FCC Part 15C
Measurement and Test Report

For

Bak USA Technologies Corp.

425 Michigan Avenue, Buffalo, New York 14203, USA

FCC ID: 2AEY7-S8A001

FCC Rule(s):	FCC Part 15C
Product Description:	Seal
Tested Model:	8
Report No.:	STR16058017I-4
Tested Date:	2016-03-01 to 2016-06-15
Issued Date:	2016-06-16
Tested By:	Irving Liu / Engineer
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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 Shenzhen SEM.Test Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Bak USA Technologies Corp.
Address of applicant: 425 Michigan Avenue, Buffalo, New York 14203, USA

Manufacturer: Shenzhen Wisky Technology Co.,LTD.
Address of manufacturer: 5th Floor,W2-A Building,Hi-tech Park South 1st Road, Nanshan District,Shenzhen

General Description of EUT	
Product Name:	Seal
Brand Name:	/
Model No.:	8
Hardware version:	T01-V1.1-0113
Software version:	Windows 10
IMEI	8262595020024440
Rated Voltage:	DC 3.7V
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20) 2422-2452MHz for 802.11n(HT40)
RF Output Power:	19.57dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 300Mbps
Quantity of Channels:	11/7
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	Antenna 1:4.12dBi, Antenna 2:4.27dBi
Lowest Internal frequency of EUT:	32.768kHz

1.2 Test Standards

The following report is prepared on behalf of the Bak USA Technologies Corp. 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 C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, 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 measurement guide KDB 558074 D01 V03r05 for digital transmission systems shall be performed also.

1.4 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology 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 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology 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 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd 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

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
DC Cable	1.0	Unshielded	Without Core

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

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

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	±2.88dB
Transmitter Spurious Emissions	Radiated	±5.1dB

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
Horn Antenna	ETS	3116B	00088203	2015-06-17	2016-06-16
Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-06-17	2016-06-16
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-06-17	2016-06-16
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-06-17	2016-06-16

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 2.1093	RF Exposure	Compliant
§ 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)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the SAR report.

4. Antenna Requirement

4.1 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.

4.2 Evaluation Information

This product has two integral antennas, fulfill the requirement of this section.

5. Power Spectral Density

5.1 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.

5.2 Test Procedure

According to the KDB 558074 D01 V03r05, such specifications require that the same method as used to determine the conducted output power shall also be used to determine the power spectral density. The test method of power spectral density as below:

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

5.3 Environmental Conditions

Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

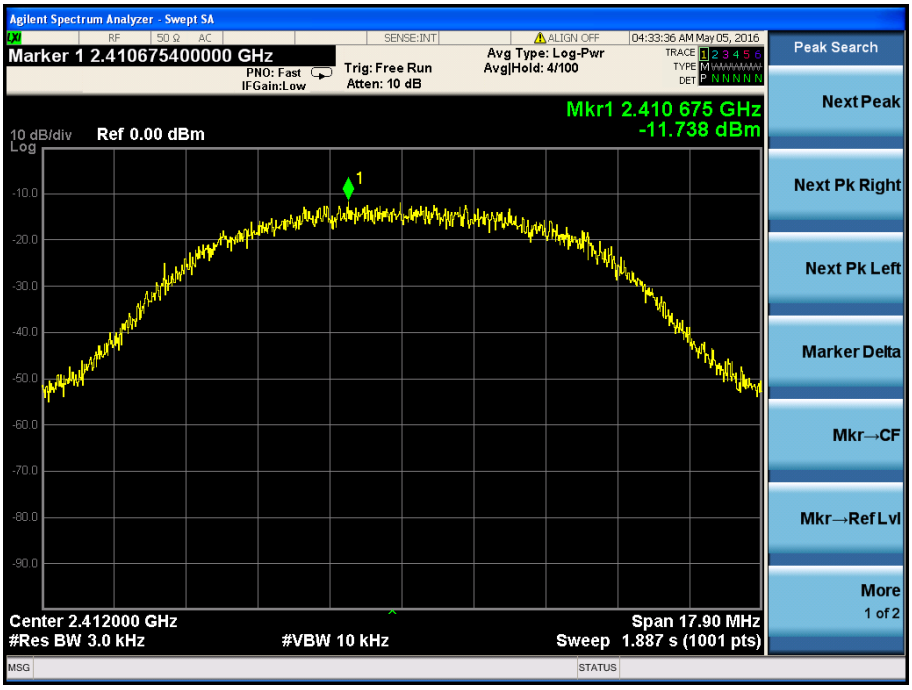
5.4 Summary of Test Results/Plots

Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz			Limit dBm/3kHz
		Chain 1	Chain 2	Total	
802.11b	2412	-11.738	-11.725	-8.86	8
	2437	-12.524	-13.789	-10.00	8
	2462	-11.718	-14.096	-9.59	8
802.11g	2412	-14.520	-14.306	-11.55	8
	2437	-14.134	-14.701	-11.55	8
	2462	-15.356	-16.210	-13.01	8
802.11n HT20	2412	-16.435	-22.837	-15.23	8
	2437	-17.092	-17.113	-13.98	8
	2462	-17.153	-17.971	-13.98	8
802.11n HT40	2422	-20.122	-20.509	-16.99	8
	2437	-19.786	-21.467	-16.99	8
	2452	-20.660	-21.311	-16.99	8

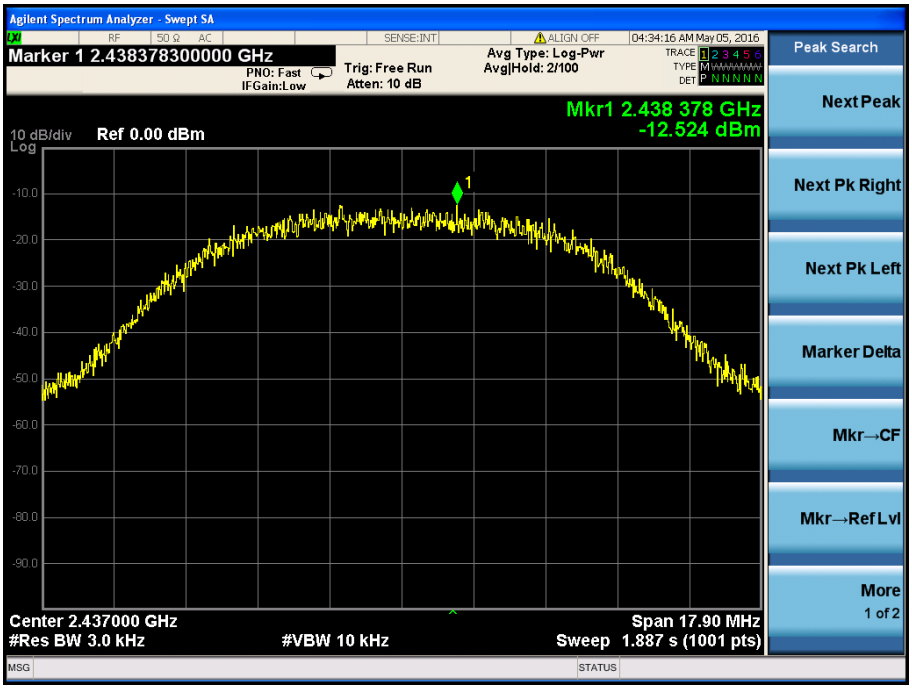
Please refer to the following test plots:

Antenna 1

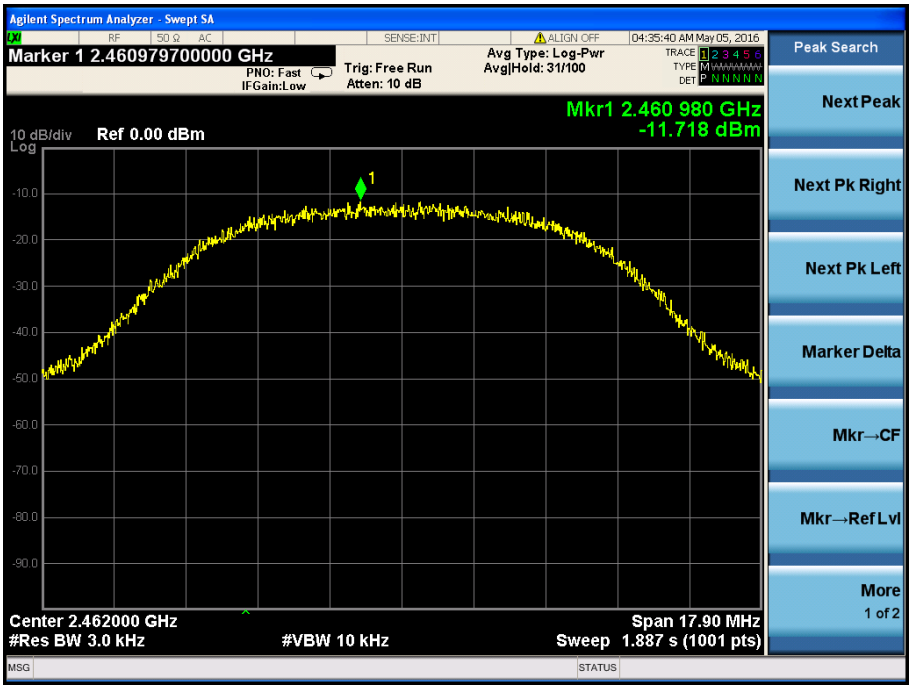
802.11b-Low Channel



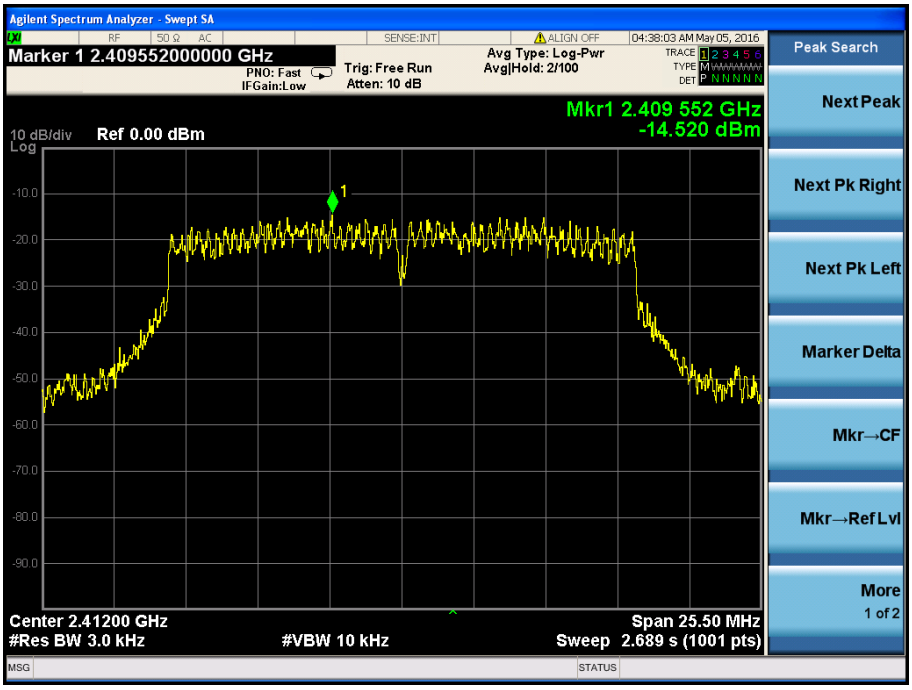
802.11b-Middle Channel



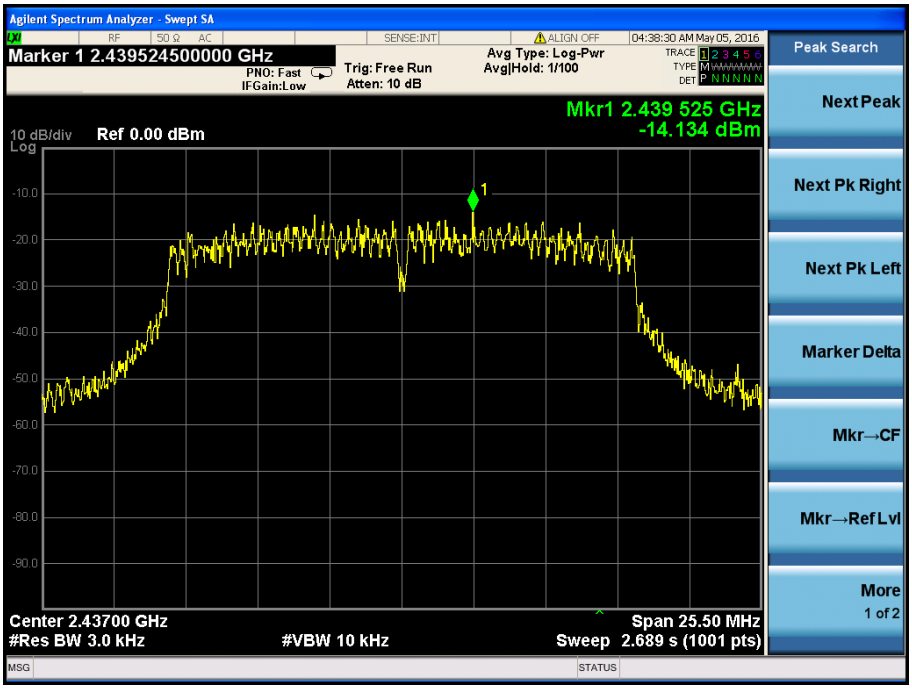
802.11b-High Channel



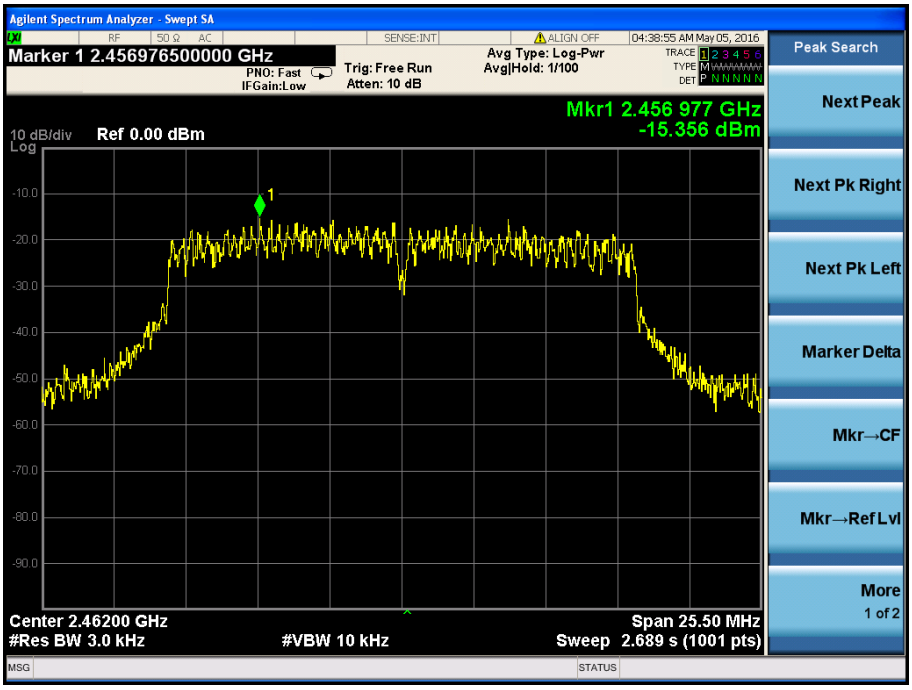
802.11g-Low Channel



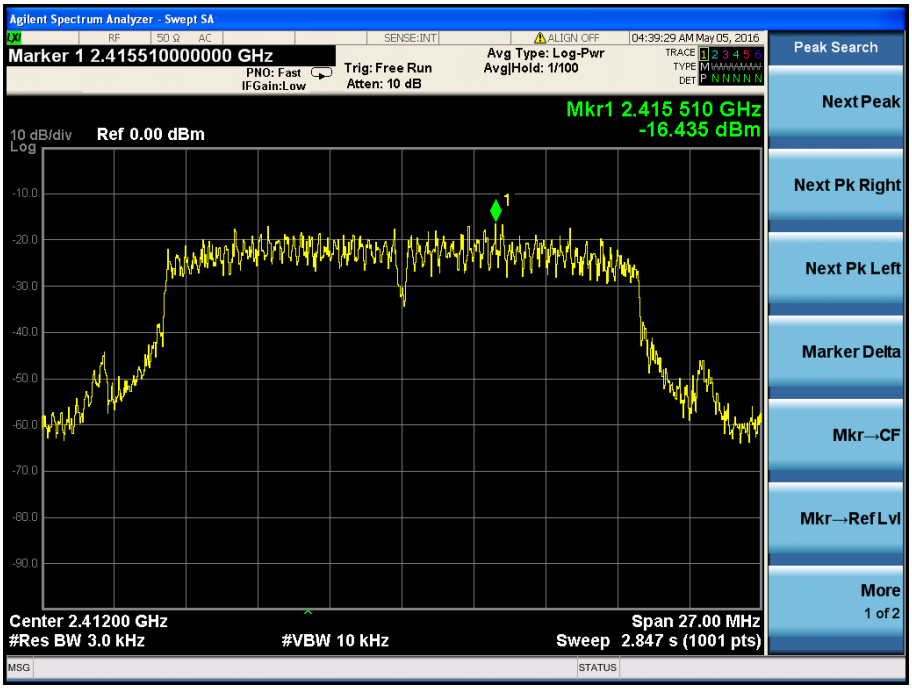
802.11g-Middle Channel



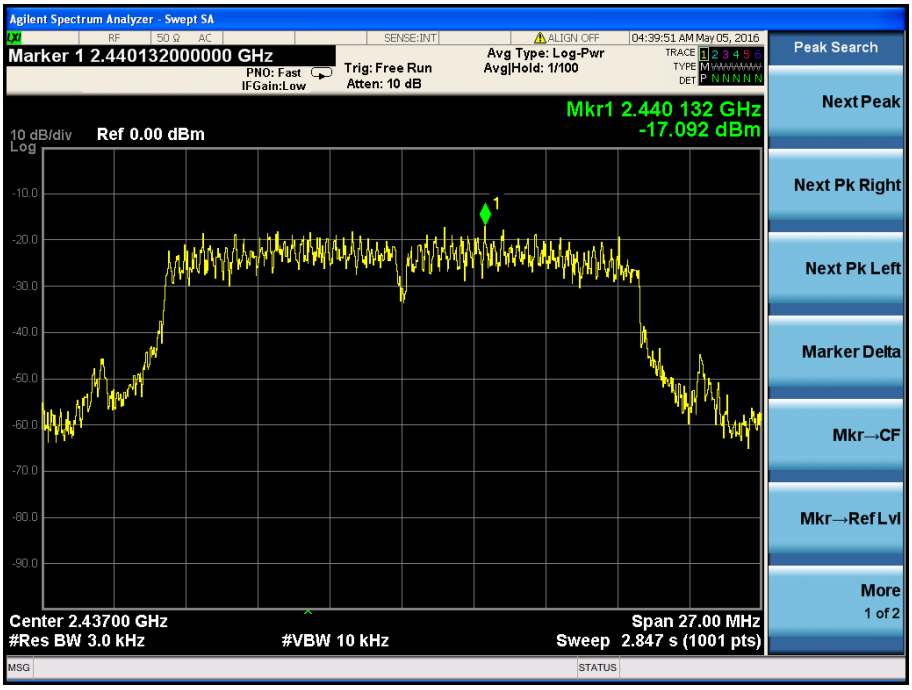
802.11g-High Channel



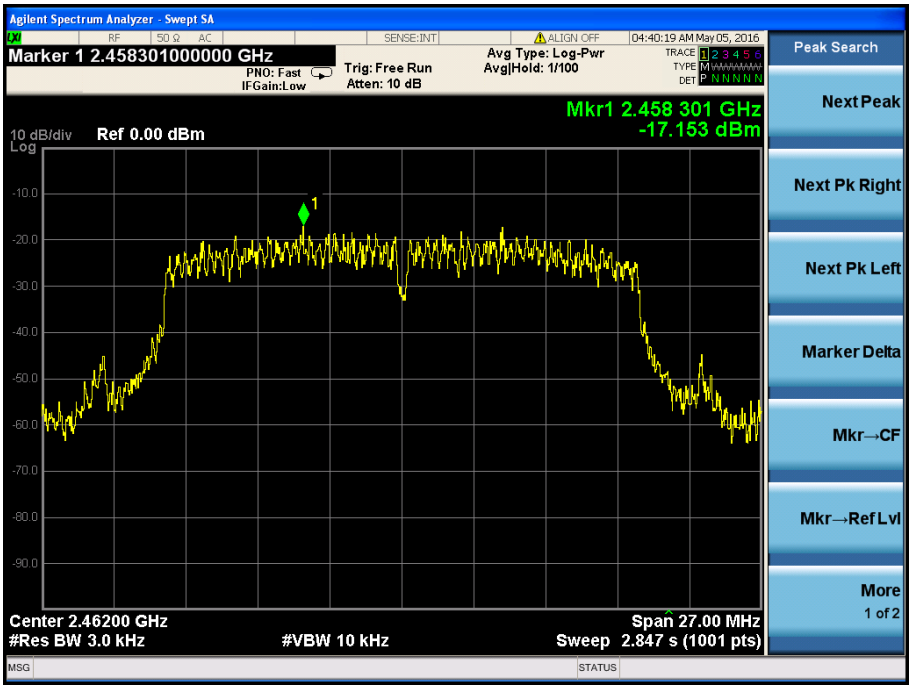
802.11n-HT20-Low Channel



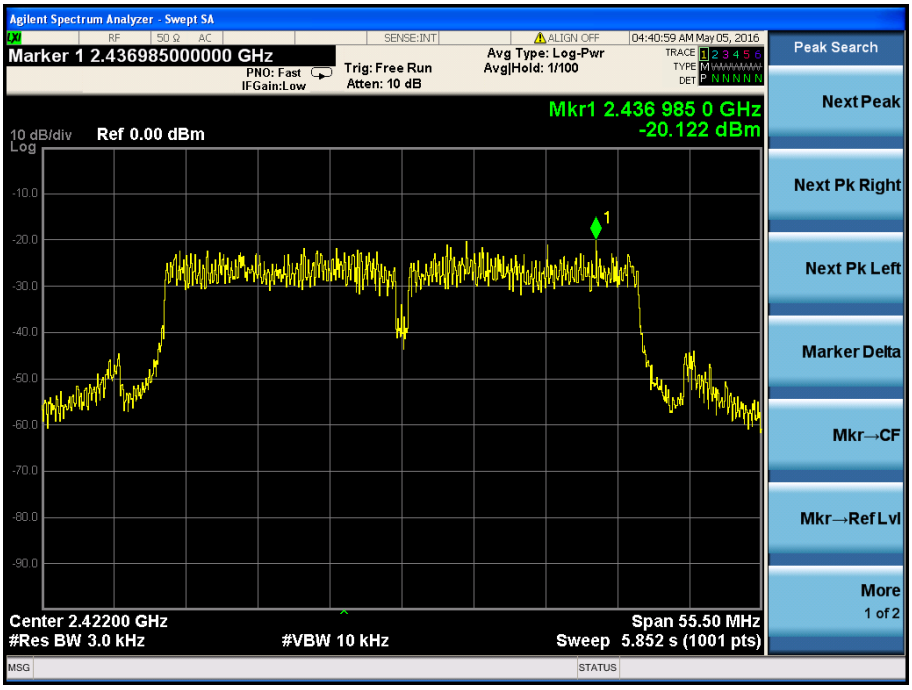
802.11n-HT20-Middle Channel



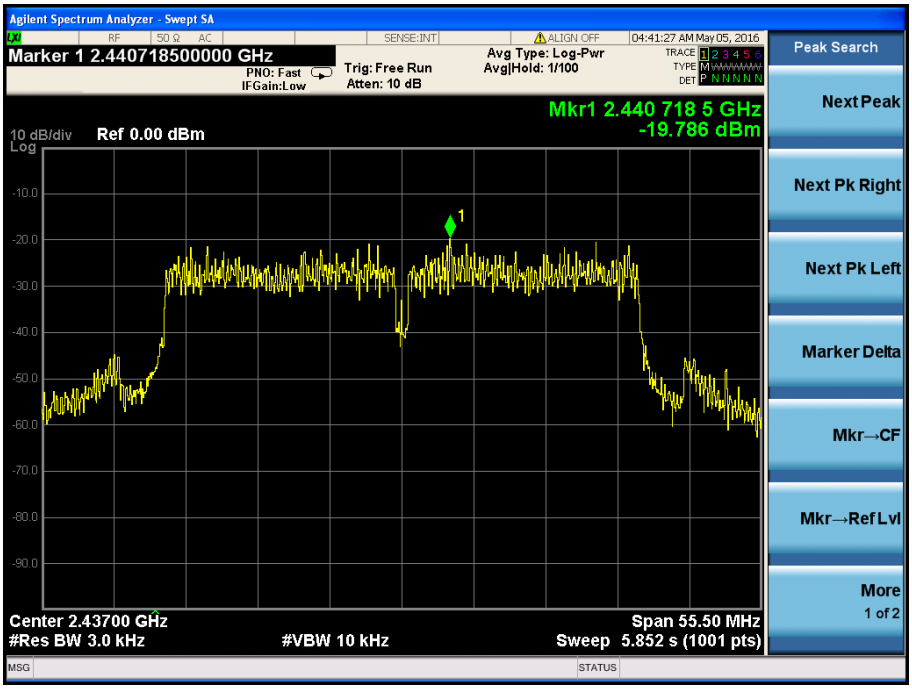
802.11n-HT20-High Channel



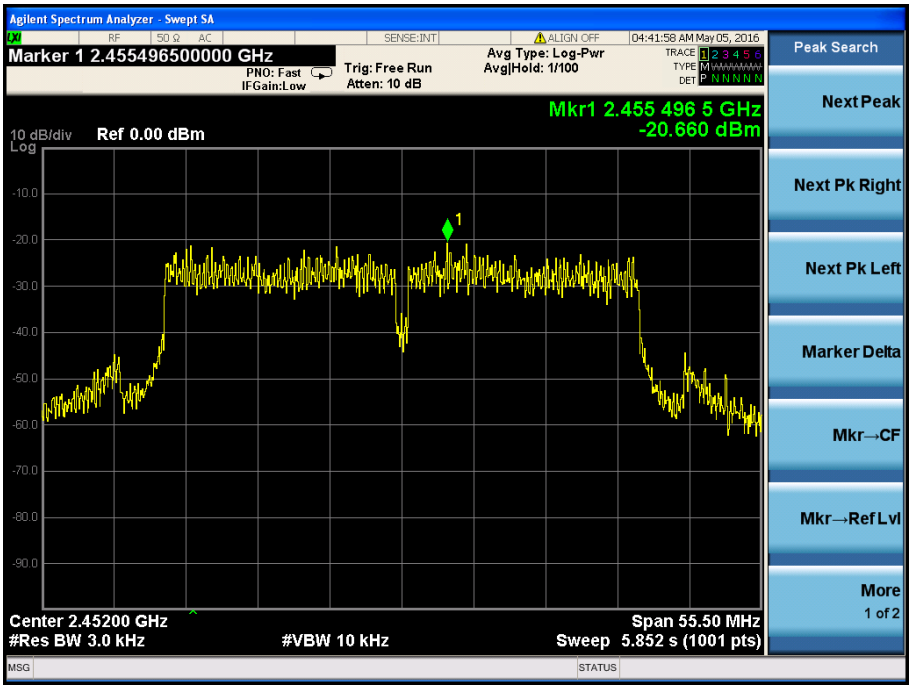
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel

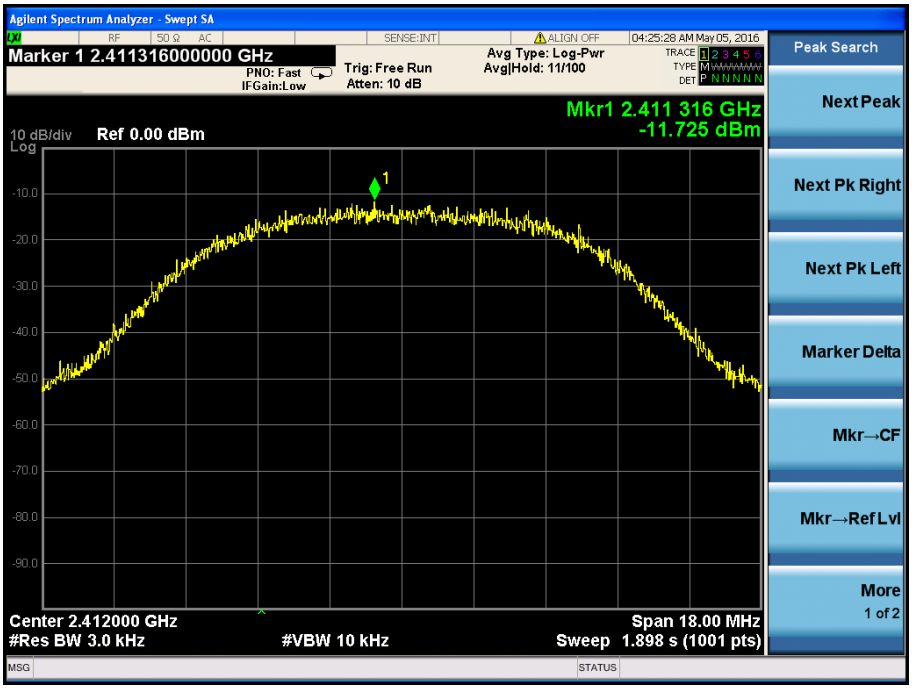


802.11n-HT40-High Channel

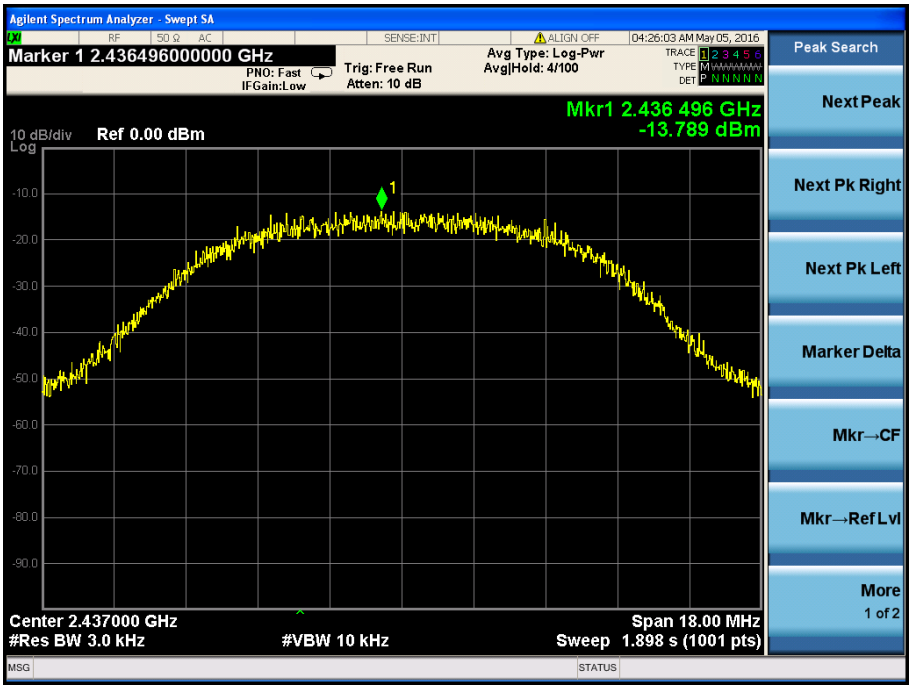


Antenna 2

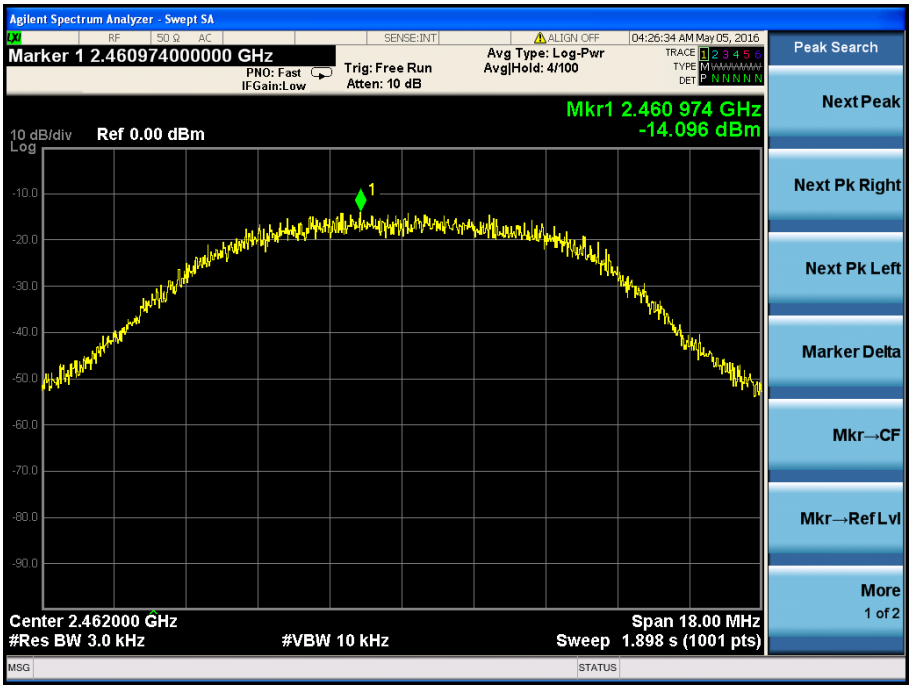
802.11b-Low Channel



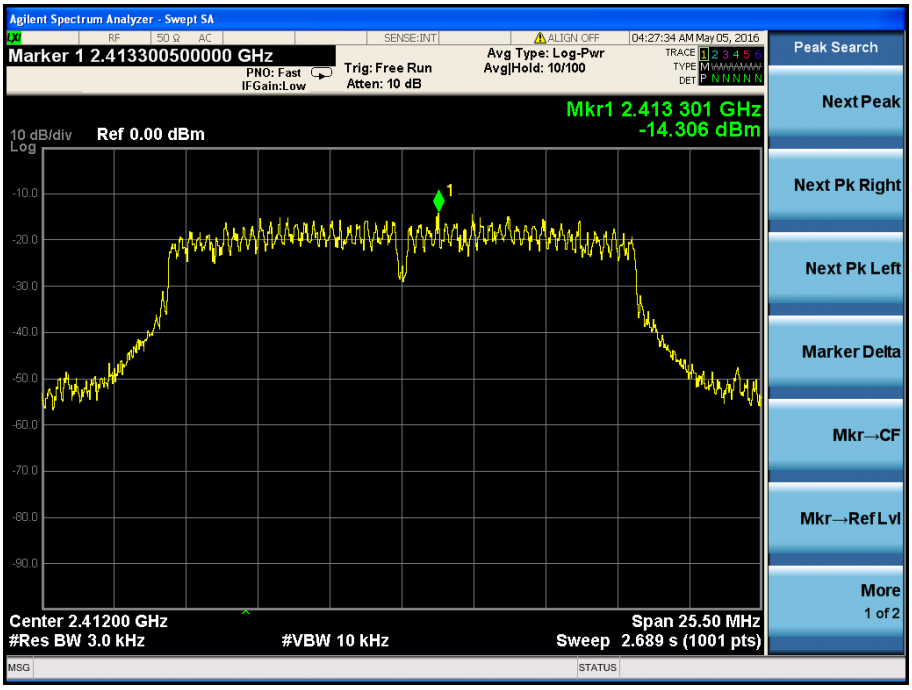
802.11b-Middle Channel



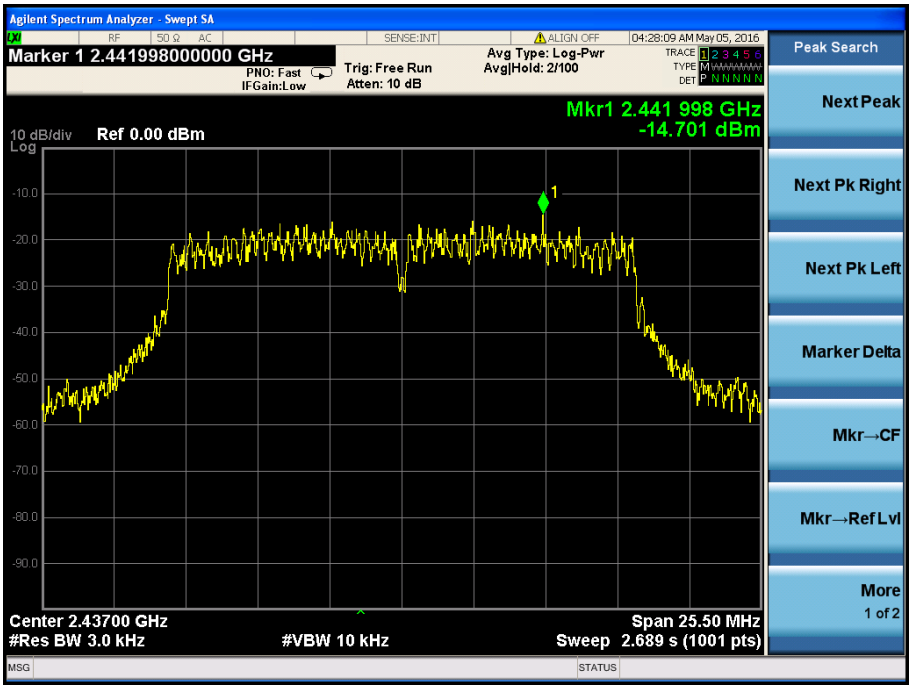
802.11b-High Channel



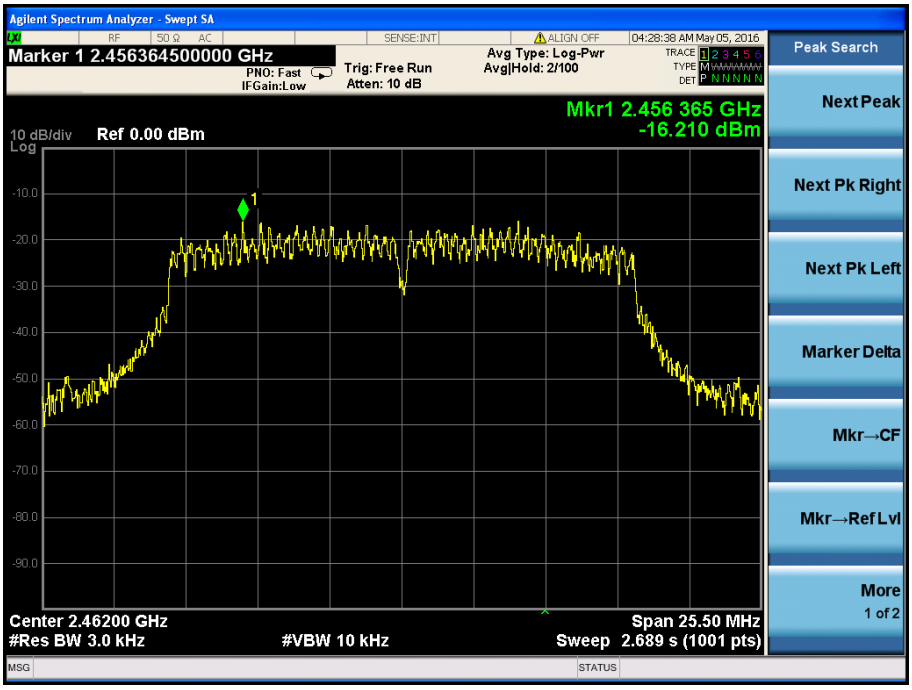
802.11g-Low Channel



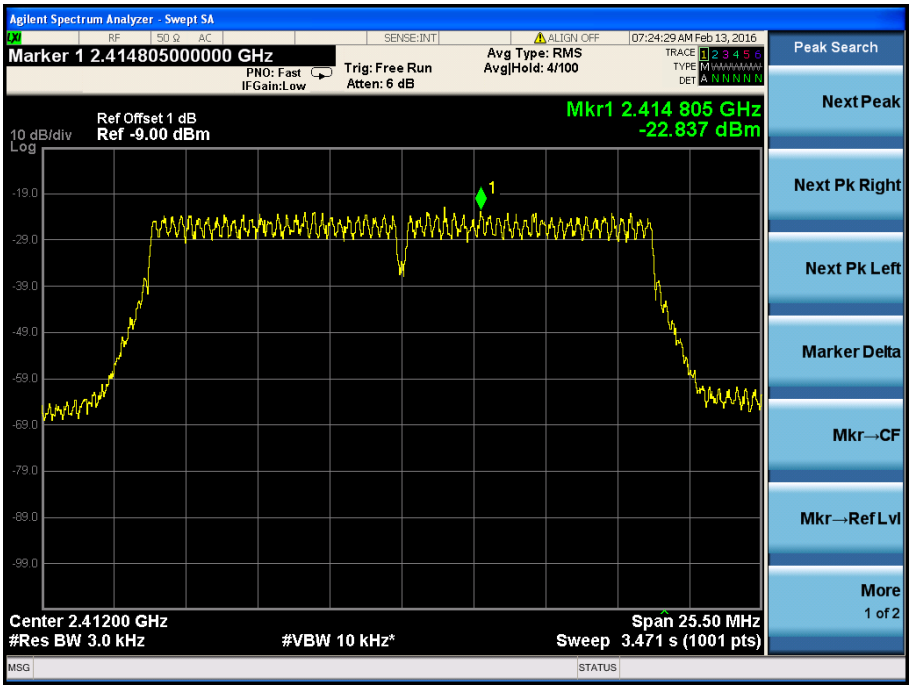
802.11g-Middle Channel



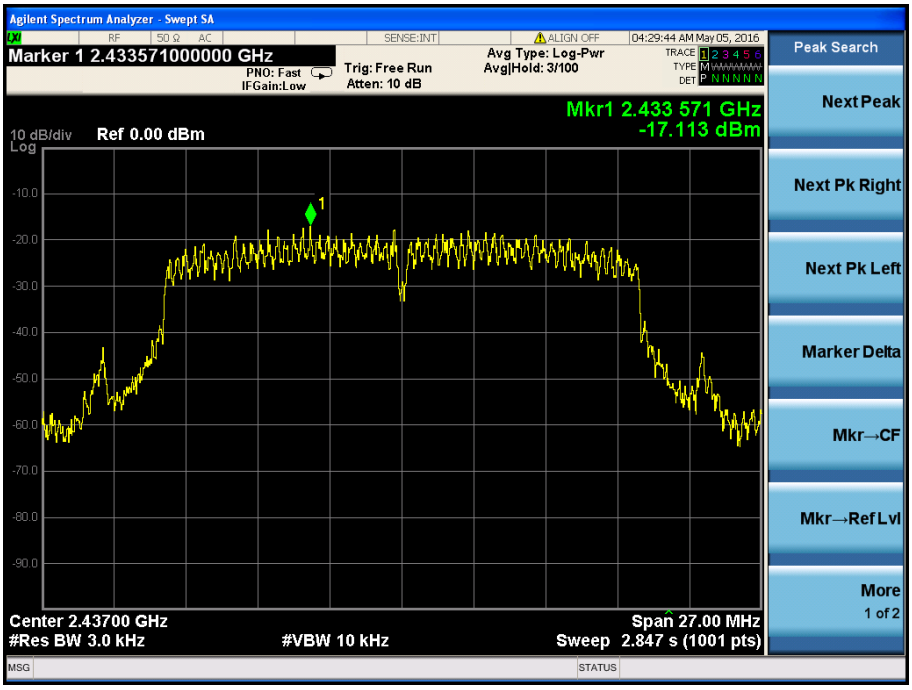
802.11g-High Channel



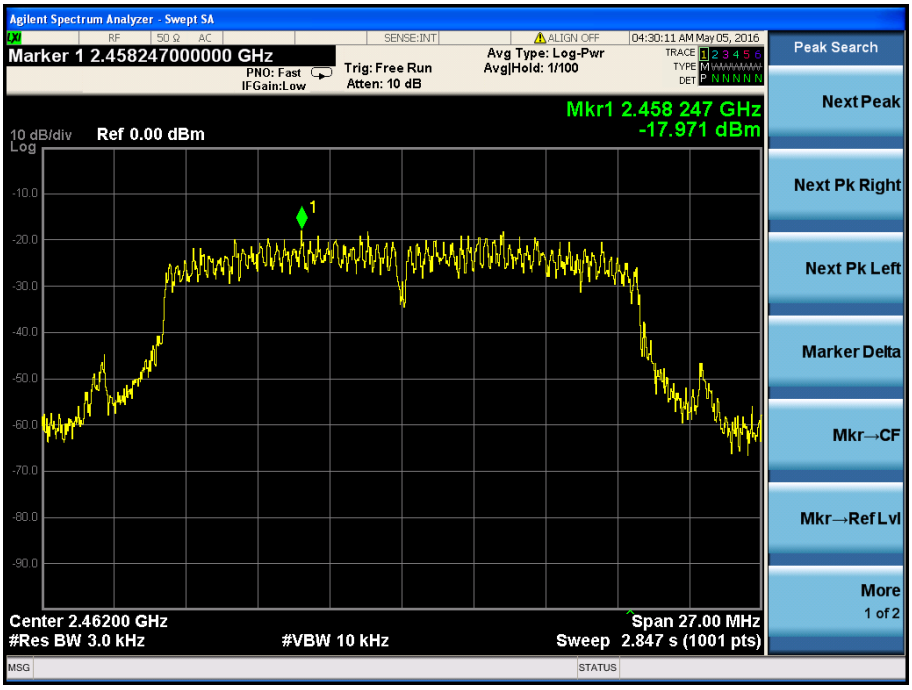
802.11n-HT20-Low Channel



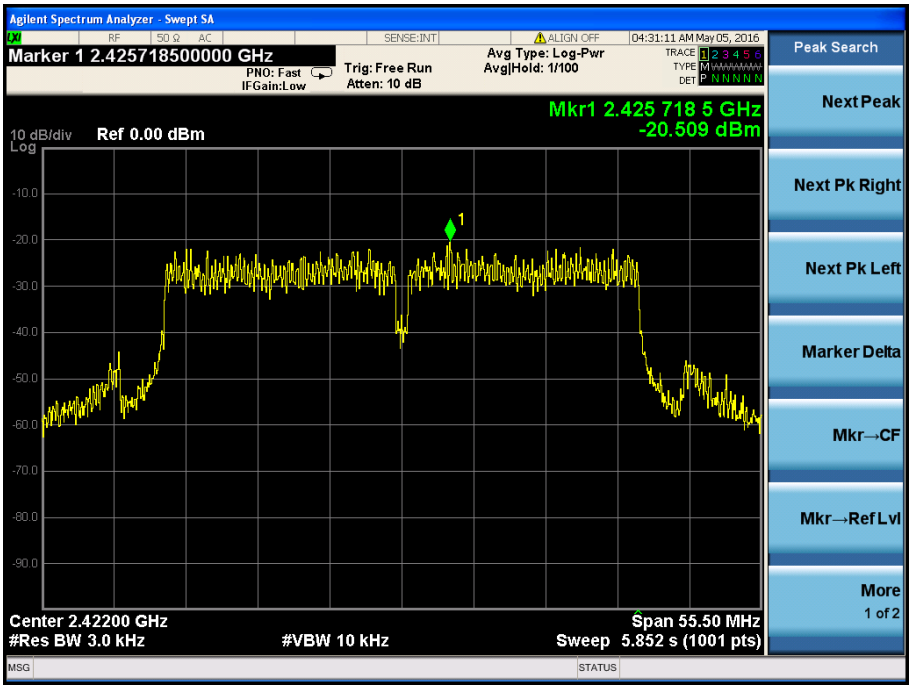
802.11n-HT20-Middle Channel



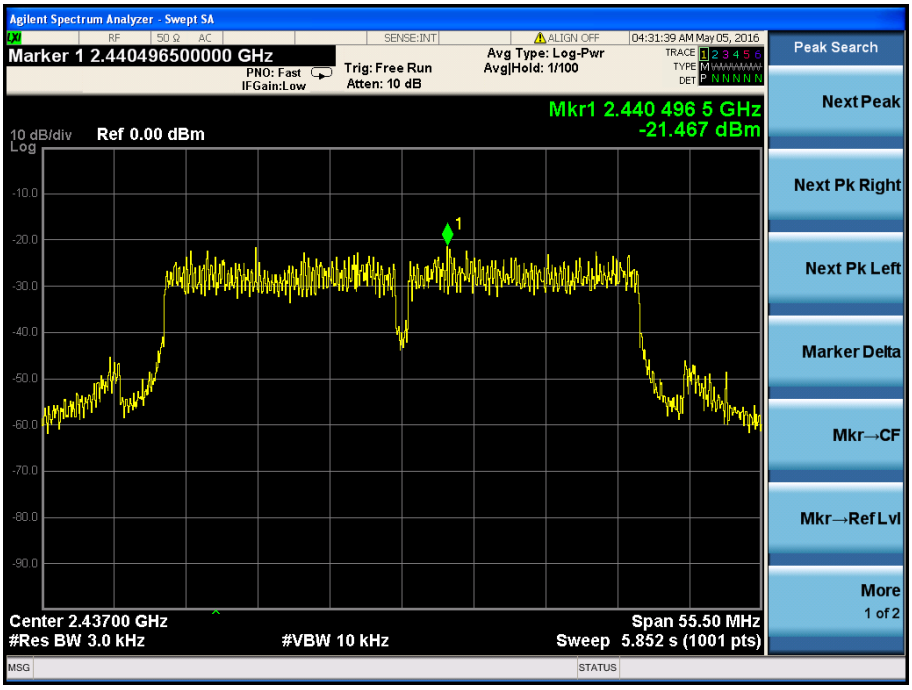
802.11n-HT20-High Channel



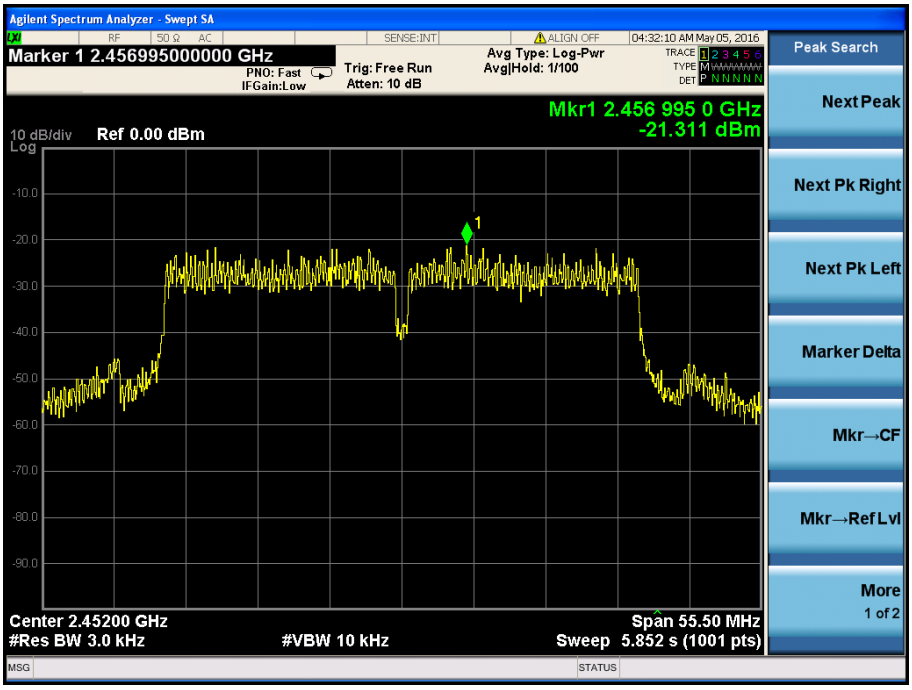
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel



802.11n-HT40-High Channel



6. 6dB Bandwidth

6.1 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.

6.2 Test Procedure

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3 Environmental Conditions

Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.4 Summary of Test Results/Plots

Antenna 1

Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
802.11b	2412	8.504	10.935	≥500
	2437	8.756	11.014	≥500
	2462	8.701	11.048	≥500
802.11g	2412	16.40	16.318	≥500
	2437	16.36	16.308	≥500
	2462	16.42	16.314	≥500
802.11n-HT20	2412	16.33	17.447	≥500
	2437	17.26	17.442	≥500
	2462	16.68	17.413	≥500
802.11n-HT40	2422	36.41	36.183	≥500
	2437	36.45	36.214	≥500
	2452	36.41	36.161	≥500

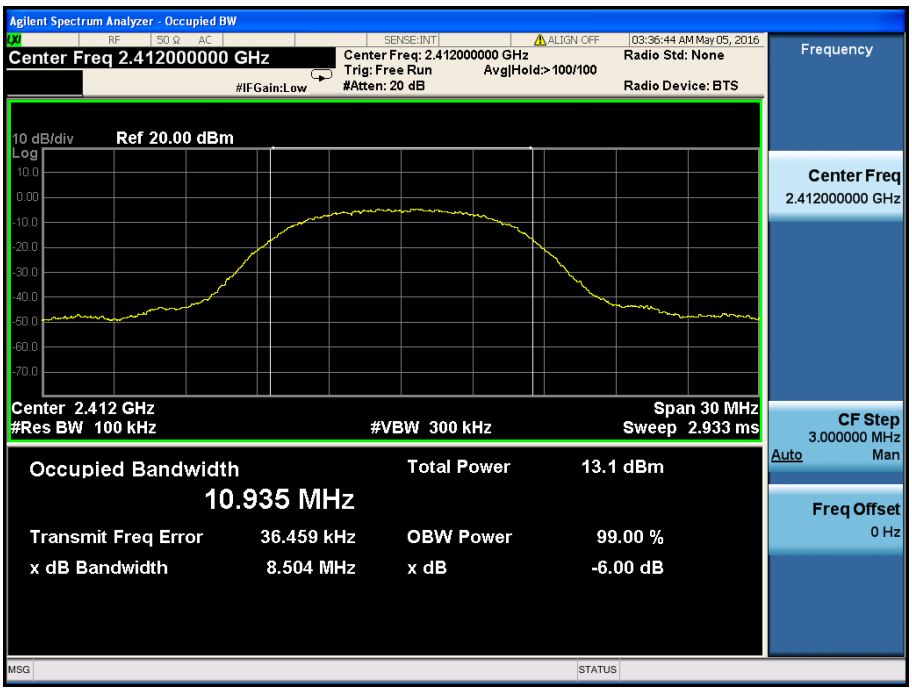
Antenna 2

Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
802.11b	2412	8.528	11.020	≥500
	2437	8.675	11.080	≥500
	2462	8.564	11.116	≥500
802.11g	2412	16.37	16.306	≥500
	2437	16.38	16.307	≥500
	2462	16.37	16.304	≥500
802.11n-HT20	2412	16.64	17.423	≥500
	2437	17.26	17.420	≥500
	2462	16.65	17.421	≥500
802.11n-HT40	2422	36.41	36.177	≥500
	2437	36.40	36.183	≥500
	2452	36.67	36.151	≥500

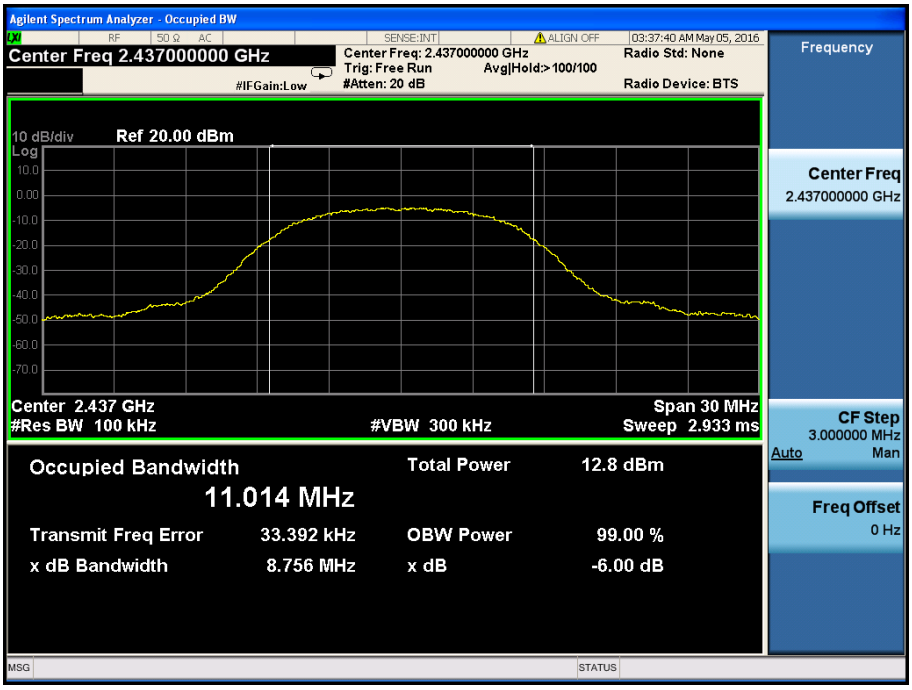
Please refer to the following test plots:

Antenna 1

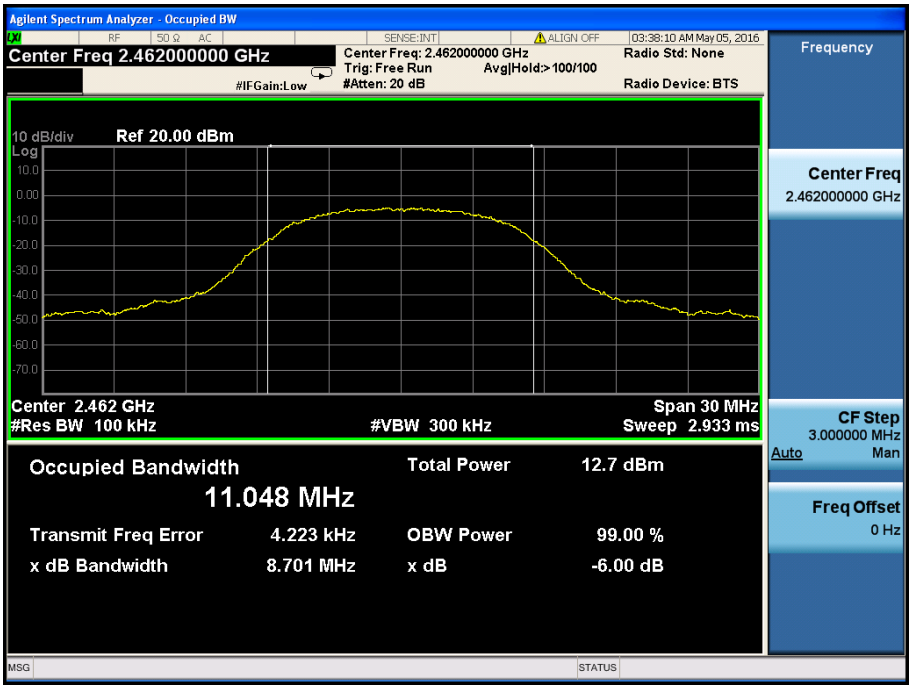
802.11b-Low Channel



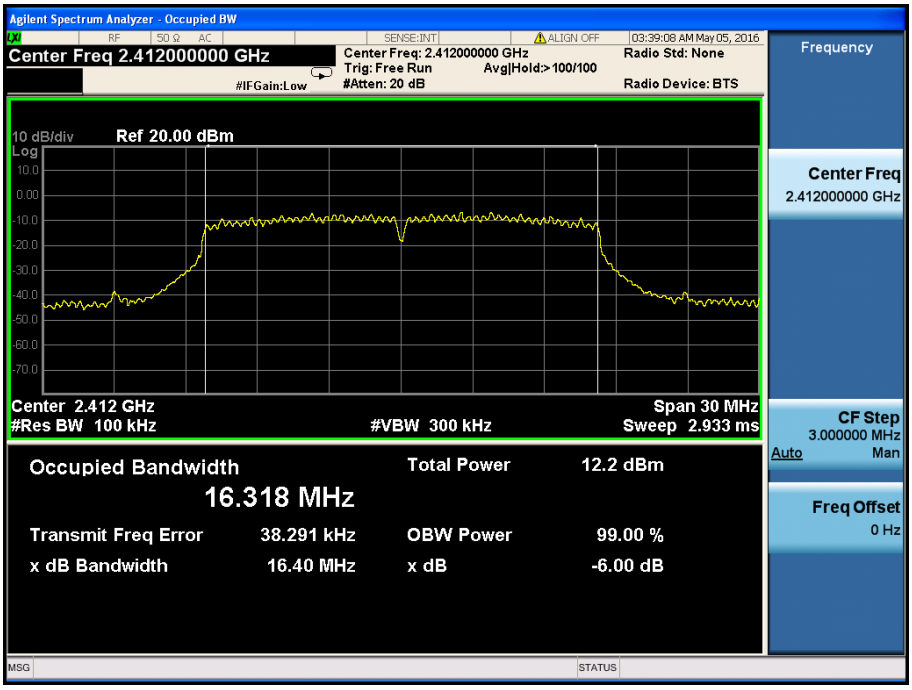
802.11b-Middle Channel



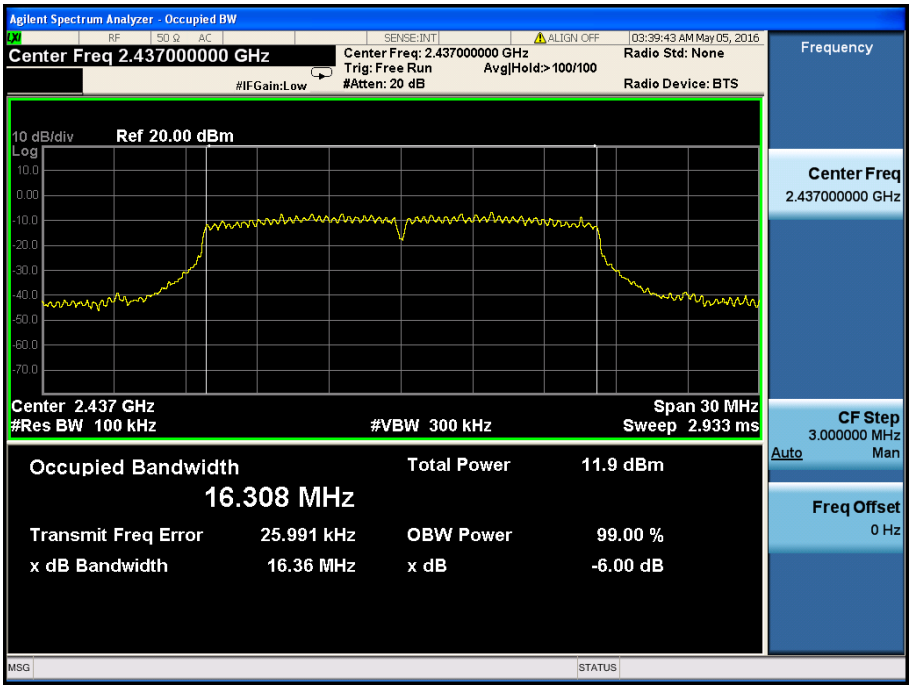
802.11b-High Channel



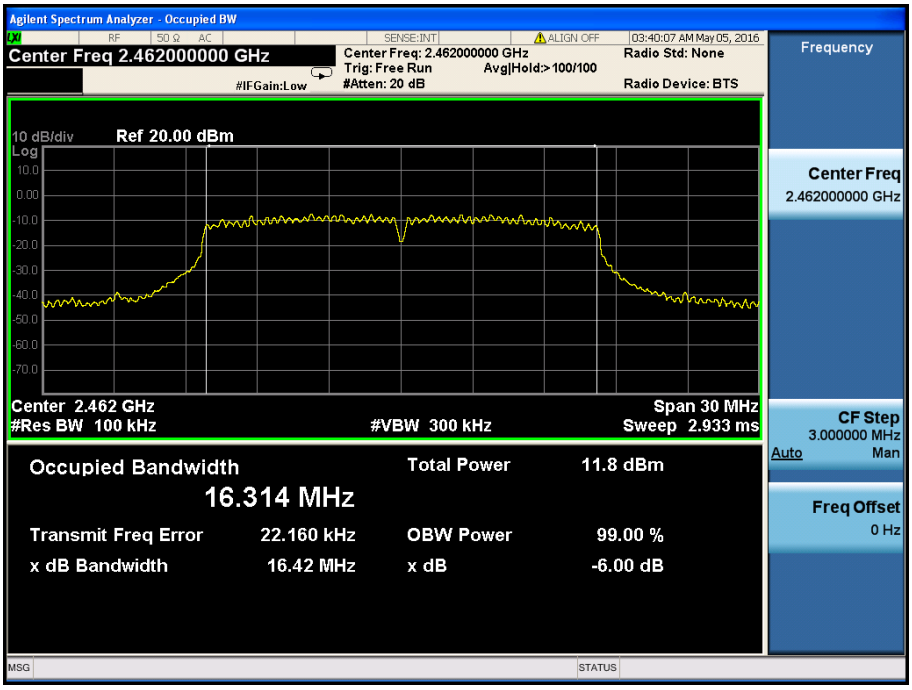
802.11g-Low Channel



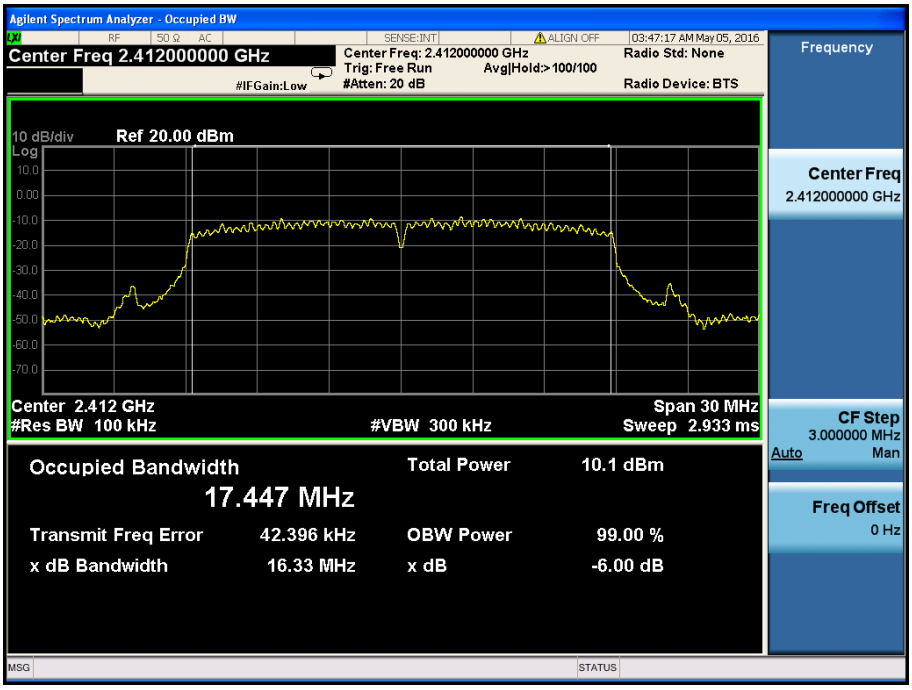
802.11g-Middle Channel



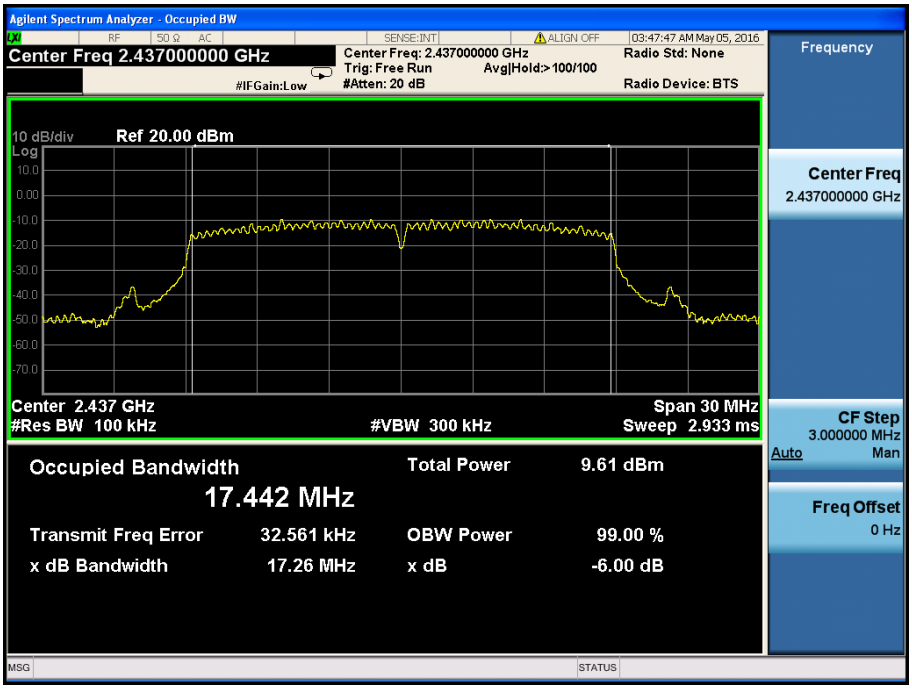
802.11g-High Channel



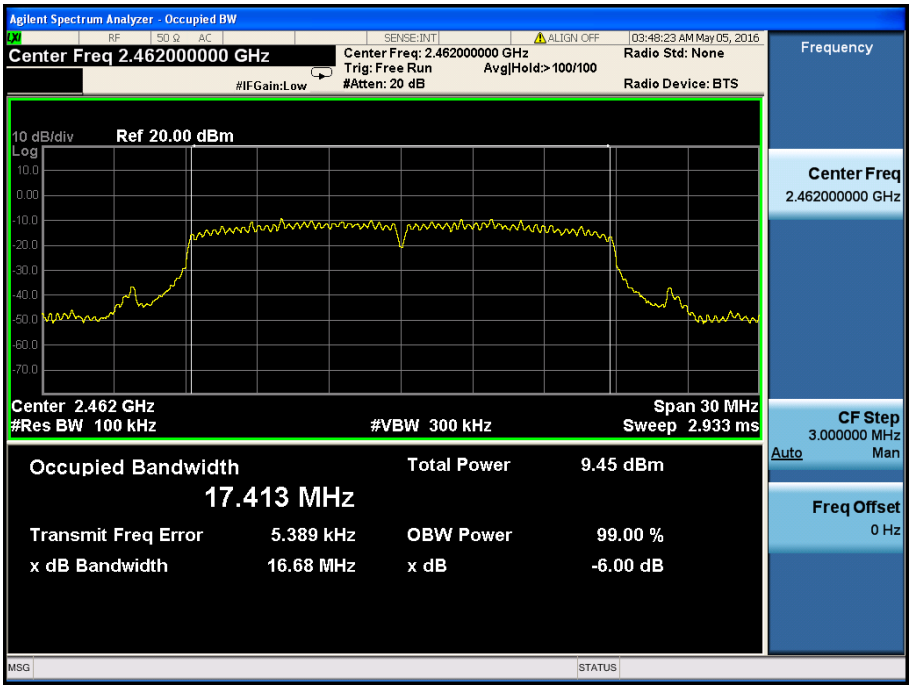
802.11n-HT20-Low Channel



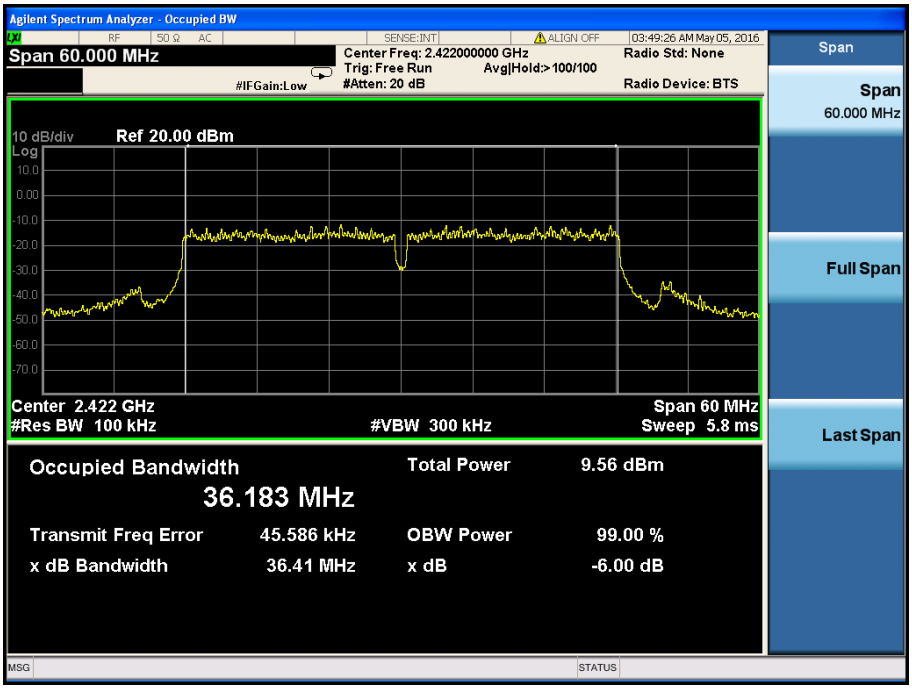
802.11n-HT20-Middle Channel



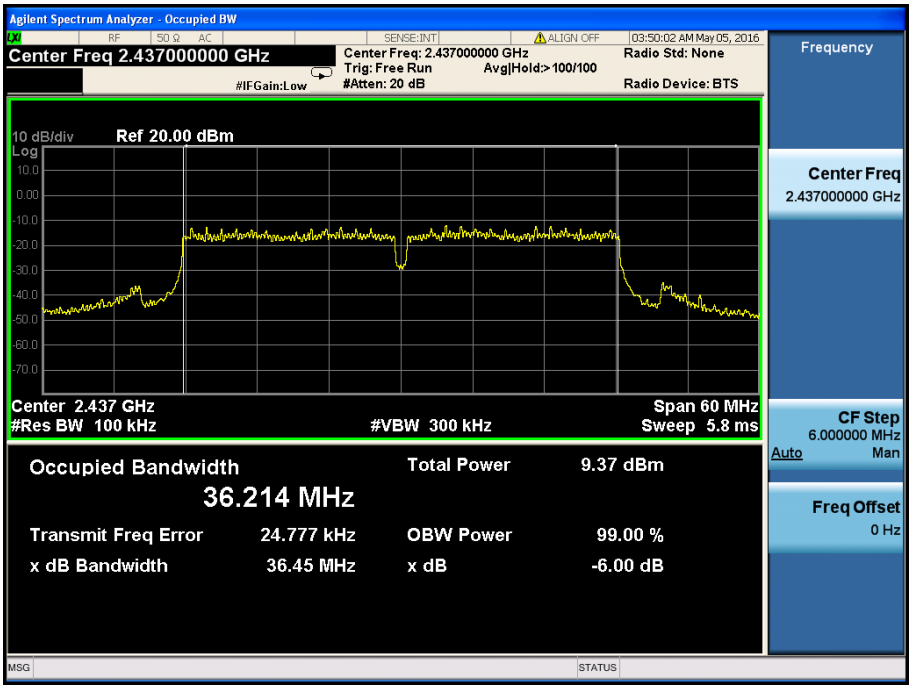
802.11n-HT20-High Channel



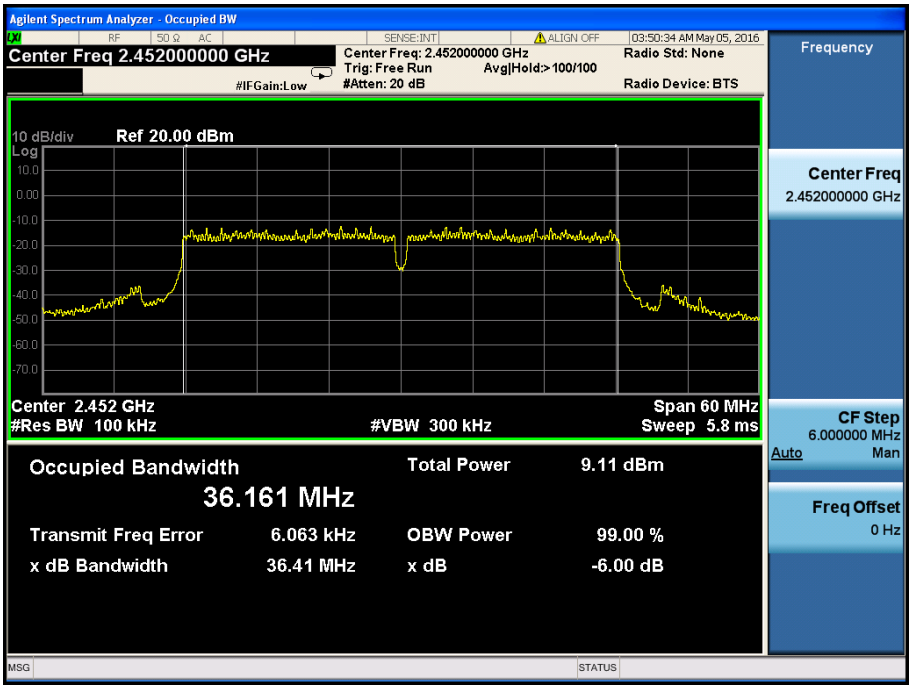
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel



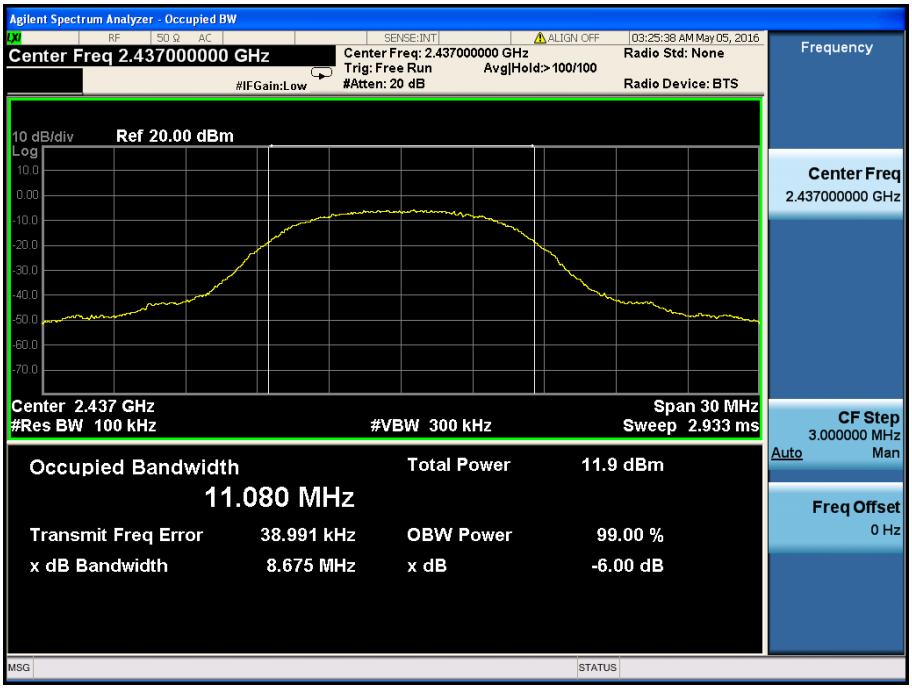
802.11n-HT40-High Channel



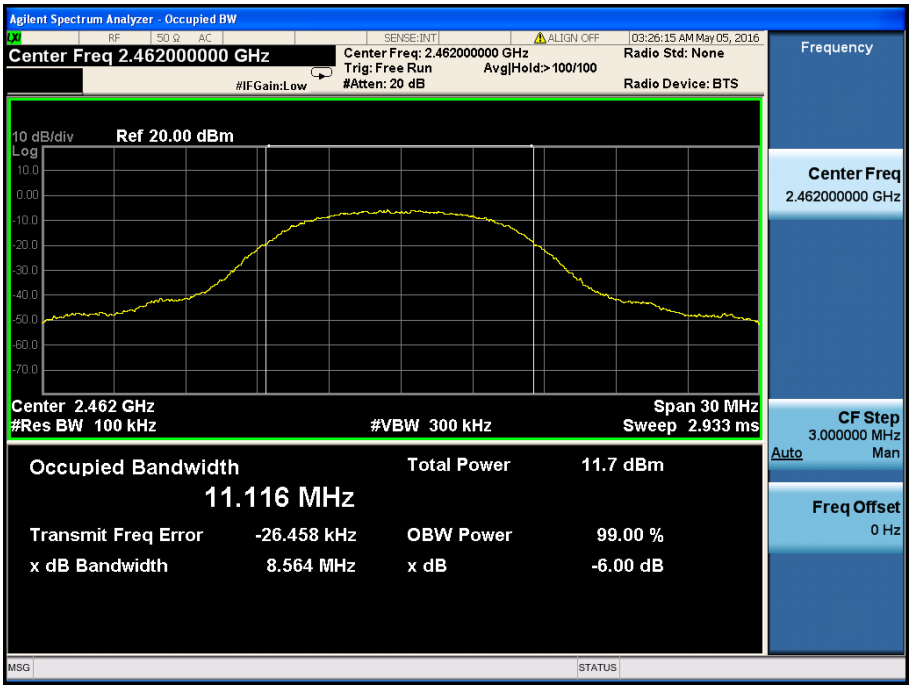
Antenna 2

802.11b-Low Channel

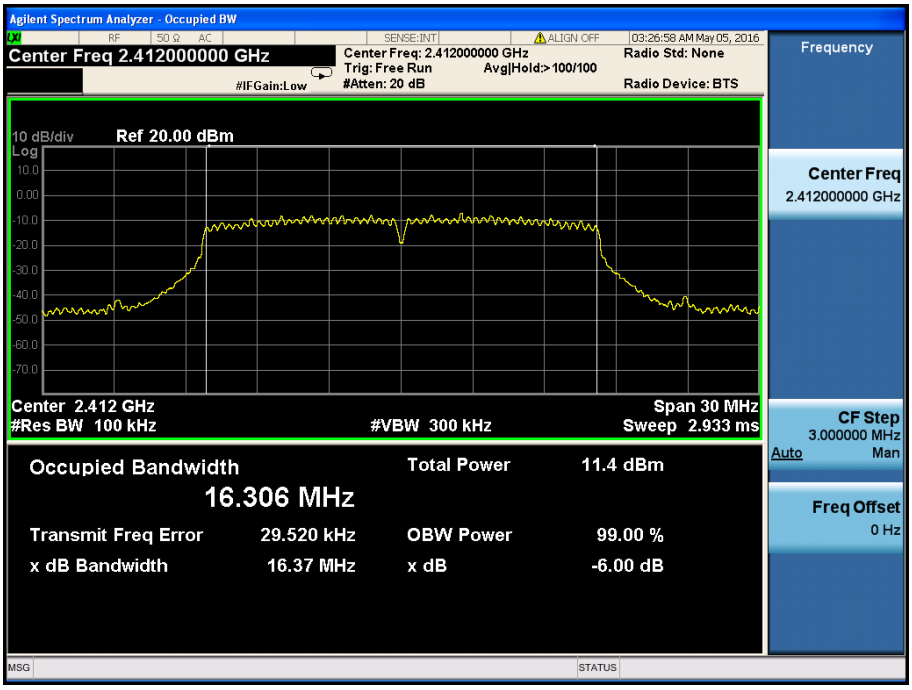
802.11b-Middle Channel



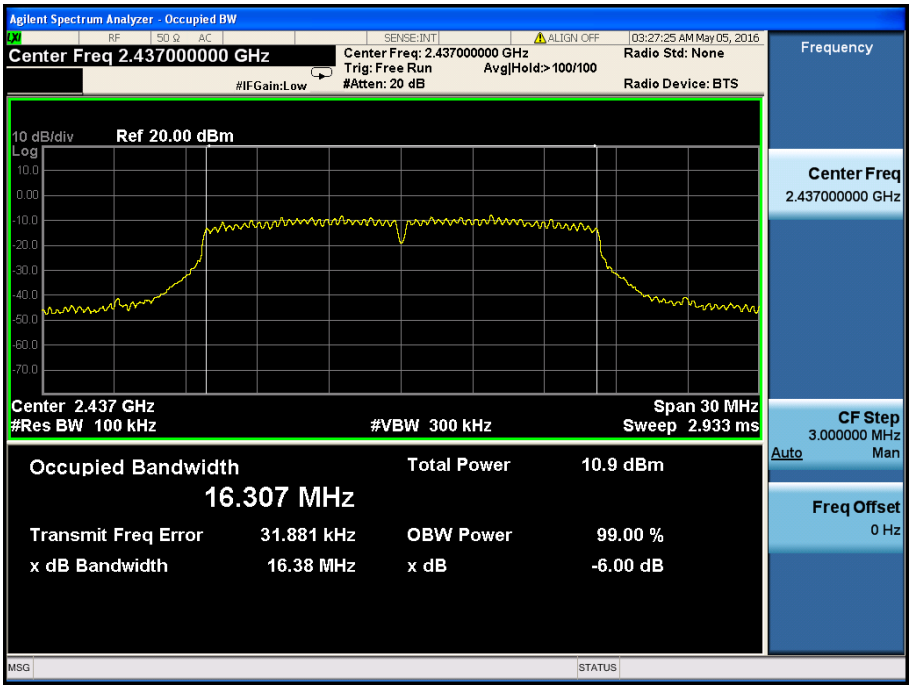
802.11b-High Channel



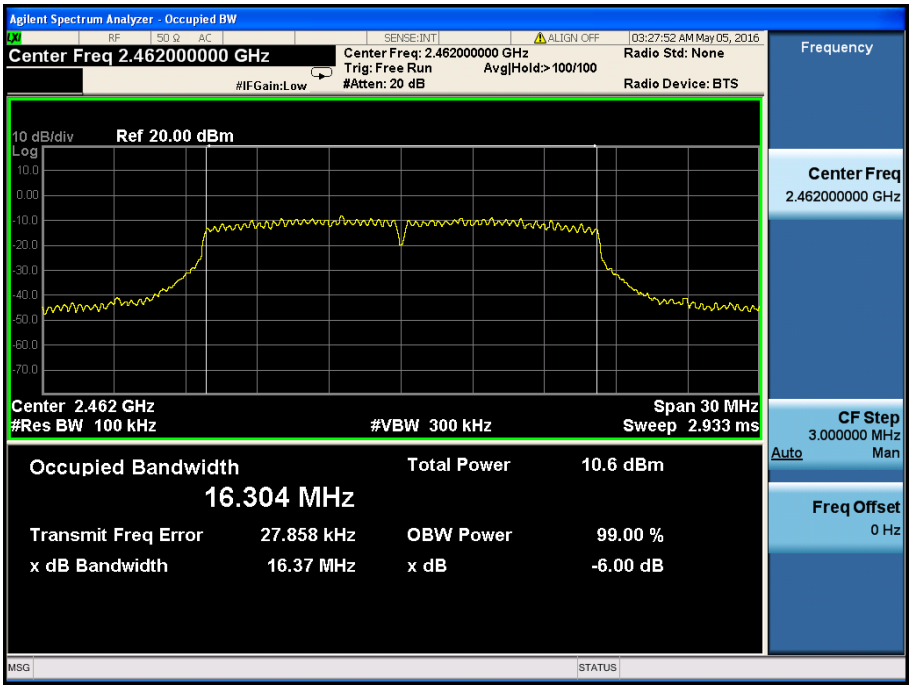
802.11g-Low Channel



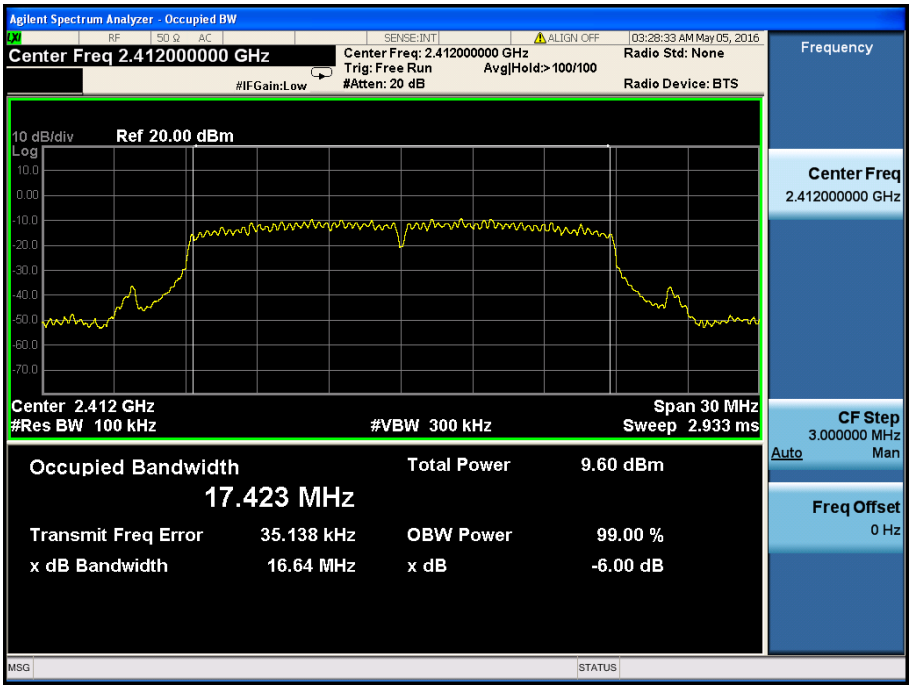
802.11g-Middle Channel



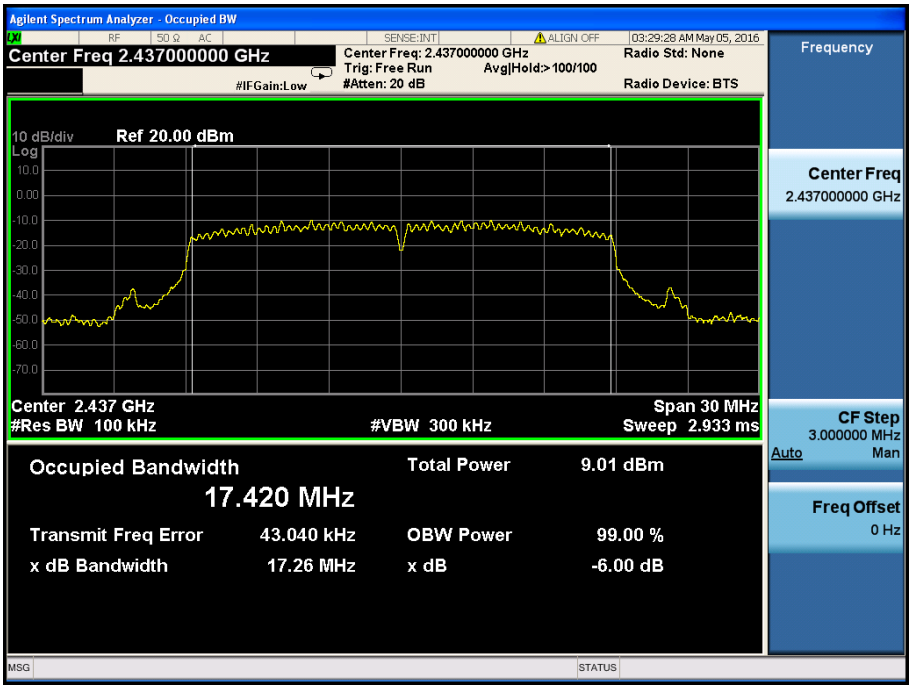
802.11g-High Channel



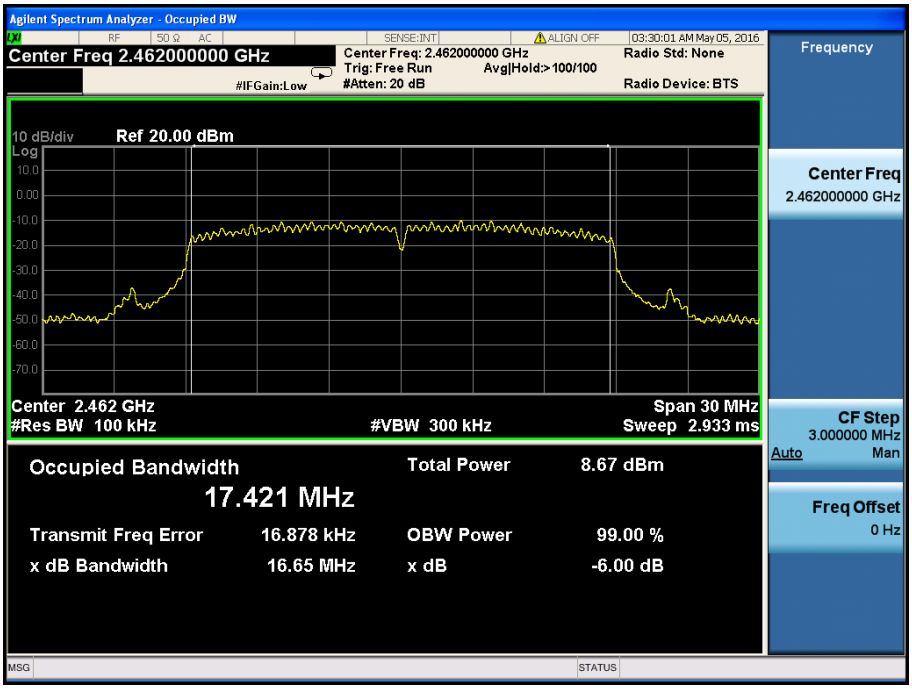
802.11n-HT20-Low Channel



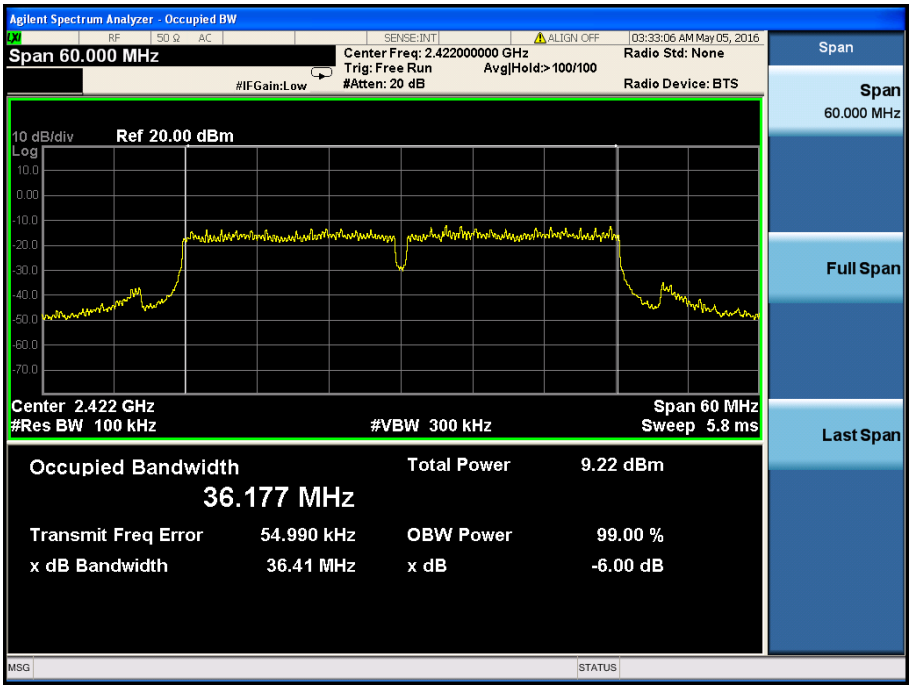
802.11n-HT20-Middle Channel



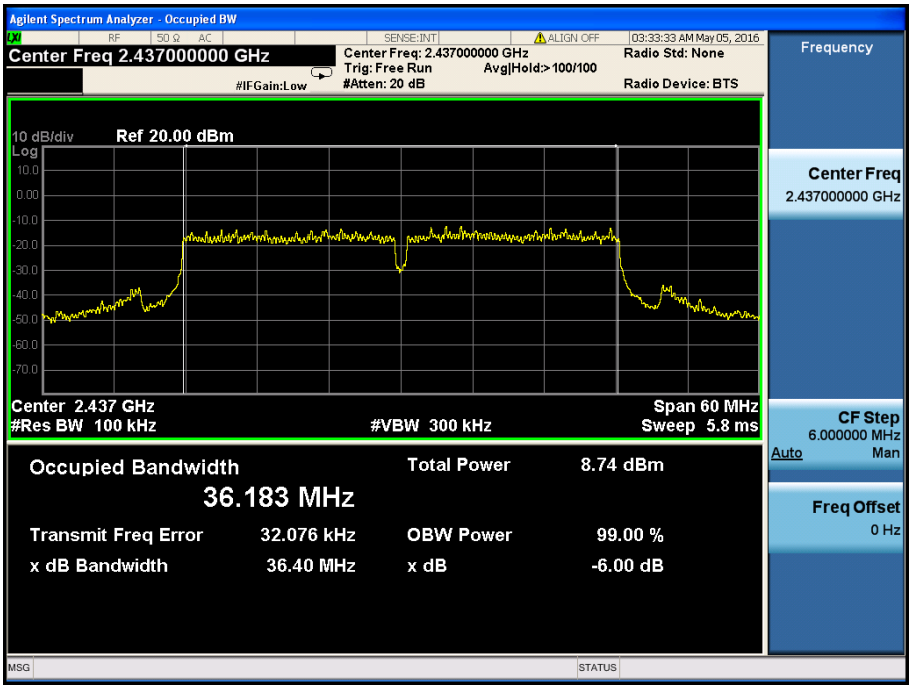
802.11n-HT20-High Channel



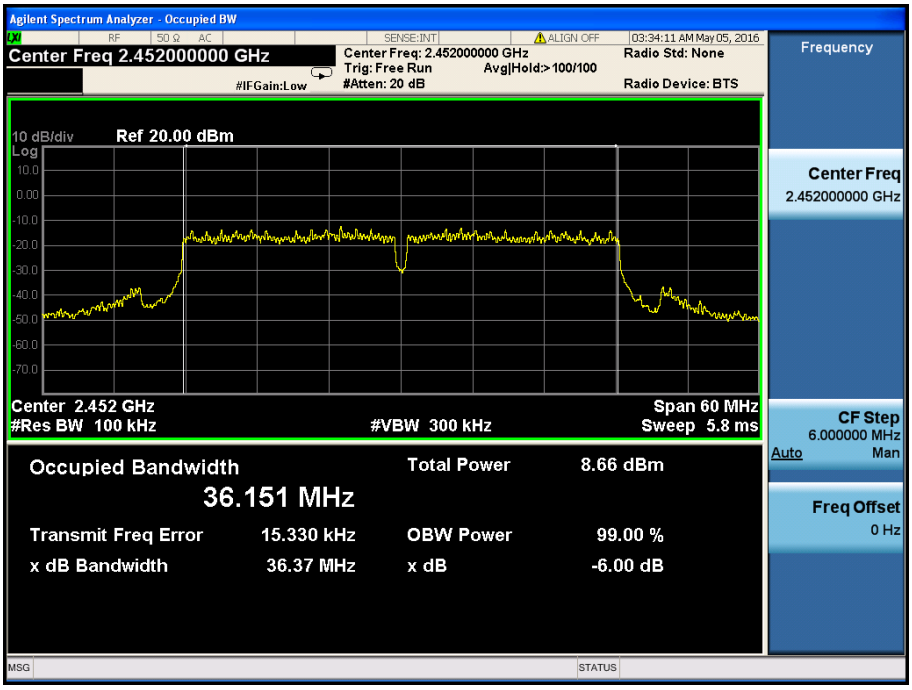
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel



802.11n-HT40-High Channel



7. RF Output Power

7.1 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.

7.2 Test Procedure

According to KDB-558074 D01 V03r05, 9.2.2.2 (channel integration method) When this option is exercised, the measured power is to be referenced to the OBW rather than the DTS bandwidth

a) Set span to at least 1.5 times the OBW.
b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
c) Set VBW ≥ 3 x RBW.
d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
e) Sweep time = auto.
f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
g) If transmit duty cycle < 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".
h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

7.3 Environmental Conditions

Temperature:	26° C
Relative Humidity:	57%
ATM Pressure:	1011 mbar

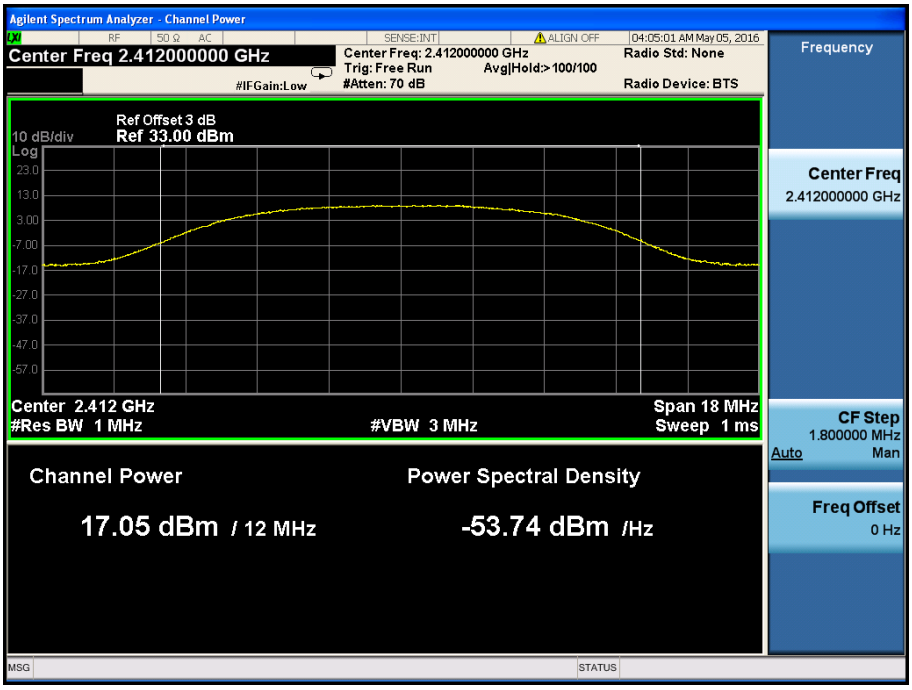
7.4 Summary of Test Results/Plots

Test Mode	Frequency MHz	Power 1 dBm	Power 2 dBm	Total Power dBm	Output Power mW	Limit mW
802.11b _ 11Mbps	2412	17.05	16.01	19.57	90.57	1000
	2437	16.7	15.53	19.16	82.41	1000
	2462	16.47	15.28	18.93	78.16	1000
802.11g_54Mbps	2412	16.46	15.5	19.02	79.80	1000
	2437	16.02	14.96	18.53	71.29	1000
	2462	15.8	14.61	18.26	66.99	1000
802.11n HT20_MCS7	2412	14.28	13.6	16.96	49.66	1000
	2437	13.83	13.11	16.5	44.67	1000
	2462	13.57	12.69	16.16	41.30	1000
802.11n HT40_MCS7	2422	12.98	12.54	15.78	37.84	1000
	2437	12.82	12.26	15.56	35.97	1000
	2452	12.55	11.93	15.26	33.57	1000

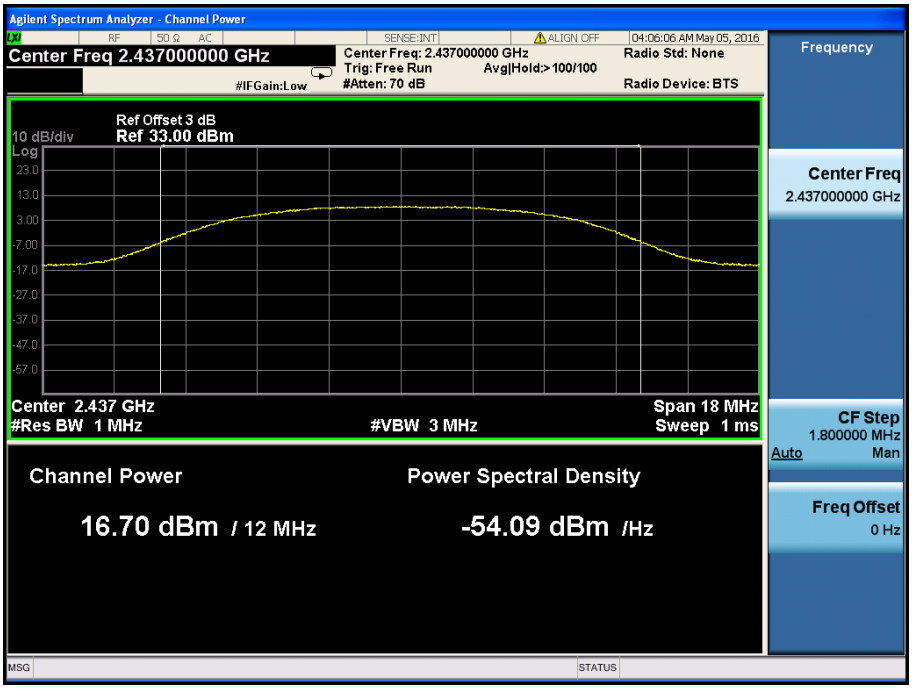
Please refer to the following test plots:

Antenna 1

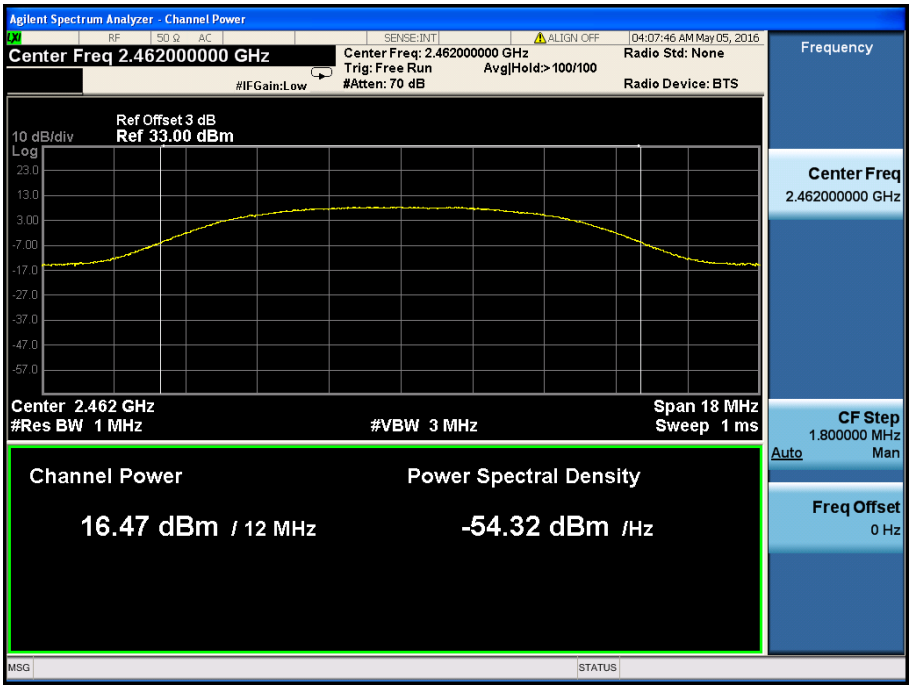
802.11b-11Mbps-Low Channel



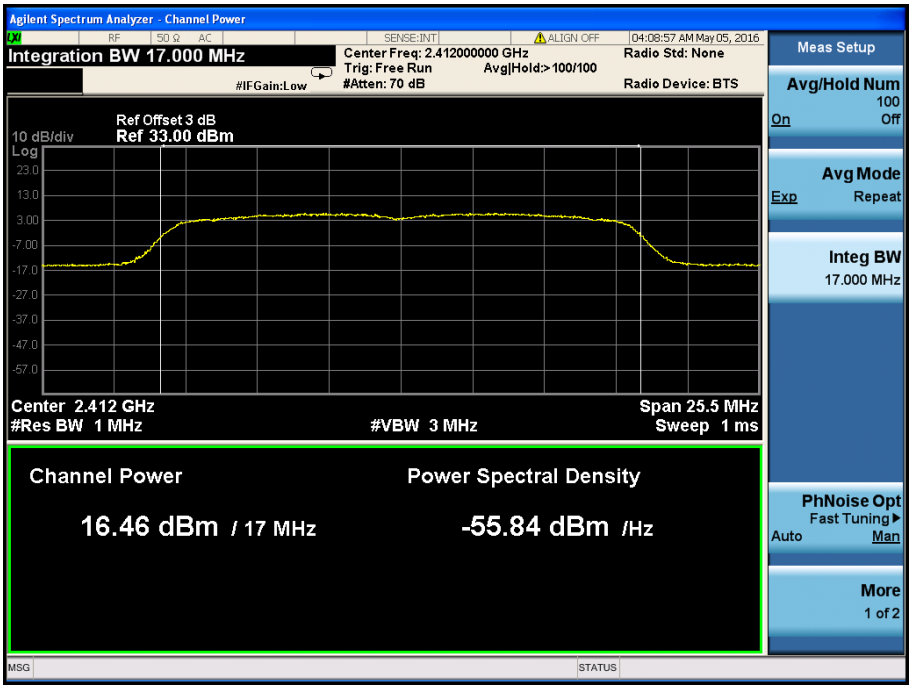
802.11b -11Mbps-Middle Channel



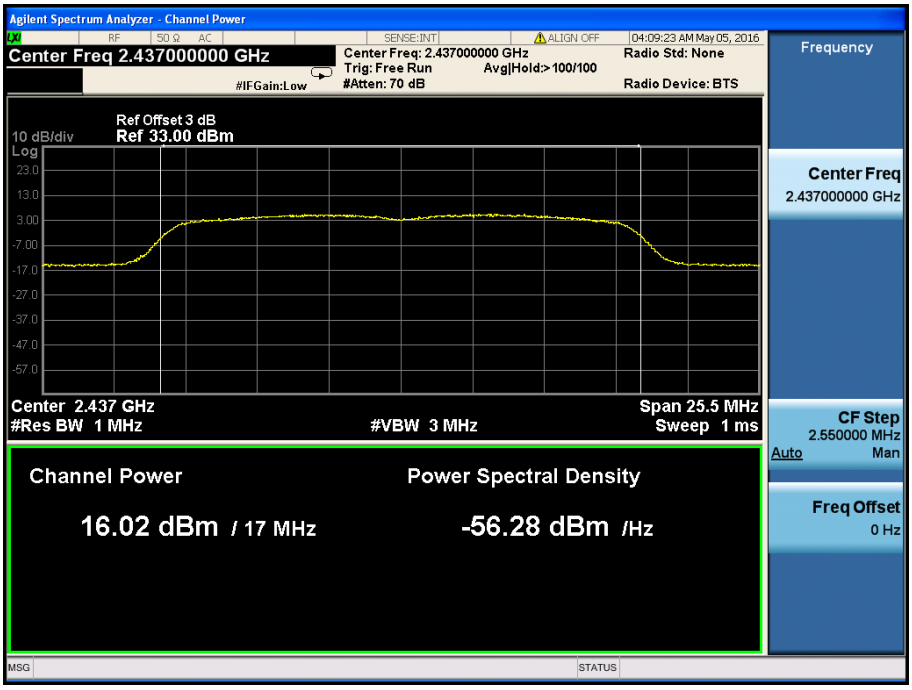
802.11b -11Mpbs-High Channel



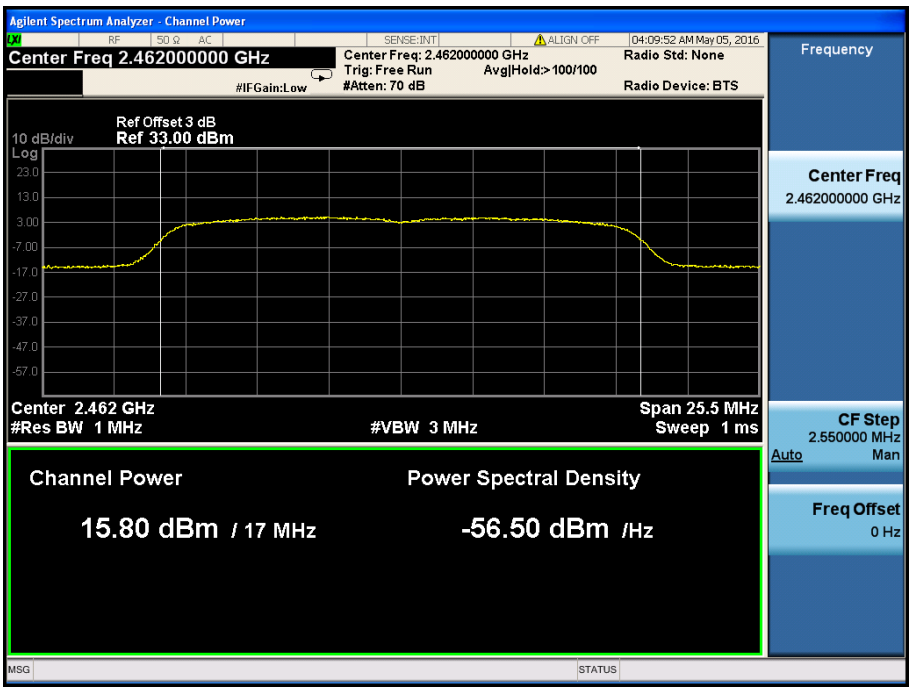
802.11g-54Mbps-Low Channel



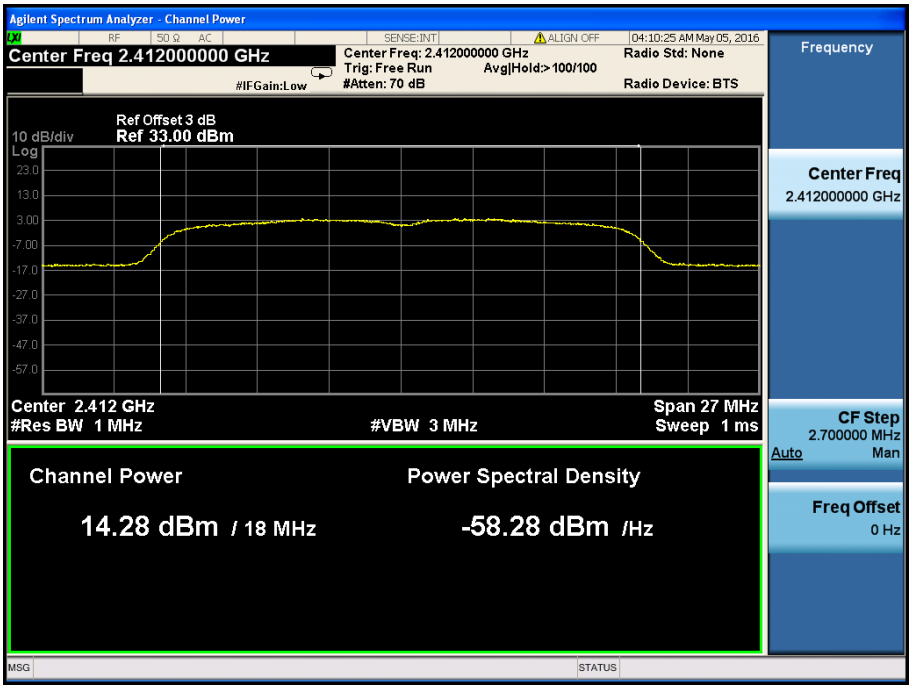
802.11g-54Mbps-Middle Channel



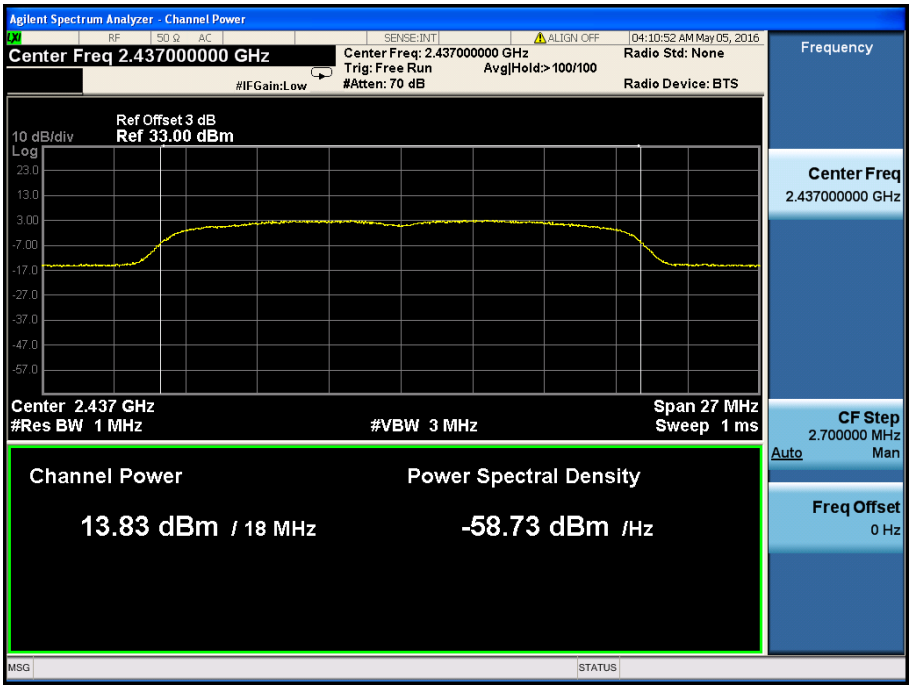
802.11g-54Mpbs-High Channel



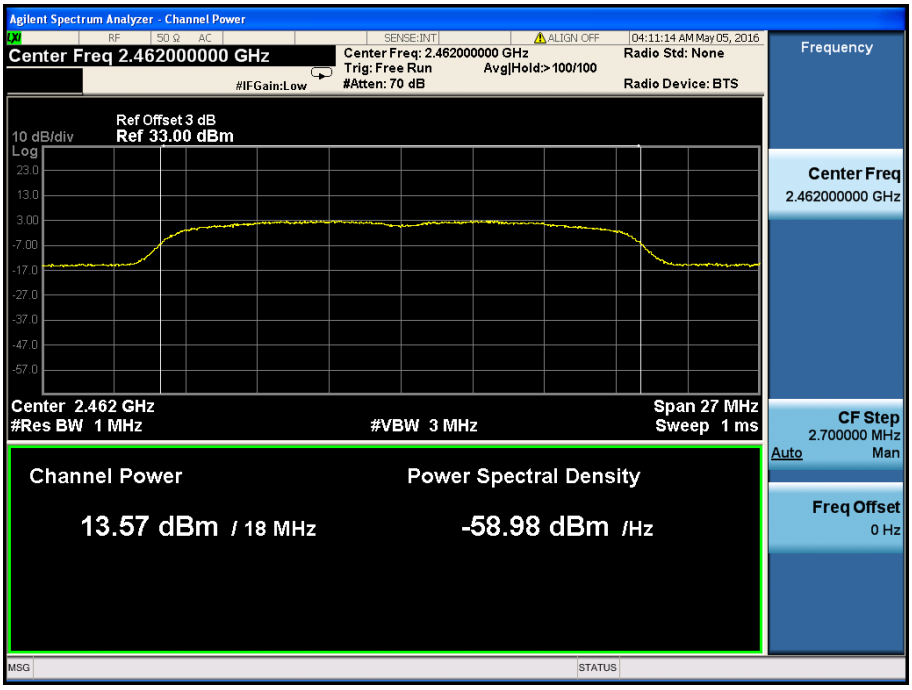
802.11n-HT20-MCS7-Low Channel



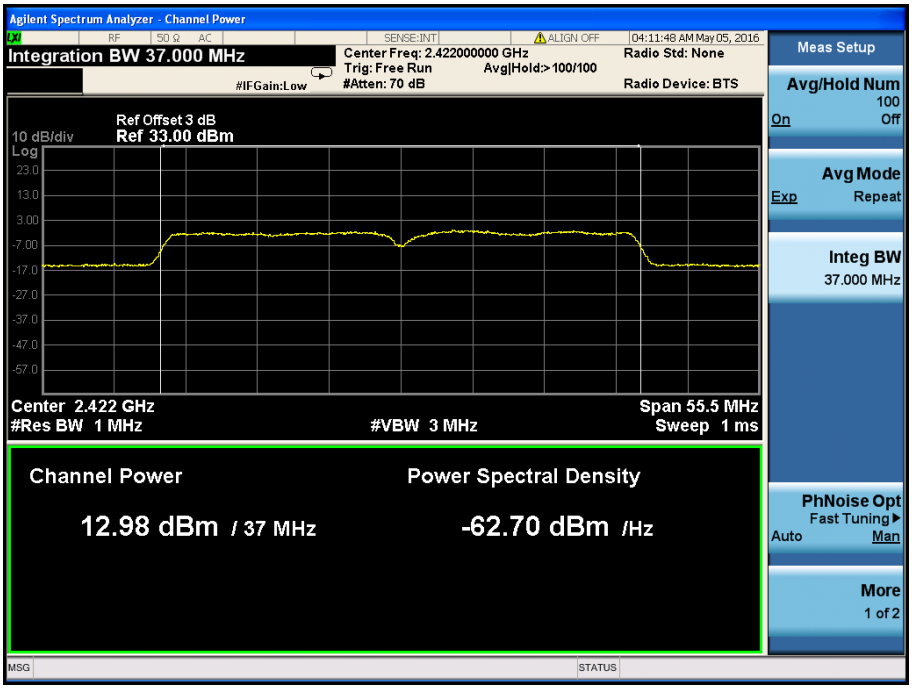
802.11n-HT20-MCS7-Middle Channel



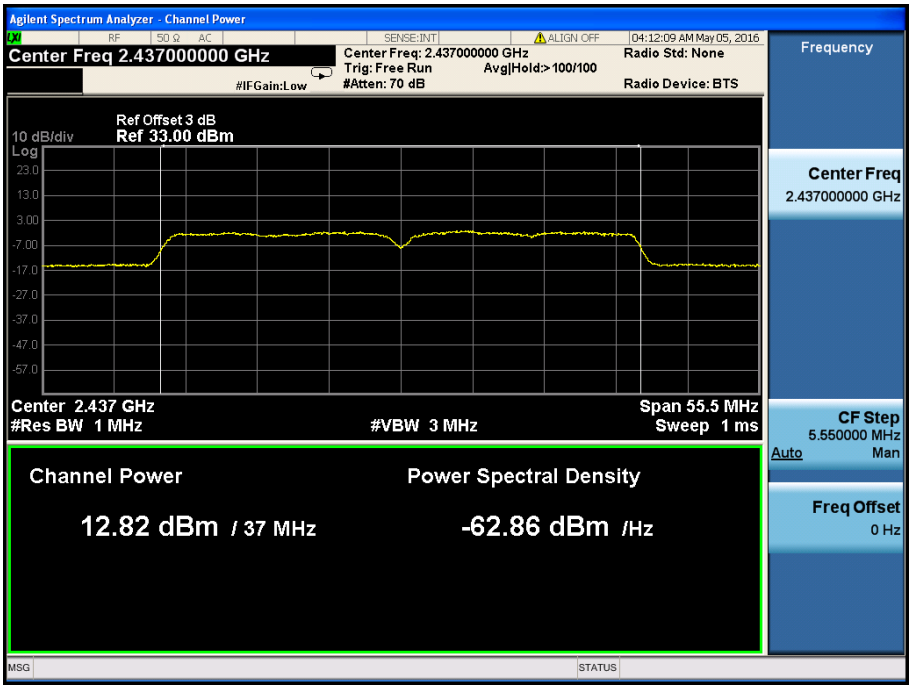
802.11n-HT20-MCS7-High Channel



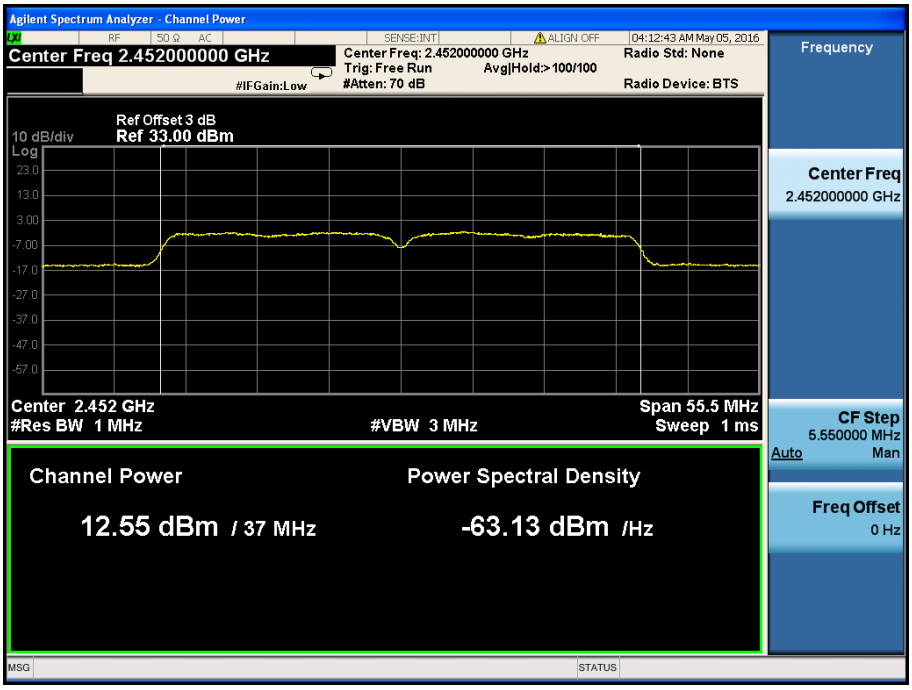
802.11n-HT40-MCS7-Low Channel



802.11n-HT40-MCS7-Middle Channel

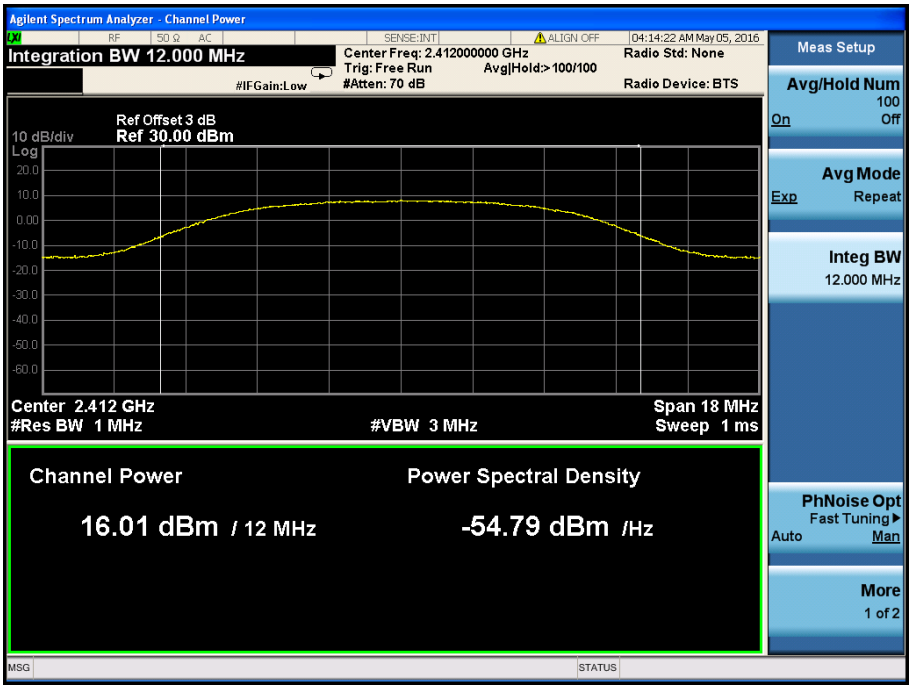


802.11n-HT40-MCS7-High Channel

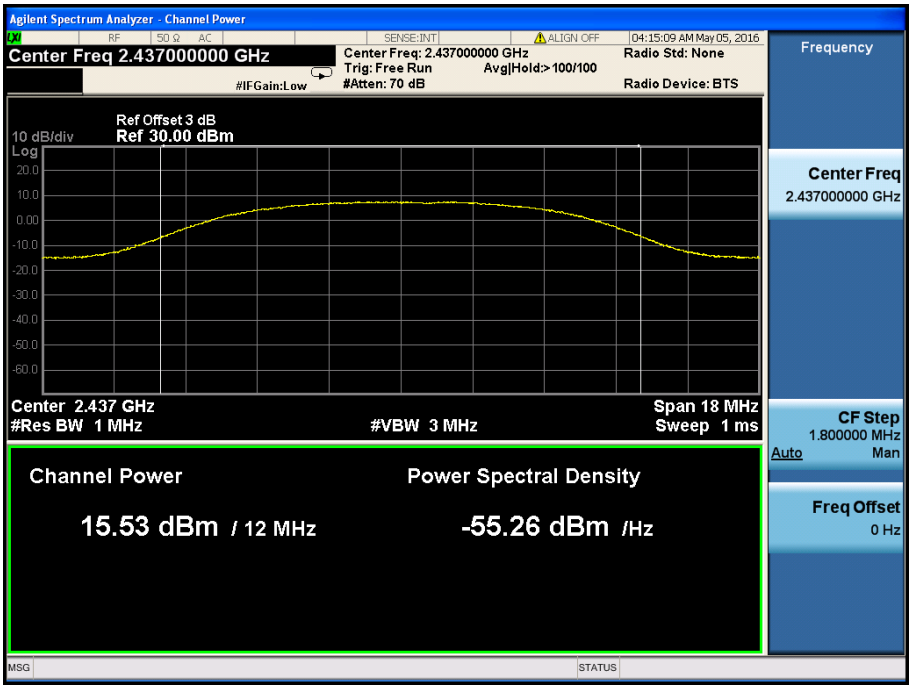


Antenna 2

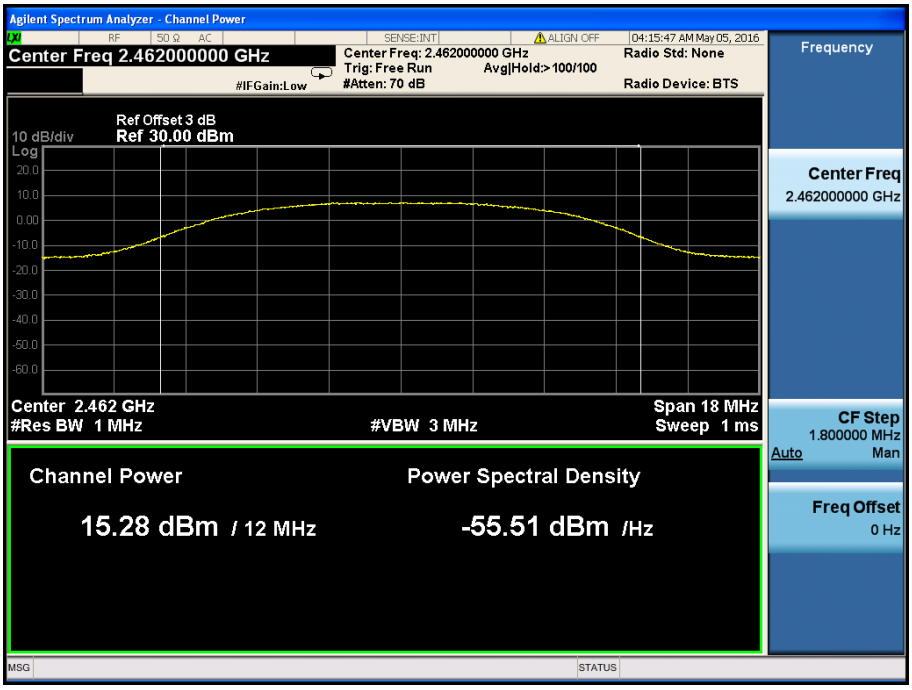
802.11b-11Mbps-Low Channel



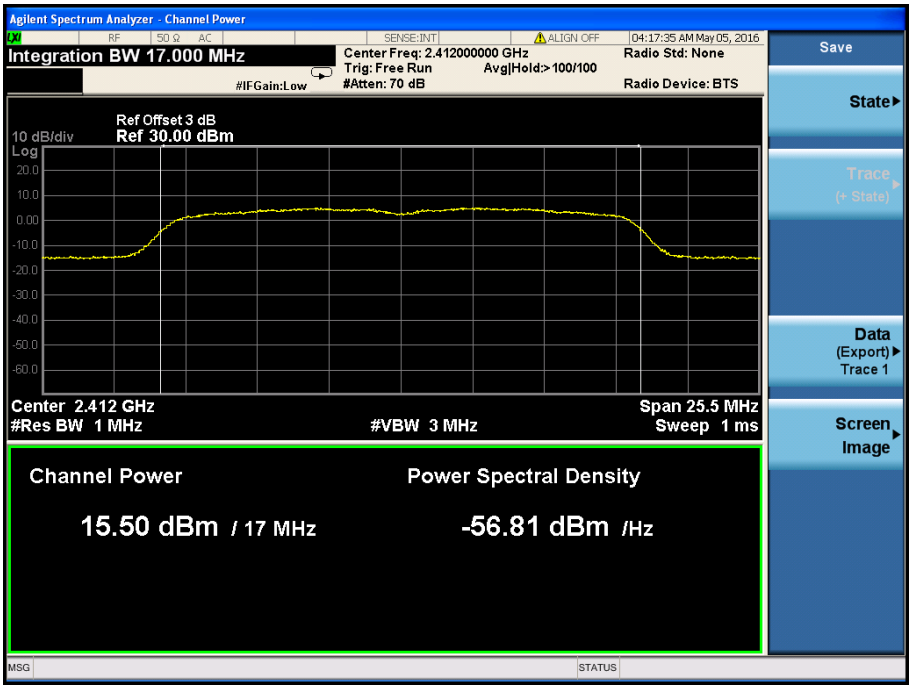
802.11b -11Mbps-Middle Channel



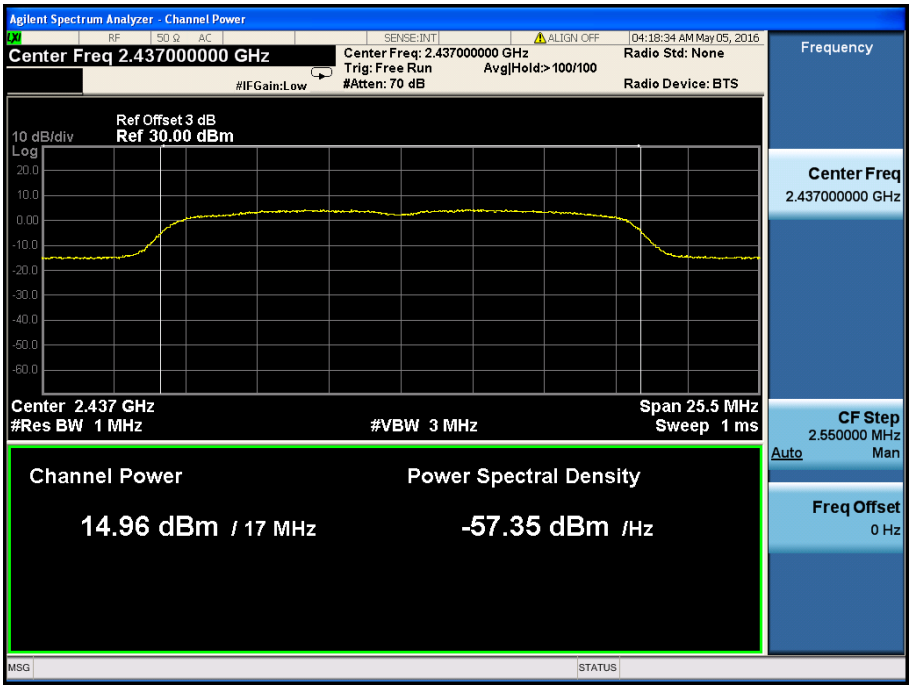
802.11b -11Mpbs-High Channel



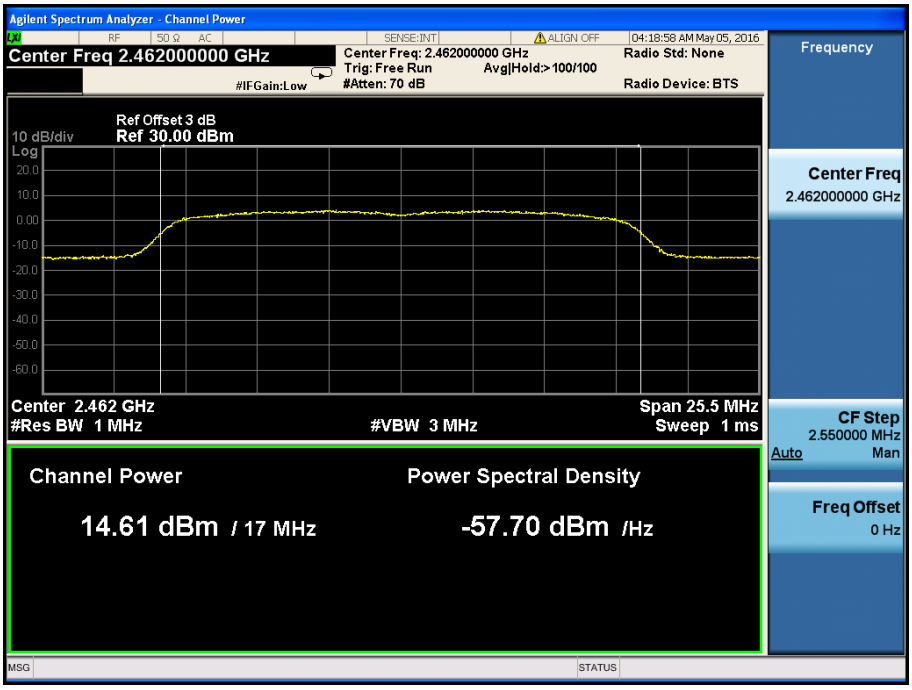
802.11g-54Mbps-Low Channel



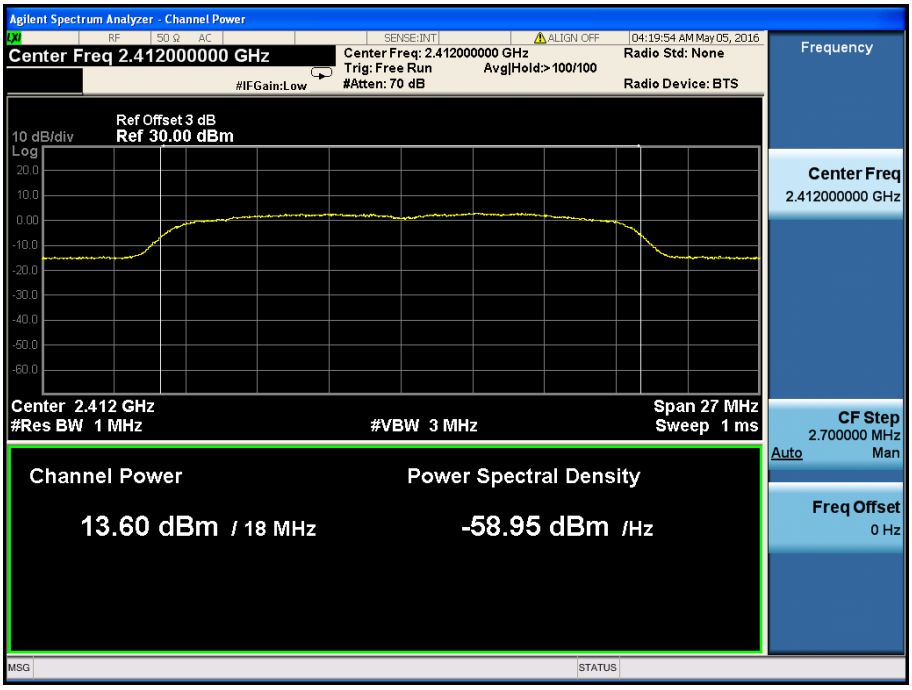
802.11g-54Mbps-Middle Channel



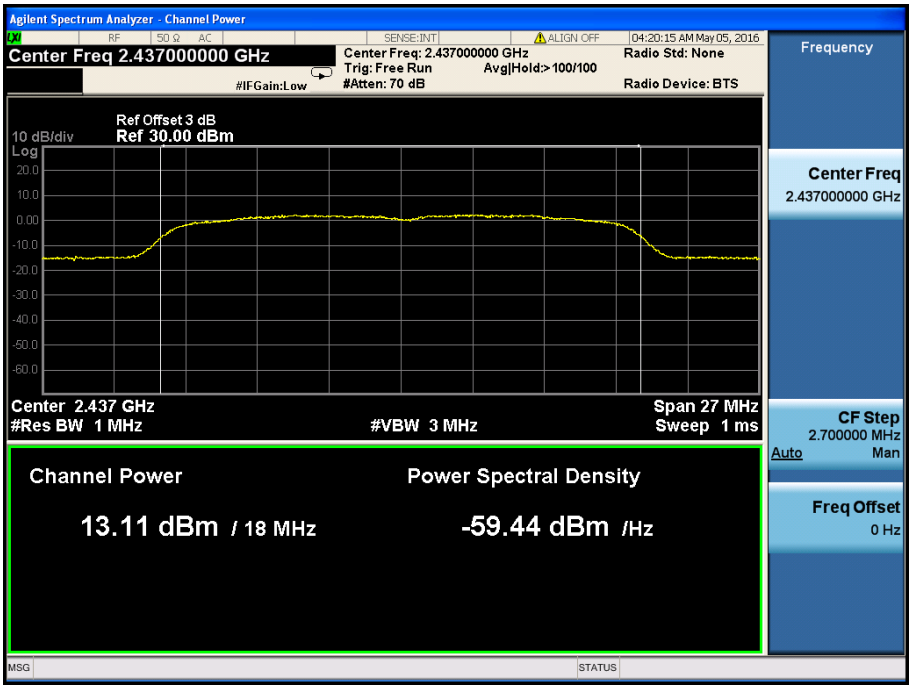
802.11g-54Mpbs-High Channel



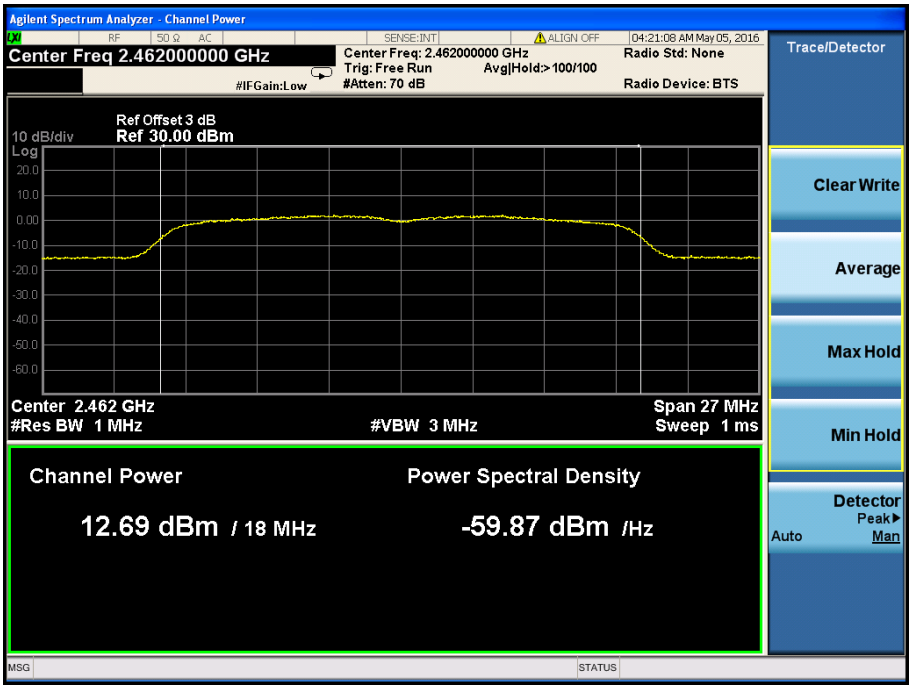
802.11n-HT20-MCS7-Low Channel



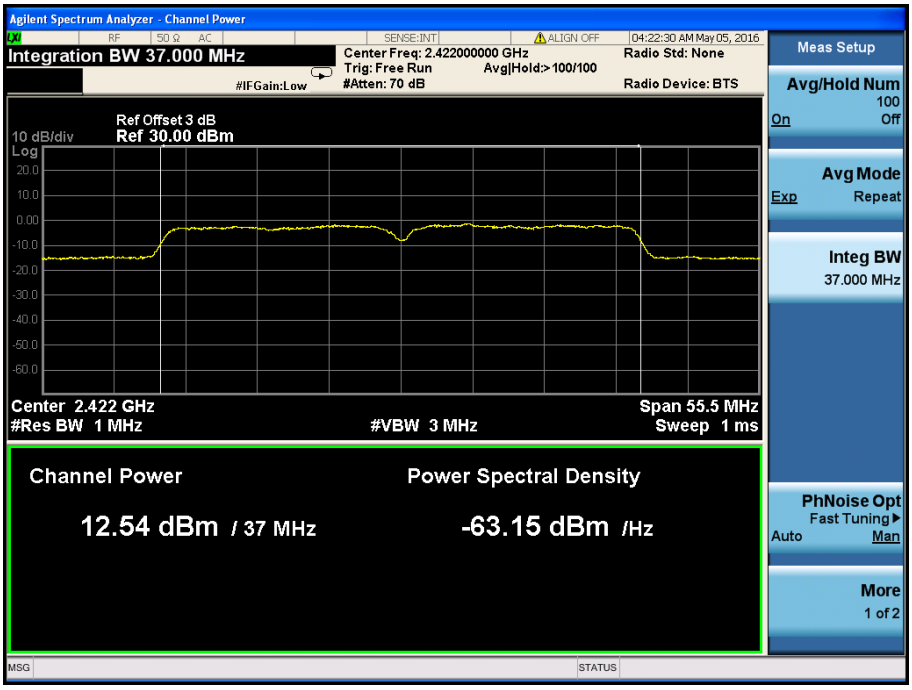
802.11n-HT20-MCS7-Middle Channel



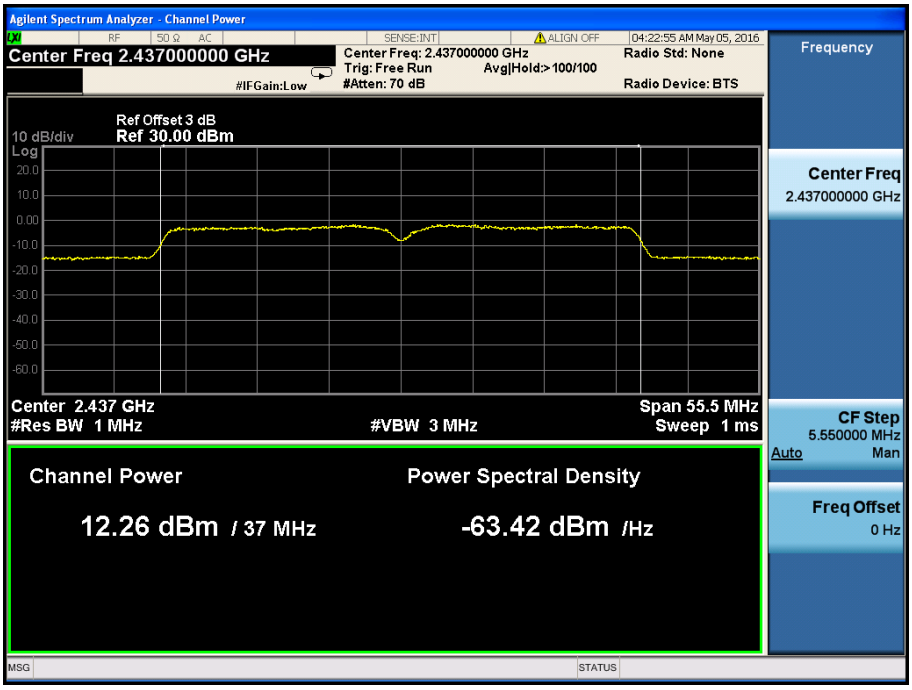
802.11n-HT20-MCS7-High Channel



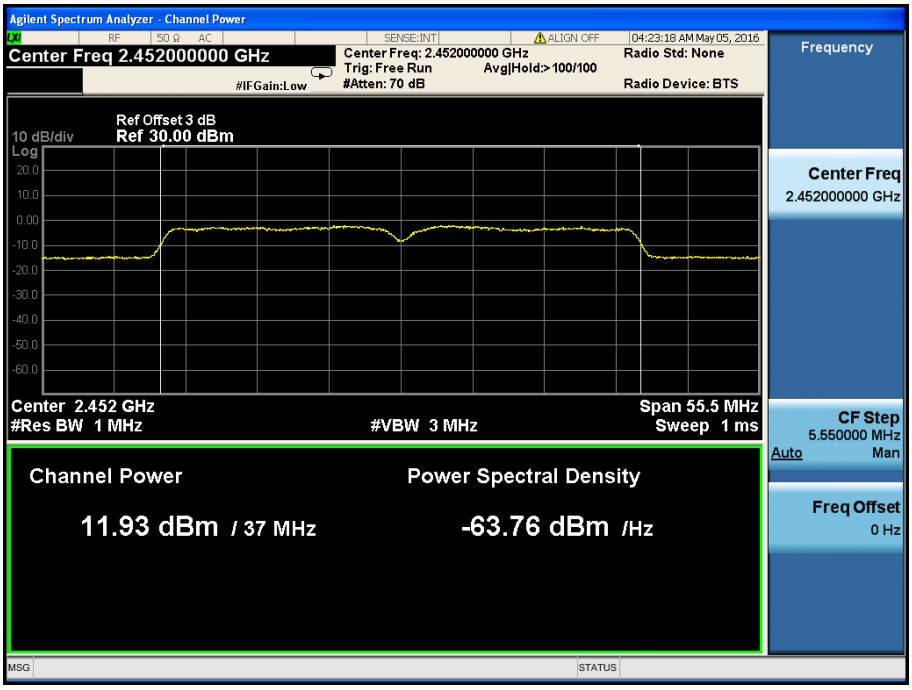
802.11n-HT40-MCS7-Low Channel



802.11n-HT40-MCS7-Middle Channel



802.11n-HT40-MCS7-High Channel



8. Field Strength of Spurious Emissions

8.1 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.

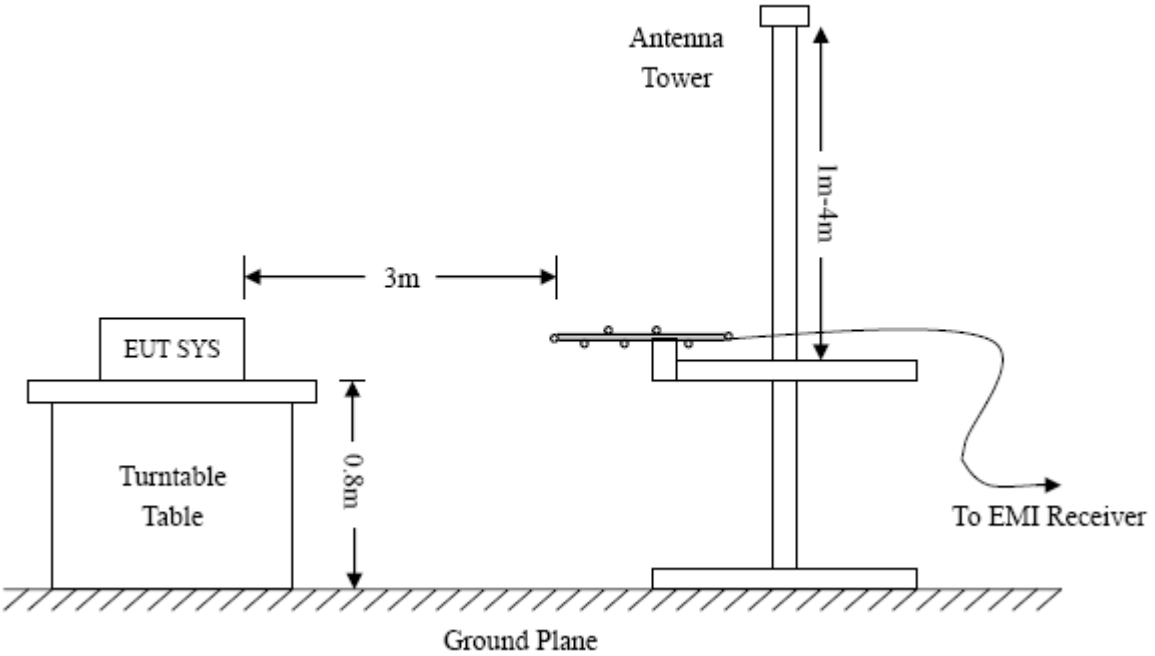
8.2 Standard Applicable

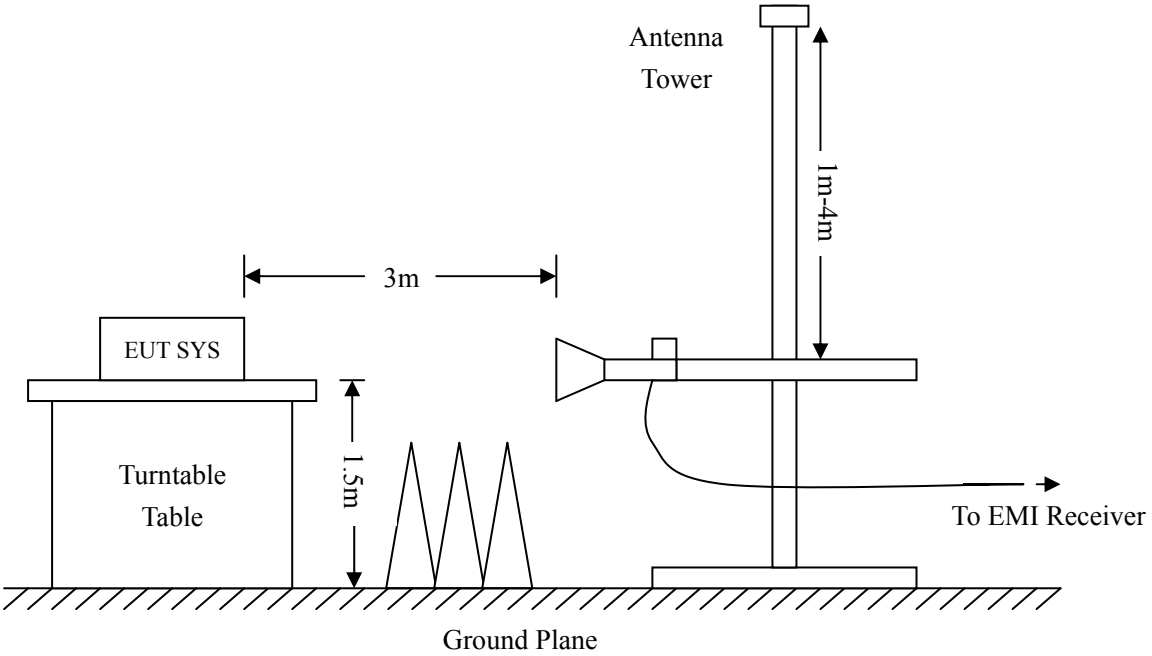
According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within 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.

8.3 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 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
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

8.4 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

8.5 Environmental Conditions

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

8.6 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 cases:

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

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

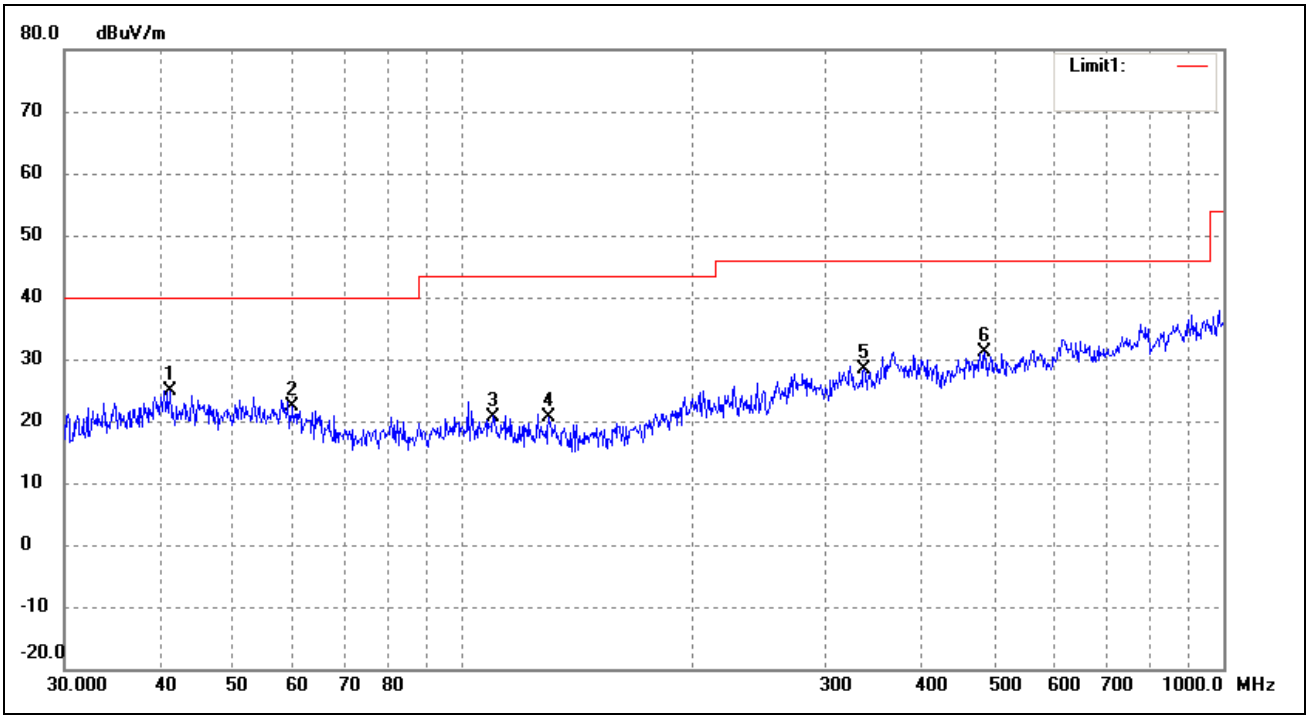
EUT: *Seal*

Tested Model: *8*

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

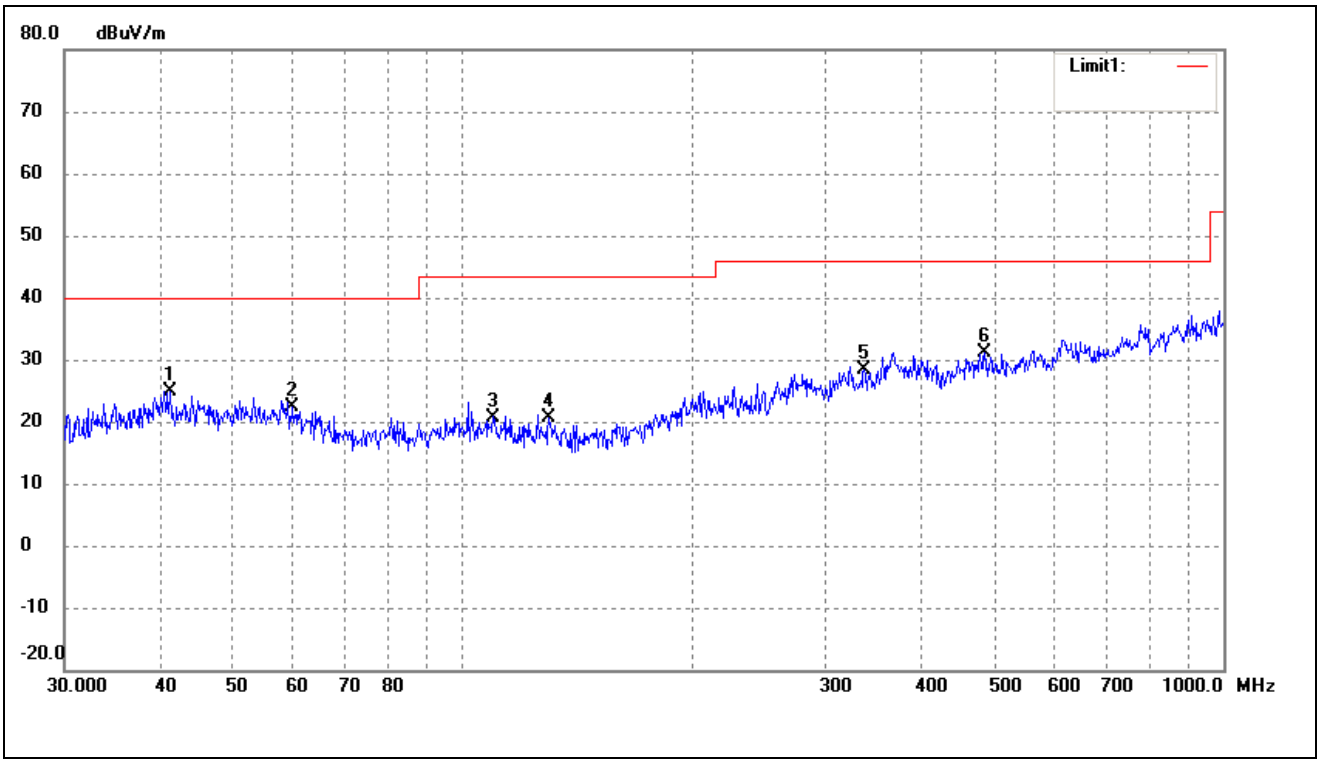
Comment: *DC3.7V*

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	41.2765	32.71	-7.75	24.96	40.00	-15.04	46	100	peak
2	59.8588	31.97	-9.56	22.41	40.00	-17.59	135	100	peak
3	109.7960	31.91	-11.16	20.75	43.50	-22.75	183	100	peak
4	129.9226	32.54	-11.99	20.55	43.50	-22.95	231	100	peak
5	337.2155	33.31	-4.93	28.38	46.00	-17.62	183	100	peak
6	485.6093	32.48	-1.36	31.12	46.00	-14.88	231	100	peak

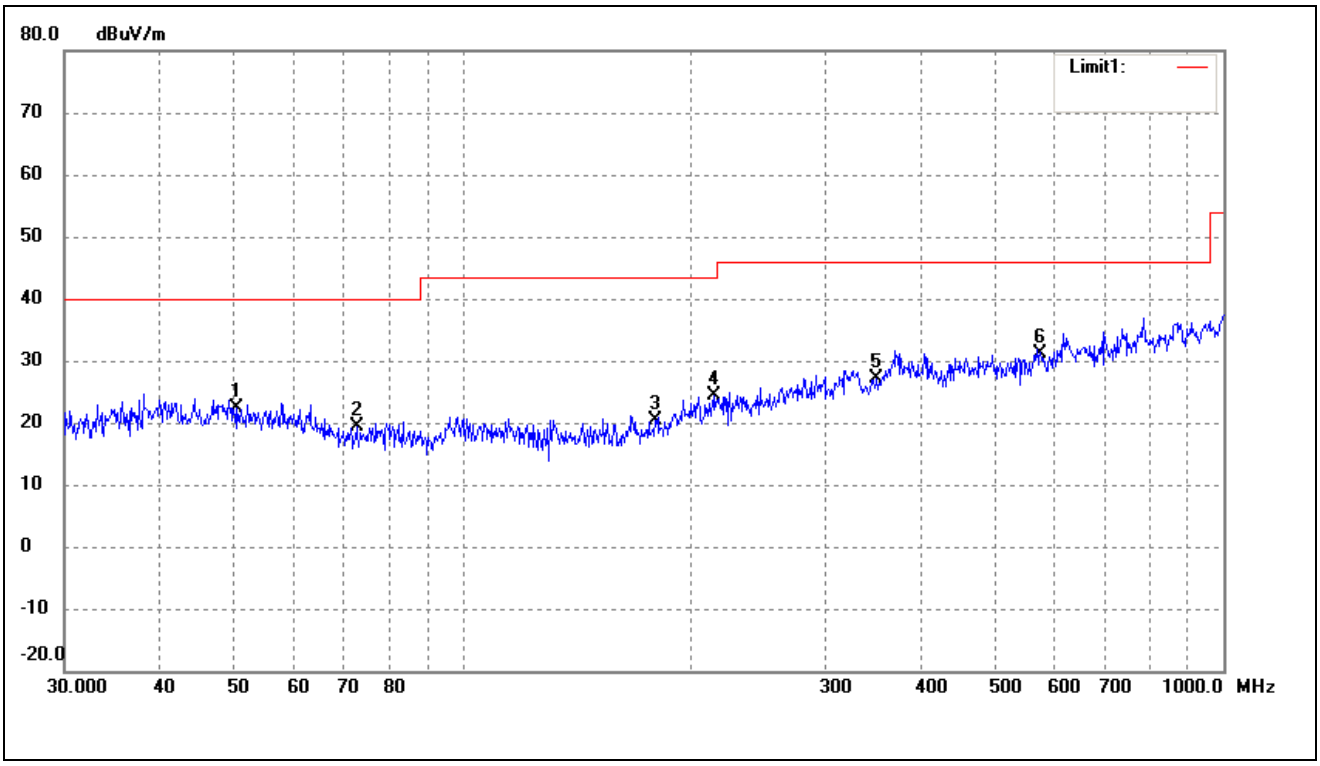
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	41.2765	32.71	-7.75	24.96	40.00	-15.04	79	100	peak
2	59.8588	31.97	-9.56	22.41	40.00	-17.59	146	100	peak
3	109.7960	31.91	-11.16	20.75	43.50	-22.75	201	100	peak
4	129.9226	32.54	-11.99	20.55	43.50	-22.95	278	100	peak
5	337.2155	33.31	-4.93	28.38	46.00	-17.62	201	100	peak
6	485.6093	32.48	-1.36	31.12	46.00	-14.88	278	100	peak

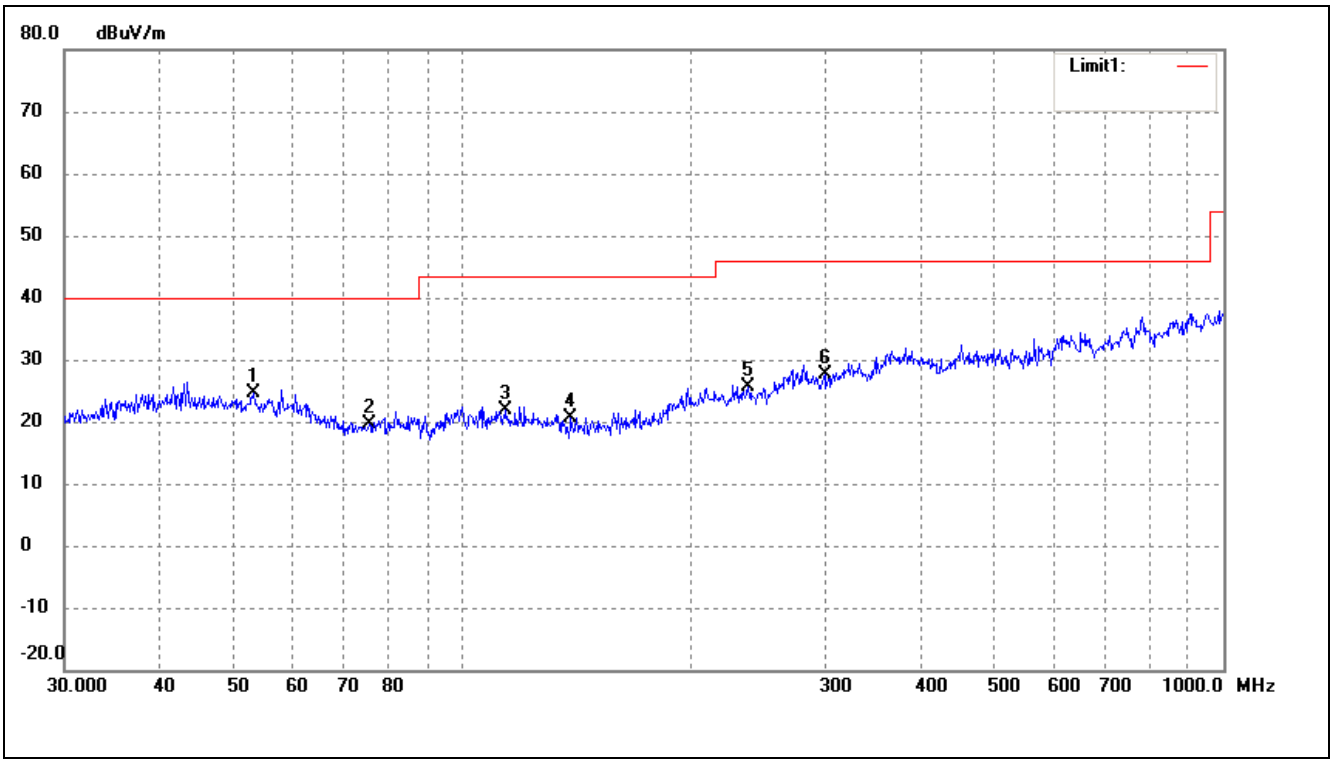
Operating Condition: *802.11b Transmitting Middle Channel-2437MHz*
Comment: *DC3.7V*

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	50.5860	30.84	-8.40	22.44	40.00	-17.56	360	100	peak
2	72.5917	31.89	-12.62	19.27	40.00	-20.73	360	100	peak
3	179.3864	31.84	-11.38	20.46	43.50	-23.04	360	100	peak
4	214.5143	33.24	-8.79	24.45	43.50	-19.05	360	100	peak
5	350.4768	31.28	-4.08	27.20	46.00	-18.80	360	100	peak
6	574.6258	32.33	-1.08	31.25	46.00	-14.75	360	100	peak

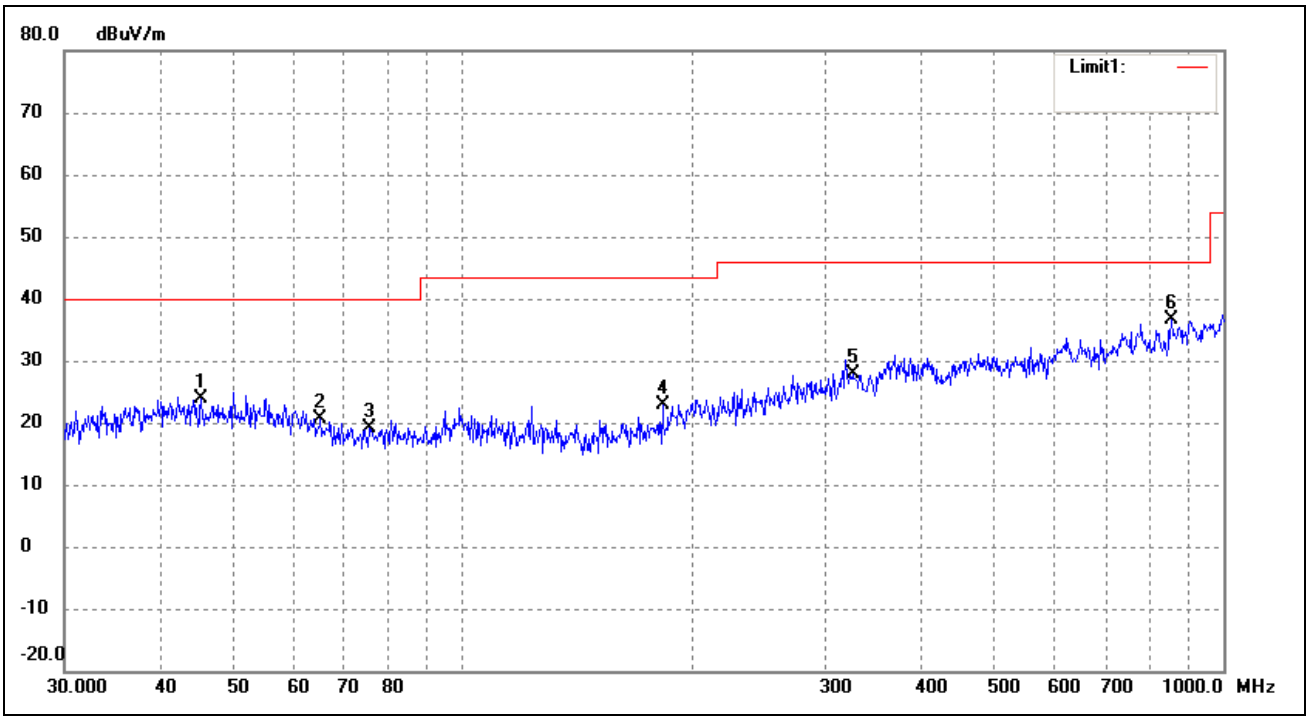
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	53.1313	33.31	-8.72	24.59	40.00	-15.41	41	100	peak
2	75.4464	31.93	-12.37	19.56	40.00	-20.44	86	100	peak
3	114.1138	33.13	-11.28	21.85	43.50	-21.65	153	100	peak
4	138.8735	33.23	-12.49	20.74	43.50	-22.76	237	100	peak
5	237.4760	33.93	-8.39	25.54	46.00	-20.46	0	100	peak
6	299.3158	33.30	-5.66	27.64	46.00	-18.36	0	100	peak

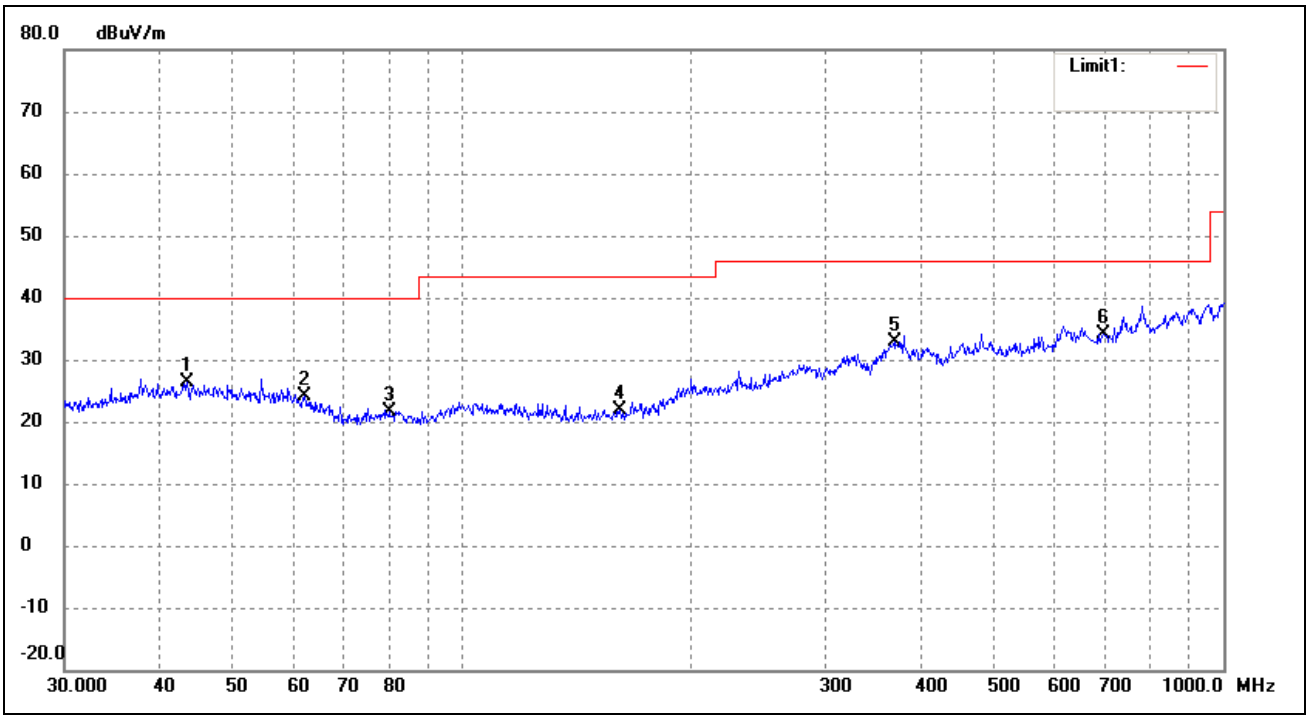
Operating Condition: *802.11b Transmitting High Channel-2462MHz*
Comment: *DC3.7V*

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	45.3755	31.79	-8.02	23.77	40.00	-16.23	360	100	peak
2	65.1145	31.90	-11.25	20.65	40.00	-19.35	360	100	peak
3	75.4464	31.60	-12.37	19.23	40.00	-20.77	360	100	peak
4	183.2005	33.74	-10.93	22.81	43.50	-20.69	360	100	peak
5	325.5958	32.70	-4.72	27.98	46.00	-18.02	360	100	peak
6	854.0247	33.89	2.63	36.52	46.00	-9.48	360	100	peak

Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	43.5057	34.33	-7.90	26.43	40.00	-13.57	360	100	peak
2	61.9951	34.33	-10.23	24.10	40.00	-15.90	360	100	peak
3	80.0806	33.61	-12.00	21.61	40.00	-18.39	360	100	peak
4	160.9089	34.08	-12.23	21.85	43.50	-21.65	360	100	peak
5	369.4047	35.69	-2.71	32.98	46.00	-13.02	360	100	peak
6	694.4174	34.00	0.10	34.10	46.00	-11.90	360	100	peak

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

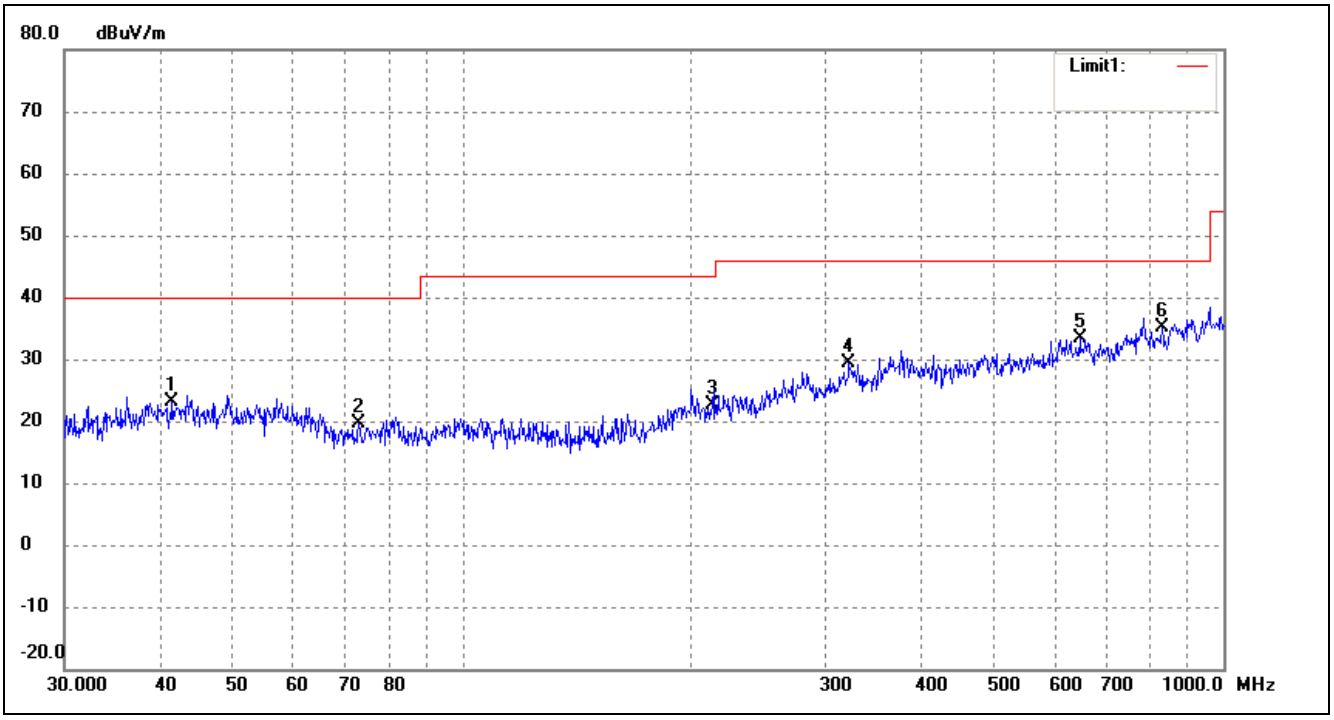
EUT: *Seal*

Tested Model: *8*

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

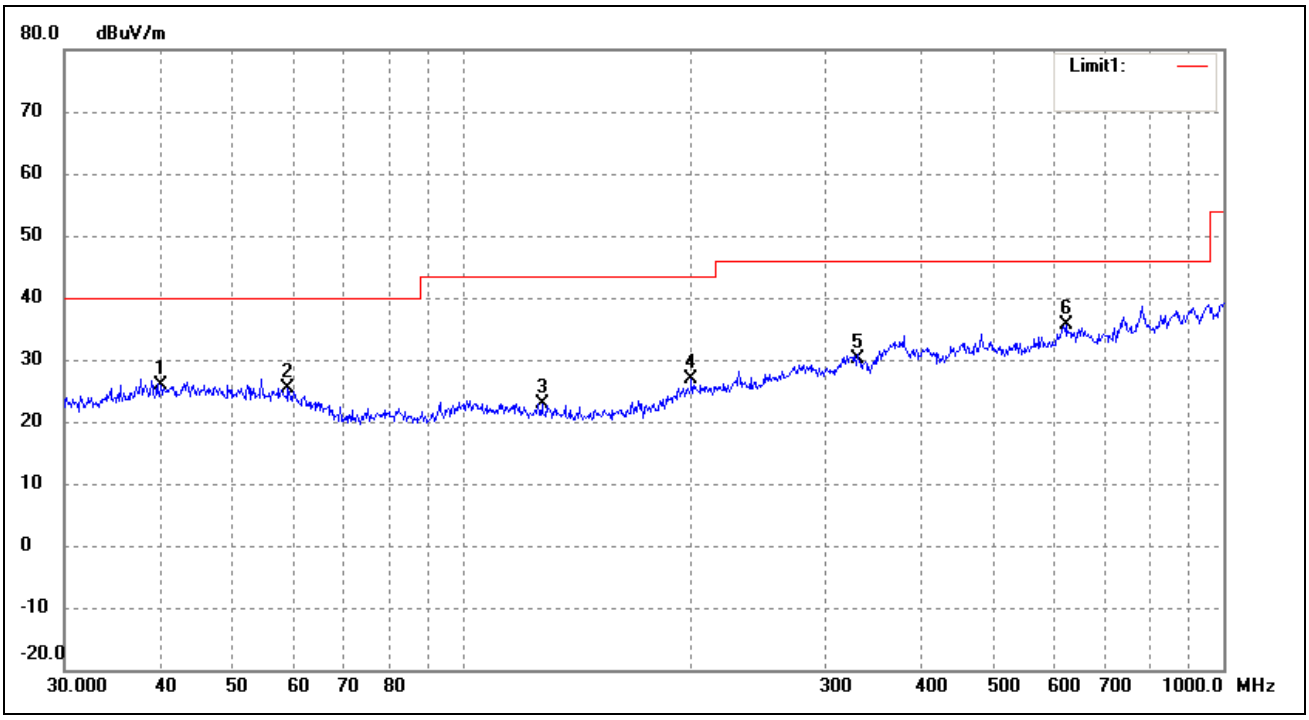
Comment: *DC 3.7V*

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	41.5670	30.95	-7.77	23.18	40.00	-16.82	360	100	peak
2	73.1025	32.21	-12.57	19.64	40.00	-20.36	360	100	peak
3	213.0151	31.35	-8.78	22.57	43.50	-20.93	360	100	peak
4	322.1886	34.01	-4.66	29.35	46.00	-16.65	360	100	peak
5	647.3856	32.77	0.56	33.33	46.00	-12.67	360	100	peak
6	830.4002	33.30	1.73	35.03	46.00	-10.97	360	100	peak

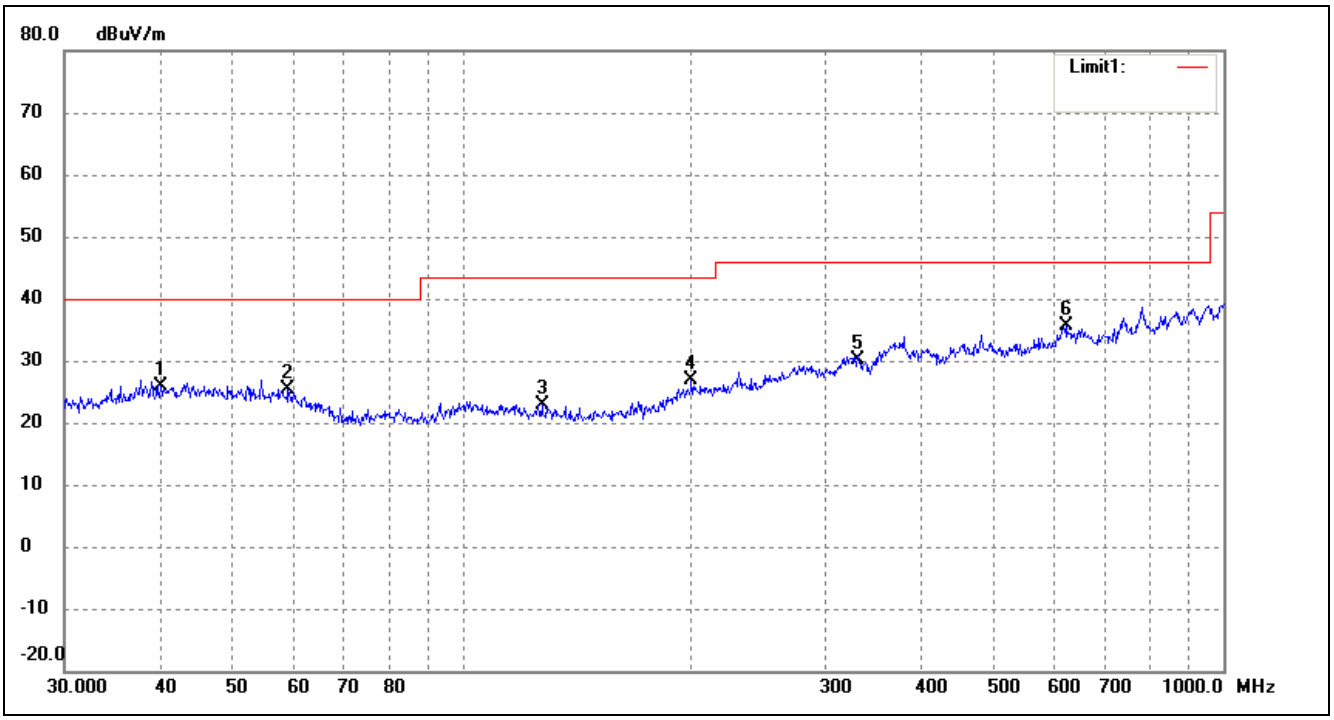
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	40.1347	33.62	-7.68	25.94	40.00	-14.06	360	100	peak
2	59.0251	34.83	-9.45	25.38	40.00	-14.62	360	100	peak
3	127.2176	34.82	-11.84	22.98	43.50	-20.52	360	100	peak
4	199.9856	35.63	-8.65	26.98	43.50	-16.52	360	100	peak
5	331.3547	35.04	-4.83	30.21	46.00	-15.79	360	100	peak
6	620.7096	34.36	1.21	35.57	46.00	-10.43	360	100	peak

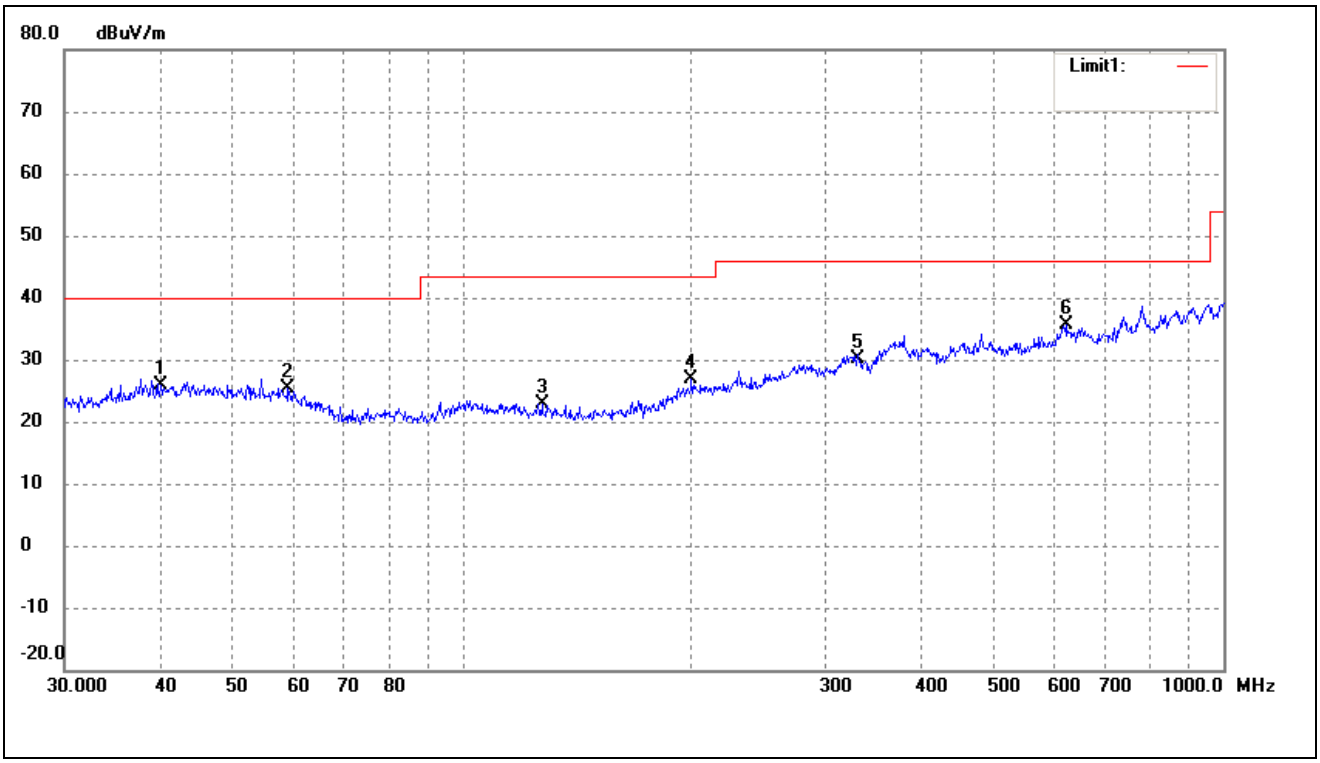
Operating Condition: *802.11g Transmitting Middle Channel-2437MHz*
Comment: *DC3.7V*

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	41.5670	30.95	-7.77	23.18	40.00	-16.82	360	100	peak
2	73.1025	32.21	-12.57	19.64	40.00	-20.36	360	100	peak
3	213.0151	31.35	-8.78	22.57	43.50	-20.93	360	100	peak
4	322.1886	34.01	-4.66	29.35	46.00	-16.65	360	100	peak
5	647.3856	32.77	0.56	33.33	46.00	-12.67	360	100	peak
6	830.4002	33.30	1.73	35.03	46.00	-10.97	360	100	peak

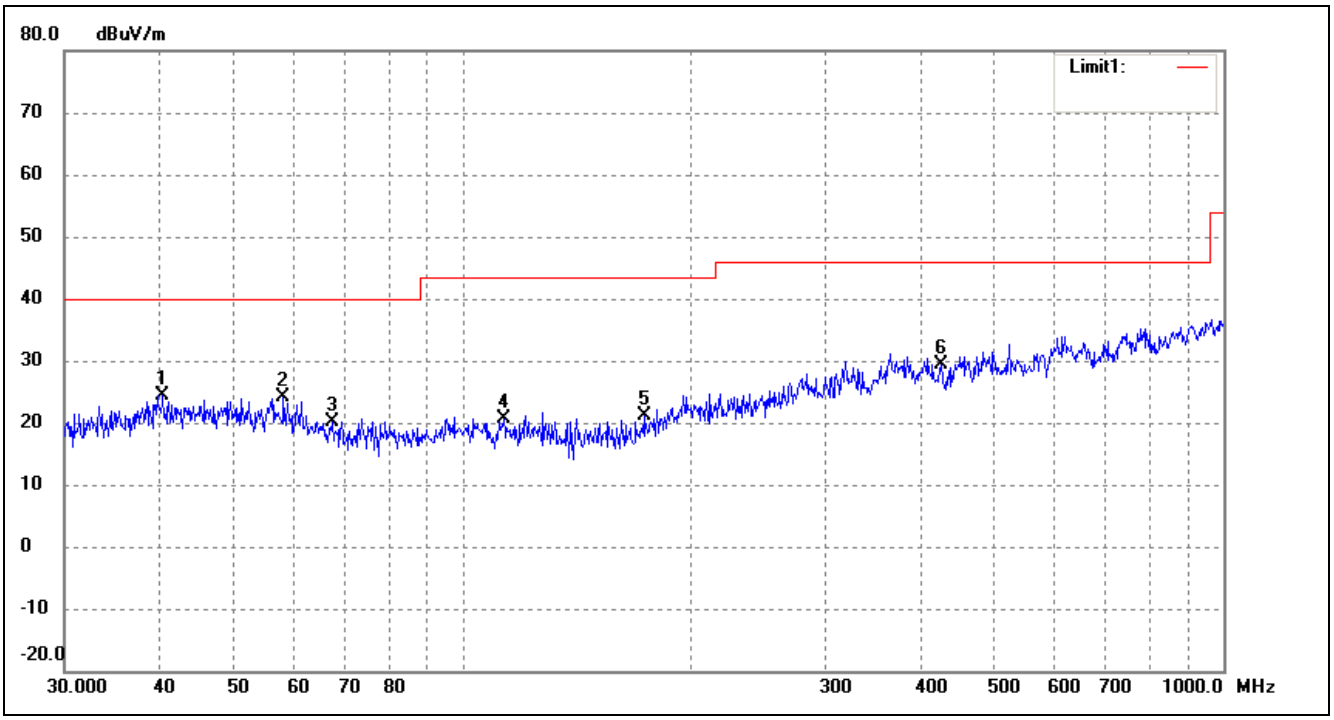
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	40.1347	33.62	-7.68	25.94	40.00	-14.06	146	100	peak
2	59.0251	34.83	-9.45	25.38	40.00	-14.62	38	100	peak
3	127.2176	34.82	-11.84	22.98	43.50	-20.52	185	100	peak
4	199.9856	35.63	-8.65	26.98	43.50	-16.52	266	100	peak
5	331.3547	35.04	-4.83	30.21	46.00	-15.79	124	100	peak
6	620.7096	34.36	1.21	35.57	46.00	-10.43	57	100	peak

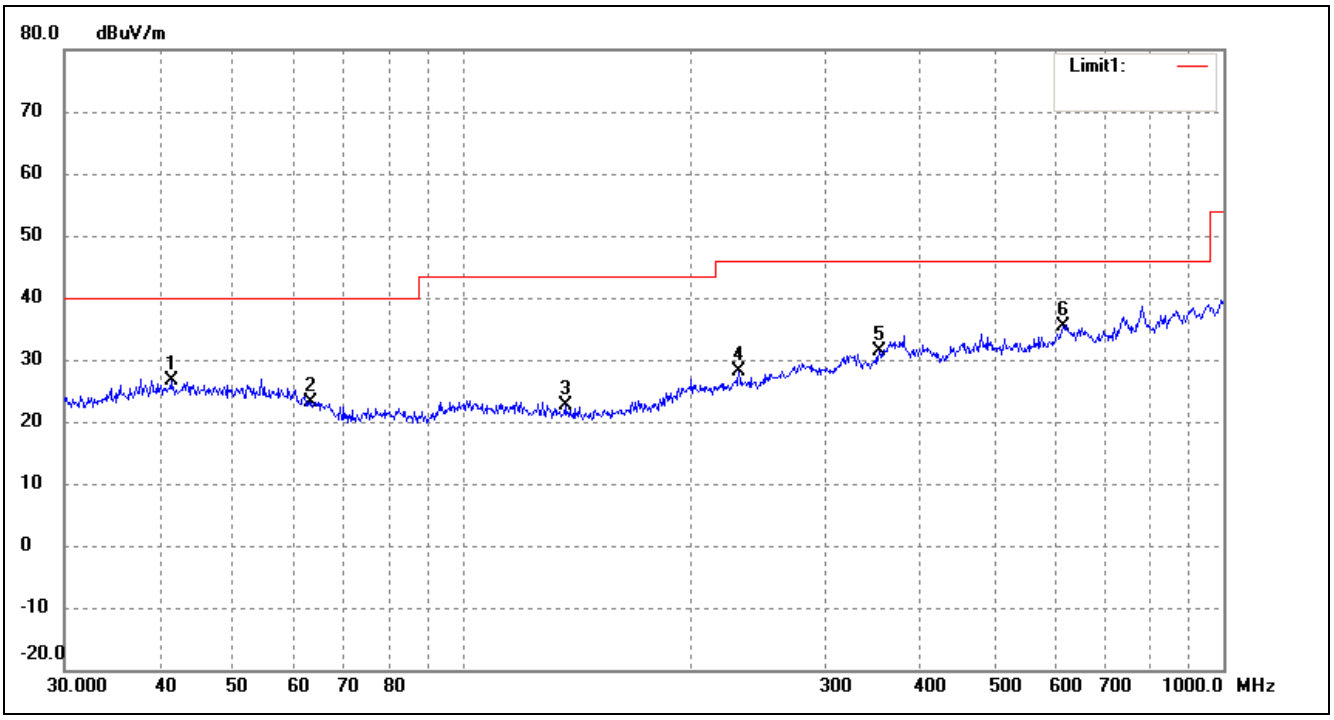
Operating Condition: *802.11g Transmitting High Channel-2462MHz*
Comment: *DC3.7V*

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	40.4172	31.96	-7.70	24.26	40.00	-15.74	360	150	peak
2	58.2030	33.52	-9.35	24.17	40.00	-15.83	360	150	peak
3	67.4382	32.22	-12.00	20.22	40.00	-19.78	360	150	peak
4	113.3163	31.87	-11.25	20.62	43.50	-22.88	360	150	peak
5	173.2051	32.81	-11.68	21.13	43.50	-22.37	360	150	peak
6	426.5210	32.82	-3.32	29.50	46.00	-16.50	360	150	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	41.4215	34.43	-7.76	26.67	40.00	-13.33	360	100	peak
2	63.3132	33.90	-10.66	23.24	40.00	-16.76	360	100	peak
3	136.4598	35.04	-12.37	22.67	43.50	-20.83	360	100	peak
4	230.9068	36.58	-8.57	28.01	46.00	-17.99	360	100	peak
5	352.9434	35.18	-3.86	31.32	46.00	-14.68	360	100	peak
6	616.3718	34.38	0.99	35.37	46.00	-10.63	360	100	peak

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

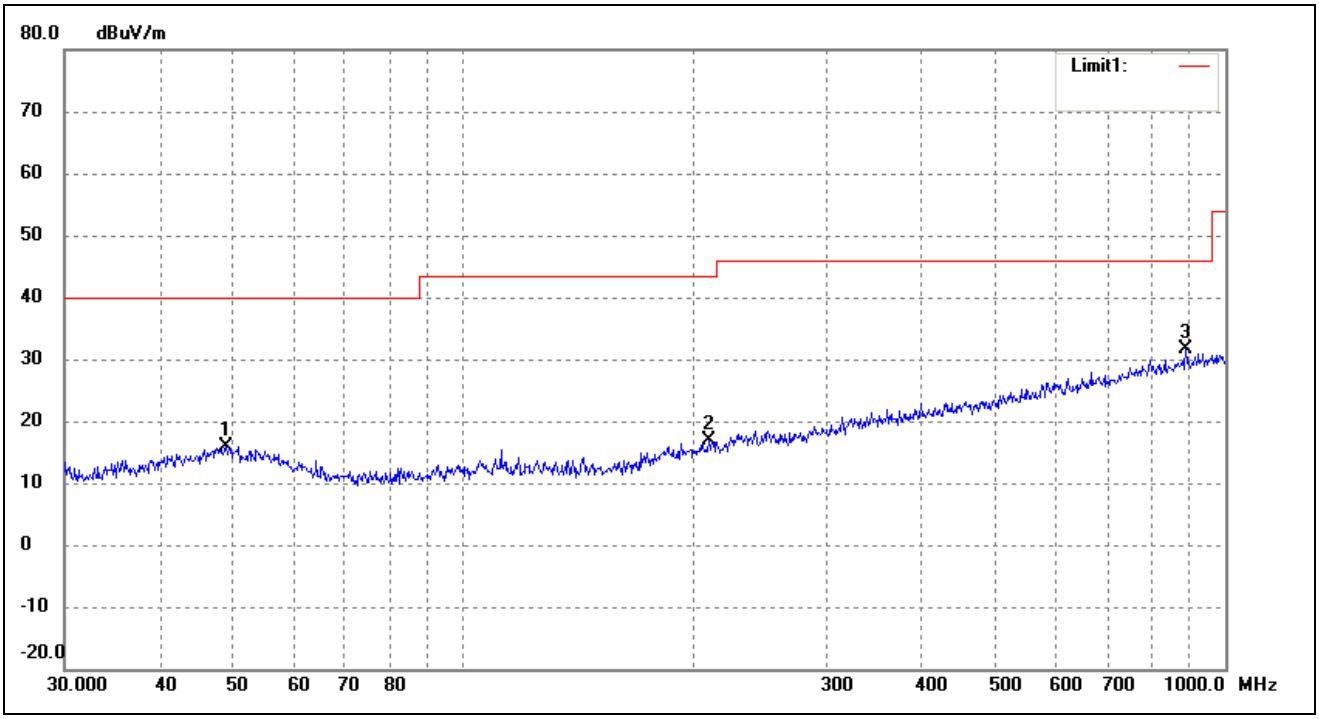
EUT: *Seal*

Tested Model: *8*

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

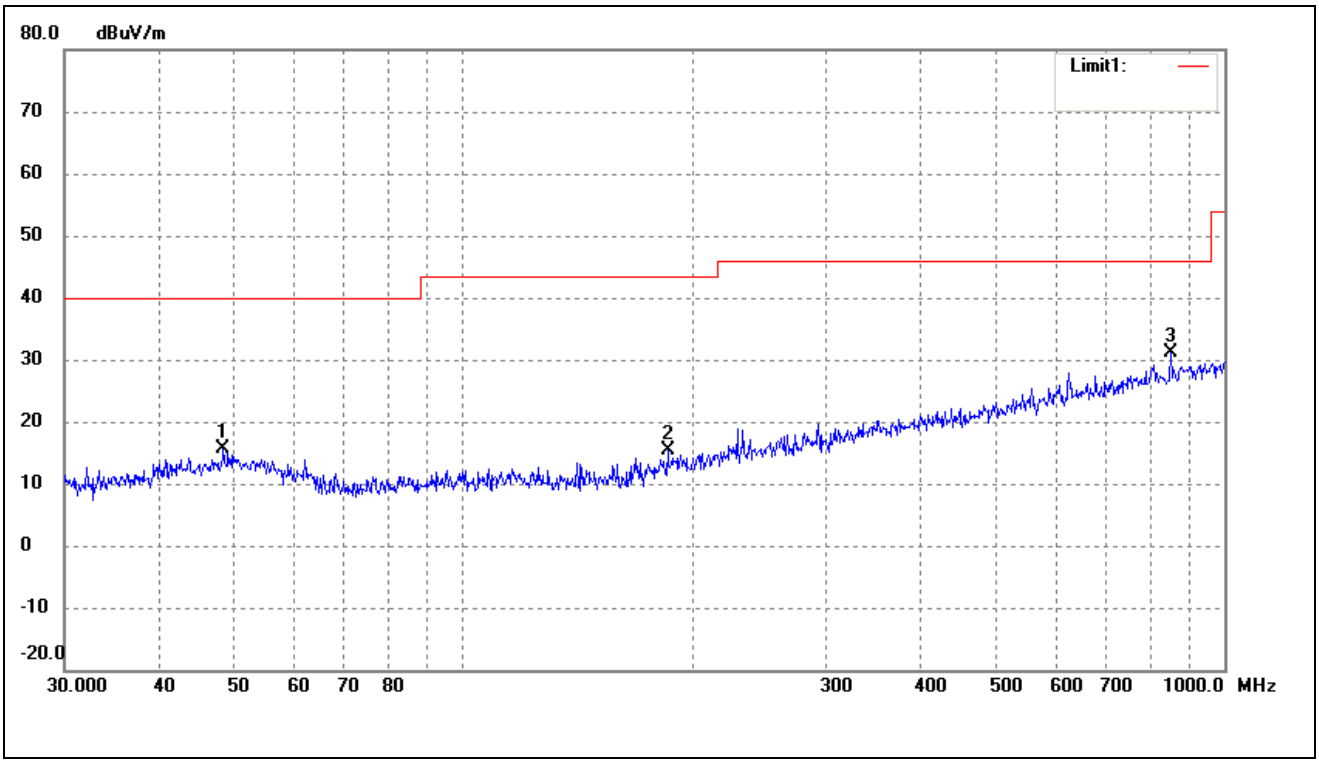
Comment: *DC 3.7V*

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	48.8429	24.35	-8.52	15.83	40.00	-24.17	270	100	peak
2	210.0482	24.66	-7.84	16.82	43.50	-26.68	160	100	peak
3	887.6099	26.23	5.51	31.74	46.00	-14.26	228	200	peak

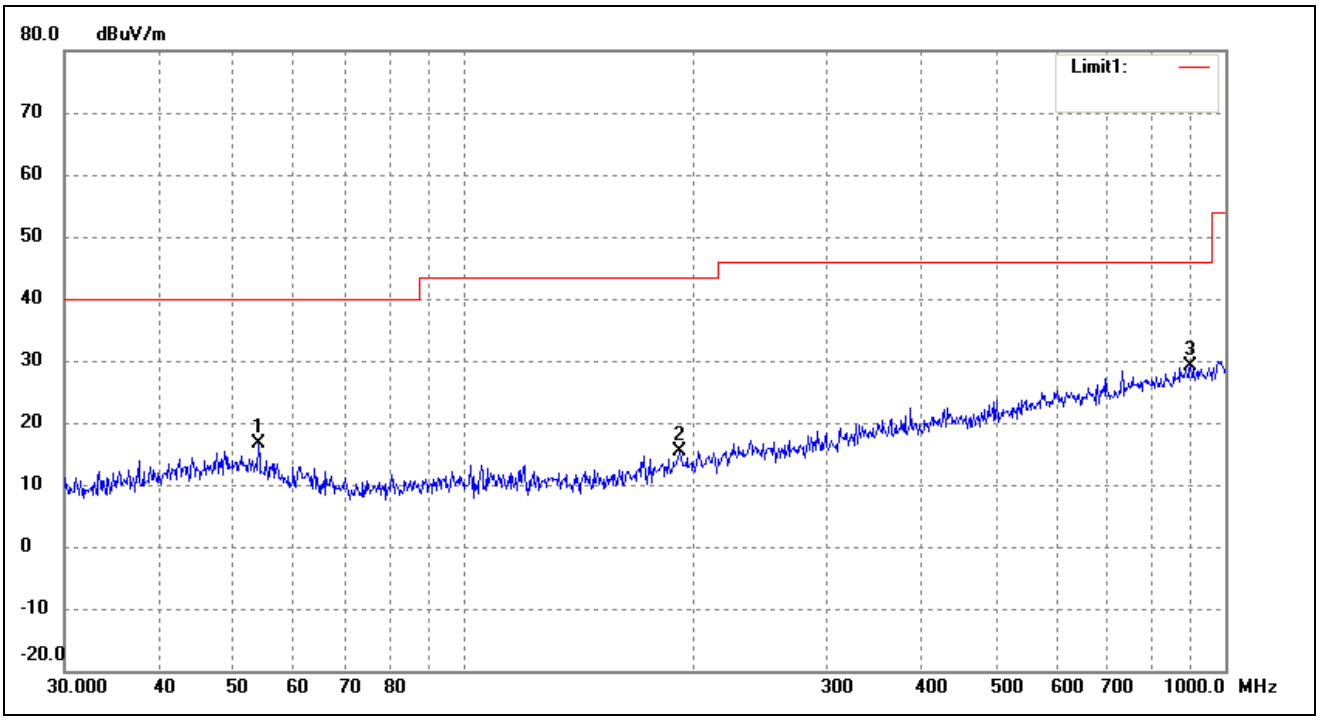
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	48.5016	24.29	-8.58	15.71	40.00	-24.29	360	100	peak
2	185.7882	24.19	-8.78	15.41	43.50	-28.09	120	100	peak
3	851.0353	26.12	4.92	31.04	46.00	-14.96	270	100	peak

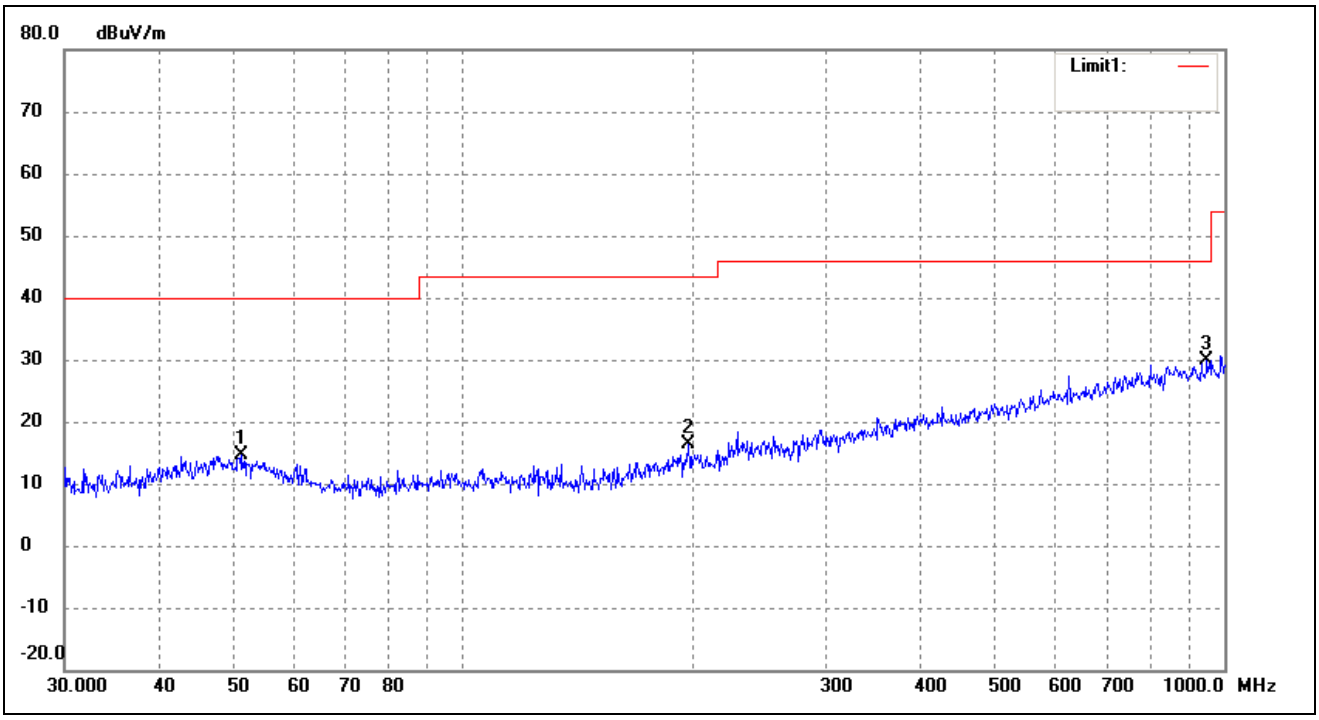
Operating Condition: *802.11n-HT20 Transmitting Middle Channel-2437MHz*
Comment: *DC3.7V*

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	53.8818	25.89	-9.17	16.72	40.00	-23.28	270	100	peak
2	192.4186	23.63	-8.37	15.26	43.50	-28.24	150	100	peak
3	900.1474	23.49	5.65	29.14	46.00	-16.86	360	100	peak

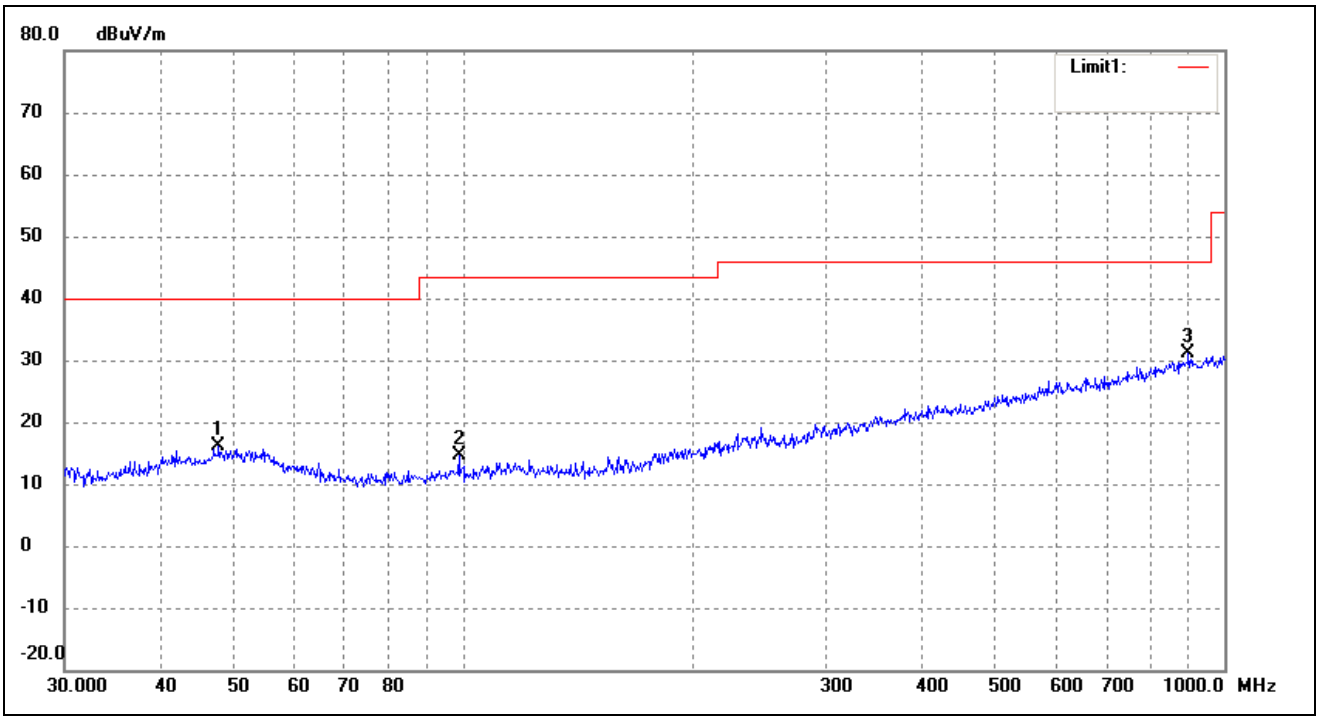
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	51.3005	23.17	-8.63	14.54	40.00	-25.46	360	100	peak
2	197.8928	24.60	-8.22	16.38	43.50	-27.12	180	100	peak
3	948.7610	23.86	5.94	29.80	46.00	-16.20	120	100	peak

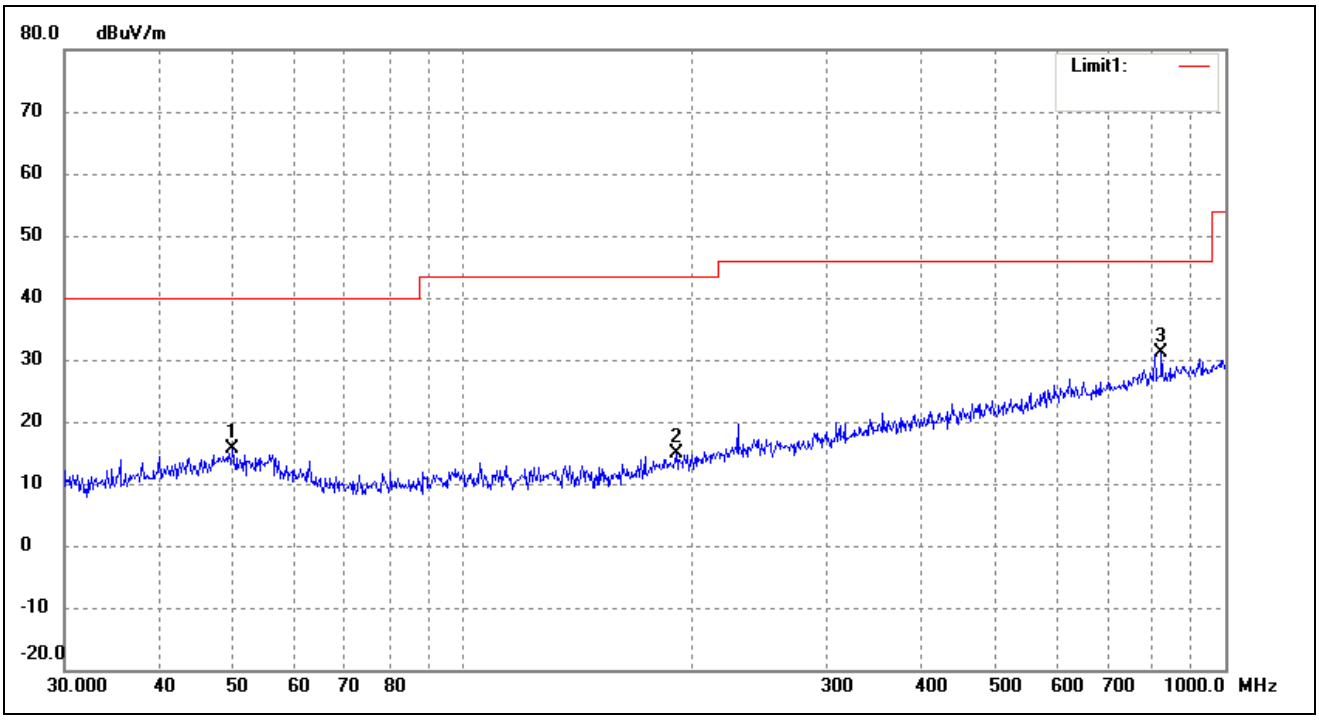
Operating Condition: *802.11n-HT20 Transmitting High Channel-2462MHz*
Comment: *DC3.7V*

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	47.8260	24.87	-8.68	16.19	40.00	-23.81	260	100	peak
2	98.8326	25.83	-11.30	14.53	43.50	-28.97	120	200	peak
3	896.9965	25.59	5.62	31.21	46.00	-14.79	289	200	peak

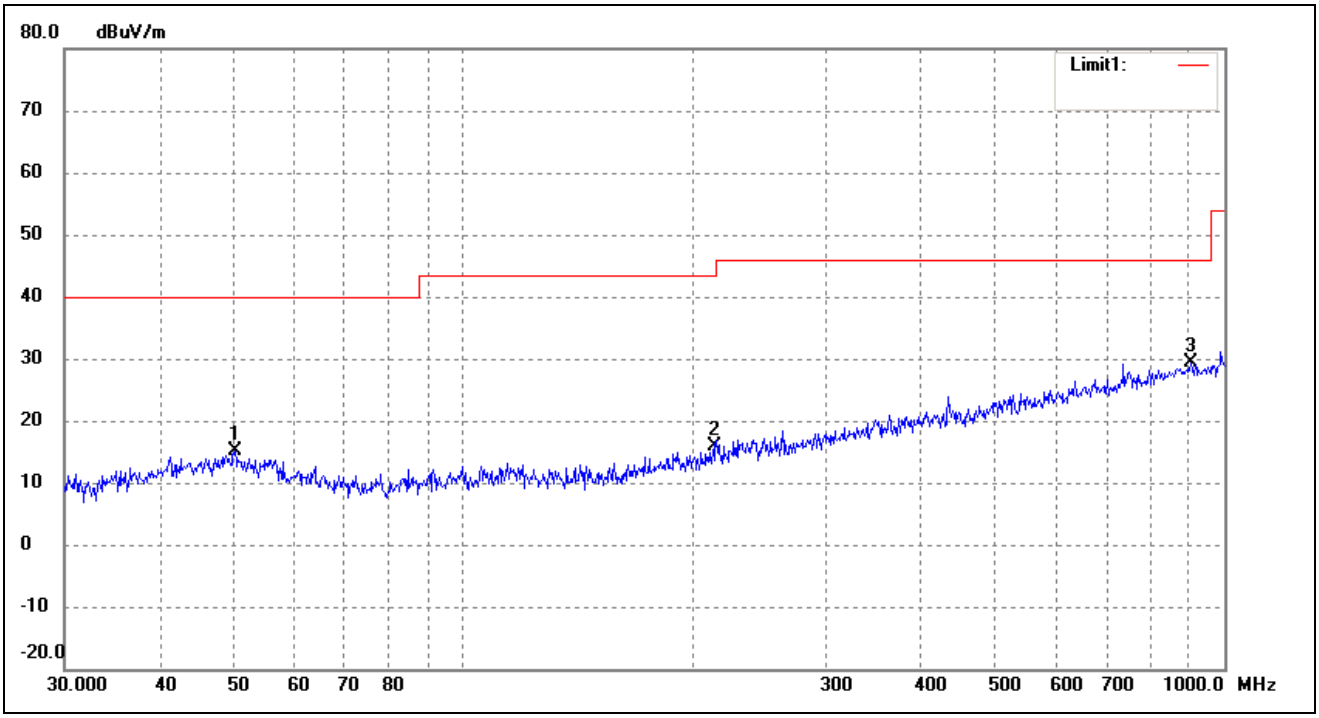
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	49.8814	24.10	-8.37	15.73	40.00	-24.27	130	100	peak
2	190.4050	23.35	-8.43	14.92	43.50	-28.58	120	100	peak
3	824.5968	26.59	4.52	31.11	46.00	-14.89	360	100	peak

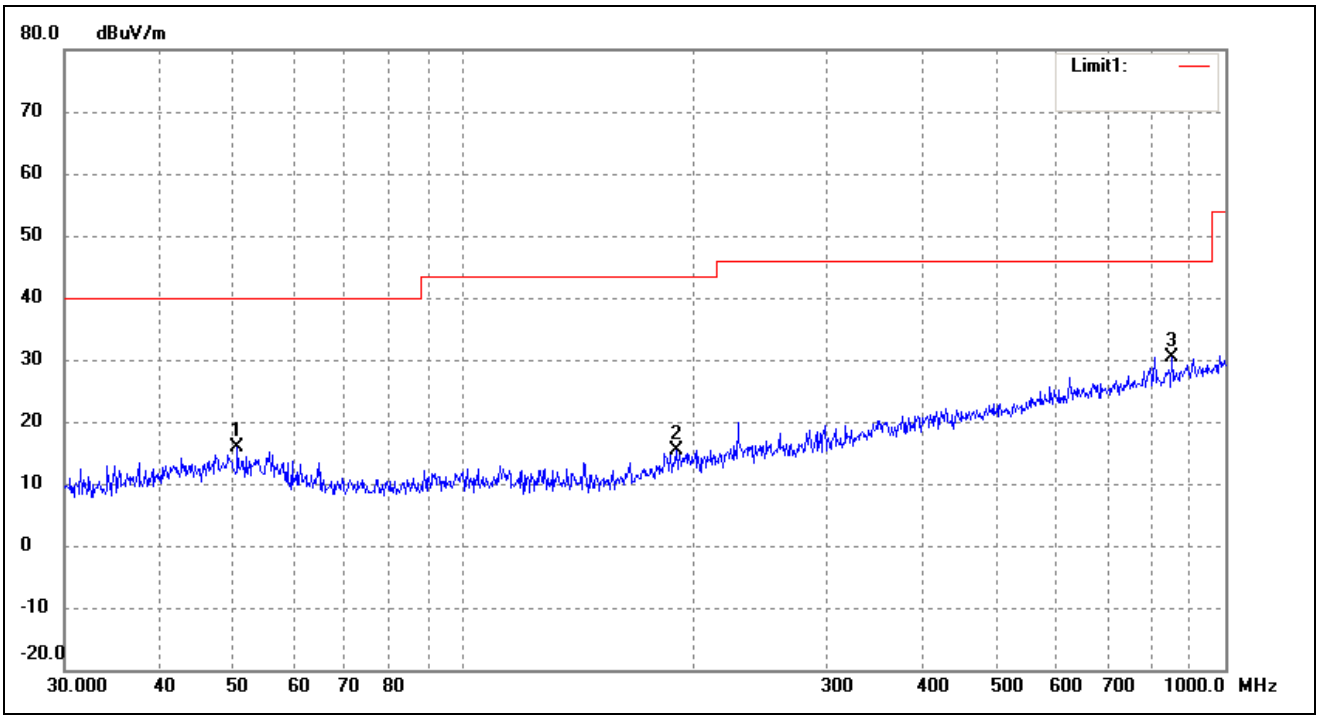
EUT: *Seal*
Tested Model: *8*
Operating Condition: *802.11n-HT40 Transmitting Low Channel-2422MHz*
Comment: *DC 3.7V*

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	50.2325	23.47	-8.40	15.07	40.00	-24.93	274	100	peak
2	214.5143	23.42	-7.60	15.82	43.50	-27.68	130	100	peak
3	903.3094	23.65	5.66	29.31	46.00	-16.69	120	100	peak

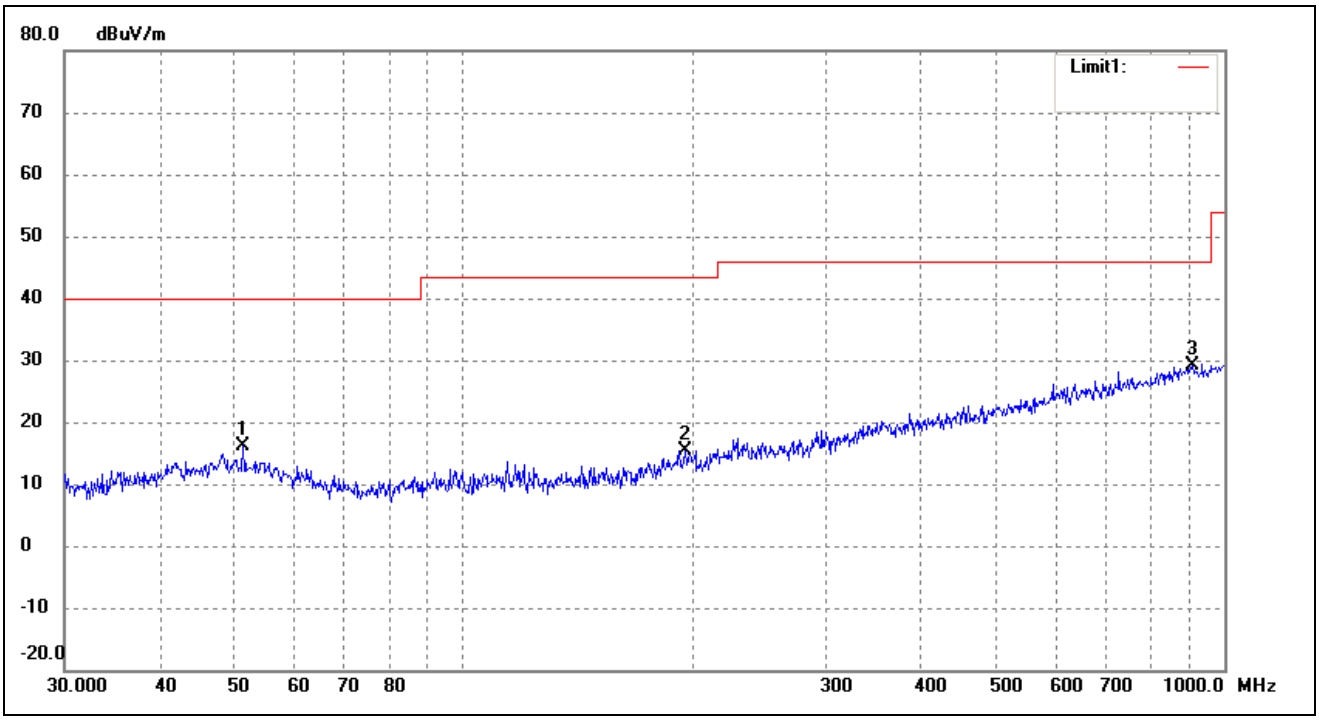
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	50.5860	24.44	-8.47	15.97	40.00	-24.03	360	100	peak
2	190.4050	23.76	-8.43	15.33	43.50	-28.17	110	100	peak
3	851.0353	25.49	4.92	30.41	46.00	-15.59	120	100	peak

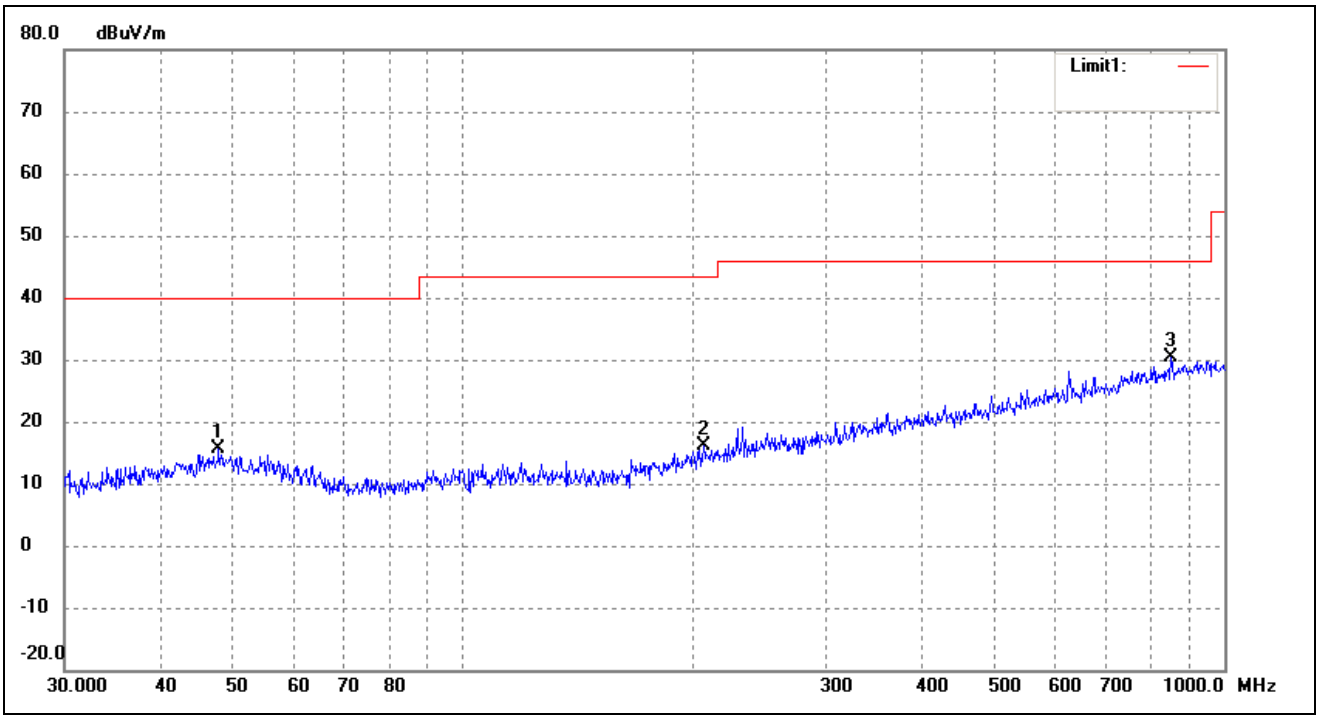
Operating Condition: *802.11n-HT40 Transmitting Middle Channel-2437MHz*
Comment: *DC3.7V*

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	51.4807	24.85	-8.67	16.18	40.00	-23.82	360	100	peak
2	195.8220	23.71	-8.27	15.44	43.50	-28.06	138	100	peak
3	909.6667	23.51	5.71	29.22	46.00	-16.78	180	200	peak

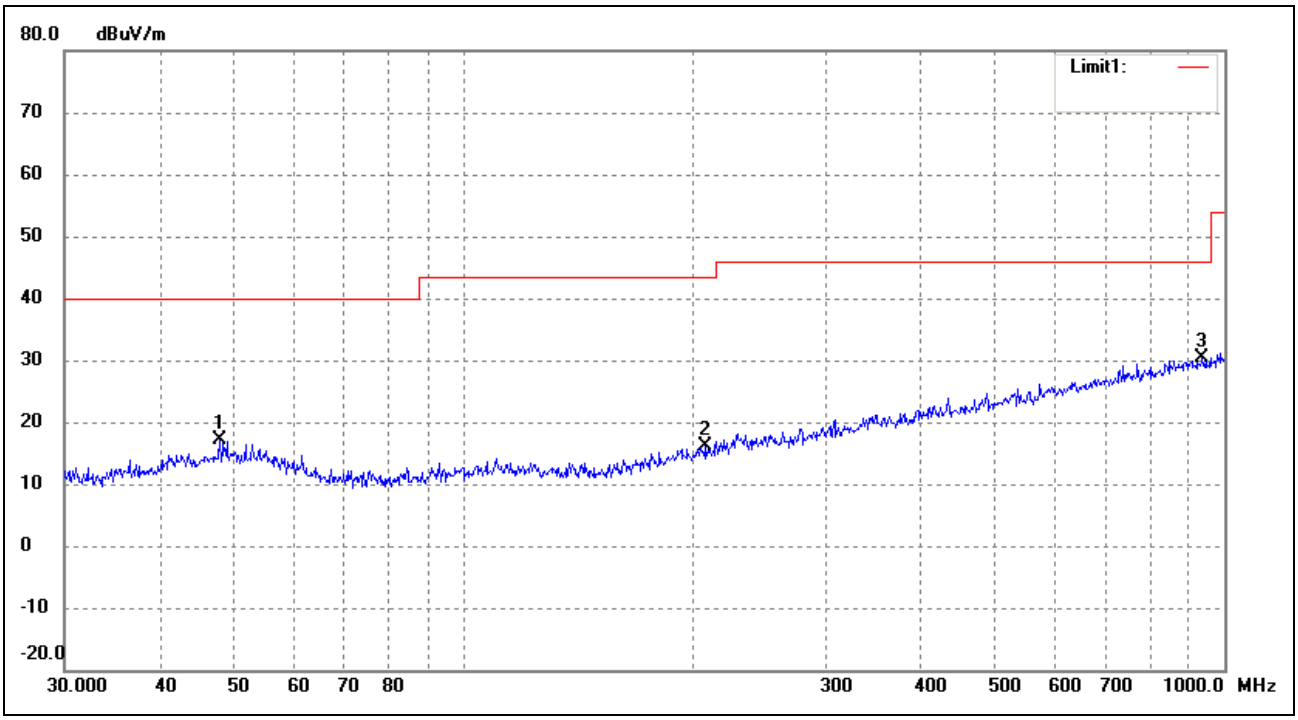
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	47.8260	24.21	-8.68	15.53	40.00	-24.47	270	100	peak
2	207.1226	24.17	-7.94	16.23	43.50	-27.27	120	100	peak
3	851.0353	25.56	4.92	30.48	46.00	-15.52	360	100	peak

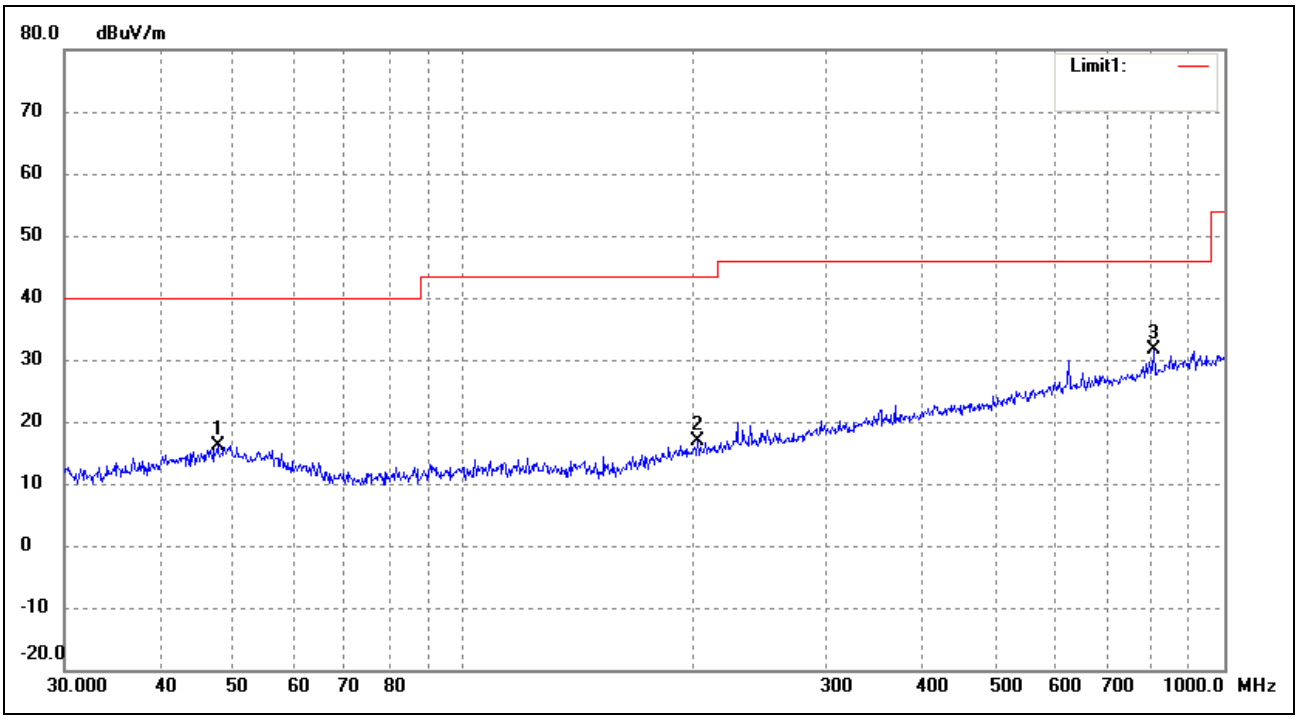
Operating Condition: *802.11n-HT40 Transmitting High Channel-2452MHz*
Comment: *DC3.7V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	47.9940	25.75	-8.66	17.09	40.00	-22.91	155	100	peak
2	208.5803	24.06	-7.89	16.17	43.50	-27.33	197	100	peak
3	935.5463	24.62	5.84	30.46	46.00	-15.54	310	100	peak

Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	47.6586	24.75	-8.70	16.05	40.00	-23.95	274	100	peak
2	203.5228	24.88	-8.04	16.84	43.50	-26.66	116	100	peak
3	807.4291	27.30	4.35	31.65	46.00	-14.35	82	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							
4824.000	44.91	12.37	57.28	74	-16.72	H	PK
4824.000	34.28	12.37	46.65	54	-7.35	H	AV
7236.000	36.69	15.49	52.18	74	-21.82	H	PK
7236.000	27.88	15.49	43.37	54	-10.63	H	AV
4824.000	45.53	12.37	57.90	74	-16.10	V	PK
4824.000	34.27	12.37	46.64	54	-7.36	V	AV
7236.000	36.67	15.49	52.16	74	-21.84	V	PK
7236.000	27.02	15.49	42.51	54	-11.49	V	AV
Middle Channel-2437MHz							
4874.000	44.57	12.46	57.03	74	-16.97	H	PK
4874.000	33.51	12.46	45.97	54	-8.03	H	AV
7311.000	39.21	15.56	54.77	74	-19.23	H	PK
7311.000	26.28	15.56	41.84	54	-12.16	H	AV
4874.000	45.46	12.46	57.92	74	-16.08	V	PK
4874.000	33.51	12.46	45.97	54	-8.03	V	AV
7311.000	38.28	15.56	53.84	74	-20.16	V	PK
7311.000	27.67	15.56	43.23	54	-10.77	V	AV
High Channel-2462MHz							
4924.000	44.33	12.55	56.88	74	-17.12	H	PK
4924.000	31.12	12.55	43.67	54	-10.33	H	AV
7386.000	34.69	15.64	50.33	74	-23.67	H	PK
7386.000	23.84	15.64	39.48	54	-14.52	H	AV
4924.000	46.37	12.55	58.92	74	-15.08	V	PK
4924.000	32.39	12.55	44.94	54	-9.06	V	AV
7386.000	34.87	15.64	50.51	74	-23.49	V	PK
7386.000	23.97	15.64	39.61	54	-14.39	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							
4824.000	42.72	12.37	55.09	74	-18.91	H	PK
4824.000	31.24	12.37	43.61	54	-10.39	H	AV
7236.000	36.71	15.49	52.20	74	-21.80	H	PK
7236.000	25.30	15.49	40.79	54	-13.21	H	AV
4824.000	43.12	12.37	55.49	74	-18.51	V	PK
4824.000	31.35	12.37	43.72	54	-10.28	V	AV
7236.000	36.85	15.49	52.34	74	-21.66	V	PK
7236.000	25.35	15.49	40.84	54	-13.16	V	AV
Middle Channel-2437MHz							
4874.000	42.44	12.46	54.9	74	-19.1	H	PK
4874.000	30.94	12.46	43.4	54	-10.6	H	AV
7311.000	37.73	15.56	53.29	74	-20.71	H	PK
7311.000	25.69	15.56	41.25	54	-12.75	H	AV
4874.000	42.32	12.46	54.78	74	-19.22	V	PK
4874.000	31.01	12.46	43.47	54	-10.53	V	AV
7311.000	36.92	15.56	52.48	74	-21.52	V	PK
7311.000	25.74	15.56	41.3	54	-12.7	V	AV
High Channel-2462MHz							
4924.000	42.92	12.55	55.47	74	-18.53	H	PK
4924.000	31.44	12.55	43.99	54	-10.01	H	AV
7386.000	36.91	15.64	52.55	74	-21.45	H	PK
7386.000	25.5	15.64	41.14	54	-12.86	H	AV
4924.000	43.32	12.55	55.87	74	-18.13	V	PK
4924.000	31.55	12.55	44.1	54	-9.9	V	AV
7386.000	37.05	15.64	52.69	74	-21.31	V	PK
7386.000	25.55	15.64	41.19	54	-12.81	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							
4824.000	42.07	12.37	54.44	74	-19.56	H	PK
4824.000	30.57	12.37	42.94	54	-11.06	H	AV
7236.000	37.36	15.49	52.85	74	-21.15	H	PK
7236.000	25.32	15.49	40.81	54	-13.19	H	AV
4824.000	41.95	12.37	54.32	74	-19.68	V	PK
4824.000	30.64	12.37	43.01	54	-10.99	V	AV
7236.000	36.55	15.49	52.04	74	-21.96	V	PK
7236.000	25.37	15.49	40.86	54	-13.14	V	AV
Middle Channel-2437MHz							
4874.000	42.93	12.46	55.39	74	-18.61	H	PK
4874.000	32.63	12.46	45.09	54	-8.91	H	AV
7311.000	35.79	15.56	51.35	74	-22.65	H	PK
7311.000	23.45	15.56	39.01	54	-14.99	H	AV
4874.000	34.53	12.46	46.99	74	-27.01	V	PK
4874.000	26.31	12.46	38.77	54	-15.23	V	AV
7311.000	34.31	15.56	49.87	74	-24.13	V	PK
7311.000	23.55	15.56	39.11	54	-14.89	V	AV
High Channel-2462MHz							
4924.000	41.88	12.55	54.43	74	-19.57	H	PK
4924.000	31.06	12.55	43.61	54	-10.39	H	AV
7386.000	37.31	15.64	52.95	74	-21.05	H	PK
7386.000	25.79	15.64	41.43	54	-12.57	H	AV
4924.000	42.17	12.55	54.72	74	-19.28	V	PK
4924.000	31.27	12.55	43.82	54	-10.18	V	AV
7386.000	36.80	15.64	52.44	74	-21.56	V	PK
7386.000	25.75	15.64	41.39	54	-12.61	V	AV

Test Mode: 802.11n-HT40

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2422MHz							
4844.000	41.60	12.4	54.00	74	-20.00	H	PK
4824.000	30.74	12.4	43.14	54	-10.86	H	AV
7266.000	33.06	15.52	48.58	74	-25.42	H	PK
7266.000	24.22	15.52	39.74	54	-14.26	H	AV
4844.000	43.70	12.4	56.10	74	-17.90	V	PK
4824.000	29.93	12.4	42.33	54	-11.67	V	AV
7266.000	33.67	15.52	49.19	74	-24.81	V	PK
7266.000	23.61	15.52	39.13	54	-14.87	V	AV
Middle Channel-2437MHz							
4874.000	42.67	12.46	55.13	74	-18.87	H	PK
4874.000	30.89	12.46	43.35	54	-10.65	H	AV
7311.000	36.98	15.56	52.54	74	-21.46	H	PK
7311.000	25.89	15.56	41.45	54	-12.55	H	AV
4874.000	42.51	12.46	54.97	74	-19.03	V	PK
4874.000	30.89	12.46	43.35	54	-10.65	V	AV
7311.000	36.91	15.56	52.47	74	-21.53	V	PK
7311.000	25.43	15.56	40.99	54	-13.01	V	AV
High Channel-2452MHz							
4904.000	43.47	12.52	55.99	74	-18.01	H	PK
4904.000	31.43	12.52	43.95	54	-10.05	H	AV
7356.000	36.34	15.61	51.95	74	-22.05	H	PK
7356.000	26.04	15.61	41.65	54	-12.35	H	AV
4904.000	42.83	12.52	55.35	74	-18.65	V	PK
4904.000	31.34	12.52	43.86	54	-10.14	V	AV
7356.000	36.65	15.61	52.26	74	-21.74	V	PK
7356.000	26.26	15.61	41.87	54	-12.13	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.

9. Out of Band Emissions

9.1 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).

9.2 Test Procedure

According to the KDB 558074D01 v03r05, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)
RBW = 1MHz, VBW = 1MHz for peak value measured
RBW = 1MHz, VBW = 10Hz for average value measured
Sweep = auto; Detector function = peak/average; Trace = max hold
All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

According to the KDB 558074 D01 V03r05, 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.

9.3 Environmental Conditions

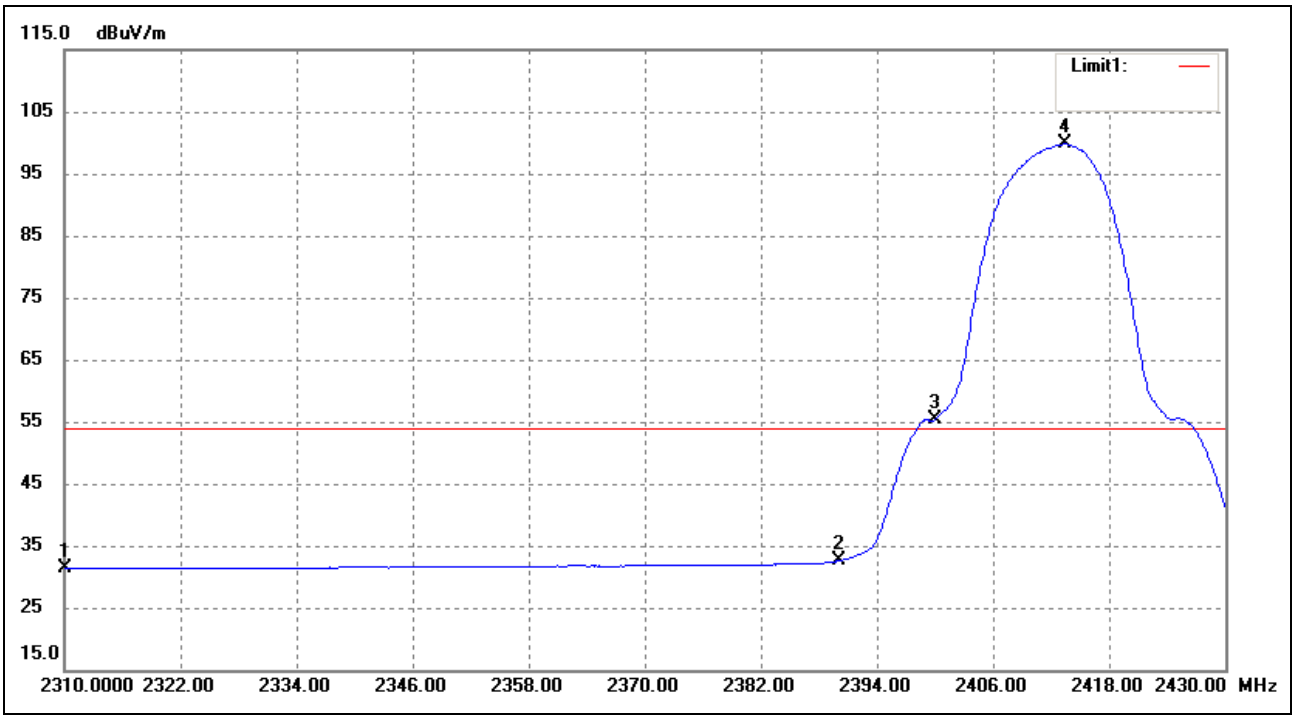
Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

9.4 Summary of Test Results/Plots

Please refer to the test plots as below.

802.11b-Lowest Bandedge

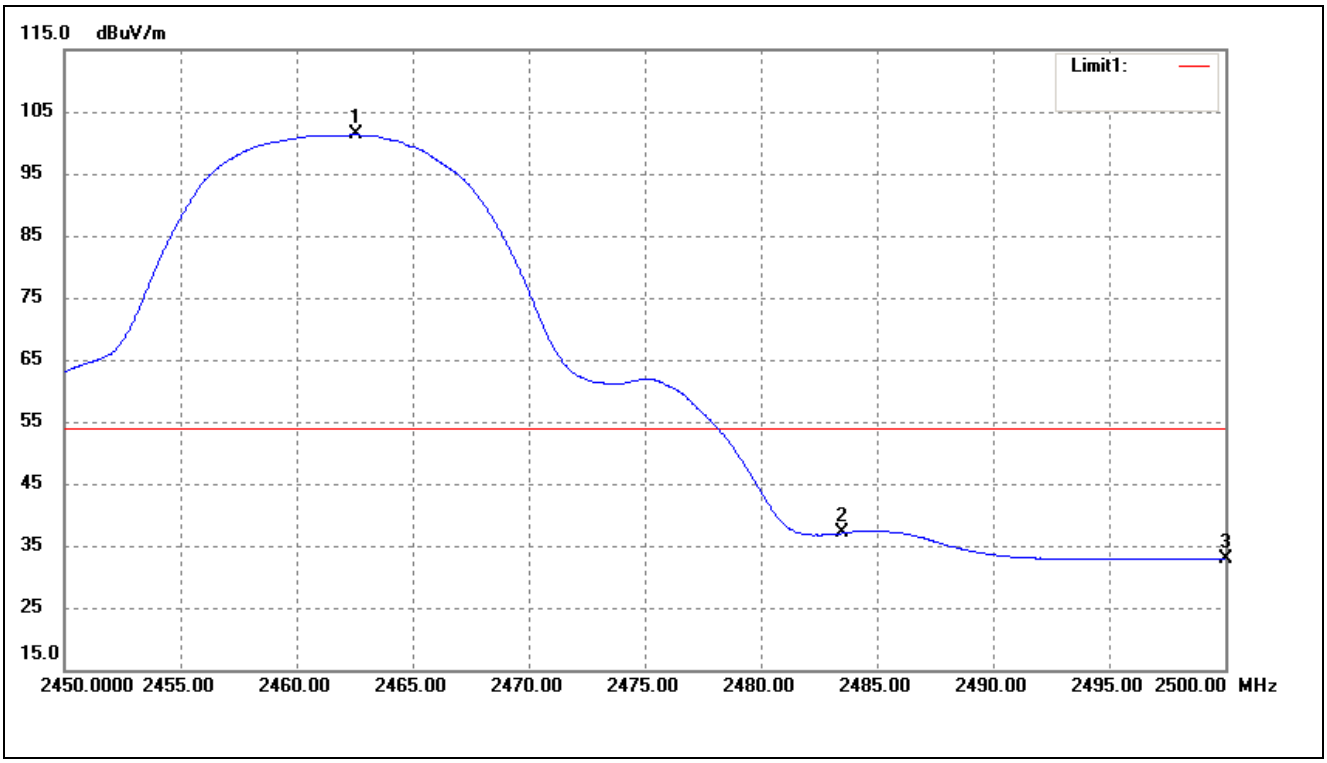
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	36.40	-4.98	31.42	54.00	-22.58	Average Detector
	2310.000	47.92	-4.98	42.94	74.00	-31.06	Peak Detector
2	2390.000	36.85	-4.26	32.59	54.00	-21.41	Average Detector
	2390.000	48.65	-4.26	44.39	74.00	-29.61	Peak Detector
3	2400.000	59.58	-4.18	55.40	Delta =44.43dBc		Average Detector
4	2413.440	103.90	-4.07	99.83			Average Detector

802.11b-Highest Bandedge

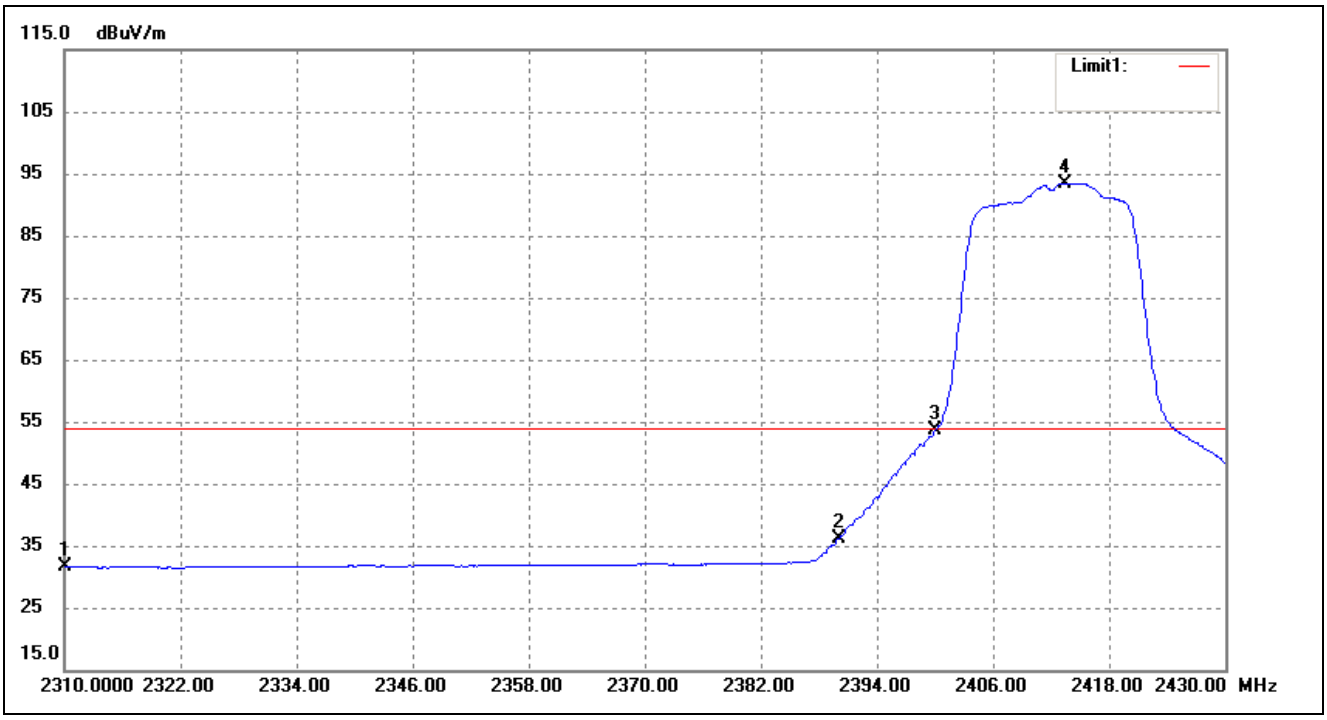
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2462.550	104.96	-3.69	101.27	/	/	Average Detector
	2463.350	113.38	-3.68	109.70	/	/	Peak Detector
2	2483.500	40.54	-3.53	37.01	54.00	-16.99	Average Detector
	2483.500	51.36	-3.53	47.83	74.00	-26.17	Peak Detector
3	2500.000	36.35	-3.39	32.96	54.00	-21.04	Average Detector
	2500.000	48.63	-3.39	45.24	74.00	-28.76	Peak Detector

802.11g-Lowest Bandedge

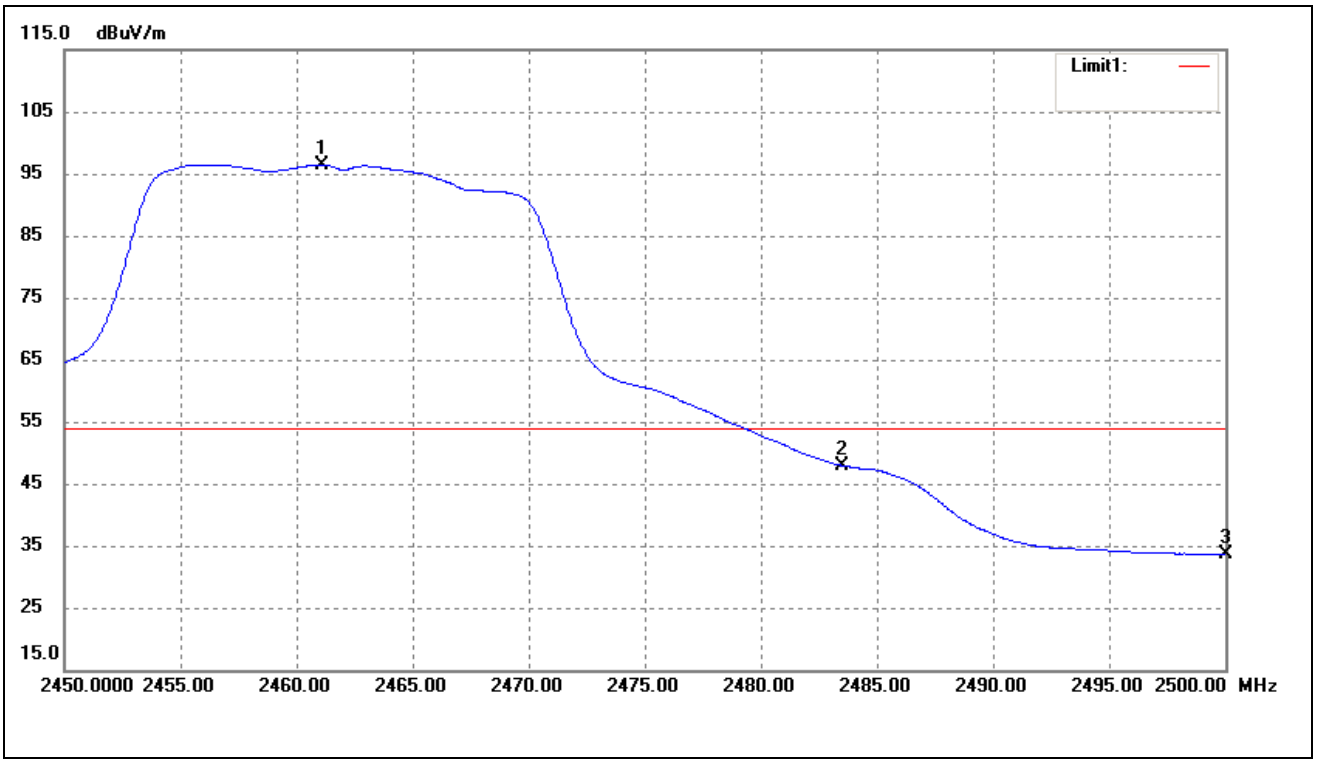
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	36.60	-4.98	31.62	54.00	-22.38	Average Detector
	2310.000	47.03	-4.98	42.05	74.00	-31.95	Peak Detector
2	2390.000	40.51	-4.26	36.25	54.00	-17.75	Average Detector
	2390.000	54.67	-4.26	50.41	74.00	-23.59	Peak Detector
3	2400.000	57.87	-4.18	53.69	Delta =39.76dBc		Average Detector
4	2413.440	97.52	-4.07	93.45			Average Detector

802.11g-Highest Bandedge

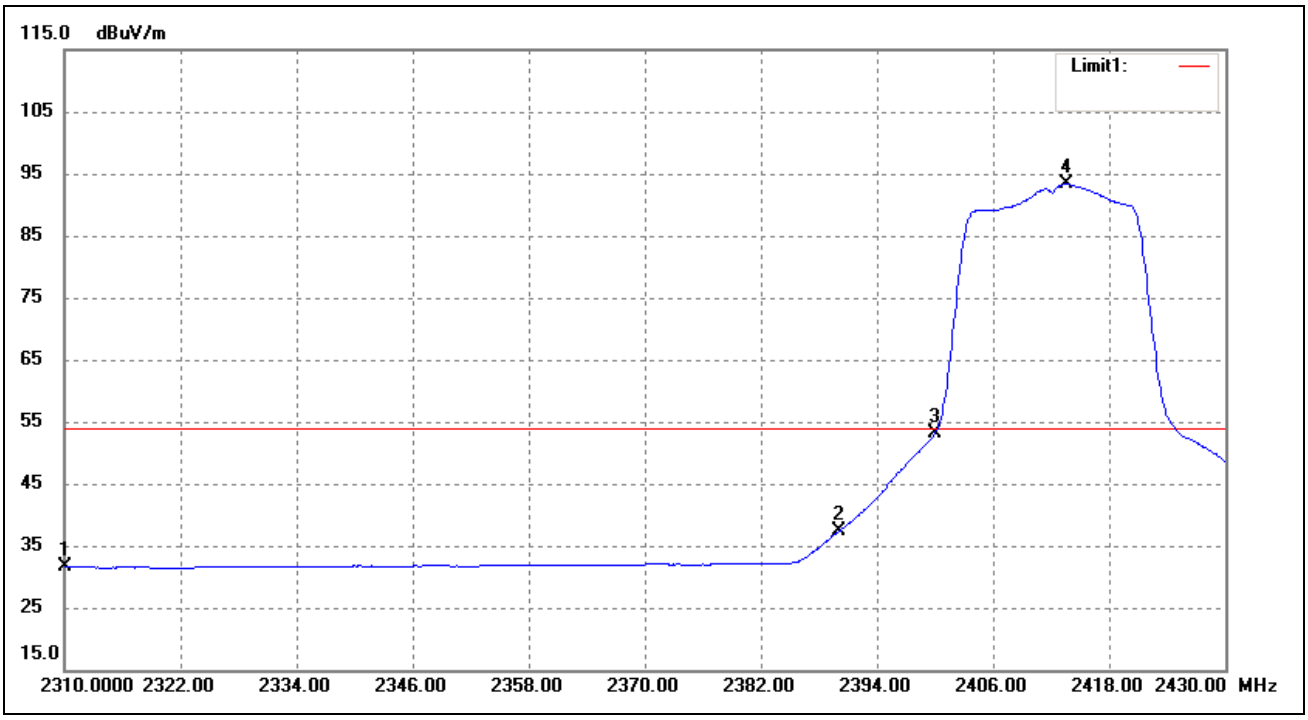
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2461.100	100.18	-3.70	96.48	/	/	Average Detector
	2461.400	111.01	-3.69	107.32	/	/	Peak Detector
2	2483.500	51.47	-3.53	47.94	54.00	-6.06	Average Detector
	2483.500	72.17	-3.53	68.64	74.00	-5.36	Peak Detector
3	2500.000	37.04	-3.39	33.65	54.00	-20.35	Average Detector
	2500.000	54.02	-3.39	50.63	74.00	-23.37	Peak Detector

802.11n-HT20-Lowest Bandedge

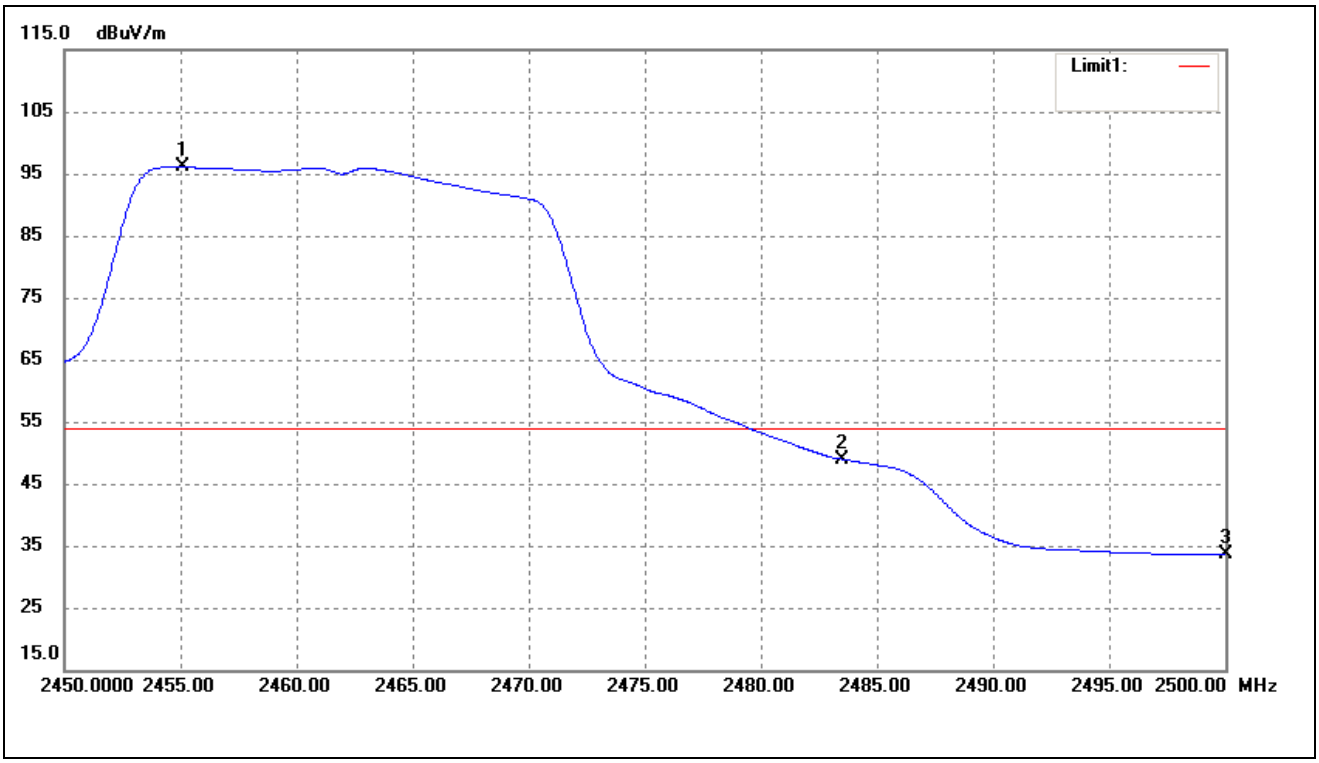
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	36.56	-4.98	31.58	54.00	-22.42	Average Detector
	2310.000	49.00	-4.98	44.02	74.00	-29.98	Peak Detector
2	2390.000	41.57	-4.26	37.31	54.00	-16.69	Average Detector
	2390.000	58.18	-4.26	53.92	74.00	-20.08	Peak Detector
3	2400.000	57.37	-4.18	53.19	Delta =40.25dBc		Average Detector
4	2413.560	97.51	-4.07	93.44			Average Detector

802.11n-HT20-Highest Bandedge

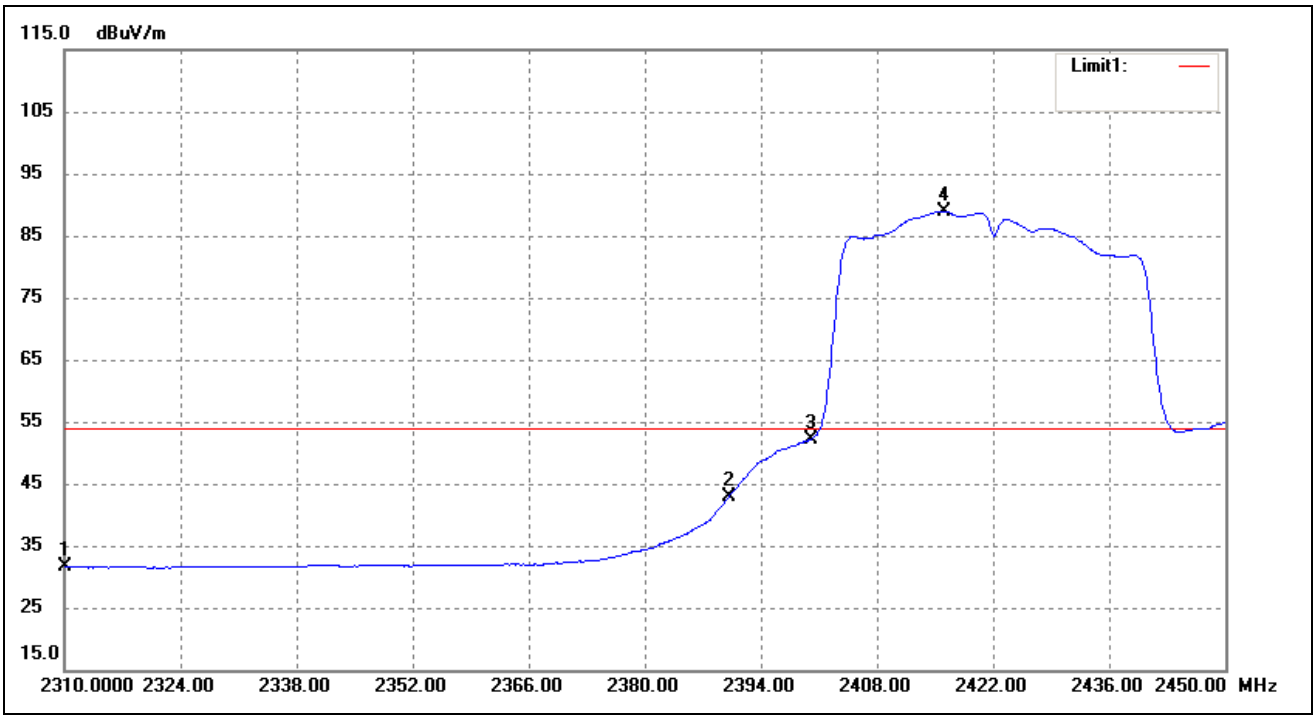
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2455.100	99.79	-3.74	96.05	/	/	Average Detector
	2461.400	111.18	-3.69	107.49	/	/	Peak Detector
2	2483.500	52.51	-3.53	48.98	54.00	-5.02	Average Detector
	2483.500	73.62	-3.53	70.09	74.00	-3.91	Peak Detector
3	2500.000	36.93	-3.39	33.54	54.00	-20.46	Average Detector
	2500.000	53.42	-3.39	50.03	74.00	-23.97	Peak Detector

802.11n-HT40-Lowest Bandedge

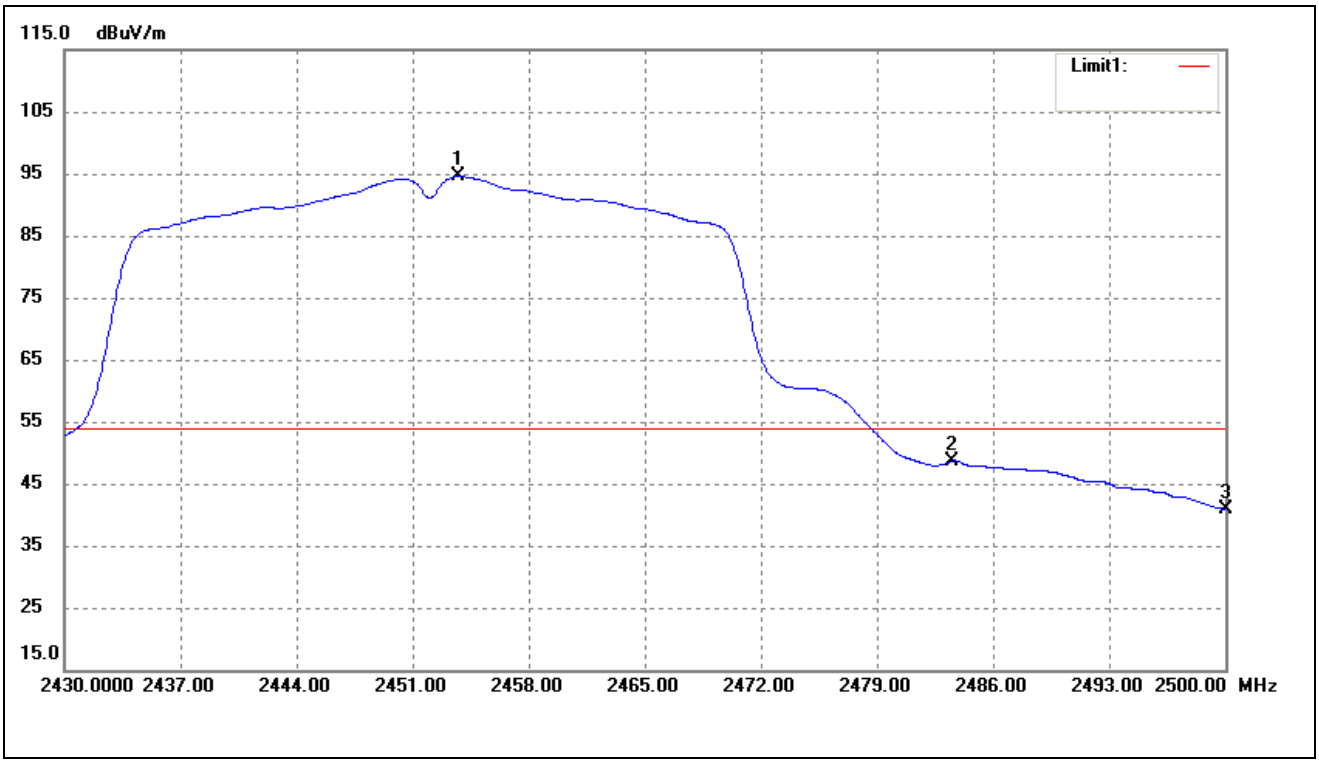
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	36.58	-4.98	31.60	54.00	-22.40	Average Detector
	2310.000	47.31	-4.98	42.33	74.00	-31.67	Peak Detector
2	2390.000	47.06	-4.26	42.80	54.00	-11.20	Average Detector
	2390.000	65.53	-4.26	61.27	74.00	-12.73	Peak Detector
3	2400.000	56.38	-4.18	52.20	Delta =36.69dBc		Average Detector
4	2416.120	92.94	-4.05	88.89			Average Detector

802.11n-HT40-Highest Bandedge

Vertical (Worst case)



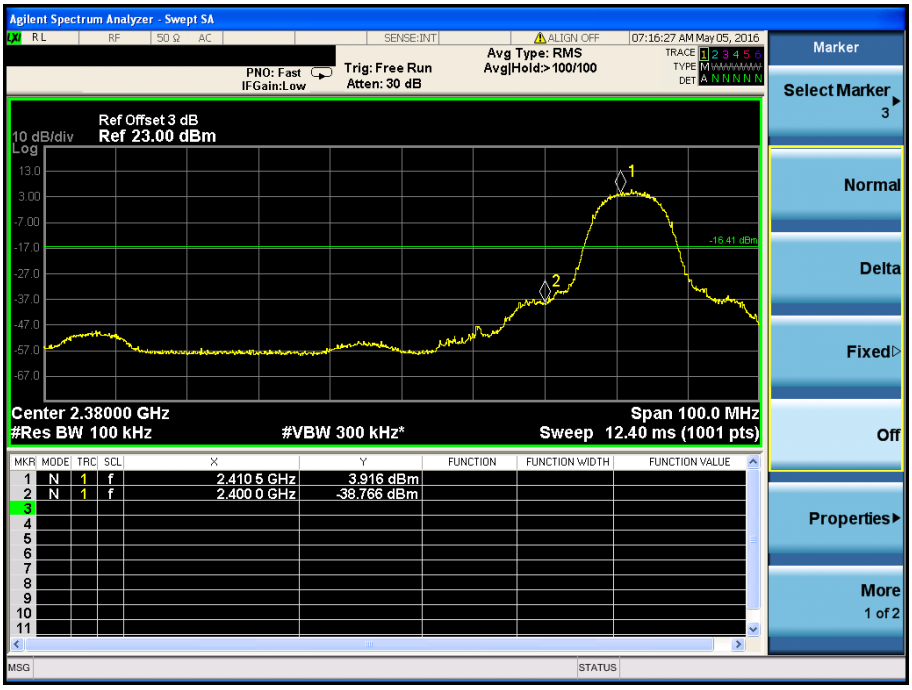
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2453.730	98.30	-3.75	94.55	/	/	Average Detector
	2455.130	108.57	-3.74	104.83	/	/	Peak Detector
2	2483.500	52.22	-3.53	48.69	54.00	-5.31	Average Detector
	2483.500	69.80	-3.53	66.27	74.00	-7.73	Peak Detector
3	2500.000	44.24	-3.39	40.85	54.00	-13.15	Average Detector
	2500.000	61.77	-3.39	58.38	74.00	-15.62	Peak Detector

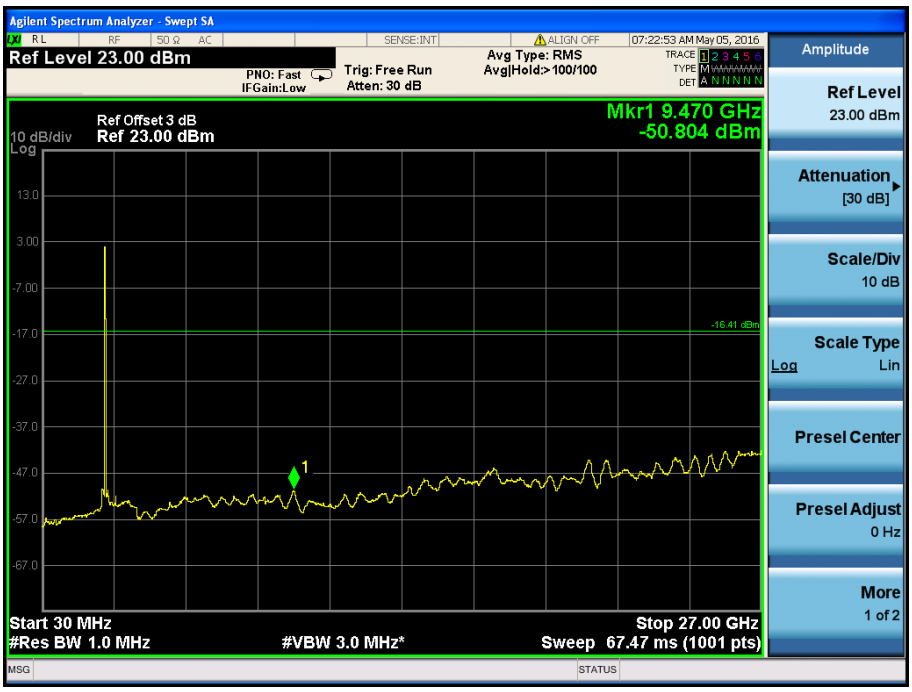
Ant. 1

Out-of-Band and Spurious Emission (Conducted)

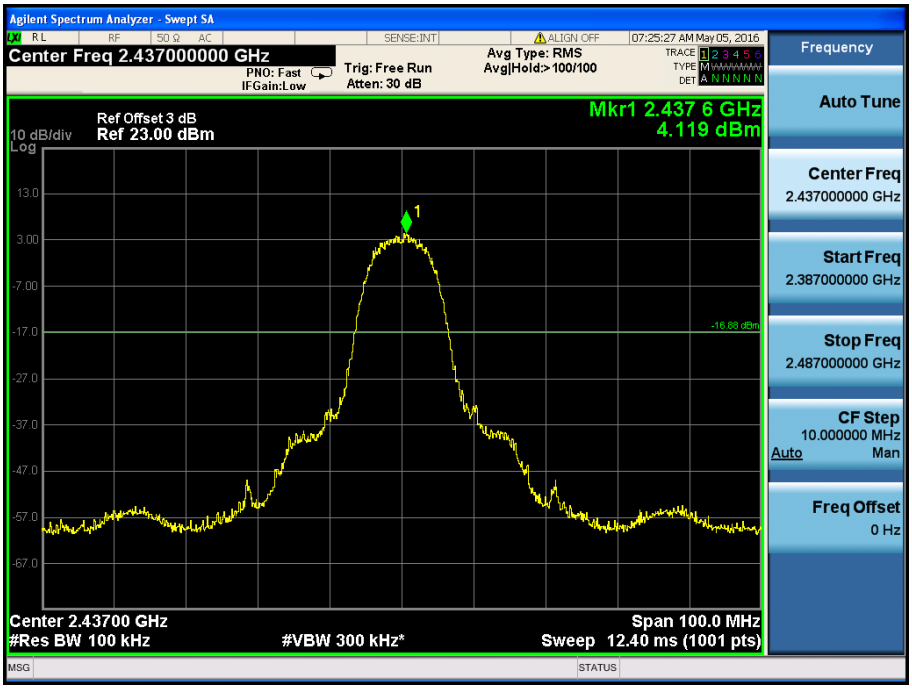
802.11b

Low Channel

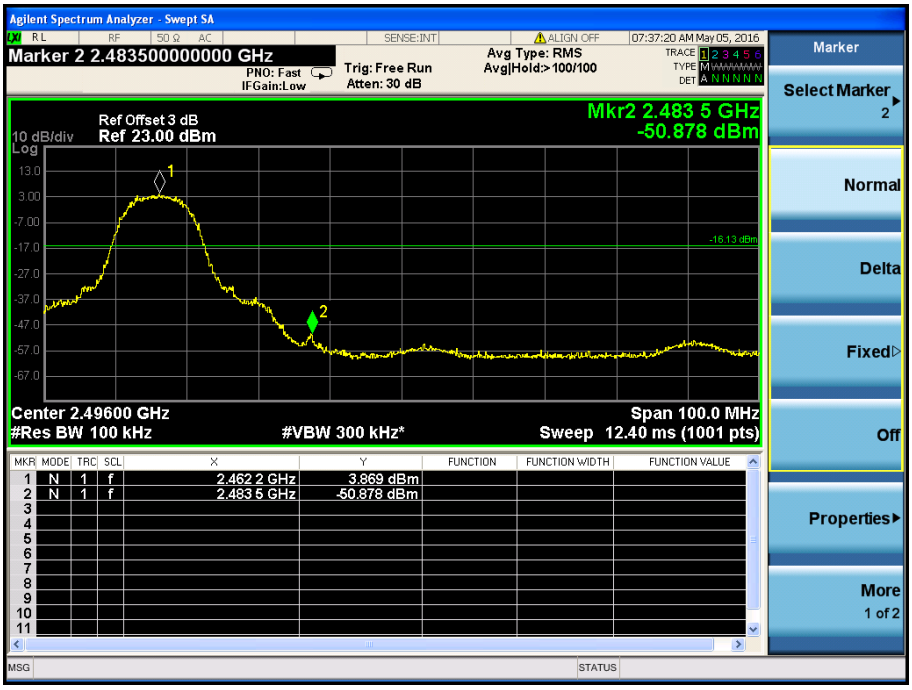




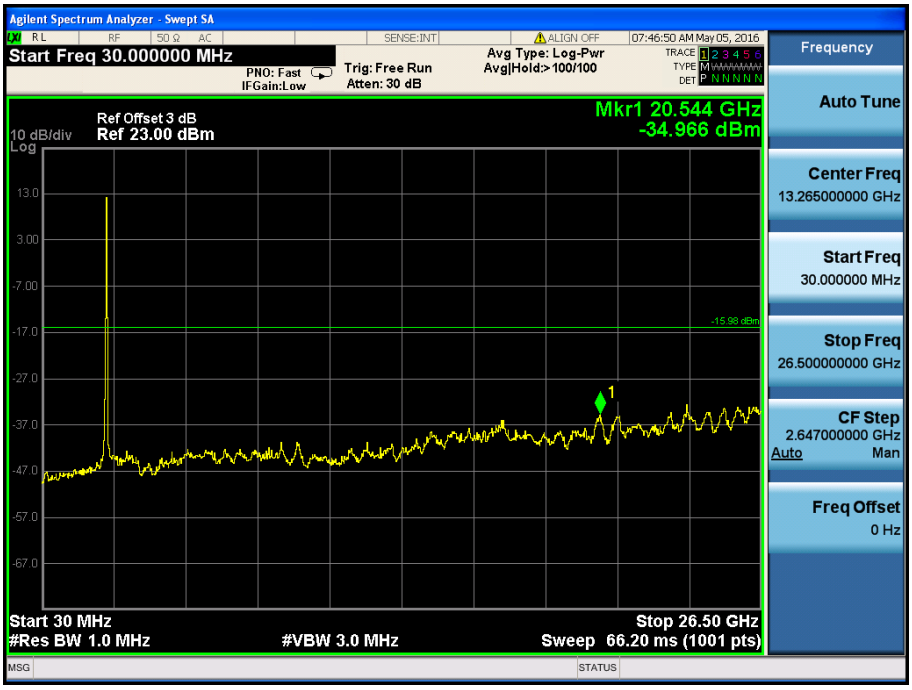
Middle Channel



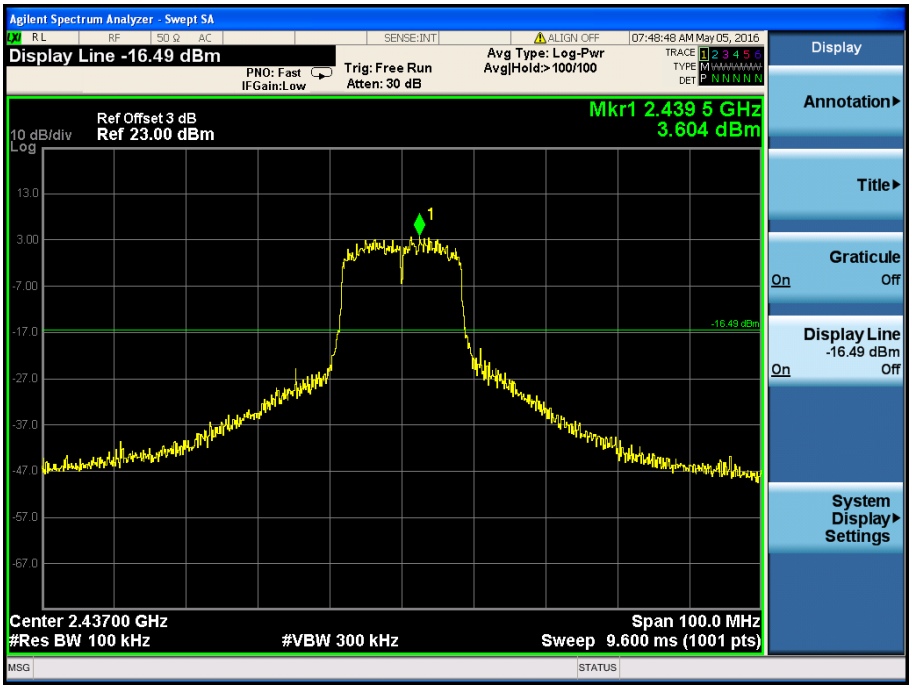
High Channel

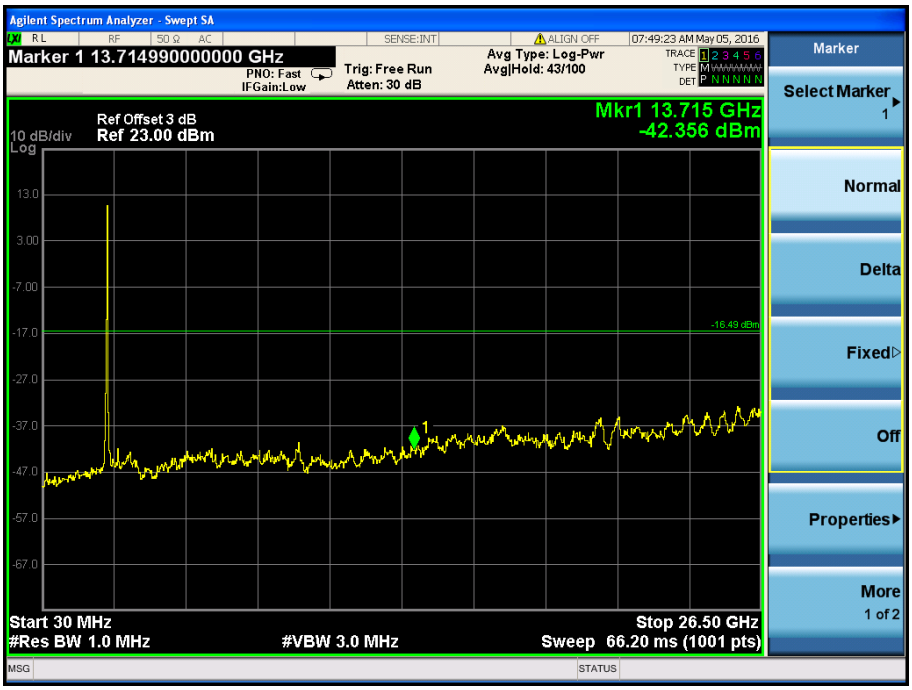


802.11g
Low Channel



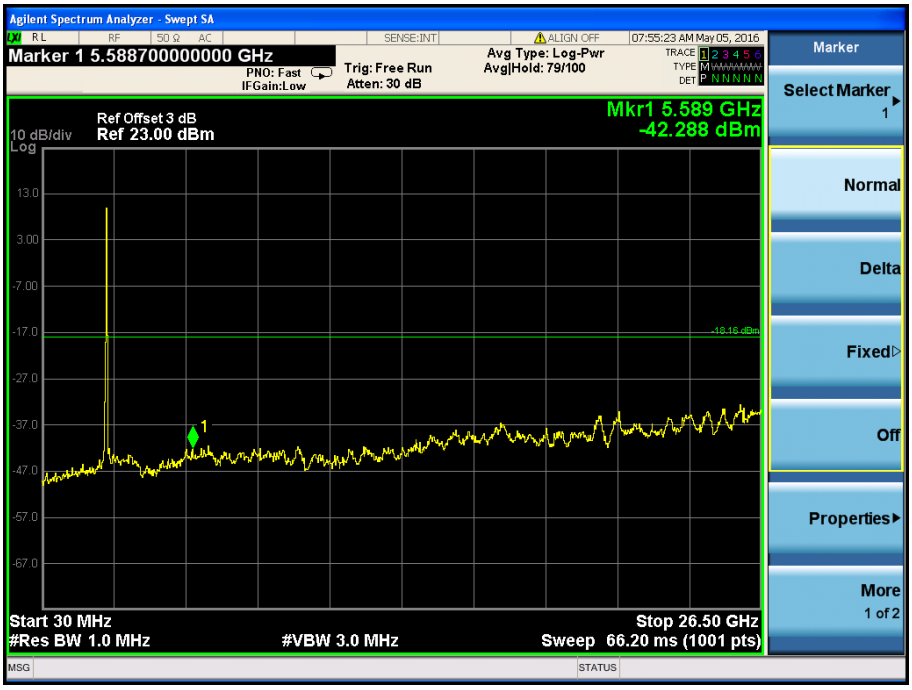
Middle Channel



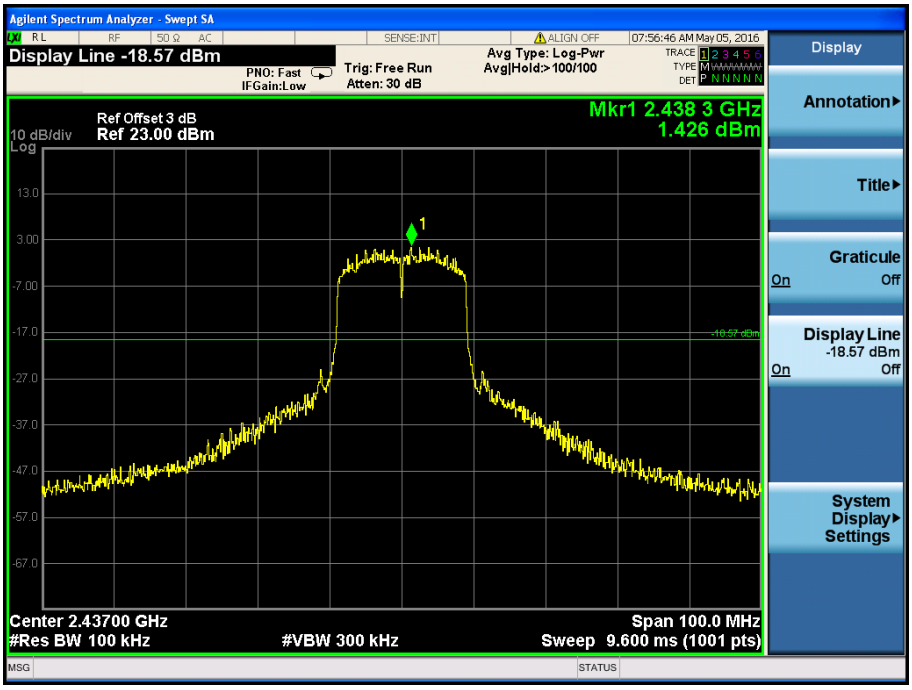


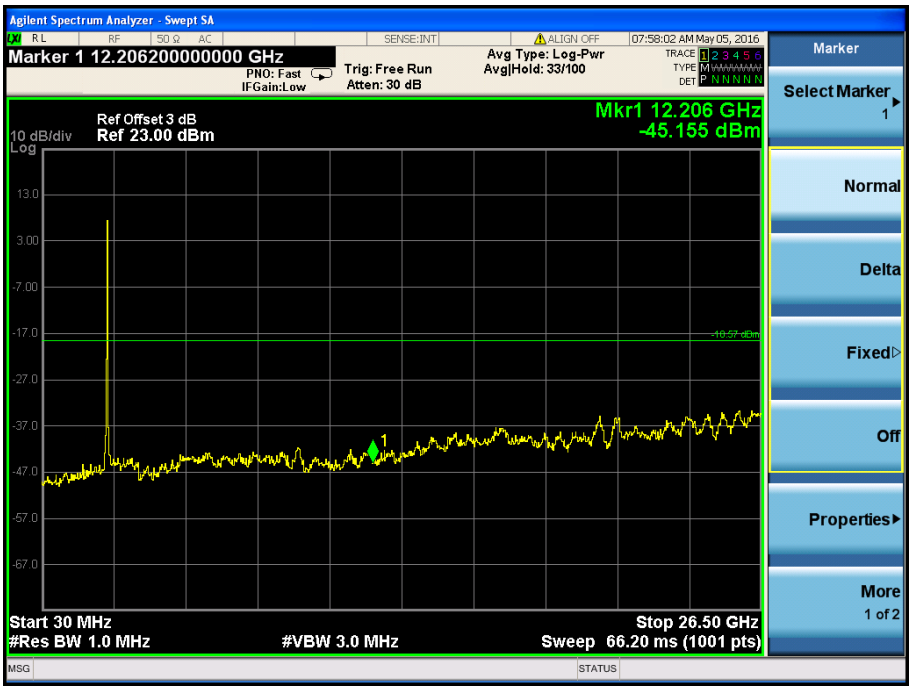
High Channel

11n-HT20
Low Channel



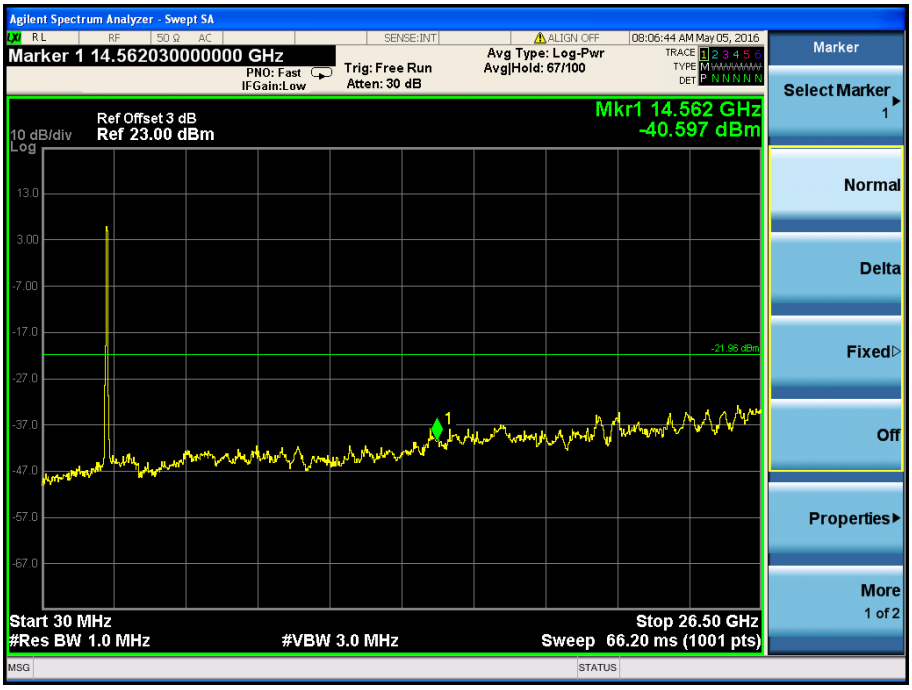
Middle Channel



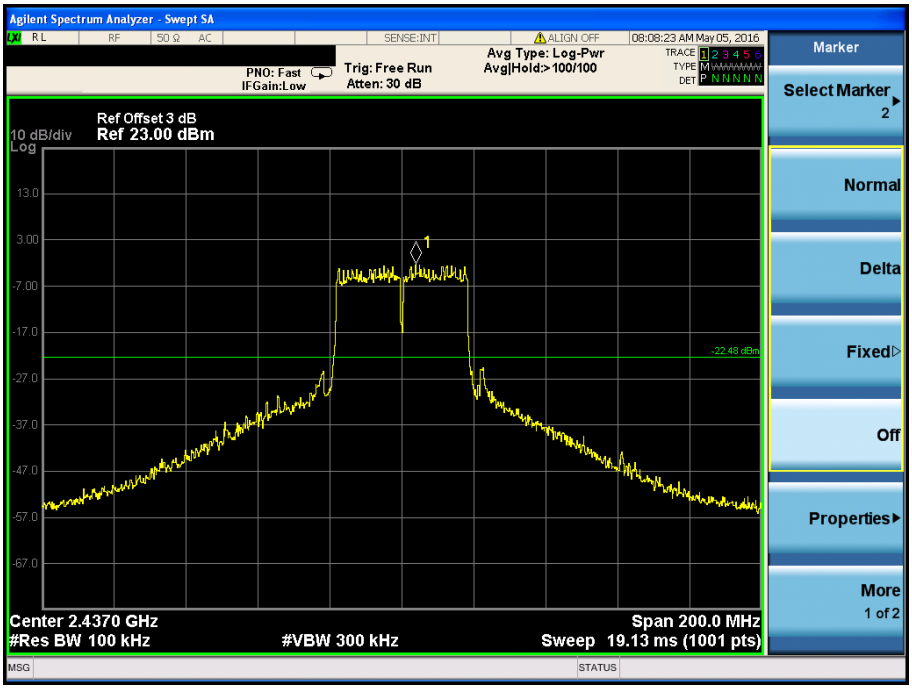


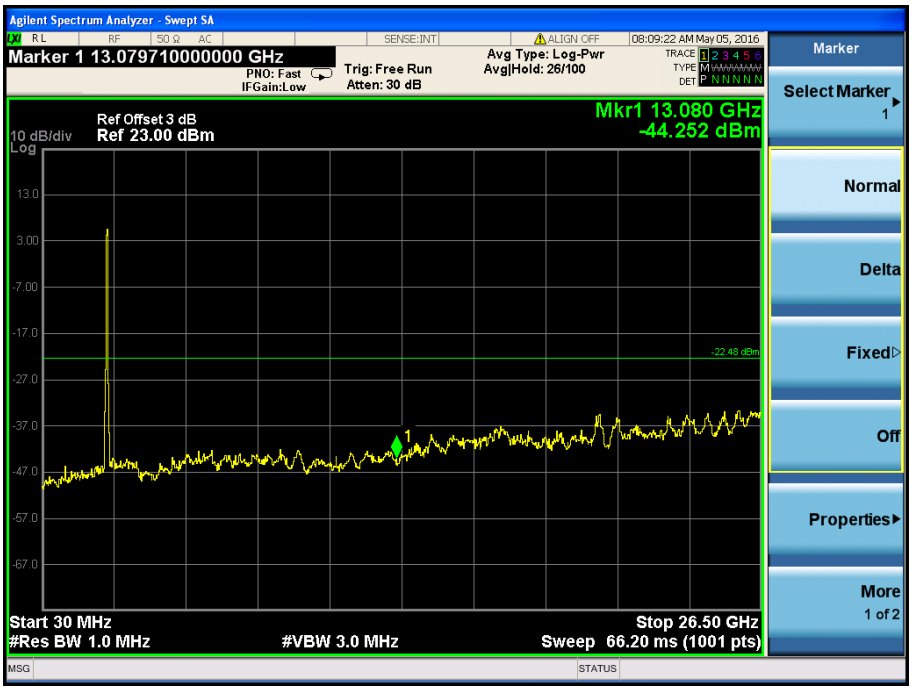
High Channel

11n-HT40
Low Channel



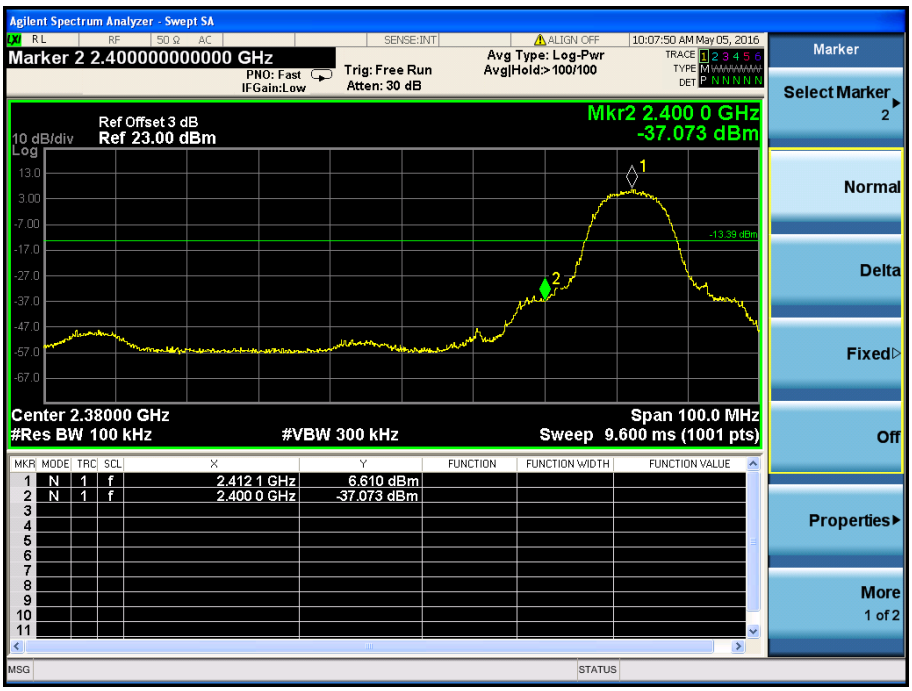
Middle Channel

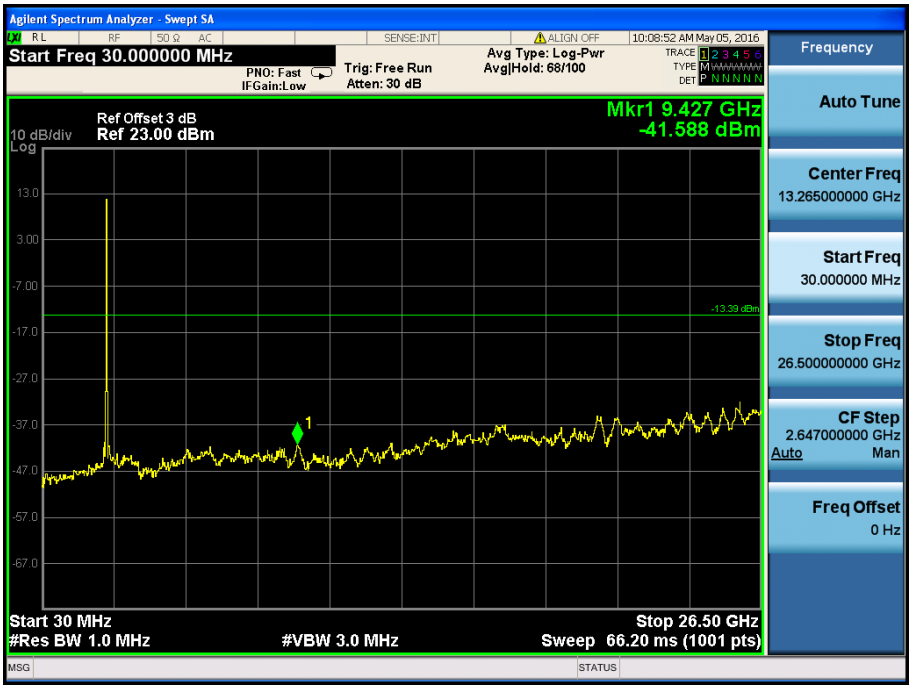




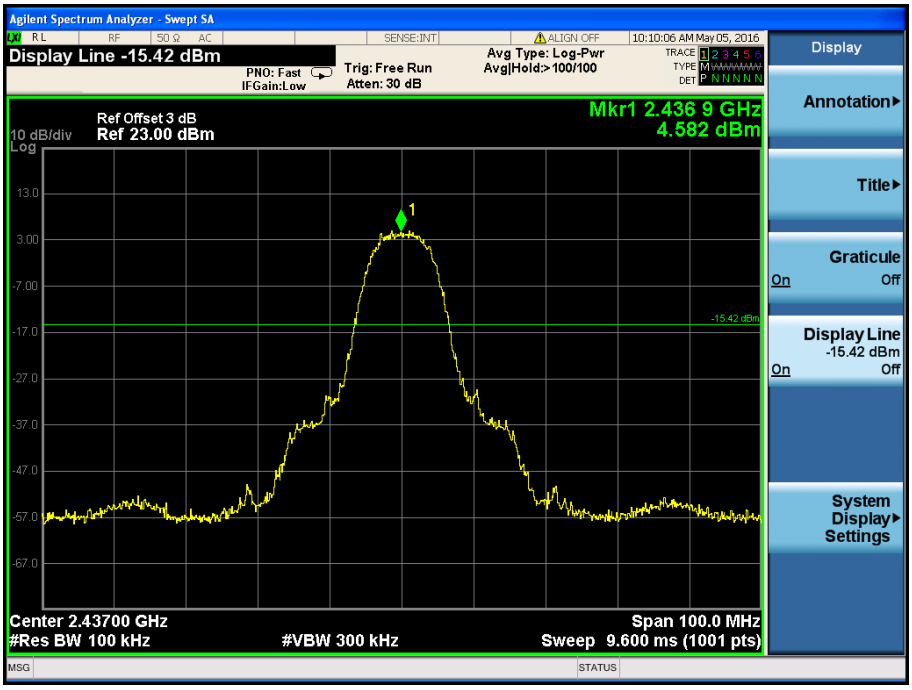
High Channel

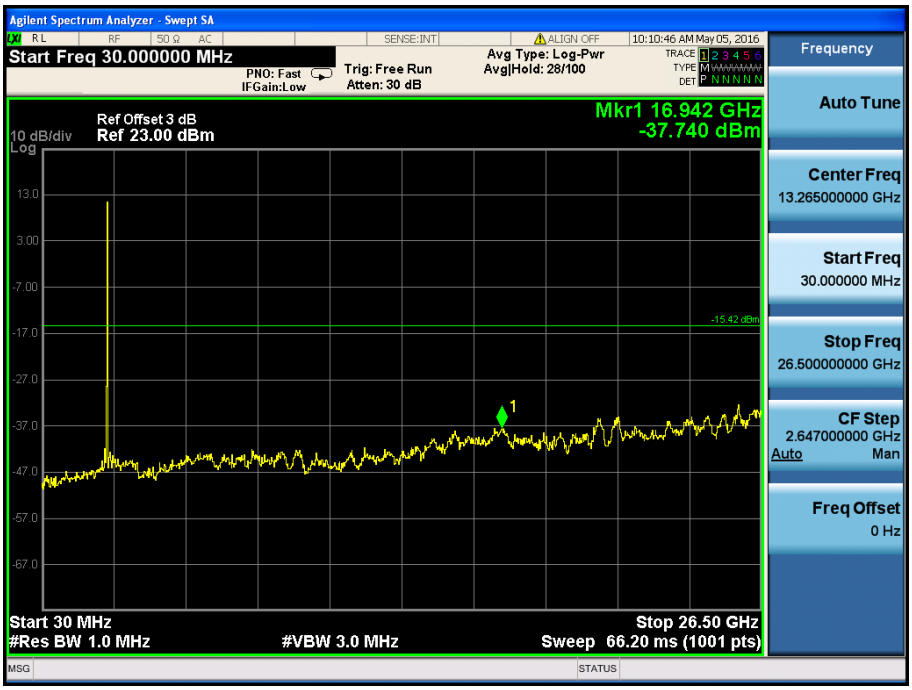
Ant. 2
802.11b
Low Channel



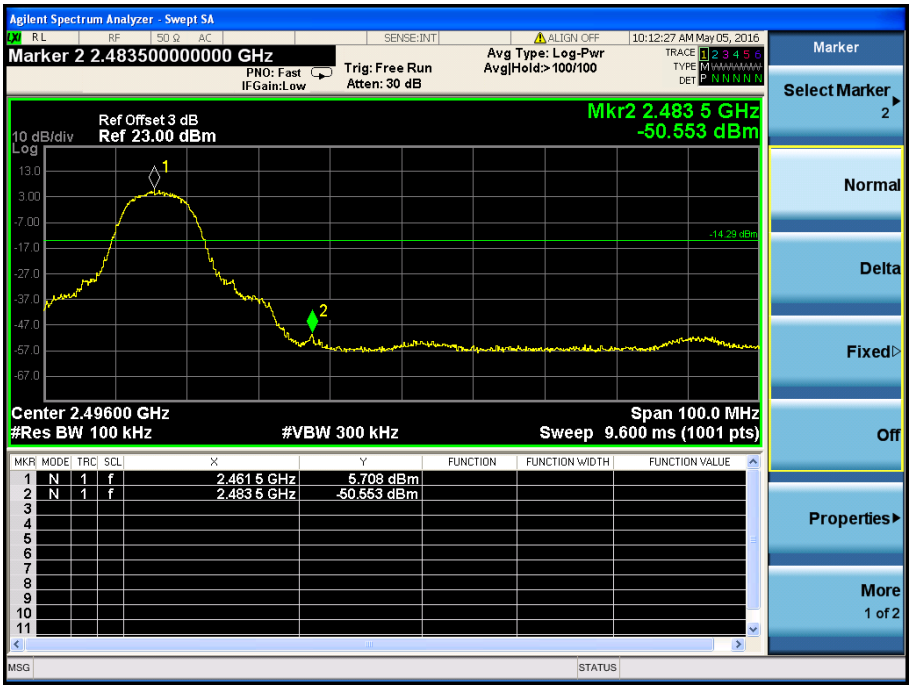


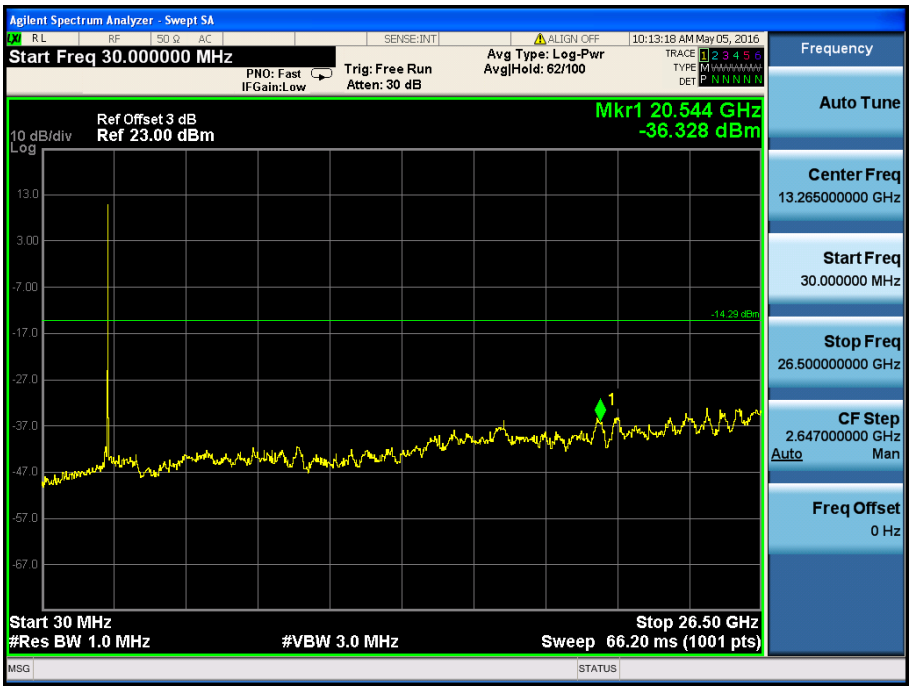
Middle Channel





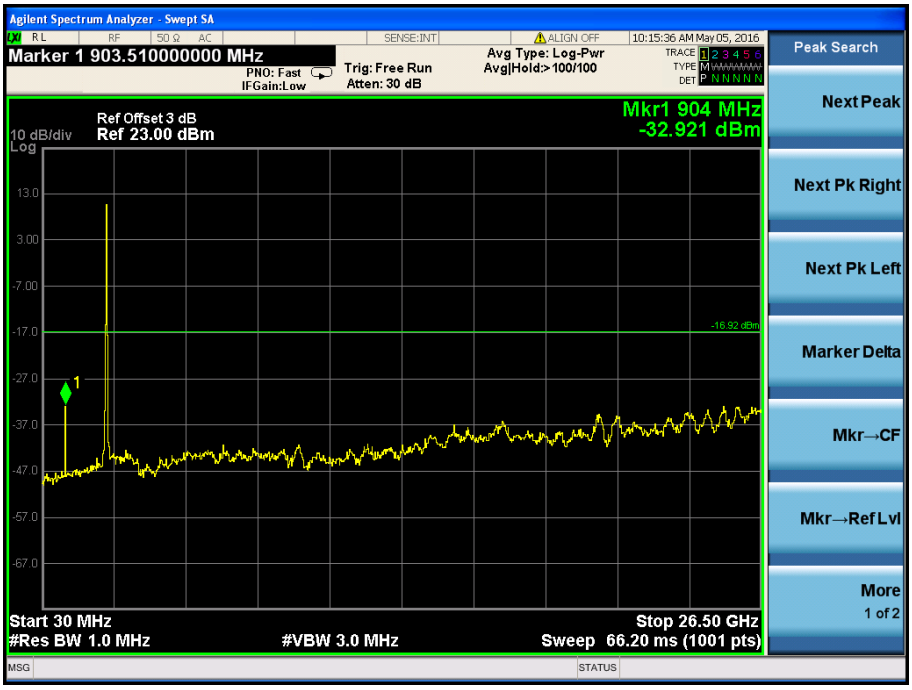
High Channel



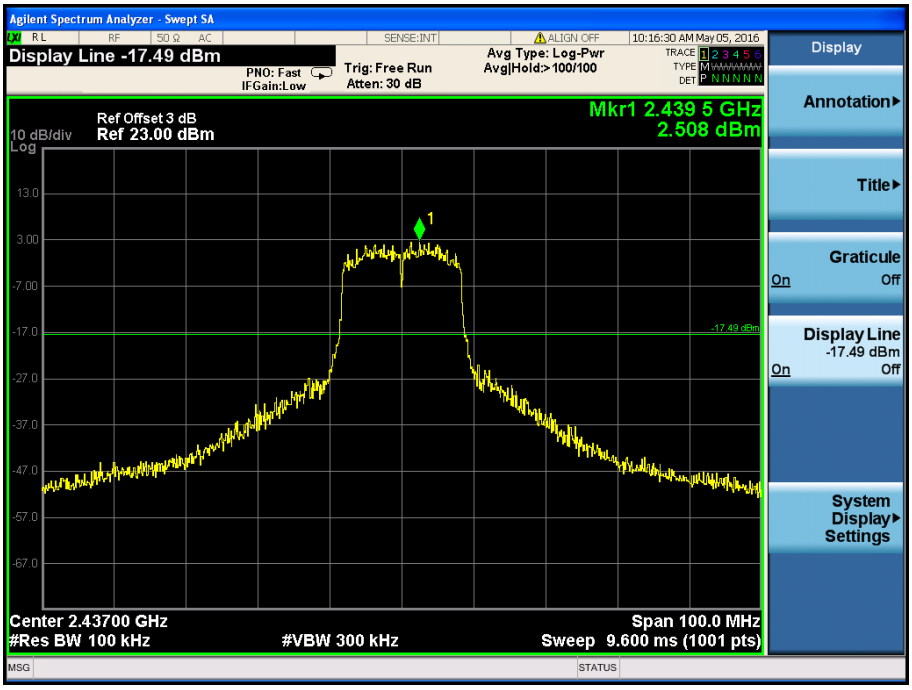


802.11g

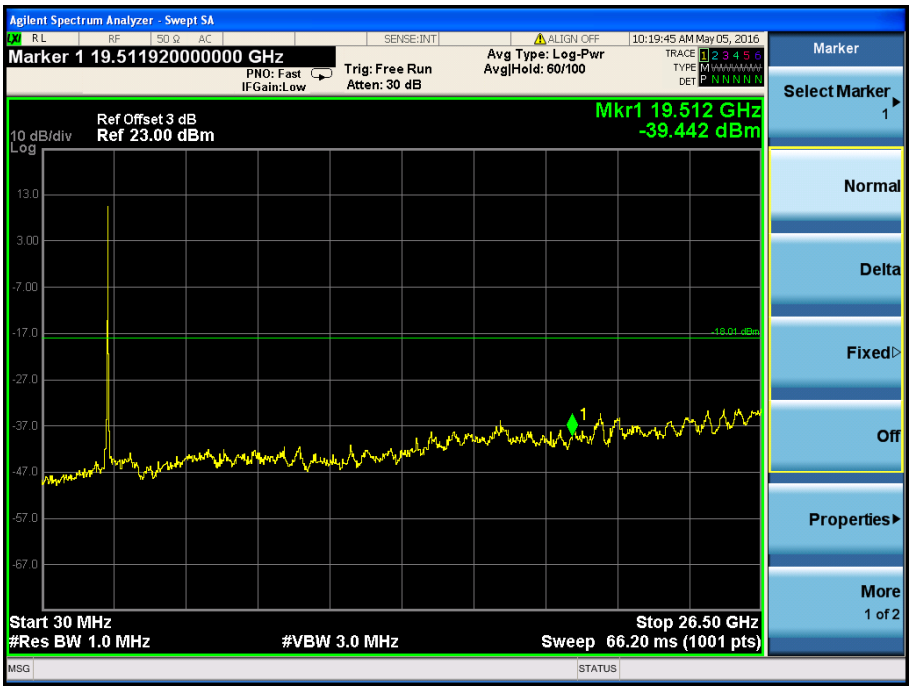
Low Channel



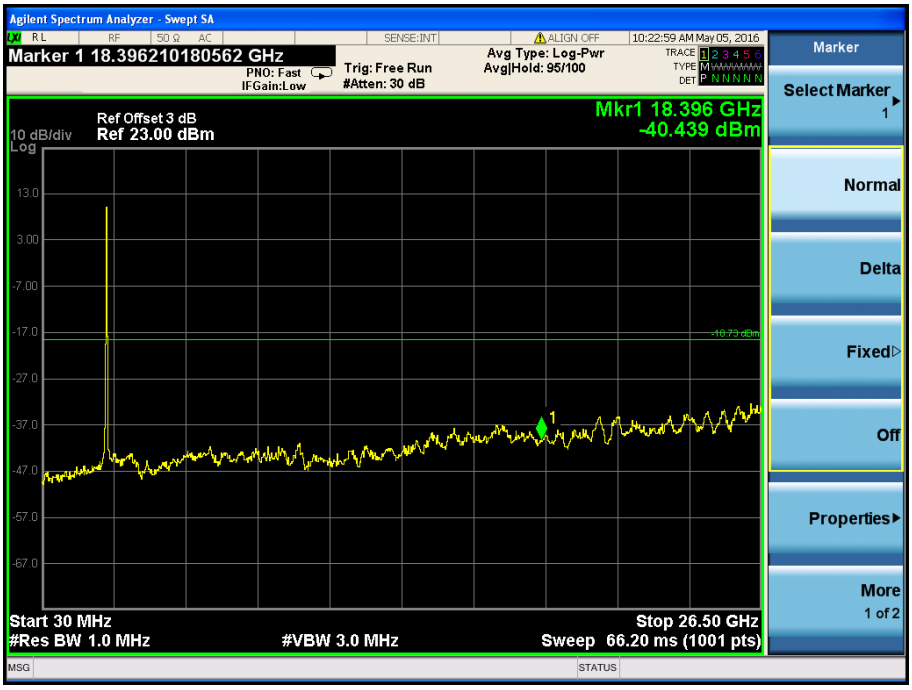
Middle Channel



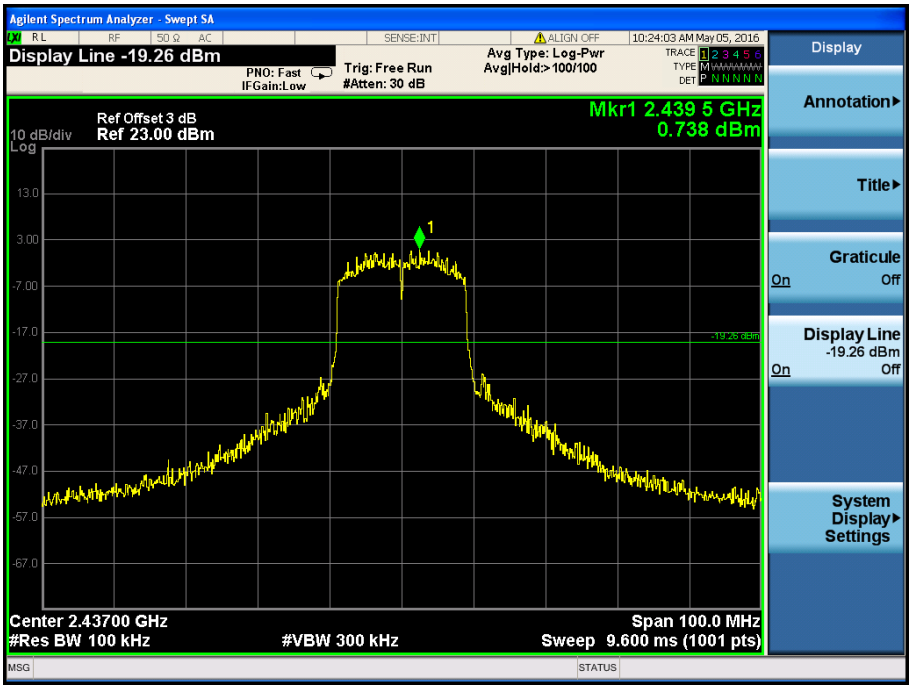
High Channel



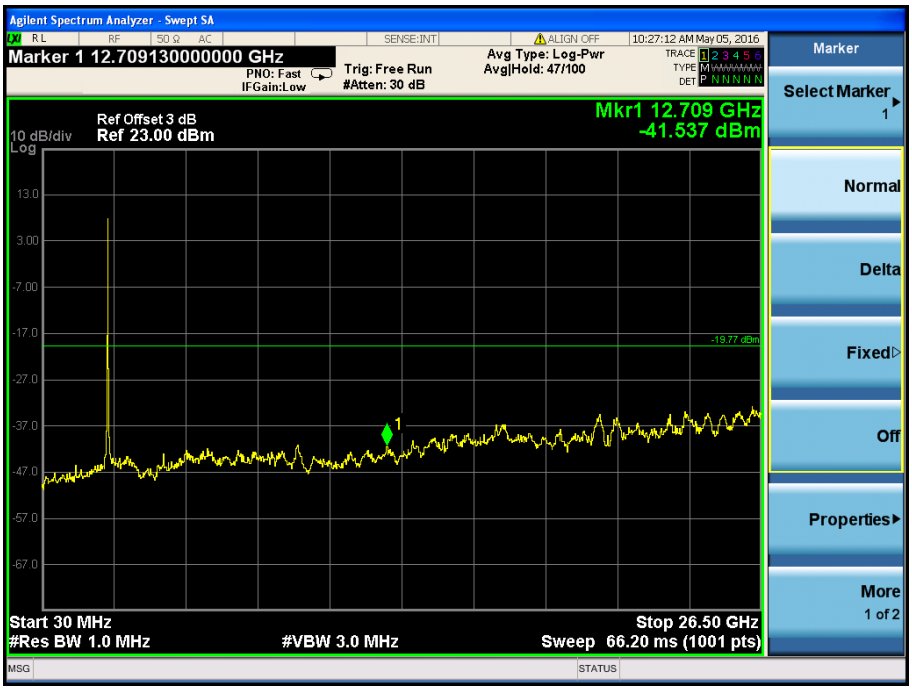
802.11n-HT20
Low Channel



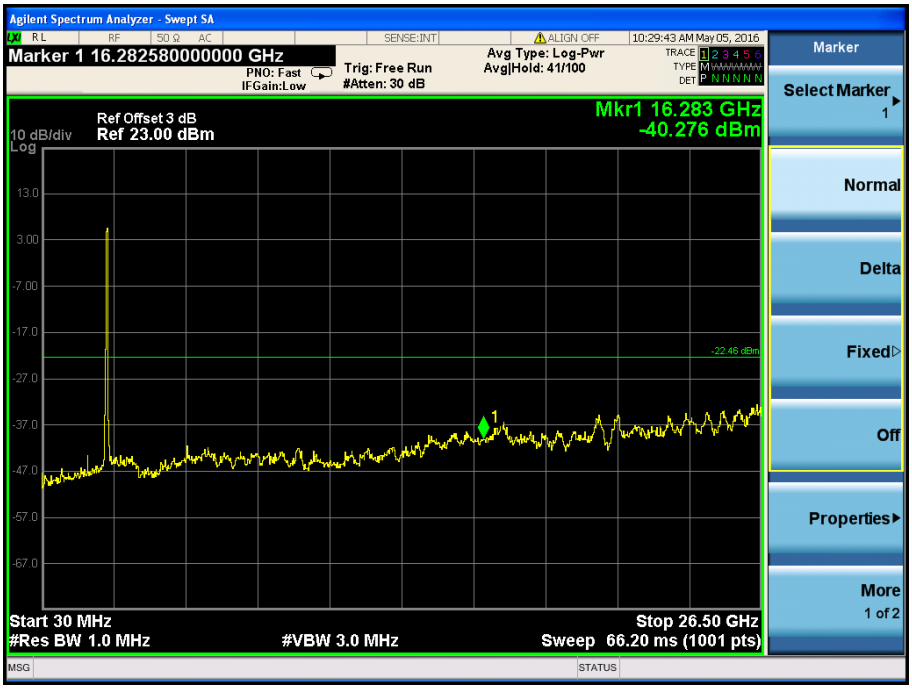
Middle Channel



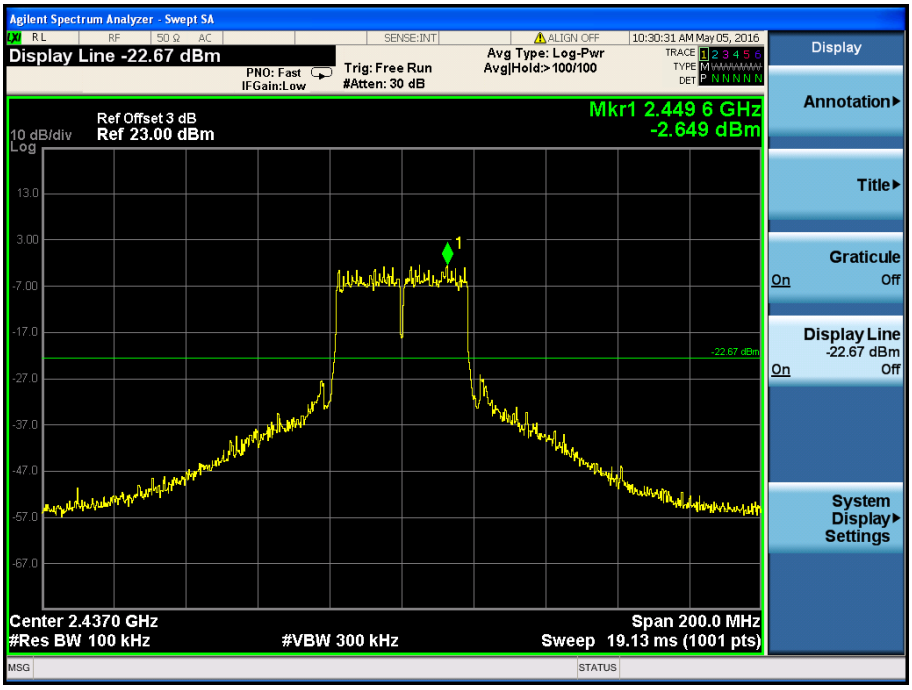
High Channel

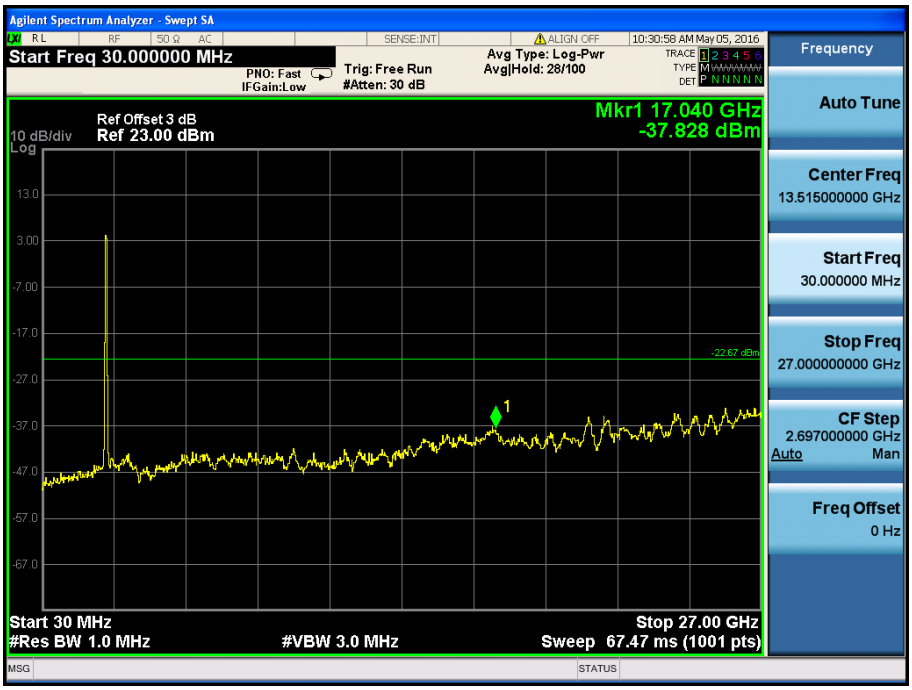


802.11n-HT40
Low Channel

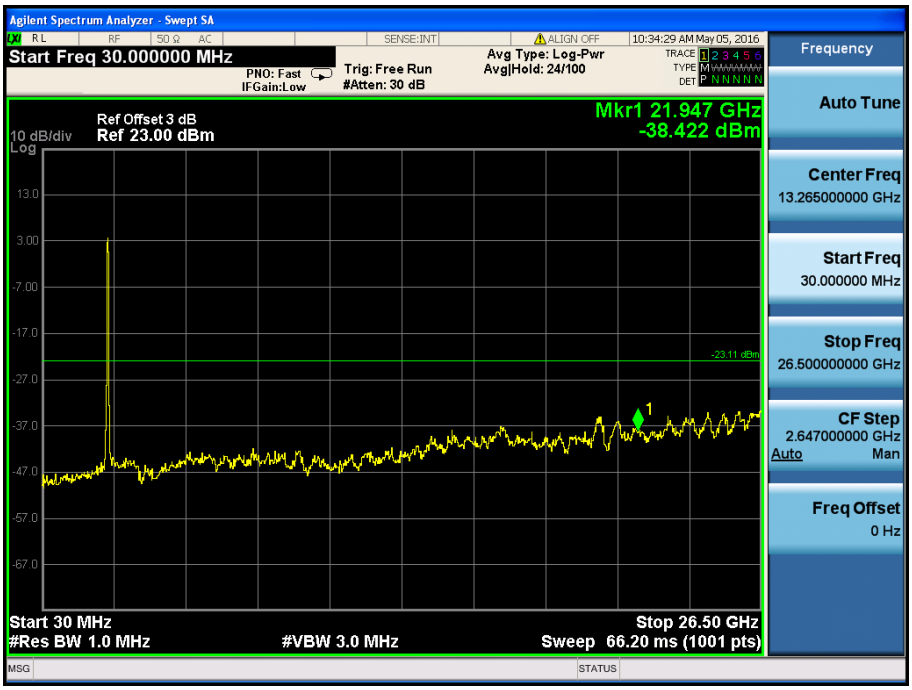


Middle Channel





High Channel

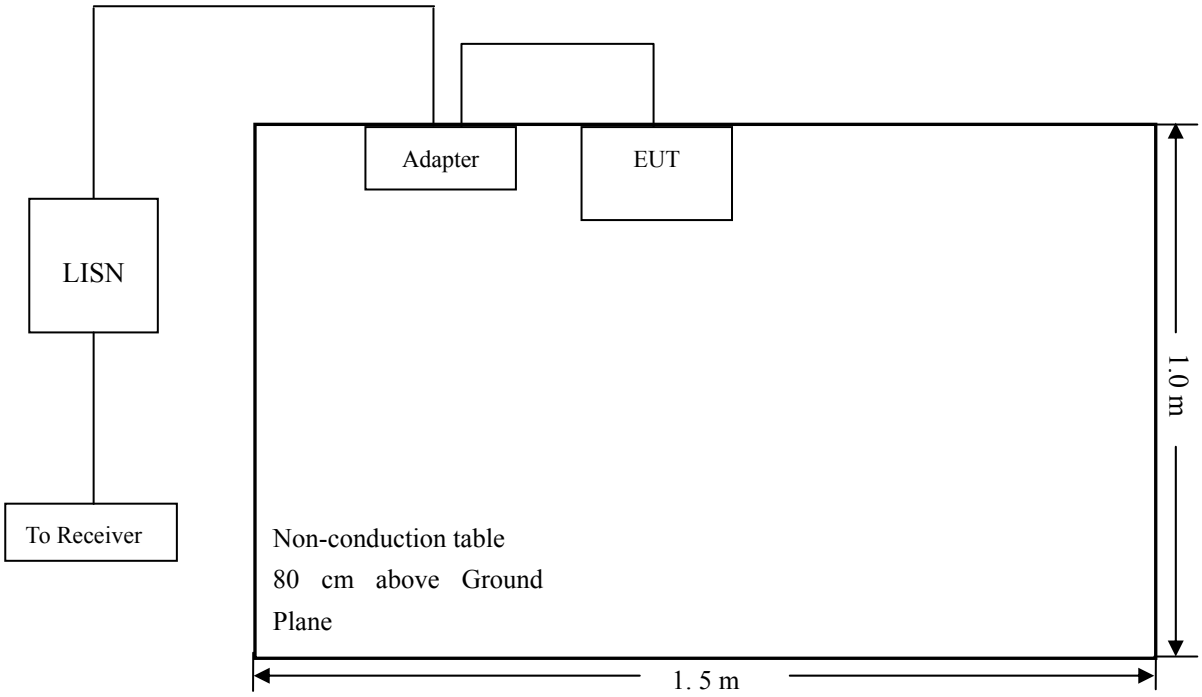


10. Conducted Emissions

10.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 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.

10.2 Basic Test Setup Block Diagram



10.3 Environmental Conditions

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

10.4 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

10.5 Summary of Test Results/Plots

According to the data in section 10.6, the EUT complied with the FCC Part 15.207 Conducted margin for this device, with the *worst* margin reading of:

-8.17 dB at 0.1900 MHz in the **Line** mode**, Peak** detector, **0.15-30MHz**

10.6 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

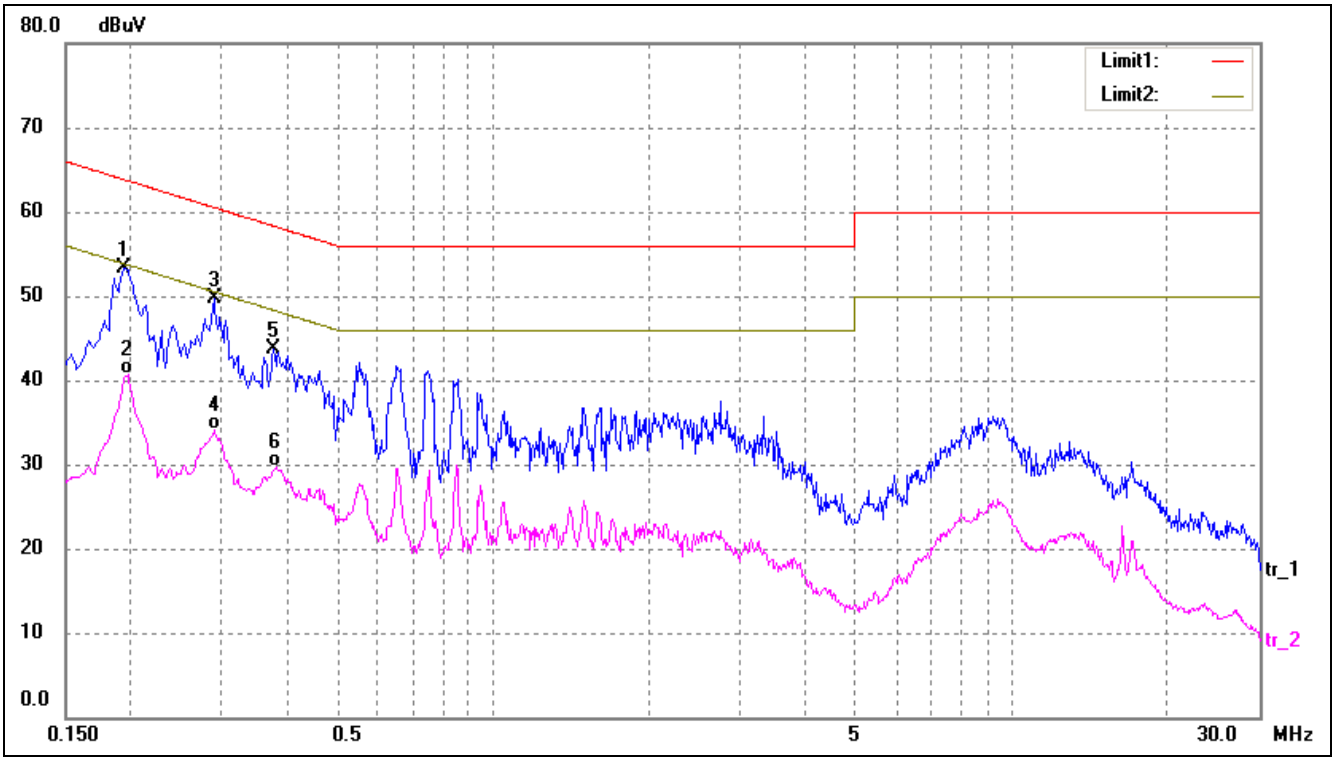
EUT: *Seal*

Tested Model: *8*

Operating Condition: *Transmitting(Wi-Fi)*

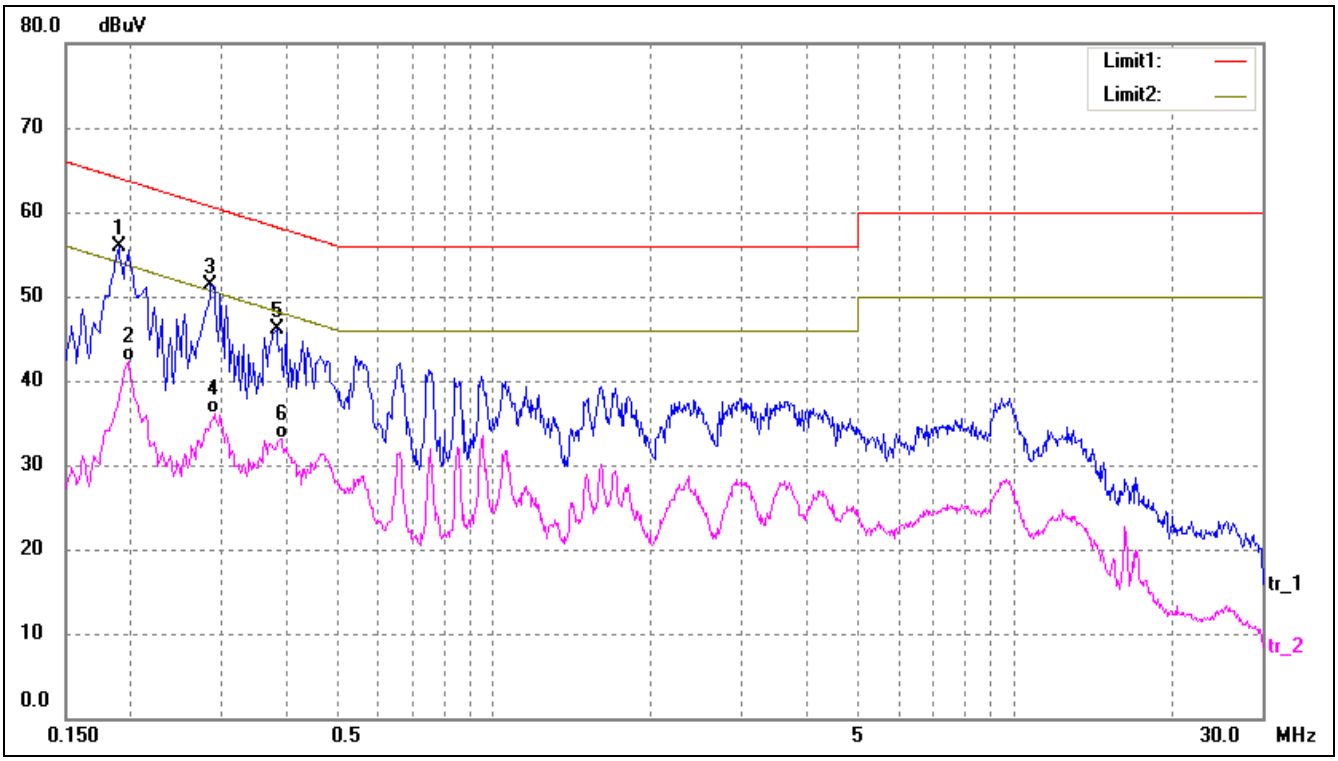
Comment: *AC 120V/60Hz; Adapter DC 5V*

Test Specification: *Neutral*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1940	43.51	9.81	53.32	63.86	-10.54	peak
2	0.1980	30.81	9.80	40.61	53.69	-13.08	AVG
3	0.2900	39.93	9.80	49.73	60.52	-10.79	peak
4	0.2900	24.27	9.80	34.07	50.52	-16.45	AVG
5	0.3780	33.94	9.80	43.74	58.32	-14.58	peak
6	0.3820	19.87	9.80	29.67	48.24	-18.57	AVG

Test Specification: *Live*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1900	46.06	9.81	55.87	64.04	-8.17	peak
2	0.1980	32.60	9.80	42.40	53.69	-11.29	AVG
3	0.2860	41.57	9.80	51.37	60.64	-9.27	peak
4	0.2900	26.25	9.80	36.05	50.52	-14.47	AVG
5	0.3820	36.39	9.80	46.19	58.24	-12.05	peak
6	0.3900	23.28	9.80	33.08	48.06	-14.98	AVG

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