FCC Part 15C
Measurement and Test Report

For

Shenzhen Discovery Technology Co., LTD.

5th floor Building 2, Block A, Internet industrial park, Baoyuan road,

Xixiang, Baoan District, Shenzhen, China

FCC ID: 2AACI-D5H-88V

FCC Rules:	FCC Part 15C
Product Description:	MID
Tested Model:	D5H-88V
Report No.:	STR13058214I-1
Tested Date:	2013-05-13 to 2013-05-25
Issued Date:	2013-05-31
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:	Shenzhen Discovery Technology Co., LTD.
Address of applicant:	5th floor Building 2, Block A, Internet industrial park, Baoyuan road, Xixiang, Baoan District, Shenzhen, China
Manufacturer:	Shenzhen Discovery Technology Co., LTD.
Address of manufacturer:	5th floor Building 2, Block A, Internet industrial park, Baoyuan road, Xixiang, Baoan District, Shenzhen, China

General Description of EUT	
Product Name:	MID
Trade Name:	/
Model No.:	D5H-88V
Adding Model(s):	/
Rated Voltage:	DC3.7V Lithium Battery
Power Adapter:	Model: YHSW-050200U
	Input: 100-240V, Output:DC 5V
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 11b/g/n(HT20) 2422-2452MHz for 11n(HT40)
RF Output Power (Conducted):	7.81 dBm
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels	11 for for 11b/g/n(HT20), 9 for 11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	2 dBi
Lowest Internal Frequency of EUT:	32.768kHz

1.2 Test Standards

The following report is prepared on behalf of the Shenzhen Discovery Technology 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 D01 V02 for digital transmission systems shall be performed also.

1.4 Test Facility

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

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

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

1.5 EUT Setup and Test Mode

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

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

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	0.9	Shielded	Without Ferrite
DC Cable	1.5	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	SAMSUNG	R20	N/A

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Earphone Cable	0.9	Unshielded	Without Ferrite

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 a permanent antenna, fulfill the requirement of this section.

4. Power Spectral Density

4.1 Standard Applicable

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

4.2 Test Equipment List and Details

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

4.3 Test Procedure

According to the KDB 558074 D01 V02, 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 analyzer center frequency to DTS channel center frequency.
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW ≥ 3 kHz.
5. Set the VBW ≥ 3 x RBW.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level.
11. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.4 Environmental Conditions

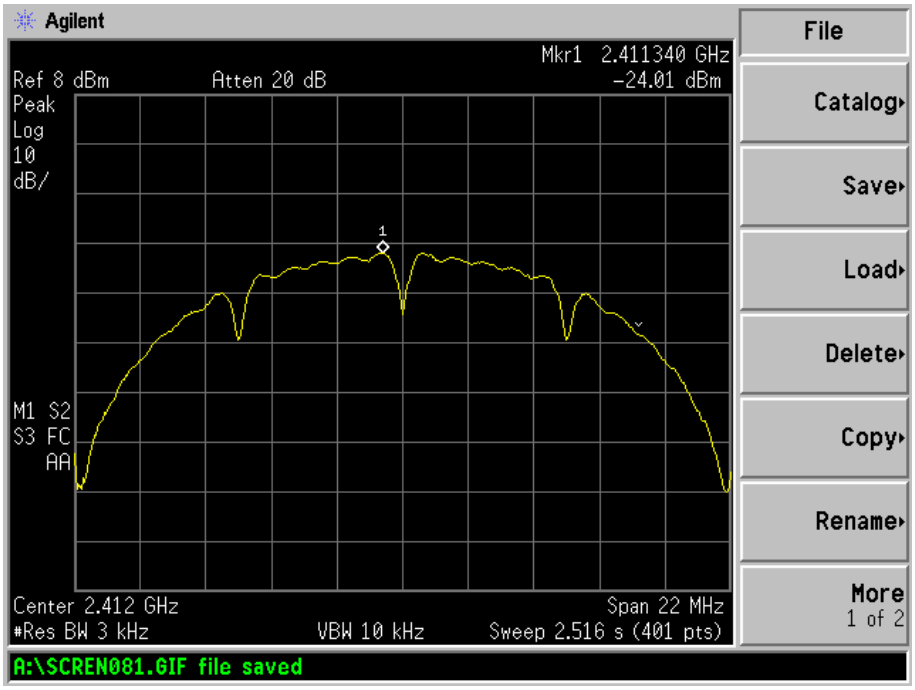
Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots

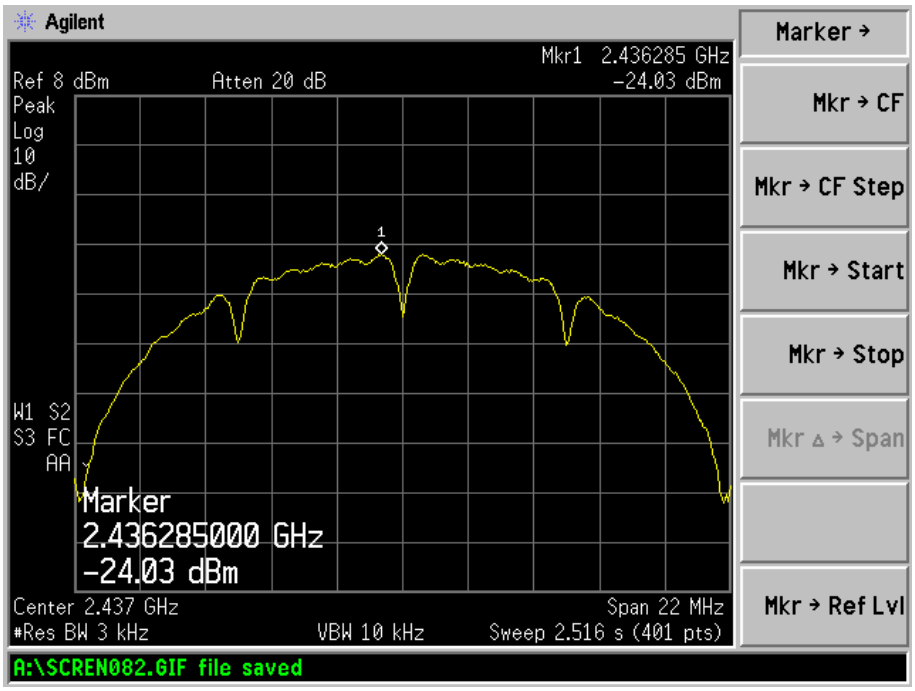
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
802.11b	2412	-24.01	8
	2437	-24.03	8
	2462	-24.80	8
802.11g	2412	-27.30	8
	2437	-27.75	8
	2462	-28.29	8
802.11n HT20	2412	-26.67	8
	2437	-27.31	8
	2462	-28.42	8
802.11n HT40	2422	-29.58	8
	2437	-29.67	8
	2452	-29.81	8

Please refer to the following test plots:

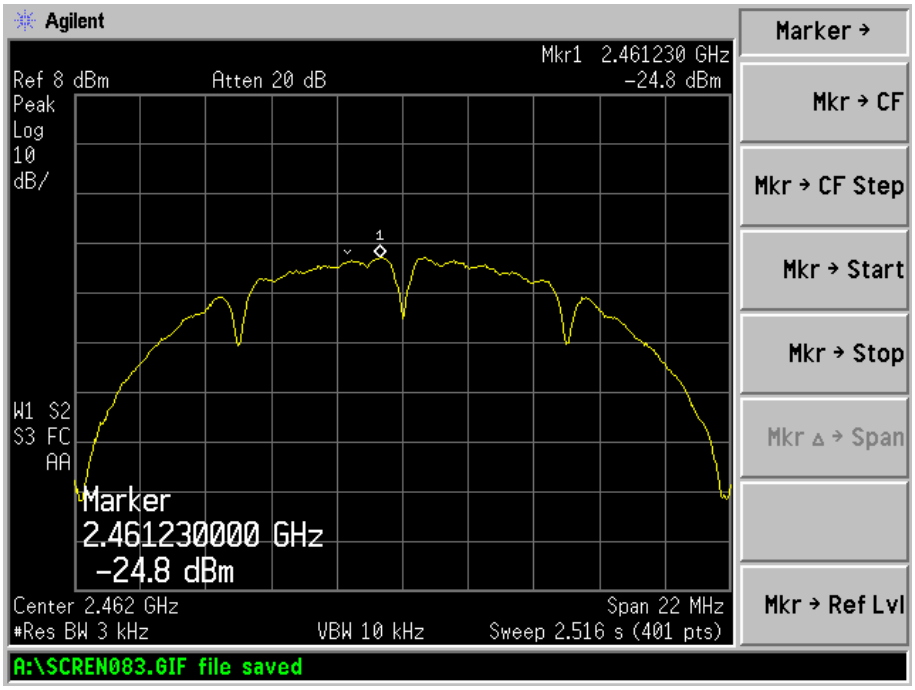
802.11b-Low Channel



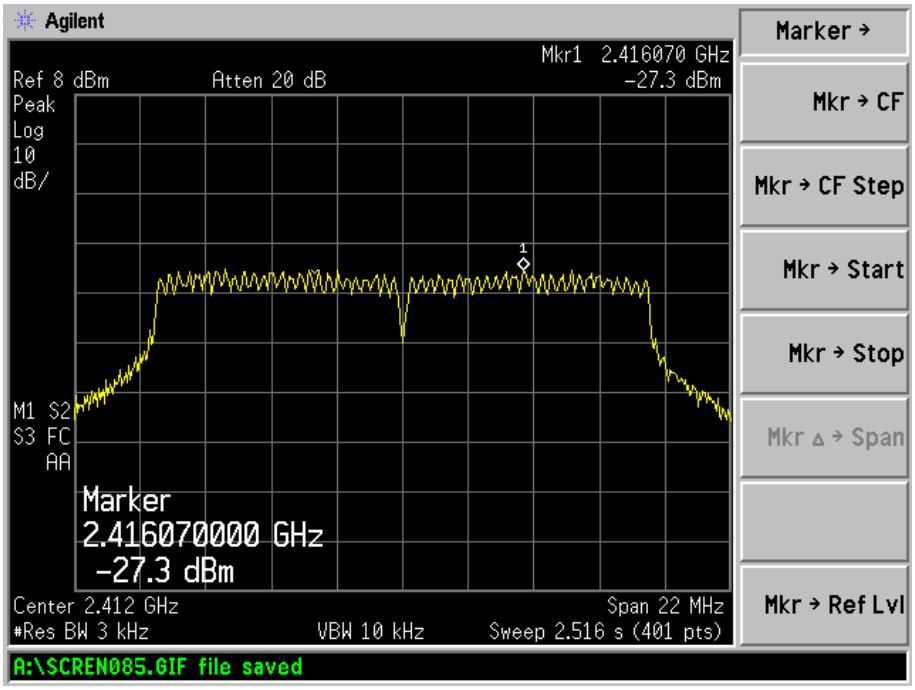
802.11b-Middle Channel



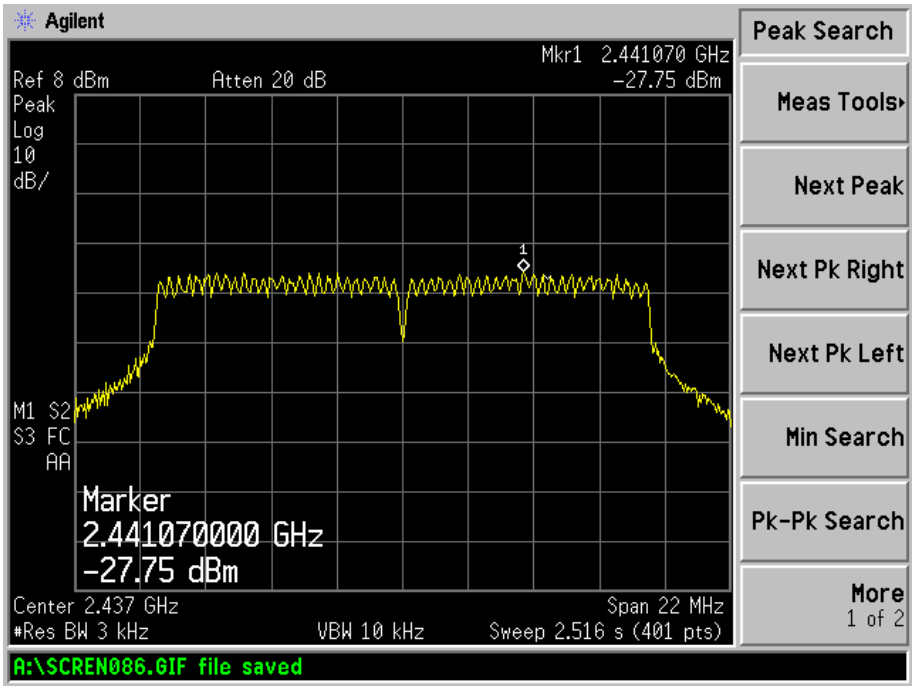
802.11b-High Channel



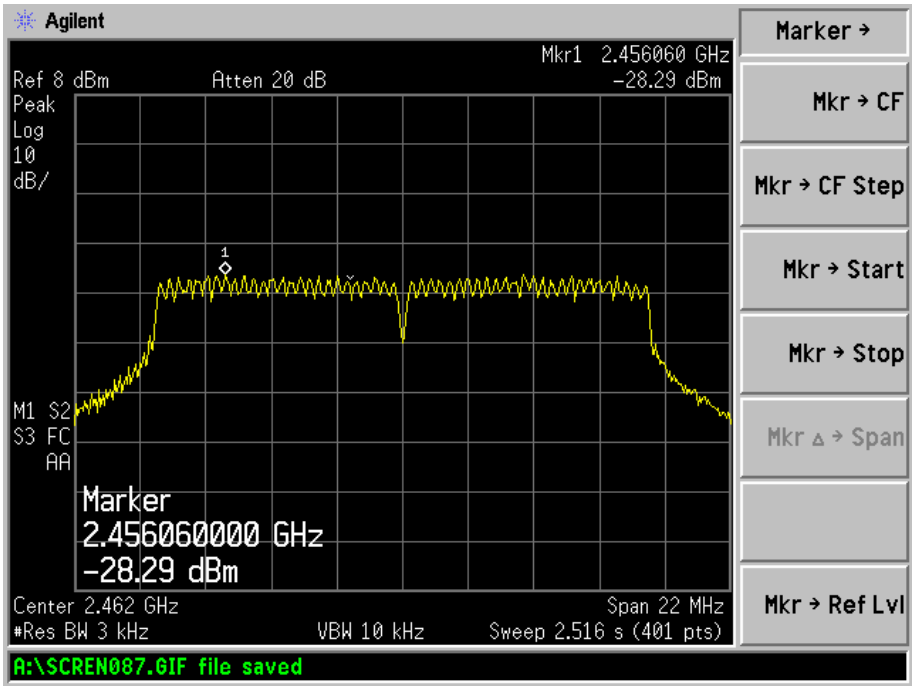
802.11g-Low Channel



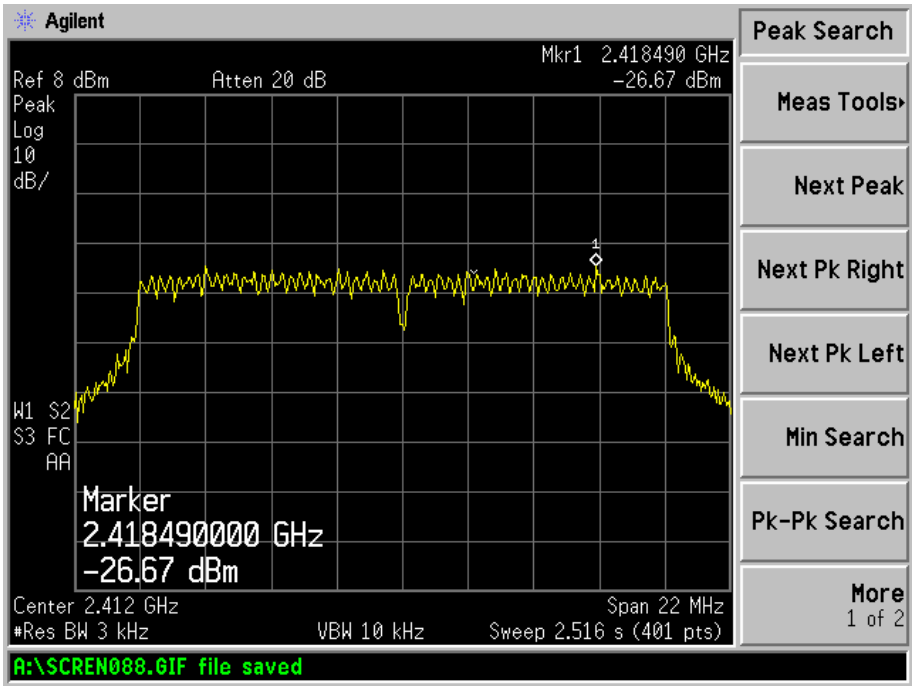
802.11g-Middle Channel



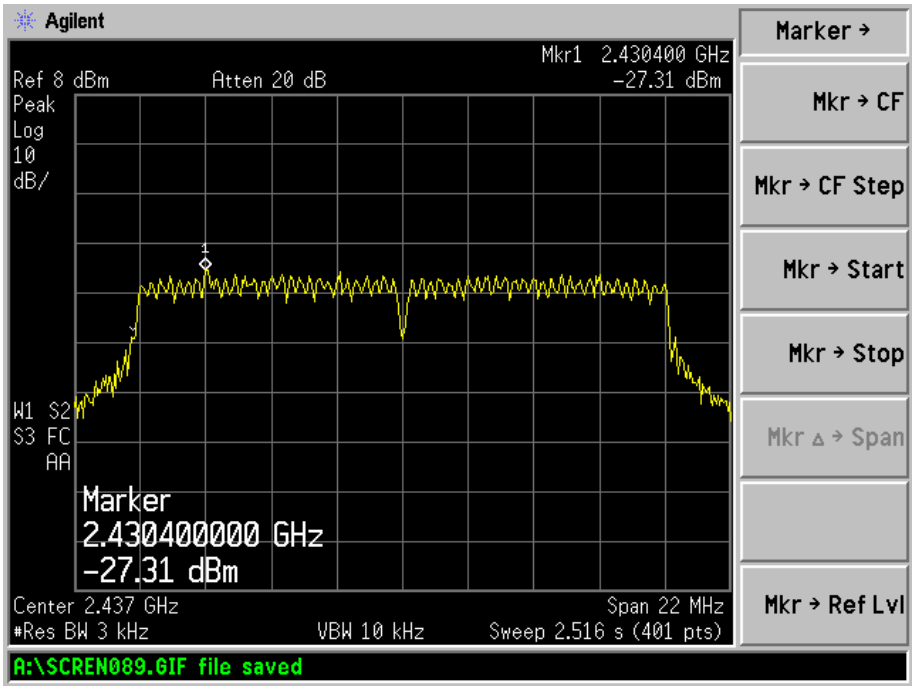
802.11g-High Channel



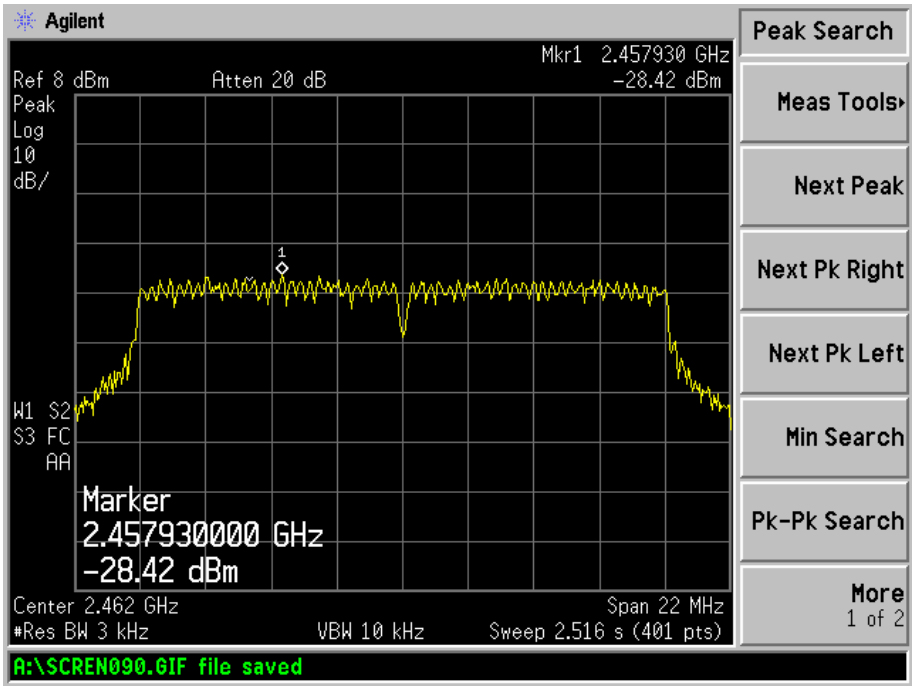
802.11n-HT20-Low Channel



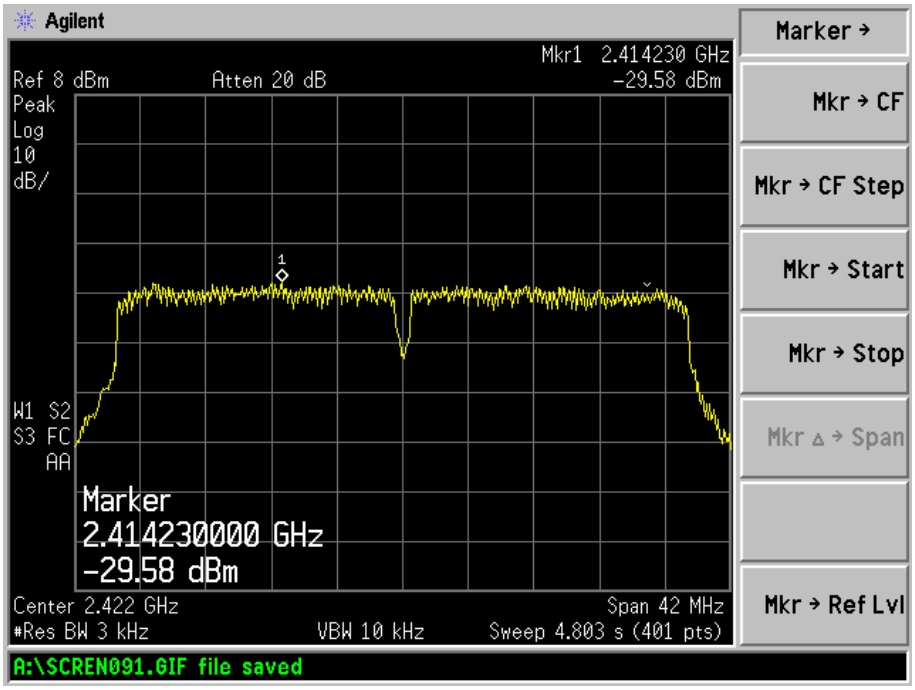
802.11n-HT20-Middle Channel



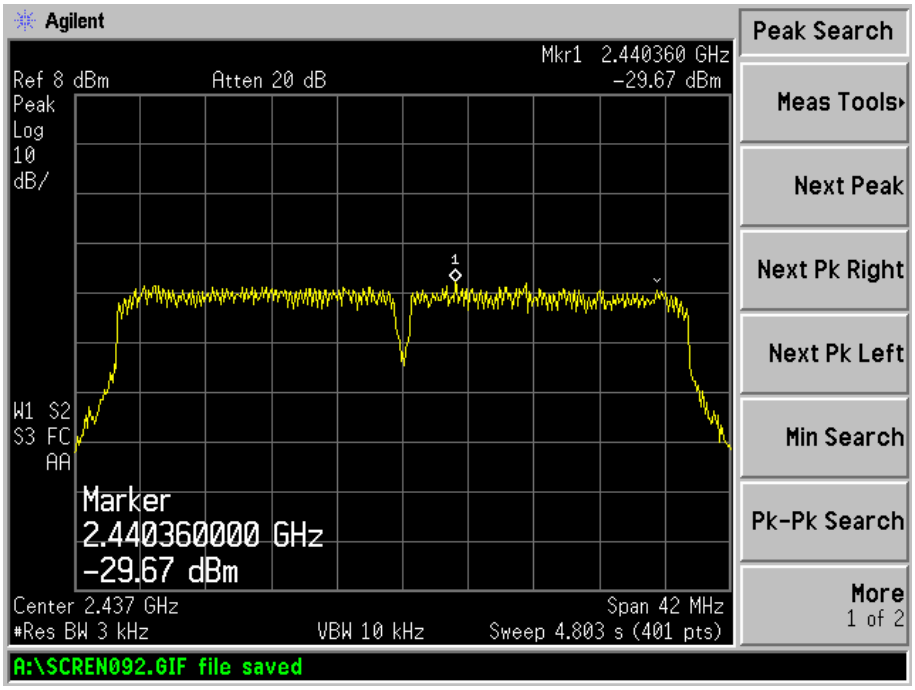
802.11n-HT20-High Channel



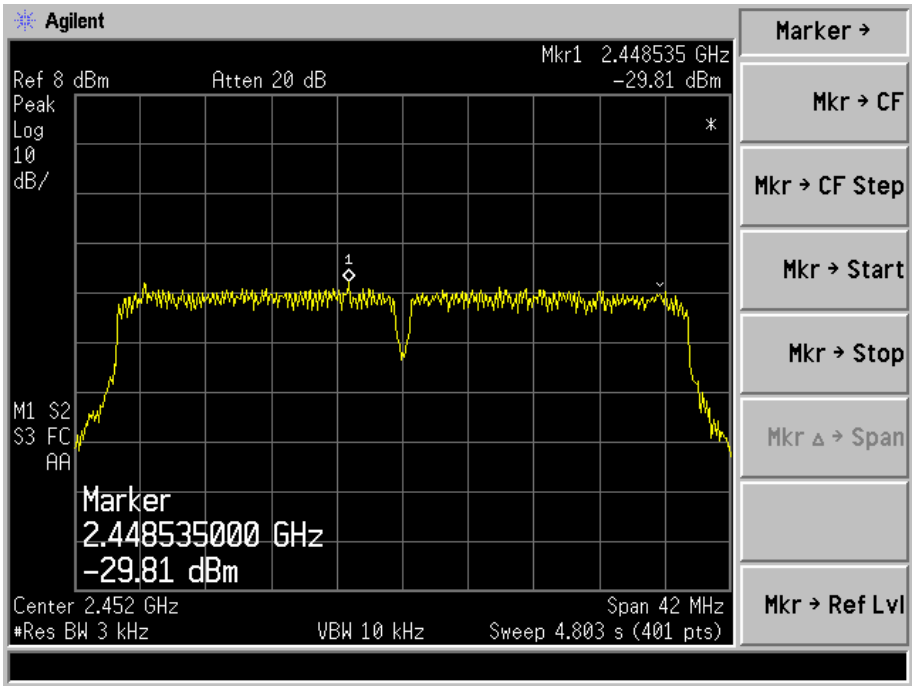
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel



802.11n-HT40-High Channel



5. 6dB Bandwidth

5.1 Standard Applicable

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

5.2 Test Equipment List and Details

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

5.3 Test Procedure

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

5.4 Environmental Conditions

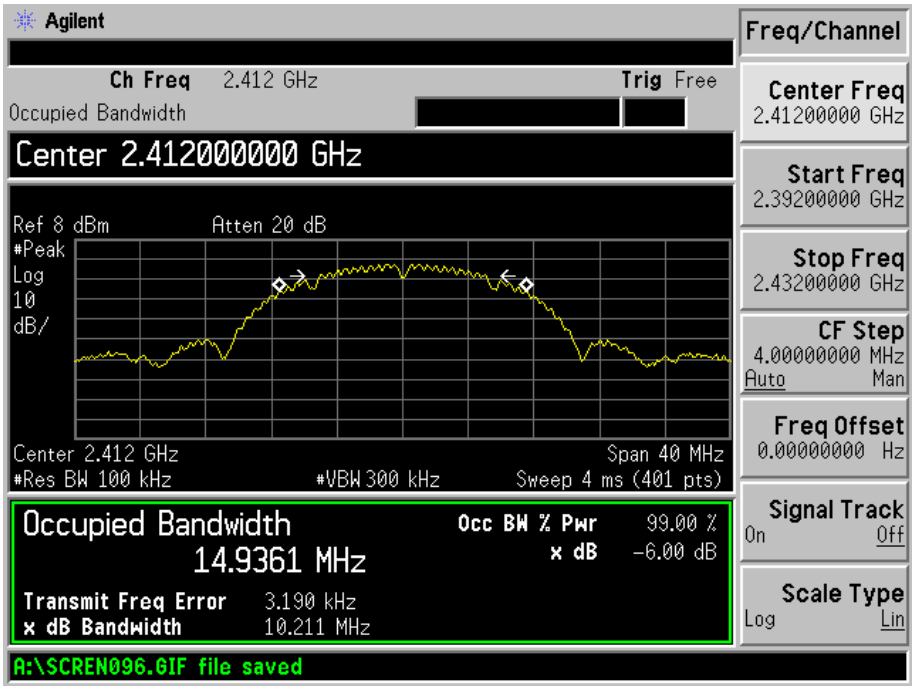
Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

5.5 Summary of Test Results/Plots

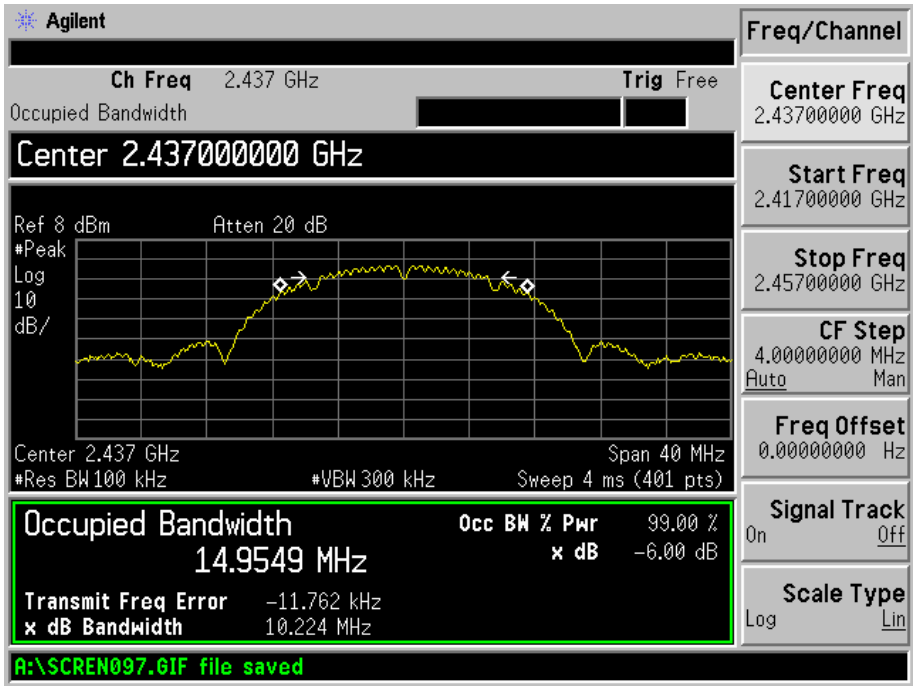
Test Mode	Test Channel MHz	6 dB Bandwidth kHz	Limit kHz
802.11b	2412	10211	500
	2437	10224	500
	2462	10224	500
802.11g	2412	16562	500
	2437	16603	500
	2462	16530	500
802.11n-HT20	2412	17752	500
	2437	17780	500
	2462	17749	500
802.11n-HT40	2422	36373	500
	2437	36348	500
	2452	36379	500

Please refer to the following test plots:

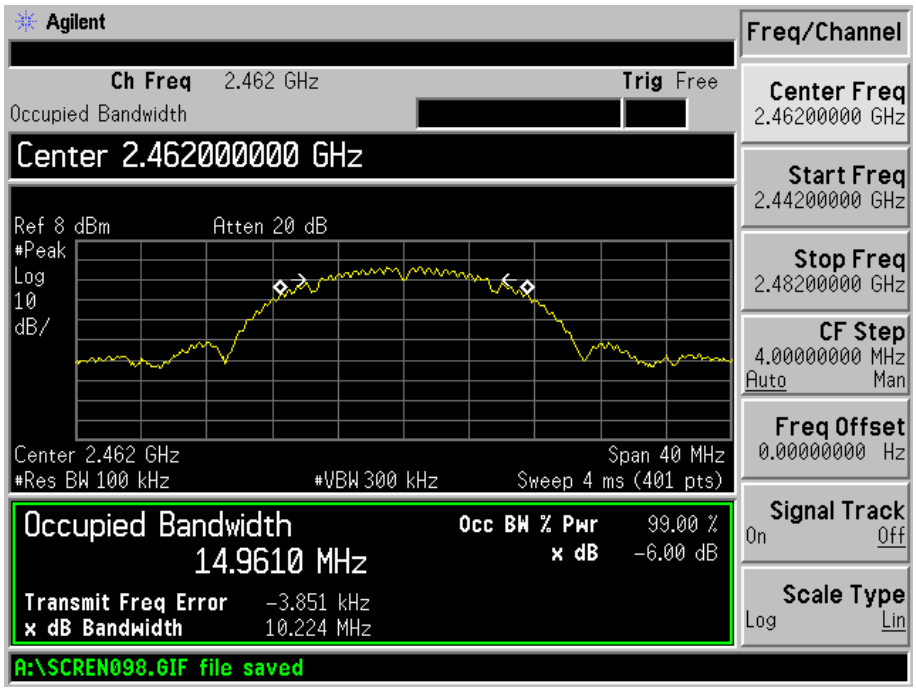
802.11b-Low Channel



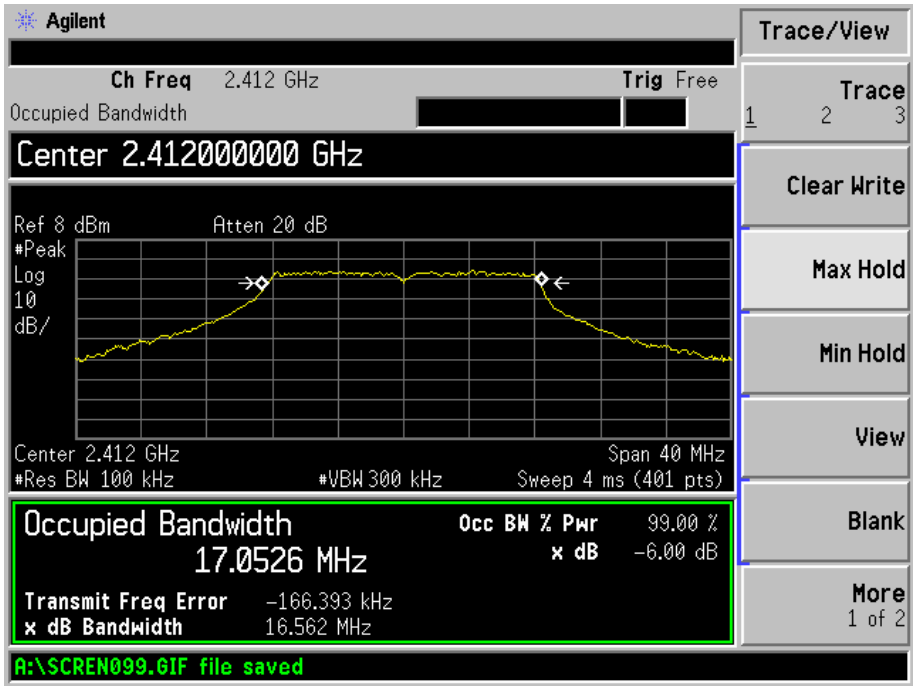
802.11b-Middle Channel



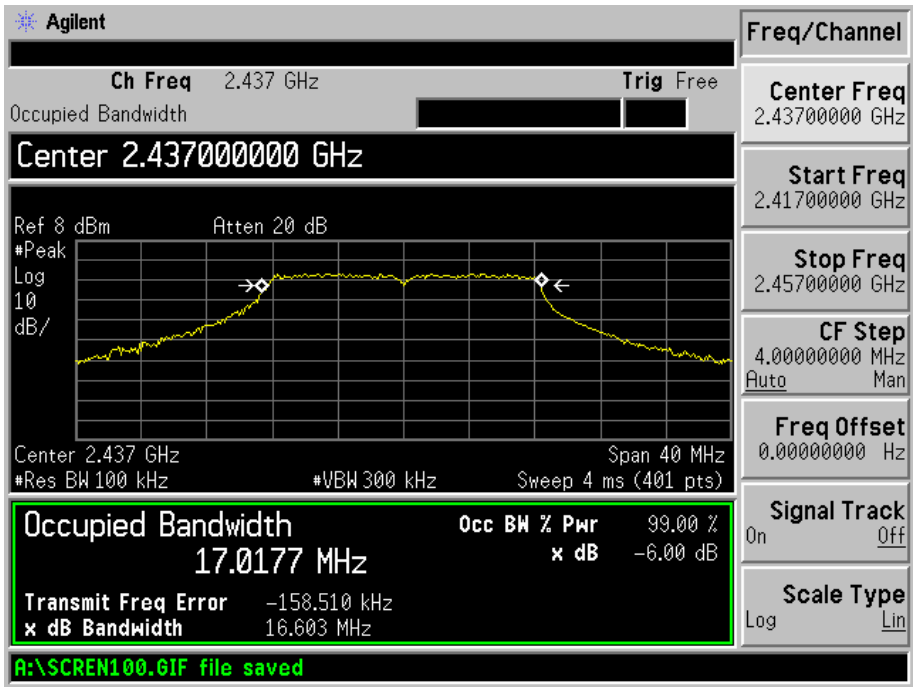
802.11b-High Channel



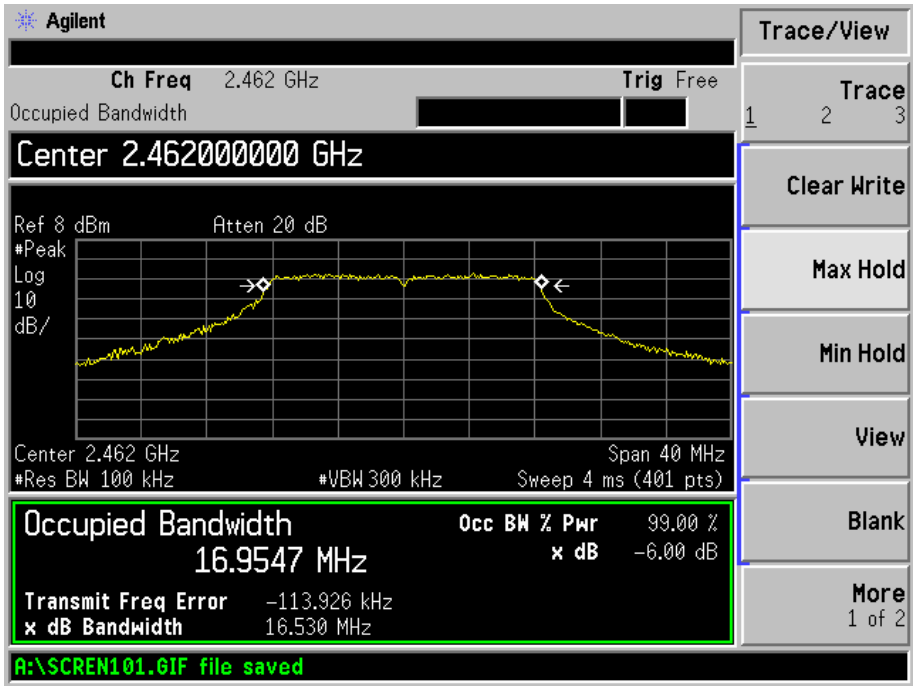
802.11g-Low Channel



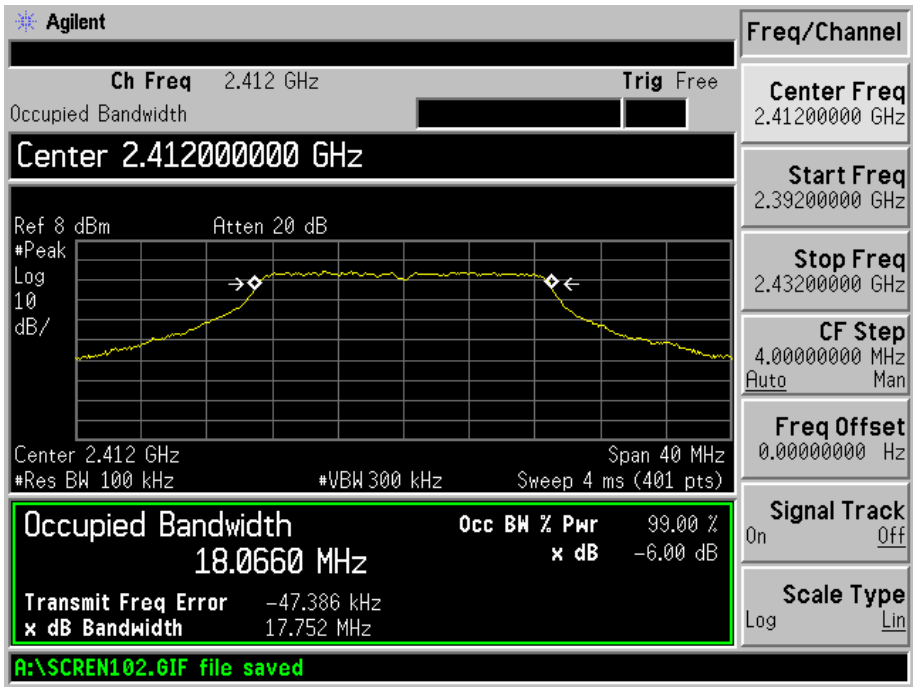
802.11g-Middle Channel



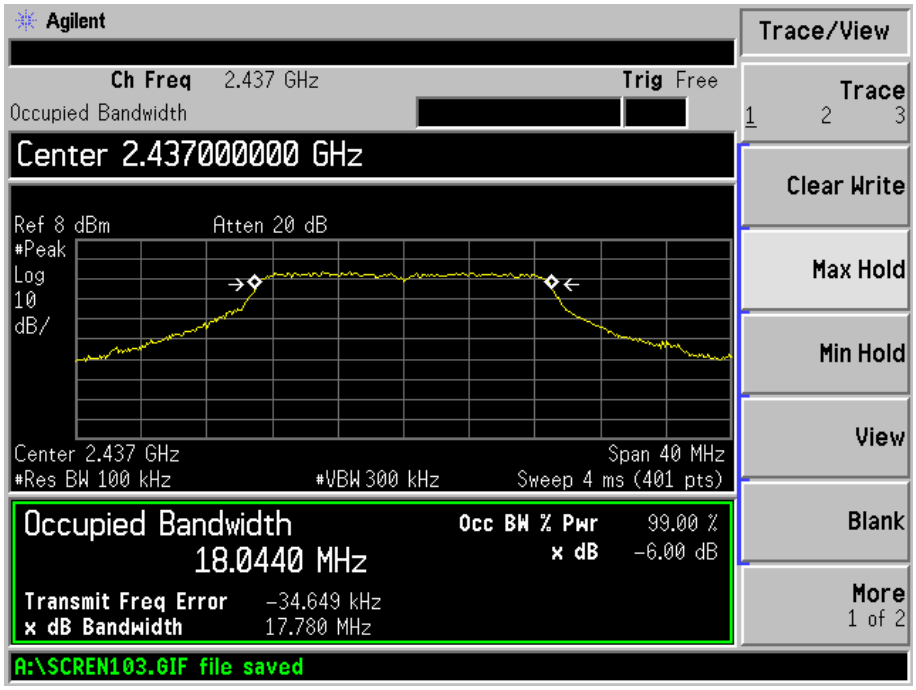
802.11g-High Channel



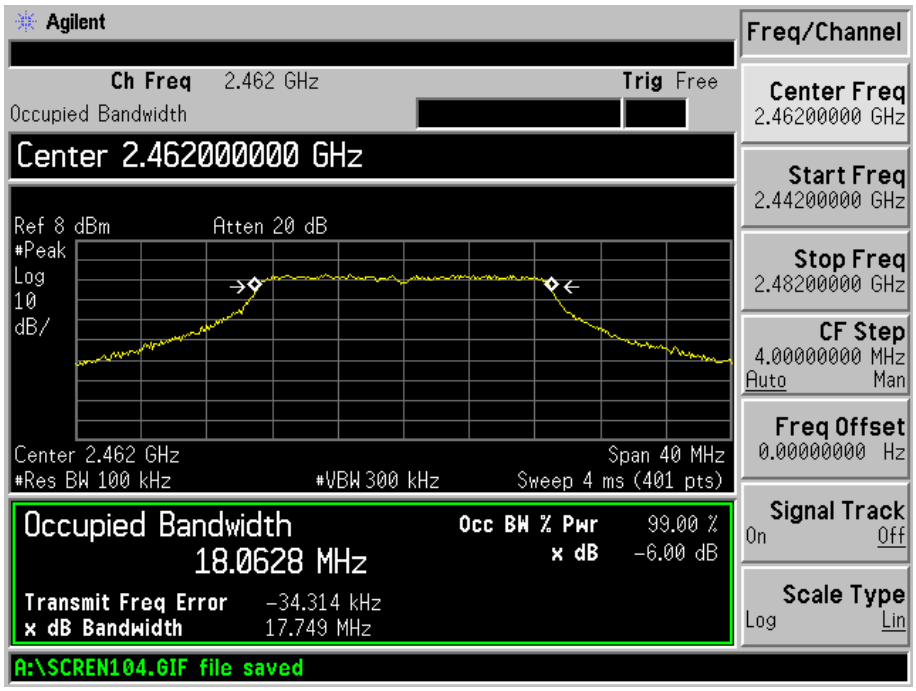
802.11n-HT20-Low Channel



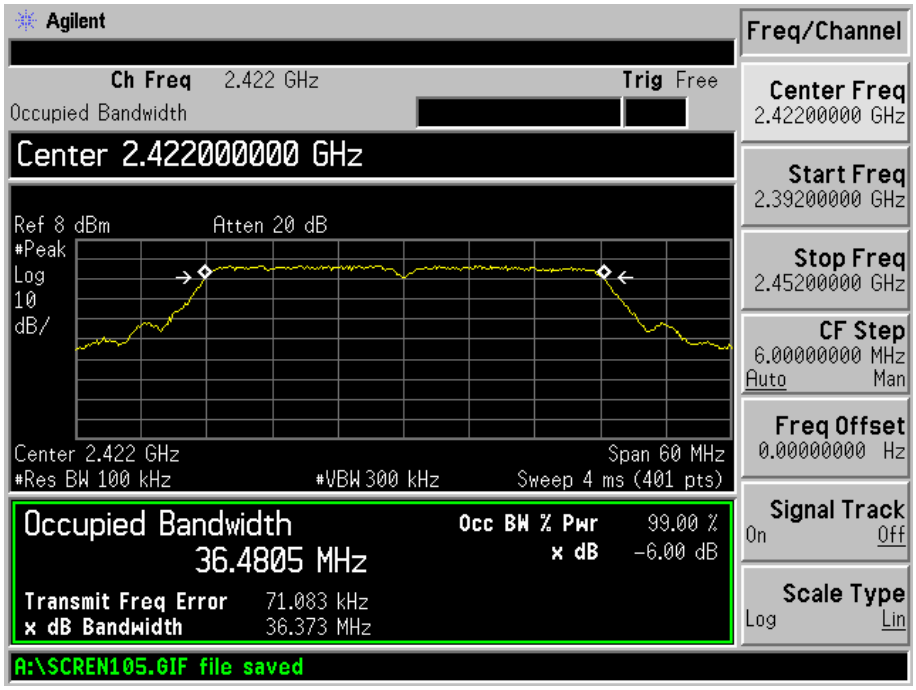
802.11n-HT20-Middle Channel



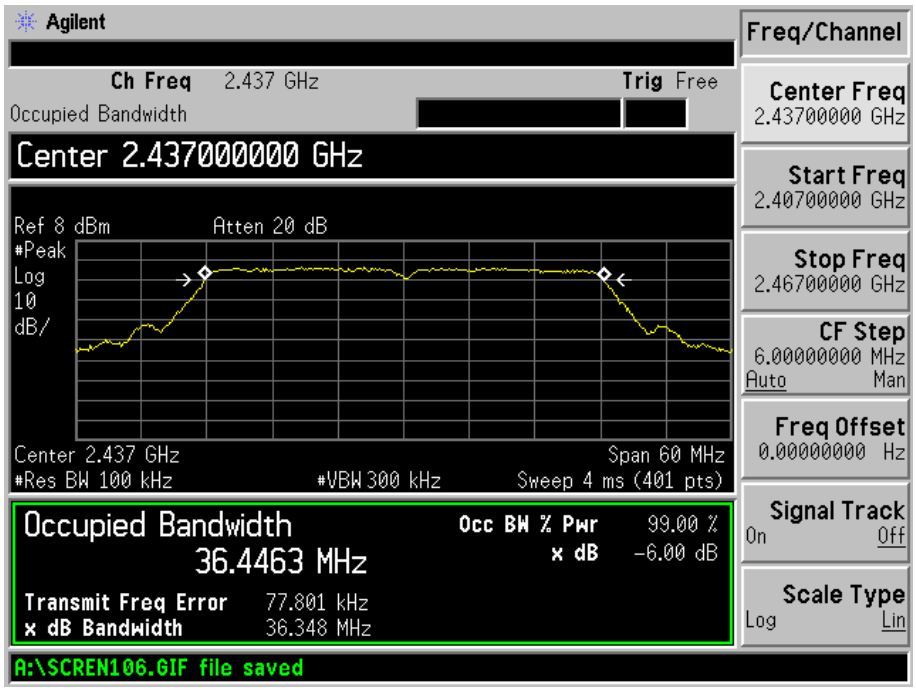
802.11n-HT20-High Channel



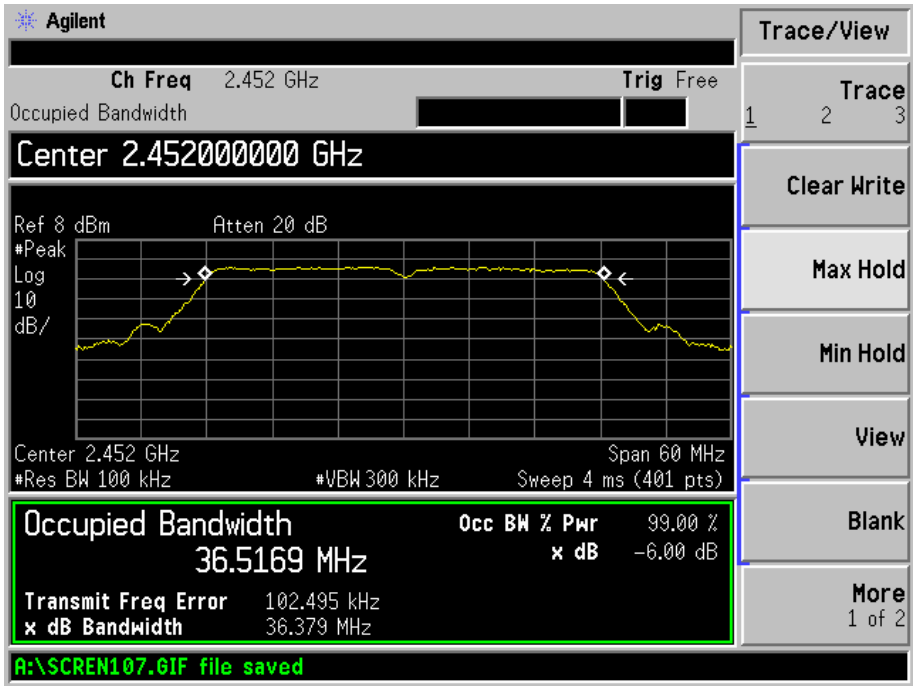
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel



802.11n-HT40-High Channel



6. RF Output Power

6.1 Standard Applicable

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

6.2 Test Equipment List and Details

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

6.3 Test Procedure

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

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

6.4 Environmental Conditions

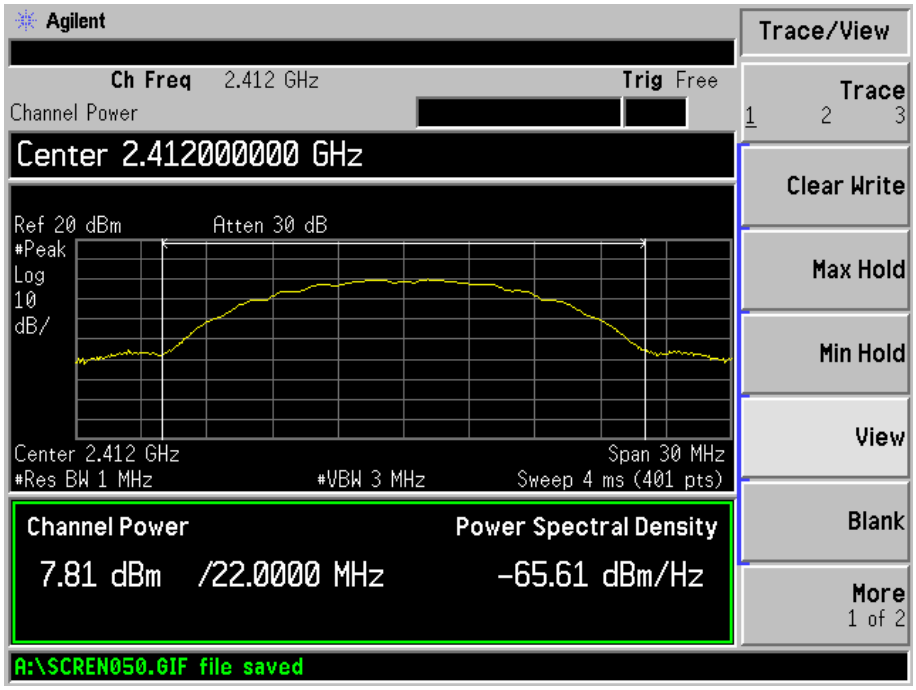
Temperature:	21° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

6.5 Summary of Test Results/Plots

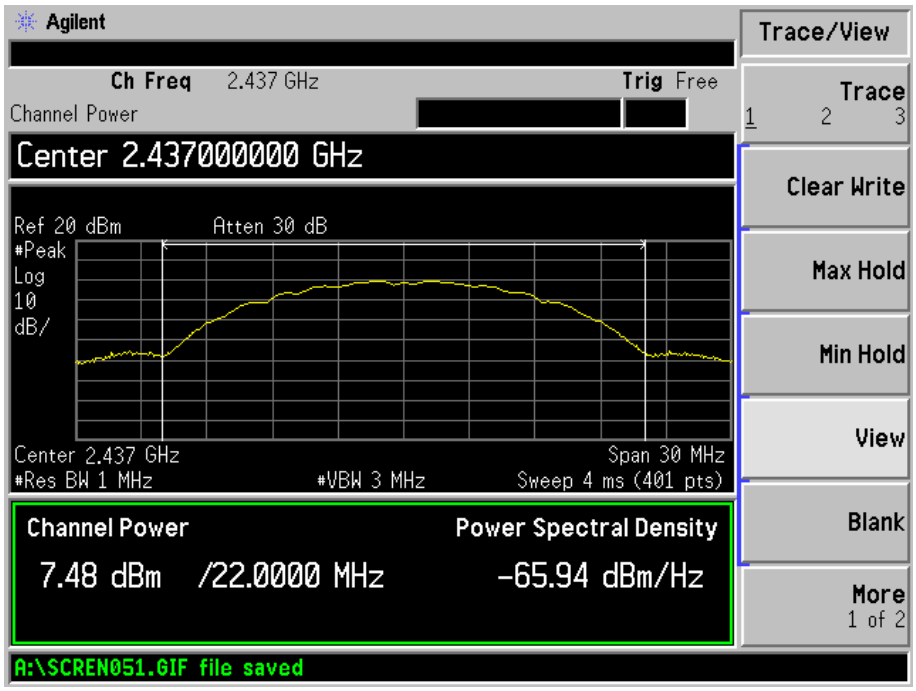
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b_1Mbps	2412	7.81	6.0395	1000
	2437	7.48	5.5976	1000
	2462	7.47	5.5847	1000
802.11b _11Mbps	2412	7.56	5.7016	1000
	2437	7.34	5.4200	1000
	2462	7.33	5.4075	1000
802.11g_6Mbps	2412	6.68	4.6559	1000
	2437	6.48	4.4463	1000
	2462	6.73	4.7098	1000
802.11g_54Mbps	2412	6.44	4.4055	1000
	2437	6.56	4.5290	1000
	2462	6.68	4.6559	1000
802.11n HT20_MCS0	2412	6.82	4.8084	1000
	2437	6.21	4.1783	1000
	2462	6.52	4.4875	1000
802.11n HT20_MCS7	2412	6.69	4.6666	1000
	2437	6.19	4.1591	1000
	2462	5.63	3.6559	1000
802.11n HT40_MCS0	2422	5.96	3.9446	1000
	2437	5.45	3.5075	1000
	2452	5.34	3.4198	1000
802.11n HT40_MCS7	2422	6.12	4.0926	1000
	2437	5.83	3.8282	1000
	2452	5.57	3.6058	1000

Please refer to the following test plots:

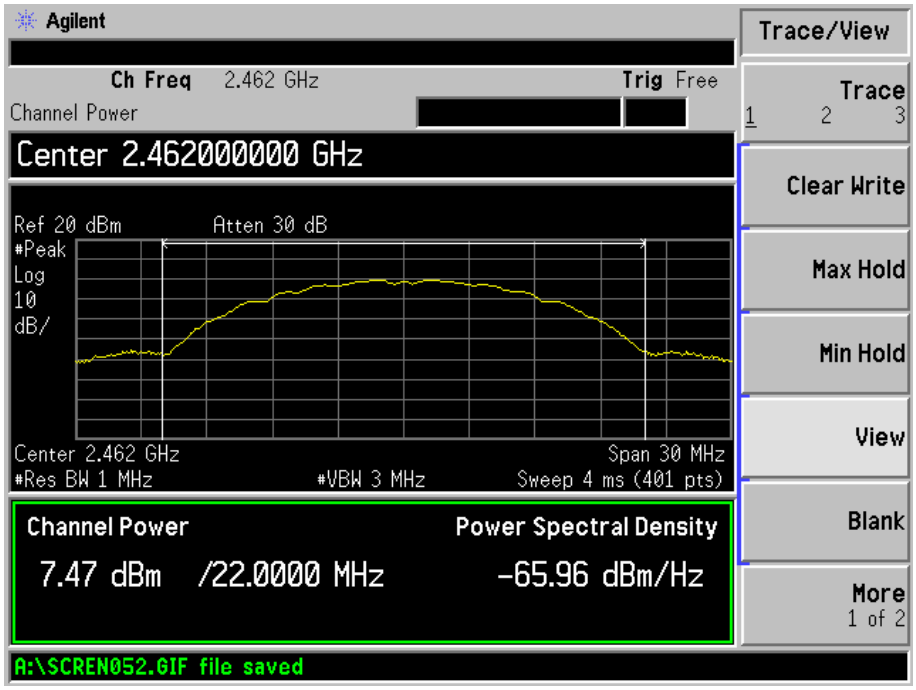
802.11b-1Mbps-Low Channel



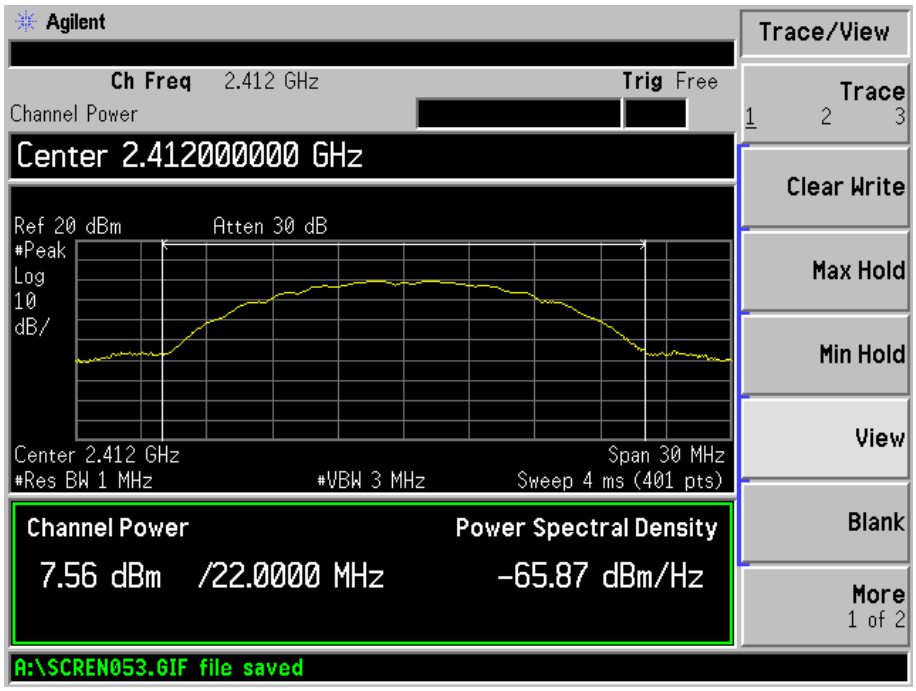
802.11b-1Mbps-Middle Channel



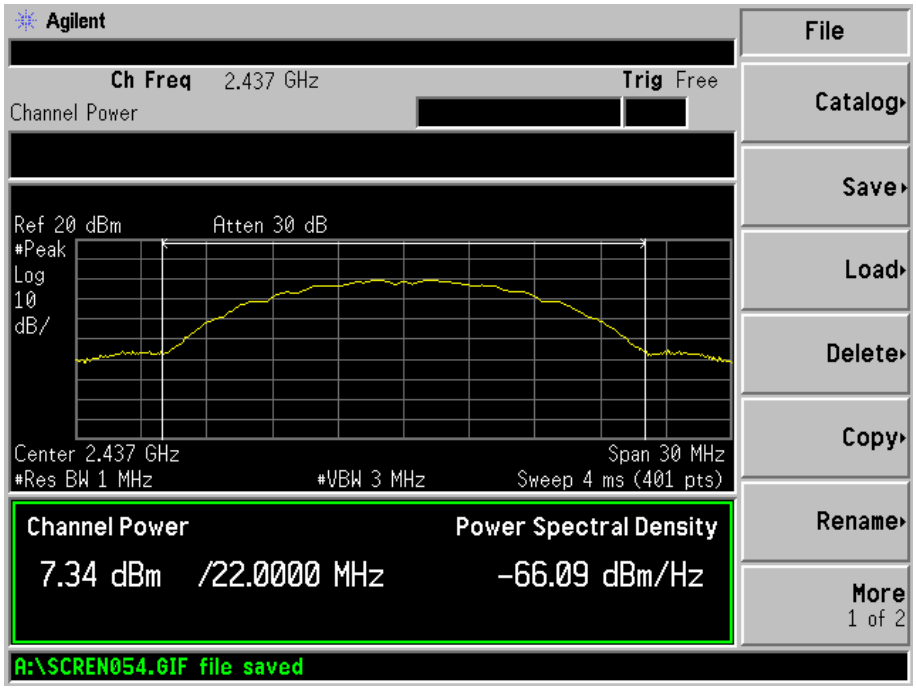
802.11b-1Mpbs-High Channel



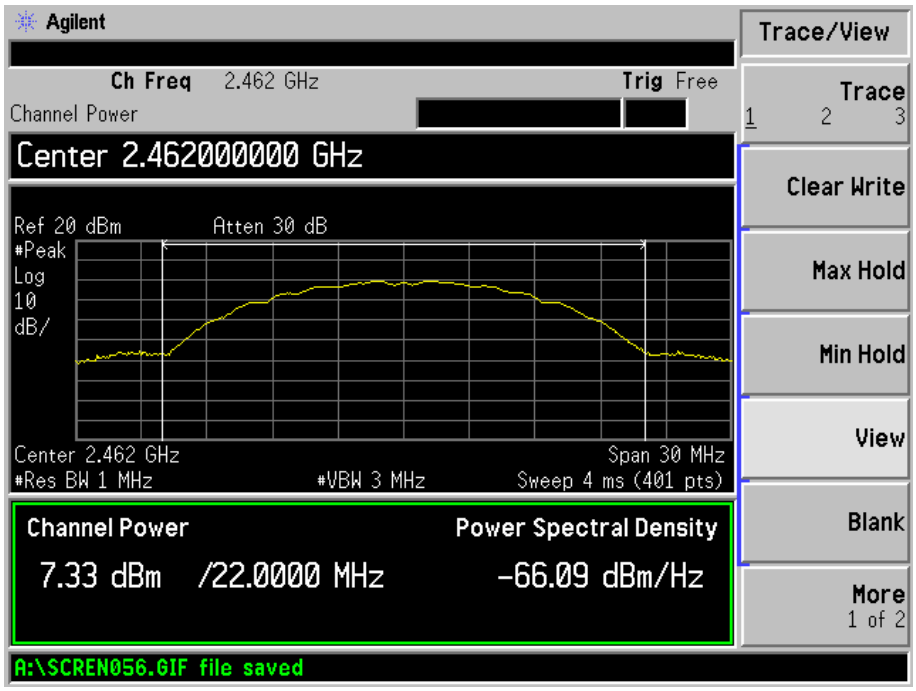
802.11b-11Mbps-Low Channel



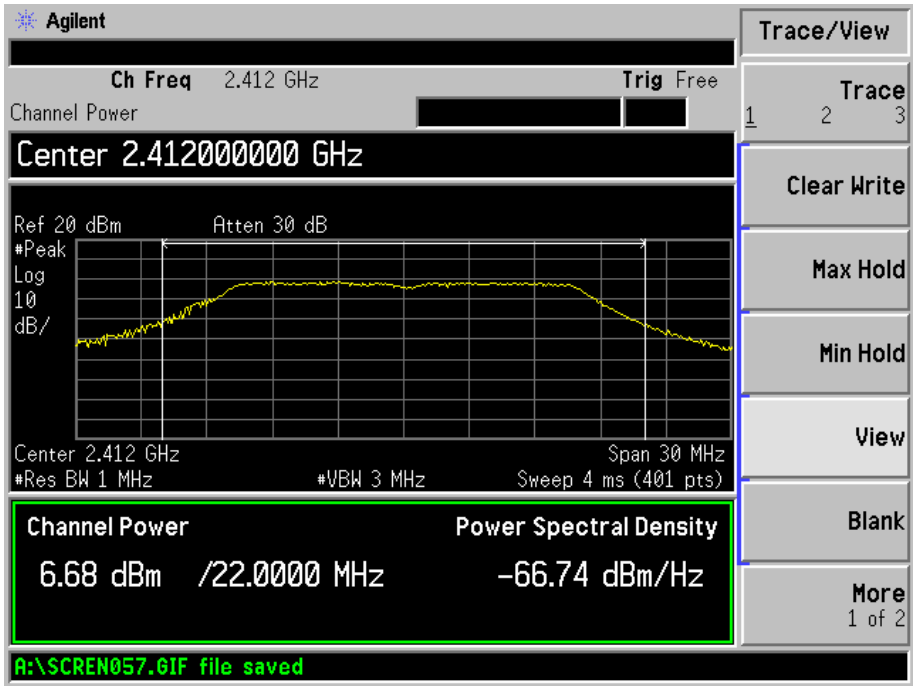
802.11b-11Mbps-Middle Channel



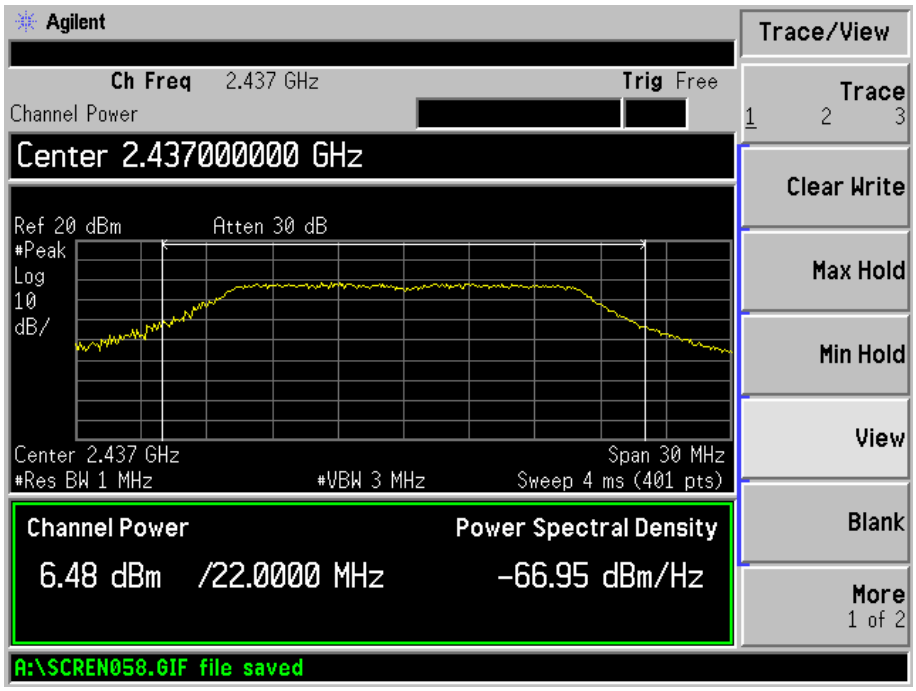
802.11b-11Mpbs-High Channel



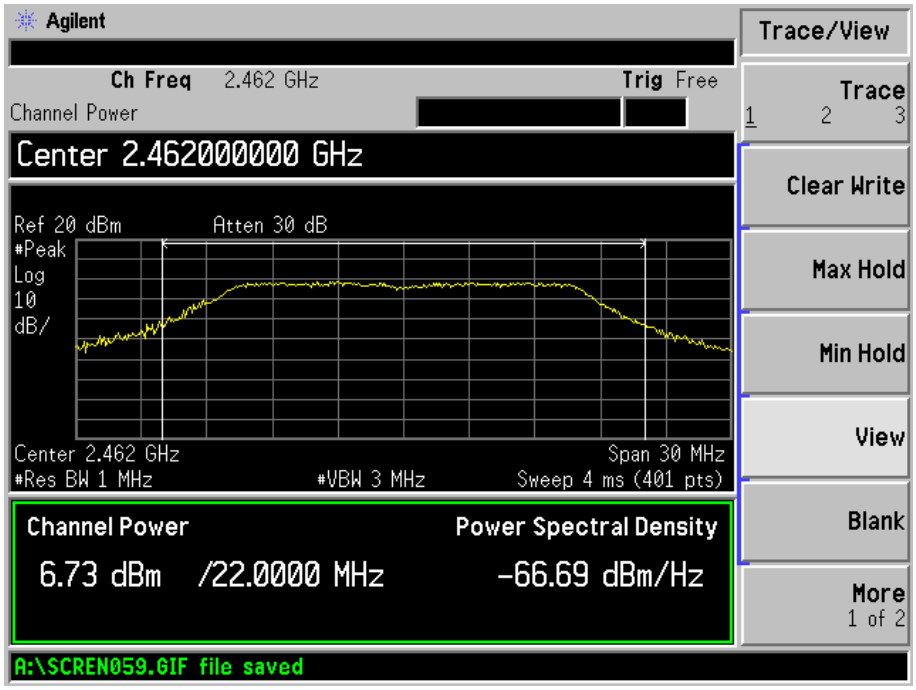
802.11g-6Mbps-Low Channel



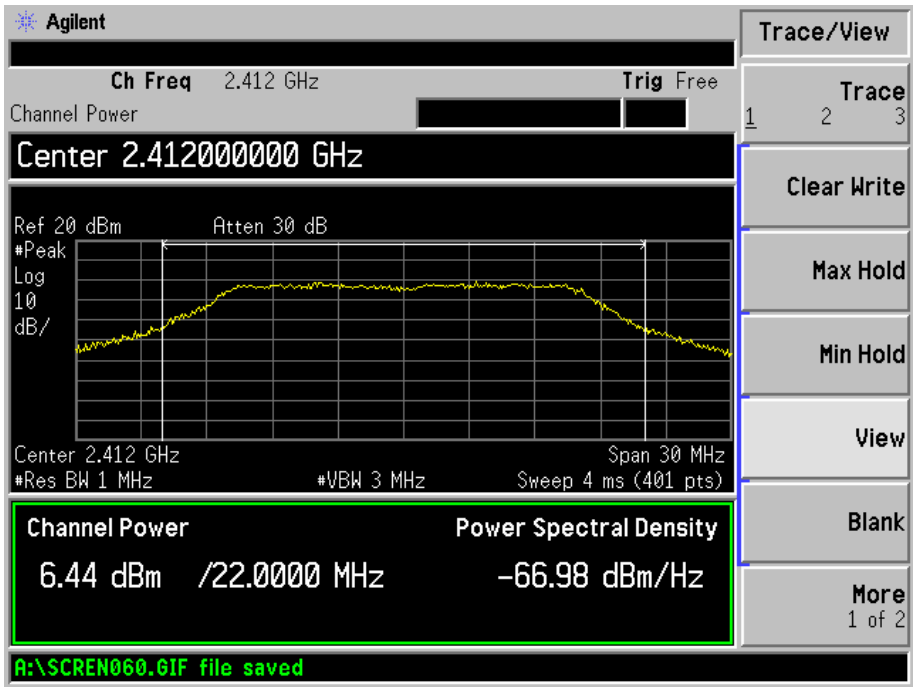
802.11g-6Mbps-Middle Channel



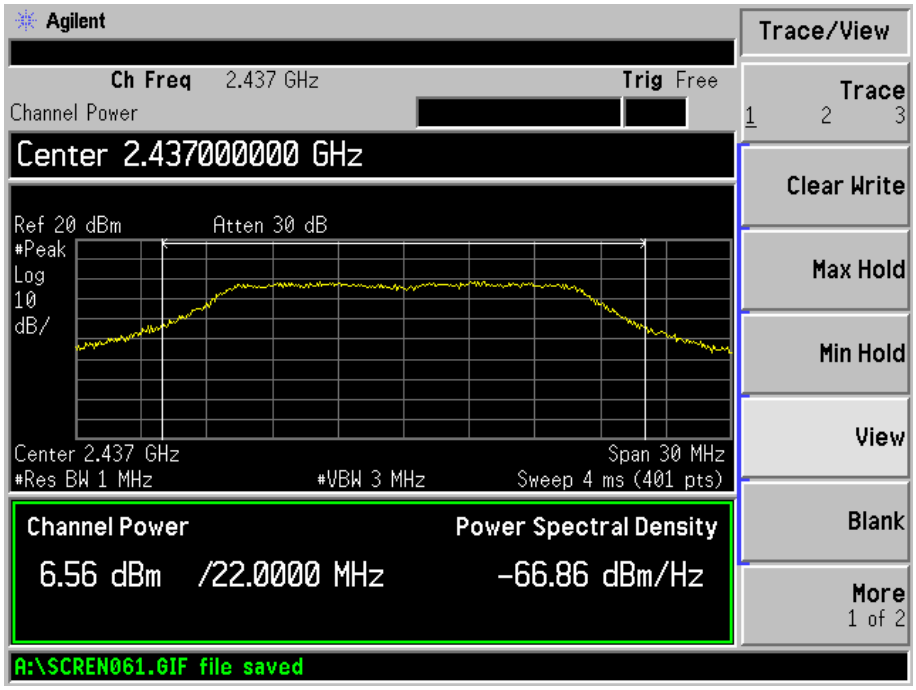
802.11g-6Mpbs-High Channel



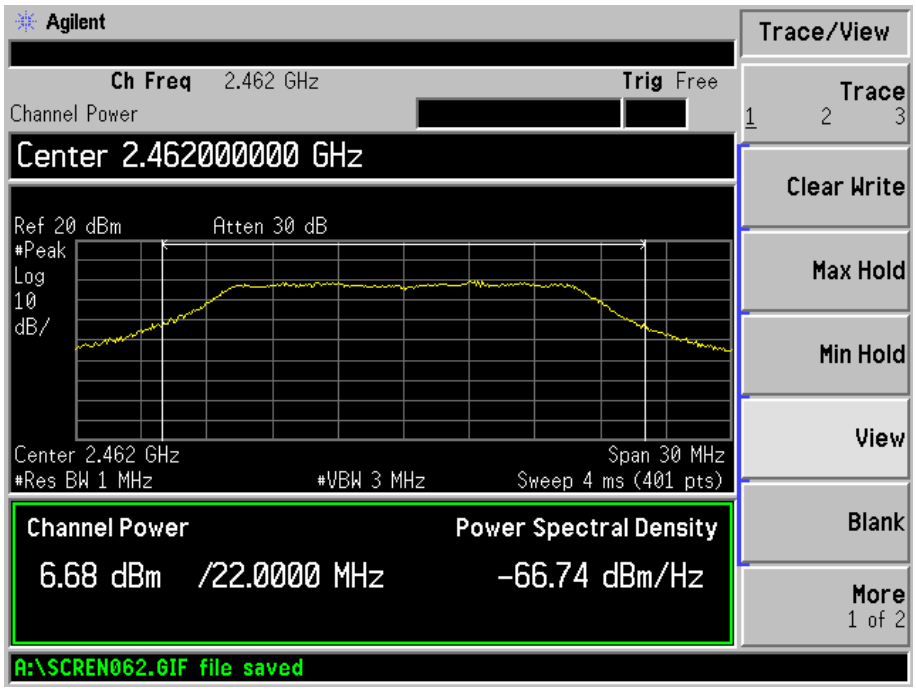
802.11g-54Mbps-Low Channel



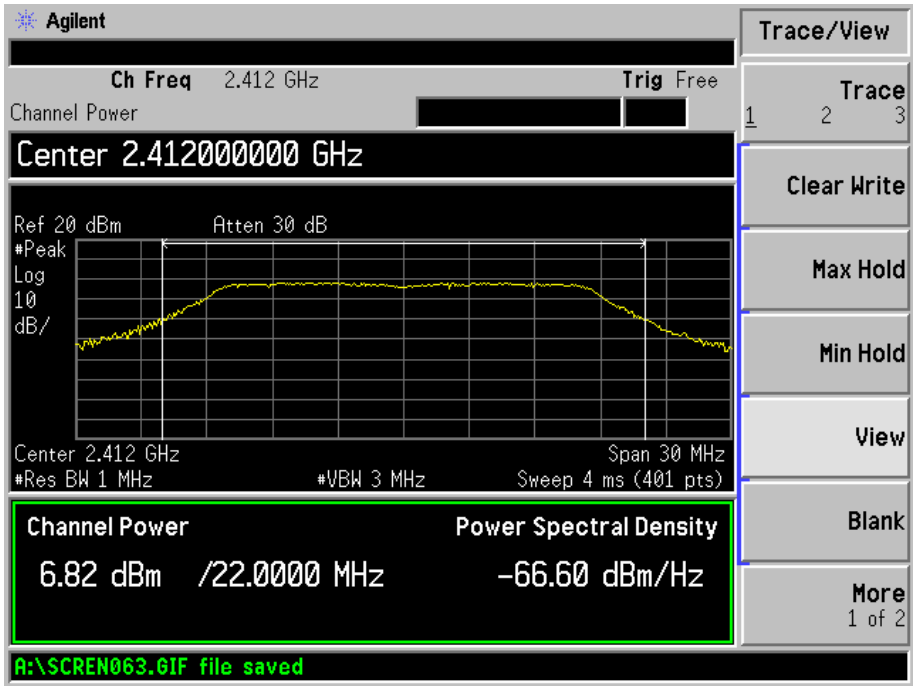
802.11g-54Mbps-Middle Channel



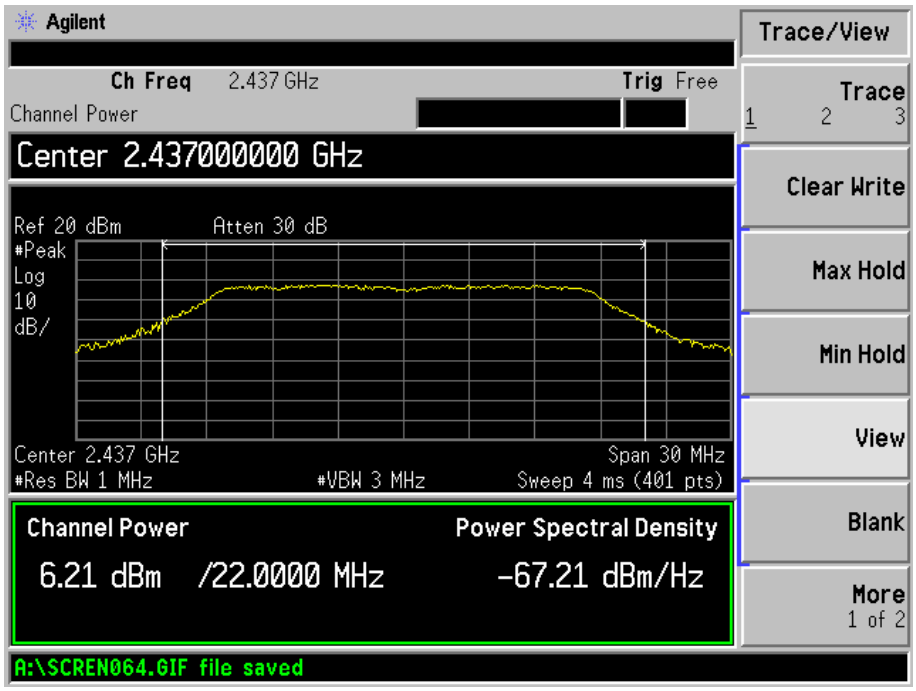
802.11g-54Mpbs-High Channel



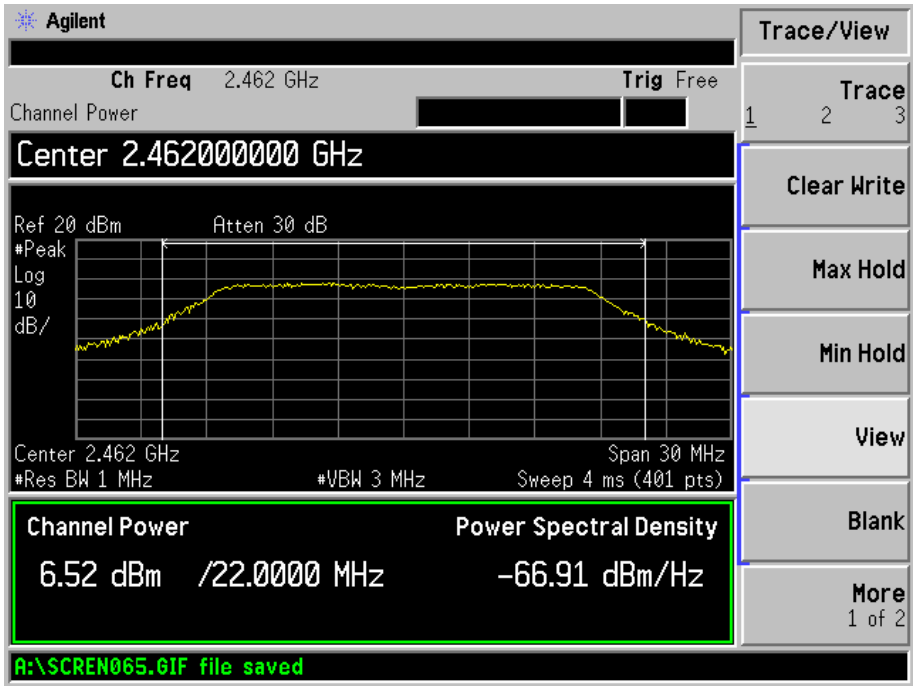
802.11n HT20_MCS0-Low Channel



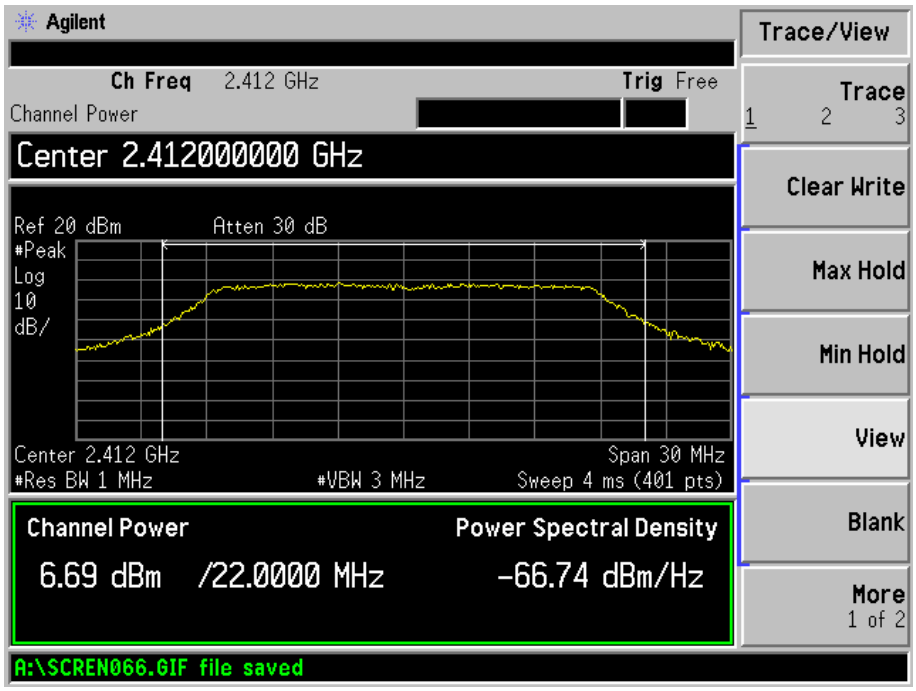
802.11n-HT20_ MCS0-Middle Channel



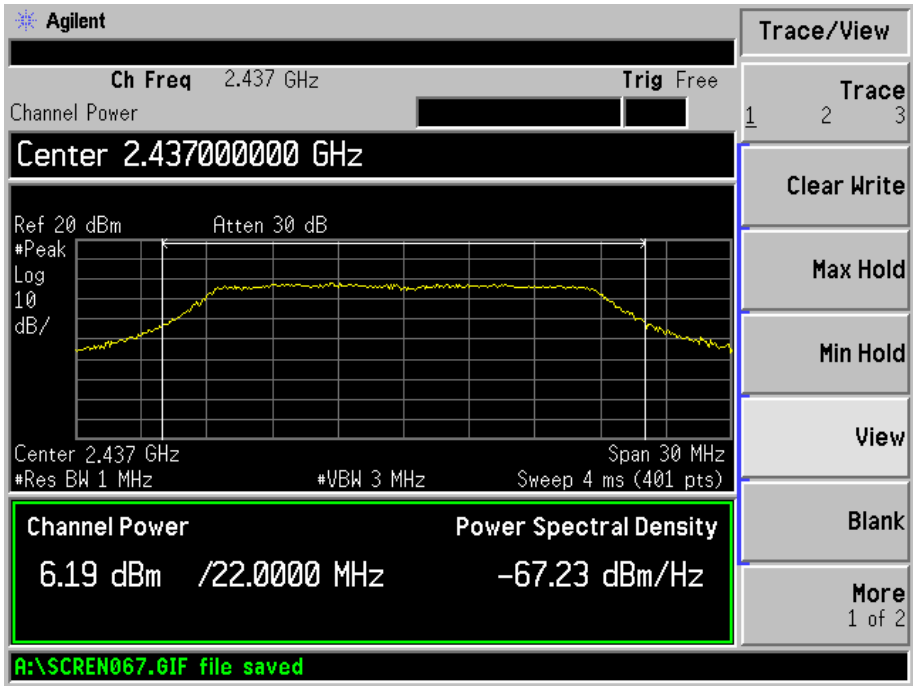
802.11n-HT20_ MCS0-High Channel



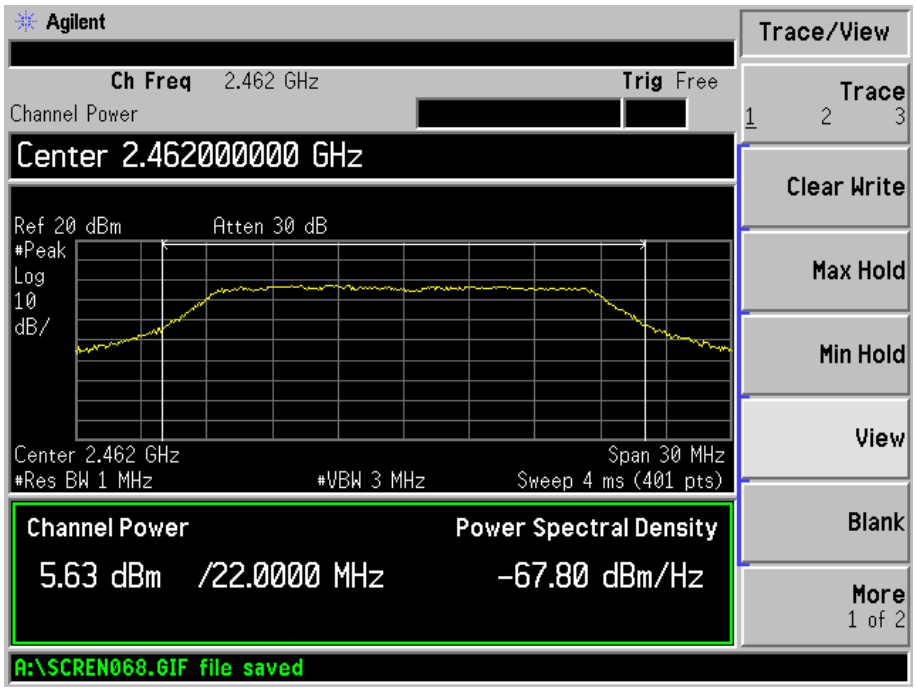
802.11n-HT20_ MCS7-Low Channel



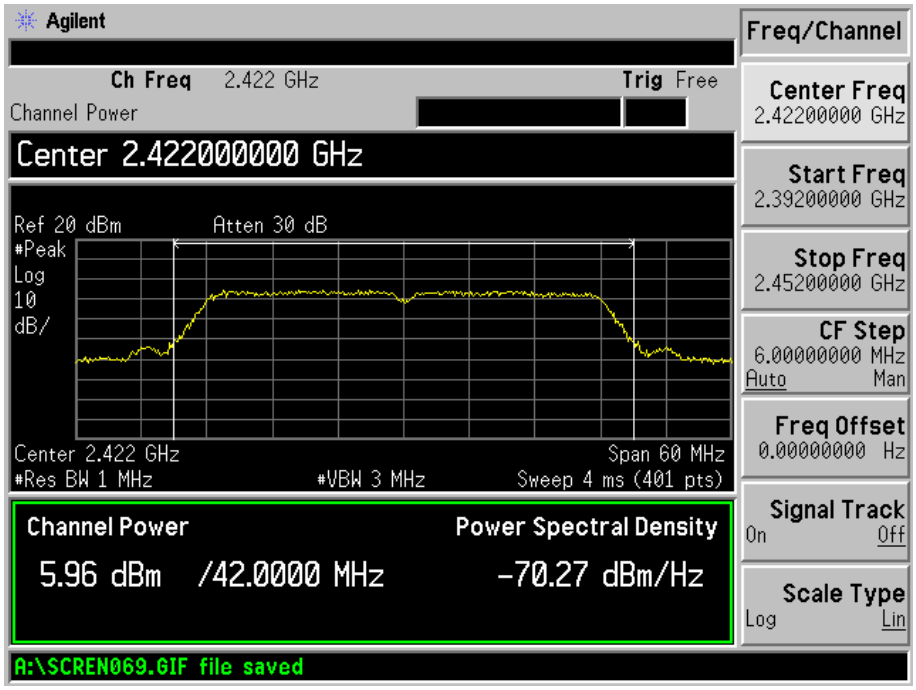
802.11n-HT20_ MCS7-Middle Channel



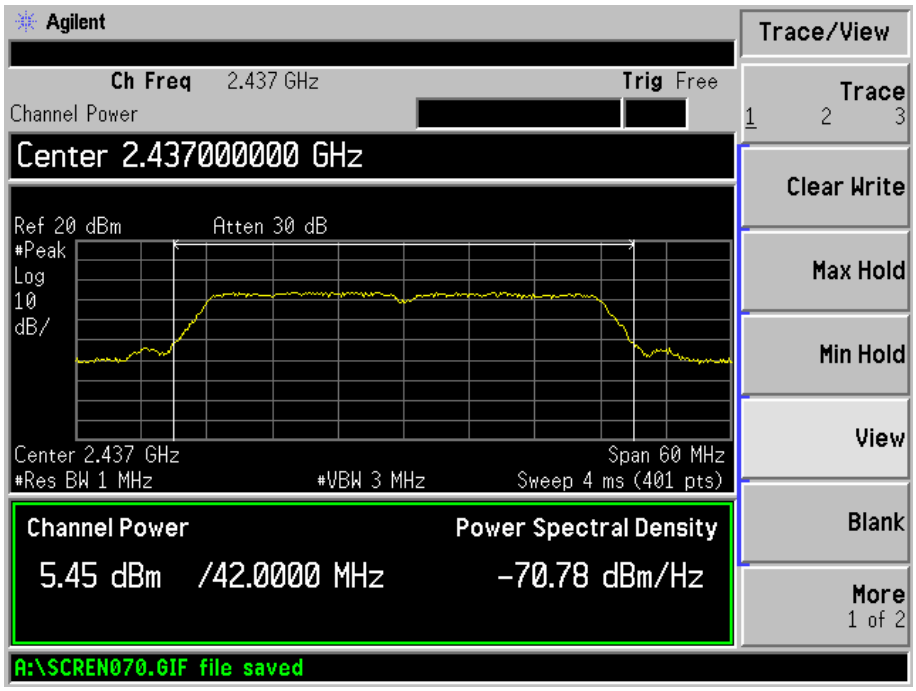
802.11n-HT20_ MCS7-High Channel



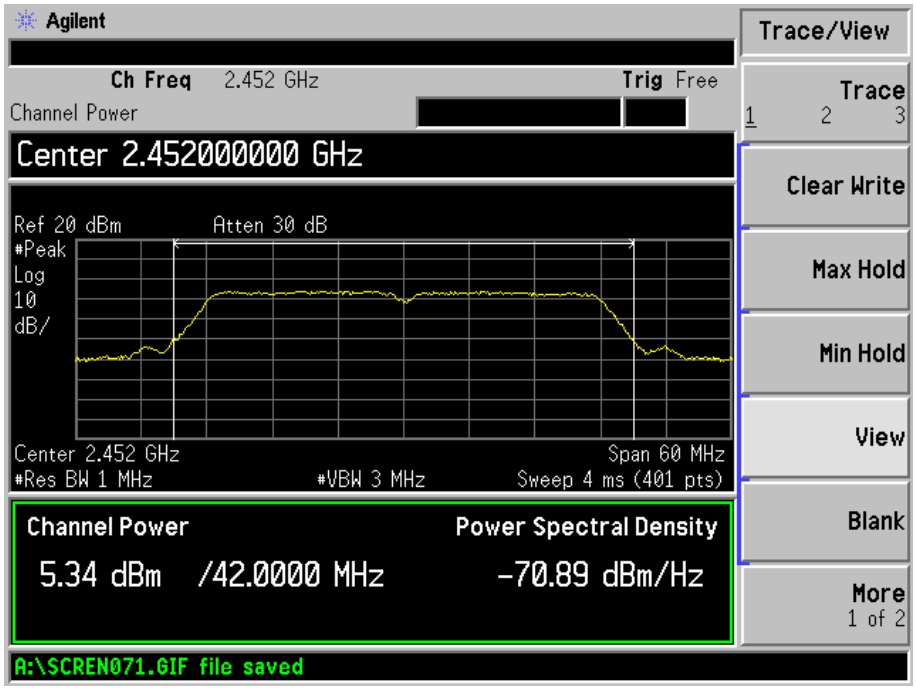
802.11n HT40_MCS0-Low Channel



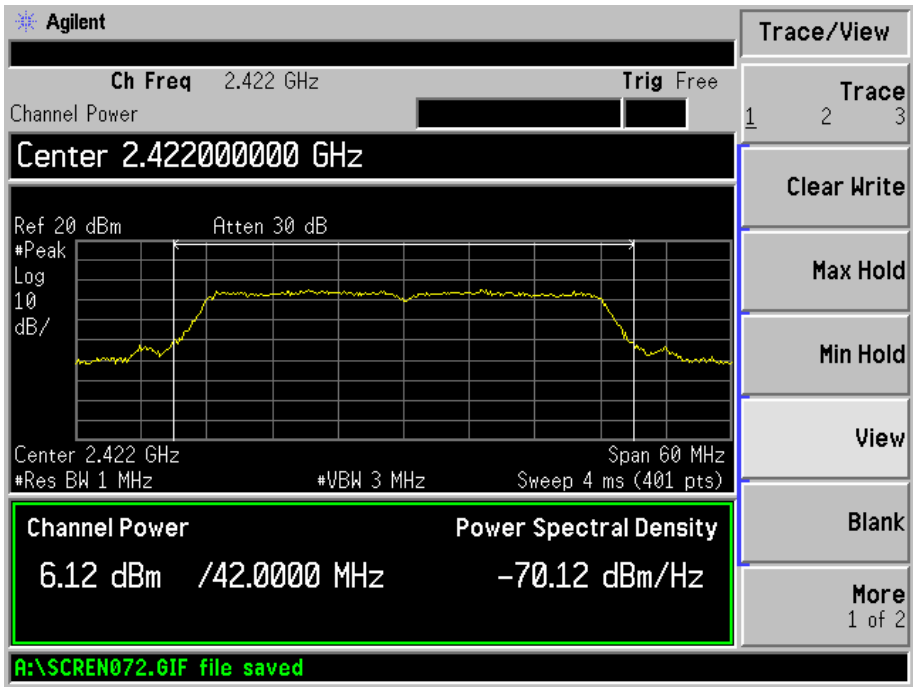
802.11n-HT40_ MCS0-Middle Channel



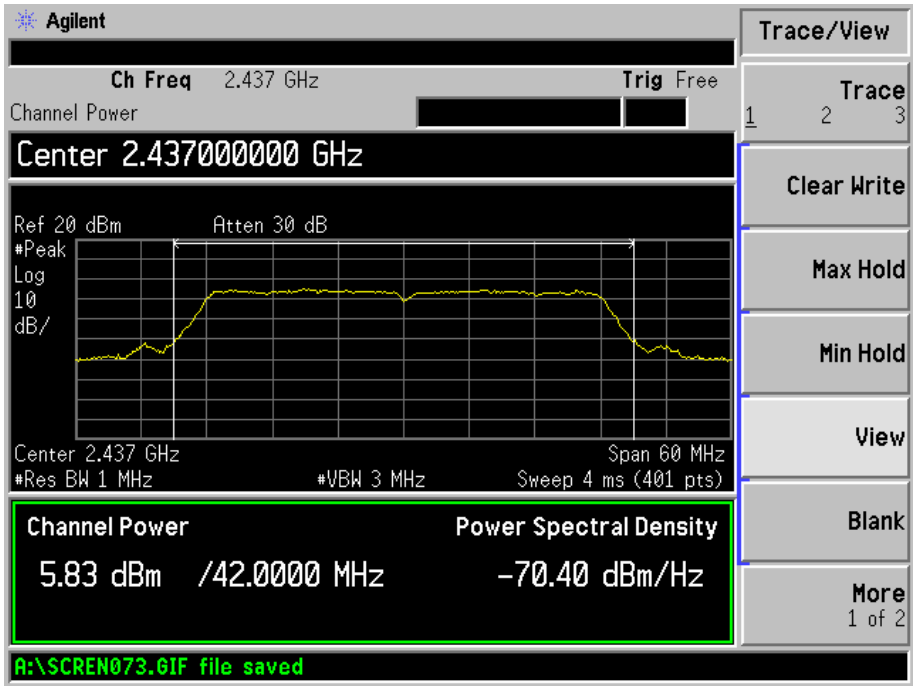
802.11n-HT40_ MCS0-High Channel



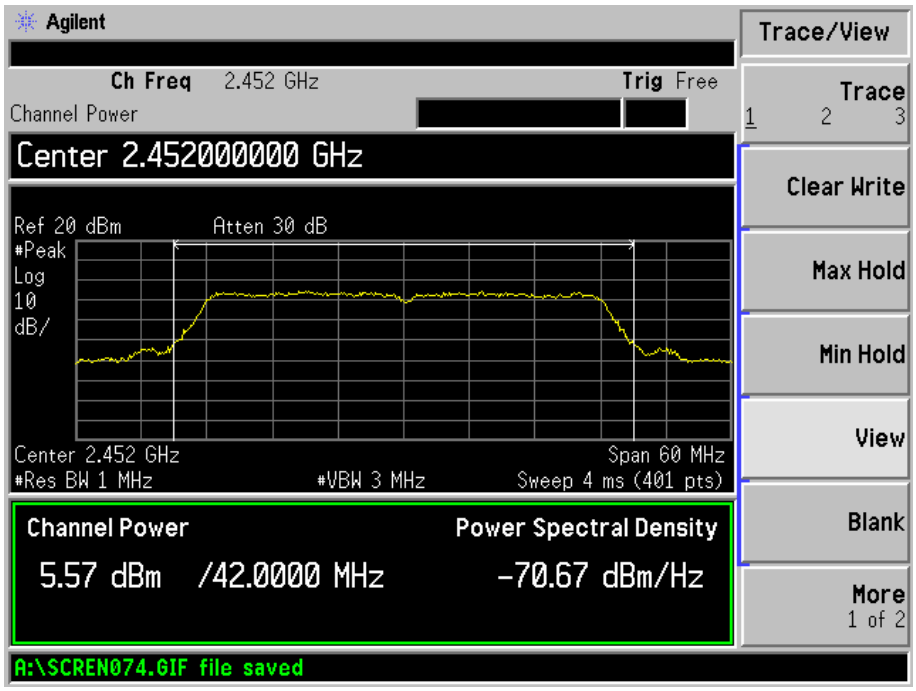
802.11n-HT40_ MCS7-Low Channel



802.11n-HT40_ MCS7-Middle Channel



802.11n-HT40_ MCS7-High Channel



7. Field Strength of Spurious Emissions

7.1 Measurement Uncertainty

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

7.2 Standard Applicable

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

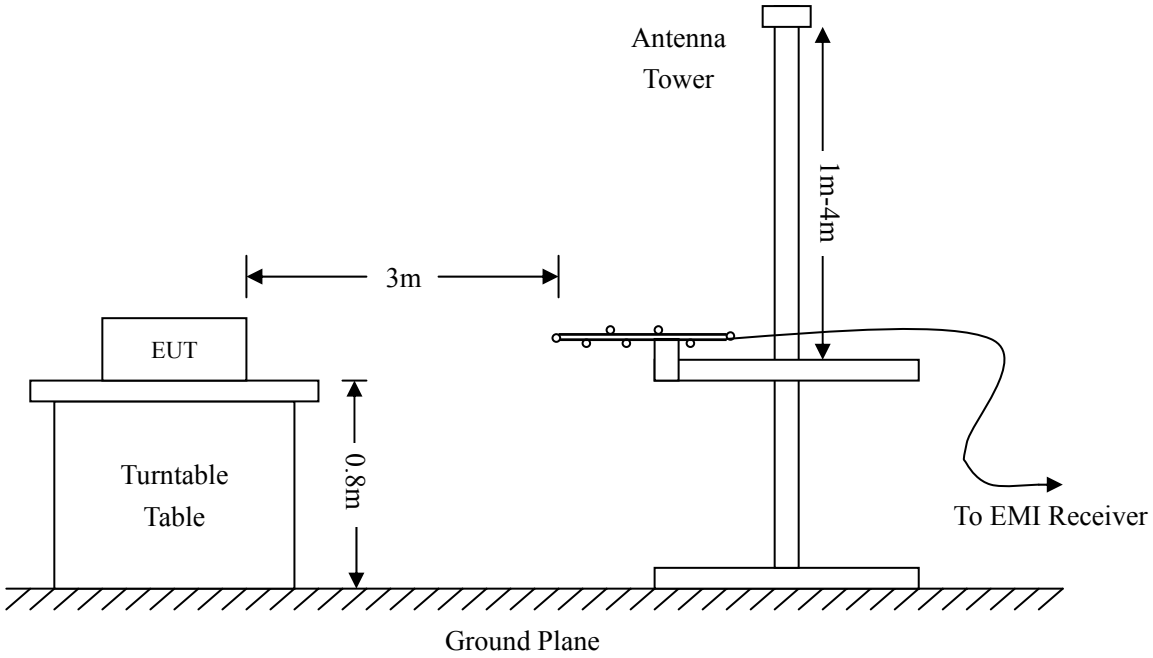
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

7.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2013-05-07	2014-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2013-05-07	2014-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2013-05-07	2014-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2013-05-07	2014-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2013-04-20	2014-04-19
Horn Antenna	ETS	3117	00086197	2013-04-20	2014-04-19
Horn Antenna	ETS	3116B	00088203	2013-04-20	2014-04-19
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2013-04-20	2014-04-19

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.



Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Detector function = peak	Detector function = peak	Detector function = peak, AV

7.5 Corrected Amplitude & Margin Calculation

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

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

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

Margin = Corr. Ampl. – FCC Part 15 Limit

7.6 Environmental Conditions

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

7.7 Summary of Test Results/Plots

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

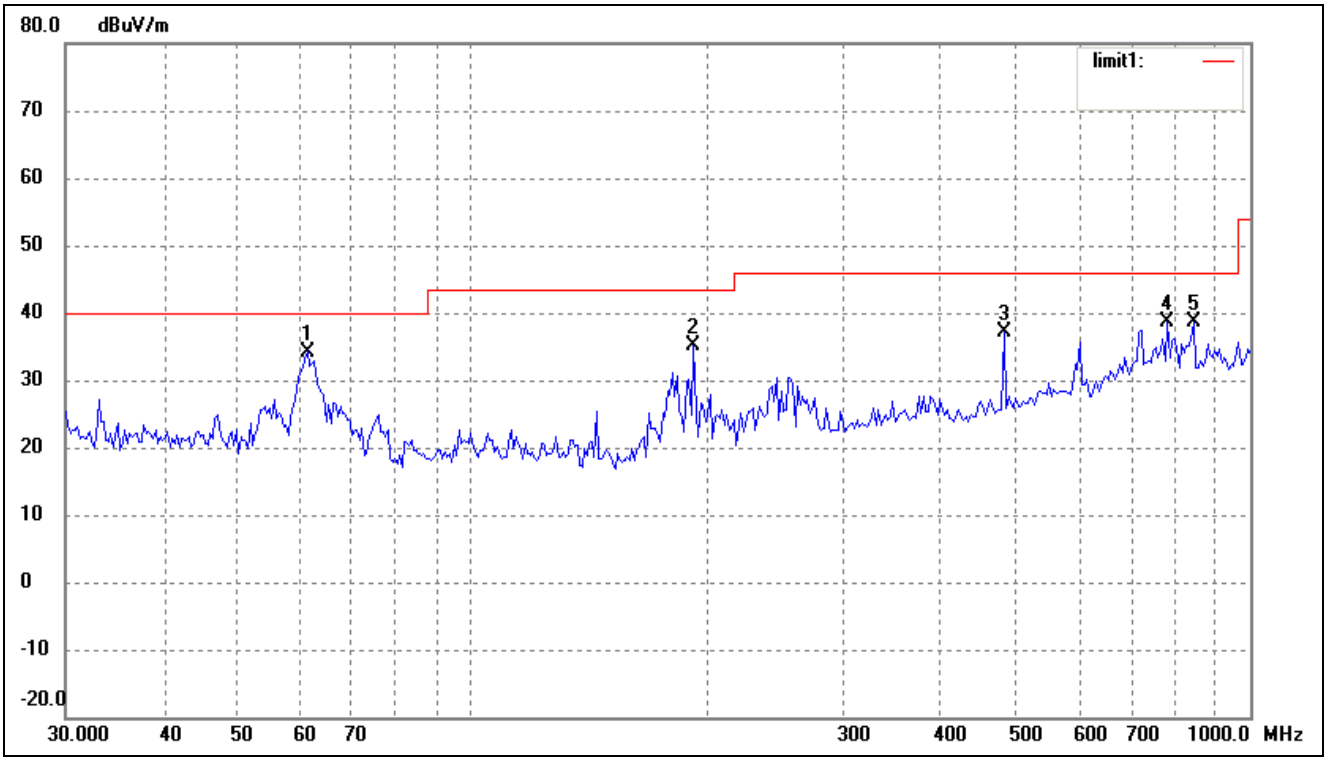
-2.88 dB at **62.2128 MHz** in the **Vertical** polarization for **802.11n-HT40 Low Channel**, **9kHz** to **25 GHz**, **3 Meters**

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)

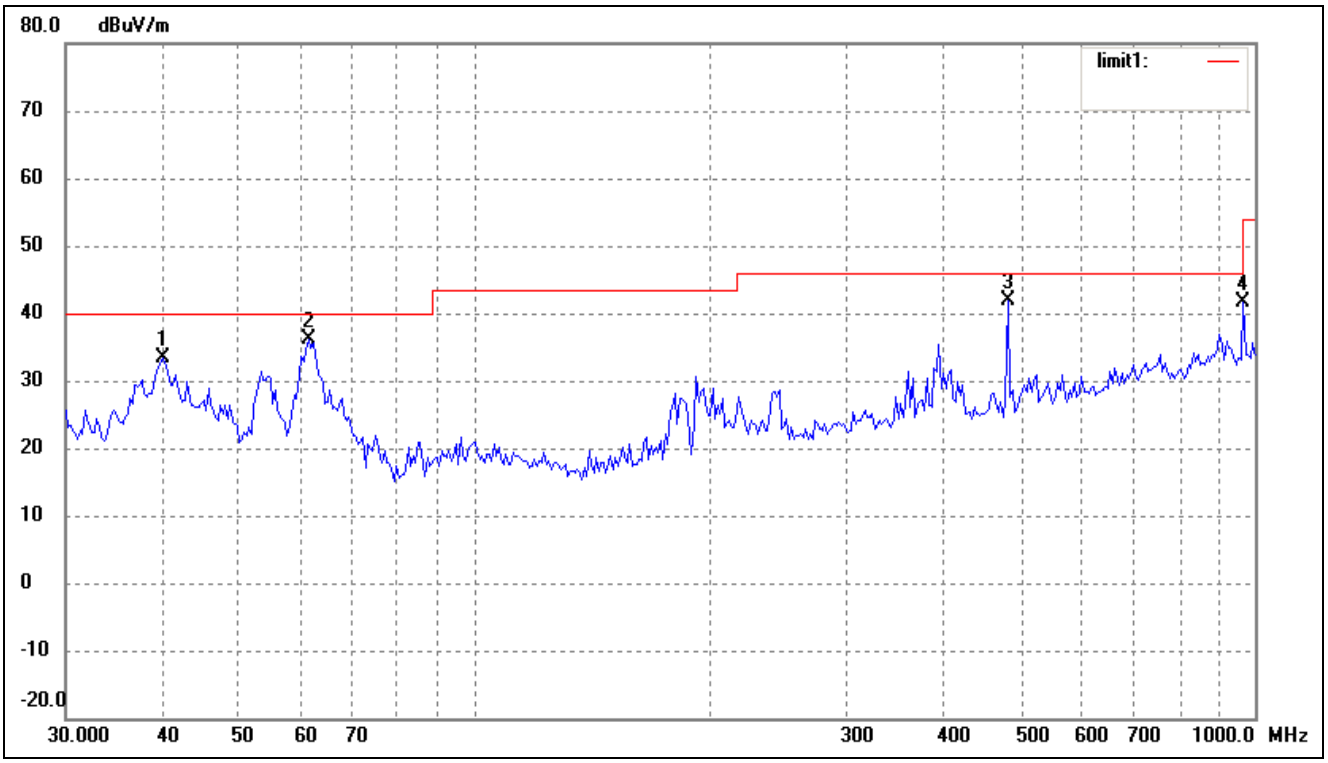
EUT: *MID*
Tested Model: *D5H-88V*
Operating Condition: *802.11b Transmitting Low Channel-2412MHz*
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	61.3463	28.98	5.27	34.25	40.00	-5.75	13	100	peak
2	192.4186	30.76	4.31	35.07	43.50	-8.43	13	100	peak
3	482.2156	25.65	11.49	37.14	46.00	-8.86	13	100	peak
4	782.3453	22.86	15.81	38.67	46.00	-7.33	13	100	peak
5	845.0878	21.29	17.45	38.74	46.00	-7.26	13	100	peak

Test Specification: *Vertical*



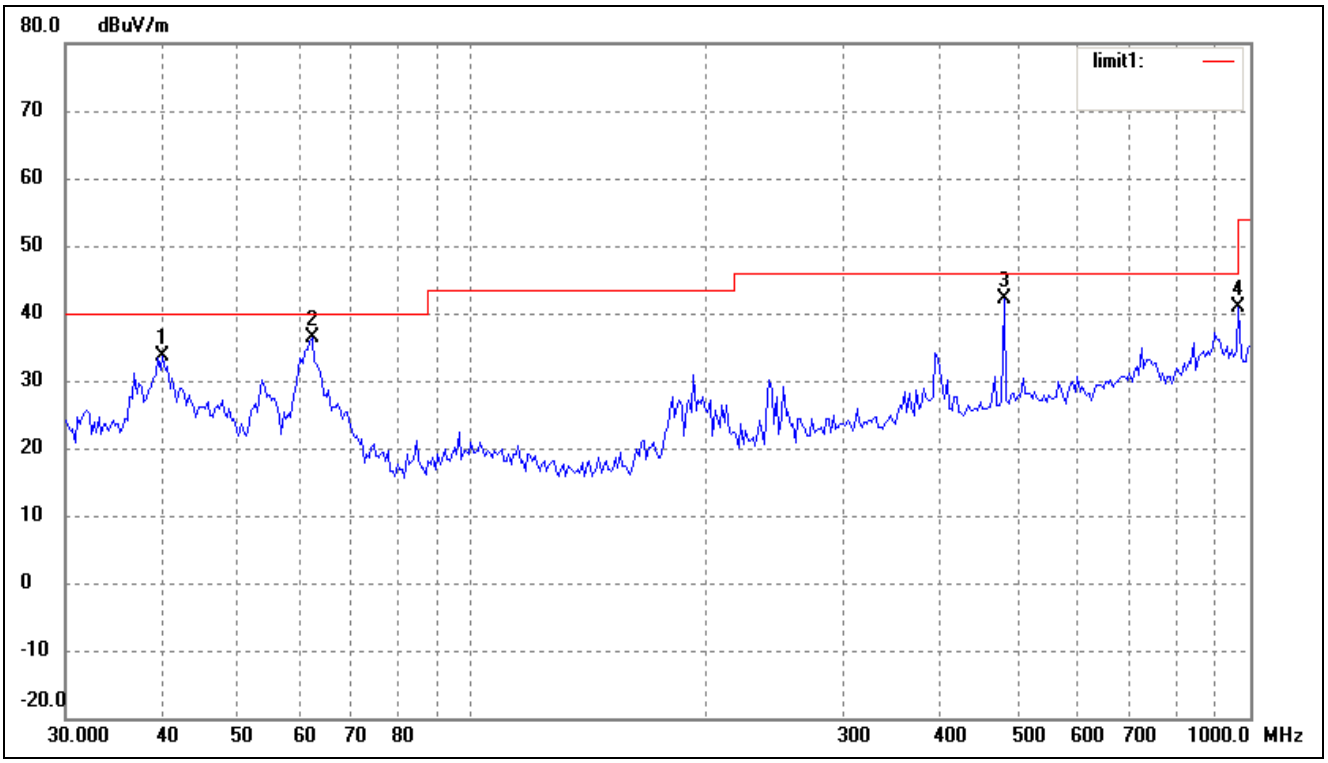
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	39.9942	23.69	9.68	33.37	40.00	-6.63	115	100	peak
2	61.3463	30.83	5.27	36.10	40.00	-3.90	115	100	peak
3	482.2156	30.42	11.49	41.91	46.00	-4.09	115	100	peak
4	965.5421	23.20	18.37	41.57	54.00	-12.43	115	100	peak

Operating Condition: *802.11b Transmitting Middle Channel-2437MHz*
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*

No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	61.3463	27.31	5.27	32.58	40.00	-7.42	13	100	peak
2	192.4186	31.46	4.31	35.77	43.50	-7.73	13	100	peak
3	245.9509	27.64	7.17	34.81	46.00	-11.19	13	100	peak
4	265.6757	26.34	8.15	34.49	46.00	-11.51	13	100	peak
5	482.2156	27.06	11.49	38.55	46.00	-7.45	13	100	peak

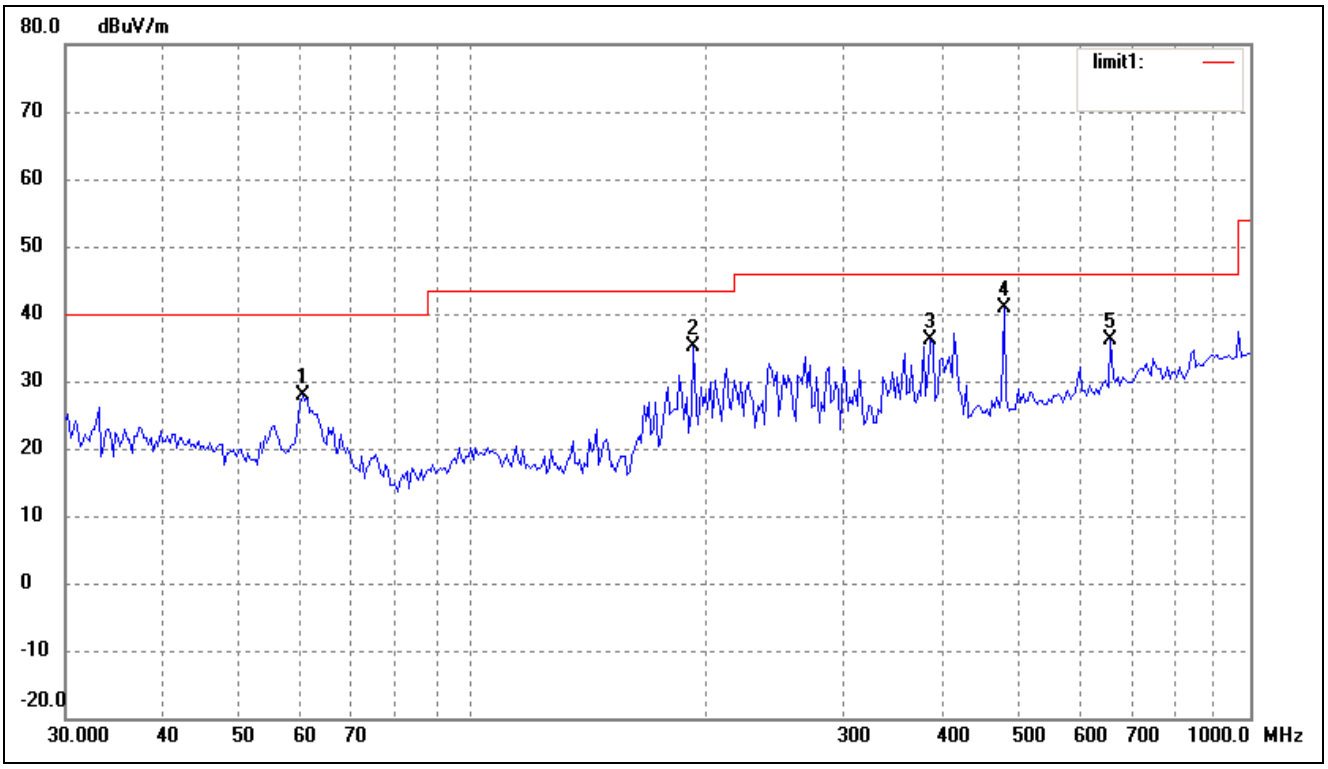
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	39.9942	23.92	9.68	33.60	40.00	-6.40	115	100	peak
2	62.2128	31.41	4.99	36.40	40.00	-3.60	115	100	peak
3	482.2156	30.56	11.49	42.05	46.00	-3.95	115	100	peak
4	965.5421	22.47	18.37	40.84	54.00	-13.16	115	100	peak

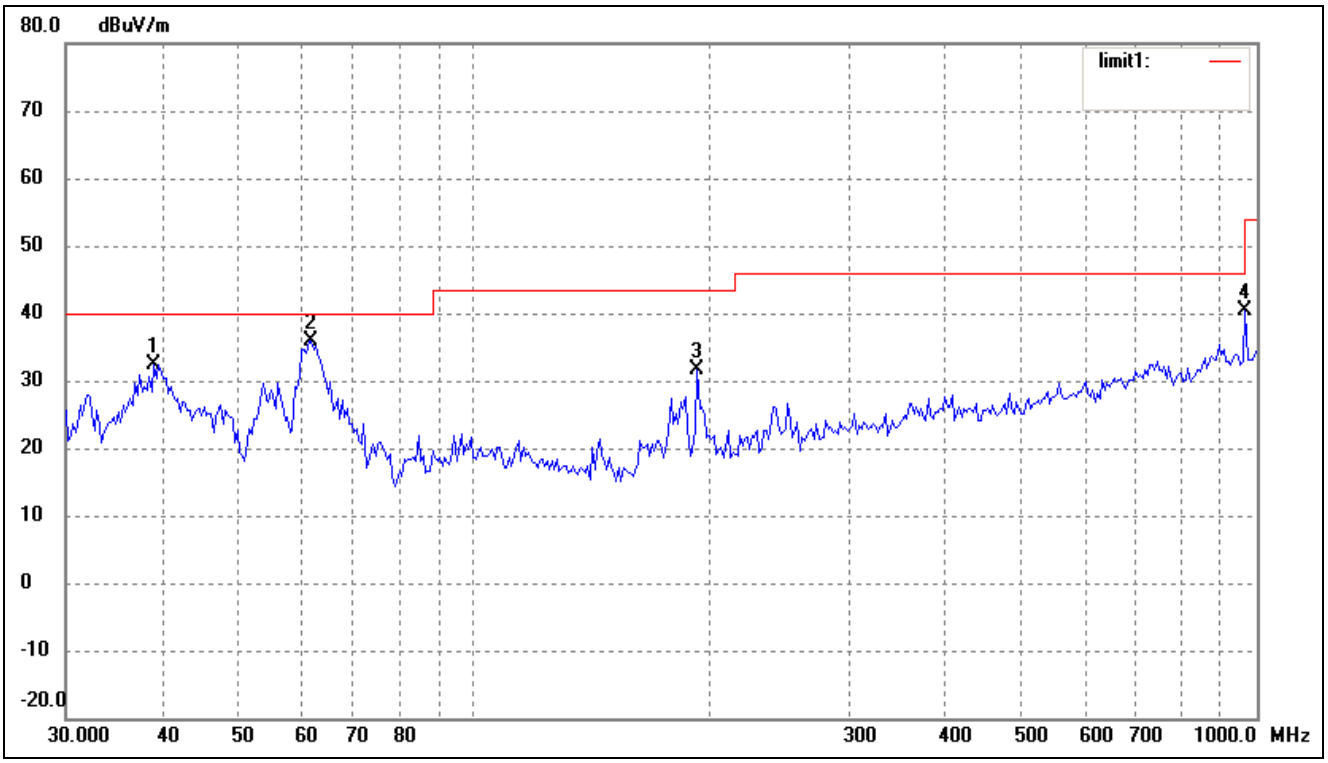
Operating Condition: *802.11b Transmitting High Channel-2462MHz*
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	60.4919	22.23	5.53	27.76	40.00	-12.24	13	100	peak
2	192.4186	30.79	4.31	35.10	43.50	-8.40	13	100	peak
3	387.9920	25.12	10.99	36.11	46.00	-9.89	13	100	peak
4	482.2156	29.28	11.49	40.77	46.00	-5.23	13	100	peak
5	661.1505	21.27	14.80	36.07	46.00	-9.93	13	100	peak

Test Specification: *Vertical*

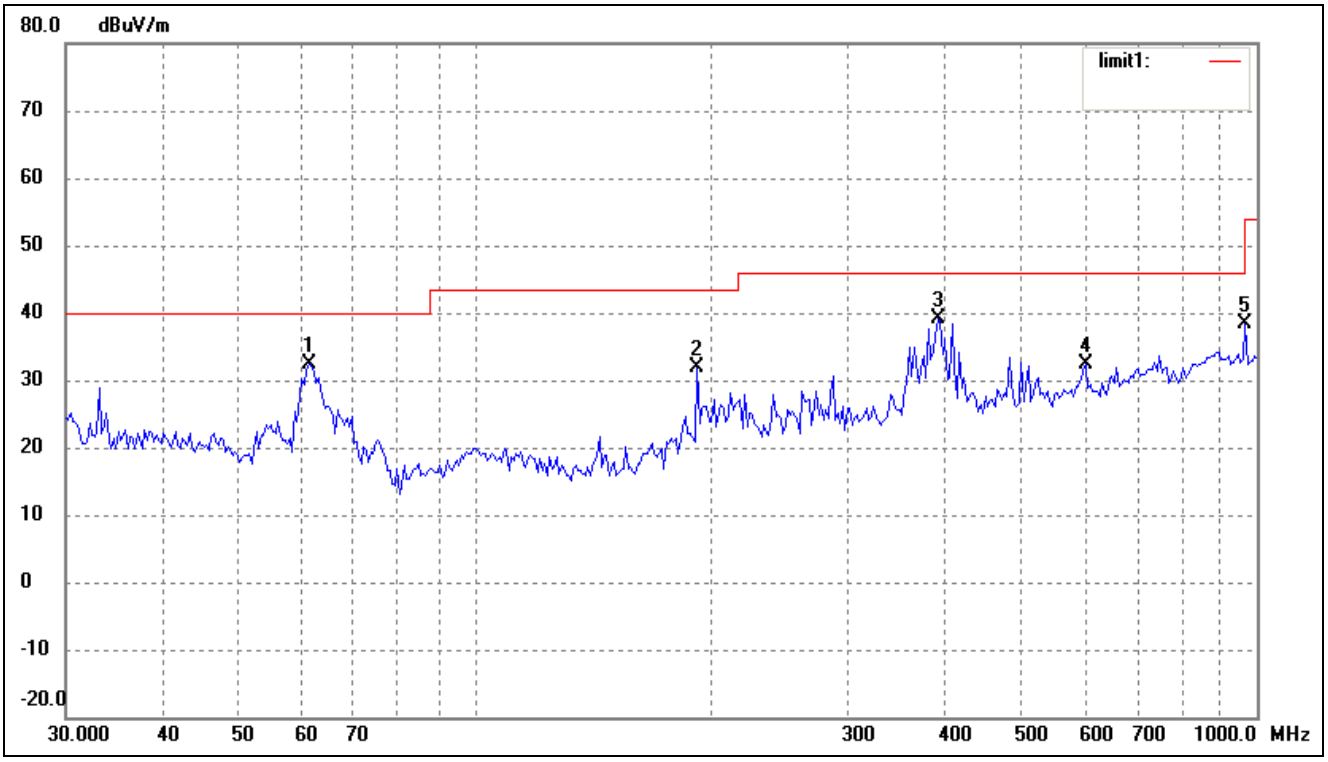


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	38.8879	22.95	9.50	32.45	40.00	-7.55	115	100	peak
2	61.7781	30.81	5.13	35.94	40.00	-4.06	115	100	peak
3	192.4186	27.26	4.31	31.57	43.50	-11.93	115	100	peak
4	965.5421	21.96	18.37	40.33	54.00	-13.67	115	100	peak

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

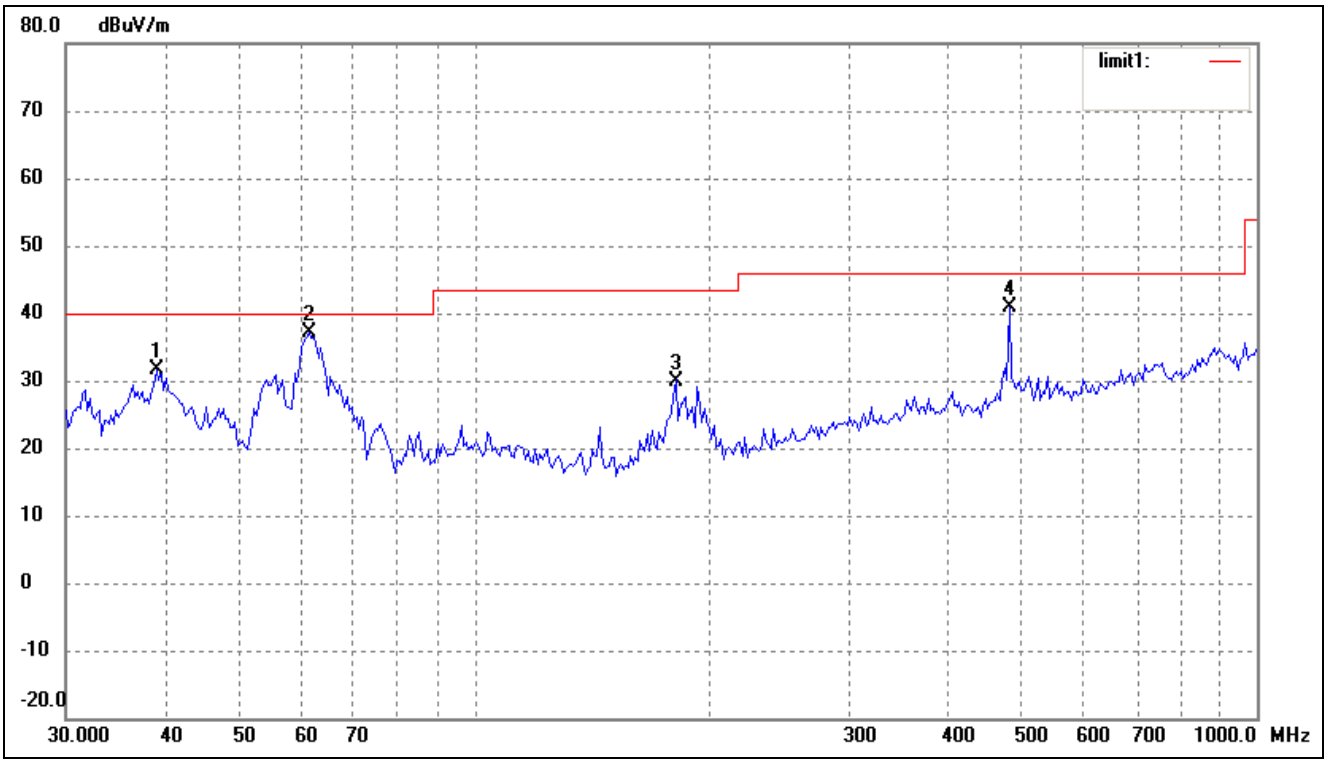
EUT: *MID*
Tested Model: *D5H-88V*
Operating Condition: *802.11g Transmitting Low Channel-2412MHz*
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	61.3463	27.21	5.27	32.48	40.00	-7.52	13	100	peak
2	192.4186	27.59	4.31	31.90	43.50	-11.60	13	100	peak
3	390.7226	28.05	11.12	39.17	46.00	-6.83	13	100	peak
4	603.5392	17.67	14.62	32.29	46.00	-13.71	13	100	peak
5	965.5421	20.06	18.37	38.43	54.00	-15.57	13	100	peak

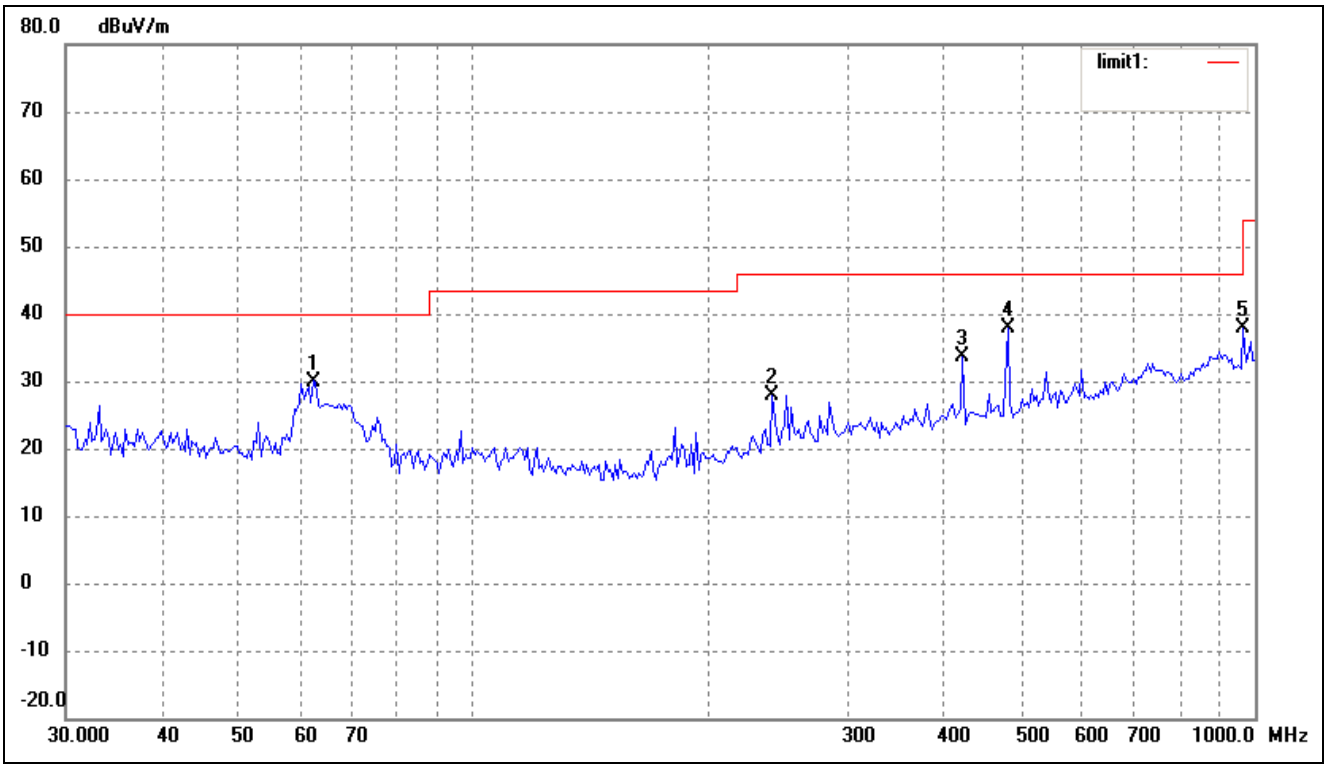
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	39.1616	22.20	9.54	31.74	40.00	-8.26	115	100	peak
2	61.3463	31.83	5.27	37.10	40.00	-2.90	115	100	peak
3	180.6488	26.22	3.78	30.00	43.50	-13.50	115	100	peak
4	482.2156	29.35	11.49	40.84	46.00	-5.16	115	100	peak

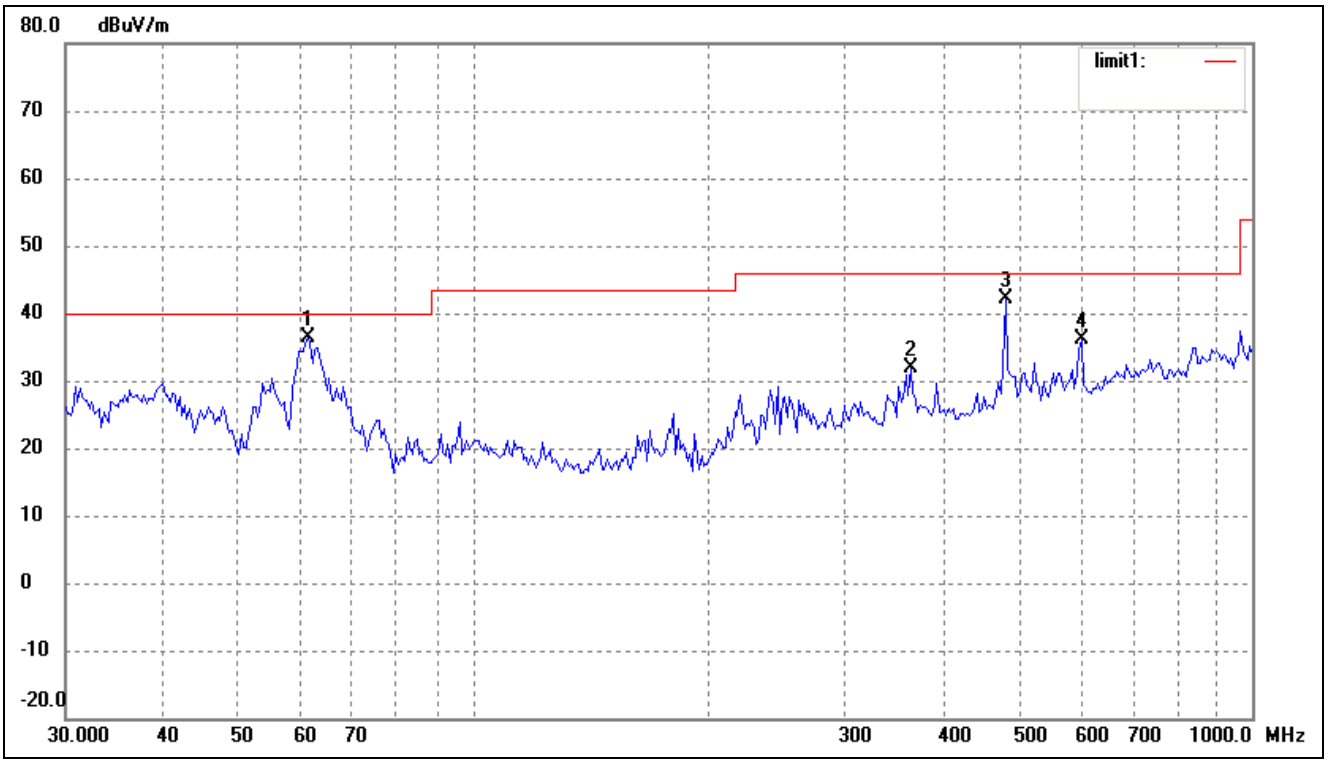
Operating Condition: *802.11g Transmitting Middle Channel-2437MHz*
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	62.2128	25.01	4.99	30.00	40.00	-10.00	13	100	peak
2	240.8304	20.94	7.02	27.96	46.00	-18.04	13	100	peak
3	422.0577	22.77	10.76	33.53	46.00	-12.47	13	100	peak
4	482.2156	26.49	11.49	37.98	46.00	-8.02	13	100	peak
5	965.5421	19.59	18.37	37.96	54.00	-16.04	13	100	peak

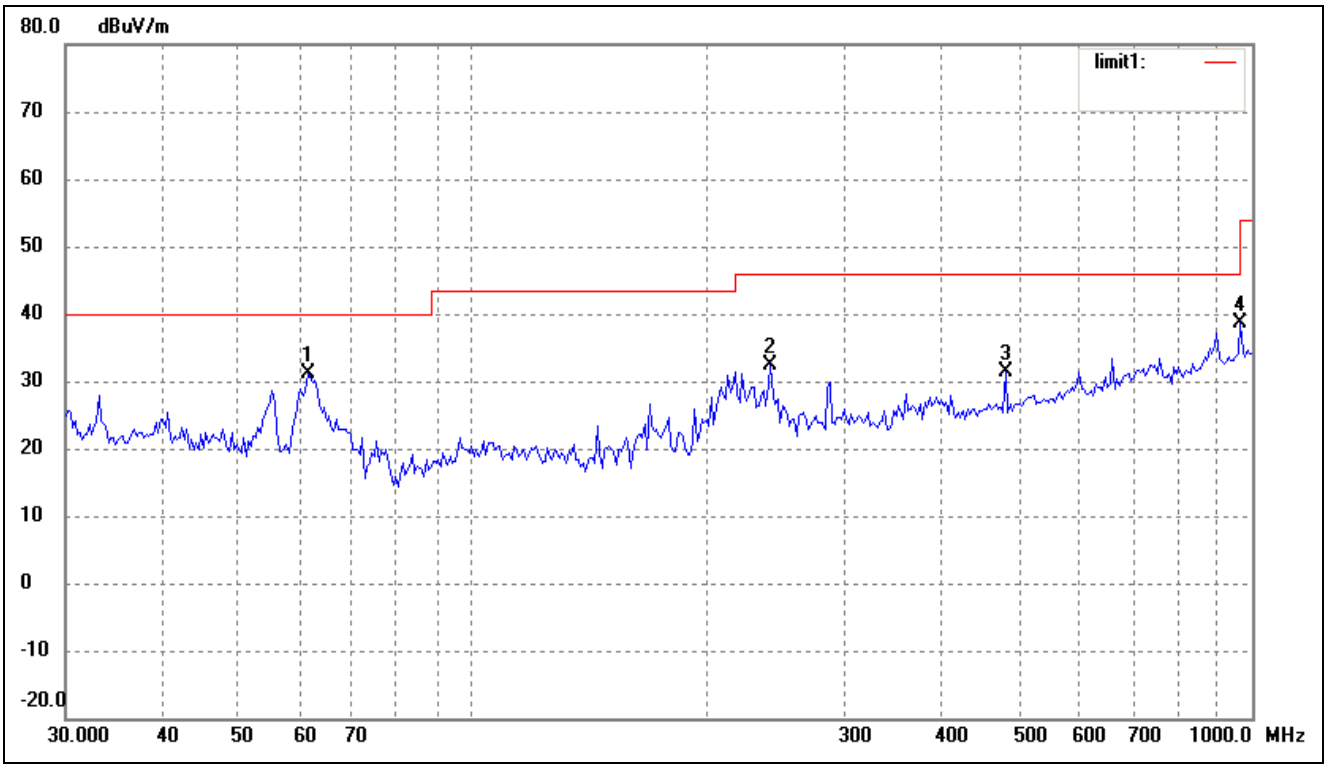
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	61.3463	31.15	5.27	36.42	40.00	-3.58	115	100	peak
2	364.2595	21.30	10.68	31.98	46.00	-14.02	115	100	peak
3	482.2156	30.63	11.49	42.12	46.00	-3.88	115	100	peak
4	603.5392	21.55	14.62	36.17	46.00	-9.83	115	100	peak

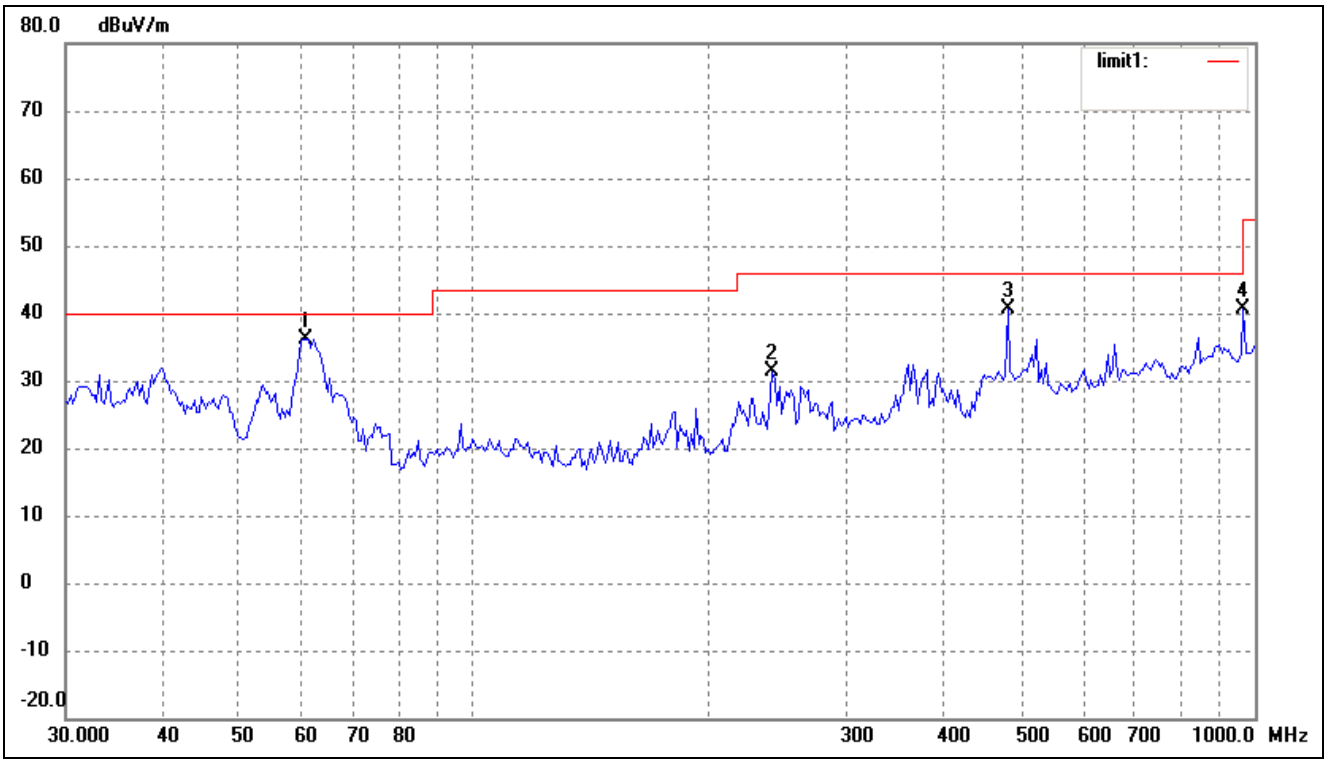
Operating Condition: *802.11g Transmitting High Channel-2462MHz*
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	61.3463	25.89	5.27	31.16	40.00	-8.84	13	100	peak
2	240.8304	25.24	7.02	32.26	46.00	-13.74	13	100	peak
3	482.2156	19.94	11.49	31.43	46.00	-14.57	13	100	peak
4	965.5421	20.18	18.37	38.55	54.00	-15.45	13	100	peak

Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	60.9176	30.82	5.40	36.22	40.00	-3.78	115	100	peak
2	240.8304	24.36	7.02	31.38	46.00	-14.62	115	100	peak
3	482.2156	29.13	11.49	40.62	46.00	-5.38	115	100	peak
4	965.5421	22.16	18.37	40.53	54.00	-13.47	115	100	peak

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

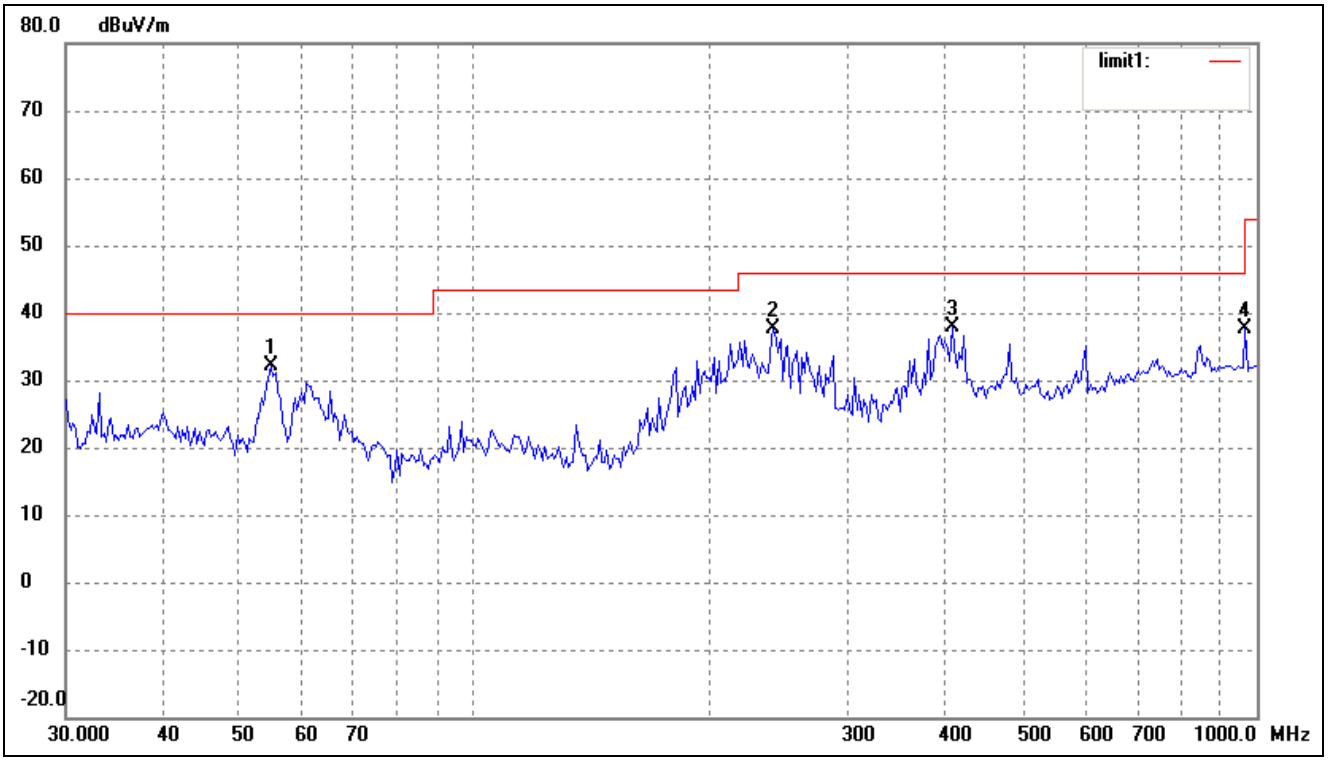
EUT: *MID*

Tested Model: *D5H-88V*

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

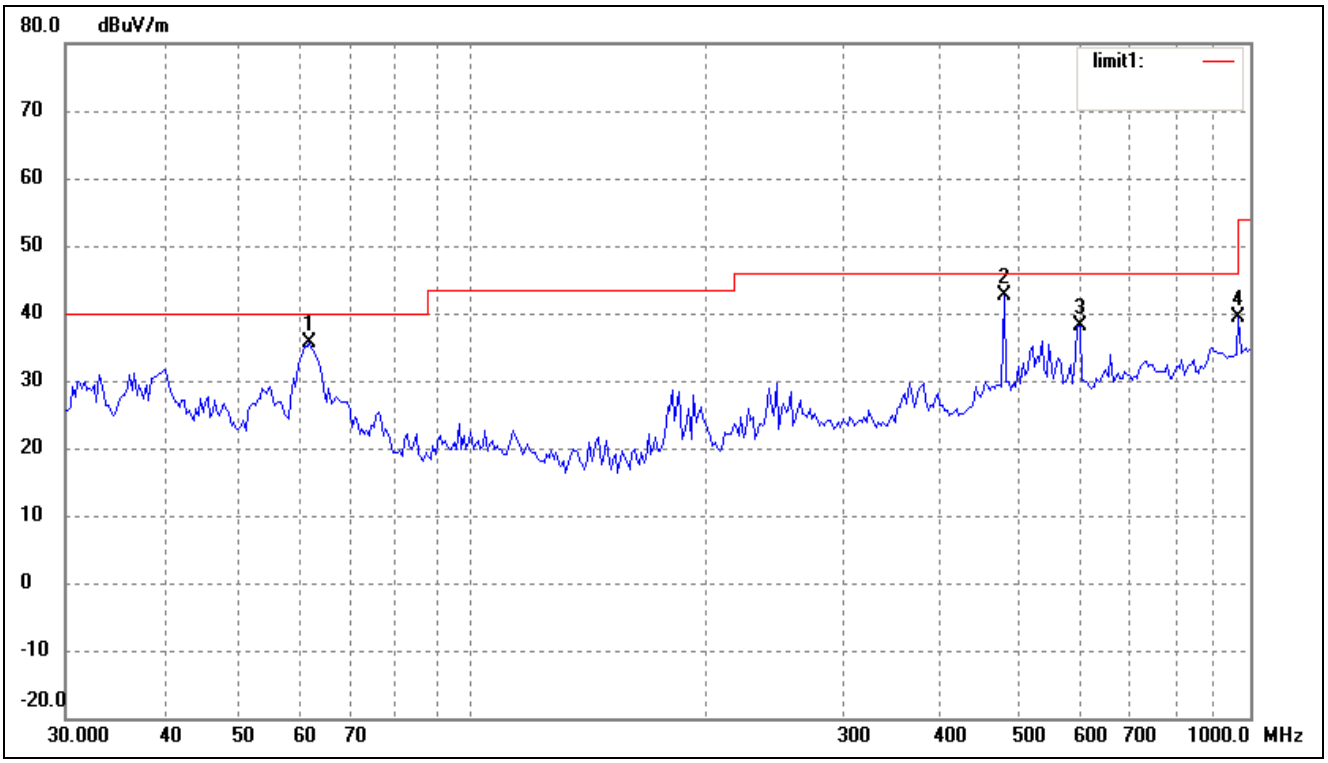
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	54.8348	26.04	6.17	32.21	40.00	-7.79	13	100	peak
2	240.8304	30.51	7.02	37.53	46.00	-8.47	13	100	peak
3	407.5145	26.57	11.22	37.79	46.00	-8.21	13	100	peak
4	965.5421	19.19	18.37	37.56	54.00	-16.44	13	100	peak

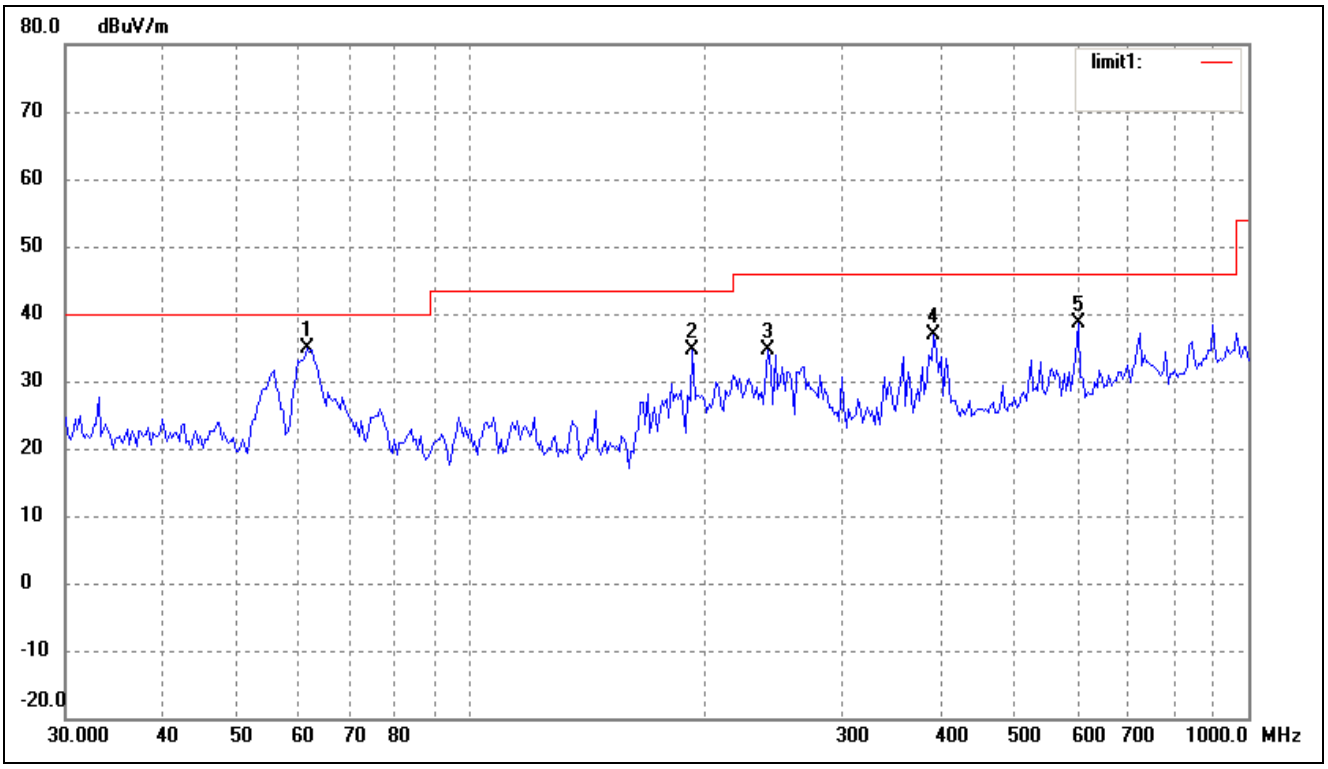
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	61.7781	30.55	5.13	35.68	40.00	-4.32	115	100	peak
2	482.2156	31.13	11.49	42.62	46.00	-3.38	115	100	peak
3	603.5392	23.52	14.62	38.14	46.00	-7.86	115	100	peak
4	965.5421	21.13	18.37	39.50	54.00	-14.50	115	100	peak

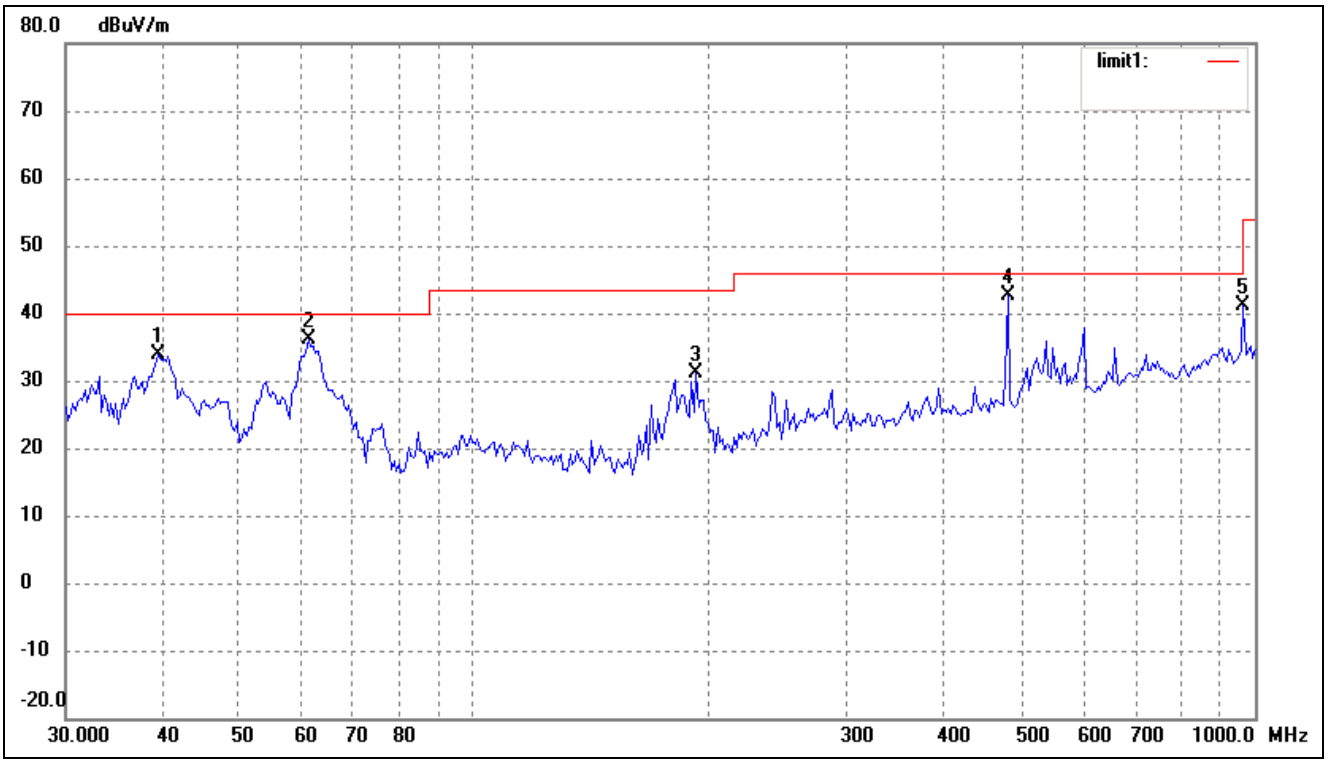
Operating Condition: *802.11n-HT20 Transmitting Middle Channel-2437MHz*
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	61.3463	29.69	5.27	34.96	40.00	-5.04	13	100	peak
2	192.4186	30.34	4.31	34.65	43.50	-8.85	13	100	peak
3	240.8304	27.59	7.02	34.61	46.00	-11.39	13	100	peak
4	393.4724	25.63	11.24	36.87	46.00	-9.13	13	100	peak
5	603.5392	24.07	14.62	38.69	46.00	-7.31	13	100	peak

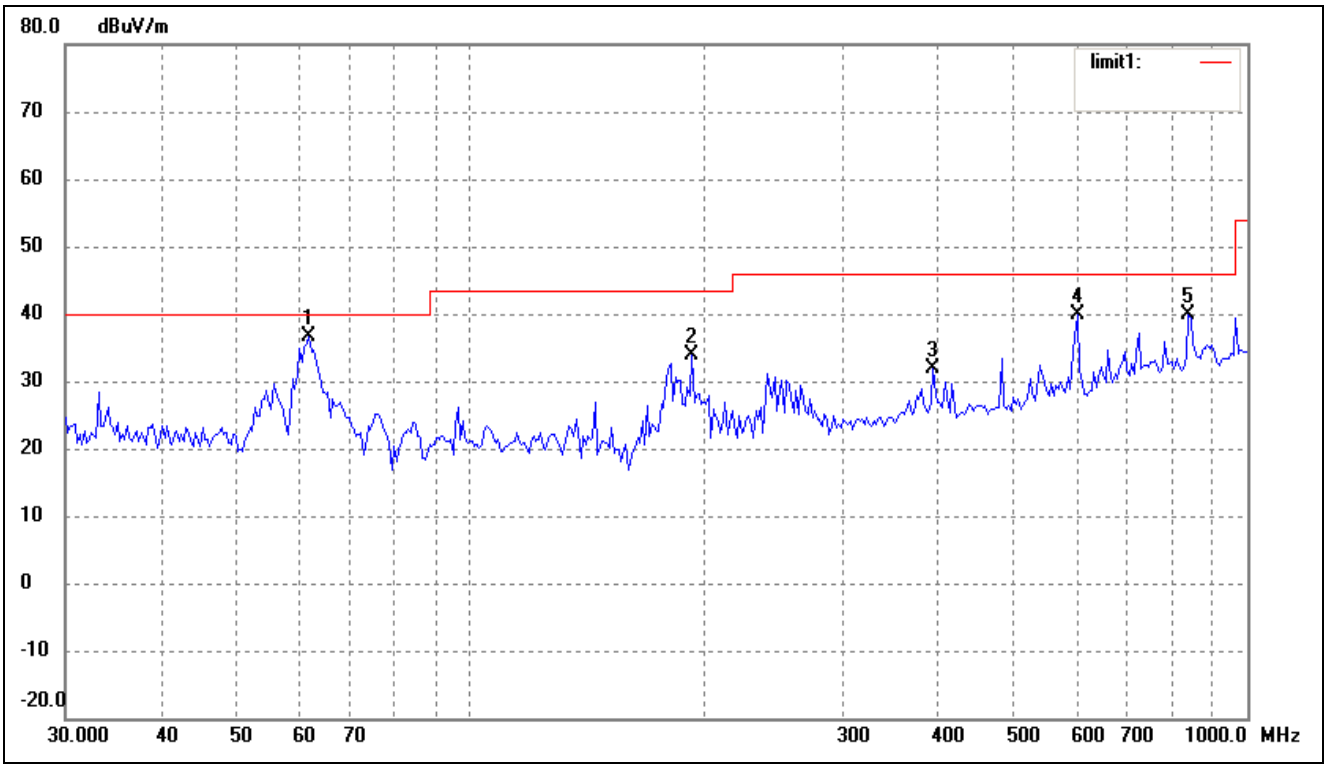
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	39.4372	24.30	9.60	33.90	40.00	-6.10	115	100	peak
2	61.3463	30.80	5.27	36.07	40.00	-3.93	115	100	peak
3	192.4186	26.77	4.31	31.08	43.50	-12.42	115	100	peak
4	482.2156	31.22	11.49	42.71	46.00	-3.29	115	100	peak
5	965.5421	22.65	18.37	41.02	54.00	-12.98	115	100	peak

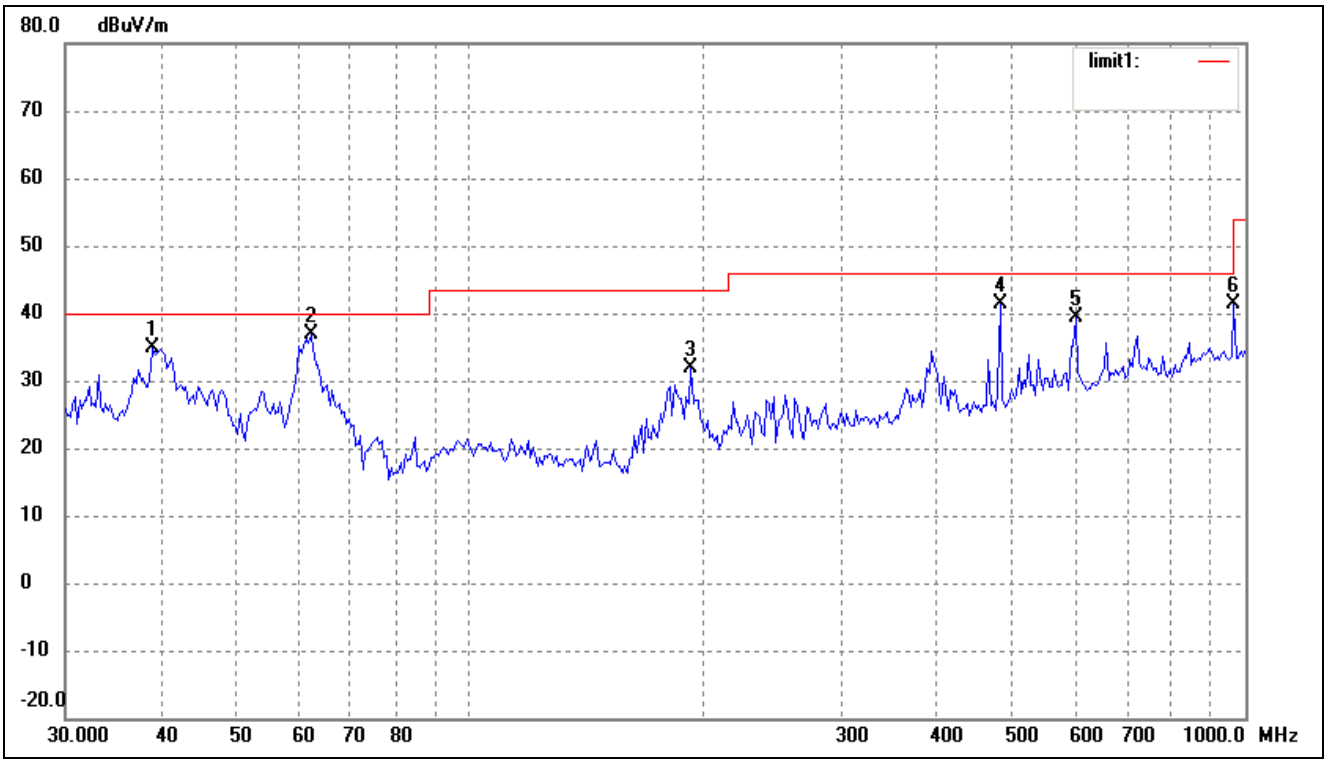
Operating Condition: *802.11n-HT20 Transmitting High Channel-2462MHz*
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	61.7781	31.38	5.13	36.51	40.00	-3.49	13	100	peak
2	192.4186	29.62	4.31	33.93	43.50	-9.57	13	100	peak
3	393.4724	20.61	11.24	31.85	46.00	-14.15	13	100	peak
4	603.5392	25.35	14.62	39.97	46.00	-6.03	13	100	peak
5	839.1818	22.48	17.28	39.76	46.00	-6.24	13	100	peak

Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	38.8879	25.42	9.50	34.92	40.00	-5.08	115	100	peak
2	62.2128	31.85	4.99	36.84	40.00	-3.16	115	100	peak
3	192.4186	27.50	4.31	31.81	43.50	-11.69	115	100	peak
4	482.2156	29.89	11.49	41.38	46.00	-4.62	115	100	peak
5	603.5392	24.74	14.62	39.36	46.00	-6.64	115	100	peak
6	965.5421	22.98	18.37	41.35	54.00	-12.65	115	100	peak

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

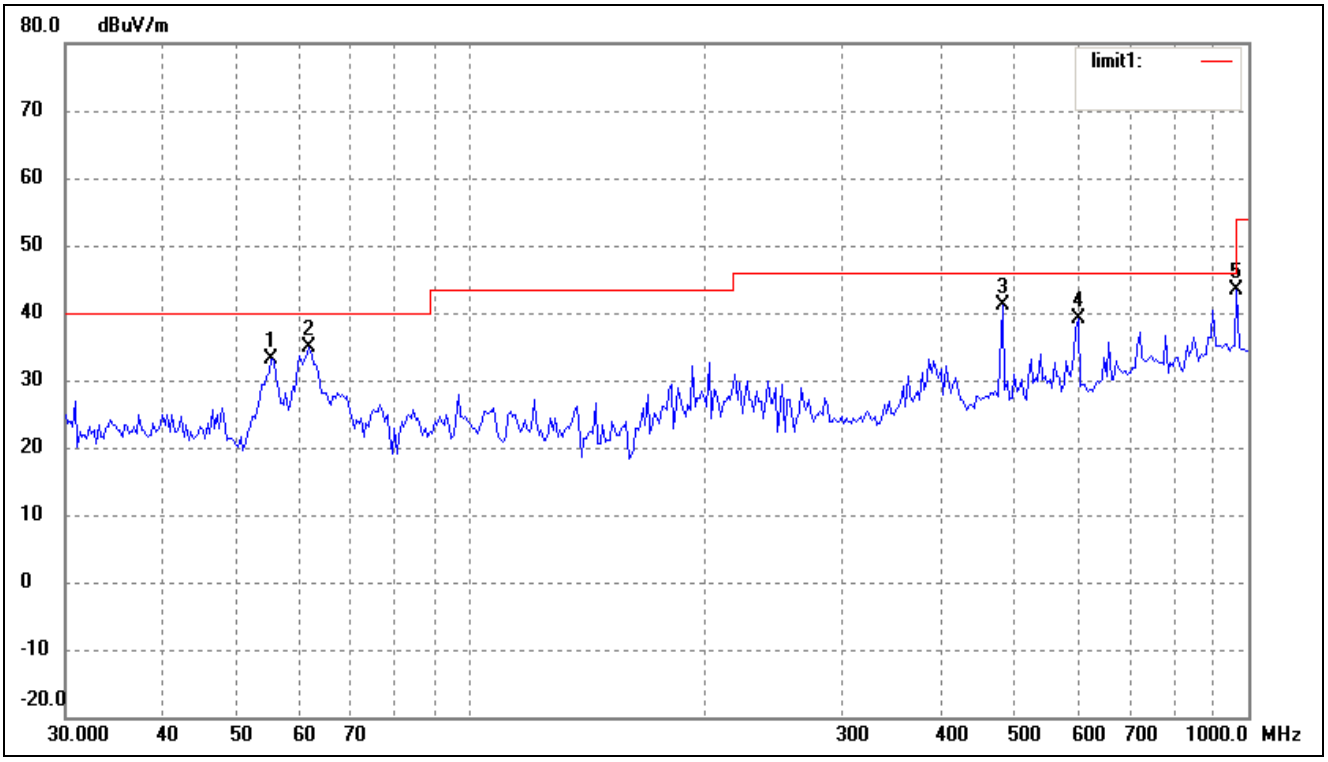
EUT: *MID*

Tested Model: *D5H-88V*

Operating Condition: *802.11n-HT40 Transmitting Low Channel-2422MHz*

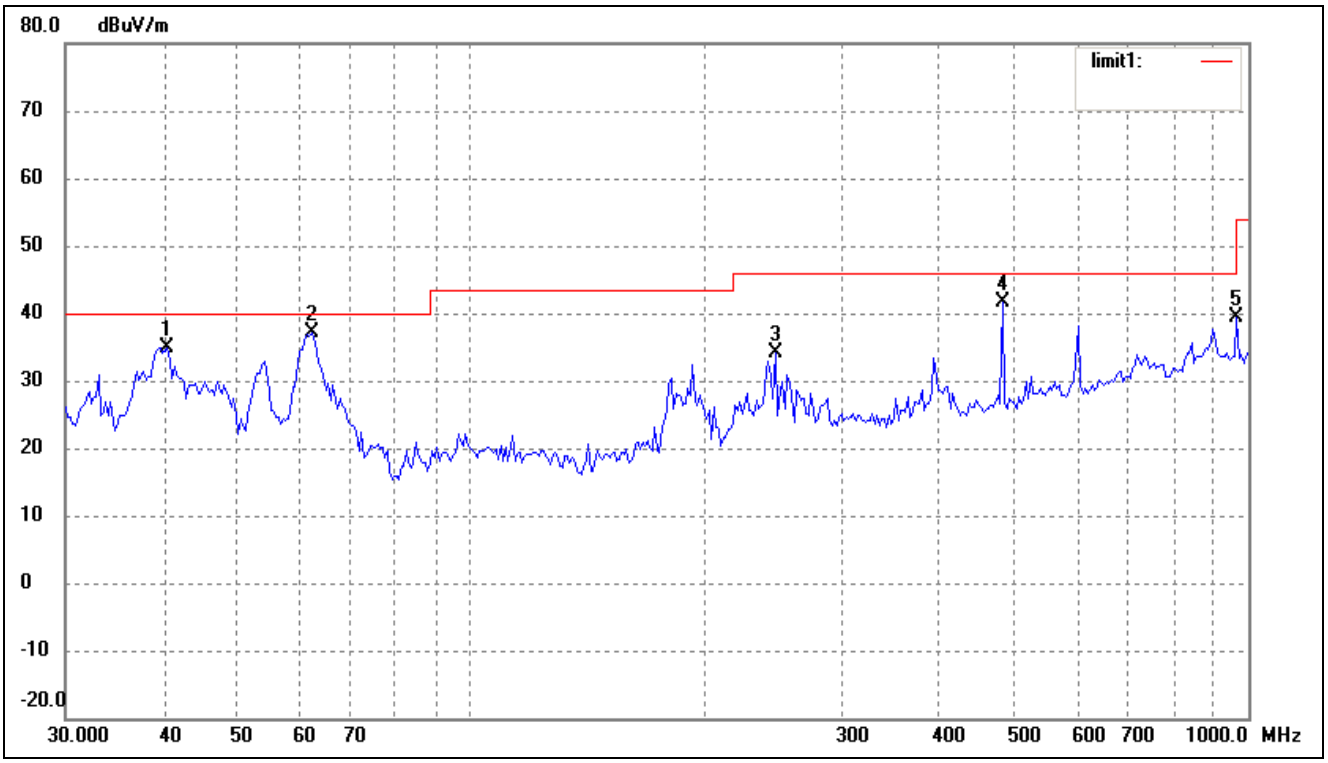
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	55.2207	26.88	6.14	33.02	40.00	-6.98	13	100	peak
2	61.7781	29.74	5.13	34.87	40.00	-5.13	13	100	peak
3	482.2156	29.66	11.49	41.15	46.00	-4.85	13	100	peak
4	603.5392	24.48	14.62	39.10	46.00	-6.90	13	100	peak
5	965.5421	24.98	18.37	43.35	54.00	-10.65	13	100	peak

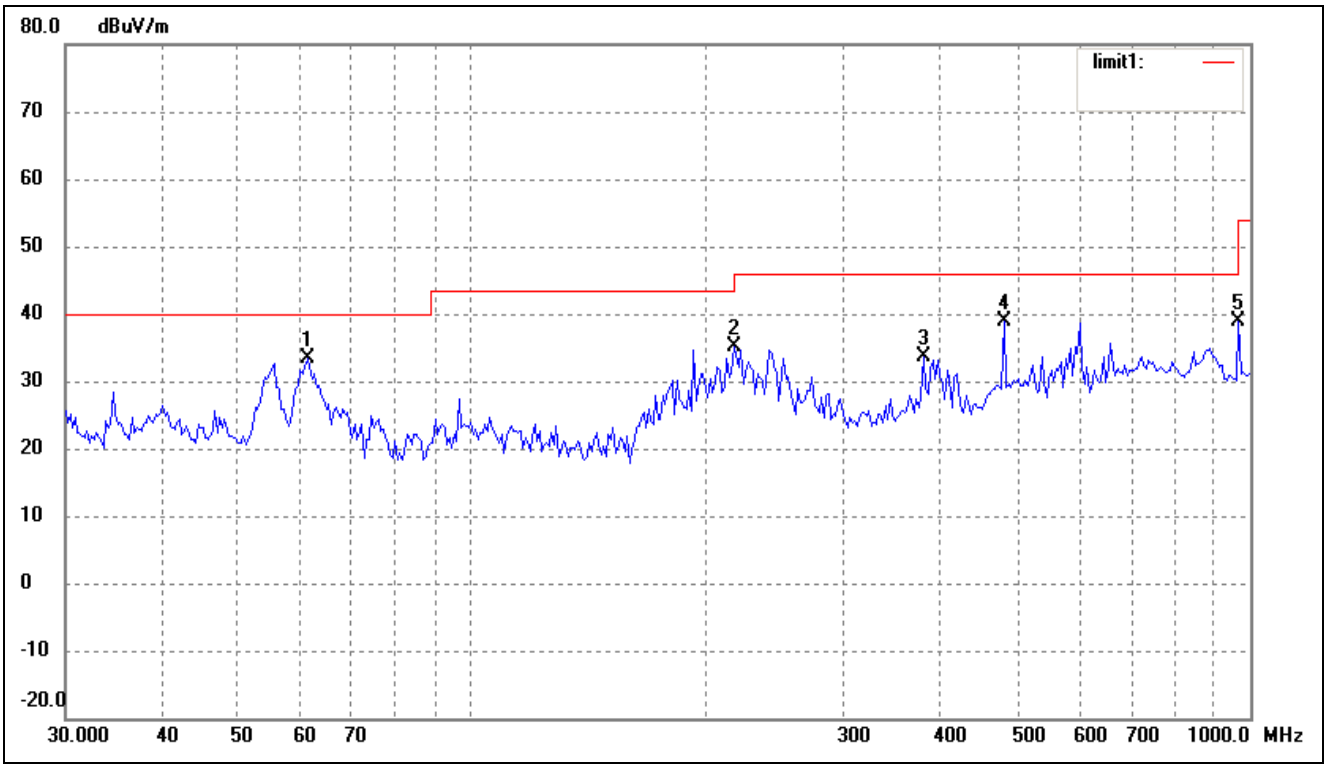
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	40.5591	25.42	9.51	34.93	40.00	-5.07	115	100	peak
2	62.2128	32.13	4.99	37.12	40.00	-2.88	115	100	peak
3	245.9509	26.96	7.17	34.13	46.00	-11.87	115	100	peak
4	482.2156	30.17	11.49	41.66	46.00	-4.34	115	100	peak
5	965.5421	20.94	18.37	39.31	54.00	-14.69	115	100	peak

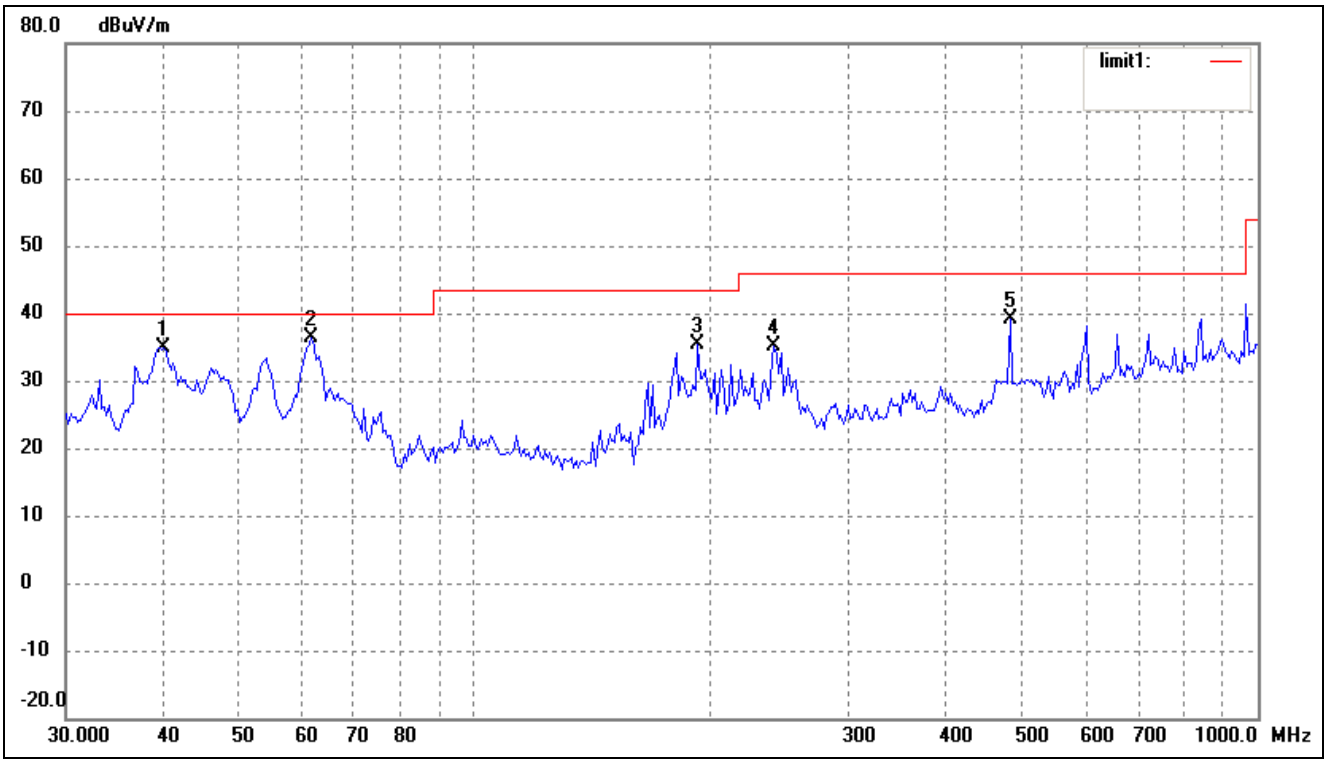
Operating Condition: *802.11n-HT40 Transmitting Middle Channel-2437MHz*
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	61.3463	28.07	5.27	33.34	40.00	-6.66	13	100	peak
2	216.7828	29.43	5.72	35.15	46.00	-10.85	13	100	peak
3	379.9141	22.98	10.62	33.60	46.00	-12.40	13	100	peak
4	482.2156	27.44	11.49	38.93	46.00	-7.07	13	100	peak
5	965.5421	20.53	18.37	38.90	54.00	-15.10	13	100	peak

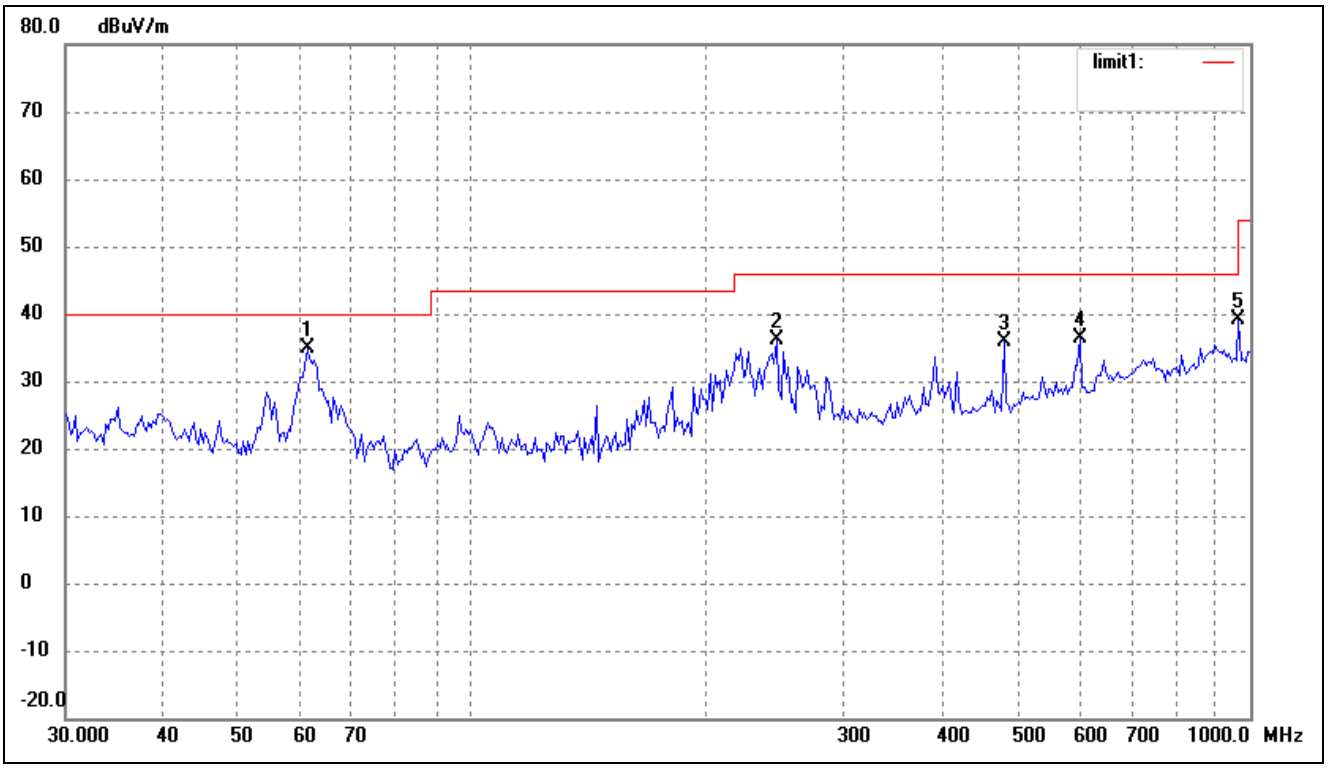
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	39.9942	25.18	9.68	34.86	40.00	-5.14	115	100	peak
2	61.7781	31.24	5.13	36.37	40.00	-3.63	115	100	peak
3	192.4186	31.01	4.31	35.32	43.50	-8.18	115	100	peak
4	240.8304	28.02	7.02	35.04	46.00	-10.96	115	100	peak
5	482.2156	27.59	11.49	39.08	46.00	-6.92	115	100	peak

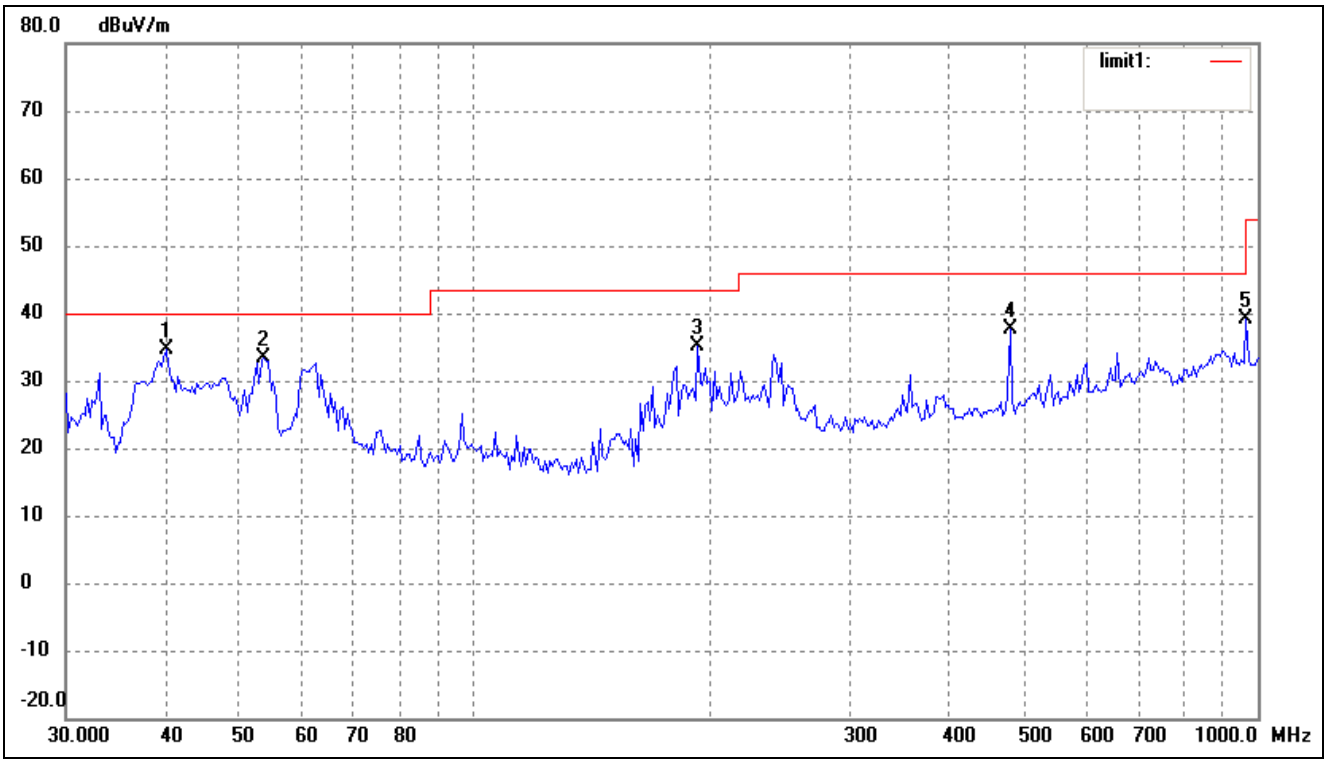
Operating Condition: *802.11n-HT40 Transmitting High Channel-2452MHz*
Comment: *3.7V lithium battery*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	61.3463	29.57	5.27	34.84	40.00	-5.16	13	100	peak
2	245.9509	28.98	7.17	36.15	46.00	-9.85	13	100	peak
3	482.2156	24.42	11.49	35.91	46.00	-10.09	13	100	peak
4	603.5392	21.74	14.62	36.36	46.00	-9.64	13	100	peak
5	965.5421	20.75	18.37	39.12	54.00	-14.88	13	100	peak

Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	40.2757	24.92	9.60	34.52	40.00	-5.48	115	100	peak
2	53.6932	27.00	6.28	33.28	40.00	-6.72	115	100	peak
3	192.4186	30.93	4.31	35.24	43.50	-8.26	115	100	peak
4	482.2156	26.06	11.49	37.55	46.00	-8.45	115	100	peak
5	965.5421	20.74	18.37	39.11	54.00	-14.89	115	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	60.07	-3.85	56.22	74.00	-17.78	H	PK
4824	42.96	-3.85	39.11	54.00	-14.89	H	AV
7236	46.02	1.14	47.16	74.00	-26.84	H	PK
7236	35.05	1.14	36.19	54.00	-17.81	H	AV
4824	63.01	-3.85	59.16	74.00	-14.84	V	PK
4824	46.55	-3.85	42.70	54.00	-11.3	V	AV
7236	48.41	1.14	49.55	74.00	-24.45	V	PK
7236	35.49	1.14	36.63	54.00	-17.37	V	AV
Middle Channel-2437MHz							
4874	56.70	-3.71	52.99	74.00	-21.01	H	PK
4874	43.84	-3.71	40.13	54.00	-13.87	H	AV
7311	48.35	1.59	49.94	74.00	-24.06	H	PK
7311	35.52	1.59	37.11	54.00	-16.89	H	AV
4874	62.53	-3.71	58.82	74.00	-15.18	V	PK
4874	44.85	-3.71	41.14	54.00	-12.86	V	AV
7311	48.76	1.59	50.35	74.00	-23.65	V	PK
7311	36.09	1.59	37.68	54.00	-16.32	V	AV
High Channel-2462MHz							
4924	57.88	-3.57	54.31	74.00	-19.69	H	PK
4924	42.22	-3.57	38.65	54.00	-15.35	H	AV
7386	47.74	1.91	49.65	74.00	-24.35	H	PK
7386	35.71	1.91	37.62	54.00	-16.38	H	AV
4924	66.25	-3.57	62.68	74.00	-11.32	V	PK
4924	49.02	-3.57	45.45	54.00	-8.55	V	AV
7386	49.58	1.91	51.49	74.00	-22.51	V	PK
7386	36.97	1.91	38.88	54.00	-15.12	V	AV

Test Mode: 802.11g

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824	65.25	-3.85	61.40	74.00	-12.6	H	PK
4824	51.1	-3.85	47.25	54.00	-6.75	H	AV
7236	54.92	1.14	56.06	74.00	-17.94	H	PK
7236	38.53	1.14	39.67	54.00	-14.33	H	AV
4824	68.46	-3.85	64.61	74.00	-9.39	V	PK
4824	52.81	-3.85	48.96	54.00	-5.04	V	AV
7236	57.6	1.14	58.74	74.00	-15.26	V	PK
7236	38.26	1.14	39.40	54.00	-14.6	V	AV
Middle Channel-2437MHz							
4874	62.88	-3.71	59.17	74.00	-14.83	H	PK
4874	49.39	-3.71	45.68	54.00	-8.32	H	AV
7311	50.42	1.59	52.01	74.00	-21.99	H	PK
7311	36.66	1.59	38.25	54.00	-15.75	H	AV
4874	64.92	-3.71	61.21	74.00	-12.79	V	PK
4874	51.46	-3.71	47.75	54.00	-6.25	V	AV
7311	53.13	1.59	54.72	74.00	-19.28	V	PK
7311	38.42	1.59	40.01	54.00	-13.99	V	AV
High Channel-2462MHz							
4924	63.27	-3.57	59.70	74.00	-14.3	H	PK
4924	49.08	-3.57	45.51	54.00	-8.49	H	AV
7386	48.13	1.91	50.04	74.00	-23.96	H	PK
7386	36.3	1.91	38.21	54.00	-15.79	H	AV
4924	60.98	-3.57	57.41	74.00	-16.59	V	PK
4924	47.97	-3.57	44.40	54.00	-9.6	V	AV
7386	48.91	1.91	50.82	74.00	-23.18	V	PK
7386	36.92	1.91	38.83	54.00	-15.17	V	AV

Test Mode: 802.11n-HT20

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824	60.5	-3.85	56.65	74.00	-17.35	H	PK
4824	45.67	-3.85	41.82	54.00	-12.18	H	AV
7236	48.37	1.14	49.51	74.00	-24.49	H	PK
7236	36.48	1.14	37.62	54.00	-16.38	H	AV
4824	65.09	-3.85	61.24	74.00	-12.76	V	PK
4824	53.45	-3.85	49.60	54.00	-4.4	V	AV
7236	54.17	1.14	55.31	74.00	-18.69	V	PK
7236	37.36	1.14	38.50	54.00	-15.5	V	AV
Middle Channel-2437MHz							
4874	68.56	-3.71	64.85	74.00	-9.15	H	PK
4874	53.49	-3.71	49.78	54.00	-4.22	H	AV
7311	54.62	1.59	56.21	74.00	-17.79	H	PK
7311	38.32	1.59	39.91	54.00	-14.09	H	AV
4874	64.05	-3.71	60.34	74.00	-13.66	V	PK
4874	49.4	-3.71	45.69	54.00	-8.31	V	AV
7311	53.88	1.59	55.47	74.00	-18.53	V	PK
7311	38.94	1.59	40.53	54.00	-13.47	V	AV
High Channel-2462MHz							
4924	63.84	-3.57	60.27	74.00	-13.73	H	PK
4924	49.98	-3.57	46.41	54.00	-7.59	H	AV
7386	54.05	1.91	55.96	74.00	-18.04	H	PK
7386	37.19	1.91	39.10	54.00	-14.9	H	AV
4924	67.3	-3.57	63.73	74.00	-10.27	V	PK
4924	53.67	-3.57	50.10	54.00	-3.9	V	AV
7386	55.04	1.91	56.95	74.00	-17.05	V	PK
7386	39.61	1.91	41.52	54.00	-12.48	V	AV

Test Mode: 802.11n-HT40

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2422MHz							
4824	59.30	-3.85	55.45	74.00	-18.55	H	PK
4824	45.16	-3.85	41.31	54.00	-12.69	H	AV
7236	47.30	1.14	48.44	74.00	-25.56	H	PK
7236	34.51	1.14	35.65	54.00	-18.35	H	AV
4824	64.23	-3.85	60.38	74.00	-13.62	V	PK
4824	52.45	-3.85	48.60	54.00	-5.40	V	AV
7236	53.58	1.14	54.72	74.00	-19.28	V	PK
7236	37.10	1.14	38.24	54.00	-15.76	V	AV
Middle Channel-2437MHz							
4874	67.05	-3.71	63.34	74.00	-10.66	H	PK
4874	52.37	-3.71	48.66	54.00	-5.34	H	AV
7311	53.48	1.59	55.07	74.00	-18.93	H	PK
7311	37.61	1.59	39.20	54.00	-14.80	H	AV
4874	62.76	-3.71	59.05	74.00	-14.95	V	PK
4874	48.88	-3.71	45.17	54.00	-8.83	V	AV
7311	52.74	1.59	54.33	74.00	-19.67	V	PK
7311	38.56	1.59	40.15	54.00	-13.85	V	AV
High Channel-2452MHz							
4924	62.79	-3.57	59.22	74.00	-14.78	H	PK
4924	50.46	-3.57	46.89	54.00	-7.11	H	AV
7386	52.87	1.91	54.78	74.00	-19.22	H	PK
7386	37.86	1.91	39.77	54.00	-14.23	H	AV
4924	65.92	-3.57	62.35	74.00	-11.65	V	PK
4924	52.42	-3.57	48.85	54.00	-5.15	V	AV
7386	53.49	1.91	55.40	74.00	-18.60	V	PK
7386	39.46	1.91	41.37	54.00	-12.63	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
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	2013-05-07	2014-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2013-05-07	2014-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2013-05-07	2014-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2013-05-07	2014-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2013-04-20	2014-04-19
Horn Antenna	ETS	3117	00086197	2013-04-20	2014-04-19

8.3 Test Procedure

According to the KDB 558074 D01 V02, 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 porduct outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

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

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

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

8.4 Environmental Conditions

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

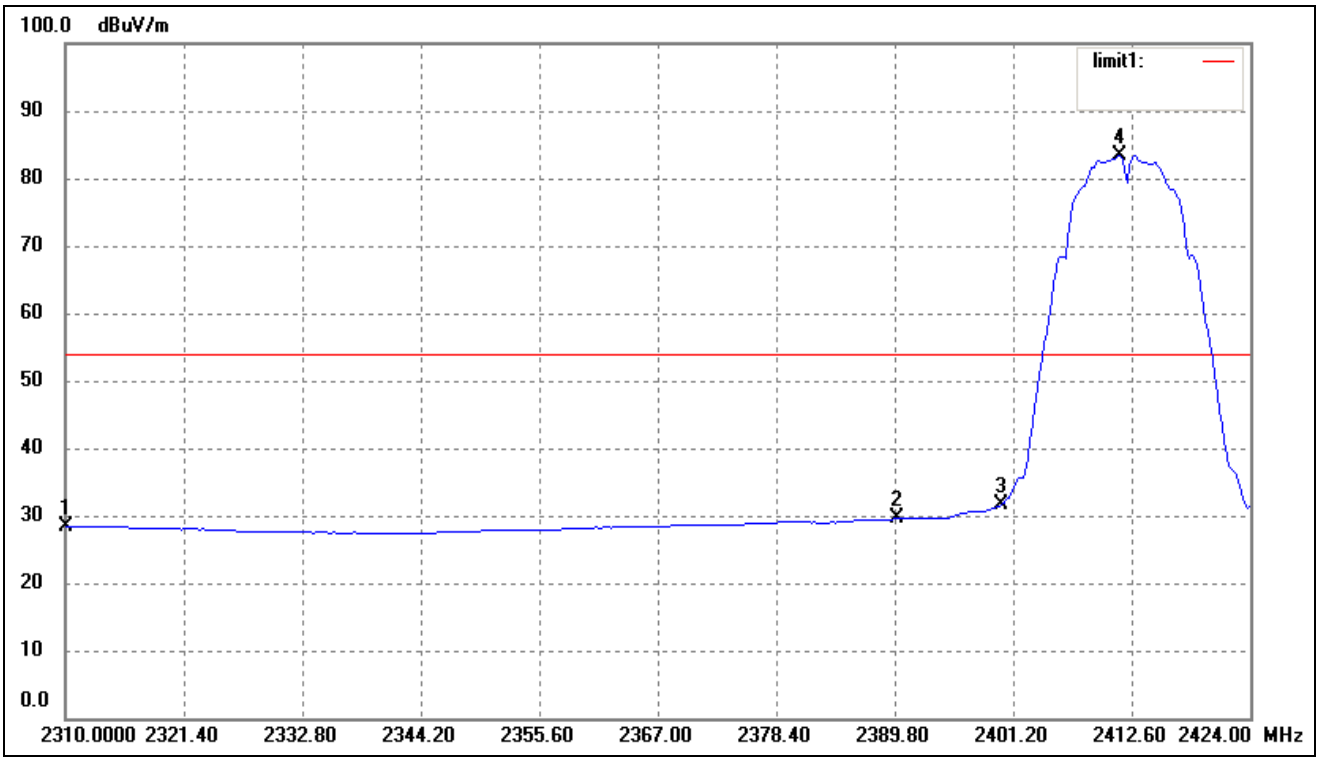
8.5 Summary of Test Results/Plots

Test Mode	Test Frequency MHz	Limit dBuV / dBc	Result
802.11b	2390.00	<54 dBuV	Pass
	2400.00	> 20dBc	Pass
	2483.50	<54 dBuV	Pass
802.11g	2390.00	<54 dBuV	Pass
	2400.00	> 20dBc	Pass
	2483.50	<54 dBuV	Pass
802.11n-HT20	2390.00	<54 dBuV	Pass
	2400.00	> 20dBc	Pass
	2483.50	<54 dBuV	Pass
802.11n-HT40	2390.00	<54 dBuV	Pass
	2400.00	> 20dBc	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

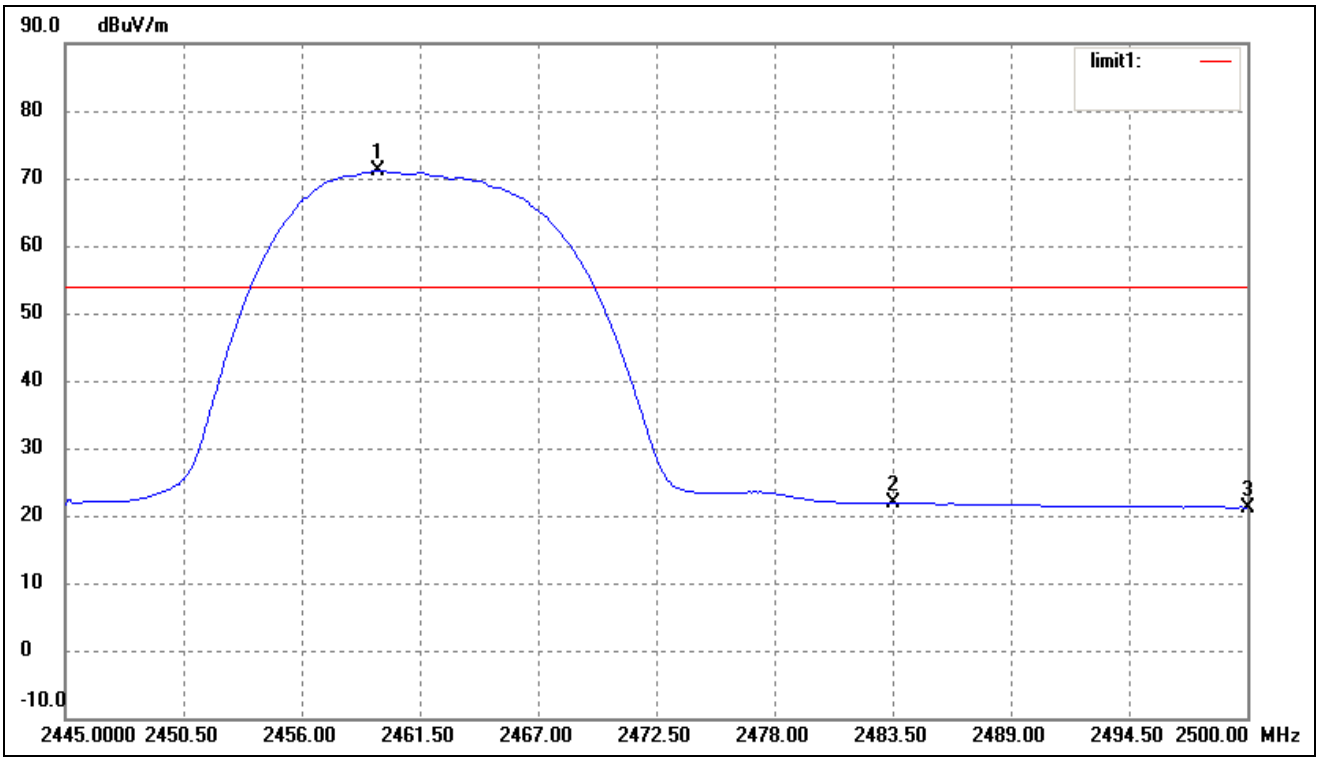
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	32.11	-3.71	28.40	54.00	-25.60	Average Detector
	2310.000	44.91	-3.71	41.20	74.00	-32.80	Peak Detector
2	2390.000	33.08	-3.54	29.54	54.00	-24.46	Average Detector
	2390.000	45.27	-3.54	41.73	74.00	-32.27	Peak Detector
3	2400.000	35.20	-3.51	31.69	Delta = 55.58 dBc		Average Detector
4	2410.548	90.75	-3.48	87.27			Average Detector

802.11b-Highest Bandedge

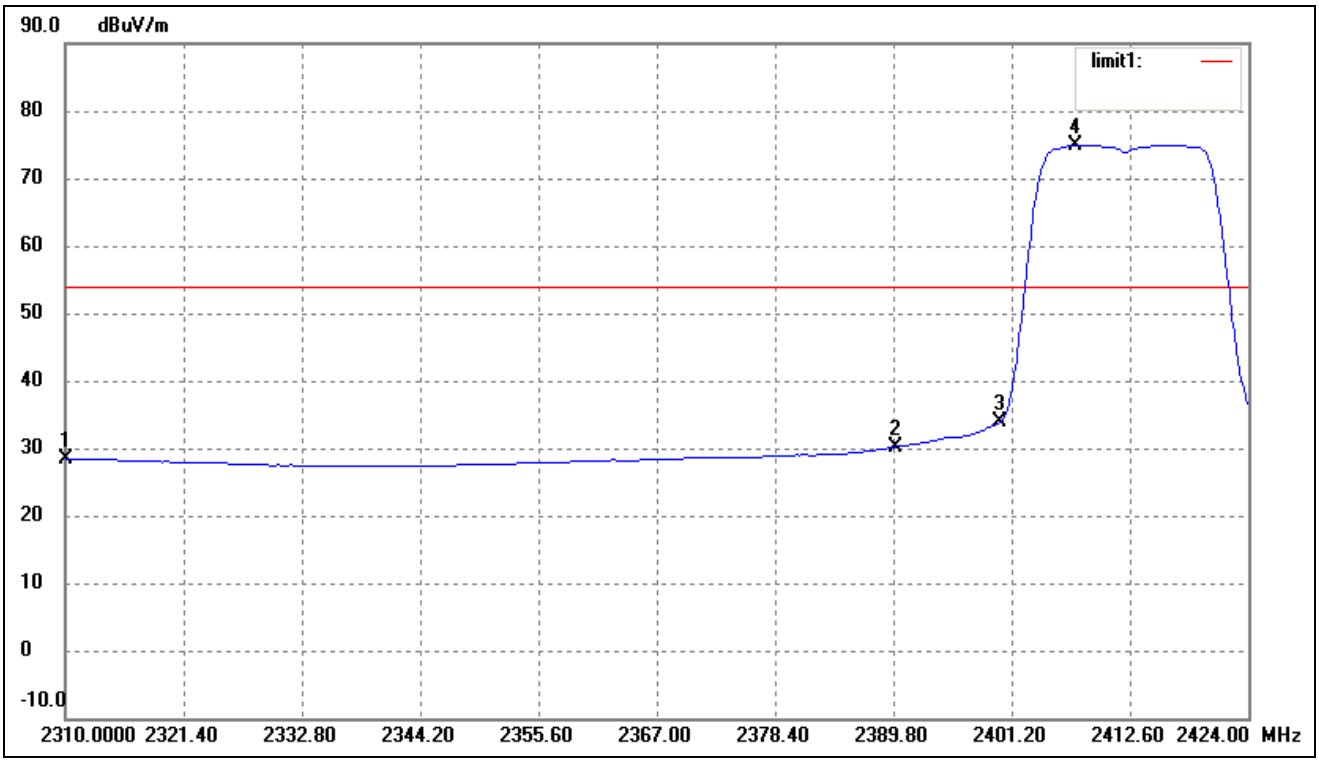
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2459.520	74.45	-3.37	71.08	/	/	Average Detector
	2461.000	95.92	-3.37	92.55	/	/	Peak Detector
2	2483.500	Delta = 49.92 dBc		21.16	54.00	-32.84	Average Detector
	2483.500			42.63	74.00	-31.37	Peak Detector
3	2500.000	24.36	-3.28	21.08	54.00	-32.92	Average Detector
	2500.000	49.49	-3.28	46.21	74.00	-27.79	Peak Detector

802.11g-Lowest Bandedge

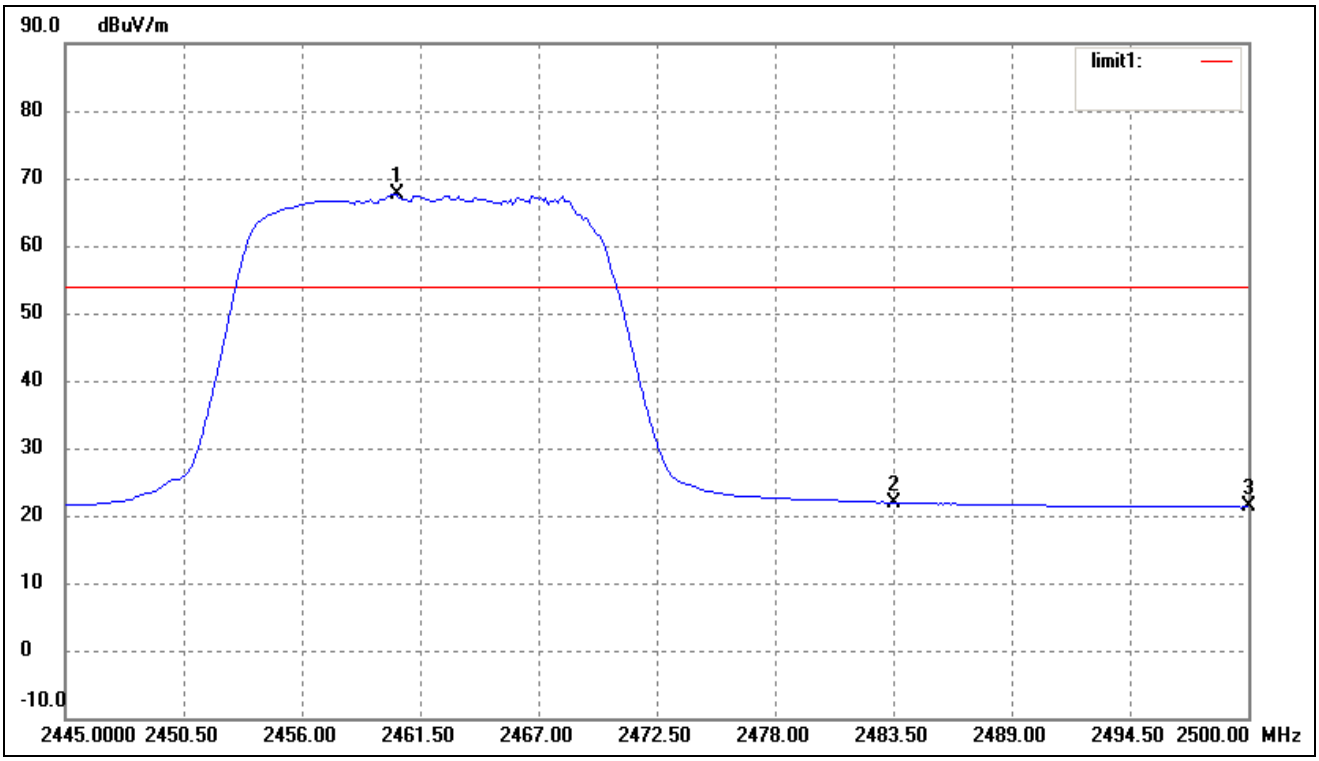
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	32.07	-3.71	28.36	54.00	-25.64	Average Detector
	2310.000	45.04	-3.71	41.33	74.00	-32.67	Peak Detector
2	2390.000	33.75	-3.54	30.21	54.00	-23.79	Average Detector
	2390.000	46.59	-3.54	43.05	74.00	-30.95	Peak Detector
3	2400.000	37.34	-3.51	33.83	Delta = 41.09 dBc		Average Detector
4	2407.356	78.41	-3.49	74.92			Average Detector

802.11g-Highest Bandedge

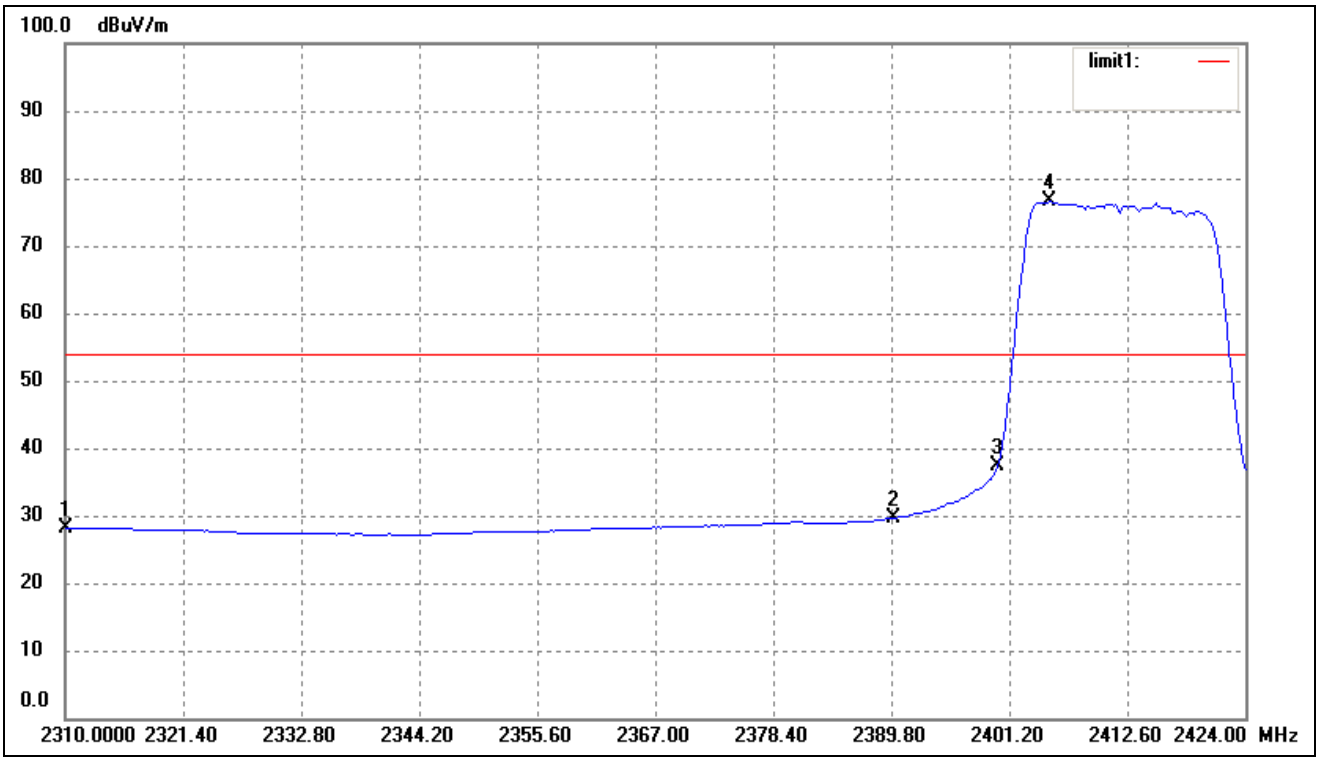
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2460.400	70.74	-3.37	67.37	/	/	Average Detector
	2460.400	101.62	-3.37	98.25	/	/	Peak Detector
2	2483.500	Delta = 45.88 dBc		21.49	54.00	-32.51	Average Detector
	2483.500			52.37	74.00	-21.63	Peak Detector
3	2500.000	24.39	-3.28	21.11	54.00	-32.89	Average Detector
	2500.000	49.72	-3.28	46.44	74.00	-27.56	Peak Detector

802.11n-HT20-Lowest Bandedge

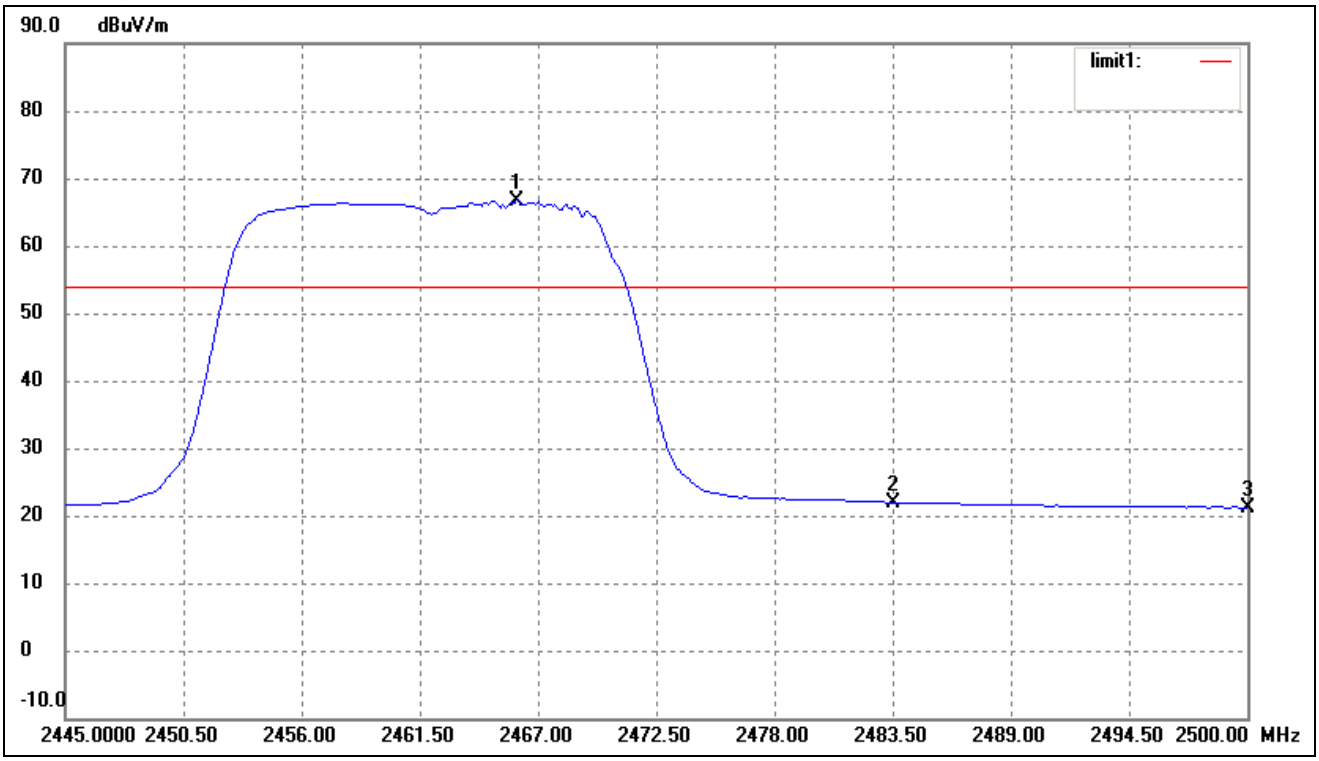
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	31.88	-3.71	28.17	54.00	-25.83	Average Detector
	2310.000	46.12	-3.71	42.41	74.00	-31.59	Peak Detector
2	2390.000	33.18	-3.54	29.64	54.00	-24.36	Average Detector
	2390.000	46.19	-3.54	42.65	74.00	-31.35	Peak Detector
3	2400.000	40.93	-3.51	37.42	Delta = 39.09 dBc		Average Detector
4	2405.076	80.01	-3.50	76.51			Average Detector

802.11n-HT20-Highest Bandedge

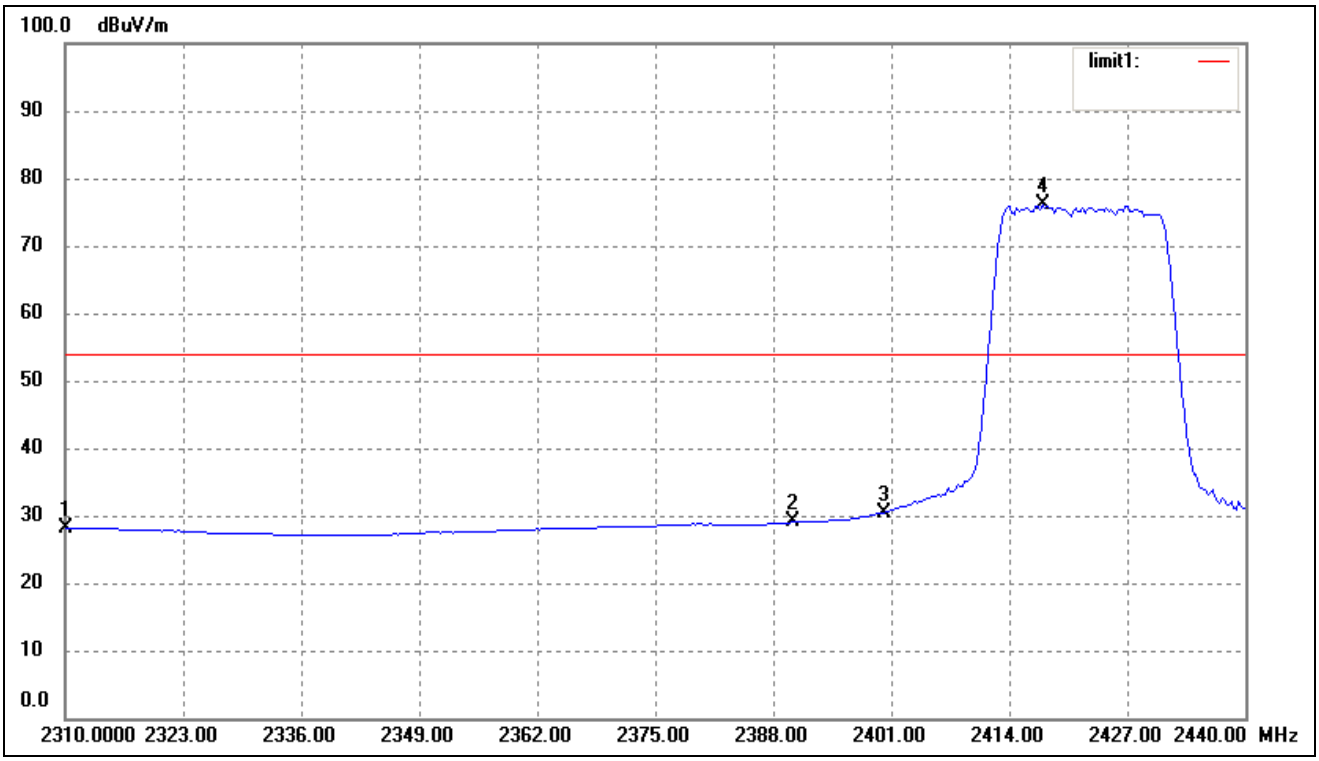
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2466.010	70.06	-3.37	66.69	/	/	Average Detector
	2466.010	99.83	-3.37	96.46	/	/	Peak Detector
2	2483.500	Delta = 45.44 dBc		21.25	54.00	-32.75	Average Detector
	2483.500			51.02	74.00	-22.98	Peak Detector
3	2500.000	24.48	-3.28	21.20	54.00	-32.80	Average Detector
	2500.000	51.52	-3.28	48.24	74.00	-25.76	Peak Detector

802.11n-HT40-Lowest Bandedge

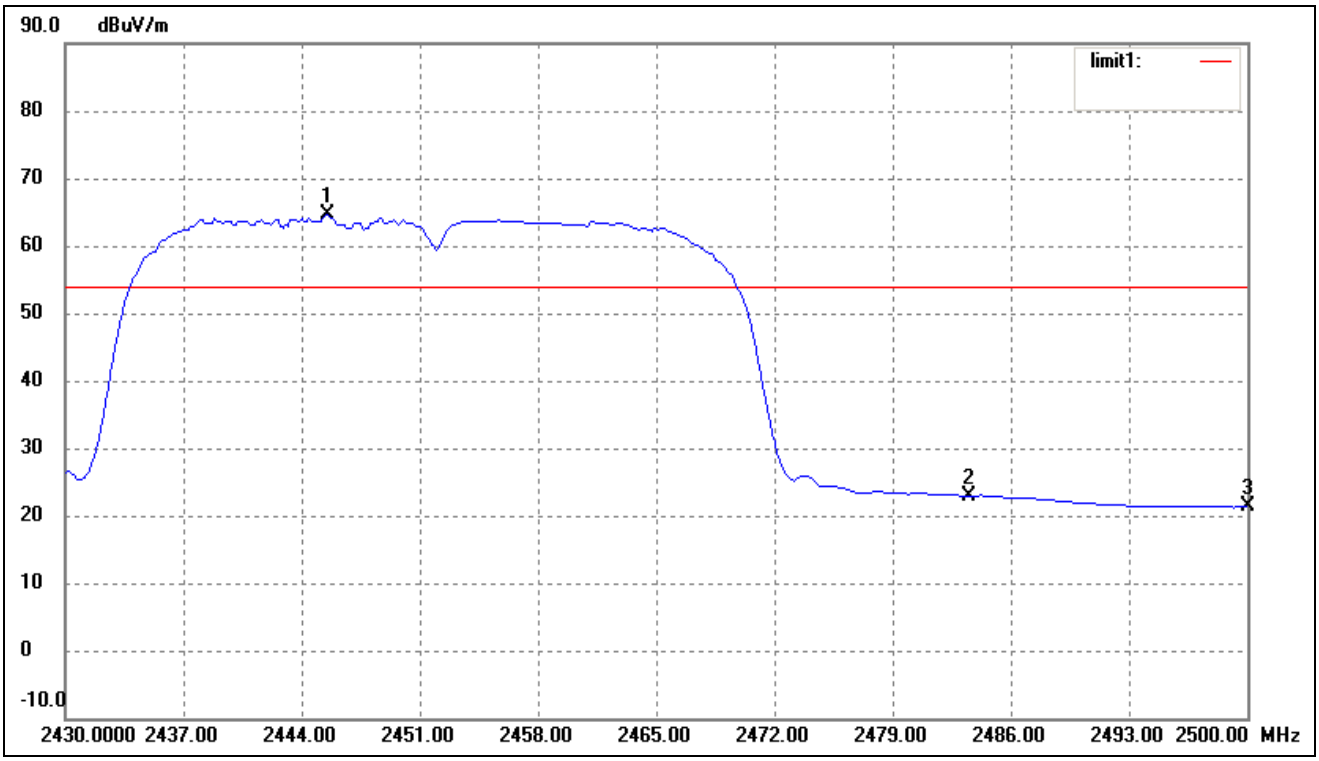
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	31.85	-3.71	28.14	54.00	-25.86	Average Detector
	2310.000	44.79	-3.71	41.08	74.00	-32.92	Peak Detector
2	2390.000	32.60	-3.54	29.06	54.00	-24.94	Average Detector
	2390.000	44.75	-3.54	41.21	74.00	-32.79	Peak Detector
3	2400.000	34.01	-3.51	30.50	Delta = 45.71 dBc		Average Detector
4	2417.640	79.68	-3.47	76.21			Average Detector

802.11n-HT40-Highest Bandedge

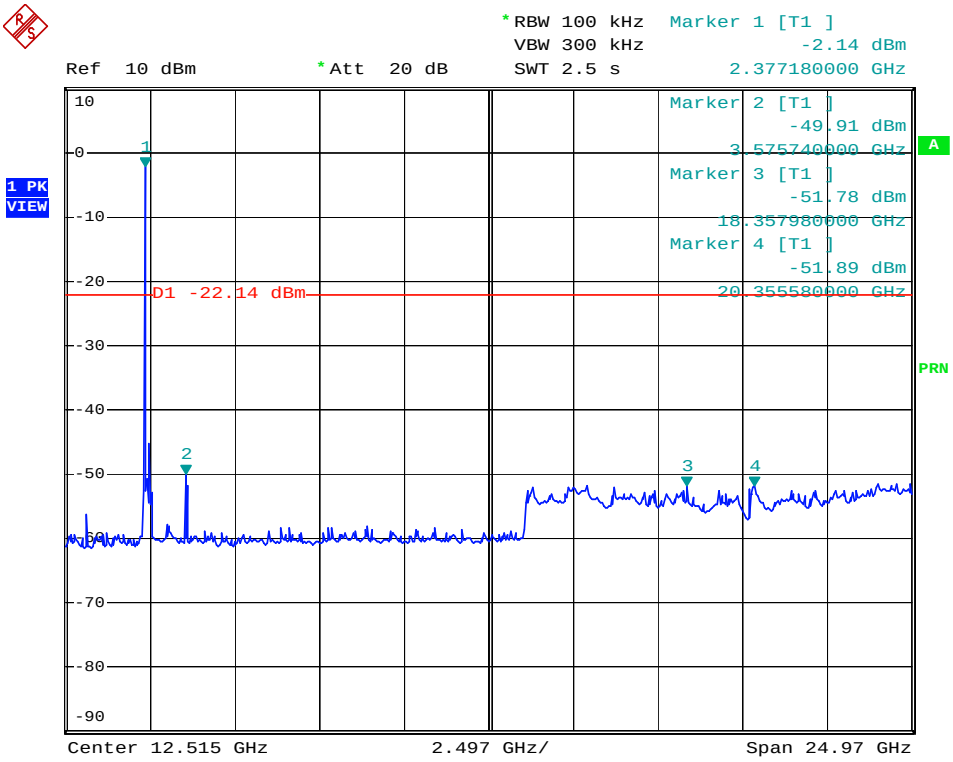
Vertical (Worst case)



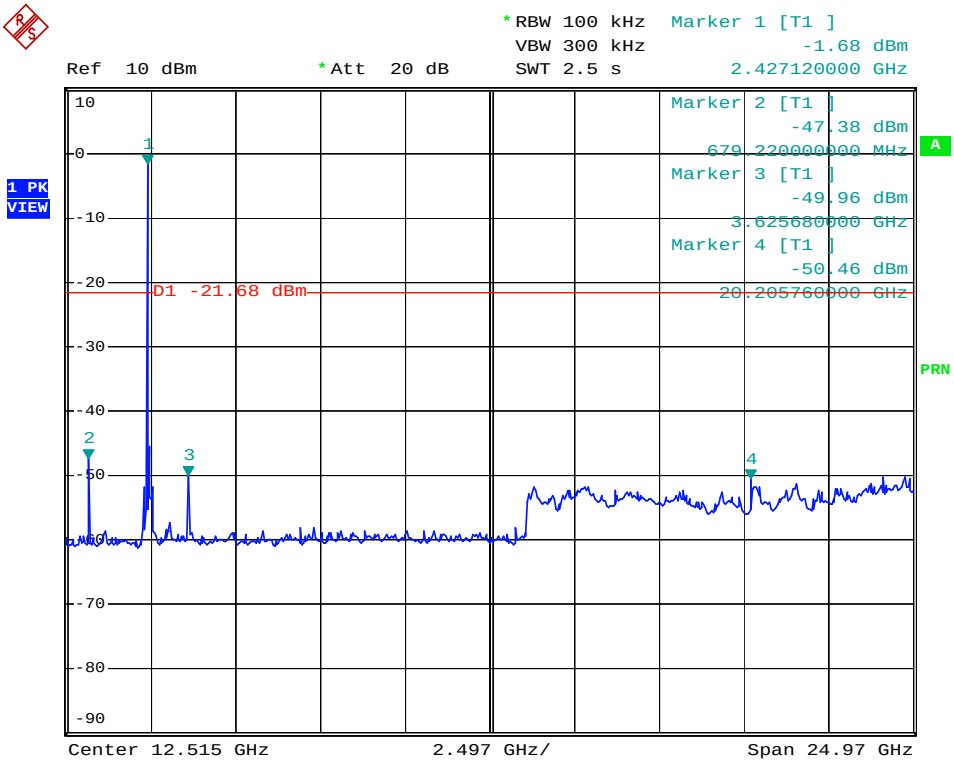
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2445.540	67.93	-3.37	64.56	/	/	Average Detector
	2445.540	99.85	-3.37	96.48	/	/	Peak Detector
2	2483.500	Delta = 42.11dBc		22.45	54.00	-31.55	Average Detector
	2483.500			54.37	74.00	-19.63	Peak Detector
3	2500.000	24.58	-3.28	21.30	54.00	-32.70	Average Detector
	2500.000	50.54	-3.28	47.26	74.00	-26.74	Peak Detector

Conducted Spurious Emissions

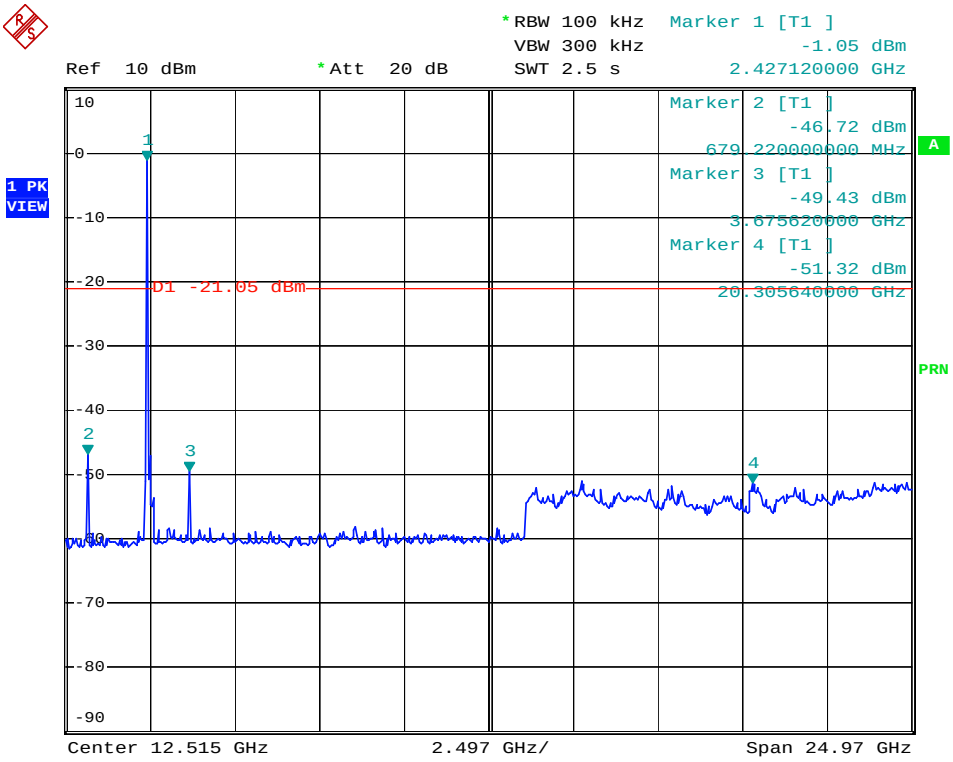
802.11b Low Bandedge



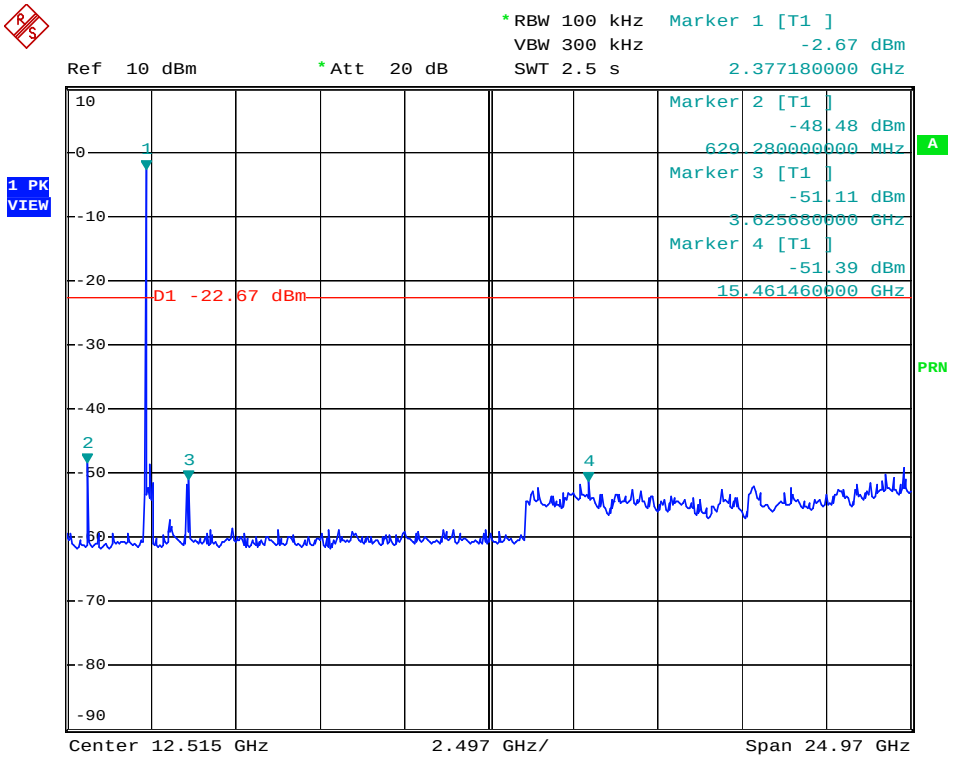
802.11b Middle Bandedge



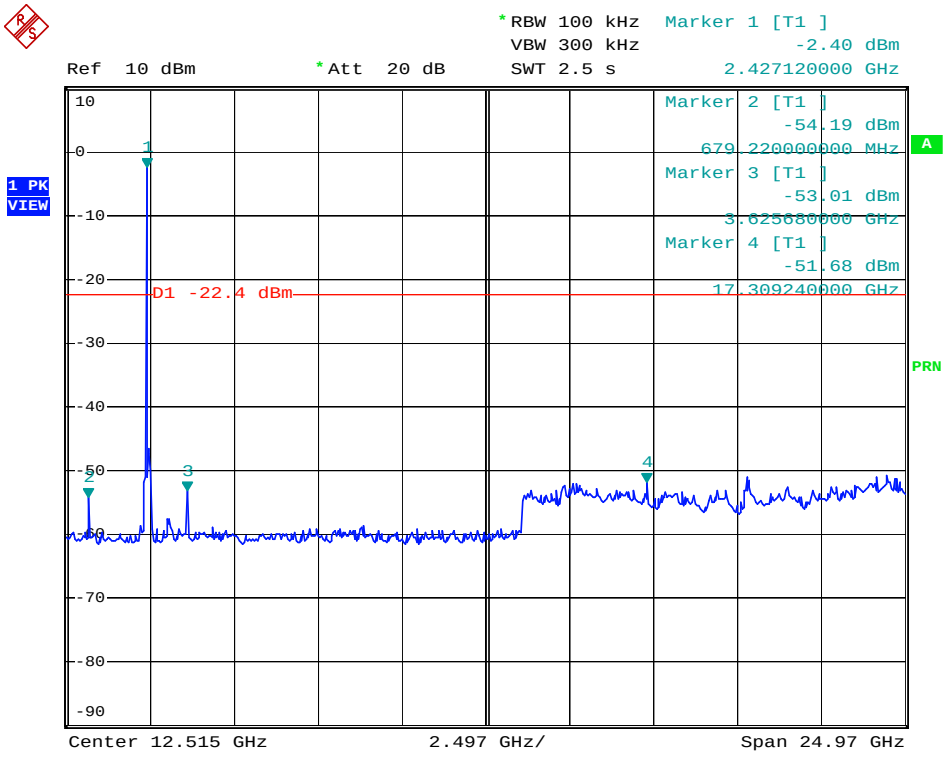
802.11b High Bandedge



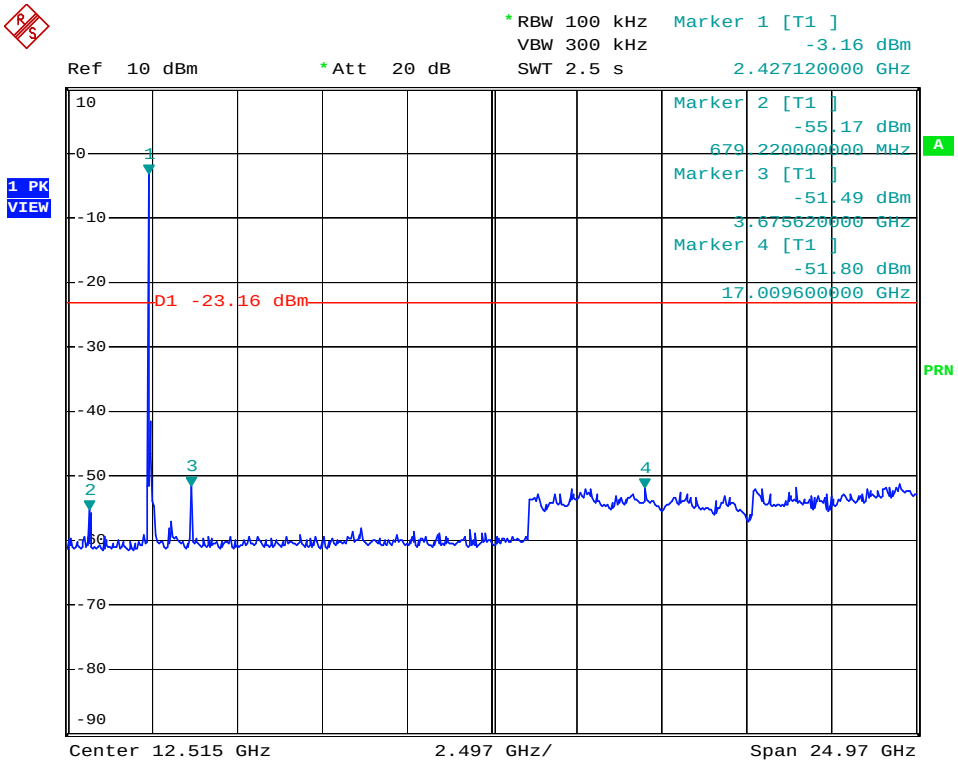
802.11g Low Bandedge



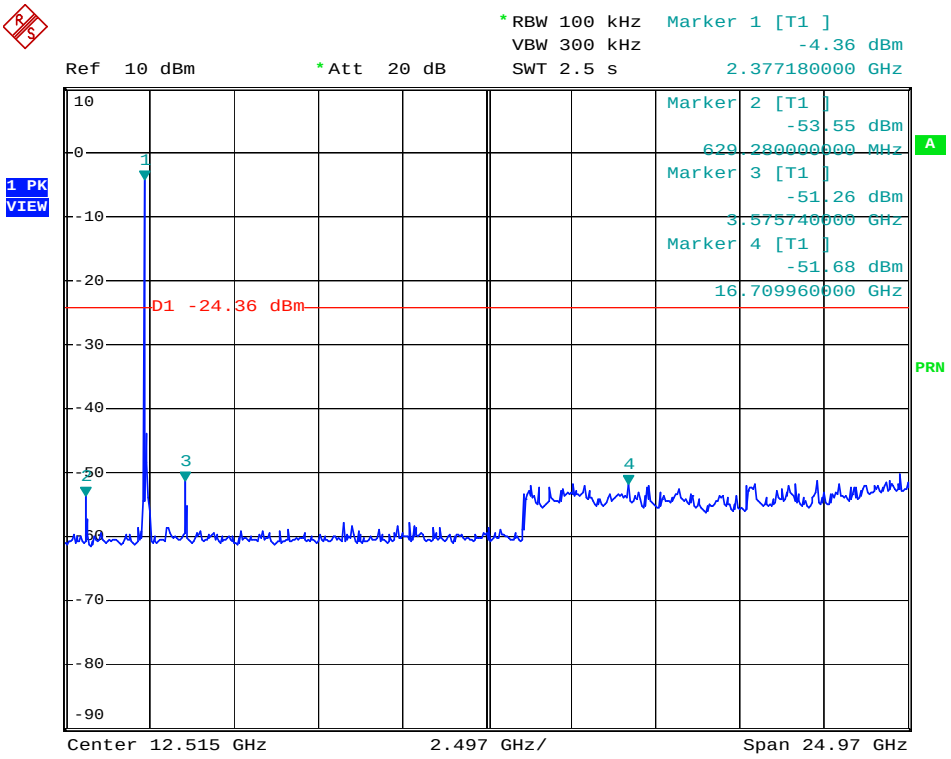
802.11g Middle Bandedge



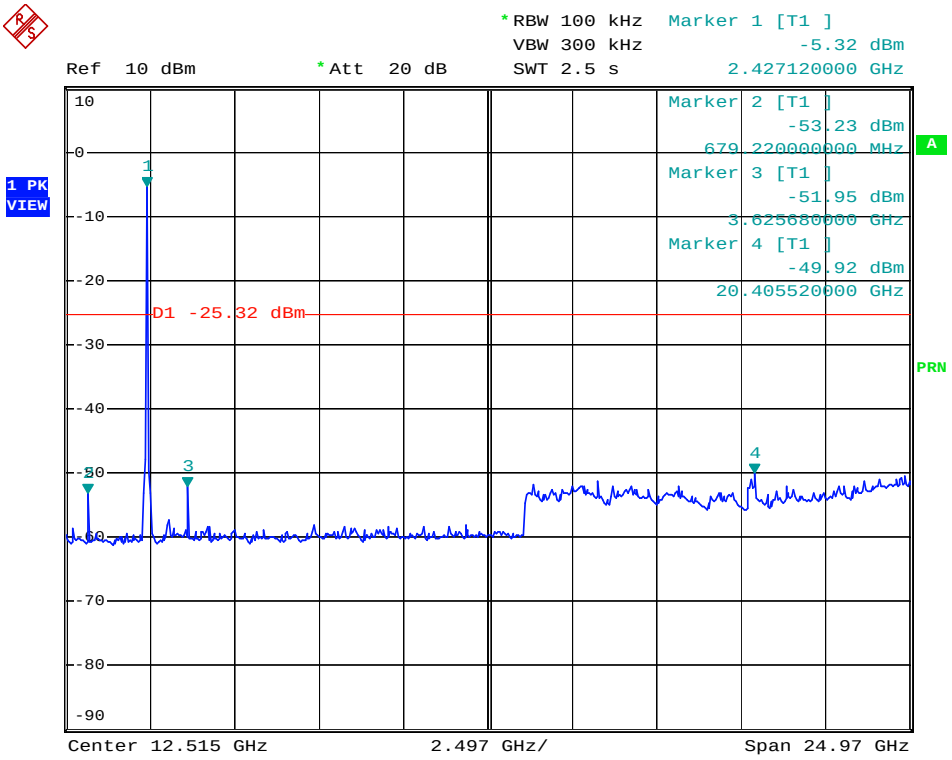
802.11g High Bandedge



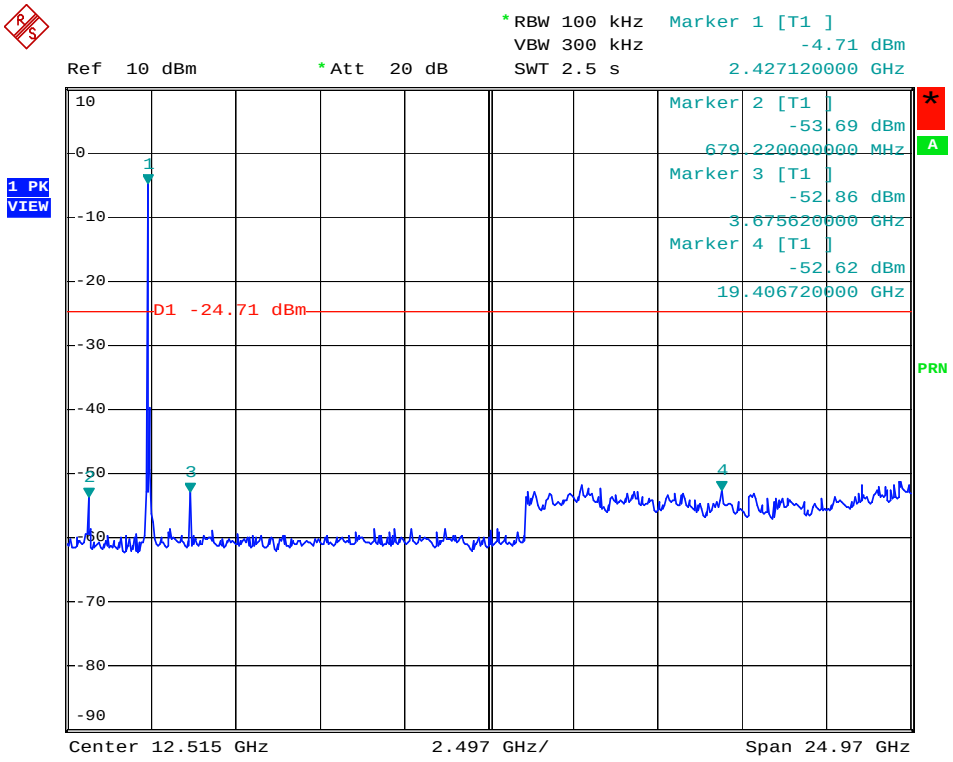
802.11n-HT20 Low Bandedge



802.11n-HT20 Middle Bandedge



802.11n-HT20 High Bandedge



9. Conducted Emissions

9.1 Measurement Uncertainty

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

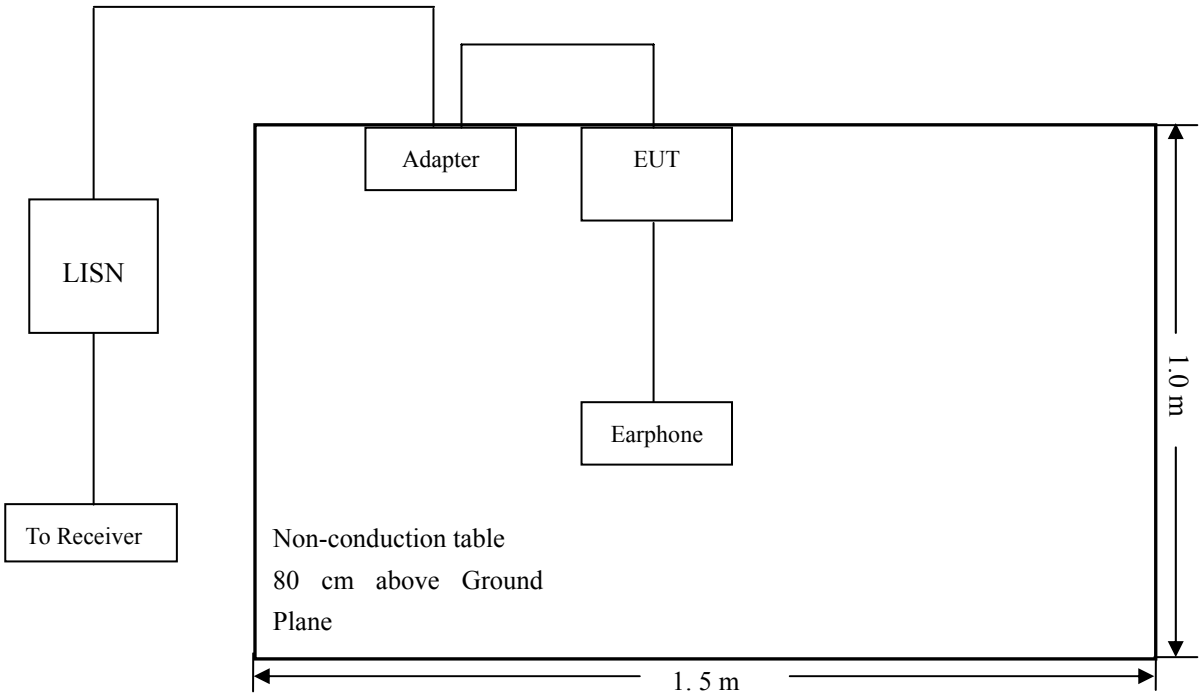
9.2 Test Equipment List and Details

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

9.3 Test Procedure

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

9.4 Basic Test Setup Block Diagram



9.5 Environmental Conditions

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

9.6 Test Receiver Setup

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

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

9.7 Summary of Test Results/Plots

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

-3.39 dB at 0.258 MHz in the **Neutral** mode**, Ave** detector, **0.15-30MHz**

9.8 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

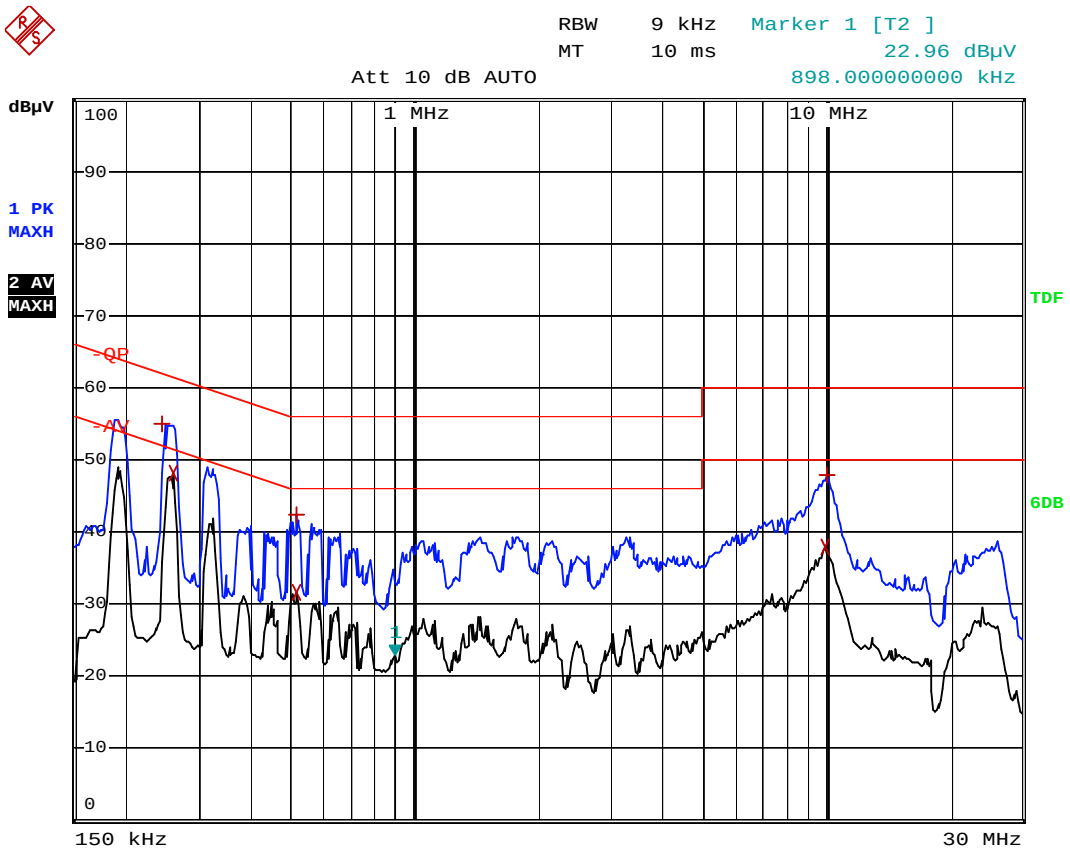
EUT: *MID*

Tested Model: *D5H-88V*

Operating Condiation: *Charging and Transmitting*

Comment: *Input AC 120V/60Hz adapter, Output DC 5V*

Test Specification: *Neutral*

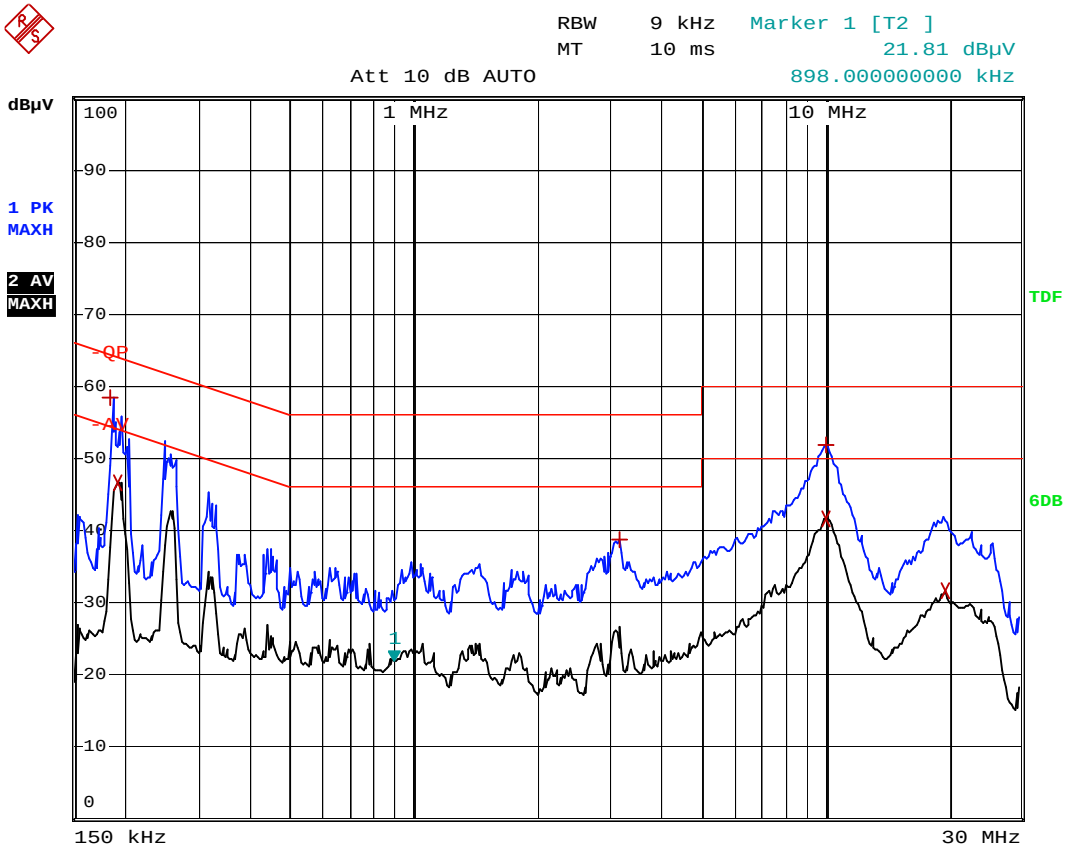


EDIT PEAK LIST (Prescan Results)

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

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	246 kHz	55.06	-6.82
2 Average	258 kHz	48.10	-3.39
1 Max Peak	514 kHz	42.36	-13.63
2 Average	514 kHz	31.55	-14.44
2 Average	10.014 MHz	38.05	-11.94
1 Max Peak	10.09 MHz	47.79	-12.21

Test Specification: *Line*



EDIT PEAK LIST (Prescan Results)

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

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Max Peak	186 kHz	58.29	-5.91
2	Average	194 kHz	46.67	-7.18
1	Max Peak	3.166 MHz	38.84	-17.15
2	Average	10.078 MHz	41.71	-8.28
1	Max Peak	10.114 MHz	51.75	-8.24
2	Average	19.642 MHz	31.70	-18.30

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