

FCC Part 15C Measurement and Test Report

For

LM Technologies Ltd.

Unit19, Spectrum House, 32-34, Gordon House Road,

London, NW5 1LP, United Kingdom

FCC ID: VVXLM809

FCC Rule(s):	<u>FCC Part 15C</u>
Product Description:	<u>LM809 WiFi USB Adapter(300Mbps)</u>
Tested Model:	<u>LM809-0647</u>
Report No.:	<u>STR18058114I</u>
Sample Receipt Date:	<u>2018-05-10</u>
Tested Date:	<u>2018-05-11 to 2018-05-25</u>
Issued Date:	<u>2018-05-28</u>
Tested By:	<u>Mike Shi / Engineer</u> <i>Mike Shi</i>
Reviewed By:	<u>Silin Chen / EMC Manager</u> <i>Silin Chen</i>
Approved & Authorized By:	<u>Jandy So / PSQ Manager</u> <i>Jandy So</i>
Prepared By:	

Shenzhen SEM Test Technology Co., Ltd.

1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road,

Bao'an District, Shenzhen, P.R.C. (518101)

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

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.

TABLE OF CONTENTS

1. GENERAL INFORMATION	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
1.2 TEST STANDARDS	3
1.3 TEST METHODOLOGY	4
1.4 TEST FACILITY	4
1.5 EUT SETUP AND TEST MODE	5
1.6 MEASUREMENT UNCERTAINTY	5
1.7 TEST EQUIPMENT LIST AND DETAILS	6
2. SUMMARY OF TEST RESULTS	7
3. RF EXPOSURE	8
3.1 STANDARD APPLICABLE	8
3.2 TEST RESULT	8
4. ANTENNA REQUIREMENT	9
4.1 STANDARD APPLICABLE	9
4.2 EVALUATION INFORMATION	9
5. POWER SPECTRAL DENSITY	10
5.1 STANDARD APPLICABLE	10
5.2 TEST PROCEDURE	10
5.3 ENVIRONMENTAL CONDITIONS	10
5.4 SUMMARY OF TEST RESULTS/PLOTS	11
6. 6DB BANDWIDTH	24
6.1 STANDARD APPLICABLE	24
6.2 TEST PROCEDURE	24
6.3 ENVIRONMENTAL CONDITIONS	24
6.4 SUMMARY OF TEST RESULTS/PLOTS	24
7. RF OUTPUT POWER	38
7.1 STANDARD APPLICABLE	38
7.2 TEST PROCEDURE	38
7.3 ENVIRONMENTAL CONDITIONS	38
7.4 SUMMARY OF TEST RESULTS/PLOTS	39
8. FIELD STRENGTH OF SPURIOUS EMISSIONS	52
8.1 MEASUREMENT UNCERTAINTY	52
8.2 STANDARD APPLICABLE	52
8.3 TEST PROCEDURE	52
8.4 CORRECTED AMPLITUDE & MARGIN CALCULATION	54
8.5 ENVIRONMENTAL CONDITIONS	54
8.6 SUMMARY OF TEST RESULTS/PLOTS	54
9. OUT OF BAND EMISSIONS	65
9.1 STANDARD APPLICABLE	65
9.2 TEST PROCEDURE	65
9.3 ENVIRONMENTAL CONDITIONS	66
9.4 SUMMARY OF TEST RESULTS/PLOTS	66
10. CONDUCTED EMISSIONS	106
10.1 MEASUREMENT UNCERTAINTY	106
10.2 TEST PROCEDURE	106
10.3 BASIC TEST SETUP BLOCK DIAGRAM	106
10.4 ENVIRONMENTAL CONDITIONS	106
10.5 TEST RECEIVER SETUP	107
10.6 SUMMARY OF TEST RESULTS/PLOTS	107
10.7 CONDUCTED EMISSIONS TEST DATA	107

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: LM Technologies Ltd
 Address of applicant: Unit19, Spectrum House, 32-34, Gordon House Road, London, NW5 1LP, United Kingdom

Manufacturer: LM Technologies Ltd
 Address of manufacturer: Unit19, Spectrum House, 32-34, Gordon House Road, London, NW5 1LP, United Kingdom

General Description of EUT	
Product Name:	LM809 WiFi USB Adapter(300Mbps)
Trade Name:	LM Technologies
Model No.:	LM809-0647
Adding Model(s):	LM809-0658, LM809-0659, LM809-0809
Rated Voltage:	USB Port:DC5V
Power Adapter Model:	/
<p><i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model LM809-0647, but the circuit and the electronic construction do not change, declared by the manufacturer.</i></p>	

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:	14.35 dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 300Mbps
Quantity of Channels:	11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	Integral
Antenna Gain:	4.7dBi
Lowest Internal Frequency	40MHz

1.2 Test Standards

The following report is prepared on behalf of the LM Technologies 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 C63.10-2013, 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 V04 for digital transmission systems and KDB 662911 D01 Multiple Transmitter Output v02r01 shall be performed also.

1.4 Test Facility

FCC – Registration No.: 125990

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

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.

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, with a duty cycle equal to 100%, 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

Note: All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report.

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

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Network cable1	4.0	Shielded	Without Core
RJ45 CABLE	1.0	Unshielded	Without Core

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Computer	Lenovo	ThinkPad Edge E445	/
wireless router	TP-LINK	TL-WR842N	2253243030553

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Power Spectral Density	Conducted	$\pm 1.8\text{dB}$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Conducted Emissions	Conducted	9-150kHz $\pm 3.74\text{dB}$
		0.15-30MHz $\pm 3.34\text{dB}$
Transmitter Spurious Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$
		6-18GHz $\pm 3.92\text{dB}$

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2017-06-12	2018-06-11
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2017-06-12	2018-06-11
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2017-06-12	2018-06-11
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2017-06-12	2018-06-11
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2017-06-12	2018-06-11
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-08	2020-06-07
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-08	2020-06-07
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2017-06-08	2020-06-07
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2020-06-07
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2017-06-12	2018-06-11
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2017-06-12	2018-06-11
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2017-06-12	2018-06-11
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2017-08-15	2018-08-14
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2017-08-15	2018-08-14
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2017-06-12	2018-06-11
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2018-03-19	2021-03-18
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2017-06-12	2018-06-11
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2017-06-12	2018-06-11
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2017-06-12	2018-06-11
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2018-03-19	2019-03-18
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2018-03-19	2019-03-18
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2018-03-19	2019-03-18
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2018-03-19	2019-03-18
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2018-03-19	2019-03-18
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2018-03-19	2019-03-18

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
§15.205	Restricted Band of Operation	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 § 2.1091, the mobile transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure 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 V04, 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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set VBW $\geq 3 \times \text{RBW}$.
- e) Detector = power averaging (RMS) or sample detector (when RMS not available).
- f) Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- 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

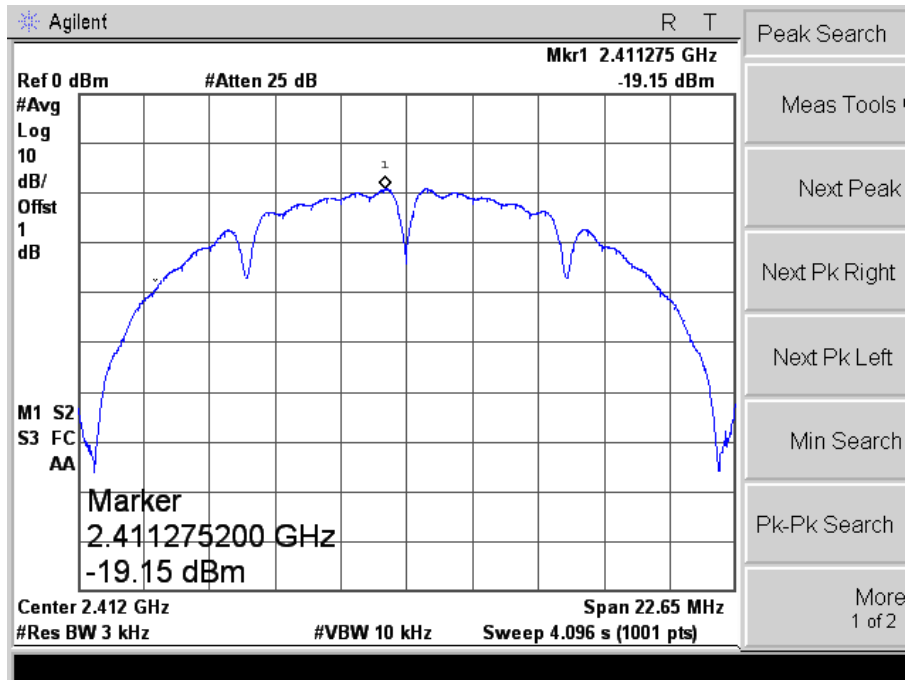
5.4 Summary of Test Results/Plots

Test Mode	Test Channel MHz	Power Spectral Density dBm/100kHz			Limit dBm/3kHz
		Chain 1	Chain 2	Total	
802.11b_11Mbps	2412	-19.15	-21.02	/	8
	2437	-19.46	-20.20	/	8
	2462	-17.22	-19.60	/	8
802.11g_54Mbps	2412	-23.12	-23.69	/	8
	2437	-23.51	-23.70	/	8
	2462	-23.84	-22.76	/	8
802.11n HT20_MCS7	2412	-23.13	-24.33	-20.68	8
	2437	-23.38	-24.62	-20.95	8
	2462	-24.81	-24.05	-21.40	8
802.11n HT40_MCS7	2422	-27.07	-28.95	-24.90	8
	2437	-27.52	-29.05	-25.21	8
	2452	-26.44	-28.91	-24.49	8

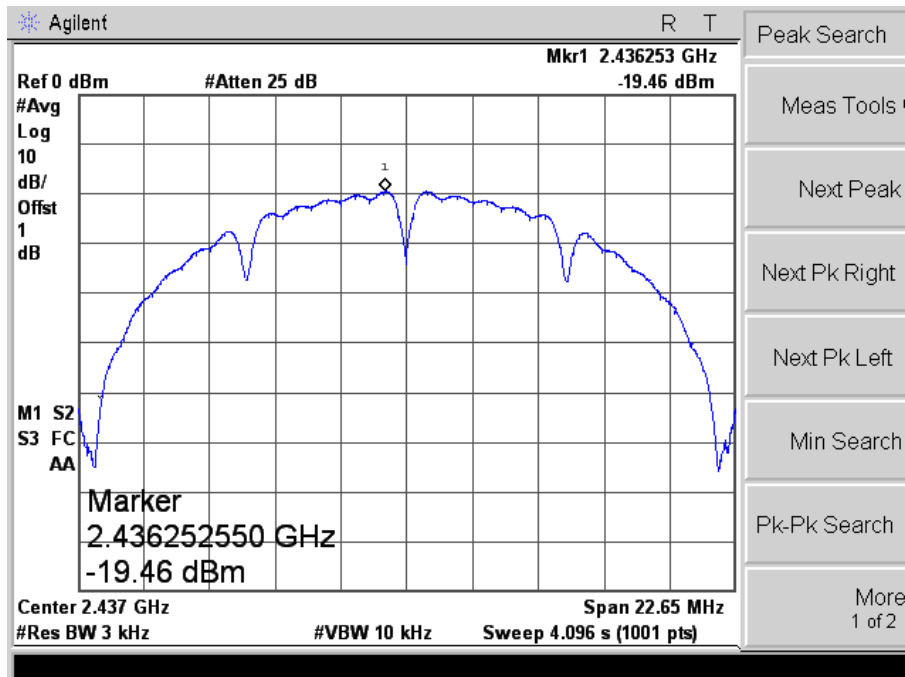
Please refer to the following test plots:

Chain 1

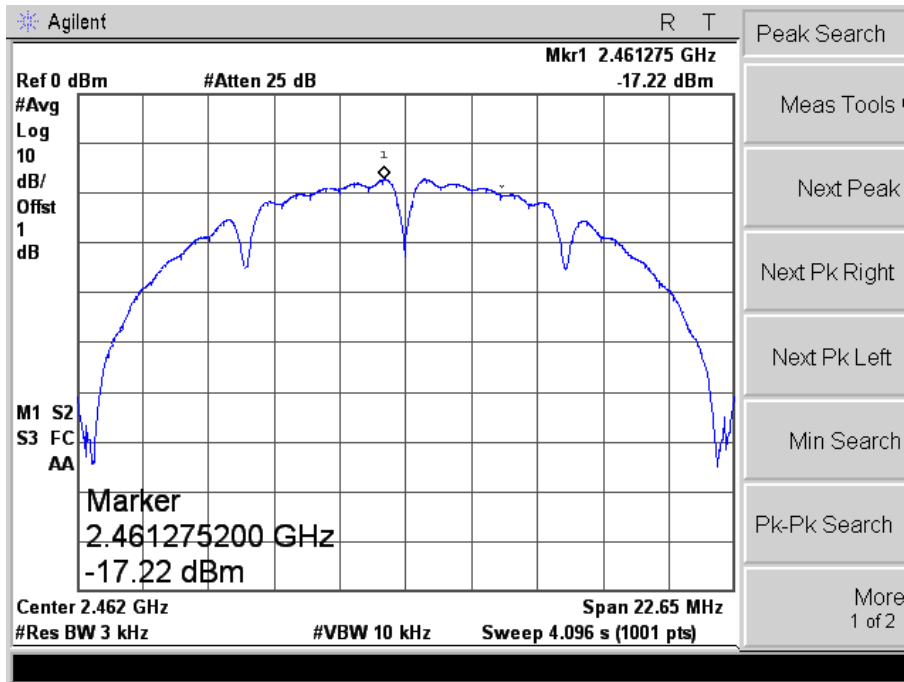
802.11b-Low Channel



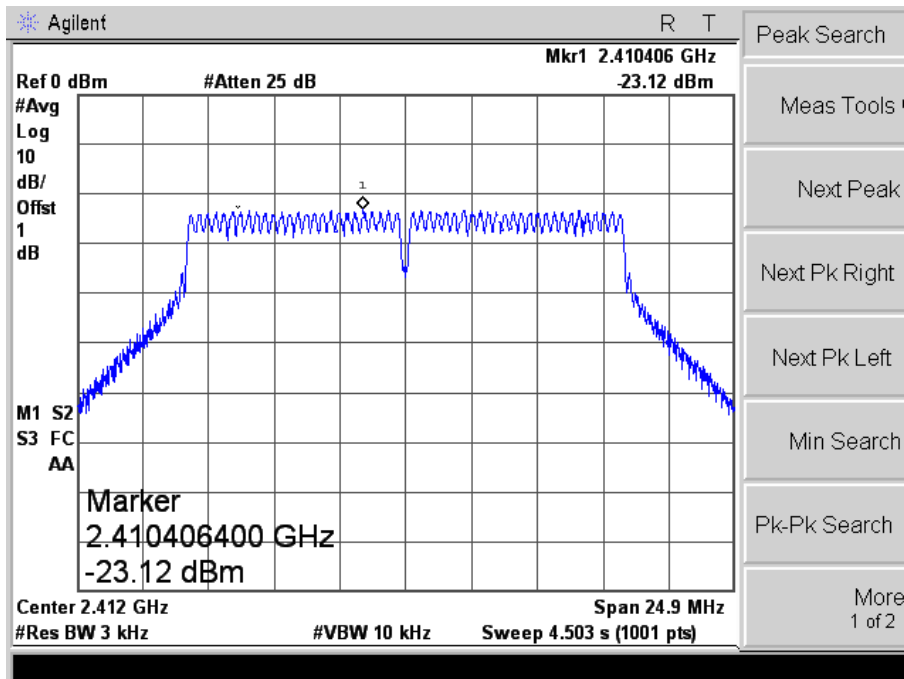
802.11b-Middle Channel



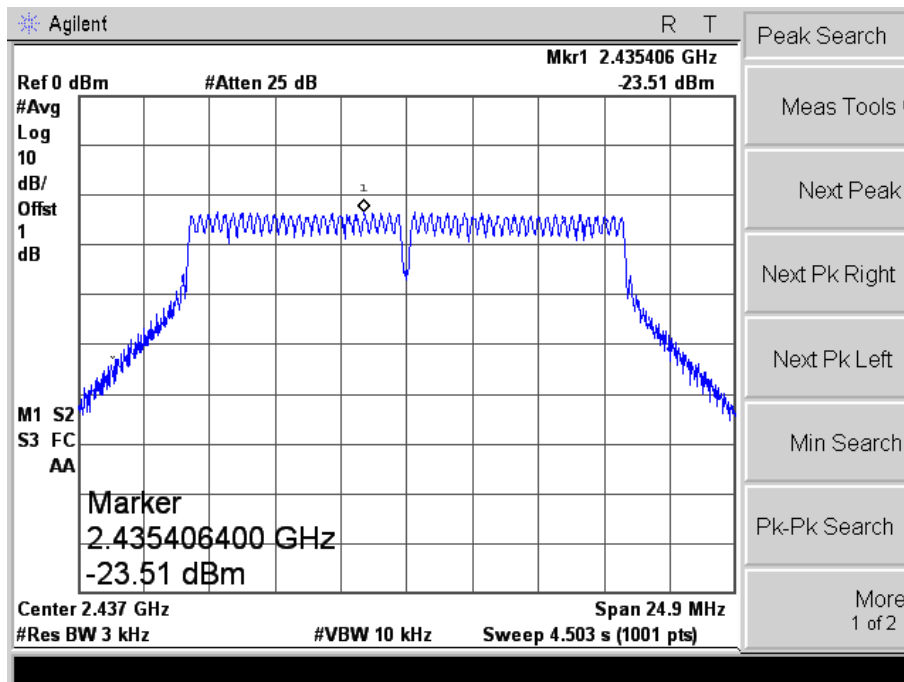
802.11b-High Channel



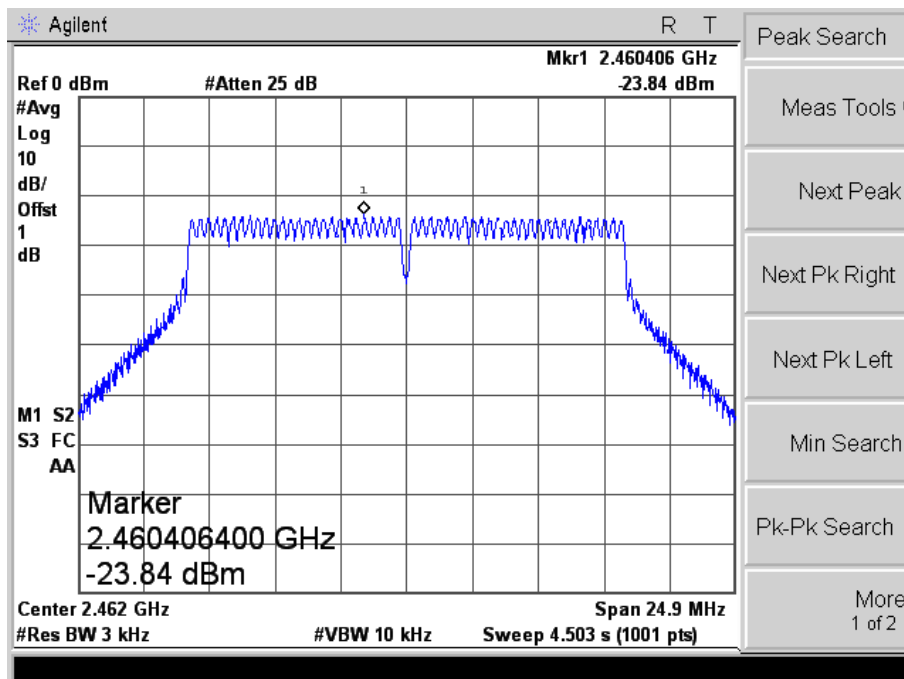
802.11g-Low Channel



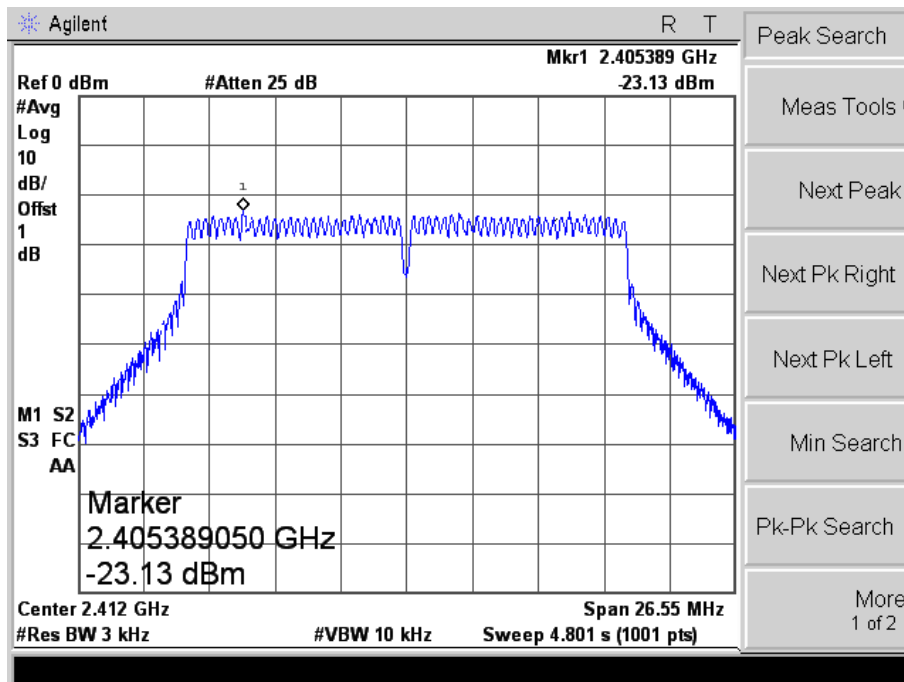
802.11g-Middle Channel



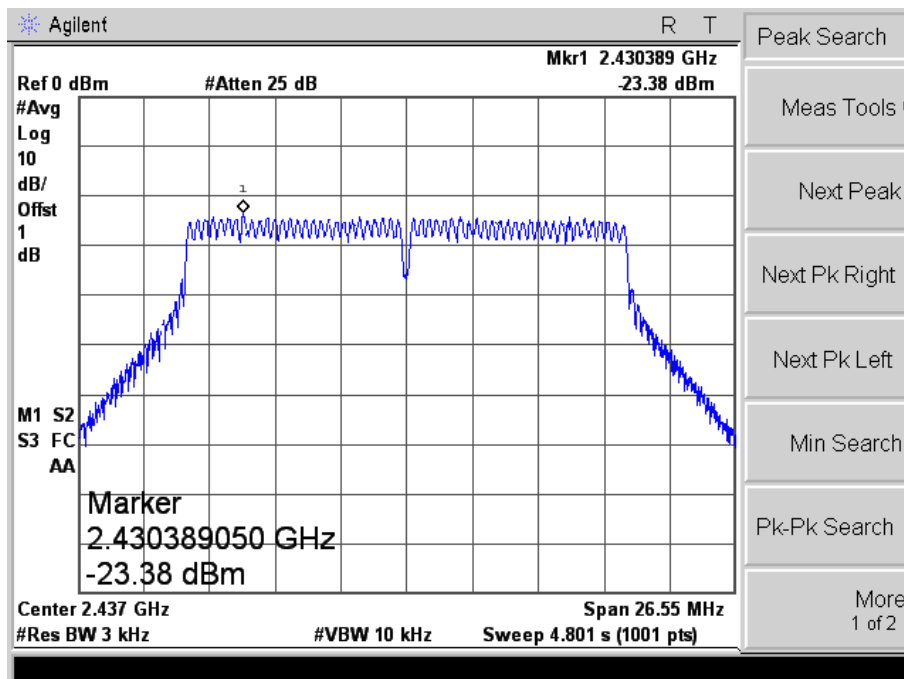
802.11g-High Channel



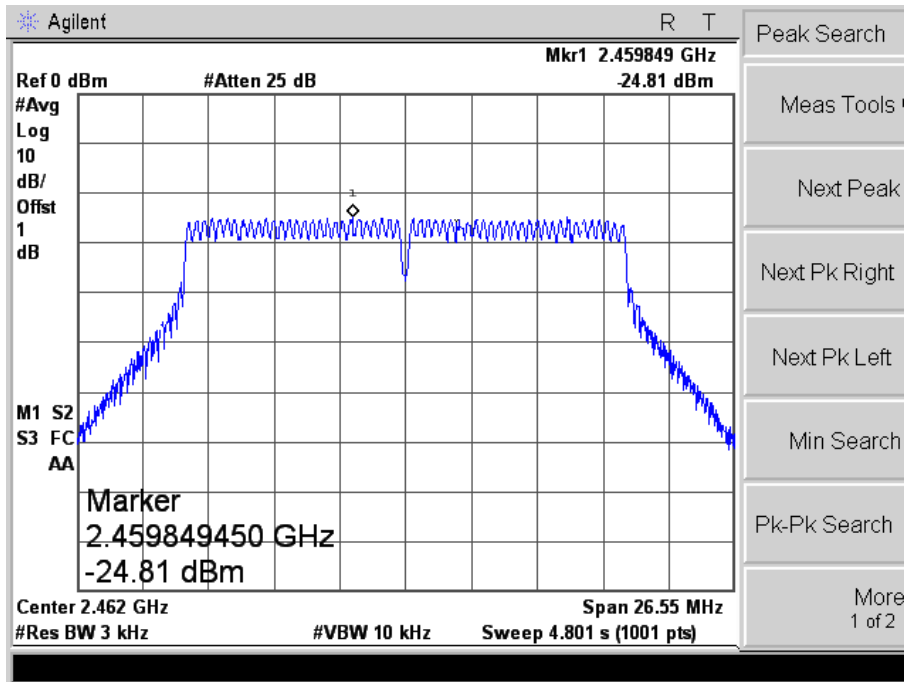
802.11n-HT20-Low Channel



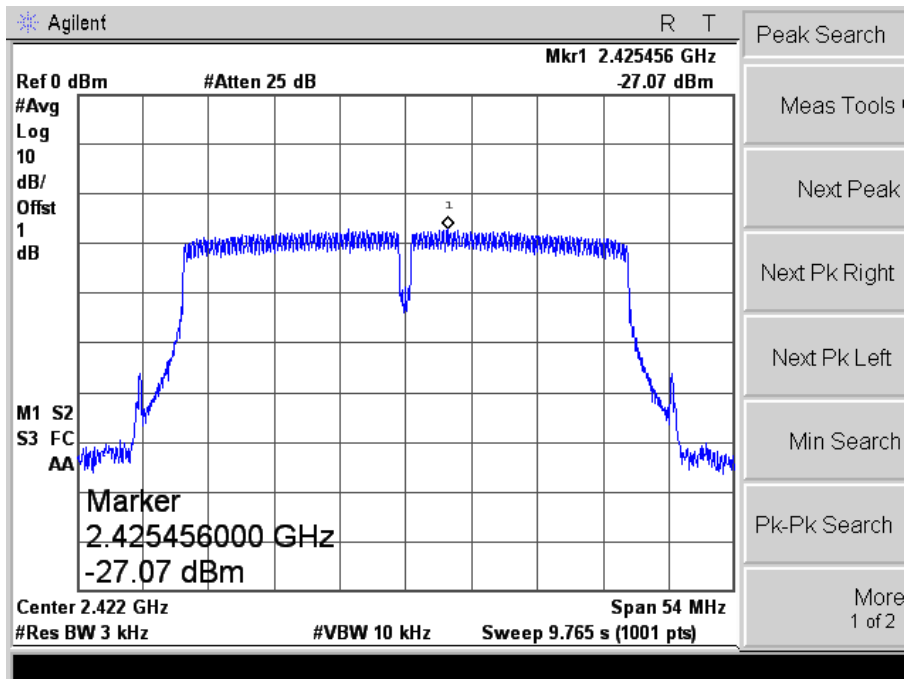
802.11n-HT20-Middle Channel



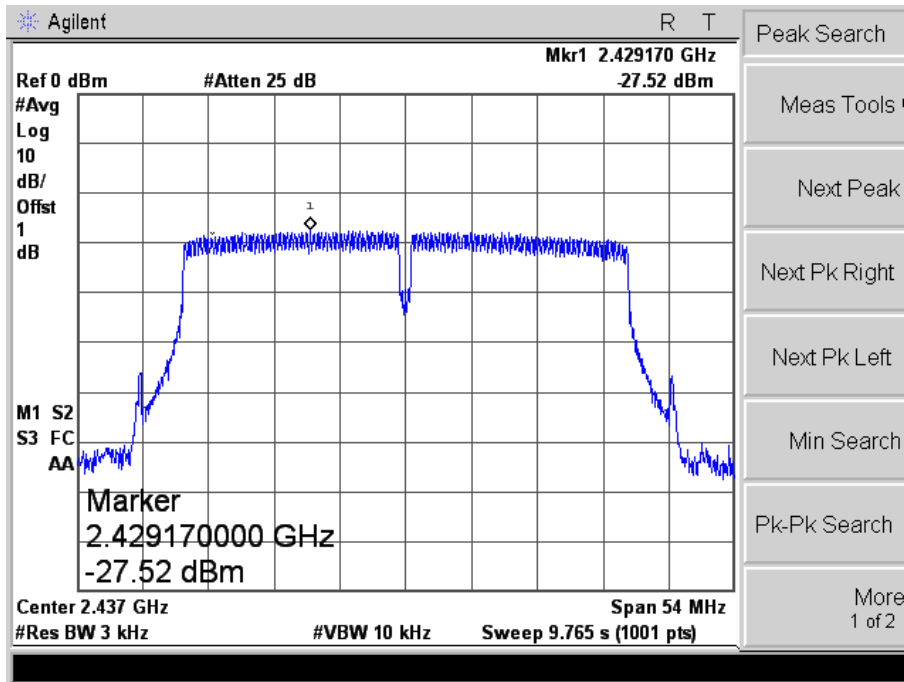
802.11n-HT20-High Channel



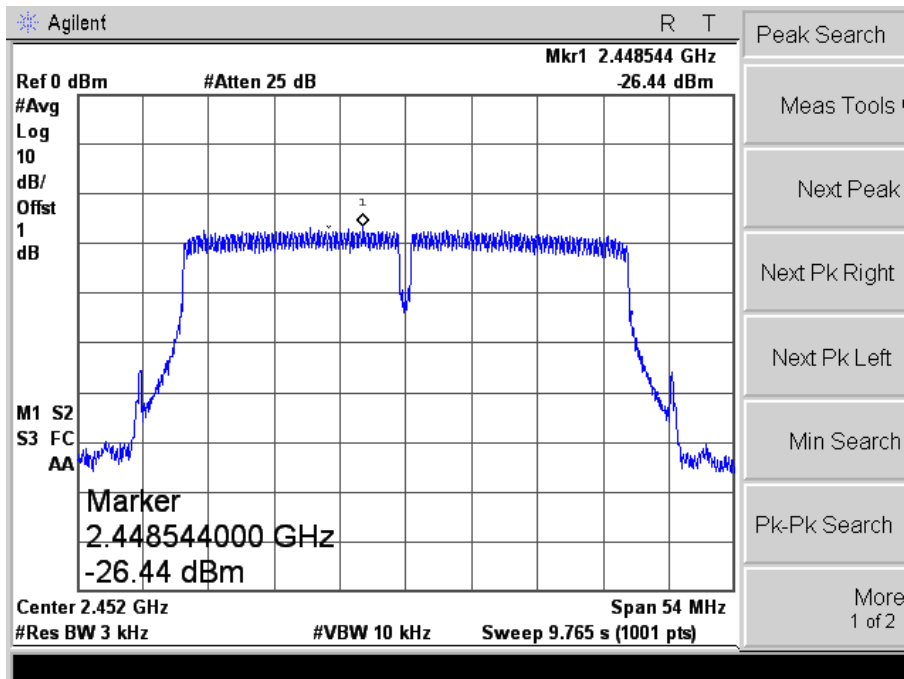
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel

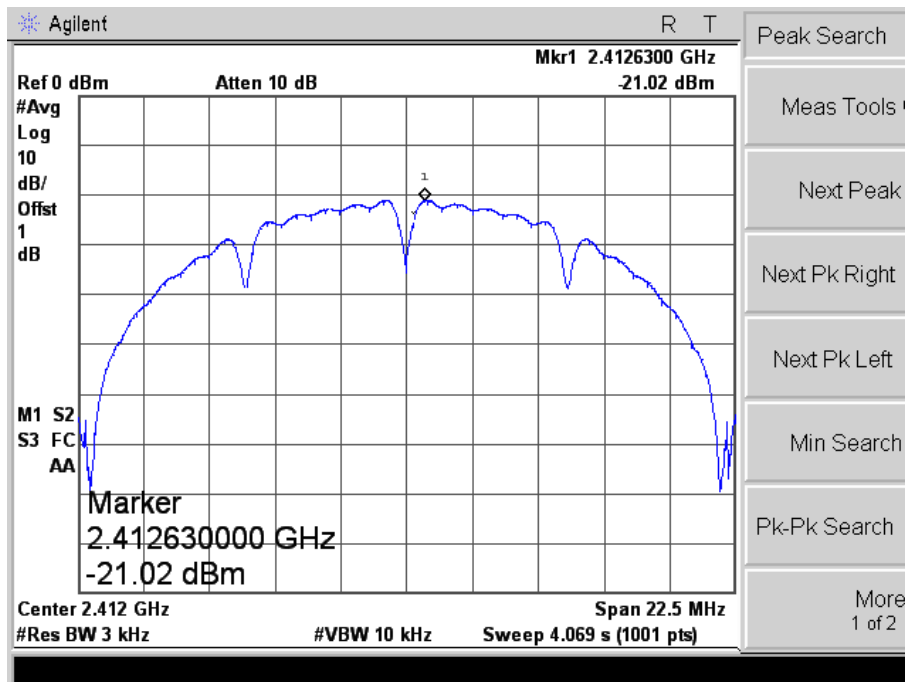


802.11n-HT40-High Channel

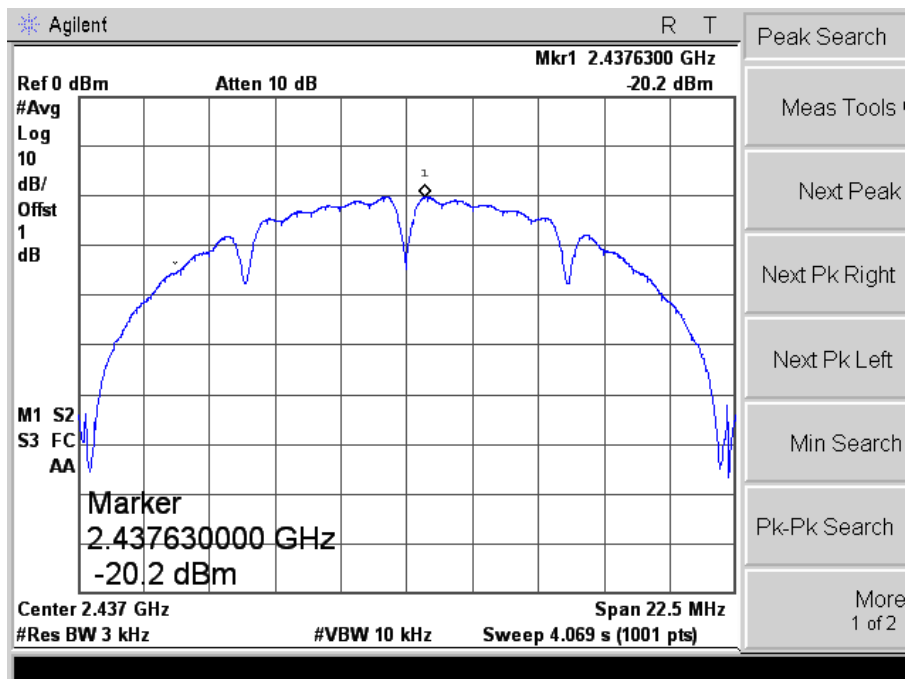


Chain 2

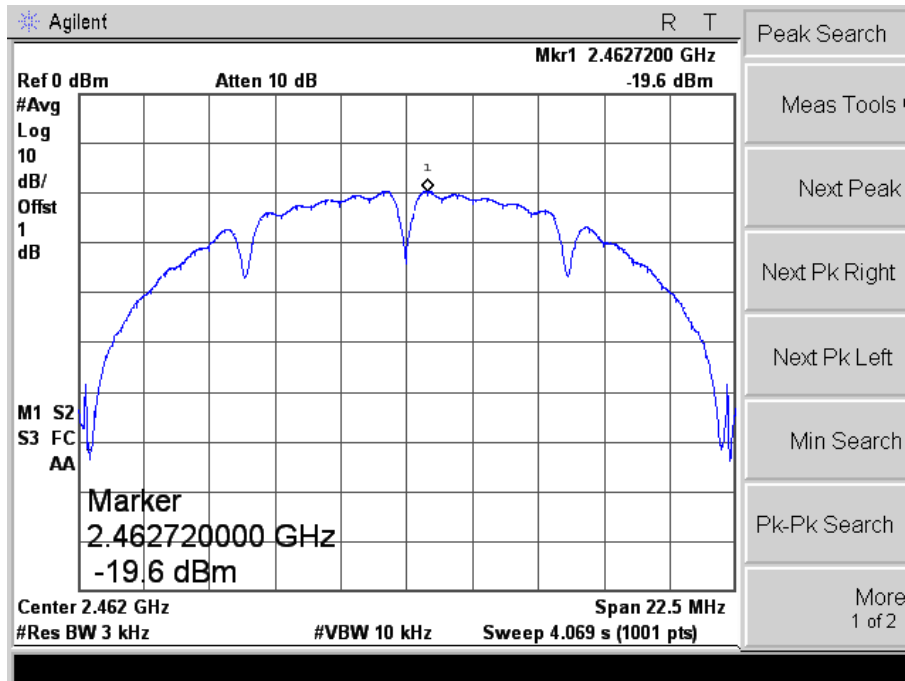
802.11b-Low Channel



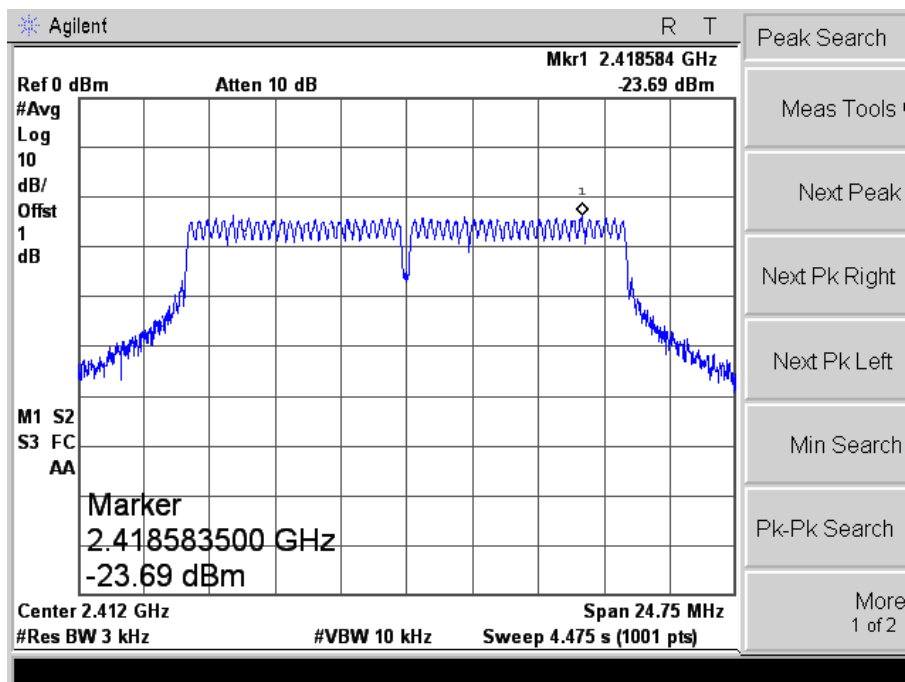
802.11b-Middle Channel



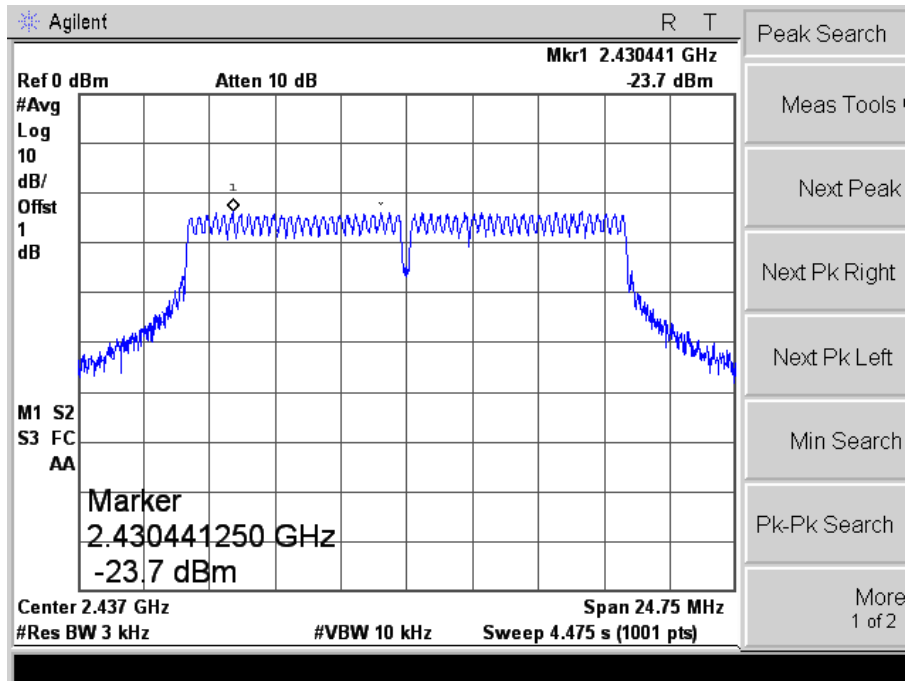
802.11b-High Channel



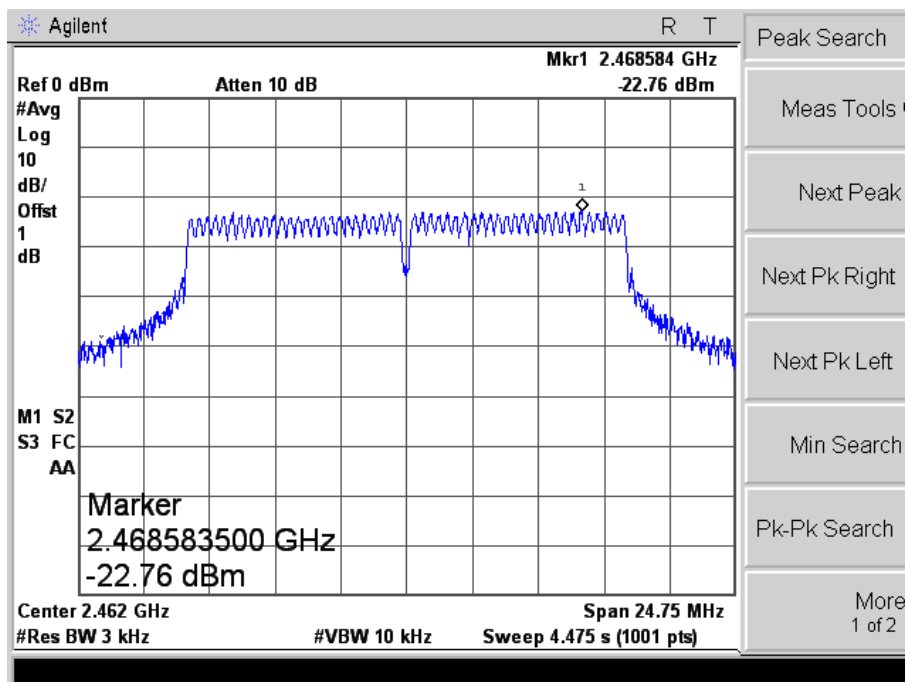
802.11g-Low Channel



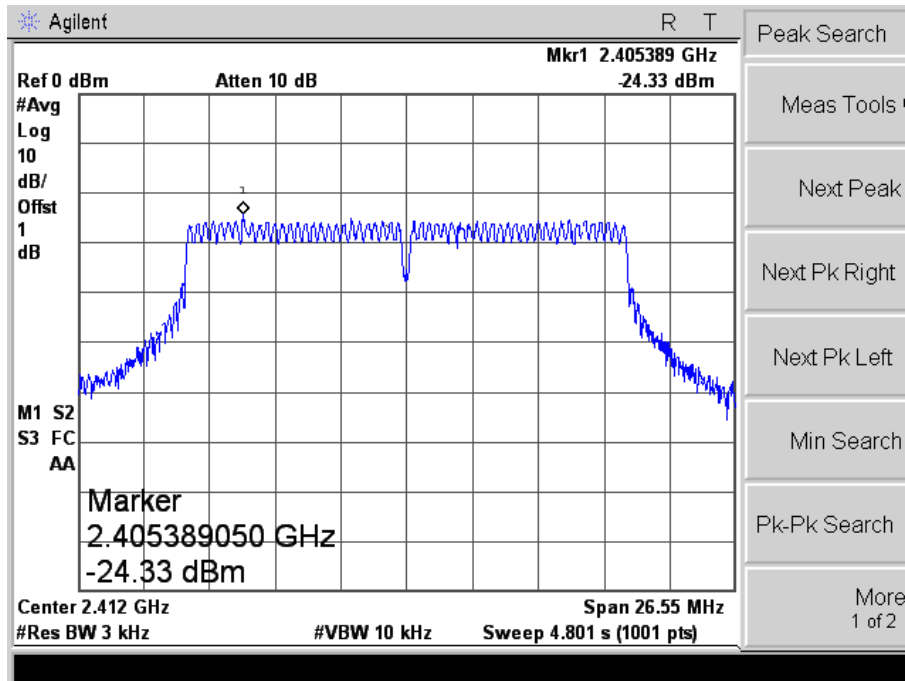
802.11g-Middle Channel



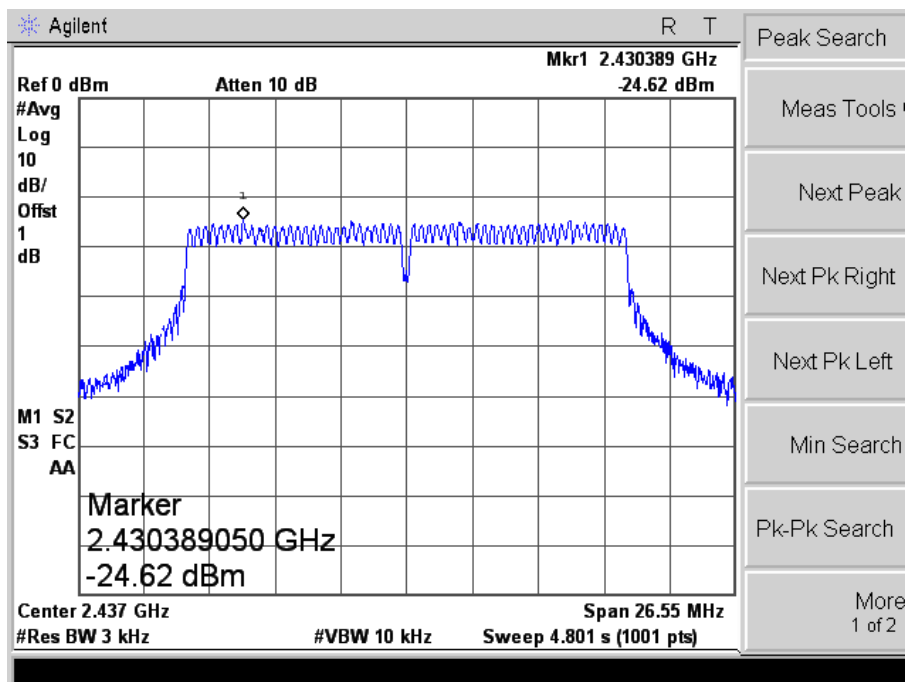
802.11g-High Channel



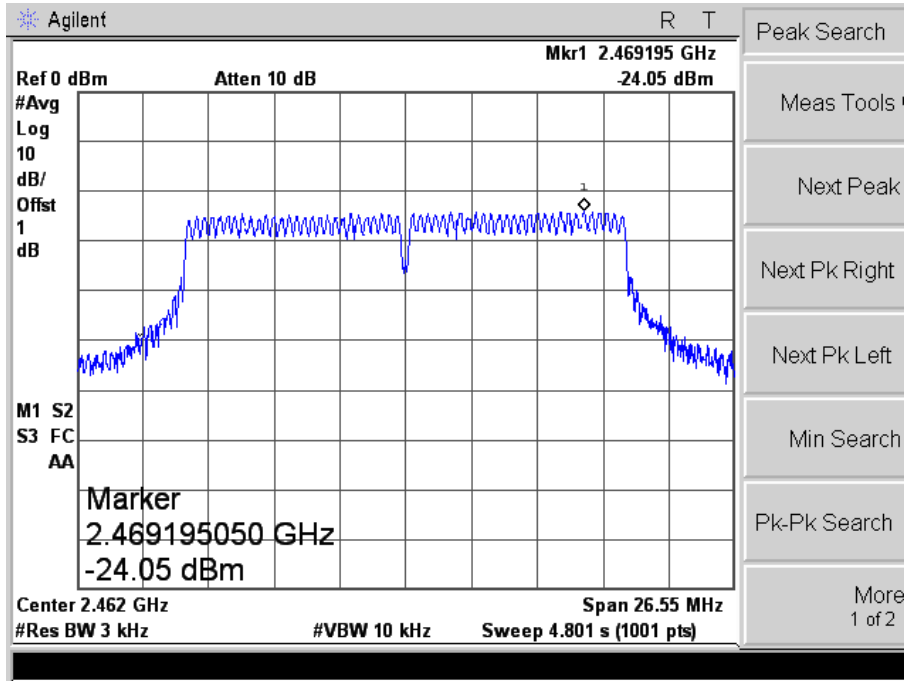
802.11n-HT20-Low Channel



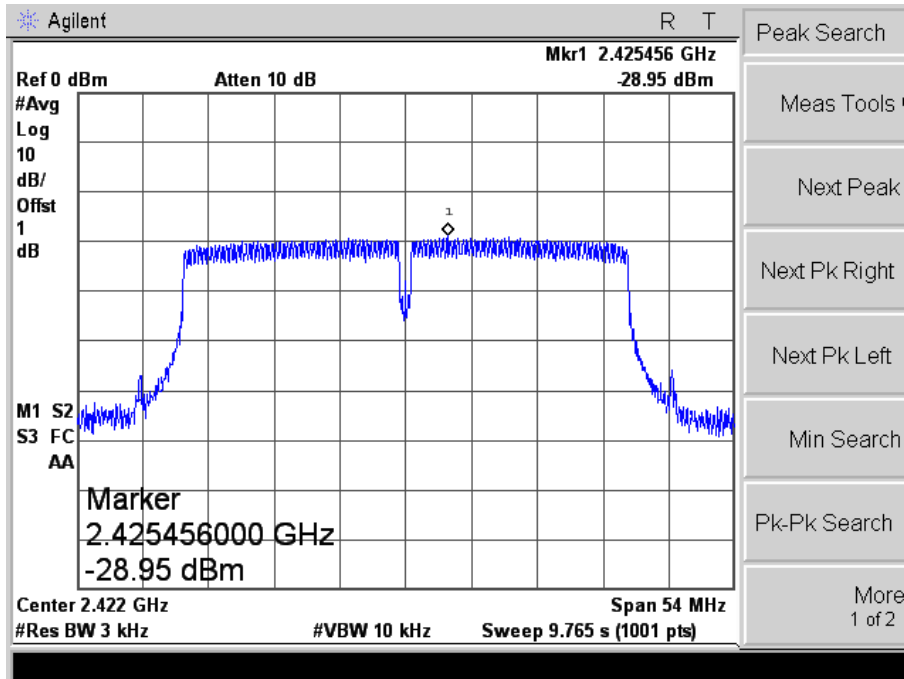
802.11n-HT20-Middle Channel



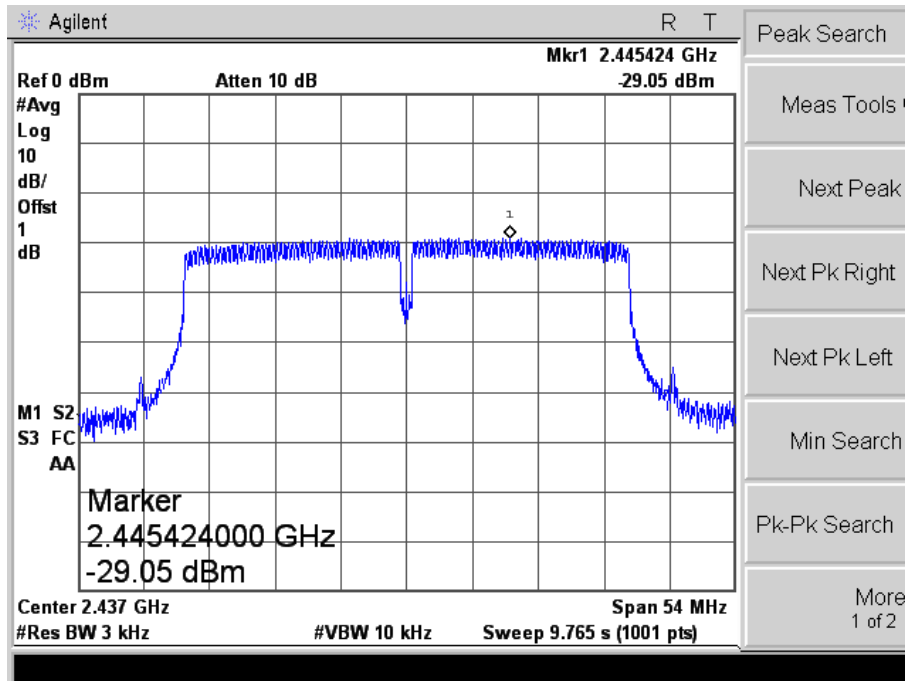
802.11n-HT20-High Channel



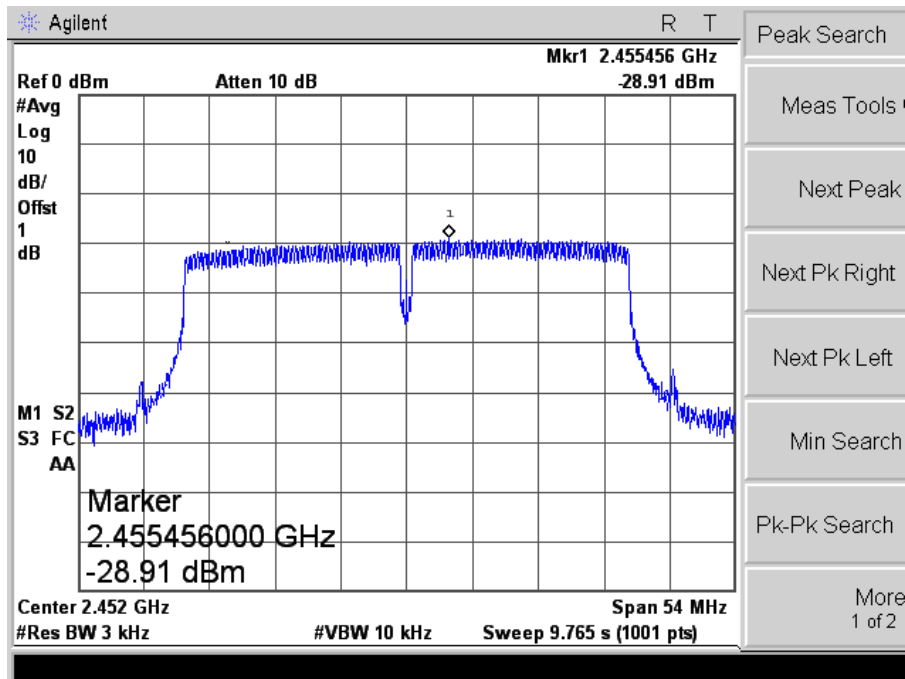
802.11n-HT40-Low Channel



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) $\geq 3 \times$ 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

Chain 1

Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
802.11b_11Mbps	2412	9.597	15.0195	≥500
	2437	10.071	15.0266	≥500
	2462	10.050	15.0197	≥500
802.11g_54Mbps	2412	16.568	16.5035	≥500
	2437	16.549	16.5055	≥500
	2462	16.568	16.5015	≥500
802.11n-HT20_MCS7	2412	17.813	17.6887	≥500
	2437	17.769	17.6916	≥500
	2462	17.784	17.6900	≥500
802.11n-HT40_MCS7	2422	36.403	35.9491	≥500
	2437	36.400	35.9809	≥500
	2452	36.408	35.9980	≥500

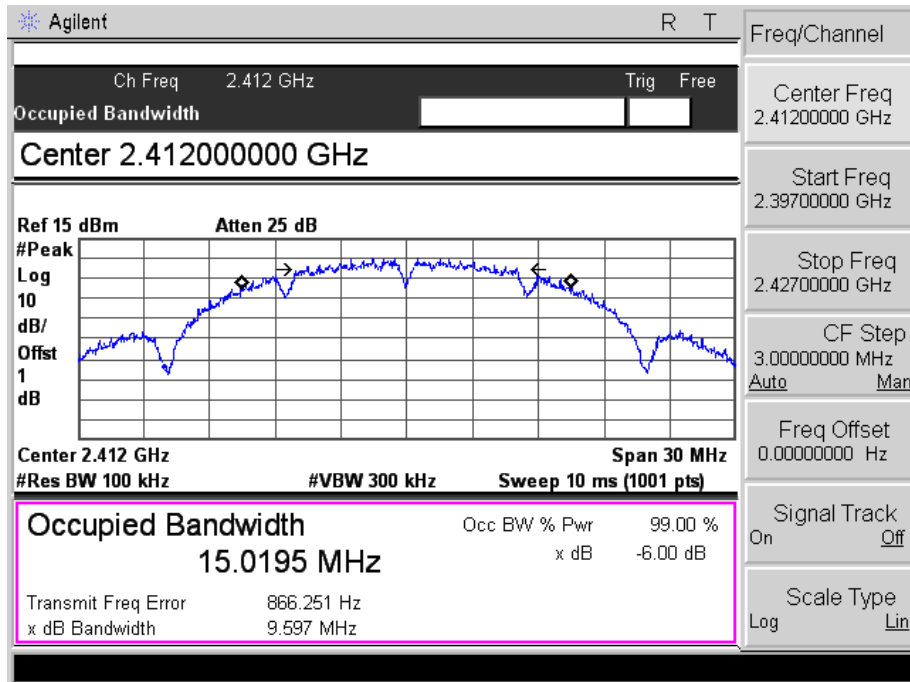
Chain 2

Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
802.11b_11Mbps	2412	10.071	14.9816	≥500
	2437	10.067	14.9839	≥500
	2462	10.037	14.9859	≥500
802.11g_54Mbps	2412	16.580	16.4960	≥500
	2437	16.564	16.4853	≥500
	2462	16.559	16.4949	≥500
802.11n-HT20_MCS7	2412	17.785	17.6812	≥500
	2437	17.809	17.6876	≥500
	2462	17.796	17.6951	≥500
802.11n-HT40_MCS7	2422	36.431	35.9786	≥500
	2437	36.421	35.9776	≥500
	2452	36.414	35.9996	≥500

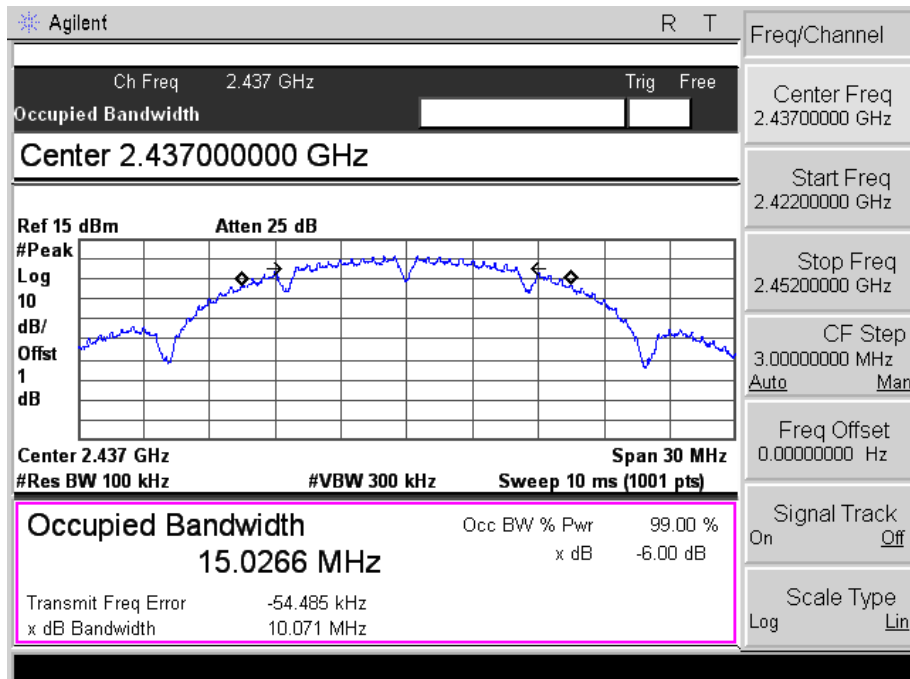
Please refer to the following test plots:

Chain 1

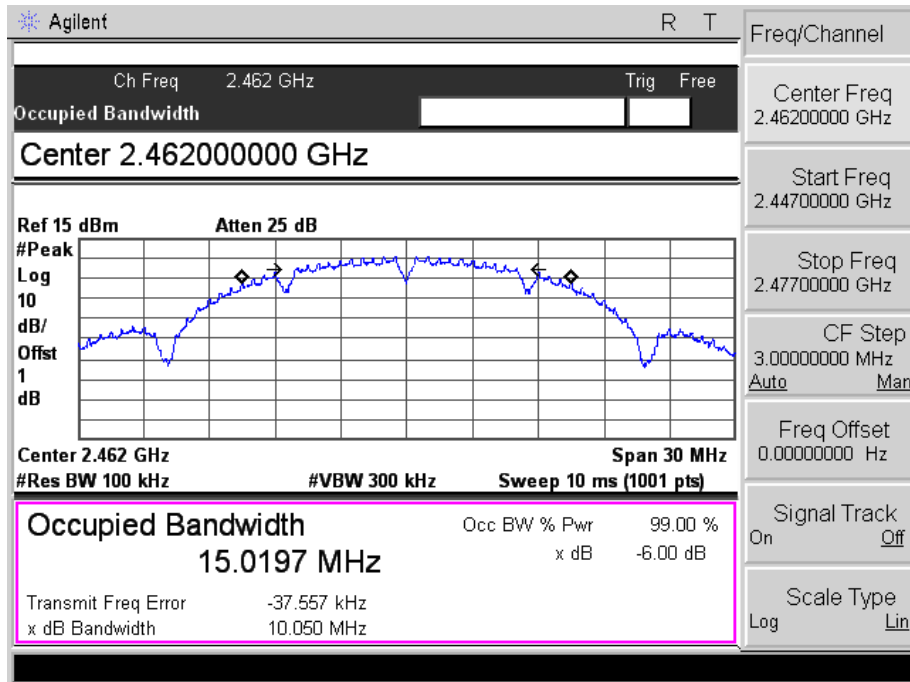
802.11b-Low Channel



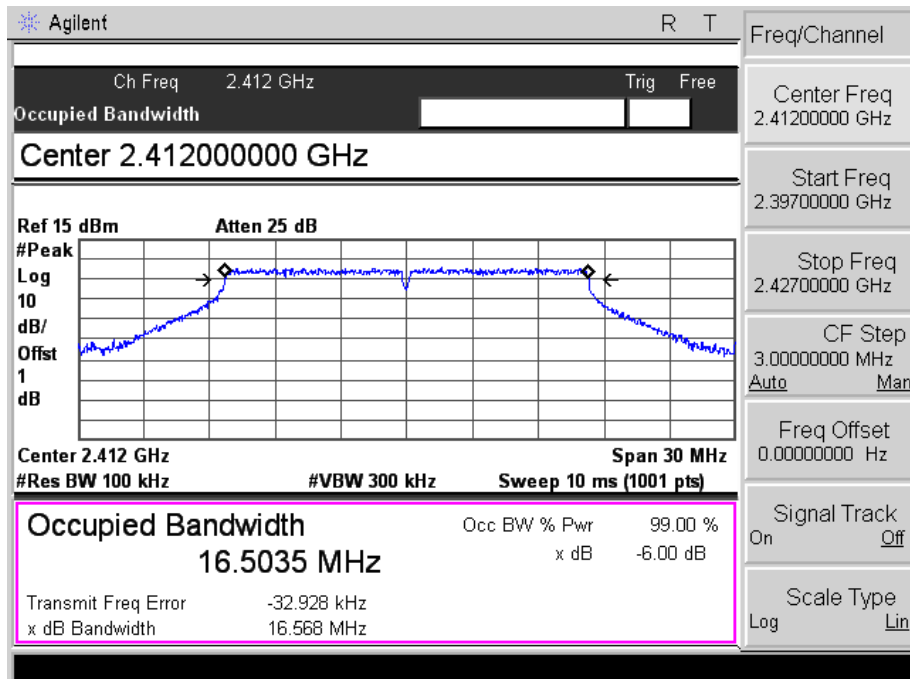
802.11b-Middle Channel



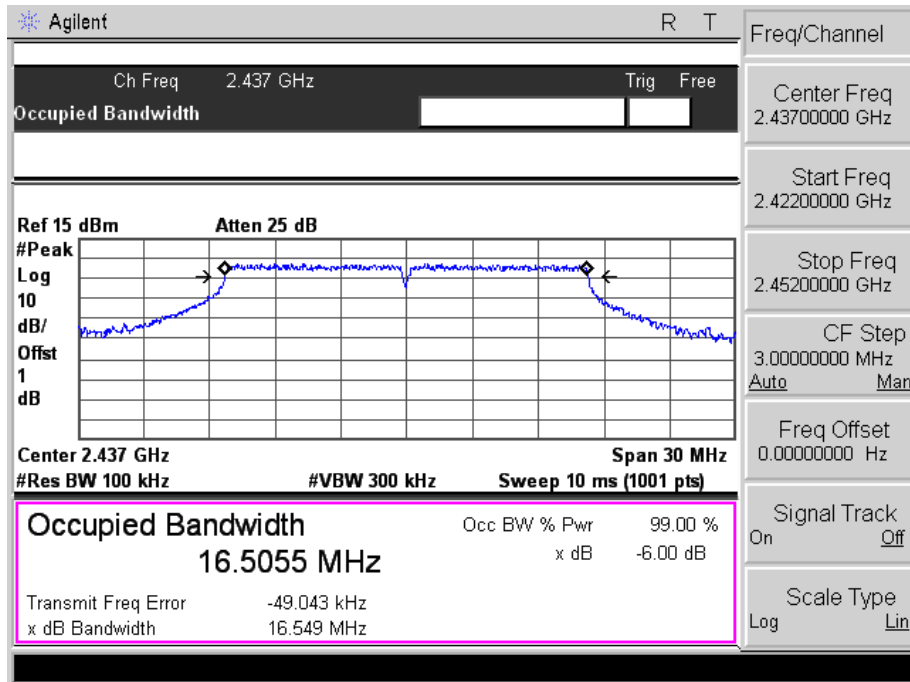
802.11b-High Channel



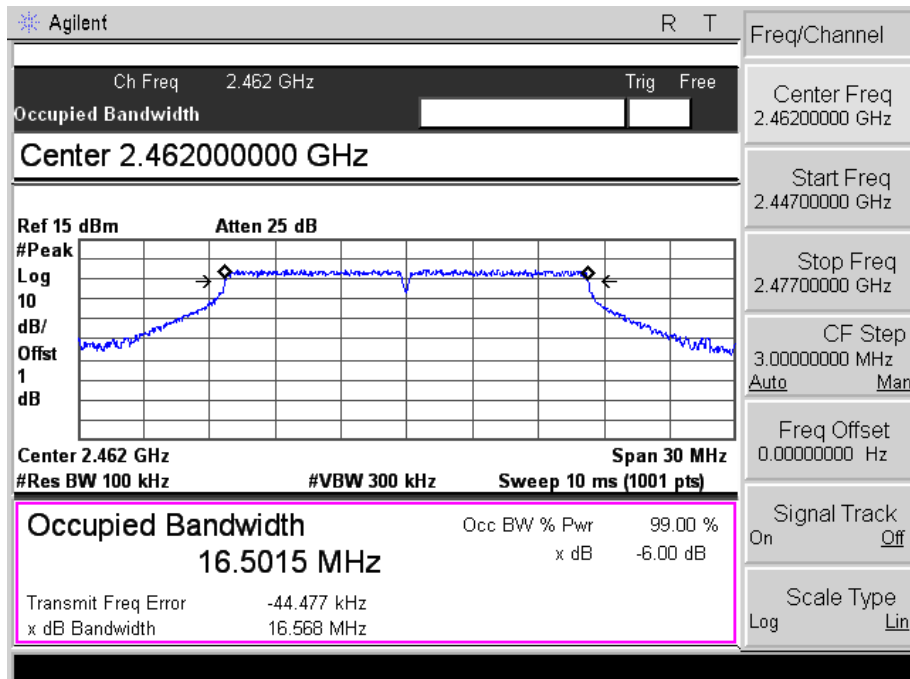
802.11g-Low Channel



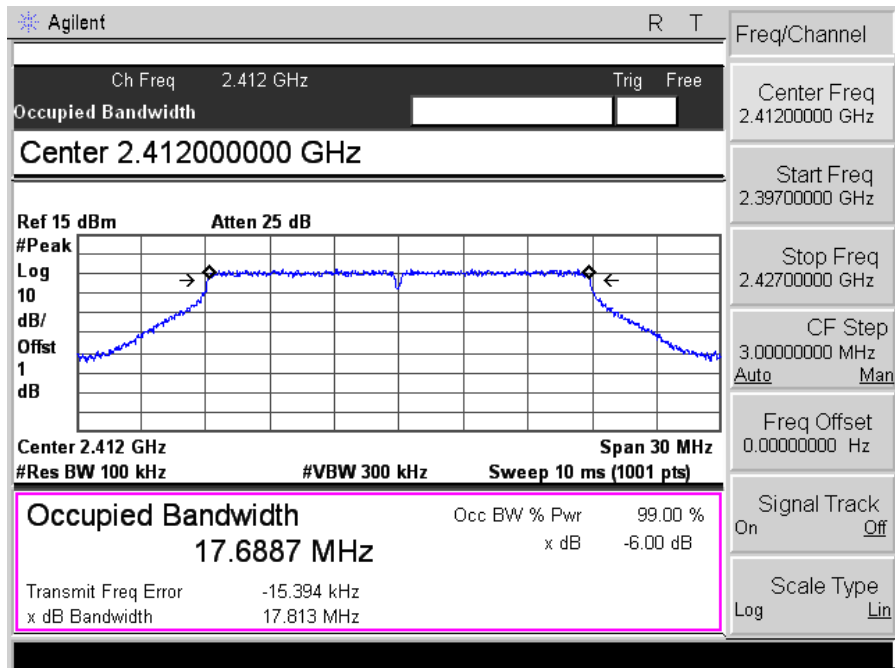
802.11g-Middle Channel



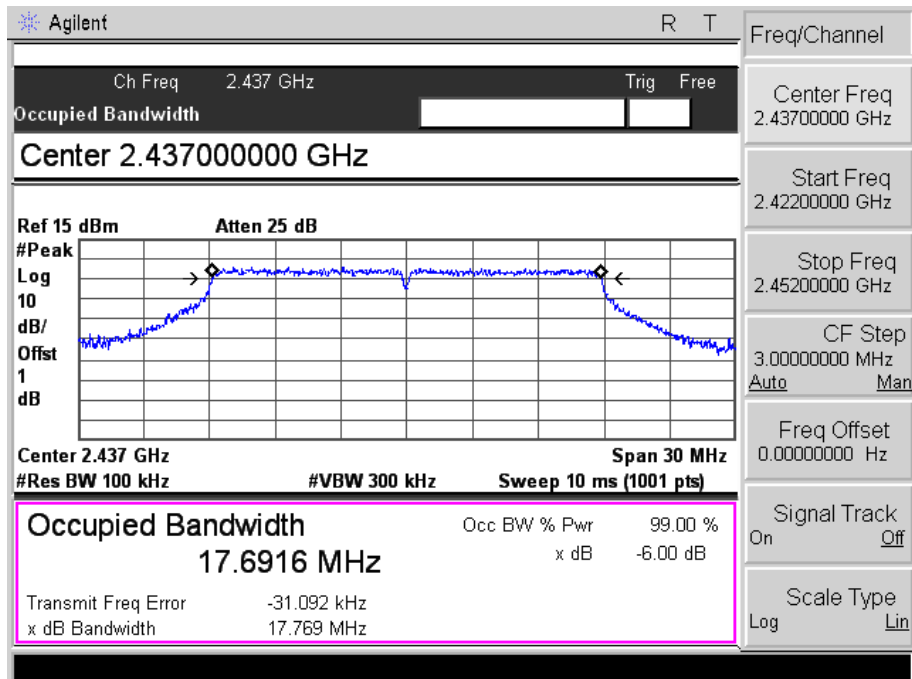
802.11g-High Channel



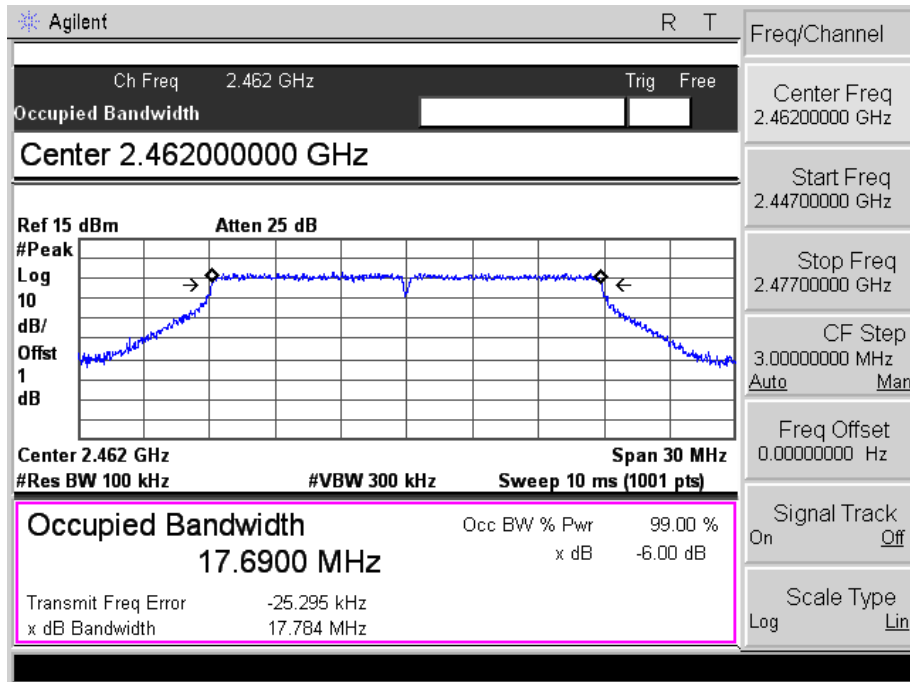
802.11n-HT20-Low Channel



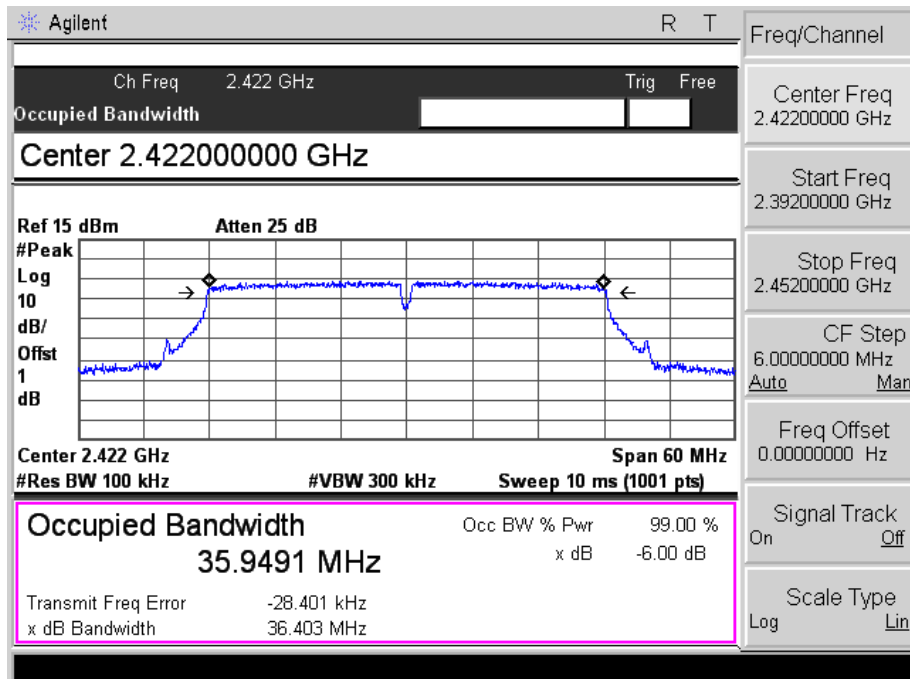
802.11n-HT20-Middle Channel



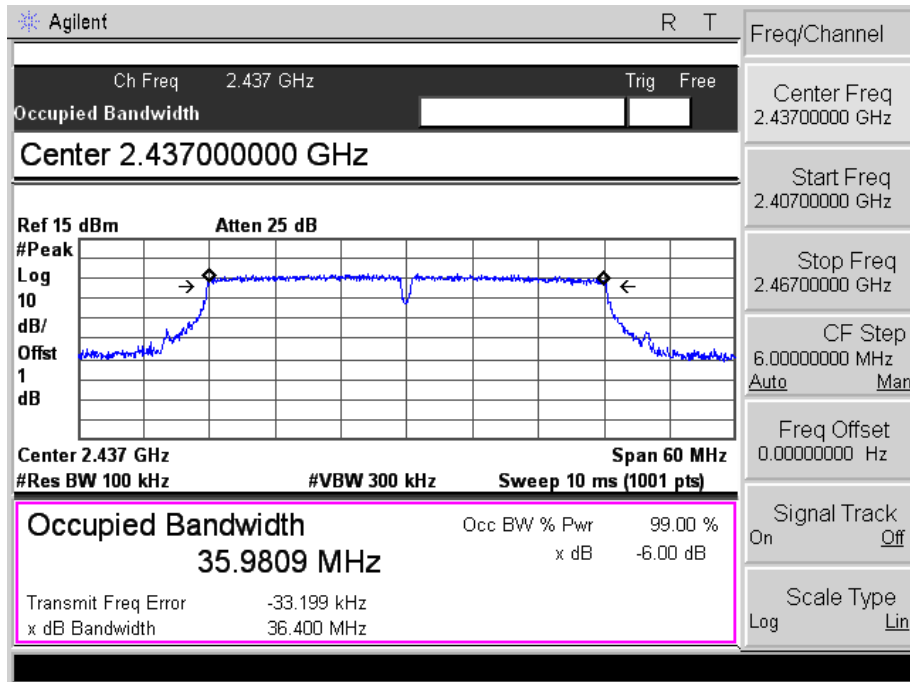
802.11n-HT20-High Channel



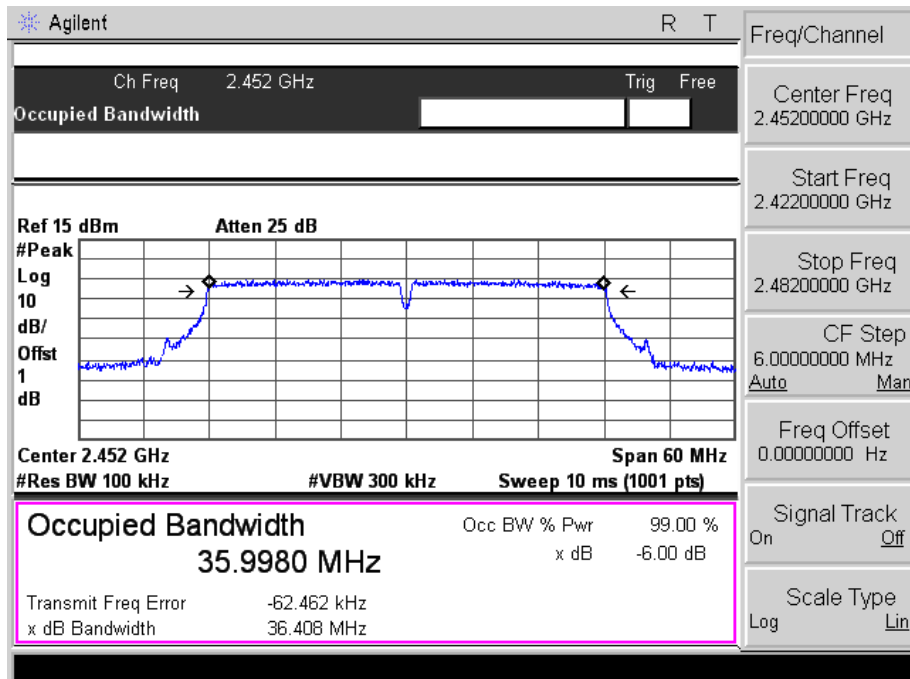
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel

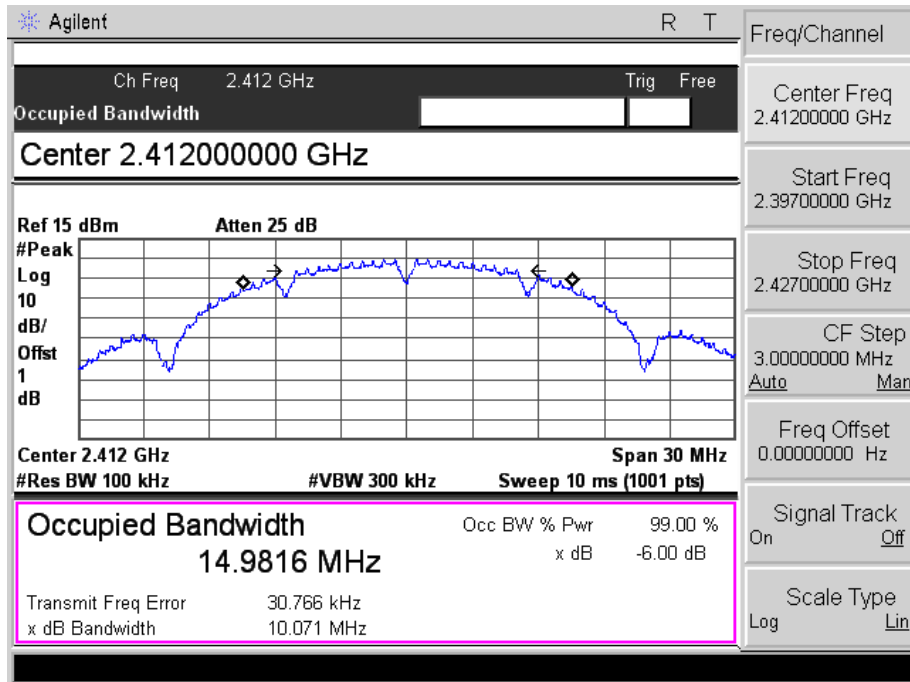


802.11n-HT40-High Channel

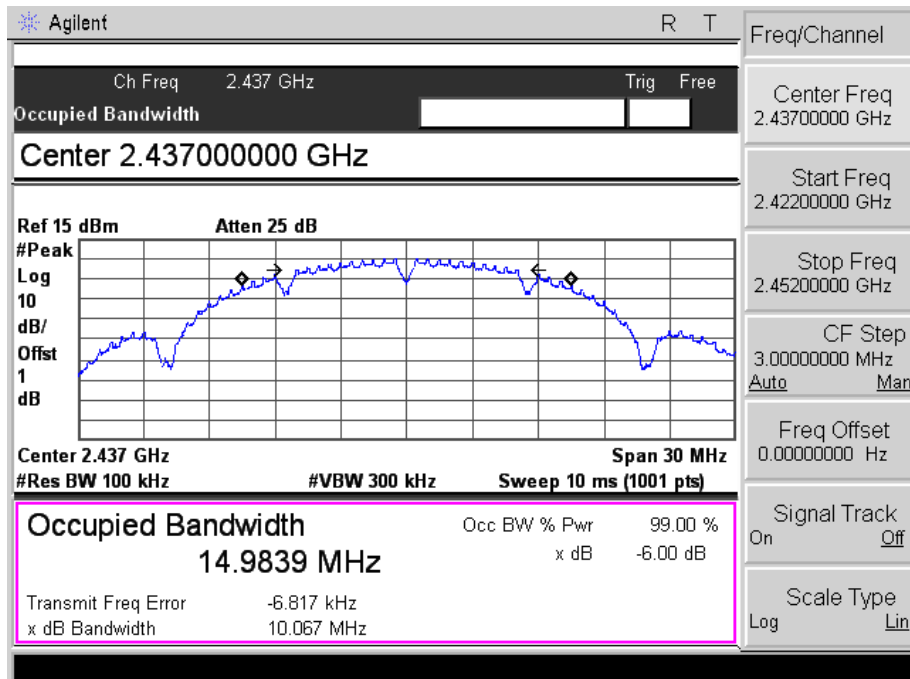


Chain 2

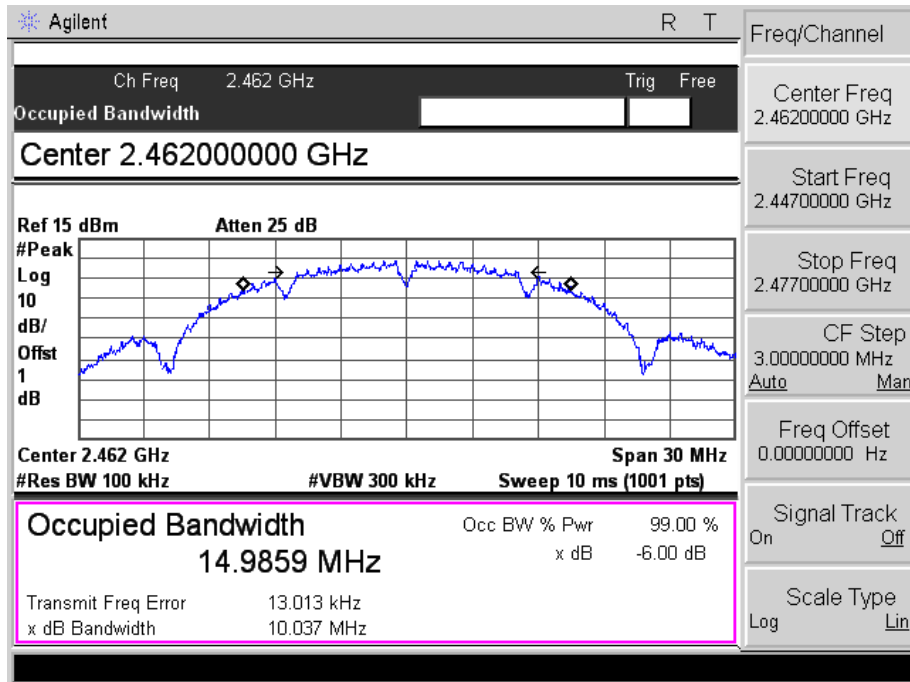
802.11b-Low Channel



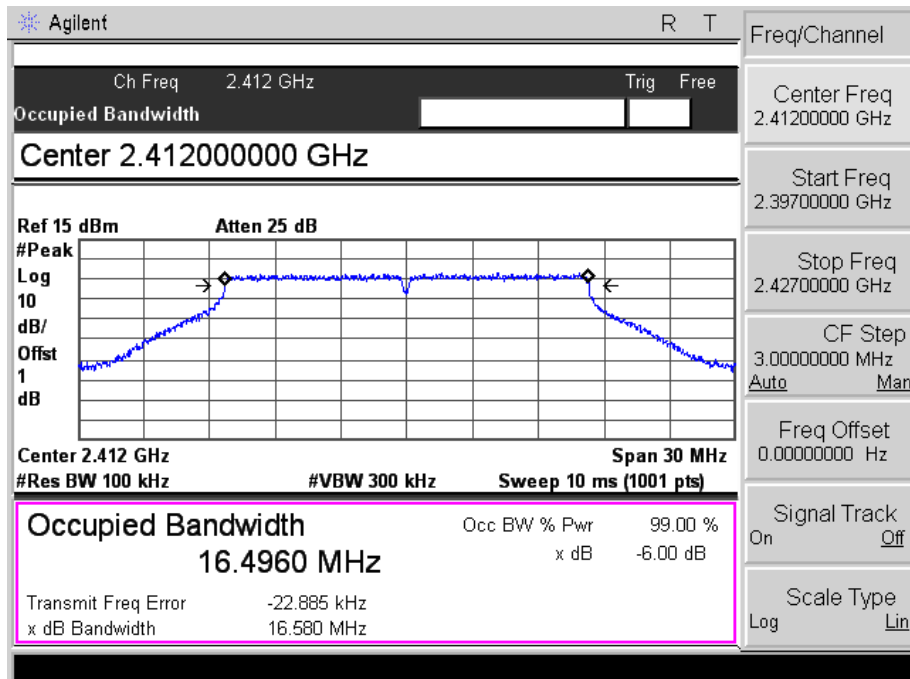
802.11b-Middle Channel



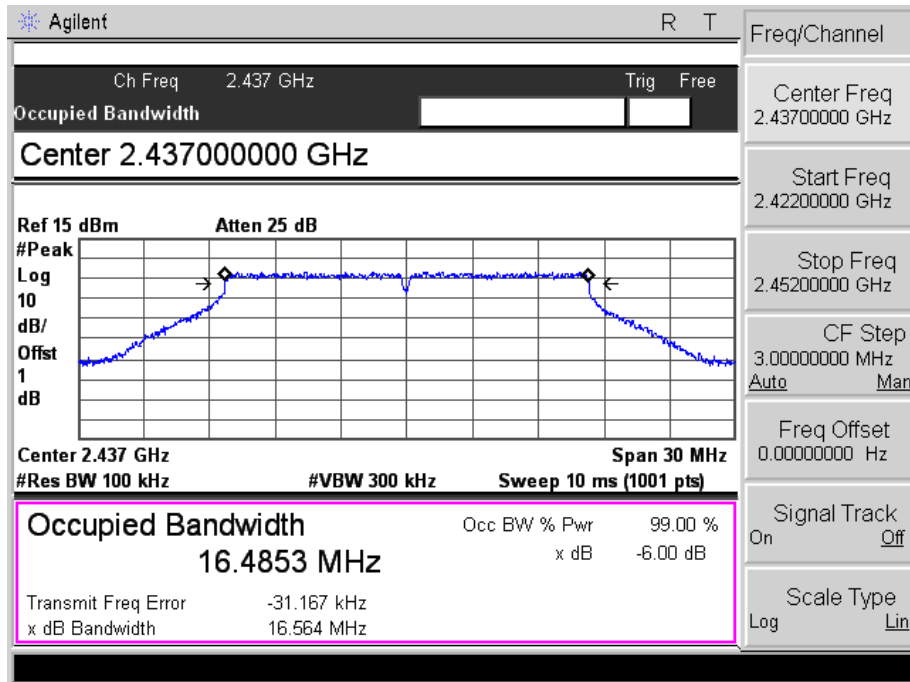
802.11b-High Channel



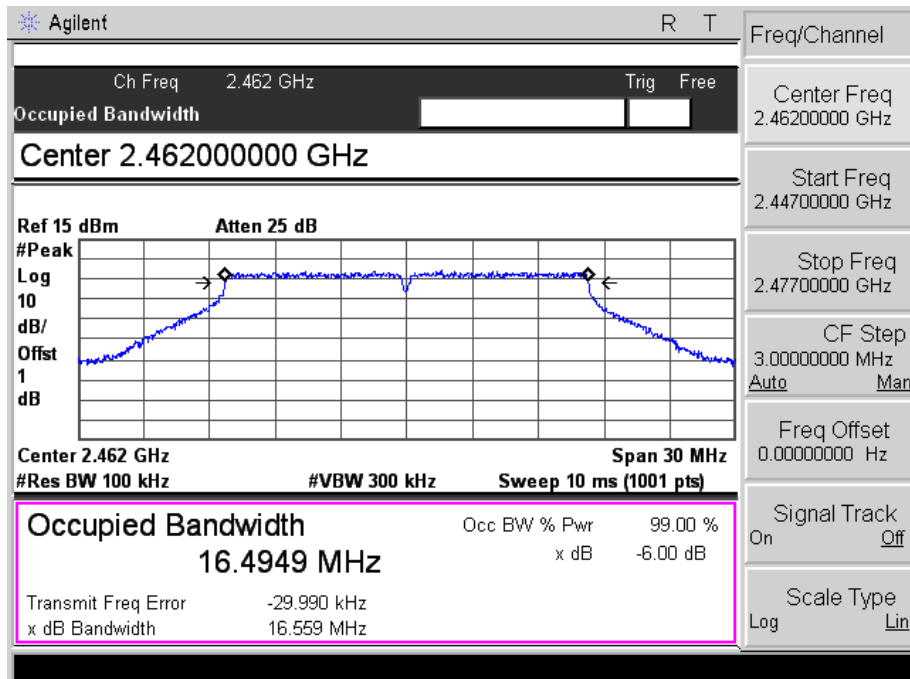
802.11g-Low Channel



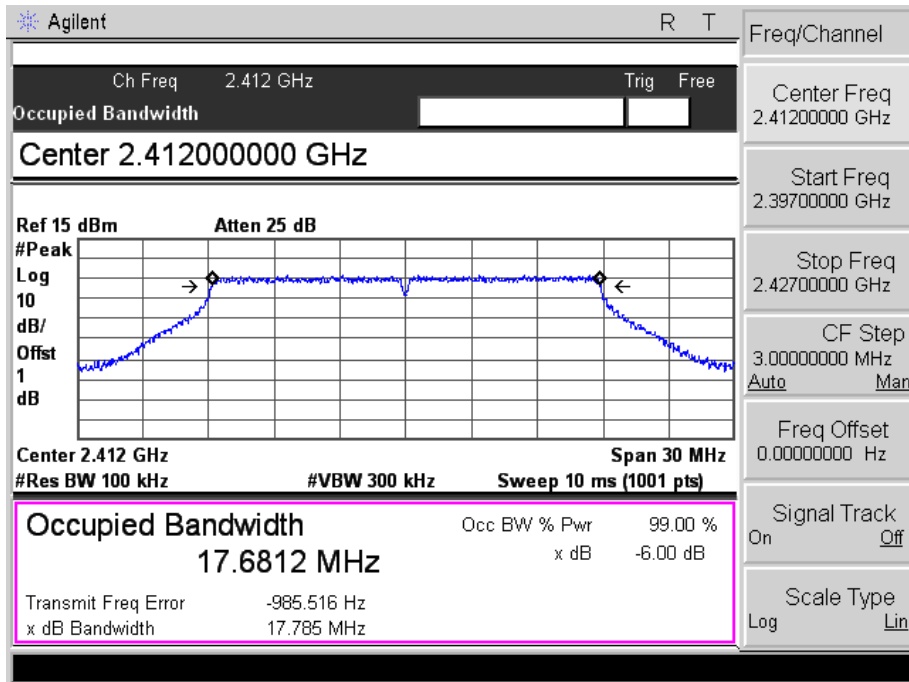
802.11g-Middle Channel



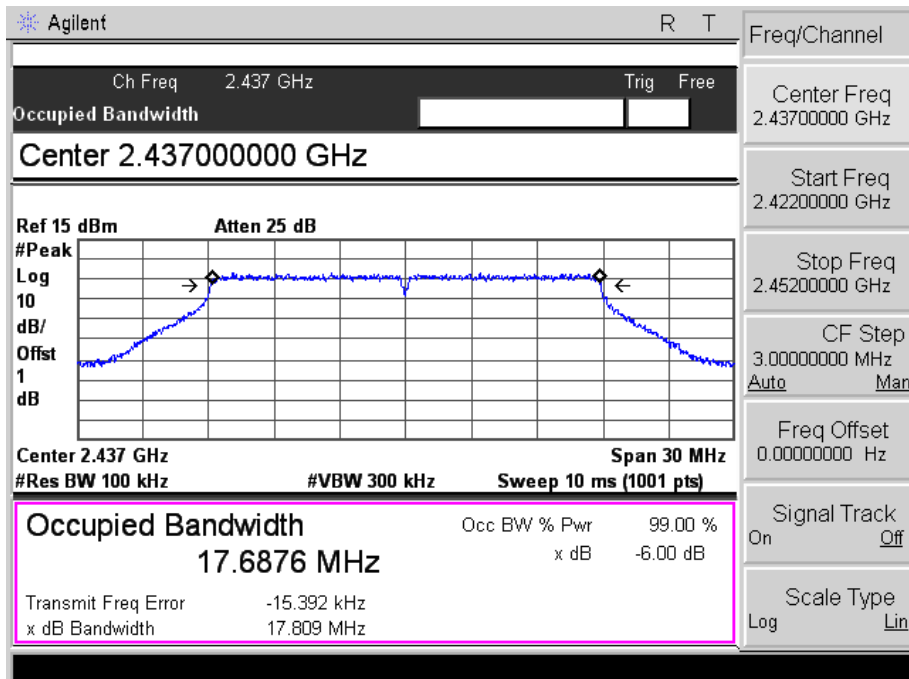
802.11g-High Channel



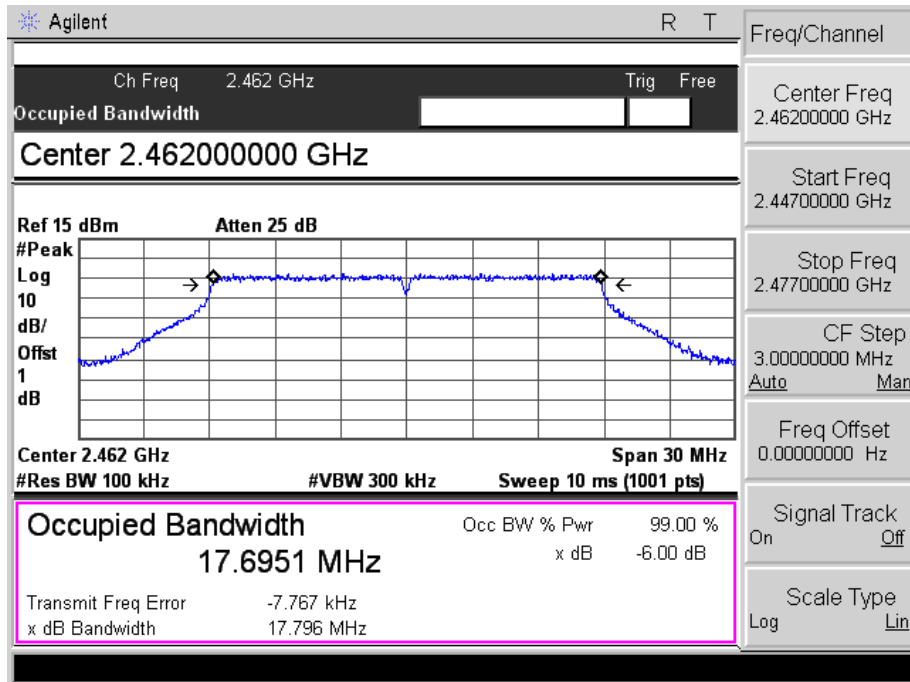
802.11n-HT20-Low Channel



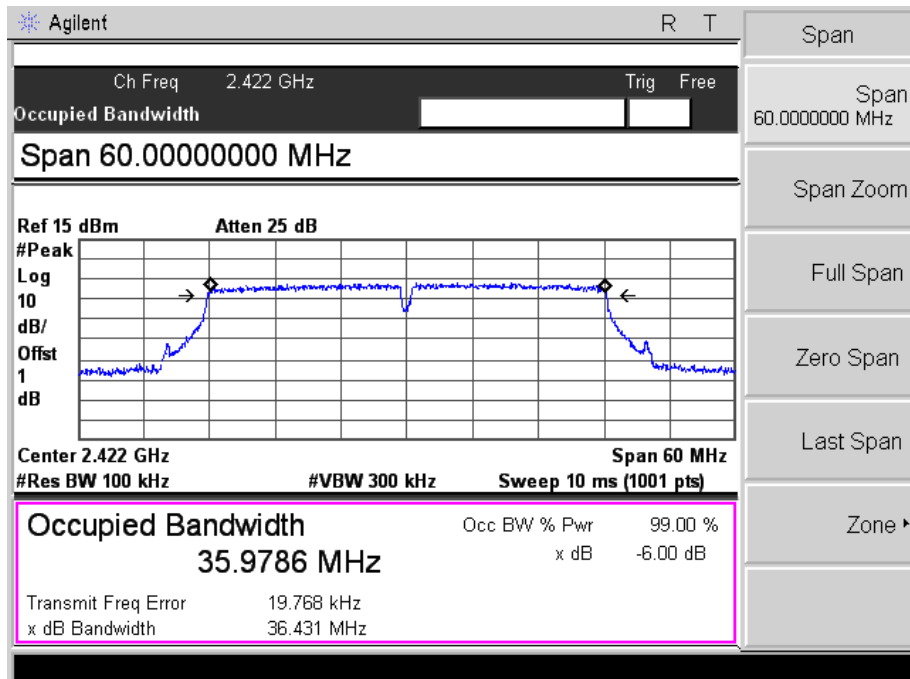
802.11n-HT20-Middle Channel



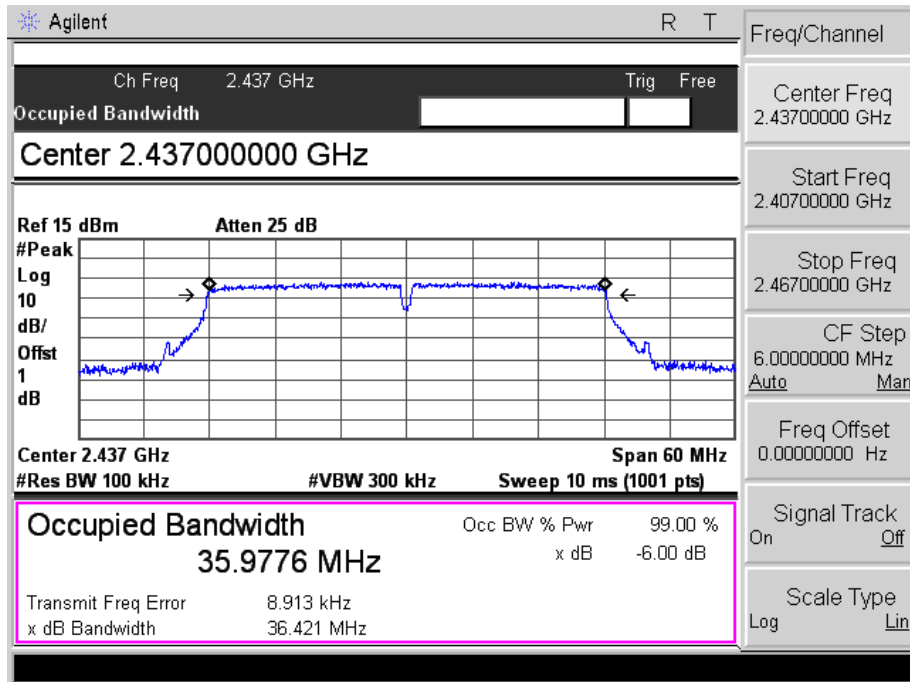
802.11n-HT20-High Channel



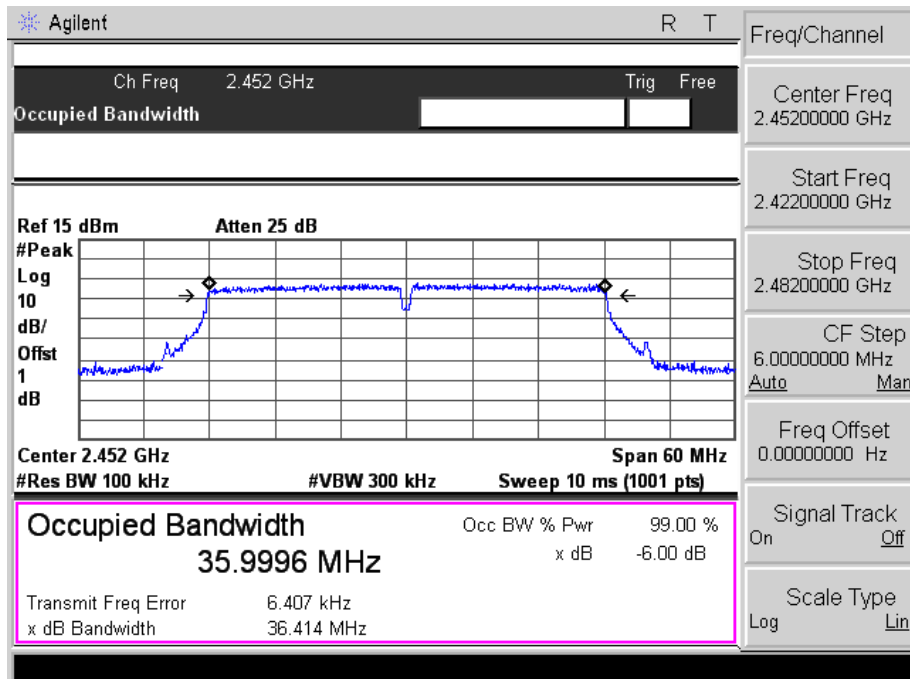
802.11n-HT40-Low Channel



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 V04, (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 $\geq 3 \times$ RBW.
- d) Number of points in sweep $\geq 2 \times$ span / RBW. (This gives bin-to-bin spacing \leq 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 $\geq 98 \%$, 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

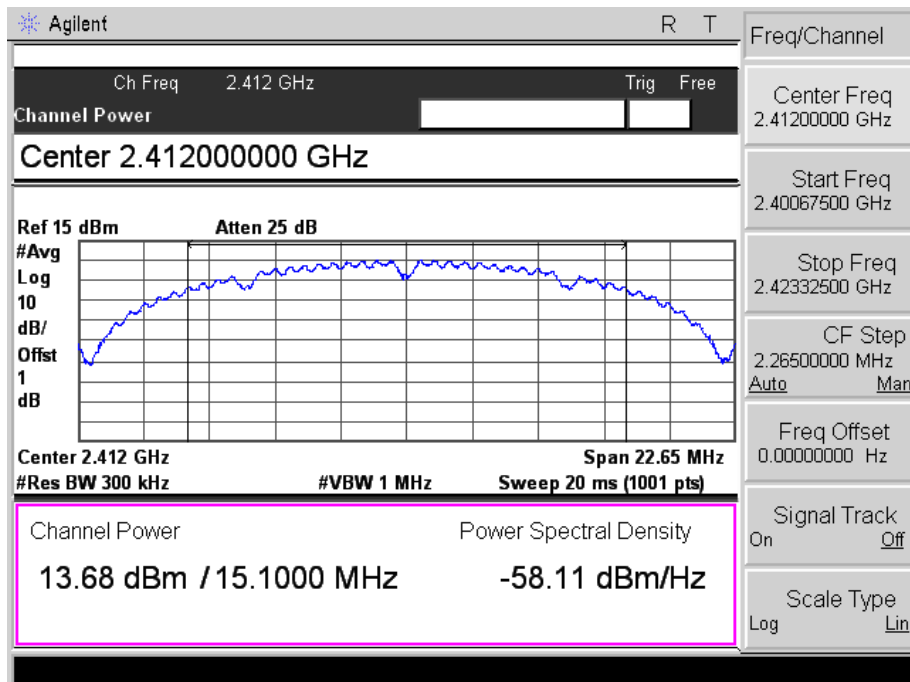
7.4 Summary of Test Results/Plots

Test Mode	Fre. MHz	Power 1 dBm	Power 2 dBm	Power 1 mW	Power 2 mW	Total Power dBm	Total Power mW	Limit mW
802.11b_1Mbps	2412	13.68	12.88	23.33	19.41	/	/	1000
	2437	13.68	13.10	23.33	20.42	/	/	1000
	2462	13.31	13.31	21.43	21.43	/	/	1000
802.11g_6Mbps	2412	12.01	11.90	15.89	15.49	/	/	1000
	2437	12.03	12.21	15.96	16.63	/	/	1000
	2462	11.21	12.46	13.21	17.62	/	/	1000
802.11n HT20_MCS0	2412	11.52	11.15	14.19	13.03	14.35	27.22	1000
	2437	11.20	11.46	13.18	14.00	14.34	27.18	1000
	2462	11.12	11.29	12.94	13.46	14.22	26.40	1000
802.11n HT40_MCS0	2422	10.31	9.77	10.74	9.48	13.06	20.22	1000
	2437	10.03	9.66	10.07	9.25	12.86	19.32	1000
	2452	9.77	9.88	9.48	9.73	12.84	19.21	1000

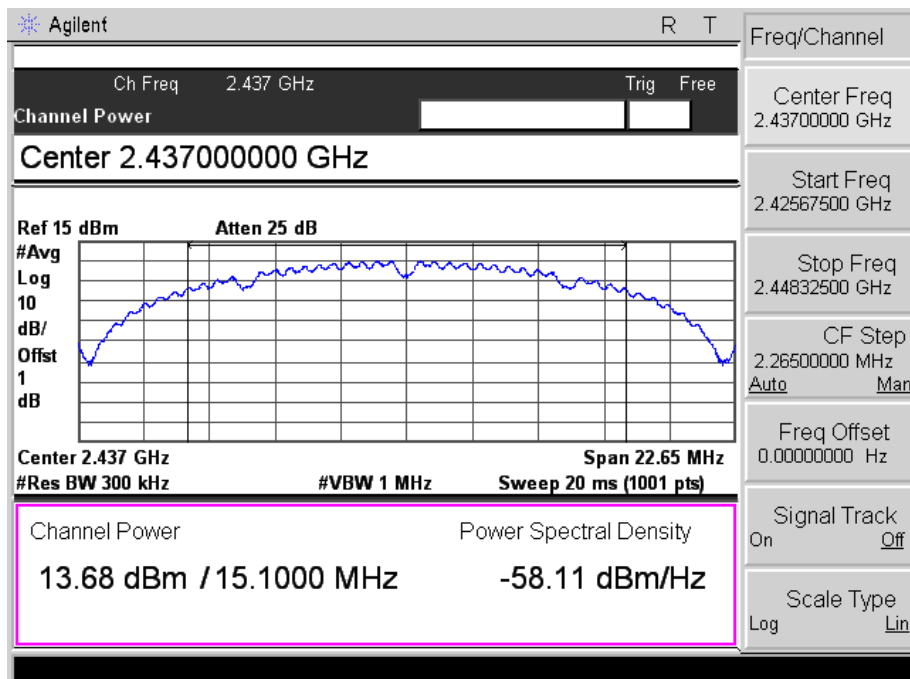
Please refer to the following test plots:

Chain 1

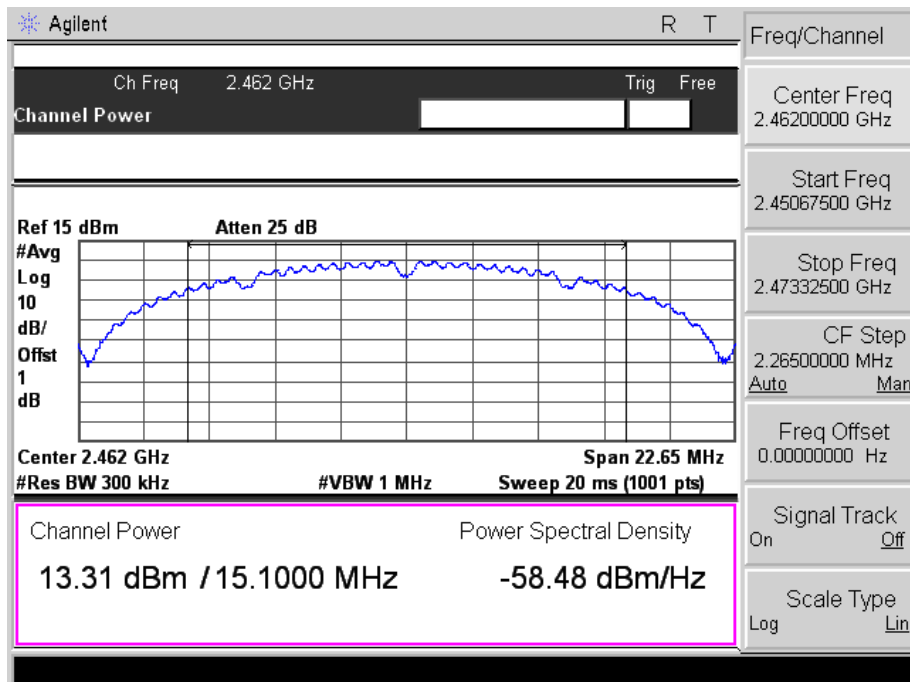
802.11b-11Mbps-Low Channel



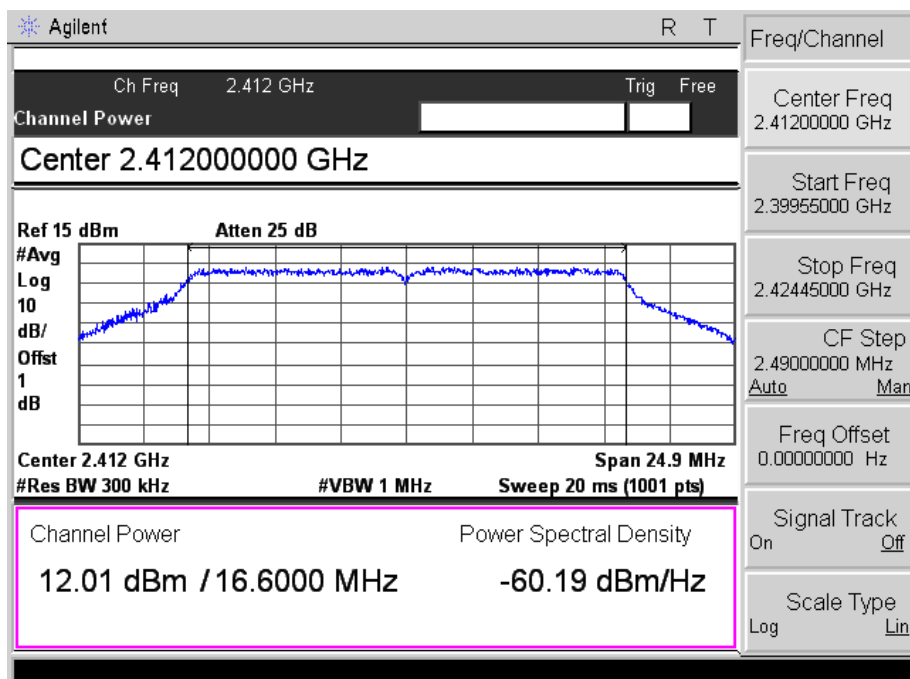
802.11b -11Mbps-Middle Channel



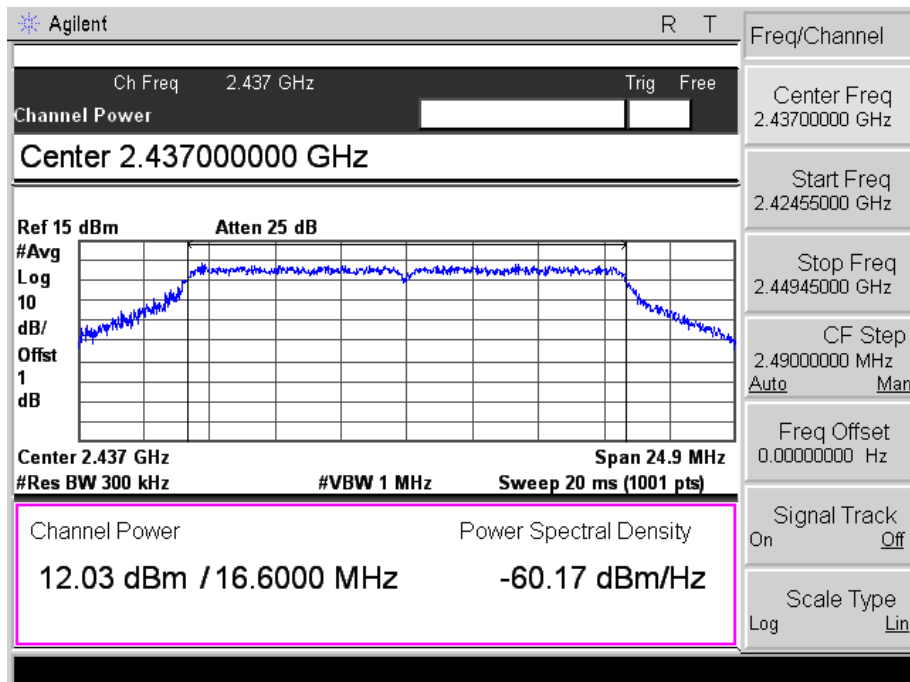
802.11b -11Mbps-High Channel



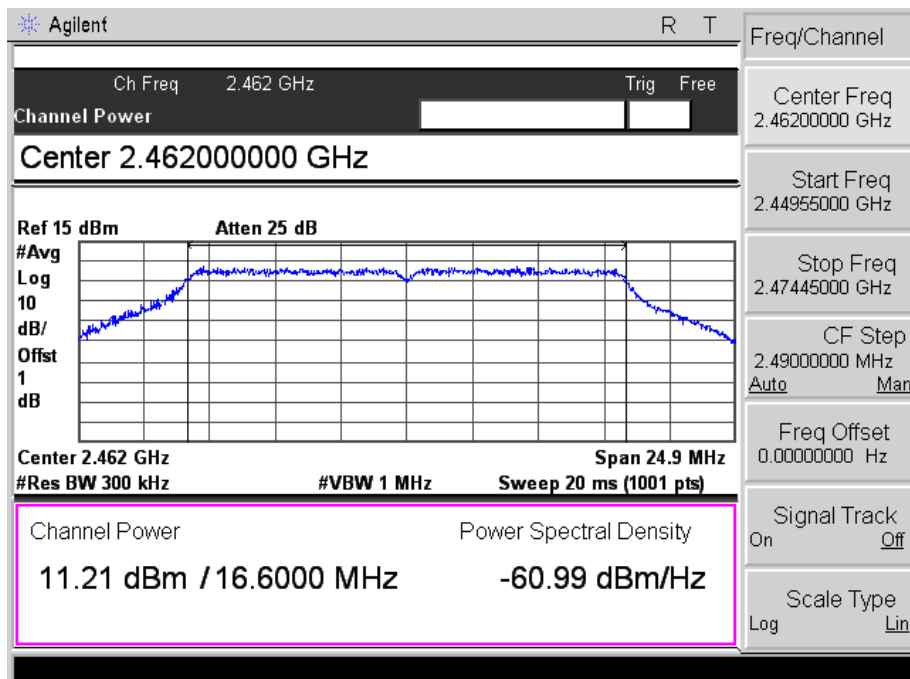
802.11g-54Mbps-Low Channel



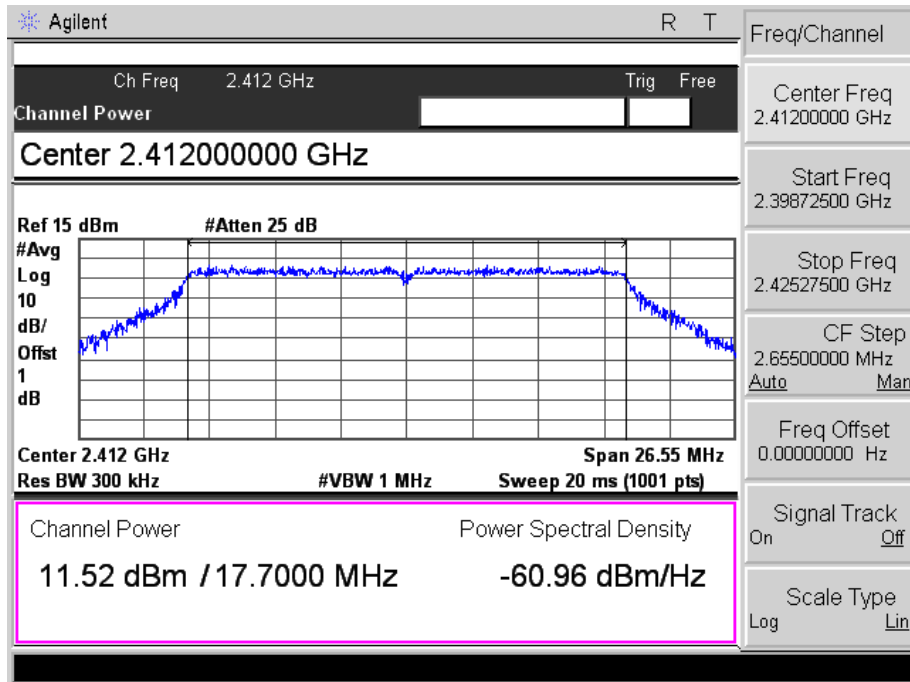
802.11g-54Mbps-Middle Channel



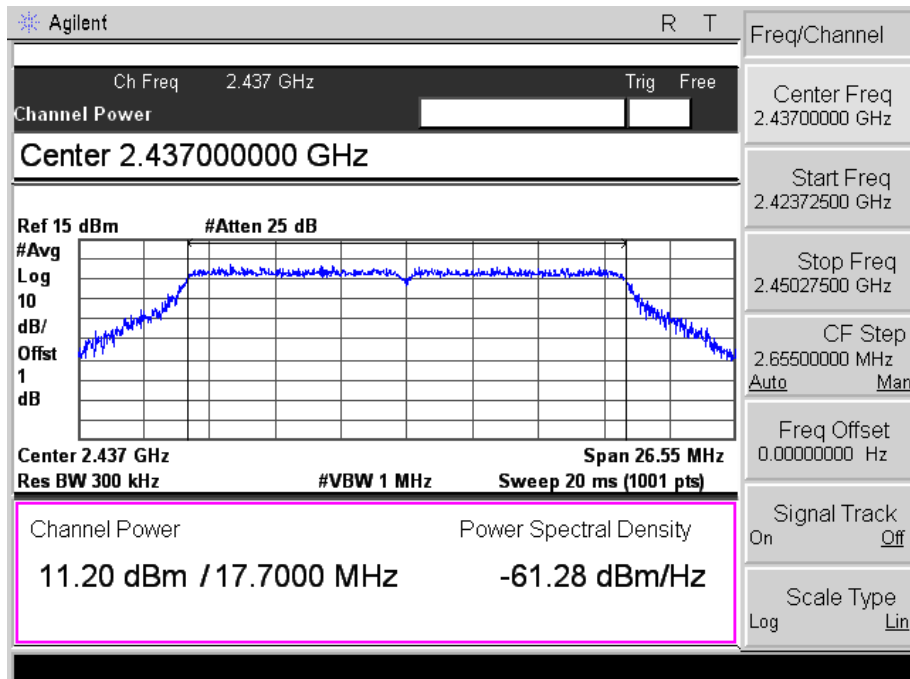
802.11g-54Mbps-High Channel



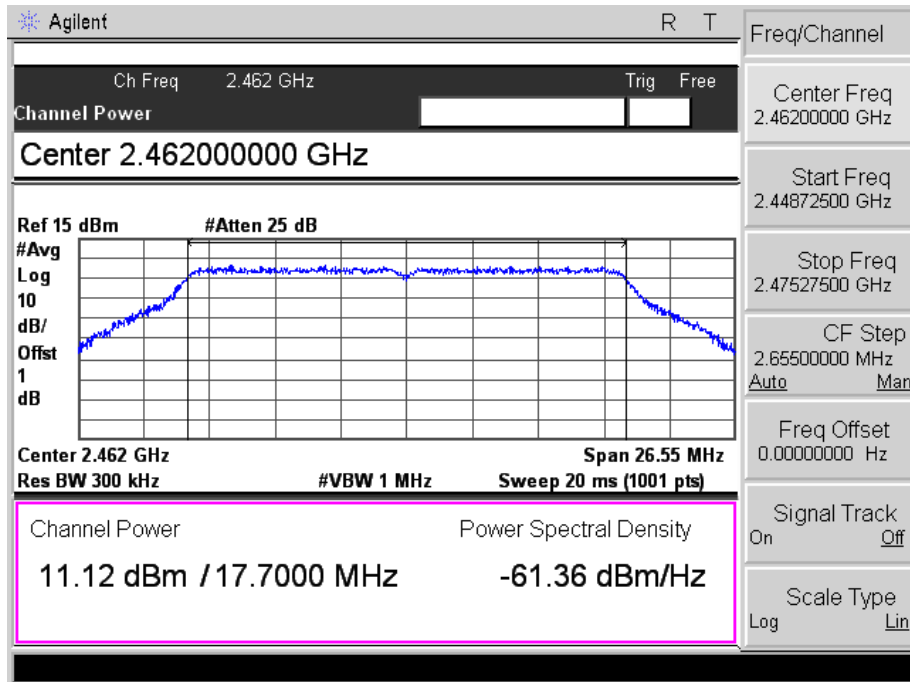
802.11n-HT20-MCS7-Low Channel



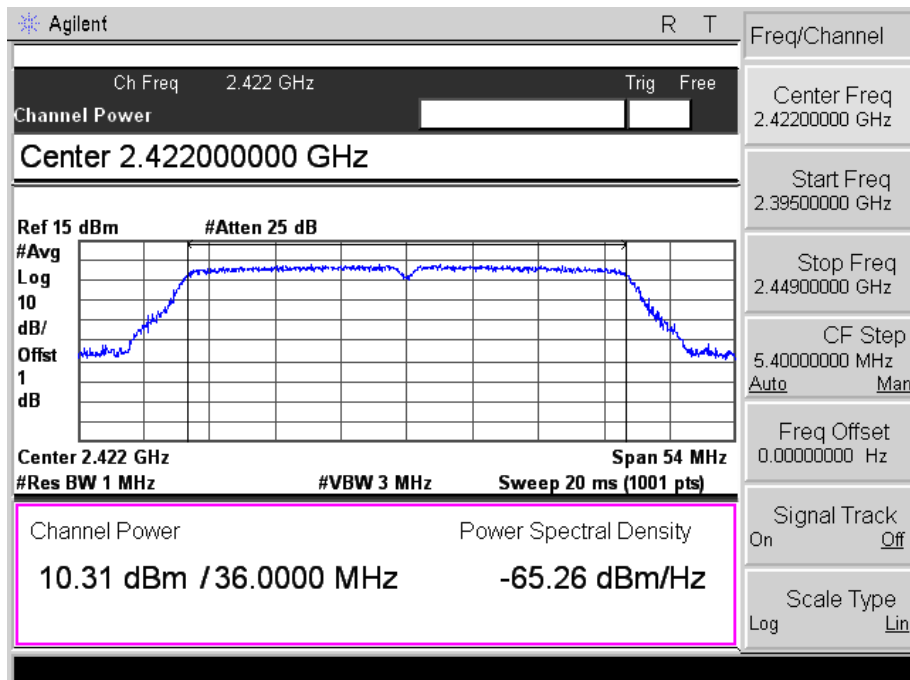
802.11n-HT20-MCS7-Middle Channel



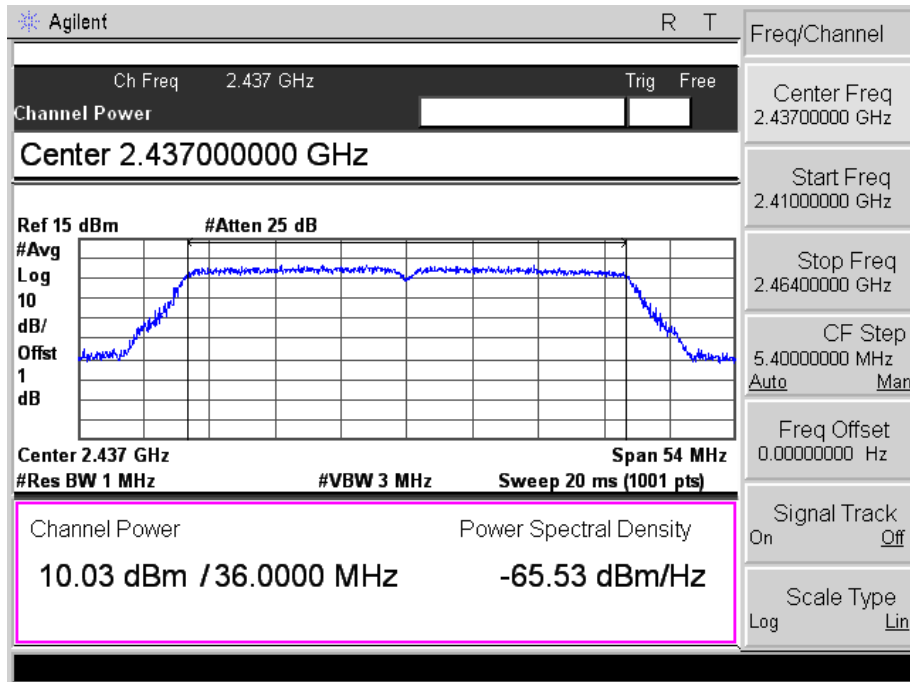
802.11n-HT20-MCS7-High Channel



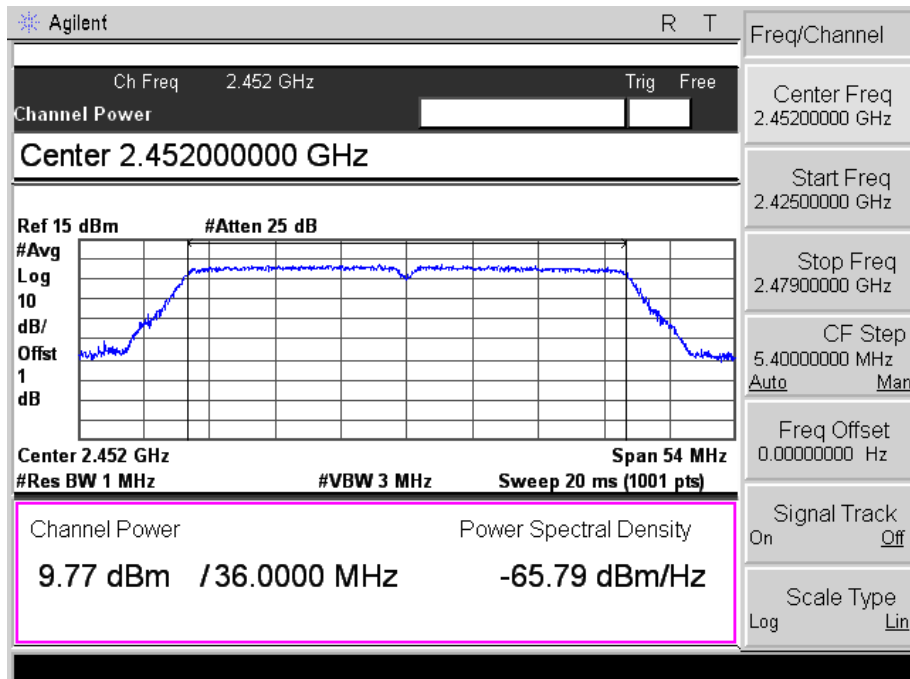
802.11n-HT40-MCS7-Low Channel



802.11n-HT40-MCS7-Middle Channel

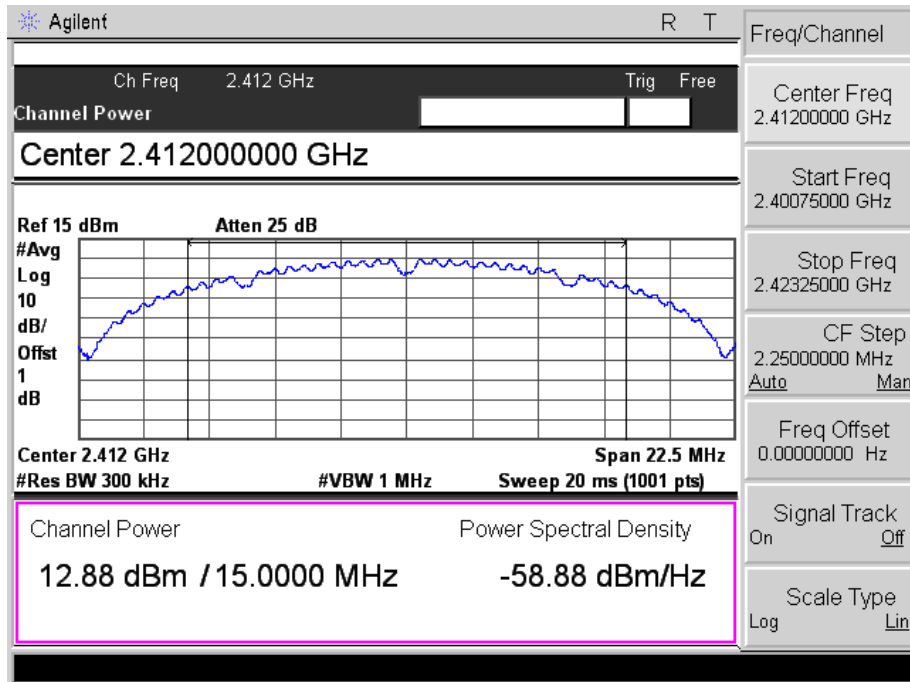


802.11n-HT40-MCS7-High Channel

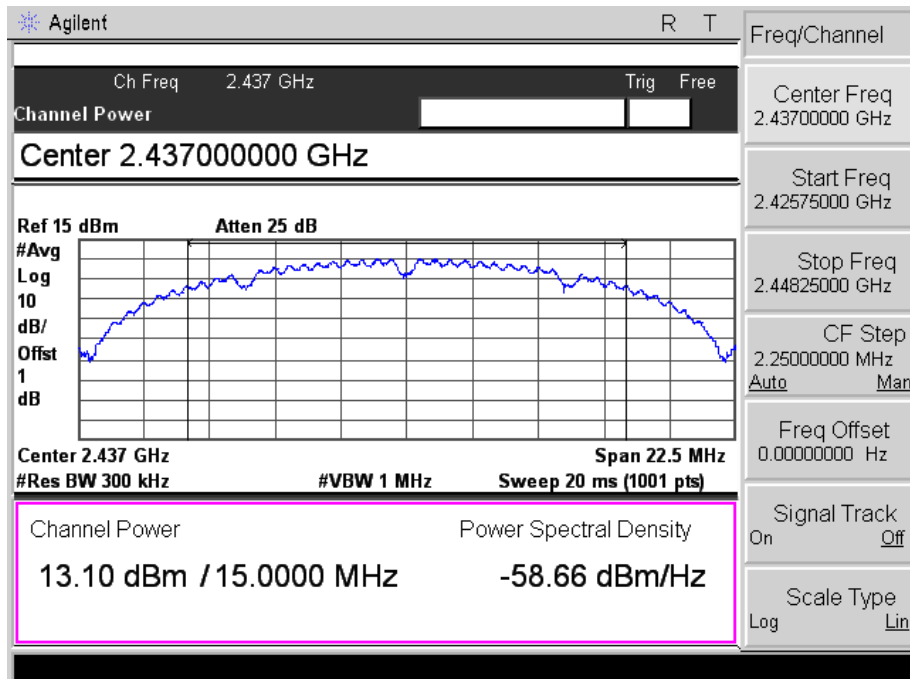


Chain 2

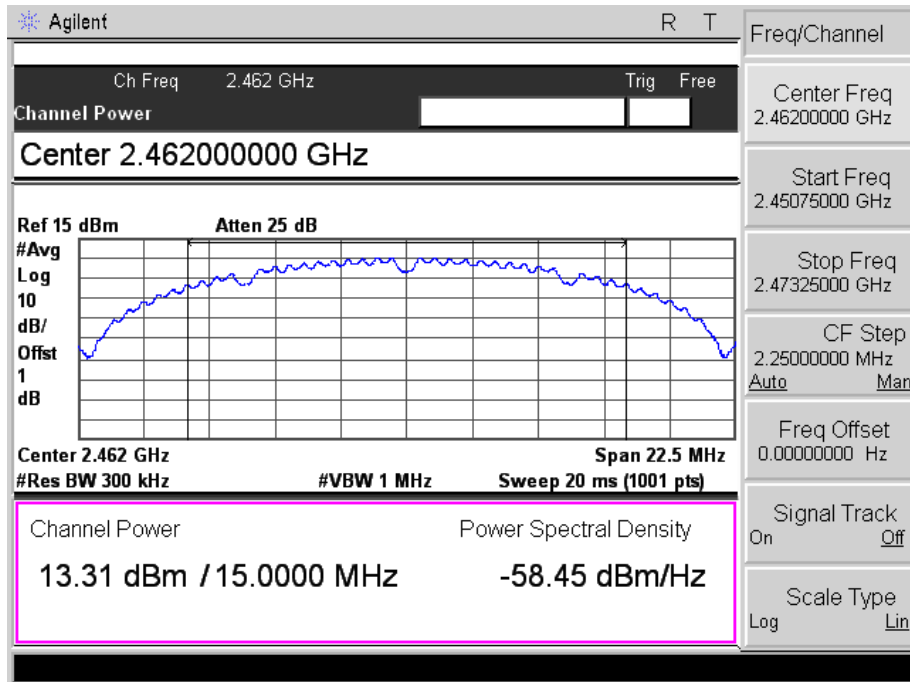
802.11b-11Mbps-Low Channel



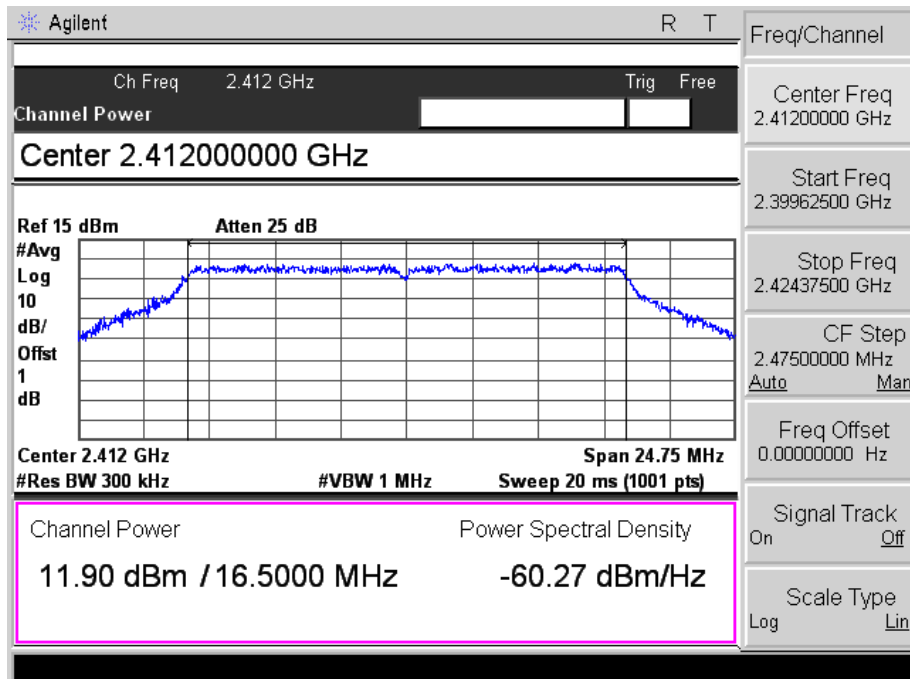
802.11b -11Mbps-Middle Channel



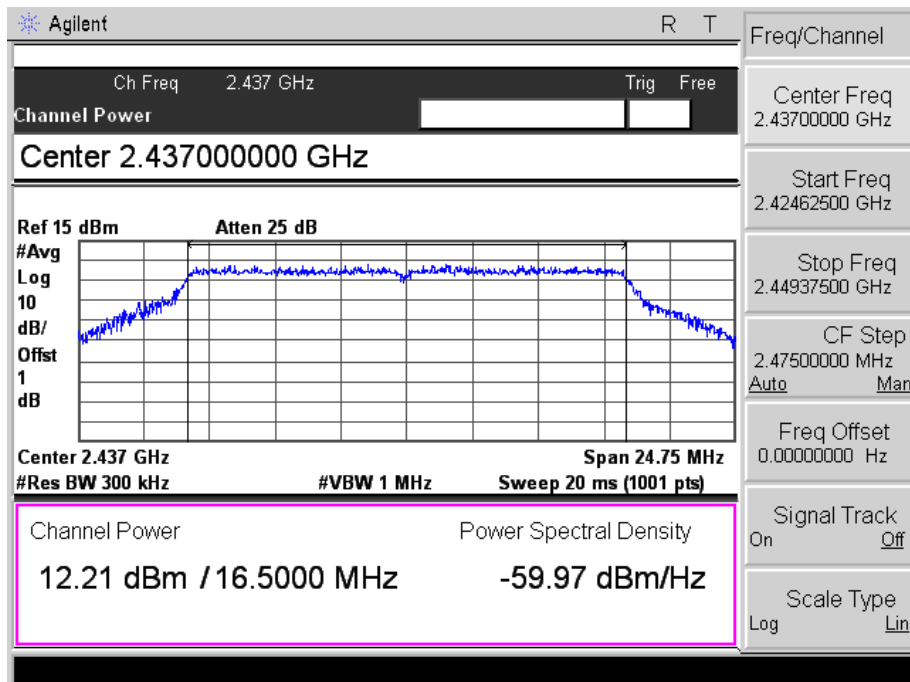
802.11b -11Mbps-High Channel



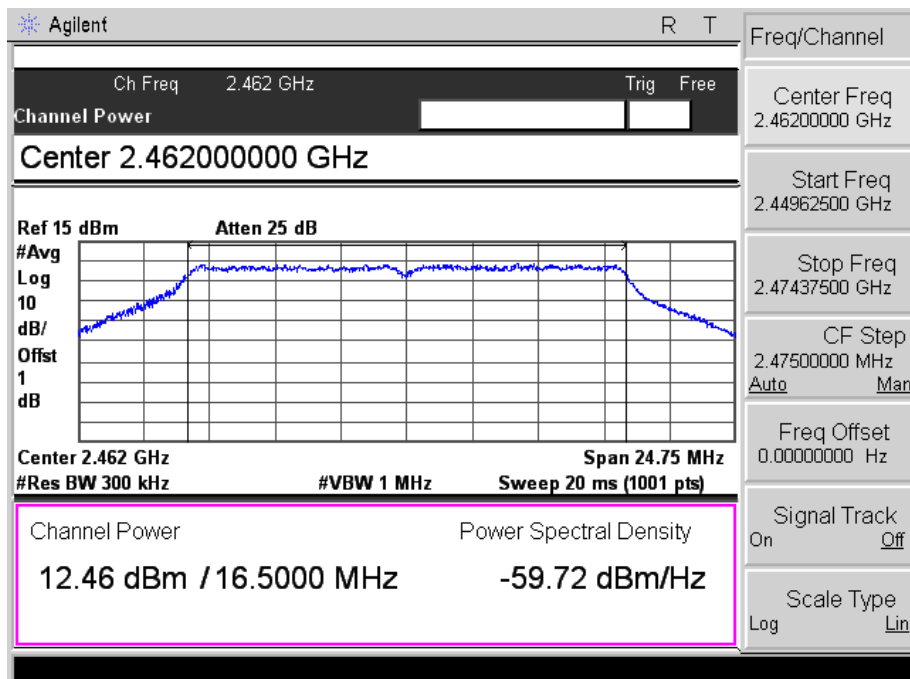
802.11g-54Mbps-Low Channel



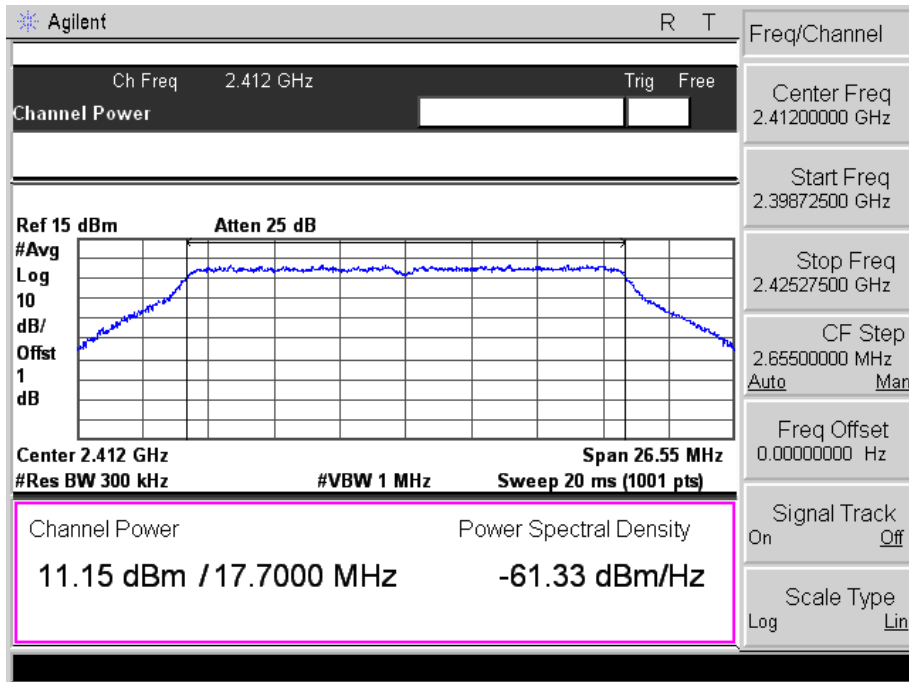
802.11g-54Mbps-Middle Channel



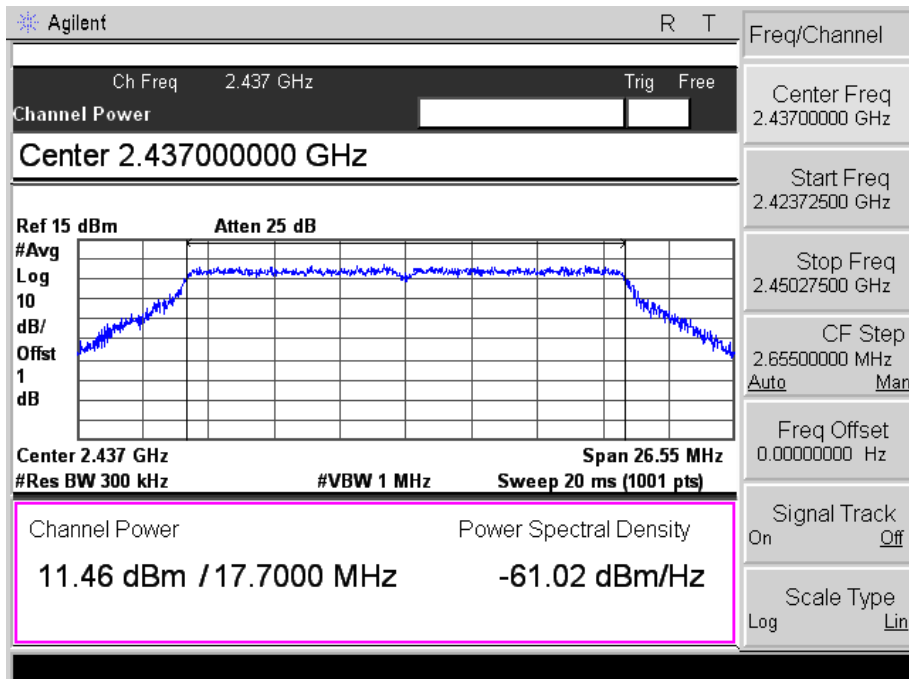
802.11g-54Mbps-High Channel



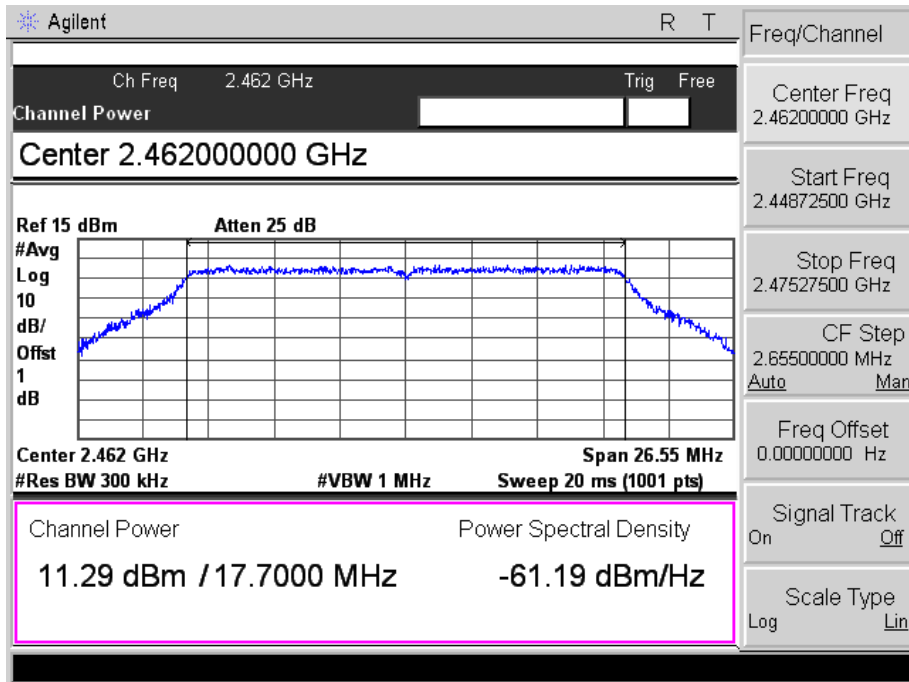
802.11n-HT20-MCS7-Low Channel



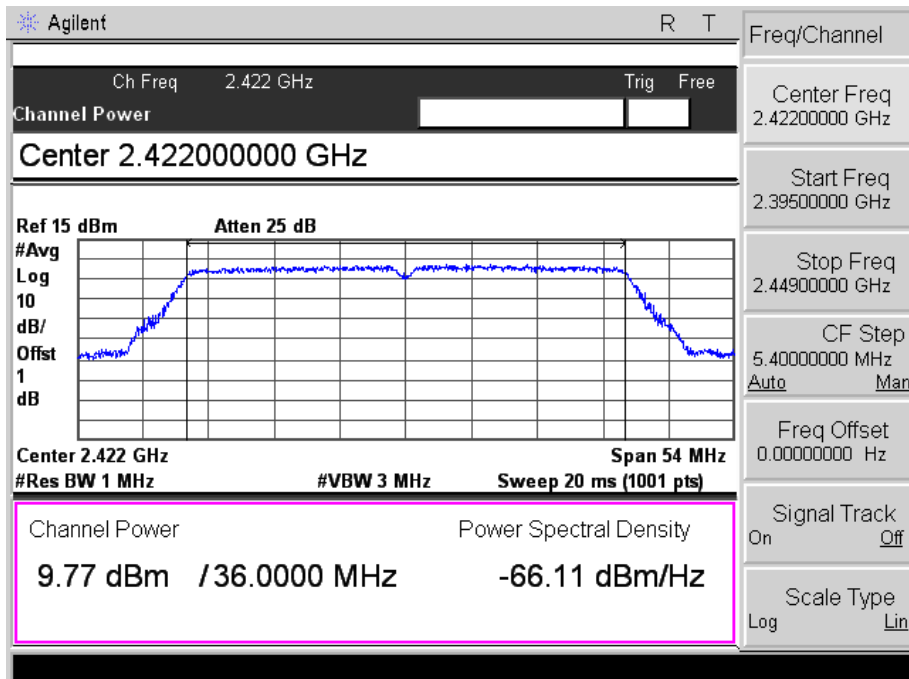
802.11n-HT20-MCS7-Middle Channel



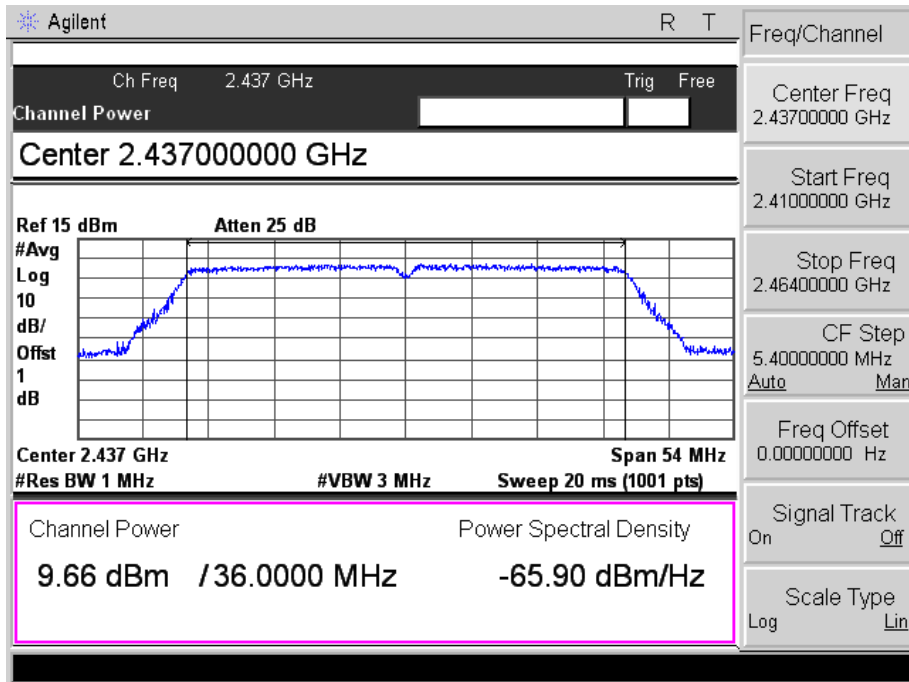
802.11n-HT20-MCS7-High Channel



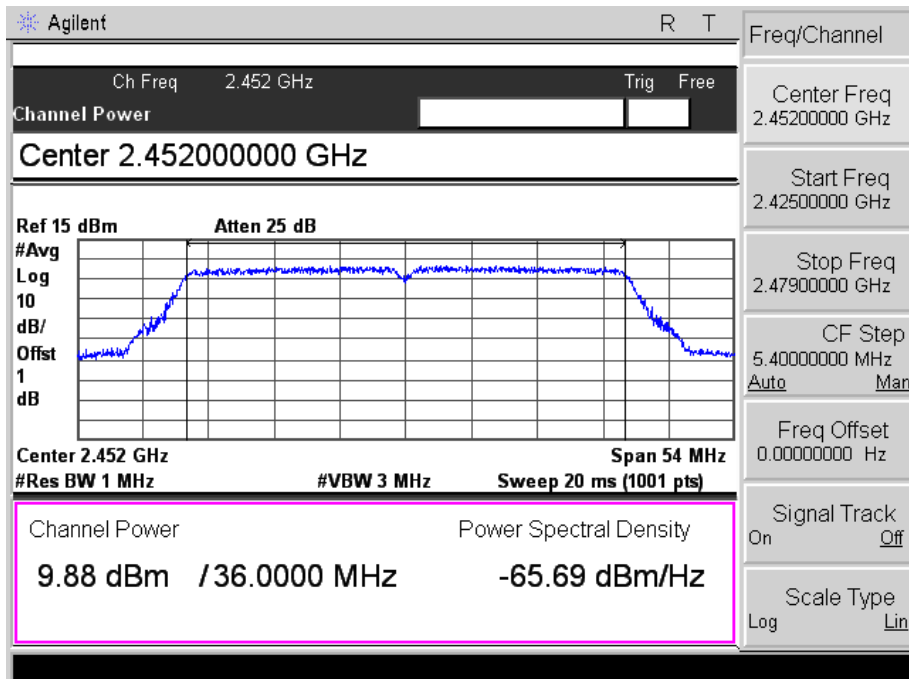
802.11n-HT40-MCS7-Low Channel



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).

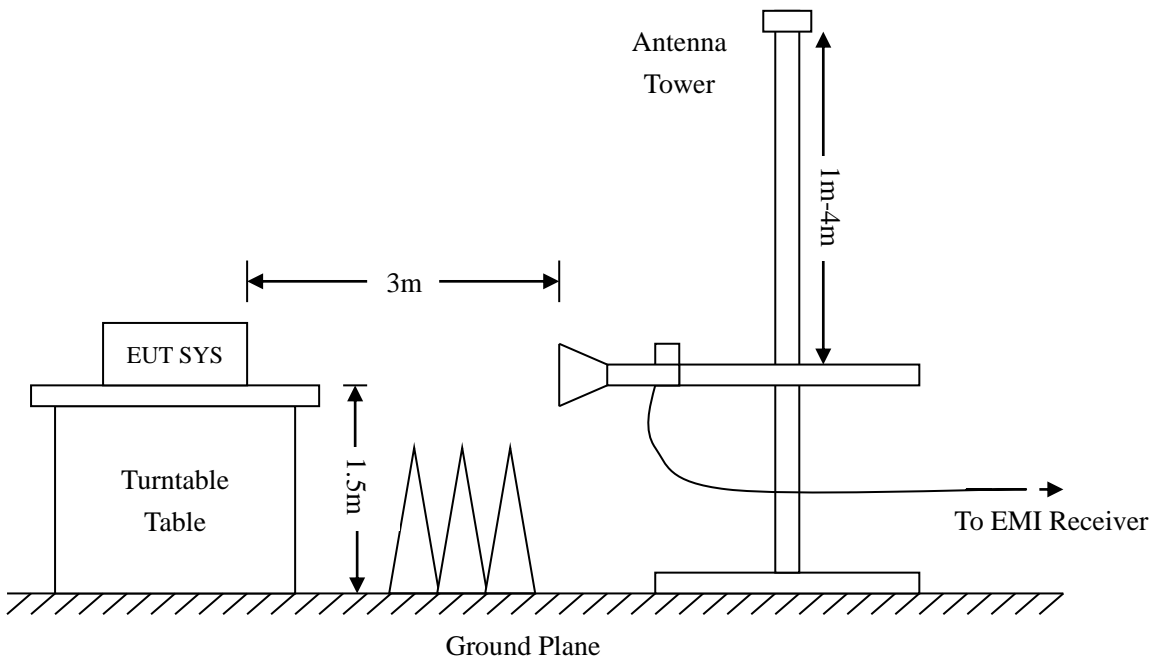
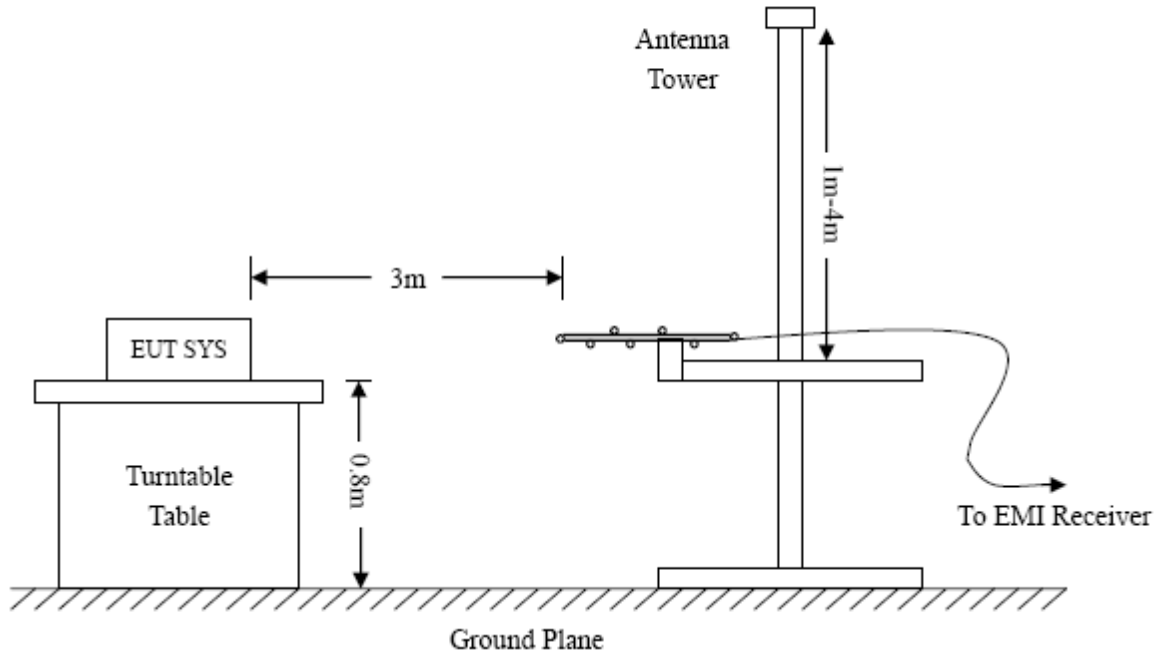
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

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
 RBW=10KHz,
 VBW =30KHz
 Sweep time= Auto
 Trace = max hold
 Detector function = peak

Frequency :30MHz-1GHz
 RBW=120KHz,
 VBW=300KHz
 Sweep time= Auto
 Trace = max hold
 Detector function = peak, QP

Frequency :Above 1GHz
 RBW=1MHz,
 VBW=3MHz(Peak), 10Hz(AV)
 Sweep time= Auto
 Trace = max hold
 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:

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

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of $-6\text{dB}\mu\text{V}$ means the emission is $6\text{dB}\mu\text{V}$ below the maximum limit. The equation for margin calculation is as follows:

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

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 and the worst case position data was reported.

Chain 1

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

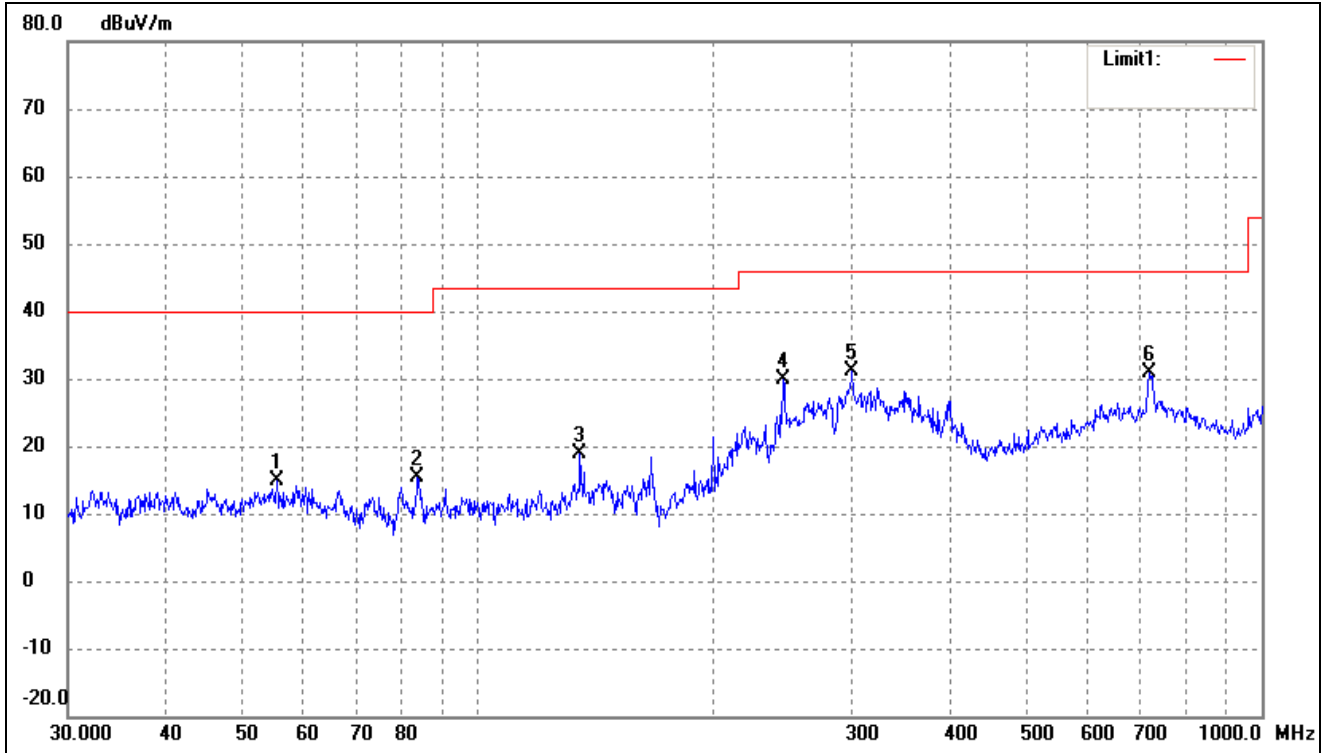
EUT: LM809 WiFi USB Adapter(300Mbps)

Tested Model: LM809-0647

Operating Condition: 802.11b_11Mbps Transmitting Low Channel-2412MHz

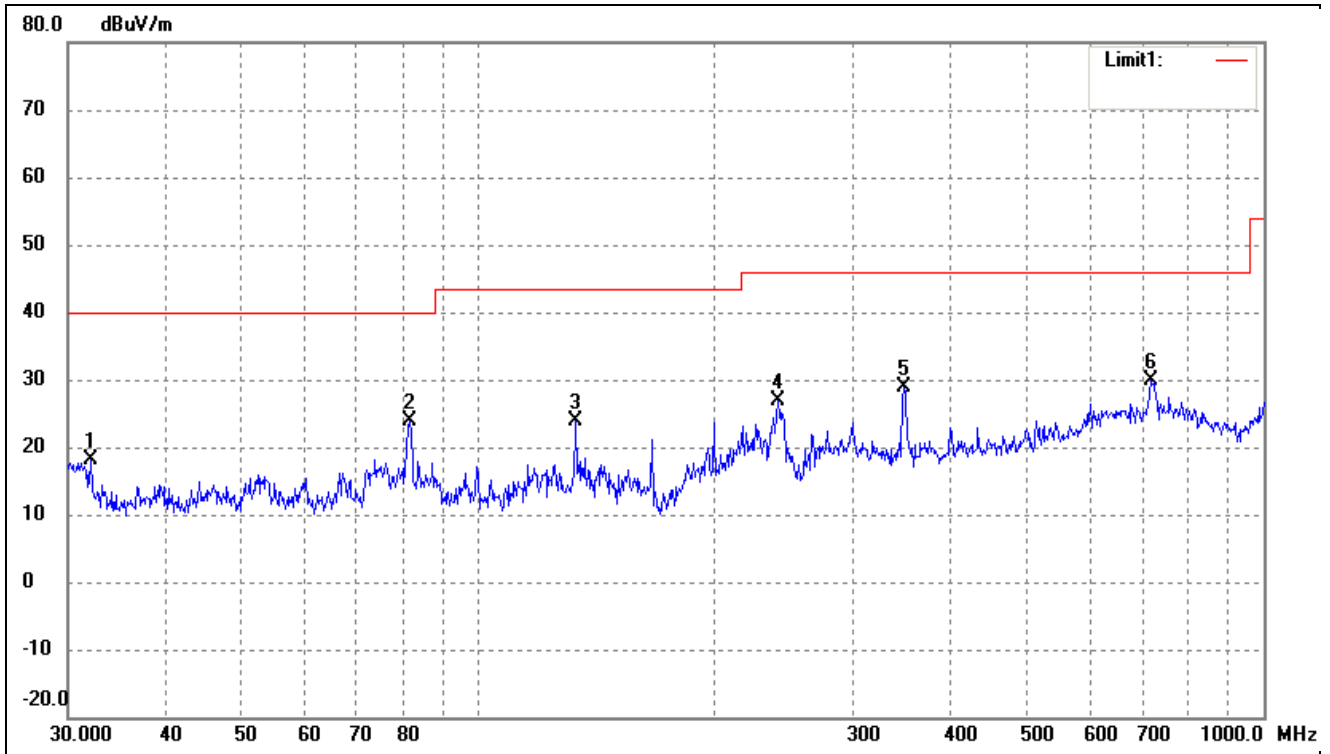
Comment: 120V/60Hz;

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	55.4147	31.32	-16.51	14.81	40.00	-25.19	302	100	peak
2	83.8156	34.64	-19.16	15.48	40.00	-24.52	93	100	peak
3	135.0319	36.89	-17.93	18.96	43.50	-24.54	317	100	peak
4	245.0900	42.22	-12.33	29.89	46.00	-16.11	101	100	peak
5	300.3673	40.60	-9.59	31.01	46.00	-14.99	183	100	peak
6	719.1995	32.05	-1.15	30.90	46.00	-15.10	134	100	peak

Test Specification: Vertical

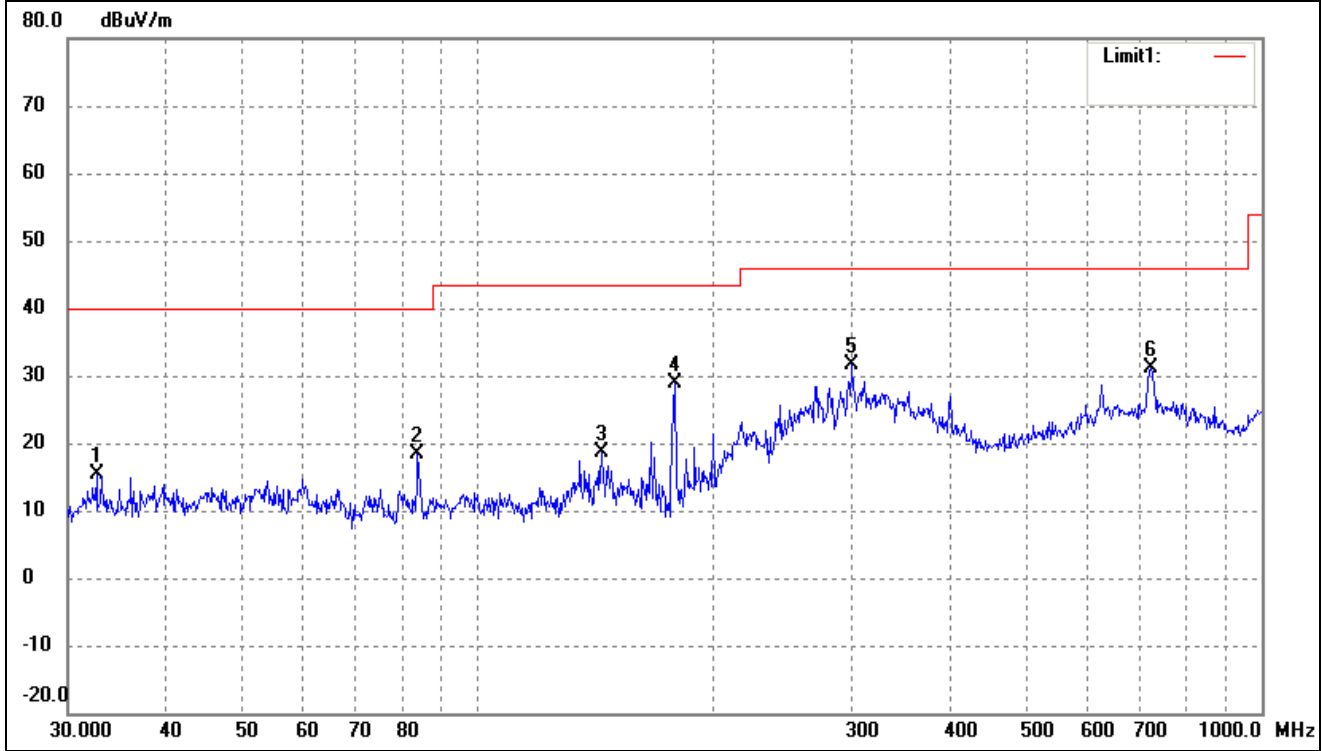


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	32.0668	35.94	-17.83	18.11	40.00	-21.89	316	100	peak
2	81.7833	43.34	-19.50	23.84	40.00	-16.16	94	100	peak
3	133.1511	41.66	-17.76	23.90	43.50	-19.60	354	100	peak
4	240.8304	39.27	-12.51	26.76	46.00	-19.24	104	100	peak
5	348.0274	38.17	-9.36	28.81	46.00	-17.19	148	100	peak
6	719.1995	30.94	-1.15	29.79	46.00	-16.21	100	100	peak

Operating Condition: 802.11b_11Mbps Transmitting High Channel-2462MHz

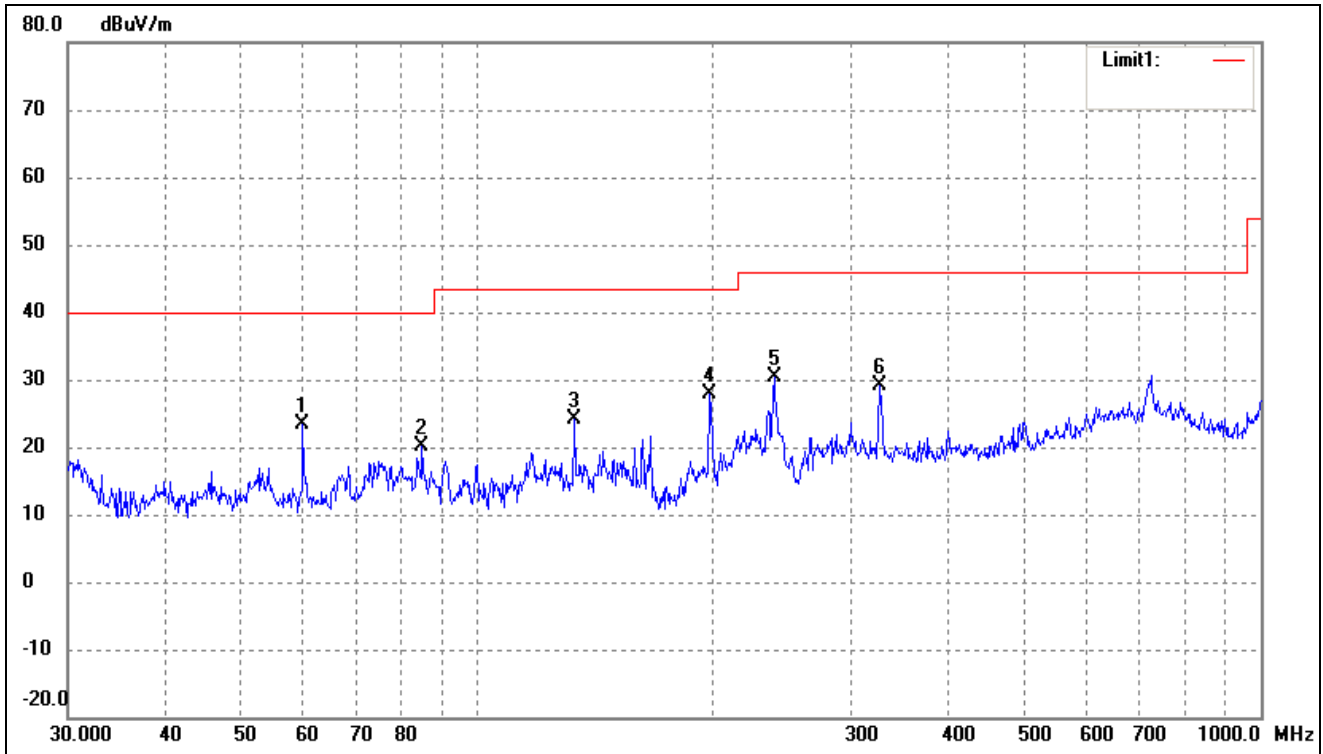
Comment: 120V/60Hz;

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	32.6340	33.20	-17.71	15.49	40.00	-24.51	97	100	peak
2	83.8156	37.59	-19.16	18.43	40.00	-21.57	331	100	peak
3	143.8295	37.04	-18.48	18.56	43.50	-24.94	57	100	peak
4	178.7584	47.85	-19.08	28.77	43.50	-14.73	193	100	peak
5	300.3673	41.25	-9.59	31.66	46.00	-14.34	347	100	peak
6	721.7259	32.24	-1.02	31.22	46.00	-14.78	97	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	59.8588	39.89	-16.51	23.38	40.00	-16.62	274	100	peak
2	84.9995	39.04	-18.96	20.08	40.00	-19.92	254	100	peak
3	133.1511	41.99	-17.76	24.23	43.50	-19.27	66	100	peak
4	197.8928	46.12	-18.30	27.82	43.50	-15.68	322	100	peak
5	239.1473	42.95	-12.60	30.35	46.00	-15.65	138	100	peak
6	325.5958	38.60	-9.45	29.15	46.00	-16.85	99	100	peak

Chain 2

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

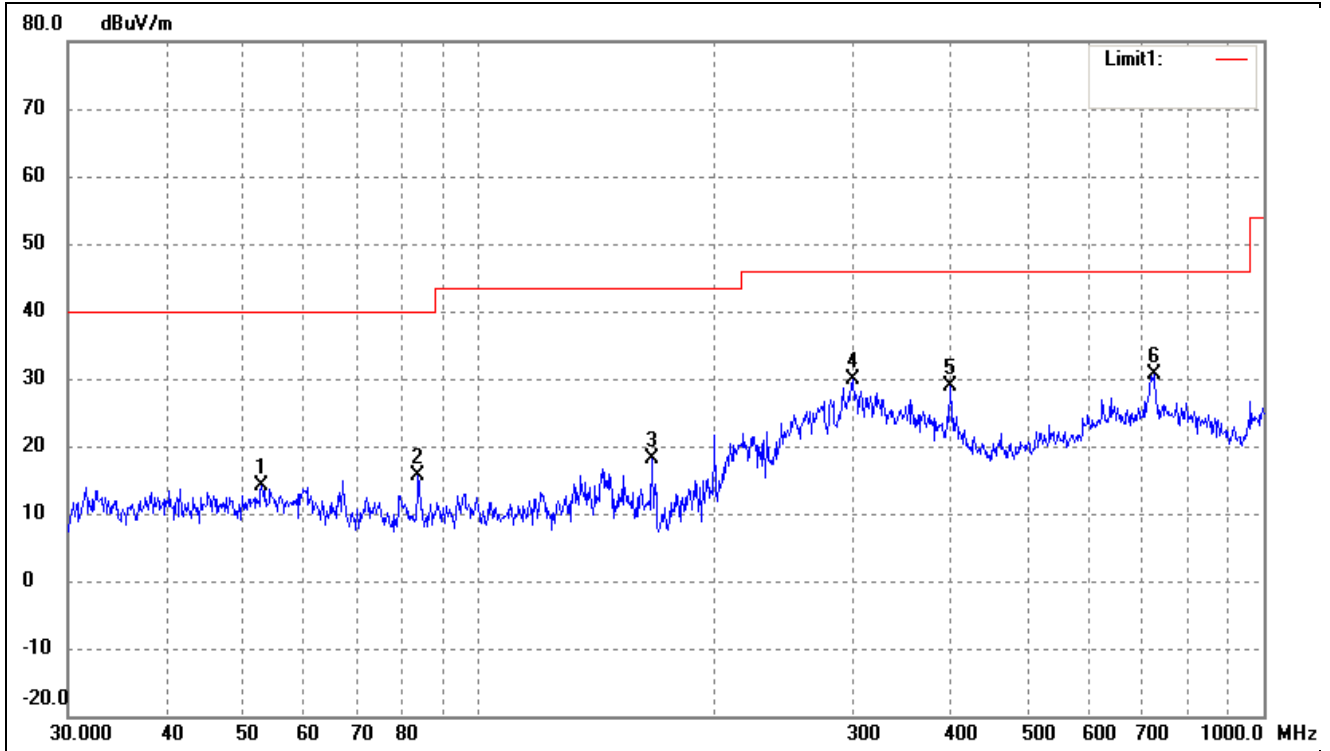
EUT: LM809 WiFi USB Adapter(300Mbps)

Tested Model: LM809-0647

Operating Condition: 802.11b_11Mbps Transmitting Low Channel-2412MHz

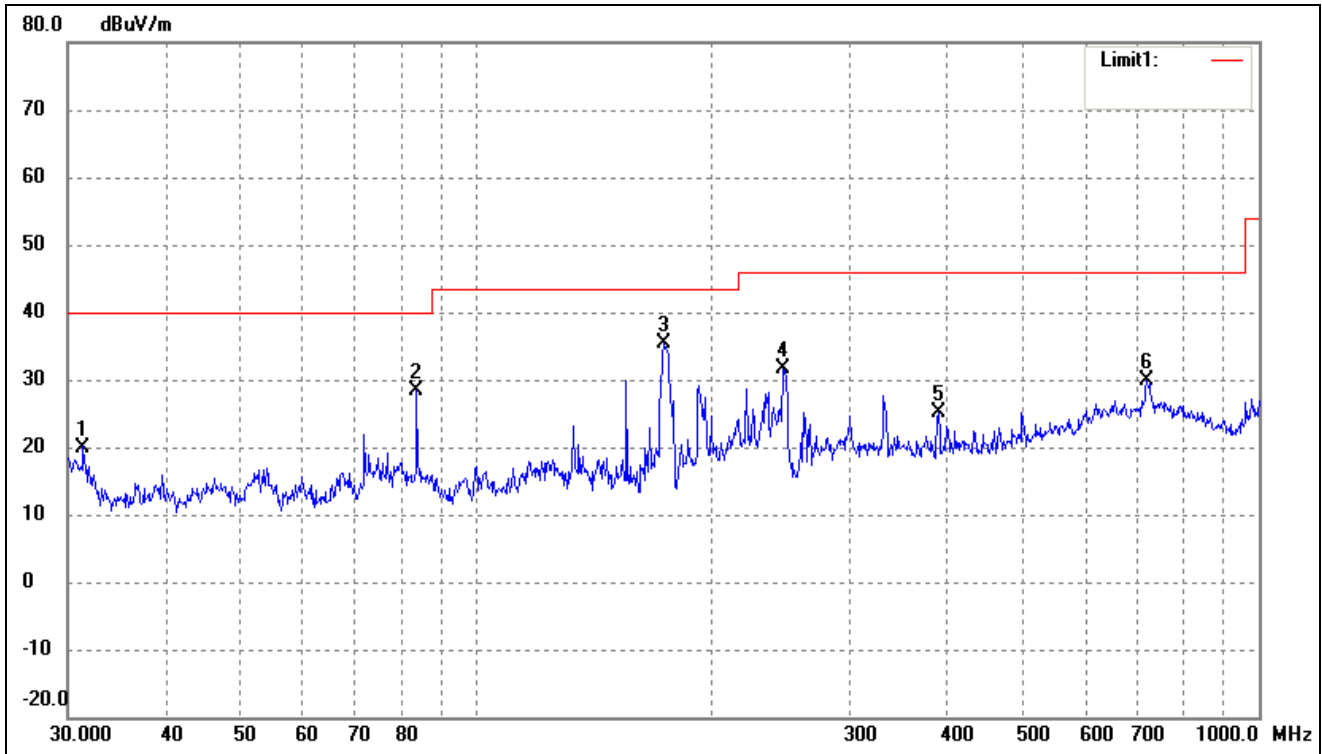
Comment: 120V/60Hz;

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.9453	30.59	-16.48	14.11	40.00	-25.89	197	100	peak
2	83.8156	34.90	-19.16	15.74	40.00	-24.26	190	100	peak
3	166.0680	37.18	-19.06	18.12	43.50	-25.38	128	100	peak
4	300.3673	39.54	-9.59	29.95	46.00	-16.05	129	100	peak
5	399.0302	36.62	-7.84	28.78	46.00	-17.22	342	100	peak
6	724.2611	31.35	-0.84	30.51	46.00	-15.49	156	100	peak

Test Specification: Vertical

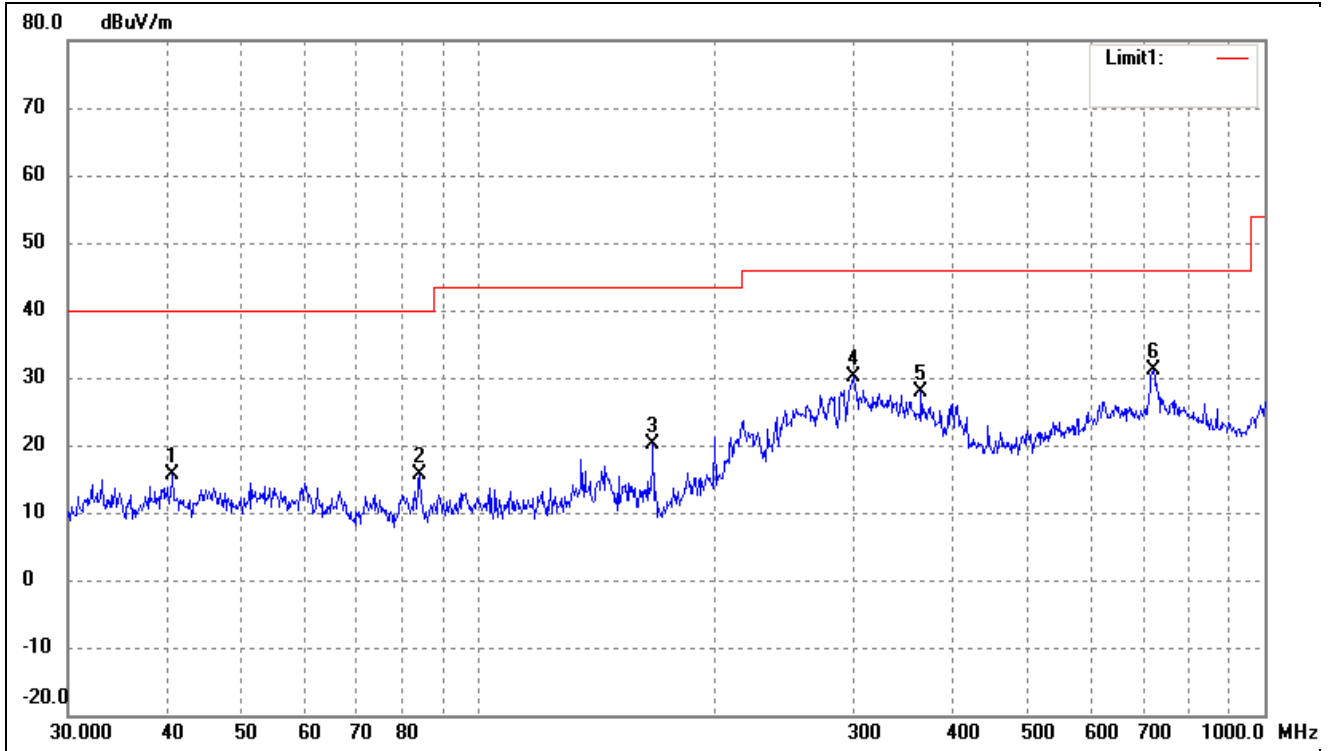


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	31.3992	37.96	-17.96	20.00	40.00	-20.00	92	100	peak
2	83.8156	47.45	-19.16	28.29	40.00	-11.71	107	100	peak
3	173.8135	54.38	-19.06	35.32	43.50	-8.18	73	100	peak
4	245.9509	43.87	-12.30	31.57	46.00	-14.43	127	100	peak
5	389.3549	33.60	-8.37	25.23	46.00	-20.77	179	100	peak
6	719.1995	31.10	-1.15	29.95	46.00	-16.05	143	100	peak

Operating Condition: 802.11b_11Mbps Transmitting High Channel-2462MHz

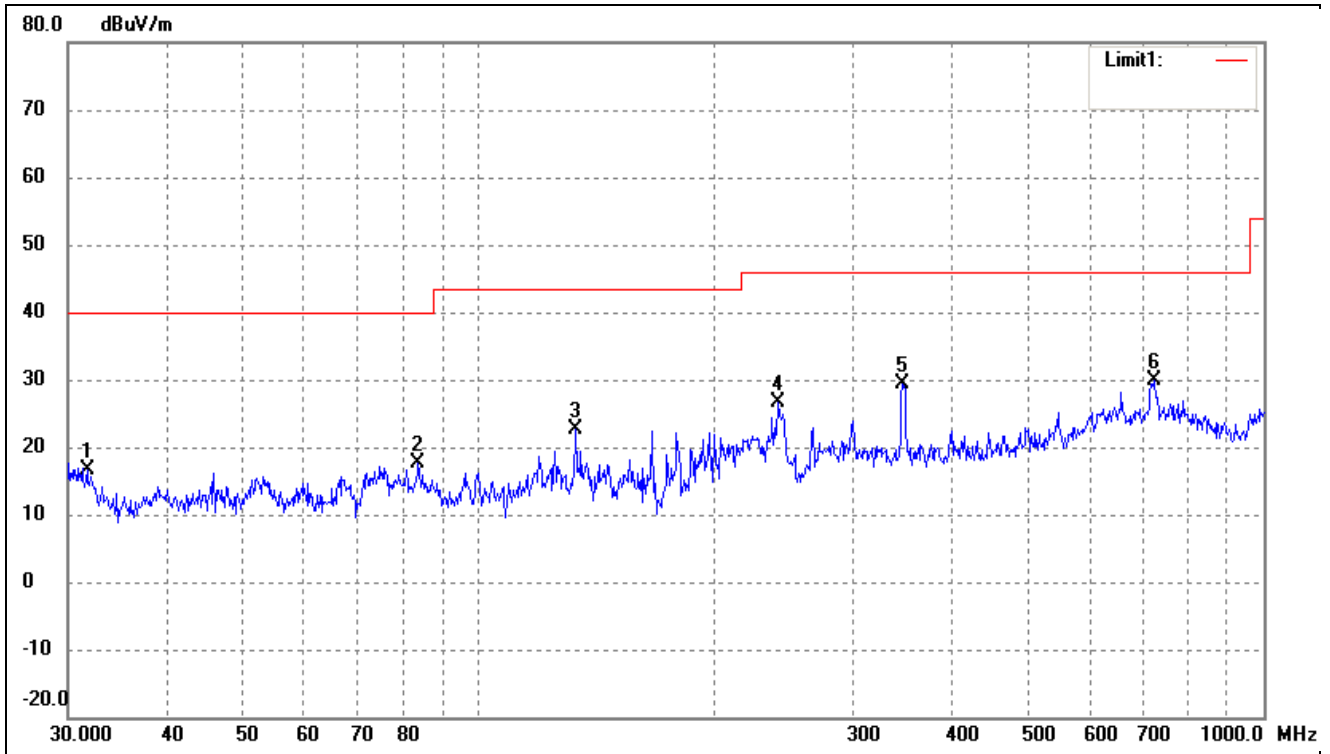
Comment: 120V/60Hz;

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	40.7016	32.22	-16.52	15.70	40.00	-24.30	98	100	peak
2	84.1100	34.69	-19.11	15.58	40.00	-24.42	34	100	peak
3	166.6514	39.12	-19.05	20.07	43.50	-23.43	180	100	peak
4	300.3673	39.84	-9.59	30.25	46.00	-15.75	190	100	peak
5	365.5391	36.71	-8.91	27.80	46.00	-18.20	170	100	peak
6	721.7259	32.06	-1.02	31.04	46.00	-14.96	236	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	31.7313	34.49	-17.89	16.60	40.00	-23.40	79	100	peak
2	83.8156	36.71	-19.16	17.55	40.00	-22.45	88	100	peak
3	133.1511	40.39	-17.76	22.63	43.50	-20.87	98	100	peak
4	240.8304	39.09	-12.51	26.58	46.00	-19.42	228	100	peak
5	346.8092	38.72	-9.40	29.32	46.00	-16.68	117	100	peak
6	726.8052	30.66	-0.68	29.98	46.00	-16.02	45	100	peak

Spurious Emissions Above 1GHz

Chain 1

Test Mode: 802.11b_11Mbps (worst case)

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	66.84	-3.87	62.97	74	-11.03	H	PK
4824.000	50.12	-3.87	46.25	54	-7.75	H	AV
7236.000	67.99	1.14	69.13	74	-4.87	H	PK
7236.000	45.59	1.19	46.78	54	-7.22	H	AV
4824.000	70.61	-3.86	66.75	74	-7.25	V	PK
4824.000	53.93	-3.86	50.07	54	-3.93	V	AV
7236.000	68.46	1.10	69.56	74	-4.44	V	PK
7236.000	44.50	1.10	45.60	54	-8.40	V	AV
Middle Channel-2437MHz							
4874.000	64.38	-3.74	60.64	74	-13.36	H	PK
4874.000	55.18	-3.74	51.44	54	-2.56	H	AV
7311.000	65.46	1.47	66.93	74	-7.07	H	PK
7311.000	46.92	1.47	48.39	54	-5.61	H	AV
4874.000	65.45	-3.74	61.71	74	-12.29	V	PK
4874.000	53.27	-3.74	49.53	54	-4.47	V	AV
7311.000	66.40	1.47	67.87	74	-6.13	V	PK
7311.000	44.49	1.47	45.96	54	-8.04	V	AV
High Channel-2462MHz							
4924.000	64.06	-3.59	60.47	74	-13.53	H	PK
4924.000	48.49	-3.59	44.90	54	-9.10	H	AV
7386.000	65.64	1.79	67.43	74	-6.57	H	PK
7386.000	48.20	1.79	49.99	54	-4.01	H	AV
4924.000	63.71	-3.59	60.12	74	-13.88	V	PK
4924.000	47.46	-3.59	43.87	54	-10.13	V	AV
7386.000	65.63	1.79	67.42	74	-6.58	V	PK
7386.000	47.42	1.79	49.21	54	-4.79	V	AV

Spurious Emissions Above 1GHz

Chain 2

Test Mode: 802.11b_11Mbps (worst case)

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	64.87	-3.87	61.00	74	-13.00	H	PK
4824.000	53.30	-3.87	49.43	54	-4.57	H	AV
7236.000	67.19	1.14	68.33	74	-5.67	H	PK
7236.000	43.03	1.19	44.22	54	-9.78	H	AV
4824.000	65.89	-3.86	62.03	74	-11.97	V	PK
4824.000	52.83	-3.86	48.97	54	-5.03	V	AV
7236.000	65.06	1.10	66.16	74	-7.84	V	PK
7236.000	45.71	1.10	46.81	54	-7.19	V	AV
Middle Channel-2437MHz							
4874.000	67.24	-3.74	63.50	74	-10.50	H	PK
4874.000	51.75	-3.74	48.01	54	-5.99	H	AV
7311.000	64.49	1.47	65.96	74	-8.04	H	PK
7311.000	49.31	1.47	50.78	54	-3.22	H	AV
4874.000	66.38	-3.74	62.64	74	-11.36	V	PK
4874.000	50.78	-3.74	47.04	54	-6.96	V	AV
7311.000	64.53	1.47	66.00	74	-8.00	V	PK
7311.000	45.52	1.47	46.99	54	-7.01	V	AV
High Channel-2462MHz							
4924.000	66.07	-3.59	62.48	74	-11.52	H	PK
4924.000	50.19	-3.59	46.60	54	-7.40	H	AV
7386.000	66.17	1.79	67.96	74	-6.04	H	PK
7386.000	47.16	1.79	48.95	54	-5.05	H	AV
4924.000	64.73	-3.59	61.14	74	-12.86	V	PK
4924.000	45.73	-3.59	42.14	54	-11.86	V	AV
7386.000	65.28	1.79	67.07	74	-6.93	V	PK
7386.000	48.34	1.79	50.13	54	-3.87	V	AV

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

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 v04, 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 V04, 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 \geq 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

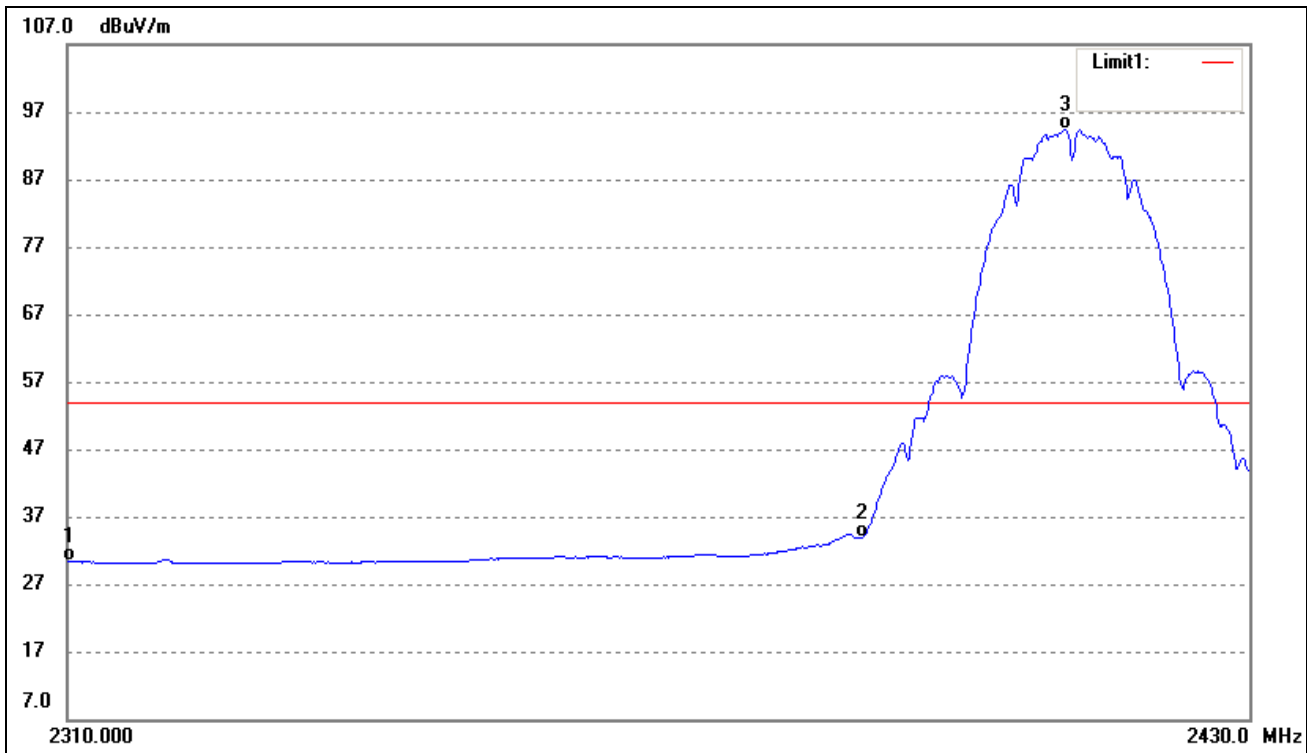
Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

9.4 Summary of Test Results/Plots

Chain 1

802.11b_11Mbps-Lowest Bandedge

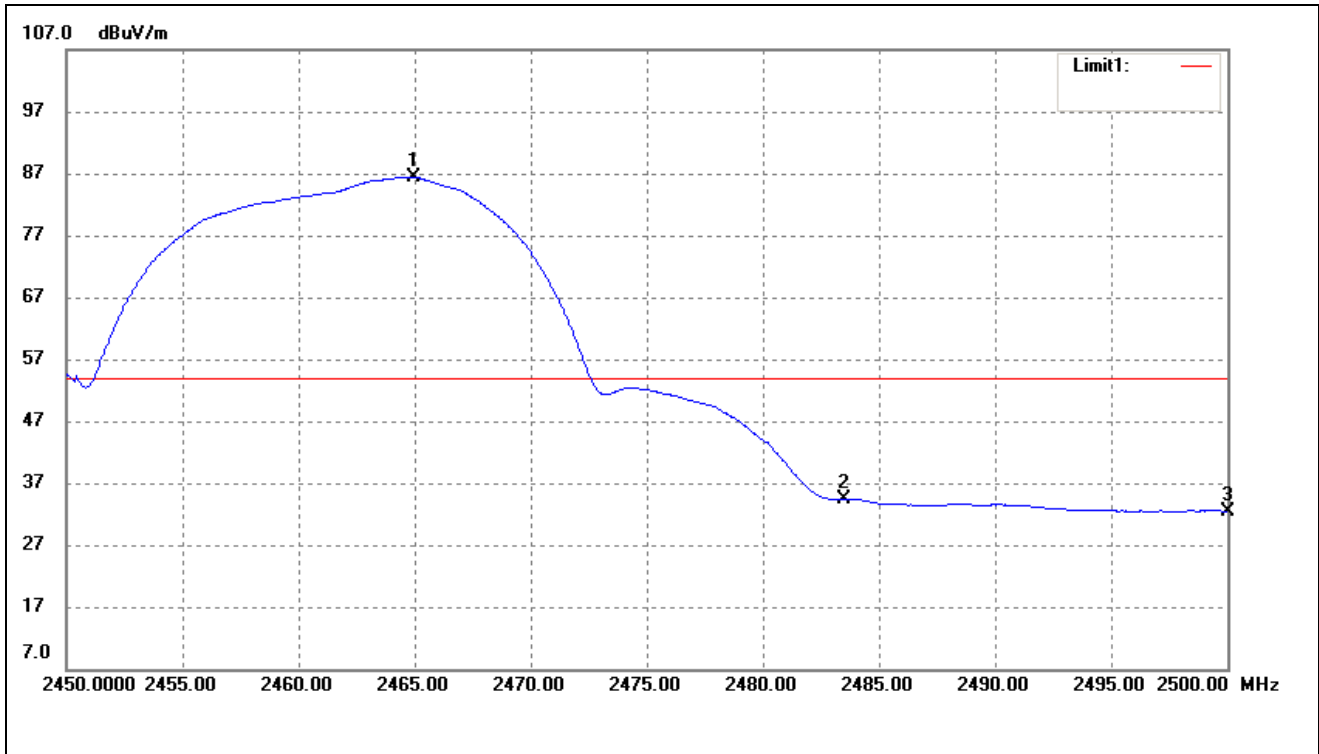
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	51.97	-6.38	45.59	74.00	-28.41	Average Detector
	2310.000	51.97	-6.38	45.59	74.00	-28.41	Peak Detector
2	2390.000	41.26	-7.26	34.00	54.00	-20.00	Average Detector
	2390.000	53.80	-7.26	46.54	74.00	-27.46	Peak Detector
3	2410.878	101.90	-7.41	94.49	Delta=32.59dBc		Average Detector
4	2410.511	107.83	-7.41	100.42			Average Detector

802.11b_11Mbps-Highest Bandedge

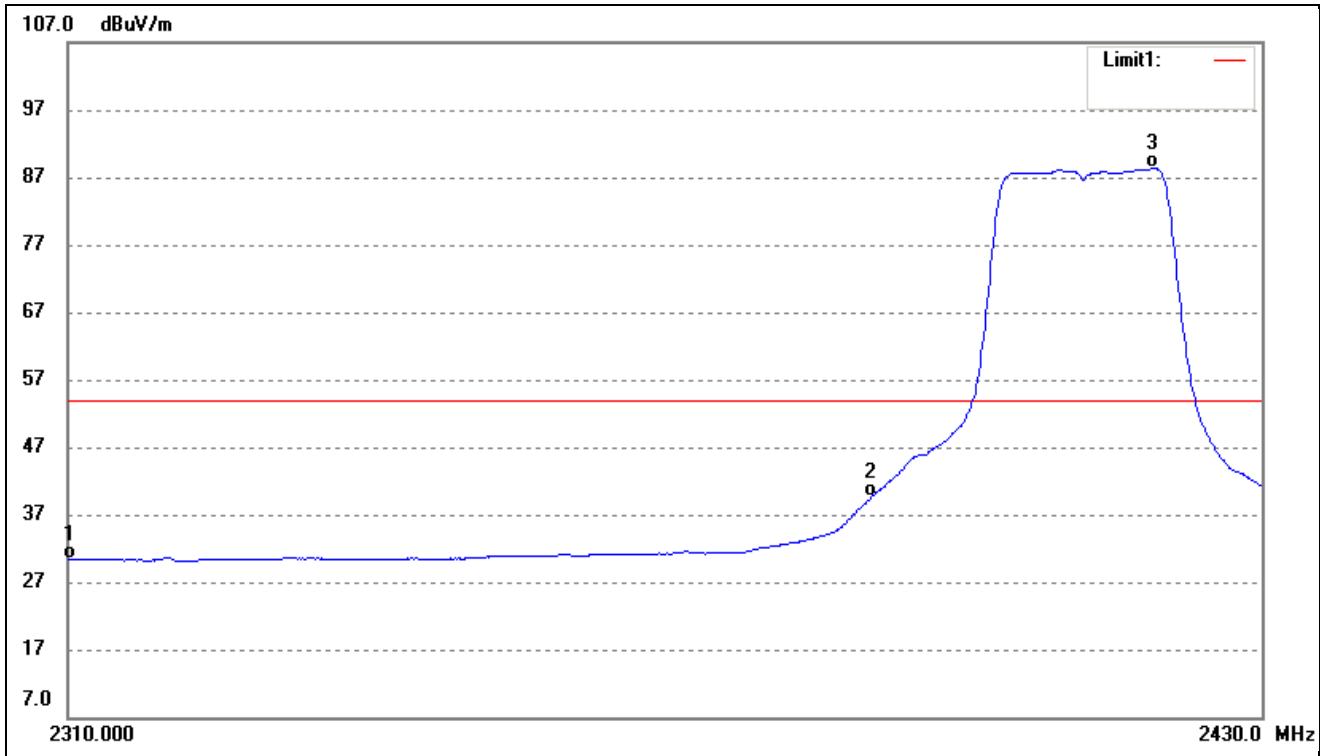
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.162	103.83	-7.32	96.51	/	/	Average Detector
	2460.864	108.27	-7.32	100.95	/	/	Peak Detector
2	2483.500	41.86	-7.28	34.58	54.00	-19.42	Average Detector
	2483.500	54.47	-7.28	47.19	74.00	-26.81	Peak Detector
3	2500.000	37.58	-7.25	30.33	54.00	-23.67	Average Detector
	2500.000	50.97	-7.25	43.72	74.00	-30.28	Peak Detector

802.11g_54Mbps-Lowest Bandedge

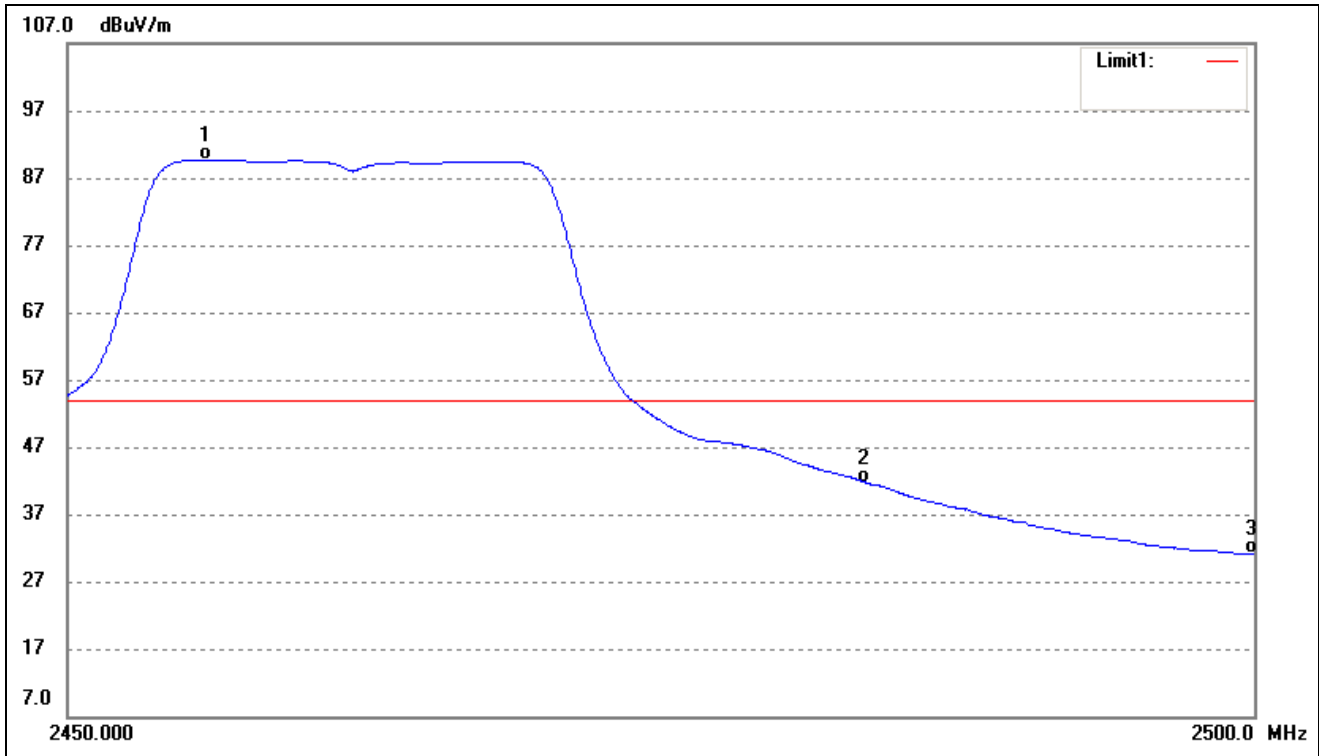
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	36.87	-6.38	30.49	54.00	-23.51	Average Detector
	2310.000	49.92	-6.38	43.54	74.00	-30.46	Peak Detector
2	2390.000	46.85	-7.26	39.59	54.00	-14.41	Average Detector
	2390.000	66.46	-7.26	59.20	74.00	-14.80	Peak Detector
3	2418.827	95.72	-7.39	88.33	Delta=33.78dBc		Average Detector
4	2418.337	106.12	-7.39	98.73			Average Detector

802.11g_54Mbps-Highest Bandedge

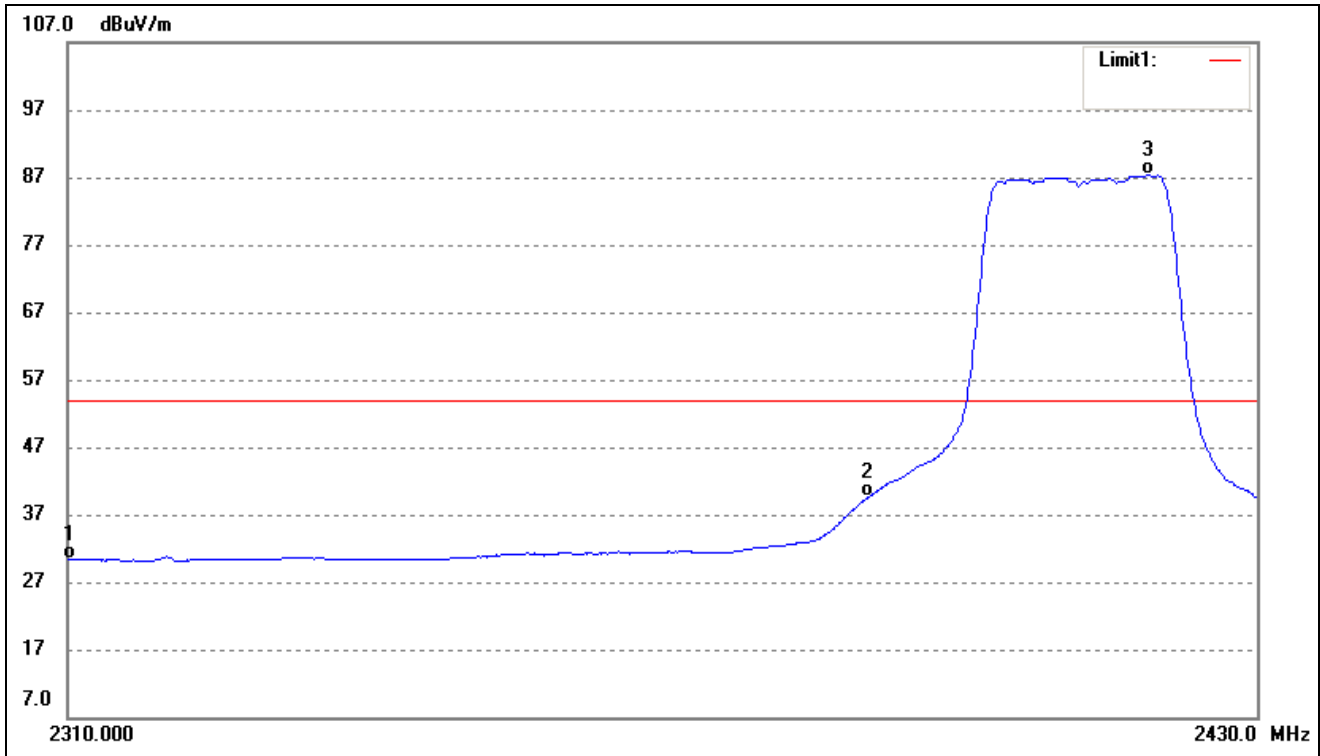
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	2455.748	97.01	-7.33	89.68	/	/	Average Detector
	2455.649	107.88	-7.33	100.55	/	/	Peak Detector
1	2483.500	48.99	-7.28	41.71	54.00	-12.29	Average Detector
	2483.500	68.38	-7.28	61.10	74.00	-12.90	Peak Detector
3	2500.000	38.26	-7.25	31.01	54.00	-22.99	Average Detector
	2500.000	50.91	-7.25	43.66	74.00	-30.34	Peak Detector

802.11n-HT20_MCS7-Lowest Bandedge

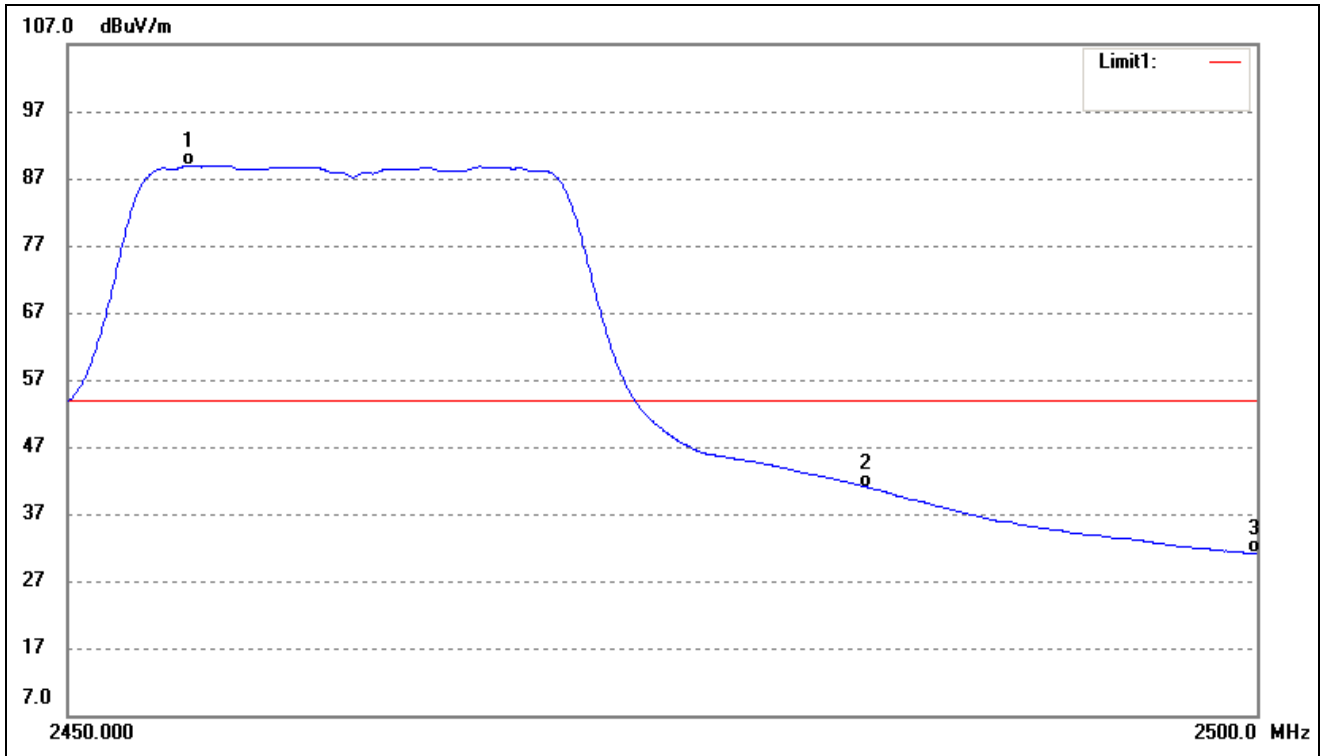
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	36.78	-6.38	30.40	54.00	-23.60	Average Detector
	2310.000	49.50	-6.38	43.12	74.00	-30.88	Peak Detector
2	2390.000	46.85	-7.26	39.59	54.00	-14.41	Average Detector
	2390.000	70.27	-7.26	63.01	74.00	-10.99	Peak Detector
3	2418.827	94.72	-7.39	87.33	Delta=35.28dBc		Average Detector
4	2408.559	105.61	-7.42	98.19			Average Detector

802.11n-HT20_MCS7-Highest Bandedge

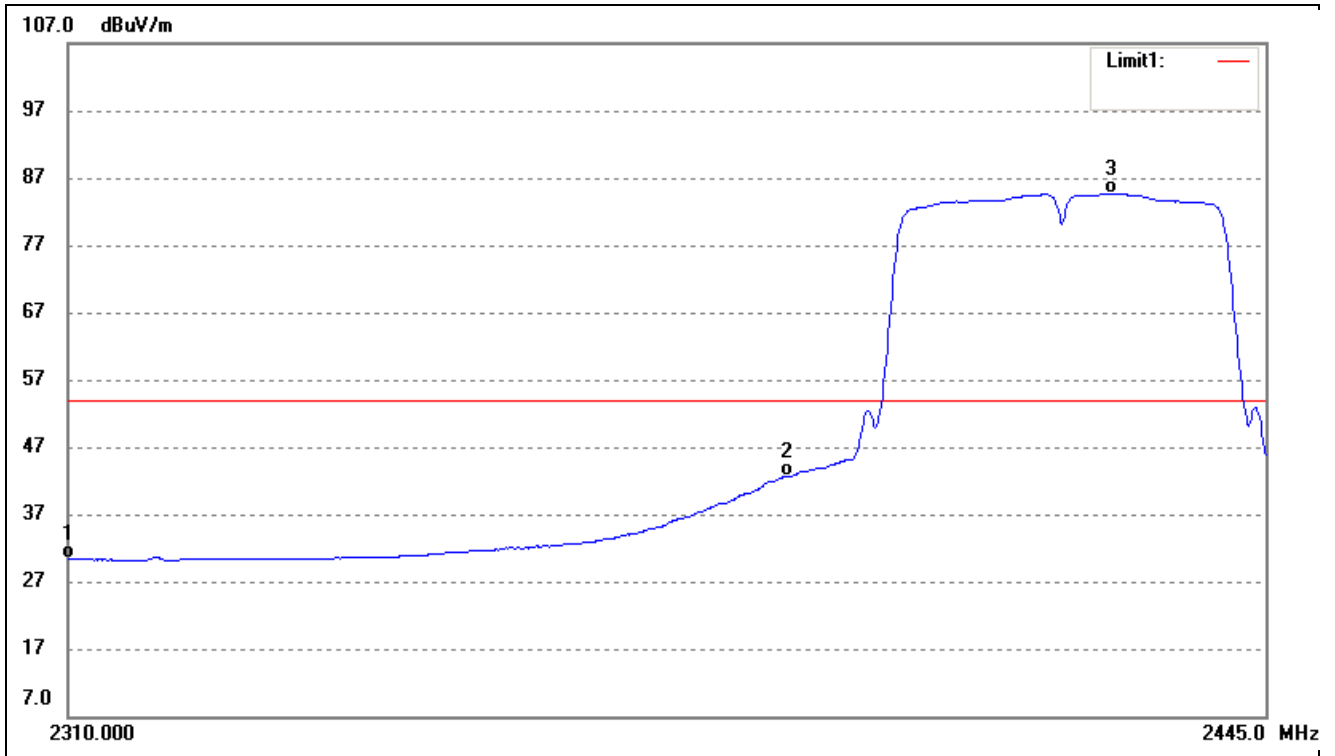
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2455.054	96.24	-7.33	88.91	/	/	Average Detector
	2458.826	107.48	-7.33	100.15	/	/	Peak Detector
2	2483.500	48.25	-7.28	40.97	54.00	-13.03	Average Detector
	2483.500	71.52	-7.28	64.24	74.00	-9.76	Peak Detector
3	2500.000	38.36	-7.25	31.11	54.00	-22.89	Average Detector
	2500.000	53.30	-7.25	46.05	74.00	-27.95	Peak Detector

802.11n-HT40_MCS7-Lowest Bandedge

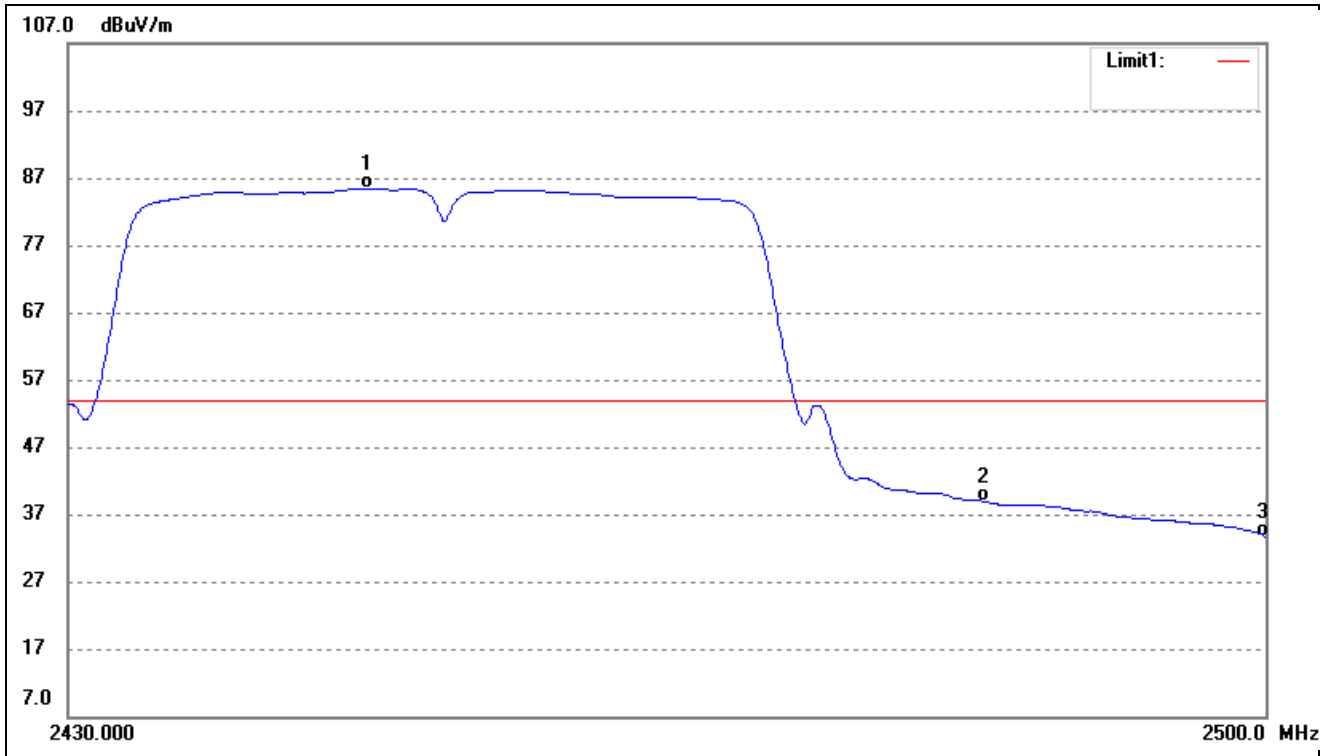
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	36.79	-6.38	30.41	54.00	-23.59	Average Detector
	2310.000	49.41	-6.38	43.03	74.00	-30.97	Peak Detector
2	2390.000	49.94	-7.26	42.68	54.00	-11.32	Average Detector
	2390.000	68.48	-7.26	61.22	74.00	-12.78	Peak Detector
3	2427.151	92.00	-7.38	84.62	Delta=33.94dBc		Average Detector
4	2419.169	102.84	-7.39	95.45			Average Detector

802.11n-HT40_MCS7-Highest Bandedge

Vertical (Worst case)

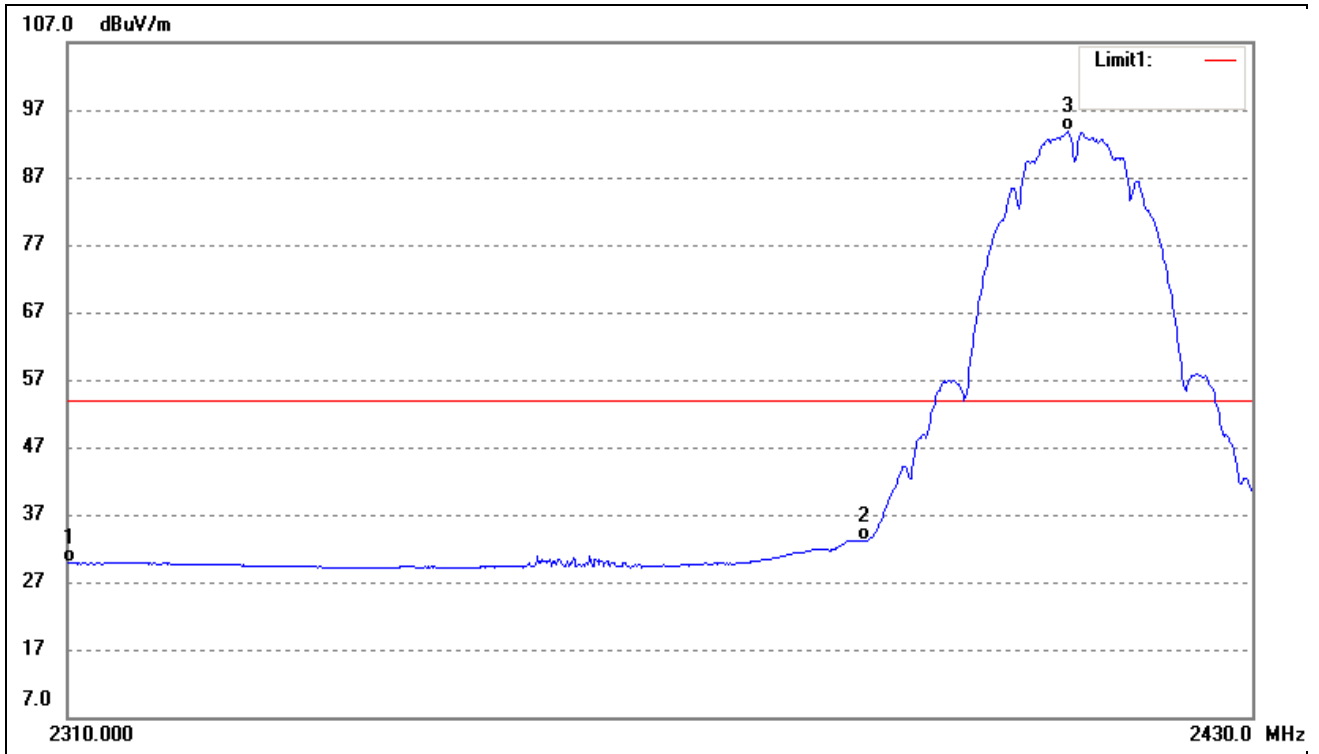


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2447.314	92.76	-7.34	85.42	/	/	Average Detector
	2449.470	104.07	-7.34	96.73	/	/	Peak Detector
2	2483.500	46.14	-7.28	38.86	54.00	-15.14	Average Detector
	2483.500	66.81	-7.28	59.53	74.00	-14.47	Peak Detector
3	2500.000	40.87	-7.25	33.62	54.00	-20.38	Average Detector
	2500.000	57.49	-7.25	50.24	74.00	-23.76	Peak Detector

Chain 2

802.11b_11Mbps-Lowest Bandedge

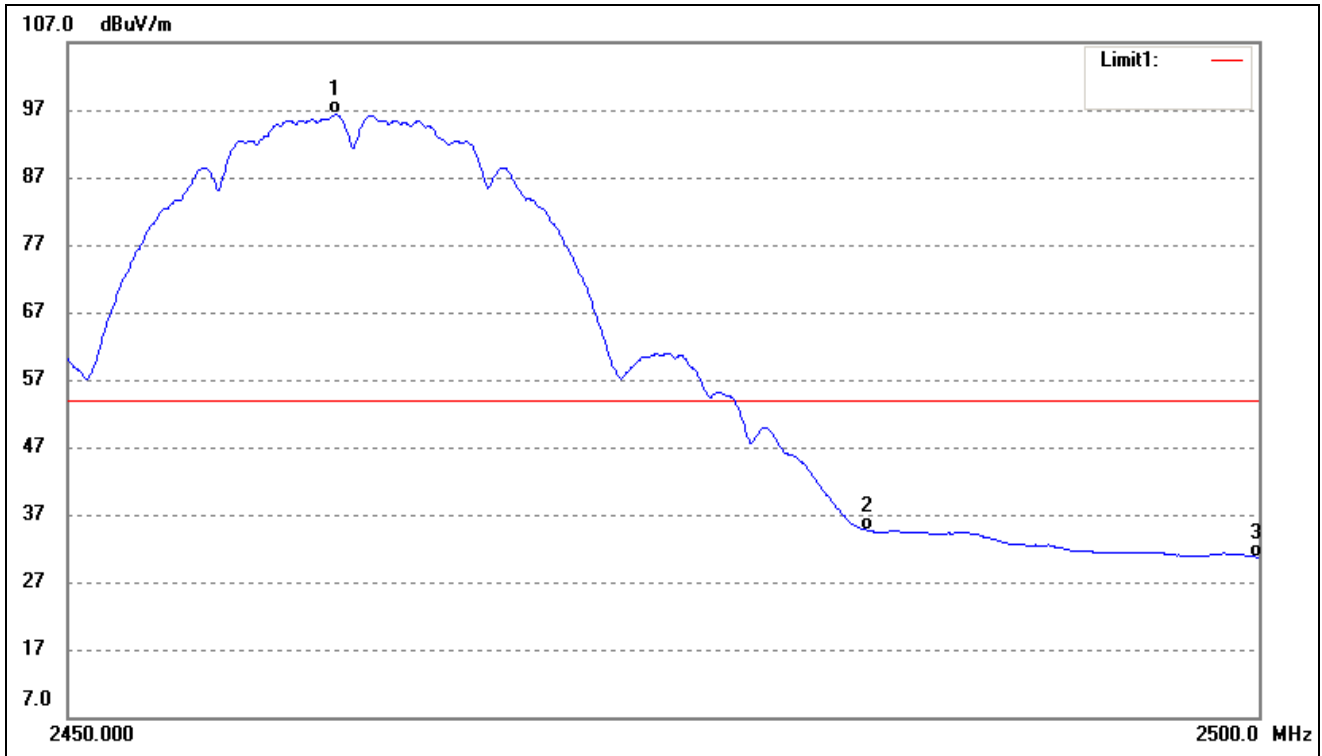
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	36.21	-6.38	29.83	54.00	-24.17	Average Detector
	2310.000	48.24	-6.38	41.86	74.00	-32.14	Peak Detector
2	2390.000	40.40	-7.26	33.14	54.00	-20.86	Average Detector
	2390.000	53.67	-7.26	46.41	74.00	-27.59	Peak Detector
3	2410.878	101.19	-7.41	93.78	Delta=32.59dBc		Average Detector
4	2412.710	105.91	-7.40	98.51			Average Detector

802.11b_11Mbps-Highest Bandedge

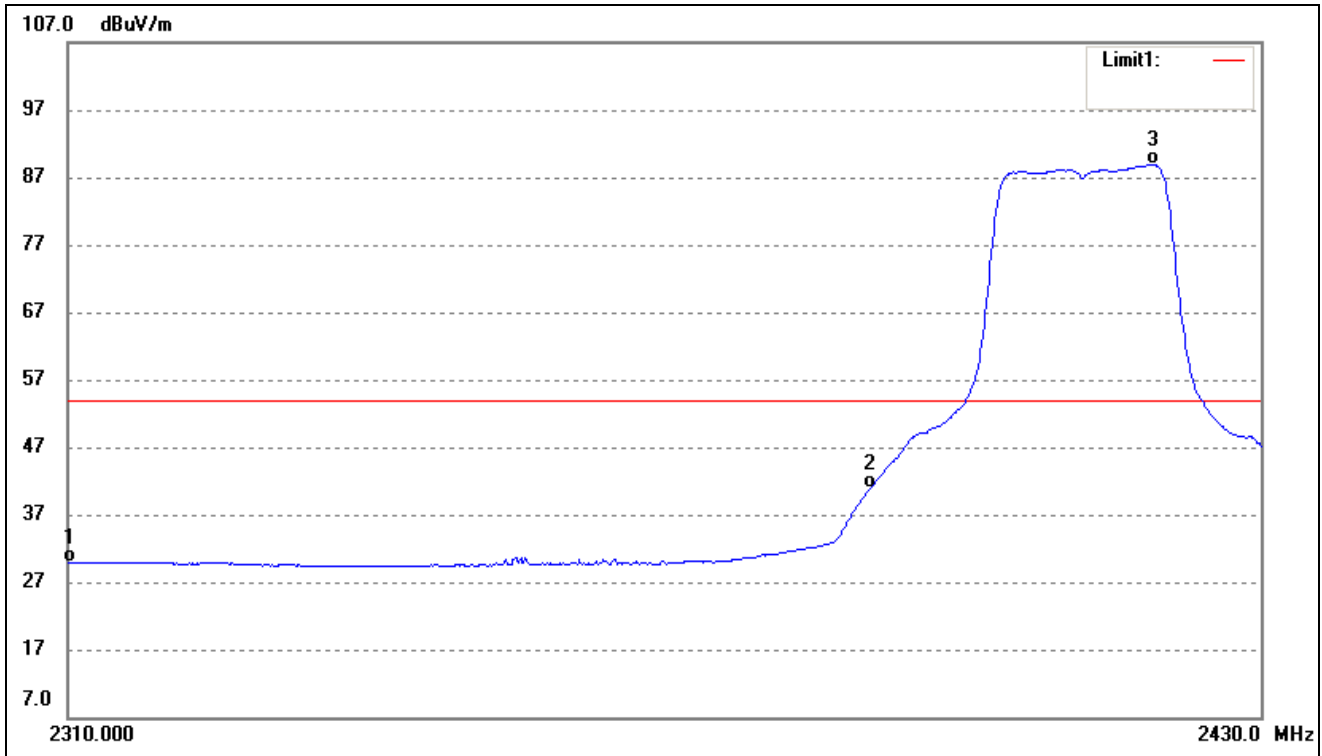
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.162	103.61	-7.32	96.29	/	/	Average Detector
	2460.814	108.95	-7.32	101.63	/	/	Peak Detector
2	2483.500	41.85	-7.28	34.57	54.00	-19.43	Average Detector
	2483.500	54.79	-7.28	47.51	74.00	-26.49	Peak Detector
3	2500.000	37.97	-7.25	30.72	54.00	-23.28	Average Detector
	2500.000	50.06	-7.25	42.81	74.00	-31.19	Peak Detector

802.11g_54Mbps-Lowest Bandedge

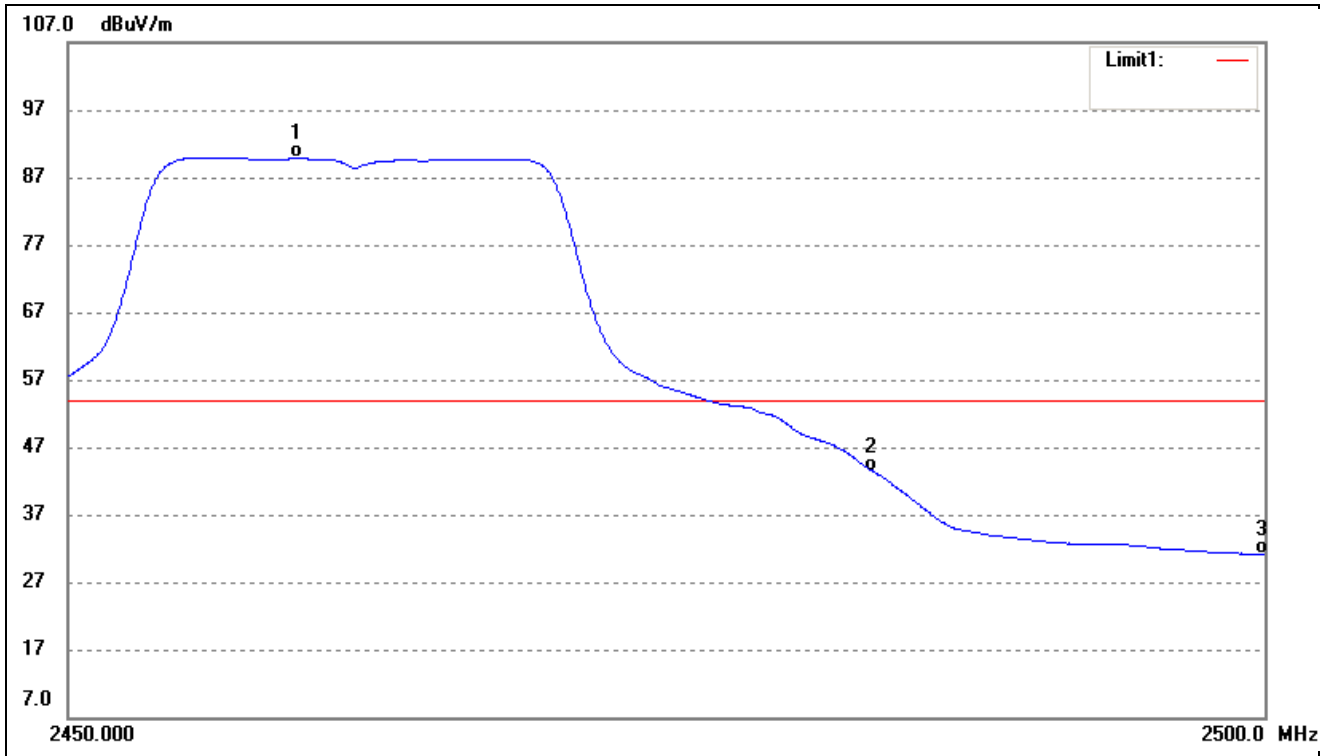
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	36.24	-6.38	29.86	54.00	-24.14	Average Detector
	2310.000	48.43	-6.38	42.05	74.00	-31.95	Peak Detector
2	2390.000	48.25	-7.26	40.99	54.00	-13.01	Average Detector
	2390.000	68.39	-7.26	61.13	74.00	-12.87	Peak Detector
3	2418.949	96.27	-7.39	88.88	Delta=33.78dBc		Average Detector
4	2418.092	106.73	-7.39	99.34			Average Detector

802.11g_54Mbps-Highest Bandedge

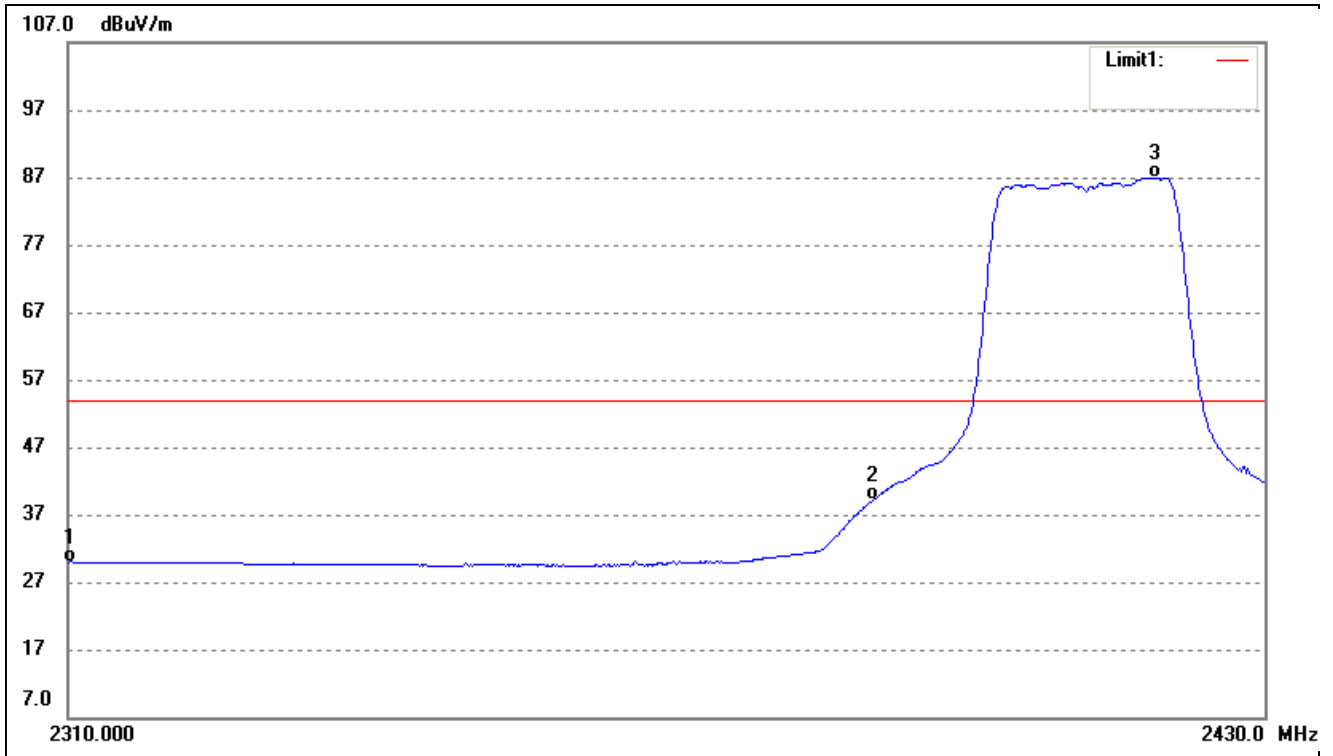
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	2459.472	97.23	-7.32	89.91	/	/	Average Detector
	2468.033	107.68	-7.30	100.38	/	/	Peak Detector
1	2483.500	50.69	-7.28	43.41	54.00	-10.59	Average Detector
	2483.500	70.22	-7.28	62.94	74.00	-11.06	Peak Detector
3	2500.000	38.32	-7.25	31.07	54.00	-22.93	Average Detector
	2500.000	52.16	-7.25	44.91	74.00	-29.09	Peak Detector

802.11n-HT20_MCS7-Lowest Bandedge

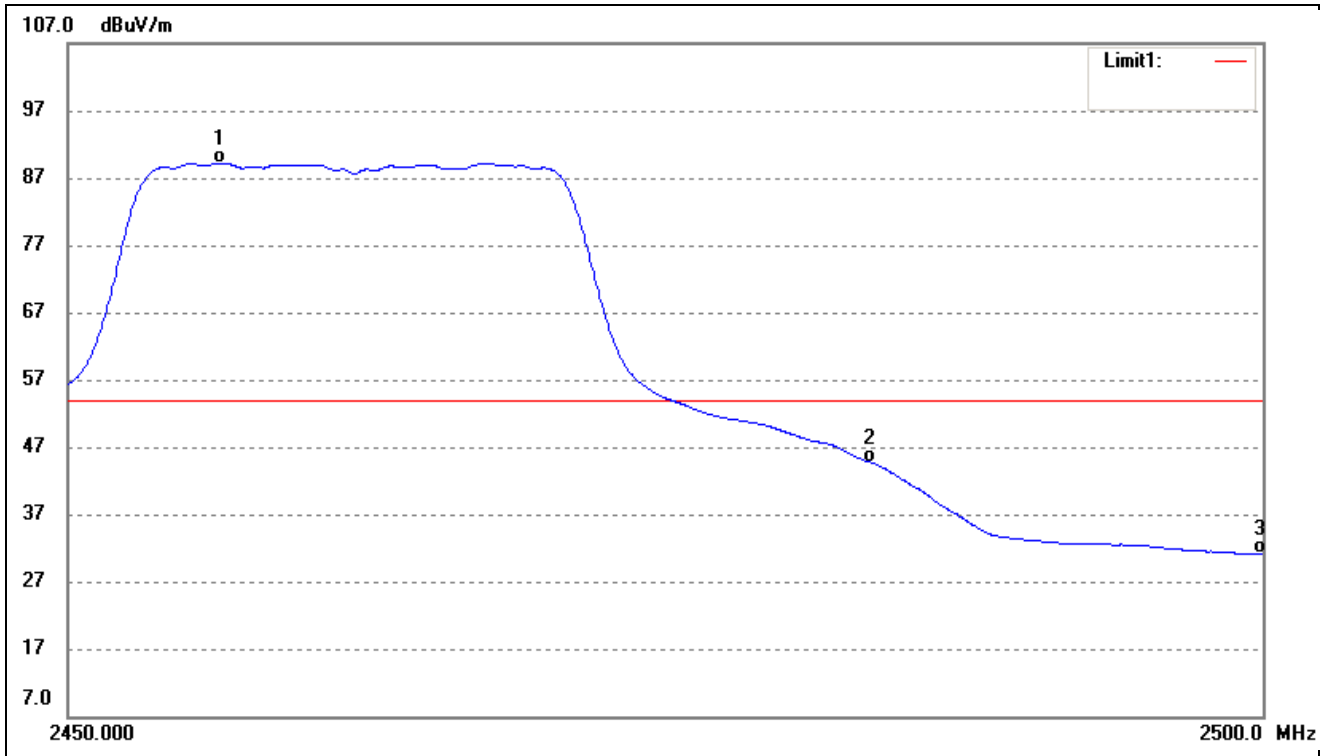
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	36.36	-6.38	29.98	54.00	-24.02	Average Detector
	2310.000	48.96	-6.38	42.58	74.00	-31.42	Peak Detector
2	2390.000	46.45	-7.26	39.19	54.00	-14.81	Average Detector
	2390.000	69.51	-7.26	62.25	74.00	-11.75	Peak Detector
3	2418.827	94.37	-7.39	86.98	Delta=35.28dBc		Average Detector
4	2419.072	105.63	-7.39	98.24			Average Detector

802.11n-HT20_MCS7-Highest Bandedge

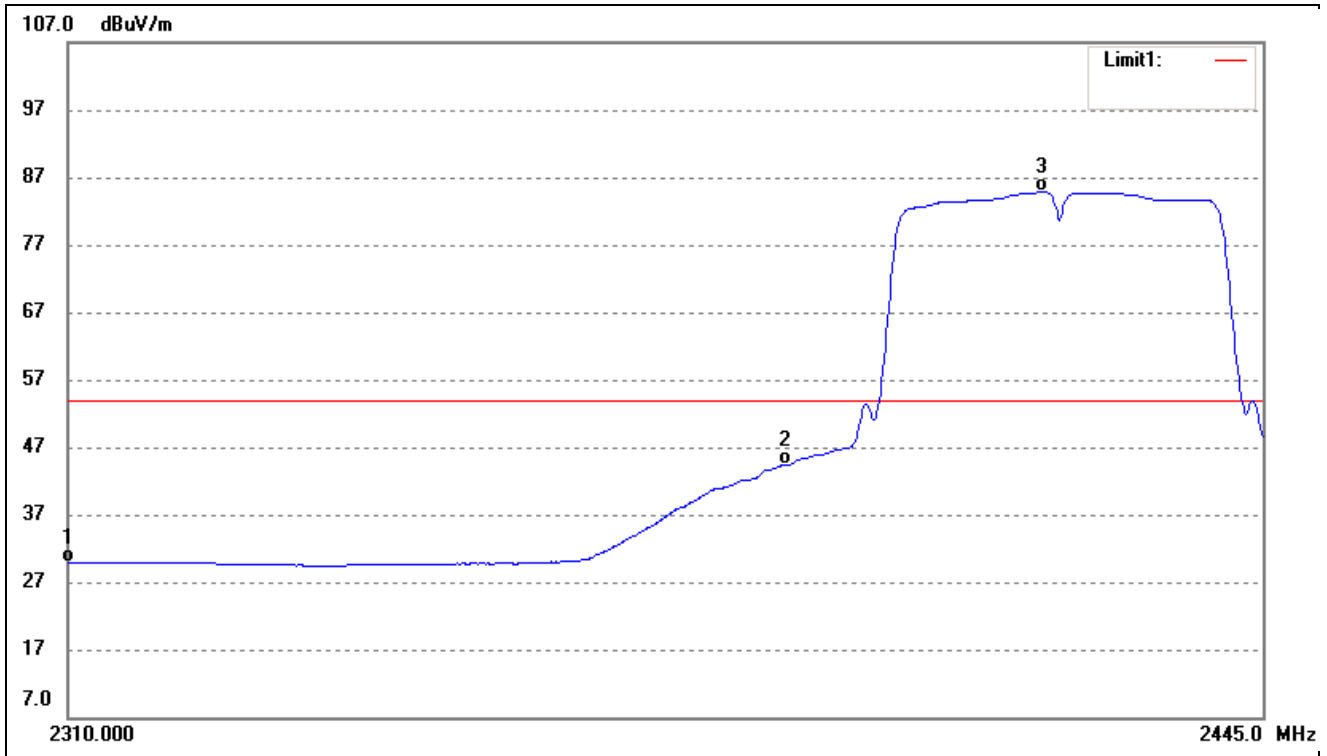
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2456.294	96.40	-7.33	89.07	/	/	Average Detector
	2458.777	107.61	-7.33	100.28	/	/	Peak Detector
2	2483.500	51.91	-7.28	44.63	54.00	-9.37	Average Detector
	2483.500	73.34	-7.28	66.06	74.00	-7.94	Peak Detector
3	2500.000	38.31	-7.25	31.06	54.00	-22.94	Average Detector
	2500.000	50.43	-7.25	43.18	74.00	-30.82	Peak Detector

802.11n-HT40_MCS7-Lowest Bandedge

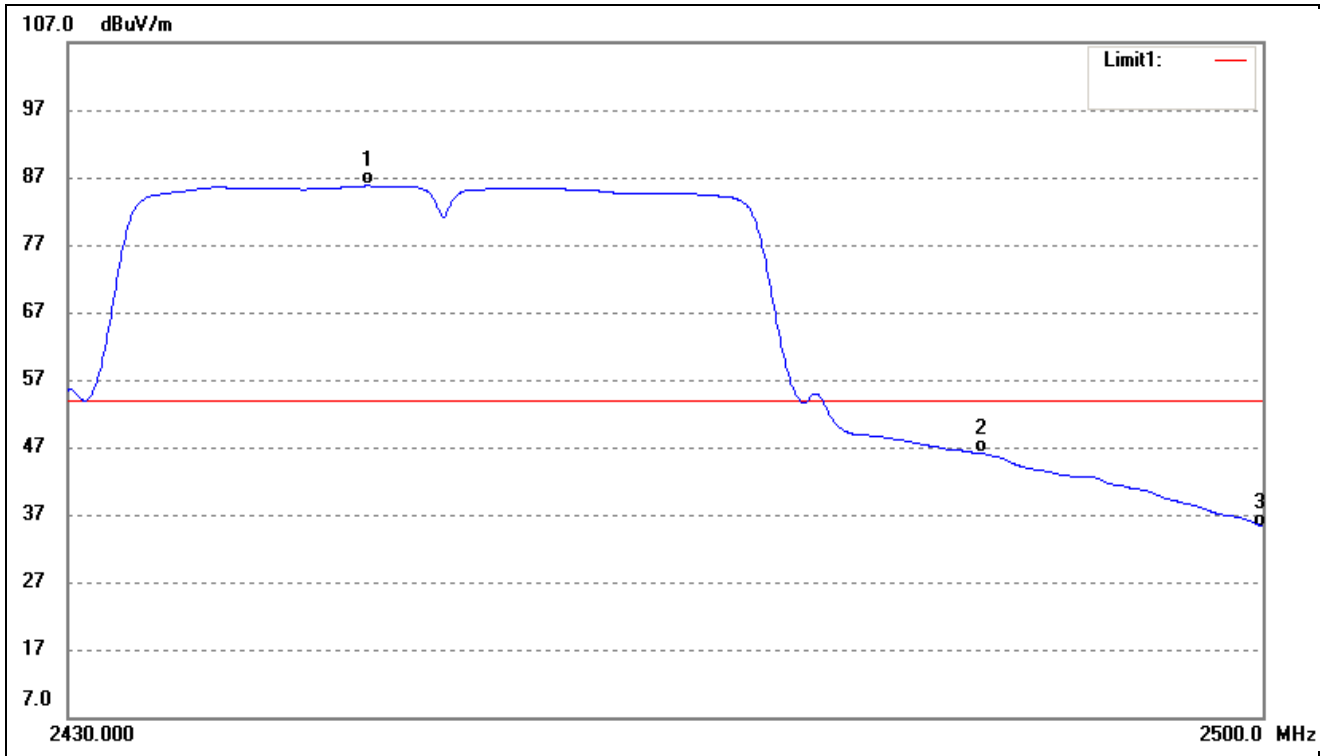
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	36.33	-6.38	29.95	54.00	-24.05	Average Detector
	2310.000	48.72	-6.38	42.34	74.00	-31.66	Peak Detector
2	2390.000	51.59	-7.26	44.33	54.00	-9.67	Average Detector
	2390.000	70.12	-7.26	62.86	74.00	-11.14	Peak Detector
3	2419.443	92.30	-7.39	84.91	Delta=33.94dBc		Average Detector
4	2419.031	103.41	-7.39	96.02			Average Detector

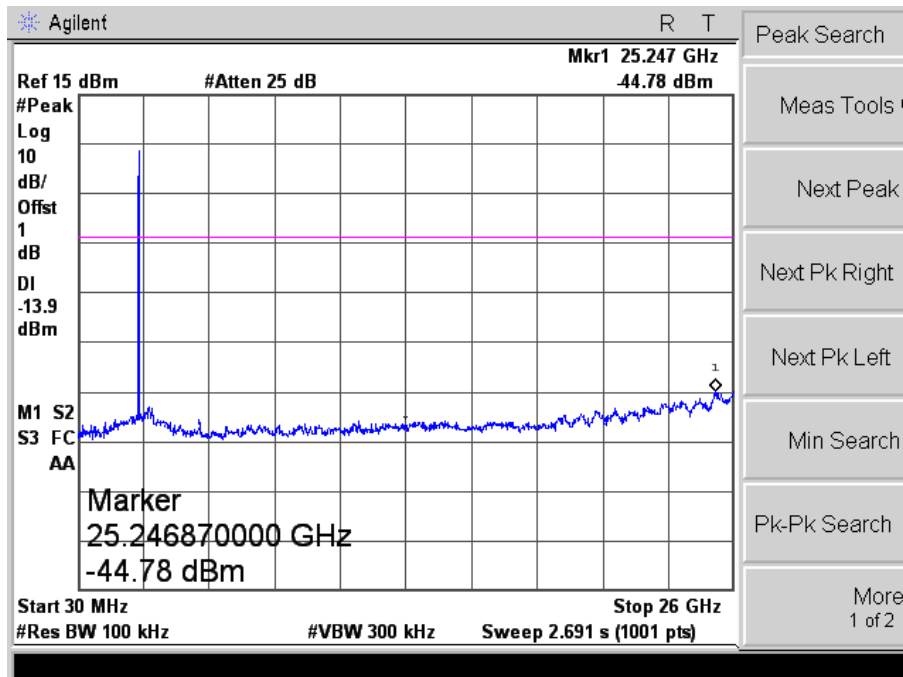
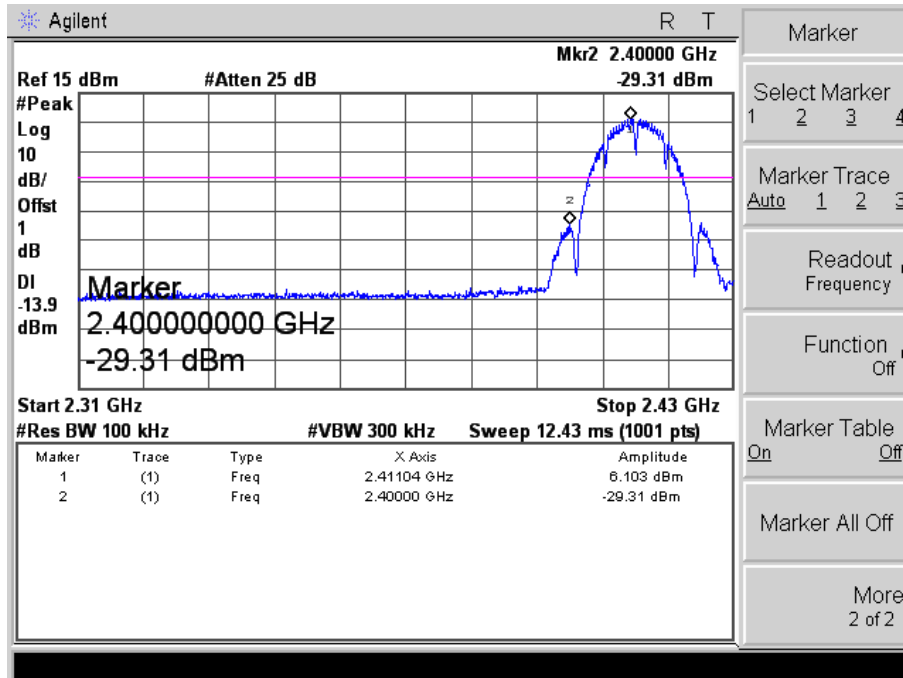
802.11n-HT40_MCS7-Highest Bandedge

Vertical (Worst case)

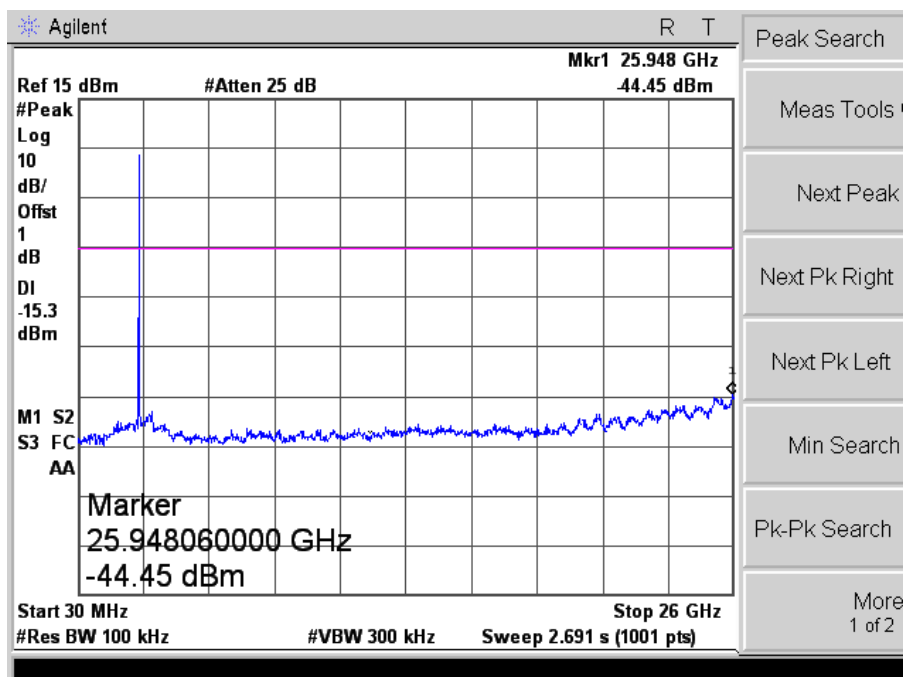
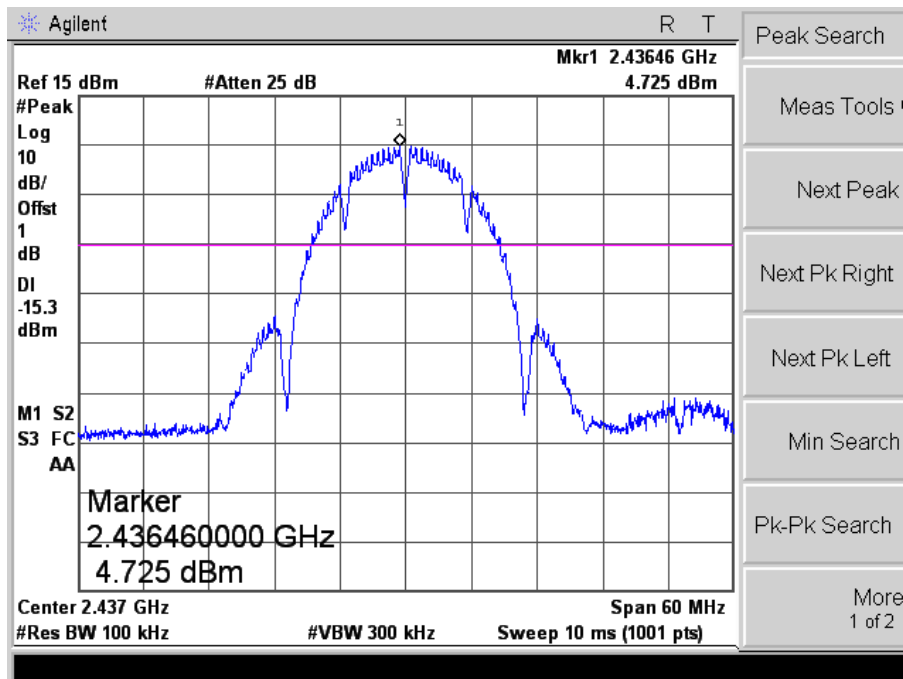


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2447.384	93.11	-7.34	85.77	/	/	Average Detector
	2449.470	104.05	-7.34	96.71	/	/	Peak Detector
2	2483.500	53.31	-7.28	46.03	54.00	-7.97	Average Detector
	2483.500	67.87	-7.28	60.59	74.00	-13.41	Peak Detector
3	2500.000	42.48	-7.25	35.23	54.00	-18.77	Average Detector
	2500.000	59.27	-7.25	52.02	74.00	-21.98	Peak Detector

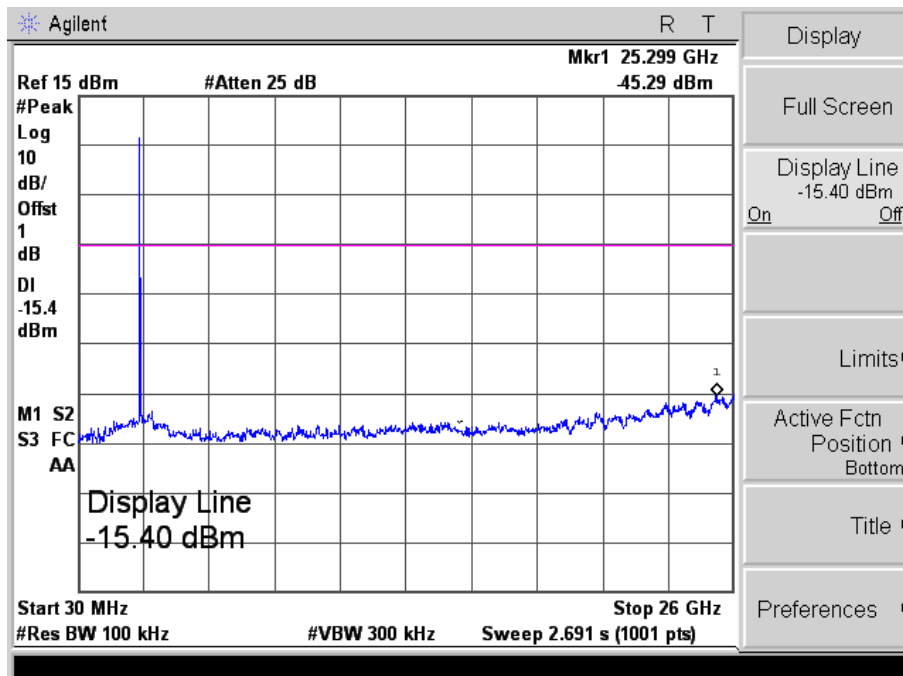
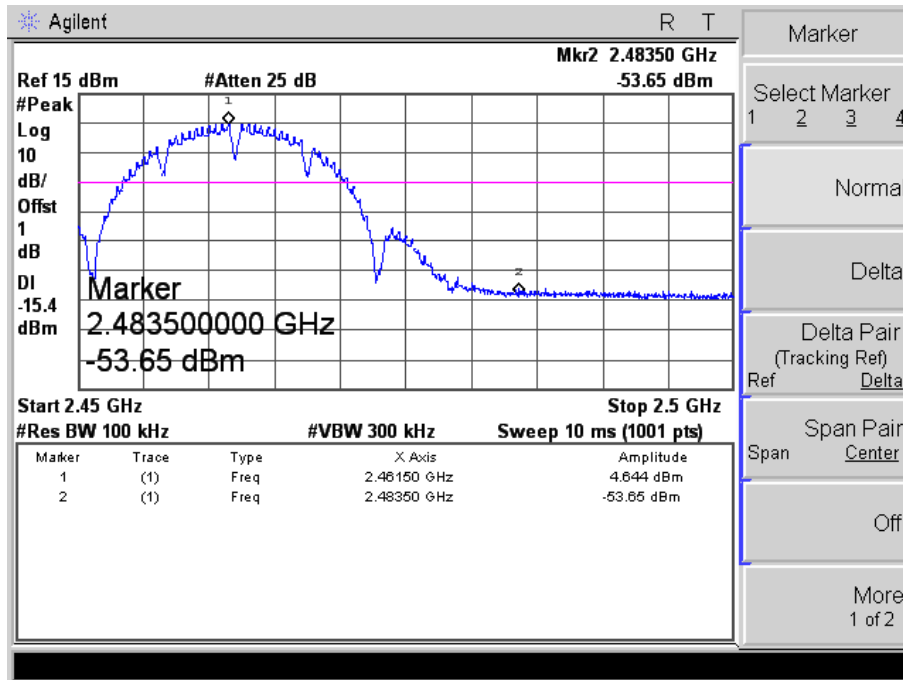
Chain 1
 Out-of-Band and Spurious Emission (Conducted)
 802.11b_11Mbps
 Low Channel



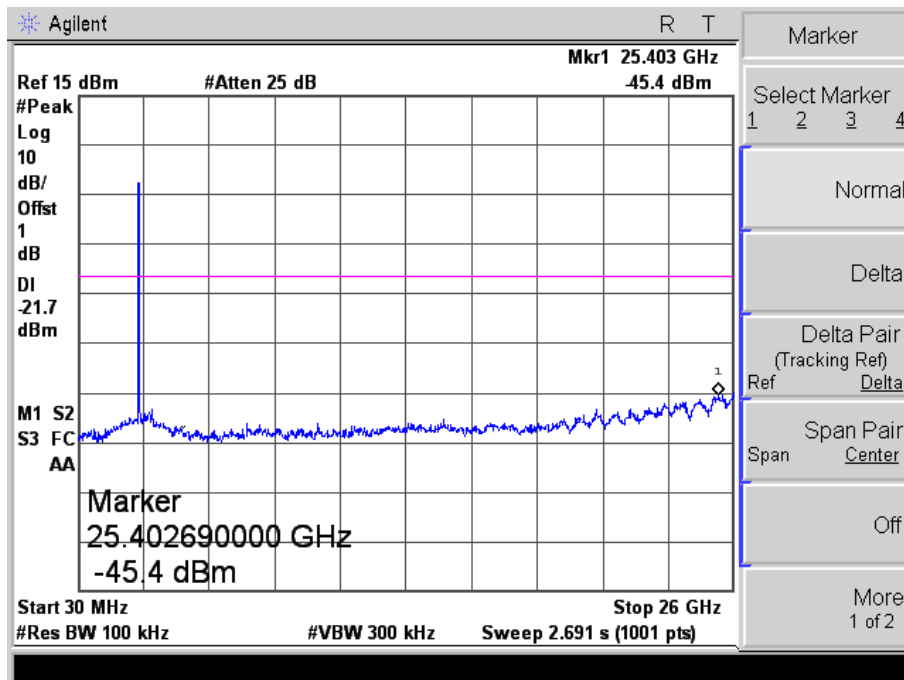
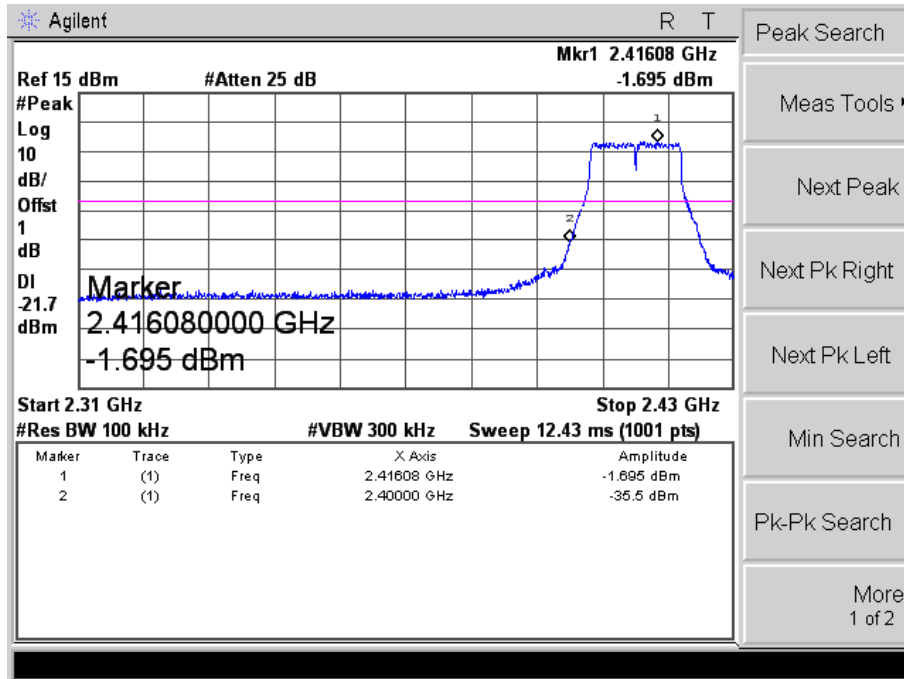
Middle Channel



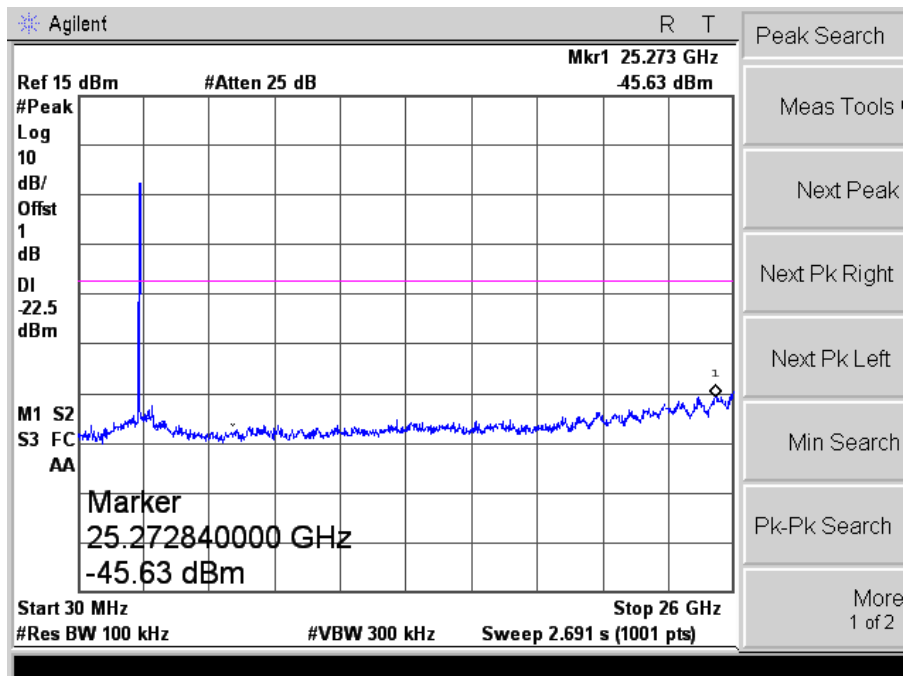
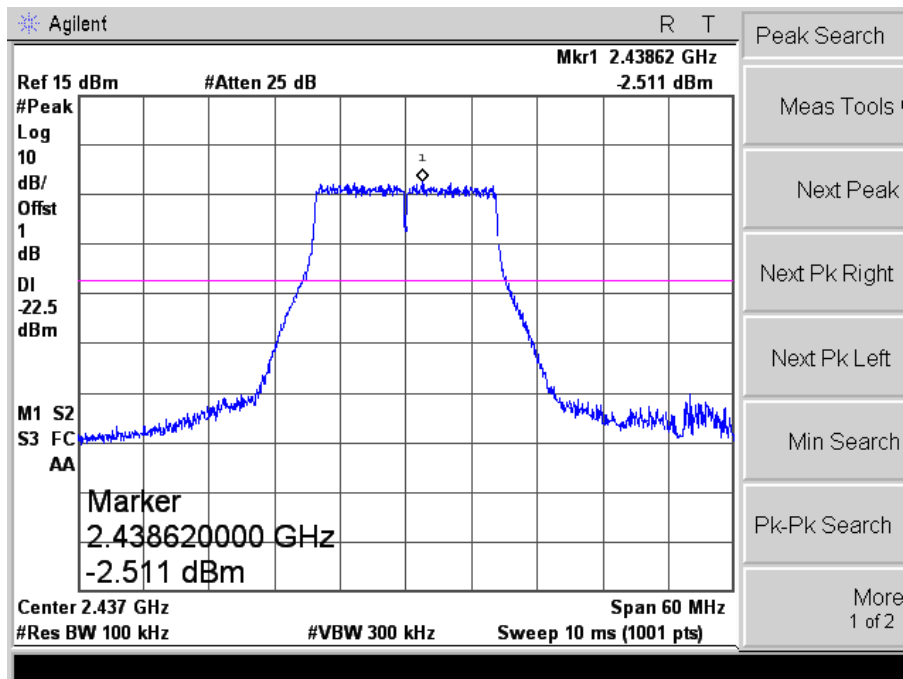
High Channel



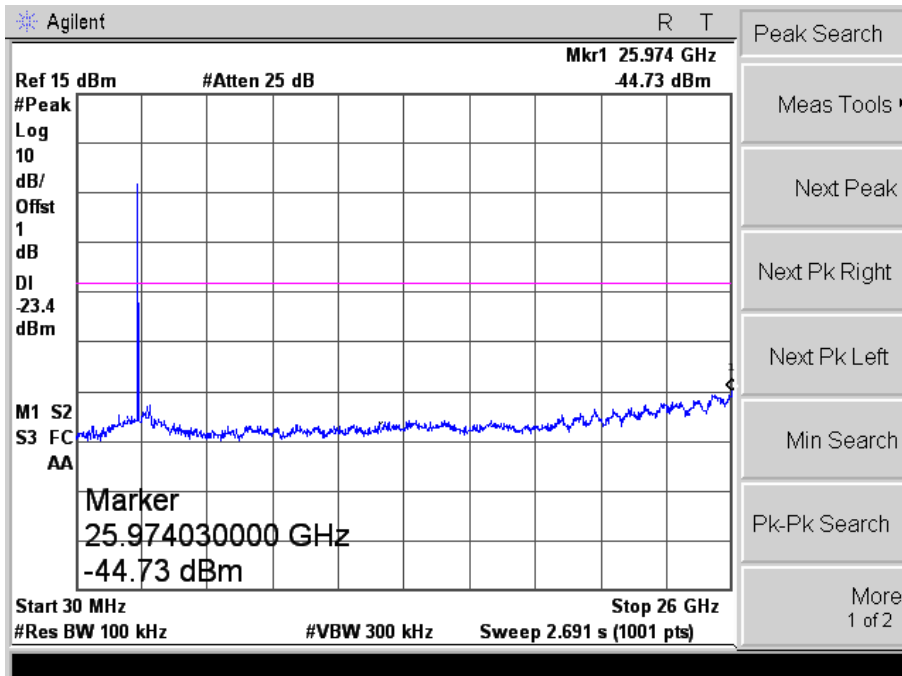
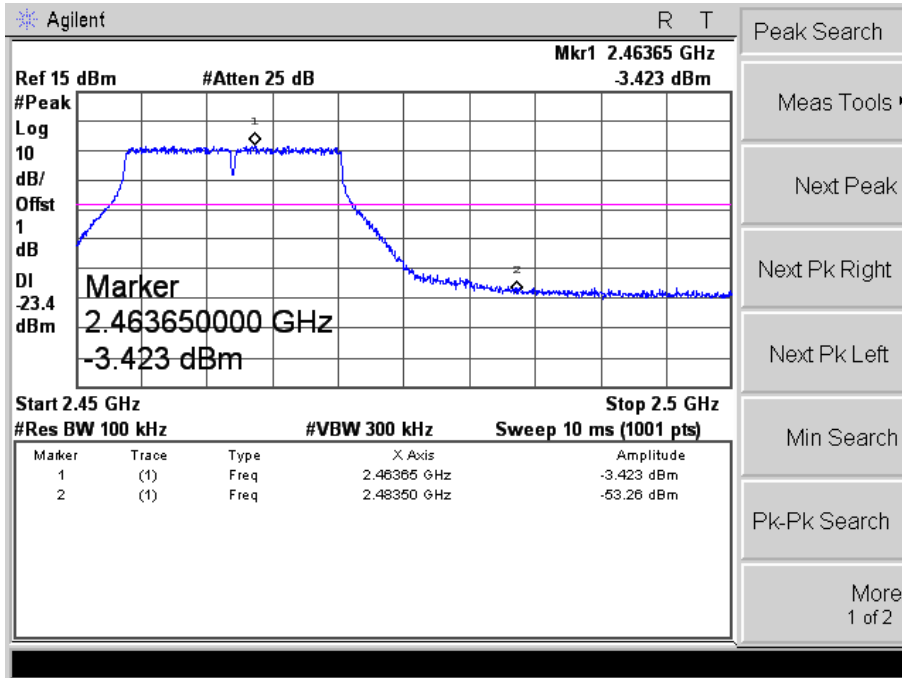
802.11g_54Mbps
Low Channel



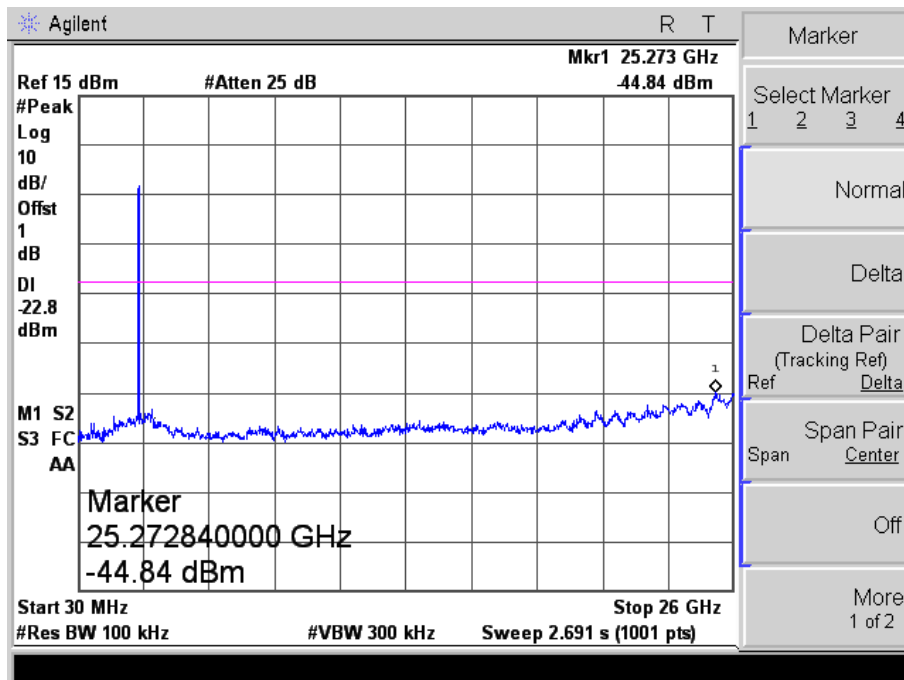
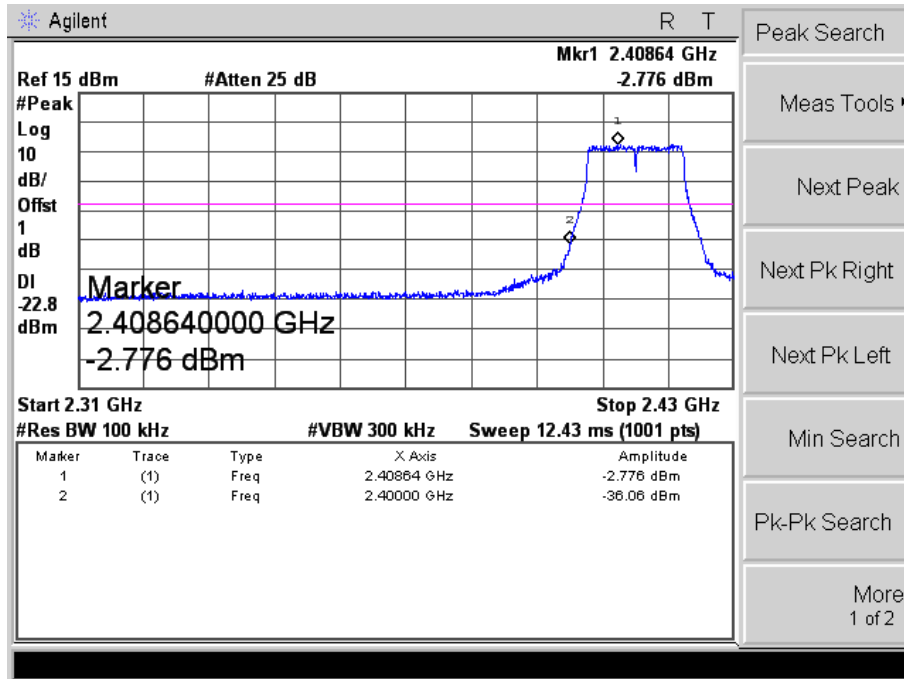
Middle Channel



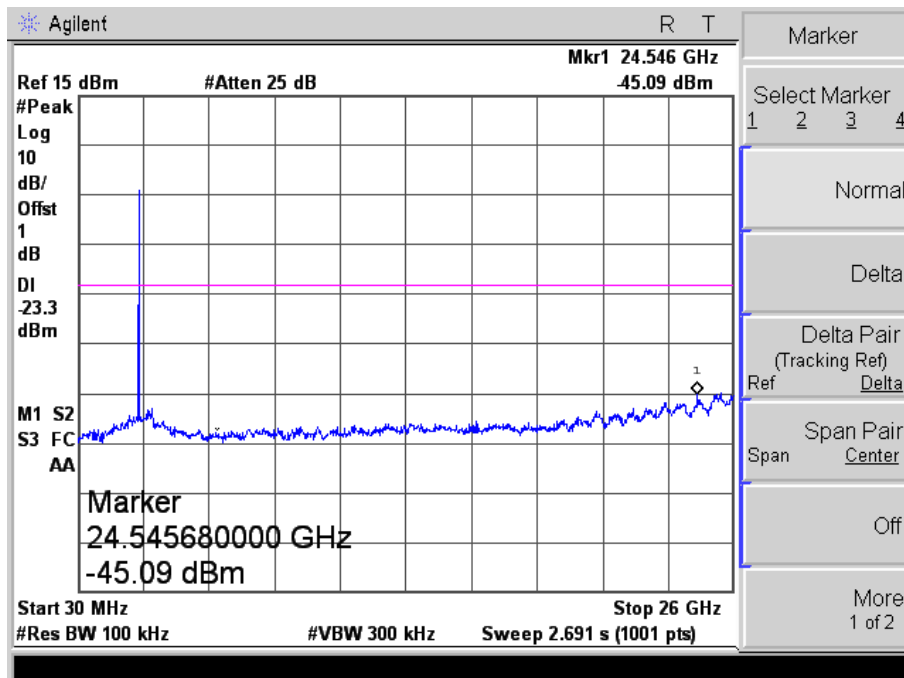
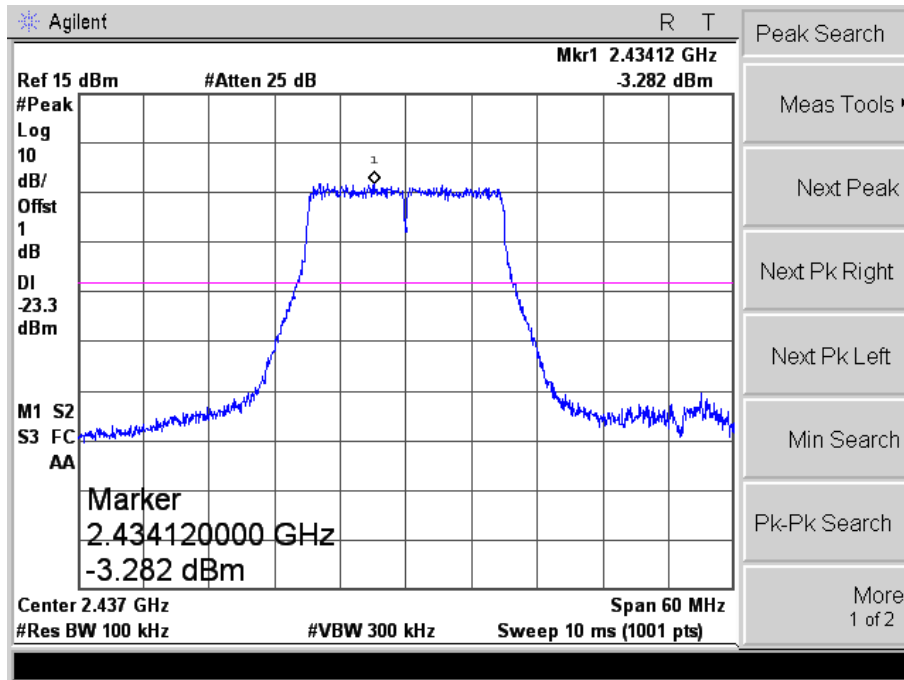
High Channel



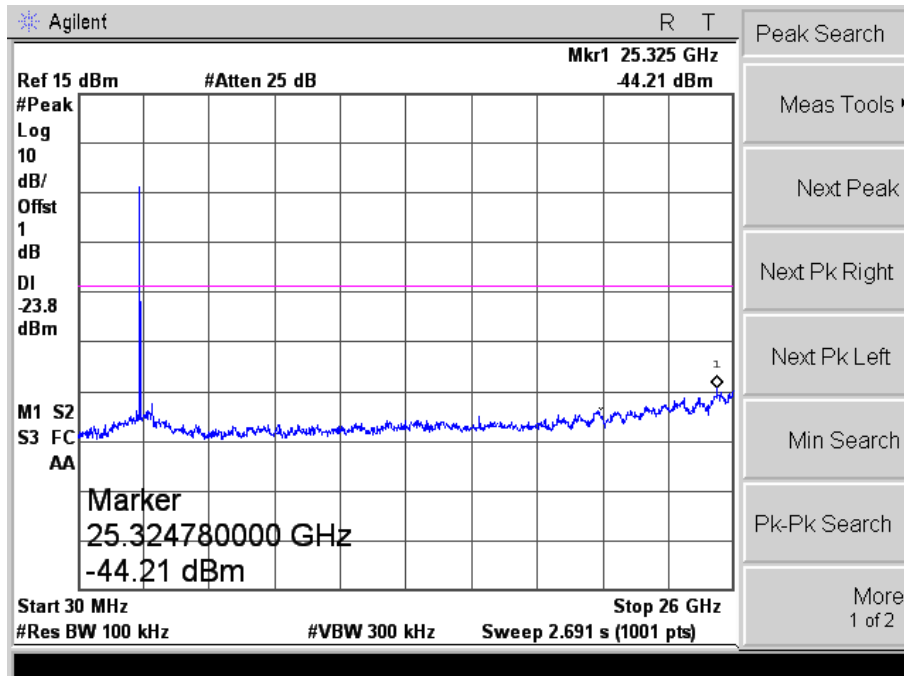
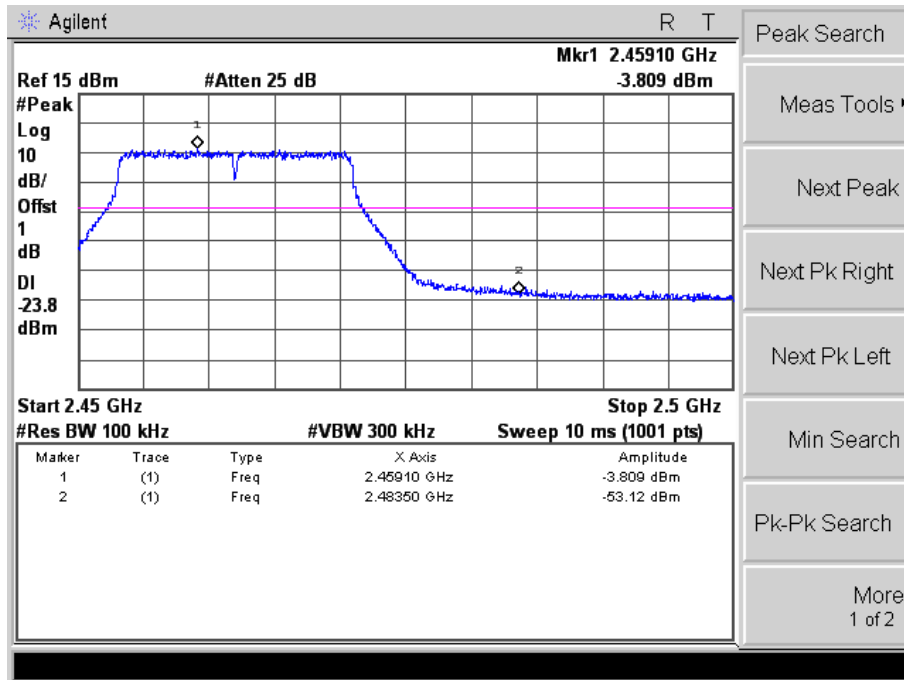
11n-HT20_MCS7
 Low Channel



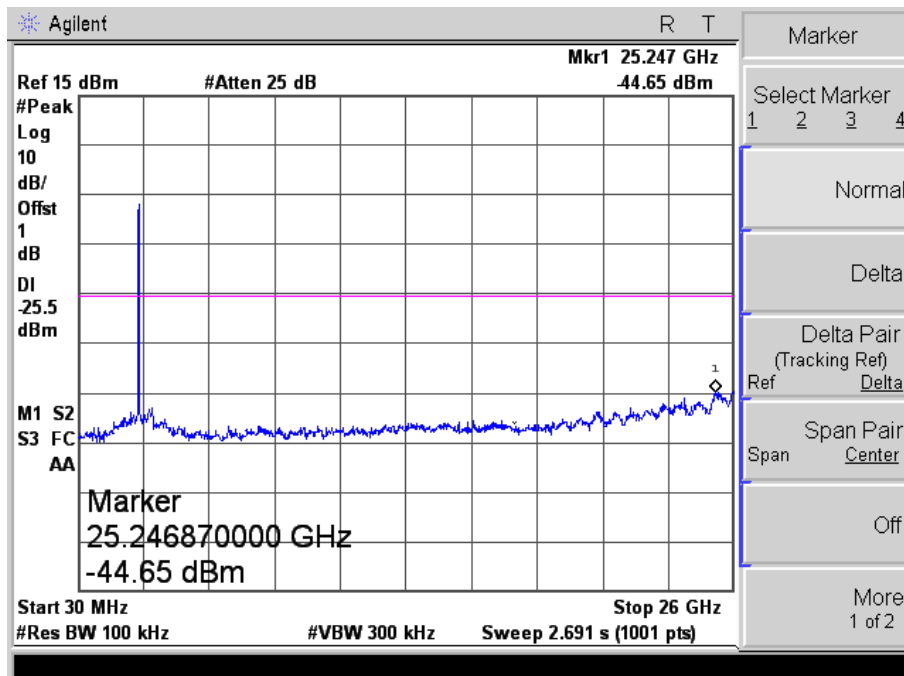
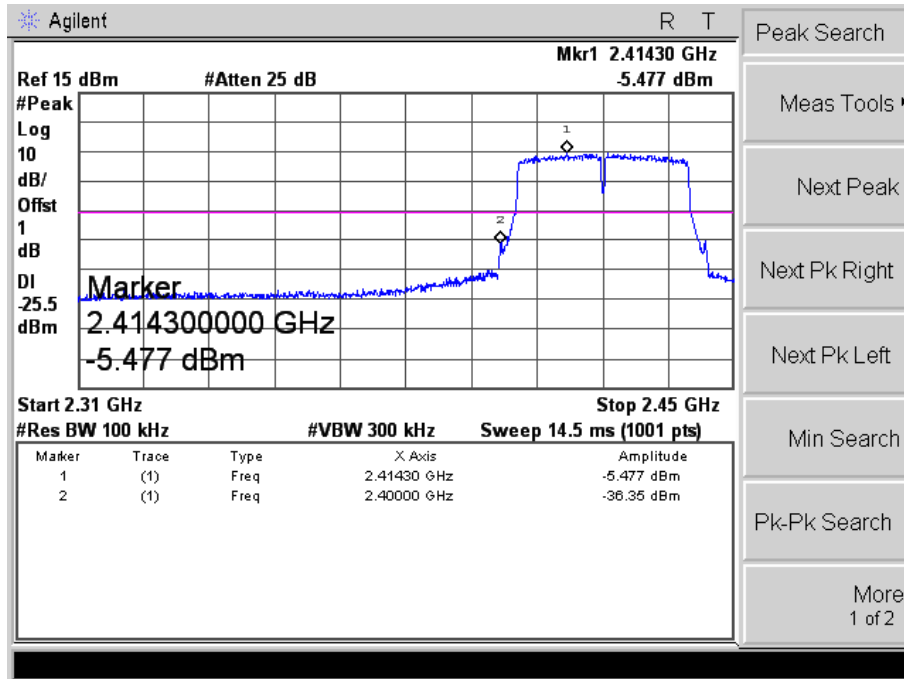
Middle Channel



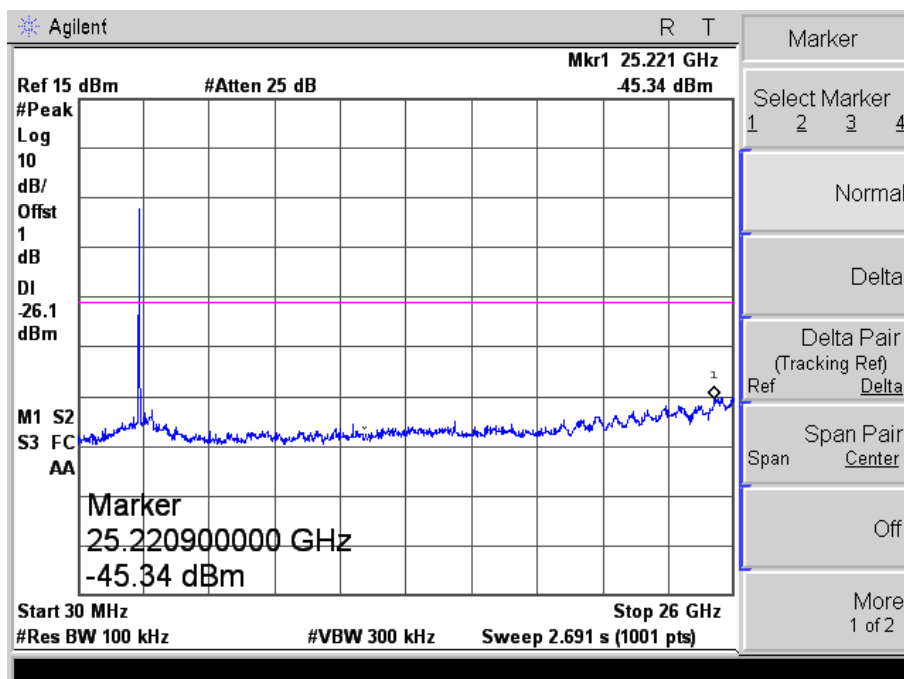
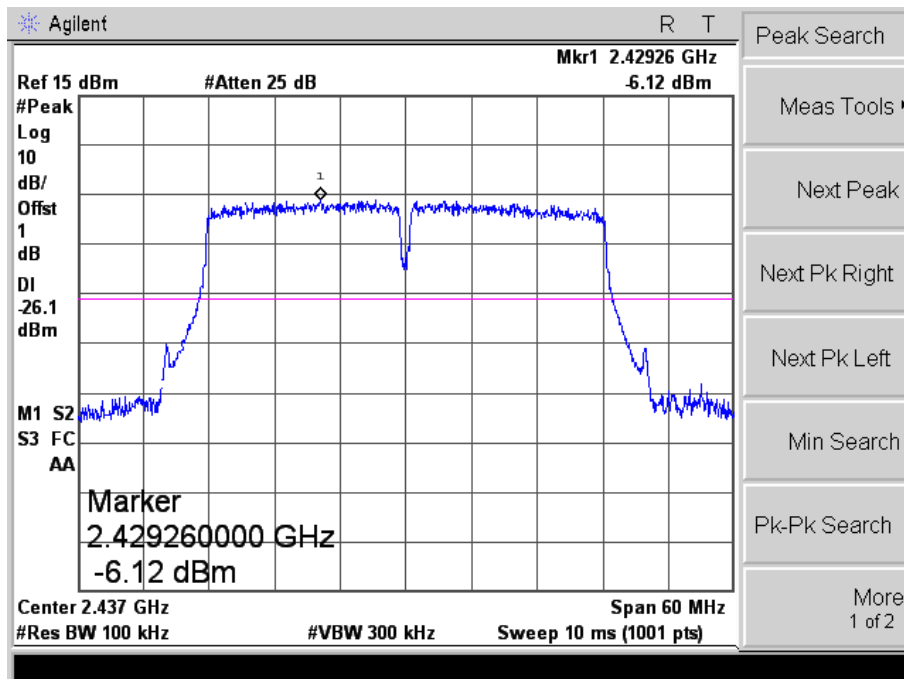
High Channel



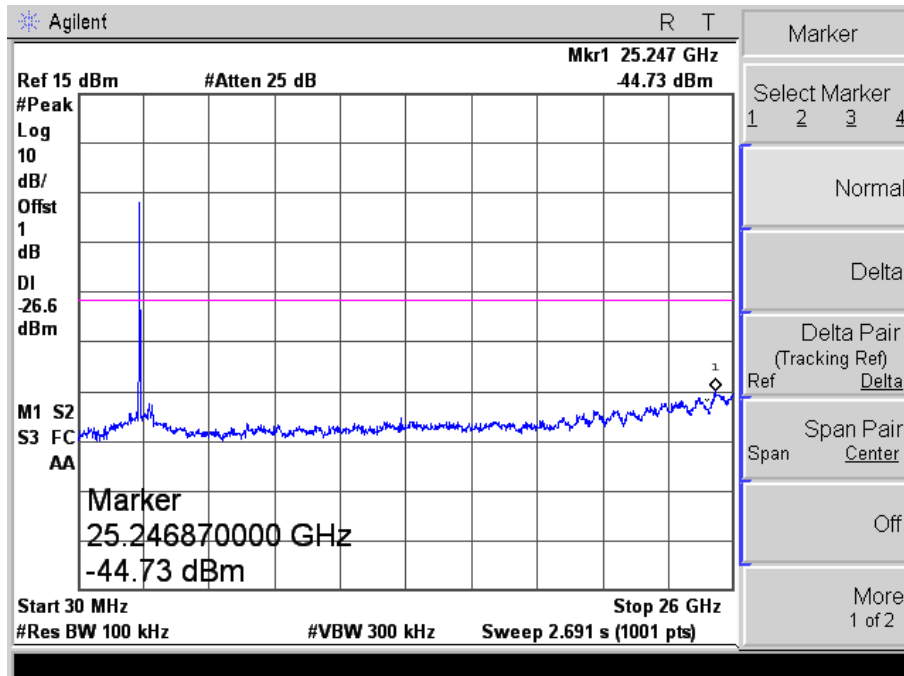
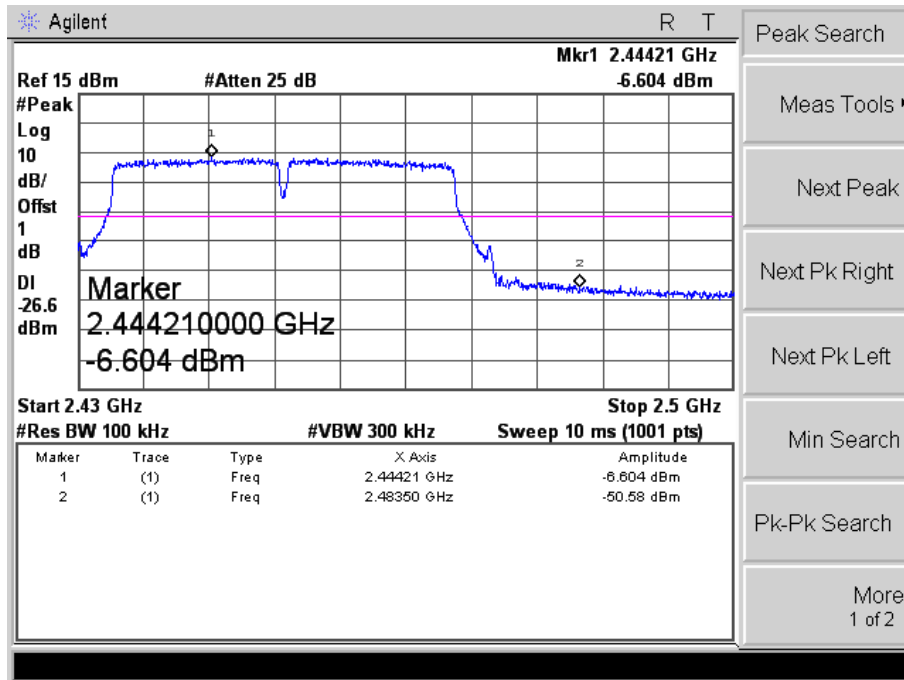
11n-HT40_MCS7
Low Channel



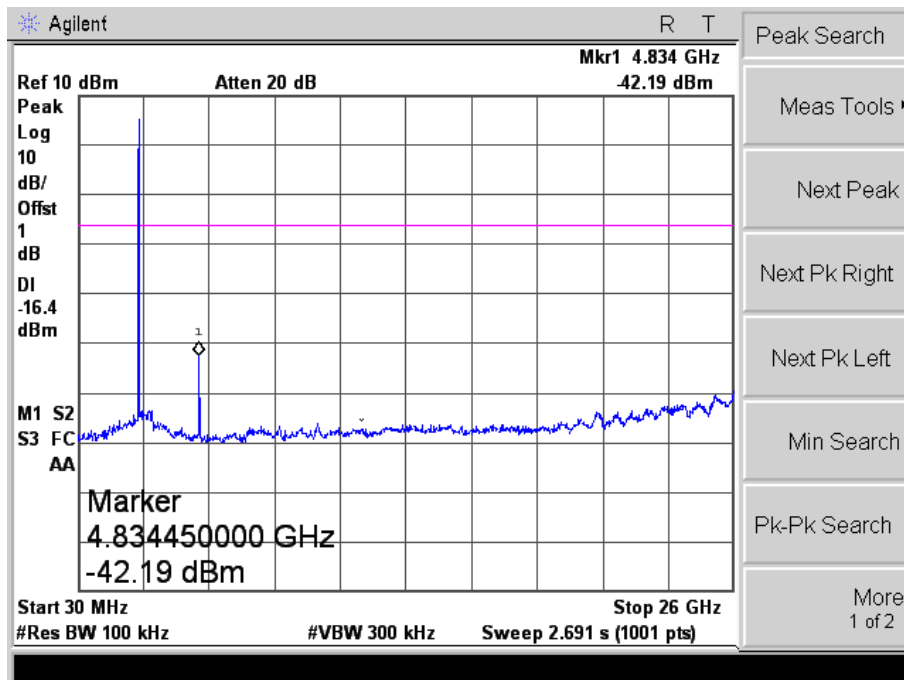
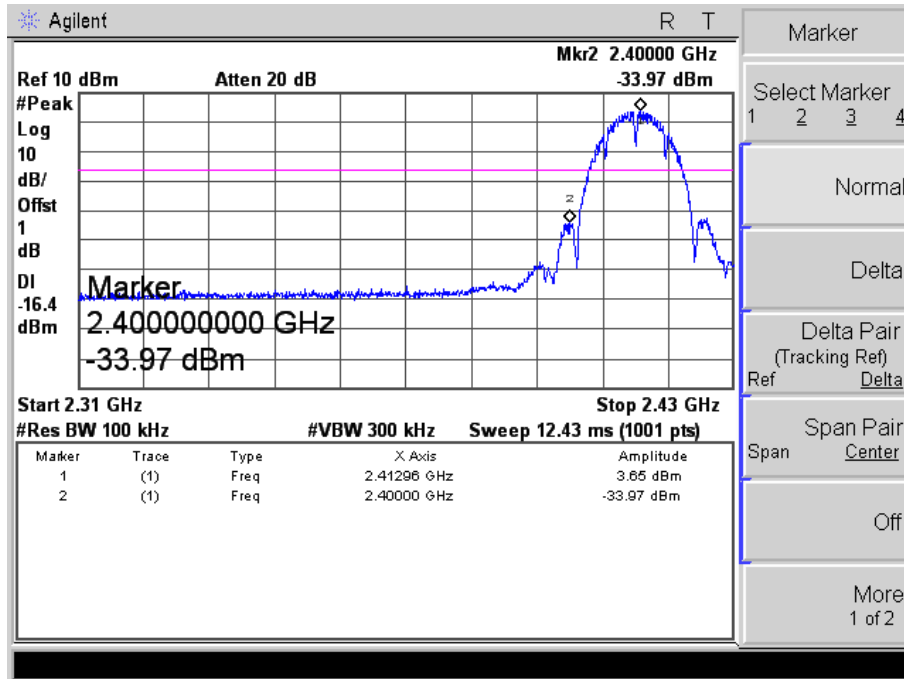
Middle Channel



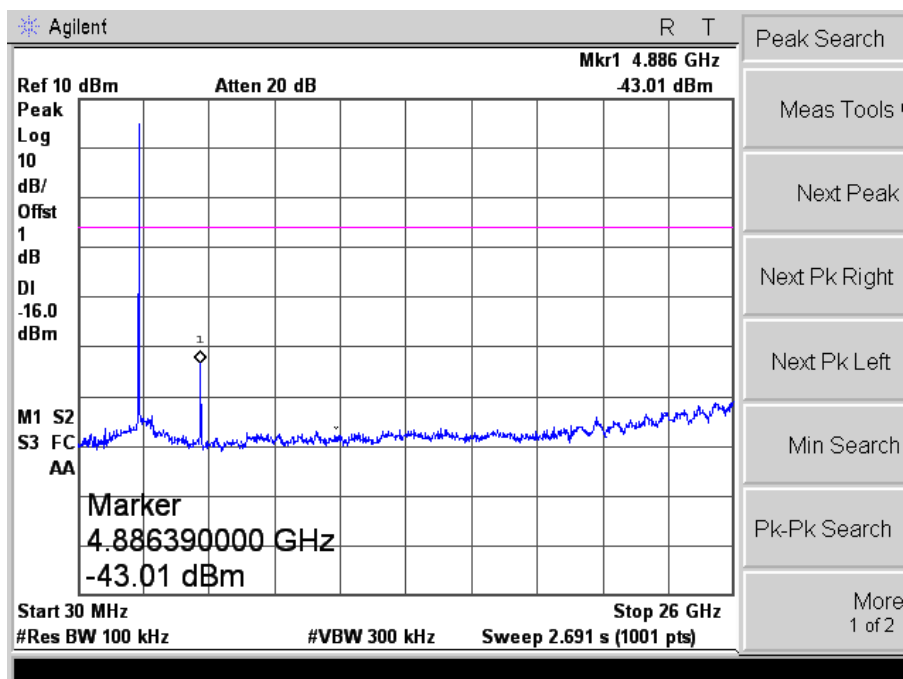
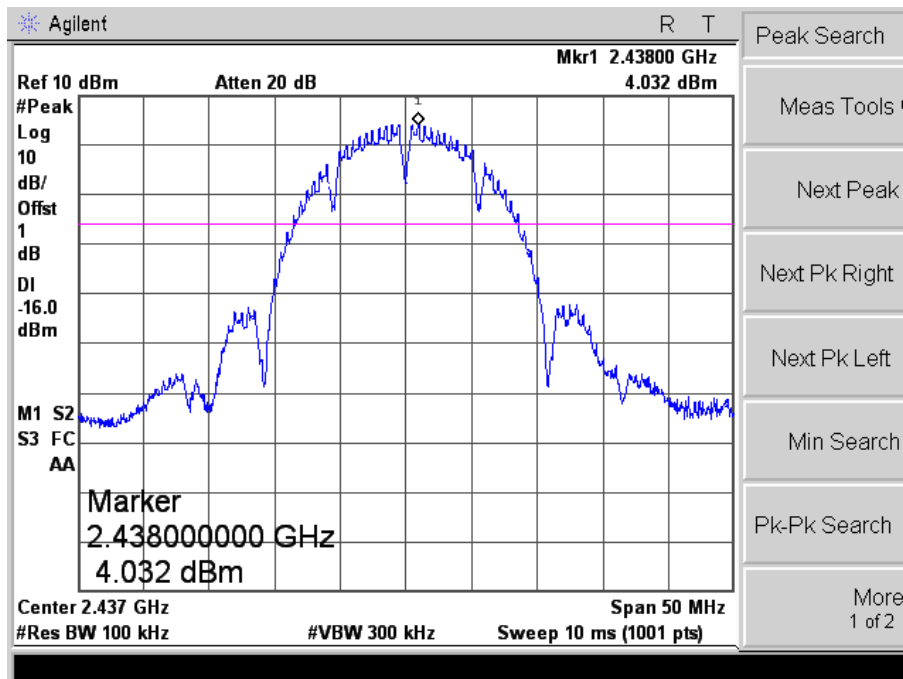
High Channel



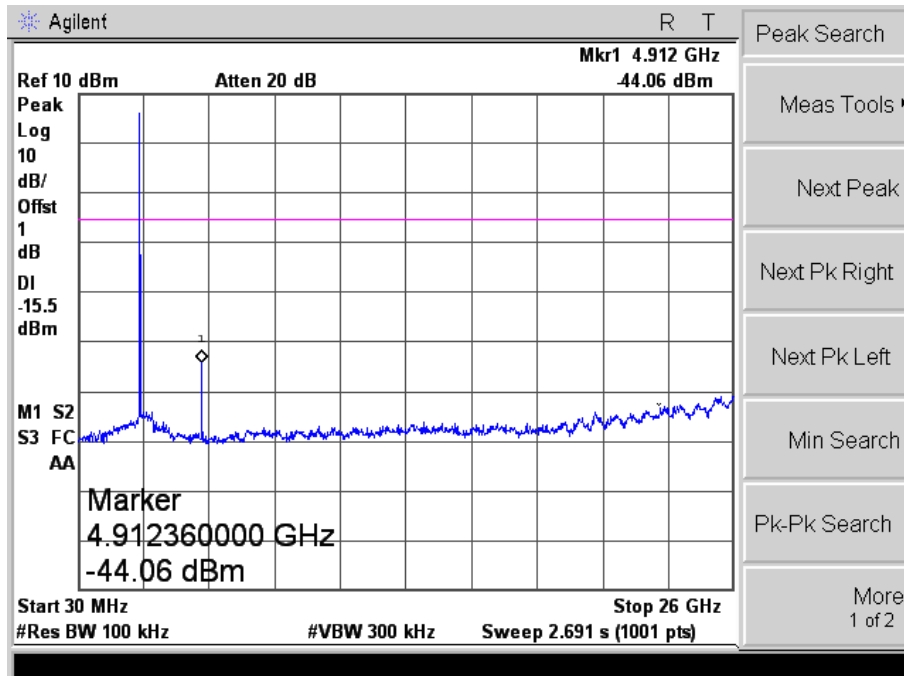
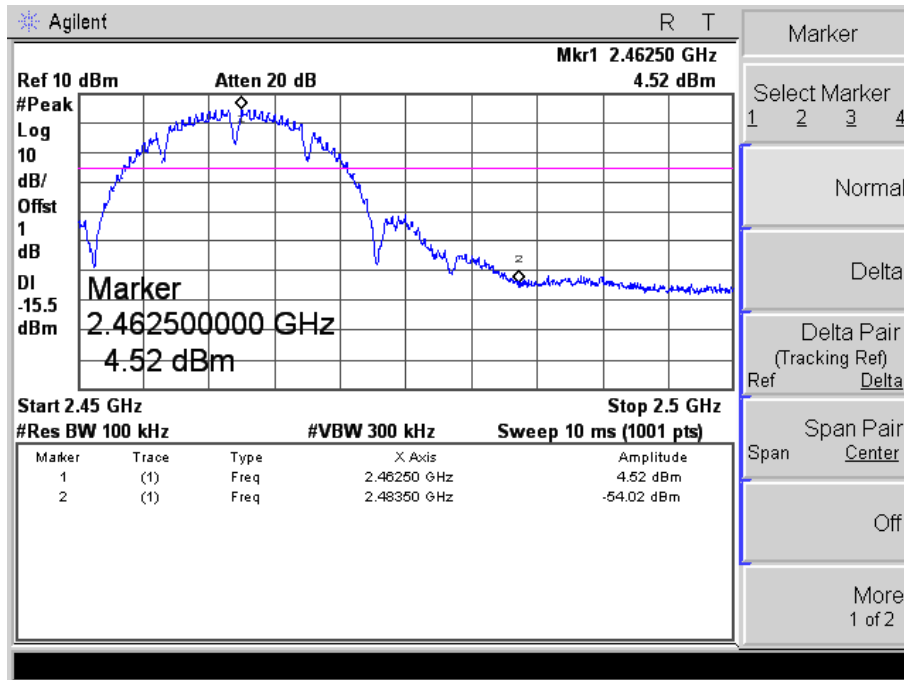
Chain 2
 802.11b_11Mbps
 Low Channel



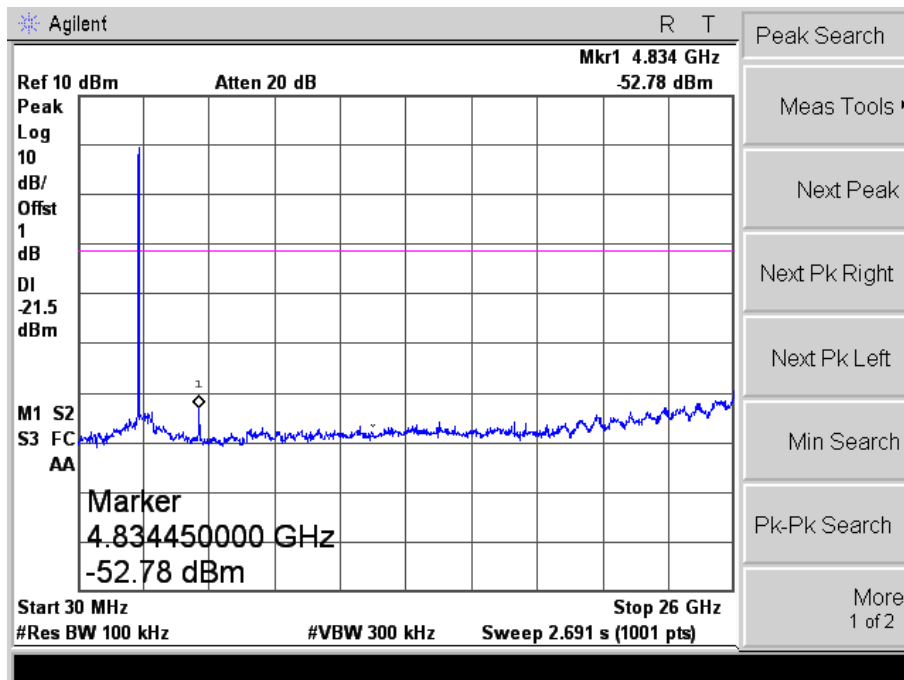
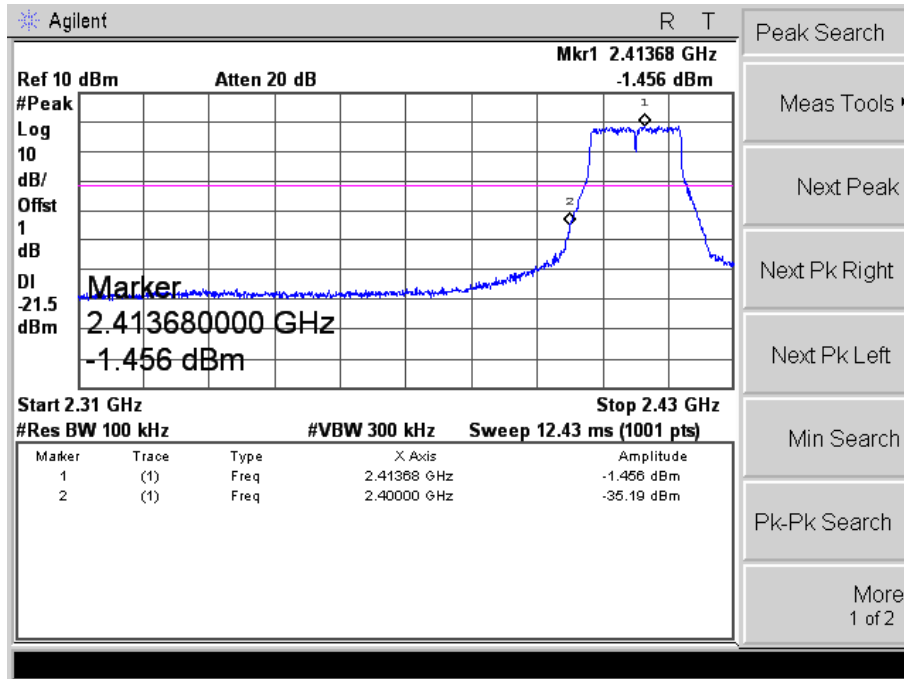
Middle Channel



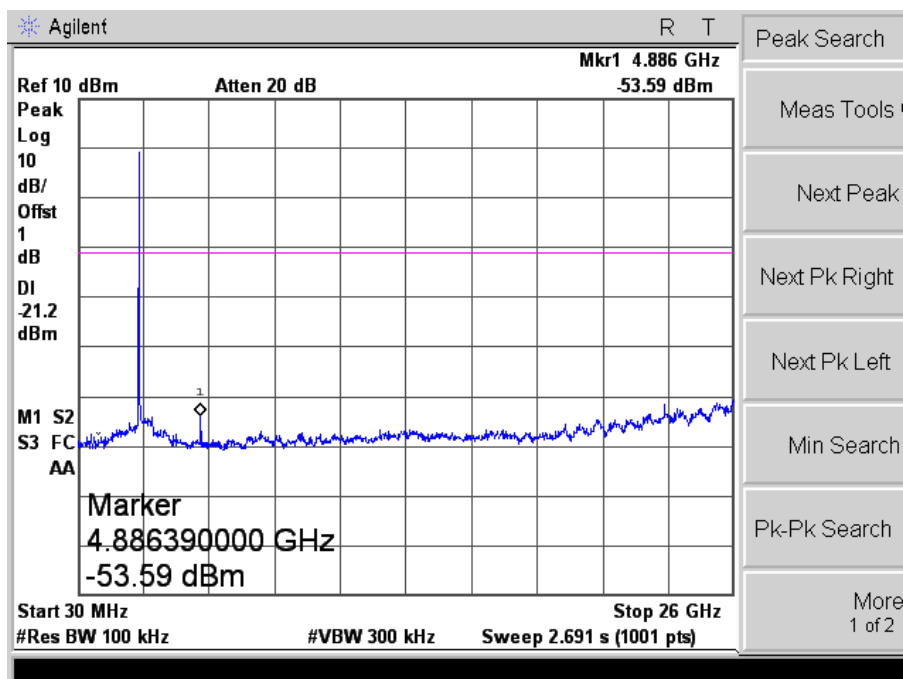
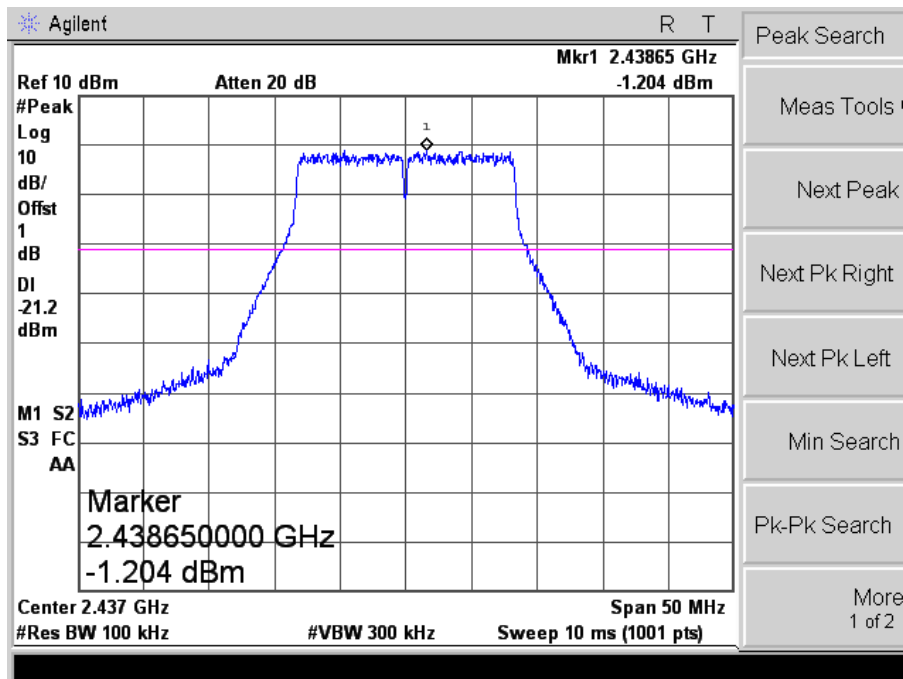
High Channel



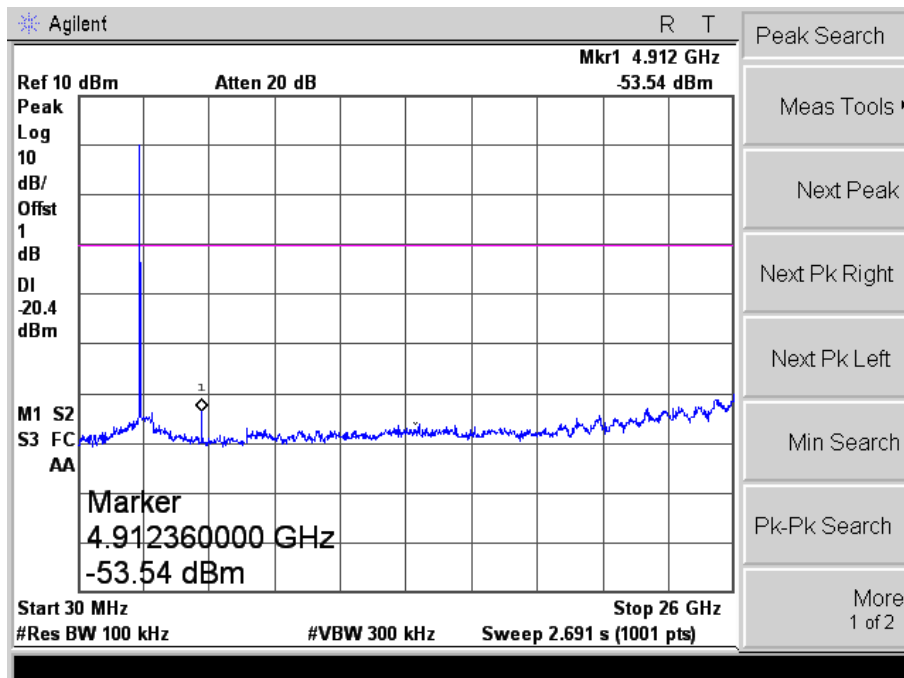
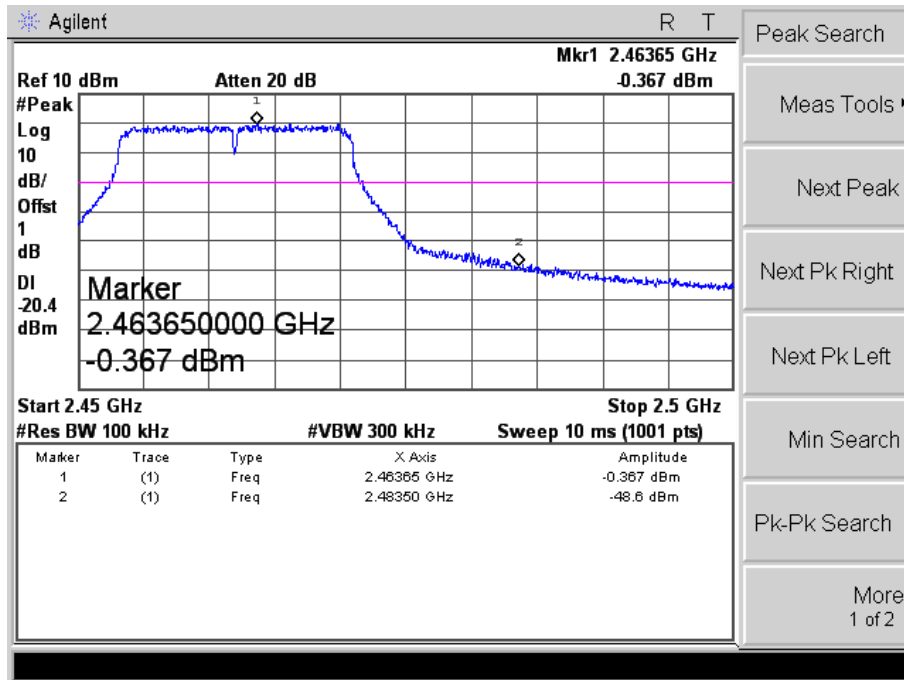
802.11g_54Mbps
Low Channel



Middle Channel

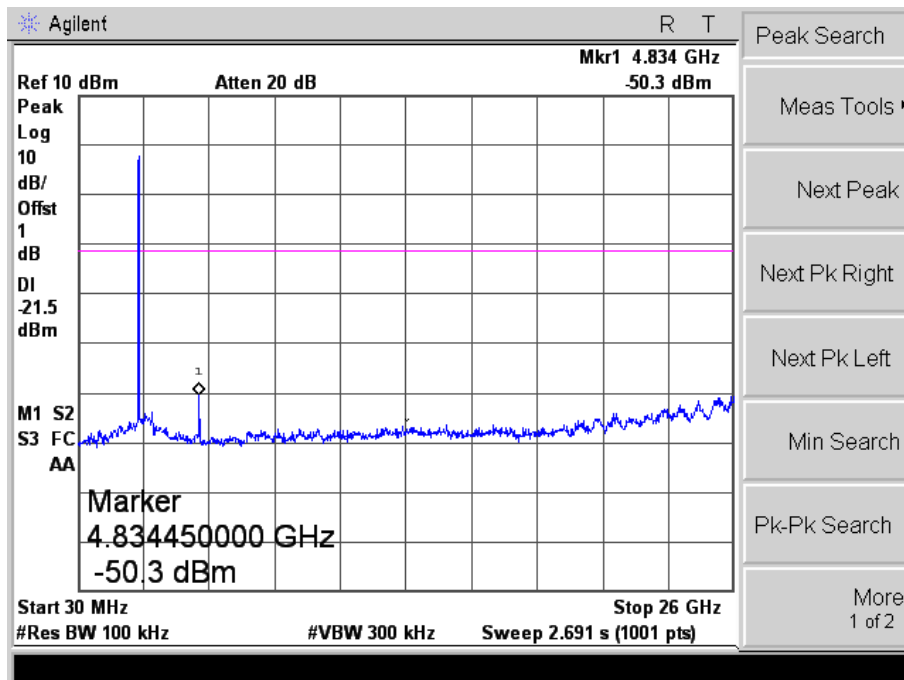
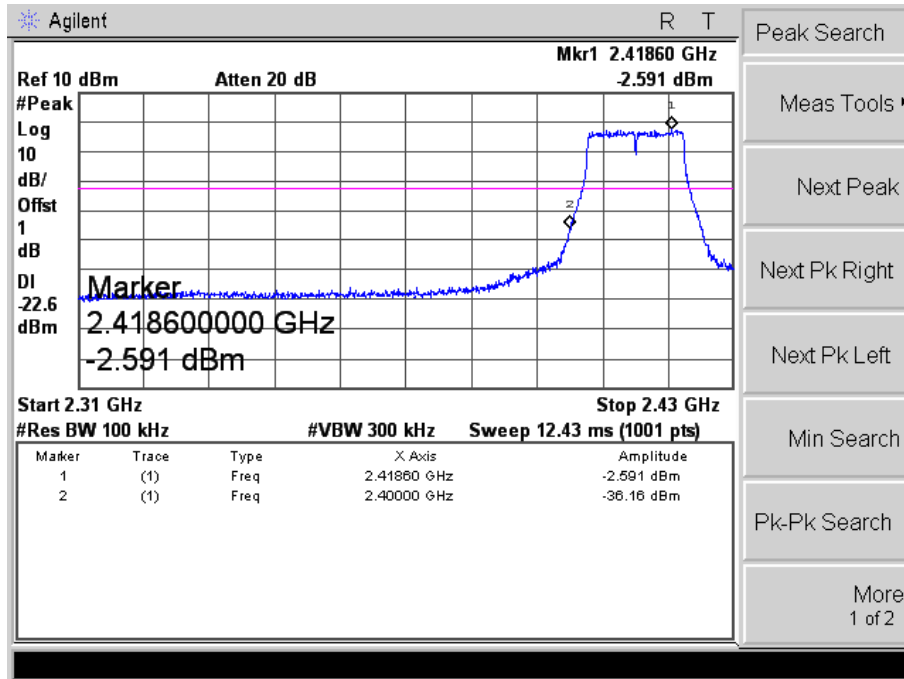


High Channel

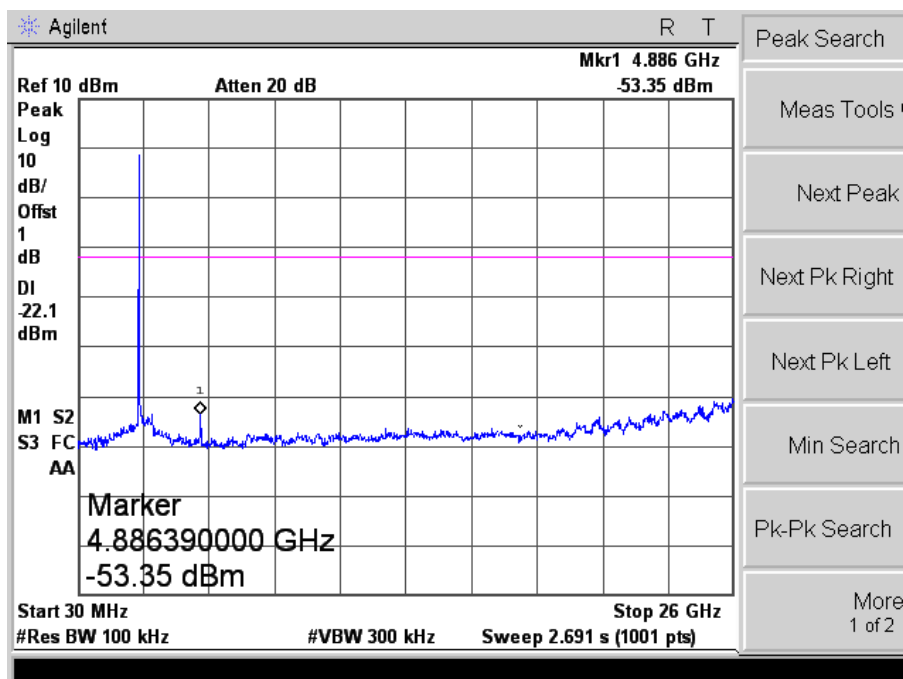
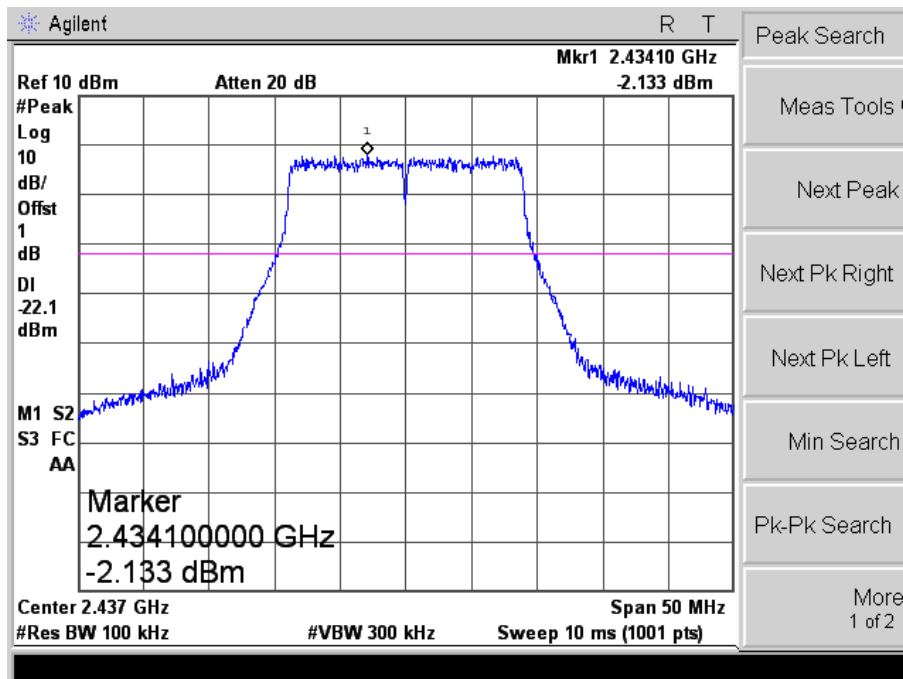


802.11n-HT20_MCS0

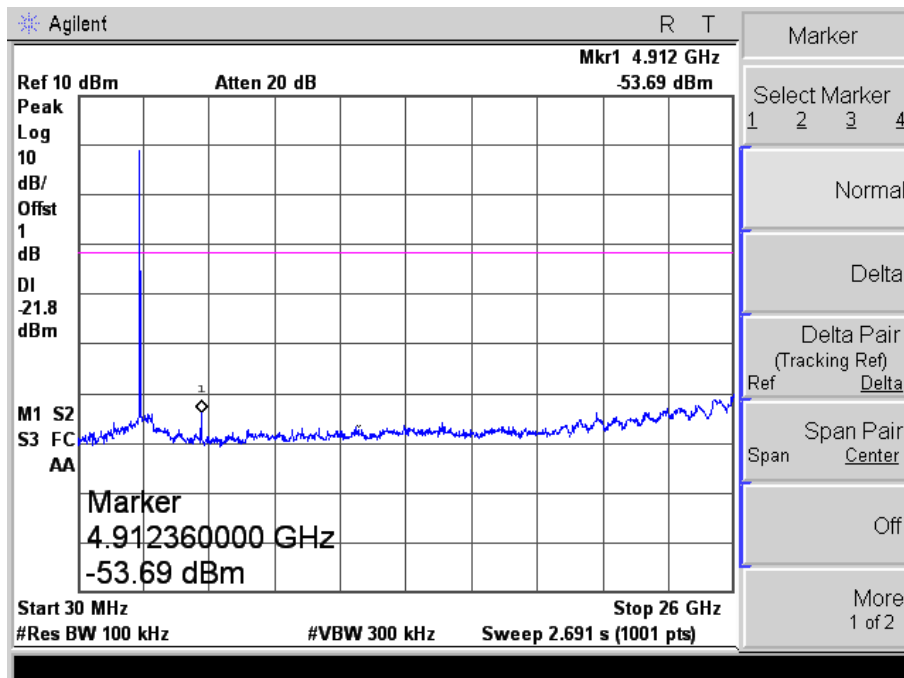
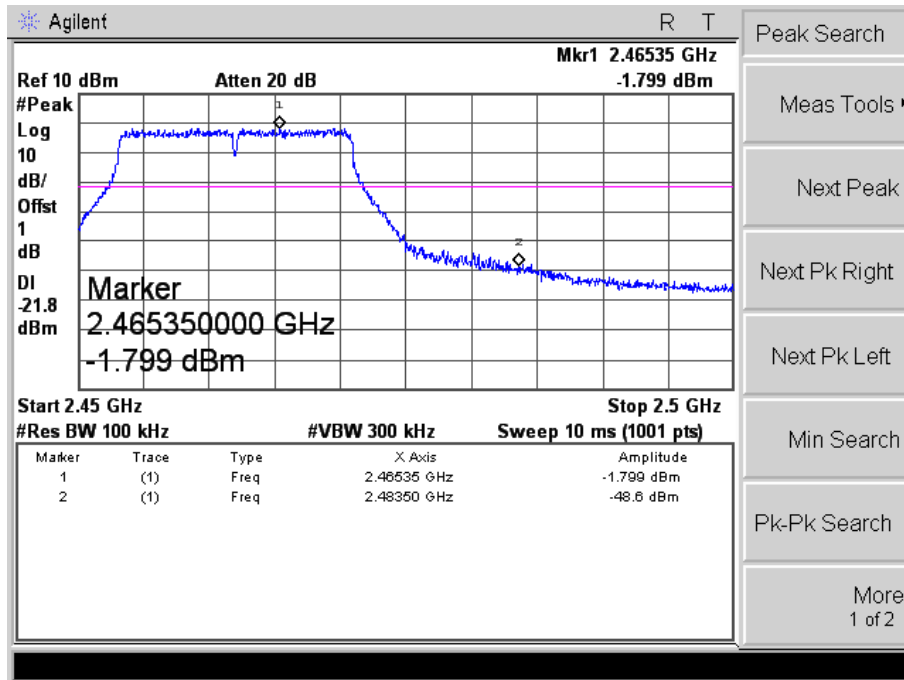
Low Channel



Middle Channel

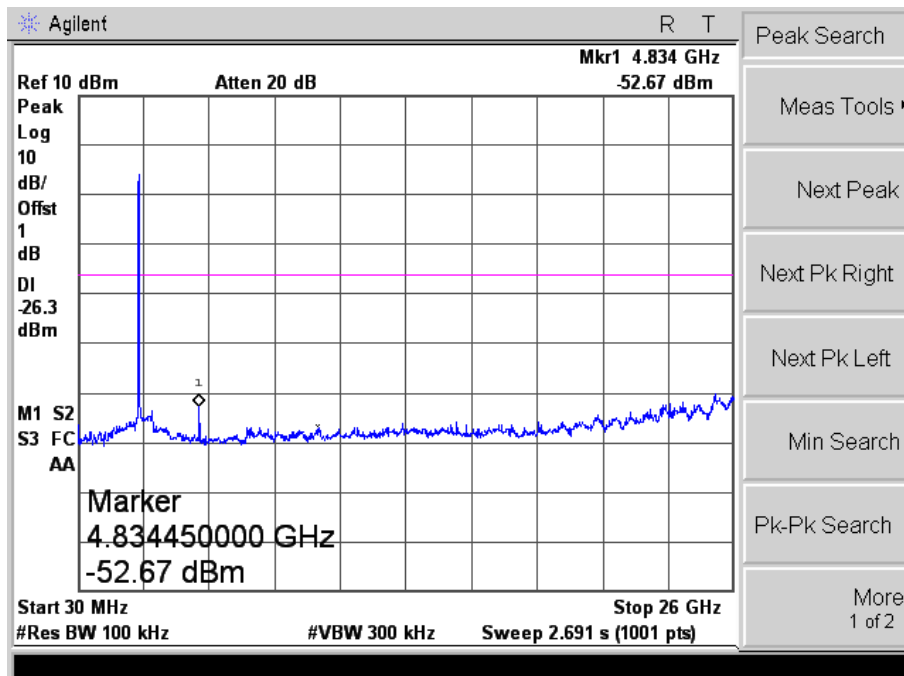
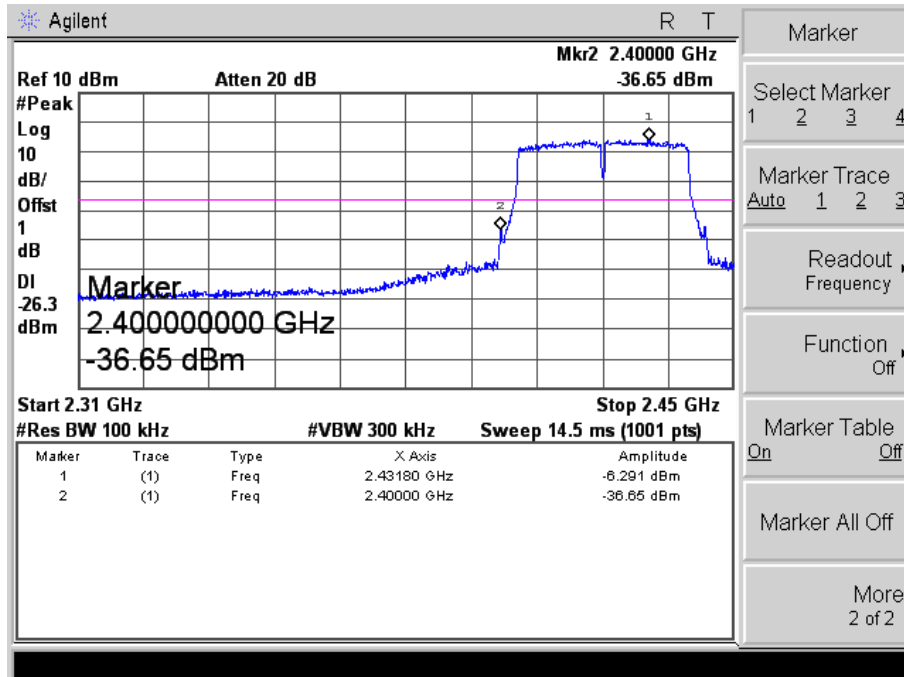


High Channel

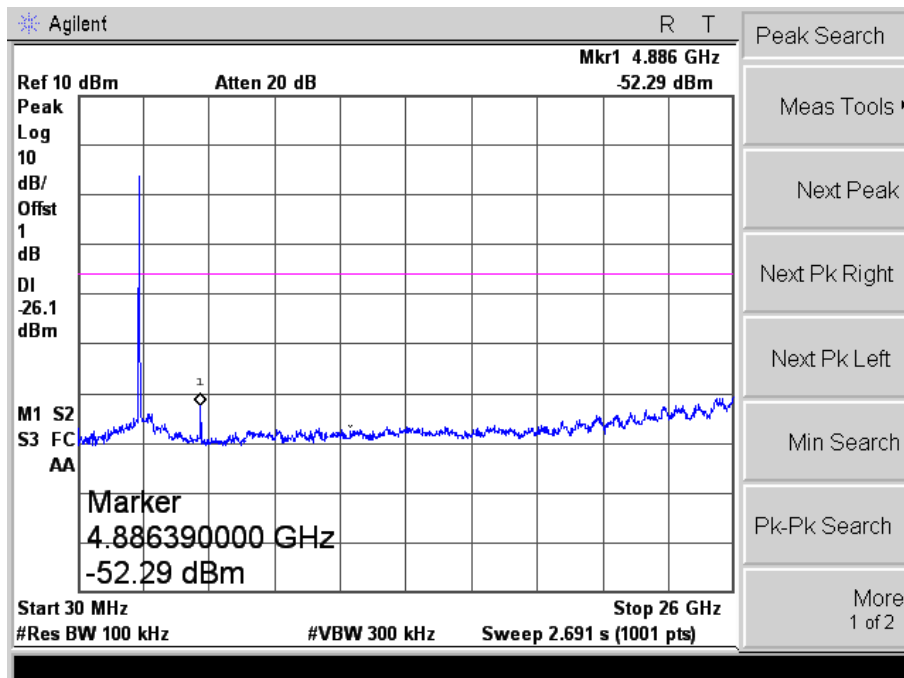
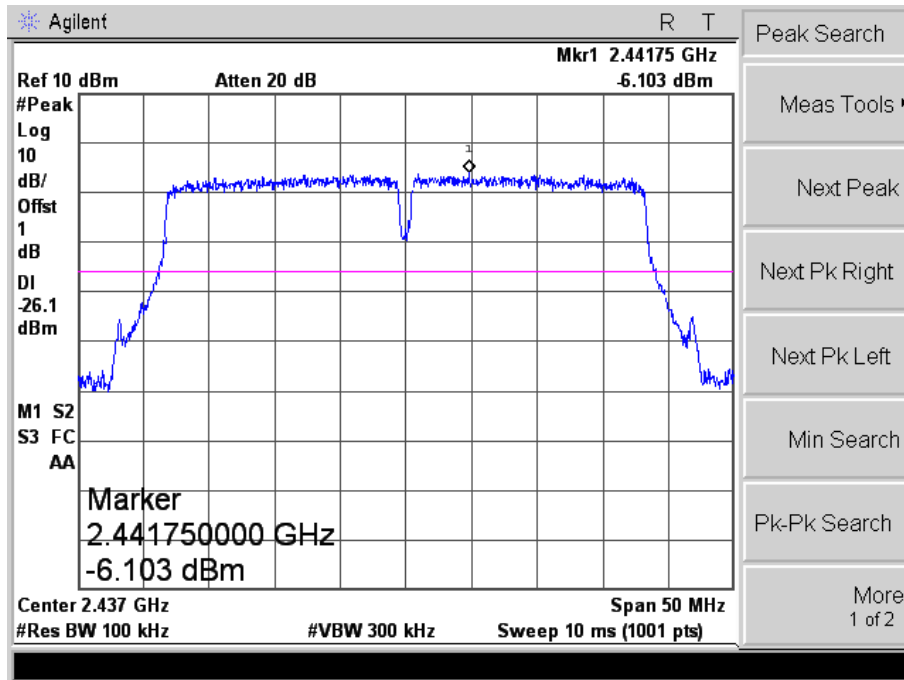


802.11n-HT40_MCS7

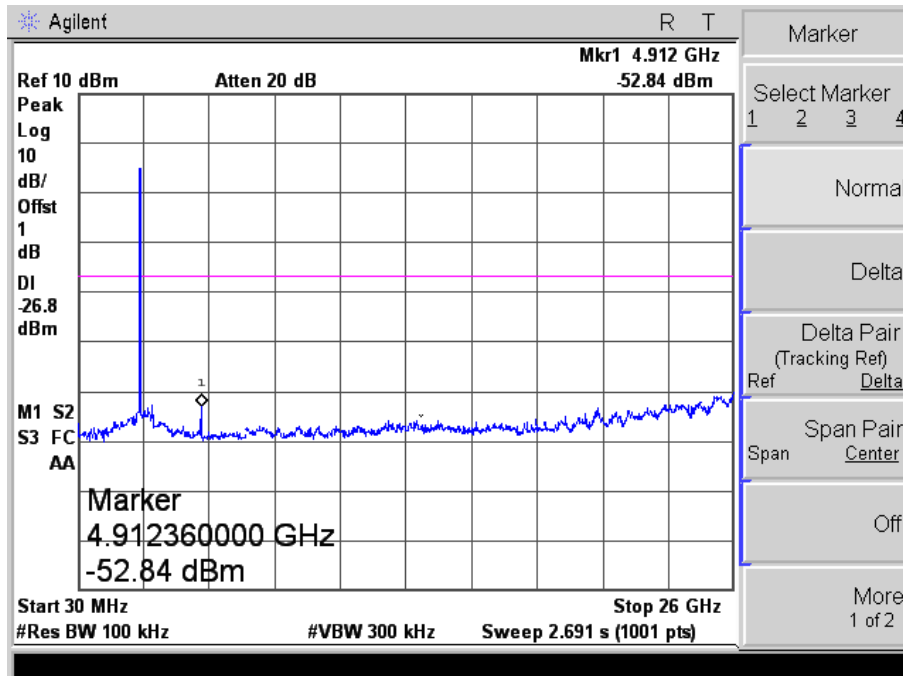
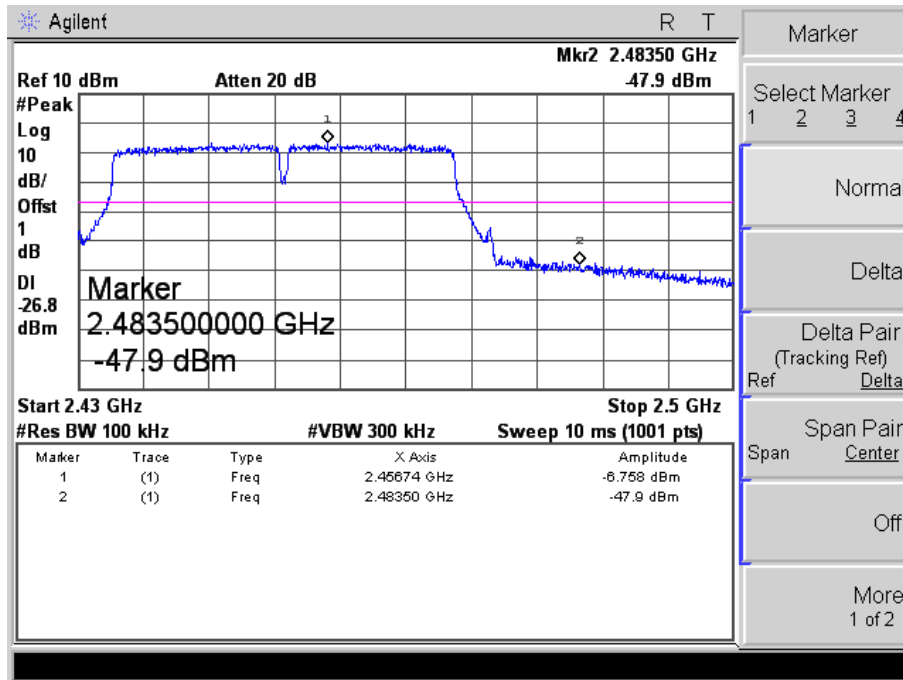
Low Channel



Middle Channel



High Channel



10. Conducted Emissions

10.1 Measurement Uncertainty

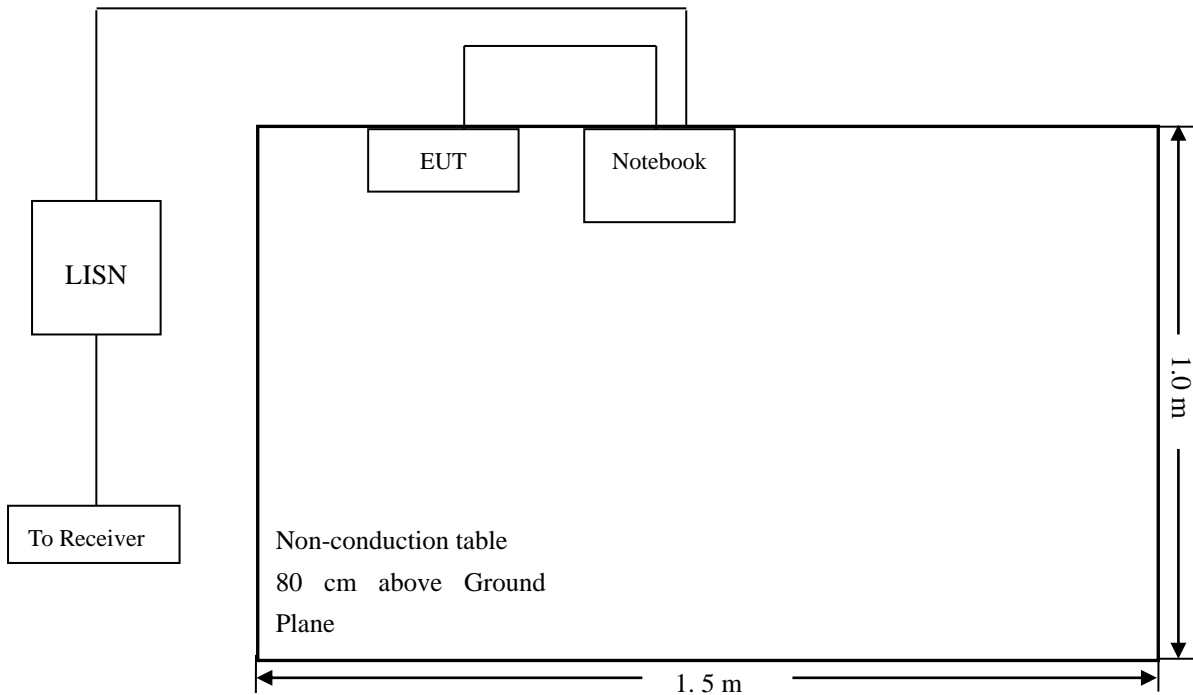
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

10.2 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.

10.3 Basic Test Setup Block Diagram



10.4 Environmental Conditions

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

10.5 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

10.6 Summary of Test Results/Plots

According to the data in section 10.7, the EUT complied with the FCC Part 15.207 Conducted margin for this device, with the *worst* margin reading of:

-3.40 dB at 0.5100MHz in the Neutral mode, AVG detector, 0.15-30MHz

10.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

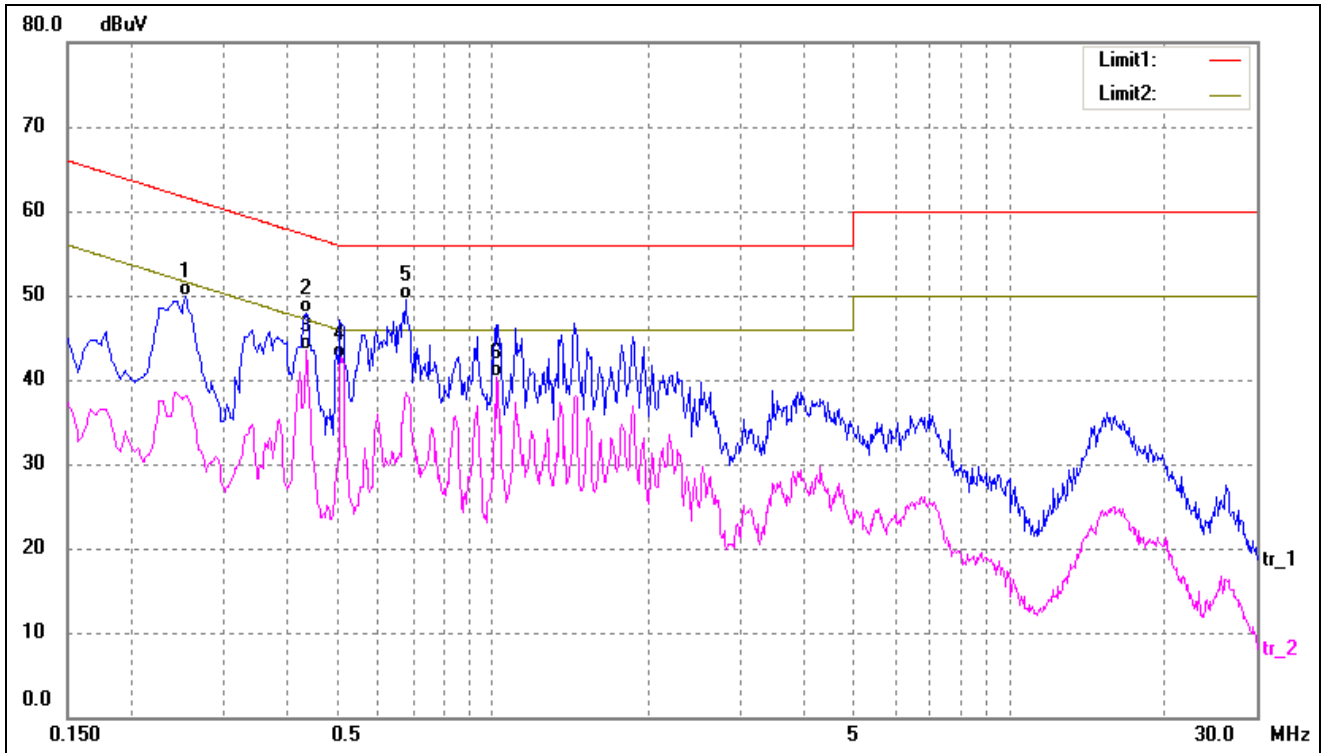
EUT: LM809 WiFi USB Adapter(300Mbps)

Tested Model: LM809-0647

Operating Condition: Transmitting

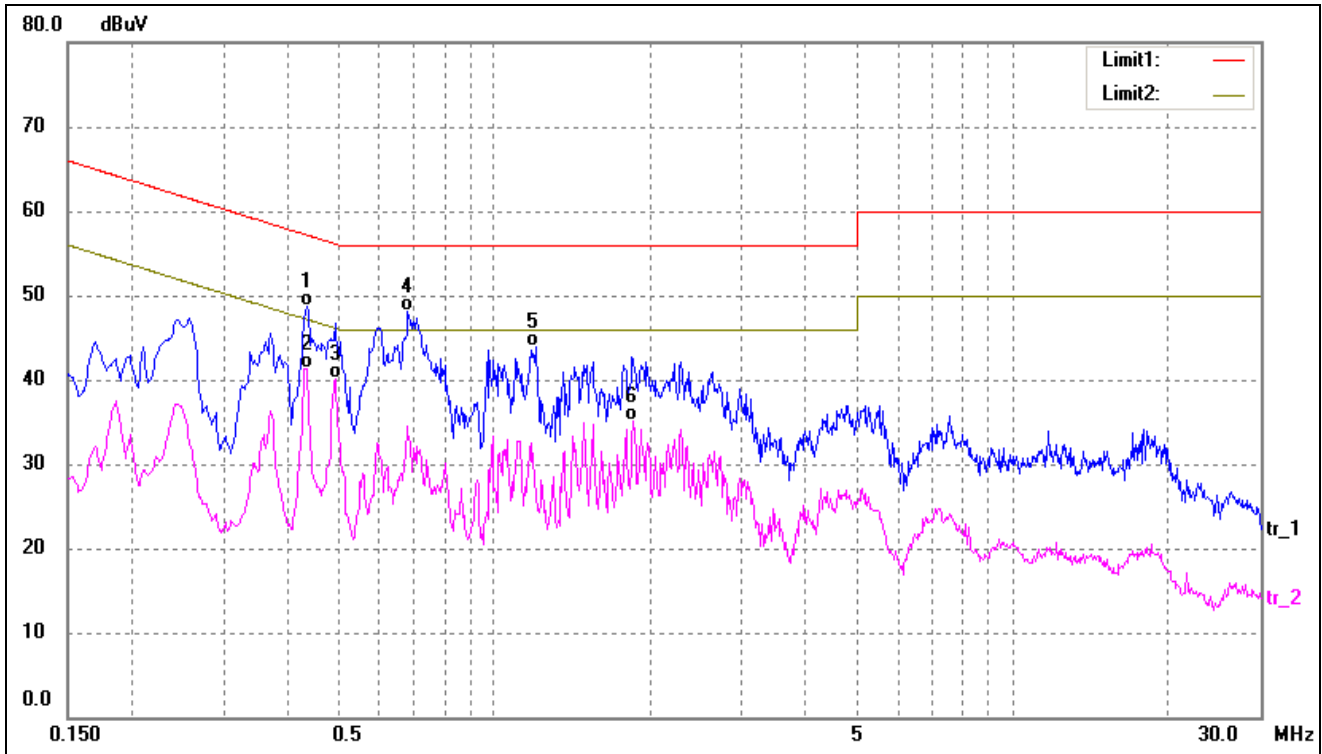
Comment: AC 120V/60Hz

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2540	40.15	9.80	49.95	61.63	-11.68	QP
2	0.4340	38.13	9.80	47.93	57.18	-9.25	QP
3	0.4340	33.71	9.80	43.51	47.18	-3.67	AVG
4*	0.5100	32.80	9.80	42.60	46.00	-3.40	AVG
5	0.6780	39.79	9.79	49.58	56.00	-6.42	QP
6	1.0180	30.59	9.76	40.35	46.00	-5.65	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4340	38.93	9.80	48.73	57.18	-8.45	QP
2*	0.4340	31.58	9.80	41.38	47.18	-5.80	AVG
3	0.4940	30.29	9.80	40.09	46.10	-6.01	AVG
4	0.6820	38.31	9.79	48.10	56.00	-7.90	QP
5	1.1980	34.19	9.76	43.95	56.00	-12.05	QP
6	1.8580	25.29	9.74	35.03	46.00	-10.97	AVG

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