

FCC Part 15C Measurement and Test Report

For

Mine Site Technologies Pty Ltd

NORTH RYDE BC, NSW, Australia

FCC ID: N73-AP60-AIR

FCC Rule(s):	<u>FCC Part 15C</u>
Product Description:	<u>AXON AIR</u>
Tested Model:	<u>A-AP60-000</u>
Report No.:	<u>WTG19G02007359W-1</u>
Sample Receipt Date:	<u>2019-02-14</u>
Tested Date:	<u>2019-02-15 to 2019-04-03</u>
Issued Date:	<u>2019-04-03</u>
Tested By:	<u>Jason Su/ Engineer</u>
Reviewed By:	<u>Silin Chen / EMC Manager</u>
Approved & Authorized By:	<u>Jandy So / PSQ Manager</u>
Prepared By:	

Jason Su
Silin Chen
Jandy So

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.....	4
1.3 TEST METHODOLOGY.....	4
1.4 TEST FACILITY.....	4
1.5 EUT SETUP AND TEST MODE.....	5
1.6 MEASUREMENT UNCERTAINTY.....	6
1.7 TEST EQUIPMENT LIST AND DETAILS.....	7
2. SUMMARY OF TEST RESULTS.....	8
3. RF EXPOSURE.....	9
3.1 STANDARD APPLICABLE.....	9
3.2 TEST RESULT.....	9
4. ANTENNA REQUIREMENT.....	10
5. POWER SPECTRAL DENSITY.....	11
5.1 STANDARD APPLICABLE.....	11
5.2 TEST PROCEDURE.....	11
5.4 SUMMARY OF TEST RESULTS/PLOTS.....	11
6. 6DB BANDWIDTH.....	21
6.1 STANDARD APPLICABLE.....	21
6.2 TEST PROCEDURE.....	21
6.3 ENVIRONMENTAL CONDITIONS.....	21
6.4 SUMMARY OF TEST RESULTS/PLOTS.....	21
7. RF OUTPUT POWER.....	31
7.1 STANDARD APPLICABLE.....	31
7.2 TEST PROCEDURE.....	31
7.3 SUMMARY OF TEST RESULTS/PLOTS.....	31
8. FIELD STRENGTH OF SPURIOUS EMISSIONS.....	41
8.1 STANDARD APPLICABLE.....	41
8.2 TEST PROCEDURE.....	41
8.3 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	42
8.5 SUMMARY OF TEST RESULTS/PLOTS.....	42
9. OUT OF BAND EMISSIONS.....	56
9.1 STANDARD APPLICABLE.....	56
9.2 TEST PROCEDURE.....	56
9.3 SUMMARY OF TEST RESULTS/PLOTS.....	57
10. CONDUCTED EMISSIONS.....	105
10.1 TEST PROCEDURE.....	105
10.2 BASIC TEST SETUP BLOCK DIAGRAM.....	105
10.3 TEST RECEIVER SETUP.....	105
10.4 SUMMARY OF TEST RESULTS/PLOTS.....	105

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Mine Site Technologies Pty Ltd
Address of applicant: NORTH RYDE BC, NSW, Australia

Manufacturer: Mine Site Technologies China Co. Ltd
Address of manufacturer: 4F Building-1 1413 Moganshan Road, Hangzhou, CHINA

General Description of EUT	
Product Name:	AXON AIR
Trade Name:	MINE SITE TECHNOLOGIES
Model No.:	A-AP60-000
Adding Model(s):	N/A
Rated Voltage:	Input: Power by POE+, DC 42.5-57V 6W
Battery:	N/A
Power Adapter Model:	N/A
Software Version:	4.0.0
Hardware Version:	C
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:	Antenna 0: 17.00dBm (Conducted) Antenna 1: 16.81dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	11 for 802.11b/g/n-HT20 7 for 802.11n-HT40
Channel Separation:	5MHz
Type of Antenna:	Omni Antenna
Antenna Gain:	Antenna 0: 2dBi Antenna 1: 2dBi
	802.11n (HT20/40) MIMO
Lowest Internal Frequency of EUT:	25MHz

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

558074 D01 DTS Meas Guidance v04: GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER SECTION 15.247

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

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, KDB 558074 D01 DTS Meas Guidance v04

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

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	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM2	802.11g	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM3	802.11n-HT20	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM4	802.11n-HT40	Low:2422MHz, Middle:2437MHz,High:2452MHz
Note: All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report.		

Test Conditions	
Temperature:	22~25 °C
Relative humidity	50~55 %.
ATM Pressure:	1019 mbar

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

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number

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	2018-05-22	2019-05-21
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2018-05-22	2019-05-21
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2018-05-22	2019-05-21
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2018-05-22	2019-05-21
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2018-05-22	2019-05-21
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	2018-05-22	2019-05-21
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2018-05-22	2019-05-21
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2018-05-22	2019-05-21
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2018-05-22	2019-05-21
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2018-05-22	2019-05-21
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2018-05-22	2019-05-21
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2018-05-22	2021-03-18
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2018-05-22	2019-05-21
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2018-05-22	2019-05-21
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2018-05-22	2019-05-21
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2018-05-22	2019-05-21
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2018-05-22	2019-05-21
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2018-05-22	2019-05-21
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2018-05-22	2019-05-21
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2018-05-22	2019-05-21
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2018-05-22	2019-05-21

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 § 2.1093, 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 RF Exposure Report.

4. Antenna Requirement

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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

EUT Antenna: The Wi-Fi antenna is a fixed external antenna which is fitted and installed by a professional installer. The best-case gain of the antenna is 2dBi.

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 $\geq 2 \times \text{span/RBW}$.
- 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).

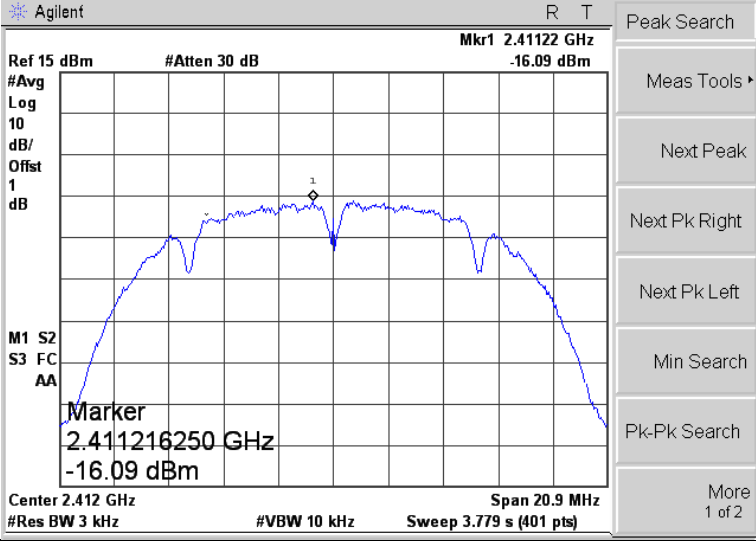
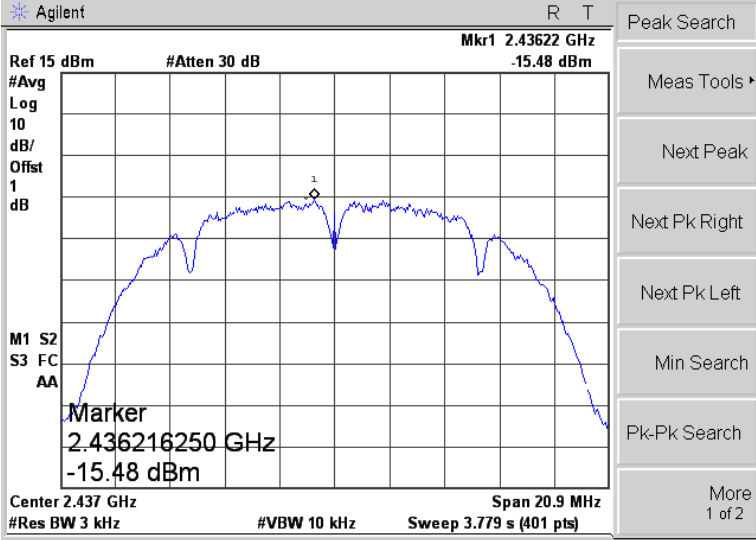
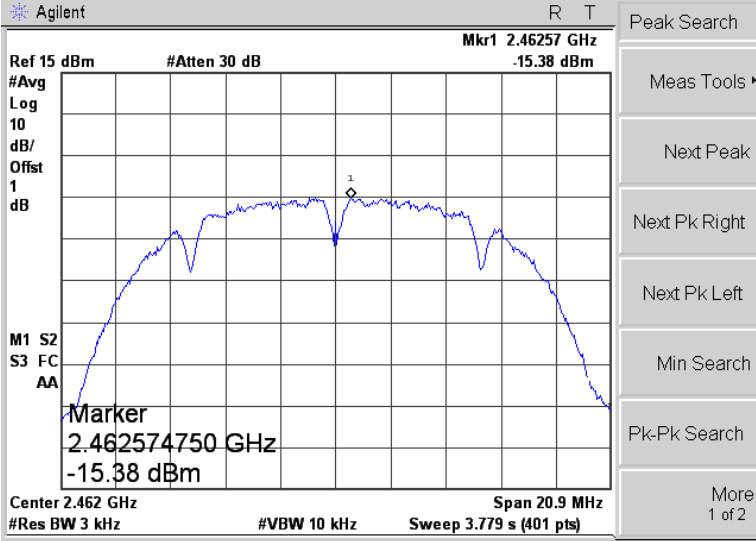
5.4 Summary of Test Results/Plots

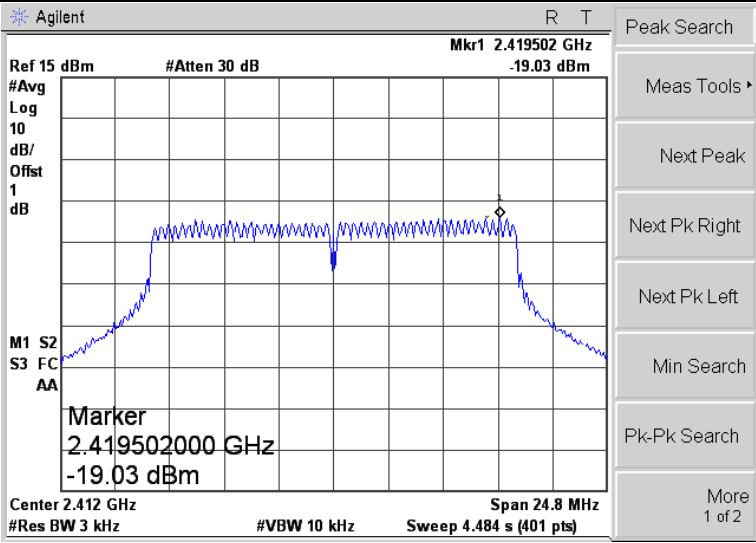
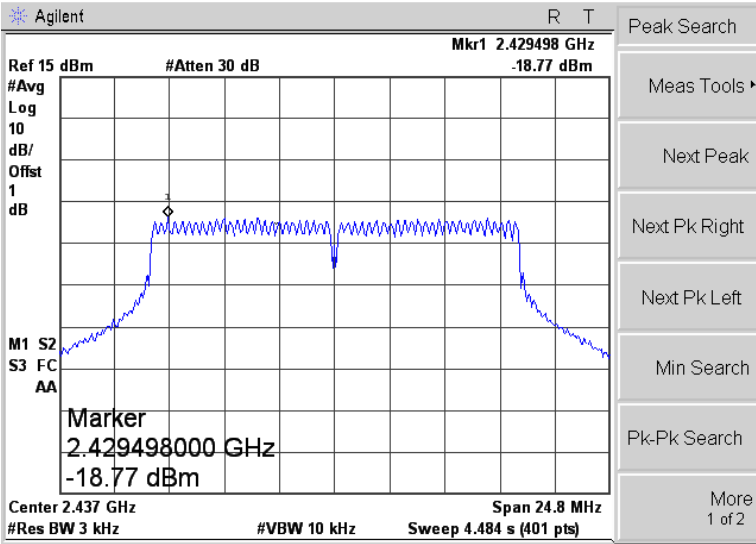
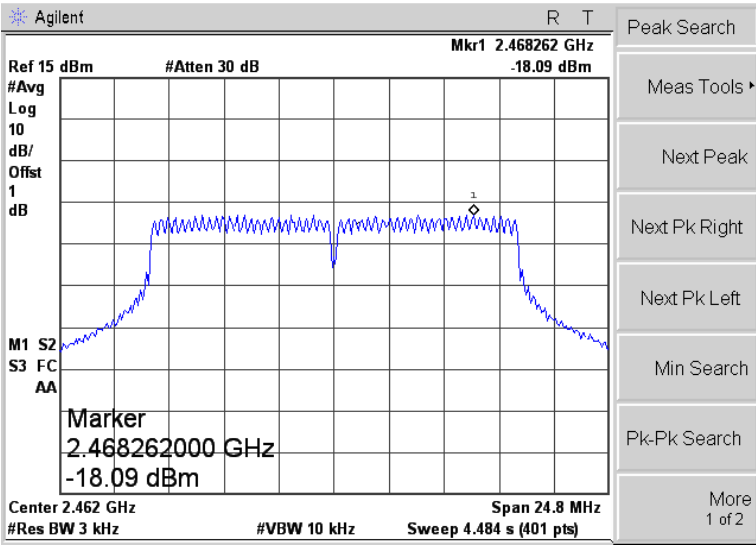
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz			Limit dBm/3kHz
		Chain 0	Chain 1	Total	
802.11b	2412	-16.09	-15.82	/	8
	2437	-15.48	-16.25	/	8
	2462	-15.38	-15.72	/	8
802.11g	2412	-19.03	-18.91	/	8
	2437	-18.77	-18.90	/	8
	2462	-18.09	-19.06	/	8
802.11n HT20	2412	-19.49	-20.40	-16.91	8
	2437	-19.16	-19.72	-16.42	8
	2462	-17.96	-19.79	-15.77	8
802.11n HT40	2422	-23.84	-24.00	-20.91	8
	2437	-23.57	-24.06	-20.80	8
	2452	-23.23	-23.55	-20.38	8

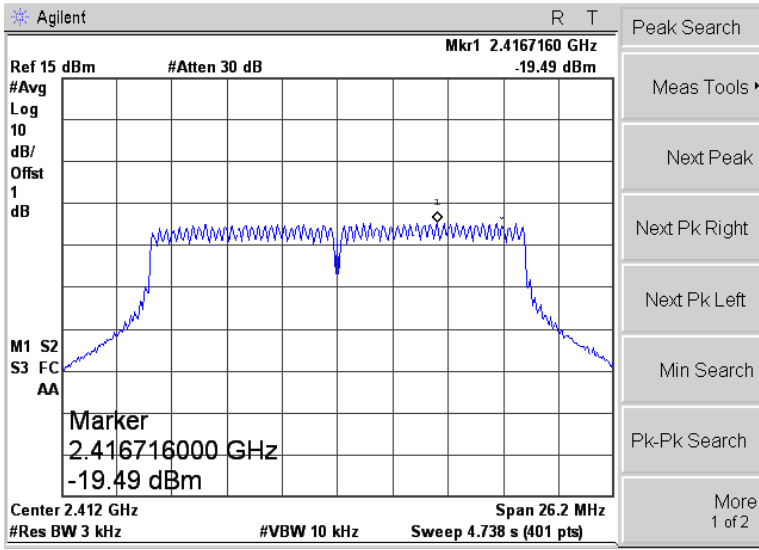
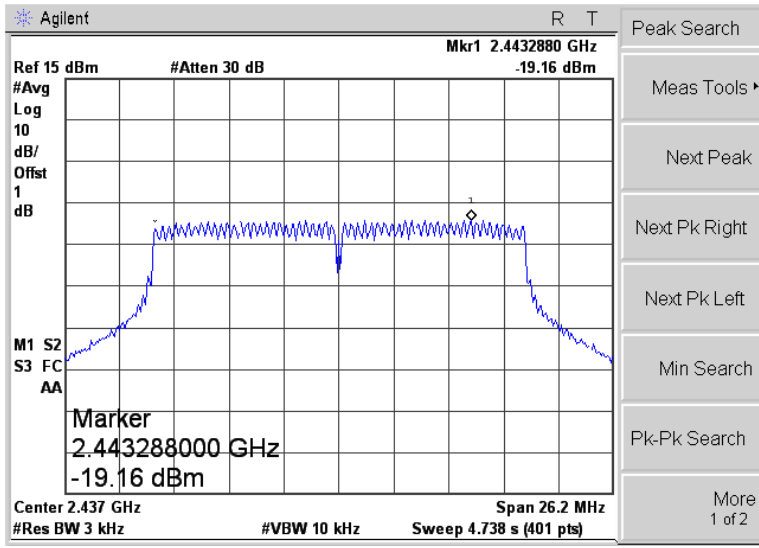
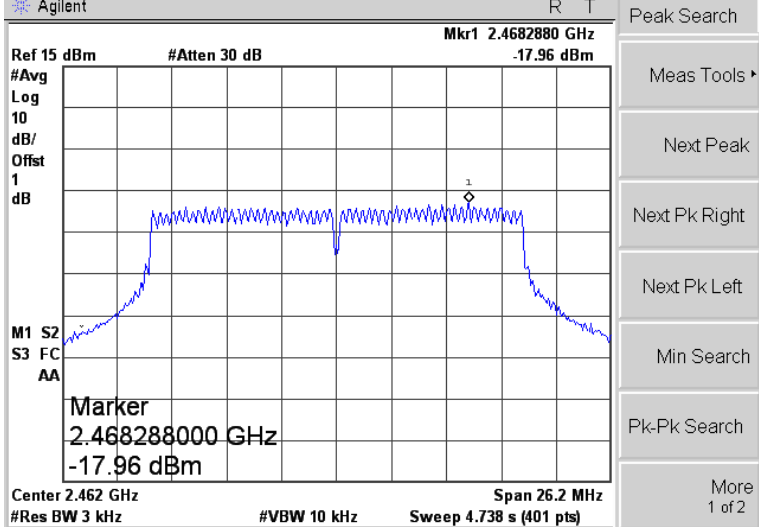
Please refer to the following test plots:

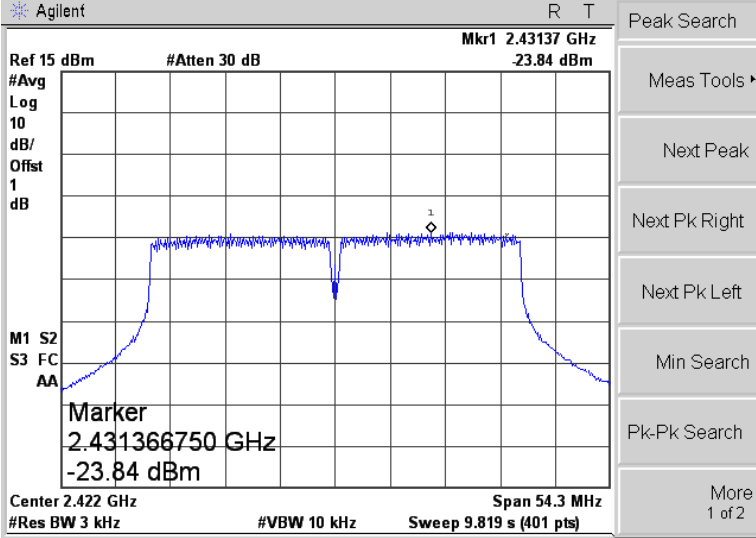
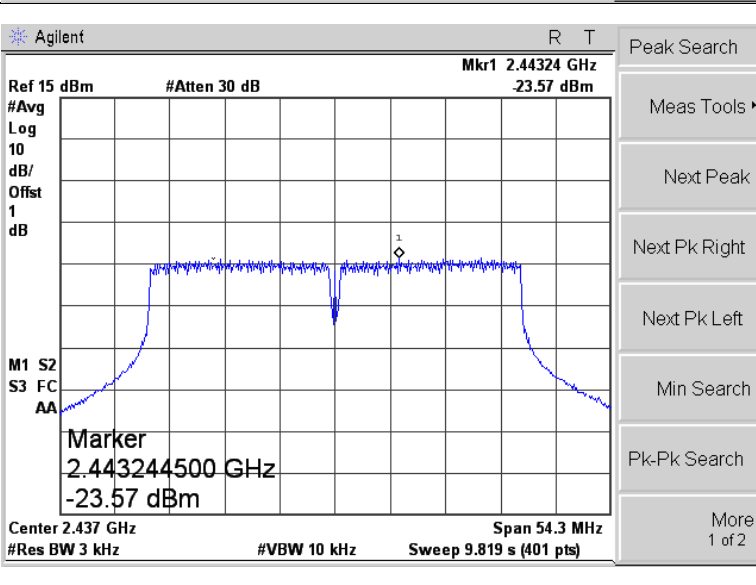
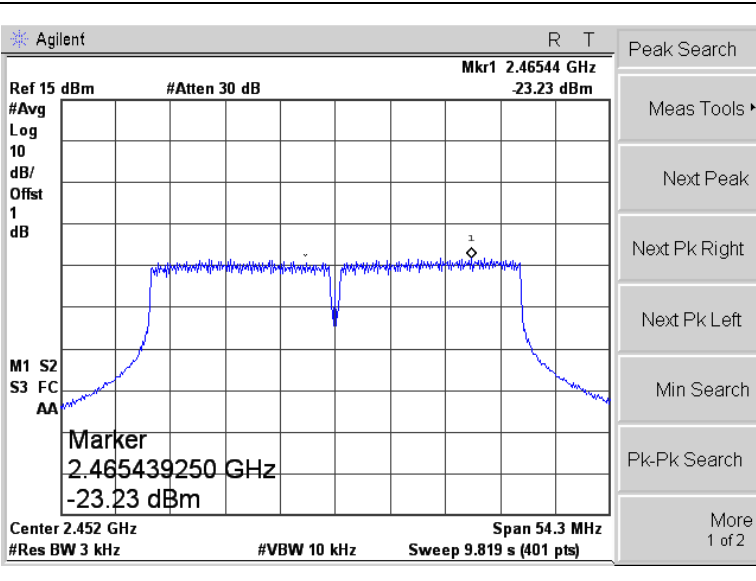
Antenna 0

Please refer to the following test plots:

802.11b-Low	
802.11b-Middle	
802.11b-High	

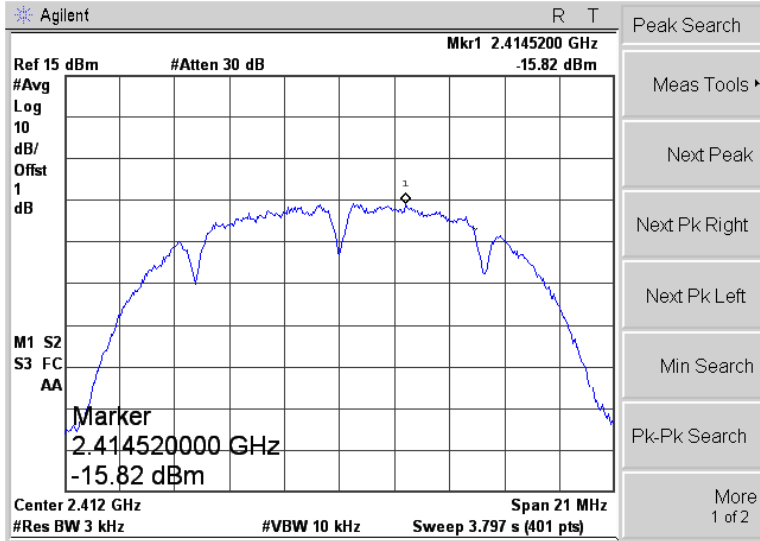
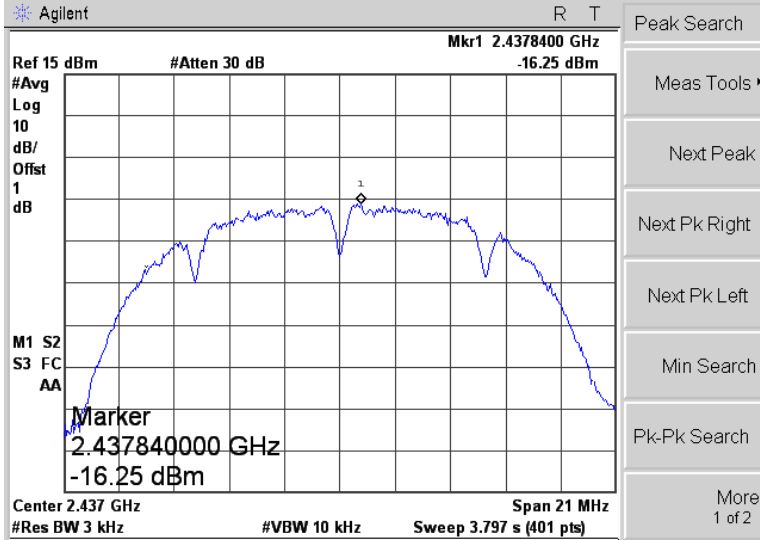
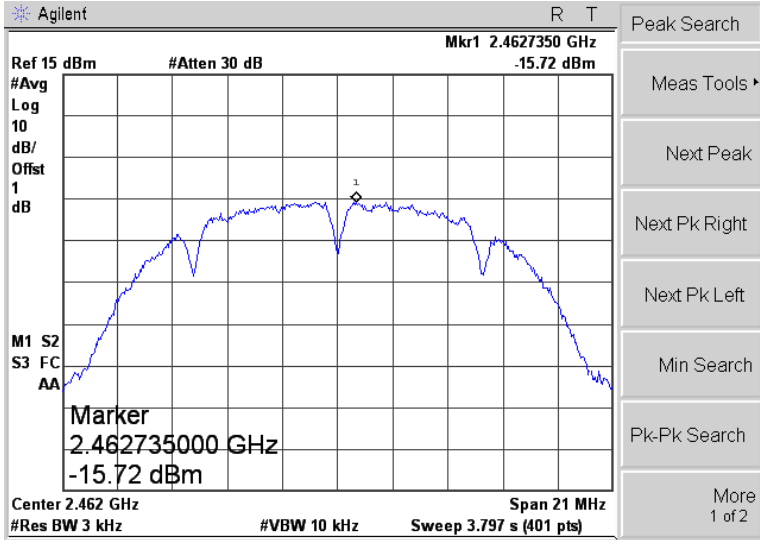
802.11g-Low	
802.11g-Middle	
802.11g-High	

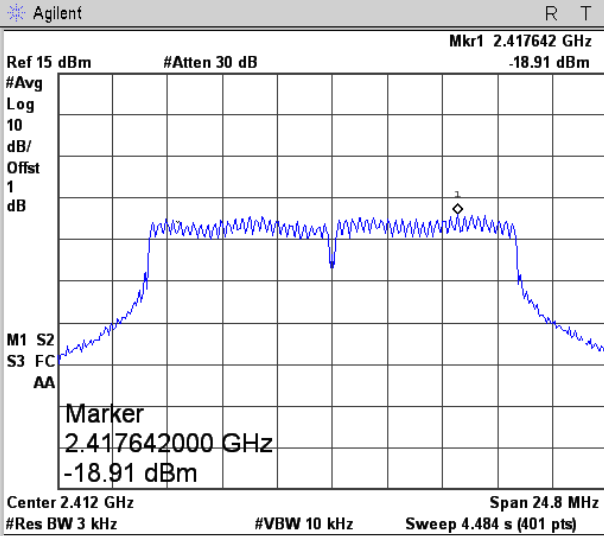
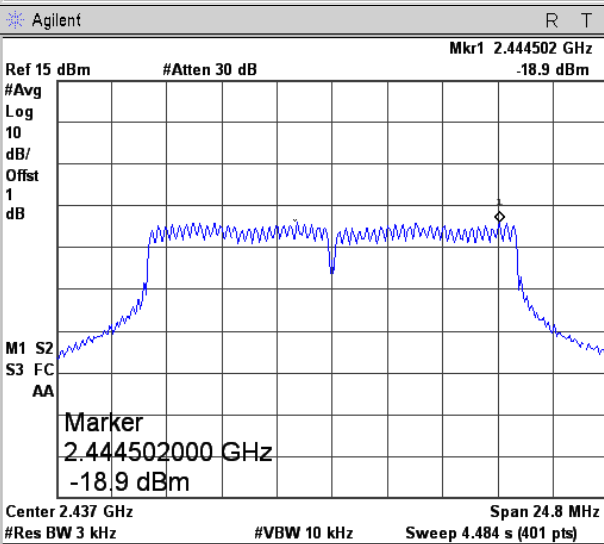
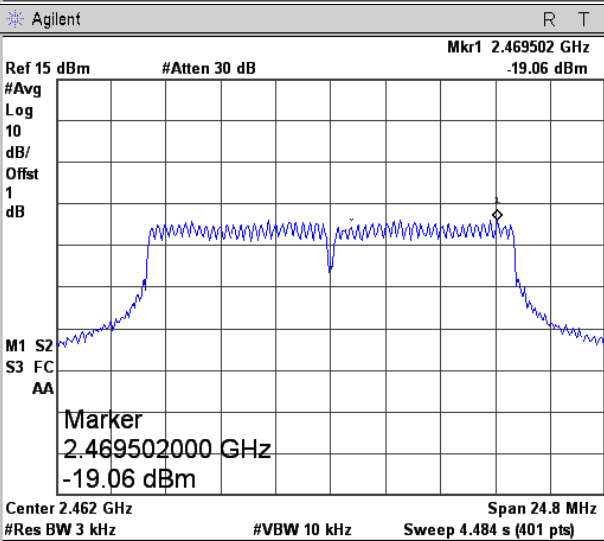
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

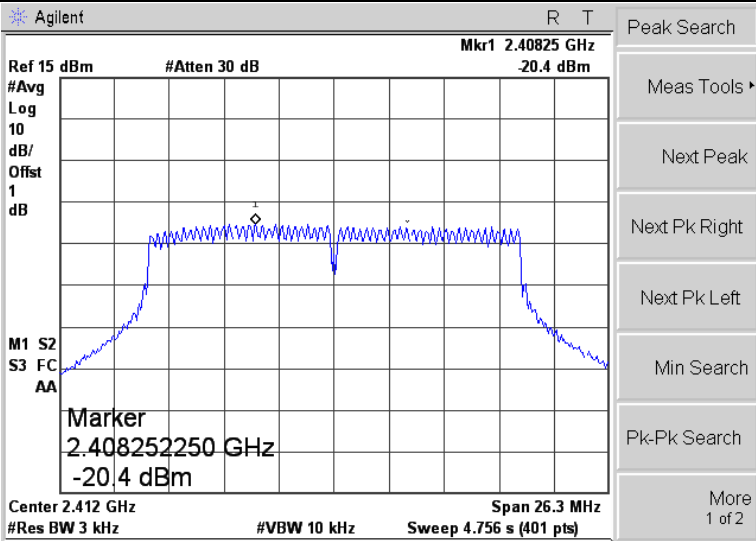
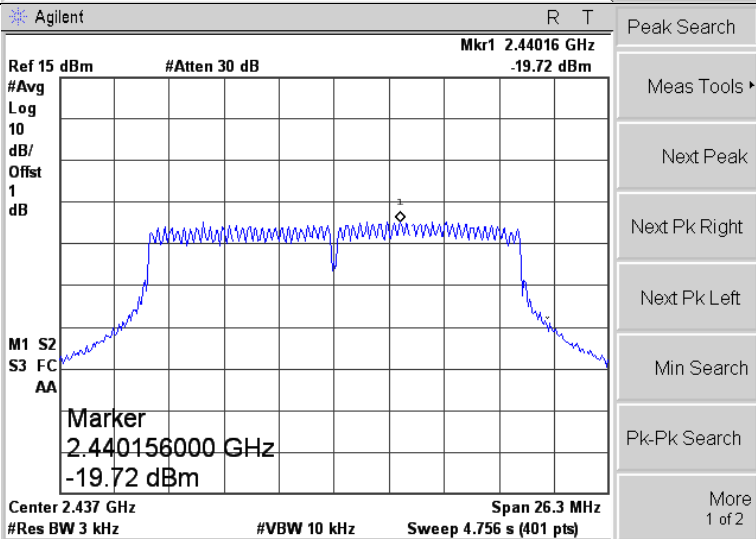
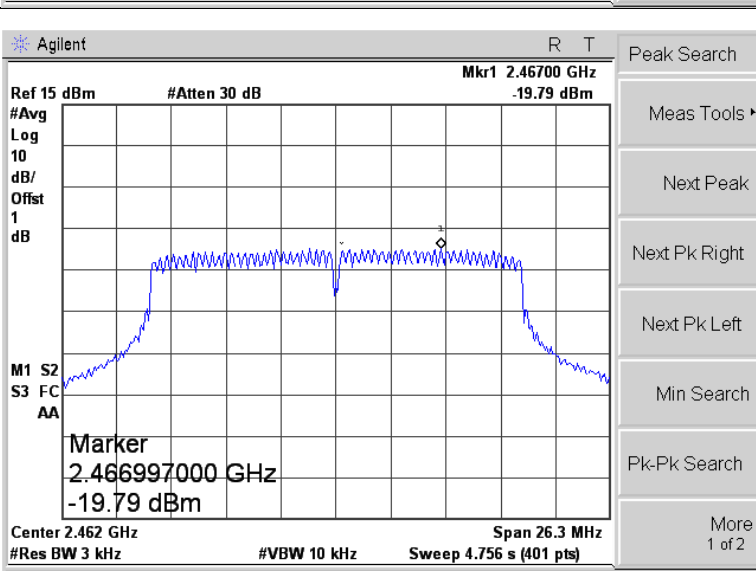
802.11n-HT40-Low	
802.11n-HT40-Middle	
802.11n-HT40-High	

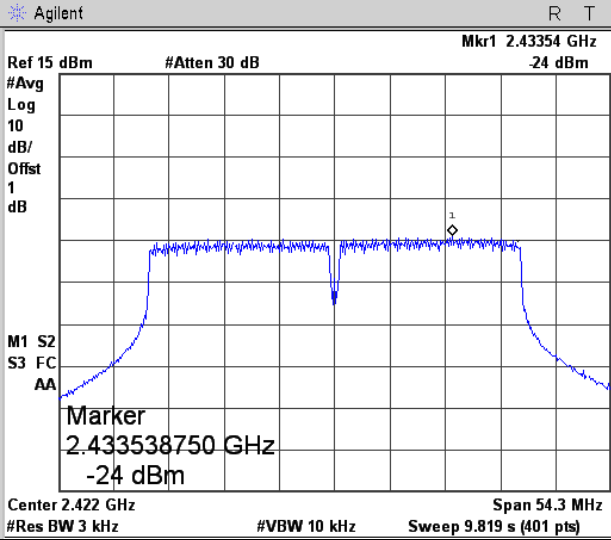
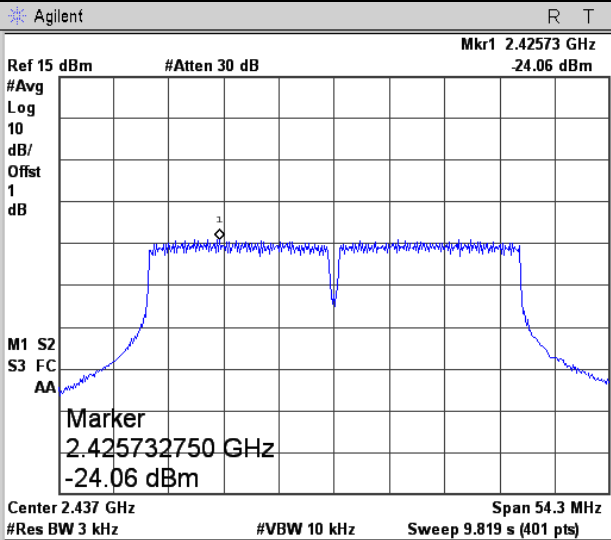
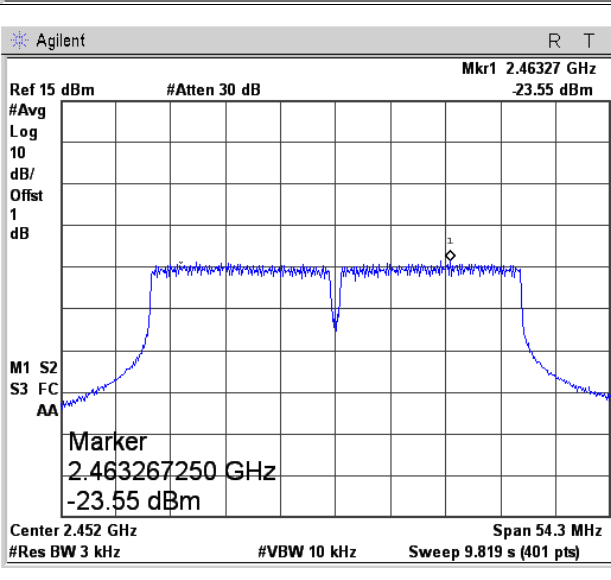
Antenna 1

Please refer to the following test plots:

802.11b-Low	 Agilent R T Ref 15 dBm #Atten 30 dB Mkr1 2.4145200 GHz -15.82 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 FC AA Marker 2.41452000 GHz -15.82 dBm Center 2.412 GHz Span 21 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 3.797 s (401 pts) Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11b-Middle	 Agilent R T Ref 15 dBm #Atten 30 dB Mkr1 2.4378400 GHz -16.25 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 FC AA Marker 2.43784000 GHz -16.25 dBm Center 2.437 GHz Span 21 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 3.797 s (401 pts) Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11b-High	 Agilent R T Ref 15 dBm #Atten 30 dB Mkr1 2.4627350 GHz -15.72 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 FC AA Marker 2.46273500 GHz -15.72 dBm Center 2.462 GHz Span 21 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 3.797 s (401 pts) Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2

802.11g-Low	 Agilent R T Ref 15 dBm #Atten 30 dB Mkr1 2.417642 GHz -18.91 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 FC AA Marker 2.417642000 GHz -18.91 dBm Center 2.412 GHz Span 24.8 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 4.484 s (401 pts) Peak Search Meas Tools ▾ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11g-Middle	 Agilent R T Ref 15 dBm #Atten 30 dB Mkr1 2.444502 GHz -18.9 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 FC AA Marker 2.444502000 GHz -18.9 dBm Center 2.437 GHz Span 24.8 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 4.484 s (401 pts) Peak Search Meas Tools ▾ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11g-High	 Agilent R T Ref 15 dBm #Atten 30 dB Mkr1 2.469502 GHz -19.06 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 FC AA Marker 2.469502000 GHz -19.06 dBm Center 2.462 GHz Span 24.8 MHz #Res BW 3 kHz #VBW 10 kHz Sweep 4.484 s (401 pts) Peak Search Meas Tools ▾ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2

802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

802.11n-HT40-Low	 - Peak Search - Meas Tools ▾ - Next Peak - Next Pk Right - Next Pk Left - Min Search - Pk-Pk Search - More 1 of 2
802.11n-HT40-Middle	 - Peak Search - Meas Tools ▾ - Next Peak - Next Pk Right - Next Pk Left - Min Search - Pk-Pk Search - More 1 of 2
802.11n-HT40-High	 - Peak Search - Meas Tools ▾ - Next Peak - Next Pk Right - Next Pk Left - Min Search - Pk-Pk Search - More 1 of 2

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

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- 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 0

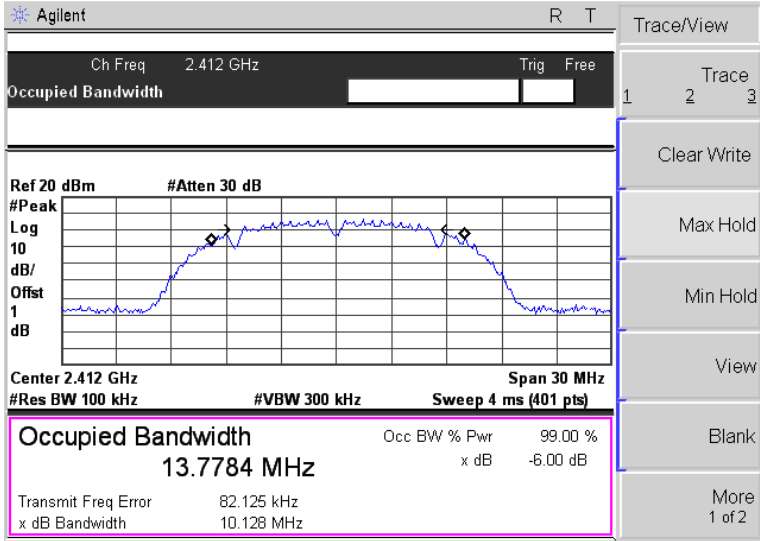
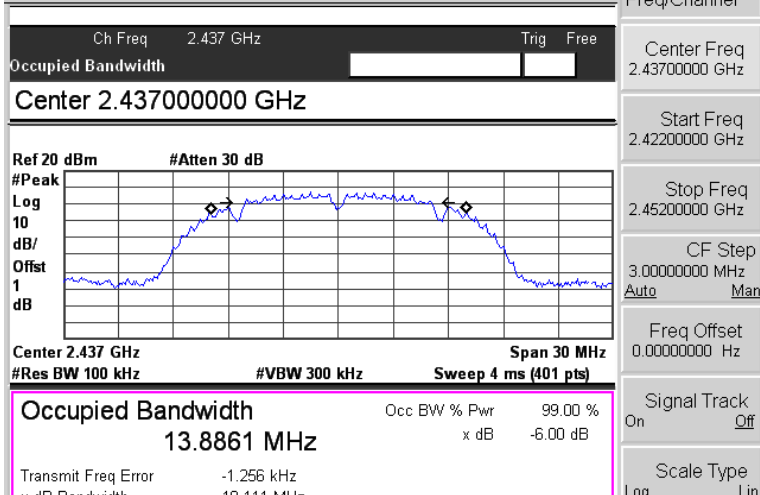
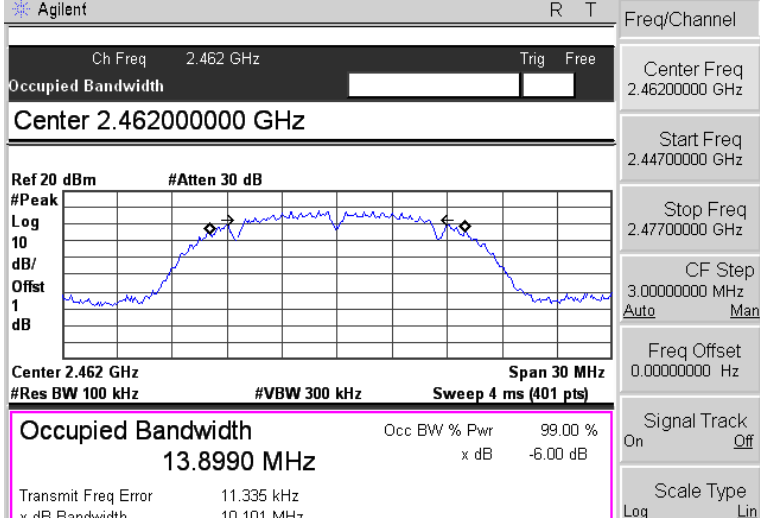
Test Mode	Test Channel MHz	6 dB Bandwidth MHz	Limit kHz
802.11b	2412	10.128	≥ 500
	2437	10.111	≥ 500
	2462	10.101	≥ 500
802.11g	2412	16.510	≥ 500
	2437	16.443	≥ 500
	2462	16.453	≥ 500
802.11n-HT20	2412	17.581	≥ 500
	2437	17.585	≥ 500
	2462	17.657	≥ 500
802.11n-HT40	2422	36.369	≥ 500
	2437	36.397	≥ 500
	2452	36.368	≥ 500

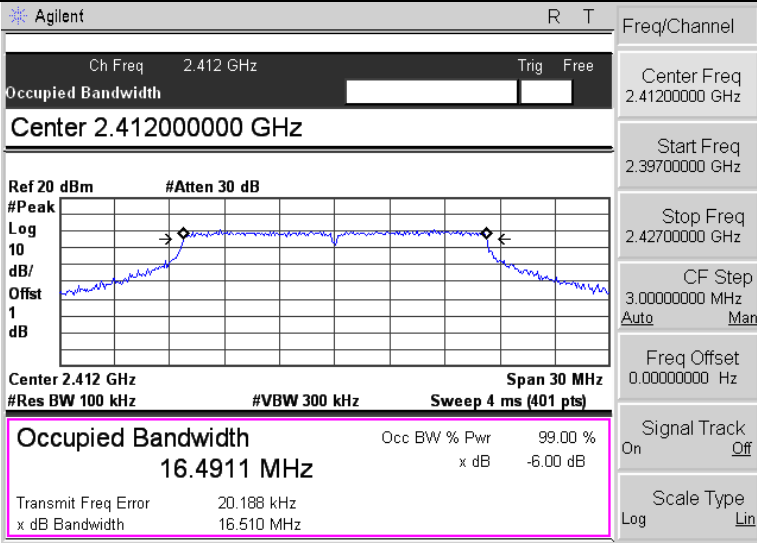
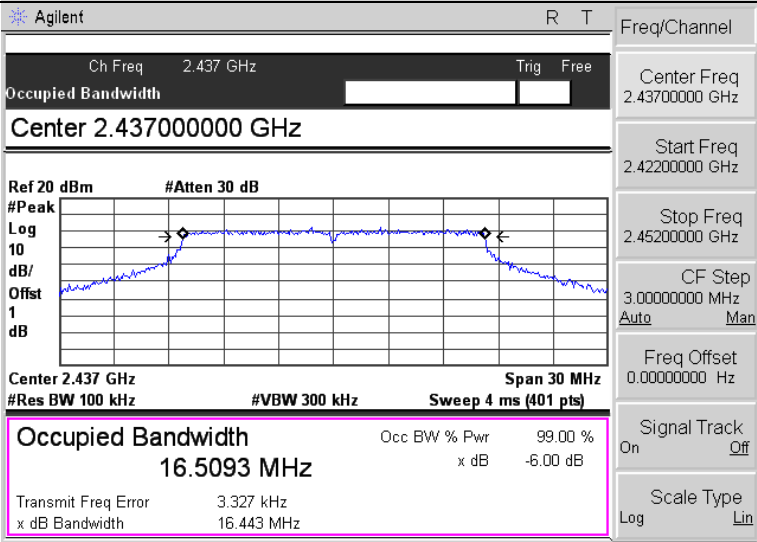
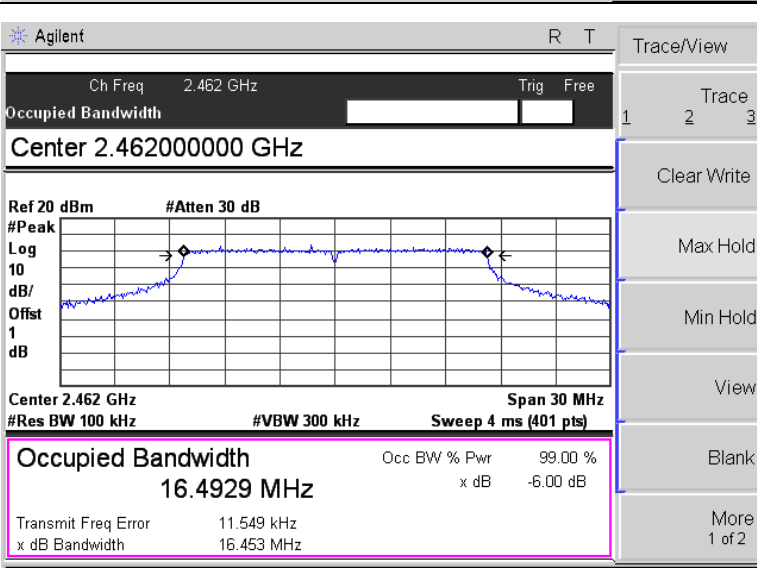
Antenna 1

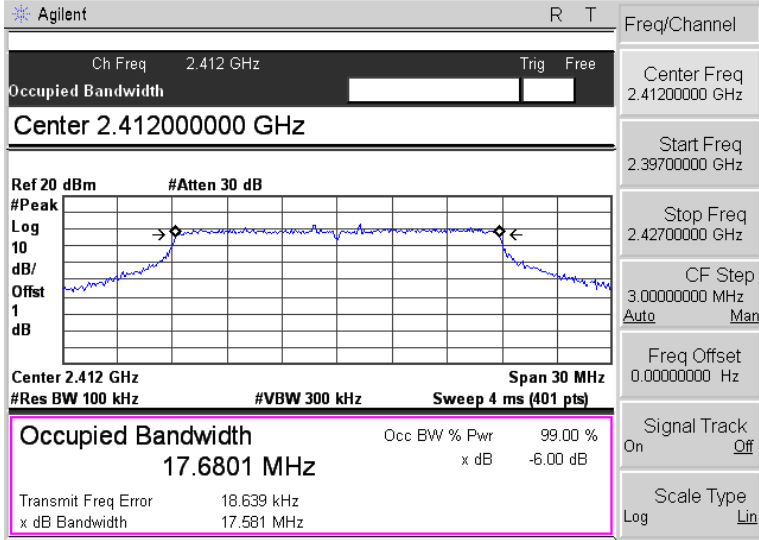
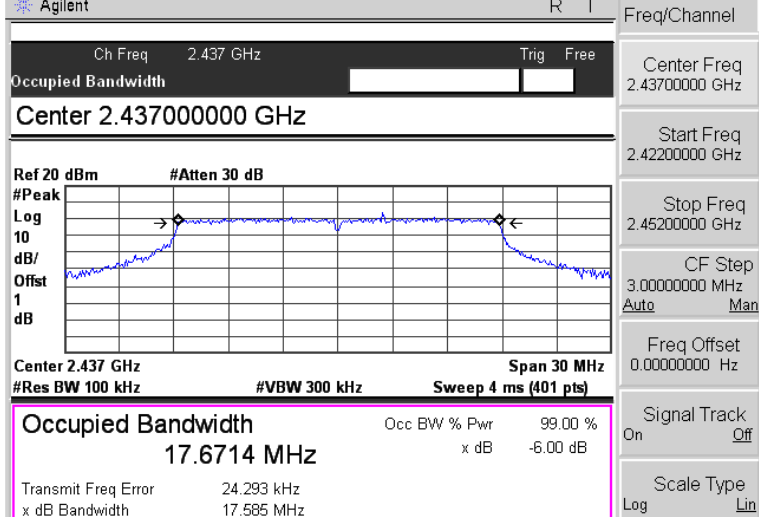
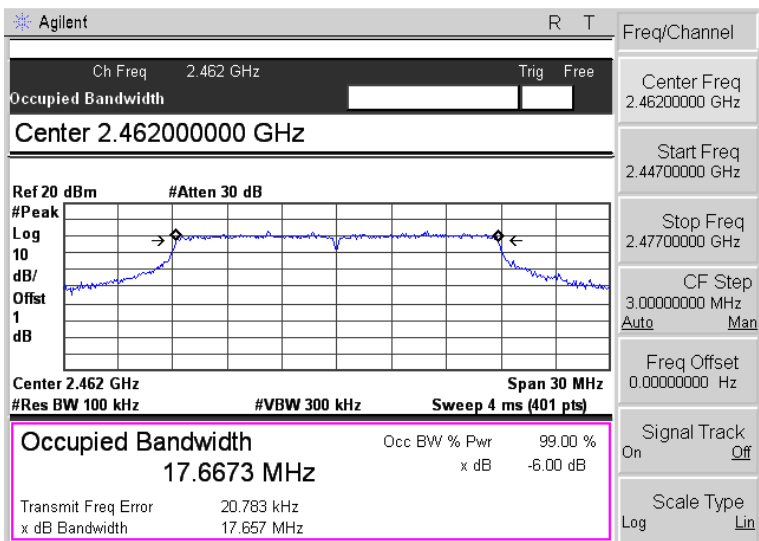
Test Mode	Test Channel MHz	6 dB Bandwidth MHz	Limit kHz
802.11b	2412	10.120	≥ 500
	2437	9.679	≥ 500
	2462	10.099	≥ 500
802.11g	2412	16.476	≥ 500
	2437	16.404	≥ 500
	2462	16.348	≥ 500
802.11n-HT20	2412	17.436	≥ 500
	2437	17.581	≥ 500
	2462	17.617	≥ 500
802.11n-HT40	2422	36.234	≥ 500
	2437	36.403	≥ 500
	2452	36.410	≥ 500

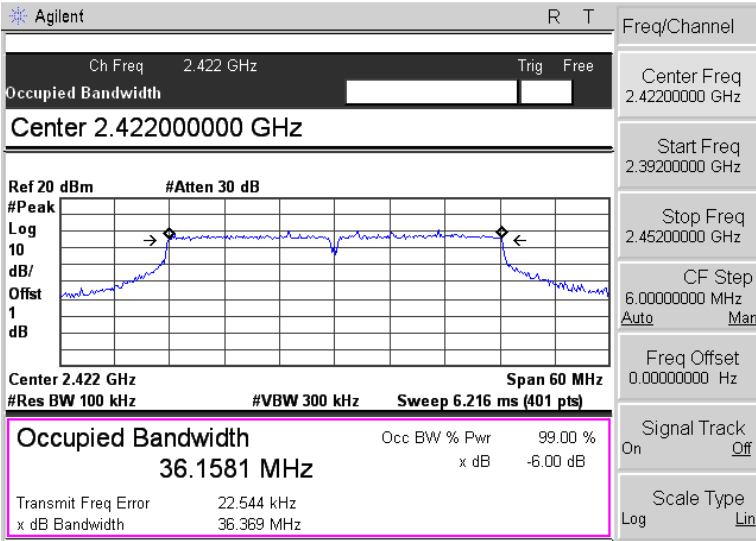
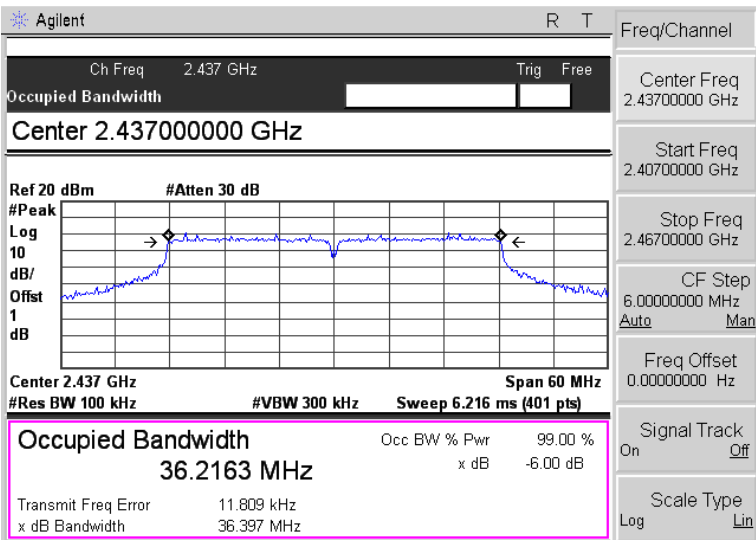
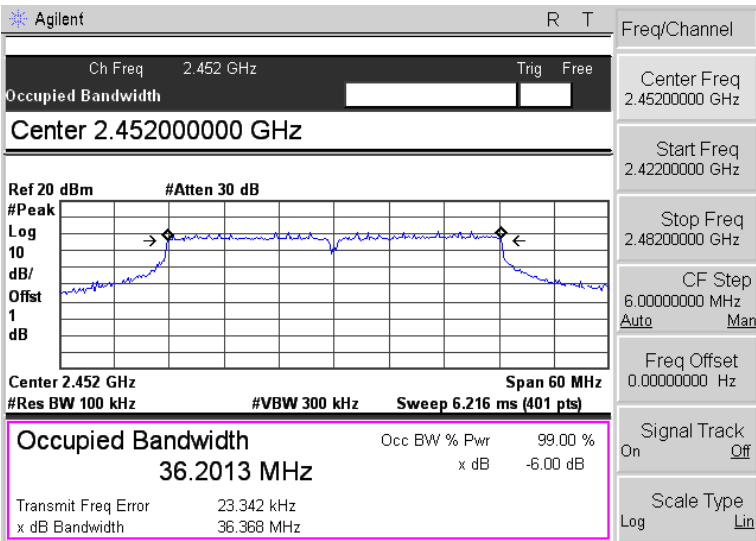
Please refer to the following test plots:

Antenna 0

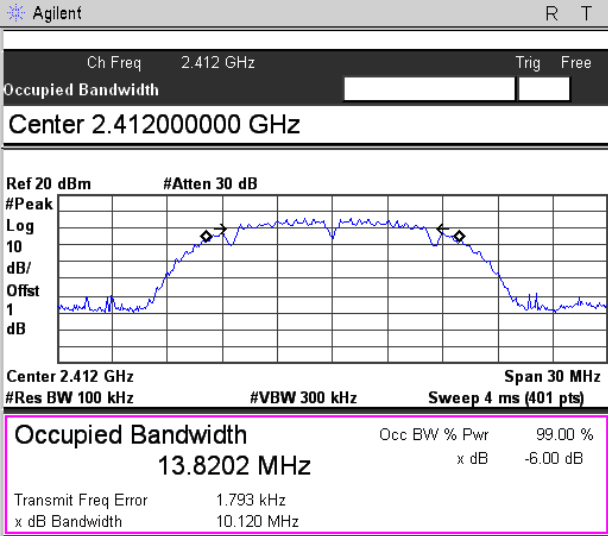
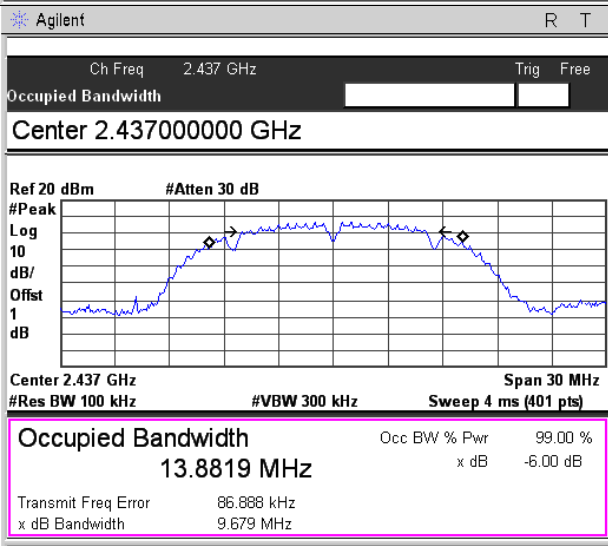
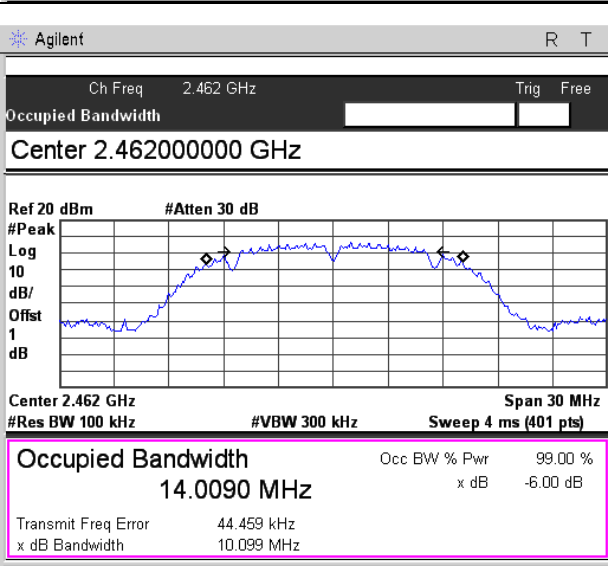
802.11b-Low	 Agilent R T Ch Freq 2.412 GHz Trig Free Occupied Bandwidth Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offset 1 dB Center 2.412 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 13.7784 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 82.125 kHz x dB Bandwidth 10.128 MHz Trace/View 1 2 3 Trace Clear Write Max Hold Min Hold View Blank More 1 of 2
802.11b-Middle	 Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Center 2.437000000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offset 1 dB Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 13.8861 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -1.256 kHz x dB Bandwidth 10.111 MHz Freq/Channel Center Freq 2.437000000 GHz Start Freq 2.422000000 GHz Stop Freq 2.452000000 GHz CF Step 3.000000000 MHz Auto Man Freq Offset 0.000000000 Hz Signal Track On Off Scale Type Log Lin
802.11b-High	 Agilent R T Ch Freq 2.462 GHz Trig Free Occupied Bandwidth Center 2.462000000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offset 1 dB Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 13.8990 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 11.335 kHz x dB Bandwidth 10.101 MHz Freq/Channel Center Freq 2.462000000 GHz Start Freq 2.447000000 GHz Stop Freq 2.477000000 GHz CF Step 3.000000000 MHz Auto Man Freq Offset 0.000000000 Hz Signal Track On Off Scale Type Log Lin

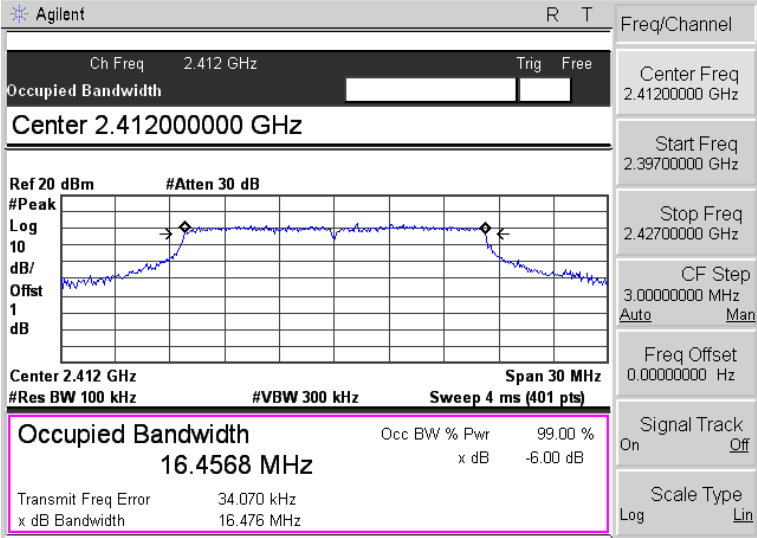
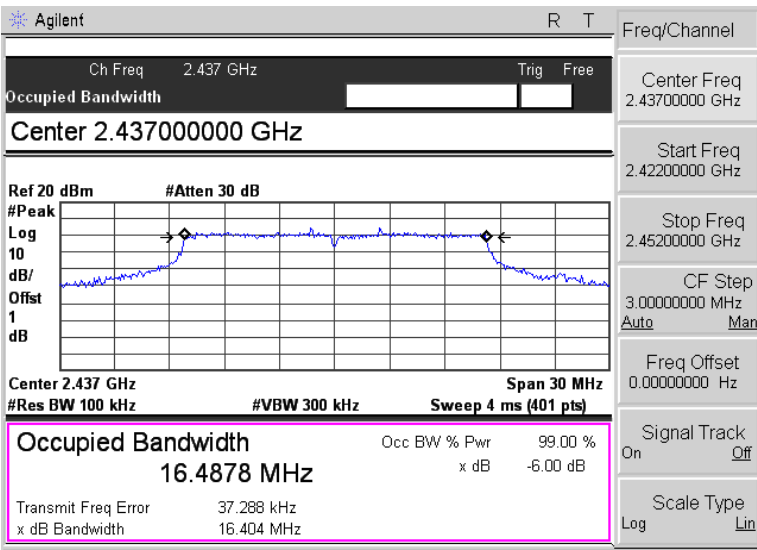
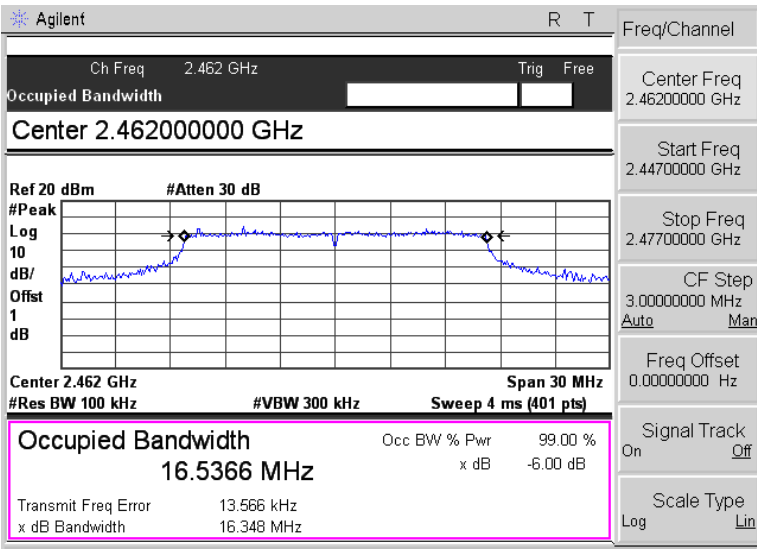
802.11g-Low	
802.11g-Middle	
802.11g-High	

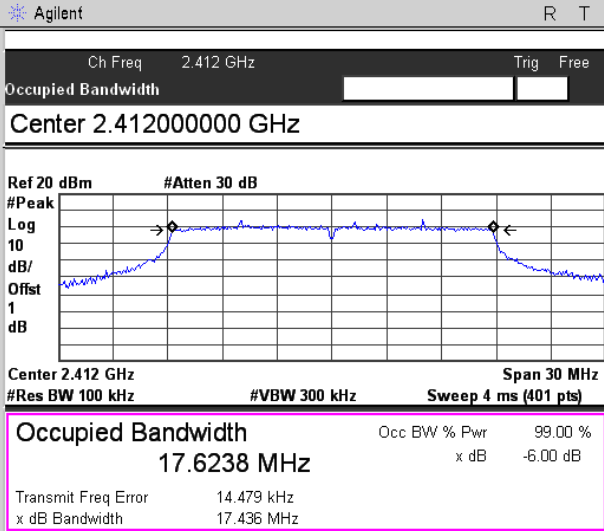
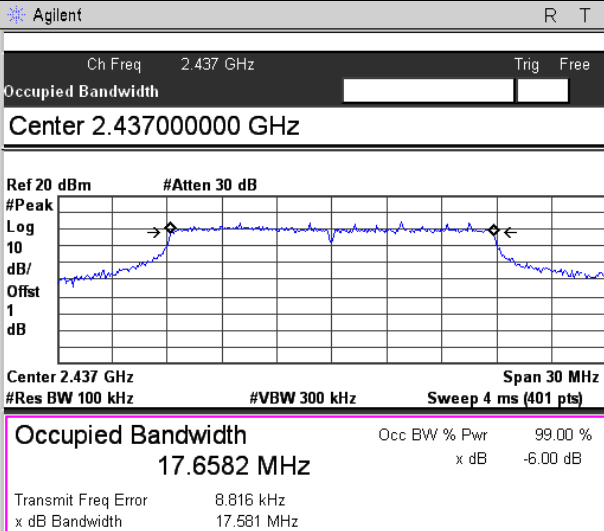
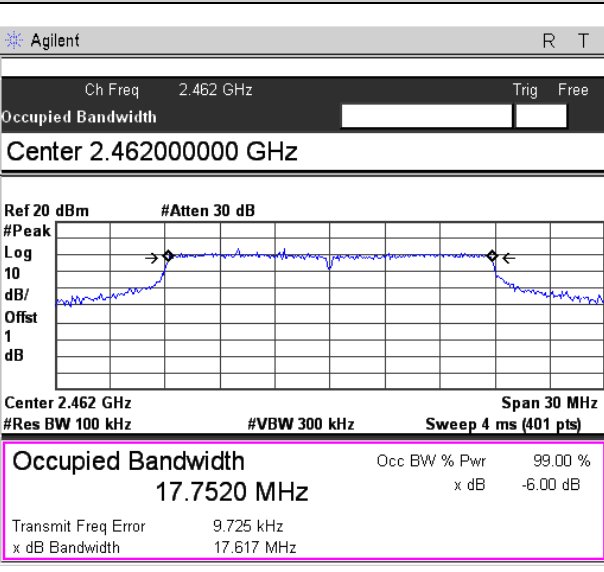
802.11n-HT20-Low	 Agilent R T Ch Freq 2.412 GHz Trig Free Occupied Bandwidth Center 2.41200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 2.412 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 17.6801 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 18.639 kHz x dB Bandwidth 17.581 MHz Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.39700000 GHz Stop Freq 2.42700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11n-HT20-Middle	 Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Center 2.43700000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 17.6714 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 24.293 kHz x dB Bandwidth 17.585 MHz Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.42200000 GHz Stop Freq 2.45200000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11n-HT20-High	 Agilent R T Ch Freq 2.462 GHz Trig Free Occupied Bandwidth Center 2.46200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 17.6673 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 20.783 kHz x dB Bandwidth 17.657 MHz Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.44700000 GHz Stop Freq 2.47700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

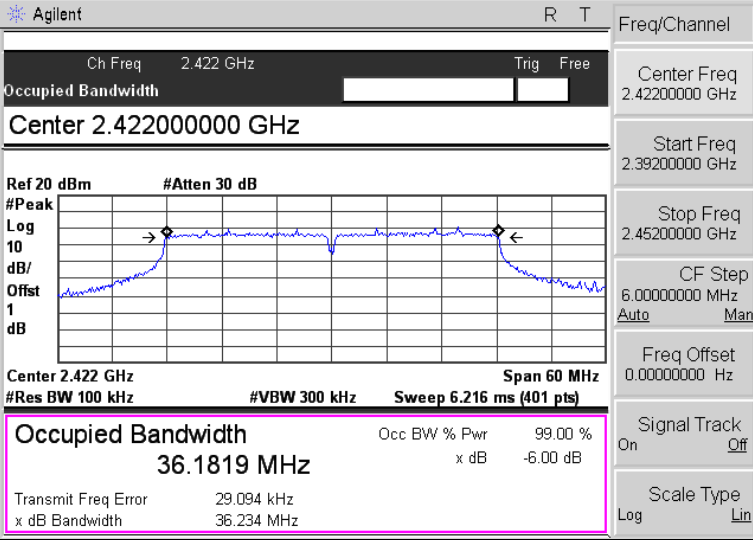
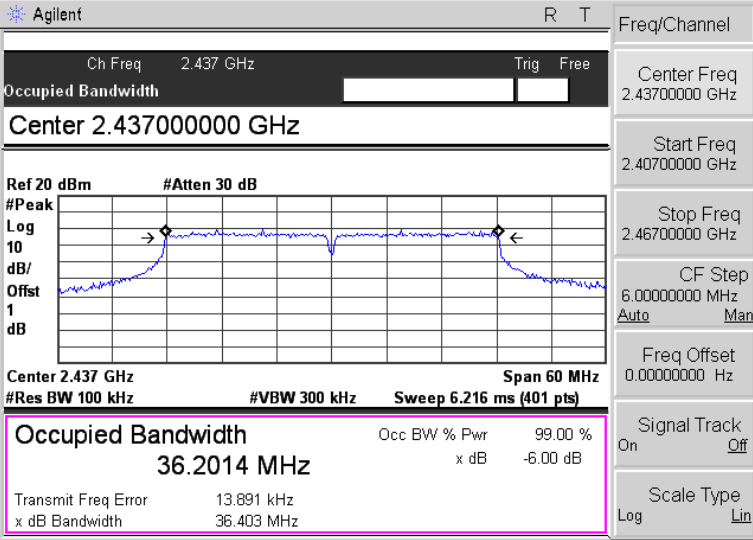
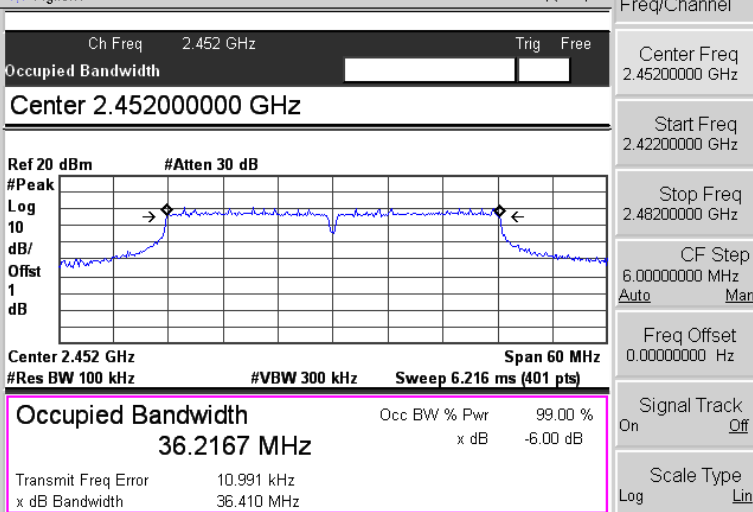
802.11n-HT40-Low	 Agilent R T Ch Freq 2.422 GHz Trig Free Occupied Bandwidth Center 2.42200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offset 1 dB Center 2.422 GHz Span 60 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 6.216 ms (401 pts) Occupied Bandwidth 36.1581 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 22.544 kHz x dB Bandwidth 36.369 MHz Freq/Channel Center Freq 2.42200000 GHz Start Freq 2.39200000 GHz Stop Freq 2.45200000 GHz CF Step 6.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11n-HT40-Middle	 Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Center 2.43700000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offset 1 dB Center 2.437 GHz Span 60 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 6.216 ms (401 pts) Occupied Bandwidth 36.2163 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 11.809 kHz x dB Bandwidth 36.397 MHz Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.40700000 GHz Stop Freq 2.46700000 GHz CF Step 6.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11n-HT40-High	 Agilent R T Ch Freq 2.452 GHz Trig Free Occupied Bandwidth Center 2.45200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offset 1 dB Center 2.452 GHz Span 60 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 6.216 ms (401 pts) Occupied Bandwidth 36.2013 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 23.342 kHz x dB Bandwidth 36.368 MHz Freq/Channel Center Freq 2.45200000 GHz Start Freq 2.42200000 GHz Stop Freq 2.48200000 GHz CF Step 6.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

Antenna 1

802.11b-Low	 Agilent R T Ch Freq 2.412 GHz Trig Free Occupied Bandwidth Center 2.41200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 2.412 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 13.8202 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 1.793 kHz x dB Bandwidth 10.120 MHz Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.39700000 GHz Stop Freq 2.42700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11b-Middle	 Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Center 2.43700000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 13.8819 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 86.888 kHz x dB Bandwidth 9.679 MHz Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.42200000 GHz Stop Freq 2.45200000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11b-High	 Agilent R T Ch Freq 2.462 GHz Trig Free Occupied Bandwidth Center 2.46200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 14.0090 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 44.459 kHz x dB Bandwidth 10.099 MHz Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.44700000 GHz Stop Freq 2.47700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

802.11g-Low	 Agilent R T Ch Freq 2.412 GHz Trig Free Occupied Bandwidth Center 2.41200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offset 1 dB Center 2.412 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 16.4568 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 34.070 kHz x dB Bandwidth 16.476 MHz Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.39700000 GHz Stop Freq 2.42700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11g-Middle	 Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Center 2.43700000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offset 1 dB Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 16.4878 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 37.288 kHz x dB Bandwidth 16.404 MHz Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.42200000 GHz Stop Freq 2.45200000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11g-High	 Agilent R T Ch Freq 2.462 GHz Trig Free Occupied Bandwidth Center 2.46200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offset 1 dB Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 16.5366 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 13.566 kHz x dB Bandwidth 16.348 MHz Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.44700000 GHz Stop Freq 2.47700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

802.11n-HT20-Low	 Agilent R T Ch Freq 2.412 GHz Trig Free Occupied Bandwidth Center 2.41200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 2.412 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 17.6238 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 14.479 kHz x dB Bandwidth 17.436 MHz Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.39700000 GHz Stop Freq 2.42700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11n-HT20-Middle	 Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Center 2.43700000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 17.6582 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 8.816 kHz x dB Bandwidth 17.581 MHz Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.42200000 GHz Stop Freq 2.45200000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11n-HT20-High	 Agilent R T Ch Freq 2.462 GHz Trig Free Occupied Bandwidth Center 2.46200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 17.7520 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 9.725 kHz x dB Bandwidth 17.617 MHz Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.44700000 GHz Stop Freq 2.47700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

802.11n-HT40-Low	 Agilent R T Ch Freq 2.422 GHz Trig Free Occupied Bandwidth Center 2.42200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 2.422 GHz Span 60 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 6.216 ms (401 pts) Occupied Bandwidth 36.1819 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 29.094 kHz x dB Bandwidth 36.234 MHz Freq/Channel Center Freq 2.42200000 GHz Start Freq 2.39200000 GHz Stop Freq 2.45200000 GHz CF Step 6.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11n-HT40-Middle	 Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Center 2.43700000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 2.437 GHz Span 60 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 6.216 ms (401 pts) Occupied Bandwidth 36.2014 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 13.891 kHz x dB Bandwidth 36.403 MHz Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.40700000 GHz Stop Freq 2.46700000 GHz CF Step 6.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11n-HT40-High	 Agilent R T Ch Freq 2.452 GHz Trig Free Occupied Bandwidth Center 2.45200000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 2.452 GHz Span 60 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 6.216 ms (401 pts) Occupied Bandwidth 36.2167 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 10.991 kHz x dB Bandwidth 36.410 MHz Freq/Channel Center Freq 2.45200000 GHz Start Freq 2.42200000 GHz Stop Freq 2.48200000 GHz CF Step 6.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

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 the KDB-558074 D01 v04, 9.2.2.2, 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 $\geq 2 \times \text{span} / \text{RBW}$. (This gives bin-to-bin spacing $\leq \text{RBW}/2$, 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.

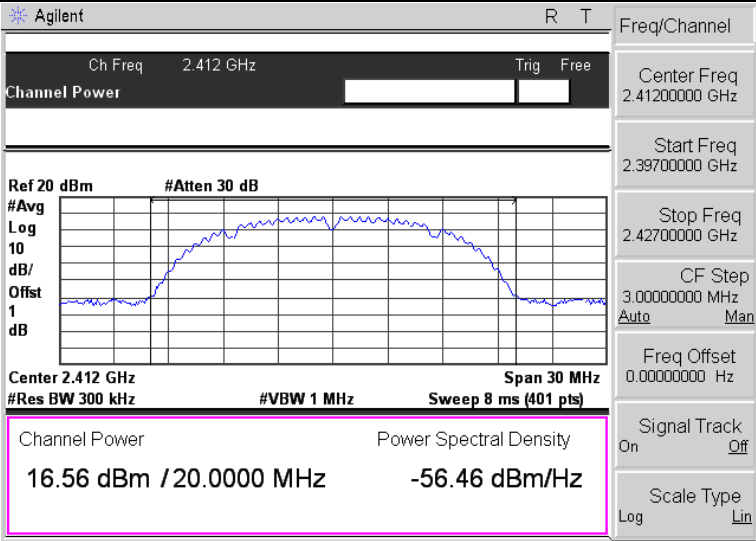
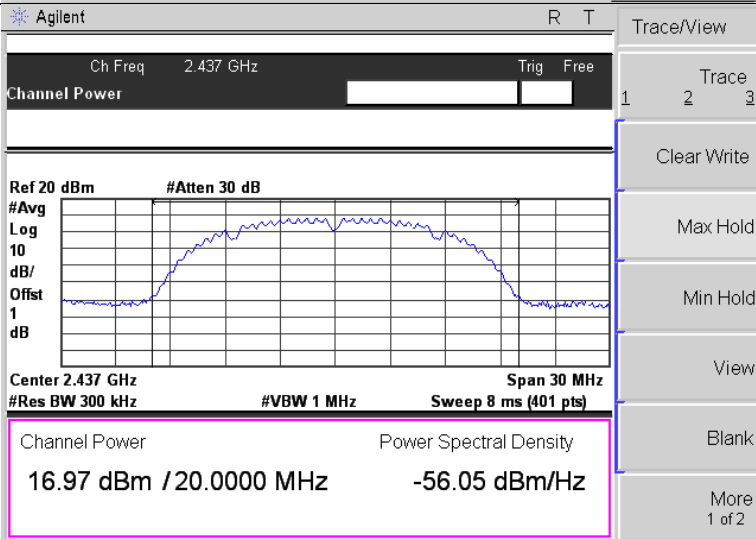
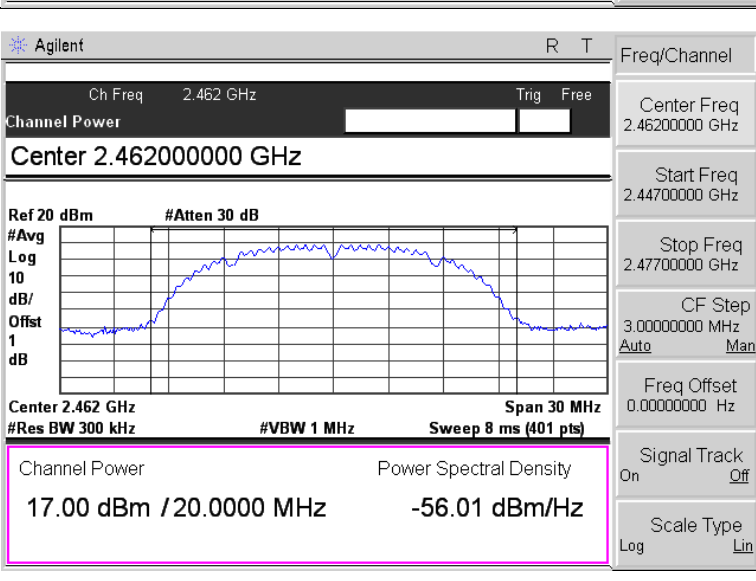
7.3 Summary of Test Results/Plots

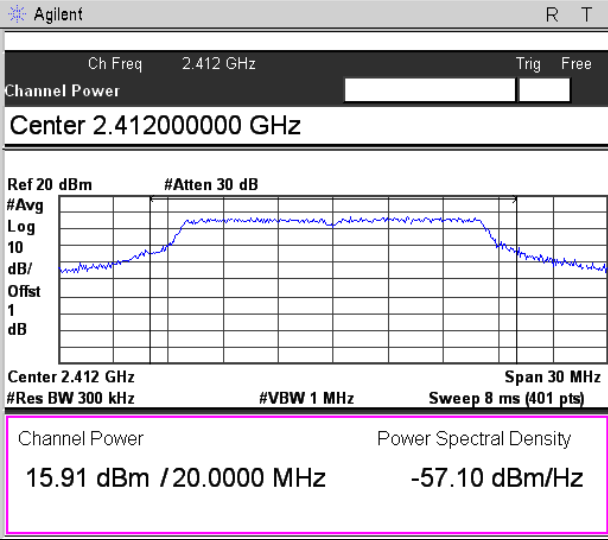
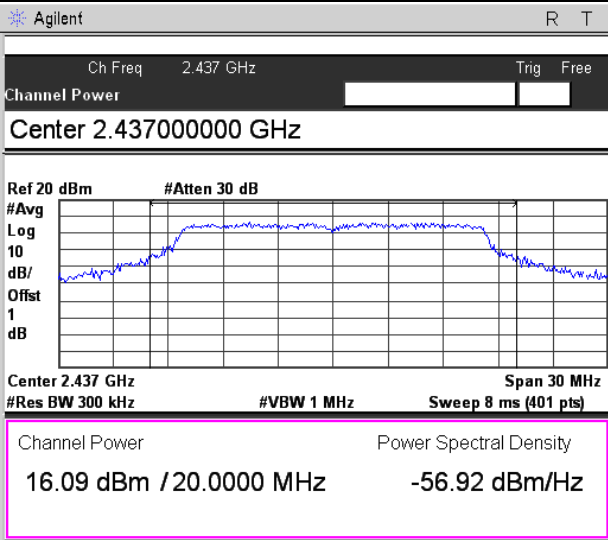
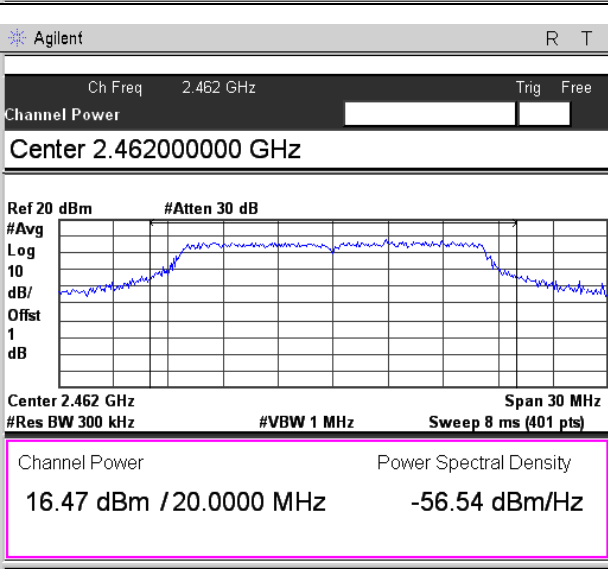
Test Mode	Frequency MHz	Power dBm		Output Power mW		Limit mW
		Antenna 0	Antenna 1	Antenna 0	Antenna 1	
802.11b	2412	16.56	16.31	45.29	42.76	1000
	2437	16.97	16.81	49.77	47.97	1000
	2462	17.00	16.58	50.12	45.50	1000
802.11g	2412	15.91	15.23	38.99	33.34	1000
	2437	16.09	15.98	40.64	39.63	1000
	2462	16.47	15.71	44.36	37.24	1000

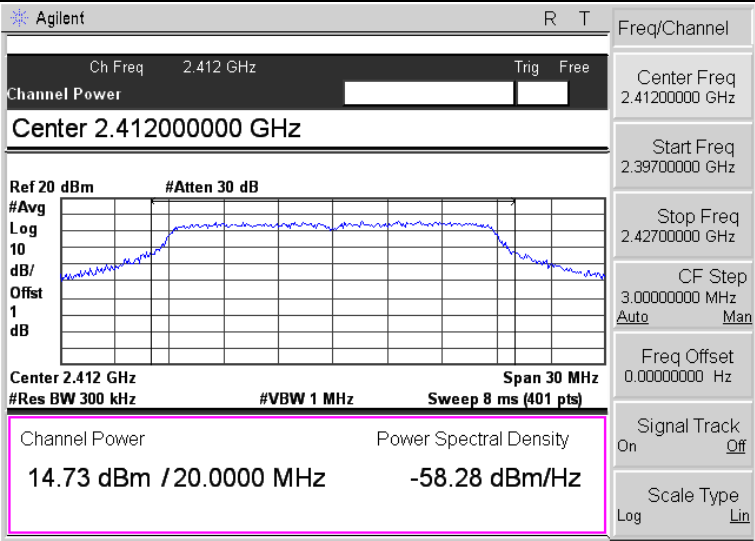
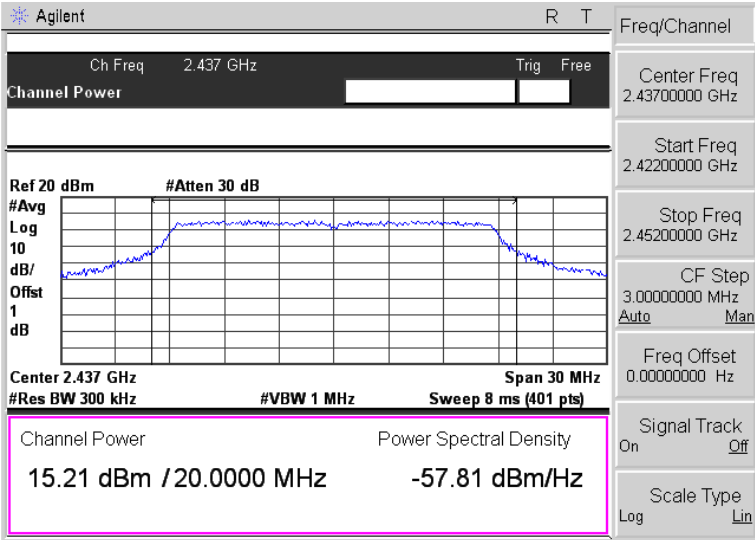
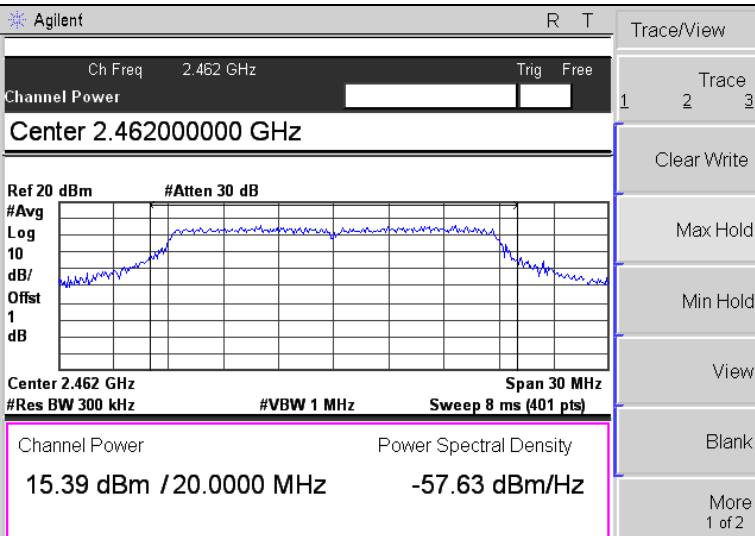
Test Mode	Frequency MHz	Power dBm			Output Power mW	Limit mW
		Antenna 0	Antenna 1	total	Total	
802.11n HT20	2412	14.73	14.63	17.69	58.75	1000
	2437	15.21	15.11	18.17	65.61	1000
	2462	15.39	14.72	18.08	64.27	1000
802.11n HT40	2422	14.29	13.72	17.02	50.35	1000
	2437	14.26	13.93	17.11	51.40	1000
	2452	14.66	14.31	17.50	56.23	1000

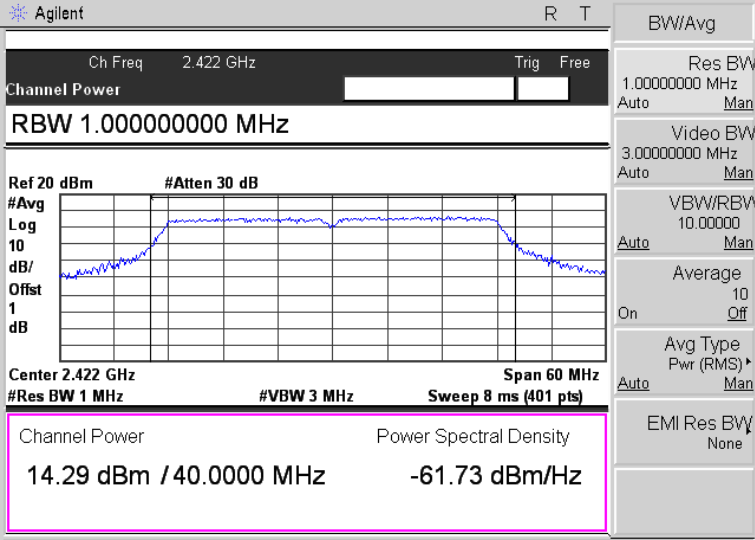
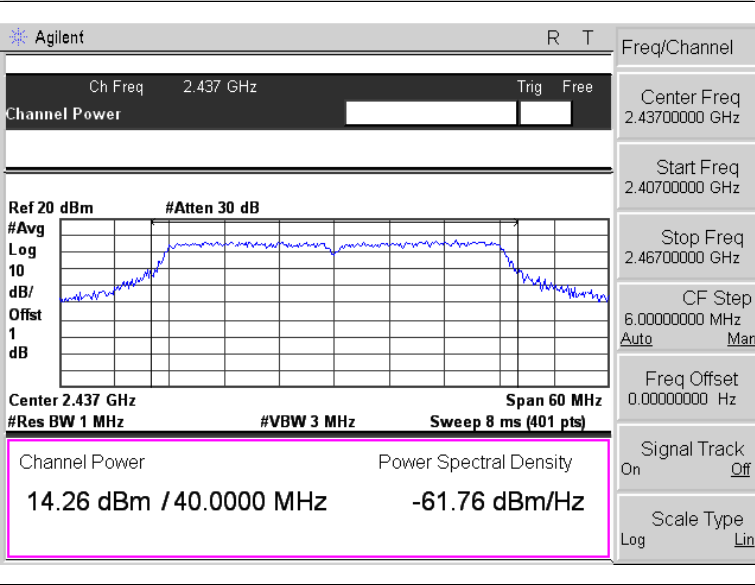
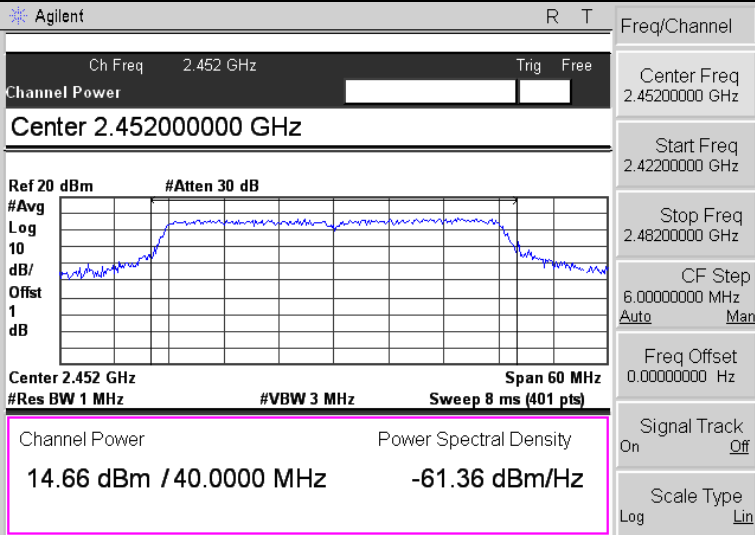
Please refer to the following test plots:

Antenna 0

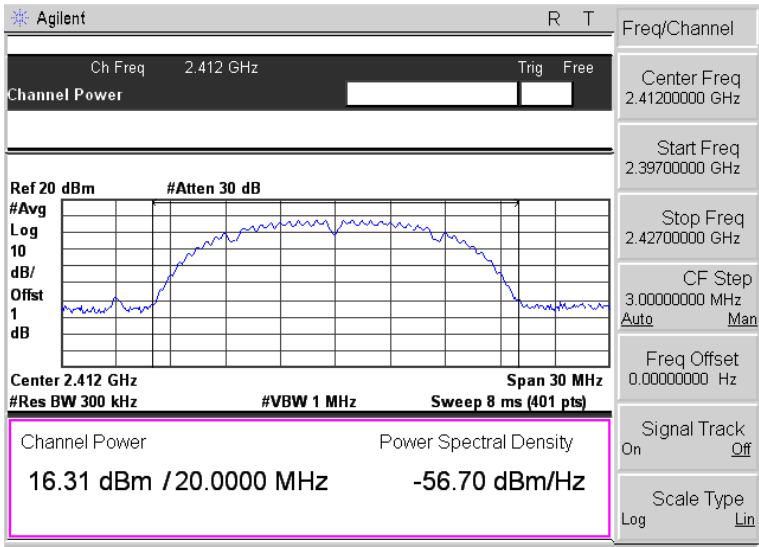
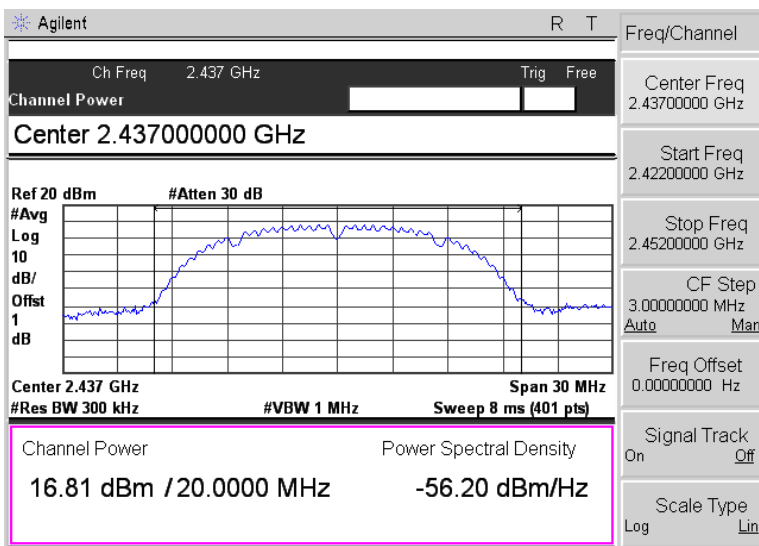
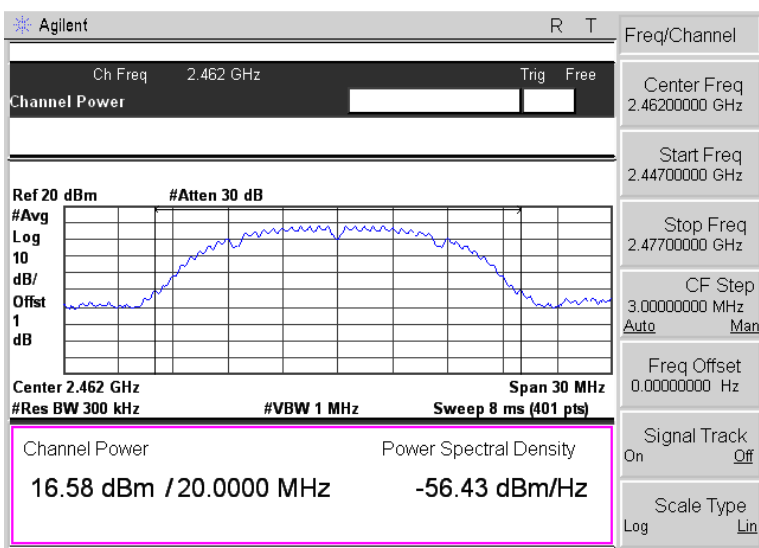
802.11b-Low 11Mbps	
802.11b-Middle 11Mbps	
802.11b-High 11Mbps	

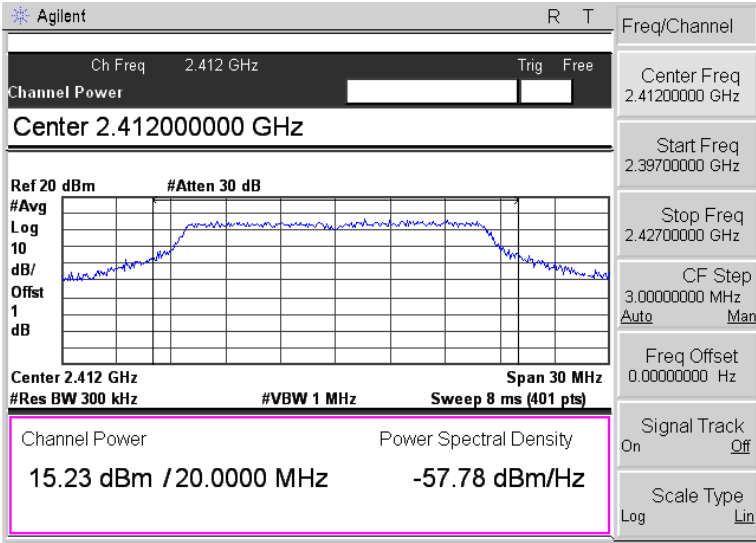
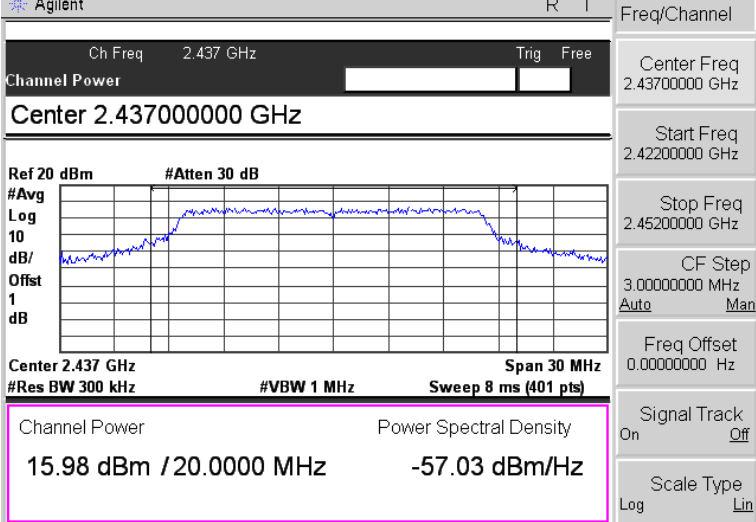
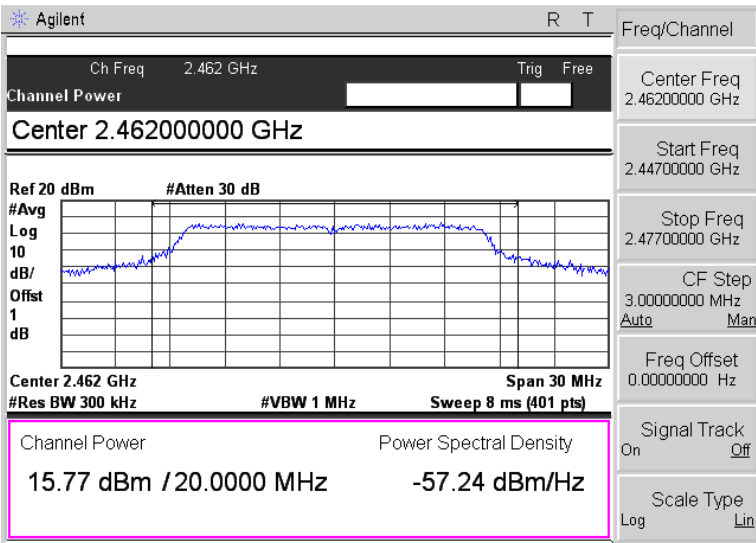
802.11g-Low 54Mbps	 Agilent R T Ch Freq 2.412 GHz Trig Free Channel Power Center 2.41200000 GHz Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 2.412 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 15.91 dBm / 20.0000 MHz -57.10 dBm/Hz Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.39700000 GHz Stop Freq 2.42700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11g-Middle 54Mbps	 Agilent R T Ch Freq 2.437 GHz Trig Free Channel Power Center 2.43700000 GHz Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 2.437 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 16.09 dBm / 20.0000 MHz -56.92 dBm/Hz Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.42200000 GHz Stop Freq 2.45200000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11g-High 54Mbps	 Agilent R T Ch Freq 2.462 GHz Trig Free Channel Power Center 2.46200000 GHz Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 2.462 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 16.47 dBm / 20.0000 MHz -56.54 dBm/Hz Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.44700000 GHz Stop Freq 2.47700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

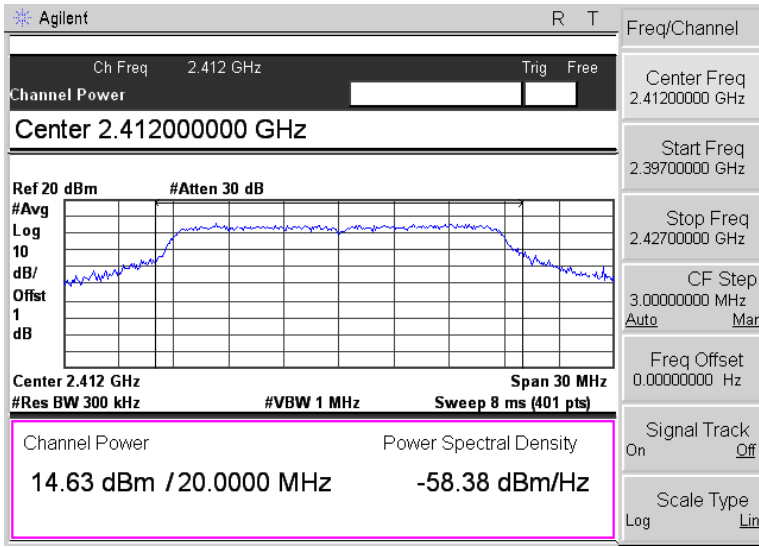
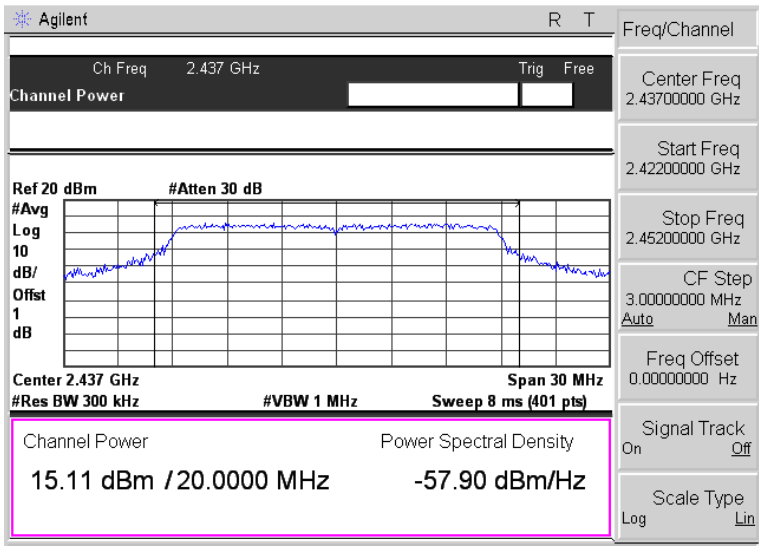
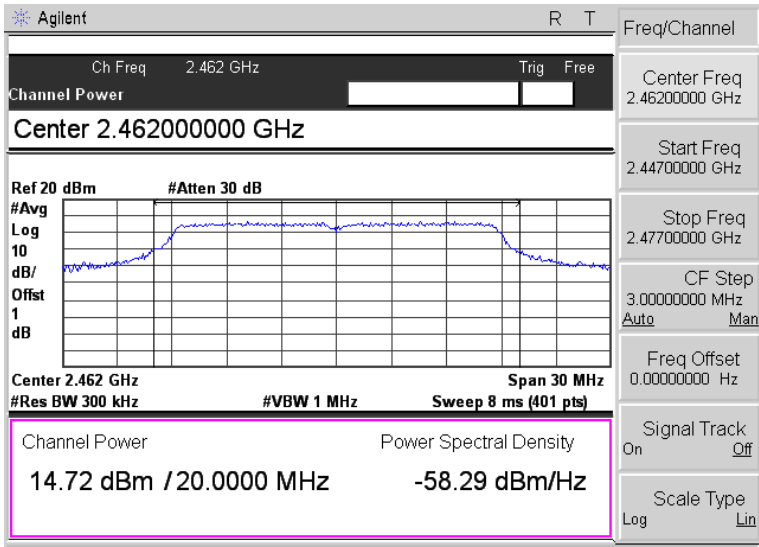
802.11n-HT20-Low MCS7	
802.11n-HT20-Middle MCS7	
802.11n-HT20-High MCS7	

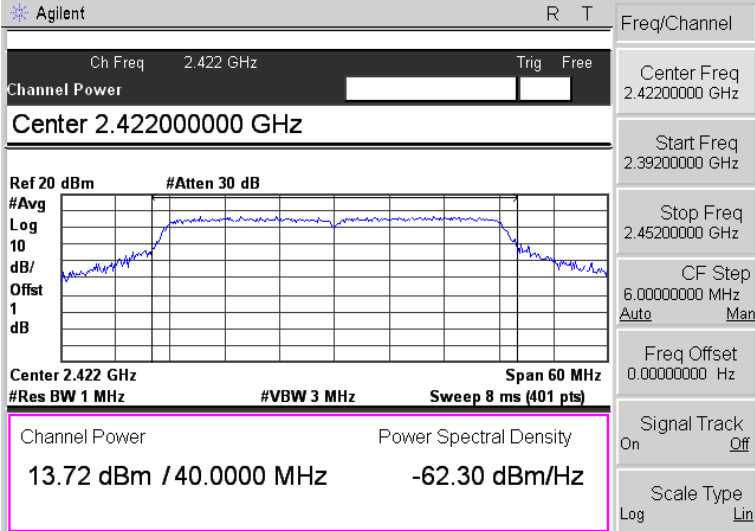
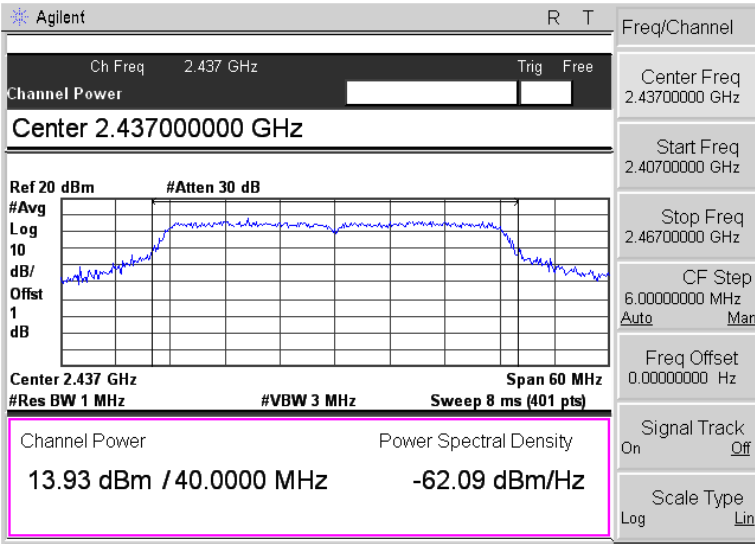
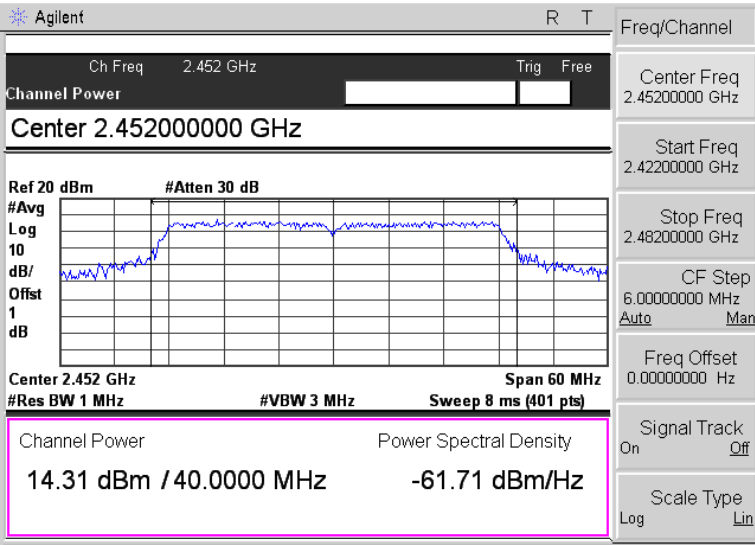
802.11n-HT40-Low MCS7	
802.11n-HT40-Middle MCS7	
802.11n-HT40-High MCS7	

Antenna 1

802.11b-Low 11Mbps	 Agilent R T Ch Freq 2.412 GHz Trig Free Channel Power Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 2.412 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 16.31 dBm / 20.0000 MHz -56.70 dBm/Hz Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.39700000 GHz Stop Freq 2.42700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11b-Middle 11Mbps	 Agilent R T Ch Freq 2.437 GHz Trig Free Channel Power Center 2.437000000 GHz Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 2.437 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 16.81 dBm / 20.0000 MHz -56.20 dBm/Hz Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.42200000 GHz Stop Freq 2.45200000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
802.11b-High 11Mbps	 Agilent R T Ch Freq 2.462 GHz Trig Free Channel Power Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 2.462 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 16.58 dBm / 20.0000 MHz -56.43 dBm/Hz Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.44700000 GHz Stop Freq 2.47700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

802.11g-Low 54Mbps	
802.11g-Middle 54Mbps	
802.11g-High 54Mbps	

802.11n-HT20-Low MCS7	
802.11n-HT20-Middle MCS7	
802.11n-HT20-High MCS7	

802.11n-HT40-Low MCS7	
802.11n-HT40-Middle MCS7	
802.11n-HT40-High MCS7	

8. Field Strength of Spurious Emissions

8.1 Standard Applicable

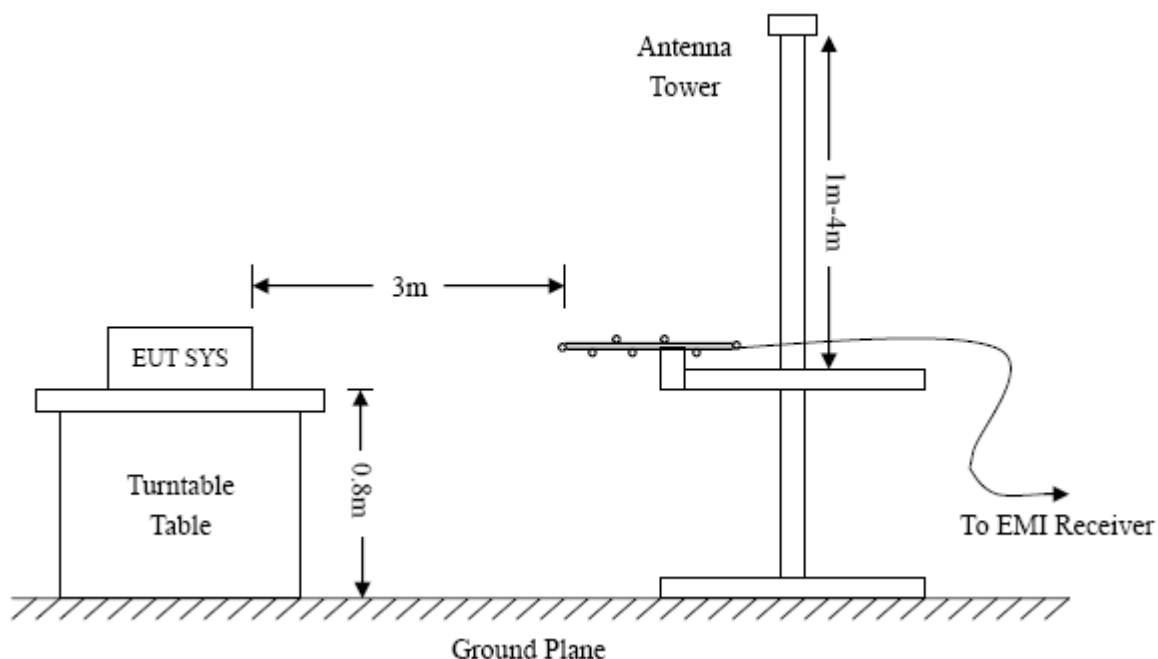
According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within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

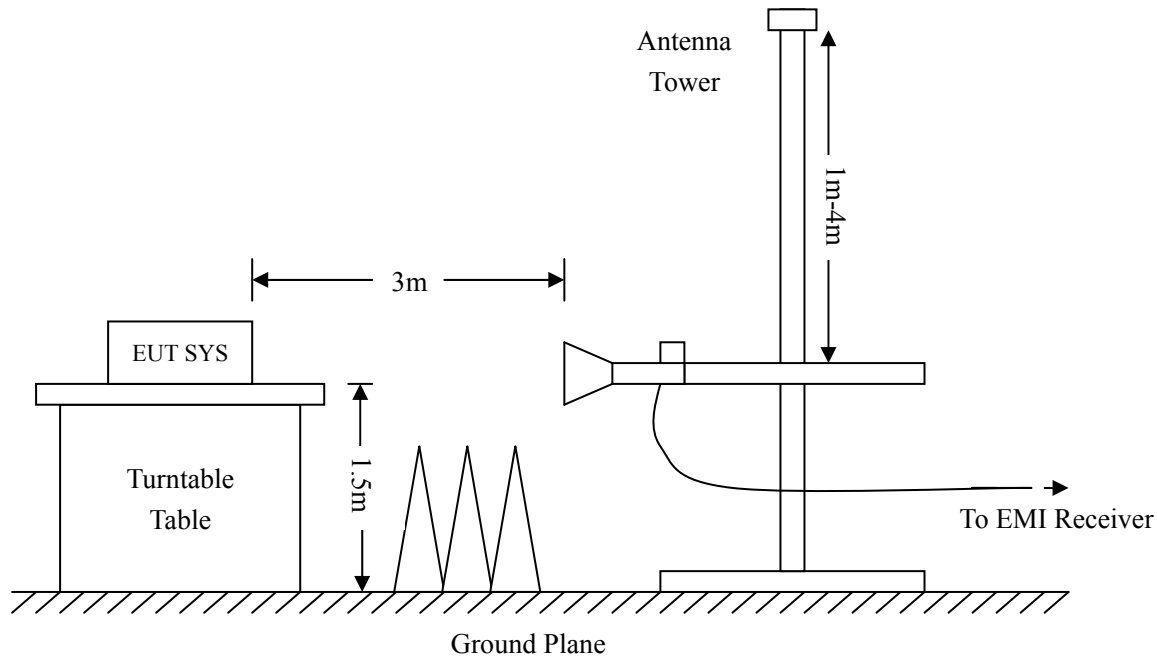
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

8.2 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=360KHz

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

8.3 Corrected Amplitude & Margin Calculation

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

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

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

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

8.5 Summary of Test Results/Plots

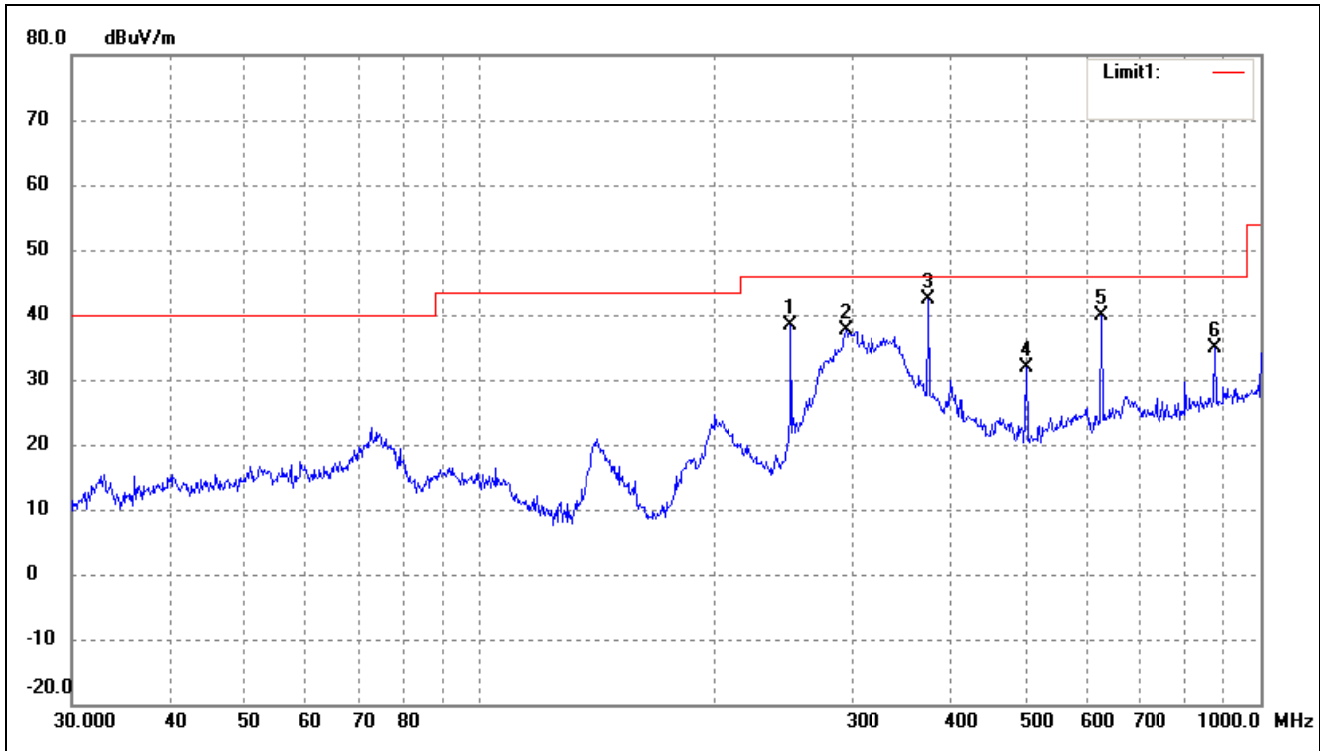
Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

➤ Spurious Emissions Below 1GHz

Antenna 0

802.11b

Test Channel	Low	Polarity:	Horizontal
--------------	-----	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	250.3012	48.12	-9.79	38.33	46.00	-7.67	peak
2	294.1137	45.74	-8.23	37.51	46.00	-8.49	peak
3	375.9385	49.38	-7.11	42.27	46.00	-3.73	peak
4	501.1790	37.18	-5.42	31.76	46.00	-14.24	peak
5	625.0780	42.78	-2.89	39.89	46.00	-6.11	peak
6	875.2470	34.41	0.51	34.92	46.00	-11.08	peak

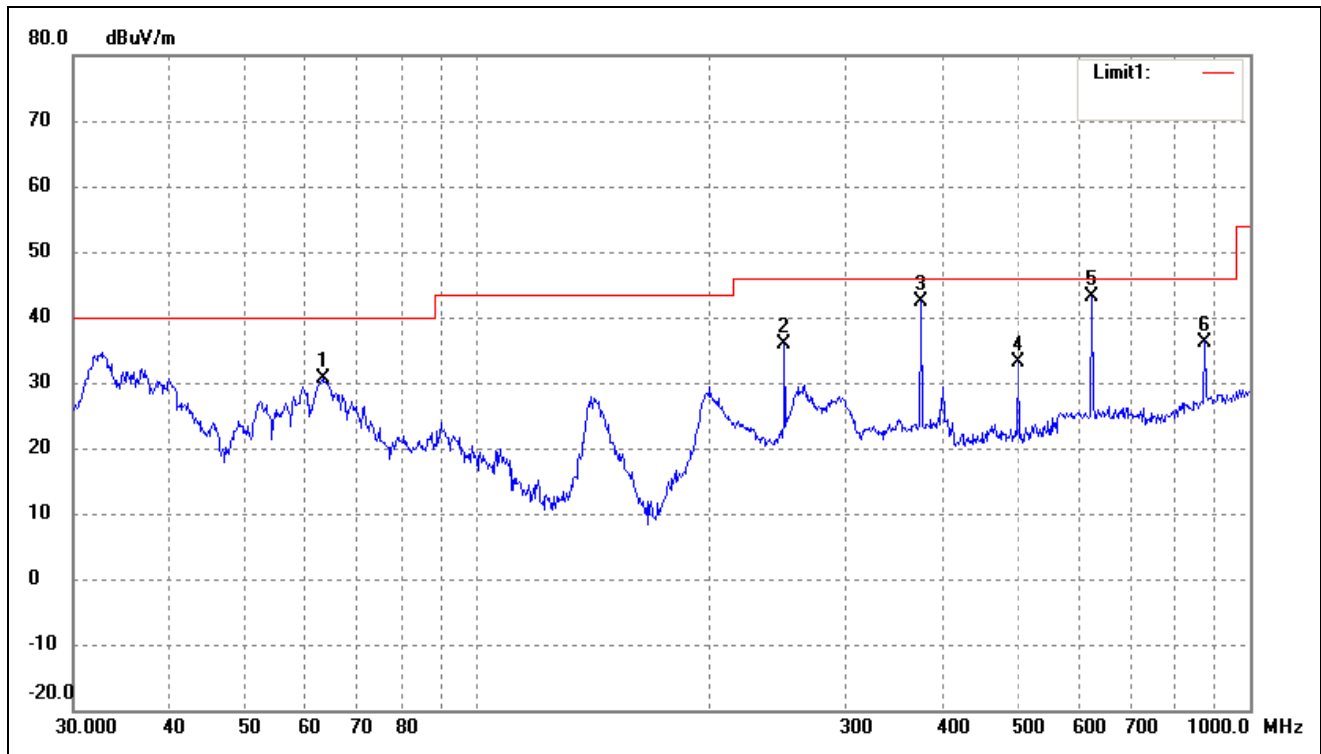
802.11b

Test Channel

Low

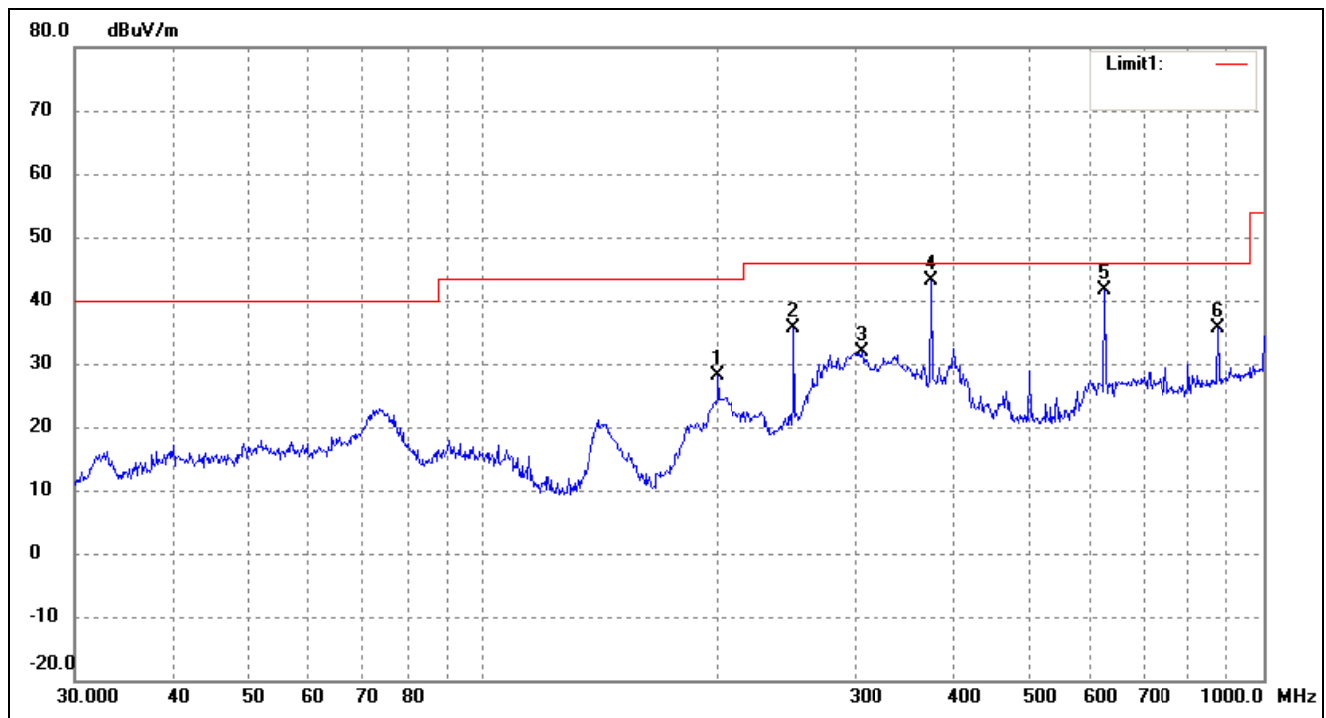
Polarity:

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	63.0916	44.43	-13.74	30.69	40.00	-9.31	peak
2	250.3012	45.79	-9.79	36.00	46.00	-10.00	peak
3	375.9385	49.42	-7.11	42.31	46.00	-3.69	peak
4	501.1790	38.55	-5.42	33.13	46.00	-12.87	peak
5	625.0780	45.92	-2.89	43.03	46.00	-2.97	peak
6	875.2470	35.74	0.51	36.25	46.00	-9.75	peak

802.11b			
Test Channel	Middle	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	199.9856	41.43	-13.20	28.23	43.50	-15.27	peak
2	250.3012	45.52	-9.79	35.73	46.00	-10.27	peak
3	305.6800	40.02	-8.24	31.78	46.00	-14.22	peak
4	375.9385	50.20	-7.11	43.09	46.00	-2.91	peak
5	625.0780	44.42	-2.89	41.53	46.00	-4.47	peak
6	875.2470	35.16	0.51	35.67	46.00	-10.33	peak

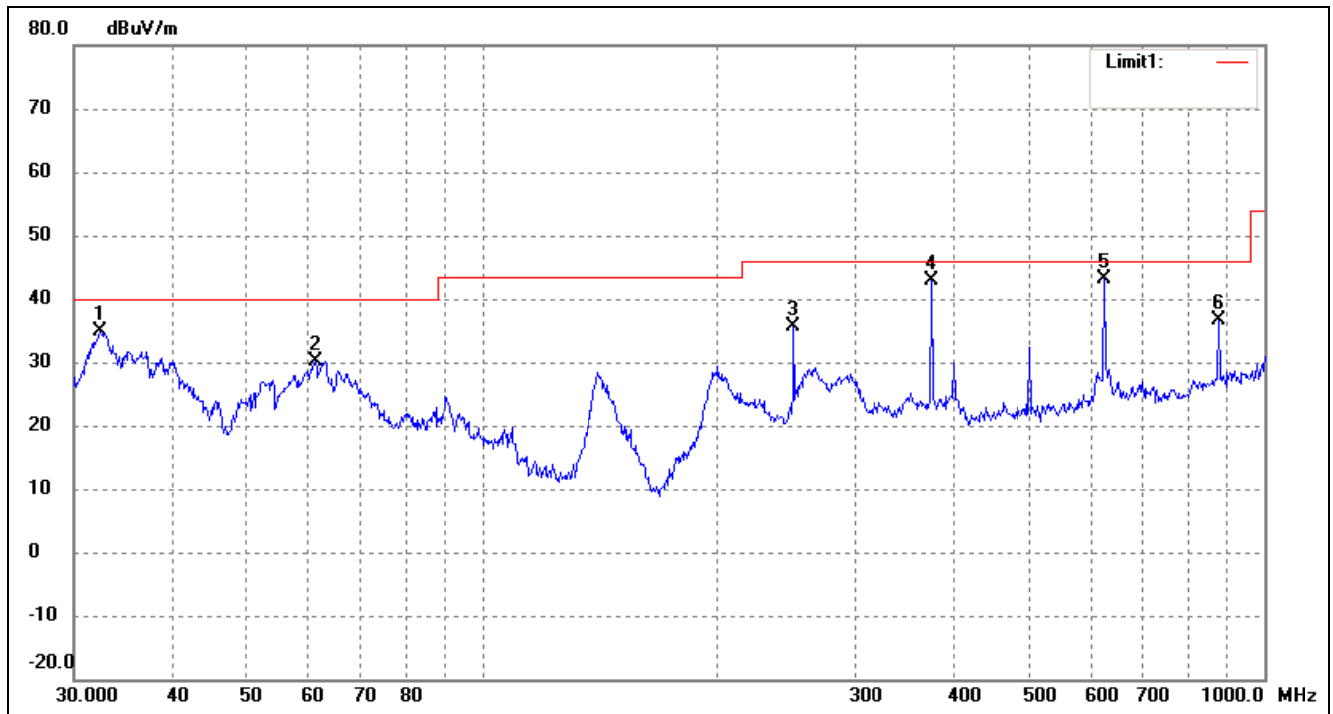
802.11b

Test Channel

Middle

Polarity:

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	32.4059	49.66	-14.83	34.83	40.00	-5.17	peak
2	61.1316	43.66	-13.49	30.17	40.00	-9.83	peak
3	250.3012	45.47	-9.79	35.68	46.00	-10.32	peak
4	375.9385	49.94	-7.11	42.83	46.00	-3.17	peak
5	625.0780	45.98	-2.89	43.09	46.00	-2.91	peak
6	875.2470	36.15	0.51	36.66	46.00	-9.34	peak

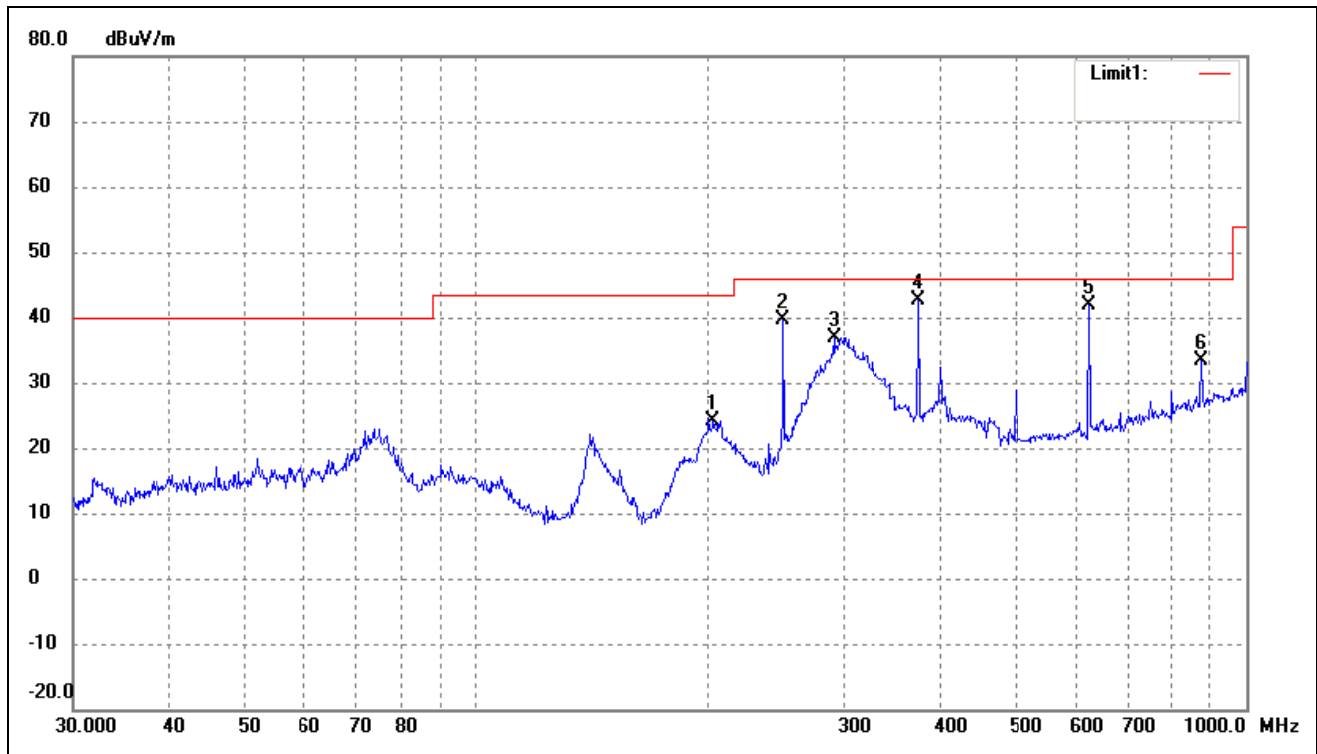
802.11b

Test Channel

High

Polarity:

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	202.8104	37.31	-13.13	24.18	43.50	-19.32	peak
2	250.3012	49.30	-9.79	39.51	46.00	-6.49	peak
3	291.0360	45.35	-8.44	36.91	46.00	-9.09	peak
4	375.9385	49.64	-7.11	42.53	46.00	-3.47	peak
5	625.0780	44.67	-2.89	41.78	46.00	-4.22	peak
6	875.2470	32.76	0.51	33.27	46.00	-12.73	peak

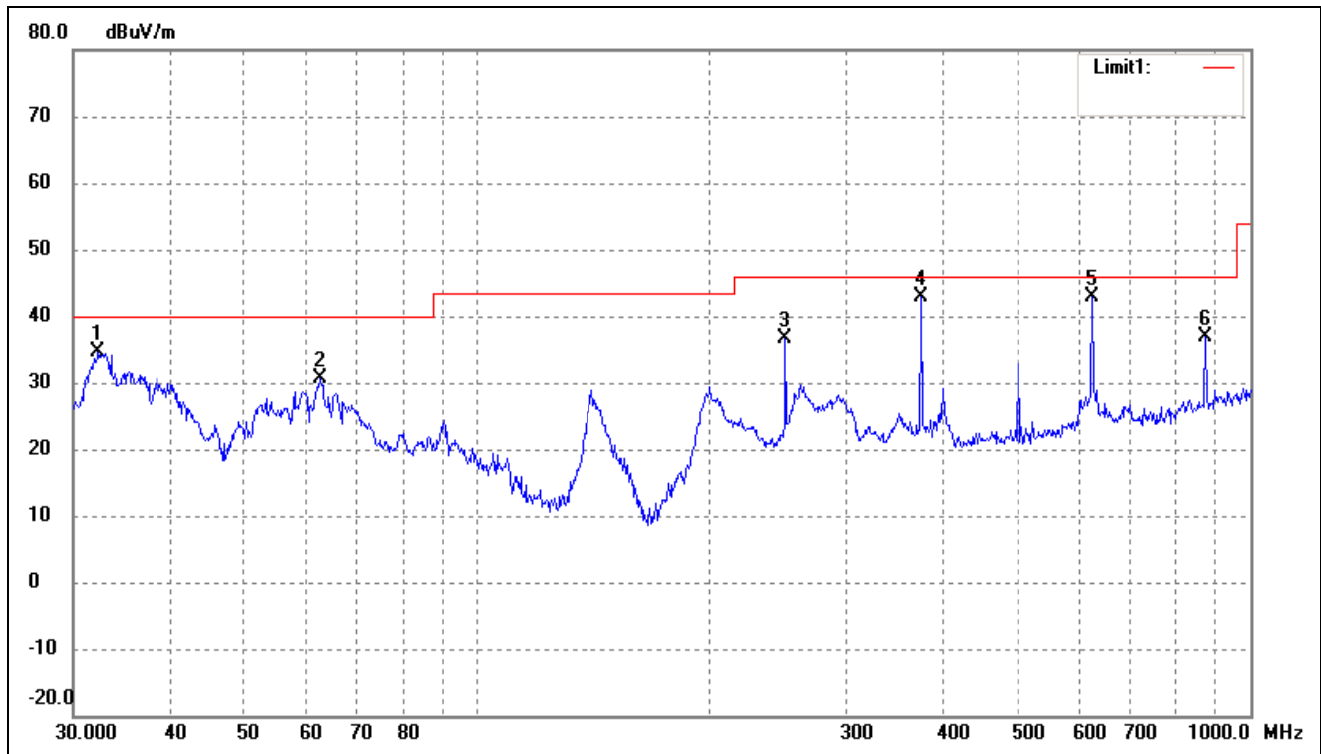
802.11b

Test Channel

High

Polarity:

Vertical

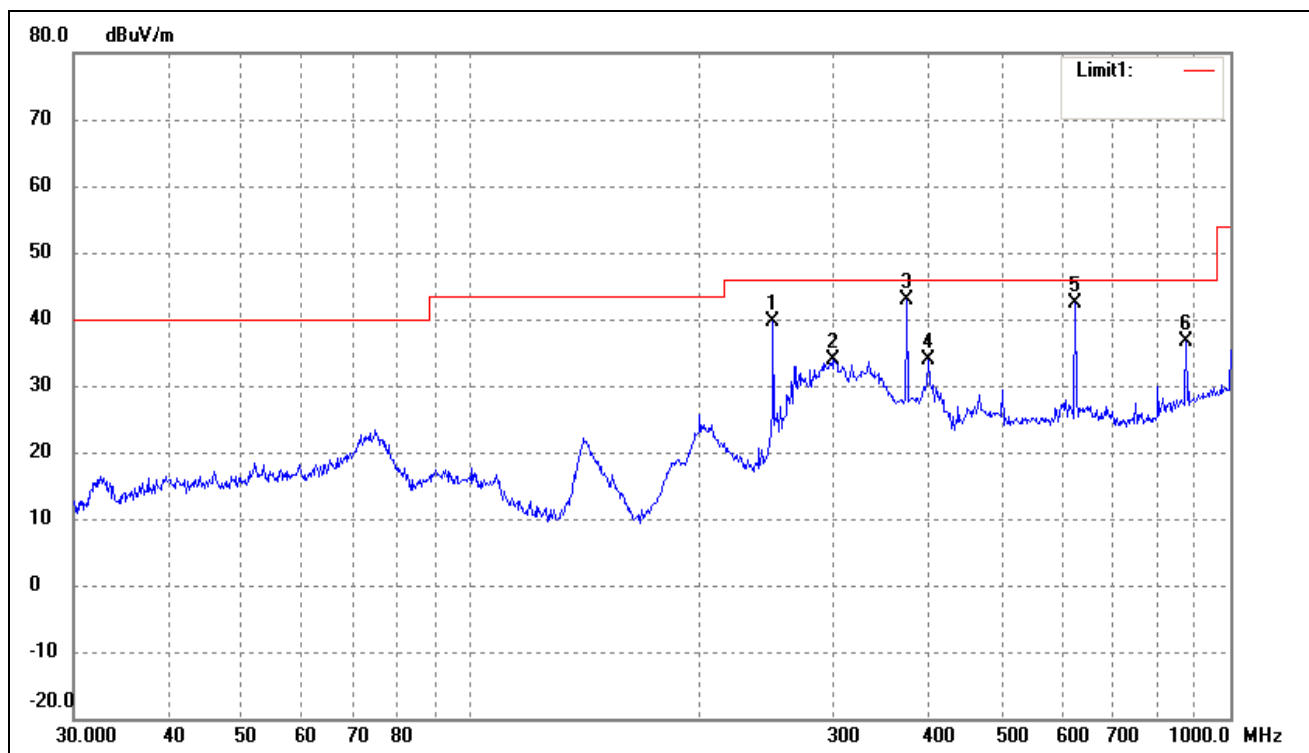


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	32.2925	49.46	-14.83	34.63	40.00	-5.37	peak
2	62.6507	44.28	-13.69	30.59	40.00	-9.41	peak
3	250.3012	46.41	-9.79	36.62	46.00	-9.38	peak
4	375.9385	49.93	-7.11	42.82	46.00	-3.18	peak
5	625.0780	45.71	-2.89	42.82	46.00	-3.18	peak
6	875.2470	36.26	0.51	36.77	46.00	-9.23	peak

➤ Spurious Emissions Below 1GHz

Antenna 1

802.11b			
Test Channel	Low	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	250.3012	49.30	-9.79	39.51	46.00	-6.49	peak
2	300.3673	42.13	-8.15	33.98	46.00	-12.02	peak
3	375.9385	49.93	-7.11	42.82	46.00	-3.18	peak
4	400.4319	40.66	-6.74	33.92	46.00	-12.08	peak
5	625.0780	45.17	-2.89	42.28	46.00	-3.72	peak
6	875.2470	36.01	0.51	36.52	46.00	-9.48	peak

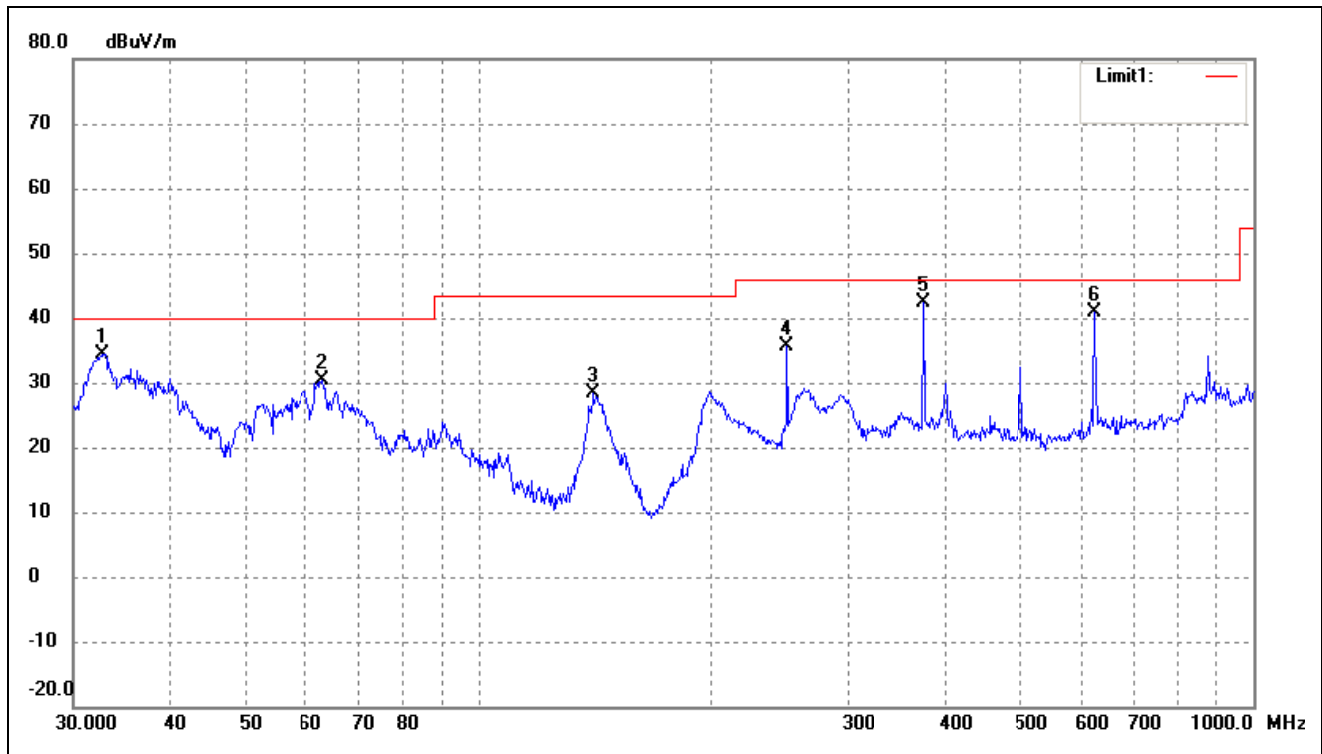
802.11b

Test Channel

Low

Polarity:

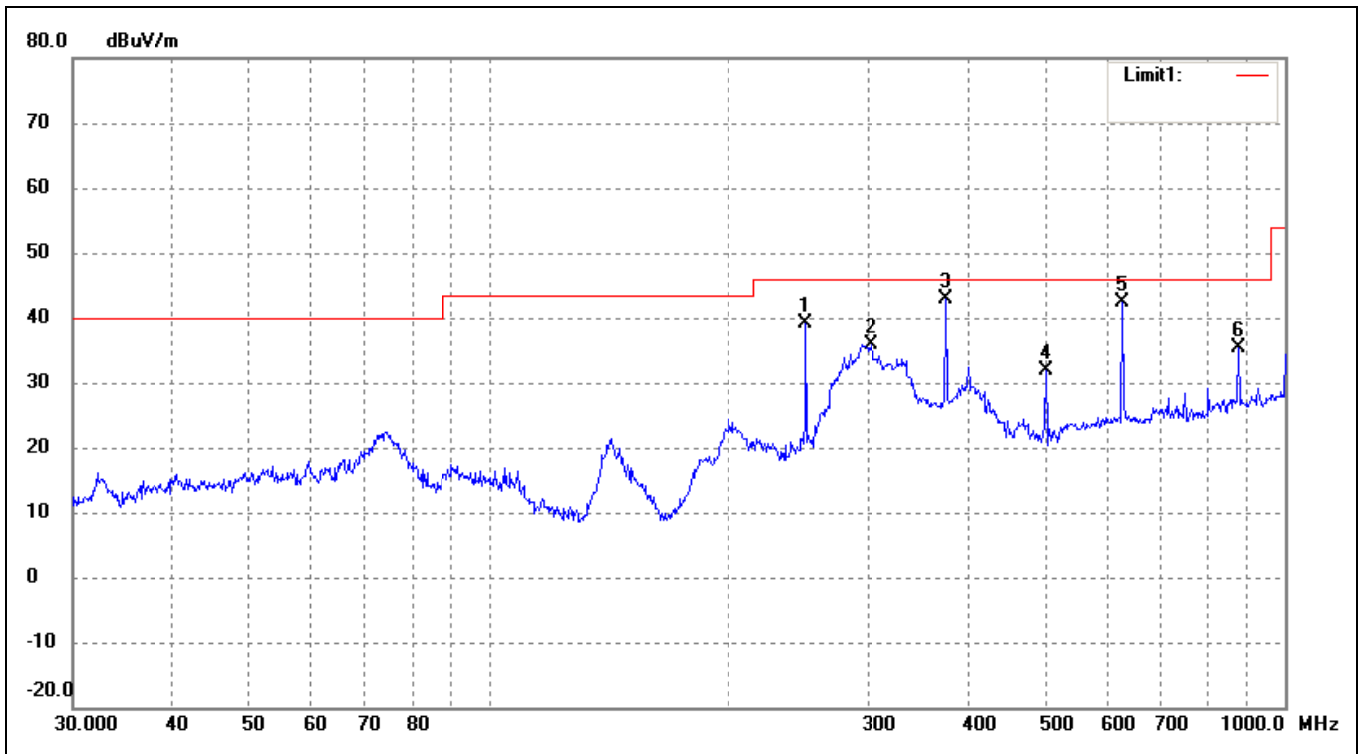
Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	32.7486	49.26	-14.83	34.43	40.00	-5.57	peak
2	62.8708	44.12	-13.71	30.41	40.00	-9.59	peak
3	140.8351	45.68	-17.29	28.39	43.50	-15.11	peak
4	250.3012	45.43	-9.79	35.64	46.00	-10.36	peak
5	375.9385	49.61	-7.11	42.50	46.00	-3.50	peak
6	625.0780	43.70	-2.89	40.81	46.00	-5.19	peak

802.11b

Test Channel	Middle	Polarity:	Horizontal
--------------	--------	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	250.3012	48.88	-9.79	39.09	46.00	-6.91	peak
2	302.4812	44.11	-8.19	35.92	46.00	-10.08	peak
3	375.9385	50.05	-7.11	42.94	46.00	-3.06	peak
4	501.1790	37.25	-5.42	31.83	46.00	-14.17	peak
5	625.0780	45.18	-2.89	42.29	46.00	-3.71	peak
6	875.2470	34.91	0.51	35.42	46.00	-10.58	peak

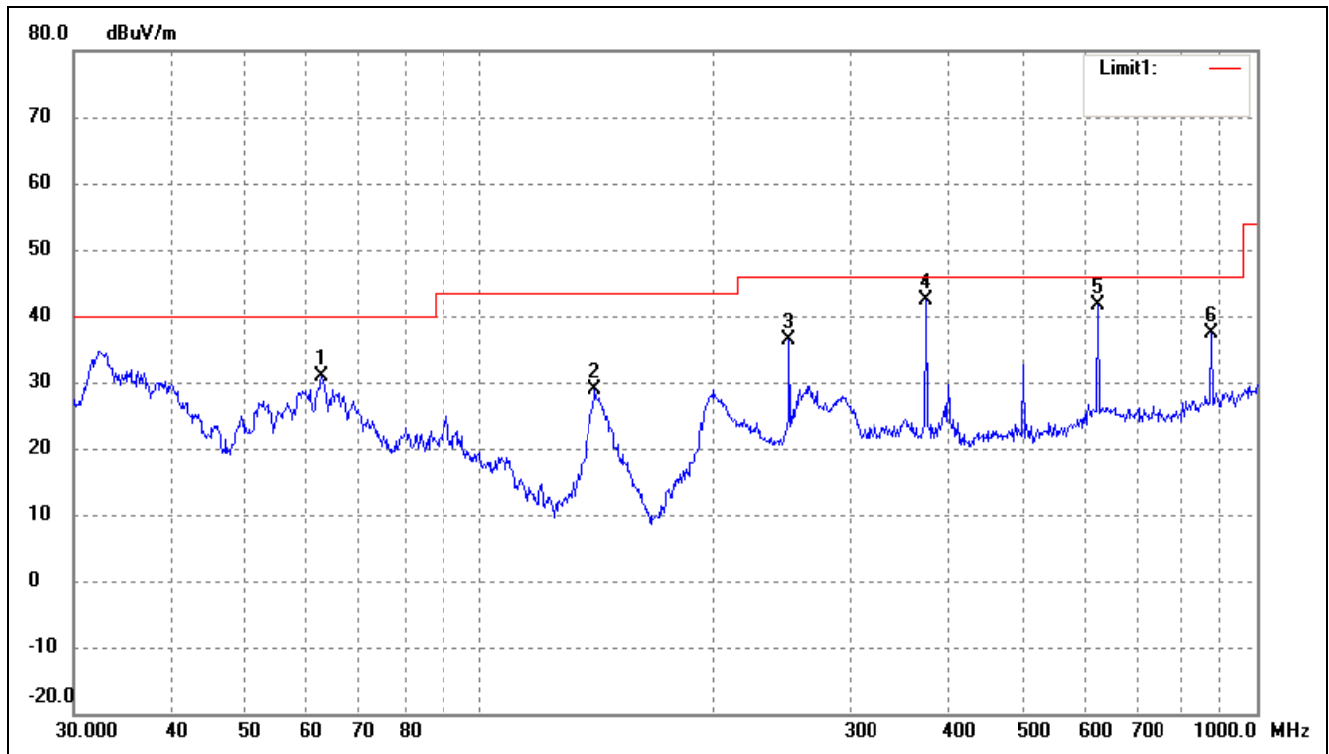
802.11b

Test Channel

Middle

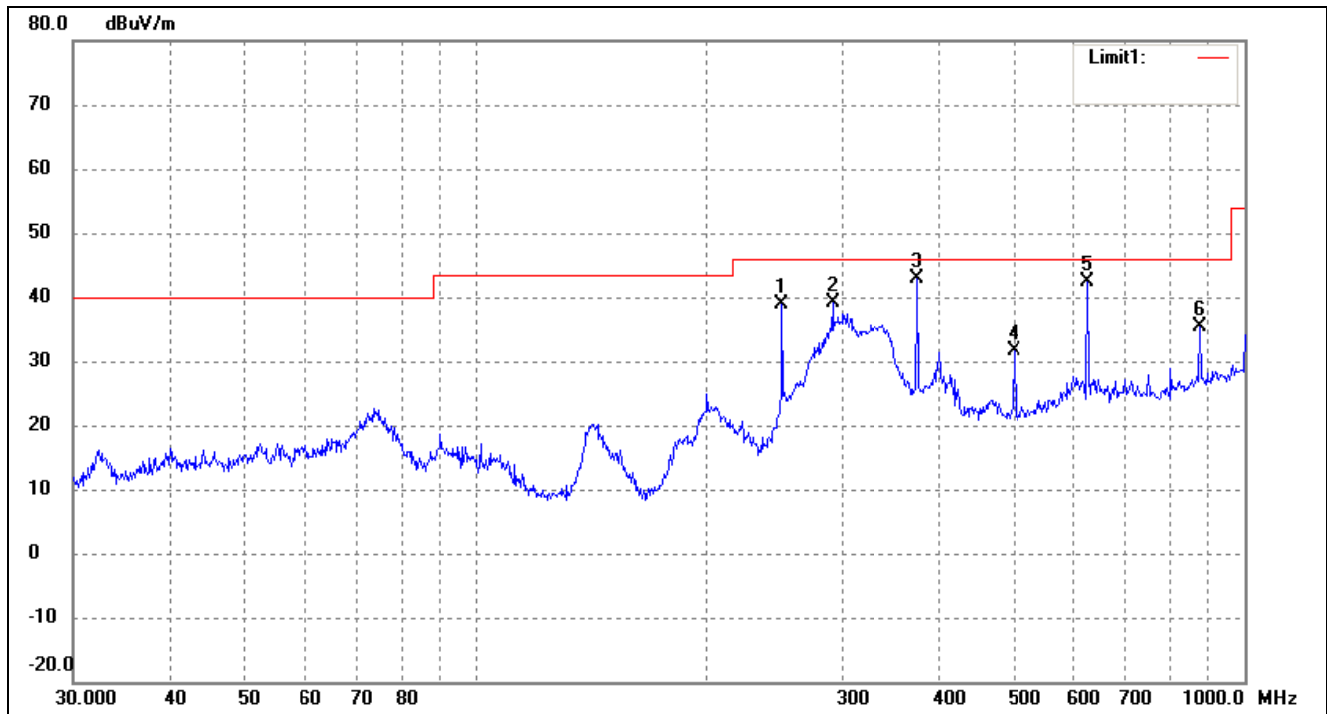
Polarity:

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	62.6507	44.51	-13.69	30.82	40.00	-9.18	peak
2	140.8351	46.14	-17.29	28.85	43.50	-14.65	peak
3	250.3012	46.28	-9.79	36.49	46.00	-9.51	peak
4	375.9385	49.52	-7.11	42.41	46.00	-3.59	peak
5	625.0780	44.55	-2.89	41.66	46.00	-4.34	peak
6	875.2470	36.98	0.51	37.49	46.00	-8.51	peak

802.11b			
Test Channel	High	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	250.3012	48.58	-9.79	38.79	46.00	-7.21	peak
2	291.0360	47.69	-8.44	39.25	46.00	-6.75	peak
3	375.9385	49.98	-7.11	42.87	46.00	-3.13	peak
4	501.1790	37.15	-5.42	31.73	46.00	-14.27	peak
5	625.0780	45.30	-2.89	42.41	46.00	-3.59	peak
6	875.2470	34.82	0.51	35.33	46.00	-10.67	peak

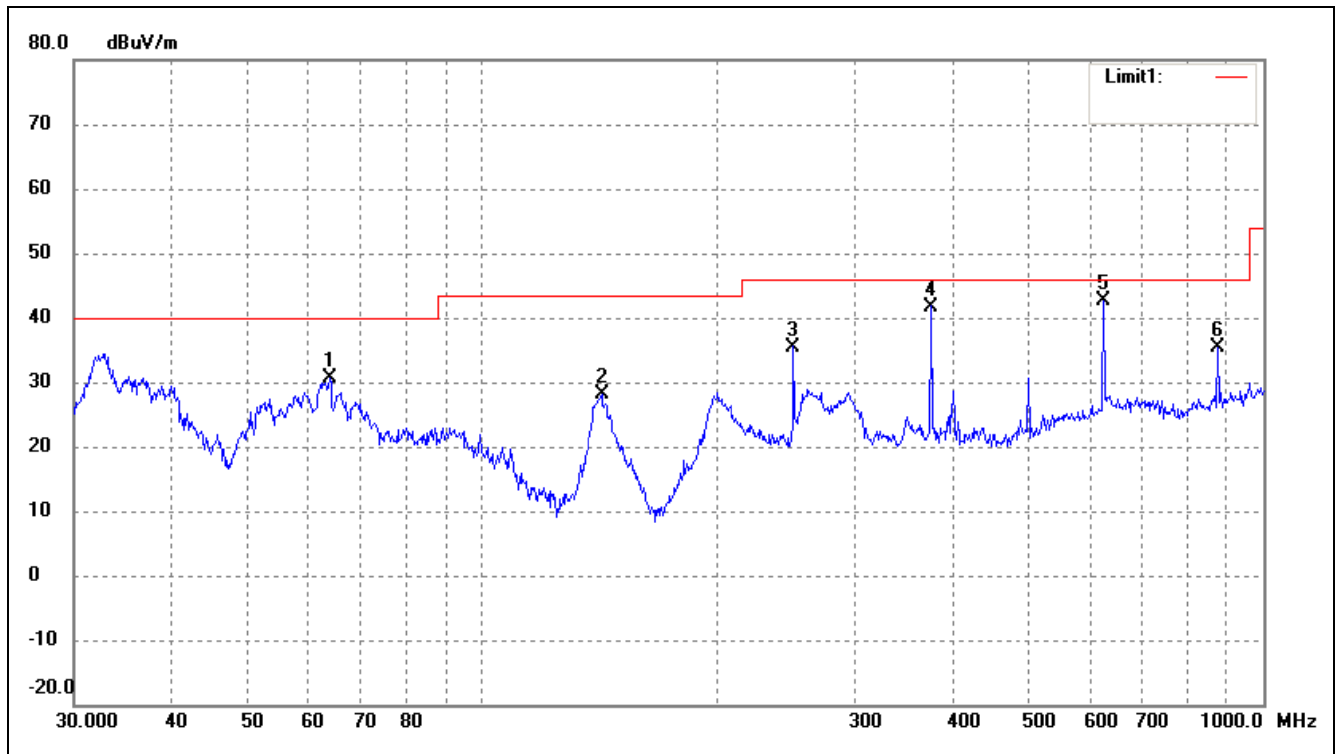
802.11b

Test Channel

High

Polarity:

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	63.7588	44.44	-13.84	30.60	40.00	-9.40	peak
2	142.3244	45.57	-17.37	28.20	43.50	-15.30	peak
3	250.3012	45.29	-9.79	35.50	46.00	-10.50	peak
4	375.9385	48.86	-7.11	41.75	46.00	-4.25	peak
5	625.0780	45.52	-2.89	42.63	46.00	-3.37	peak
6	875.2470	34.85	0.51	35.36	46.00	-10.64	peak

➤ Spurious Emissions Above 1GHz

➤ Test Mode: 802.11b (worst case)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	60.13	-3.87	56.26	74	-17.74	H	PK
4824.000	41.65	-3.87	37.78	54	-16.22	H	AV
7236.000	53.03	1.14	54.17	74	-19.83	H	PK
7236.000	40.24	1.19	41.43	54	-12.57	H	AV
4824.000	61.85	-3.86	57.99	74	-16.01	V	PK
4824.000	43.37	-3.86	39.51	54	-14.49	V	AV
7236.000	53.17	1.1	54.27	74	-19.73	V	PK
7236.000	39.14	1.1	40.24	54	-13.76	V	AV
Middle Channel-2437MHz							
4874.000	59.76	-3.74	56.02	74	-17.98	H	PK
4874.000	43.24	-3.74	39.5	54	-14.5	H	AV
7311.000	55.76	1.47	57.23	74	-16.77	H	PK
7311.000	39.53	1.47	41	54	-13	H	AV
4874.000	58.49	-3.74	54.75	74	-19.25	V	PK
4874.000	43.99	-3.74	40.25	54	-13.75	V	AV
7311.000	55.97	1.47	57.44	74	-16.56	V	PK
7311.000	40.14	1.47	41.61	54	-12.39	V	AV
High Channel-2462MHz							
4924.000	58.12	-3.59	54.53	74	-19.47	H	PK
4924.000	43.23	-3.59	39.64	54	-14.36	H	AV
7386.000	52.97	1.79	54.76	74	-19.24	H	PK
7386.000	39.43	1.79	41.22	54	-12.78	H	AV
4924.000	58.39	-3.59	54.8	74	-19.2	V	PK
4924.000	43.41	-3.59	39.82	54	-14.18	V	AV
7386.000	54.92	1.79	56.71	74	-17.29	V	PK
7386.000	39.98	1.79	41.77	54	-12.23	V	AV

Note: Testing is carried out with frequency rang 9kHz 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.

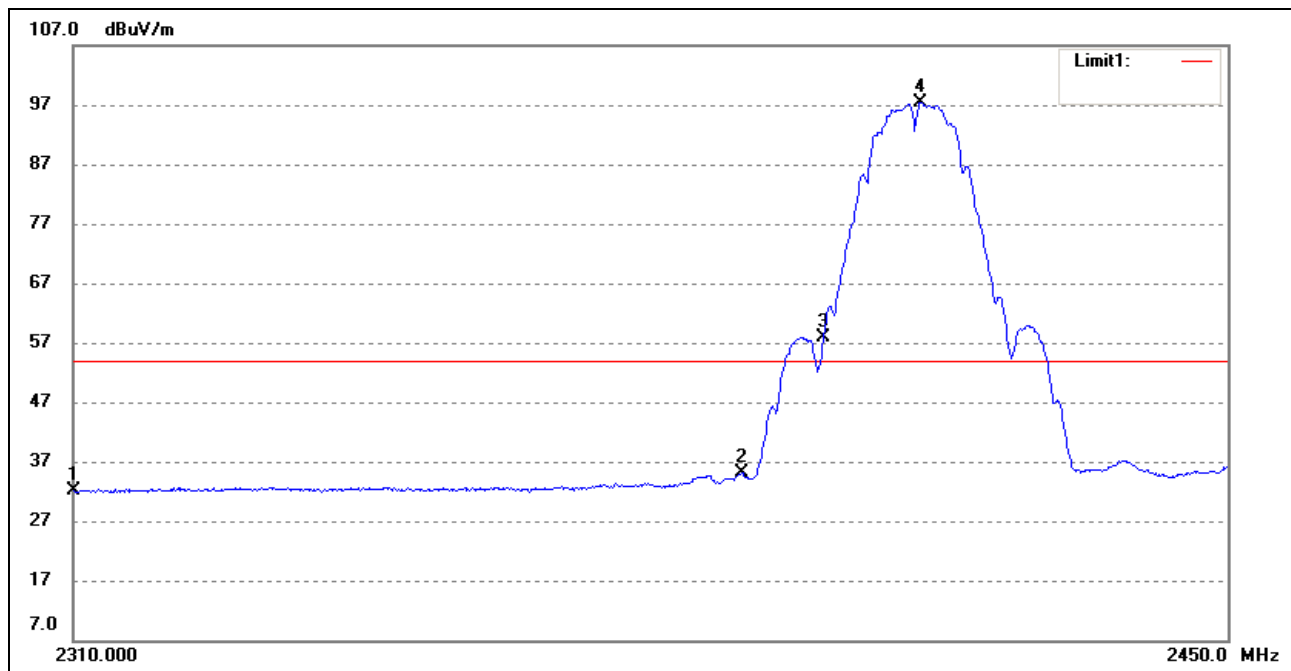
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

9.3 Summary of Test Results/Plots

Antenna 0

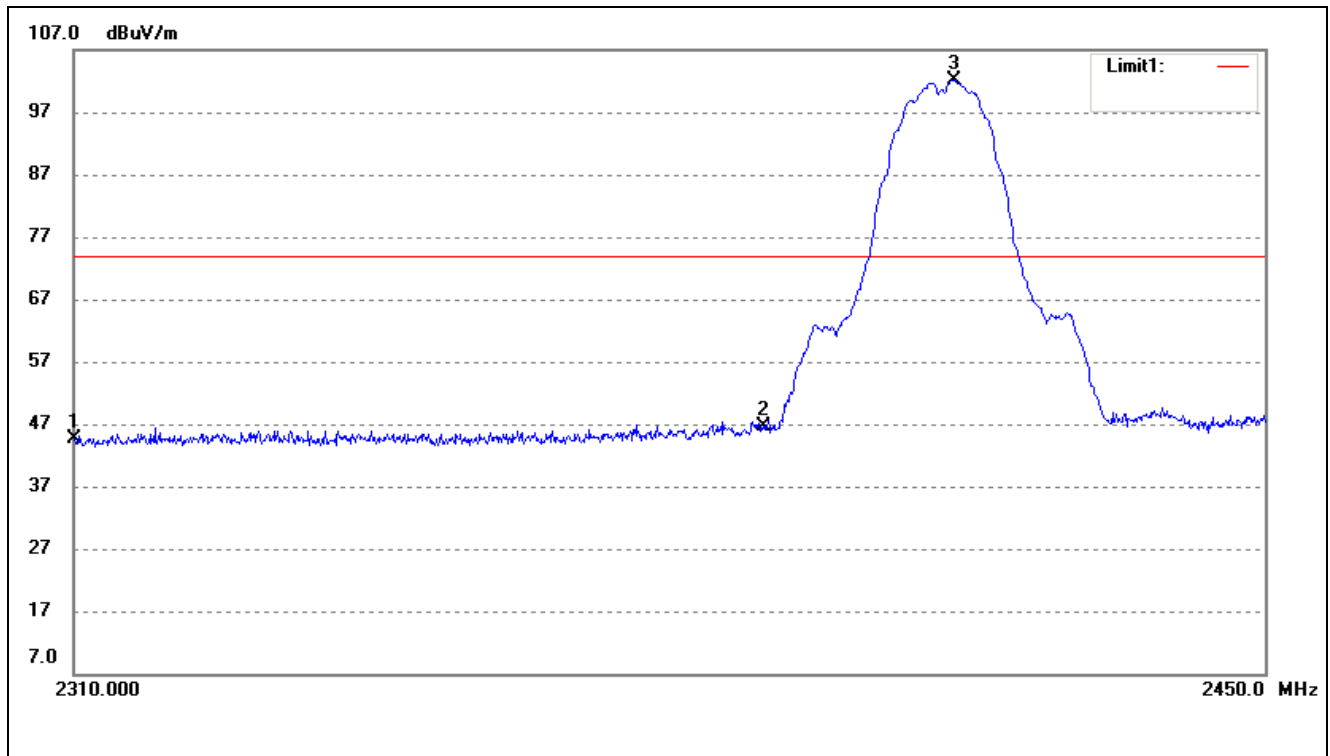
➤ Radiated test

802.11b			
Test Channel	Low	Polarity:	Vertical(worst case)



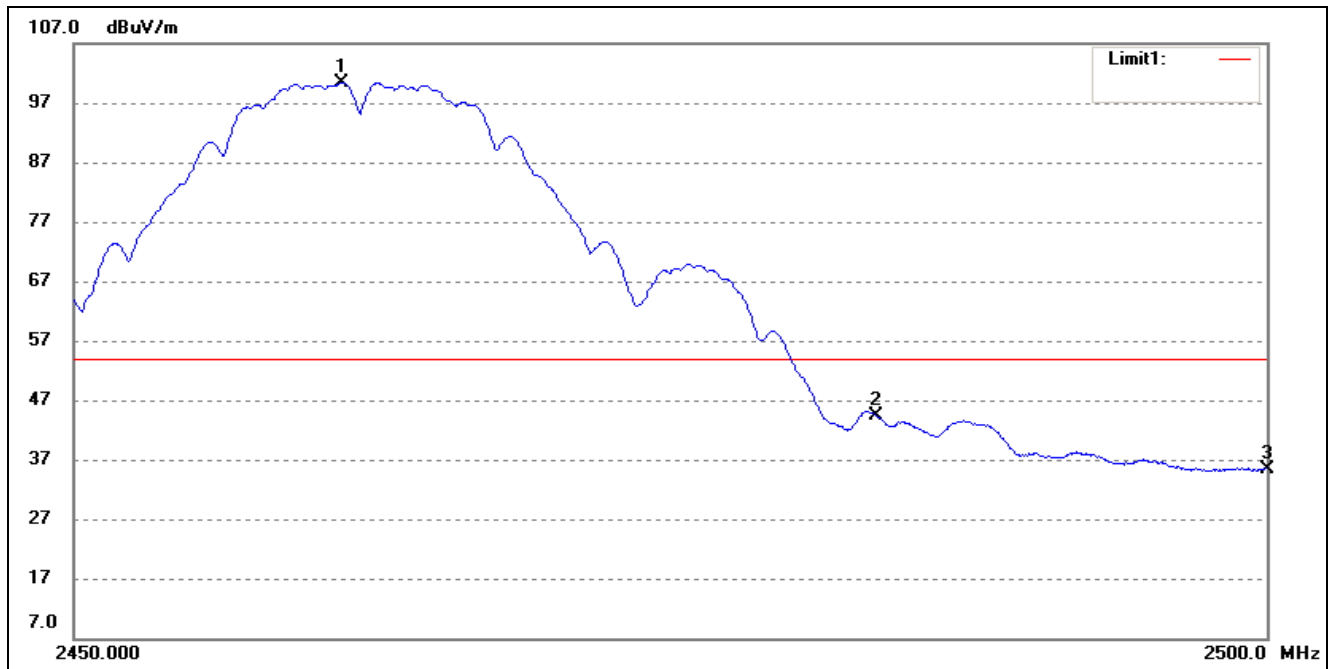
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	39.81	-7.78	32.03	54.00	-21.97	peak
2	2390.000	42.34	-7.32	35.02	54.00	-18.98	peak
3	2400.000	65.22	-7.26	57.96	54.00	3.96	peak
4	2411.952	104.61	-7.19	97.42	54.00	43.42	peak

802.11b			
Test Channel	Low	Polarity:	Vertical(worst case)



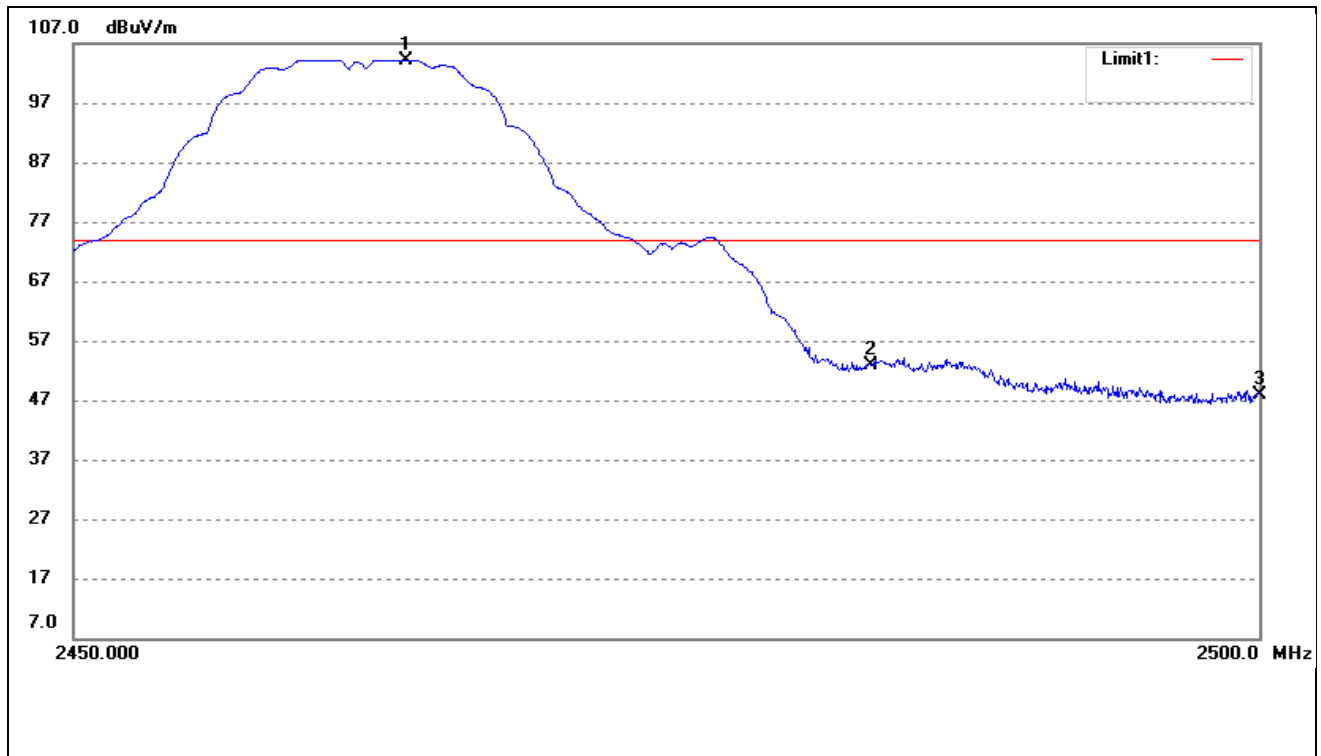
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	52.35	-7.78	44.57	74.00	-29.43	peak
2	2390.000	53.91	-7.32	46.59	74.00	-27.41	peak
3	2412.662	109.43	-7.18	102.25	74.00	28.25	peak

802.11b			
Test Channel	High	Polarity:	Vertical(worst case)



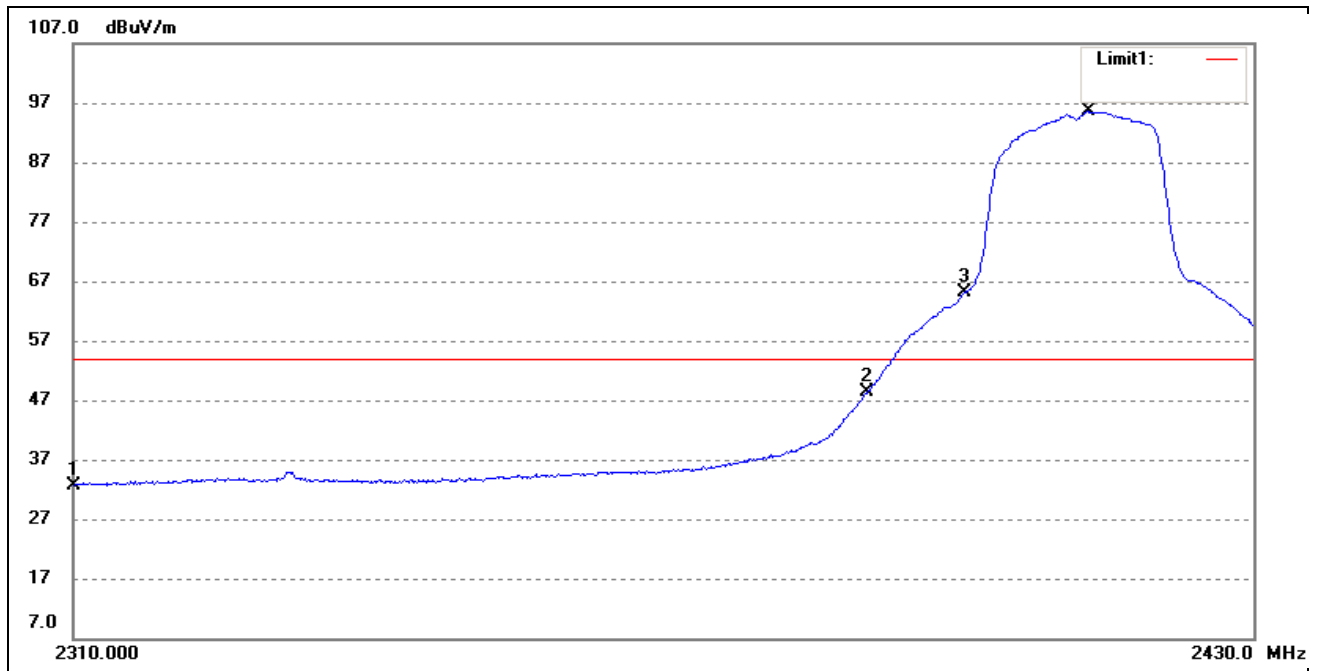
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.162	107.33	-6.90	100.43	54.00	46.43	peak
2	2483.500	51.16	-6.77	44.39	54.00	-9.61	peak
3	2500.000	41.99	-6.67	35.32	54.00	-18.68	peak

802.11b			
Test Channel	High	Polarity:	Vertical(worst case)



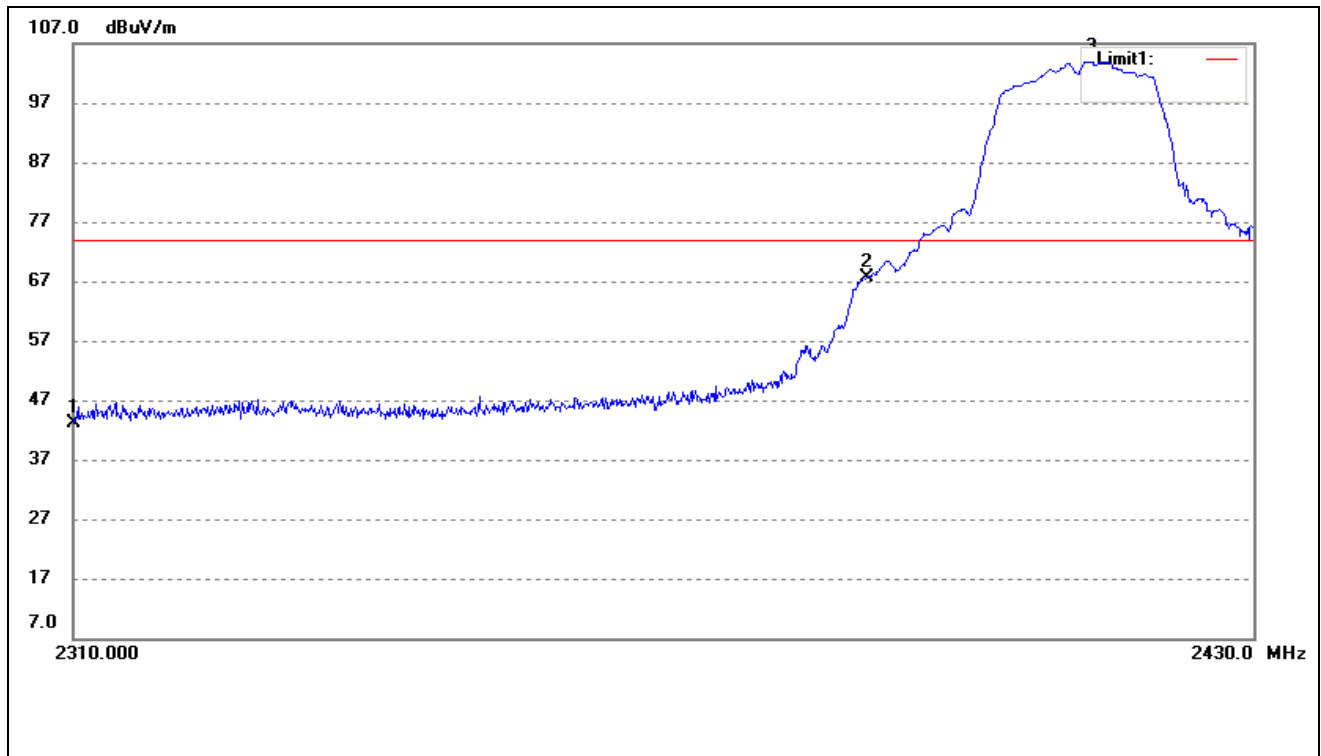
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.898	111.06	-6.89	104.17	74.00	30.17	peak
2	2483.500	59.61	-6.77	52.84	74.00	-21.16	peak
3	2500.000	54.66	-6.67	47.99	74.00	-26.01	peak

802.11g			
Test Channel	Low	Polarity:	Vertical(worst case)



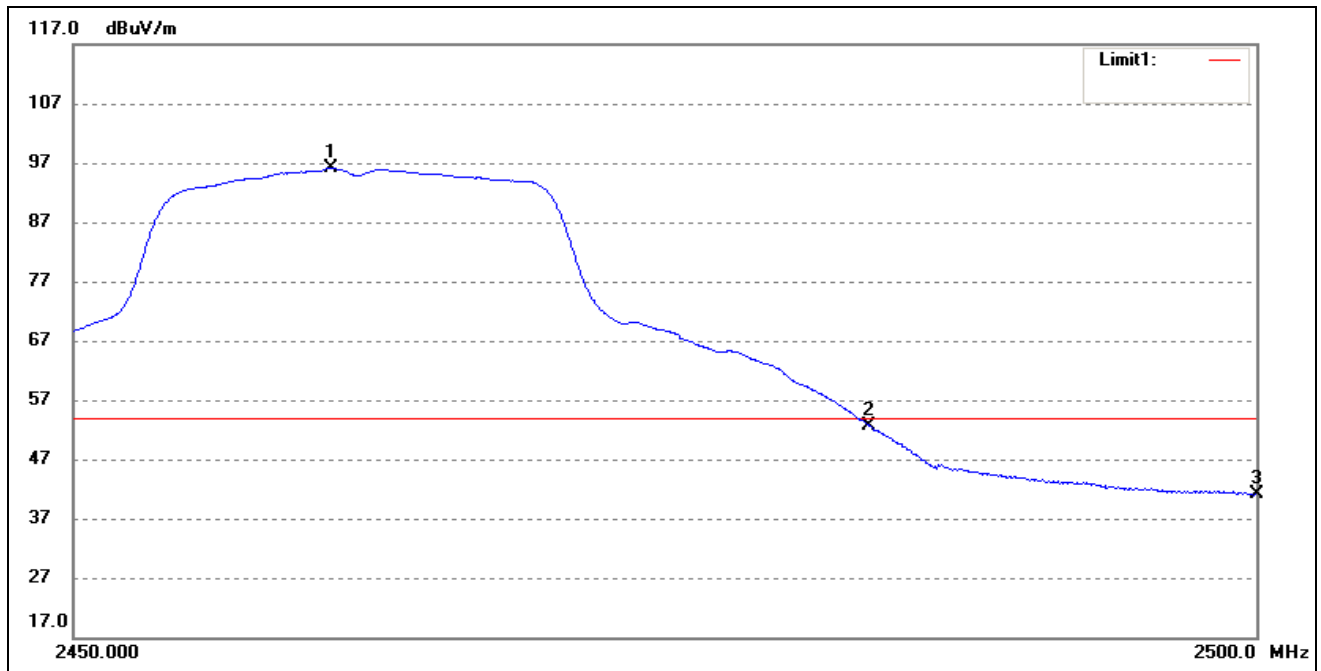
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	40.47	-7.78	32.69	54.00	-21.31	peak
2	2390.000	55.72	-7.32	48.40	54.00	-5.60	peak
3	2400.000	72.33	-7.26	65.07	54.00	11.07	peak
4	2412.832	102.72	-7.18	95.54	54.00	41.54	peak

802.11g			
Test Channel	Low	Polarity:	Vertical(worst case)



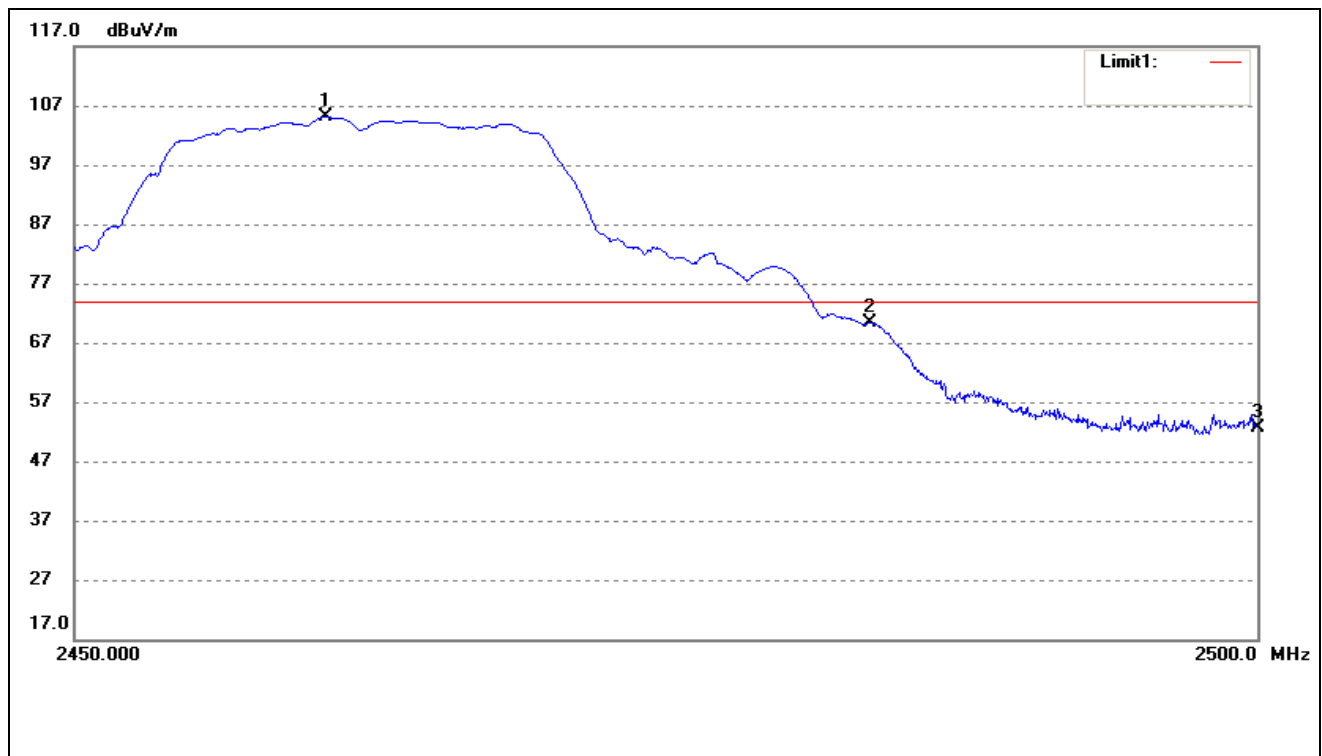
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	50.88	-7.78	43.10	74.00	-30.90	peak
2	2390.000	74.92	-7.32	67.60	74.00	-6.40	peak
3	2413.198	111.11	-7.18	103.93	74.00	29.93	peak

802.11g			
Test Channel	High	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.814	103.03	-6.90	96.13	54.00	42.13	peak
2	2483.500	59.33	-6.77	52.56	54.00	-1.44	peak
3	2500.000	47.69	-6.67	41.02	54.00	-12.98	peak

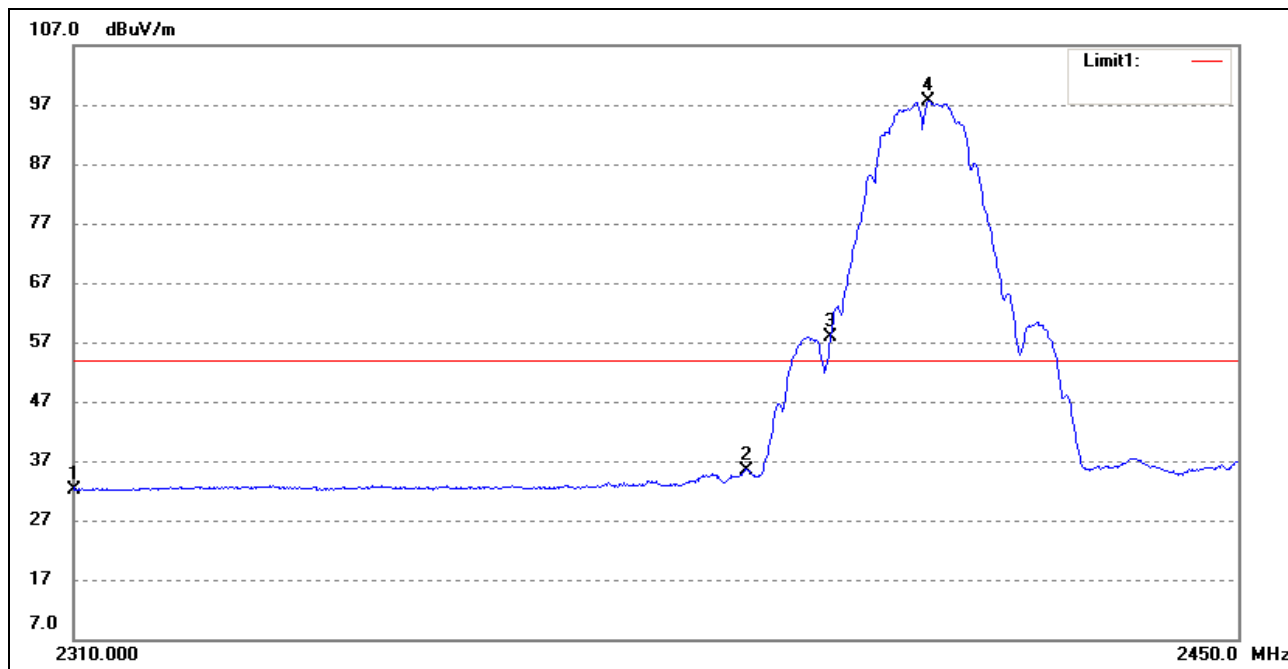
802.11g			
Test Channel	High	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.566	112.01	-6.90	105.11	74.00	31.11	peak
2	2483.500	77.19	-6.77	70.42	74.00	-3.58	peak
3	2500.000	59.31	-6.67	52.64	74.00	-21.36	peak

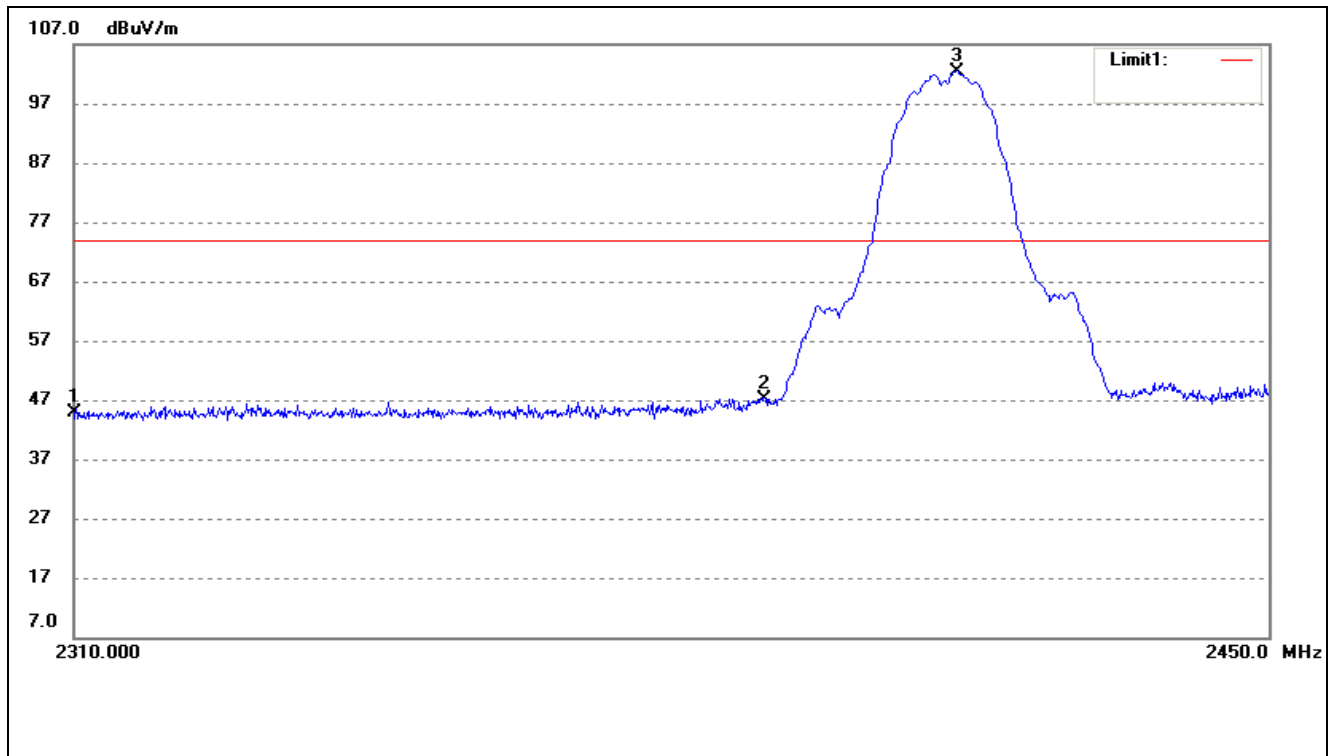
Antenna 1

802.11b			
Test Channel	Low	Polarity:	Vertical(worst case)



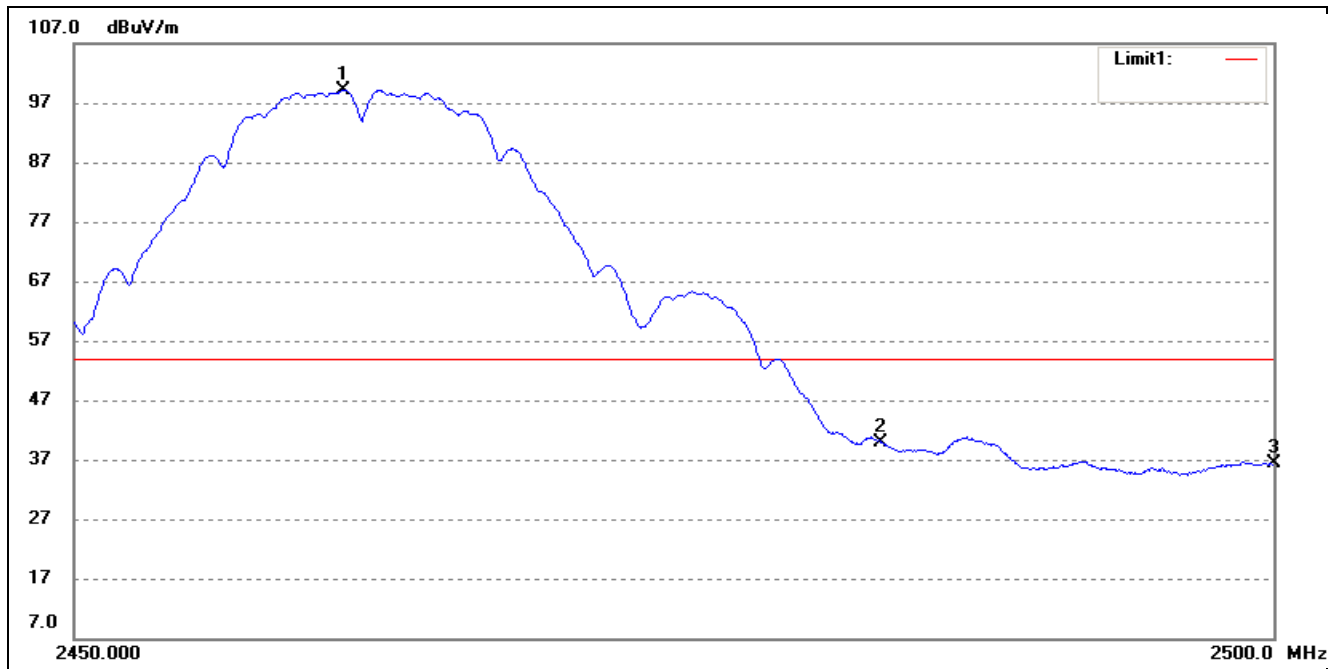
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	39.88	-7.78	32.10	54.00	-21.90	peak
2	2390.000	42.77	-7.32	35.45	54.00	-18.55	peak
3	2400.000	65.12	-7.26	57.86	54.00	3.86	peak
4	2411.952	104.82	-7.19	97.63	54.00	43.63	peak

802.11b			
Test Channel	Low	Polarity:	Vertical(worst case)



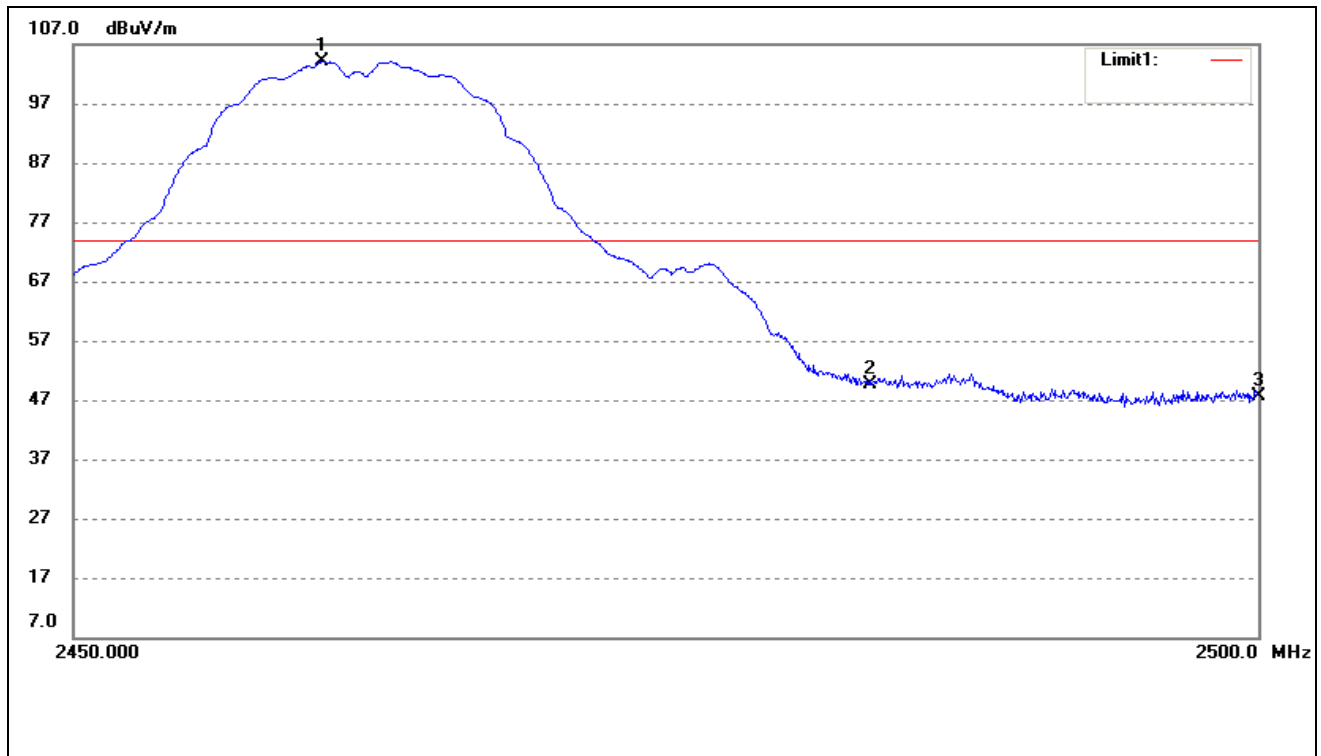
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	52.65	-7.78	44.87	74.00	-29.13	peak
2	2390.000	54.56	-7.32	47.24	74.00	-26.76	peak
3	2412.662	109.68	-7.18	102.50	74.00	28.50	peak

802.11b			
Test Channel	High	Polarity:	Vertical(worst case)



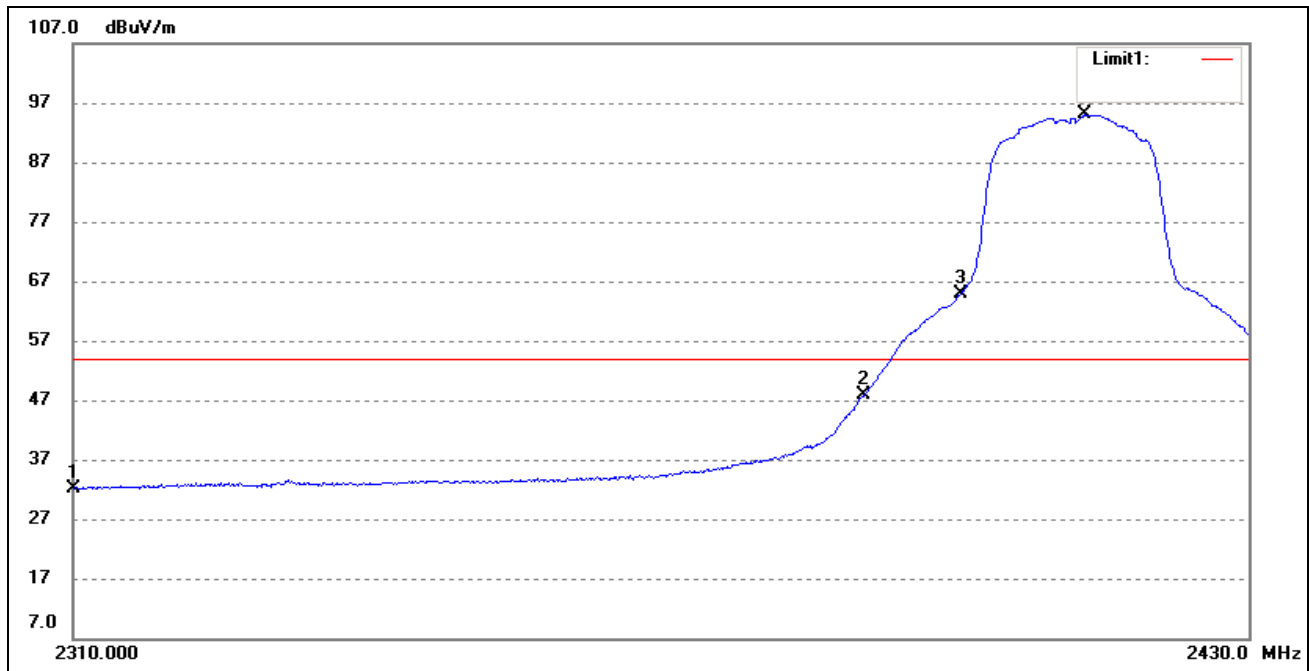
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.162	106.03	-6.90	99.13	54.00	45.13	peak
2	2483.500	46.75	-6.77	39.98	54.00	-14.02	peak
3	2500.000	42.97	-6.67	36.30	54.00	-17.70	peak

802.11b			
Test Channel	High	Polarity:	Vertical(worst case)



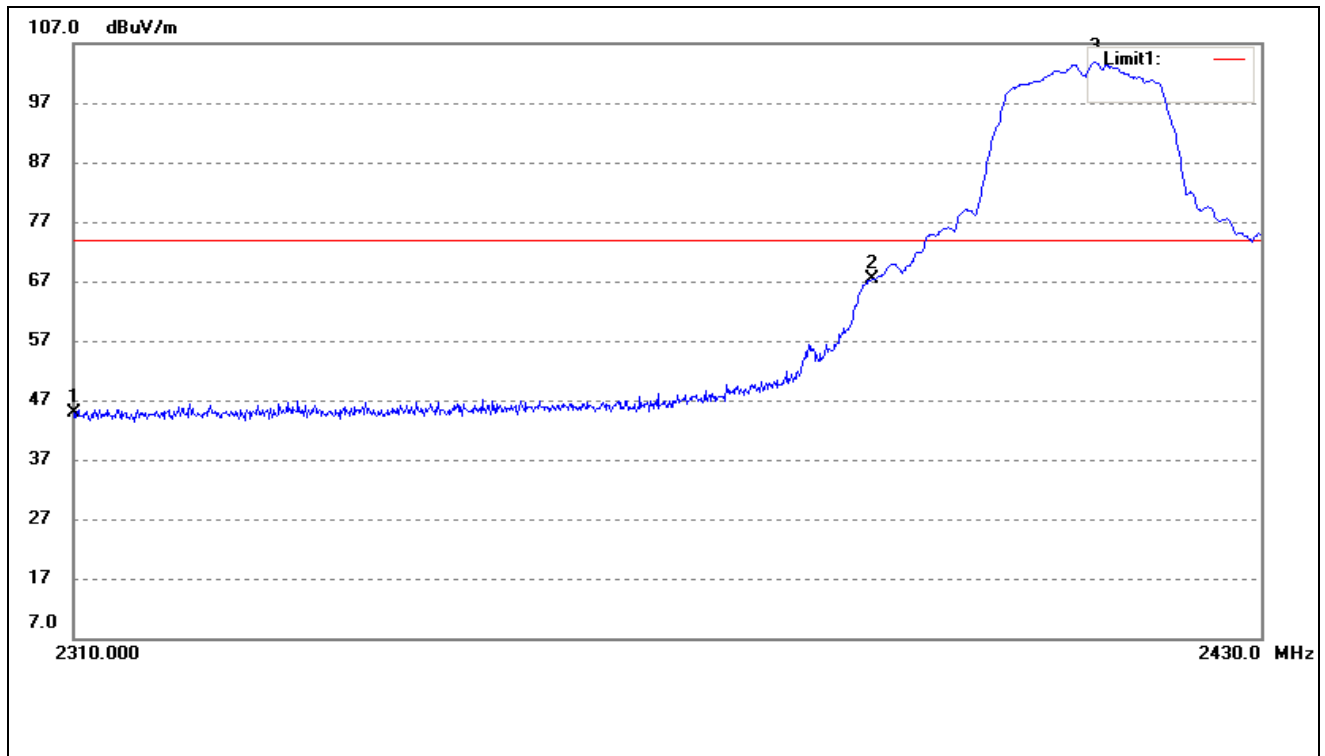
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.416	110.93	-6.90	104.03	74.00	30.03	peak
2	2483.500	56.47	-6.77	49.70	74.00	-24.30	peak
3	2500.000	54.30	-6.67	47.63	74.00	-26.37	peak

802.11g			
Test Channel	Low	Polarity:	Vertical(worst case)



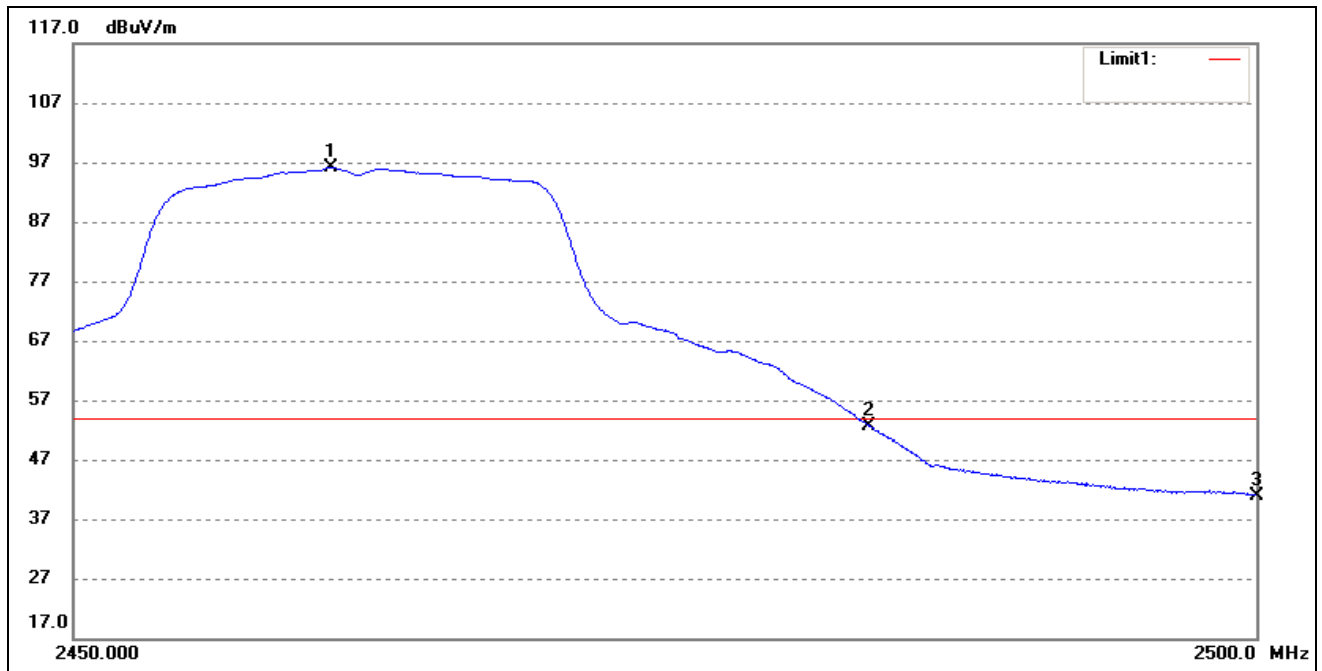
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	39.92	-7.78	32.14	54.00	-21.86	peak
2	2390.000	55.16	-7.32	47.84	54.00	-6.16	peak
3	2400.000	72.19	-7.26	64.93	54.00	10.93	peak
4	2412.832	102.20	-7.18	95.02	54.00	41.02	peak

802.11n-HT20			
Test Channel	Low	Polarity:	Vertical(worst case)



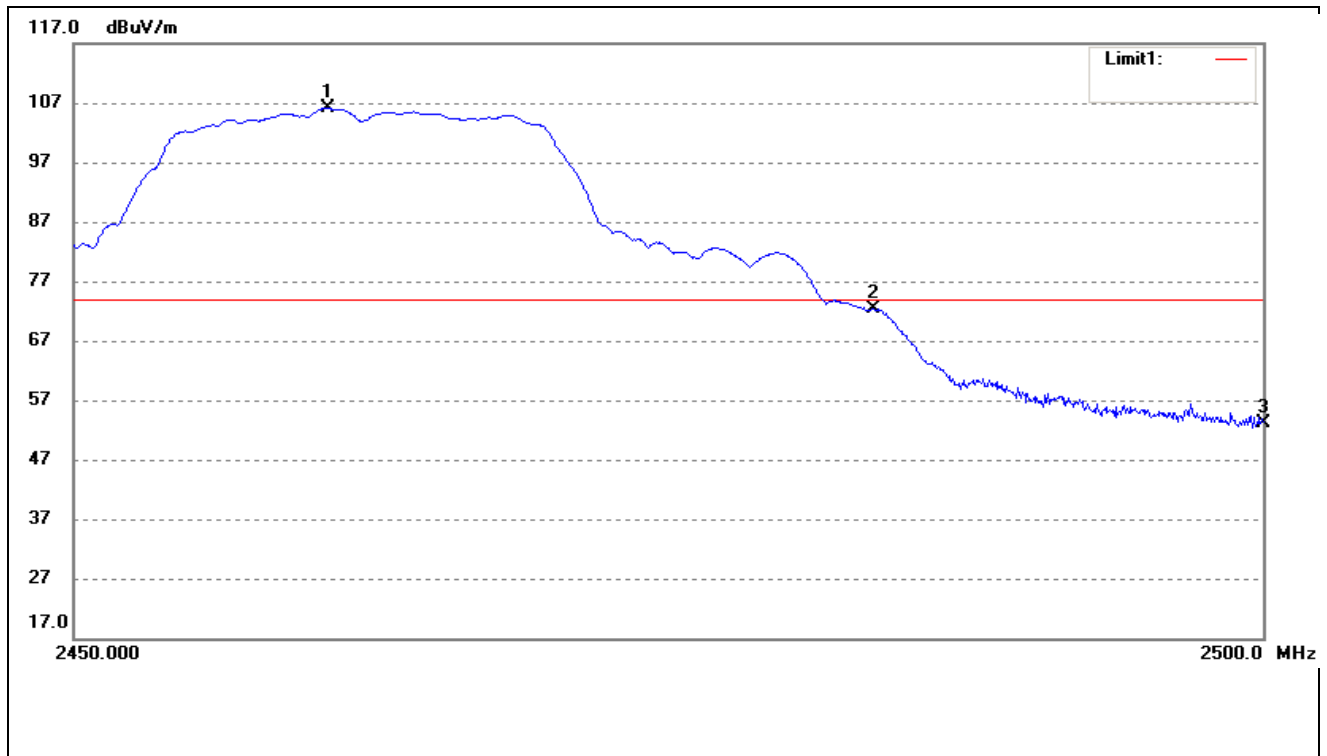
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	52.73	-7.78	44.95	74.00	-29.05	peak
2	2390.000	74.71	-7.32	67.39	74.00	-6.61	peak
3	2412.954	110.98	-7.18	103.80	74.00	29.80	peak

802.11g			
Test Channel	High	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.814	103.04	-6.90	96.14	54.00	42.14	peak
2	2483.500	59.44	-6.77	52.67	54.00	-1.33	peak
3	2500.000	47.64	-6.67	40.97	54.00	-13.03	peak

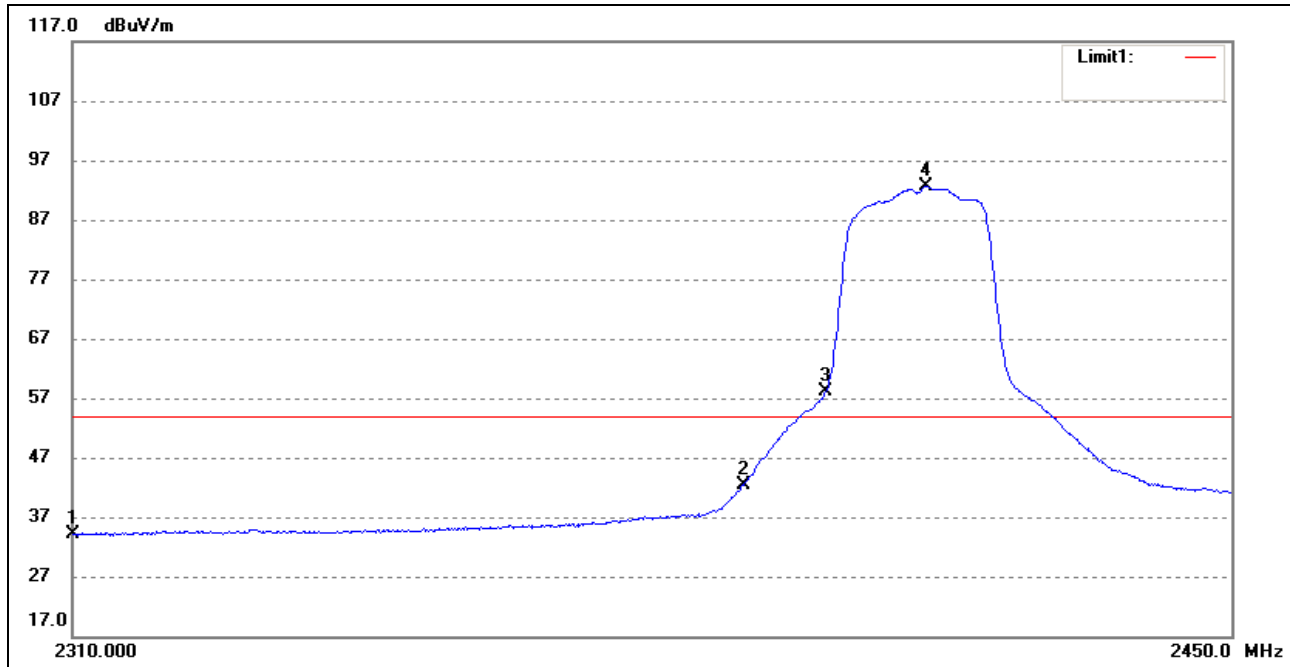
802.11g			
Test Channel	High	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.615	113.00	-6.90	106.10	74.00	32.10	peak
2	2483.500	79.03	-6.77	72.26	74.00	-1.74	peak
3	2500.000	59.92	-6.67	53.25	74.00	-20.75	peak

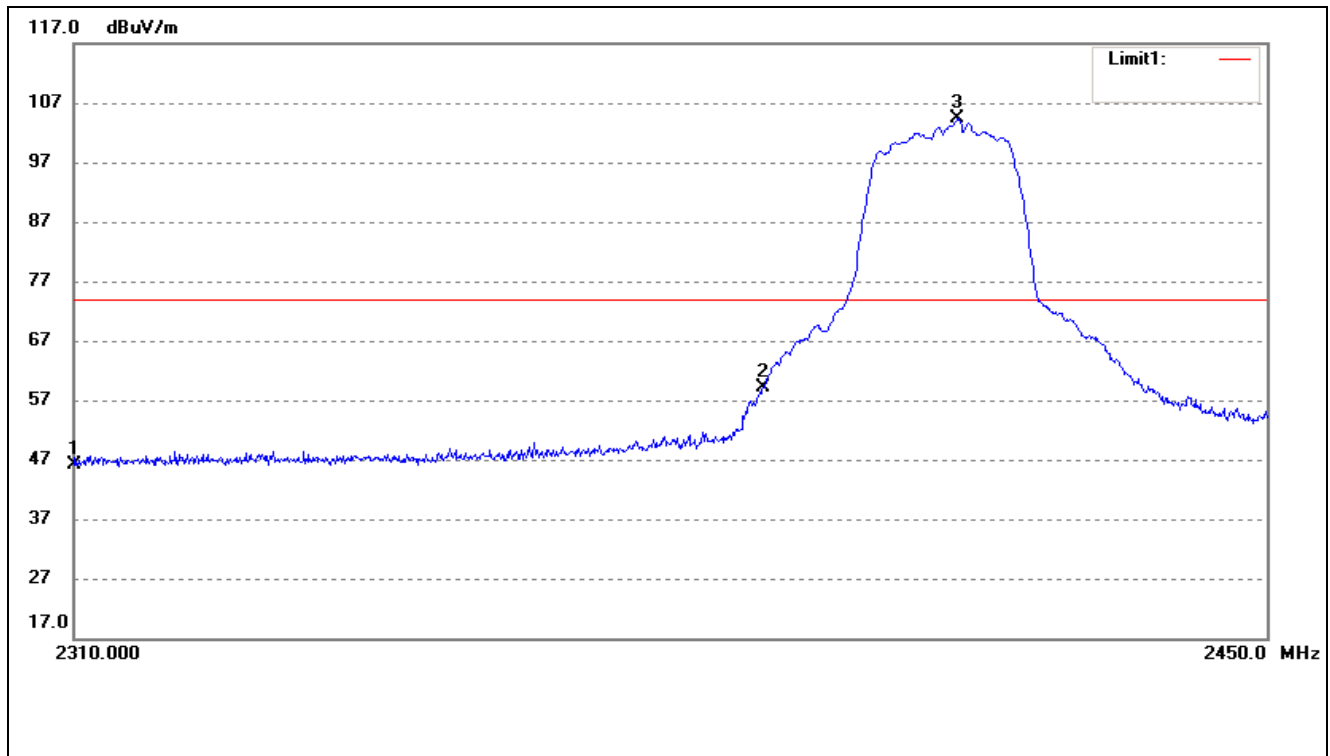
Antenna 0+1

802.11n-HT20			
Test Channel	Low	Polarity:	Vertical(worst case)



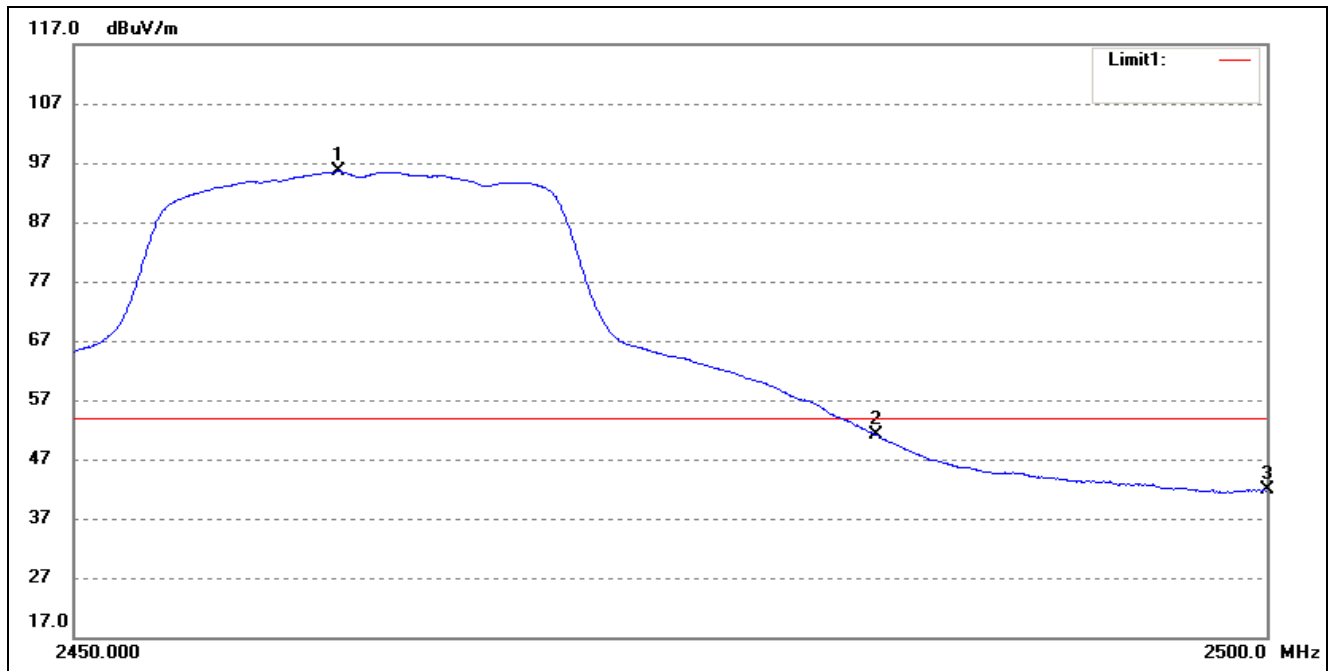
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	41.88	-7.78	34.10	54.00	-19.90	peak
2	2390.000	49.79	-7.32	42.47	54.00	-11.53	peak
3	2400.000	65.27	-7.26	58.01	54.00	4.01	peak
4	2412.236	99.78	-7.19	92.59	54.00	38.59	peak

802.11n-HT20			
Test Channel	Low	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	53.97	-7.78	46.19	74.00	-27.81	peak
2	2390.000	66.53	-7.32	59.21	74.00	-14.79	peak
3	2412.946	111.48	-7.18	104.30	74.00	30.30	peak

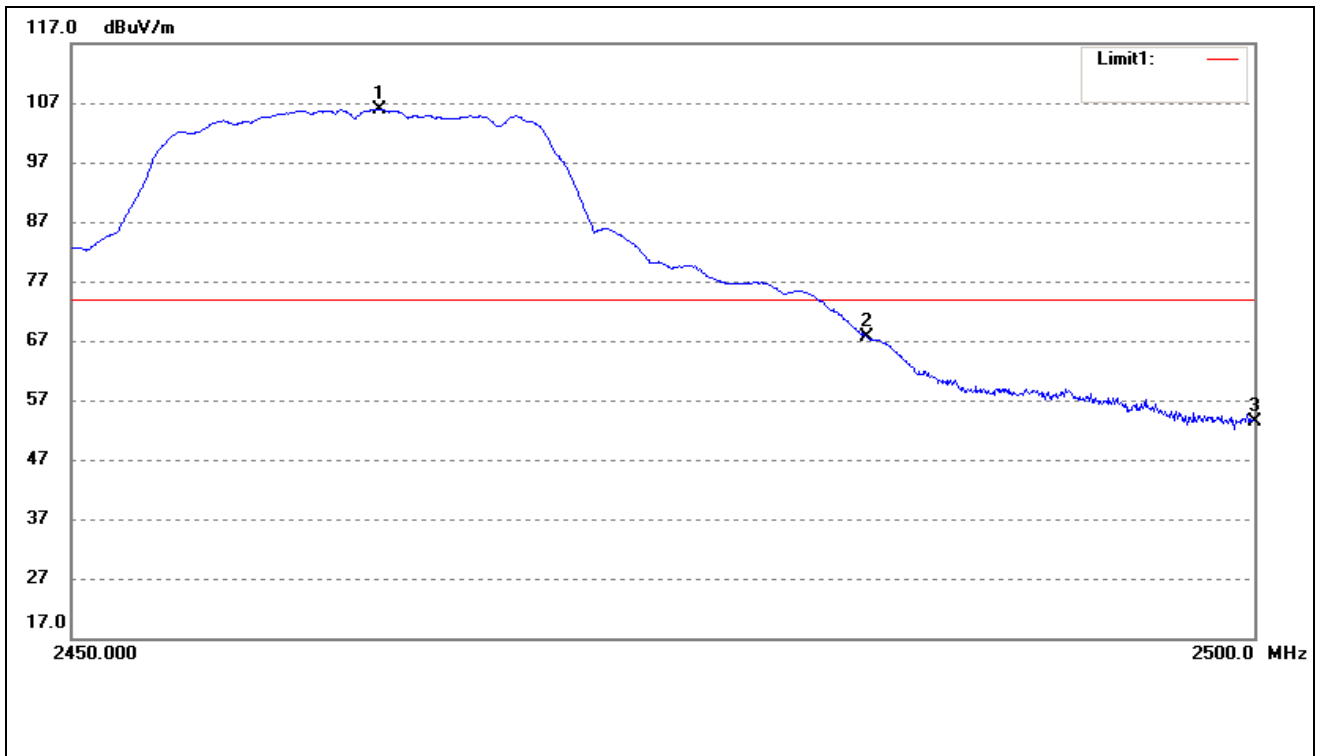
802.11n-HT20			
Test Channel	High	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.013	102.43	-6.90	95.53	54.00	41.53	peak
2	2483.500	57.80	-6.77	51.03	54.00	-2.97	peak
3	2500.000	48.46	-6.67	41.79	54.00	-12.21	peak

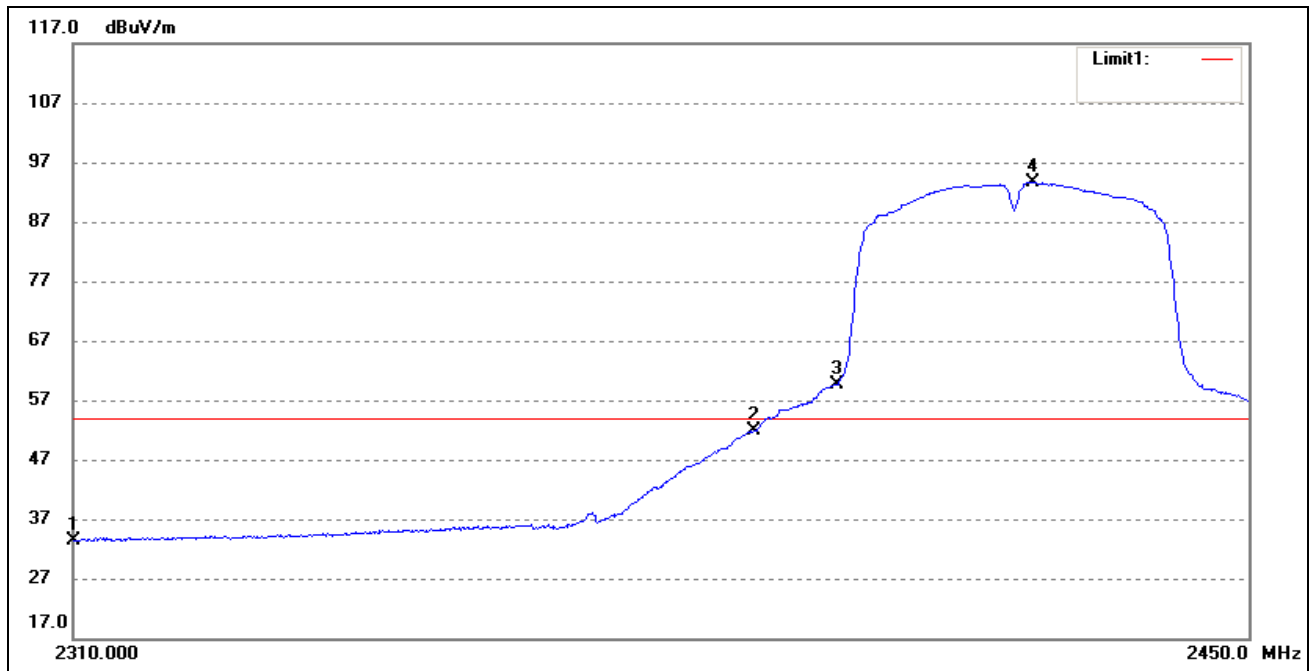
802.11n-HT20

Test Channel	High	Polarity:	Vertical(worst case)
--------------	------	-----------	----------------------



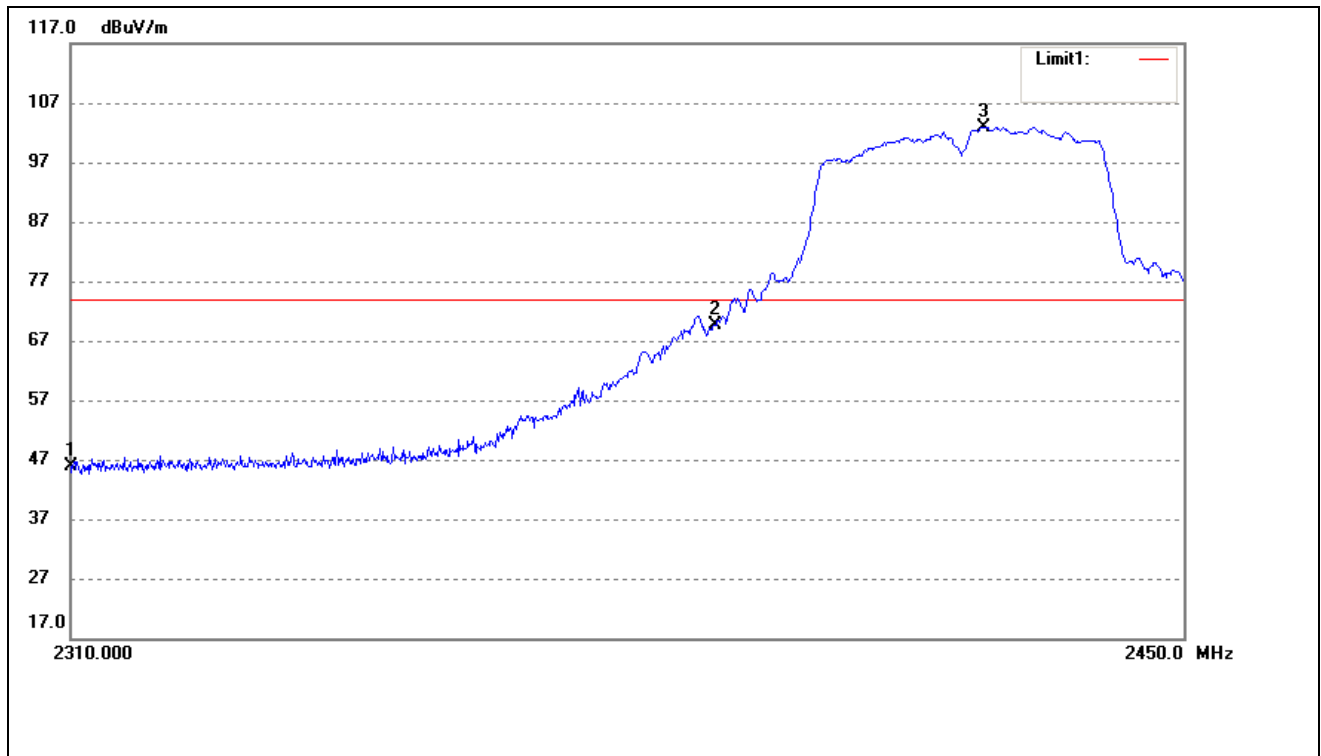
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2462.903	112.88	-6.89	105.99	74.00	31.99	peak
2	2483.500	74.28	-6.77	67.51	74.00	-6.49	peak
3	2500.000	59.93	-6.67	53.26	74.00	-20.74	peak

802.11n-HT40			
Test Channel	Low	Polarity:	Vertical(worst case)



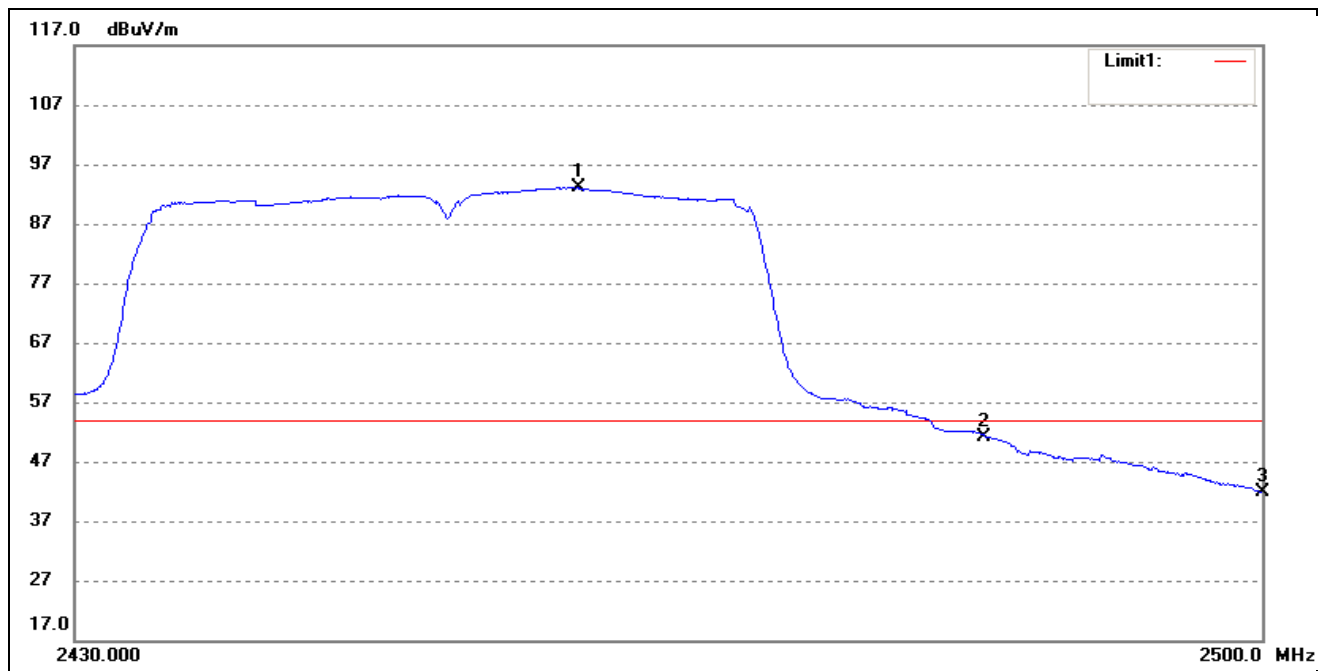
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	41.25	-7.78	33.47	54.00	-20.53	peak
2	2390.000	59.18	-7.32	51.86	54.00	-2.14	peak
3	2400.000	66.86	-7.26	59.60	54.00	5.60	peak
4	2423.618	100.77	-7.12	93.65	54.00	39.65	peak

802.11n-HT40			
Test Channel	Low	Polarity:	Vertical(worst case)



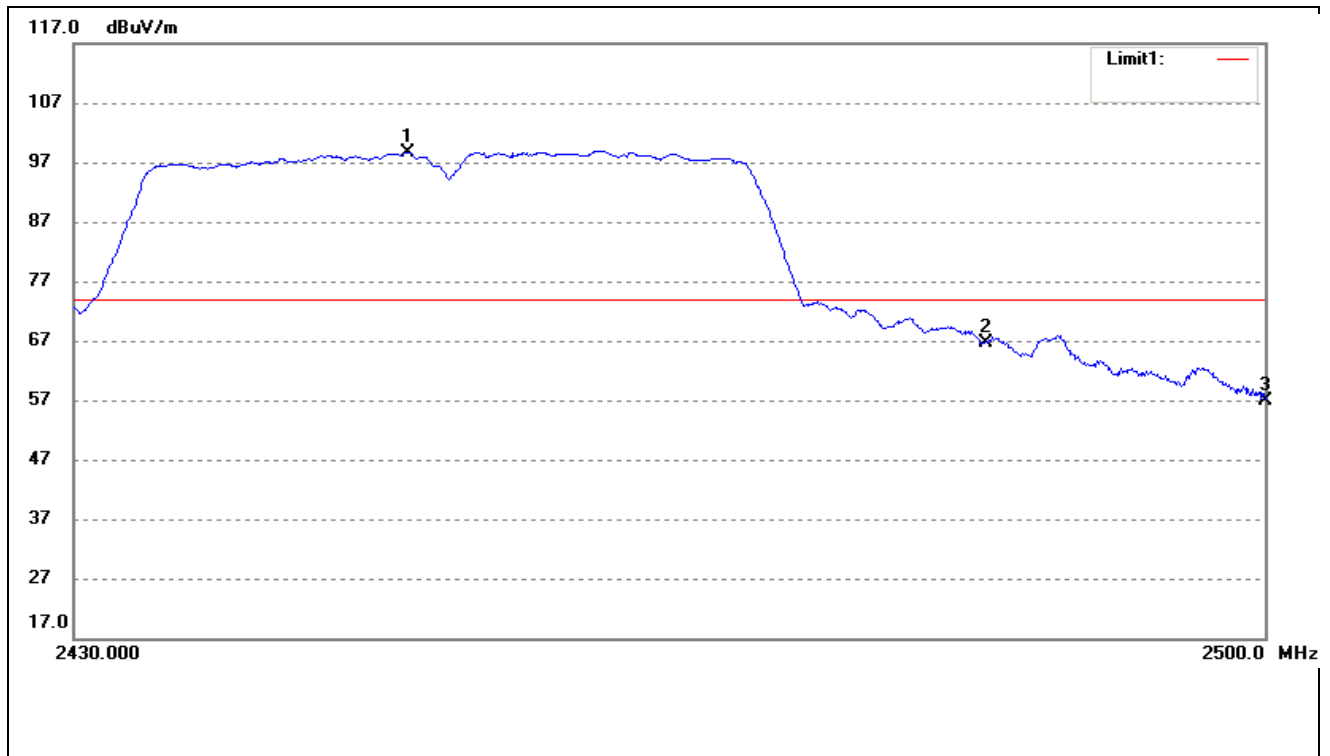
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	53.67	-7.78	45.89	74.00	-28.11	peak
2	2390.000	77.01	-7.32	69.69	74.00	-4.31	peak
3	2424.331	110.11	-7.12	102.99	74.00	28.99	peak

802.11n-HT40			
Test Channel	High	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2459.437	100.00	-6.90	93.10	54.00	39.10	peak
2	2483.500	57.83	-6.77	51.06	54.00	-2.94	peak
3	2500.000	48.58	-6.67	41.91	54.00	-12.09	peak

802.11n-HT40			
Test Channel	High	Polarity:	Vertical(worst case)

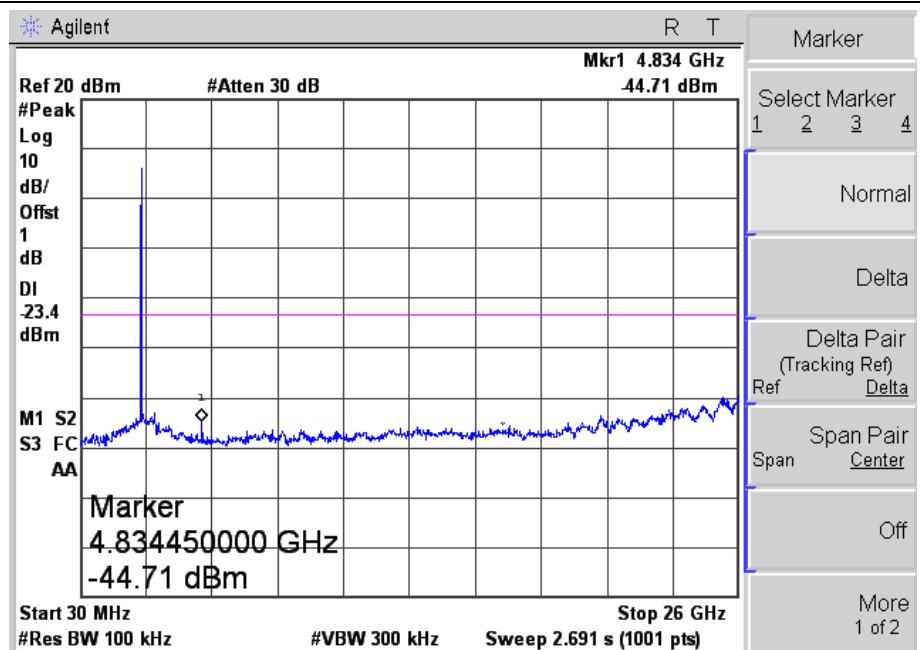
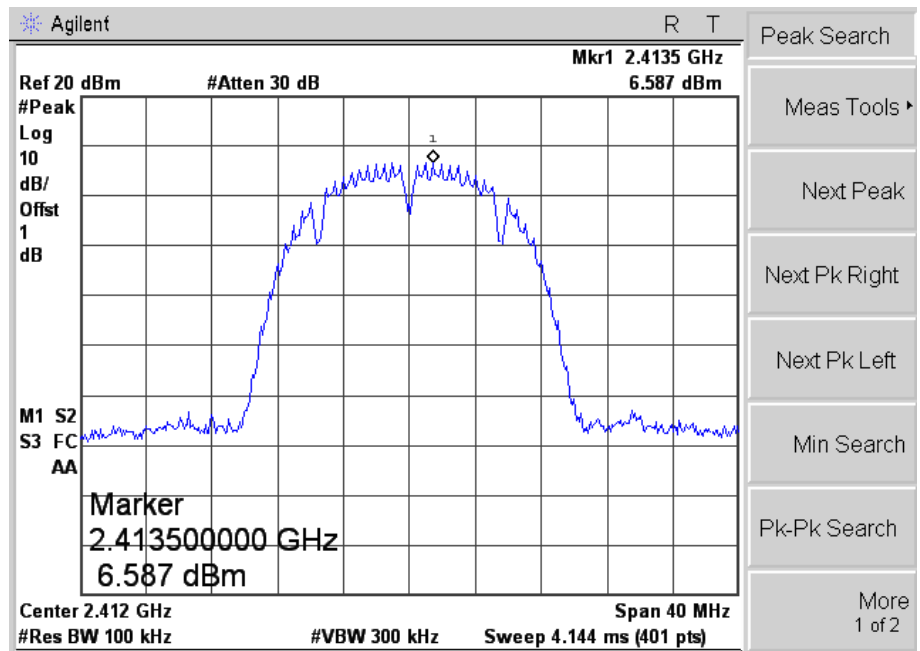


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2449.400	105.70	-6.96	98.74	74.00	24.74	peak
2	2483.500	73.51	-6.77	66.74	74.00	-7.26	peak
3	2500.000	63.58	-6.67	56.91	74.00	-17.09	peak

- Conducted test
Antenna 0

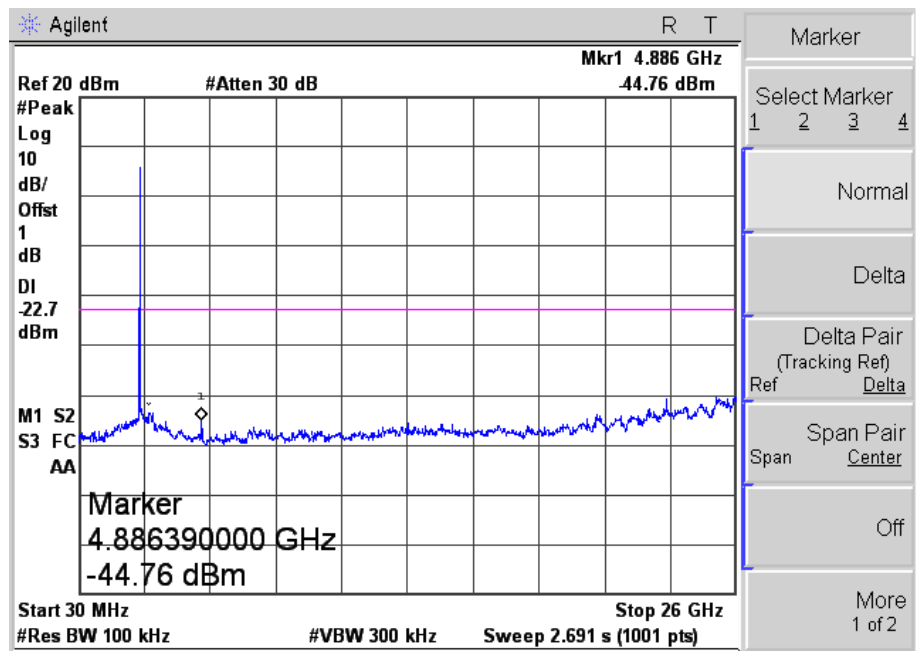
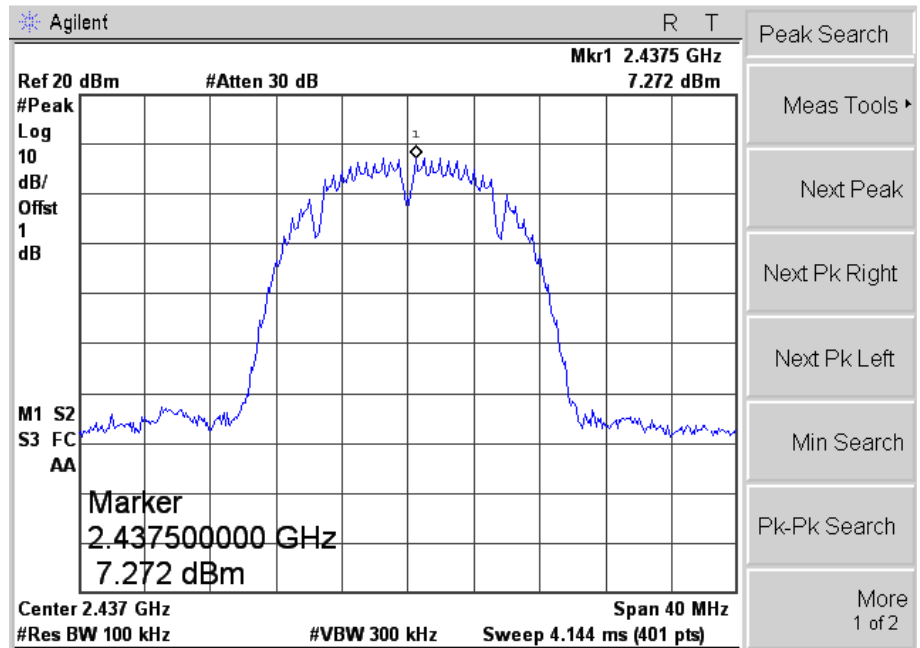
802.11b

Low



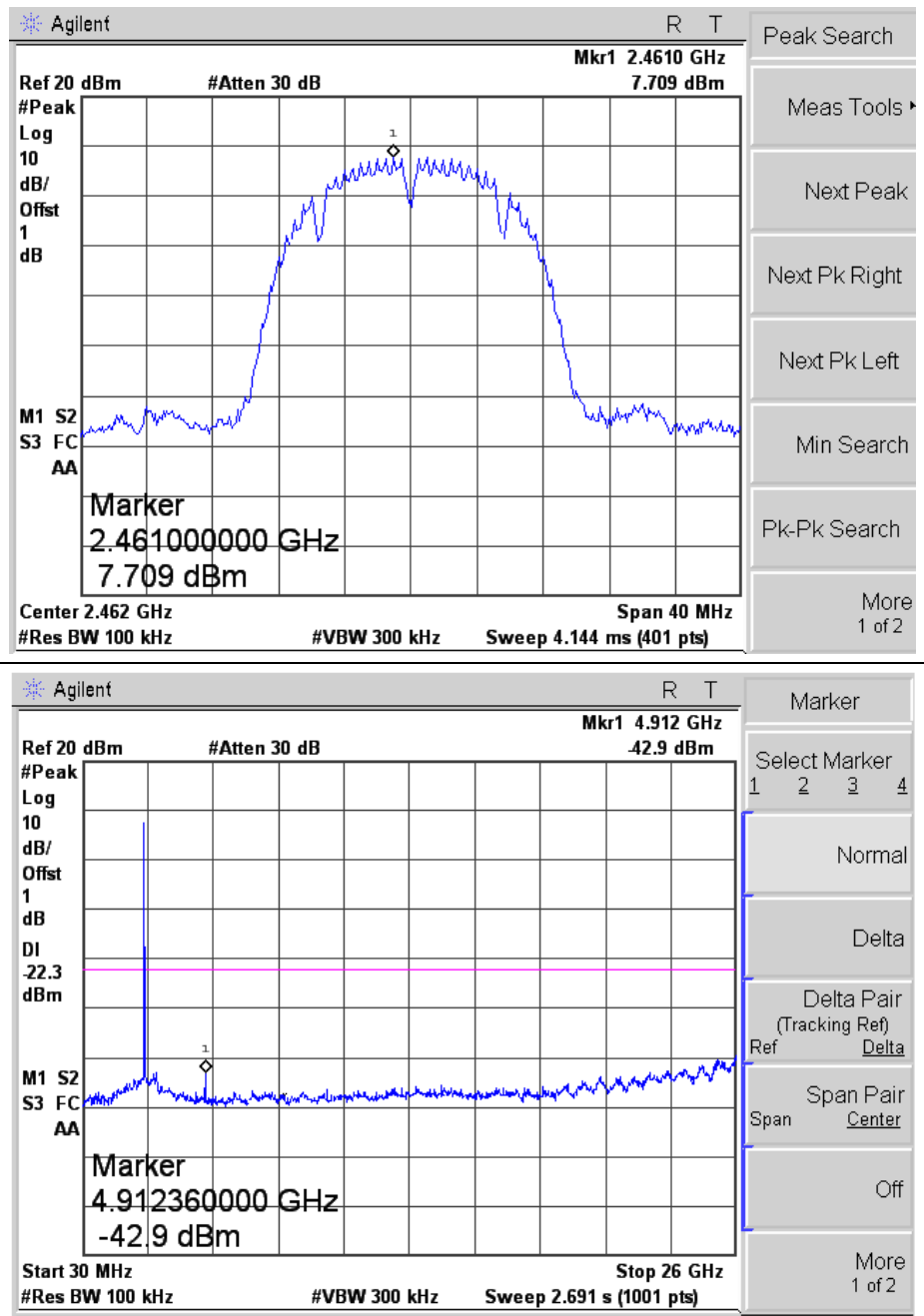
802.11b

Middle



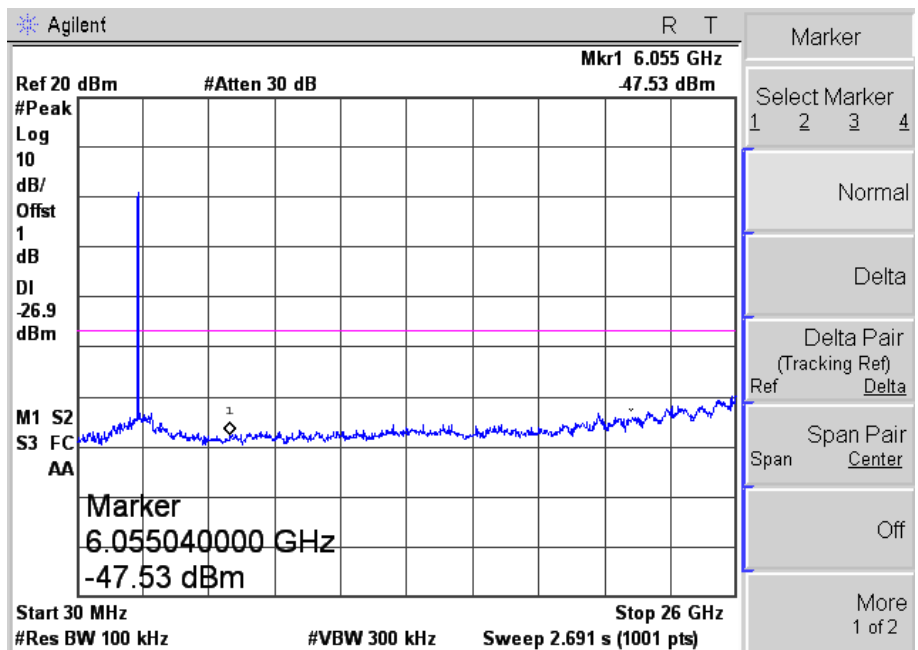
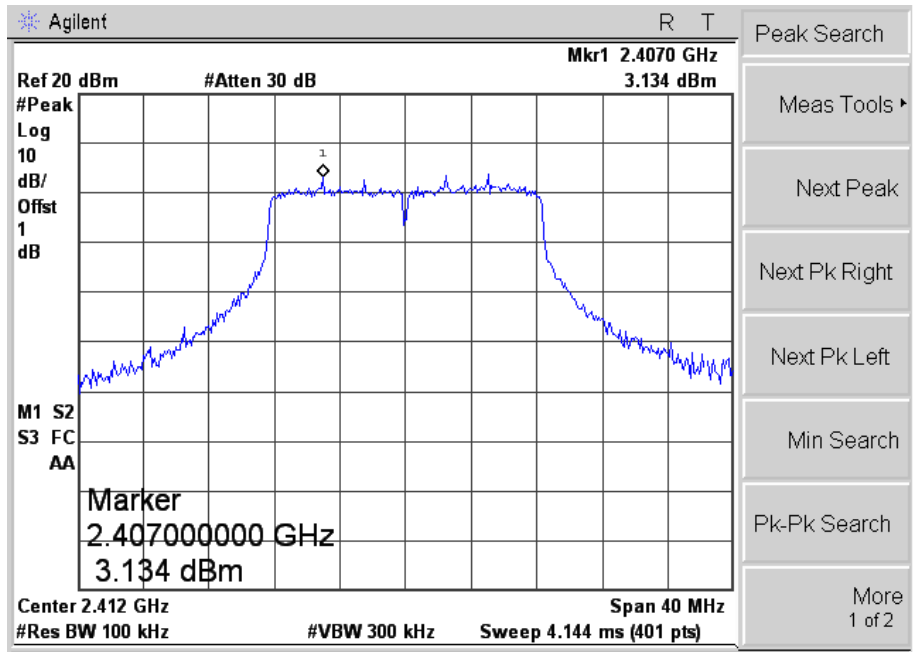
802.11b

High



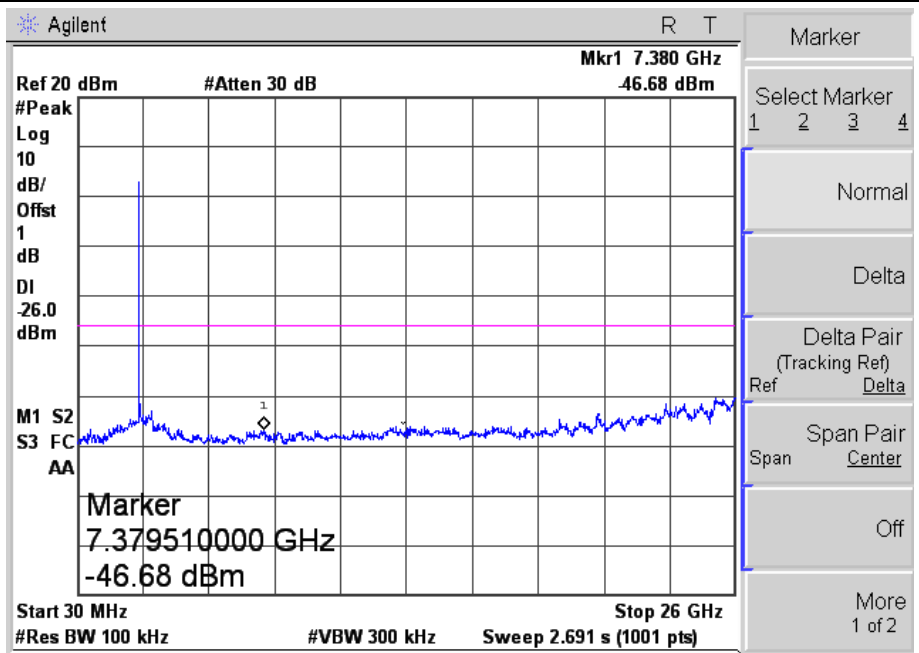
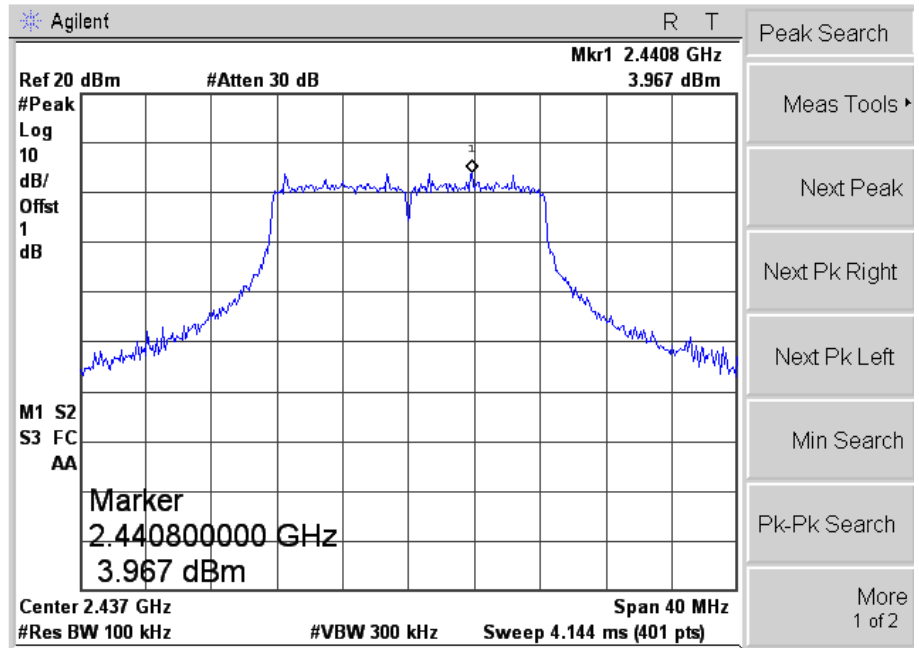
802.11g

Low



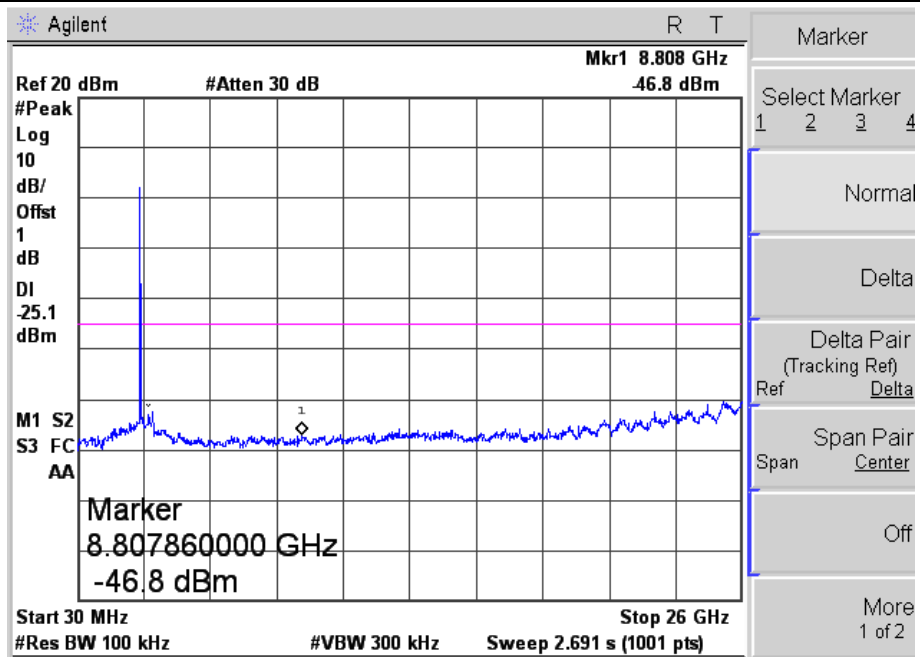
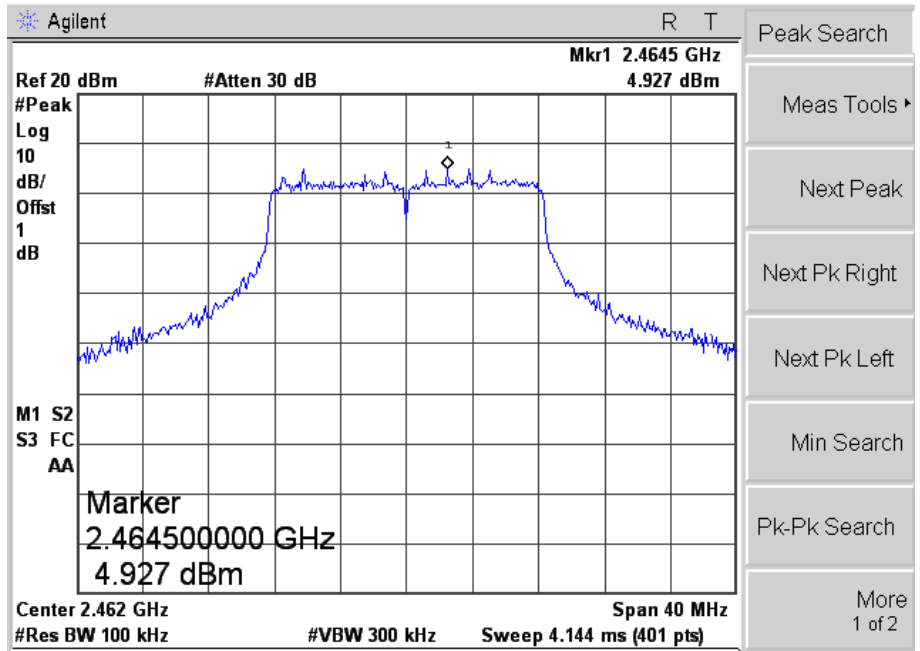
802.11g

Middle



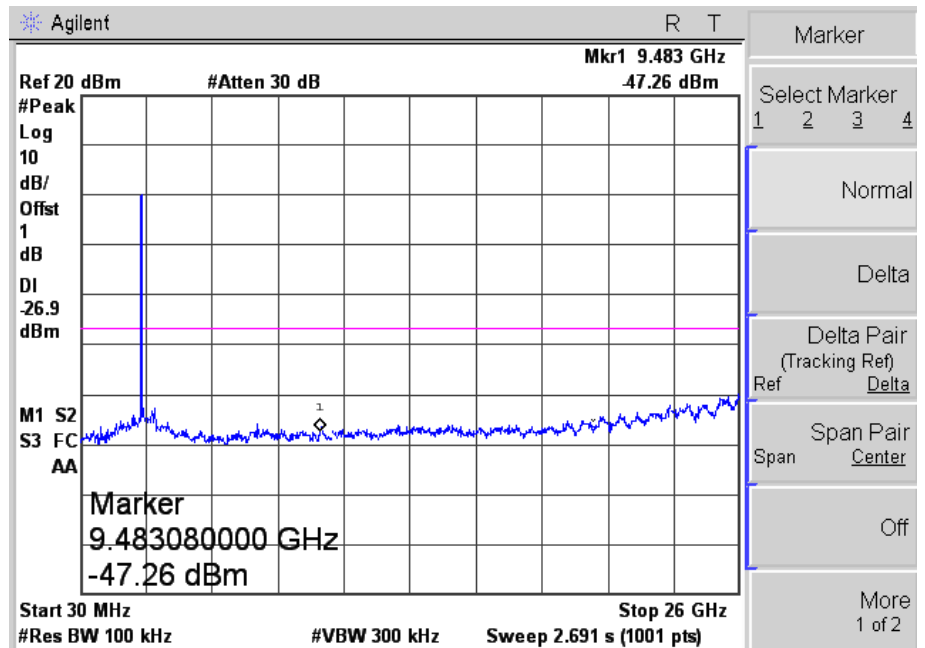
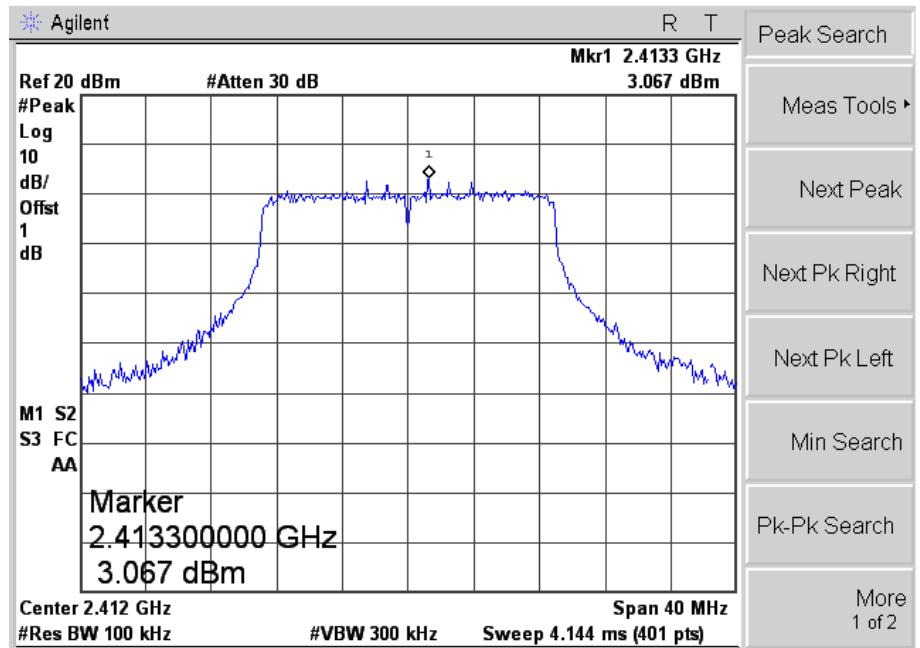
802.11g

High



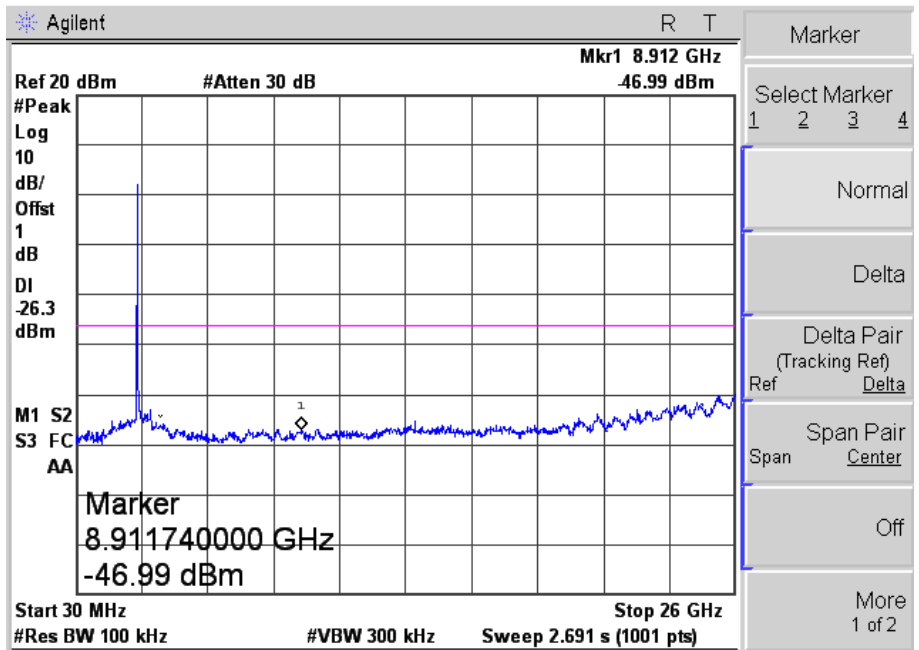
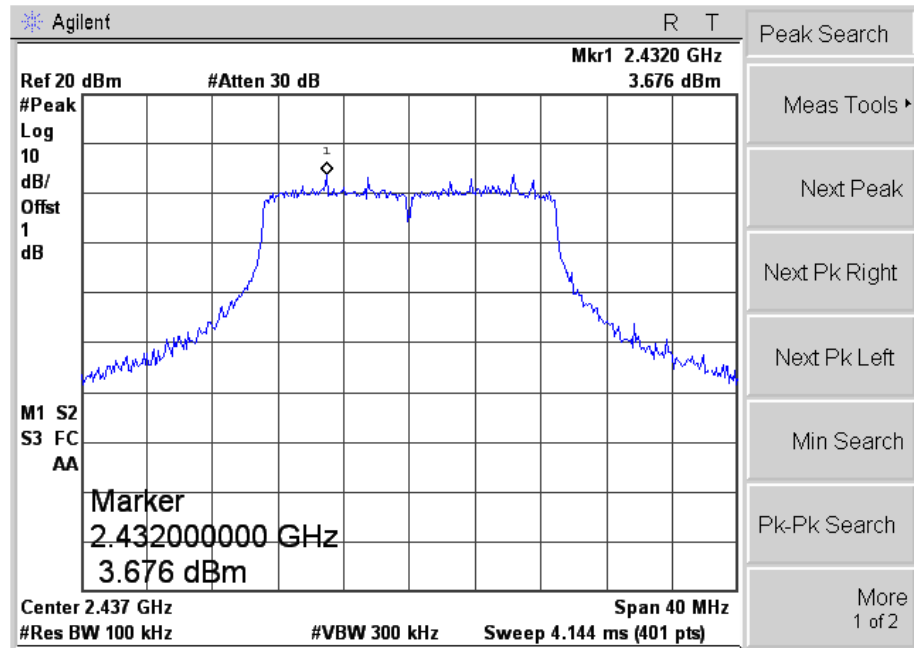
802.11n-HT20

Low



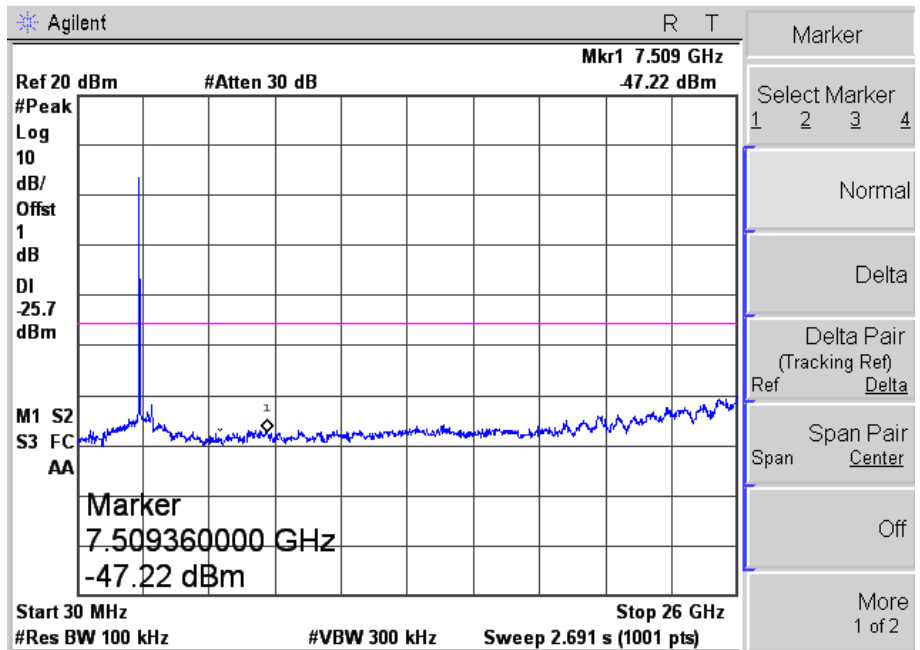
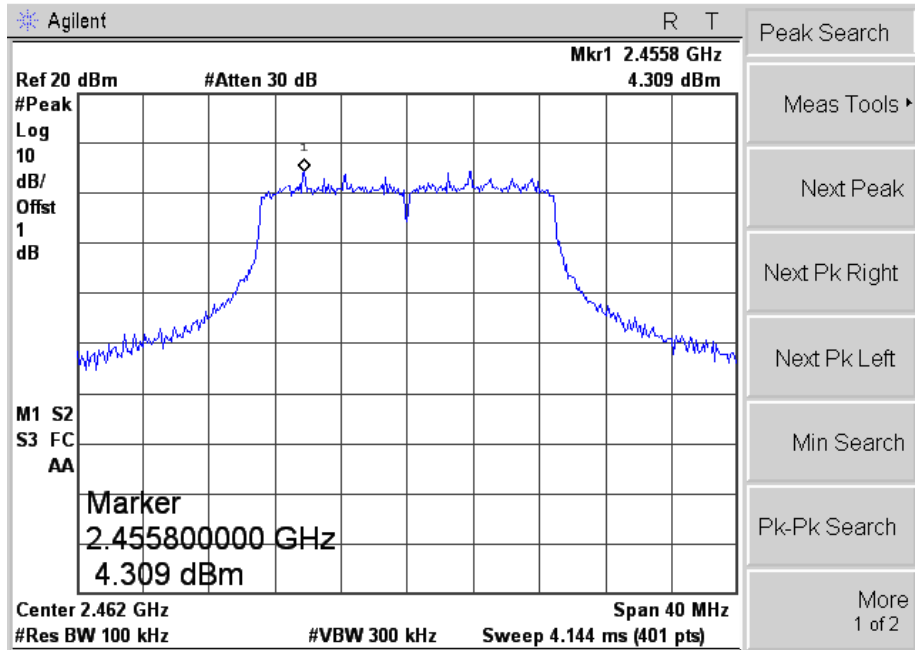
802.11n-HT20

Middle



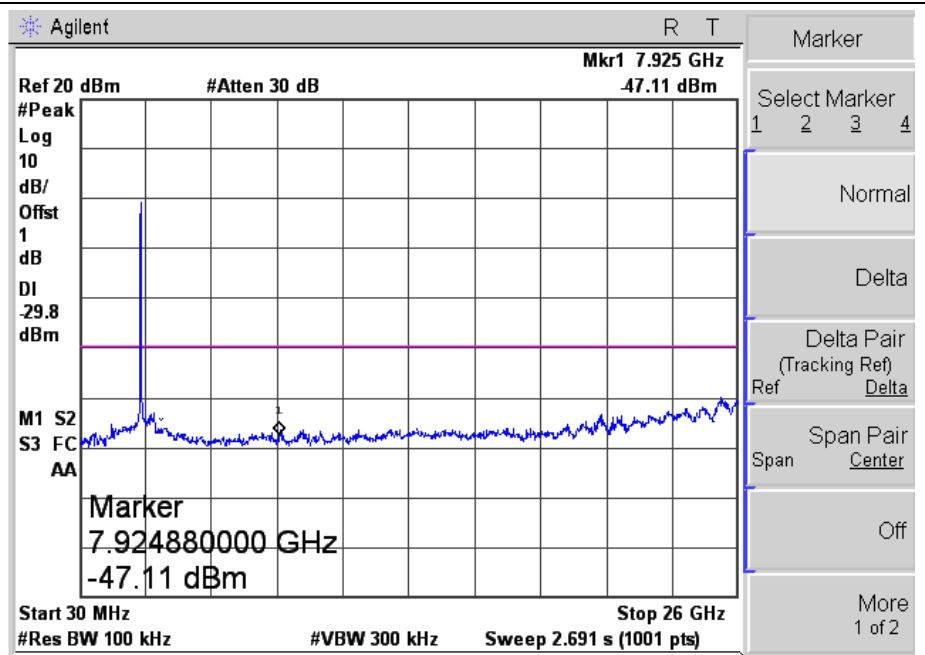
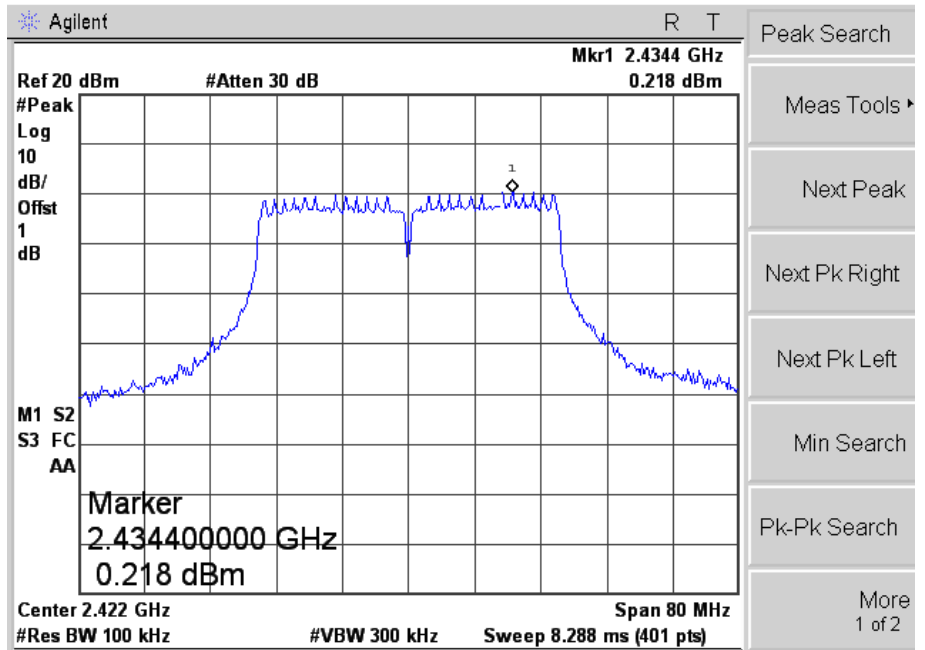
802.11n-HT20

High



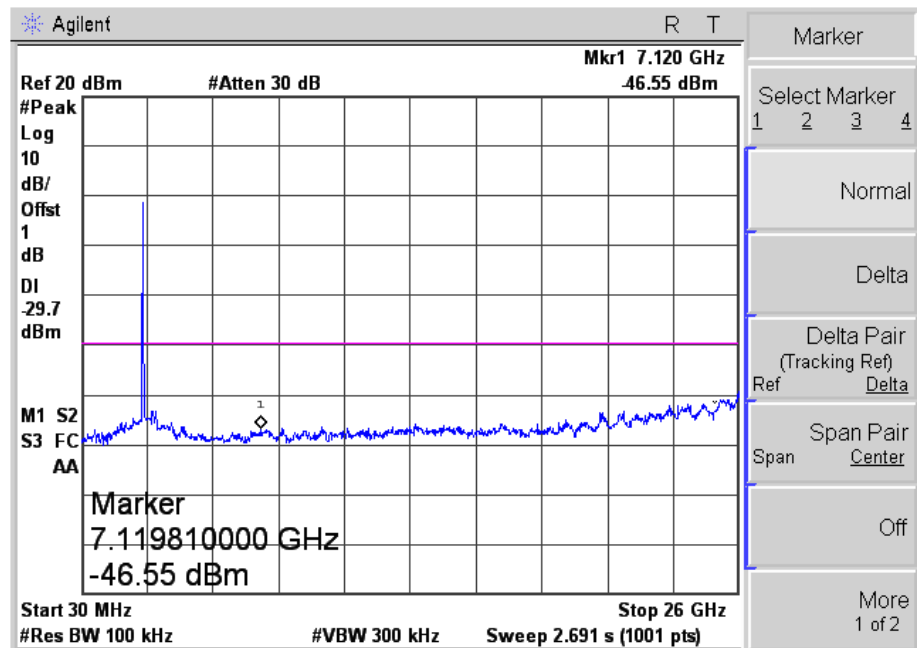
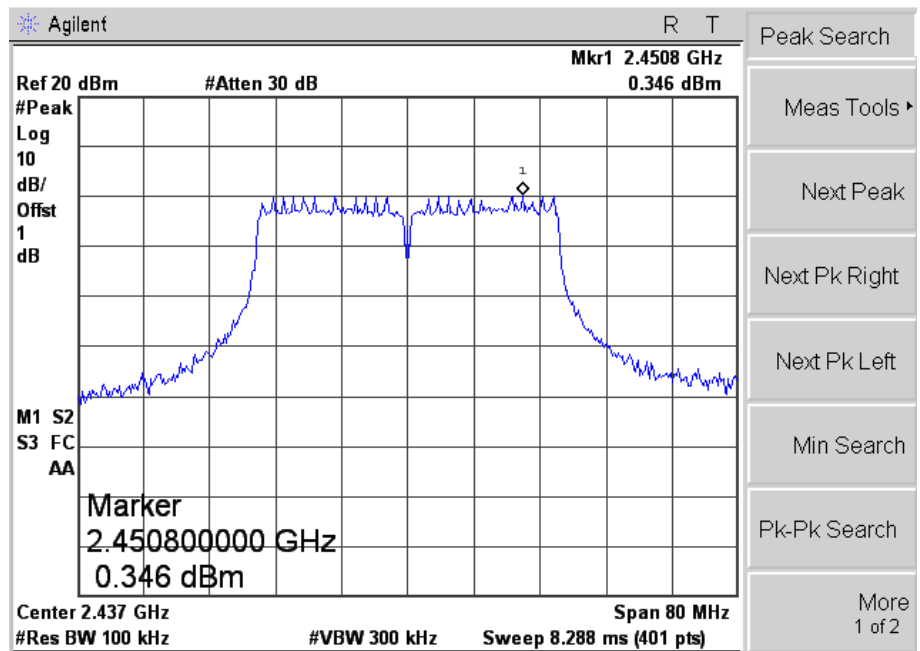
802.11n-HT40

Low



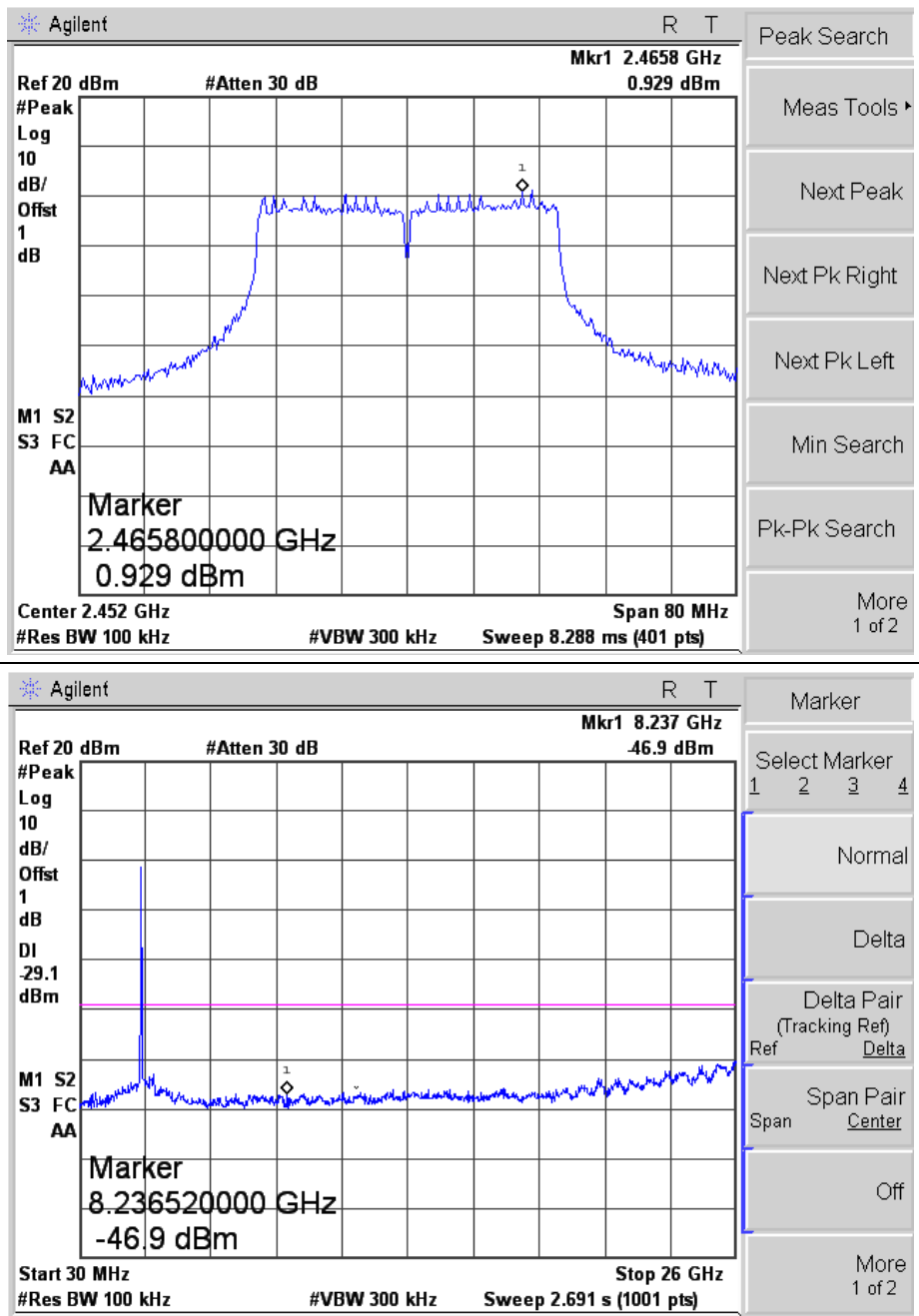
802.11n-HT40

Middle



802.11n-HT40

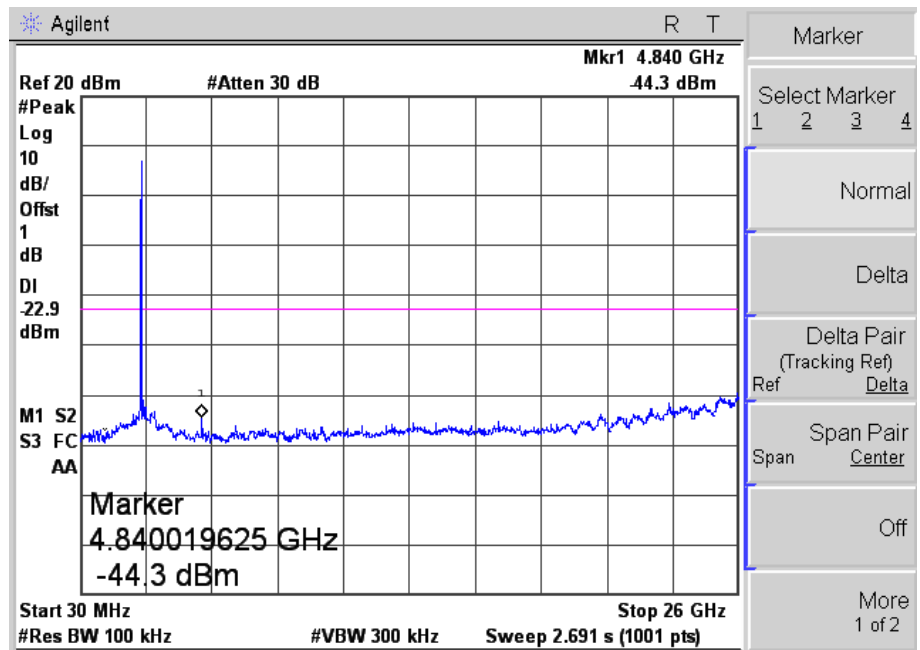
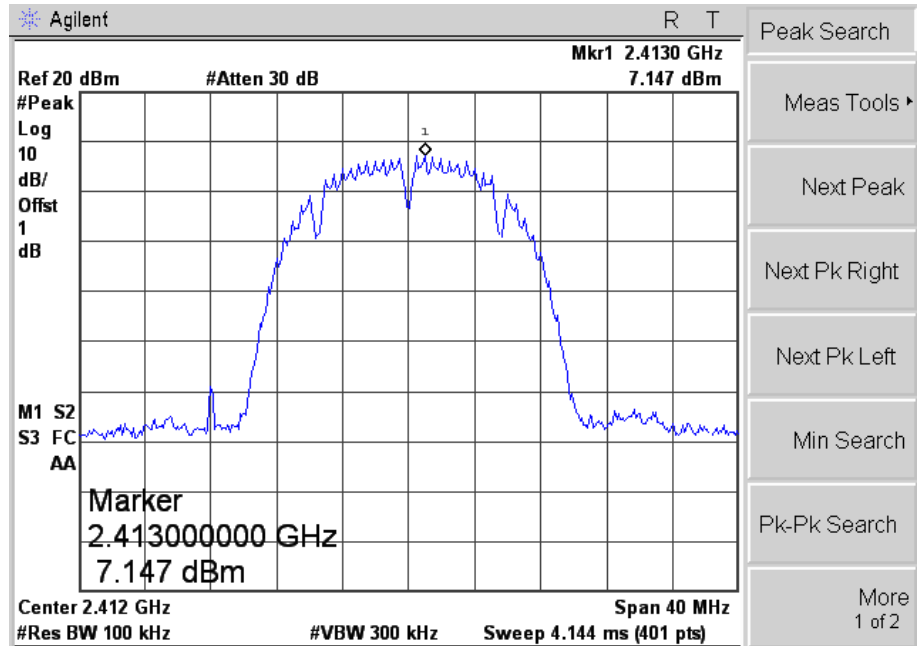
High



Antenna 1

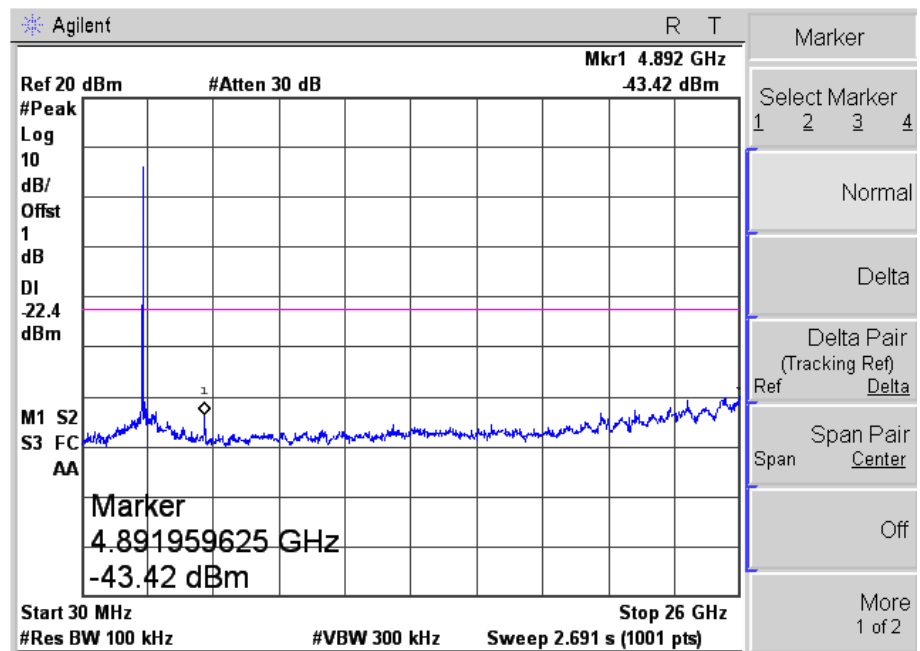
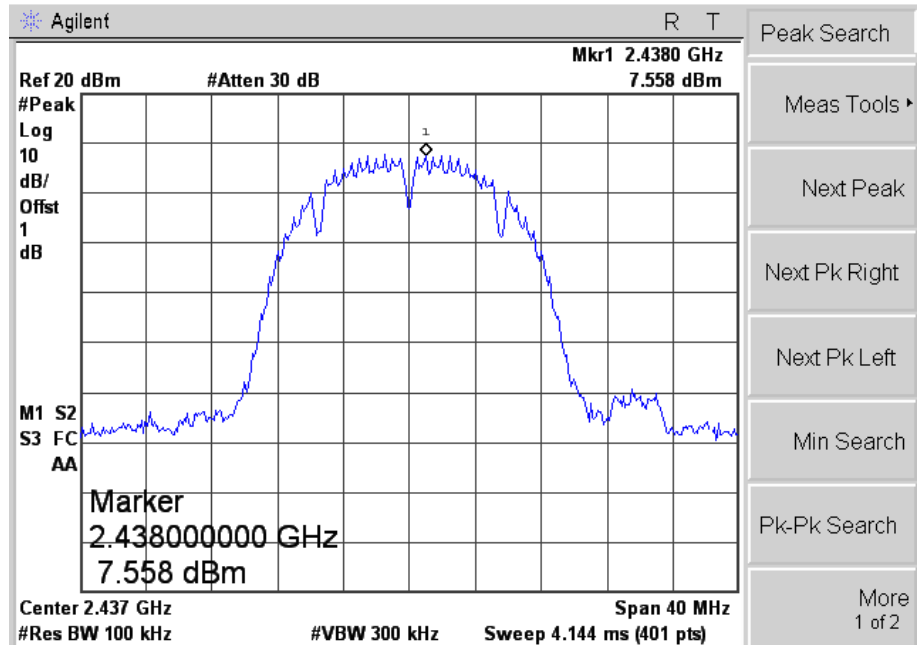
802.11b

Low



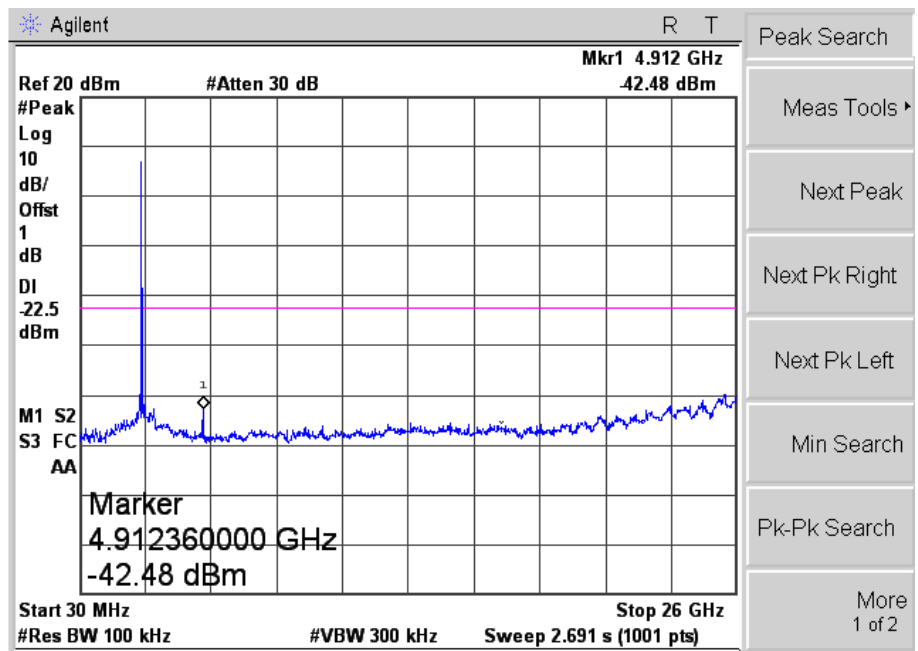
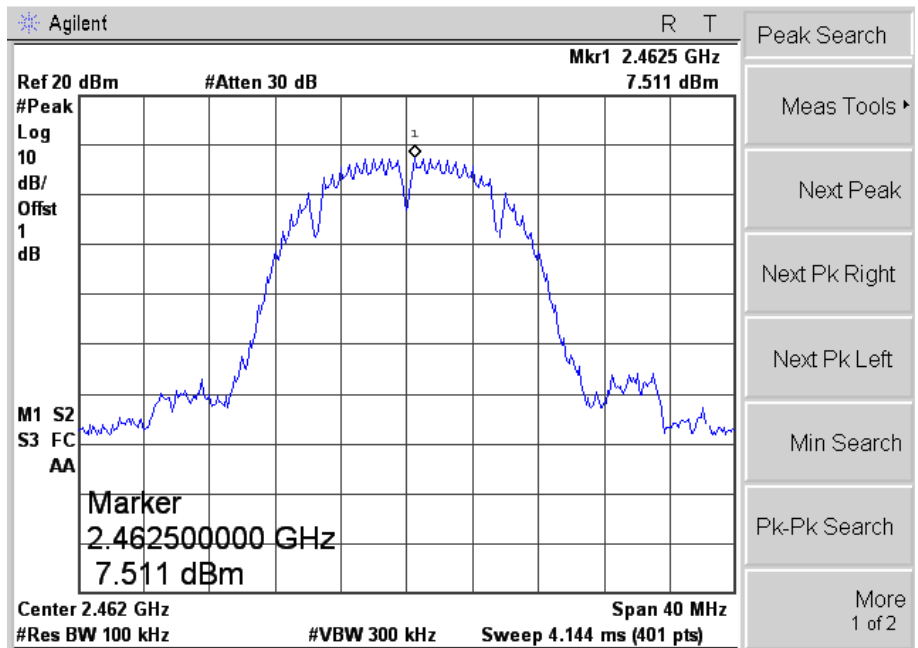
802.11b

Middle



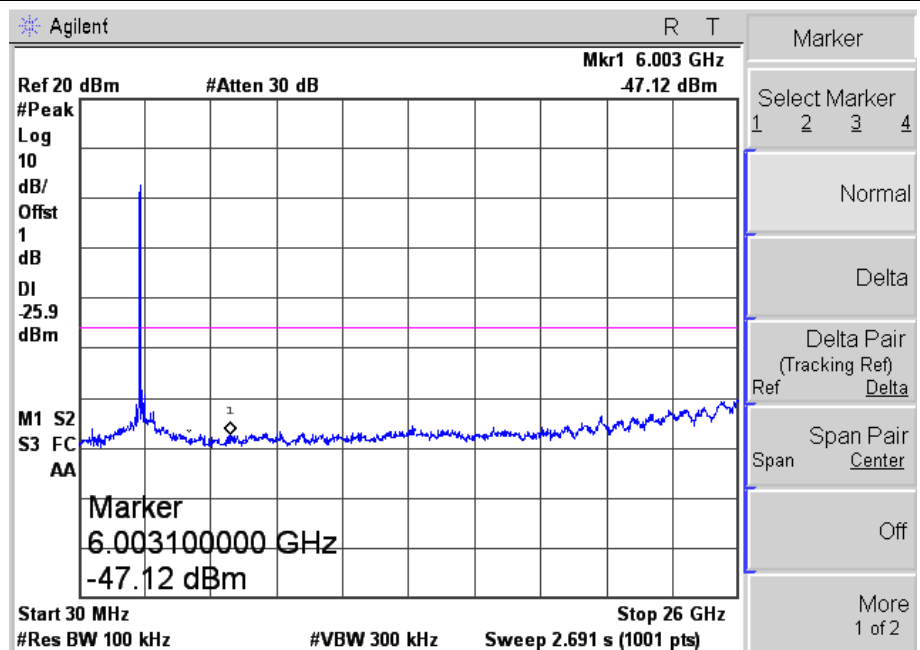
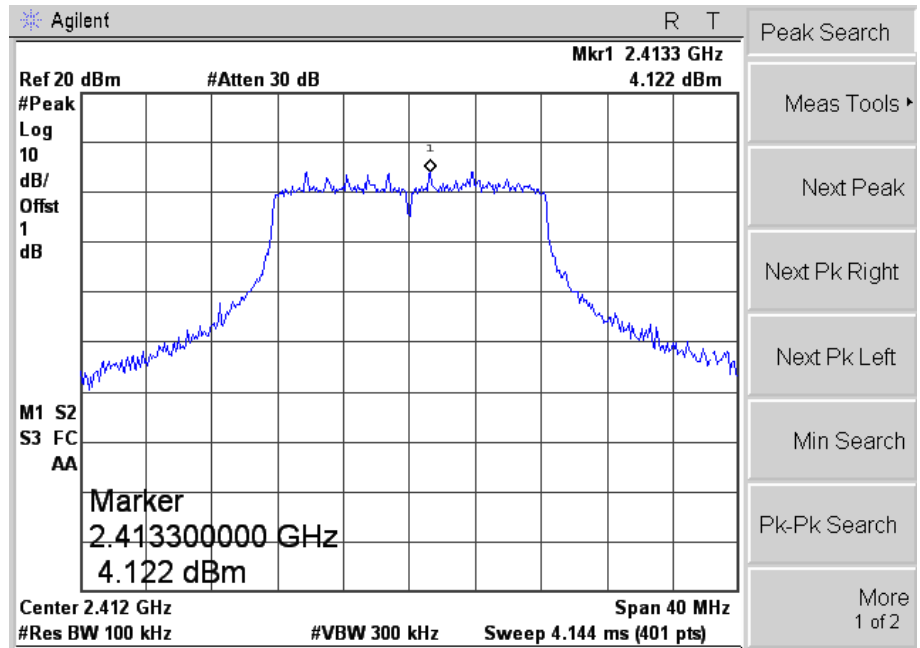
802.11b

High



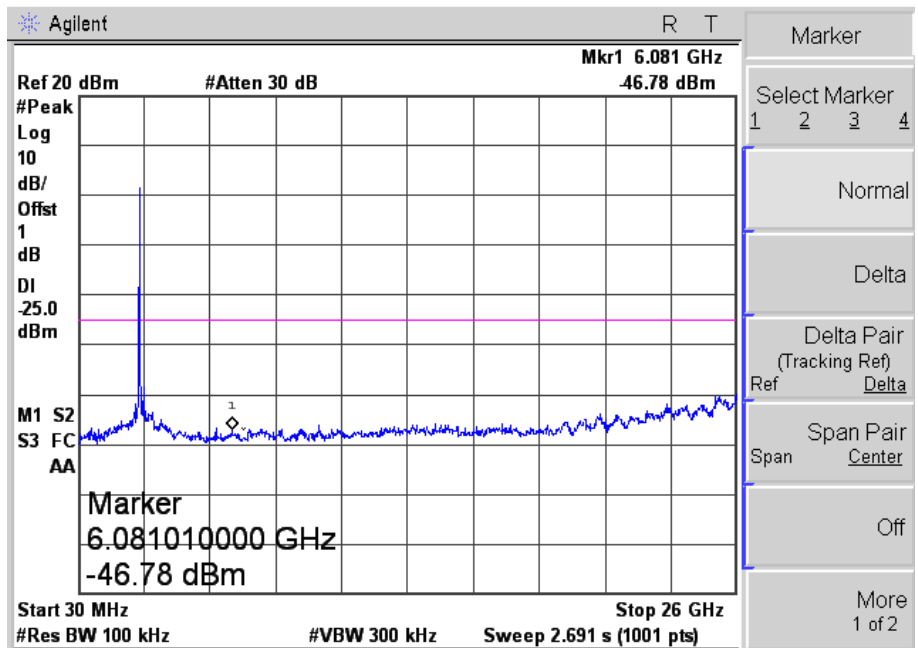
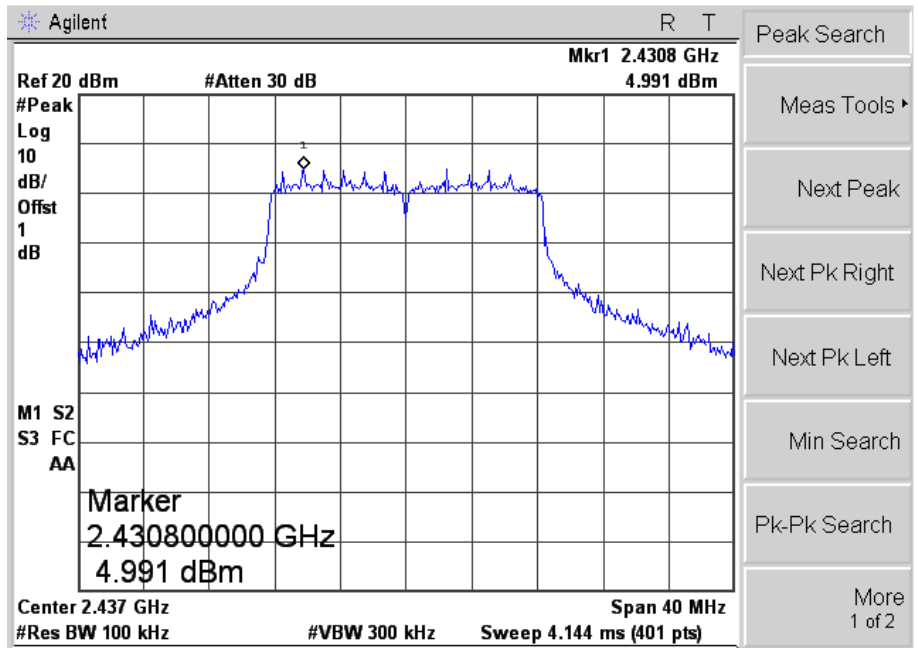
802.11g

Low



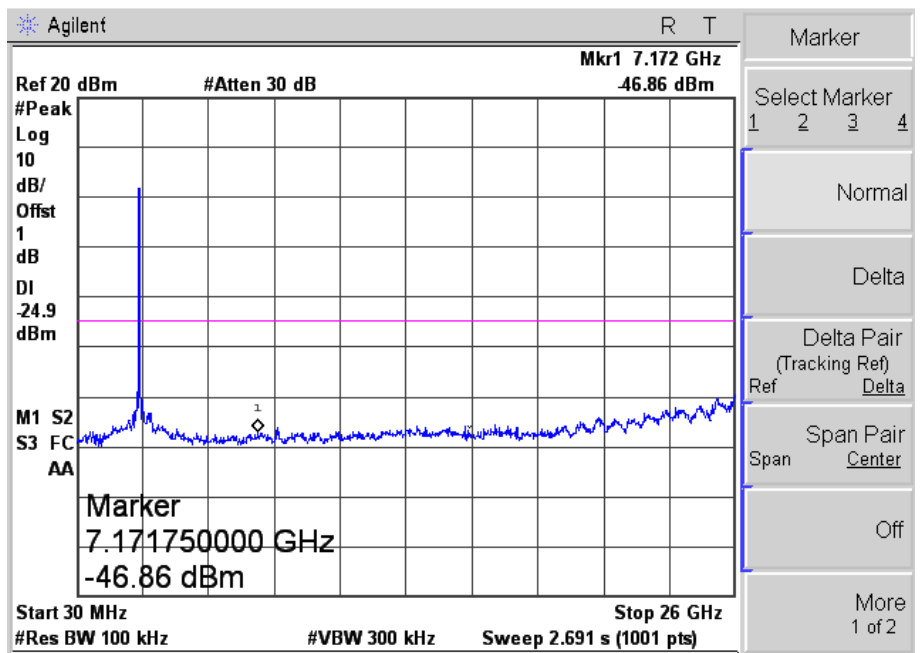
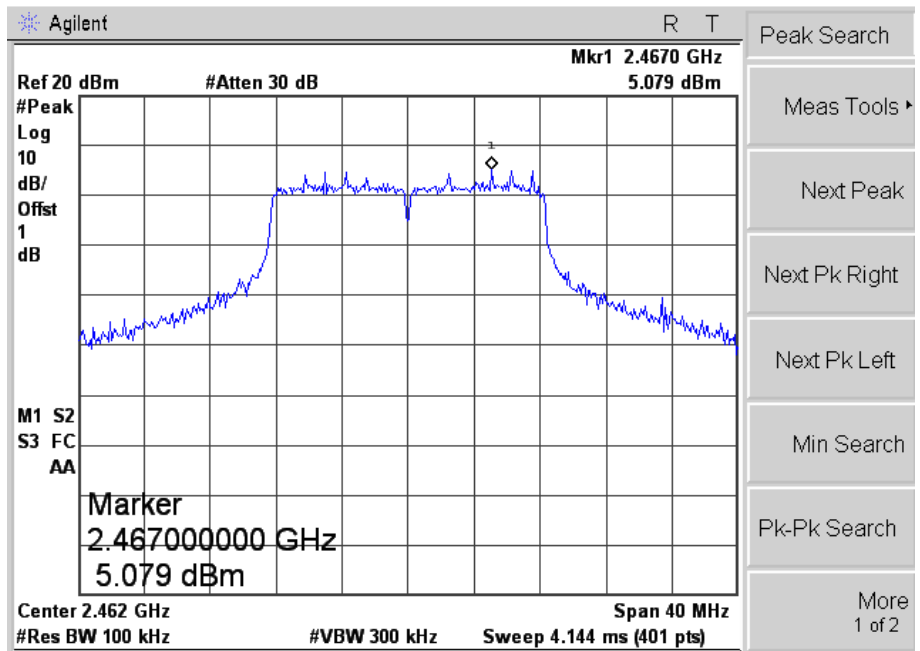
802.11g

Middle



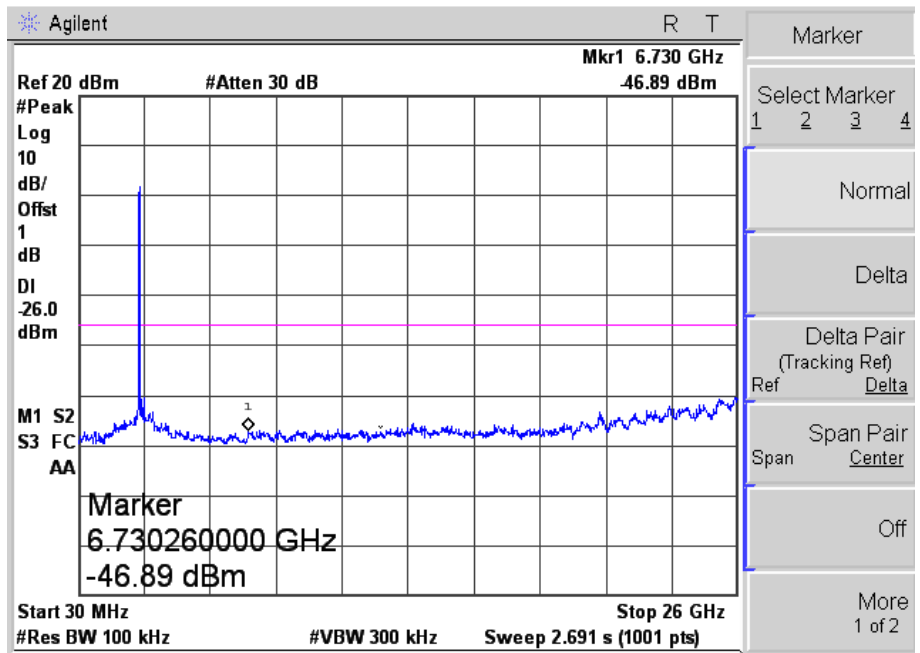
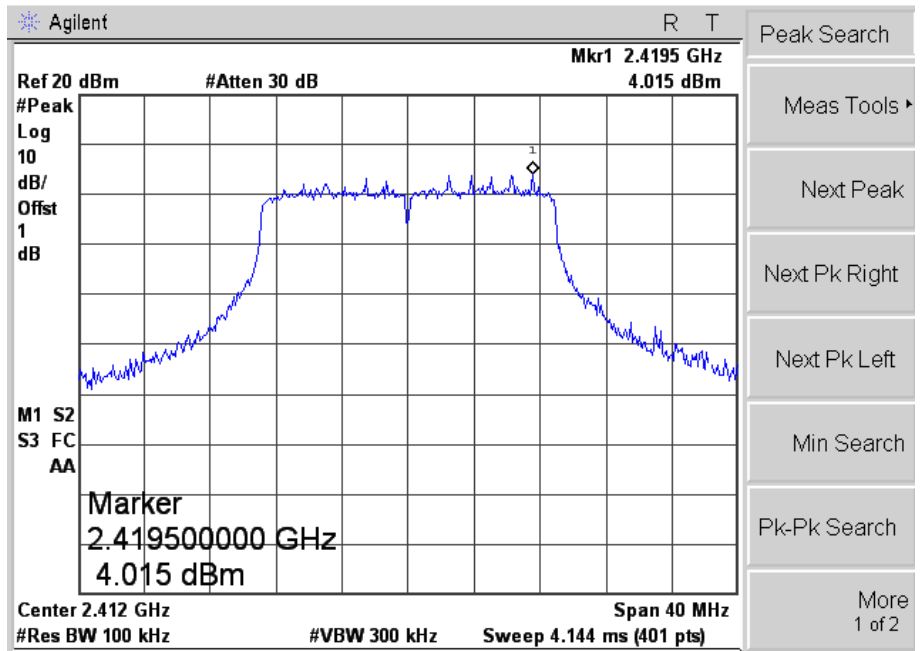
802.11g

High



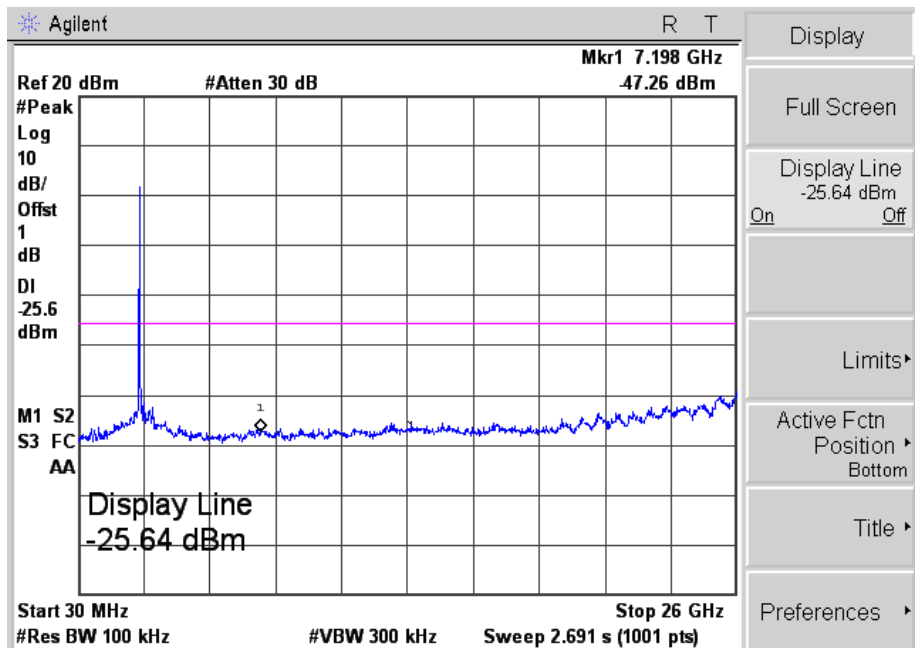
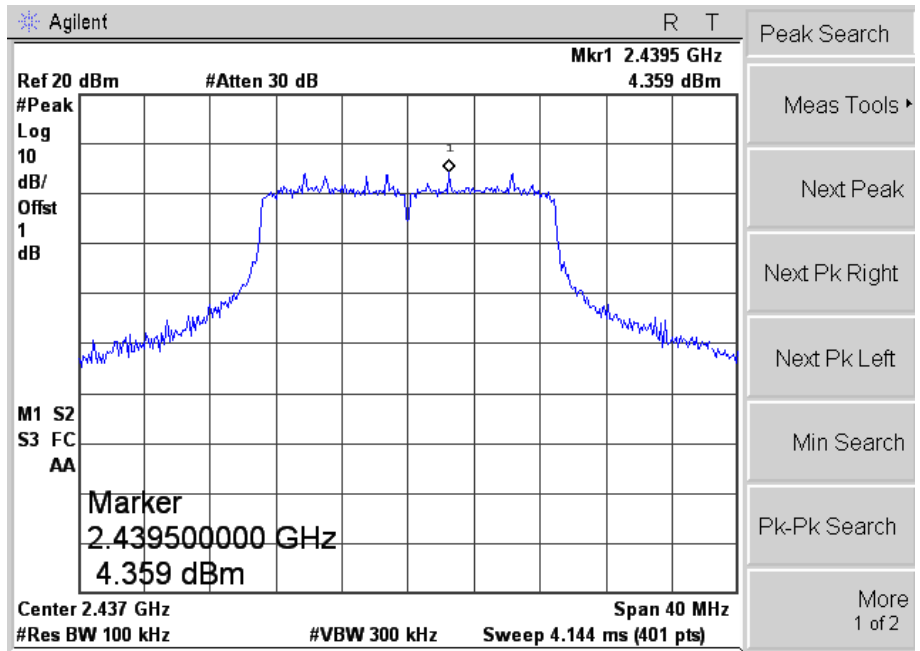
802.11n-HT20

Low



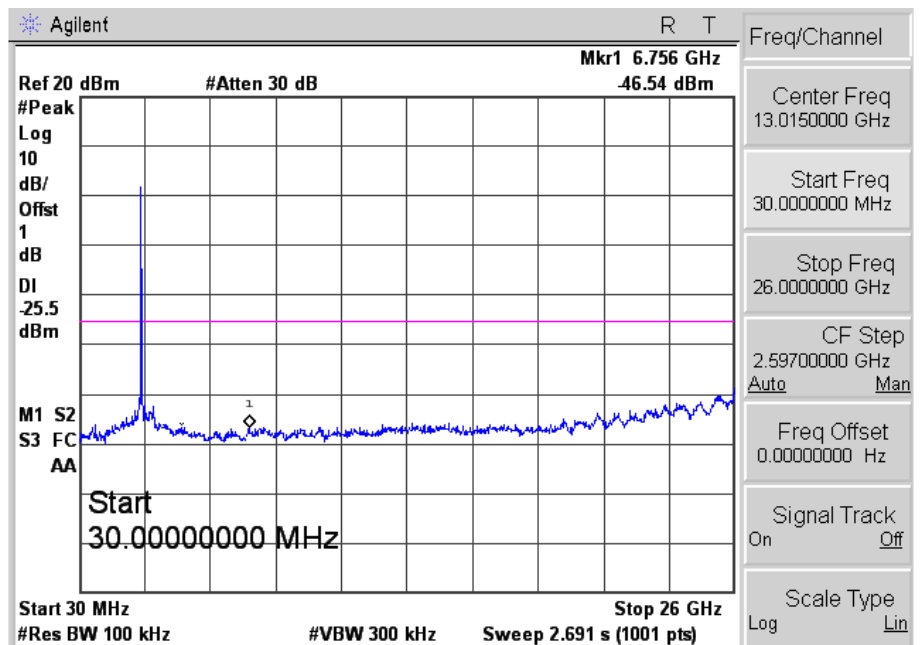
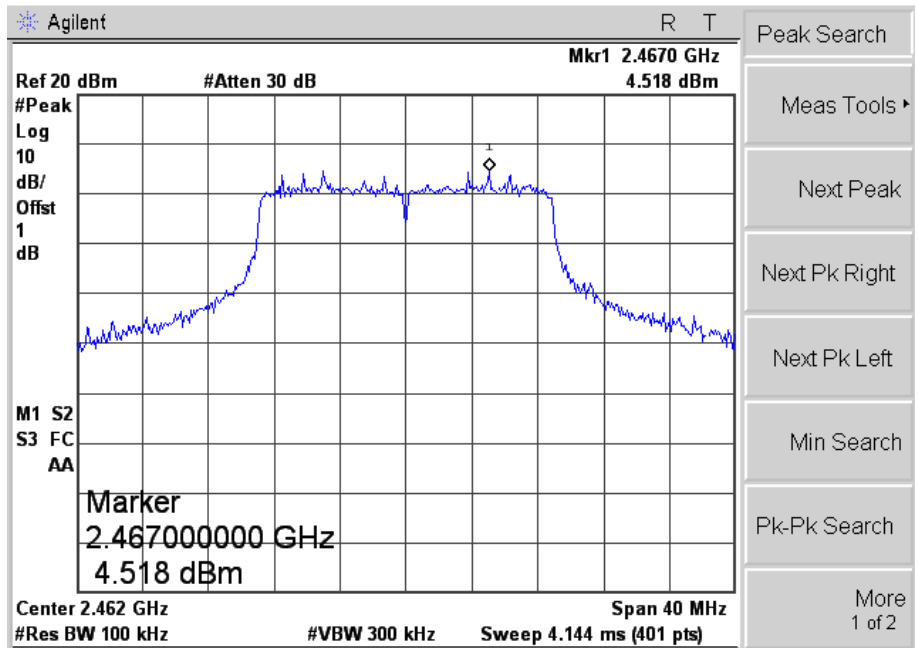
802.11n-HT20

Middle



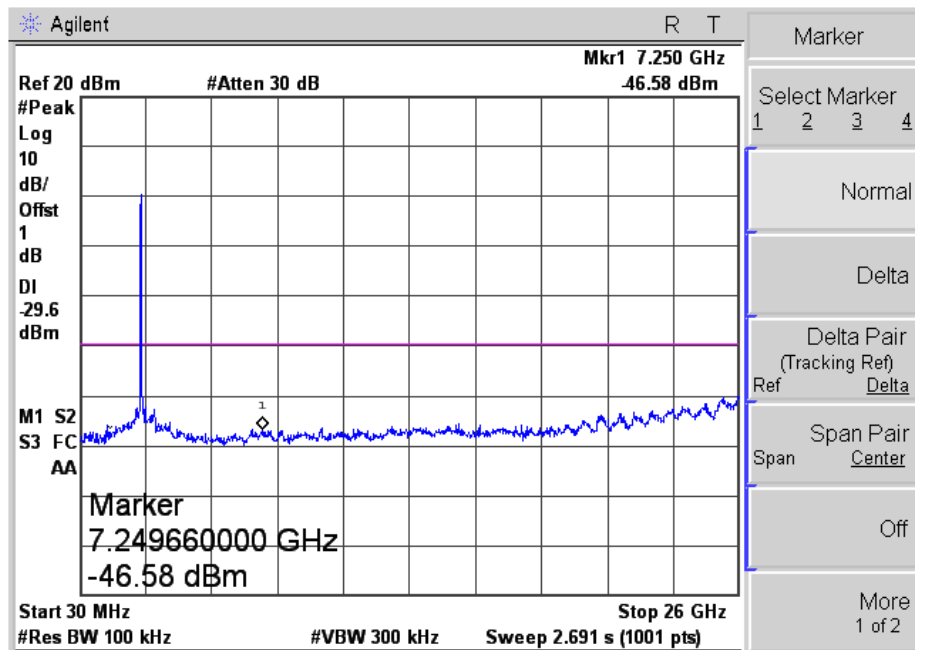
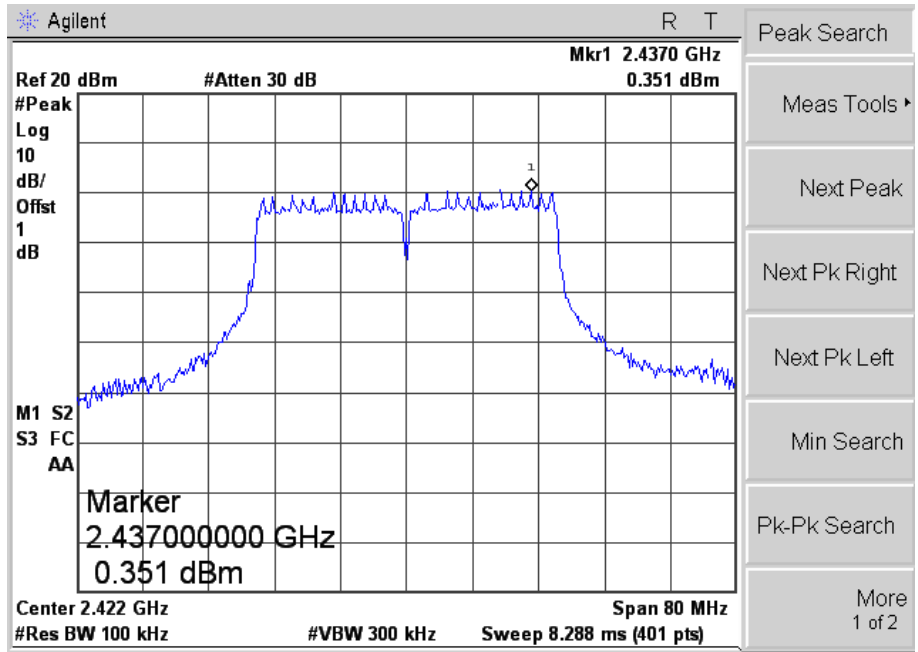
802.11n-HT20

High



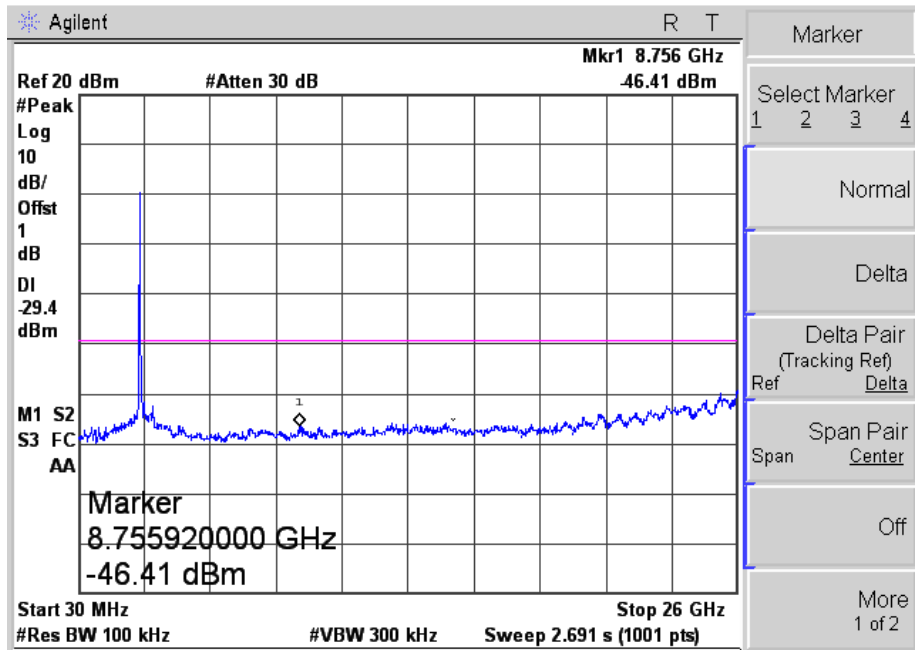
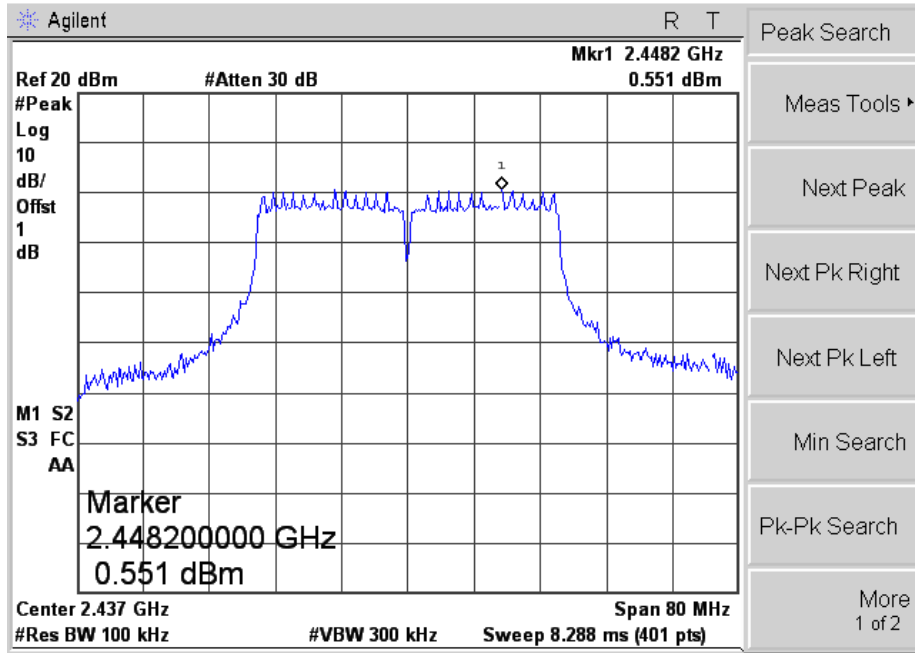
802.11n-HT40

Low



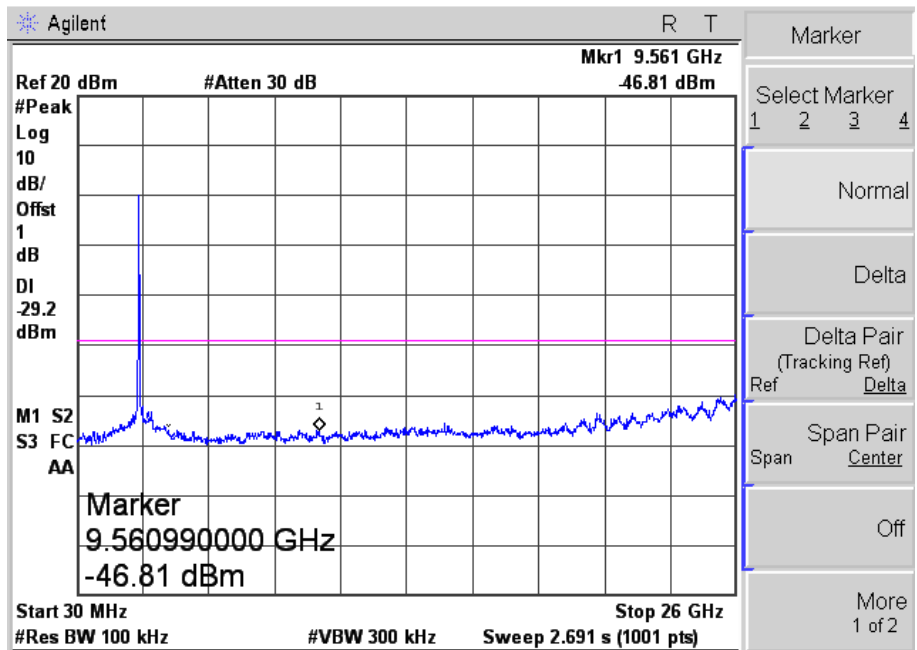
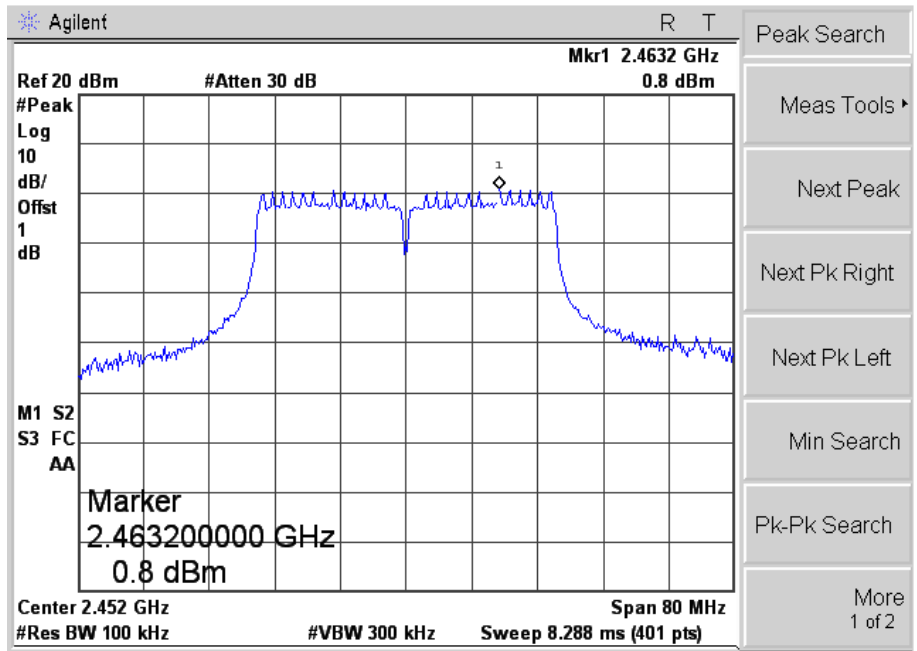
802.11n-HT40

Middle



802.11n-HT40

High



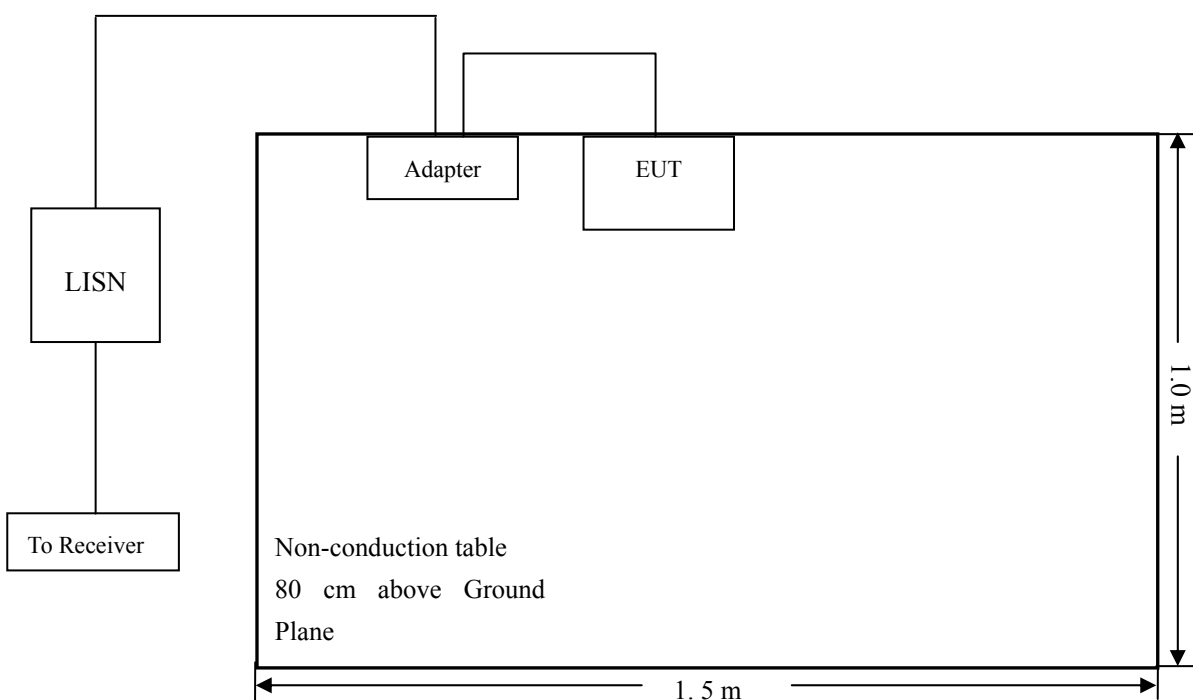
10. Conducted Emissions

10.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 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



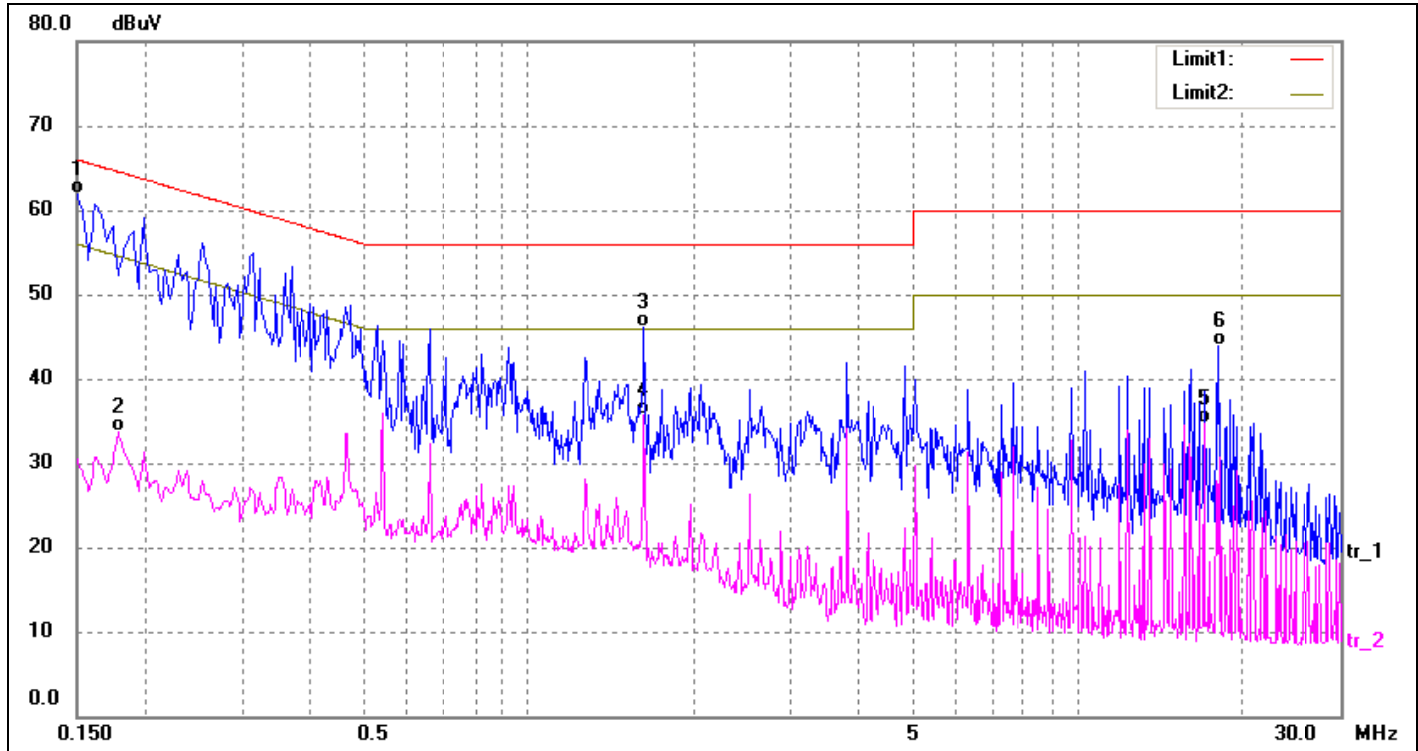
10.3 Test Receiver Setup

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

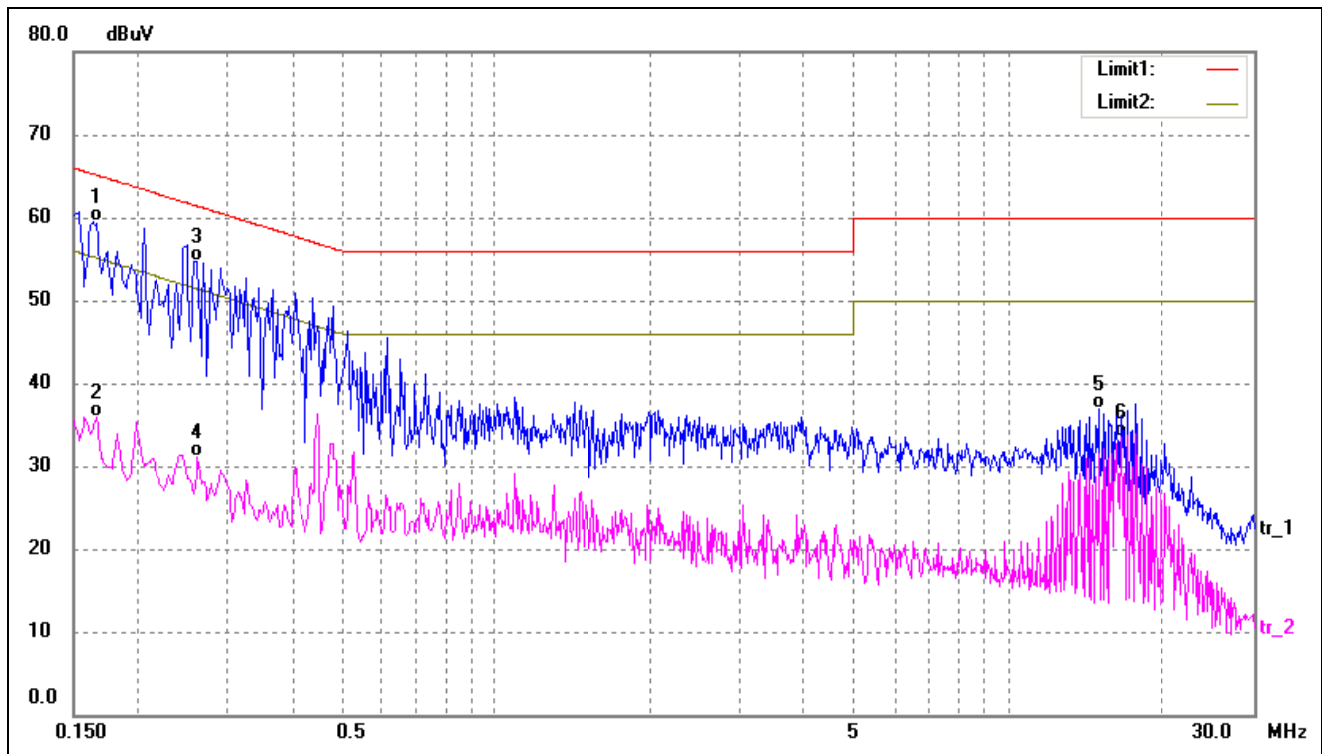
10.4 Summary of Test Results/Plots

Test Mode	Communication	DC 48V from of POE+	Polarity:	Neutral
-----------	---------------	---------------------	-----------	---------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1499	51.90	10.10	62.00	66.00	-4.00	QP
2	0.1780	23.58	10.11	33.69	54.57	-20.88	AVG
3	1.6220	35.64	10.56	46.20	56.00	-9.80	QP
4	1.6220	25.13	10.56	35.69	46.00	-10.31	AVG
5	16.9579	23.56	11.09	34.65	50.00	-15.35	AVG
6	17.9779	32.79	11.11	43.90	60.00	-16.10	QP

Test Mode	Communication	DC 48V from of POE+	Polarity:	Line
-----------	---------------	---------------------	-----------	------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1640	49.36	10.11	59.47	65.25	-5.78	QP
2	0.1660	25.75	10.11	35.86	55.15	-19.29	AVG
3	0.2620	44.62	10.16	54.78	61.36	-6.58	QP
4	0.2620	20.85	10.16	31.01	51.36	-20.35	AVG
5	14.9138	25.79	11.03	36.82	60.00	-23.18	QP
6	16.5699	22.36	11.08	33.44	50.00	-16.56	AVG

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