FCC Part 15C (WiFi Portion)

Measurement and Test Report

For

Matsunichi Digital Development (Shenzhen) Co., Ltd

F/22, Matsunichi Building, No.9996, Shennan Boulevard, Nanshan District,

Shenzhen, China

FCC ID: ZDRMP436

Report Concerns: Original Report	**Equipment Type:** WCDMA Smart Phone
Model:	MP436
Report No.:	STR12038238I-2
Test Date:	2012-03-29 to 2012-04-23
Issue Date:	2012-04-24
Tested By:	Silin Chen / 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:	Matsunichi Digital Development (Shenzhen) Co., Ltd
Address of applicant:	F/22, Matsunichi Building, No.9996, Shennan Boulevard, Nanshan District, Shenzhen, China
Manufacturer 1:	Matsunichi Digital Development (Shenzhen) Co., Ltd
Address of manufacturer:	No.5, KeJi Road, PingShan Industrial Estate, PinShan New District, Shenzhen, China
Manufacturer 2:	Guangzhou Singulargold Electronics Co., Ltd
Address of manufacturer:	No.6, Lianhua yan Road, Science City, Guangzhou Hi-Tech Industrial Development Zone, Guangzhou, China

General Description of E.U.T

Items	Description
EUT Description:	WCDMA Smart Phone
Trade Name:	Matsunichi / Le Pan
Model No.:	MP436
Power Supply:	Input 100-240V/50/60Hz Output 5V DC Adaptor DC 3.7V Battery
Adaptor Model:	KSAS0060500120VUU
Rated Voltage:	DC 3.7V
Battery Capacity:	1530mAh（5.66Wh）
Hardware Version:	R004
Software Version:	4833
RF Output Power	Max.13.73dBm (Conducted)
Antenna Gain:	4.8dBi
Frequency range:	2412MHz~2462MHz for 11b/g/n(HT20)
Number of channels:	11 for 11b/g/n(HT20)
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna

Note: The test data is gathered from a production sample, provided by the manufacture.

1.2 Test Standards

The following report is prepared on behalf of the Matsunichi Digital Development (Shenzhen) 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 equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted with Low Channel, Middle Channel and High Channel, accordingly in reference to the Operating Instructions.

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 Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components.

1.6 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number
N/A	N/A	N/A	N/A

1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.0	Shielded	With Core
Earphone Cable	1.4	Unshielded	Without Core

2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203; § 15.247(c)(1)(i)	Antenna Requirement	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	Power Output	Compliant
§ 15.209(a)(d)	Radiated Emission	Compliant
§ 15.247(d)	Band edge	Compliant
§ 15.207(a)	Conducted Emission	Compliant

3. §15.203 - ANTENNA REQUIREMENT

3.1 Standard Applicable

According to FCC 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 Test Result

This product has a 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	2012-03-28	2013-03-27
Attenuator	ATTEN	ATS100-4-20	/	2012-03-28	2013-03-27

4.3 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 center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW=3kHz, Span = 1.5MHz.
4. Repeat above procedures until all frequency measured was complete.

4.4 Environmental Conditions

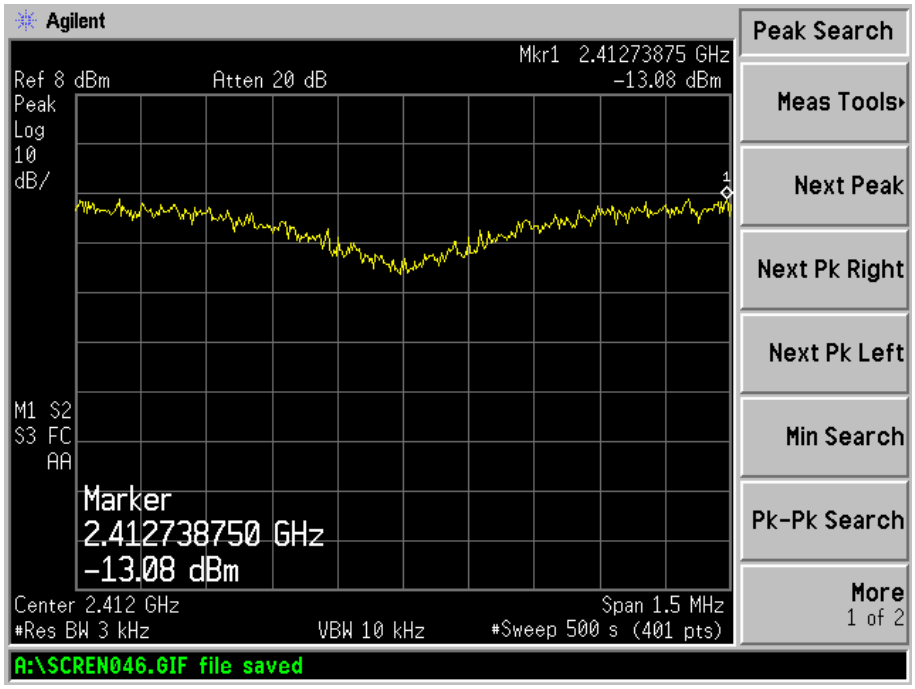
Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots

Test mode	Test channel	Reading dBm/3kHz	Limit dBm/3kHz
802.11b	Low channel (2412MHz)	-13.08	8
	Middle channel (2437MHz)	-13.00	8
	High channel (2462MHz)	-13.22	8
802.11g	Low channel (2412MHz)	-15.08	8
	Middle channel (2437MHz)	-14.78	8
	High channel (2462MHz)	-13.72	8
802.11n	Low channel (2412MHz)	-16.01	8
	Middle channel (2437MHz)	-15.15	8
	High channel (2462MHz)	-14.77	8

For 802.11b

Low Channel:



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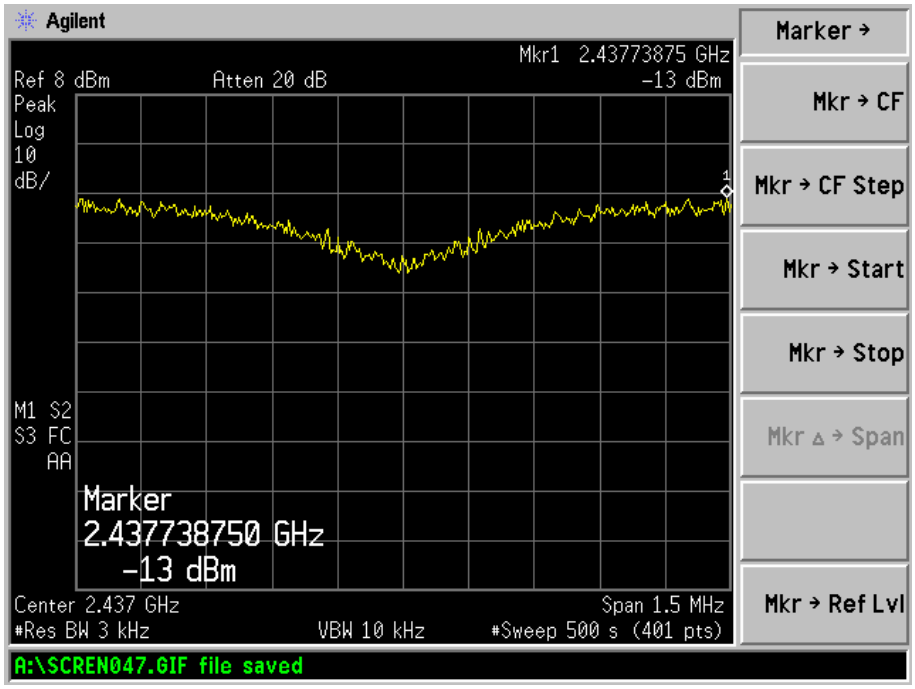

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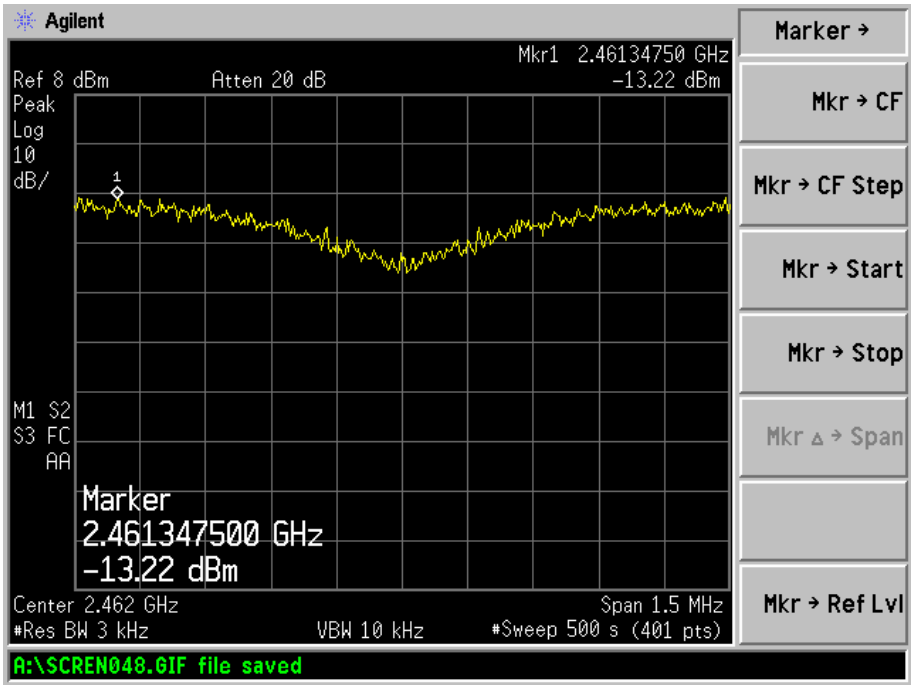
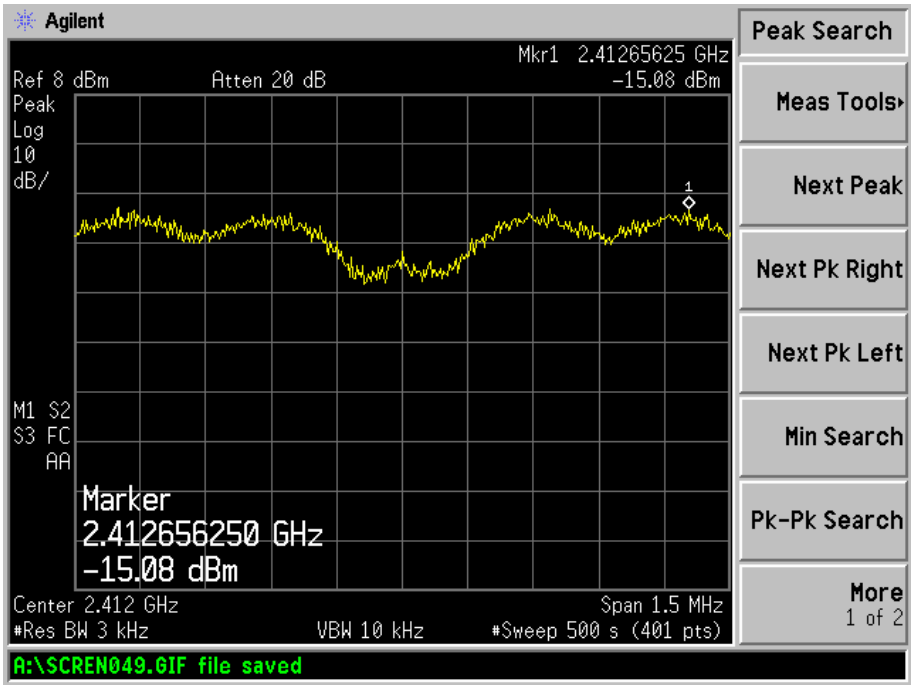


For 802.11g

Low Channel:



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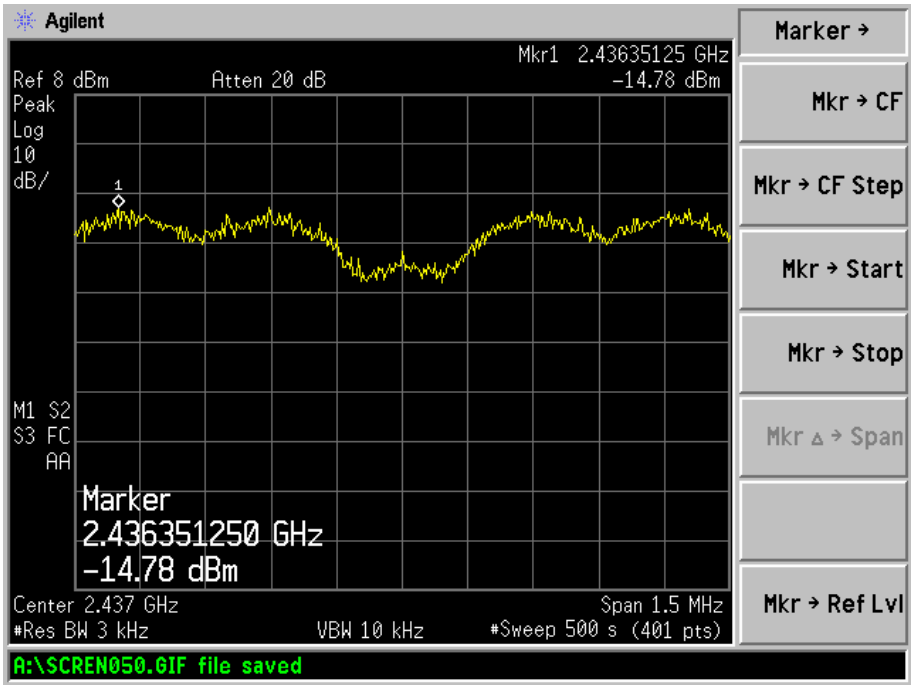

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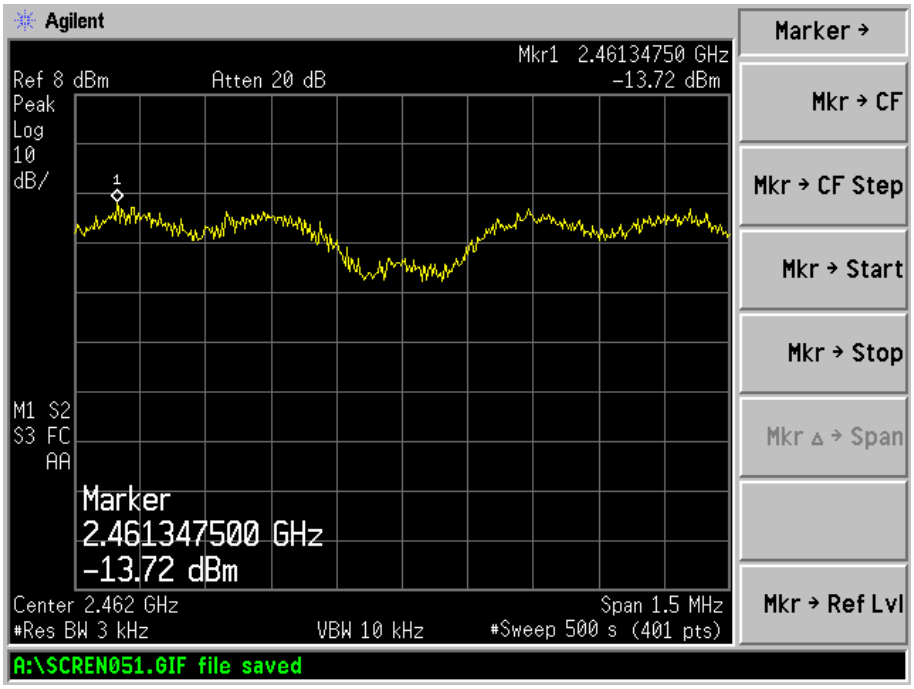
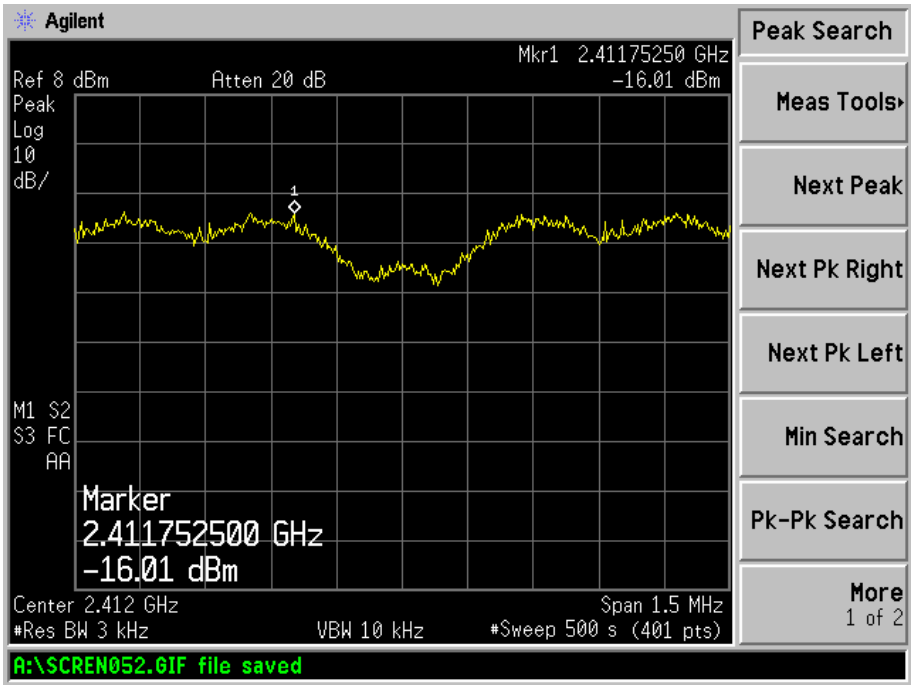


For 802.11n

Low Channel:



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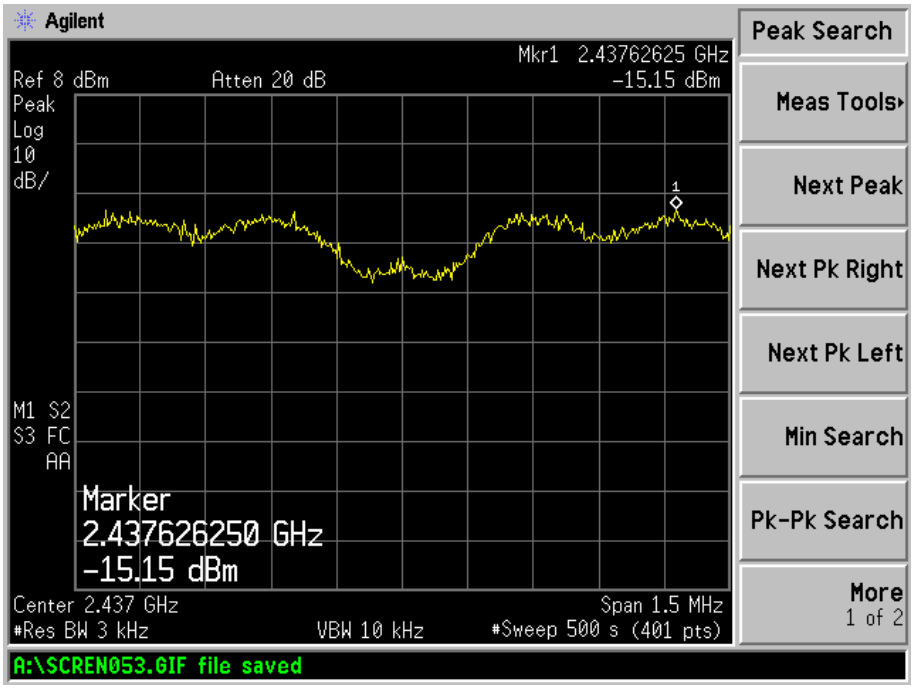

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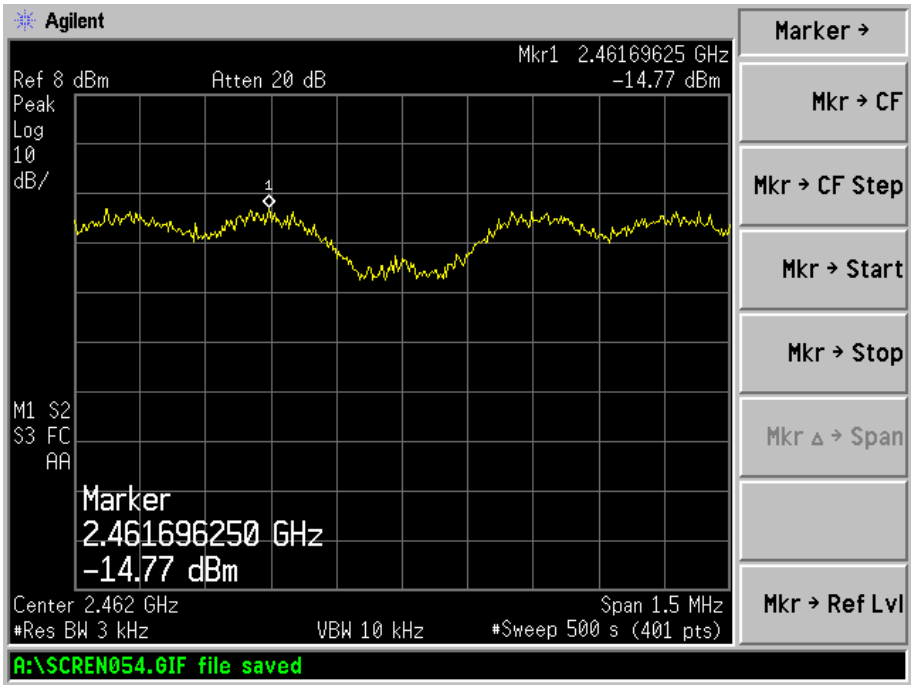


5. 6-dB BANDWIDTH

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	2012-03-28	2013-03-27
Attenuator	ATTEN	ATS100-4-20	/	2012-03-28	2013-03-27

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 center frequency of spectrum analyzer = operating frequency.
3. The spectrum analyzer as RBW=300kHz (1 % of Bandwidth.), Sweep time=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.

5.4 Environmental Conditions

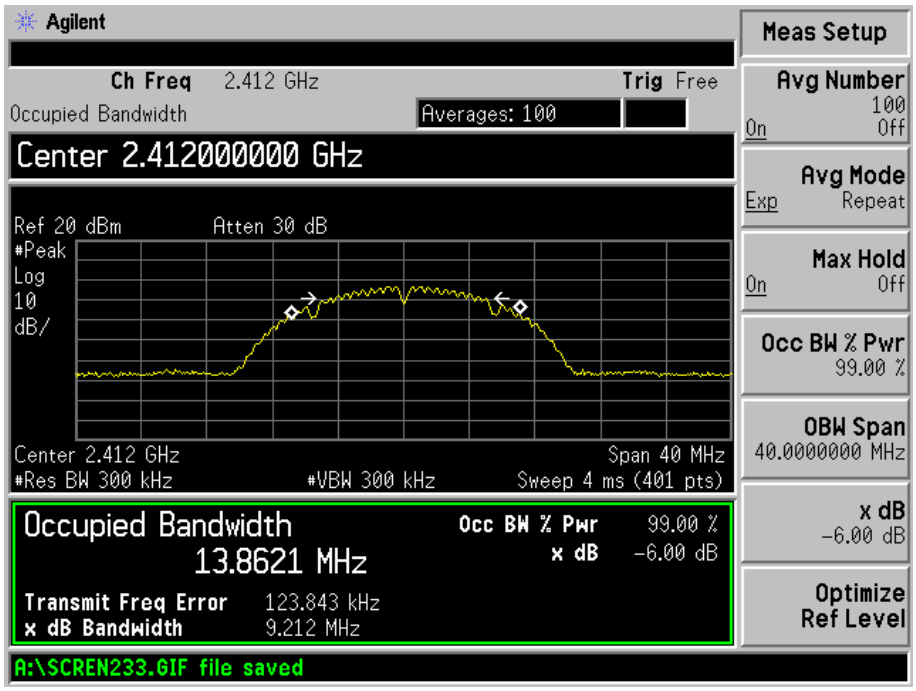
Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

5.5 Summary of Test Results/Plots

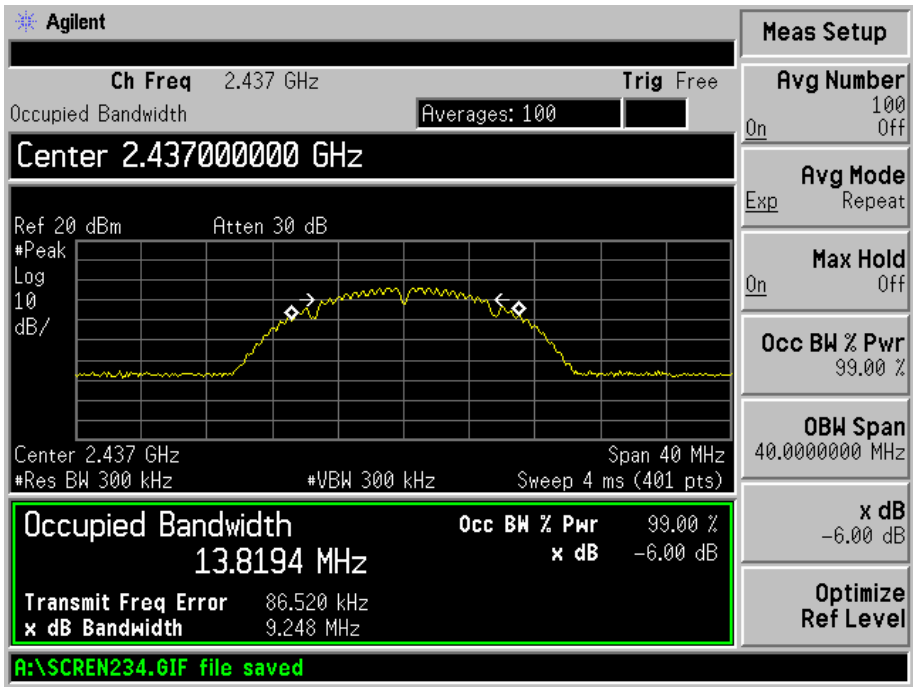
Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11b	2412	9212	500
	2437	9248	500
	2462	9202	500
802.11g	2412	16358	500
	2437	16172	500
	2462	16116	500
802.11n	2412	17400	500
	2437	17316	500
	2462	17247	500

For 802.11b

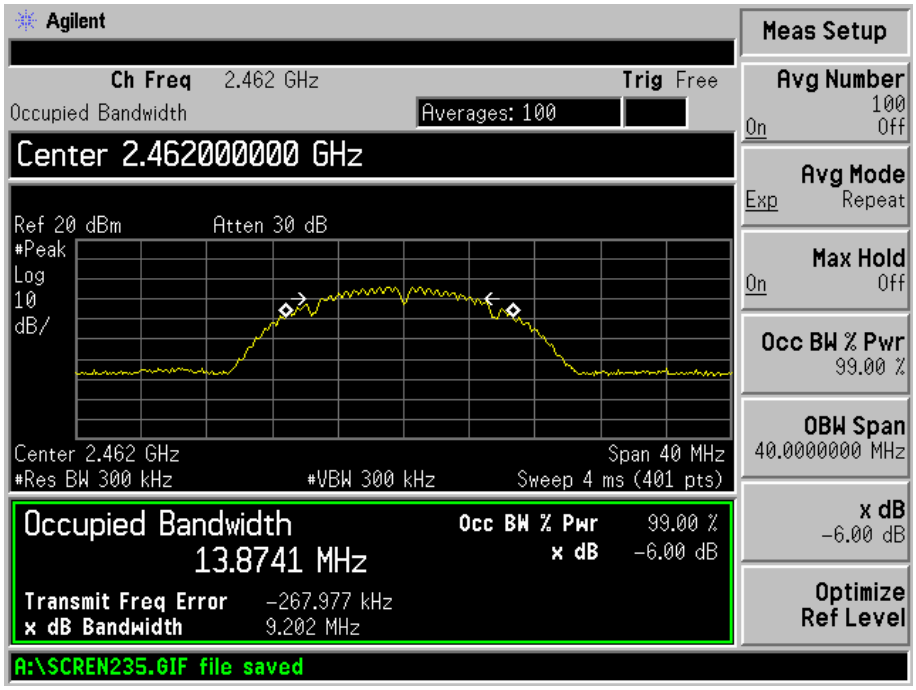
Low Channel:



Middle Channel:

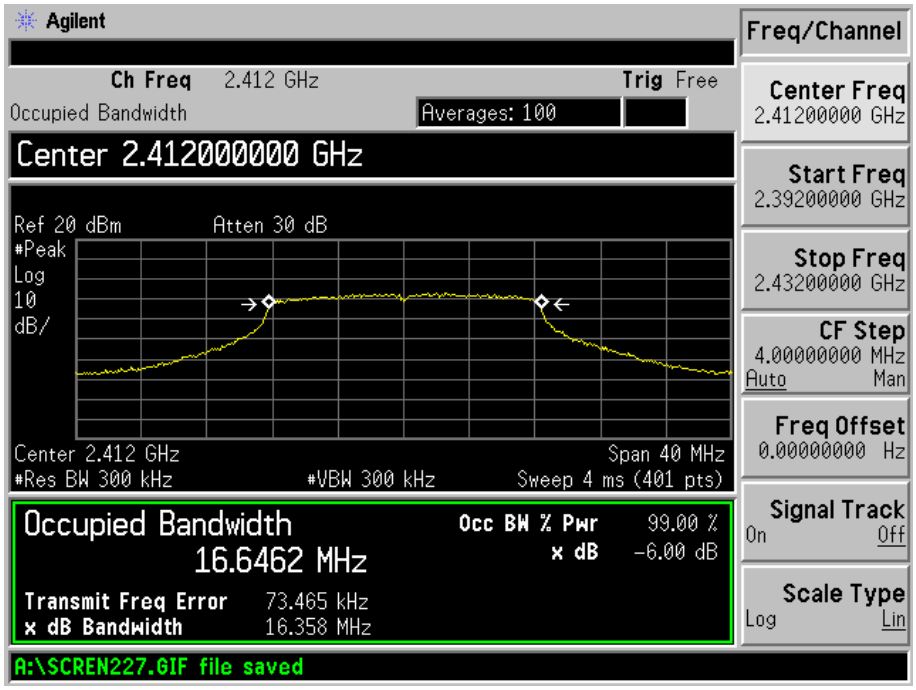


High Channel:

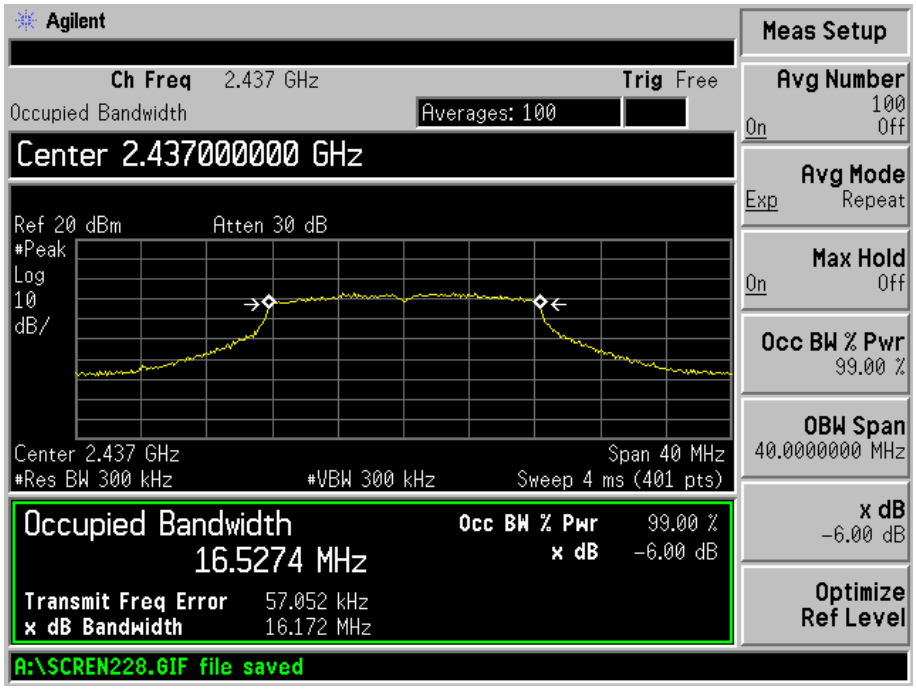


For 802.11g

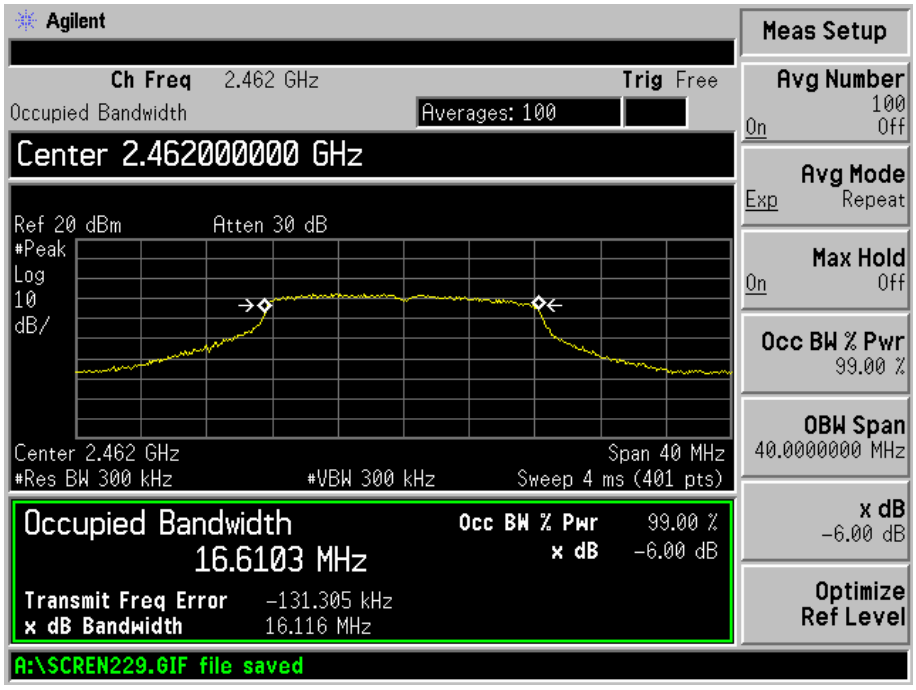
Low Channel:



Middle Channel:

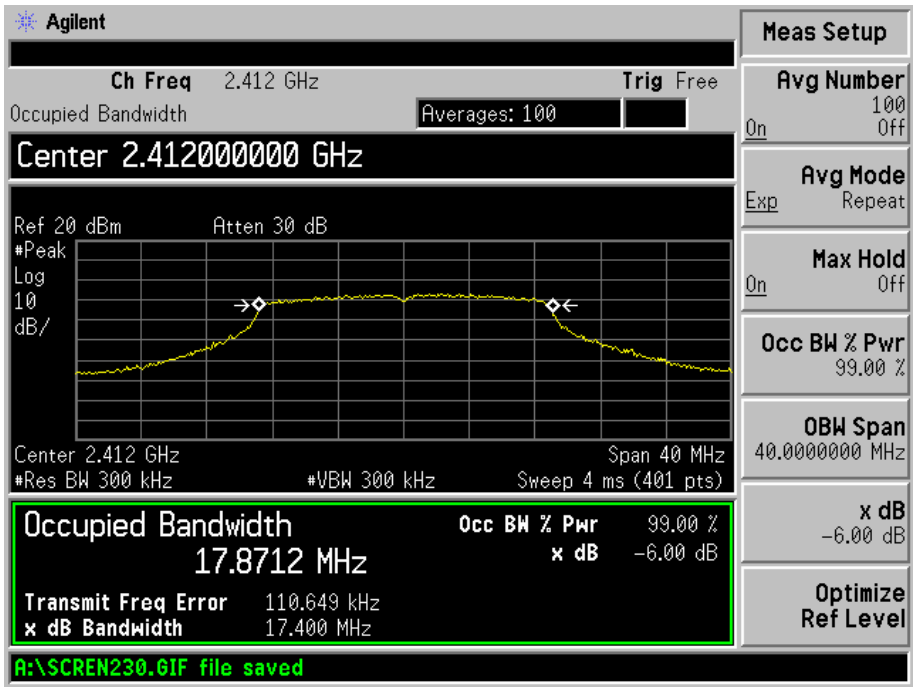


High Channel:

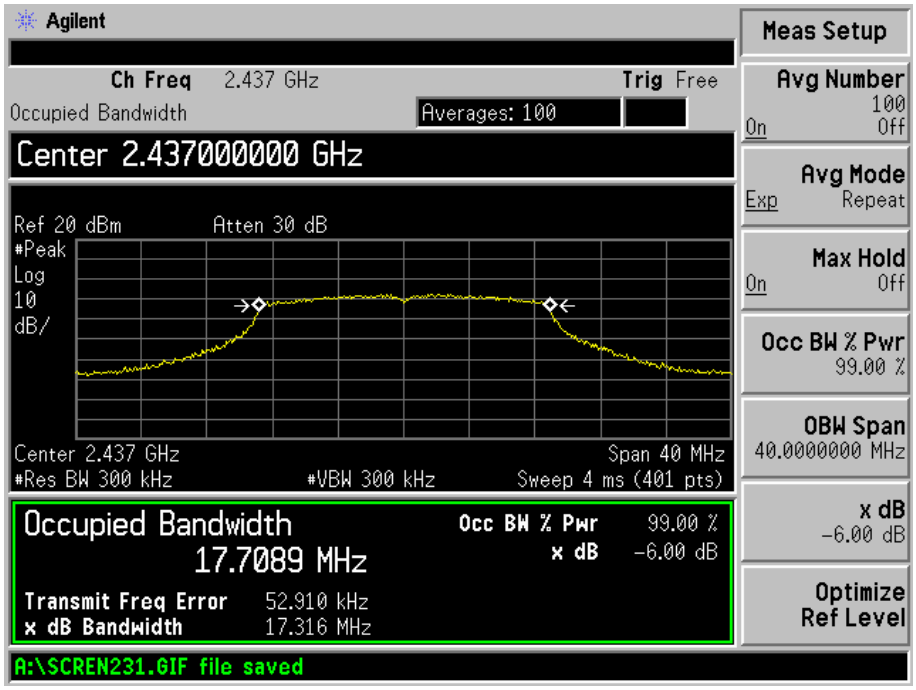


For 802.11n

Low Channel:



Middle Channel:



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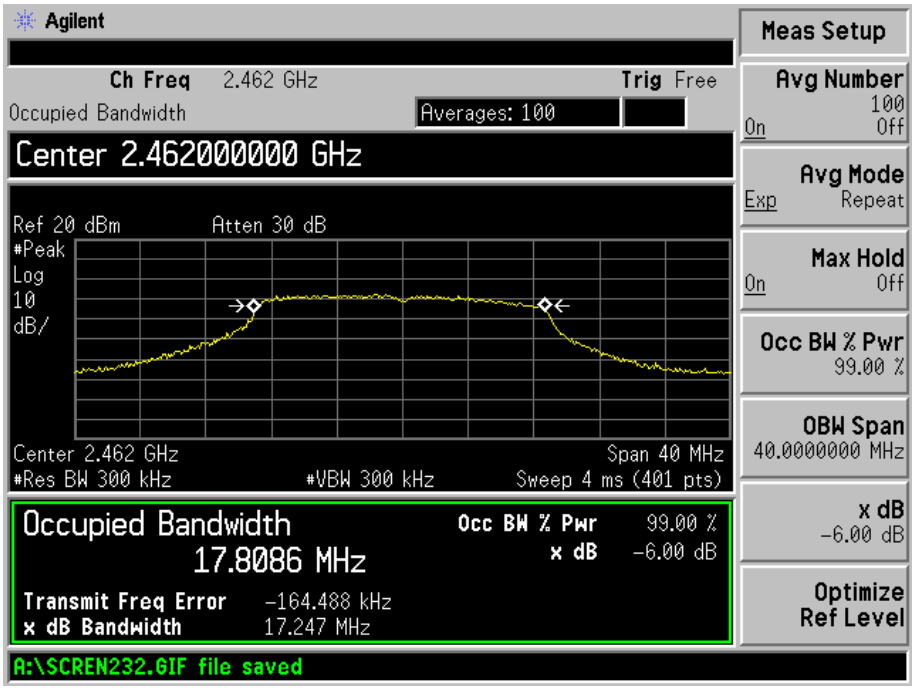


6. POWER OUTPUT

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	2012-03-28	2013-03-27
Attenuator	ATTEN	ATS100-4-20	/	2012-03-28	2013-03-27

6.3 Test Procedure

According to section 15.247(b)-power output of the KDB-558074 (2005), the method #1 of the power output option2 was used, the following is the measurement procedure.

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.

2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz.

4. Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode.

5. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”.

6. Trace average 100 traces in power averaging mode.

7. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges.

6.4 Environmental Conditions

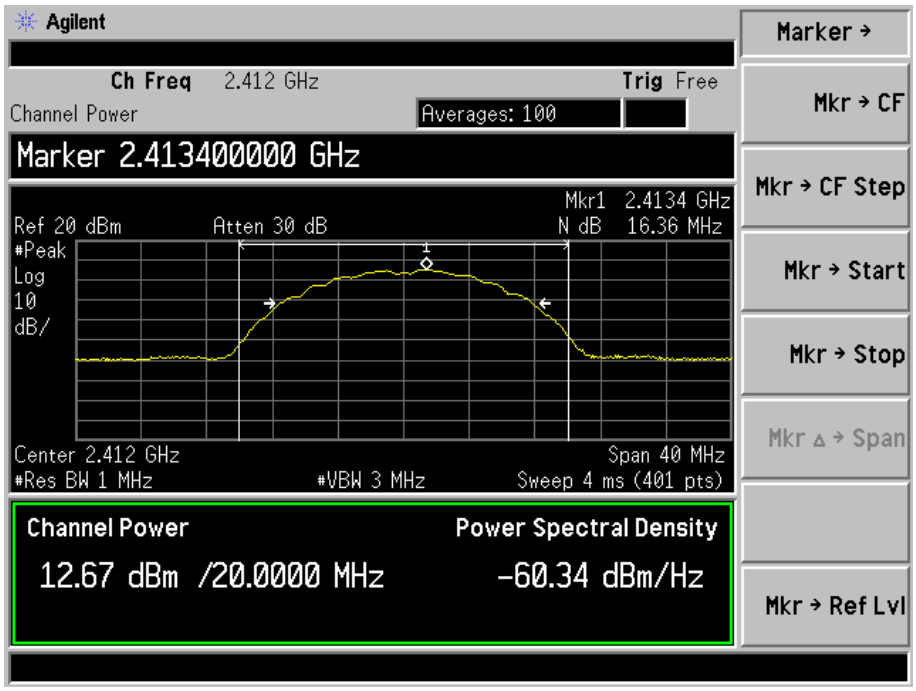
Temperature:	21° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

6.5 Summary of Test Results/Plots

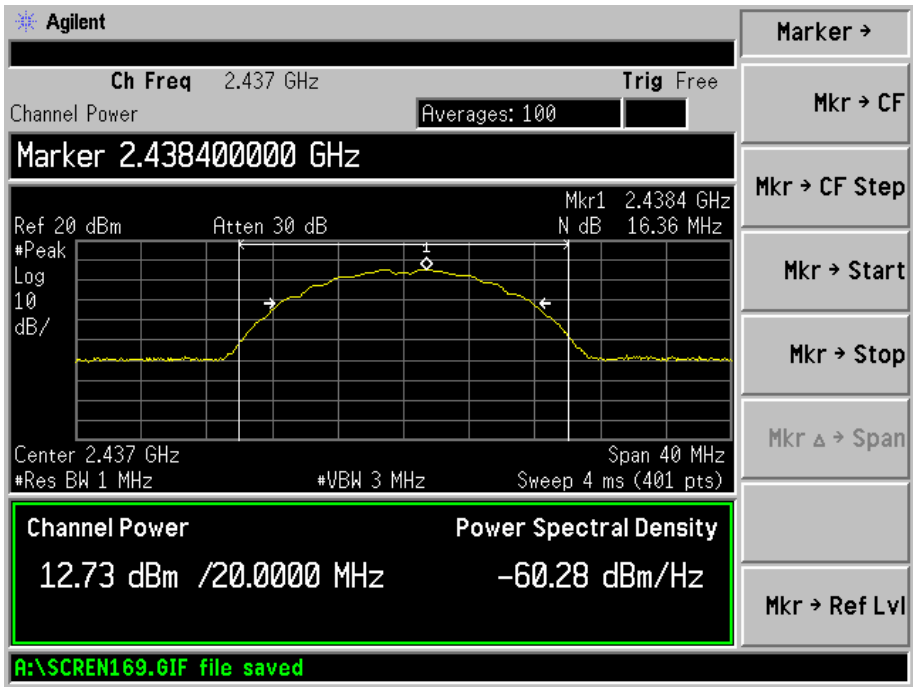
Test mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
11b_ 1Mbps	2412	12.67	18.4927	1000
	2437	12.73	18.7499	1000
	2462	13.09	20.3704	1000
11b_11Mbps	2412	13.61	22.9615	1000
	2437	13.46	22.1820	1000
	2462	13.73	23.6048	1000
11g_6Mbps	2412	10.88	12.2462	1000
	2437	11.56	14.3219	1000
	2462	11.84	15.2757	1000
11g_54Mbps	2412	10.77	11.9399	1000
	2437	11.06	12.7644	1000
	2462	11.20	13.1826	1000
11n_MCS0	2412	11.13	12.9718	1000
	2437	11.31	13.5207	1000
	2462	11.62	14.5211	1000
11n_MCS7	2412	10.40	10.9648	1000
	2437	10.92	12.3595	1000
	2462	10.83	12.1060	1000

For 802.11b_1Mbps

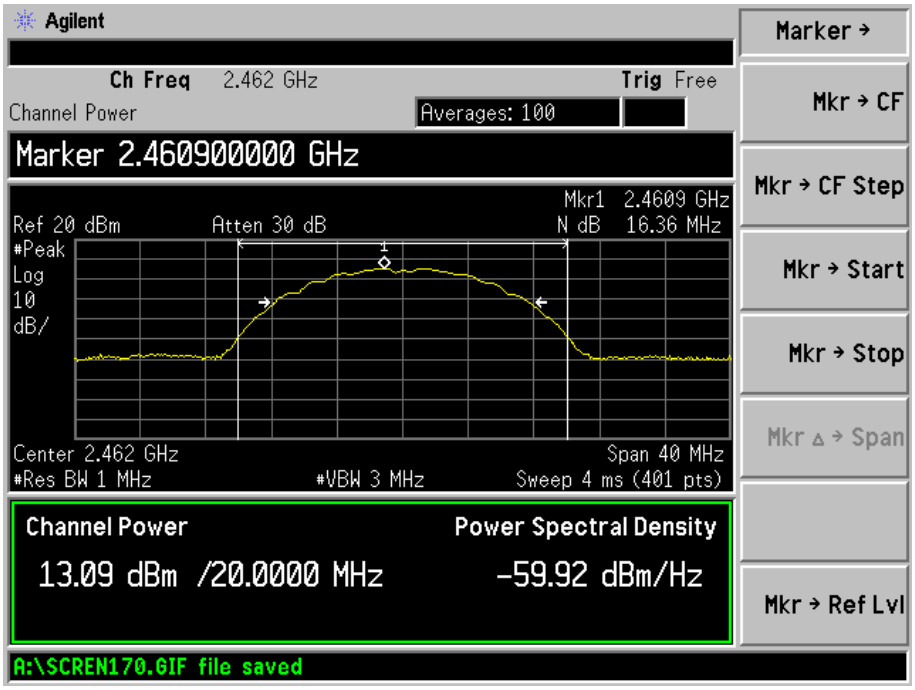
Low Channel:



Middle Channel:

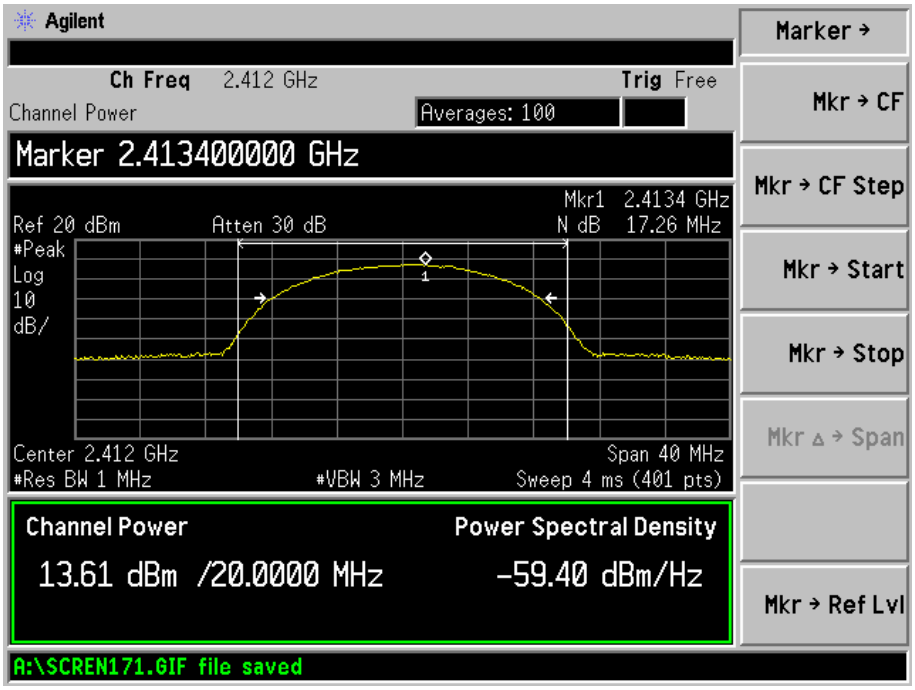


High Channel:



For 802.11b_11Mbps

Low Channel:



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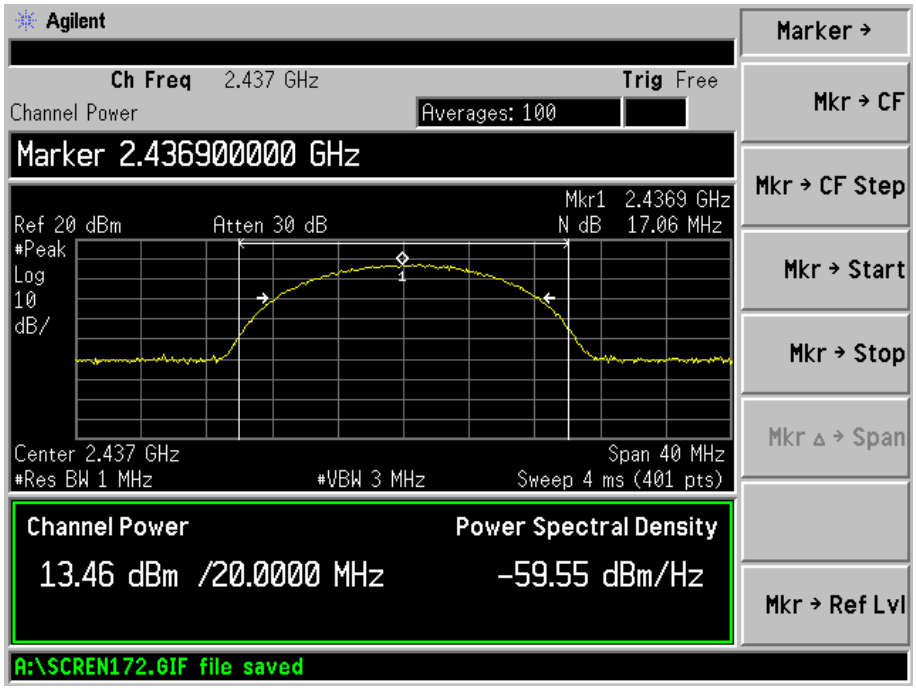

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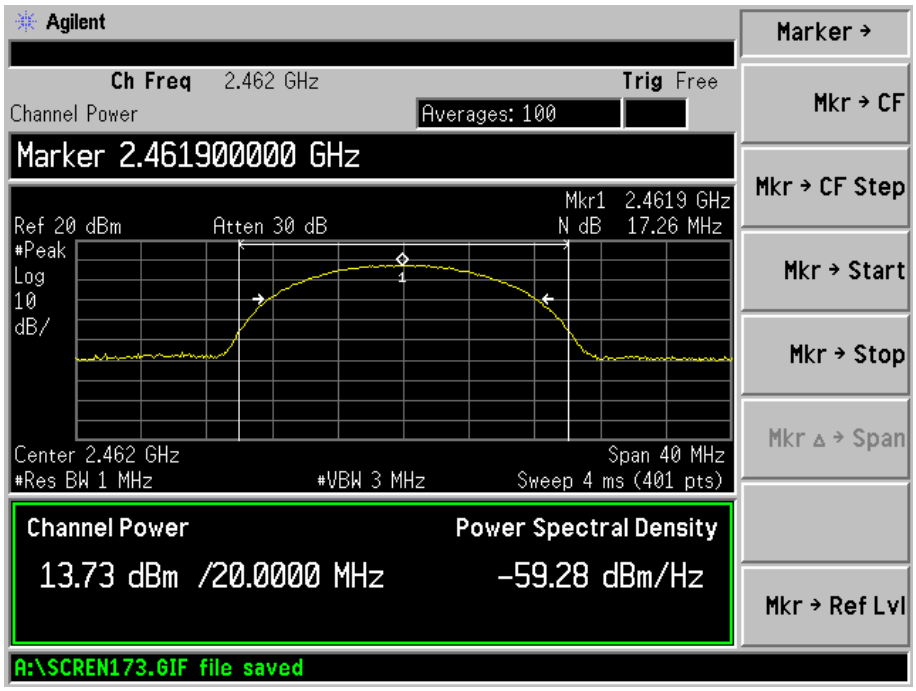
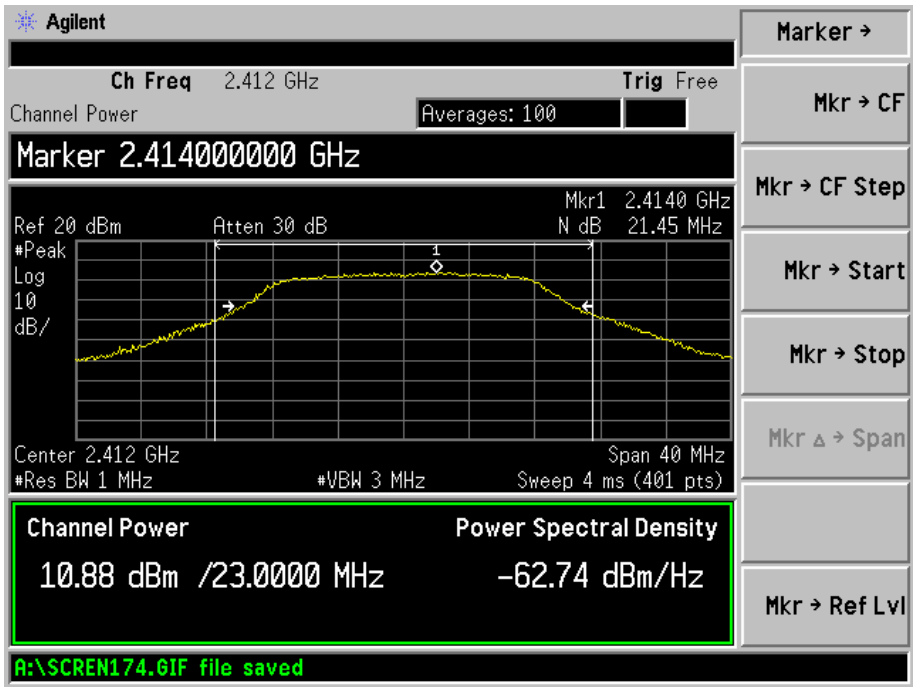


For 802.11g_6Mbps

Low Channel:



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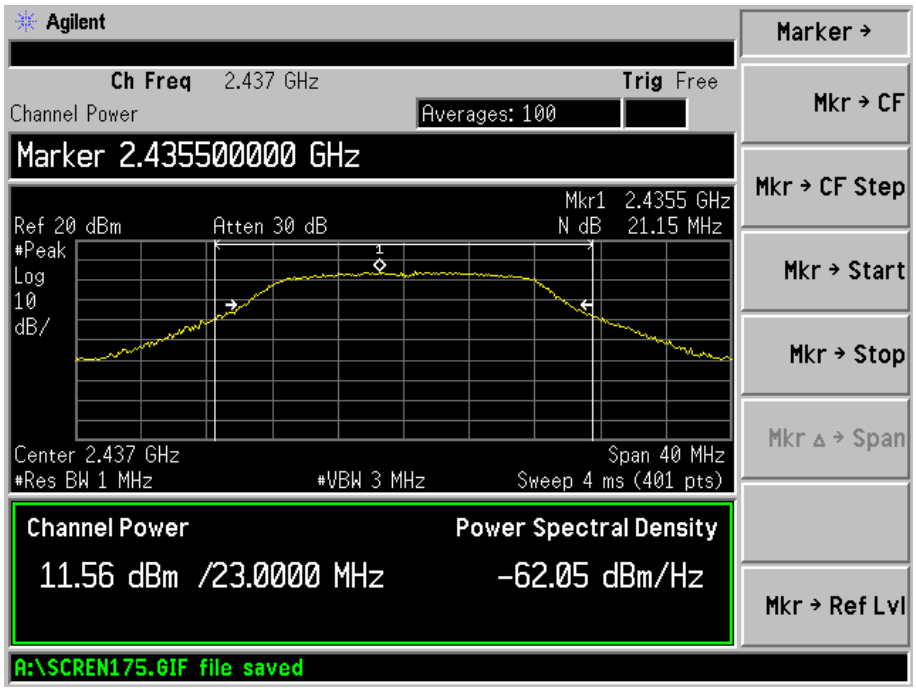

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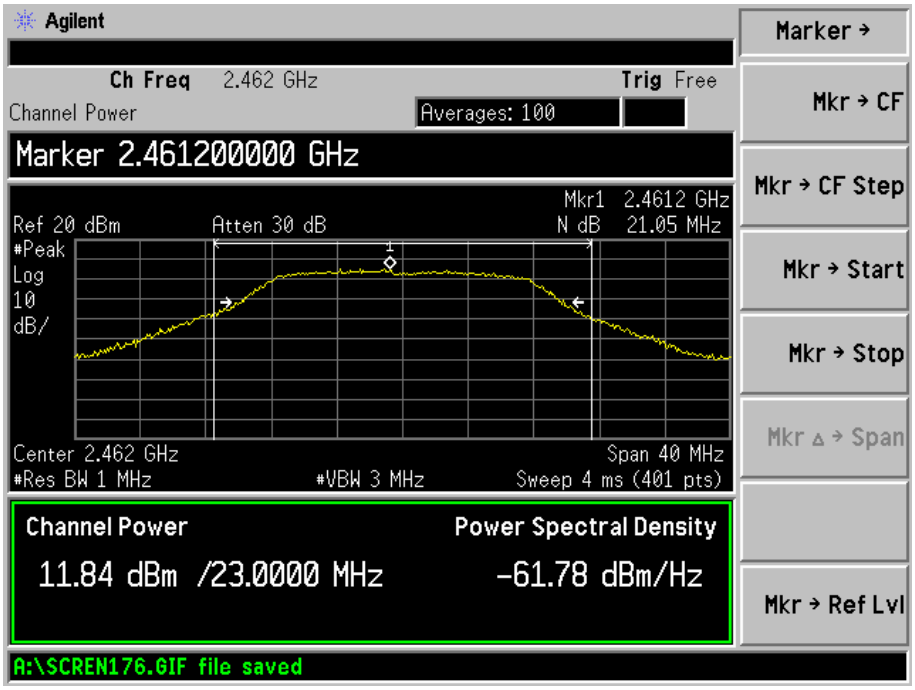

For 802.11g_54Mbps

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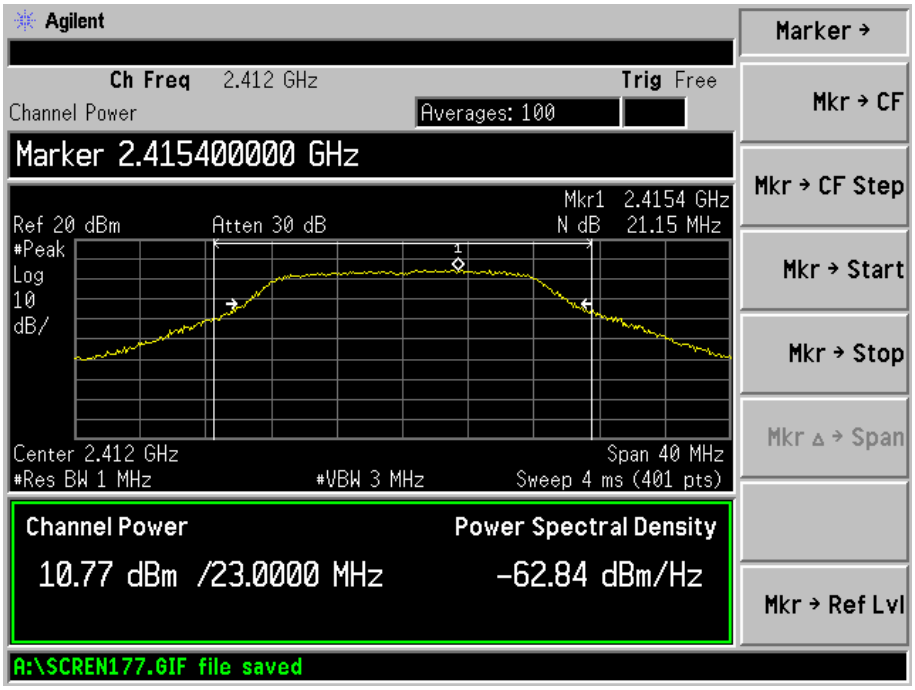

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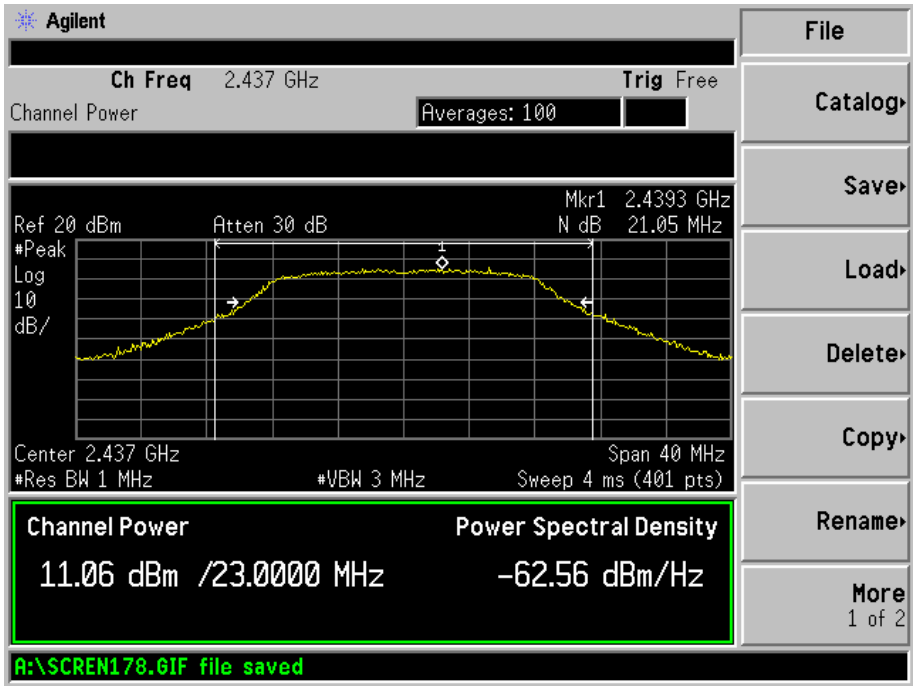

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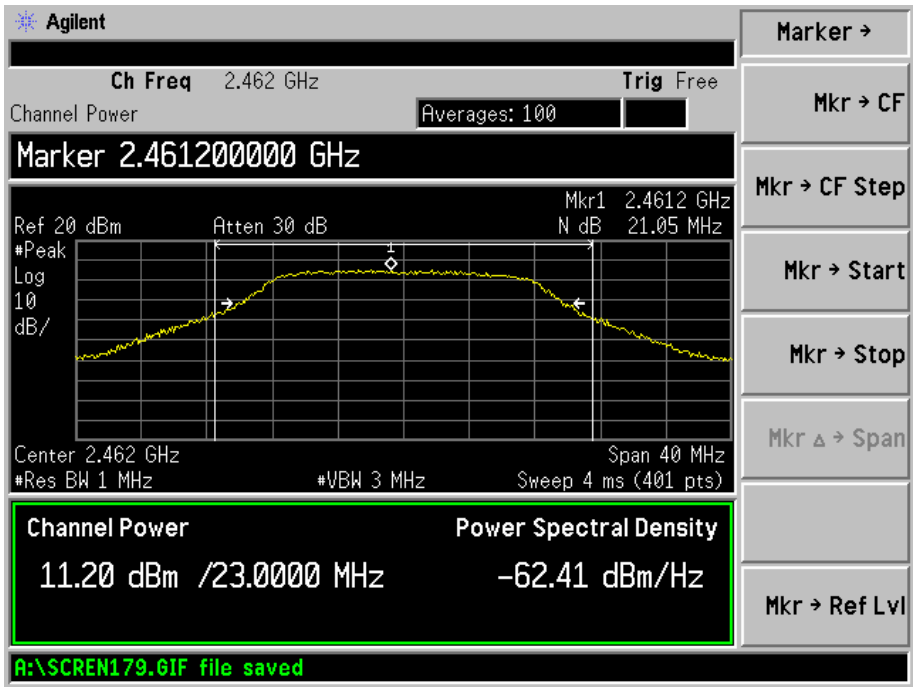

For 802.11n_MCS 0

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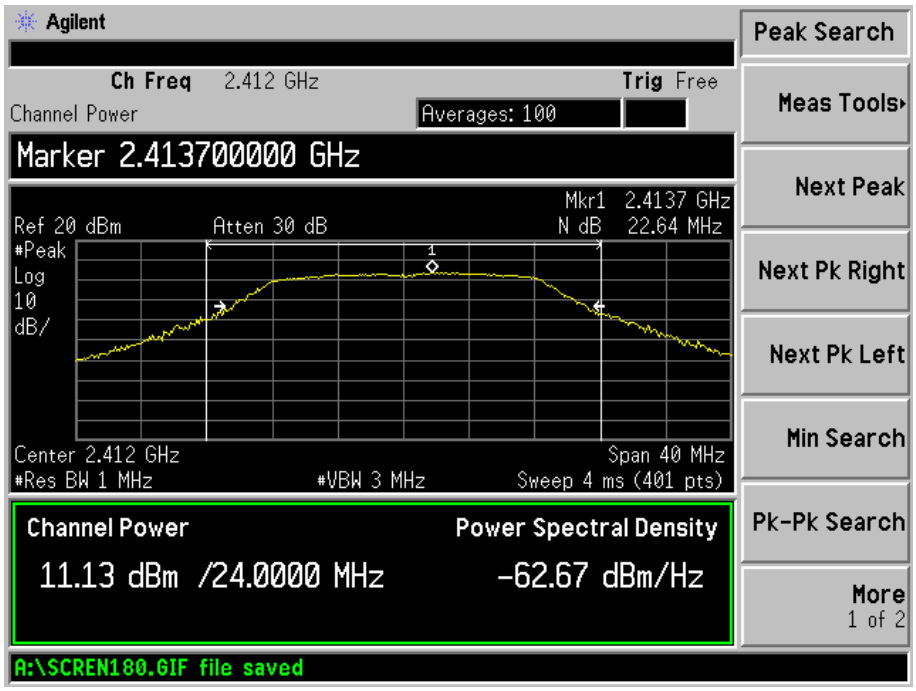

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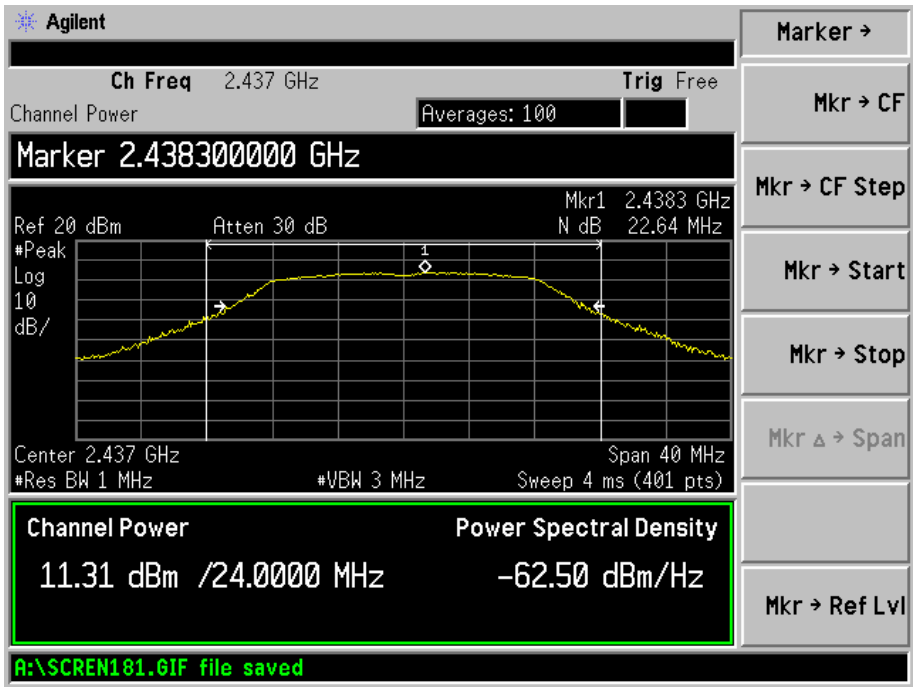

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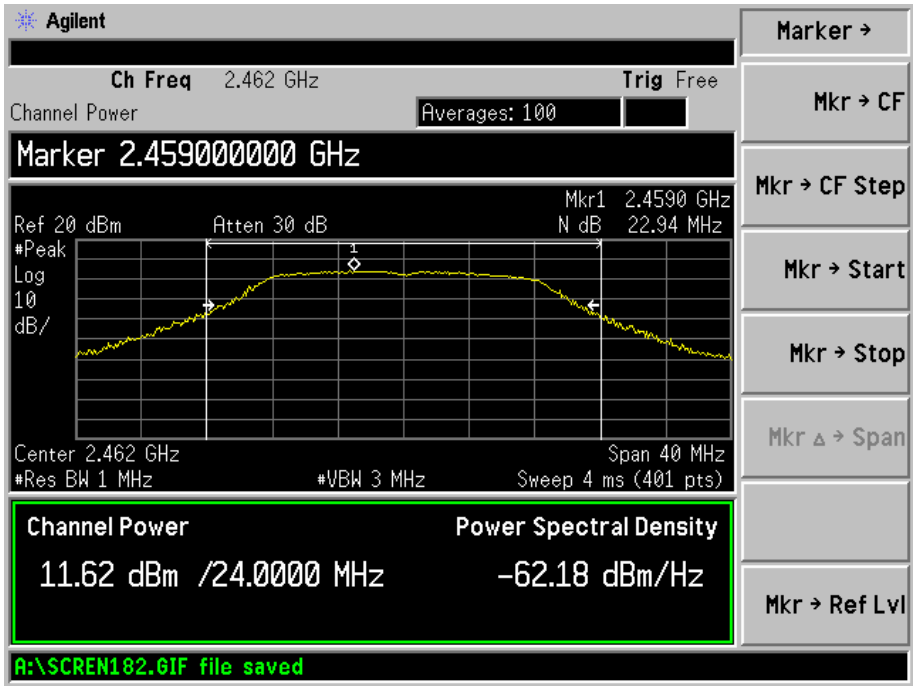

For 802.11n_MCS 7

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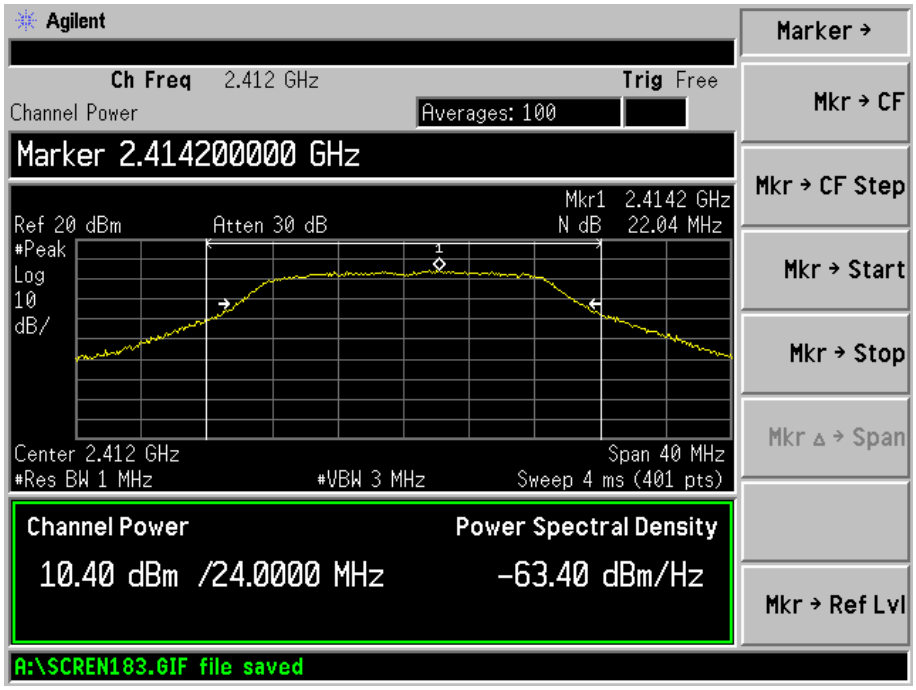
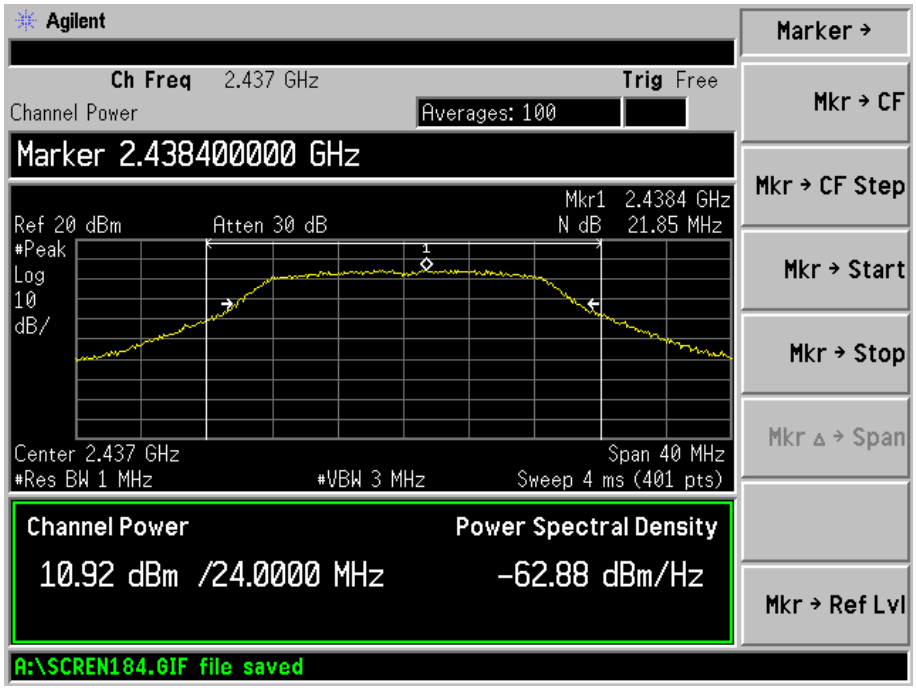
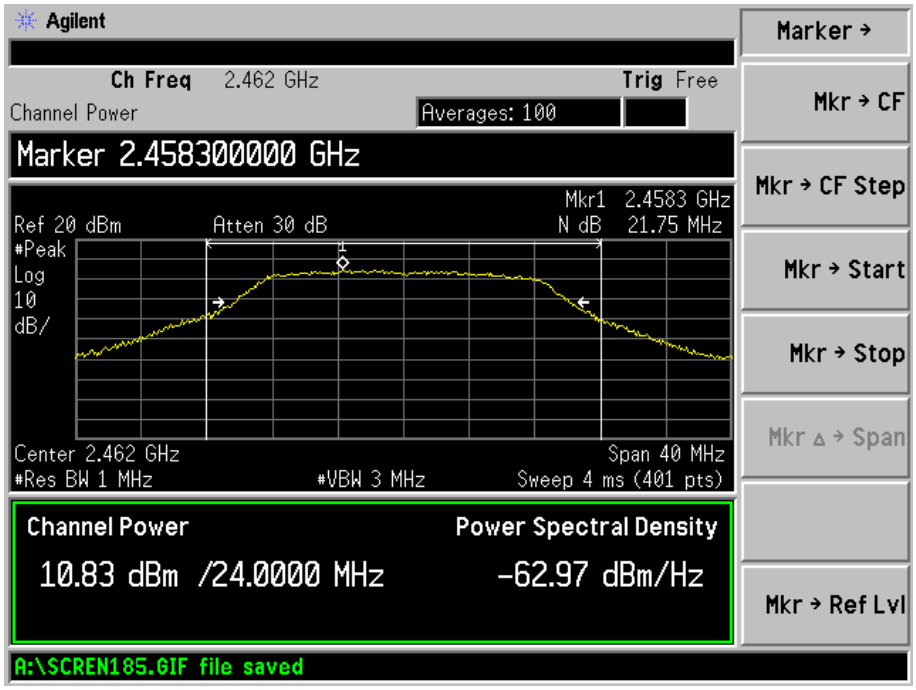


Middle Channel:



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).

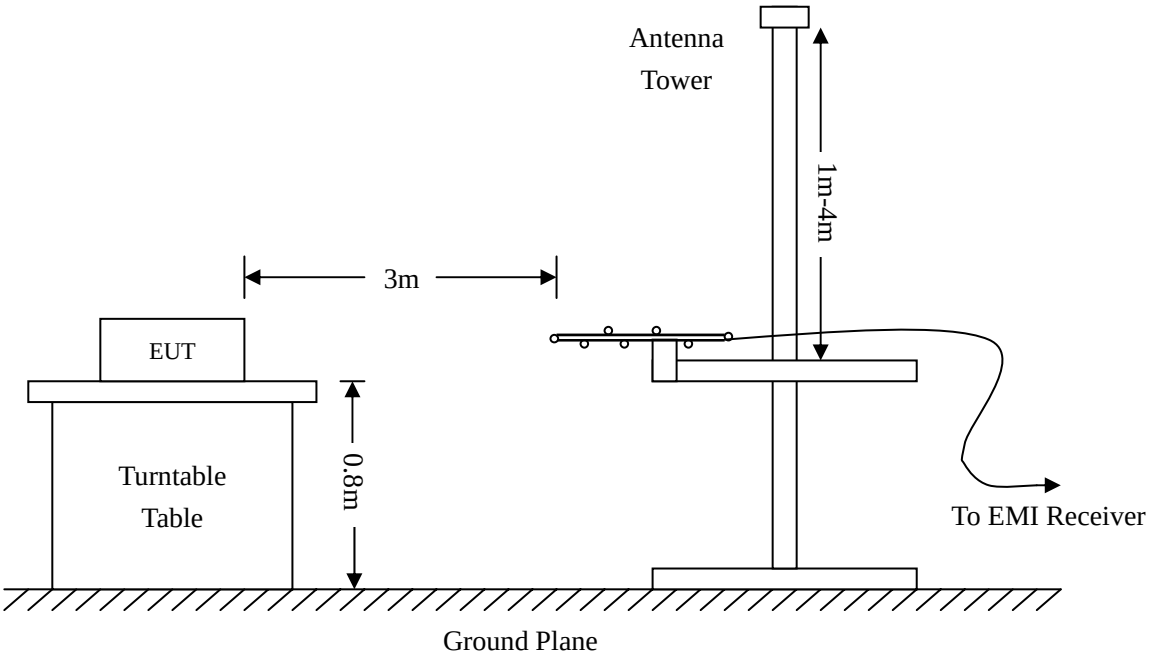
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

7.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	2013-03-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2012-02-25	2013-02-24
Horn Antenna	ETS	3117	00086197	2012-02-25	2013-02-24
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2012-02-25	2013-02-24

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 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:	22° C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

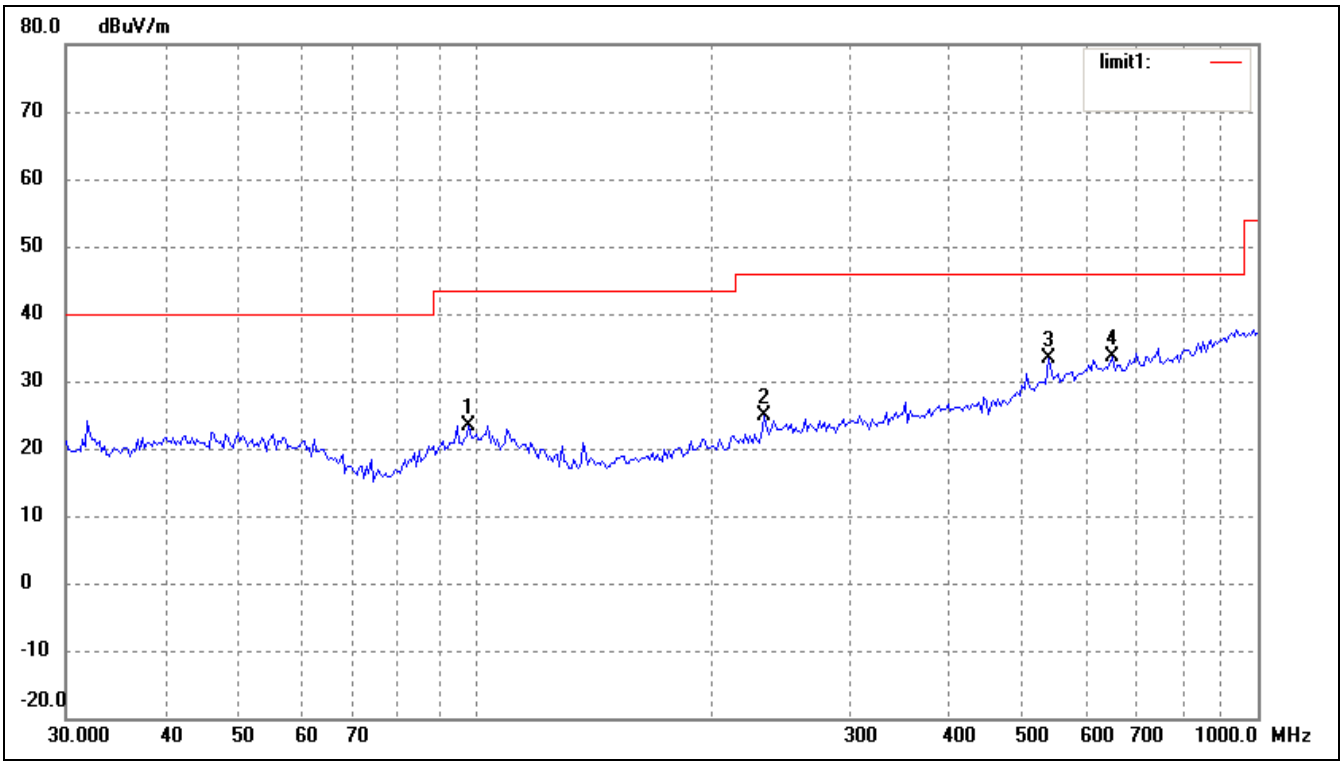
7.7 Summary of Test Results/Plots

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

-9.92 dBµV at **729.3583 MHz** in the **Horizontal** polarization, **Transmitting 802.11g Low Channel** test mode with, **9 kHz to 25 GHz, 3Meters**

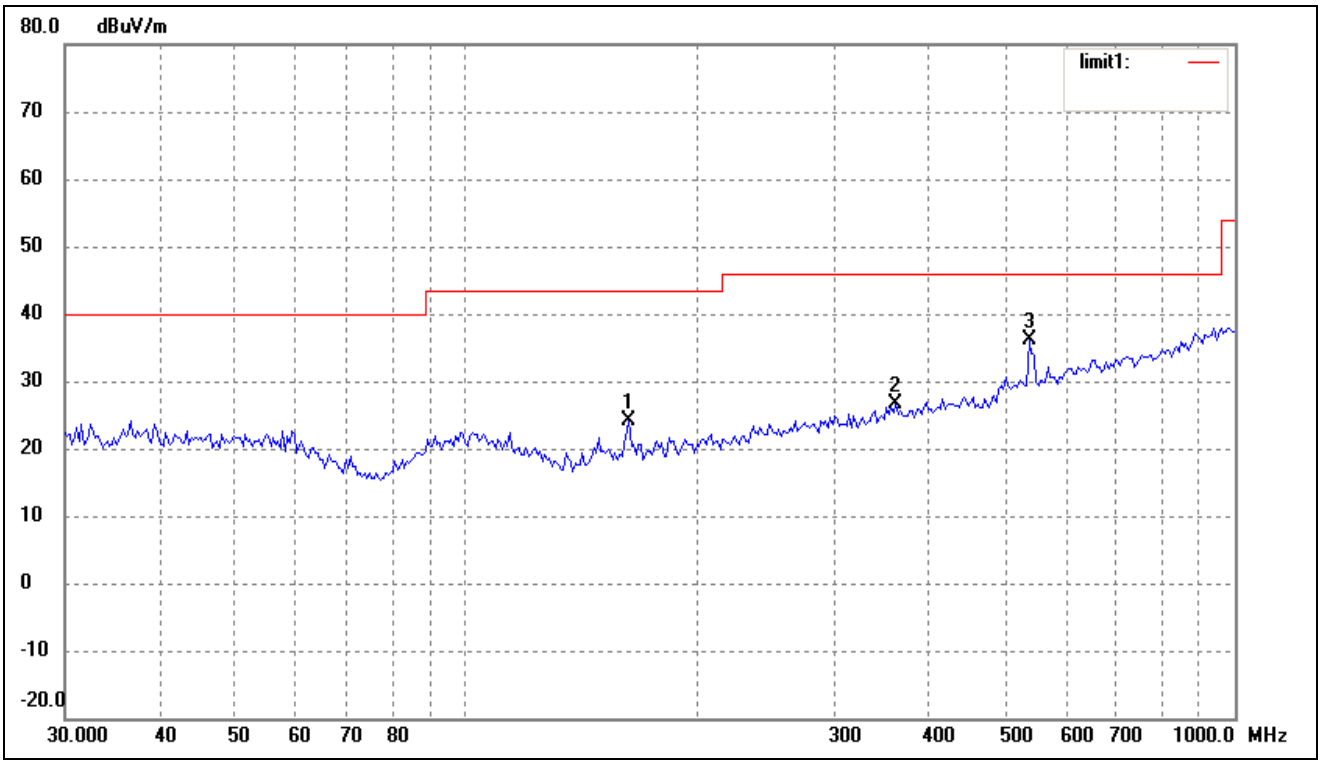
Note: *this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

Test Result/Plots:
Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11b) Low Channel (2412MHz)
Comment:
Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	98.1419	15.18	8.30	23.48	43.50	-20.02	360	100	peak
2	234.1684	16.69	8.10	24.79	46.00	-21.21	360	100	peak
3	539.4775	17.97	15.30	33.27	46.00	-12.73	360	100	peak
4	651.9417	16.43	17.11	33.54	46.00	-12.46	360	100	peak

Vertical



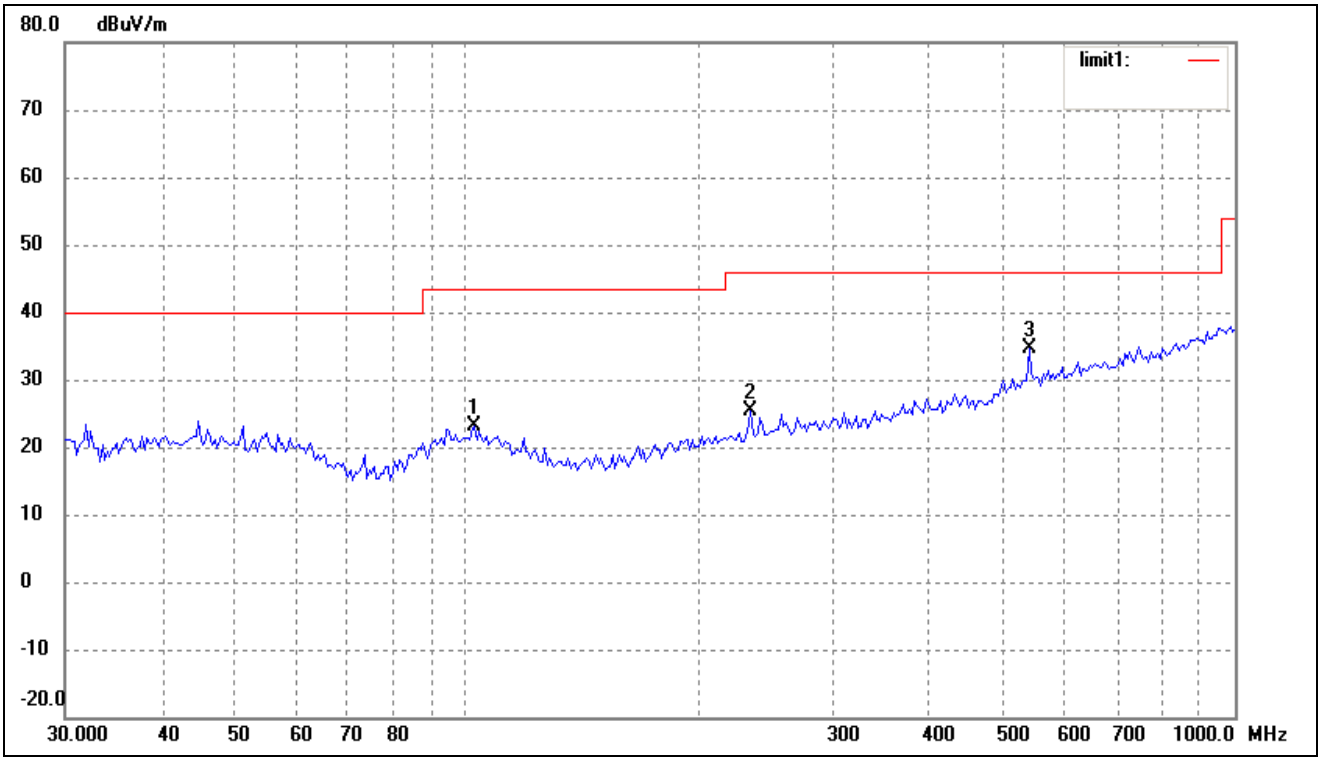
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	162.6106	19.61	4.63	24.24	43.50	-19.26	360	100	peak
2	361.7139	15.63	10.91	26.54	46.00	-19.46	360	100	peak
3	539.4775	20.78	15.30	36.08	46.00	-9.92	360	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11b) Middle Channel (2437MHz)

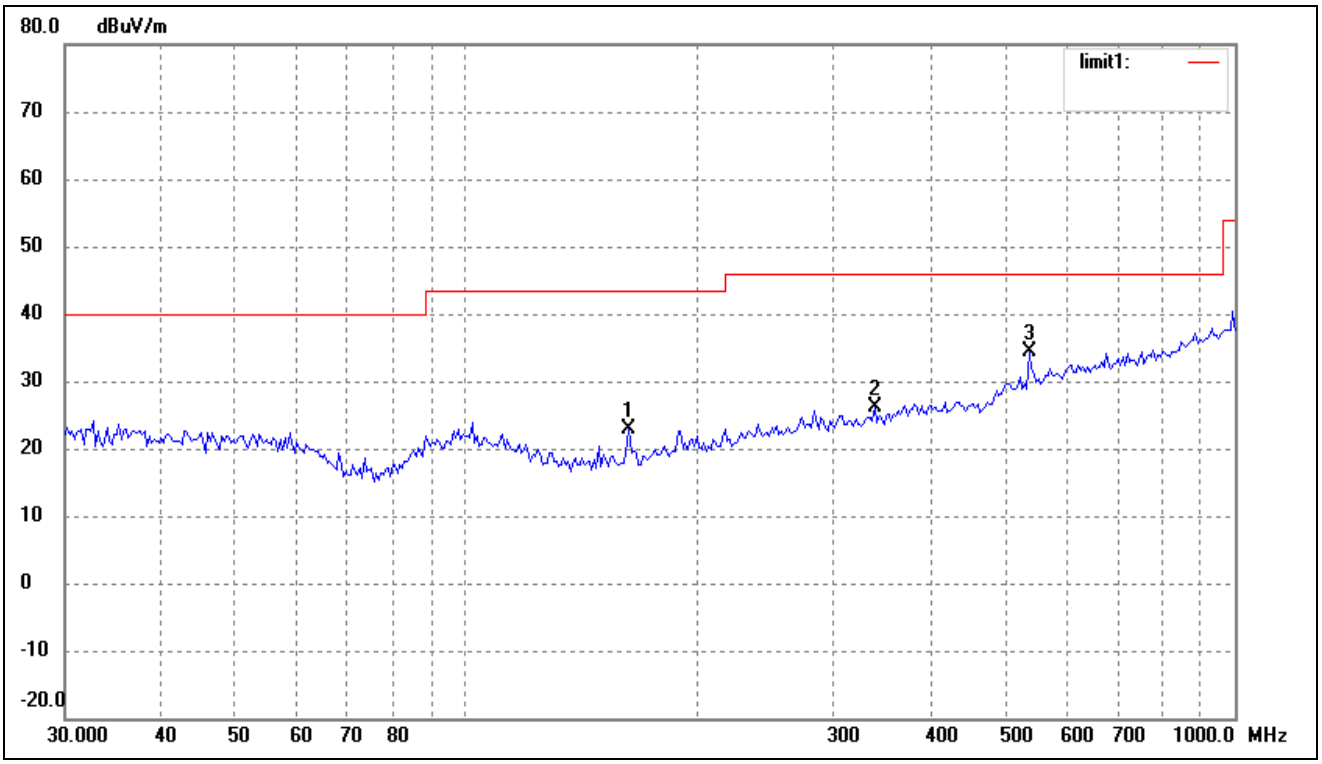
Comment:

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	102.3597	14.83	8.23	23.06	43.50	-20.44	1	100	peak
2	234.1684	17.30	8.10	25.40	46.00	-20.60	2	100	peak
3	539.4775	19.39	15.30	34.69	46.00	-11.31	3	100	peak

Vertical



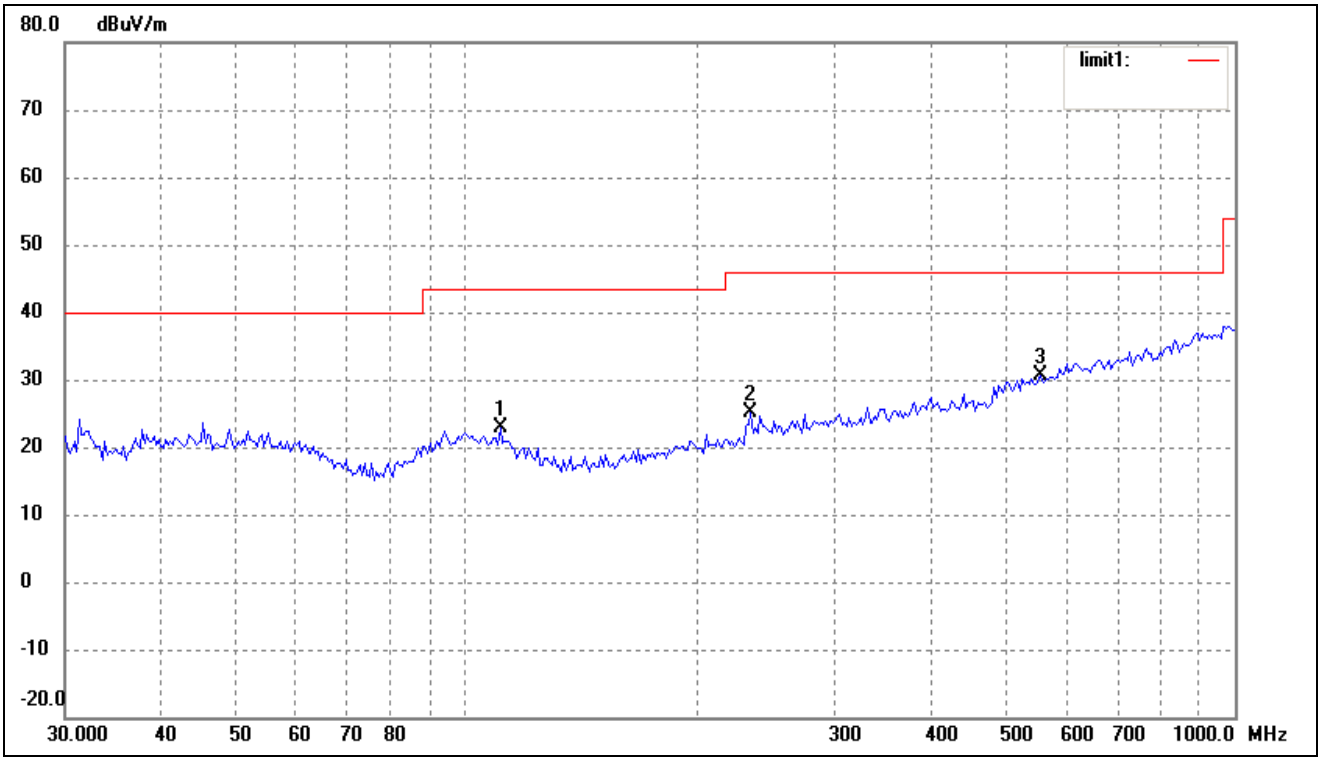
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	162.6106	18.34	4.63	22.97	43.50	-20.53	360	100	peak
2	339.5888	15.67	10.42	26.09	46.00	-19.91	360	100	peak
3	539.4775	19.00	15.30	34.30	46.00	-11.70	360	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11b) High Channel (2462MHz)

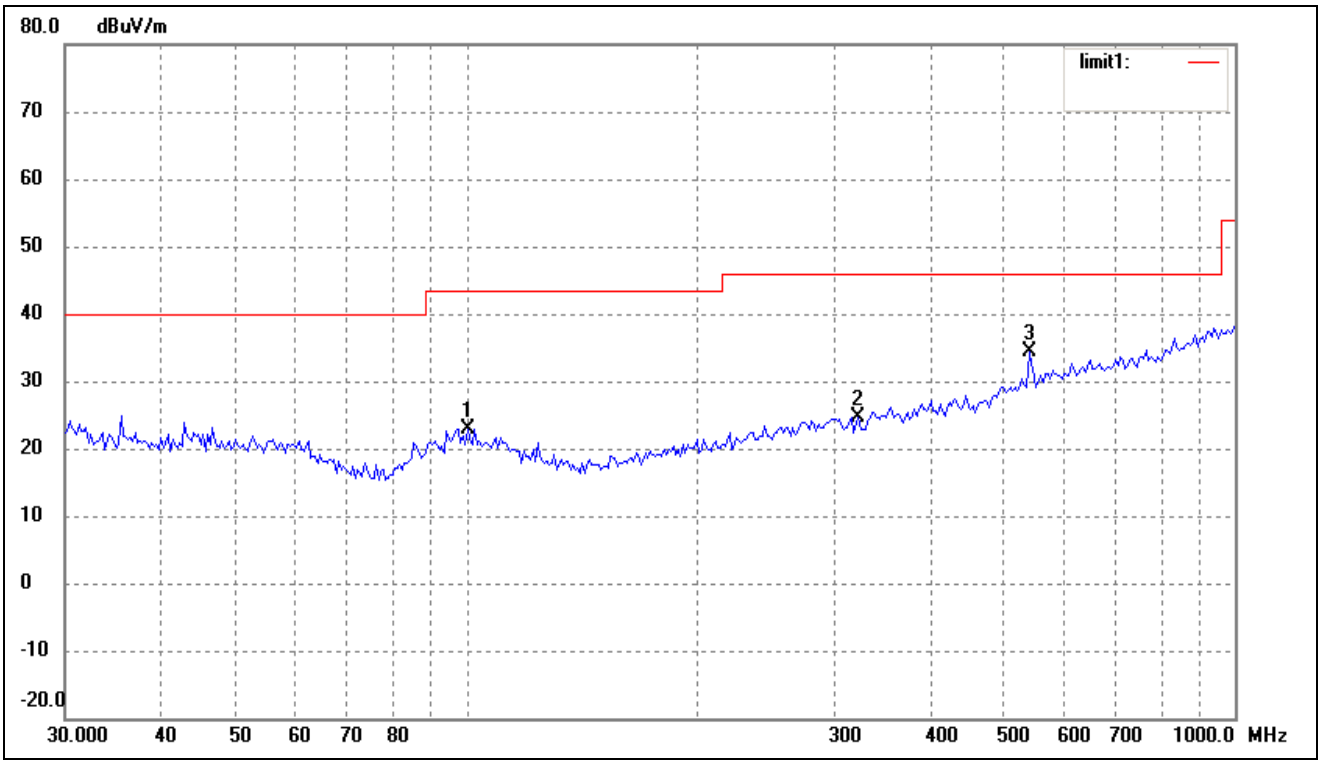
Comment:

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	110.5687	15.31	7.50	22.81	43.50	-20.69	360	100	peak
2	234.1684	16.96	8.10	25.06	46.00	-20.94	360	100	peak
3	558.7302	14.94	15.73	30.67	46.00	-15.33	360	100	peak

Vertical



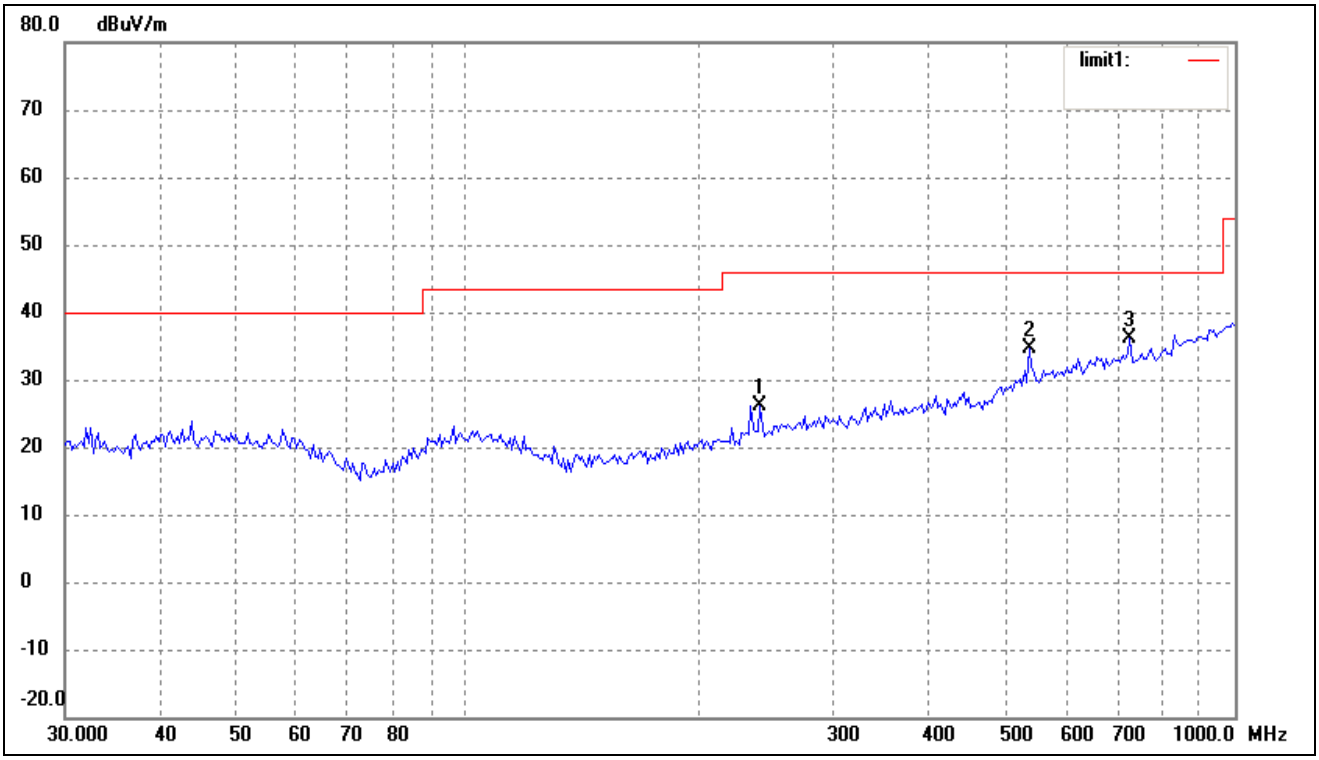
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	100.2286	14.54	8.41	22.95	43.50	-20.55	360	100	peak
2	323.3204	14.63	10.06	24.69	46.00	-21.31	360	100	peak
3	539.4775	19.19	15.30	34.49	46.00	-11.51	360	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11g) Low Channel (2412MHz)

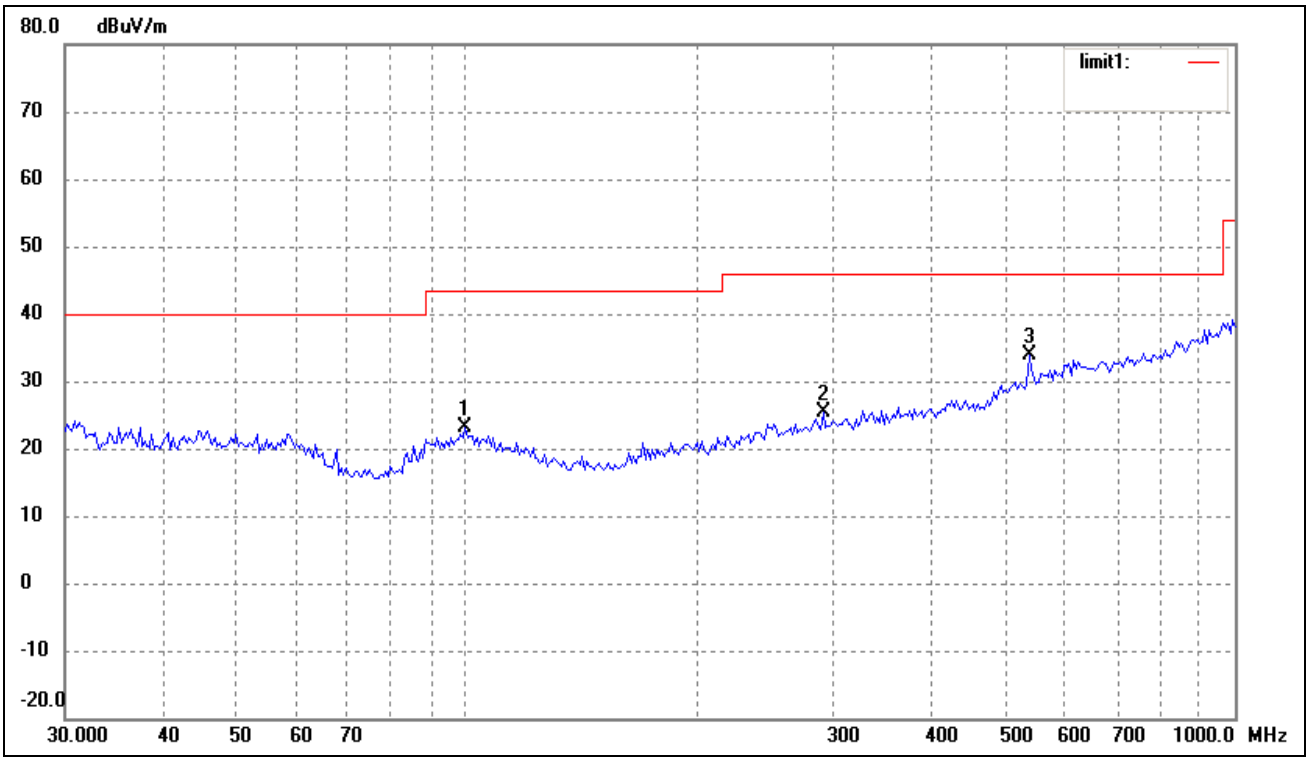
Comment:

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	240.8304	17.73	8.45	26.18	46.00	-19.82	360	100	peak
2	539.4775	19.25	15.30	34.55	46.00	-11.45	360	100	peak
3	729.3583	18.14	17.94	36.08	46.00	-9.92	360	100	peak

Vertical



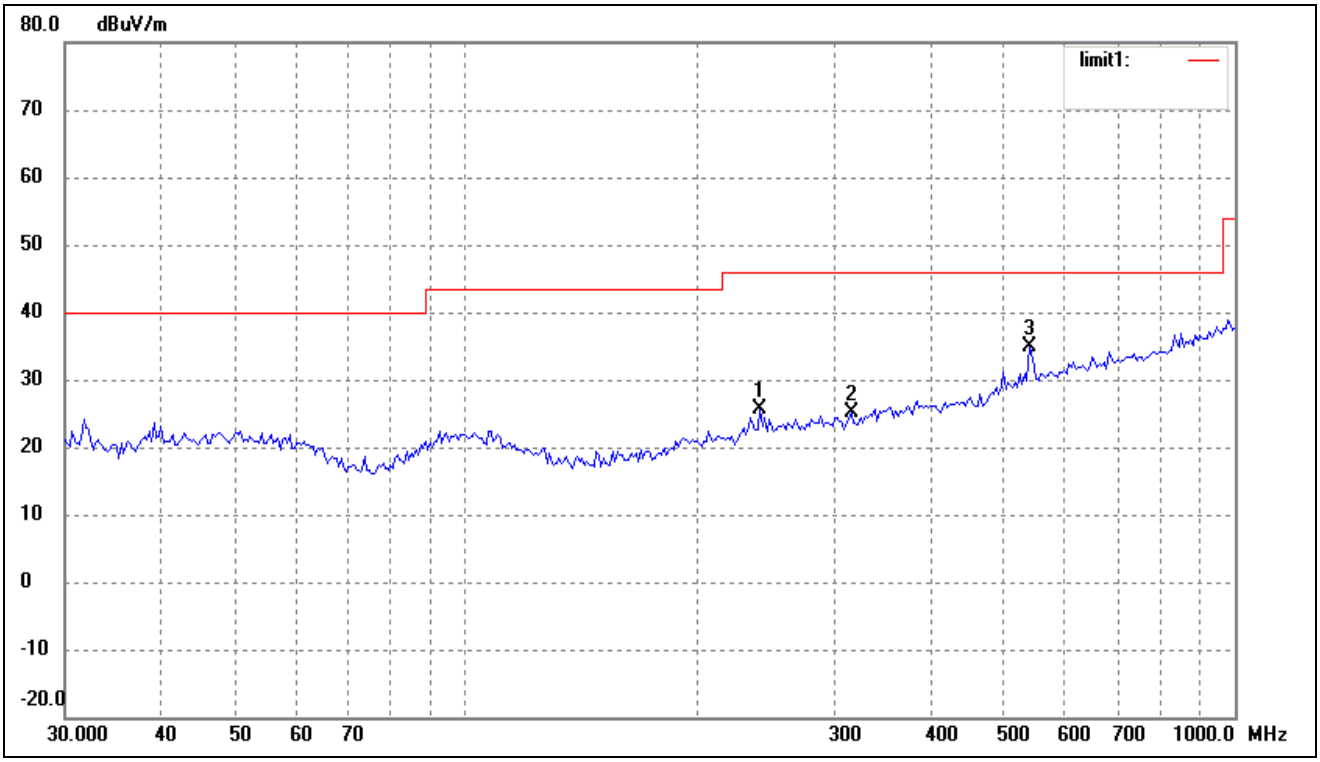
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	99.5281	14.68	8.40	23.08	43.50	-20.42	360	100	peak
2	291.0360	15.74	9.66	25.40	46.00	-20.60	360	100	peak
3	539.4775	18.49	15.30	33.79	46.00	-12.21	360	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11g) Middle Channel (2437MHz)

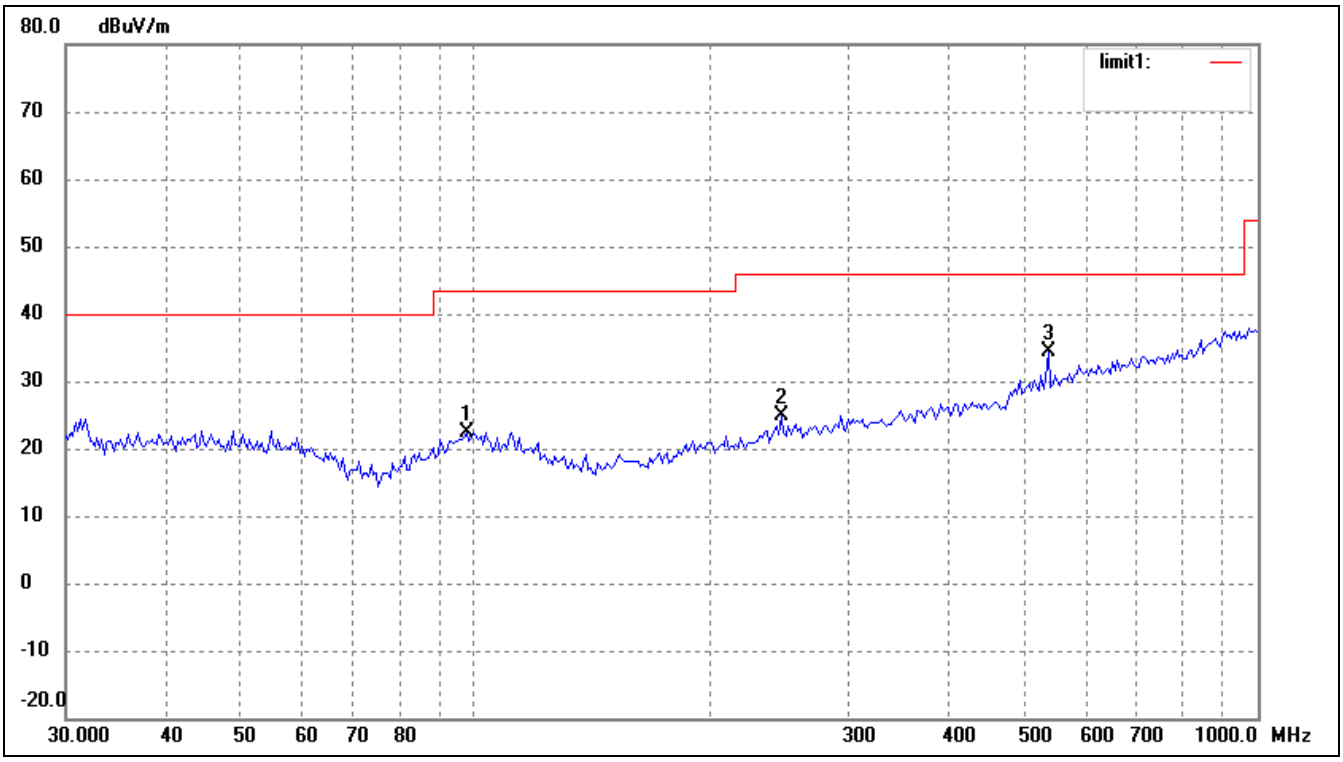
Comment:

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	240.8304	17.28	8.45	25.73	46.00	-20.27	360	100	peak
2	316.5890	15.15	9.95	25.10	46.00	-20.90	360	100	peak
3	539.4775	19.47	15.30	34.77	46.00	-11.23	360	100	peak

Vertical



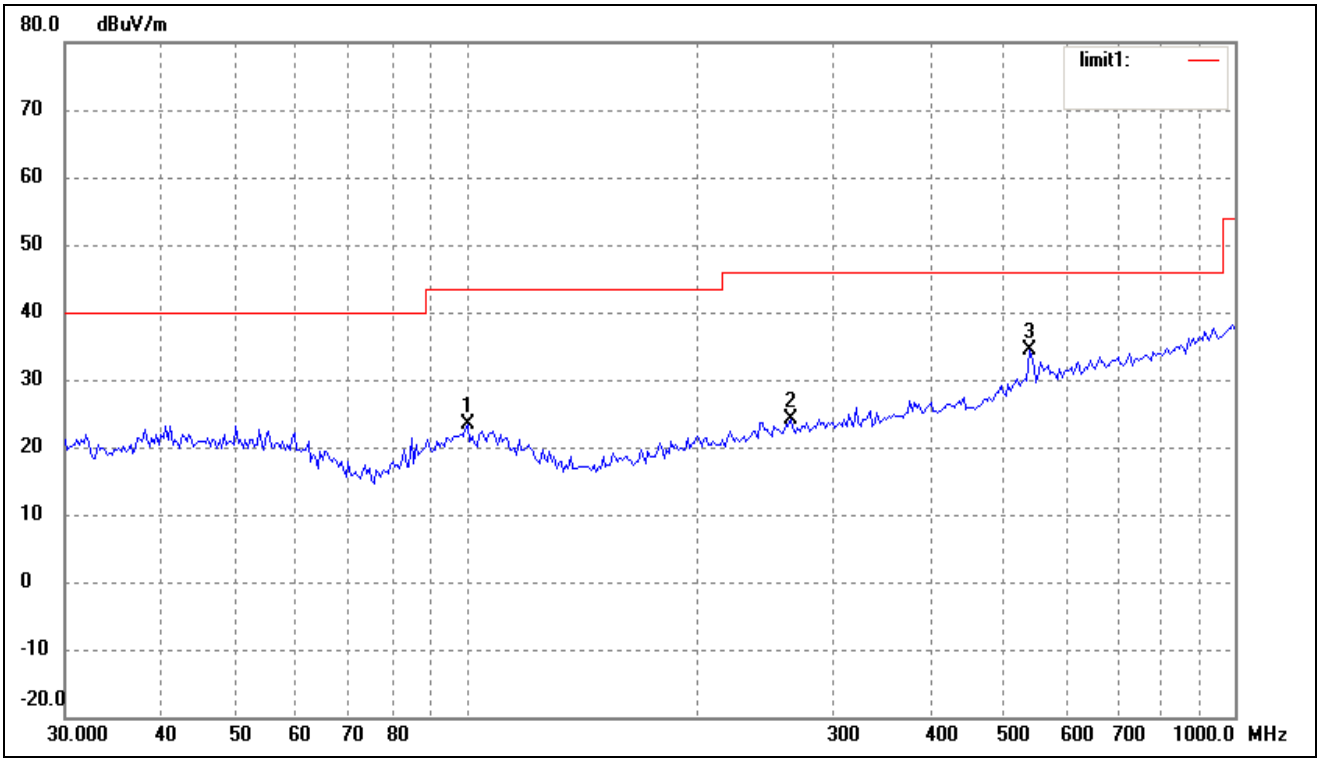
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	97.4560	14.06	8.23	22.29	43.50	-21.21	360	100	peak
2	245.9509	16.24	8.58	24.82	46.00	-21.18	360	100	peak
3	539.4775	19.11	15.30	34.41	46.00	-11.59	360	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11g) High Channel (2462MHz)

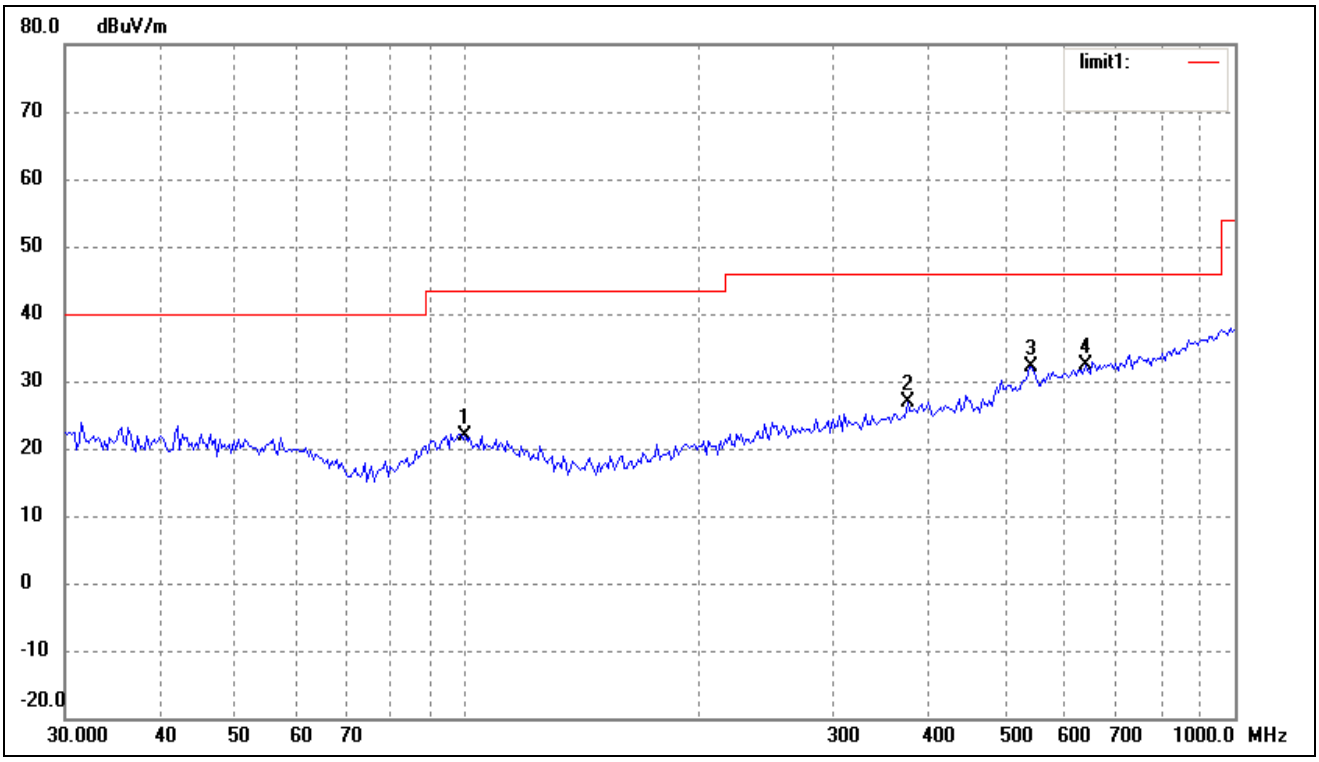
Comment:

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	100.2286	14.92	8.41	23.33	43.50	-20.17	360	100	peak
2	263.8190	15.06	9.06	24.12	46.00	-21.88	360	100	peak
3	539.4775	19.18	15.30	34.48	46.00	-11.52	360	100	peak

Vertical



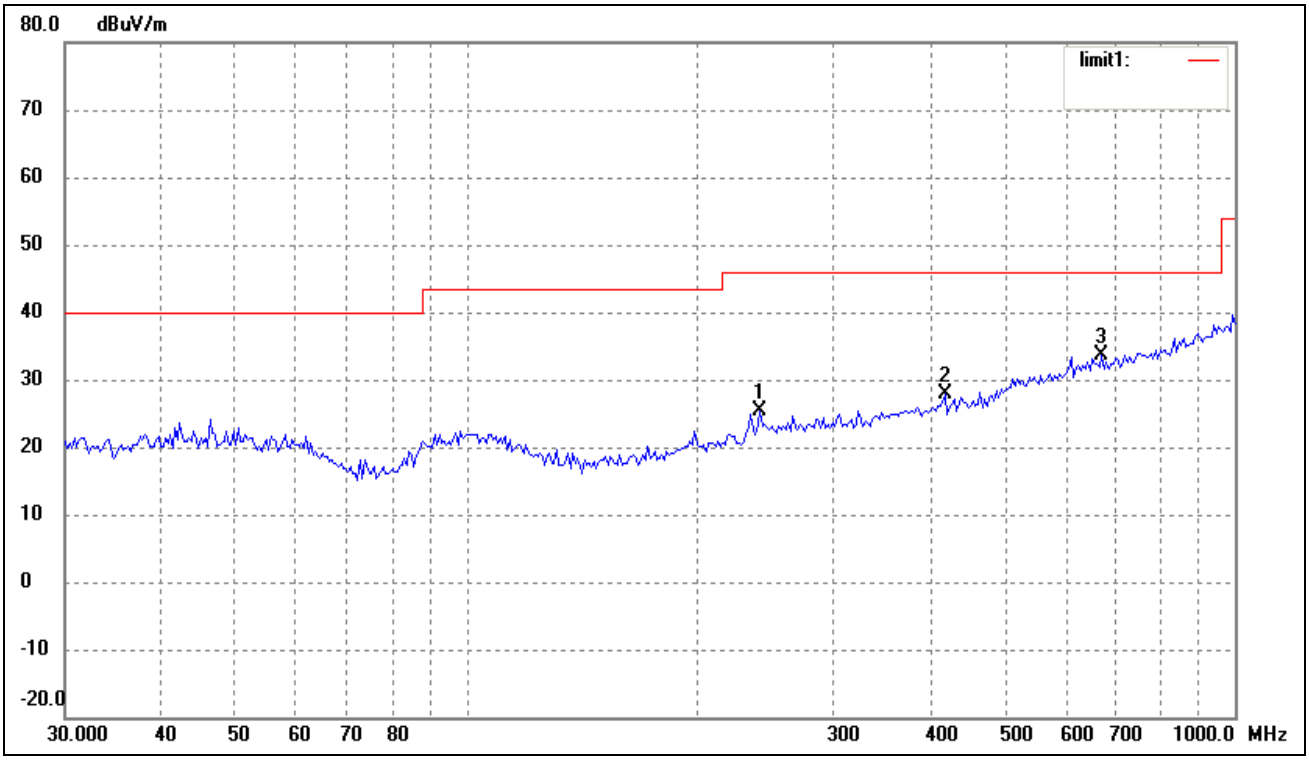
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	99.5281	13.58	8.40	21.98	43.50	-21.52	360	100	peak
2	374.6226	15.85	11.11	26.96	46.00	-19.04	360	100	peak
3	543.2742	16.82	15.38	32.20	46.00	-13.80	360	100	peak
4	638.3686	15.33	16.99	32.32	46.00	-13.68	360	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11n) Low Channel (2412MHz)

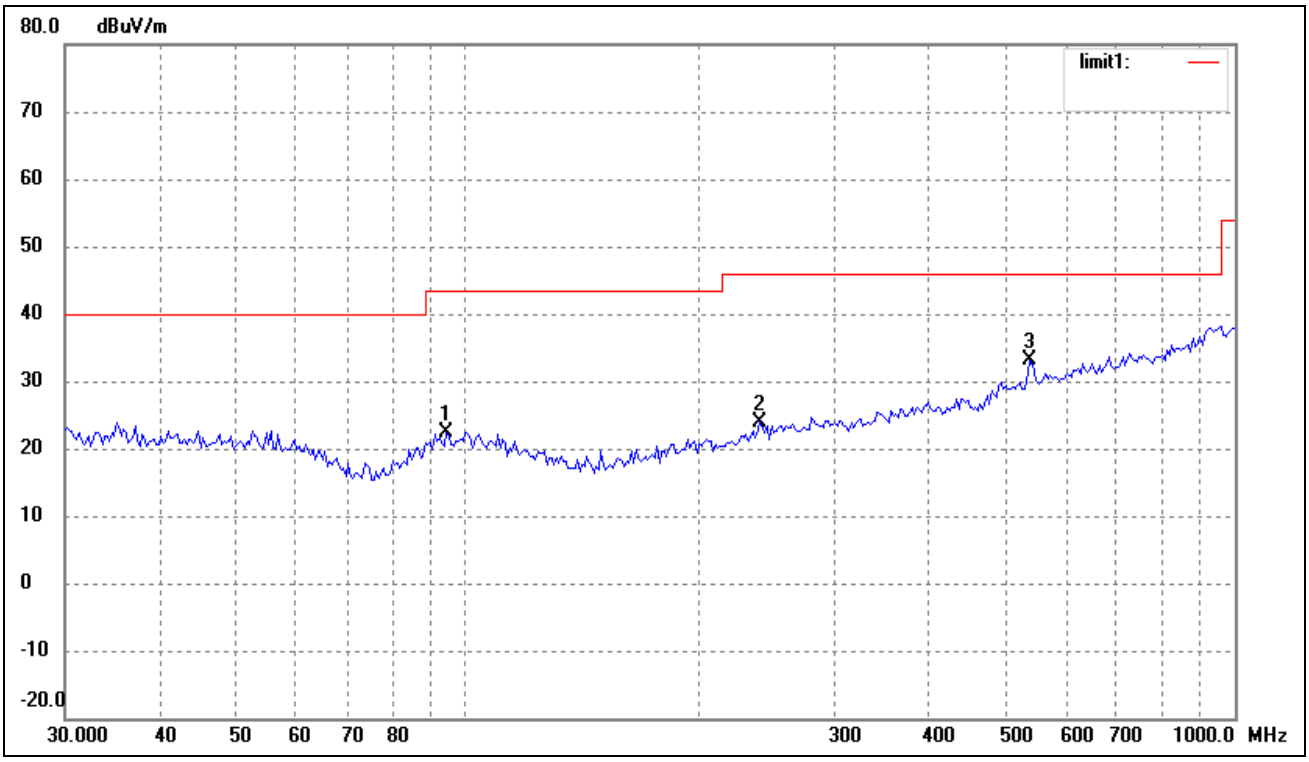
Comment:

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	240.8304	16.89	8.45	25.34	46.00	-20.66	1	100	peak
2	419.1081	16.53	11.36	27.89	46.00	-18.11	2	100	peak
3	670.4893	16.34	17.26	33.60	46.00	-12.40	3	100	peak

Vertical



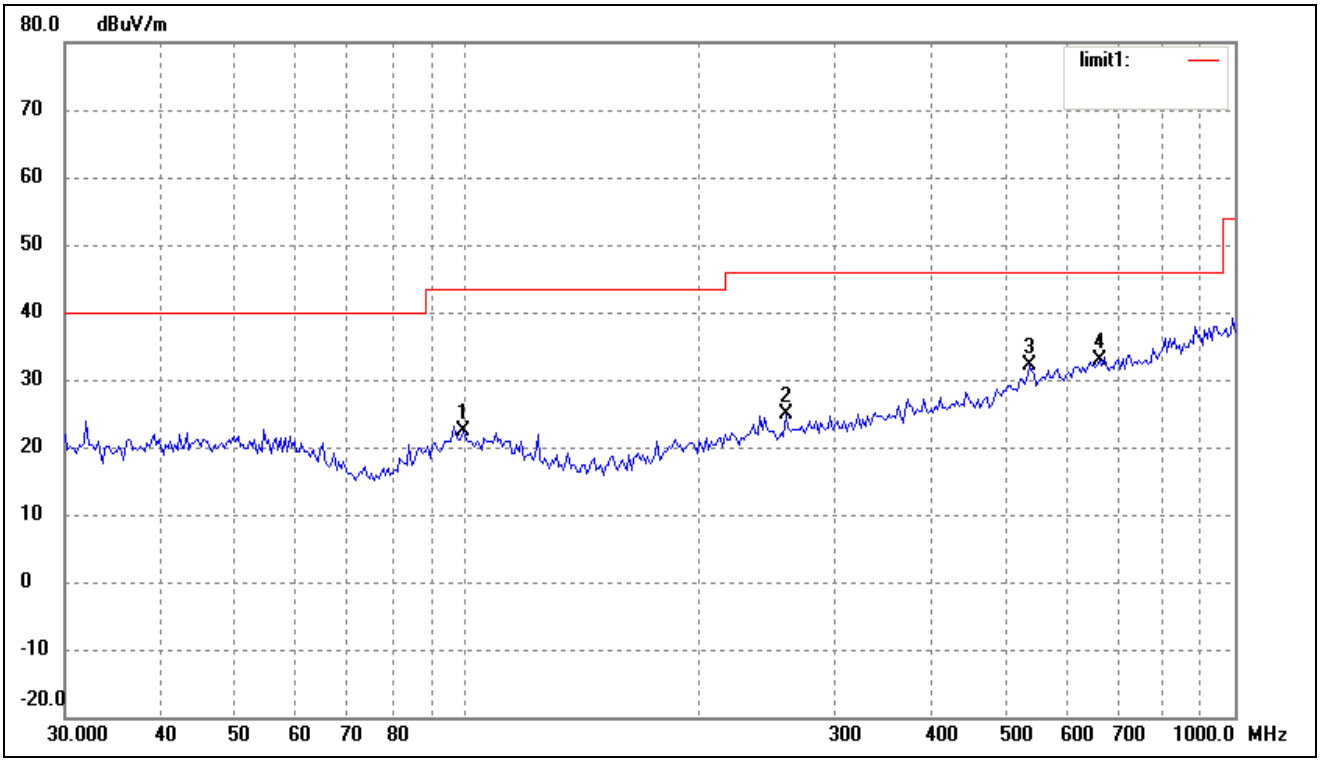
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	94.0979	14.59	7.88	22.47	43.50	-21.03	360	100	peak
2	240.8304	15.55	8.45	24.00	46.00	-22.00	360	100	peak
3	539.4775	17.76	15.30	33.06	46.00	-12.94	360	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11n) Middle Channel (2437MHz)

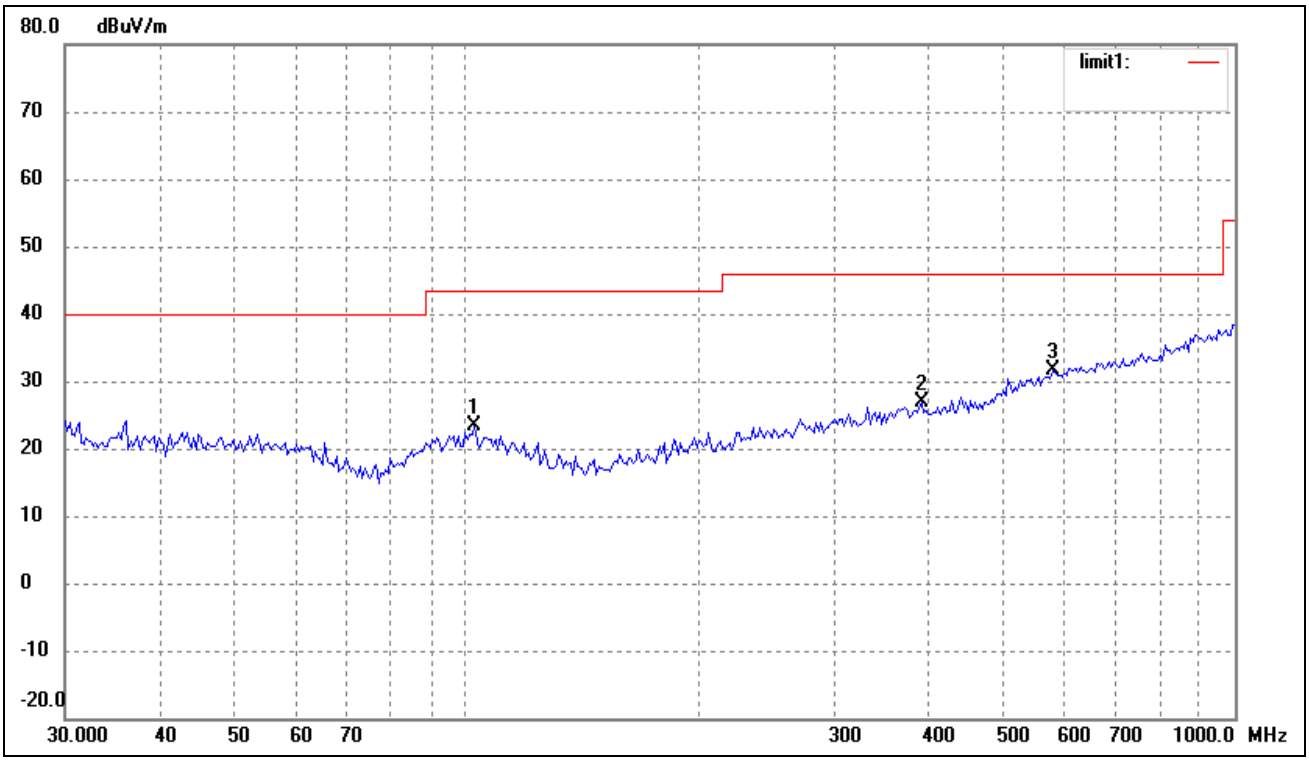
Comment:

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	98.8326	14.06	8.34	22.40	43.50	-21.10	360	100	peak
2	260.1444	16.03	8.95	24.98	46.00	-21.02	360	100	peak
3	539.4775	16.94	15.30	32.24	46.00	-13.76	360	100	peak
4	665.8035	15.66	17.22	32.88	46.00	-13.12	360	100	peak

Vertical



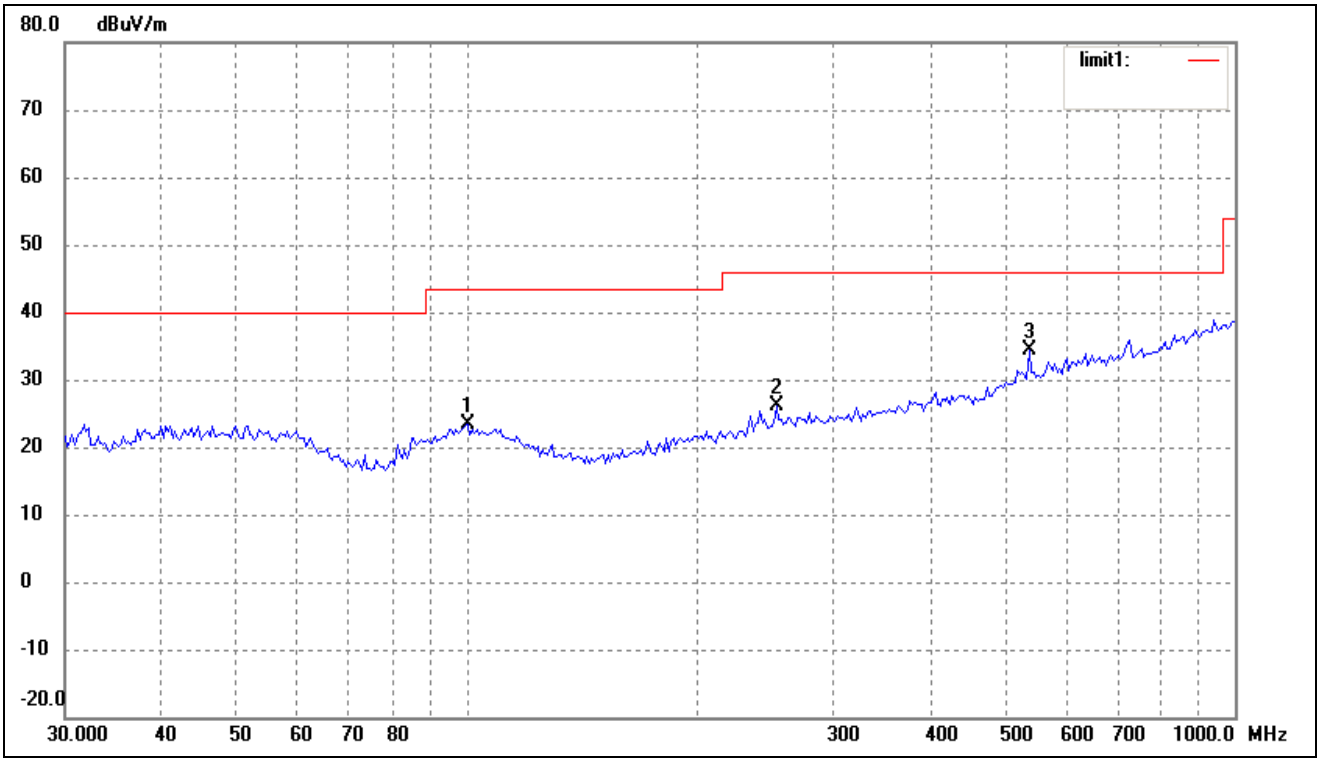
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	102.3597	15.11	8.23	23.34	43.50	-20.16	360	100	peak
2	390.7226	15.69	11.31	27.00	46.00	-19.00	360	100	peak
3	578.6699	15.46	16.18	31.64	46.00	-14.36	360	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11n) High Channel (2462MHz)

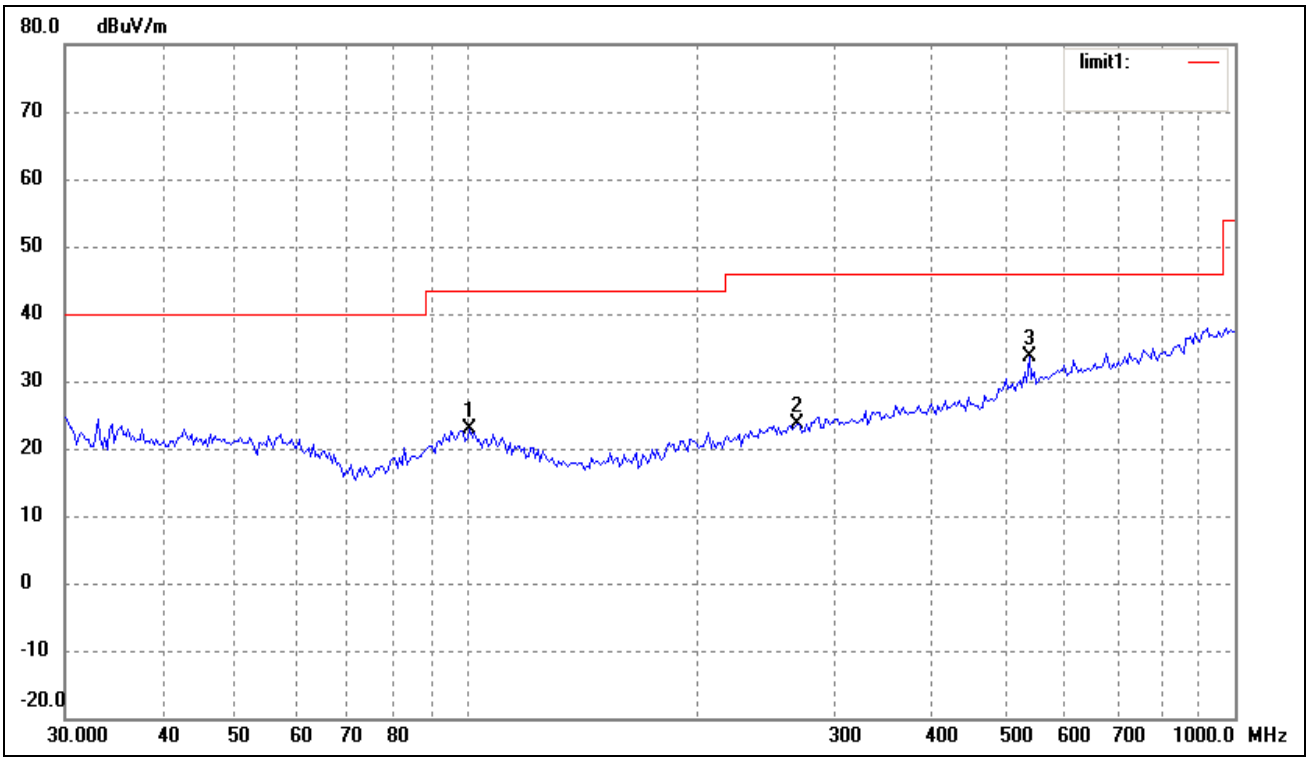
Comment:

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	100.2286	14.92	8.41	23.33	43.50	-20.17	360	100	peak
2	252.9482	17.27	8.77	26.04	46.00	-19.96	360	100	peak
3	539.4775	19.18	15.30	34.48	46.00	-11.52	360	100	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	100.9340	14.53	8.34	22.87	43.50	-20.63	360	100	peak
2	269.4284	14.35	9.22	23.57	46.00	-22.43	360	100	peak
3	539.4775	18.34	15.30	33.64	46.00	-12.36	360	100	peak

Spurious Emission above 1GHz

Test Mode: Transmitting (802.11b)

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (2412MHz)										
4824.0	PK	39.30	90	V	34.1	5.2	33.0	45.6	74	-28.40
4824.0	PK	38.90	270	H	34.1	5.2	33.0	45.2	74	-28.80
7236.0	PK	34.60	180	V	37.4	6.1	33.5	44.6	74	-29.40
7236.0	PK	35.20	45	H	37.4	6.1	33.5	45.2	74	-28.80
4824.0	AV	36.50	270	V	34.1	5.2	33.0	42.8	54	-11.20
4824.0	AV	35.70	90	H	34.1	5.2	33.0	42.0	54	-12.00
7236.0	AV	31.30	45	V	37.4	6.1	33.5	41.3	54	-12.70
7236.0	AV	30.20	60	H	37.4	6.1	33.5	40.2	54	-13.80
Middle Channel (2437MHz)										
4874.0	PK	38.90	45	V	34.1	5.2	33.0	45.2	74	-28.80
4874.0	PK	37.90	270	H	34.1	5.2	33.0	44.2	74	-29.80
7311.0	PK	32.90	45	V	37.4	6.1	33.5	42.9	74	-31.10
7311.0	PK	34.60	180	H	37.4	6.1	33.5	44.6	74	-29.40
4874.0	AV	36.00	270	V	34.1	5.2	33.0	42.3	54	-11.70
4874.0	AV	34.70	90	H	34.1	5.2	33.0	41.0	54	-13.00
7311.0	AV	29.60	60	V	37.4	6.1	33.5	39.6	54	-14.40
7311.0	AV	29.40	45	H	37.4	6.1	33.5	39.4	54	-14.60
High Channel (2462MHz)										
4924.0	PK	38.20	270	V	34.1	5.2	33.0	44.5	74	-29.50
4924.0	PK	40.30	45	H	34.1	5.2	33.0	46.6	74	-27.40
7386.0	PK	36.90	180	V	37.4	6.1	33.5	46.9	74	-27.10
7386.0	PK	33.40	45	H	37.4	6.1	33.5	43.4	74	-30.60
4924.0	AV	36.30	90	V	34.1	5.2	33.0	42.6	54	-11.40
4924.0	AV	33.70	270	H	34.1	5.2	33.0	40.0	54	-14.00
7386.0	AV	31.40	60	V	37.4	6.1	33.5	41.4	54	-12.60
7386.0	AV	29.30	60	H	37.4	6.1	33.5	39.3	54	-14.70

Spurious Emission Above 1GHz

Test Mode: Transmitting (802.11g)

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (2412MHz)										
4824.0	PK	38.90	90	V	34.1	5.2	33.0	45.2	74	-28.80
4824.0	PK	38.90	270	H	34.1	5.2	33.0	45.2	74	-28.80
7236.0	PK	33.20	180	V	37.4	6.1	33.5	43.2	74	-30.80
7236.0	PK	35.70	45	H	37.4	6.1	33.5	45.7	74	-28.30
4824.0	AV	33.90	270	V	34.1	5.2	33.0	40.2	54	-13.80
4824.0	AV	36.00	90	H	34.1	5.2	33.0	42.3	54	-11.70
7236.0	AV	29.30	45	V	37.4	6.1	33.5	39.3	54	-14.70
7236.0	AV	30.40	60	H	37.4	6.1	33.5	40.4	54	-13.60
Middle Channel (2437MHz)										
4874.0	PK	39.30	45	V	34.1	5.2	33.0	45.6	74	-28.40
4874.0	PK	37.90	270	H	34.1	5.2	33.0	44.2	74	-29.80
7311.0	PK	36.10	45	V	37.4	6.1	33.5	46.1	74	-27.90
7311.0	PK	37.30	180	H	37.4	6.1	33.5	47.3	74	-26.70
4874.0	AV	35.10	270	V	34.1	5.2	33.0	41.4	54	-12.60
4874.0	AV	36.00	90	H	34.1	5.2	33.0	42.3	54	-11.70
7311.0	AV	29.10	60	V	37.4	6.1	33.5	39.1	54	-14.90
7311.0	AV	30.20	45	H	37.4	6.1	33.5	40.2	54	-13.80
High Channel (2462MHz)										
4924.0	PK	39.30	270	V	34.1	5.2	33.0	45.6	74	-28.40
4924.0	PK	39.80	45	H	34.1	5.2	33.0	46.1	74	-27.90
7386.0	PK	34.90	180	V	37.4	6.1	33.5	44.9	74	-29.10
7386.0	PK	36.20	45	H	37.4	6.1	33.5	46.2	74	-27.80
4924.0	AV	33.90	90	V	34.1	5.2	33.0	40.2	54	-13.80
4924.0	AV	33.60	270	H	34.1	5.2	33.0	39.9	54	-14.10
7386.0	AV	30.20	60	V	37.4	6.1	33.5	40.2	54	-13.80
7386.0	AV	30.00	60	H	37.4	6.1	33.5	40.0	54	-14.00

Spurious Emission Above 1GHz

Test Mode: Transmitting (802.11n)

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (2412MHz)										
4824.0	PK	39.60	90	V	34.1	5.2	33.0	45.9	74	-28.10
4824.0	PK	39.70	270	H	34.1	5.2	33.0	46.0	74	-28.00
7236.0	PK	35.30	180	V	37.4	6.1	33.5	45.3	74	-28.70
7236.0	PK	34.90	45	H	37.4	6.1	33.5	44.9	74	-29.10
4824.0	AV	35.80	270	V	34.1	5.2	33.0	42.1	54	-11.90
4824.0	AV	33.90	90	H	34.1	5.2	33.0	40.2	54	-13.80
7236.0	AV	29.50	45	V	37.4	6.1	33.5	39.5	54	-14.50
7236.0	AV	29.50	60	H	37.4	6.1	33.5	39.5	54	-14.50
Middle Channel (2437MHz)										
4874.0	PK	38.70	45	V	34.1	5.2	33.0	45.0	74	-29.00
4874.0	PK	39.90	270	H	34.1	5.2	33.0	46.2	74	-27.80
7311.0	PK	33.60	45	V	37.4	6.1	33.5	43.6	74	-30.40
7311.0	PK	35.30	180	H	37.4	6.1	33.5	45.3	74	-28.70
4874.0	AV	39.50	270	V	34.1	5.2	33.0	45.8	54	-8.20
4874.0	AV	33.40	90	H	34.1	5.2	33.0	39.7	54	-14.30
7311.0	AV	29.70	60	V	37.4	6.1	33.5	39.7	54	-14.30
7311.0	AV	30.20	45	H	37.4	6.1	33.5	40.2	54	-13.80
High Channel (2462MHz)										
4924.0	PK	39.30	270	V	34.1	5.2	33.0	45.6	74	-28.40
4924.0	PK	40.20	45	H	34.1	5.2	33.0	46.5	74	-27.50
7386.0	PK	35.00	180	V	37.4	6.1	33.5	45.0	74	-29.00
7386.0	PK	34.30	45	H	37.4	6.1	33.5	44.3	74	-29.70
4924.0	AV	33.90	90	V	34.1	5.2	33.0	40.2	54	-13.80
4924.0	AV	32.90	270	H	34.1	5.2	33.0	39.2	54	-14.80
7386.0	AV	29.20	60	V	37.4	6.1	33.5	39.2	54	-14.80
7386.0	AV	29.80	60	H	37.4	6.1	33.5	39.8	54	-14.20

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
The measurements greater than 20dB below the limit from 9kHz to 30MHz..

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.

8.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	2013-03-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2012-02-25	2013-02-24
Horn Antenna	ETS	3117	00086197	2012-02-25	2013-02-24

8.3 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 the spectrum analyzer as RBW, VBW=100KHz, Span=50MHz, Sweep = auto
3. Set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2438.5MHz, then mark the higher-level emission for comparing with the FCC rules.

8.4 Environmental Conditions

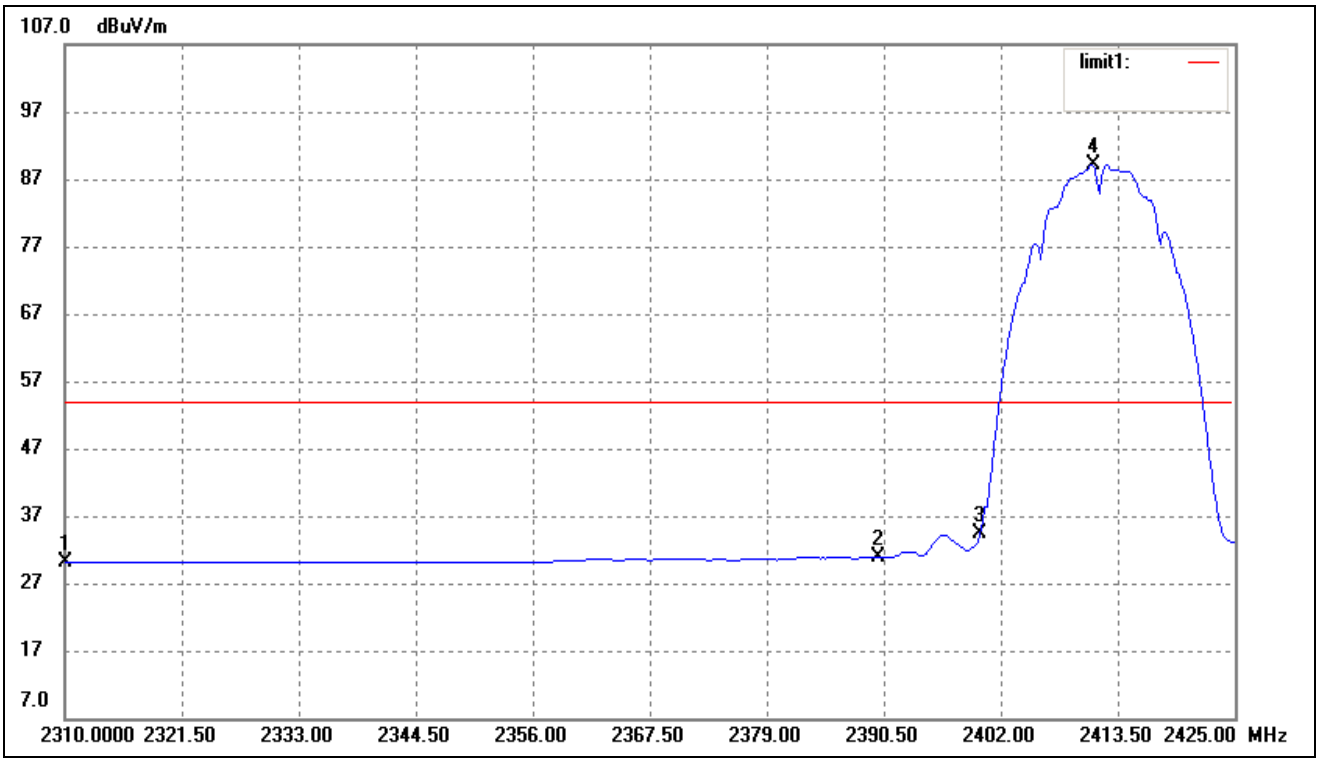
Temperature:	21° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

8.5 Summary of Test Results/Plots

Test mode	Frequency MHz	Limit dBuV /dB	Result
802.11b	2390.00	<54dBuv	Pass
	2400.00	>20dB ATT	Pass
	2483.50	<54dBuv	Pass
	2488.24	<54dBuv	Pass
	2500.00	<54dBuv	Pass
802.11g	2390.00	<54dBuv	Pass
	2400.00	>20dB ATT	Pass
	2483.50	<54dBuv	Pass
	2500.00	<54dBuv	Pass
802.11n	2390.00	<54dBuv	Pass
	2400.00	>20dB ATT	Pass
	2483.50	<54dBuv	Pass
	2500.00	<54dBuv	Pass

For 802.11b

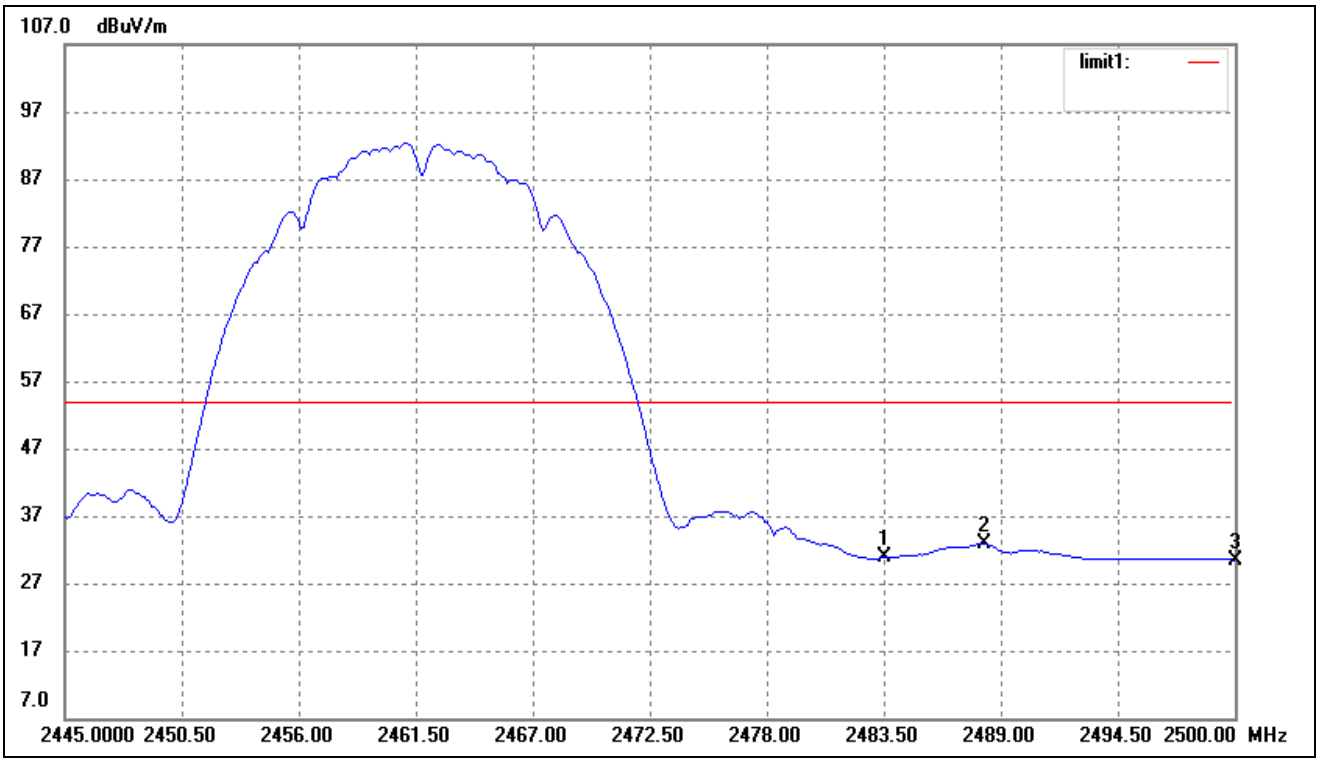
Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2310.000	37.59	-7.51	30.08	54.00	-23.92	136	100	Ave
	2310.000	50.50	-7.51	42.99	74.00	-31.01	136	100	peak
2	2390.000	38.29	-7.34	30.95	54.00	-23.05	136	100	Ave
	2390.000	50.71	-7.34	43.37	74.00	-30.63	136	100	peak
3	2400.000	41.72	-7.31	34.41	54.00	-19.59	136	100	Ave
	2400.000	53.44	-7.31	46.13	74.00	-27.87	136	100	peak
4	2411.137	96.38	-7.28	89.10			136	100	Ave

For 802.11b

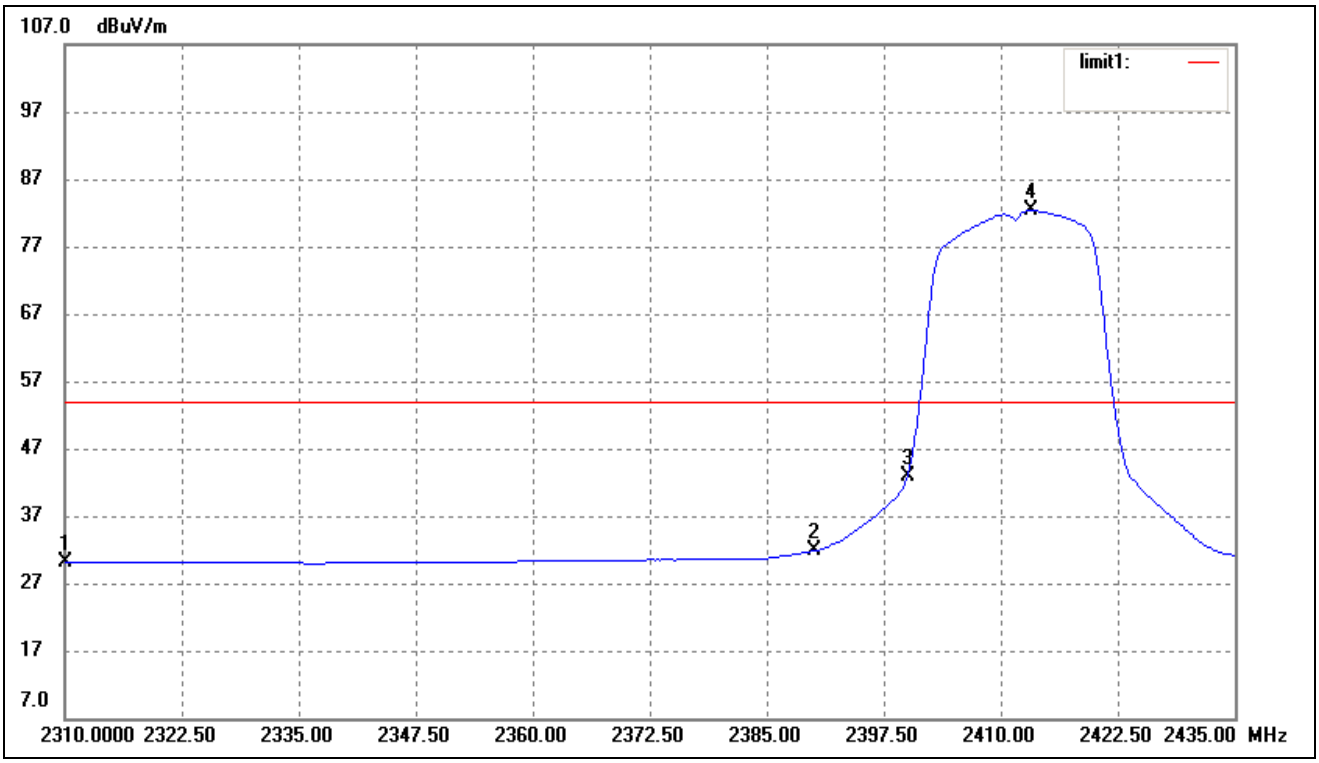
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	37.98	-7.13	30.85	54.00	-23.15	136	100	Ave
	2483.500	50.96	-7.13	43.83	74.00	-30.17	136	100	Peak
2	2488.238	40.01	-7.11	32.90	54.00	-21.10	136	100	Ave
	2488.238	53.21	-7.11	46.01	74.00	-27.99	136	100	Peak
2	2500.000	37.57	-7.08	30.49	54.00	-23.51	136	100	Ave
	2500.000	50.45	-7.08	43.37	74.00	-30.63	136	100	Peak

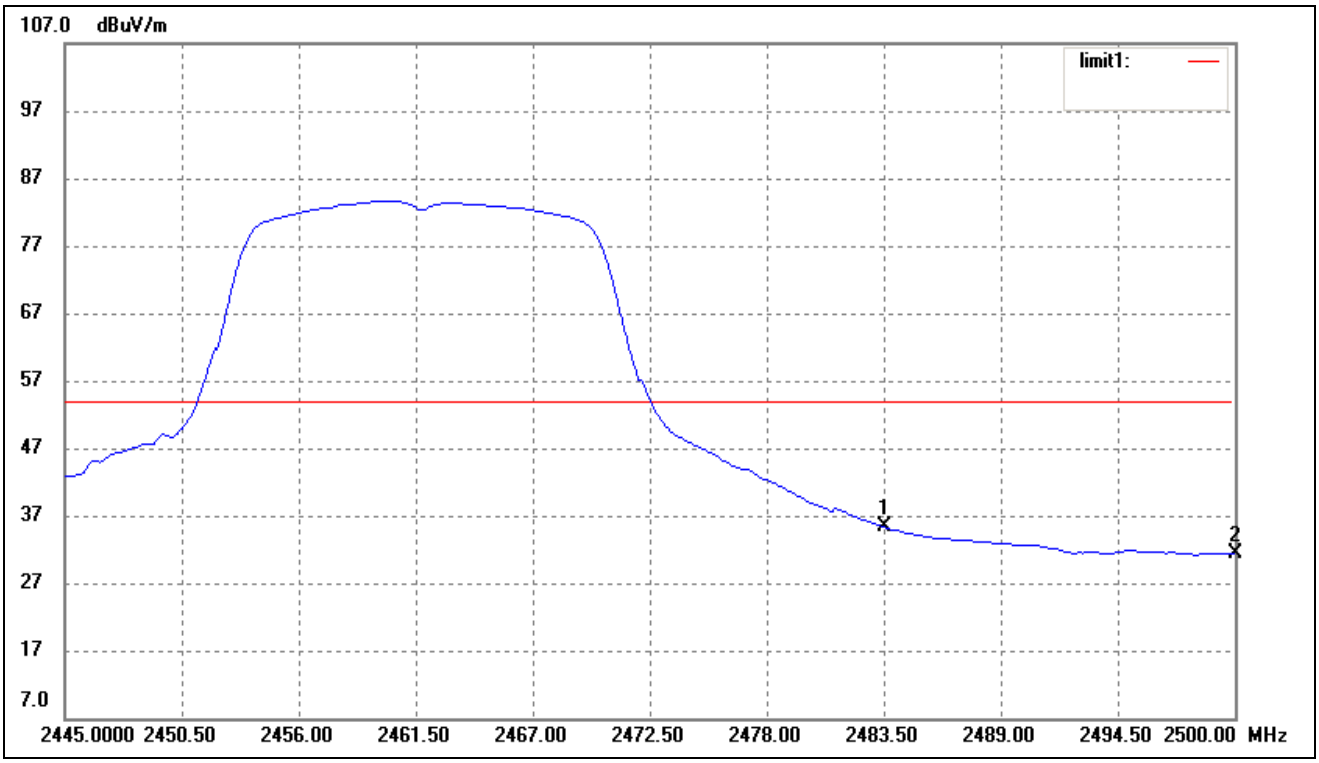
For 802.11g

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	(°)	(cm)	
1	2310.000	37.54	-7.51	30.03	54.00	-23.97	136	100	Ave
	2310.000	50.36	-7.51	42.85	74.00	-31.15	136	100	peak
2	2390.000	39.26	-7.34	31.92	54.00	-22.08	136	100	Ave
	2390.000	52.72	-7.34	45.38	74.00	-28.62	136	100	peak
3	2400.000	50.23	-7.31	42.92	54.00	-11.08	136	100	Ave
	2400.000	78.78	-7.31	71.47	74.00	-2.53	136	100	peak
4	2413.283	89.60	-7.28	82.32			136	100	Ave

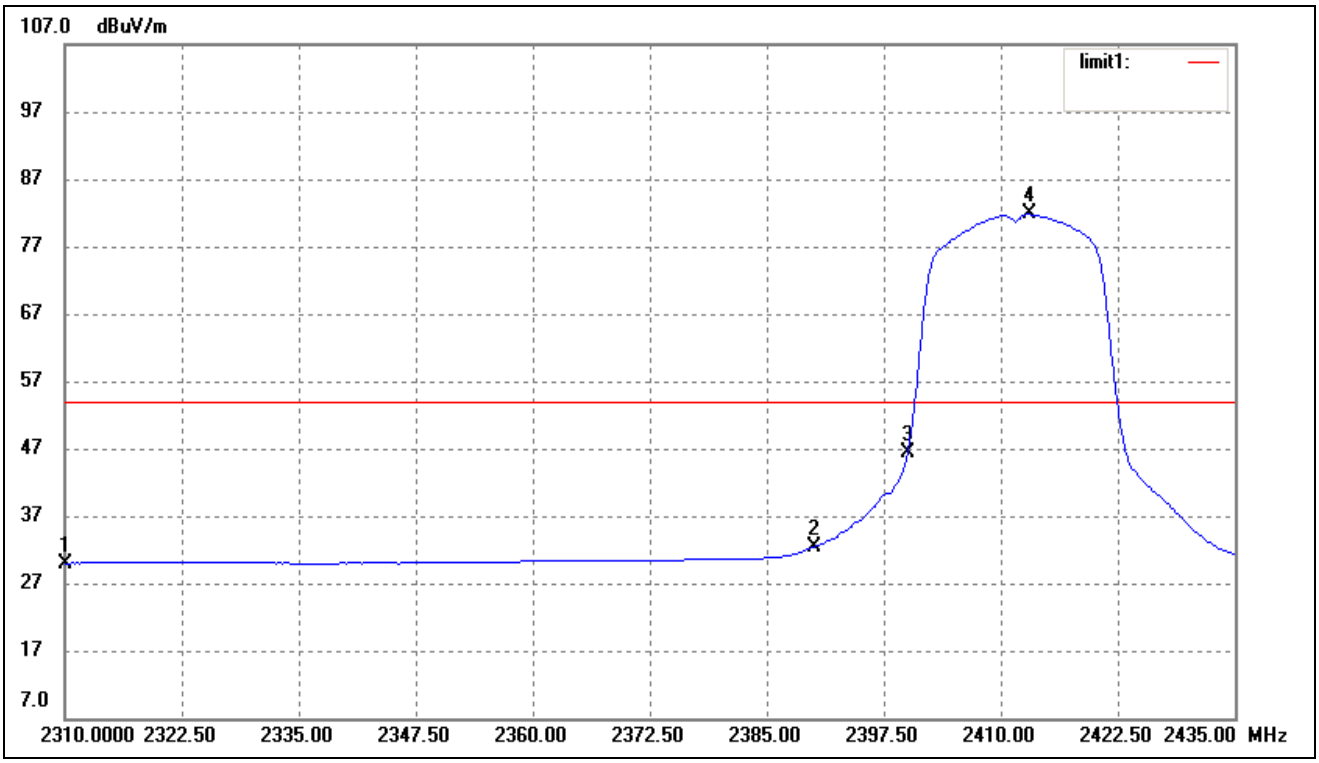
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	(°)	(cm)	
1	2483.500	42.46	-7.13	35.33	54.00	-18.67	136	100	Ave
	2483.500	56.59	-7.13	49.46	74.00	-24.54	136	100	peak
2	2500.000	38.38	-7.08	31.30	54.00	-22.70	136	100	Ave
	2500.000	51.07	-7.08	43.99	74.00	-30.01	136	100	peak

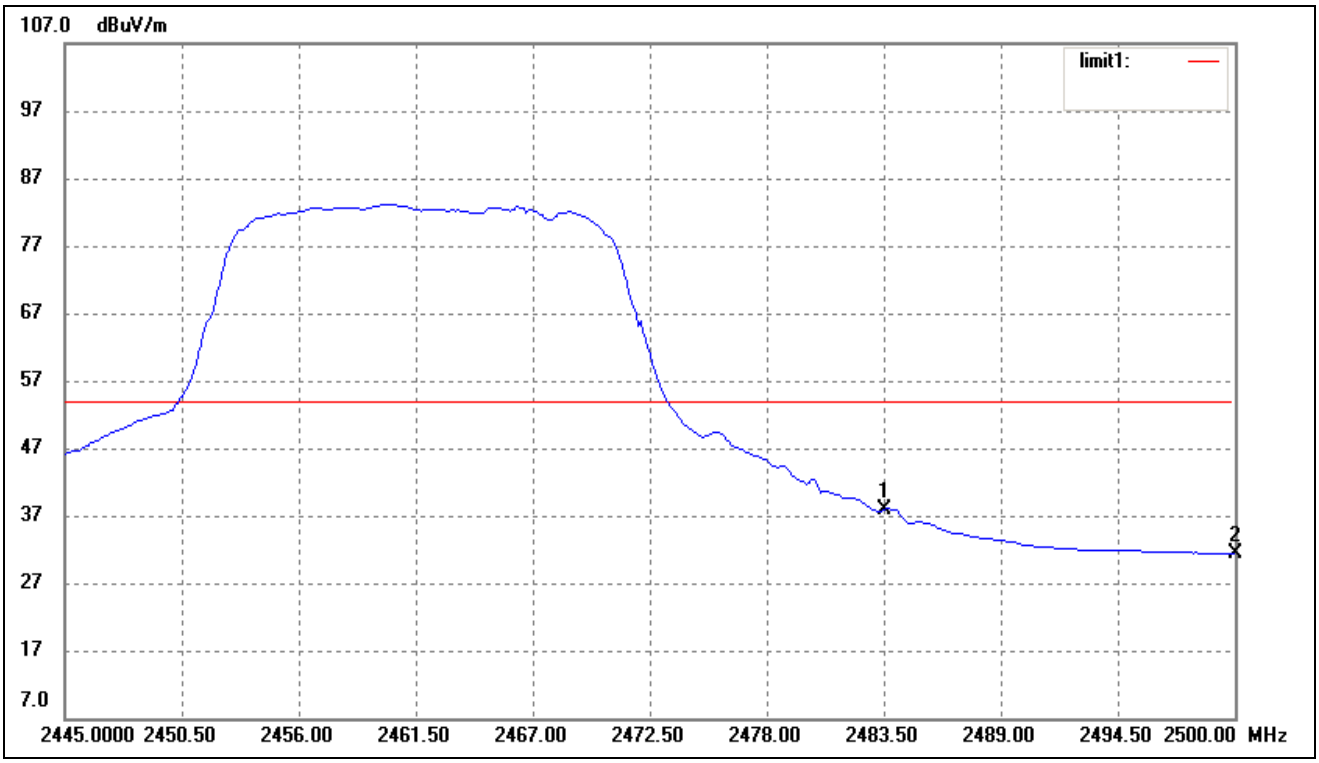
For 802.11n

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	(°)	(cm)	
1	2310.000	37.47	-7.51	29.96	54.00	-24.04	136	100	Ave
	2310.000	50.75	-7.51	43.24	74.00	-30.76	136	100	peak
2	2390.000	39.76	-7.34	32.42	54.00	-21.58	136	100	Ave
	2390.000	55.11	-7.34	47.77	74.00	-26.23	136	100	peak
3	2400.000	53.58	-7.31	46.27	54.00	-7.73	136	100	Ave
	2400.000	80.00	-7.31	72.69	74.00	-1.31	136	100	peak
4	2413.028	89.06	-7.28	81.78			136	100	Ave

Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	(°)	(cm)	
1	2483.500	45.01	-7.13	37.88	54.00	-16.12	136	100	Ave
	2483.500	61.98	-7.13	54.85	74.00	-19.15	136	100	peak
2	2500.000	38.39	-7.08	31.31	54.00	-22.69	136	100	Ave
	2500.000	52.99	-7.08	45.91	74.00	-28.09	136	100	peak

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

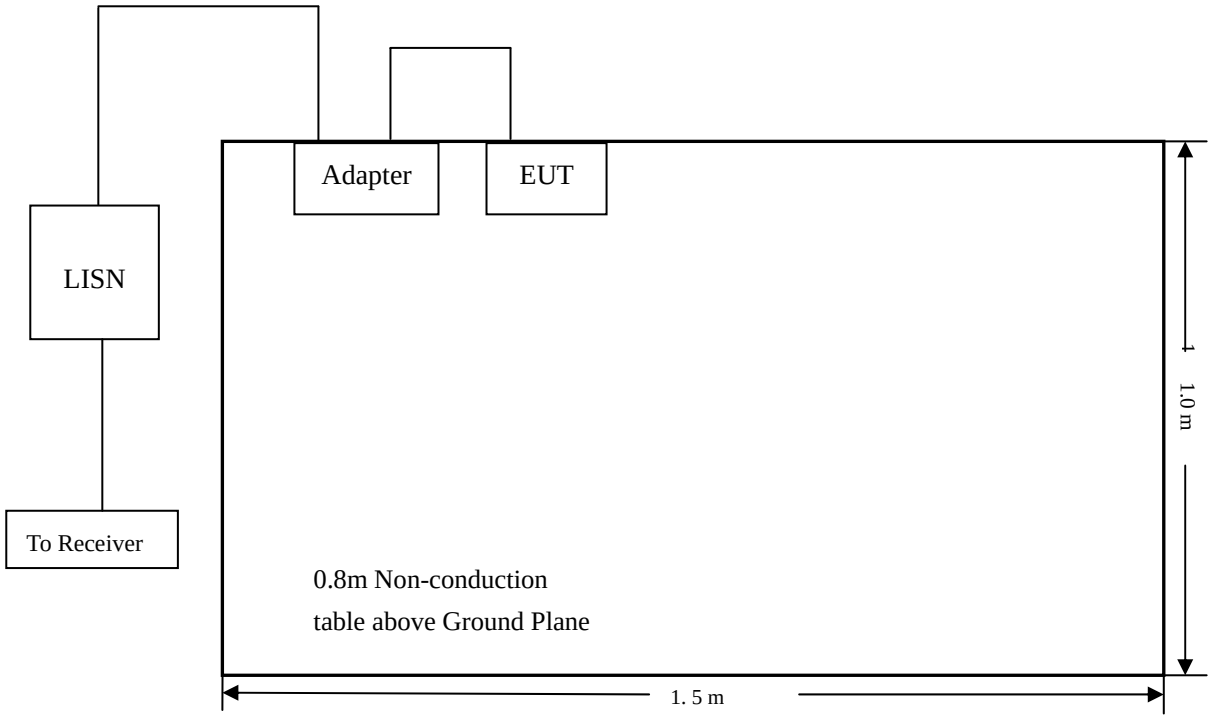
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2012-03-28	2013-03-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2012-03-28	2013-03-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2012-03-28	2013-03-27

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

9.3 Test Procedure

Test is conducting under the description of 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.

9.4 Basic Test Setup Block Diagram



9.5 Environmental Conditions

Temperature:	20° C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

9.6 Summary of Test Results/Plots

According to the data in section 9.7, the EUT complied with the FCC Part 15.207 Conducted margin for a Class B device, with the *worst* margin reading of:

-7.39 dBμV at **1.366 MHz** in the **Neutral, PeaK** Detector, 0.15-30MHz

9.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

Conducted Disturbance

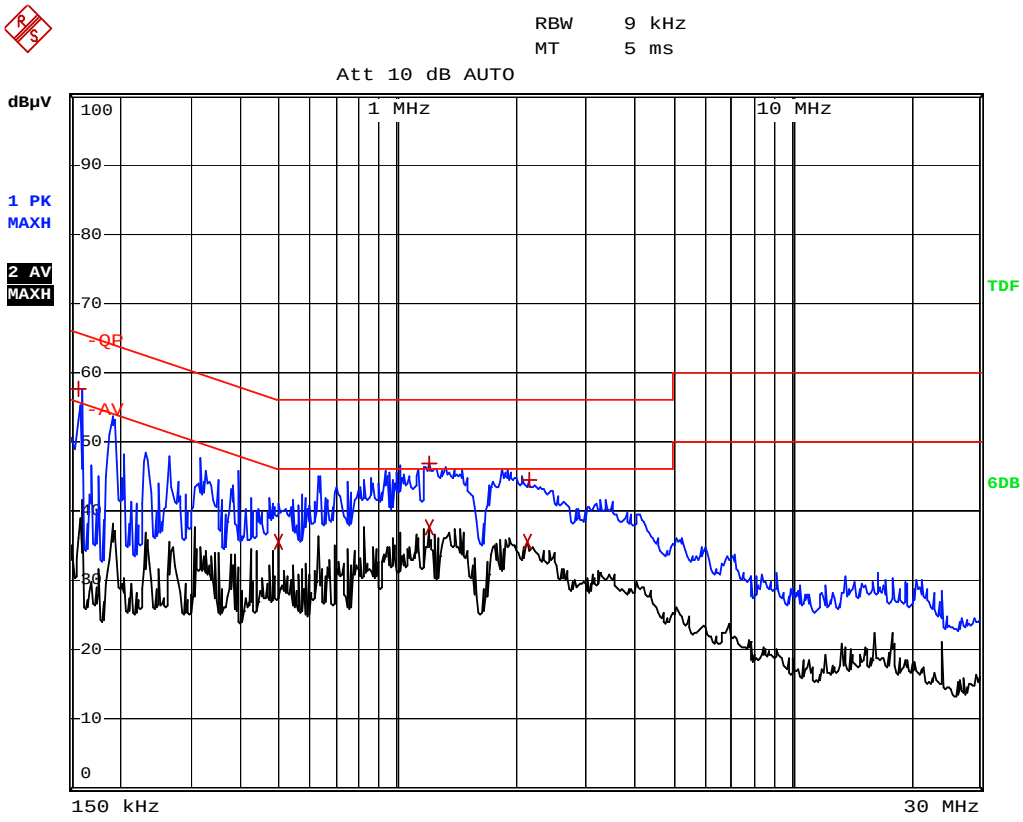
EUT: WCDMA Smart Phone

M/N: MP436

Operating Condition: WIFI Transmitting

Test Specification: Line

Comment: AC 120V/60Hz/Adapter DC 5V



EDIT PEAK LIST (Prescan Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	158 kHz	57.49	-8.07
2 Average	498 kHz	35.43	-10.59
1 Max Peak	1.206 MHz	46.74	-9.25
2 Average	1.206 MHz	37.68	-8.31
2 Average	2.142 MHz	35.44	-10.55
1 Max Peak	2.17 MHz	44.42	-11.57

Plot of Conducted Emissions Test Data

Conducted Disturbance

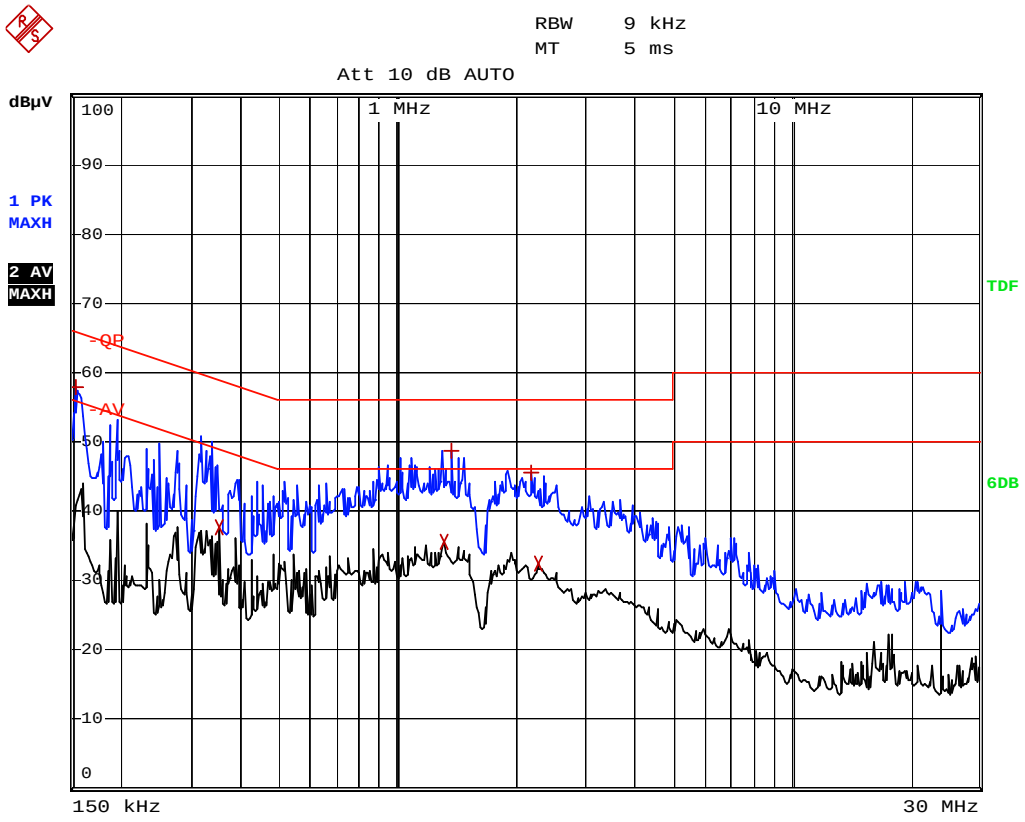
EUT: WCDMA Smart Phone

M/N: MP436

Operating Condition: WIFI Transmitting

Test Specification: Neutral

Comment: AC 120V/60Hz/Adapter 5V



EDIT PEAK LIST (Prescan Results)

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

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	154 kHz	57.80	-7.97
2 Average	350 kHz	37.56	-11.39
2 Average	1.31 MHz	35.55	-10.44
1 Max Peak	1.366 MHz	48.60	-7.39
1 Max Peak	2.186 MHz	45.61	-10.38
2 Average	2.274 MHz	32.41	-13.58

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