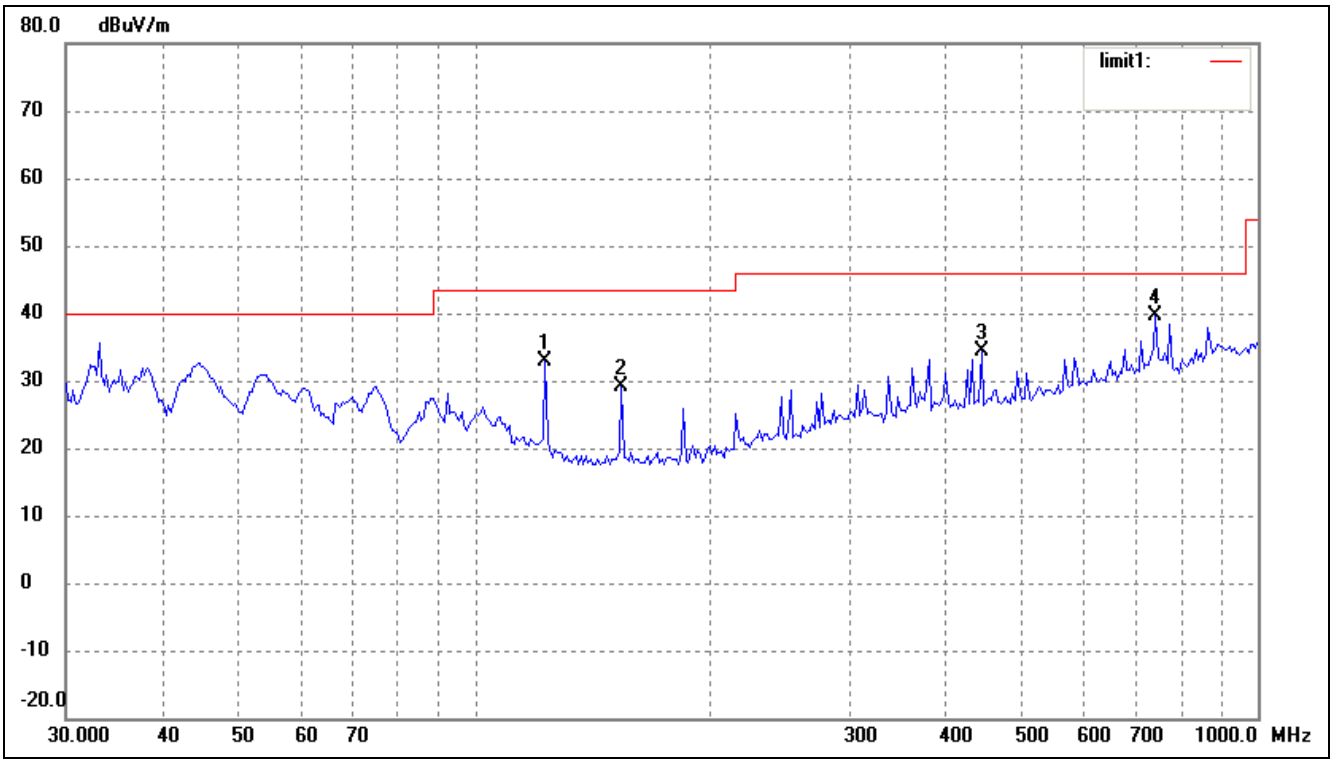
Operating Condition: *802.11b Transmitting Middle Channel-2437MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.0950	28.05	8.56	36.61	40.00	-3.39	162	100	peak
2	153.7385	36.09	3.59	39.68	43.50	-3.82	200	100	peak
3	361.7139	28.14	10.69	38.83	46.00	-7.17	359	100	peak
4	709.1823	26.03	16.15	42.18	46.00	-3.82	359	100	peak

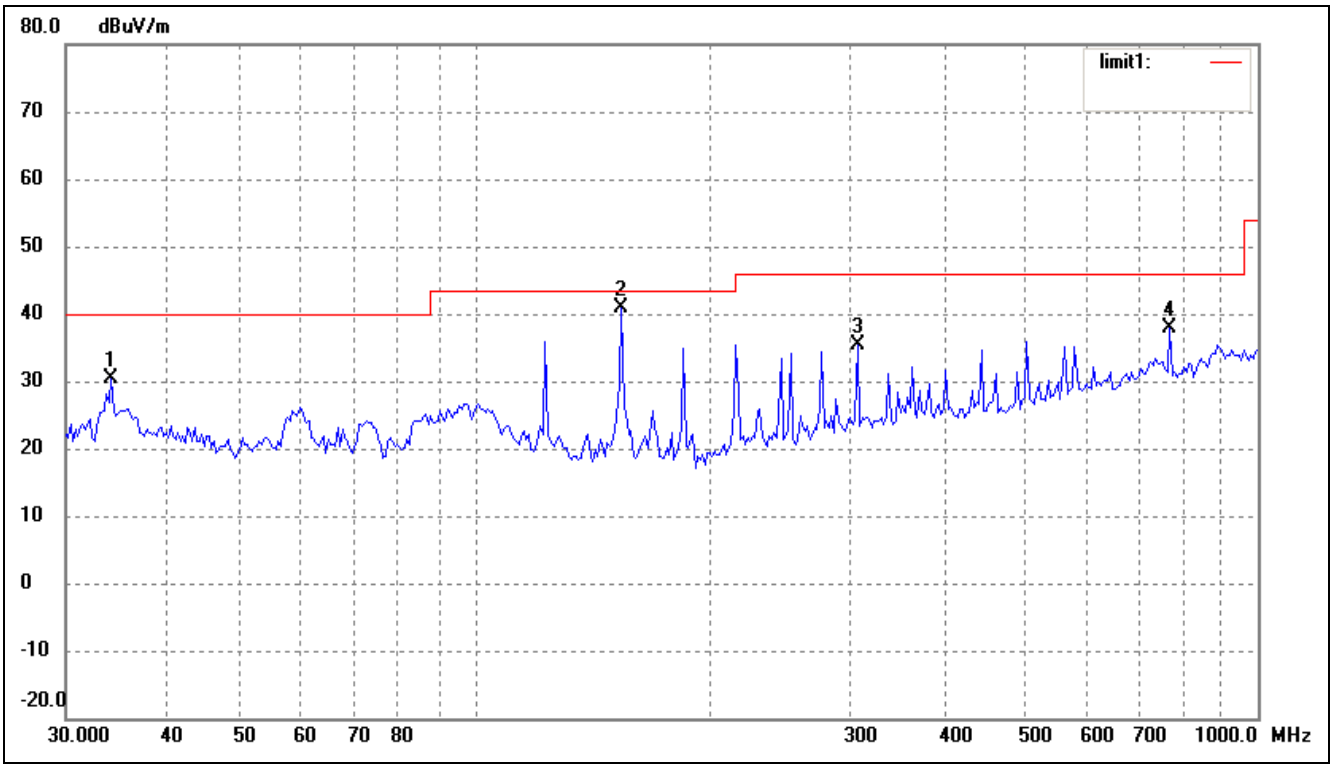
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	122.8340	28.34	4.66	33.00	43.50	-10.50	240	100	peak
2	153.7385	25.63	3.59	29.22	43.50	-14.28	187	100	peak
3	443.2943	23.05	11.34	34.39	46.00	-11.61	220	100	peak
4	739.6605	21.53	18.07	39.60	46.00	-6.40	359	100	peak

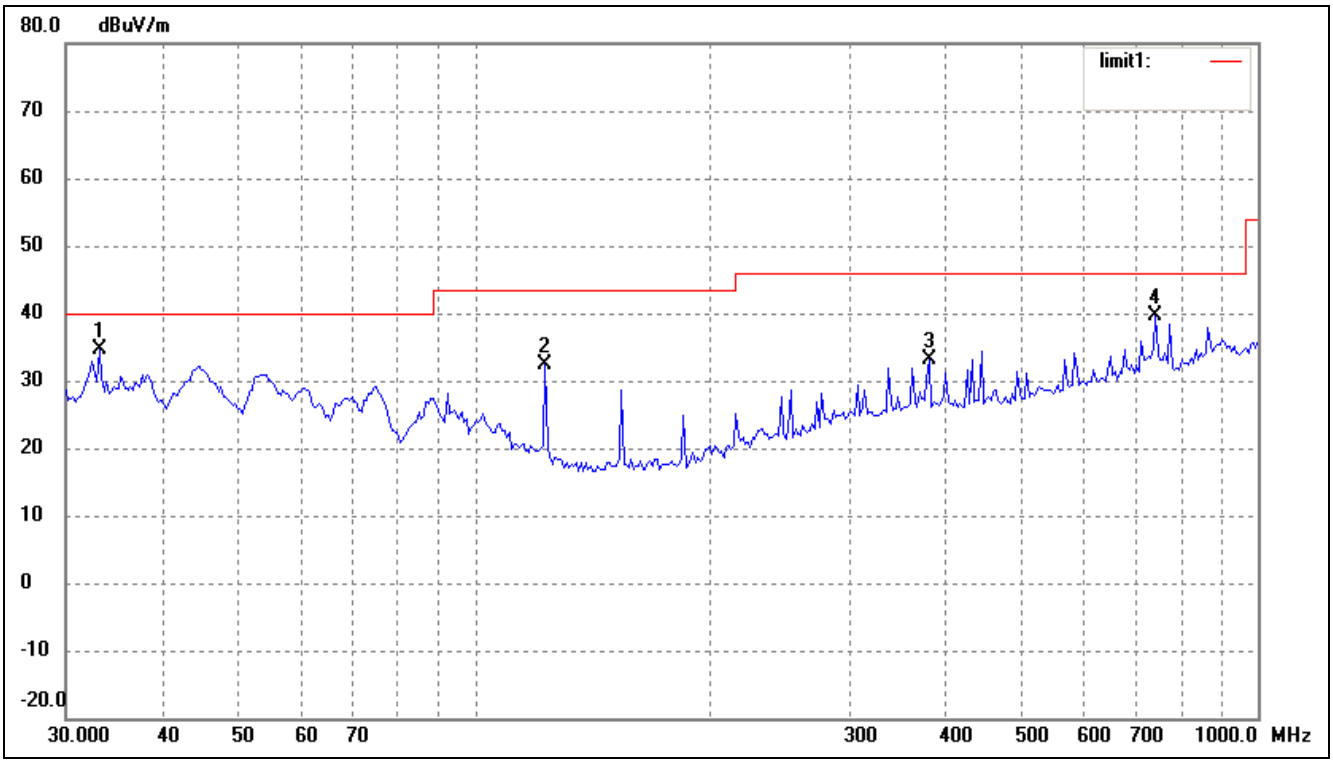
Operating Condition: *802.11b Transmitting High Channel-2462MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	34.2760	21.74	8.76	30.50	40.00	-9.50	162	100	peak
2	153.7385	37.26	3.59	40.85	43.50	-2.65	200	100	peak
3	307.8313	25.12	10.30	35.42	46.00	-10.58	200	100	peak
4	771.4486	21.42	16.37	37.79	46.00	-8.21	200	100	peak

Test Specification: *Vertical*

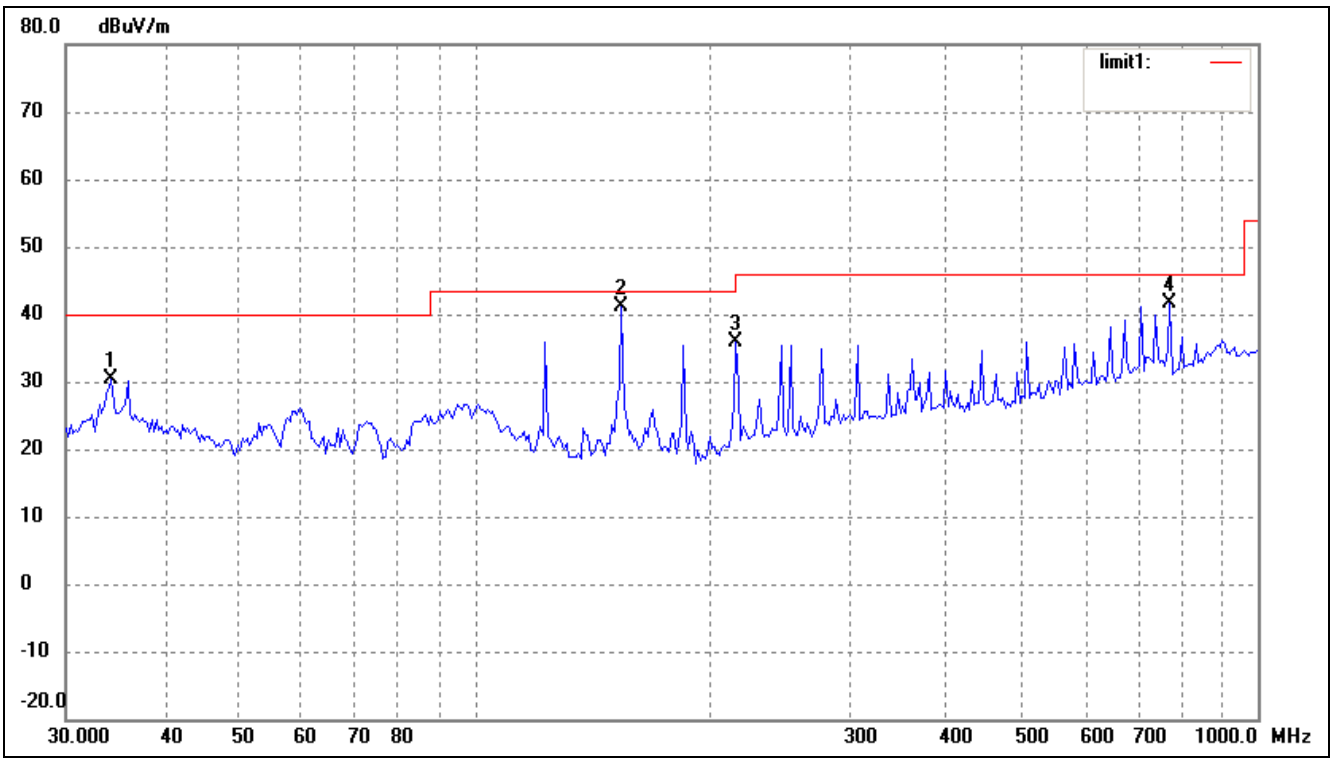


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.0950	26.01	8.56	34.57	40.00	-5.43	240	100	peak
2	122.8340	27.84	4.66	32.50	43.50	-11.00	187	100	peak
3	379.9141	22.58	10.62	33.20	46.00	-12.80	220	100	peak
4	739.6605	21.53	18.07	39.60	46.00	-6.40	220	100	peak

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

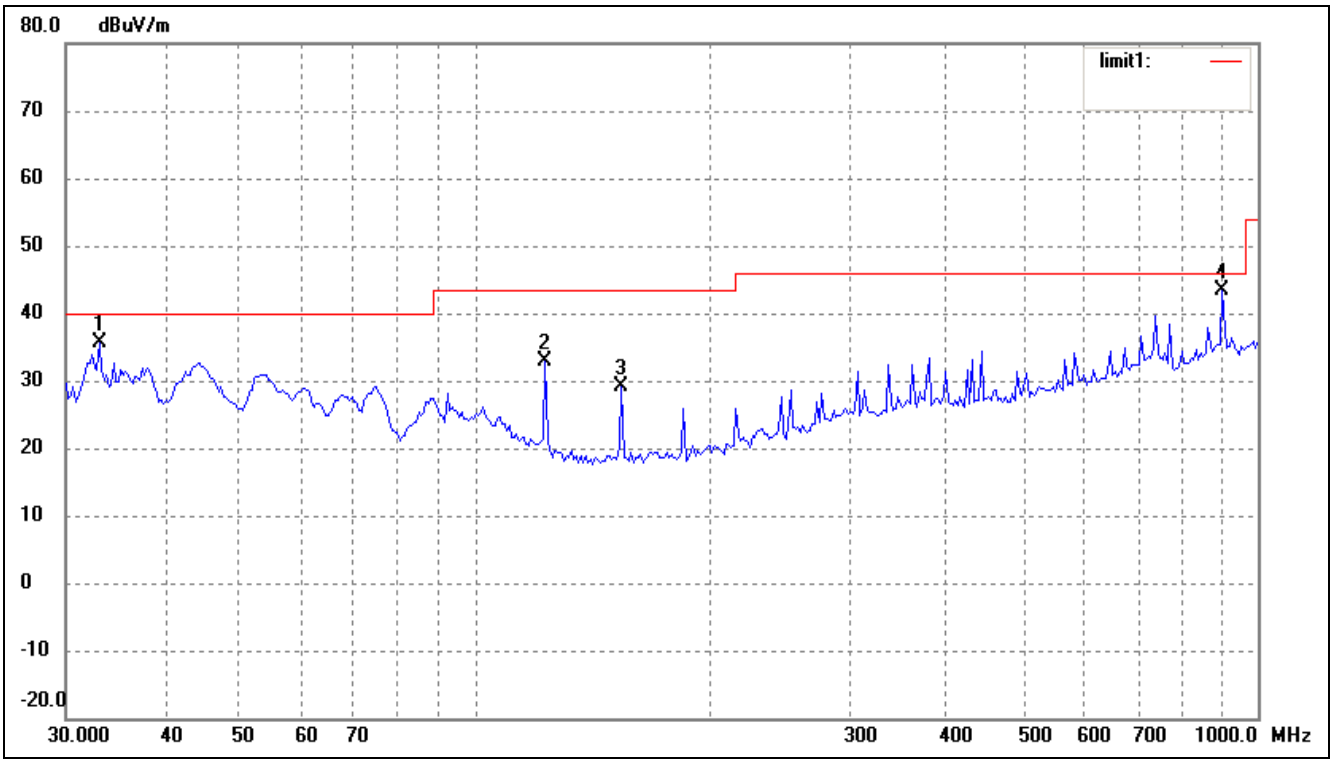
EUT: *WiFi USB Dongle*
Tested Model: *AWUHN2405-2*
Operating Condition: *802.11g Transmitting Low Channel-2412MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	34.2760	21.74	8.76	30.50	40.00	-9.50	264	100	peak
2	153.7385	37.64	3.59	41.23	43.50	-2.27	113	200	peak
3	215.2678	30.36	5.62	35.98	43.50	-7.52	287	100	peak
4	771.4486	25.21	16.37	41.58	46.00	-4.42	185	200	peak

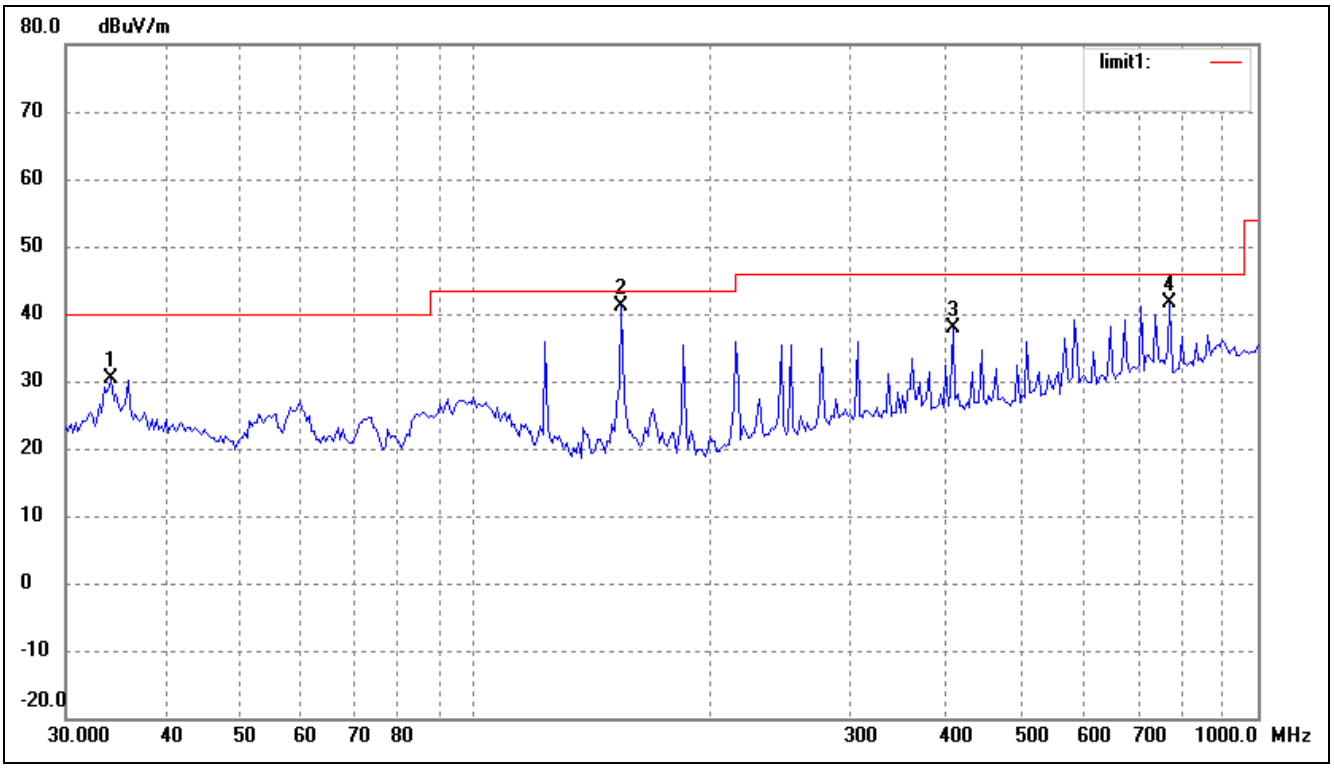
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.0950	27.01	8.56	35.57	40.00	-4.43	240	100	peak
2	122.8340	28.34	4.66	33.00	43.50	-10.50	187	100	peak
3	153.7385	25.63	3.59	29.22	43.50	-14.28	220	100	peak
4	900.1474	24.01	19.38	43.39	46.00	-2.61	359	100	peak

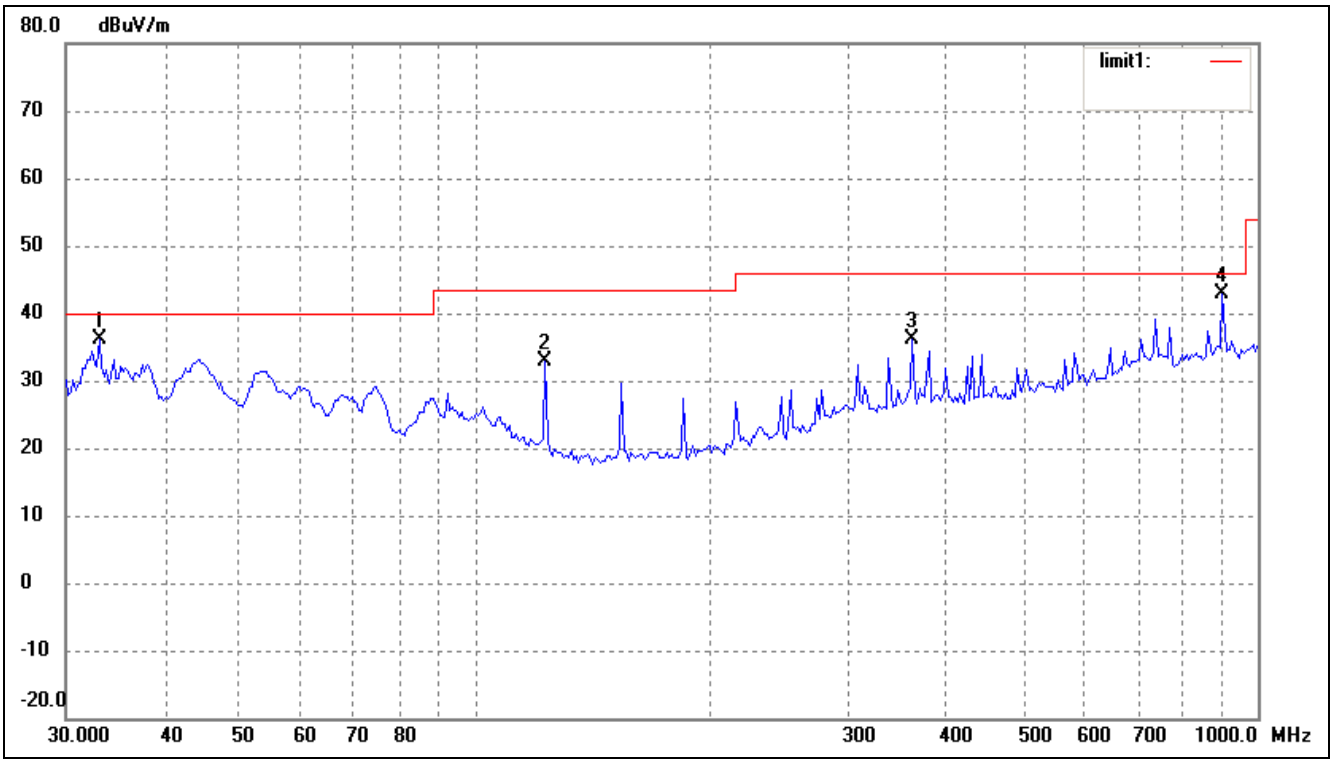
Operating Condition: *802.11g Transmitting Middle Channel-2437MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	34.2760	21.74	8.76	30.50	40.00	-9.50	162	100	peak
2	153.7385	37.64	3.59	41.23	43.50	-2.27	200	100	peak
3	407.5145	26.56	11.22	37.78	46.00	-8.22	359	100	peak
4	771.4486	25.21	16.37	41.58	46.00	-4.42	359	100	peak

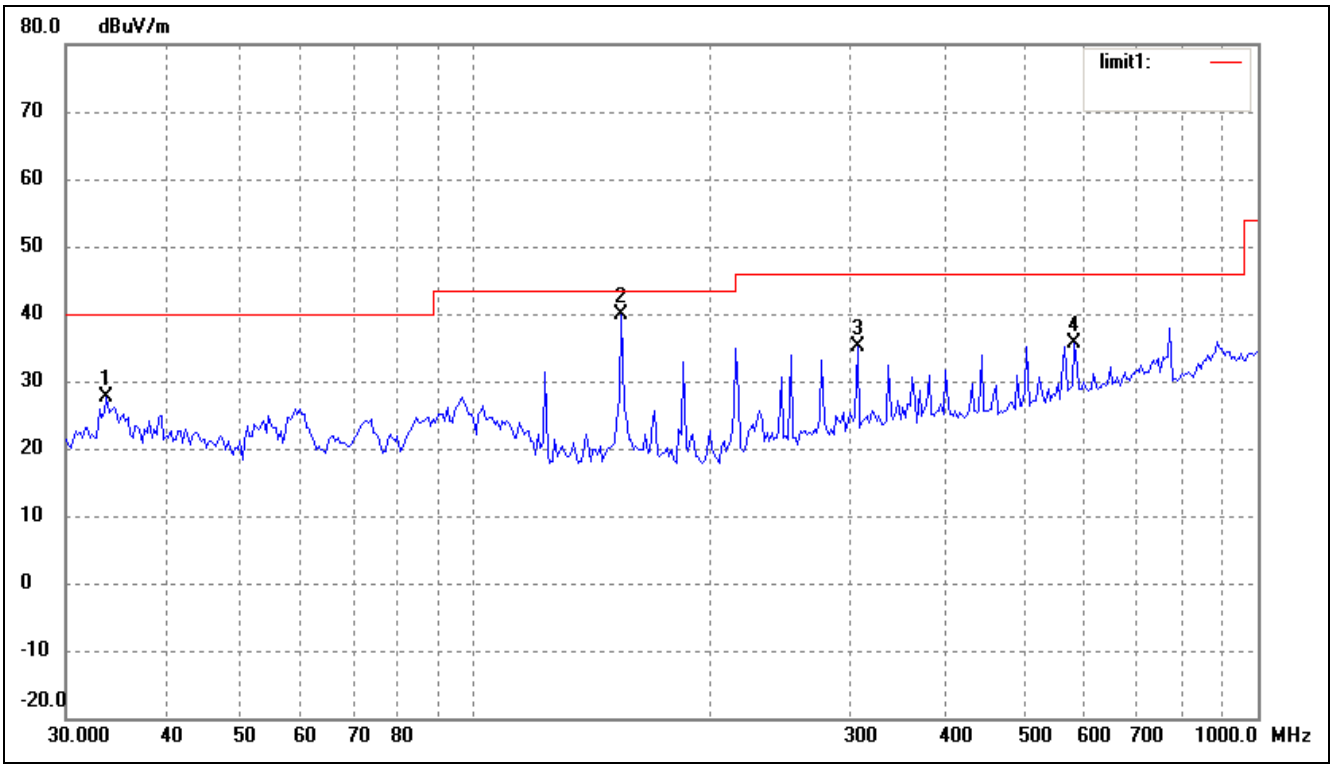
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.0950	27.51	8.56	36.07	40.00	-3.93	240	100	peak
2	122.8340	28.34	4.66	33.00	43.50	-10.50	187	100	peak
3	361.7139	25.32	10.69	36.01	46.00	-9.99	220	100	peak
4	900.1474	23.51	19.38	42.89	46.00	-3.11	359	100	peak

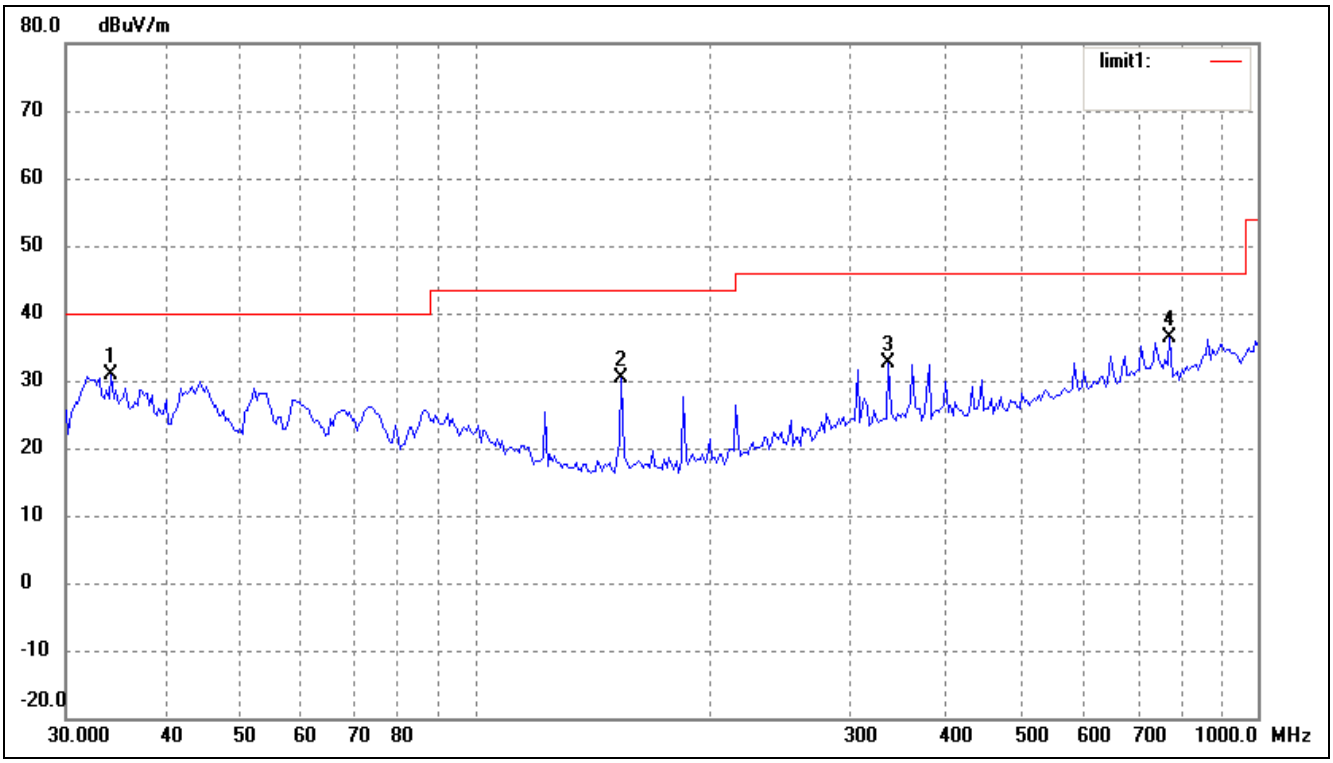
Operating Condition: *802.11g Transmitting High Channel-2462MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.7986	18.90	8.68	27.58	40.00	-12.42	162	100	peak
2	153.7385	36.29	3.59	39.88	43.50	-3.62	200	100	peak
3	307.8313	24.81	10.30	35.11	46.00	-10.89	200	100	peak
4	582.7425	21.33	14.27	35.60	46.00	-10.40	200	100	peak

Test Specification: *Vertical*

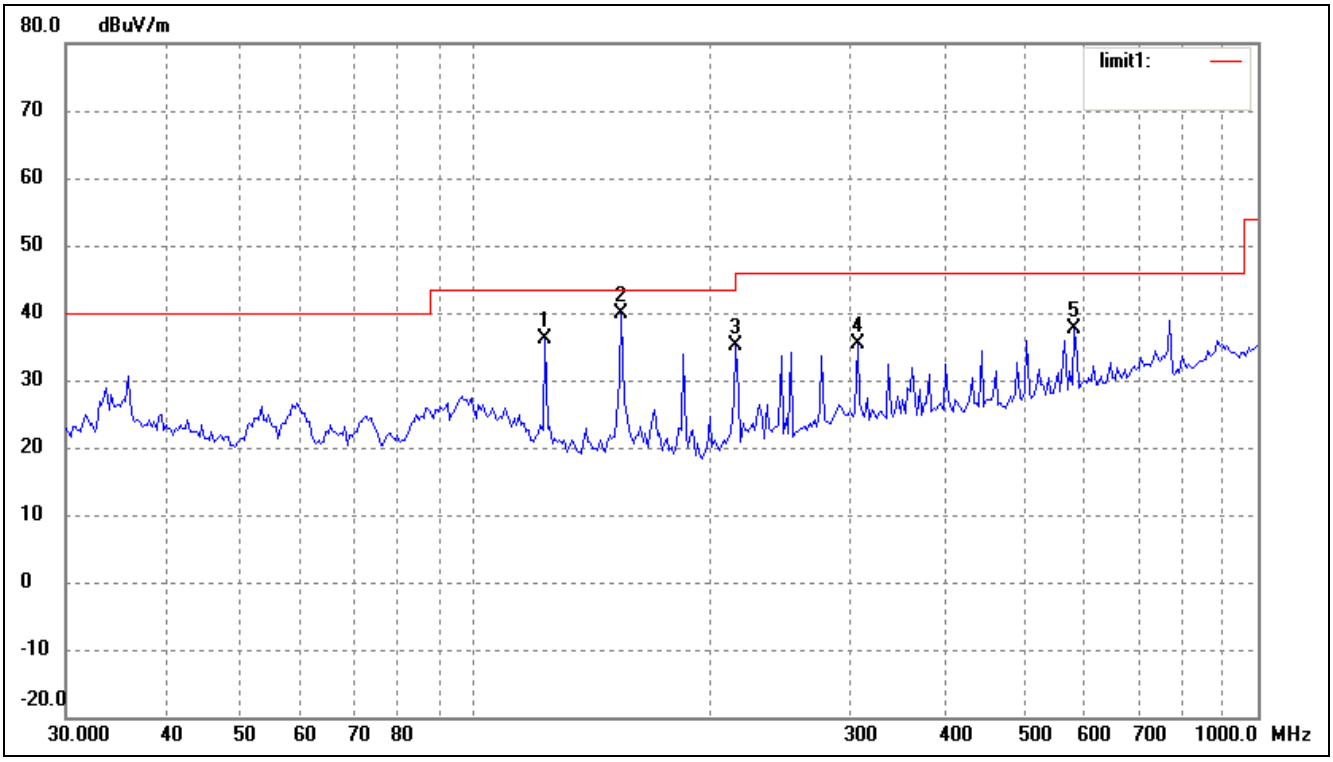


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	34.2760	22.15	8.76	30.91	40.00	-9.09	240	100	peak
2	153.7385	26.78	3.59	30.37	43.50	-13.13	187	100	peak
3	337.2155	22.56	10.14	32.70	46.00	-13.30	220	100	peak
4	771.4486	20.03	16.37	36.40	46.00	-9.60	220	100	peak

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

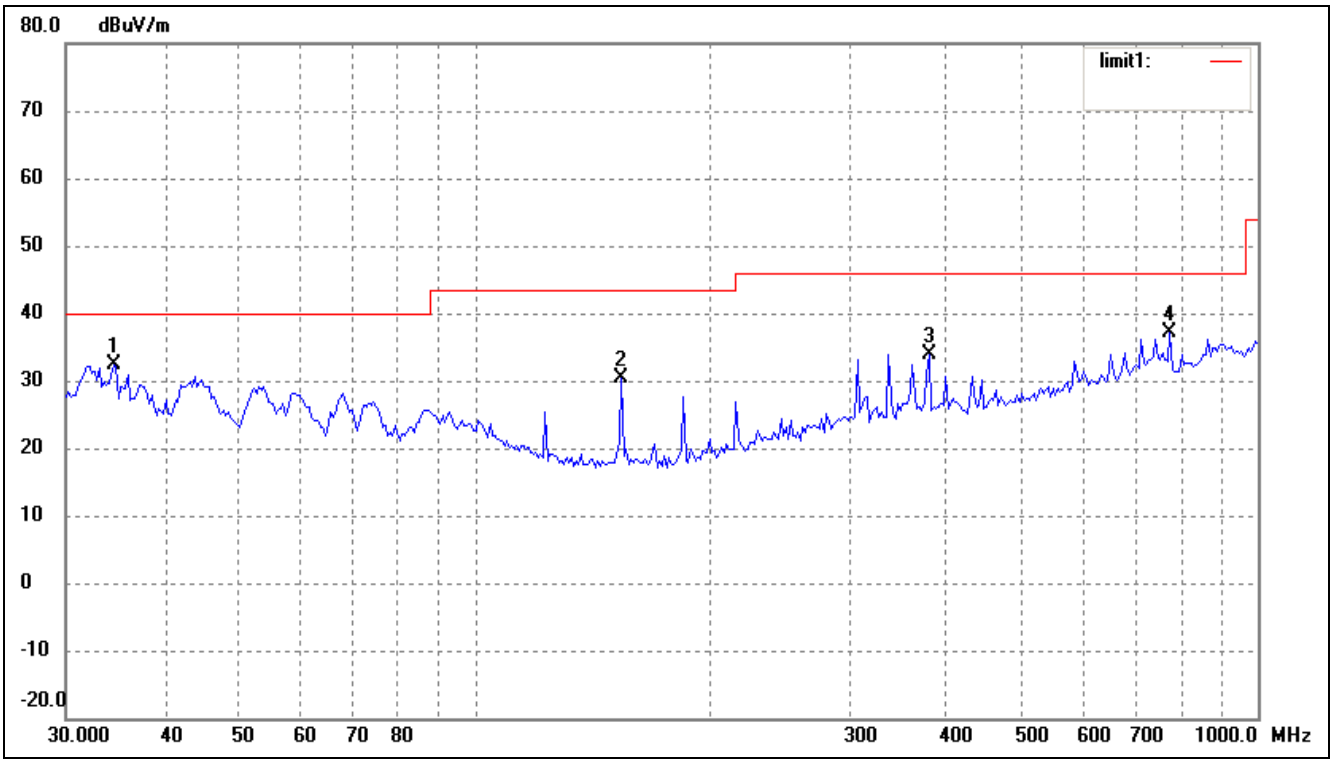
EUT: *WiFi USB Dongle*
Tested Model: *AWUHN2405-2*
Operating Condition: *802.11n-HT20 Transmitting Low Channel-2412MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	122.8340	31.56	4.66	36.22	43.50	-7.28	264	100	peak
2	153.7385	36.36	3.59	39.95	43.50	-3.55	113	200	peak
3	215.2678	29.54	5.62	35.16	43.50	-8.34	287	100	peak
4	307.8313	25.01	10.30	35.31	46.00	-10.69	185	200	peak
5	582.7425	23.42	14.27	37.69	46.00	-8.31	359	200	peak

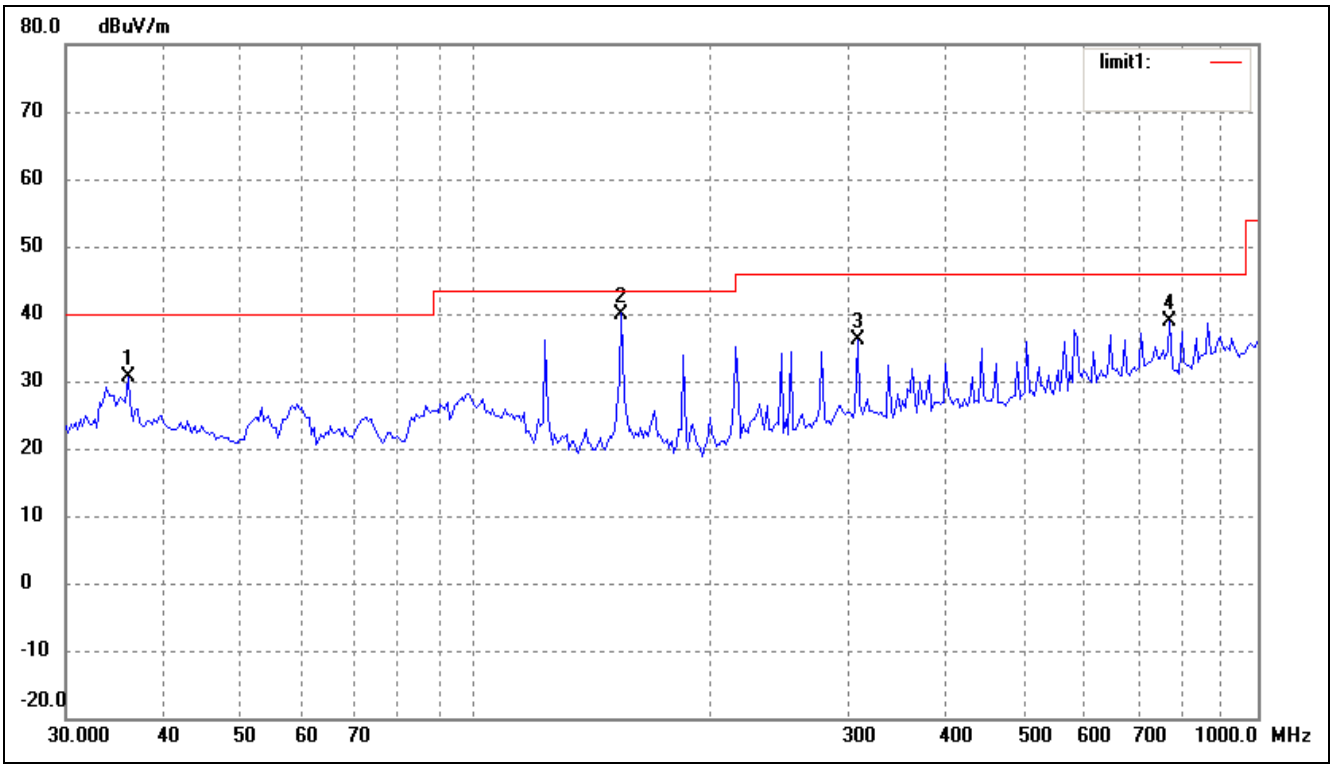
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	34.5173	23.54	8.80	32.34	40.00	-7.66	240	100	peak
2	153.7385	26.78	3.59	30.37	43.50	-13.13	187	100	peak
3	379.9141	23.18	10.62	33.80	46.00	-12.20	220	100	peak
4	771.4486	20.64	16.37	37.01	46.00	-8.99	359	100	peak

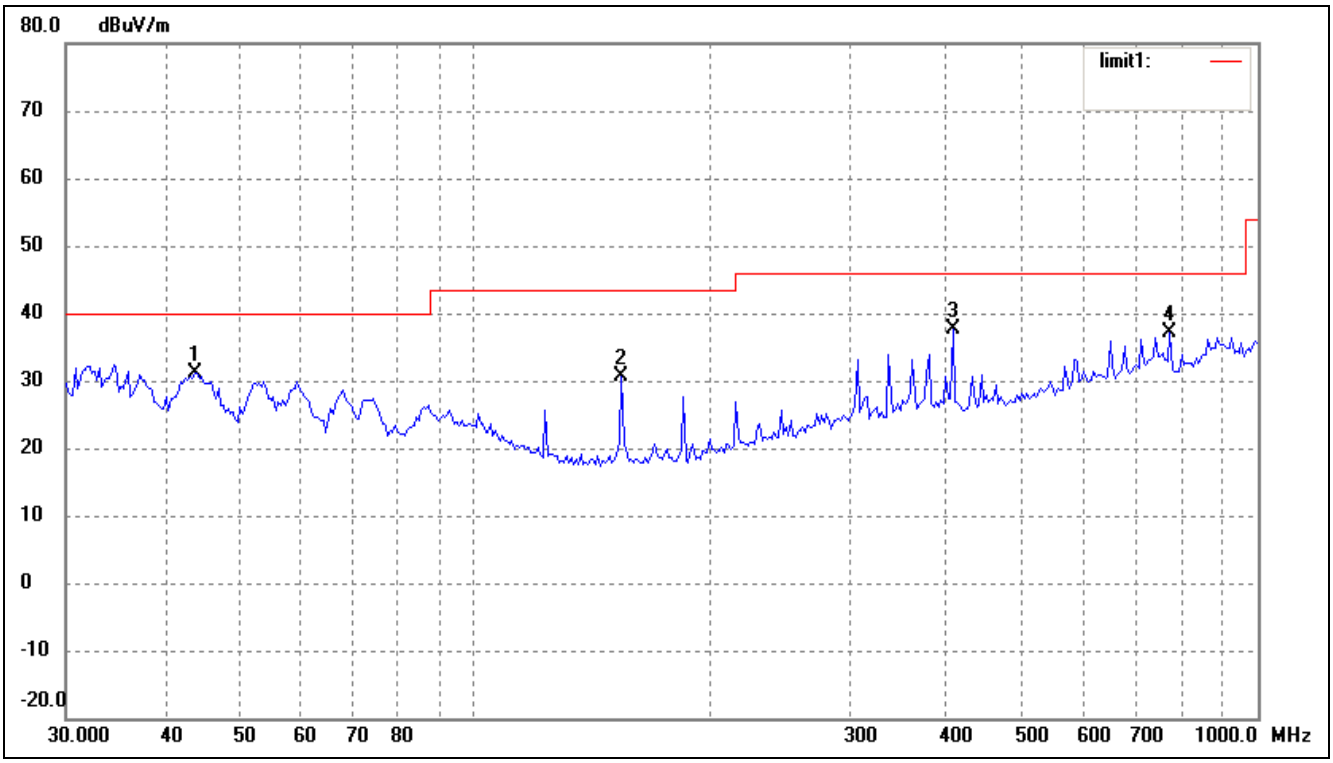
Operating Condition: *802.11n-HT20 Transmitting Middle Channel-2437MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	36.0007	21.66	9.04	30.70	40.00	-9.30	162	100	peak
2	153.7385	36.41	3.59	40.00	43.50	-3.50	200	100	peak
3	307.8313	25.83	10.30	36.13	46.00	-9.87	359	100	peak
4	771.4486	22.60	16.37	38.97	46.00	-7.03	359	100	peak

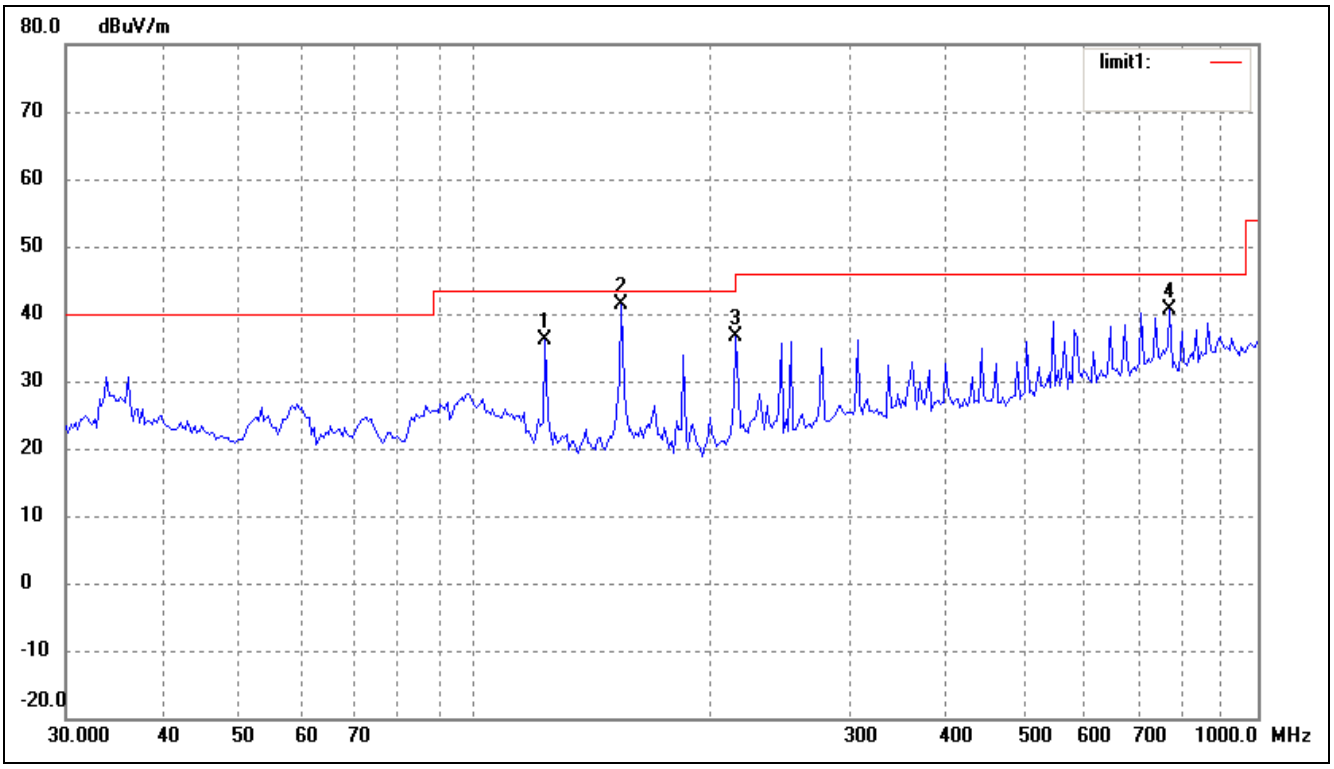
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	43.8119	22.53	8.53	31.06	40.00	-8.94	240	100	peak
2	153.7385	26.96	3.59	30.55	43.50	-12.95	187	100	peak
3	407.5145	26.47	11.22	37.69	46.00	-8.31	220	100	peak
4	771.4486	20.64	16.37	37.01	46.00	-8.99	359	100	peak

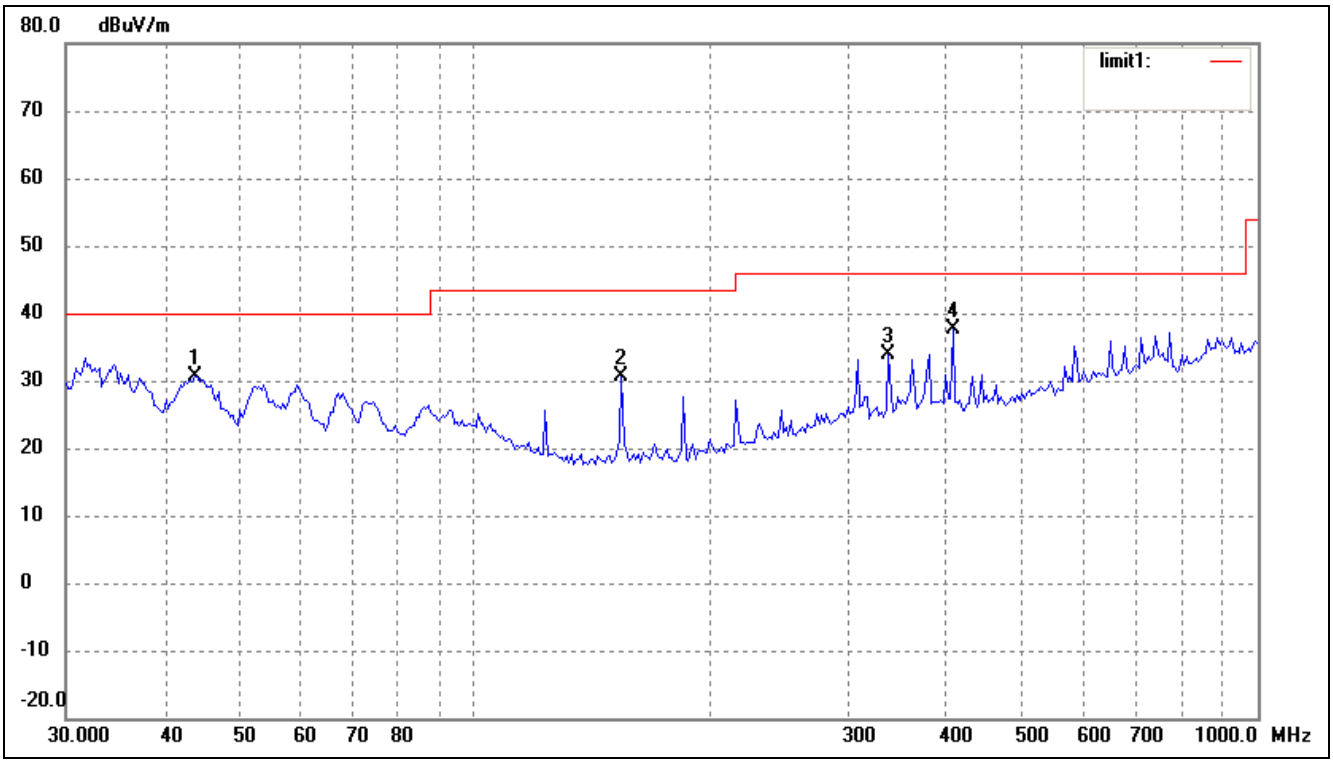
Operating Condition: *802.11n-HT20 Transmitting High Channel-2462MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	122.8340	31.56	4.66	36.22	43.50	-7.28	162	100	peak
2	153.7385	37.68	3.59	41.27	43.50	-2.23	200	100	peak
3	215.2678	30.98	5.62	36.60	43.50	-6.90	200	100	peak
4	771.4486	24.37	16.37	40.74	46.00	-5.26	200	100	peak

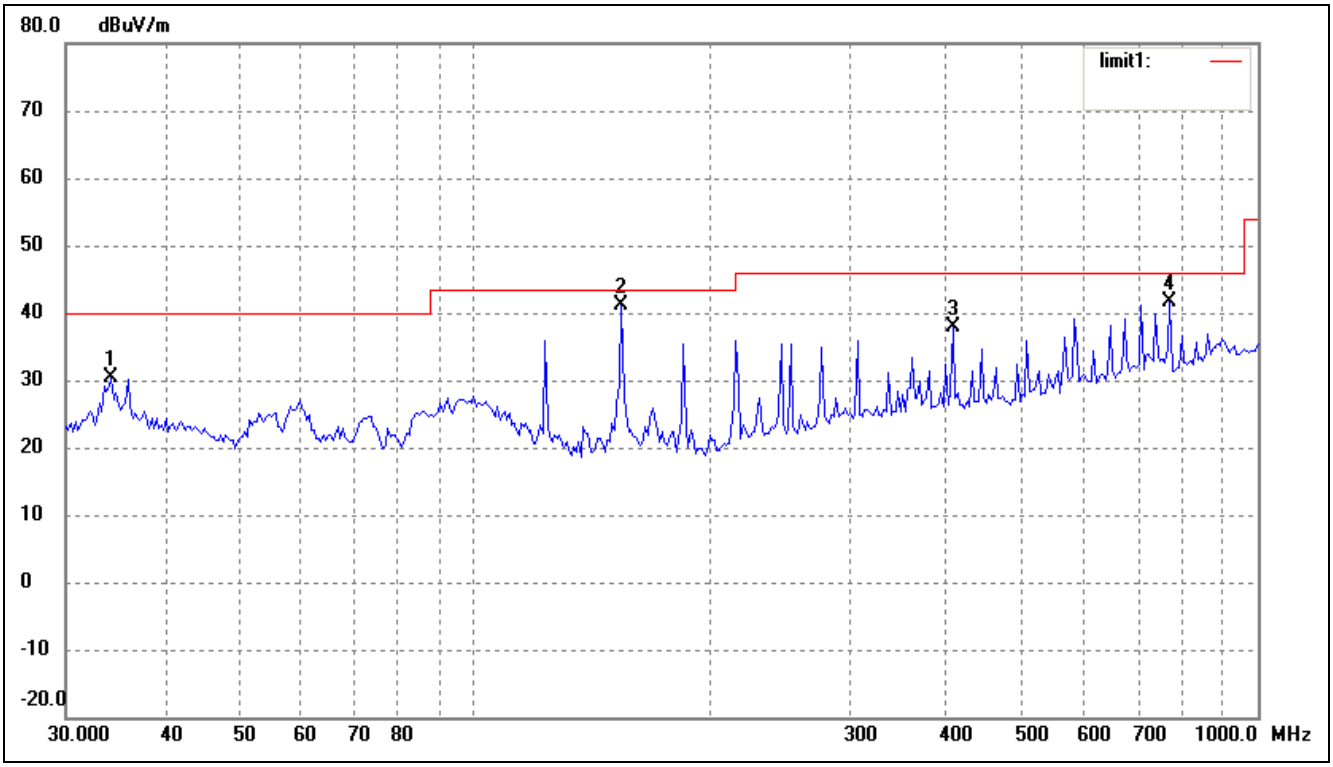
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	43.8119	22.03	8.53	30.56	40.00	-9.44	240	100	peak
2	153.7385	26.96	3.59	30.55	43.50	-12.95	187	100	peak
3	337.2155	23.64	10.14	33.78	46.00	-12.22	220	100	peak
4	407.5145	26.47	11.22	37.69	46.00	-8.31	220	100	peak

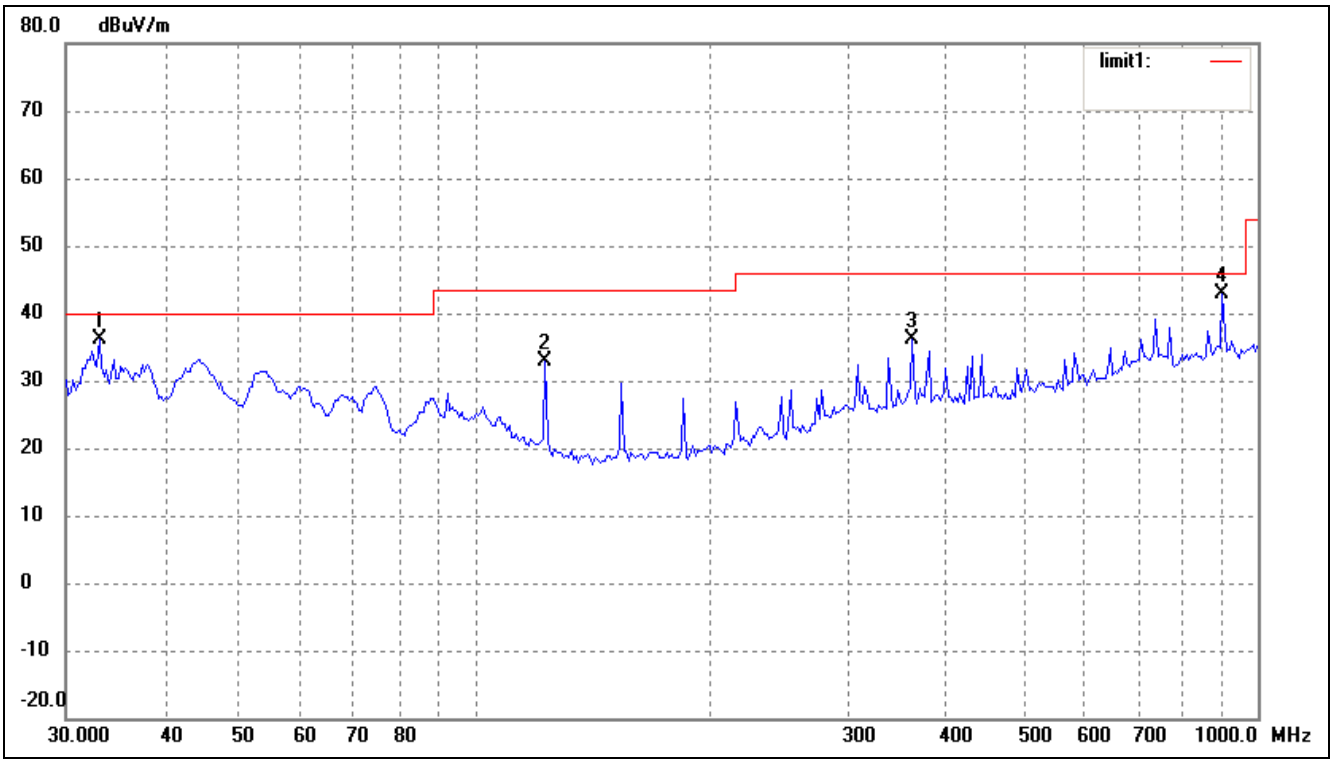
Operating Condition: *802.11n-HT40 Transmitting Low Channel-2412MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	34.2760	21.74	8.76	30.50	40.00	-9.50	162	100	peak
2	153.7385	37.64	3.59	41.23	43.50	-2.27	200	100	peak
3	407.5145	26.56	11.22	37.78	46.00	-8.22	359	100	peak
4	771.4486	25.21	16.37	41.58	46.00	-4.42	359	100	peak

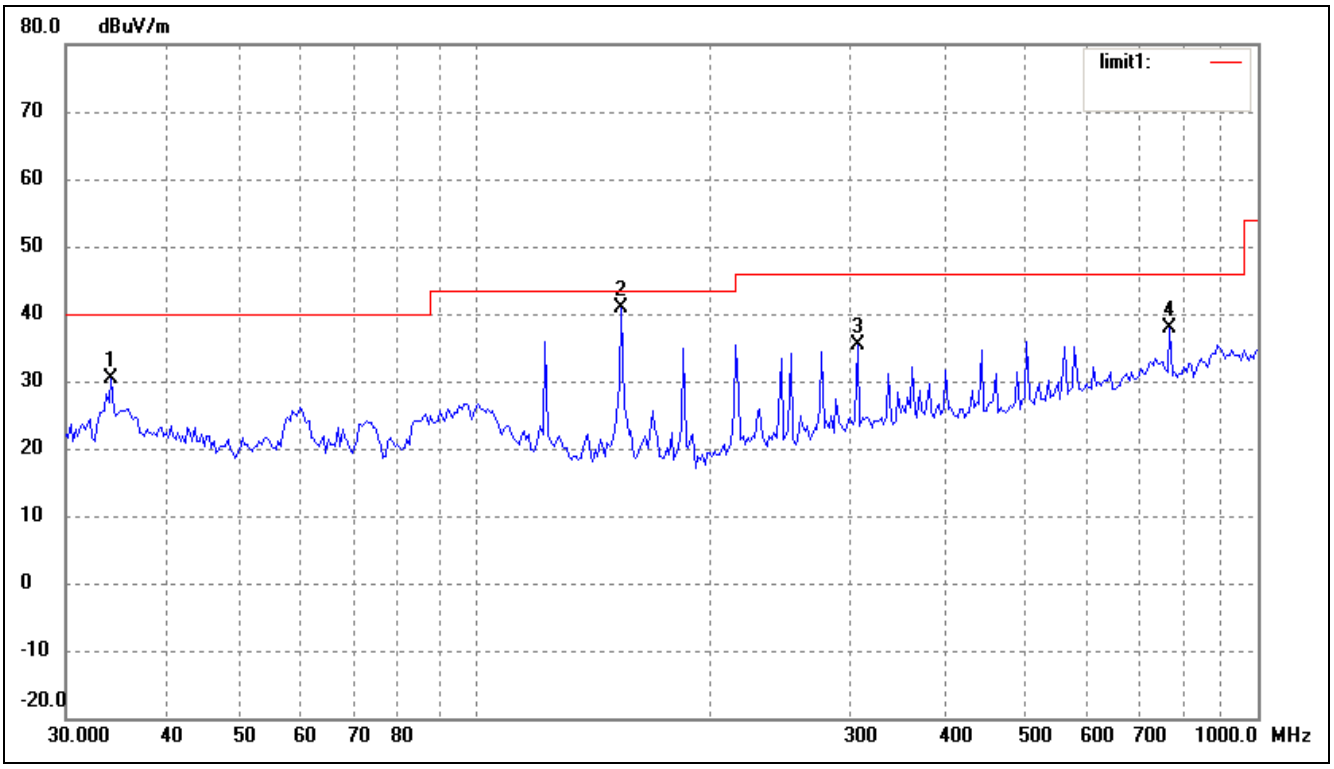
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.0950	27.51	8.56	36.07	40.00	-3.93	240	100	peak
2	122.8340	28.34	4.66	33.00	43.50	-10.50	187	100	peak
3	361.7139	25.32	10.69	36.01	46.00	-9.99	220	100	peak
4	900.1474	23.51	19.38	42.89	46.00	-3.11	359	100	peak

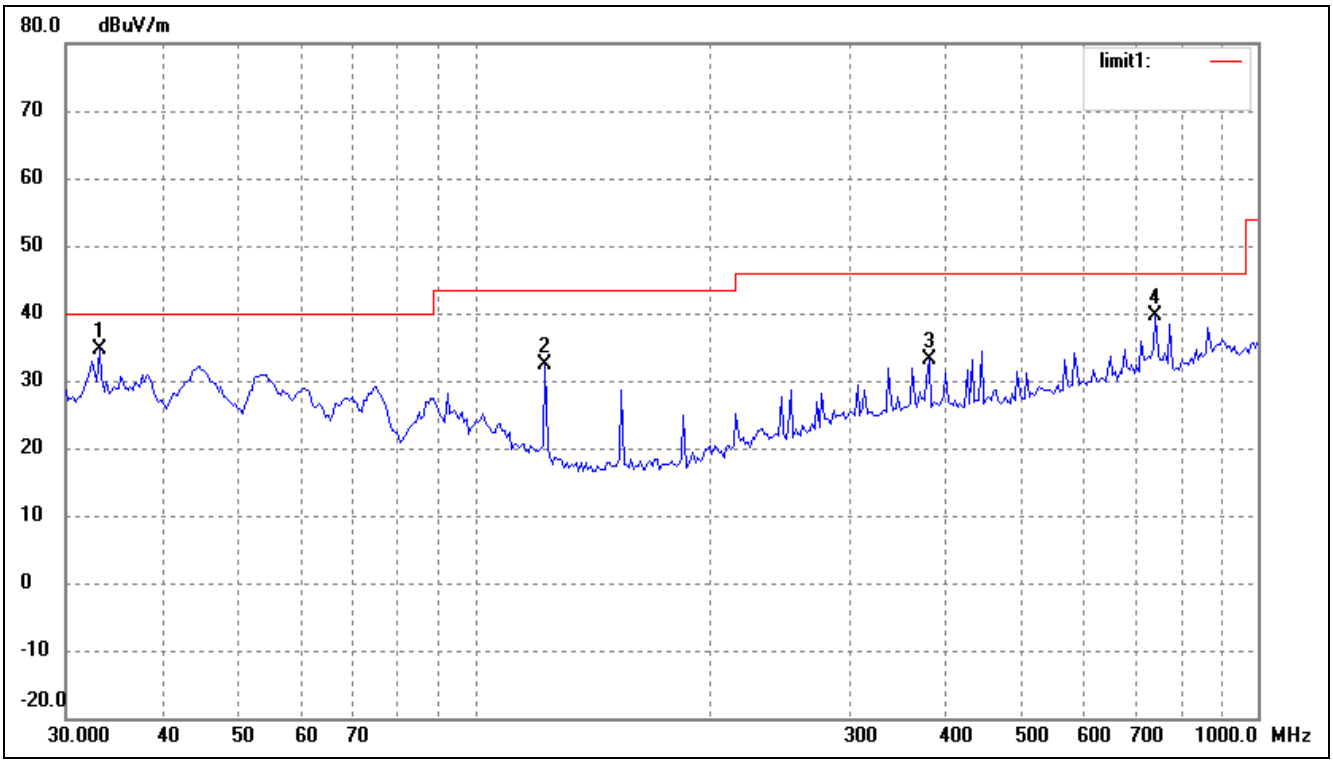
Operating Condition: *802.11n-HT40 Transmitting Middle Channel-2437MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	34.2760	21.74	8.76	30.50	40.00	-9.50	162	100	peak
2	153.7385	37.26	3.59	40.85	43.50	-2.65	200	100	peak
3	307.8313	25.12	10.30	35.42	46.00	-10.58	200	100	peak
4	771.4486	21.42	16.37	37.79	46.00	-8.21	200	100	peak

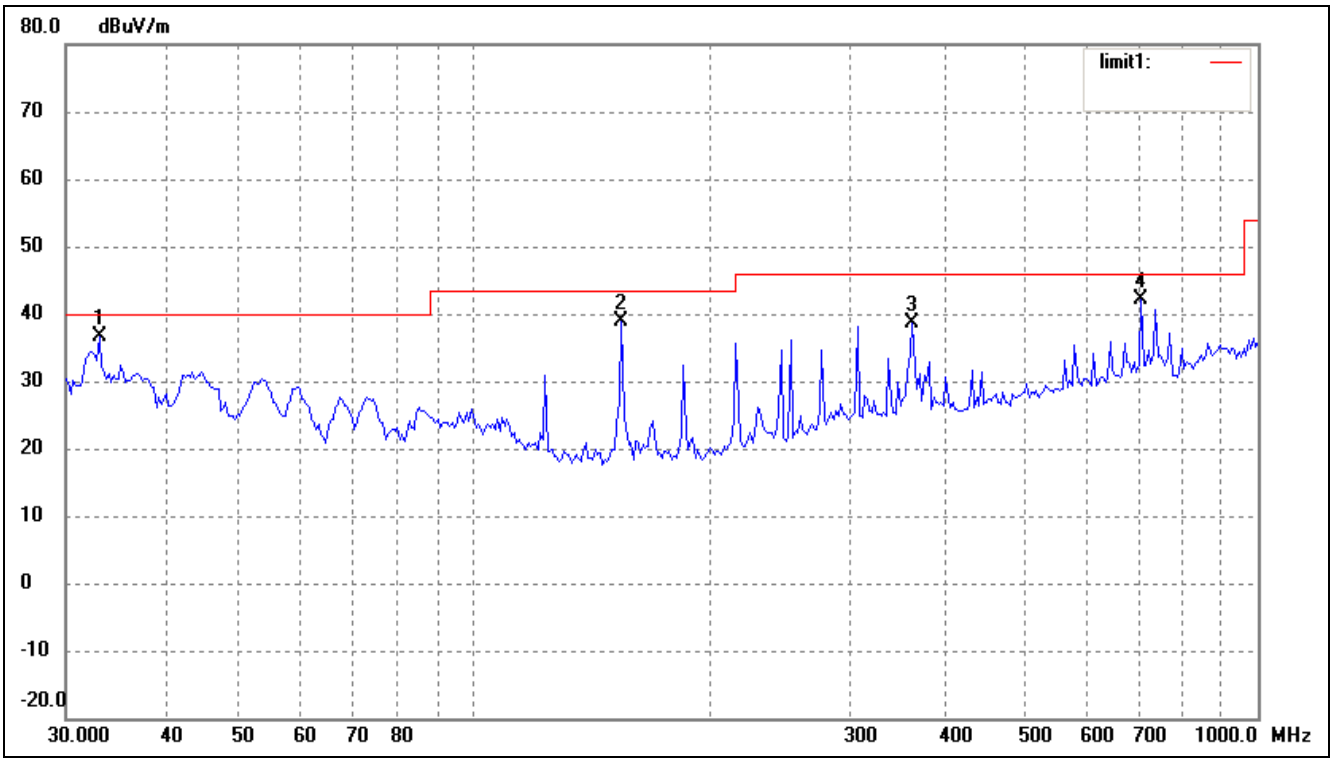
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.0950	26.01	8.56	34.57	40.00	-5.43	240	100	peak
2	122.8340	27.84	4.66	32.50	43.50	-11.00	187	100	peak
3	379.9141	22.58	10.62	33.20	46.00	-12.80	220	100	peak
4	739.6605	21.53	18.07	39.60	46.00	-6.40	220	100	peak

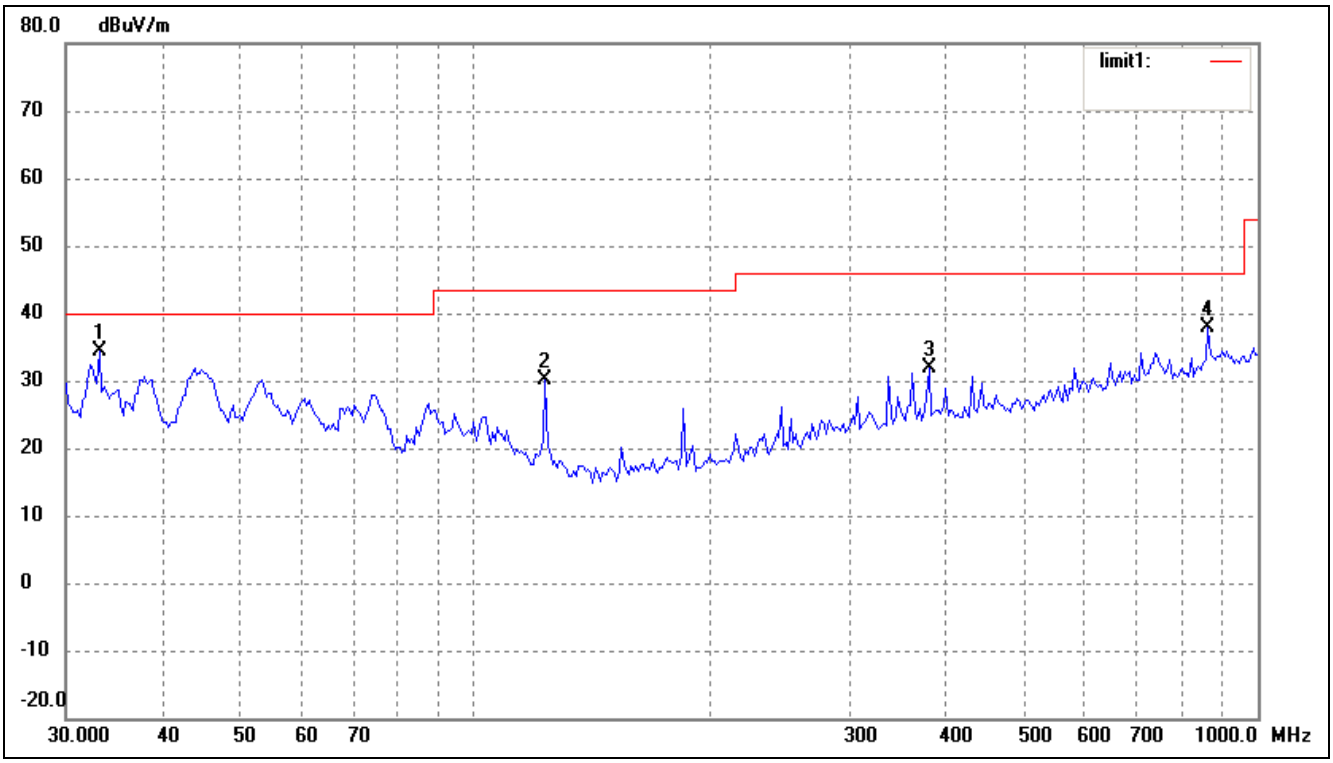
Operating Condition: *802.11n-HT40 Transmitting High Channel-2462MHz*
Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.0950	28.05	8.56	36.61	40.00	-3.39	264	100	peak
2	153.7385	35.26	3.59	38.85	43.50	-4.65	113	200	peak
3	361.7139	27.93	10.69	38.62	46.00	-7.38	287	100	peak
4	709.1823	26.03	16.15	42.18	46.00	-3.82	185	200	peak

Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	33.0950	25.90	8.56	34.46	40.00	-5.54	240	100	peak
2	122.8340	25.41	4.66	30.07	43.50	-13.43	187	100	peak
3	379.9141	21.31	10.62	31.93	46.00	-14.07	220	100	peak
4	863.0562	19.52	18.27	37.79	46.00	-8.21	359	100	peak

Spurious Emissions Above 1GHz

Test Mode: 802.11b

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824	64.61	-3.88	60.73	74.00	-13.27	H	PK
4824	46.11	-3.88	42.23	54.00	-11.77	H	AV
7236	45.79	1.14	46.93	74.00	-27.07	H	PK
7236	34.23	1.14	35.37	54.00	-18.63	H	AV
4824	65.70	-3.88	61.82	74.00	-12.18	V	PK
4824	49.29	-3.88	45.41	54.00	-8.59	V	AV
7236	46.41	1.14	47.55	74.00	-26.45	V	PK
7236	34.74	1.14	35.88	54.00	-18.12	V	AV
Middle Channel-2437MHz							
4874	70.88	-3.74	67.14	74.00	-6.86	H	PK
4874	53.51	-3.74	49.77	54.00	-4.23	H	AV
7311	49.80	1.47	51.27	74.00	-22.73	H	PK
7311	36.57	1.47	38.04	54.00	-15.96	H	AV
4874	68.55	-3.74	64.81	74.00	-9.19	V	PK
4874	51.74	-3.74	48.00	54.00	-6.00	V	AV
7311	50.17	1.47	51.64	74.00	-22.36	V	PK
7311	37.09	1.47	38.56	54.00	-15.44	V	AV
High Channel-2462MHz							
4924	67.32	-3.59	63.73	74.00	-10.27	H	PK
4924	50.88	-3.59	47.29	54.00	-6.71	H	AV
7386	49.07	1.79	50.86	74.00	-23.14	H	PK
7386	36.16	1.79	37.95	54.00	-16.05	H	AV
4924	65.79	-3.59	62.20	74.00	-11.80	V	PK
4924	50.49	-3.59	46.90	54.00	-7.10	V	AV
7386	52.19	1.79	53.98	74.00	-20.02	V	PK
7386	37.56	1.79	39.35	54.00	-14.65	V	AV

Test Mode: 802.11g

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824	50.34	-3.88	46.46	74.00	-27.54	H	PK
4824	35.88	-3.88	32.00	54.00	-22.00	H	AV
7236	44.95	1.14	46.09	74.00	-27.91	H	PK
7236	32.58	1.14	33.72	54.00	-20.28	H	AV
4824	51.23	-3.88	47.35	74.00	-26.65	V	PK
4824	37.23	-3.88	33.35	54.00	-20.65	V	AV
7236	44.61	1.14	45.75	74.00	-28.25	V	PK
7236	32.57	1.14	33.71	54.00	-20.29	V	AV
Middle Channel-2437MHz							
4874	59.15	-3.74	55.41	74.00	-18.59	H	PK
4874	43.69	-3.74	39.95	54.00	-14.05	H	AV
7311	46.38	1.47	47.85	74.00	-26.15	H	PK
7311	33.80	1.47	35.27	54.00	-18.73	H	AV
4874	55.07	-3.74	51.33	74.00	-22.67	V	PK
4874	39.35	-3.74	35.61	54.00	-18.39	V	AV
7311	45.16	1.47	46.63	74.00	-27.37	V	PK
7311	33.88	1.47	35.35	54.00	-18.65	V	AV
High Channel-2462MHz							
4924	58.82	-3.59	55.23	74.00	-18.77	H	PK
4924	41.85	-3.59	38.26	54.00	-15.74	H	AV
7386	47.84	1.79	49.63	74.00	-24.37	H	PK
7386	34.50	1.79	36.29	54.00	-17.71	H	AV
4924	57.19	-3.59	53.60	74.00	-20.40	V	PK
4924	41.89	-3.59	38.30	54.00	-15.70	V	AV
7386	45.39	1.79	47.18	74.00	-26.82	V	PK
7386	33.21	1.79	35.00	54.00	-19.00	V	AV

Test Mode: 802.11n-HT20

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824	47.98	-3.88	44.10	74.00	-29.90	H	PK
4824	35.92	-3.88	32.04	54.00	-21.96	H	AV
7236	44.44	1.14	45.58	74.00	-28.42	H	PK
7236	32.31	1.14	33.55	54.00	-20.45	H	AV
4824	48.54	-3.88	44.66	74.00	-29.34	V	PK
4824	35.24	-3.88	31.36	54.00	-22.64	V	AV
7236	44.90	1.14	46.04	74.00	-27.96	V	PK
7236	32.44	1.14	33.58	54.00	-20.42	V	AV
Middle Channel-2437MHz							
4874	52.77	-3.74	49.03	74.00	-24.97	H	PK
4874	40.03	-3.74	36.29	54.00	-17.71	H	AV
7311	46.33	1.47	47.80	74.00	-26.20	H	PK
7311	33.64	1.47	35.11	54.00	-18.89	H	AV
4874	50.69	-3.74	46.95	74.00	-27.05	V	PK
4874	38.20	-3.74	34.46	54.00	-19.54	V	AV
7311	45.46	1.47	46.93	74.00	-27.07	V	PK
7311	33.54	1.47	35.01	54.00	-18.99	V	AV
High Channel-2462MHz							
4924	52.87	-3.59	49.28	74.00	-24.72	H	PK
4924	37.31	-3.59	33.72	54.00	-20.28	H	AV
7386	45.08	1.79	46.87	74.00	-27.13	H	PK
7386	33.09	1.79	34.88	54.00	-19.12	H	AV
4924	54.09	-3.59	50.50	74.00	-23.50	V	PK
4924	36.12	-3.59	32.53	54.00	-21.47	V	AV
7386	45.10	1.79	46.89	74.00	-27.11	V	PK
7386	33.10	1.79	34.89	54.00	-19.11	V	AV

Test Mode: 802.11n-HT40

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2422MHz							
4844	68.49	-3.86	64.63	74	-9.37	H	PK
4844	50.38	-3.86	46.52	54	-7.48	H	AV
7266	61.25	1.10	62.35	74	-11.65	H	PK
7266	43.25	1.10	44.35	54	-9.65	H	AV
4844	63.57	-3.86	59.71	74	-14.29	V	PK
4844	49.14	-3.86	45.28	54	-8.72	V	AV
7266	54.87	1.10	55.97	74	-18.03	V	PK
7266	39.98	1.10	41.08	54	-12.92	V	AV
Middle Channel-2437MHz							
4874	64.06	-3.74	60.32	74	-13.68	H	PK
4874	46.39	-3.74	42.65	54	-11.35	H	AV
7311	62.85	1.47	64.32	74	-9.68	H	PK
7311	45.05	1.47	46.52	54	-7.48	H	AV
4874	61.29	-3.74	57.55	74	-16.45	V	PK
4874	46.02	-3.74	42.28	54	-11.72	V	AV
7311	55.30	1.47	56.77	74	-17.23	V	PK
7311	40.61	1.47	42.08	54	-11.92	V	AV
High Channel-2452MHz							
4904	65.13	-3.59	61.54	74	-12.46	H	PK
4904	43.93	-3.59	40.34	54	-13.66	H	AV
7356	63.96	1.79	65.75	74	-8.25	H	PK
7356	44.91	1.79	46.70	54	-7.30	H	AV
4904	62.41	-3.59	58.82	74	-15.18	V	PK
4904	47.43	-3.59	43.84	54	-10.16	V	AV
7356	55.98	1.79	57.77	74	-16.23	V	PK
7356	42.51	1.79	44.30	54	-9.70	V	AV

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

8. Out of Band Emissions

8.1 Standard Applicable

According to §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

8.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2013-05-07	2014-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2013-05-07	2014-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2013-05-07	2014-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2013-05-07	2014-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2013-04-20	2014-04-19
Horn Antenna	ETS	3117	00086197	2013-04-20	2014-04-19

8.3 Test Procedure

According to the KDB 558074, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)
RBW = 1MHz, VBW = 1MHz for peak value measured
RBW = 1MHz, VBW = 10Hz for average value measured
Sweep = auto; Detector function = peak/average; Trace = max hold

All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

According to the KDB 558074 D01 V02, the conducted spurious emissions test method as follows:

1. Set start frequency to DTS channel edge frequency.
2. Set stop frequency so as to encompass the spectrum to be examined.
3. Set RBW = 100 kHz.
4. Set VBW ≥ 300 kHz.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
9. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

8.4 Environmental Conditions

Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

8.5 Summary of Test Results/Plots

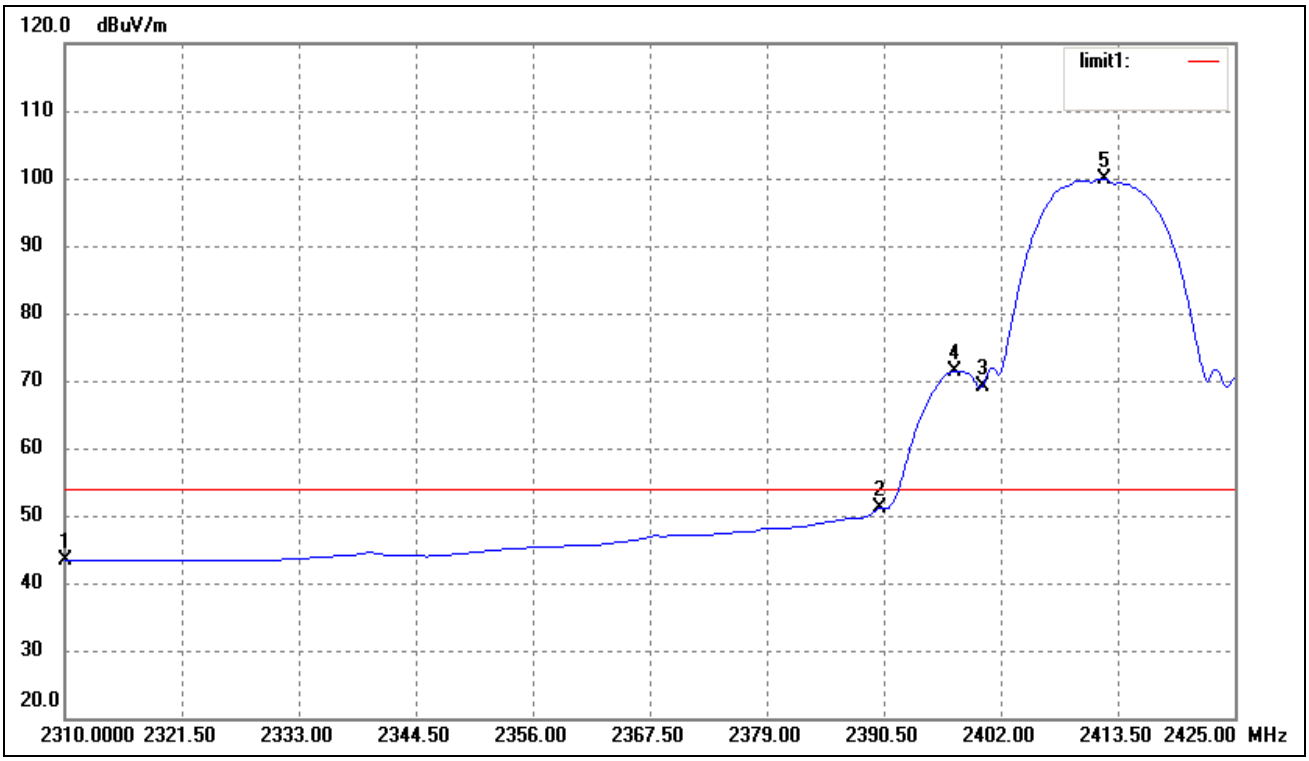
Test Mode	Test Frequency MHz	Limit dBuV / dBc	Result
802.11b	2310.000	<54 dBuV	Pass
	2390.000	<54 dBuV	Pass
	2397.400	>20 dBc	Pass
	2400.000	> 20 dBc	Pass
	2483.500	<54 dBuV	Pass
	2500.000	<54 dBuV	Pass
802.11g	2310.000	<54 dBuV	Pass
	2390.000	<54 dBuV	Pass
	2400.000	>20 dBc	Pass
	2483.500	<54 dBuV	Pass
	2500.000	<54 dBuV	Pass
802.11n-HT20	2310.000	<54 dBuV	Pass
	2390.000	<54 dBuV	Pass
	2400.000	>20 dBc	Pass
	2483.500	<54 dBuV	Pass
	2500.000	<54 dBuV	Pass
802.11n-HT40	2310.000	<54 dBuV	Pass
	2390.000	<54 dBuV	Pass
	2400.000	>20 dBc	Pass
	2483.500	<54 dBuV	Pass
	2500.000	<54 dBuV	Pass

The edge emissions are below the FCC 15.209 Limits or complies with the 15.247(d) requirements.

Please refer to the test plots as below.

802.11b-Lowest Bandedge

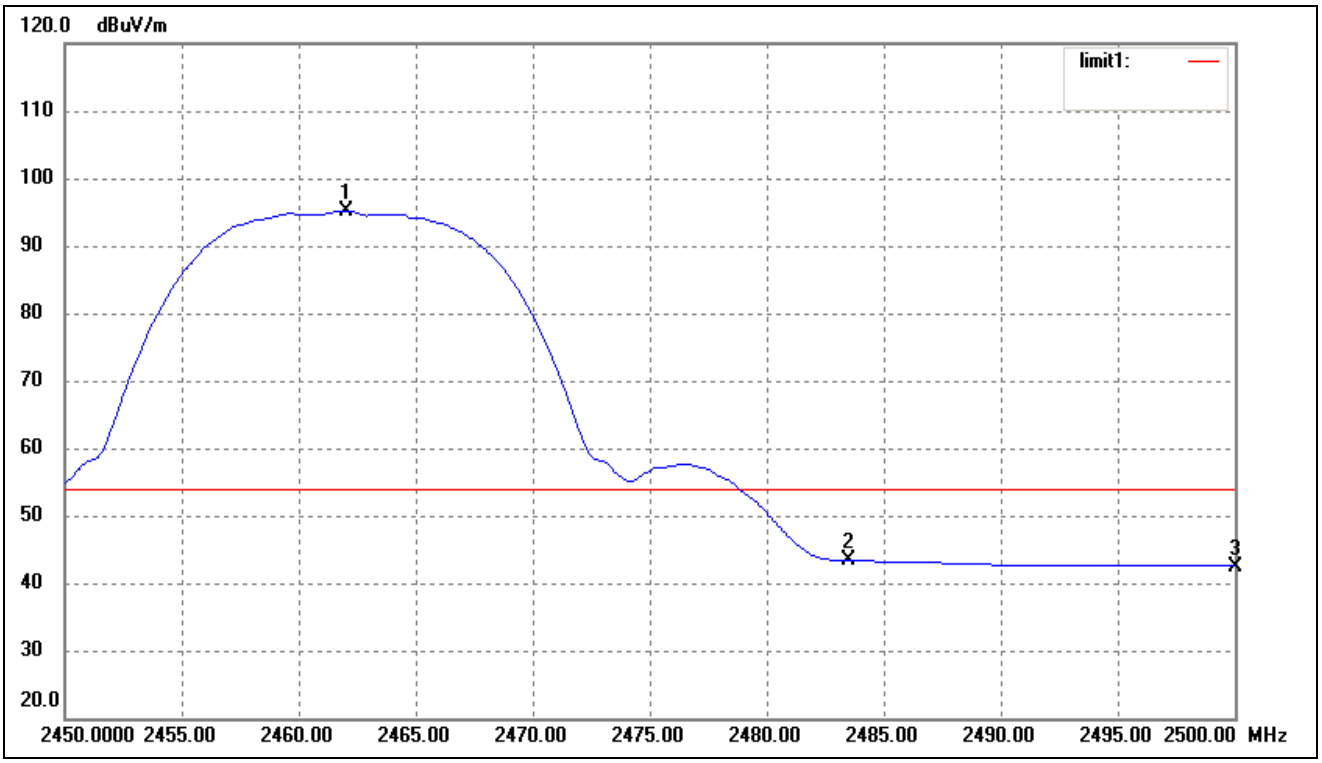
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	50.37	-7.07	43.30	54.00	-10.70	Average Detector
	2310.000	27.90	36.35	64.25	74.00	-9.75	Peak Detector
2	2390.000	57.96	-6.92	51.04	54.00	-2.96	Average Detector
	2390.000	33.58	36.54	70.12	74.00	-3.88	Peak Detector
3	2400.000	76.02	-6.89	69.13	Delta = 30.81 dBc		Average Detector
4	2397.400	78.32	-6.89	71.43	Delta = 28.51 dBc		Average Detector
5	2412.120	106.80	-6.86	99.94	/		Average Detector

802.11b-Highest Bandedge

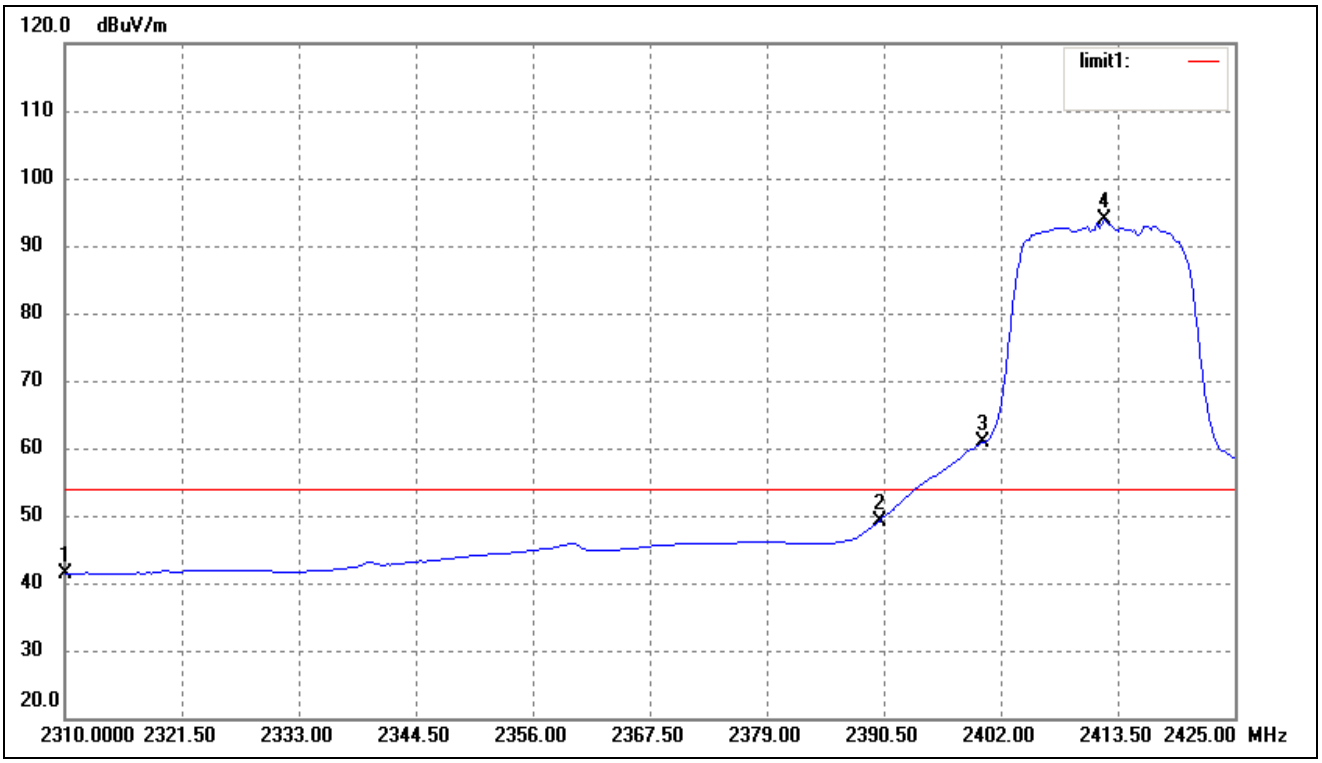
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2462.206	101.94	-6.76	95.18	/	/	Average Detector
	2462.206	111.16	-6.76	104.40	/	/	Peak Detector
2	2483.500	Delta = 59.49dBc		35.69	54.00	-18.31	Average Detector
	2483.500			44.91	74.00	-29.09	Peak Detector
3	2500.000	49.18	-6.68	42.50	54.00	-11.50	Average Detector
	2500.000	62.21	-6.68	55.53	74.00	-18.47	Peak Detector

802.11g-Lowest Bandedge

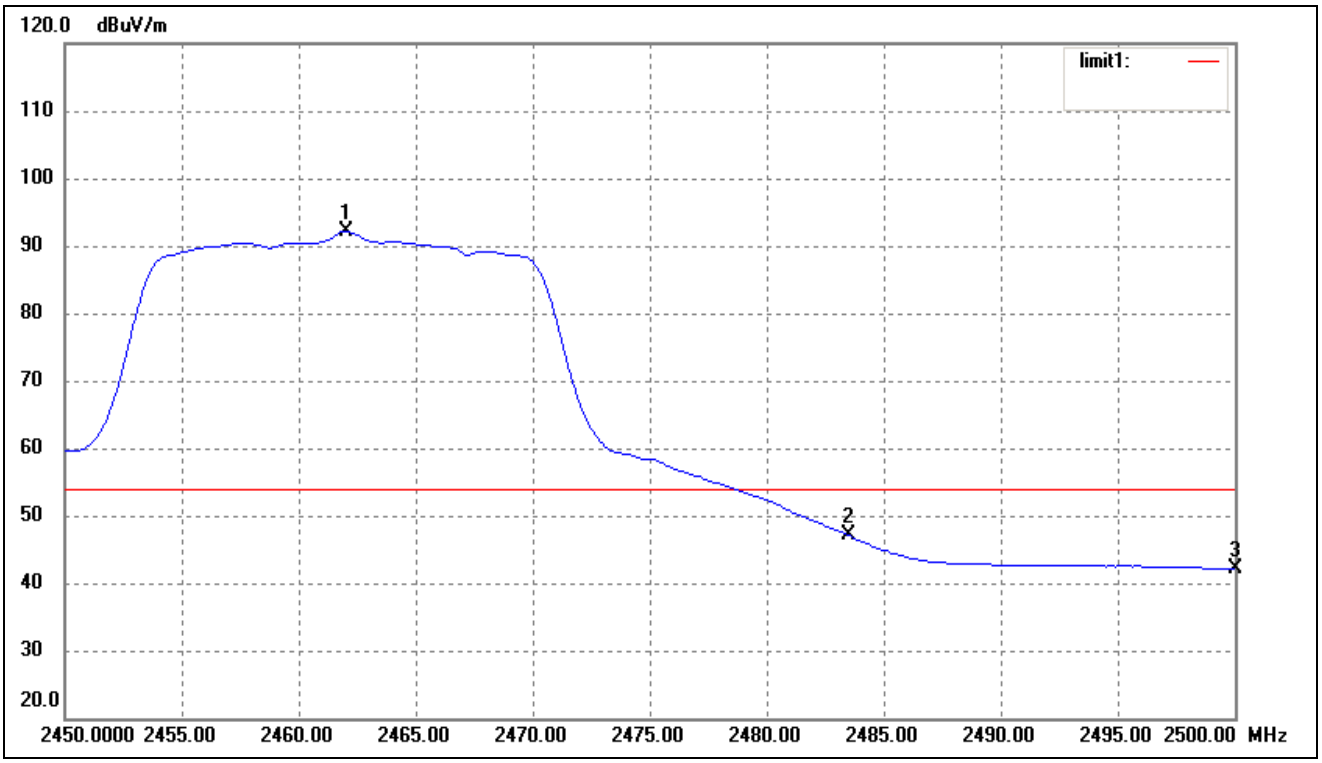
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	48.45	-7.07	41.38	54.00	-12.62	Average Detector
	2310.000	60.48	-7.07	53.41	74.00	-20.59	Peak Detector
2	2390.000	56.12	-6.92	49.20	54.00	-4.80	Average Detector
	2390.000	68.94	-6.92	62.02	74.00	-11.98	Peak Detector
3	2400.000	67.74	-6.89	60.85	Delta = 32.96dBc		Average Detector
4	2412.120	100.67	-6.86	93.81			Average Detector

802.11g-Highest Bandedge

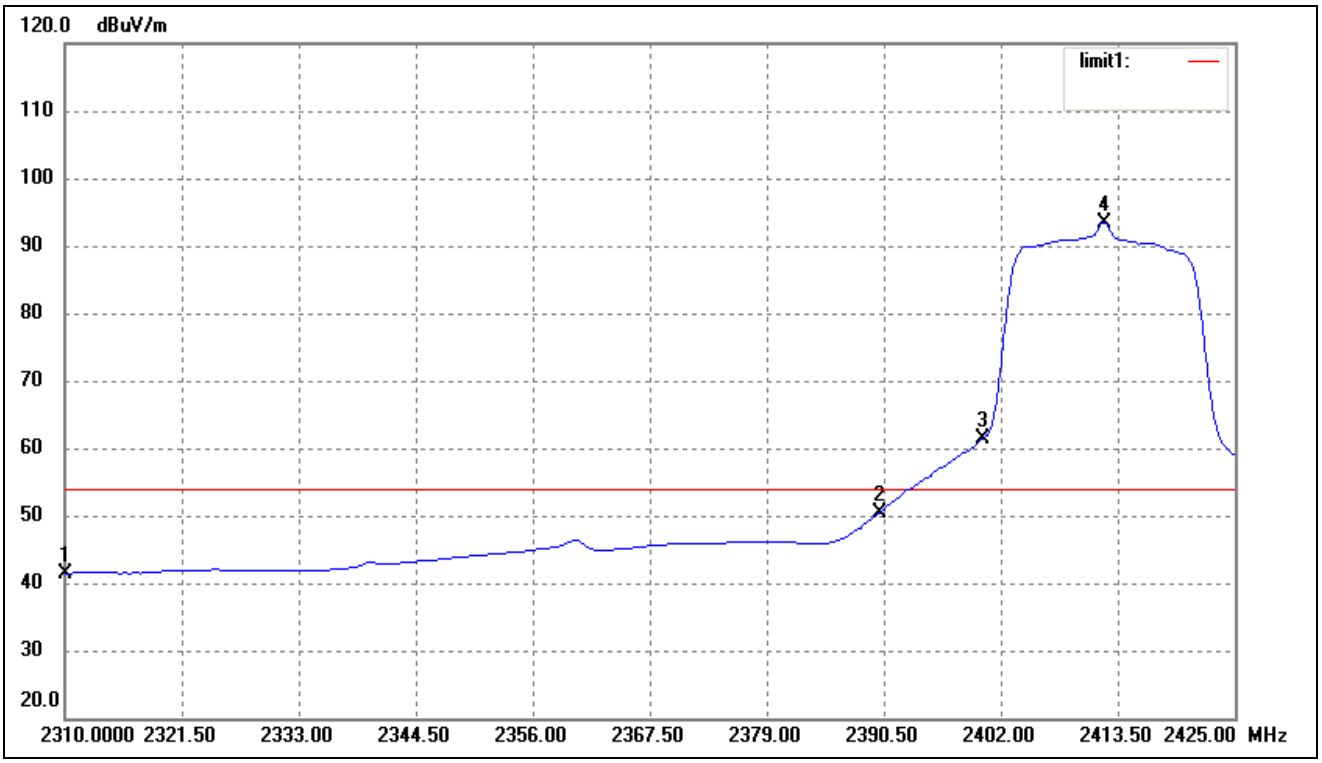
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2462.000	98.86	-6.76	92.10	/	/	Average Detector
	2462.000	109.47	-6.76	102.71	/	/	Peak Detector
2	2483.500	Delta = 57.61dBc		34.49	54.00	-19.51	Average Detector
	2483.500			45.10	74.00	-28.90	Peak Detector
3	2500.000	48.85	-6.68	42.17	54.00	-11.83	Average Detector
	2500.000	61.99	-6.68	55.31	74.00	-18.69	Peak Detector

802.11n-HT20-Lowest Bandedge

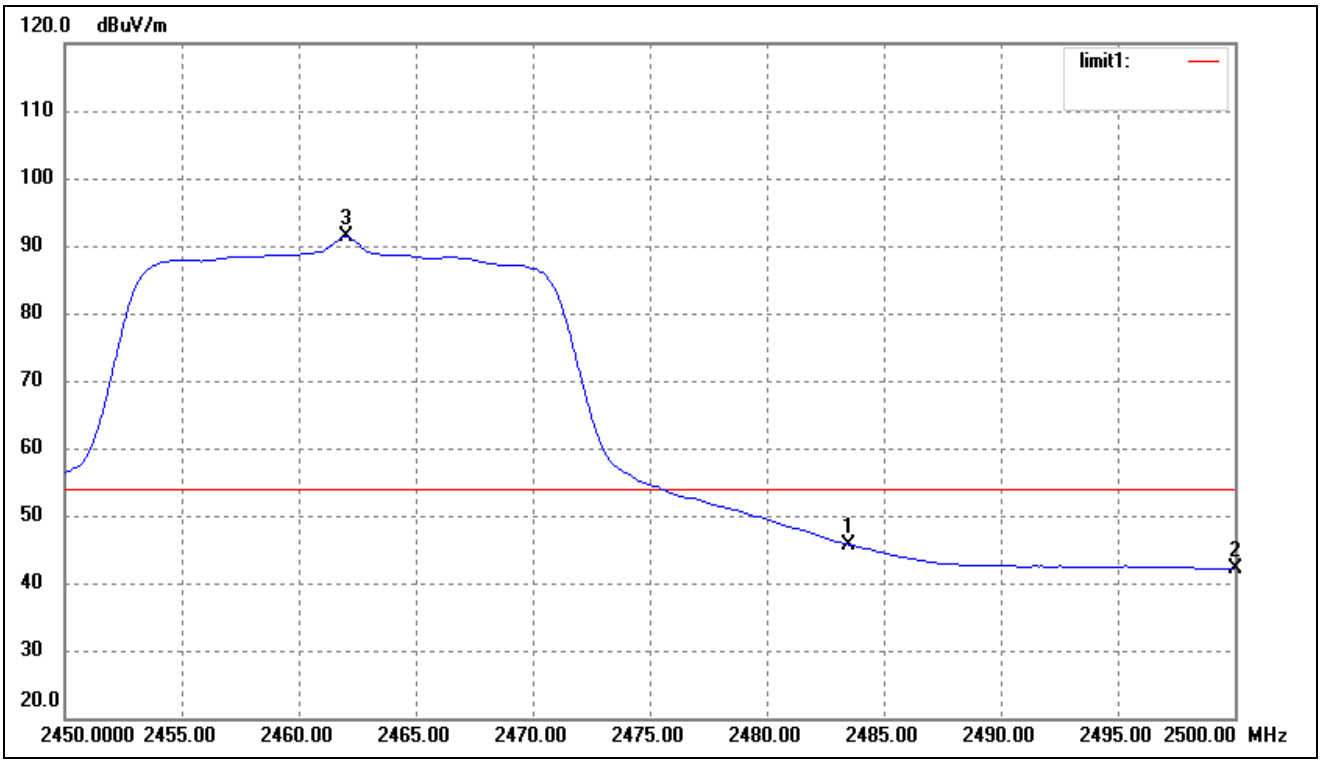
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	48.51	-7.07	41.44	54.00	-12.56	Average Detector
	2310.000	62.23	-7.07	55.16	74.00	-18.84	Peak Detector
2	2390.000	57.37	-6.92	50.45	54.00	-3.55	Average Detector
	2390.000	77.09	-6.92	70.17	74.00	-3.83	Peak Detector
3	2400.000	68.28	-6.89	61.39	Delta = 32.01dBc		Average Detector
4	2412.120	100.26	-6.86	93.40			Average Detector

802.11n-HT20-Highest Bandedge

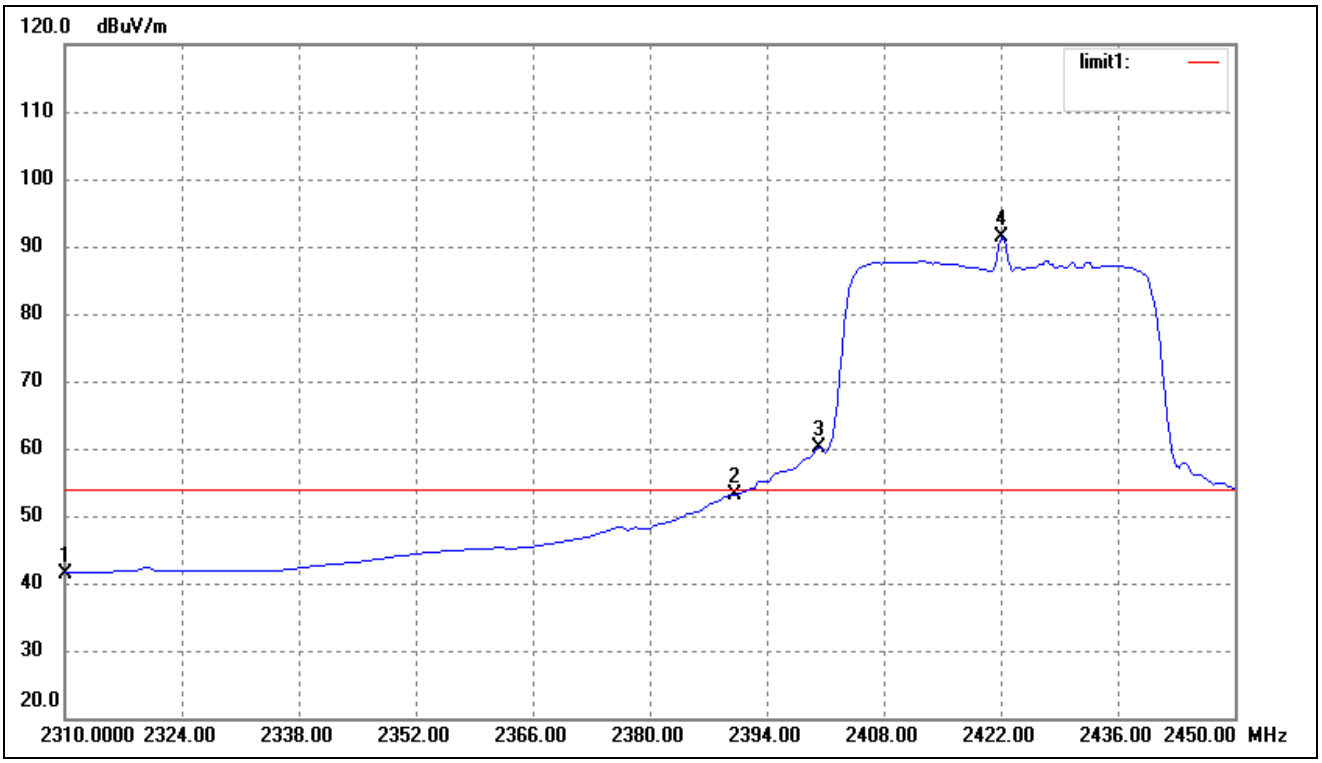
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
3	2462.000	98.06	-6.76	91.30	/	/	Average Detector
	2462.000	108.61	-6.76	101.85	/	/	Peak Detector
1	2483.500	Delta = 59.57dBc		31.37	54.00	-22.27	Average Detector
	2483.500			42.28	74.00	-31.72	Peak Detector
2	2500.000	48.82	-6.68	42.14	54.00	-11.86	Average Detector
	2500.000	62.10	-6.68	55.42	74.00	-18.58	Peak Detector

802.11n-HT40-Lowest Bandedge

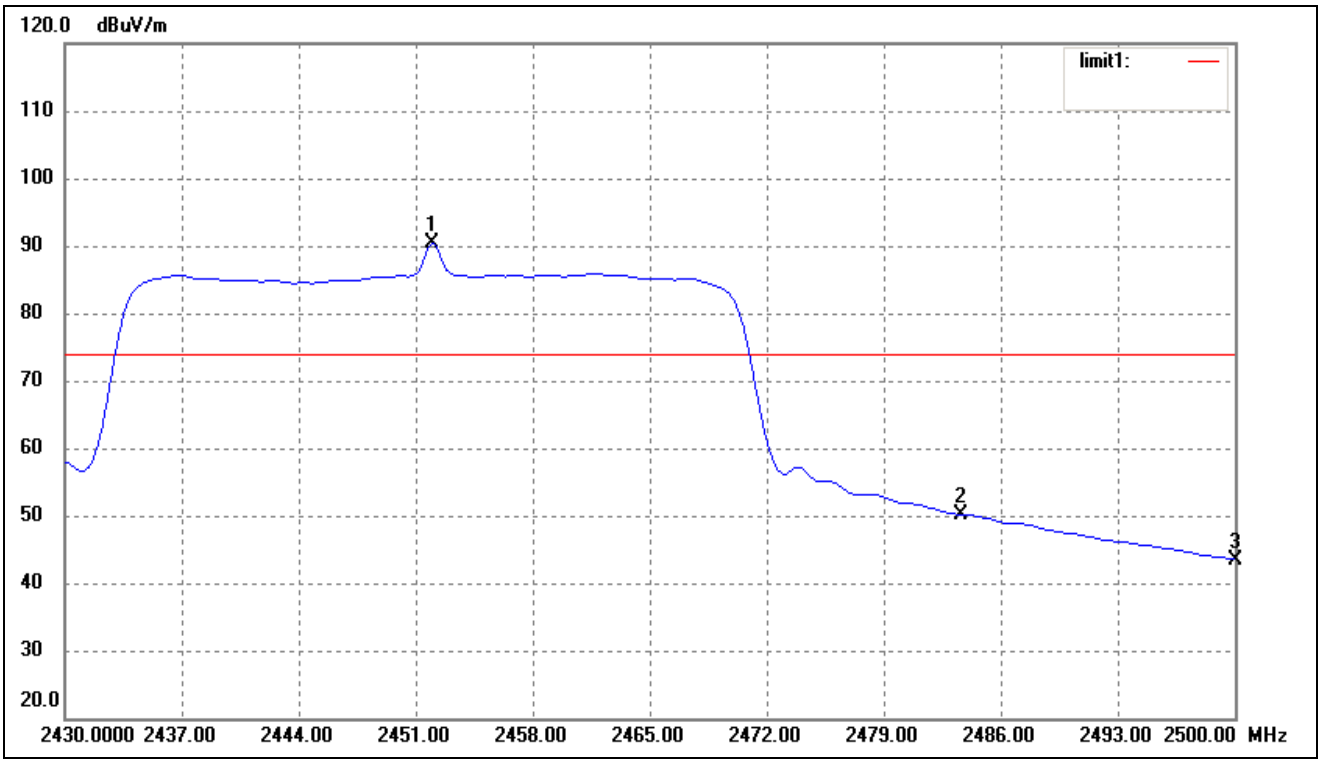
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	48.57	-7.07	41.50	54.00	-12.50	Average Detector
	2310.000	61.16	-7.07	54.09	74.00	-19.91	Peak Detector
2	2390.000	60.09	-6.92	53.17	54.00	-0.83	Average Detector
	2390.000	75.91	-6.92	68.99	74.00	-5.01	Peak Detector
3	2400.000	66.92	-6.89	60.03	Delta = 31.32dBc		Average Detector
4	2422.000	98.19	-6.84	91.35			Average Detector

802.11n-HT40-Highest Bandedge

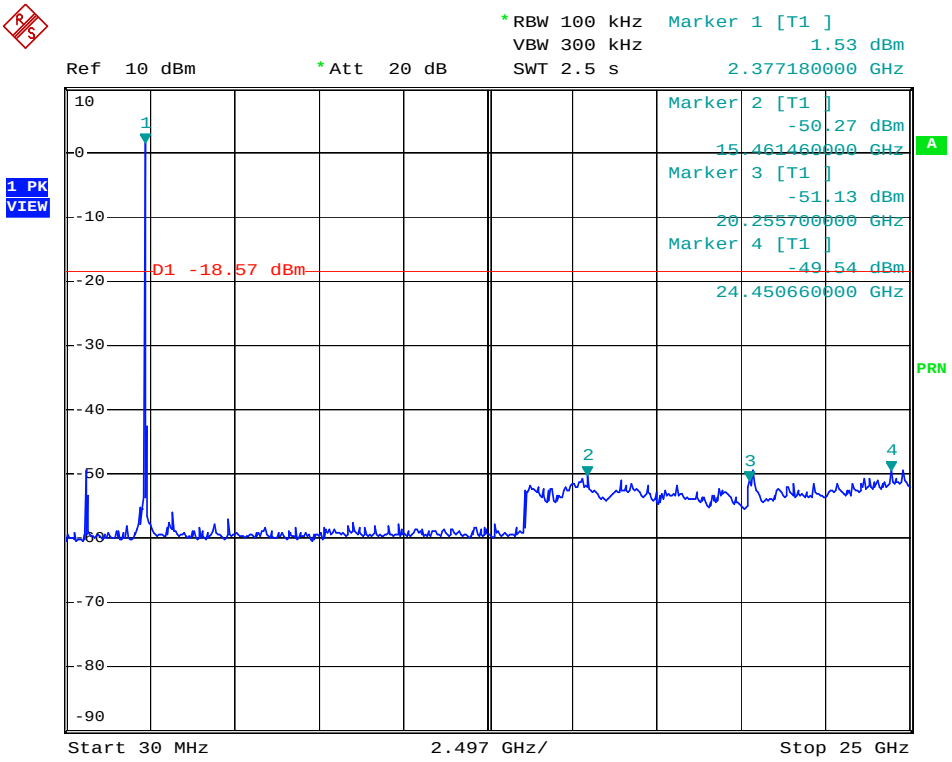
Vertical (Worst case)



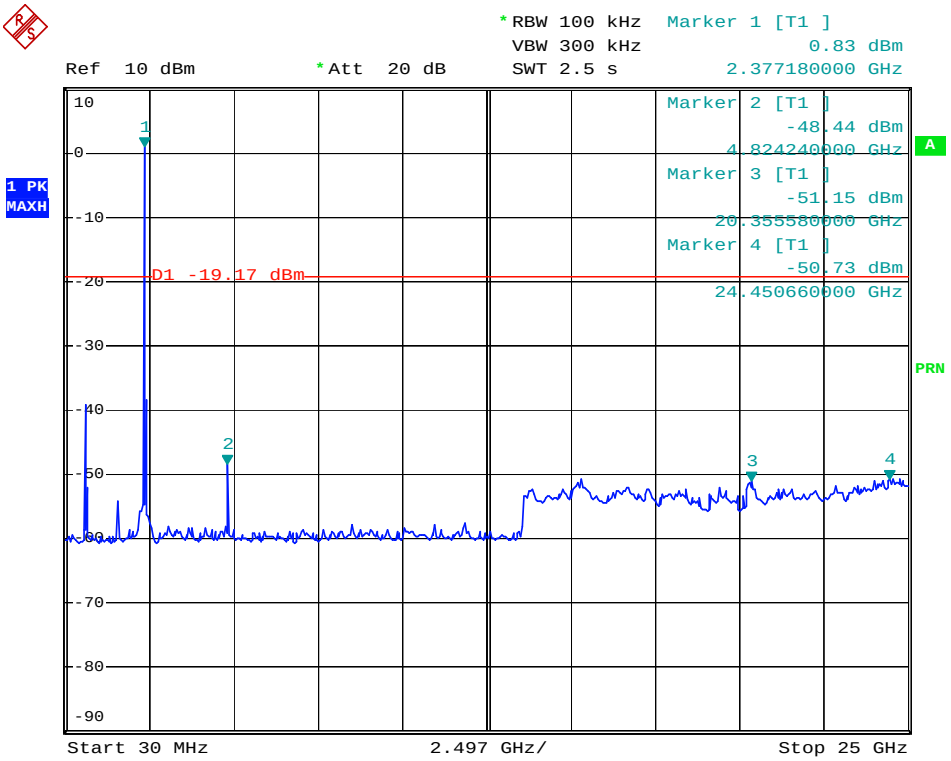
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2451.980	97.06	-6.78	90.28	/	/	Average Detector
	2451.980	104.42	-6.78	97.64	/	/	Peak Detector
2	2483.500	Delta = 49.58dBc		40.70	54.00	-13.30	Average Detector
	2483.500			48.06	74.00	-25.94	Peak Detector
3	2500.000	50.17	-6.68	43.49	74.00	-30.51	Average Detector
	2500.000	64.27	-6.68	57.59	74.00	-16.41	Peak Detector

Conducted Spurious Emissions

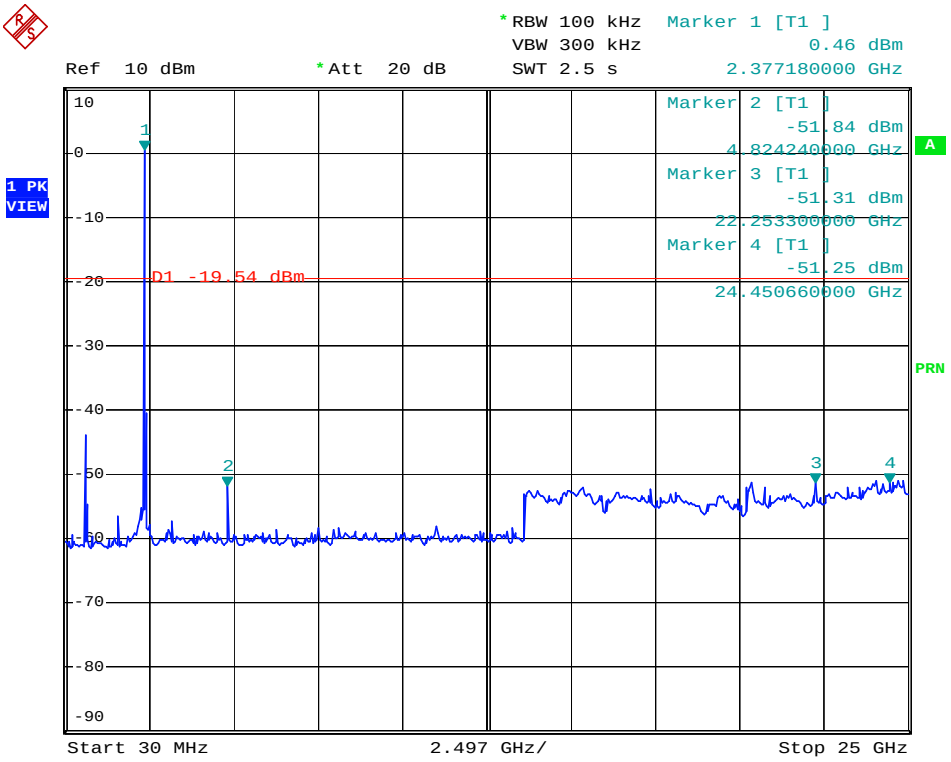
802.11b-Low Bandedge



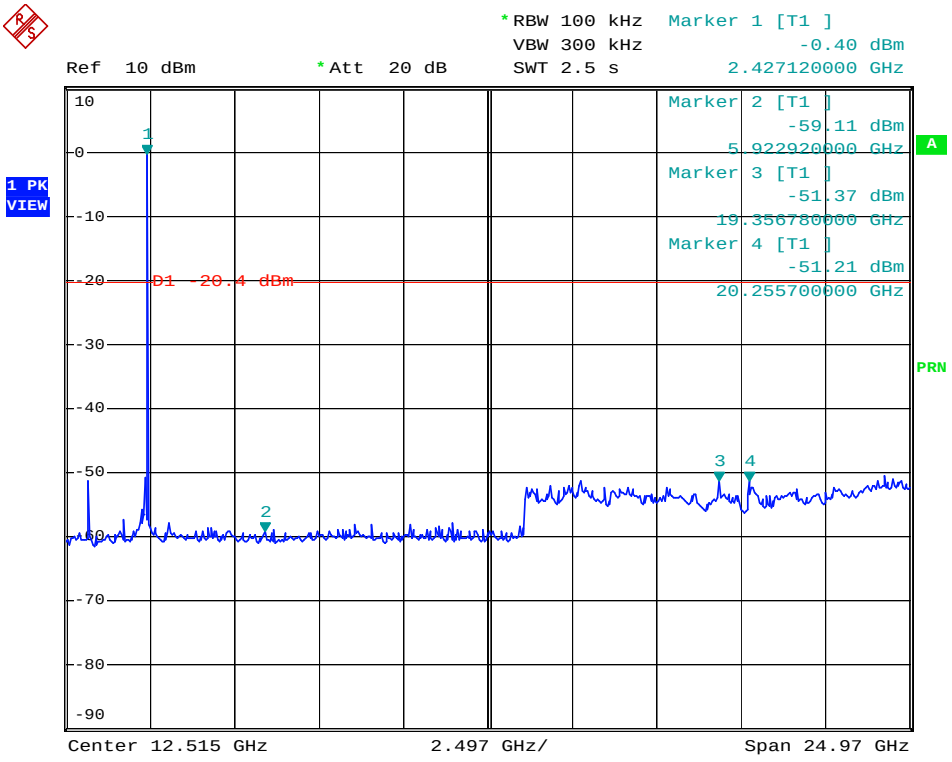
802.11b-Middle Bandedge



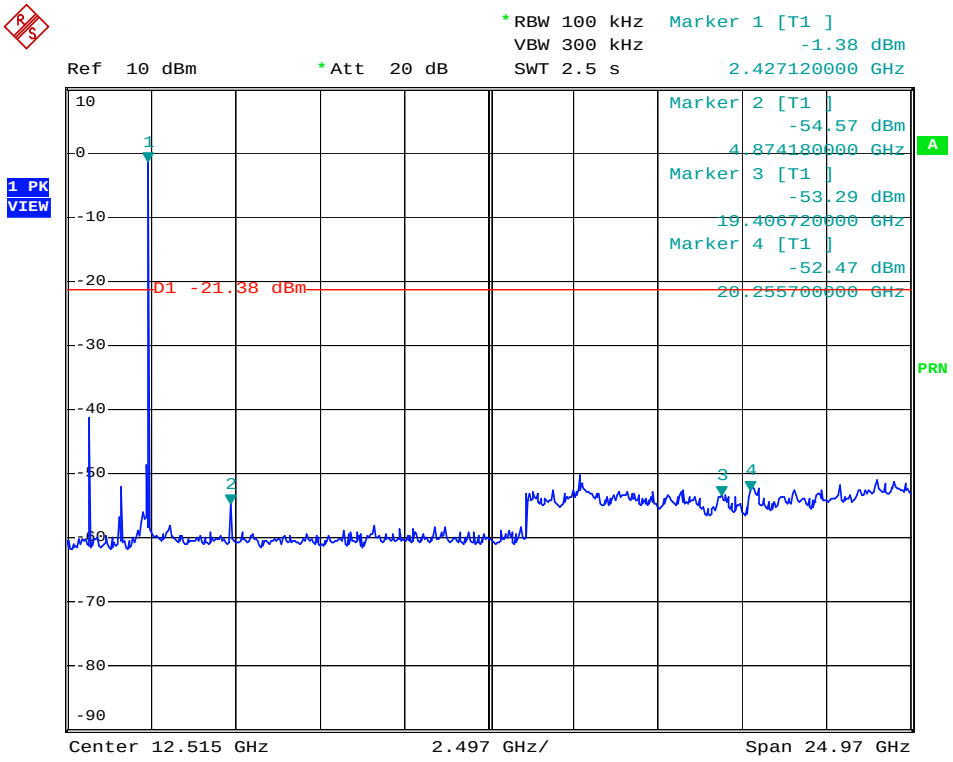
802.11b High-Bandedge



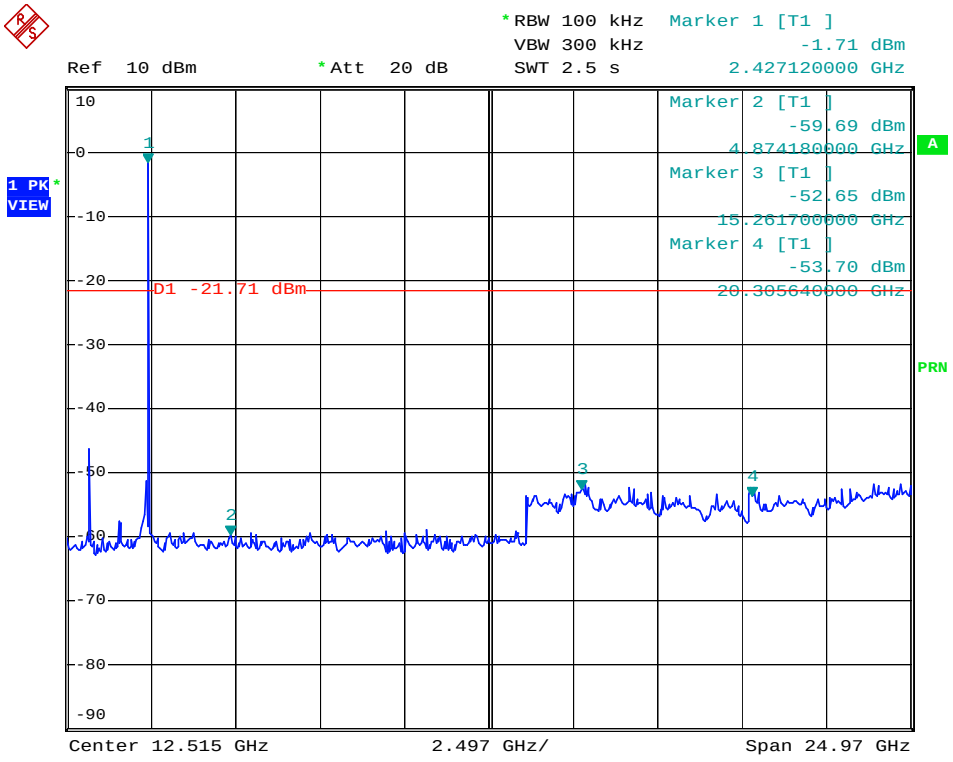
802.11g Low-Bandedge



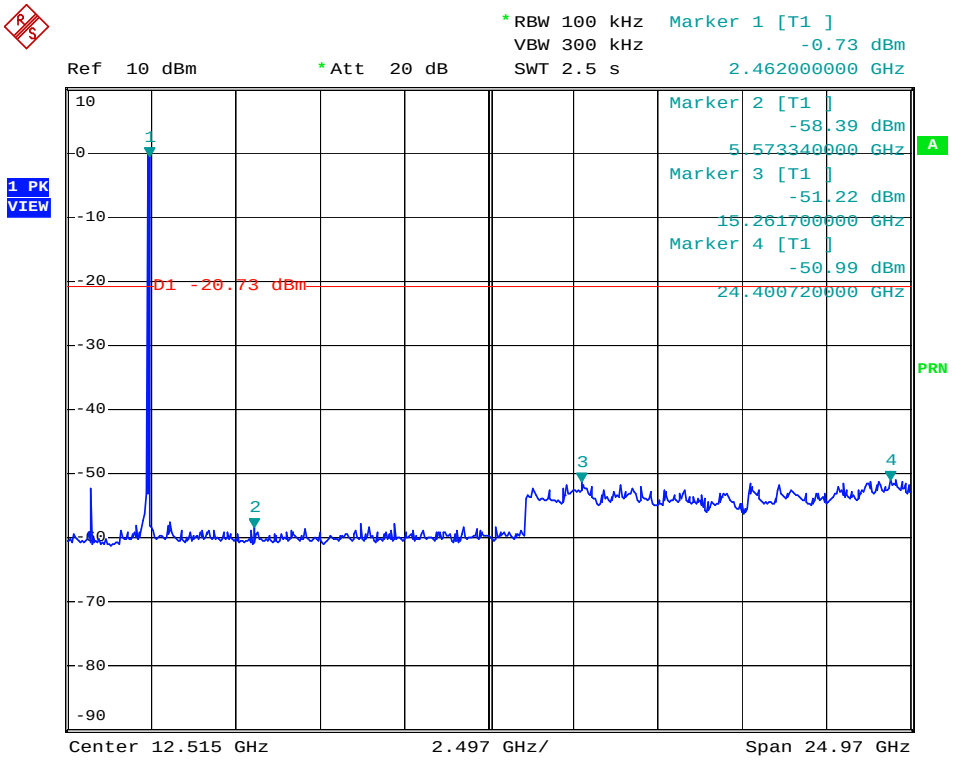
802.11g-Middle Bandedge



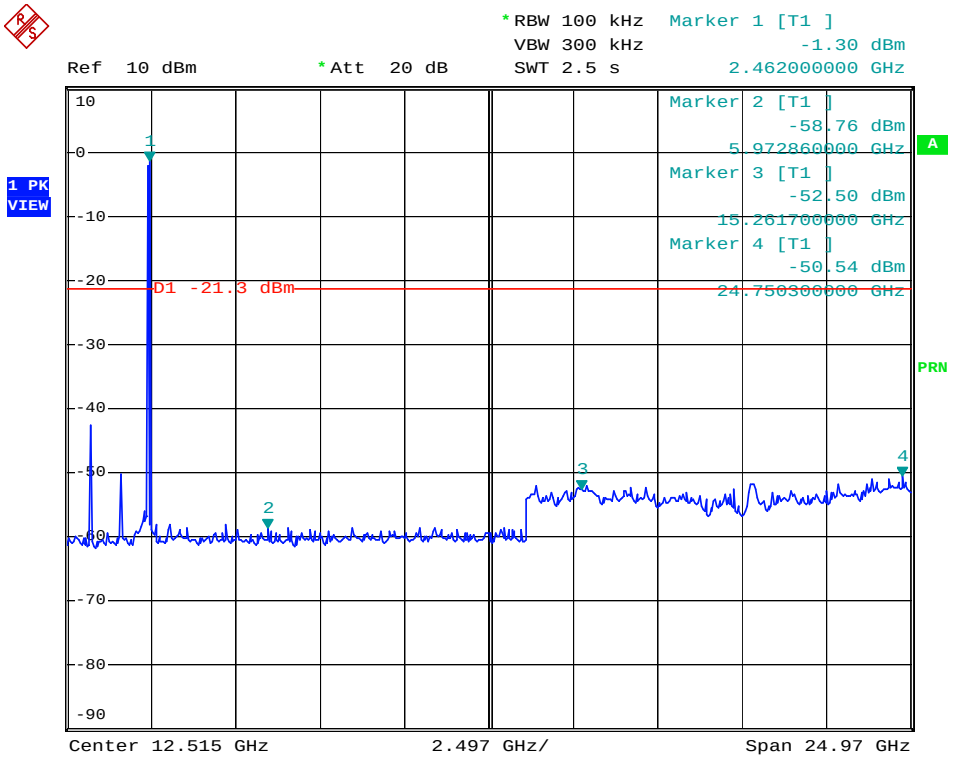
802.11g-High Bandedge



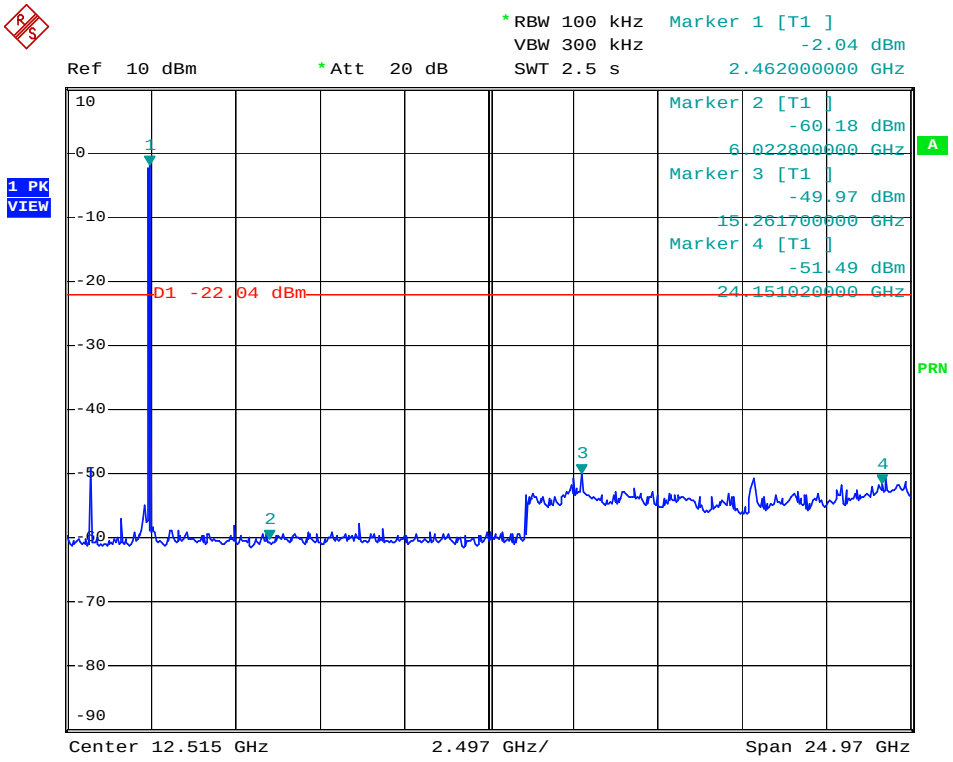
802.11n-HT20 Low Bandedge



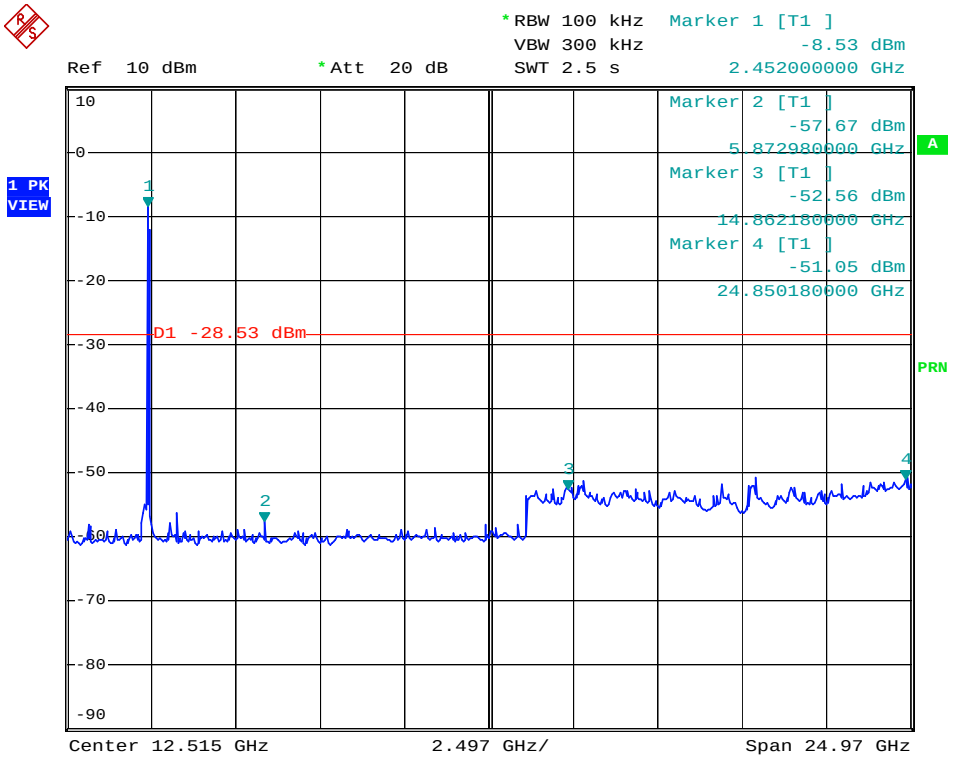
802.11n-HT20 Middle Bandedge



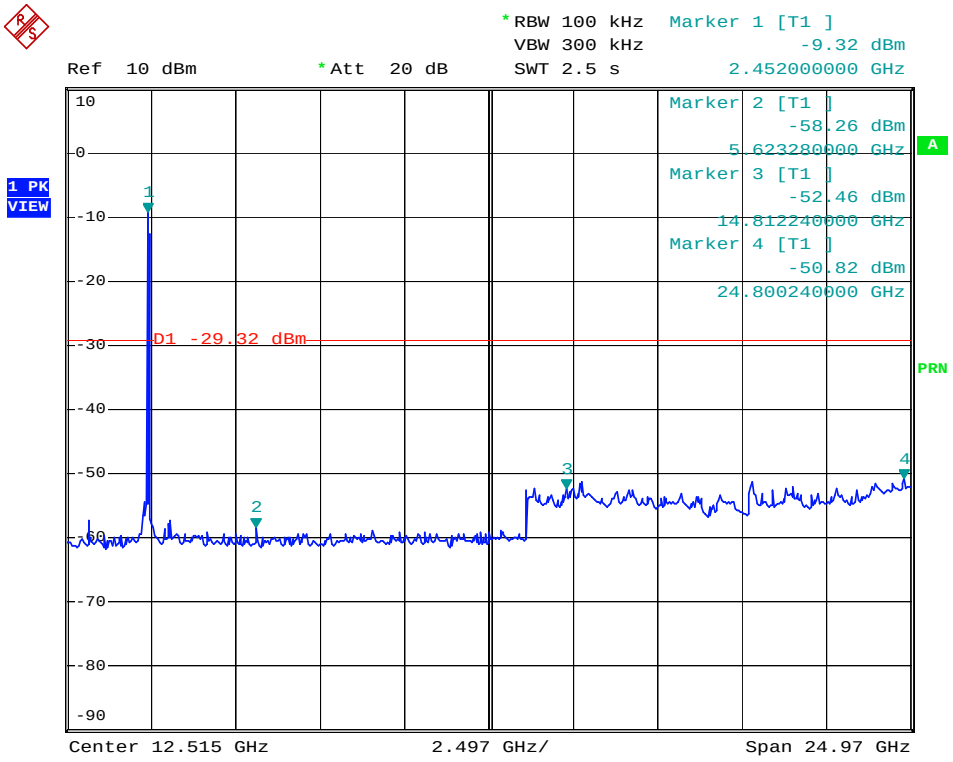
802.11n-HT20 High Bandedge



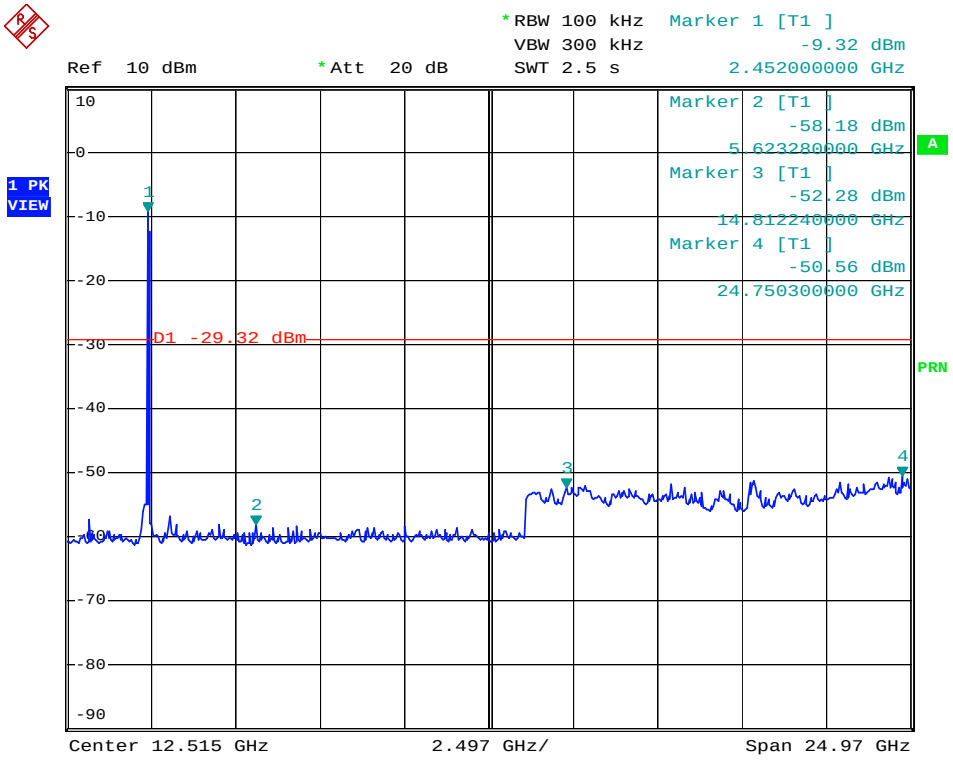
802.11n-HT40 Low Bandedge



802.11n-HT40 Middle Bandedge



802.11n-HT40 High Bandedge



9. Conducted Emissions

9.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

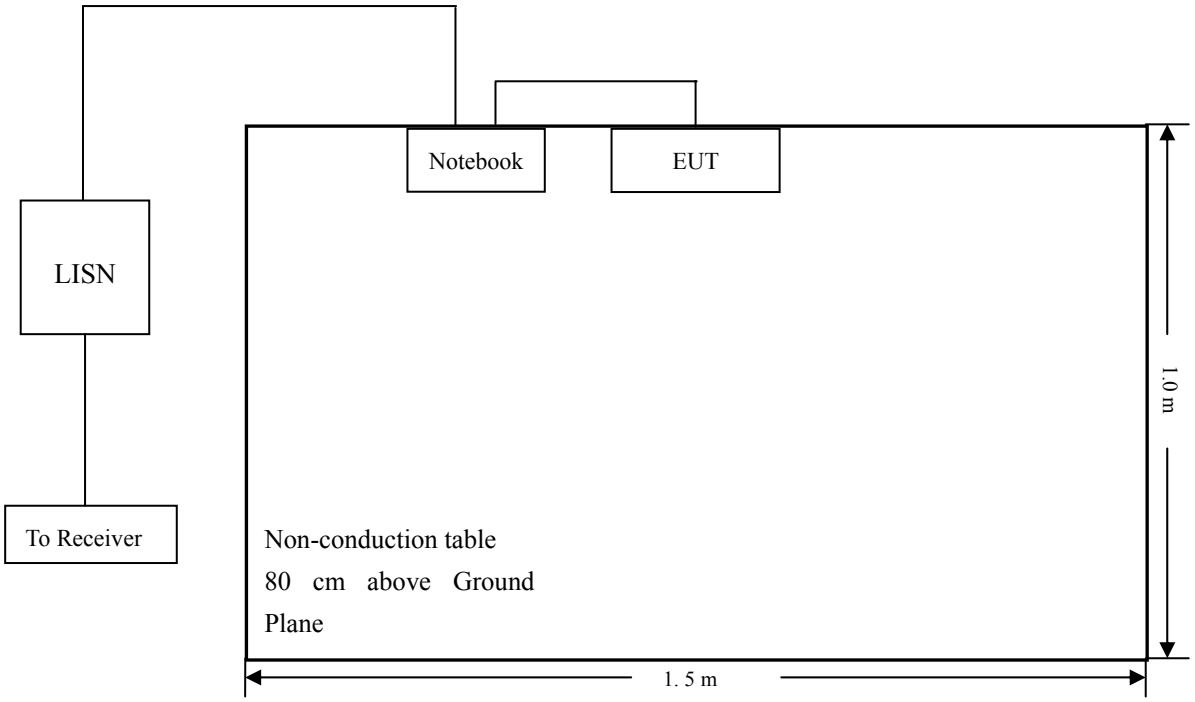
9.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2013-05-07	2014-05-06
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2013-05-07	2014-05-06
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2013-05-07	2014-05-06

9.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.

9.4 Basic Test Setup Block Diagram



9.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

9.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth ..... 9 kHz
Quasi-Peak Adapter Mode ..... Normal

9.7 Summary of Test Results/Plots

According to the data in section 9.8, the EUT complied with the FCC Part 15.207 Conducted margin for a Class B device, with the *worst* margin reading of:

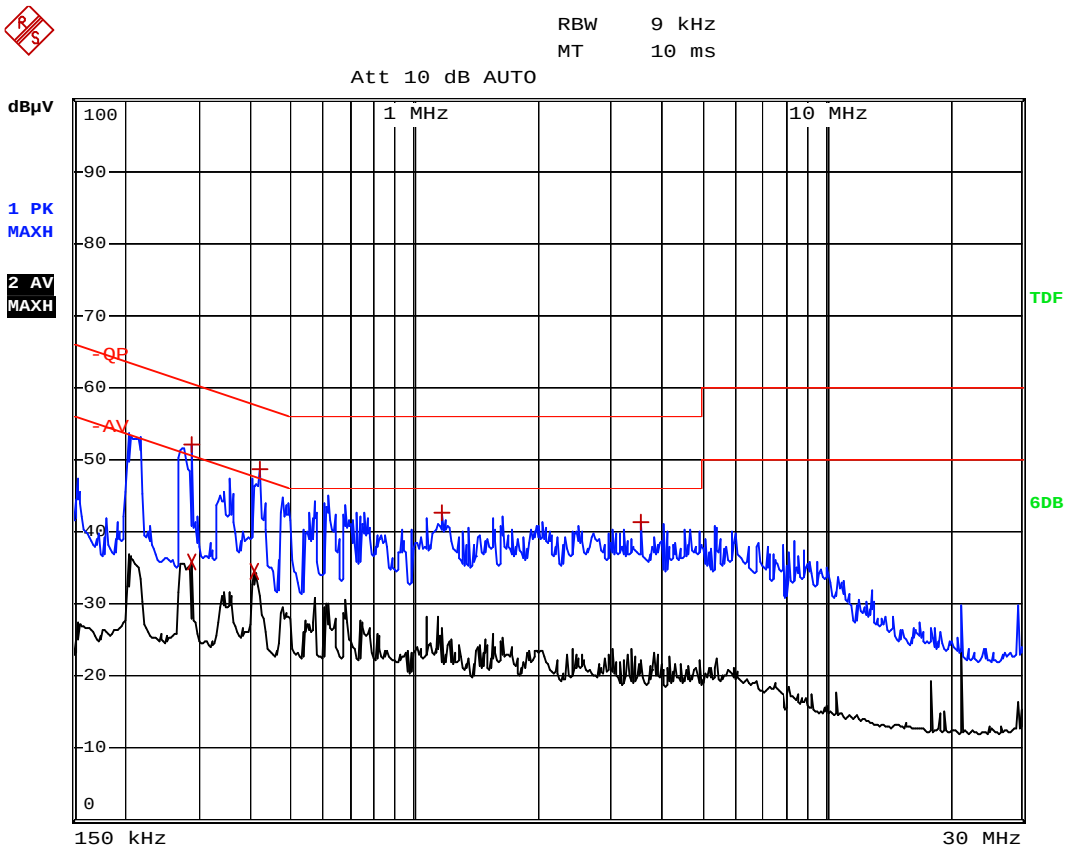
-7.44 dB at 0.414 MHz in the **Line** mode**, Ave** detector, **0.15-30MHz**

9.8 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

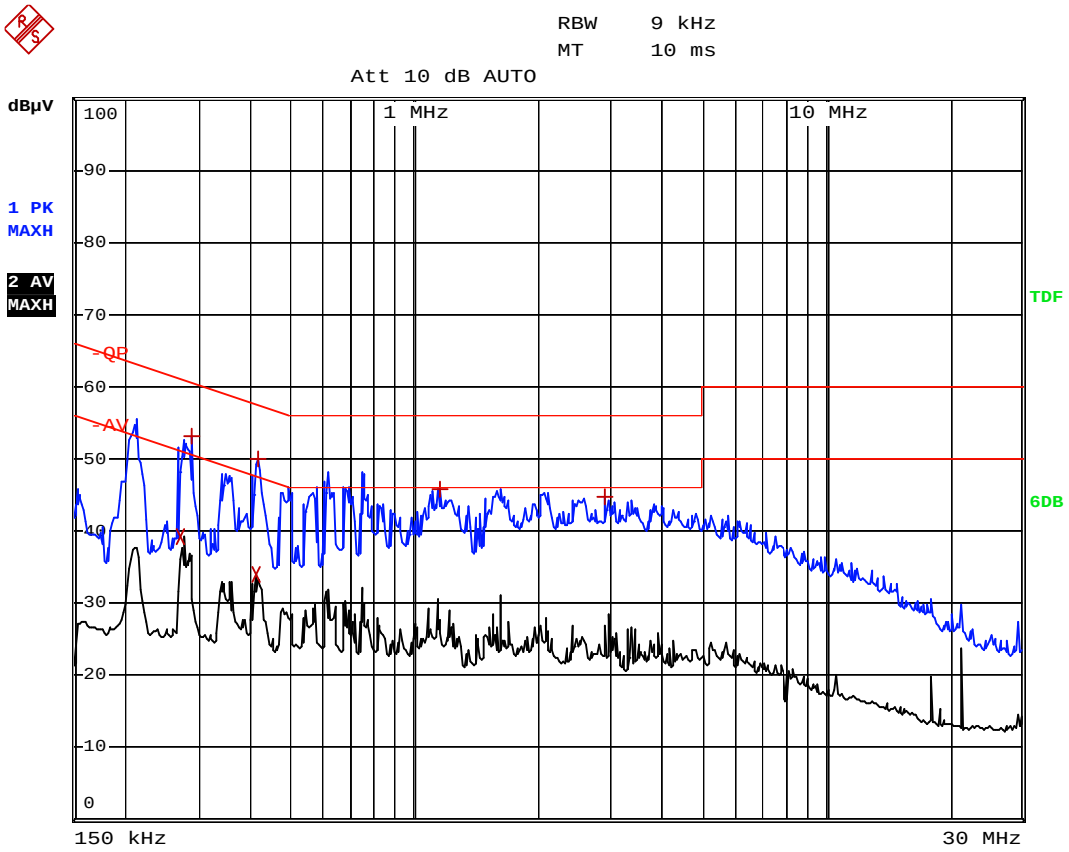
EUT: *WiFi USB Dongle*
Tested Model: *AWUHN2405-2*
Operating Condition: *Transmitting*
Comment: *AC 120V/60Hz, USB 5V*

Test Specification: *Neutral*



EDIT PEAK LIST (Prescan Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	286 kHz	52.01	-8.62
2 Average	286 kHz	35.89	-14.74
2 Average	406 kHz	34.39	-13.33
1 Max Peak	418 kHz	48.63	-8.85
1 Max Peak	1.162 MHz	42.54	-13.46
1 Max Peak	3.574 MHz	41.46	-14.53

Test Specification: *Live*



EDIT PEAK LIST (Prescan Results)

Trace1:	-QP
Trace2:	-AV
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	274 kHz	39.32	-11.66
1 Max Peak	286 kHz	53.08	-7.55
2 Average	410 kHz	33.95	-13.69
1 Max Peak	414 kHz	50.11	-7.44
1 Max Peak	1.158 MHz	45.90	-10.09
1 Max Peak	2.902 MHz	44.74	-11.25

******* END OF REPORT *******