

FCC Part 15C Measurement and Test Report

For

China Greatwall Computer Shenzhen Co., Ltd.

Greatwall Computer Bldg, Kefa Road, Nanshan District, Shenzhen,

Guangdong, PRC.

FCC ID: P3S711

FCC Rules:	<u>FCC Part 15C</u>
Product Description:	<u>tablet pc</u>
Tested Model:	<u>D2-711</u>
Report No.:	<u>STR12098266I-1</u>
Tested Date:	<u>2012-09-26 to 2012-10-09</u>
Issued Date:	<u>2012-10-10</u>
Tested By:	<u>Seven Song / Engineer</u> <i>Seven Song</i>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: China Greatwall Computer Shenzhen Co., Ltd.
 Address of applicant: Greatwall Computer Bldg, Kefa Road, Nanshan District, Shenzhen, Guangdong, PRC.

Manufacturer: China Greatwall Computer Shenzhen Co., Ltd.
 Address of manufacturer: Greatwall Computer Bldg, Kefa Road, Nanshan District, Shenzhen, Guangdong, PRC.

General Description of EUT	
Product Name:	tablet pc
Trade Name:	Great Wall
Model No.:	D2-711
Adding Model(s):	D2-711_BK, D2-711_WH, D2-711_PK, D2-711_PL, D2-711_BL, D2-711_XXX, 711 XXX
Rated Voltage:	Battery: DC 3.7V, Adapter: DC 5V
Power Adapter Model:	CPS012A050150U (Input: AC 100-240V 50/60Hz, Output: DC 5V 1500mA)
<p><i>Note: The test data is gathered from a production sample, provided by the manufacturer. The other model listed in the report has different appearance only of D2-711 without circuit and electronic construction changed, declared by the manufacturer.</i></p>	

Technical Characteristics of EUT	
Support Standards:	802.11b/g/n
Frequency Range:	2412-2462MHz
RF Output Power:	10.23 dBm (Conducted)
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Modulation:	CCK, BPSK, QPSK, 16QAM, 64QAM
Quantity of Channels:	11
Channel Separation:	5MHz
Antenna Type:	Integral Antenna
Antenna Gain:	2.0 dBi
Lowest Internal Frequency of EUT:	32.768 kHz
Device Category:	Portable Device

1.2 Test Standards

The following report is prepared on behalf of the China Greatwall Computer 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 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

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

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

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

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:

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=100 kHz, VBW=300 kHz, Span 5-30 % greater than the EBW.
4. Repeat above procedures until all frequency measured was complete.
5. (BWCF) where $BWCF = 10\log(3\text{ kHz}/100\text{kHz} = -15.2\text{ dB})$.

4.4 Environmental Conditions

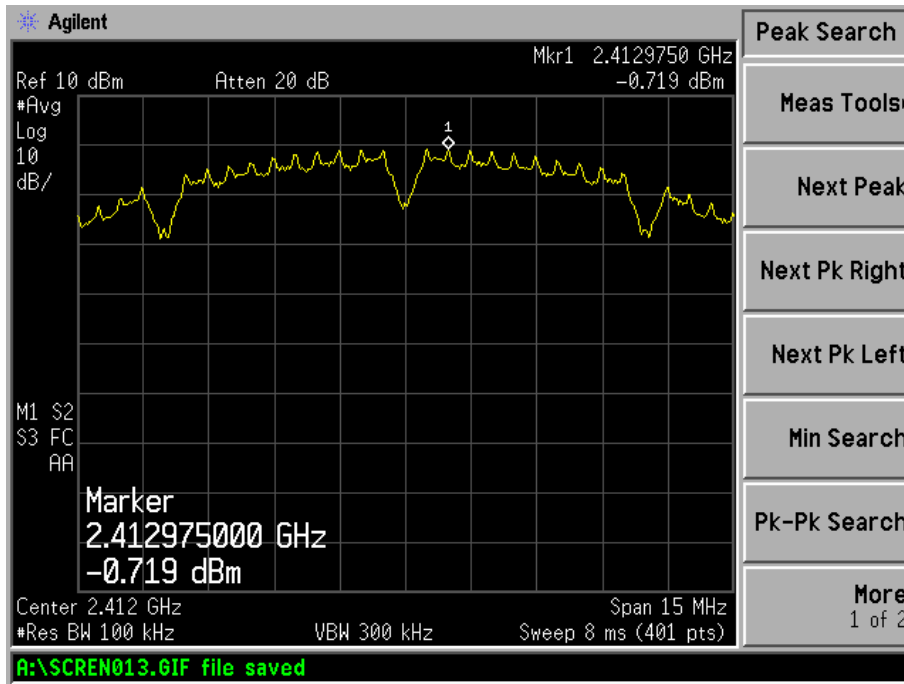
Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots

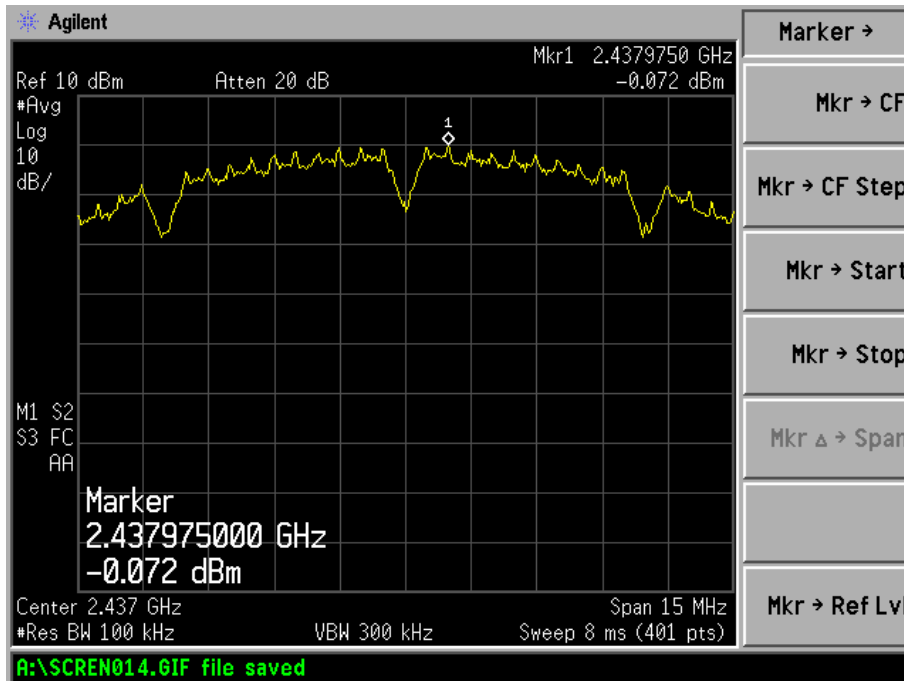
Test Mode	Test Channel MHz	Power Spectral Density dBm/100kHz	BWCF	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
802.11b	2412	-0.719	-15.2	-15.919	8
	2437	-0.072	-15.2	-15.272	8
	2462	0.214	-15.2	-14.986	8
802.11g	2412	-2.797	-15.2	-17.997	8
	2437	-2.259	-15.2	-17.459	8
	2462	-2.678	-15.2	-17.878	8
802.11n HT20	2412	-2.752	-15.2	-17.952	8
	2437	-2.255	-15.2	-17.455	8
	2462	-2.678	-15.2	-17.878	8

Please refer to the following test plots:

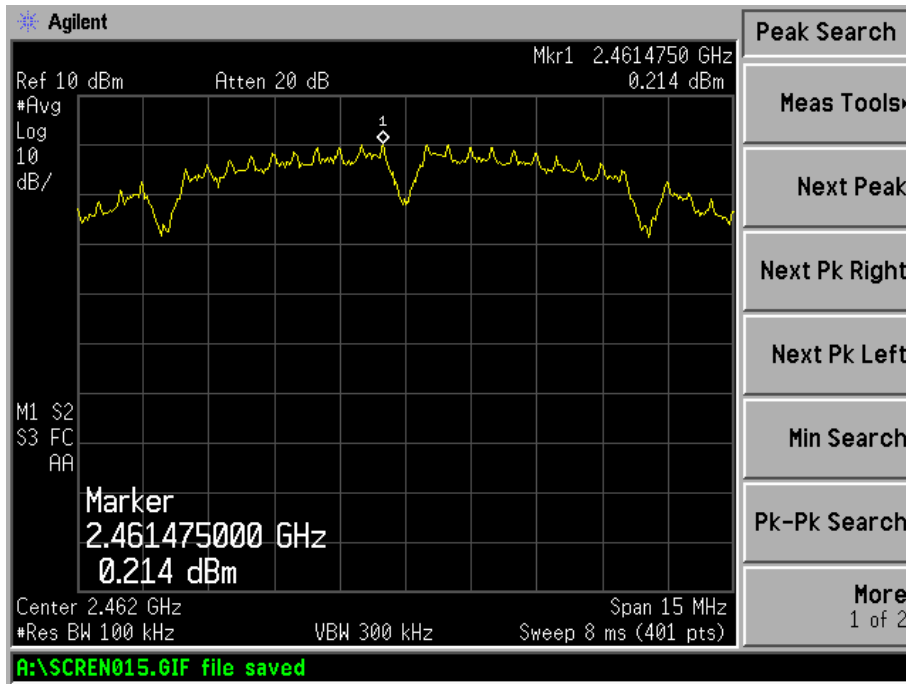
802.11b-Low Channel



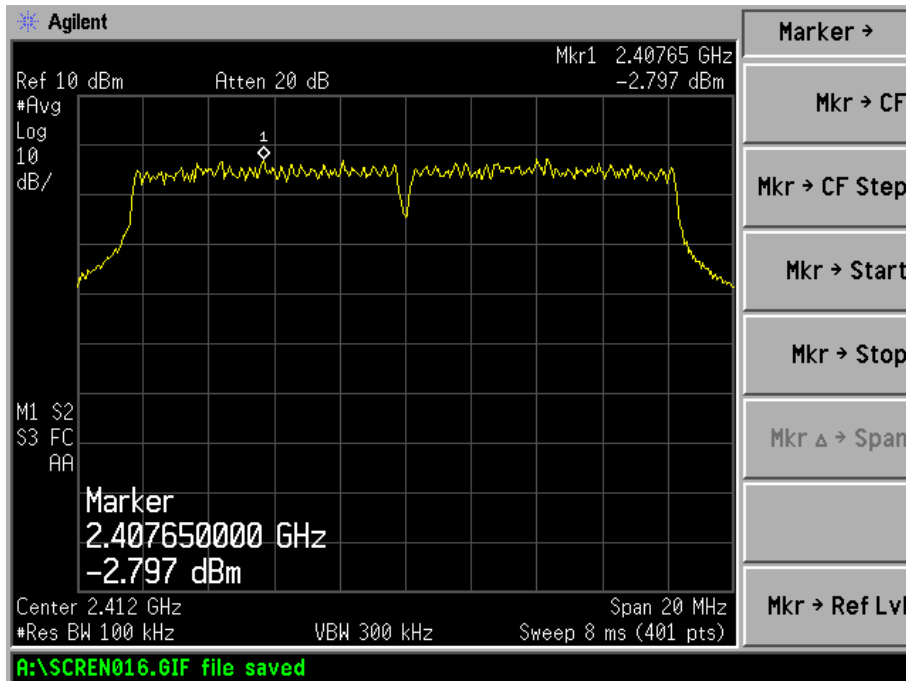
802.11b-Middle Channel



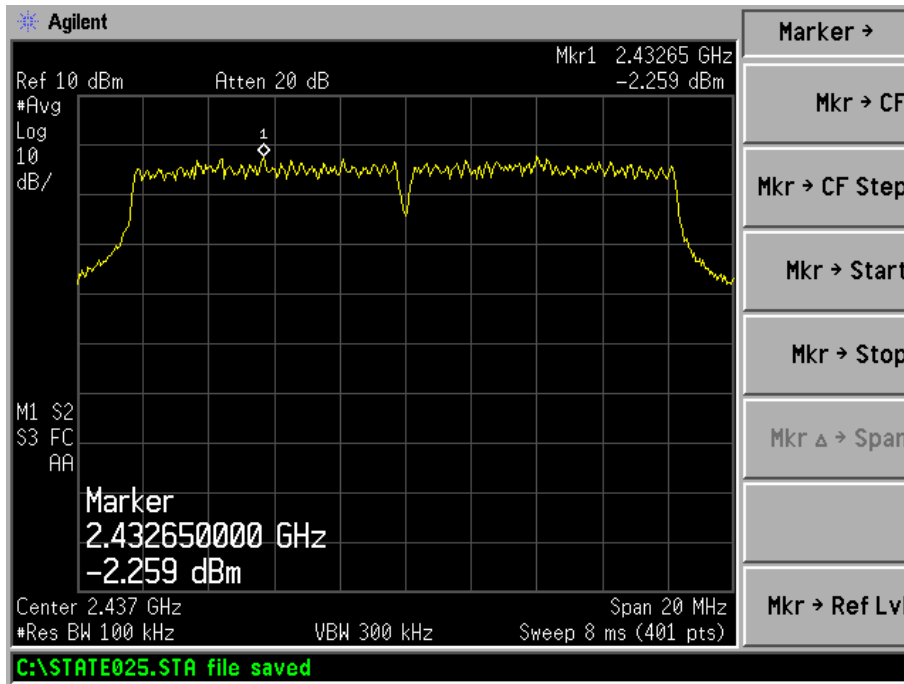
802.11b-High Channel



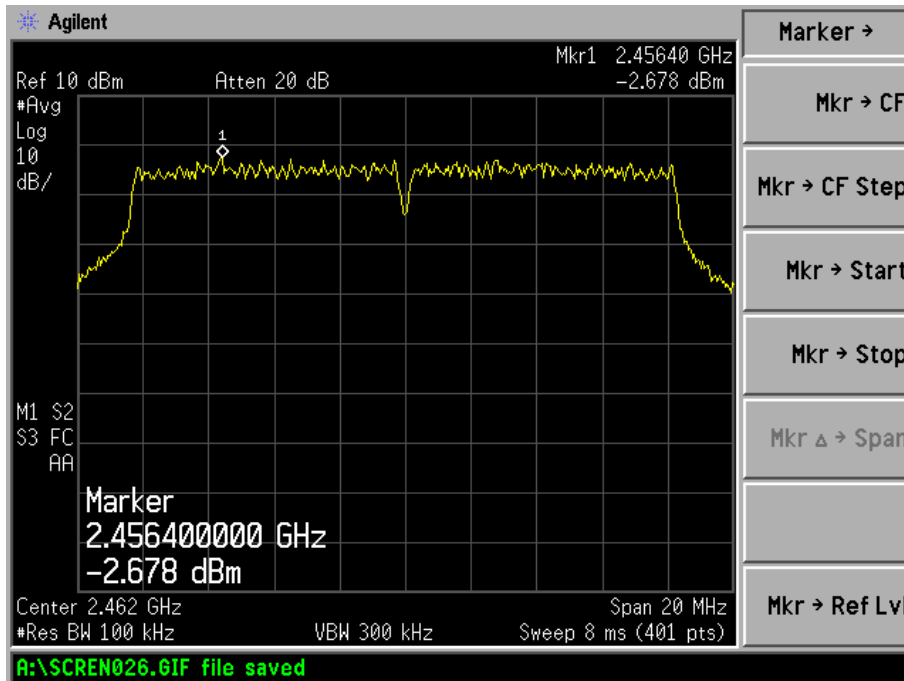
802.11g-Low Channel



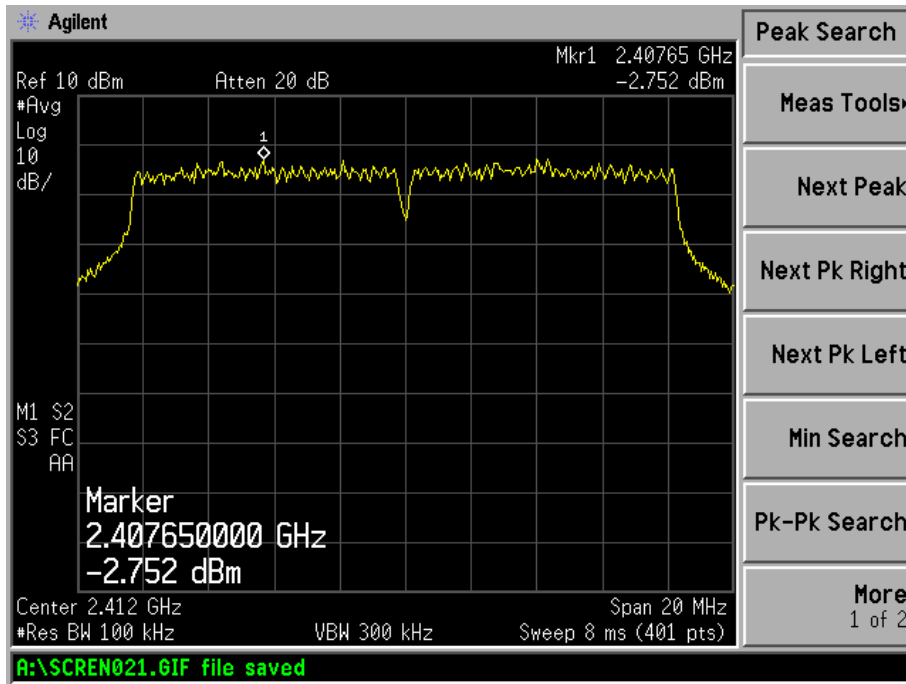
802.11g-Middle Channel



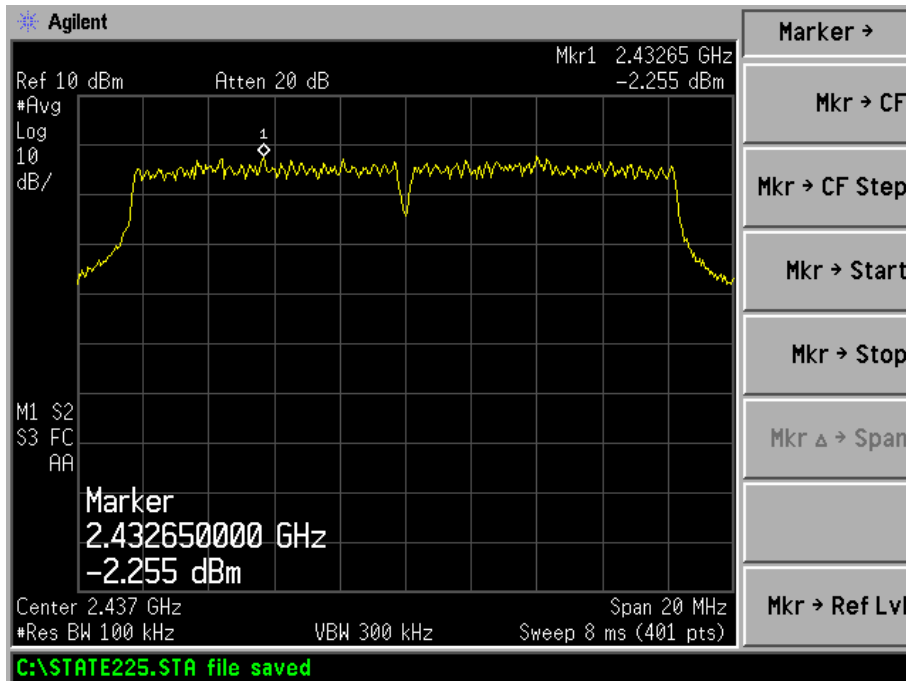
802.11g-High Channel



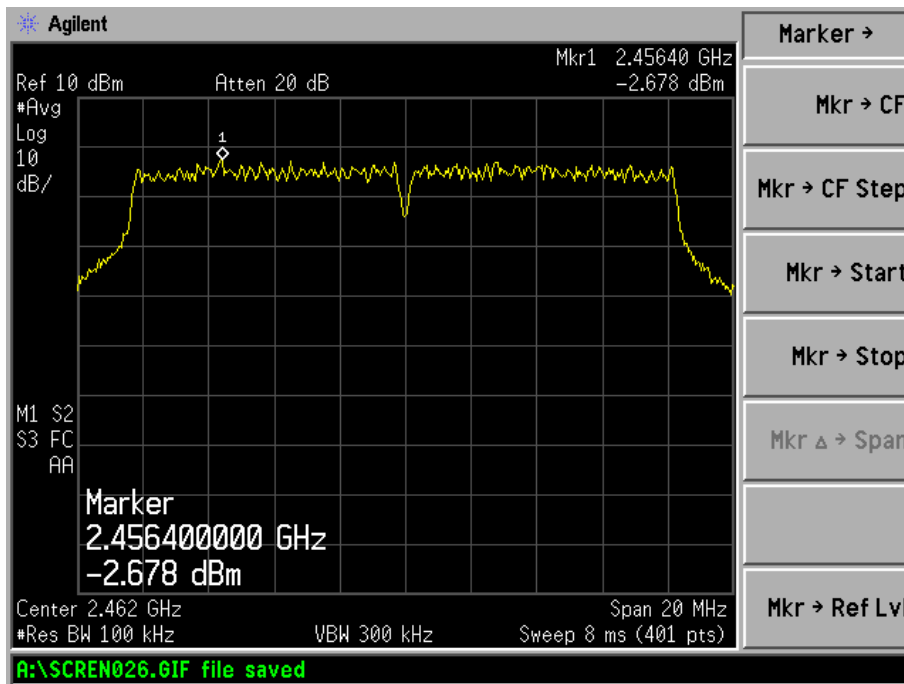
802.11n-HT20-Low Channel



802.11n-HT20-Middle Channel



802.11n-HT20-High Channel



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	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=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.

5.4 Environmental Conditions

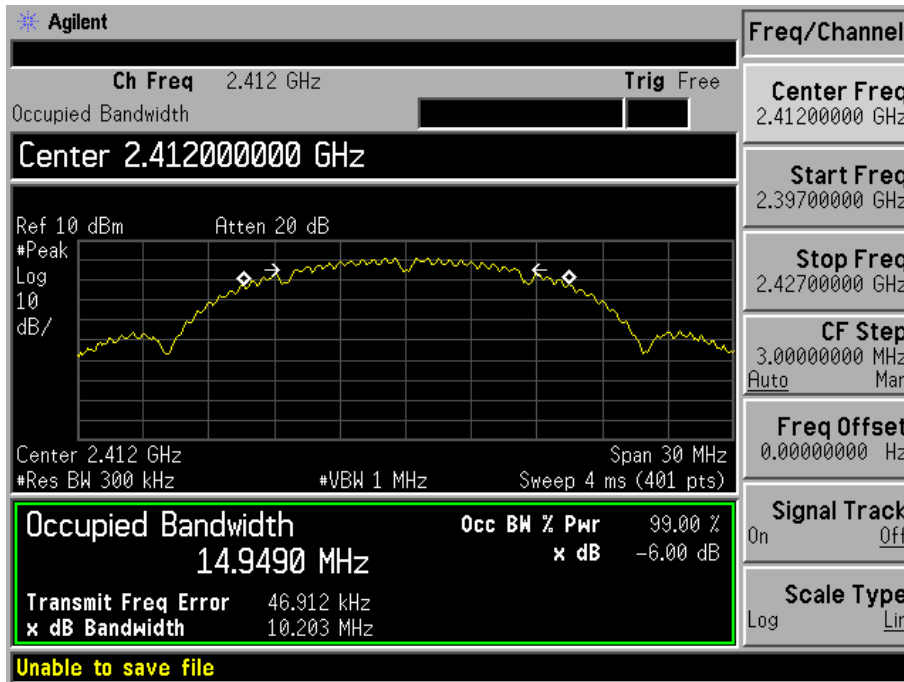
Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

5.5 Summary of Test Results/Plots

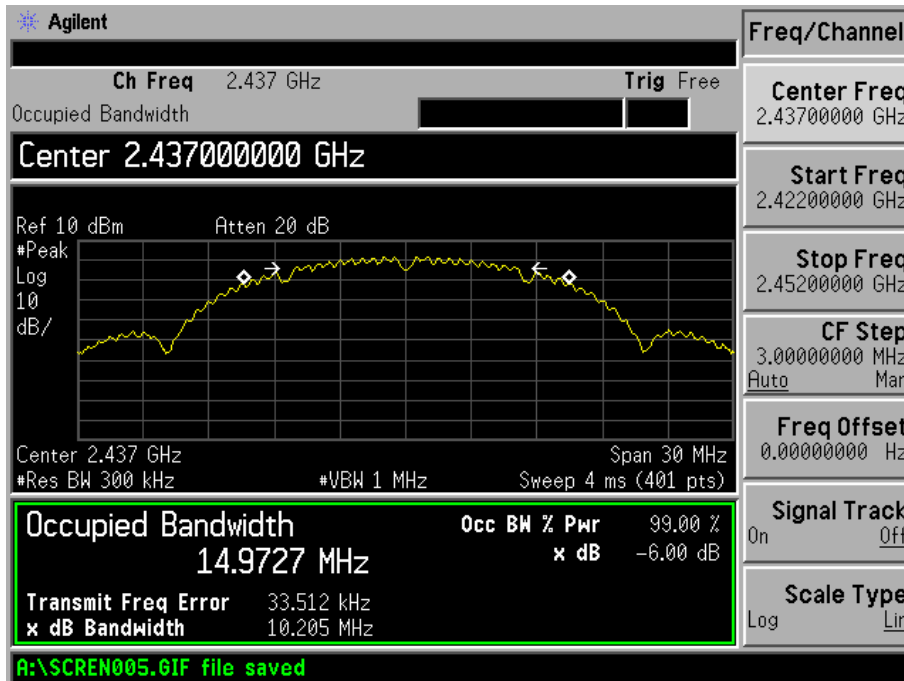
Test Mode	Test Channel MHz	6 dB Bandwidth kHz	Limit kHz
802.11b	2412	10203	500
	2437	10205	500
	2462	10212	500
802.11g	2422	16599	500
	2437	16537	500
	2452	16581	500
802.11n-HT20	2412	16544	500
	2437	16646	500
	2462	16566	500

Please refer to the following test plots:

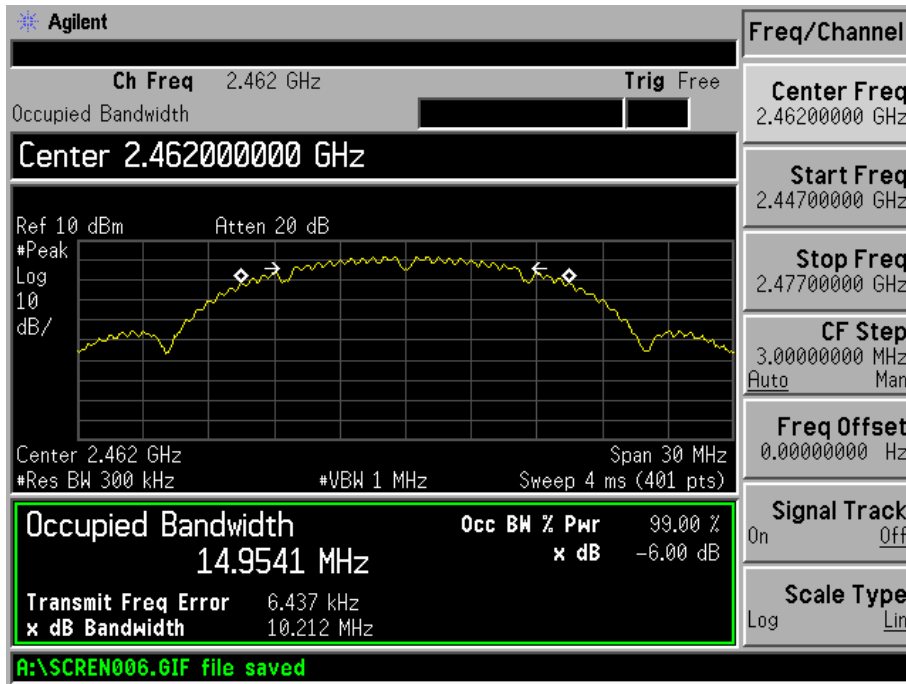
802.11b-Low Channel



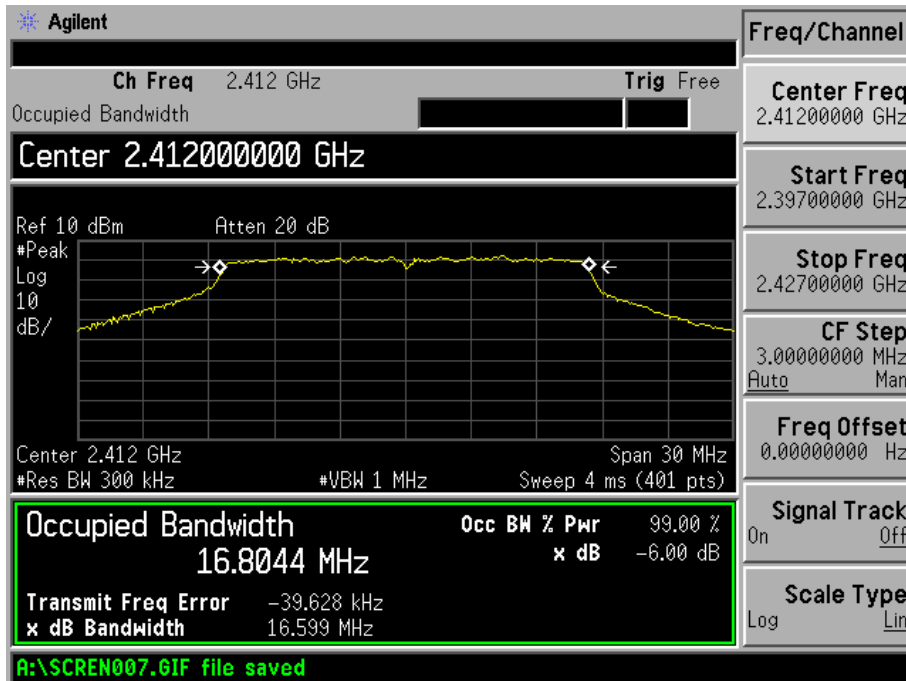
802.11b-Middle Channel



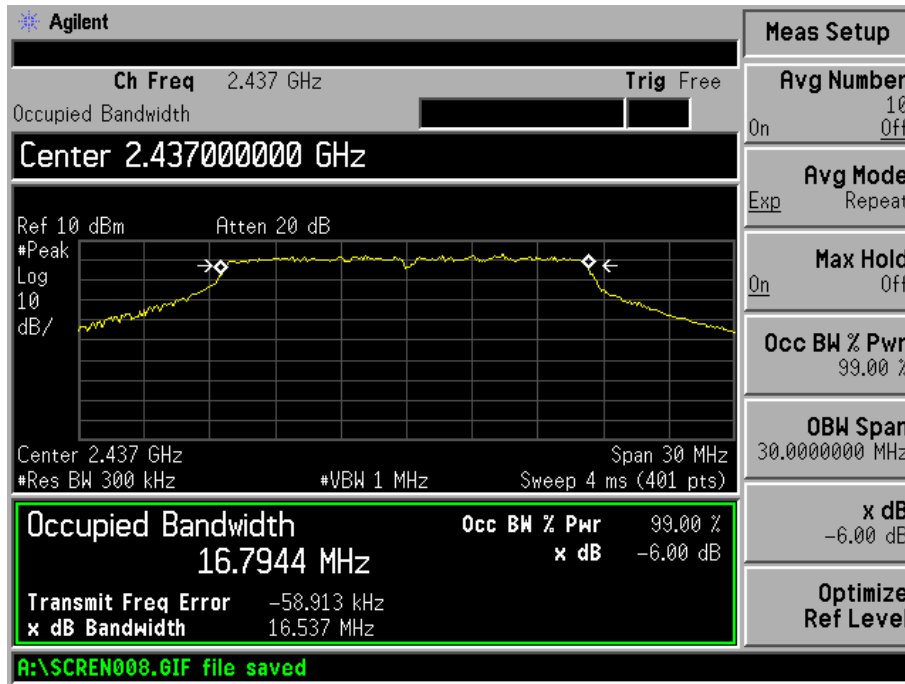
802.11b-High Channel



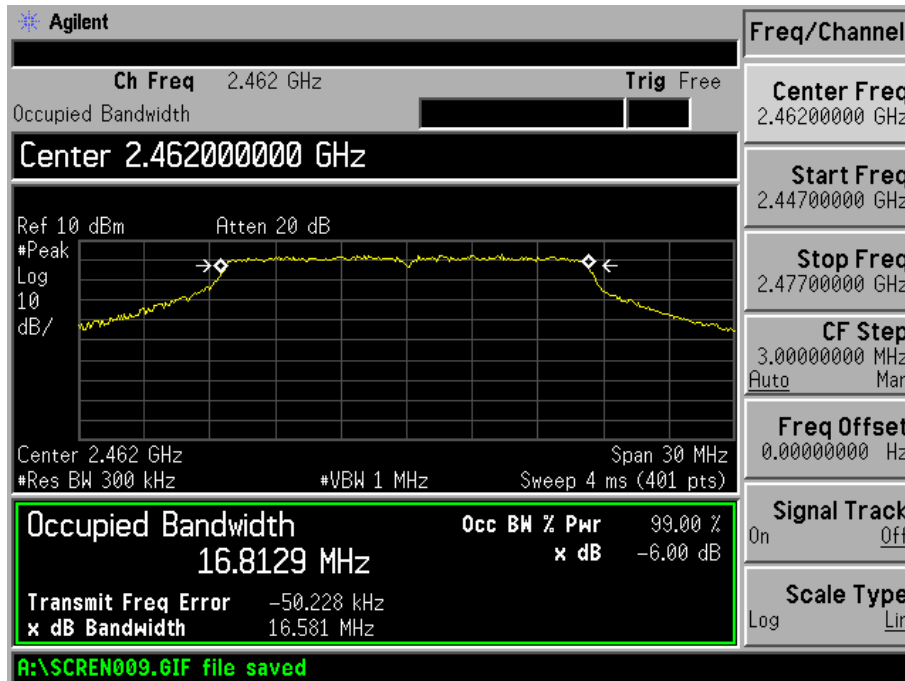
802.11g-Low Channel



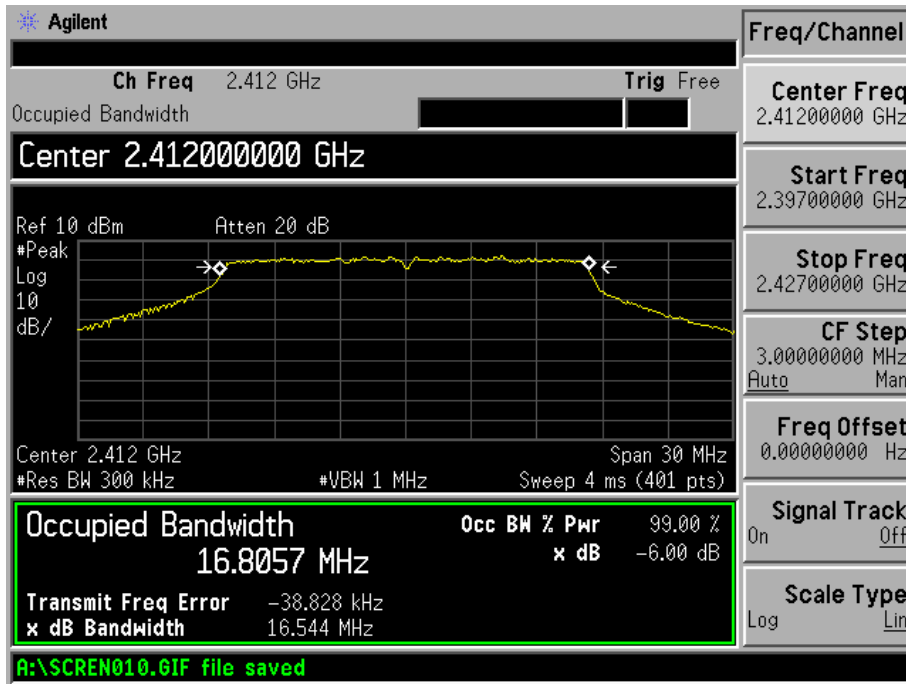
802.11g-Middle Channel



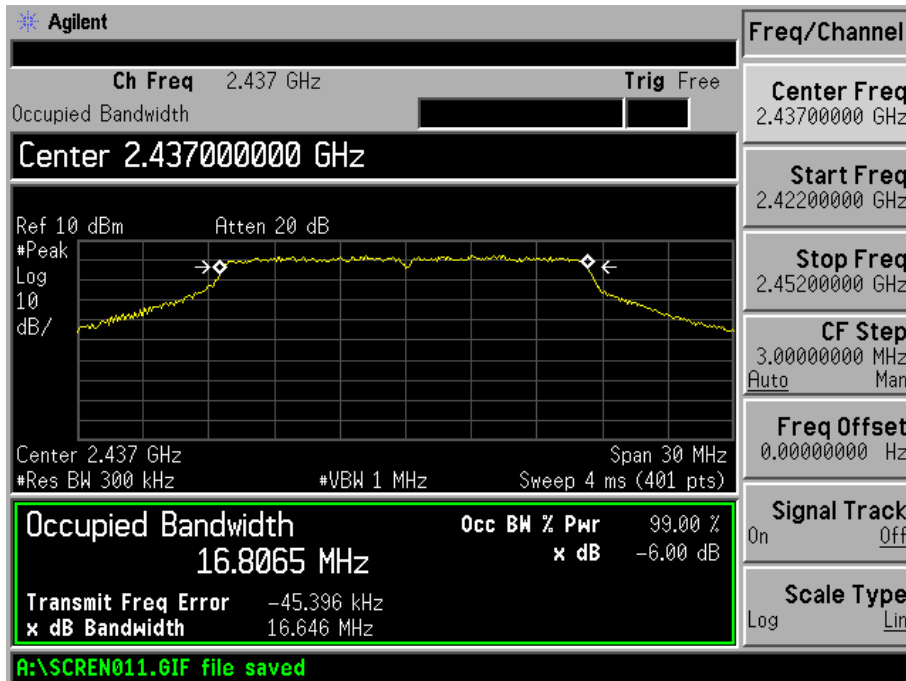
802.11g-High Channel



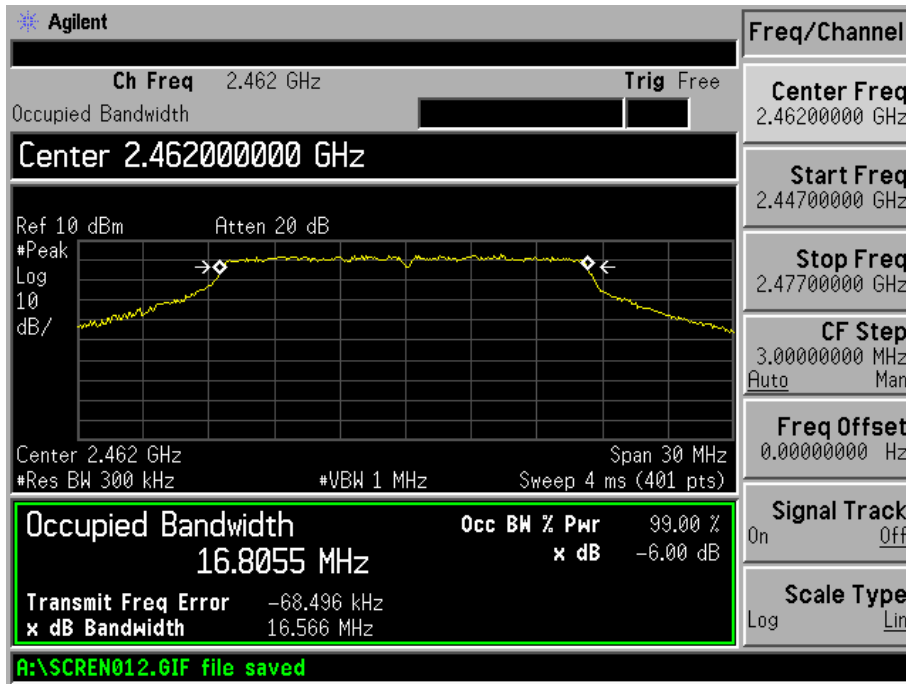
802.11n-HT20-Low Channel



802.11n-HT20-Middle Channel



802.11n-HT20-High Channel



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

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 (2012),

1. This procedure provides an integrated measurement alternative when the maximum available RBW < EBW.
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Set the span to a value that is 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges (for some analyzers, this may require a manual override to ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at 1 MHz intervals extending across the EBW of the spectrum.

6.4 Environmental Conditions

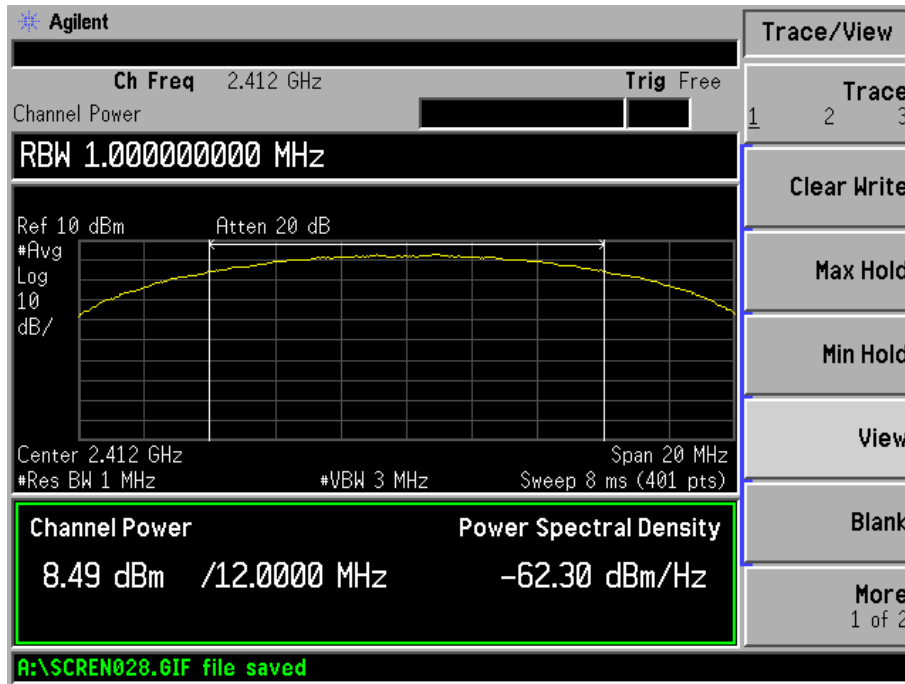
Temperature:	21° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

6.5 Summary of Test Results/Plots

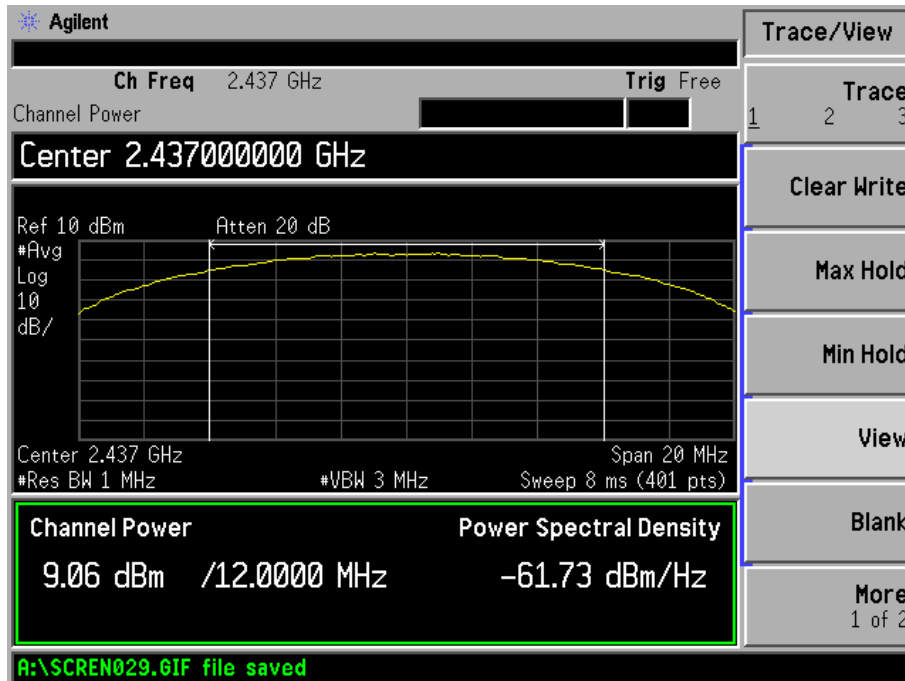
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b_1Mbps	2412	8.49	7.06	1000
	2437	9.06	8.05	1000
	2462	9.40	8.71	1000
802.11b_11Mbps	2412	8.26	6.70	1000
	2437	8.99	7.93	1000
	2462	9.29	8.49	1000
802.11g_6Mbps	2412	8.82	7.62	1000
	2437	9.82	9.59	1000
	2462	9.91	9.79	1000
802.11g_54Mbps	2412	8.77	7.53	1000
	2437	9.17	8.26	1000
	2462	9.83	9.62	1000
802.11n HT20_MCS0	2412	9.45	8.81	1000
	2437	9.50	8.91	1000
	2462	10.23	10.54	1000
802.11n HT20_MCS7	2412	9.23	8.38	1000
	2437	9.84	9.64	1000
	2462	9.96	9.91	1000

Please refer to the following test plots:

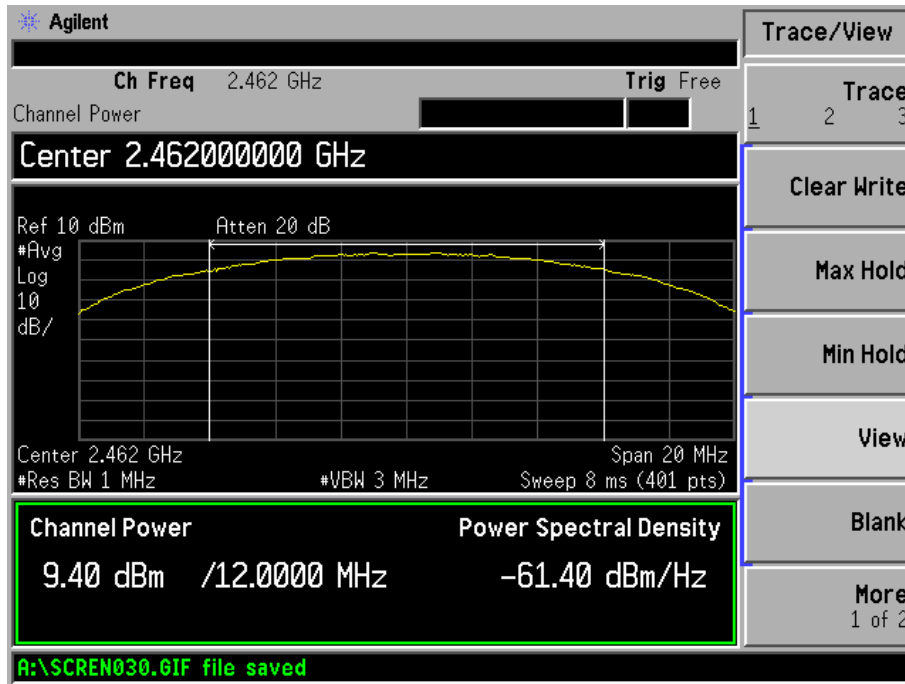
802.11b-1Mbps-Low Channel



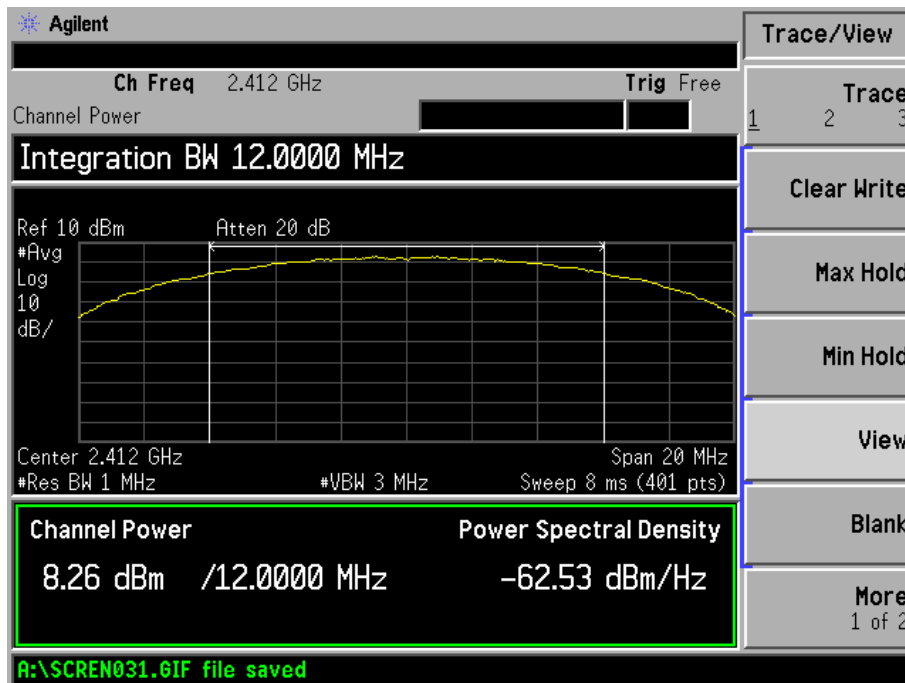
802.11b-1Mbps-Middle Channel



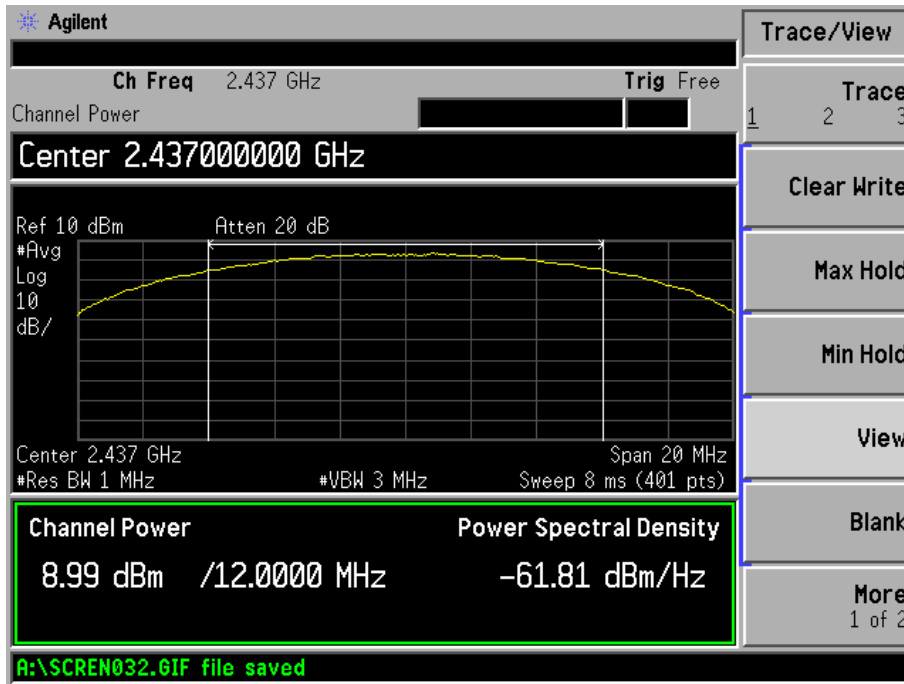
802.11b-1Mbps-High Channel



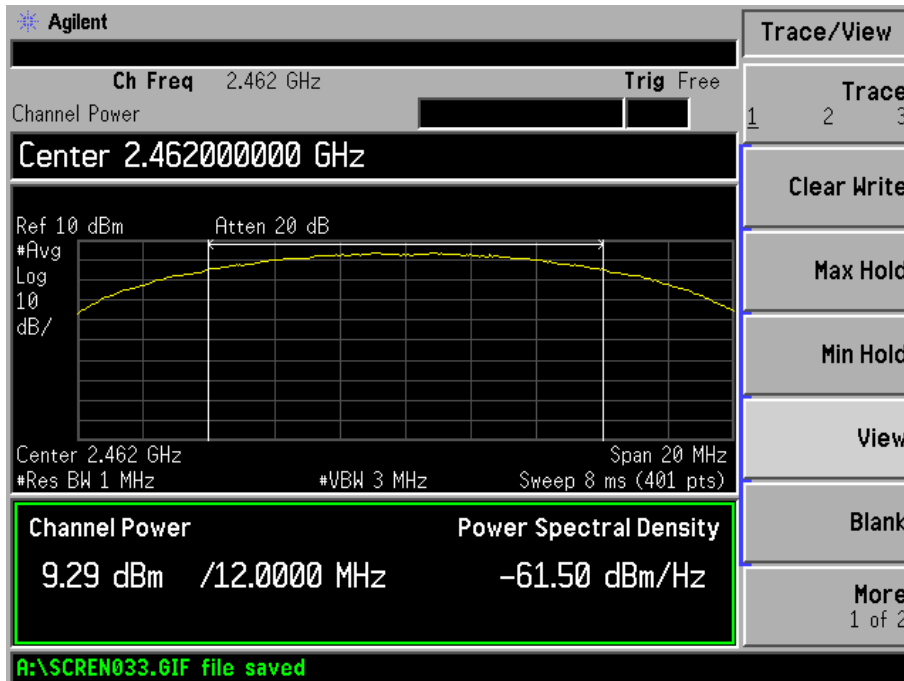
802.11b- 11Mbps-Low Channel



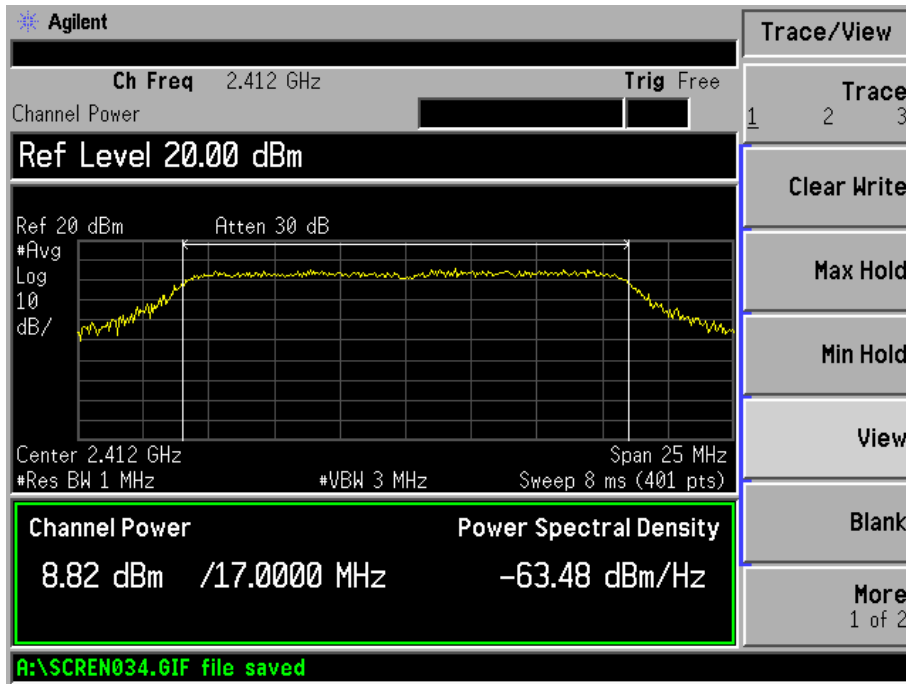
802.11b-11Mbps-Middle Channel



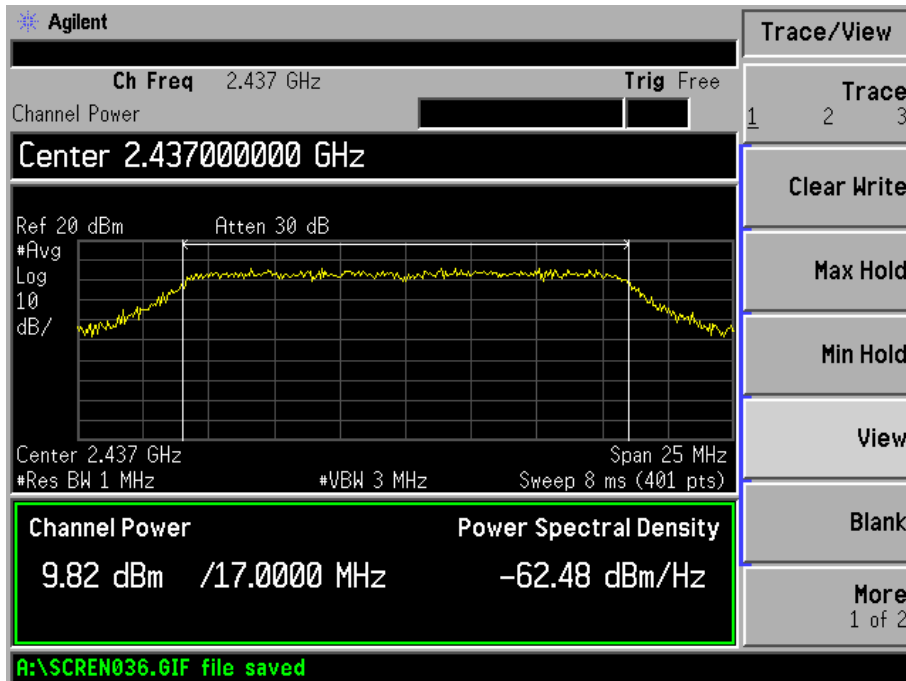
802.11b-11Mbps-High Channel



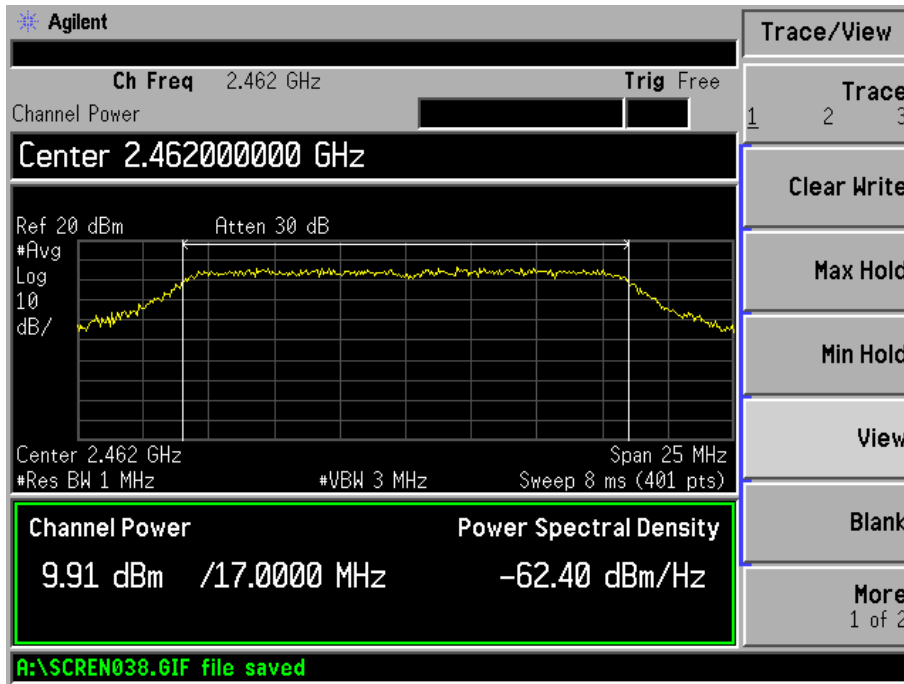
802.11g-6Mbps-Low Channel



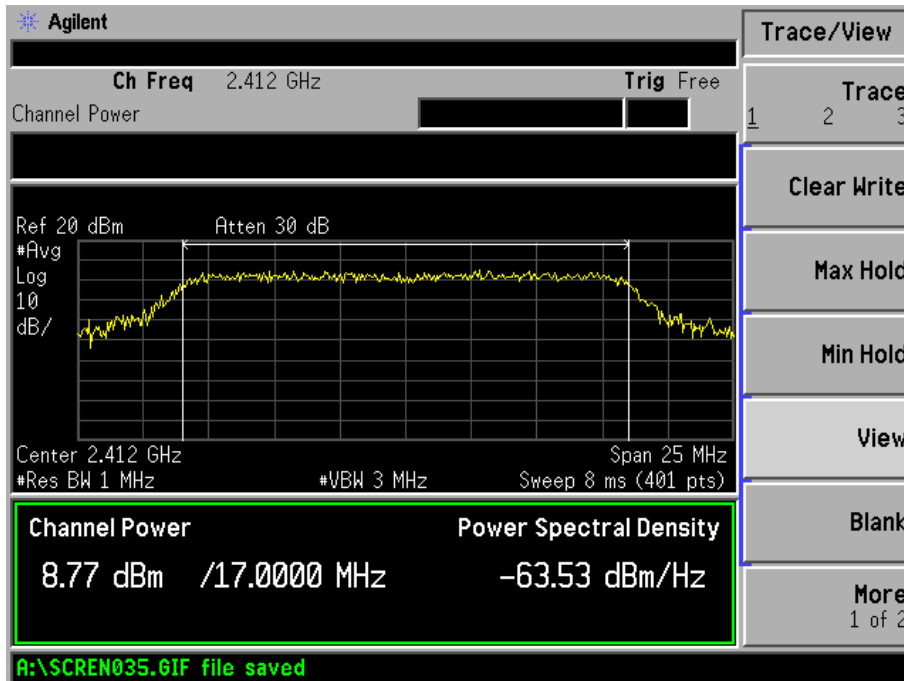
802.11g-6Mbps-Middle Channel



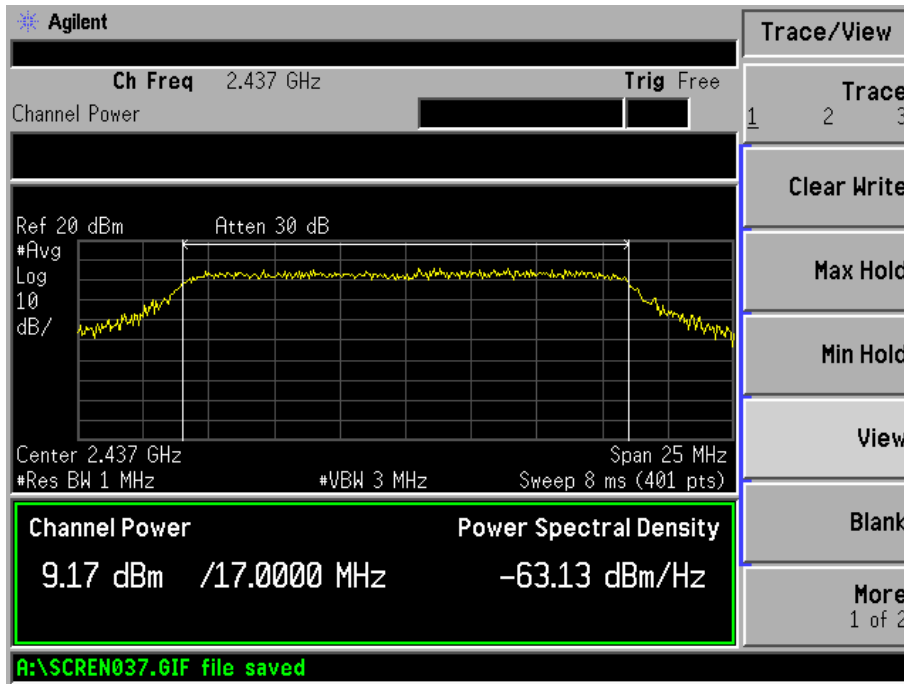
802.11g-6Mbps-High Channel



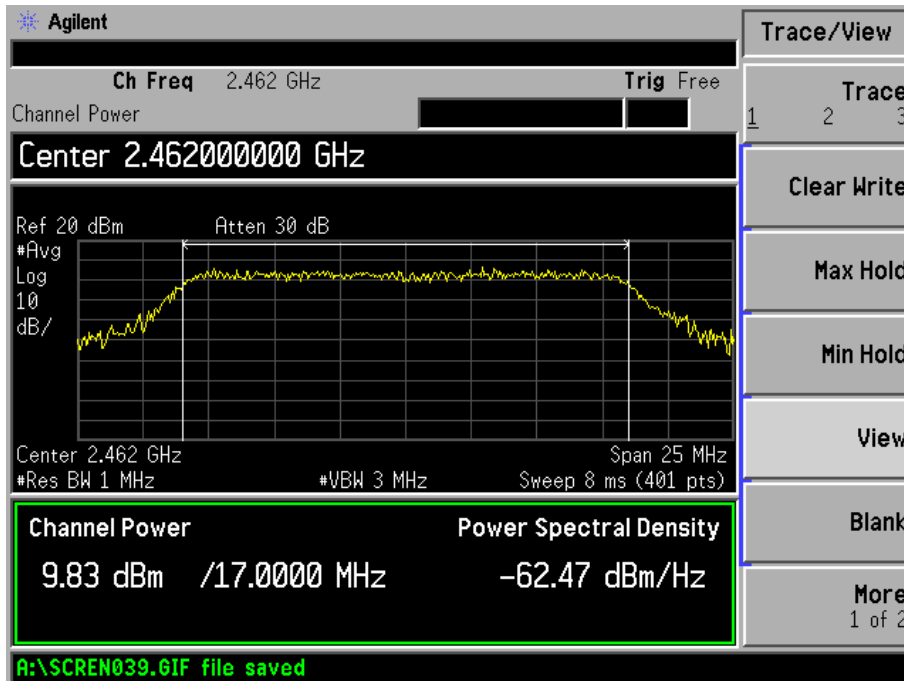
802.11g-54Mbps-Low Channel



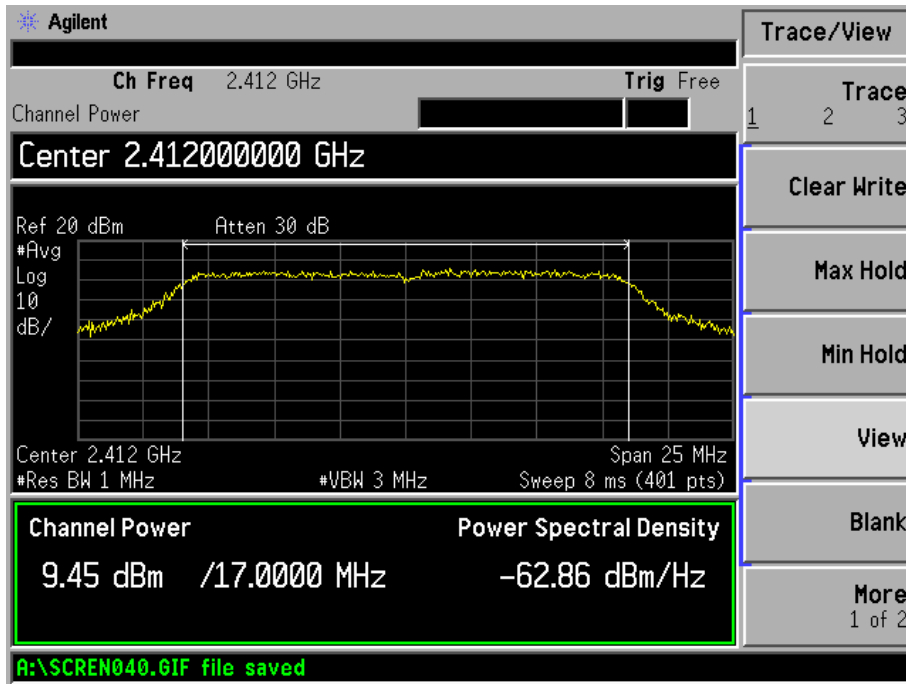
802.11g-54Mbps-Middle Channel



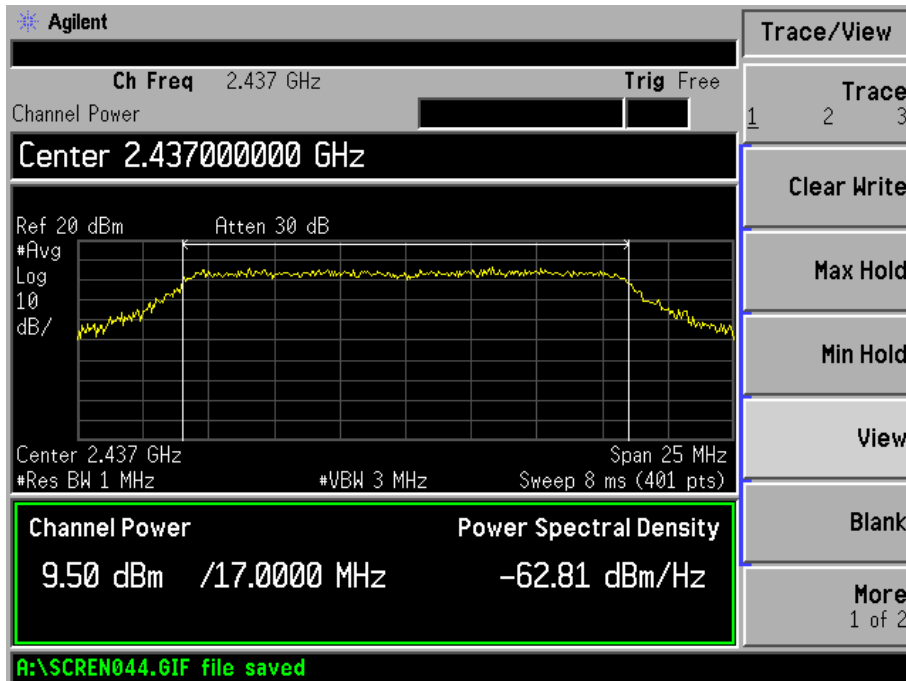
802.11g-54Mbps-High Channel



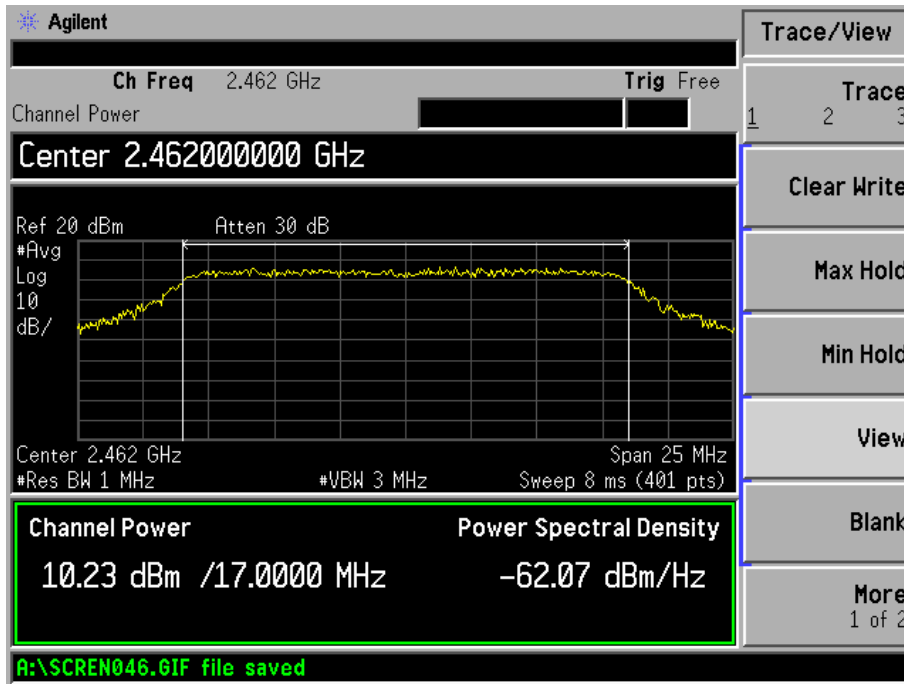
802.11n-HT20-MCS0-Low Channel



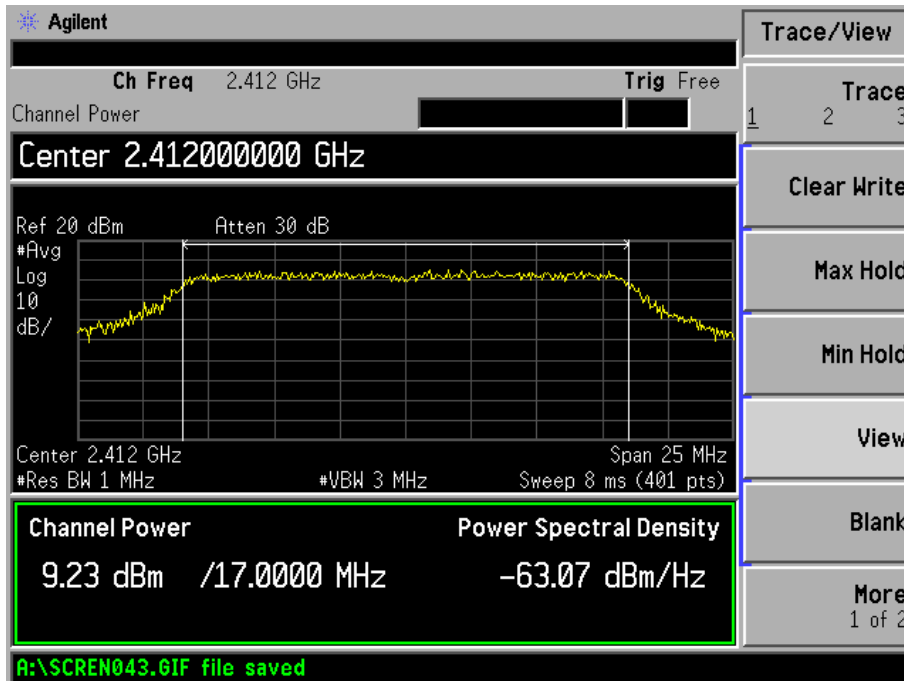
802.11n-HT20-MCS0-Middle Channel



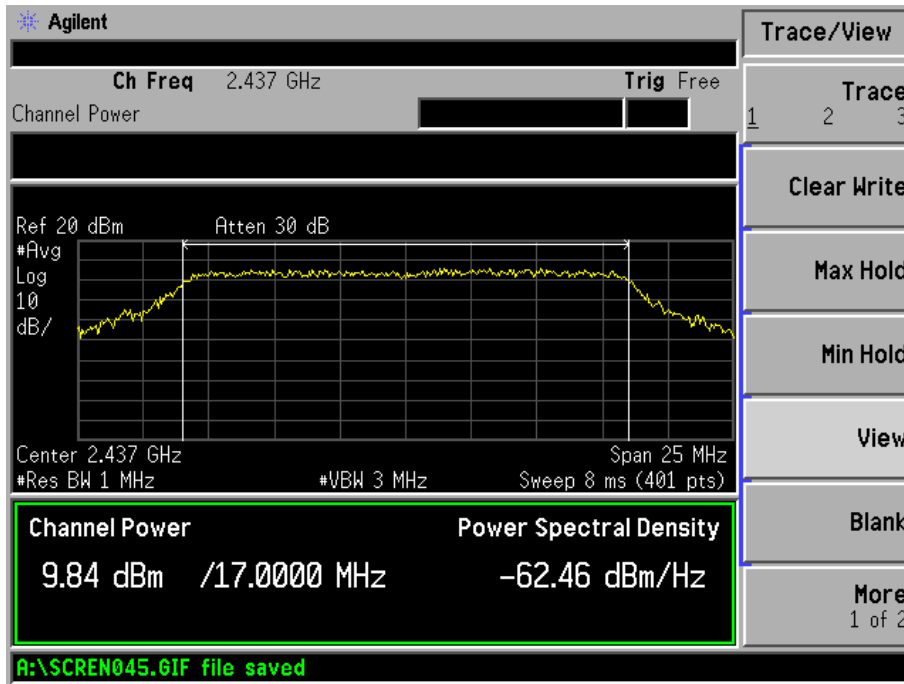
802.11n-HT20-MCS0-High Channel



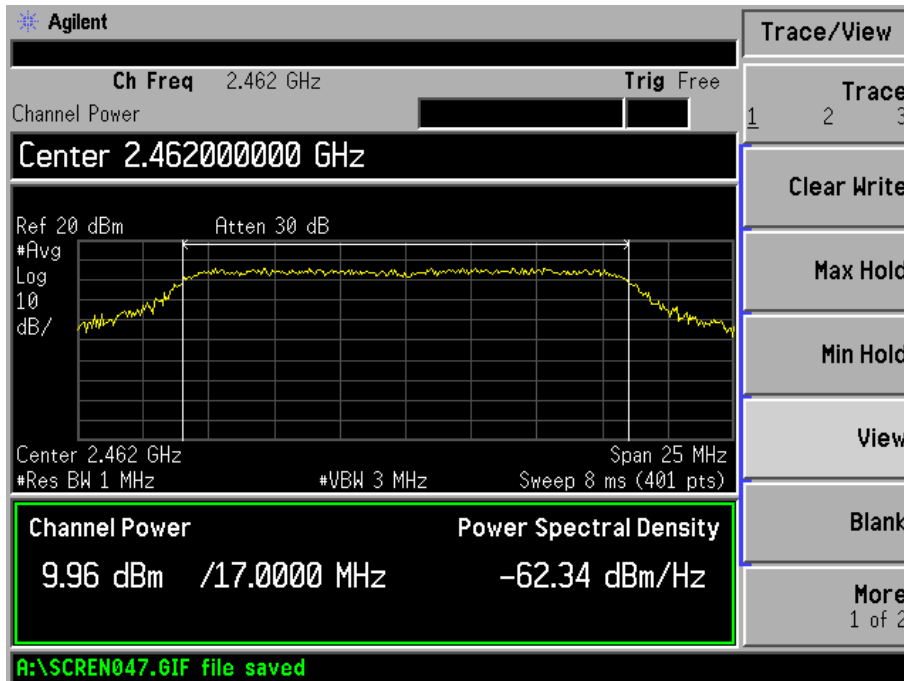
802.11n-HT20-MCS7-Low Channel



802.11n-HT20-MCS7-Middle Channel



802.11n-HT20-MCS7-High Channel



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

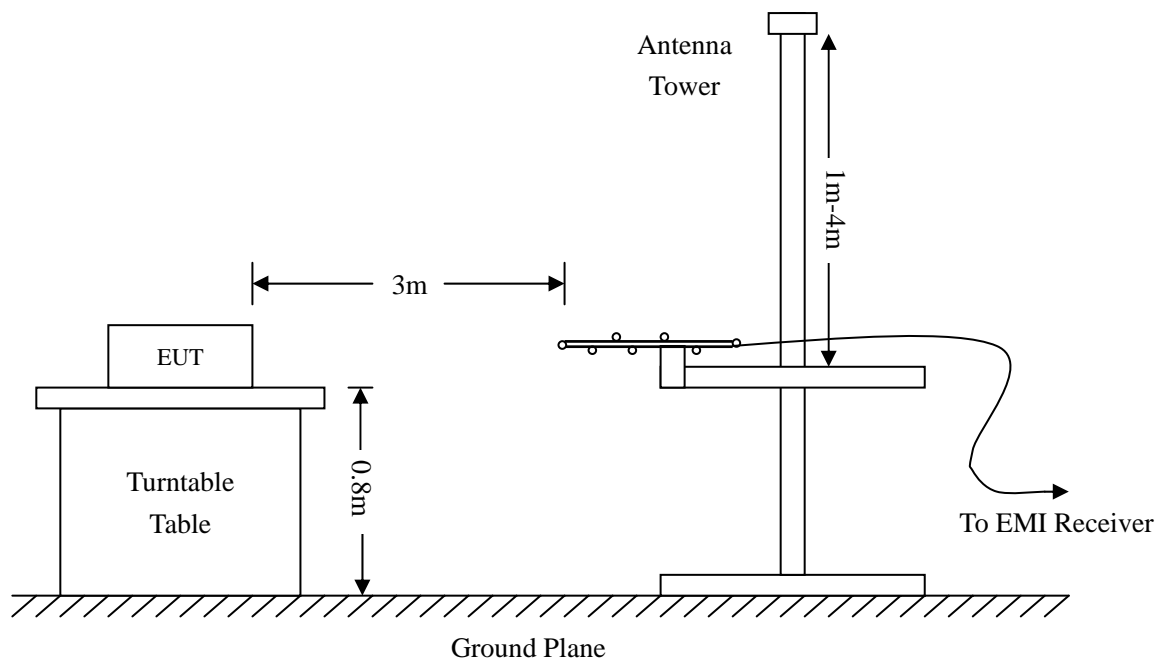
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	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
Horn Antenna	ETS	3116B	00088203	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 by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

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

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

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:

**-7.87 dB μ V at 32.4059 MHz in the Vertical polarization for 11n_Middle Channel Transmitting Mode,
9kHz 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)

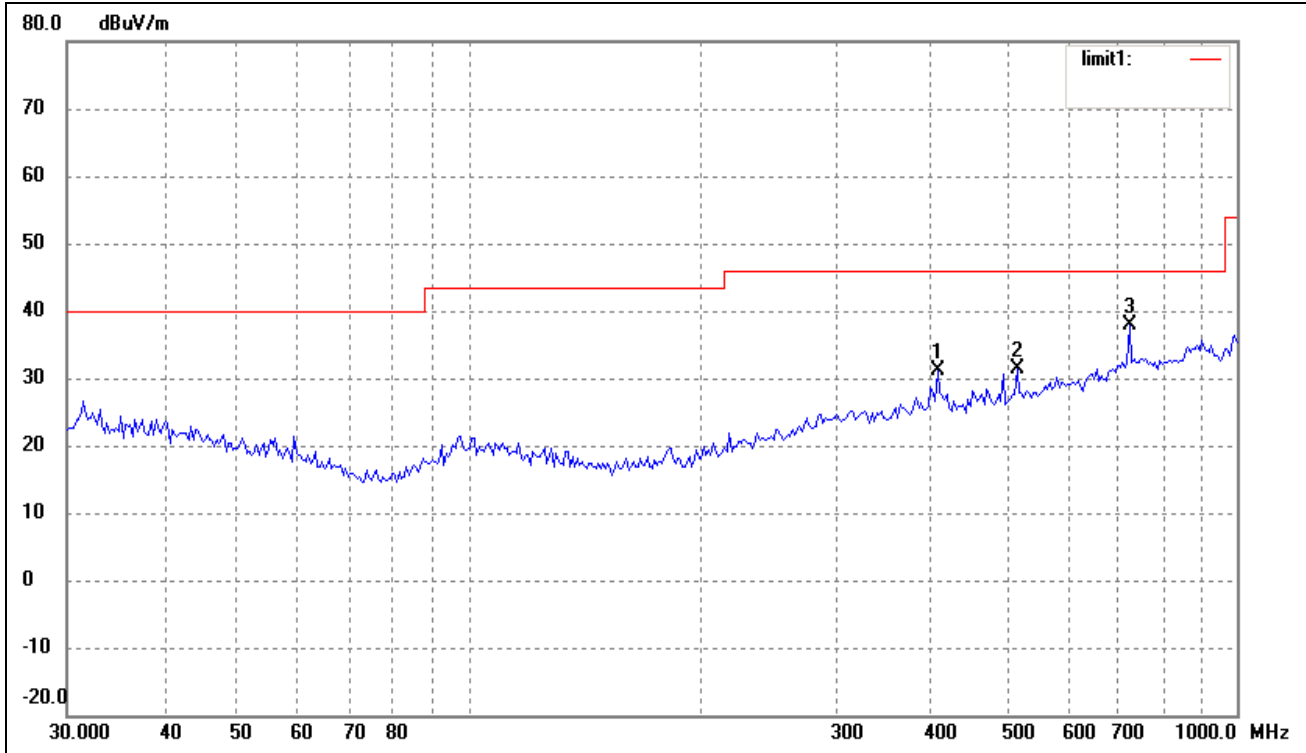
EUT: *tablet pc*

Tested Model: *D2-711*

Operating Condition: *802.11b Transmitting Low Channel-2412MHz*

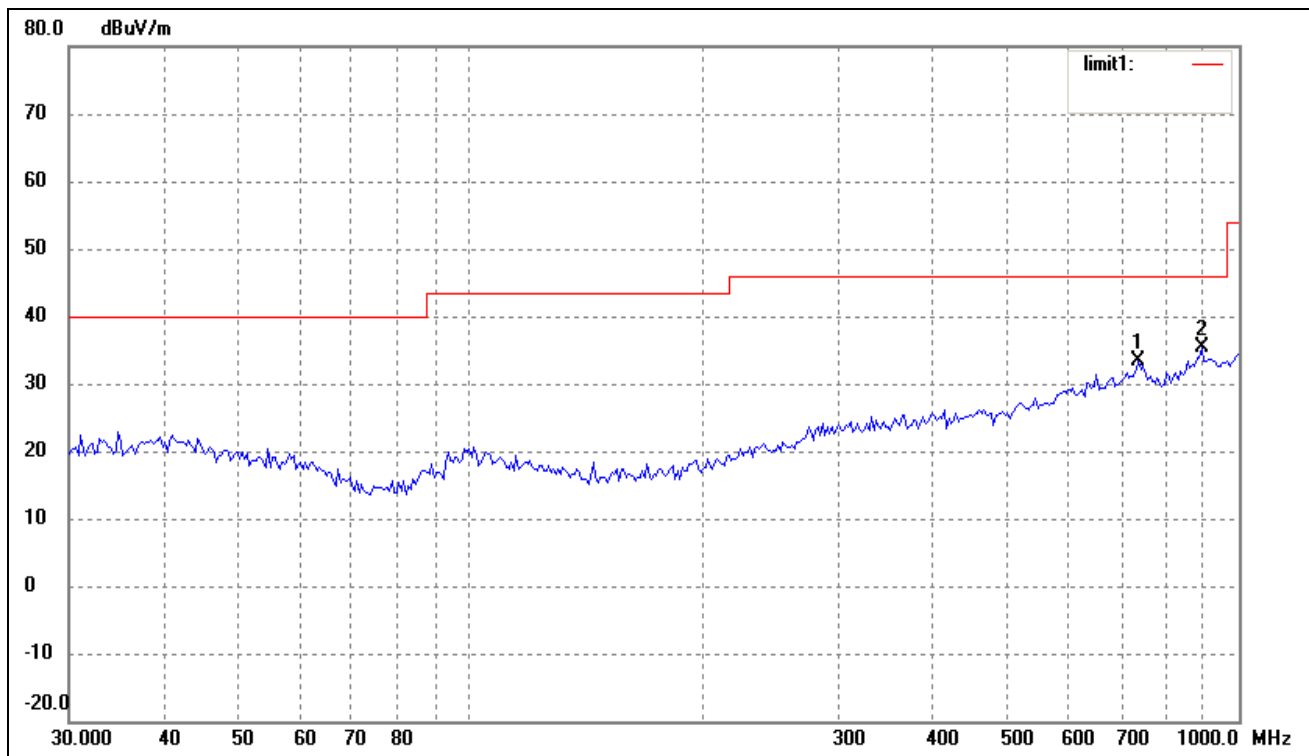
Comment:

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	407.5145	19.79	11.22	31.01	46.00	-14.99	264	100	peak
2	517.2480	18.65	12.82	31.47	46.00	-14.53	138	100	peak
3	724.2611	20.86	16.93	37.79	46.00	-8.21	360	100	peak

Test Specification: Vertical

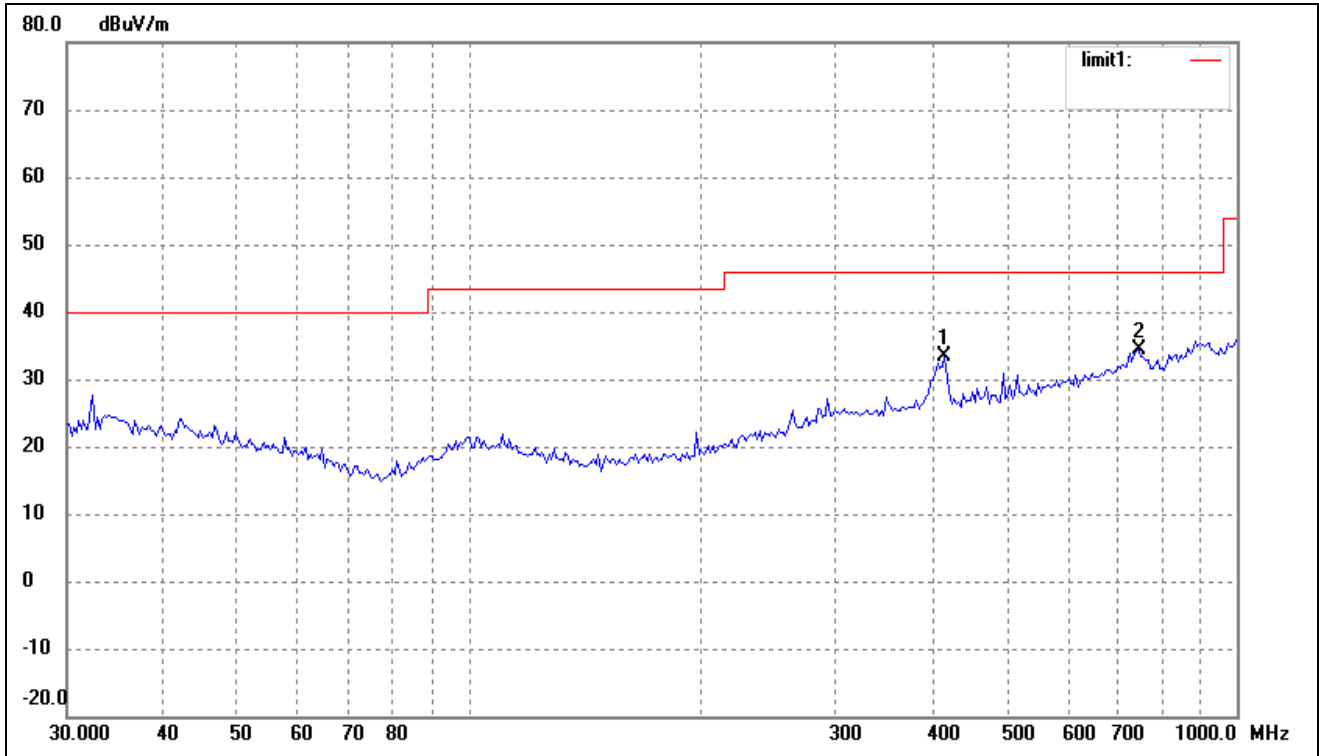


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	739.6604	15.24	18.07	33.31	46.00	-12.69	214	100	peak
2	893.8567	16.15	19.27	35.42	46.00	-10.58	360	100	peak

Operating Condition: 802.11b Transmitting Middle Channel-2437MHz

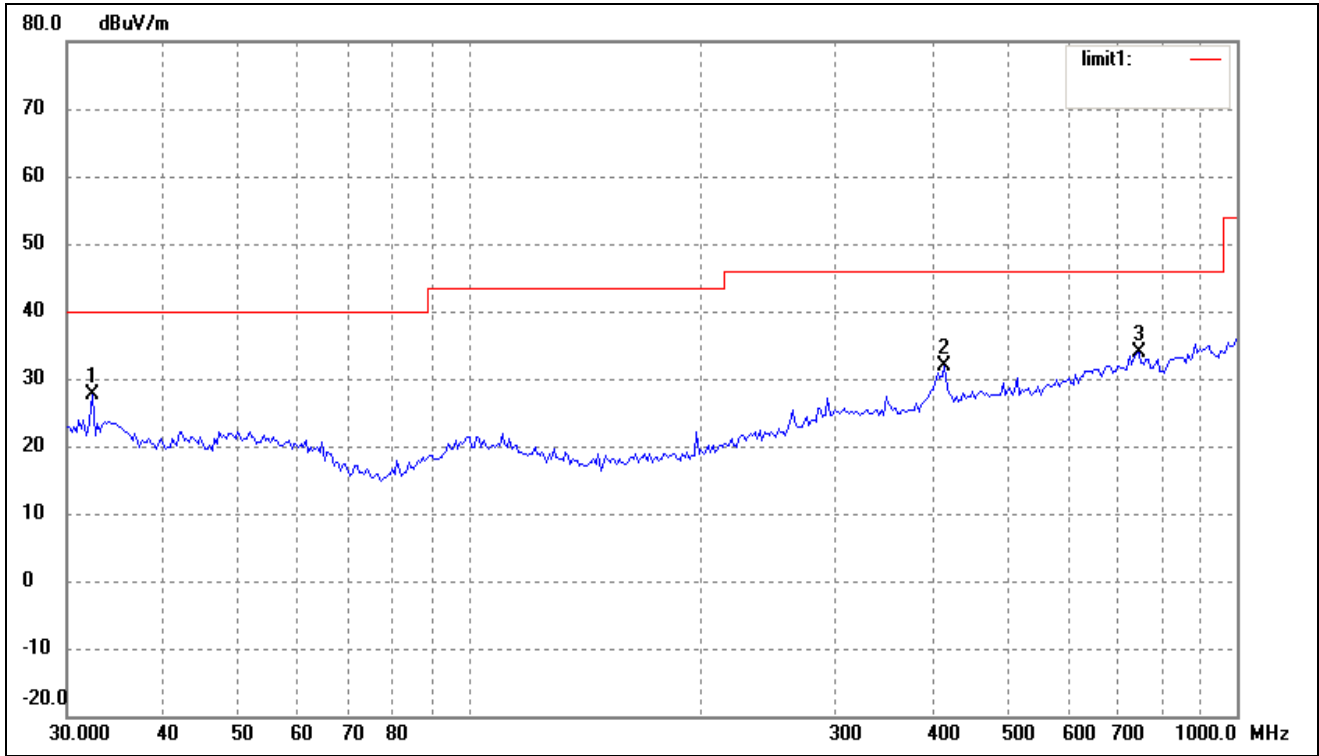
Comment:

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	416.1791	22.43	10.86	33.29	46.00	-12.71	360	100	peak
2	744.8661	16.34	17.95	34.29	46.00	-11.71	360	100	peak

Test Specification: Vertical

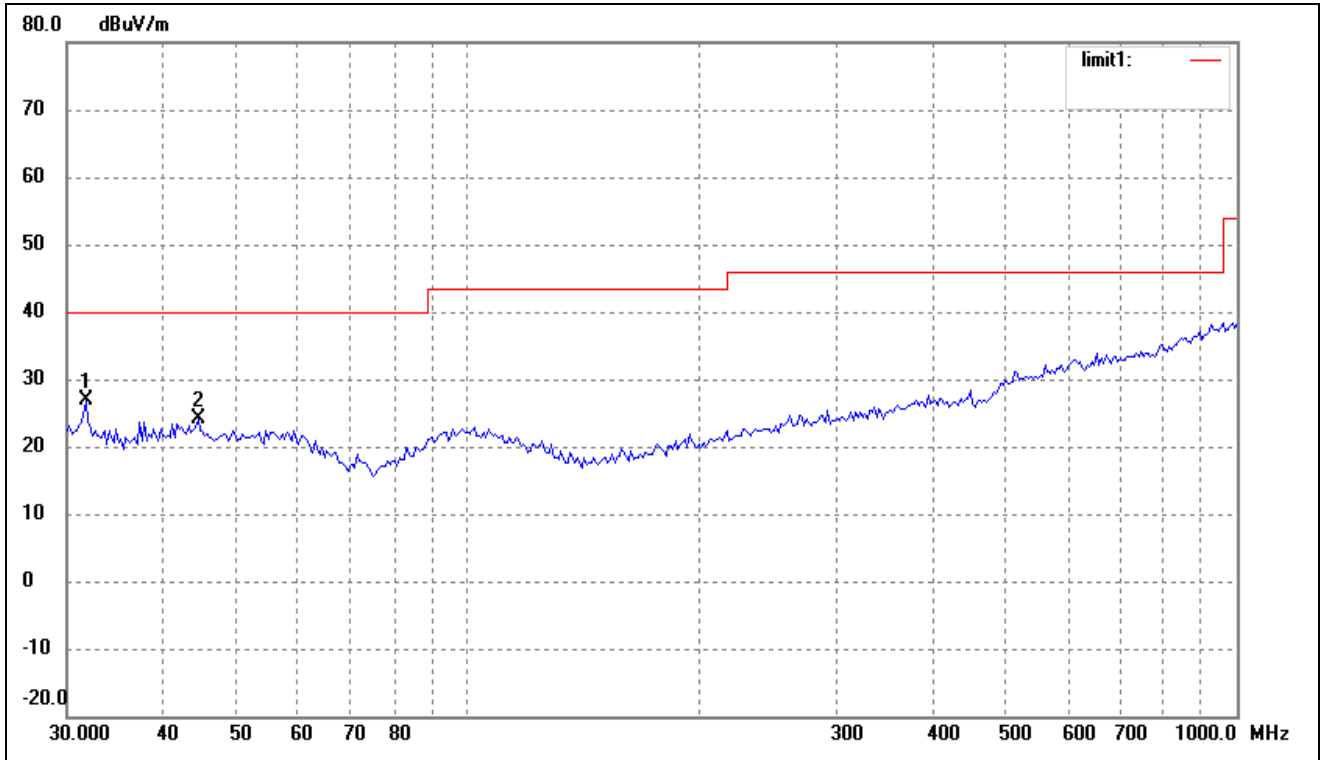


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.4059	19.17	8.44	27.61	40.00	-12.39	255	100	peak
2	416.1791	20.93	10.86	31.79	46.00	-14.21	278	100	peak
3	744.8661	15.84	17.95	33.79	46.00	-12.21	134	100	peak

Operating Condition: 802.11b Transmitting High Channel-2462MHz

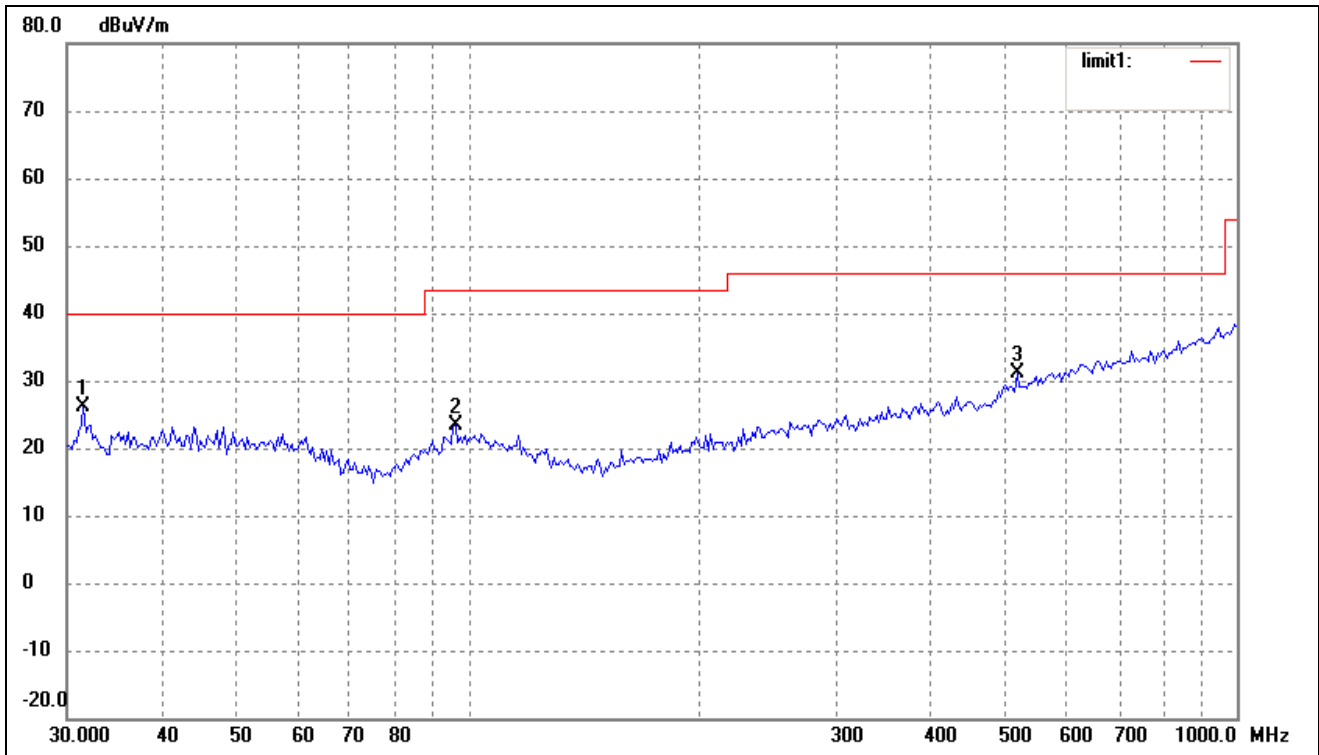
Comment:

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	31.7313	20.09	6.77	26.86	40.00	-13.14	162	100	peak
2	44.4308	15.81	8.22	24.03	40.00	-15.97	200	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	31.5095	19.46	6.77	26.23	40.00	-13.77	240	100	peak
2	96.0986	15.12	8.14	23.26	43.50	-20.24	187	100	peak
3	517.2480	16.25	14.80	31.05	46.00	-14.95	220	100	peak

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

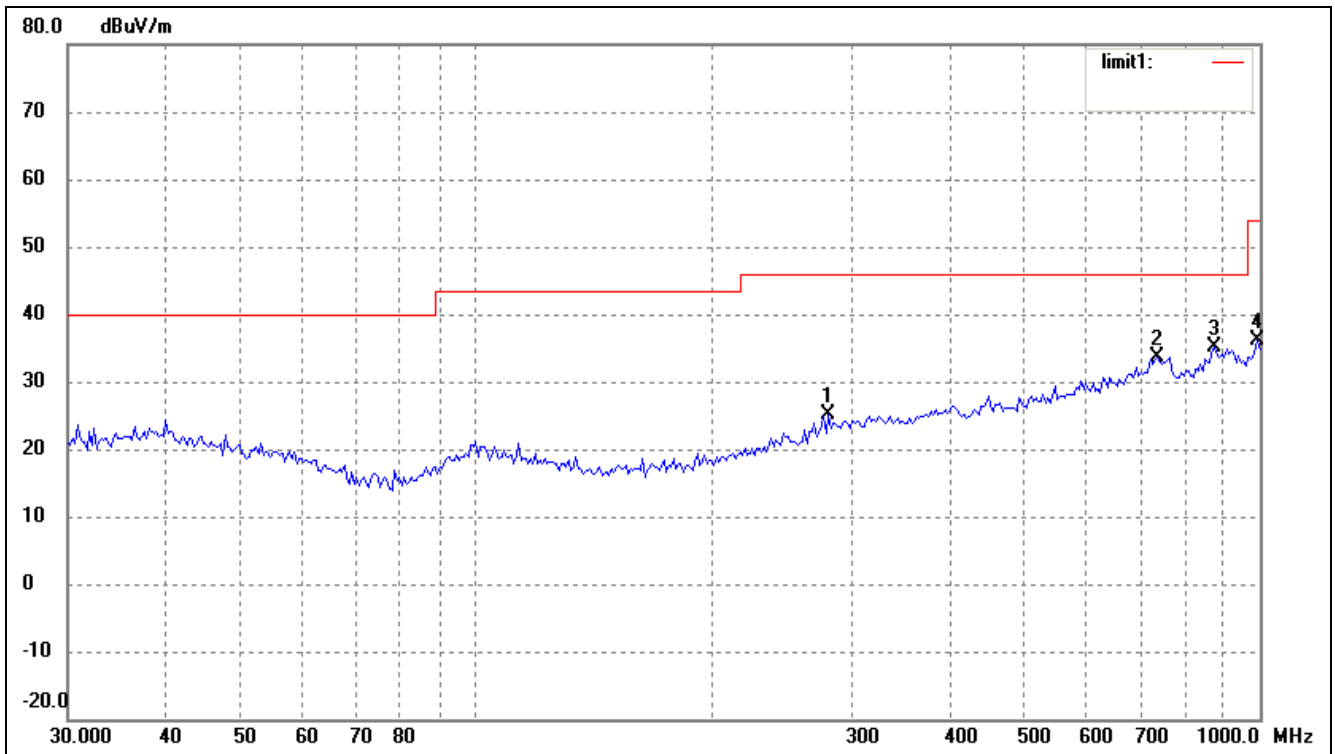
EUT: *tablet pc*

Tested Model: *D2-711*

Operating Condition: *802.11g Transmitting Low Channel-2412MHz*

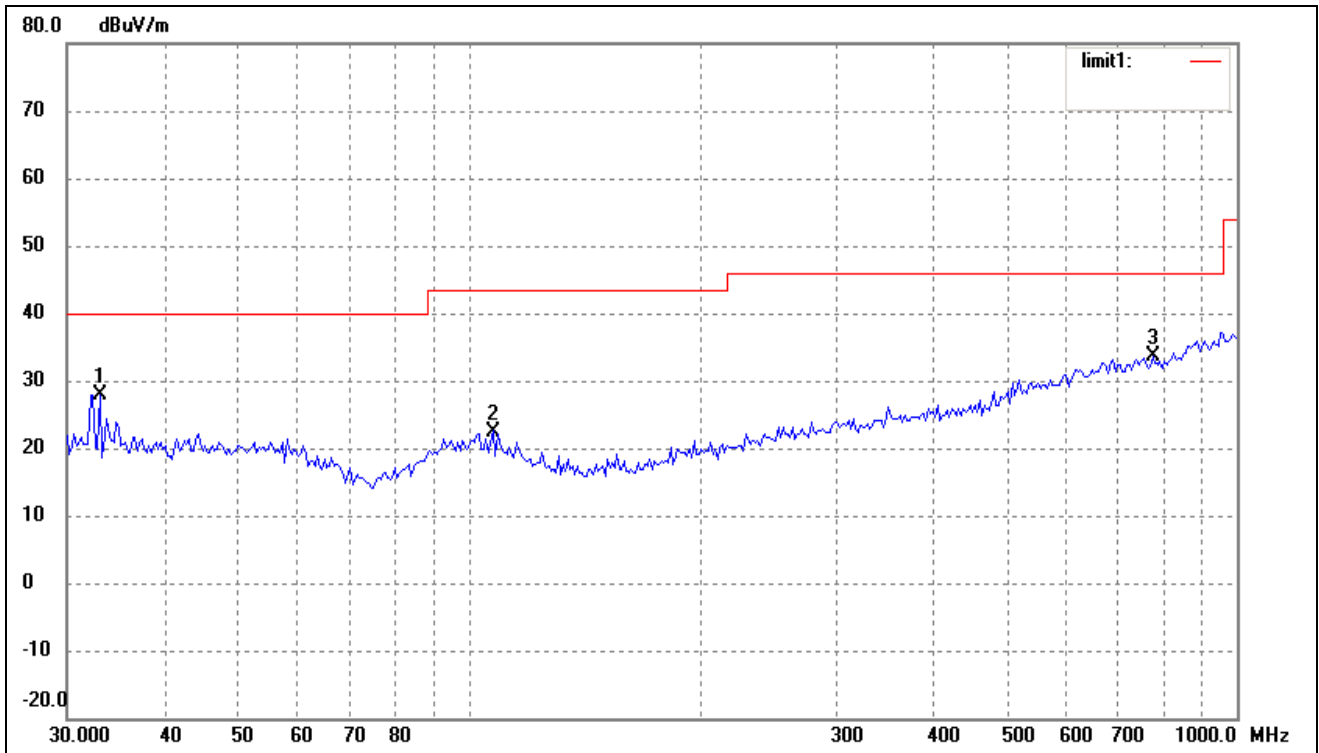
Comment:

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	281.0075	15.92	9.29	25.21	46.00	-20.79	360	100	peak
2	739.6605	15.61	18.07	33.68	46.00	-12.32	147	100	peak
3	875.2470	16.42	18.80	35.22	46.00	-10.78	152	100	peak
4	993.0114	16.48	19.53	36.01	54.00	-17.99	360	100	peak

Test Specification: Vertical

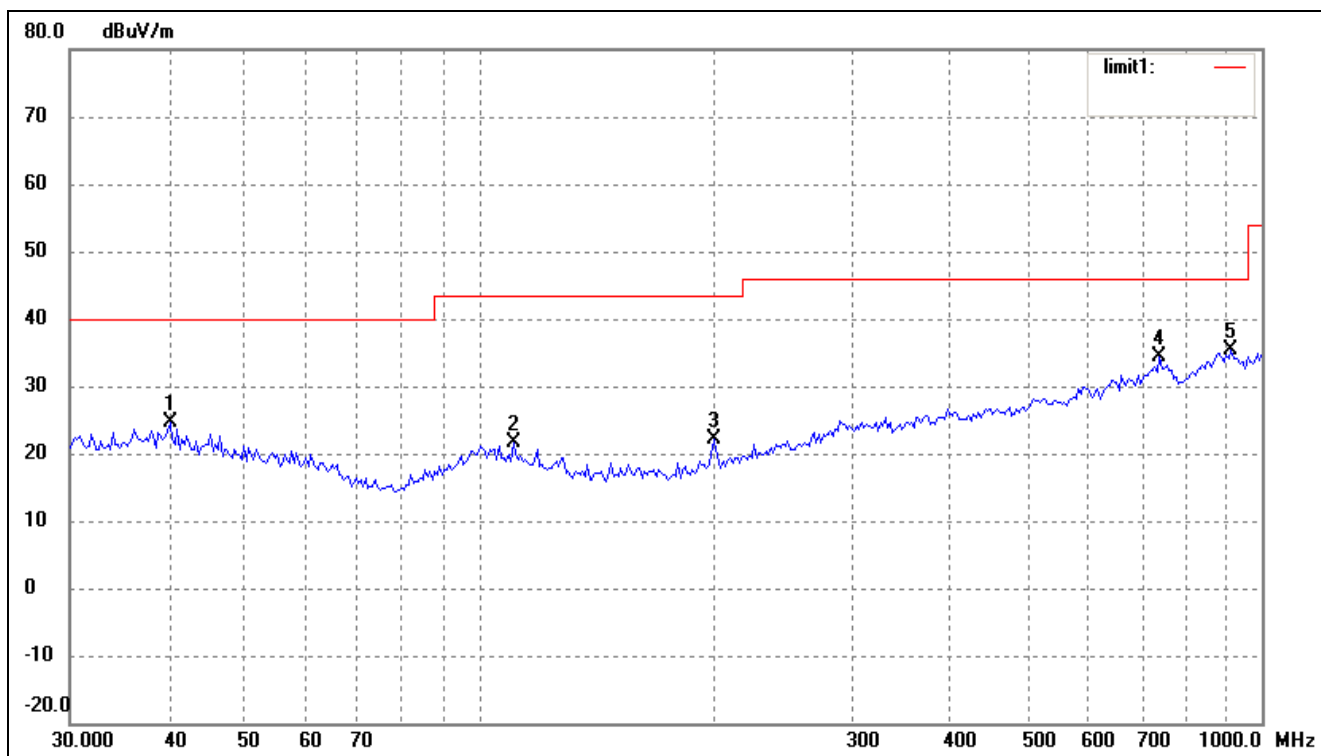


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	33.0950	21.20	6.77	27.97	40.00	-12.03	255	100	peak
2	107.5101	14.70	7.80	22.50	43.50	-21.00	180	100	peak
3	776.8778	15.04	18.66	33.70	46.00	-12.30	87	100	peak

Operating Condition: 802.11g Transmitting Middle Channel-2437MHz

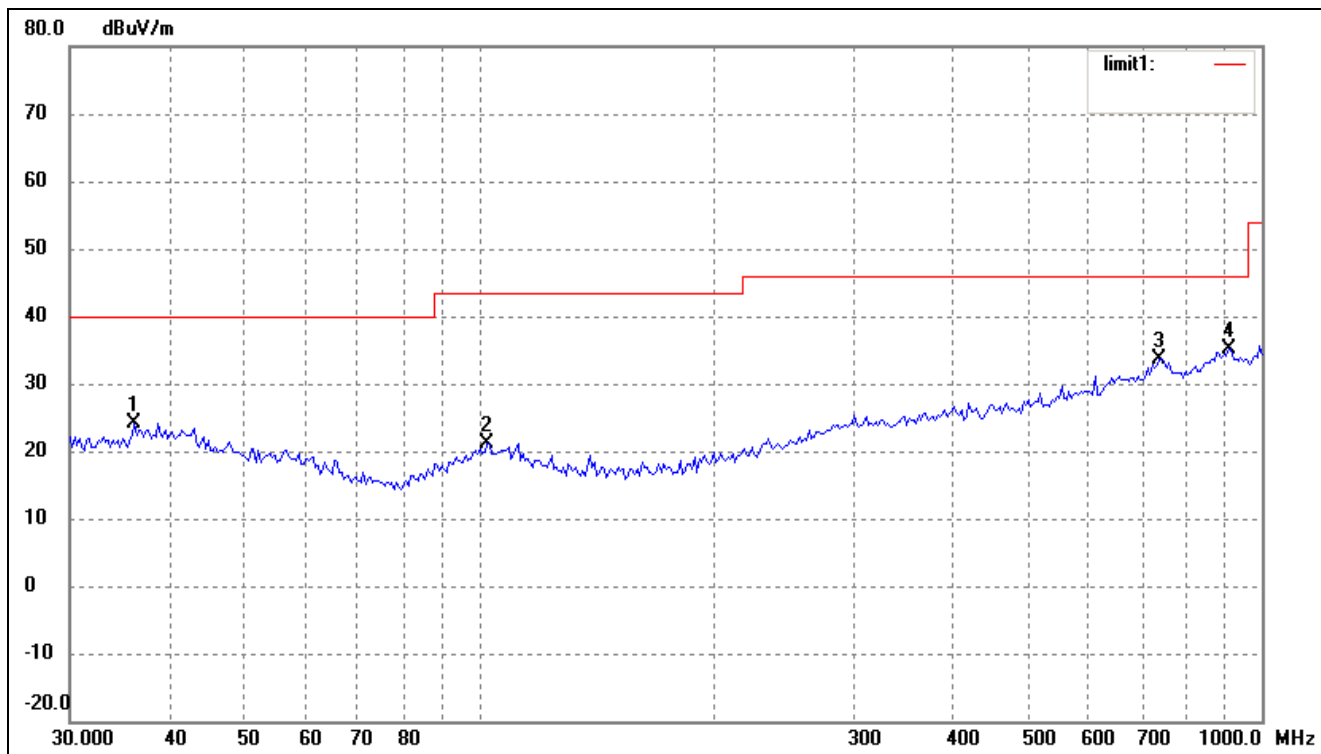
Comment:

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	40.2757	15.03	9.60	24.63	40.00	-15.37	221	100	peak
2	110.5687	15.81	5.80	21.61	43.50	-21.89	238	100	peak
3	199.2855	17.47	4.61	22.08	43.50	-21.42	67	100	peak
4	739.6605	16.33	18.07	34.40	46.00	-11.60	91	100	peak
5	912.8620	16.49	18.93	35.42	46.00	-10.58	236	100	peak

Test Specification: Vertical

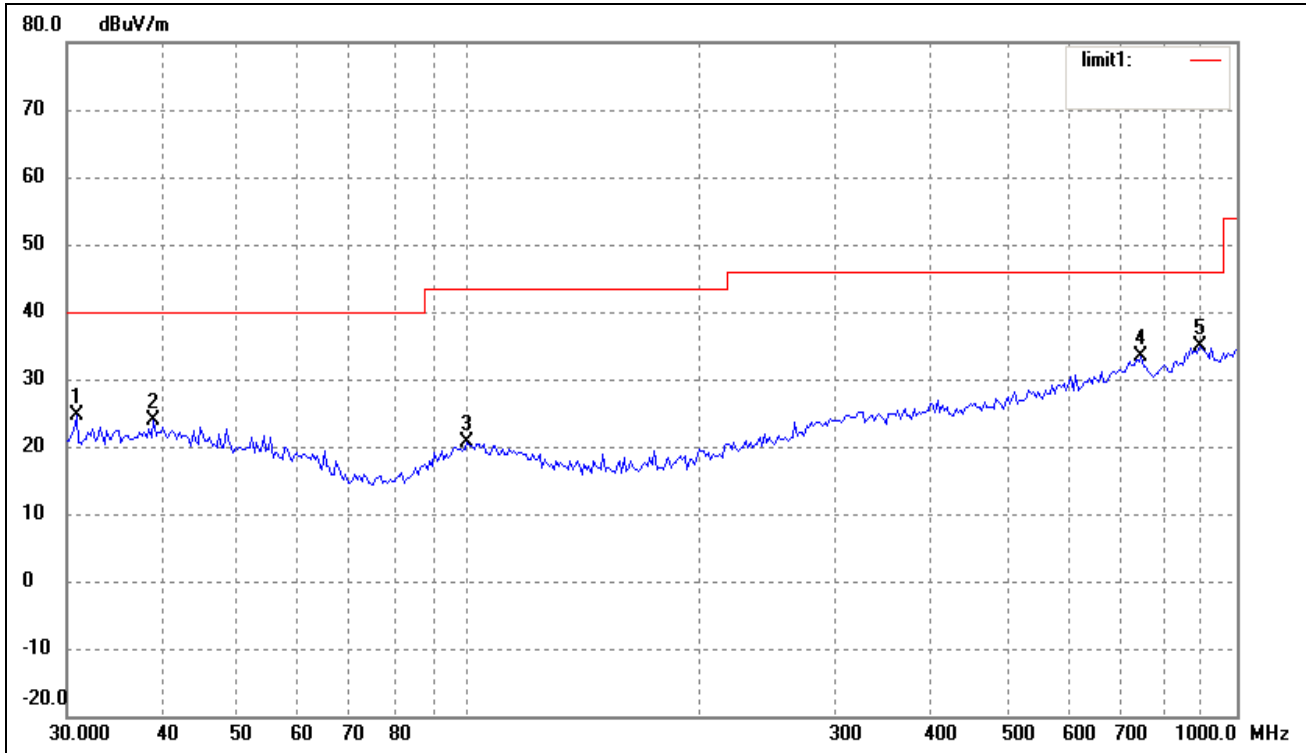


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.2541	14.92	9.09	24.01	40.00	-15.99	264	100	peak
2	102.3597	14.60	6.61	21.21	43.50	-22.29	180	100	peak
3	739.6605	15.59	18.07	33.66	46.00	-12.34	255	100	peak
4	906.4824	15.98	19.15	35.13	46.00	-10.87	65	100	peak

Operating Condition: 802.11g Transmitting High Channel-2462MHz

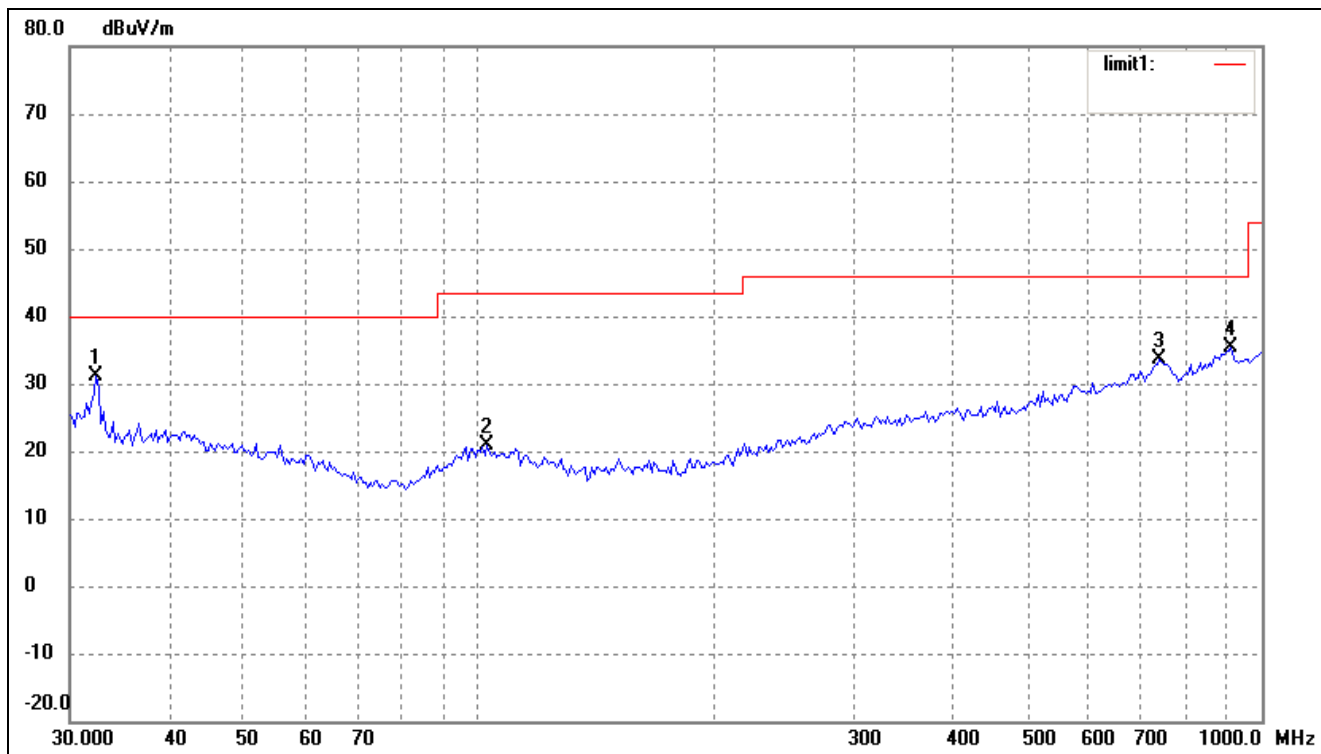
Comment:

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	30.8535	16.45	8.19	24.64	40.00	-15.36	244	100	peak
2	38.8879	14.29	9.50	23.79	40.00	-16.21	73	200	peak
3	99.5281	14.02	6.72	20.74	43.50	-22.76	164	100	peak
4	750.1083	15.67	17.78	33.45	46.00	-12.55	220	100	peak
5	893.8567	15.72	19.27	34.99	46.00	-11.01	113	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.4059	22.61	8.44	31.05	40.00	-8.95	261	100	peak
2	102.3597	14.29	6.61	20.90	43.50	-22.60	360	100	peak
3	739.6605	15.66	18.07	33.73	46.00	-12.27	119	100	peak
4	912.8620	16.55	18.93	35.48	46.00	-10.52	250	100	peak

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

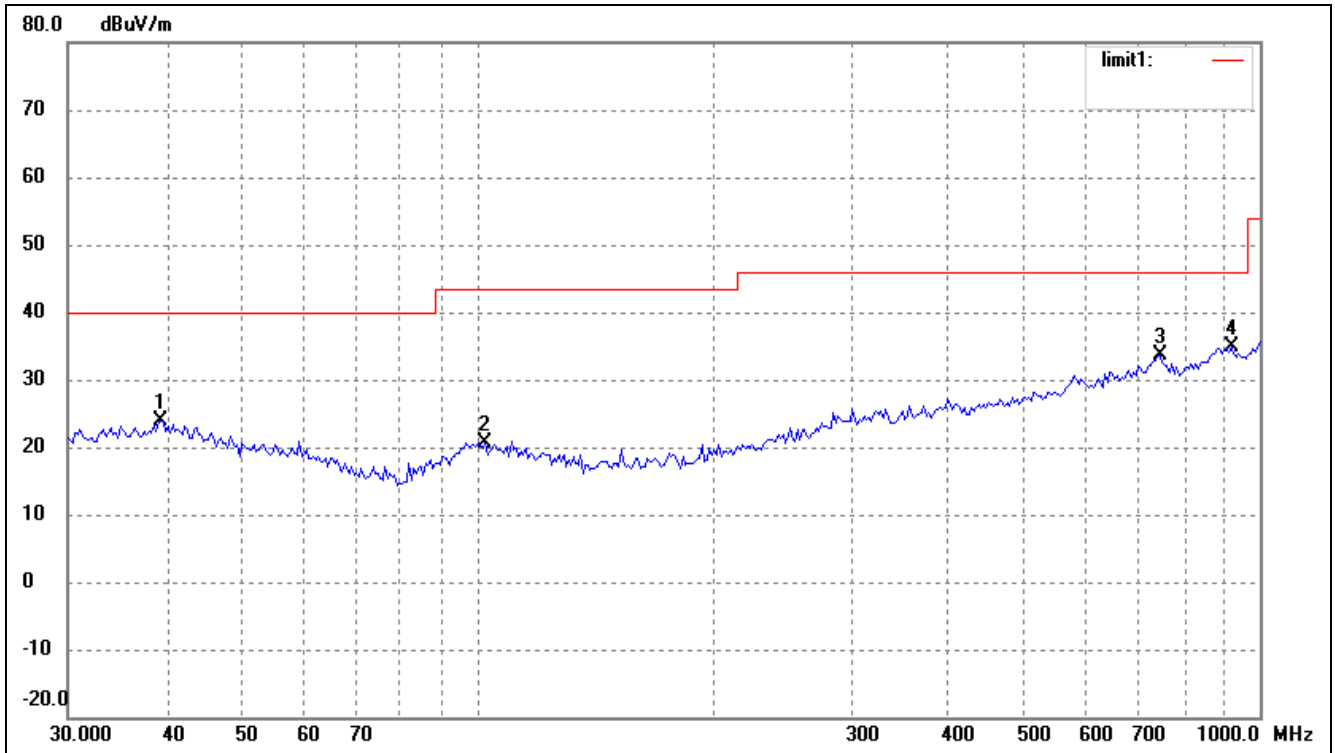
EUT: *tablet pc*

Tested Model: *D2-711*

Operating Condition: *802.11n-HT20 Transmitting Low Channel-2412MHz*

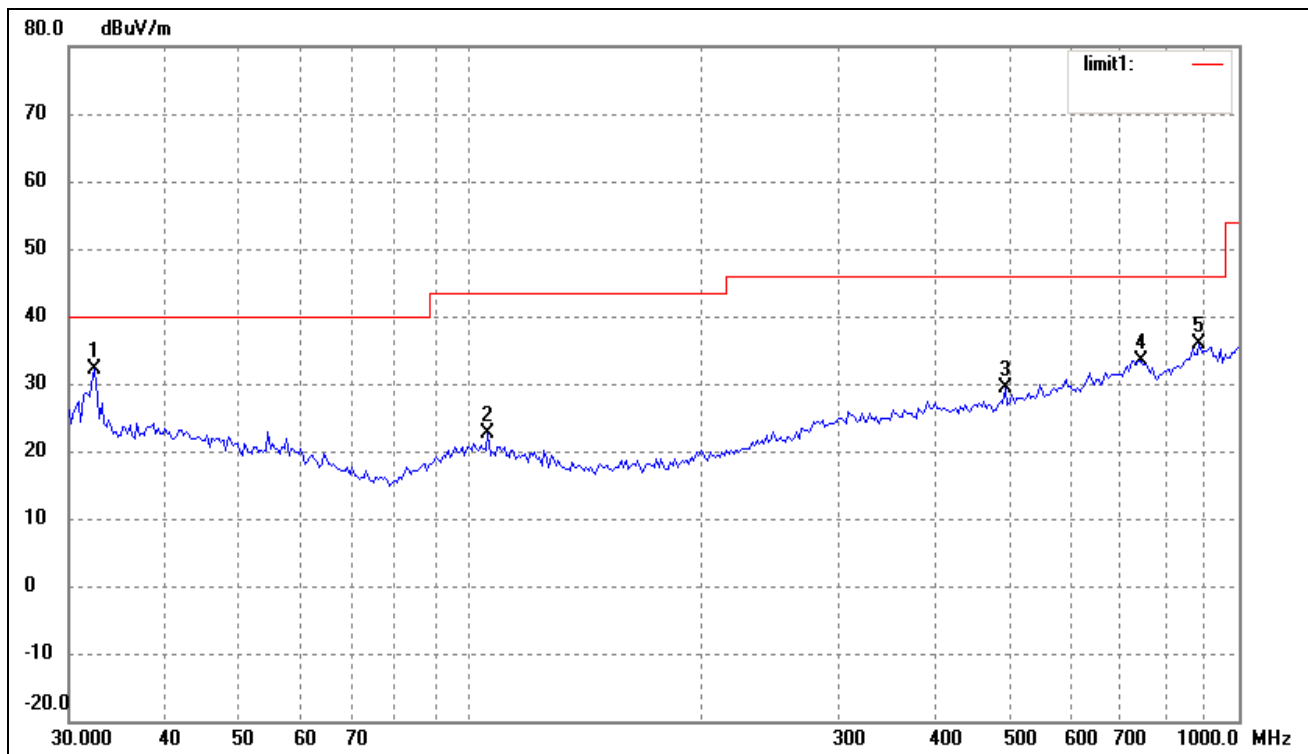
Comment:

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	39.4372	14.37	9.60	23.97	40.00	-16.03	260	100	peak
2	102.3597	14.14	6.61	20.75	43.50	-22.75	131	200	peak
3	744.8661	15.61	17.95	33.56	46.00	-12.44	285	200	peak
4	919.2866	16.27	18.70	34.97	46.00	-11.03	224	100	peak

Test Specification: Vertical

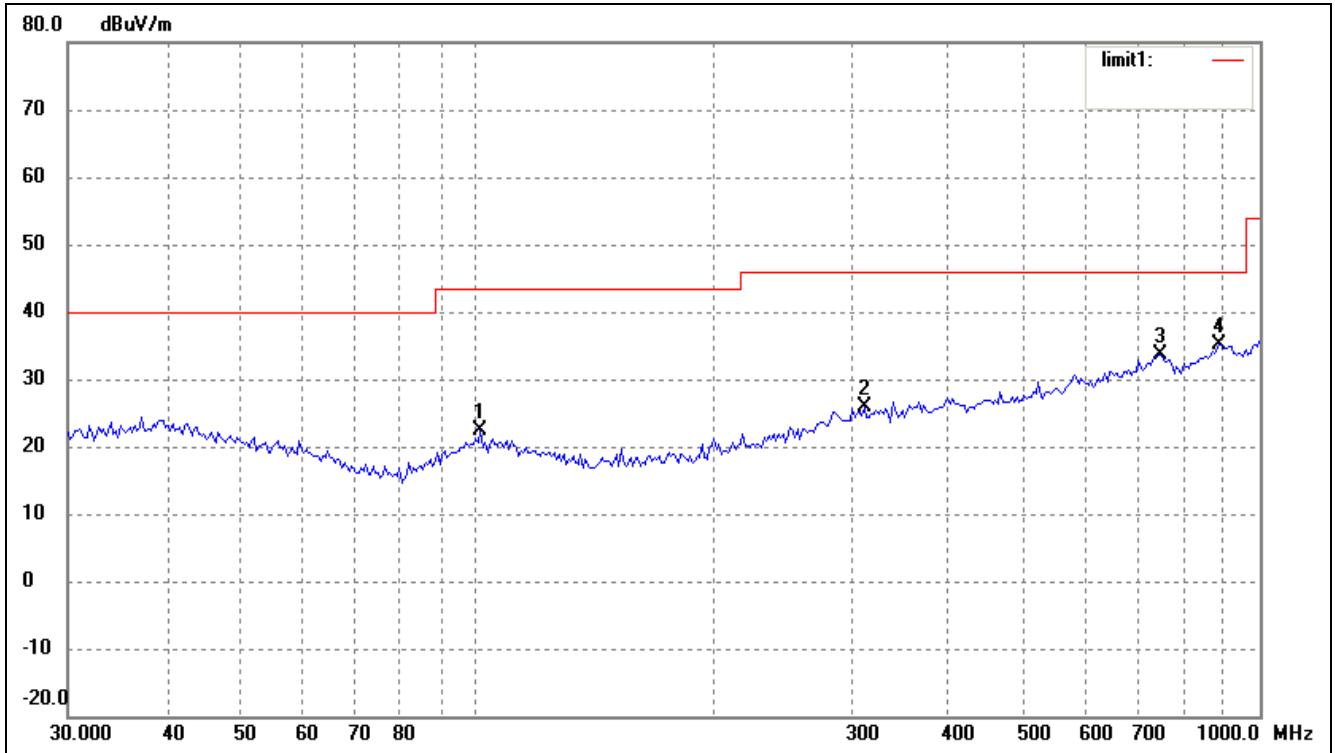


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.4059	23.67	8.44	32.11	40.00	-7.89	150	100	peak
2	105.2718	16.25	6.32	22.57	43.50	-20.93	197	100	peak
3	495.9344	17.25	12.04	29.29	46.00	-16.71	310	100	peak
4	744.8661	15.46	17.95	33.41	46.00	-12.59	229	100	peak
5	887.6099	16.71	19.15	35.86	46.00	-10.14	130	100	peak

Operating Condition: 802.11n-HT20 Transmitting Middle Channel-2437MHz

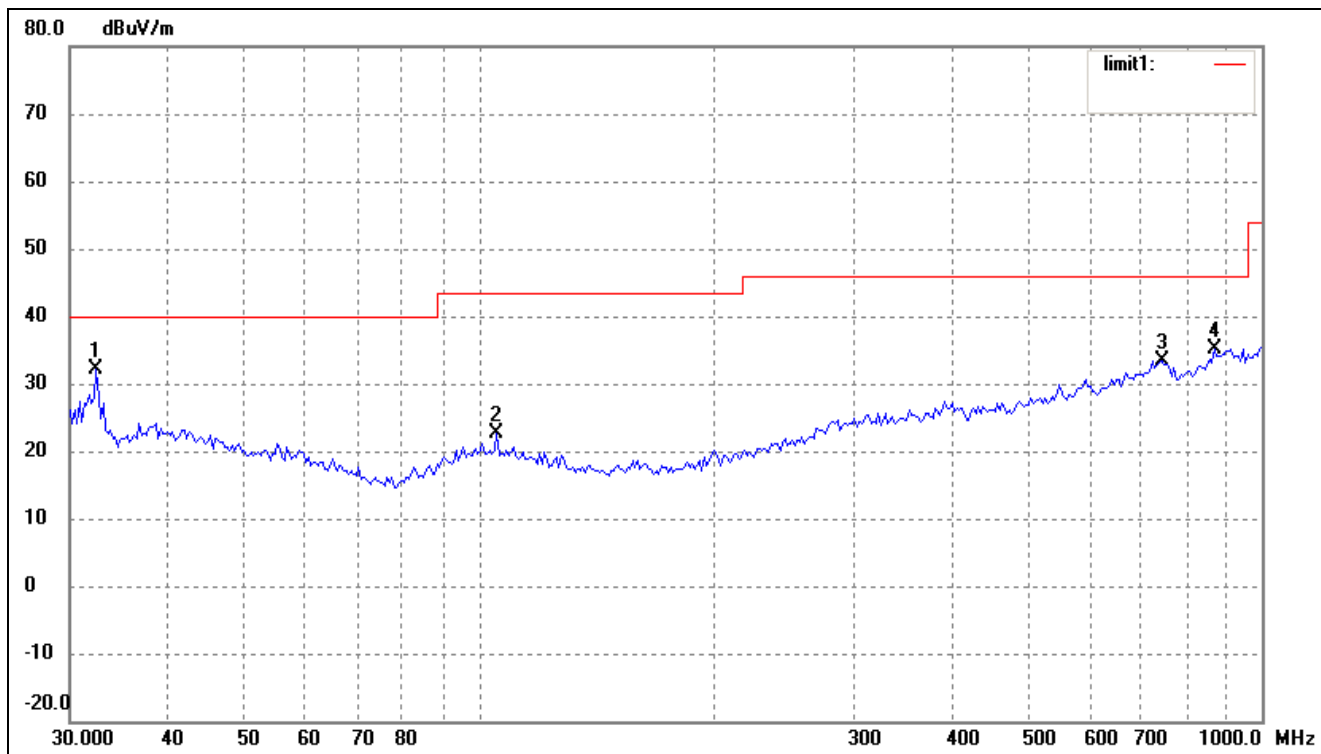
Comment:

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	100.9340	15.68	6.75	22.43	43.50	-21.07	274	100	peak
2	312.1794	15.59	10.36	25.95	46.00	-20.05	116	100	peak
3	744.8661	15.61	17.95	33.56	46.00	-12.44	82	100	peak
4	887.6099	15.93	19.15	35.08	46.00	-10.92	134	100	peak

Test Specification: Vertical

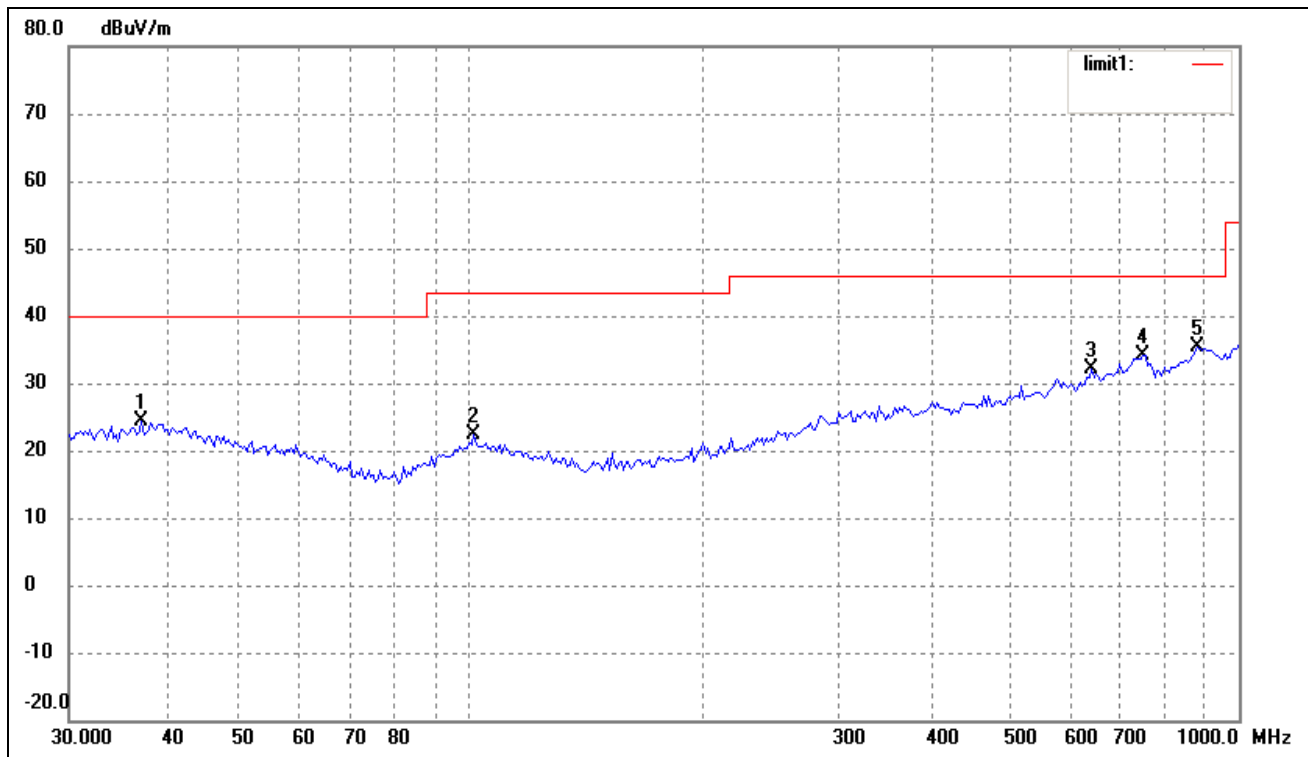


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.4059	23.69	8.44	32.13	40.00	-7.87	264	100	peak
2	105.2718	16.25	6.32	22.57	43.50	-20.93	110	100	peak
3	744.8661	15.46	17.95	33.41	46.00	-12.59	136	100	peak
4	869.1302	16.70	18.54	35.24	46.00	-10.76	90	100	peak

Operating Condition: 802.11n-HT20 Transmitting High Channel-2462MHz

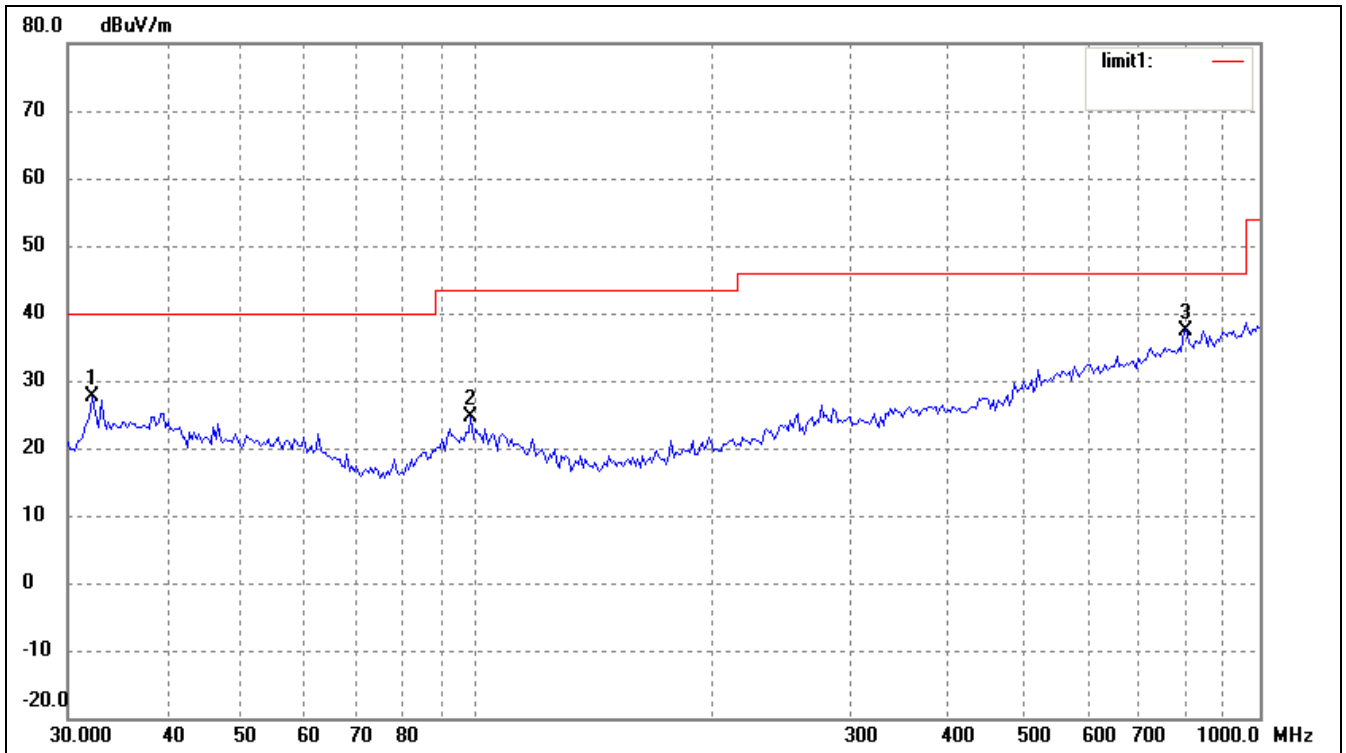
Comment:

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	37.2855	15.17	9.25	24.42	40.00	-15.58	264	100	peak
2	100.9340	15.68	6.75	22.43	43.50	-21.07	113	100	peak
3	642.8613	17.05	15.14	32.19	46.00	-13.81	80	100	peak
4	750.1083	16.28	17.78	34.06	46.00	-11.94	340	100	peak
5	881.4067	16.33	19.03	35.36	46.00	-10.64	116	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.1795	20.84	6.77	27.61	40.00	-12.39	25	100	peak
2	98.1419	16.21	8.30	24.51	43.50	-18.99	300	100	peak
3	804.6028	18.40	19.10	37.50	46.00	-8.50	130	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	53.31	-3.86	49.45	74.00	-24.55	H	PK
4824	38.14	-3.86	34.28	54.00	-19.72	H	AV
7236	49.53	1.10	50.63	74.00	-23.37	H	PK
7236	36.79	1.10	37.89	54.00	-16.11	H	AV
4824	50.44	-3.86	46.58	74.00	-27.42	V	PK
4824	36.56	-3.86	32.70	54.00	-21.30	V	AV
7236	48.85	1.10	49.95	74.00	-24.05	V	PK
7236	36.84	1.10	37.94	54.00	-16.06	V	AV
Middle Channel-2437MHz							
4874	54.97	-3.74	51.23	74.00	-22.77	H	PK
4874	39.87	-3.74	36.13	54.00	-17.87	H	AV
7311	49.66	1.47	51.13	74.00	-22.87	H	PK
7311	37.77	1.47	39.24	54.00	-14.76	H	AV
4874	50.99	-3.74	47.25	74.00	-26.75	V	PK
4874	35.31	-3.74	31.57	54.00	-22.43	V	AV
7311	49.73	1.47	51.20	74.00	-22.80	V	PK
7311	38.85	1.47	40.32	54.00	-13.68	V	AV
High Channel-2462MHz							
4924	54.96	-3.59	51.37	74.00	-22.63	H	PK
4924	46.11	-3.59	42.52	54.00	-11.48	H	AV
7386	50.42	1.79	52.21	74.00	-21.79	H	PK
7386	39.01	1.79	40.80	54.00	-13.20	H	AV
4924	54.51	-3.59	50.92	74.00	-23.08	V	PK
4924	35.14	-3.59	31.55	54.00	-22.45	V	AV
7386	46.68	1.79	48.47	74.00	-25.53	V	PK
7386	38.48	1.79	40.27	54.00	-13.73	V	AV

Test Mode: 802.11g

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2412MHz							
4824	51.67	-3.86	47.81	74.00	-26.19	H	PK
4824	38.00	-3.86	34.14	54.00	-19.86	H	AV
7236	48.41	1.10	49.51	74.00	-24.49	H	PK
7236	36.63	1.10	37.73	54.00	-16.27	H	AV
4824	53.64	-3.86	49.78	74.00	-24.22	V	PK
4824	40.38	-3.86	36.52	54.00	-17.48	V	AV
7236	48.47	1.10	49.57	74.00	-24.43	V	PK
7236	36.44	1.10	37.54	54.00	-16.46	V	AV
Middle Channel-2437MHz							
4874	51.99	-3.74	48.25	74.00	-25.75	H	PK
4874	40.28	-3.74	36.54	54.00	-17.46	H	AV
7311	48.27	1.47	49.74	74.00	-24.26	H	PK
7311	34.90	1.47	36.37	54.00	-17.63	H	AV
4874	49.32	-3.74	45.58	74.00	-28.42	V	PK
4874	36.31	-3.74	32.57	54.00	-21.43	V	AV
7311	48.50	1.47	49.97	74.00	-24.03	V	PK
7311	29.91	1.47	31.38	54.00	-22.62	V	AV
High Channel-2462MHz							
4924	52.96	-3.59	49.37	74.00	-24.63	H	PK
4924	38.11	-3.59	34.52	54.00	-19.48	H	AV
7386	47.56	1.79	49.35	74.00	-24.65	H	PK
7386	34.92	1.79	36.71	54.00	-17.29	H	AV
4924	51.93	-3.59	48.34	74.00	-25.66	V	PK
4924	41.31	-3.59	37.72	54.00	-16.28	V	AV
7386	49.88	1.79	51.67	74.00	-22.33	V	PK
7386	36.24	1.79	38.03	54.00	-15.97	V	AV

Test Mode: 802.11n-HT20

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2412MHz							
4824	52.49	-3.86	48.63	74.00	-25.37	H	PK
4824	39.74	-3.86	35.88	54.00	-18.12	H	AV
7236	48.71	1.10	49.81	74.00	-24.19	H	PK
7236	36.77	1.10	37.87	54.00	-16.13	H	AV
4824	49.78	-3.86	45.92	74.00	-28.08	V	PK
4824	38.55	-3.86	34.69	54.00	-19.31	V	AV
7236	49.03	1.10	50.13	74.00	-23.87	V	PK
7236	36.53	1.10	37.63	54.00	-16.37	V	AV
Middle Channel-2437MHz							
4874	52.06	-3.74	48.32	74.00	-25.68	H	PK
4874	39.39	-3.74	35.65	54.00	-18.35	H	AV
7311	47.85	1.47	49.32	74.00	-24.68	H	PK
7311	36.05	1.47	37.52	54.00	-16.48	H	AV
4874	54.29	-3.74	50.55	74.00	-23.45	V	PK
4874	38.02	-3.74	34.28	54.00	-19.72	V	AV
7311	48.30	1.47	49.77	74.00	-24.23	V	PK
7311	34.90	1.47	36.37	54.00	-17.63	V	AV
High Channel-2462MHz							
4924	53.13	-3.59	49.54	74.00	-24.46	H	PK
4924	37.93	-3.59	34.34	54.00	-19.66	H	AV
7386	48.96	1.79	50.75	74.00	-23.25	H	PK
7386	34.91	1.79	36.70	54.00	-17.30	H	AV
4924	51.41	-3.59	47.82	74.00	-26.18	V	PK
4924	39.43	-3.59	35.84	54.00	-18.16	V	AV
7386	48.98	1.79	50.77	74.00	-23.23	V	PK
7386	35.51	1.79	37.30	54.00	-16.70	V	AV

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. 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	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

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.

8.4 Environmental Conditions

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

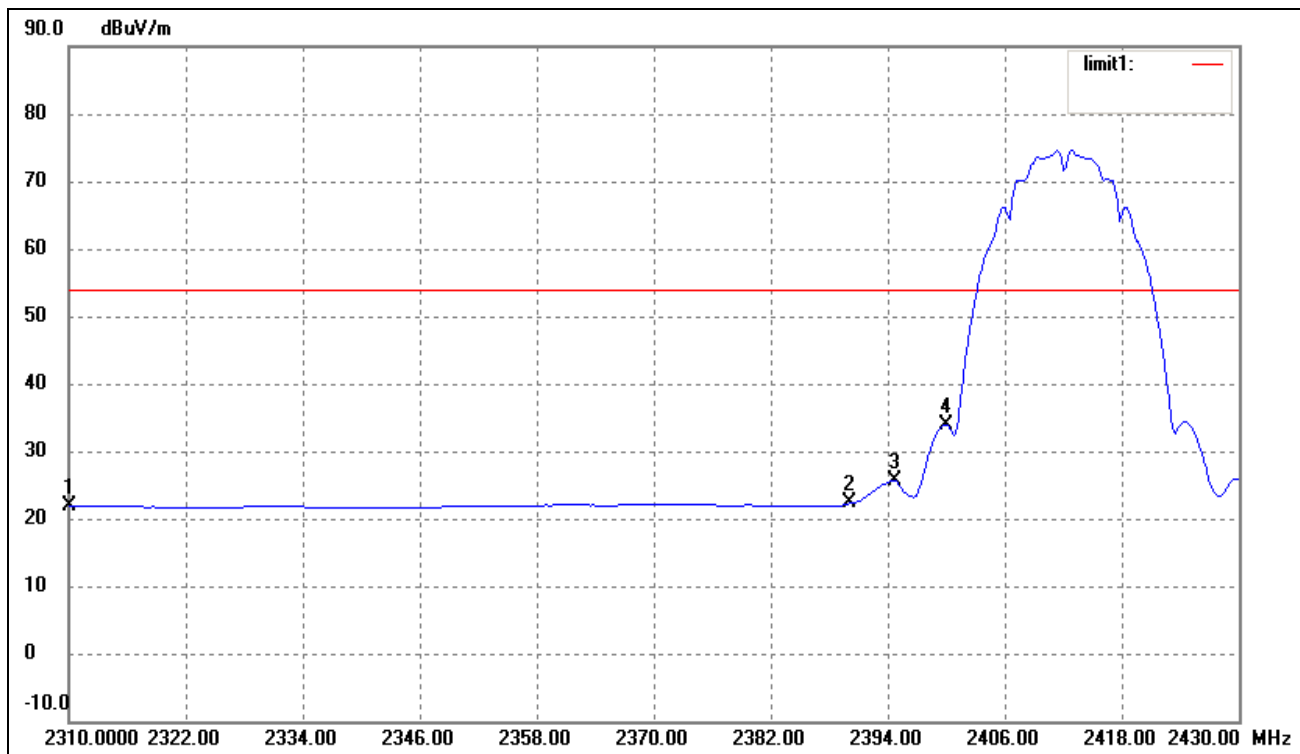
8.5 Summary of Test Results/Plots

Test Mode	Test Frequency MHz	Limit dBuV / dBc	Result
802.11b	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
	2483.50	<54 dBuV	Pass
802.11g	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
	2483.50	<54 dBuV	Pass
802.11n-HT20	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
	2483.50	<54 dBuV	Pass

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

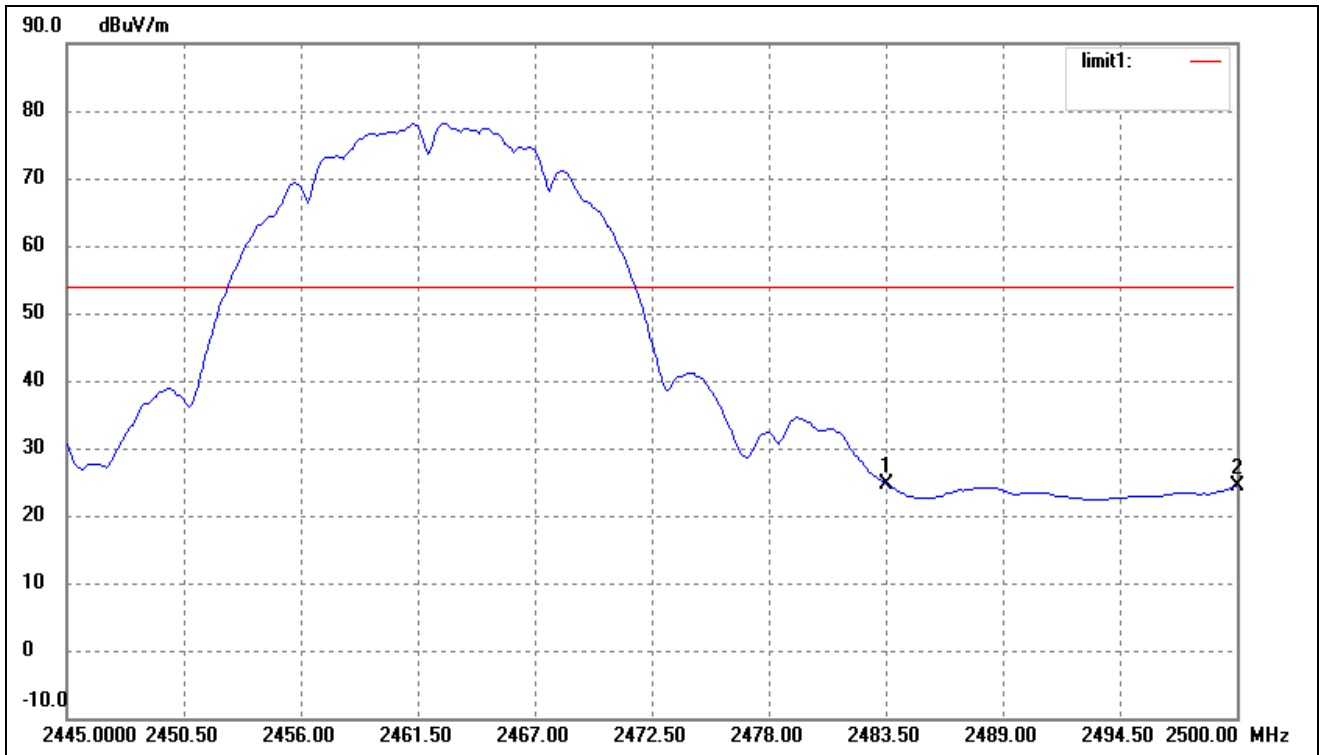
Please refer to the test plots as below.

802.11b-Lowest Bandedge



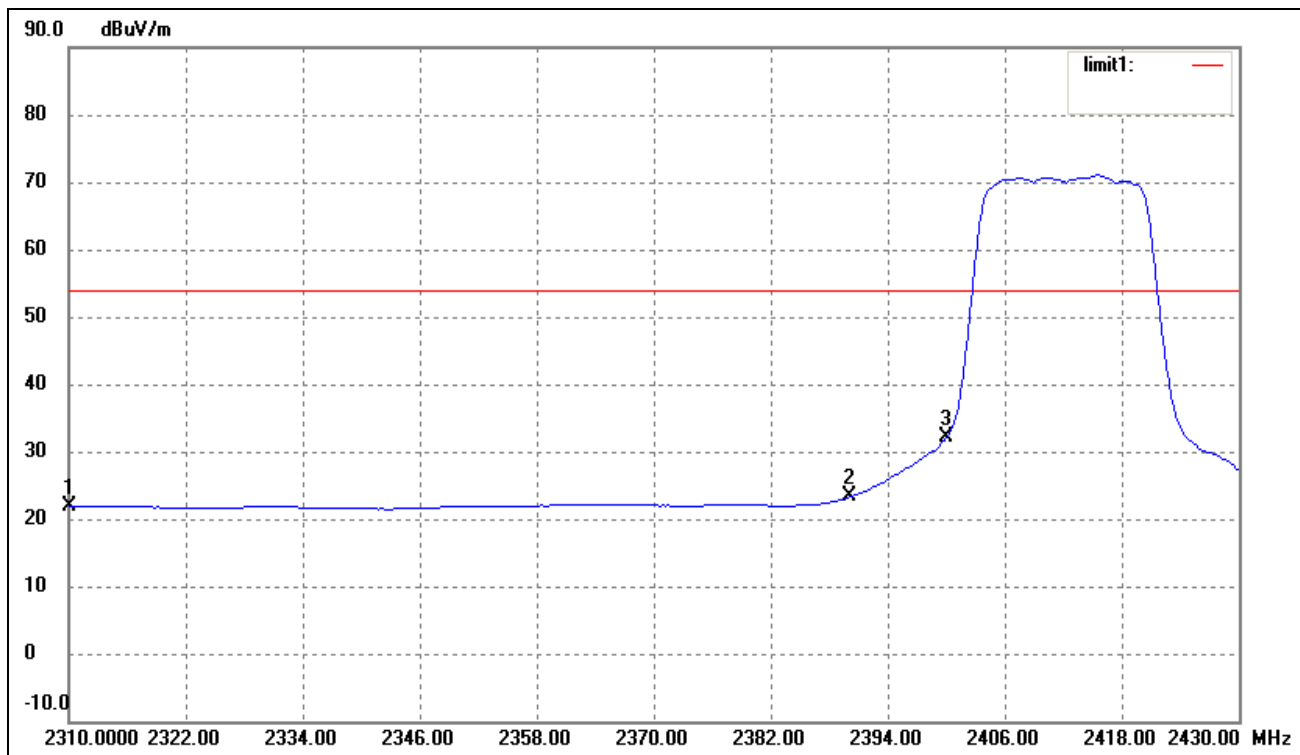
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2310.000	33.62	-11.72	21.90	54.00	-32.10	256	100	Ave
	2310.000	47.38	-11.72	35.66	74.00	-38.34	256	100	peak
2	2390.000	34.05	-11.75	22.30	54.00	-31.70	180	100	Ave
	2390.000	46.52	-11.75	34.77	74.00	-39.23	180	100	peak
3	2394.720	37.40	-11.76	25.64	54.00	-28.36	270	100	Ave
	2394.720	54.38	-11.76	42.62	74.00	-31.38	270	100	peak
4	2400.000	45.60	-11.75	33.85	54.00	-20.15	254	100	Ave
	2400.000	52.10	-11.75	40.35	74.00	-33.65	254	100	peak

802.11b-Highest Bandedge



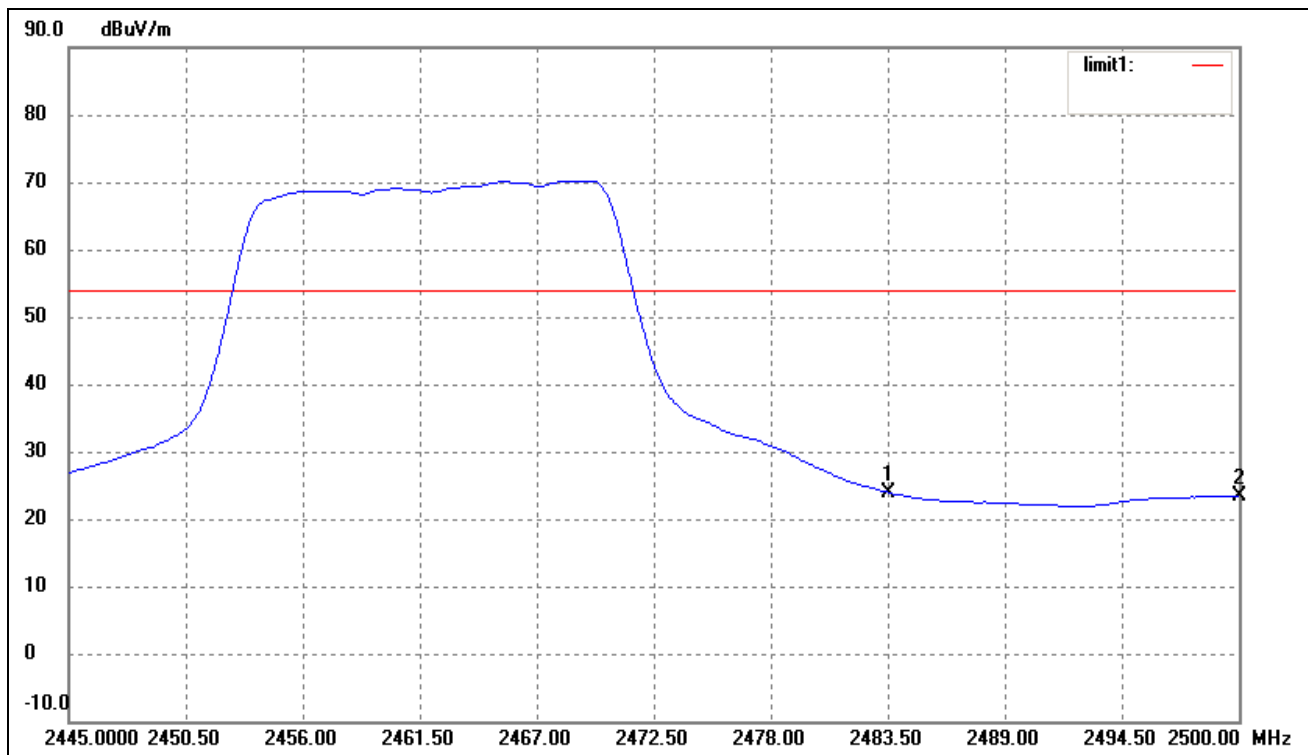
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2483.500	36.33	-11.78	24.55	54.00	-29.45	360	100	Ave
	2483.500	48.63	-11.78	36.85	74.00	-37.15	360	100	peak
2	2500.000	36.09	-11.78	24.31	54.00	-29.69	180	100	Ave
	2500.000	49.12	-11.78	37.34	74.00	-36.66	180	100	peak

802.11g-Lowest Bandedge



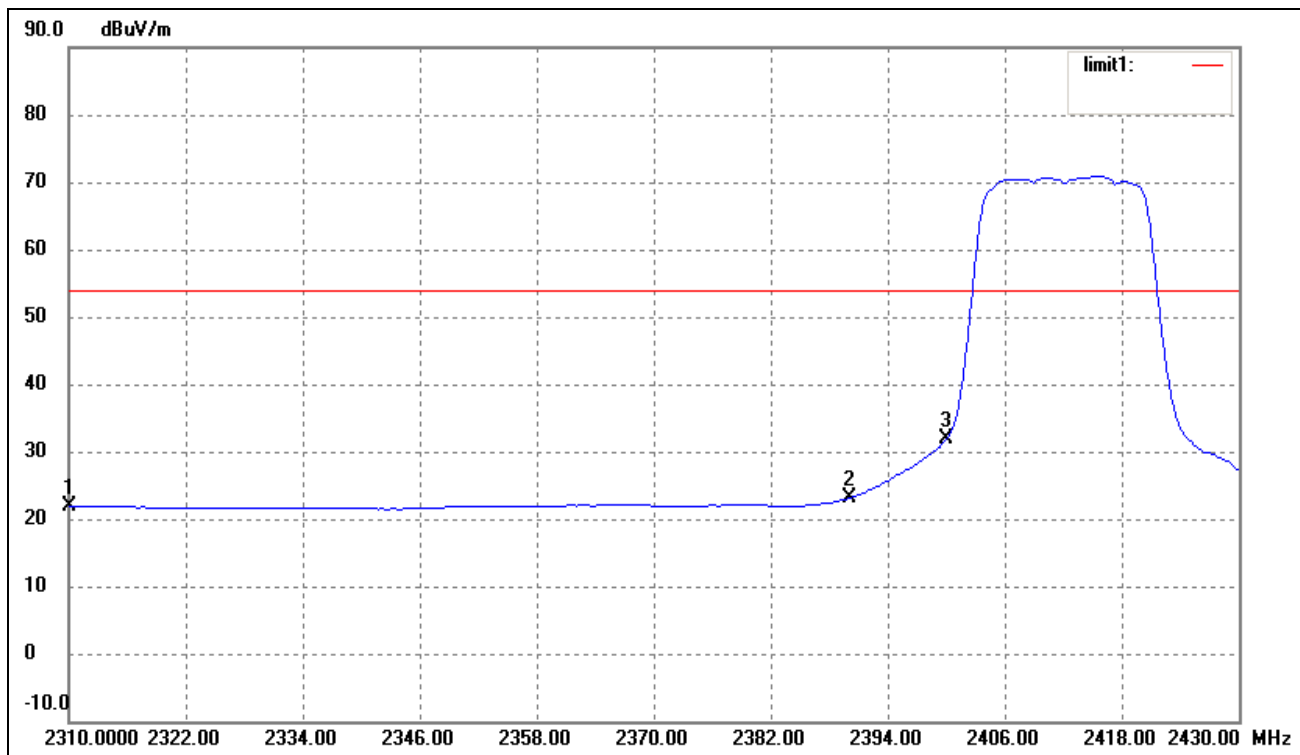
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2310.000	33.63	-11.72	21.91	54.00	-32.09	270	100	Ave
	2310.000	46.23	-11.72	34.51	74.00	-39.49	270	100	peak
2	2390.000	35.07	-11.75	23.32	54.00	-30.68	180	100	Ave
	2390.000	49.30	-11.75	37.55	74.00	-36.45	180	100	peak
3	2400.000	43.79	-11.75	32.04	54.00	-21.96	270	100	Ave
	2400.000	70.45	-11.75	58.70	74.00	-15.30	270	100	peak

802.11g-Highest Bandedge



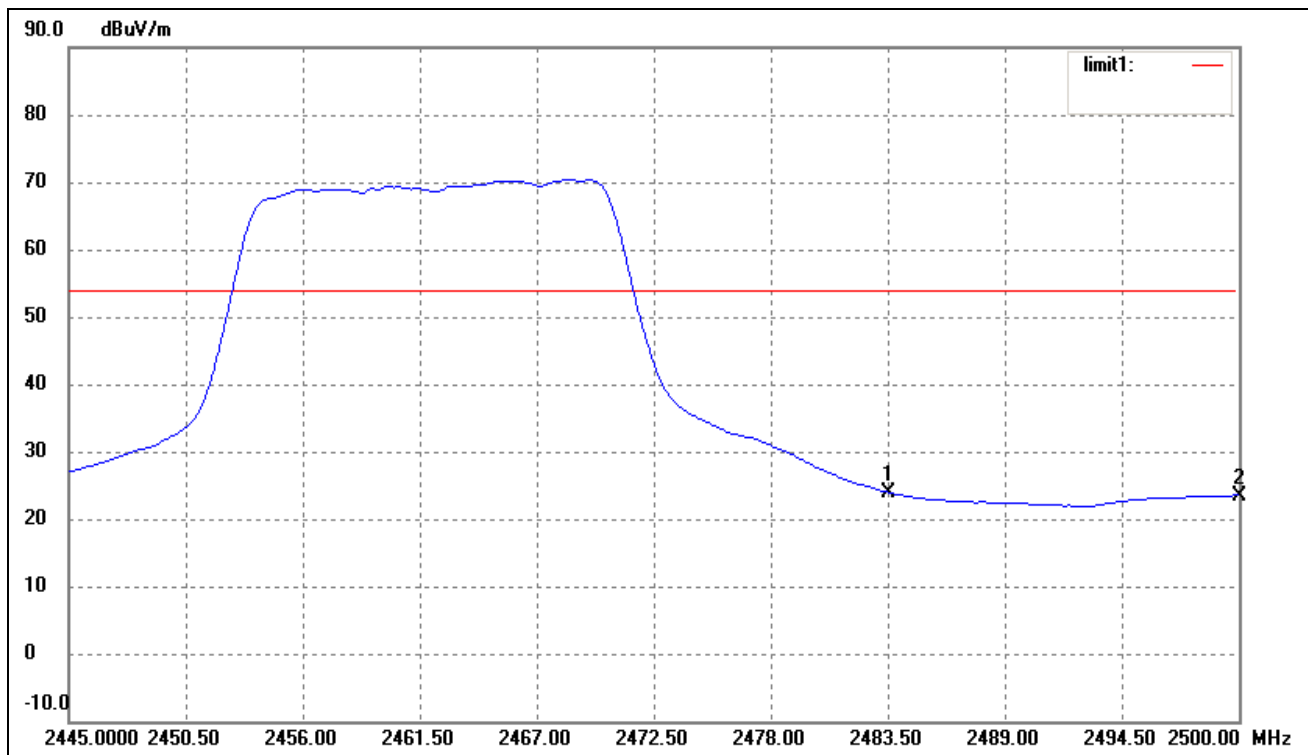
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2483.500	35.70	-11.78	23.92	54.00	-30.08	270	100	Ave
	2483.500	50.25	-11.78	38.47	74.00	-35.53	270	100	peak
2	2500.000	35.24	-11.78	23.46	54.00	-30.54	182	100	Ave
	2500.000	48.35	-11.78	36.57	74.00	-37.43	182	100	peak

802.11n-HT20-Lowest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2310.000	33.57	-11.72	21.85	54.00	-32.15	272	100	Ave
	2310.000	46.90	-11.72	35.18	74.00	-38.82	272	100	peak
2	2390.000	34.92	-11.75	23.17	54.00	-30.83	180	100	Ave
	2390.000	49.91	-11.75	38.16	74.00	-35.84	180	100	peak
3	2400.000	43.64	-11.75	31.89	54.00	-22.11	272	100	Ave
	2400.000	70.66	-11.75	58.91	74.00	-15.09	272	100	peak

802.11n-HT20-Highest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2483.500	35.68	-11.78	23.90	54.00	-30.10	267	100	Ave
	2483.500	51.34	-11.78	39.56	74.00	-34.44	267	100	peak
2	2500.000	35.27	-11.78	23.49	54.00	-30.51	178	100	Ave
	2500.000	48.30	-11.78	36.52	74.00	-37.48	178	100	peak