

FCC Part 15E Measurement and Test Report

For

Cyrus Technology GmbH

Hergelsbendenstrasse 49, D-52080 Aachen, Germany

FCC ID: 2AI3KCS45XA

FCC Rule(s): FCC Part 15.407

Product Description: Rugged Phone

Tested Model: CS45XA

Report No.: WTX19X11079863W-4

Sample Receipt Date: 2019-11-18

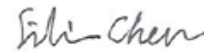
Tested Date: 2019-11-18 to 2019-12-11

Issued Date: 2019-12-12

Tested By: Jason Su / Engineer



Reviewed By: Silin Chen / EMC Manager



Approved & Authorized By: Jandy So / PSQ Manager



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	4
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
1.2 TEST STANDARDS	5
1.3 TEST METHODOLOGY	5
1.4 TABLE FOR PARAMETERS OF TEST SOFTWARE SETTING	5
1.5 EUT OPERATING DURING TEST	6
1.6 TEST FACILITY	6
1.7 EUT SETUP AND TEST MODE	7
1.8 MEASUREMENT UNCERTAINTY	8
1.9 TEST EQUIPMENT LIST AND DETAILS	9
2. SUMMARY OF TEST RESULTS	11
3. RF EXPOSURE	12
3.1 STANDARD APPLICABLE	12
3.2 TEST RESULT	12
4. ANTENNA REQUIREMENT	13
4.1 STANDARD APPLICABLE	13
4.2 EVALUATION INFORMATION	13
5. CONDUCTED EMISSIONS	14
5.1 TEST PROCEDURE	14
5.2 BASIC TEST SETUP BLOCK DIAGRAM	14
5.3 TEST RECEIVER SETUP	14
5.4 SUMMARY OF TEST RESULTS/PLOTS	14
6. POWER SPECTRAL DENSITY	17
6.1 STANDARD APPLICABLE	17
6.2 TEST PROCEDURE	17
6.3 SUMMARY OF TEST RESULTS/PLOTS	18
7. EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH	36
7.1 STANDARD APPLICABLE	36
7.2 TEST PROCEDURE	36
7.3 SUMMARY OF TEST RESULTS/PLOTS	38
8. MAXIMUM CONDUCTED OUTPUT POWER	56
8.1 STANDARD APPLICABLE	56
8.2 TEST PROCEDURE	56
8.3 SUMMARY OF TEST RESULTS/PLOTS	57
9. RADIATED SPURIOUS EMISSIONS	75
9.1 STANDARD APPLICABLE	75
9.2 TEST PROCEDURE	75
9.3 TEST RECEIVER SETUP	77
9.4 CORRECTED AMPLITUDE & MARGIN CALCULATION	77
9.5 SUMMARY OF TEST RESULTS/PLOTS	77
10. FREQUENCY STABILITY	137
10.1 STANDARD APPLICABLE	137
10.2 TEST PROCEDURE	137
10.3 SUMMARY OF TEST RESULTS/PLOTS	137

Report version

Version No.	Date of issue	Description
Rev.00	2019-12-12	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Cyrus Technology GmbH
 Address of applicant: Hergelsbendenstrasse 49, D-52080 Aachen, Germany

Manufacturer: Cyrus Technology GmbH
 Address of manufacturer: Hergelsbendenstrasse 49, D-52080 Aachen, Germany

General Description of EUT	
Product Name:	Rugged Phone
Brand Name:	CYRUS
Model No.:	CS45XA
Adding Model(s):	/
Rated Voltage:	DC3.85V
Battery Capacity:	4400mAh
Power Adapter:	MKC-0502000SU INPUT: AC100-240V, 50/60Hz, 0.4A; Output: DC5V, 2000mA
Software Version:	CS45XA_ROW_1.0.3
Hardware Version:	V1.1
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n(HT20) , 802.11n-HT40, 802.11ac-VH80
Frequency Range:	5150-5250MHz, 5250-5350MHz, 5470-5725MHz, 5725-5850MHz
RF Output Power:	11.97dBm (Conducted)
Type of Modulation:	BPSK, QPSK,16QAM,64QAM, 256QAM
Data Rate:	6-54Mbps, up to 433.3Mbps
Quantity of Channels:	15
Type of Antenna:	Integral Antenna
Antenna Gain:	1.44dBi

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.407: General technical requirements.

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

KDB789033 D02 v02r01: GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E

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, KDB789033 D02 v02r01. 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 Table for parameters of Test Software setting

Enter `###3646633###` into the calculator to enter the engineer mode, you can start to test. During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Mode	Test Frequency (MHz)													
	NCB: 20MHz													
	5180	5200	5240	5260	5300	5320	5500	5580	5700	5720	5745	5785	5825	
802.11a 6Mbps	20	20	20	20	20	20	20	20	20	20	20	20	20	
802.11n-HT20 MCS0	20	20	20	20	20	20	20	20	20	20	20	20	20	
Mode	NCB: 40MHz													
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795				
802.11n-HT40 MCS0	20	20	20	20	20	20	20	20	20	20				
Mode	NCB: 80MHz													
	5210		5290		5530		5610		5690		5775			
802.11ac-VH80 MCS0/Nss2	18		18		18		18		18		18			

1.5 EUT Operating during test

EUT was programmed to be in continuously transmitting mode. During the test, EUT operation to normal function and programs under Android were executed.

1.6 Test Facility

Address of the test laboratory

Laboratory: Shenzhen SEM Test Technology Co., Ltd.

Address: 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C. (518101)

FCC – Registration No.: 125990

Shenzhen SEM Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010. 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.

1.7 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	802.11a	5180MHz,5200MHz,5240MHz,5260MHz,5280MHz,5320MHz,5500MHz,5600MHz,5700MHz,5745MHz, 5785MHz,5825MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz,5260MHz,5280MHz,5320MHz,5500MHz,5600MHz,5700MHz,5745MHz, 5785MHz,5825MHz
TM3	802.11n-HT40	5190MHz,5230MHz,5270MHz,5310MHz,5510MHz,5590MHz,5670MHz,5755MHz,5795MHz
TM4	802.11ac-VH80	5210MHz,5290MHz,5530 MHz,5610 MHz,5775 MHz

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
USB-C Cable	1.5	Unshielded	Without Ferrite
Earphone Cable	1.2	Unshielded	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
/	/	/	/

1.8 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 $\pm 3.92\text{dB}$

1.9 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2019-04-30	2020-04-29
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2019-04-30	2020-04-29
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2019-04-30	2020-04-29
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2019-04-30	2020-04-29
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2019-04-30	2020-04-29
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
SEMT-1042	Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2019-05-05	2021-05-04
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2019-04-30	2020-04-29
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2019-04-30	2020-04-29
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2019-04-30	2020-04-29
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2019-04-30	2020-04-29
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2019-04-30	2020-04-29
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2019-04-30	2020-04-29
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2019-05-05	2021-05-04
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2019-04-30	2020-04-29
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2019-04-30	2020-04-29
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2019-04-30	2020-04-29
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2019-03-18	2020-03-17
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2019-03-18	2020-03-17
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2019-03-18	2020-03-17
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2019-03-18	2020-03-17
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2019-03-18	2020-03-17
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2019-03-18	2020-03-17

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203; §15.405	Antenna Requirement	Compliant
§15.207; §15.407(b)(6)	Conducted Emission	Compliant
§15.407(a)(1),(2)	Power Spectral Density	Compliant
§15.407(e)	Emission Bandwidth and Occupied Bandwidth	Compliant
§15.407(a)(1),(2)	Maximum Conducted Output Power	Compliant
§15.407(b)(1),(2),(3),(4)	Undesirable emission	Compliant
§15.205; §15.407(b)(1),(2),(3)	Radiated Emission	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.407(h)	Dynamic Frequency Selection (DFS)	Compliant

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

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

3.2 Test Result

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

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

This product has an integral antenna, fulfill the requirement of this section.

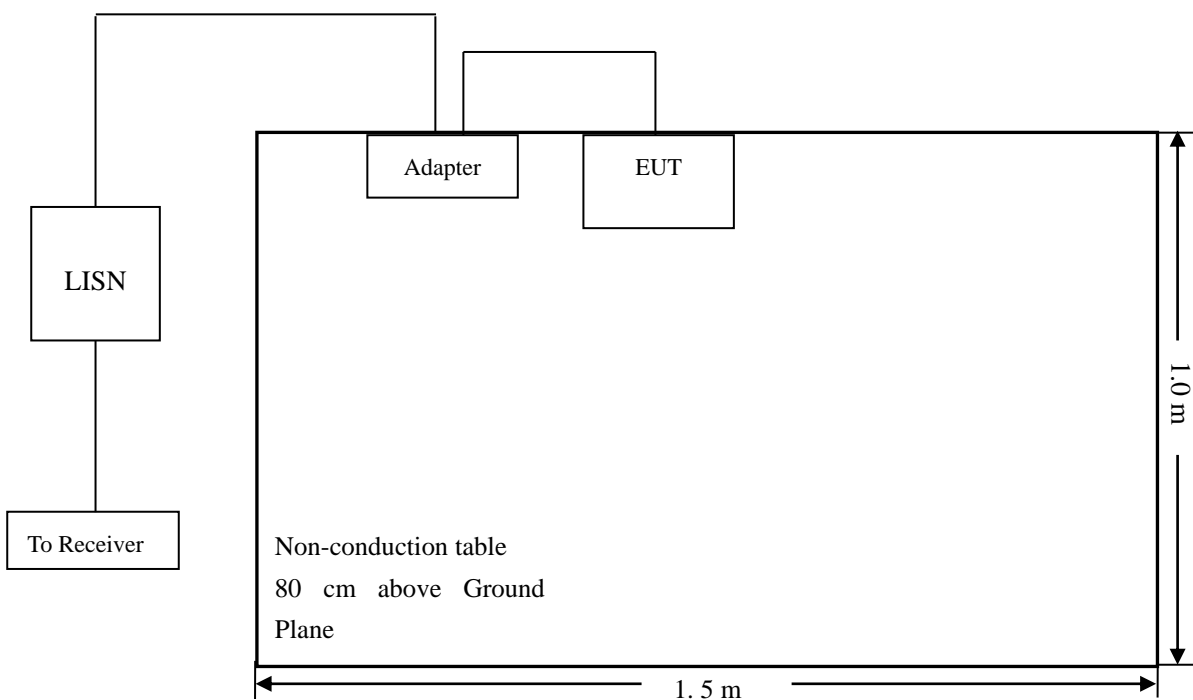
5. Conducted Emissions

5.1 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.

5.2 Basic Test Setup Block Diagram



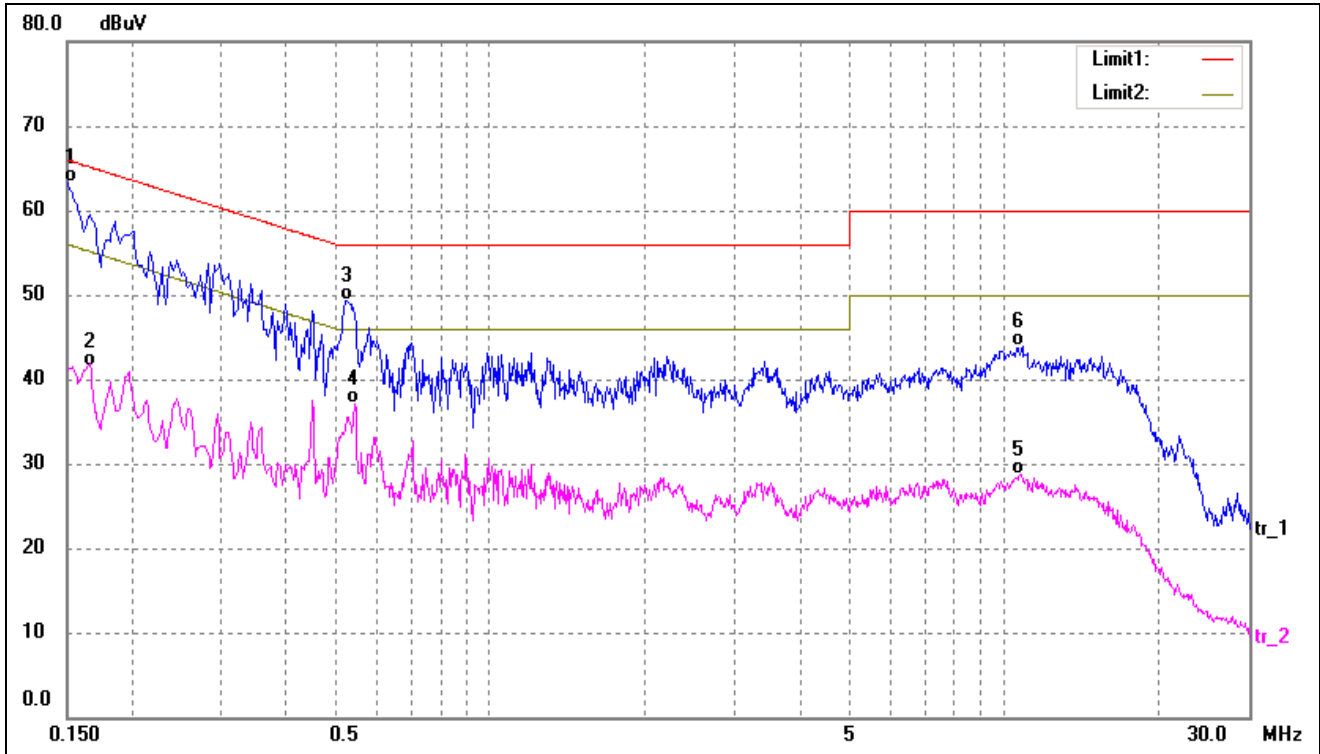
5.3 Test Receiver Setup

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

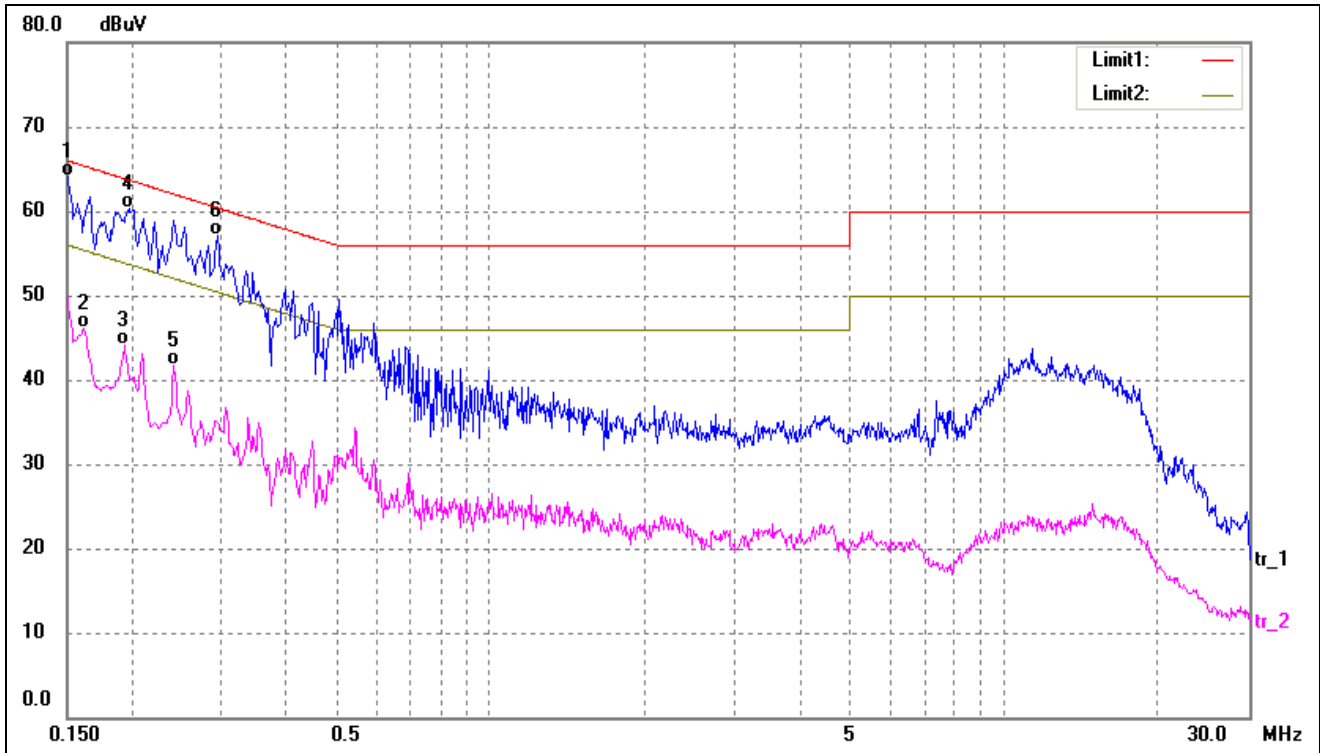
5.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral
-----------	---------------	-------------	-----------	---------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1500	53.40	9.95	63.35	66.00	-2.65	QP
2	0.1641	31.59	9.95	41.54	55.25	-13.71	AVG
3	0.5260	39.33	10.03	49.36	56.00	-6.64	QP
4	0.5460	27.13	10.03	37.16	46.00	-8.84	AVG
5	10.7820	18.16	10.58	28.74	50.00	-21.26	AVG
6	10.8860	33.30	10.58	43.88	60.00	-16.12	QP

Test Mode	Communication	AC120V 60Hz	Polarity:	Line
-----------	---------------	-------------	-----------	------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1500	54.25	9.95	64.20	66.00	-1.80	QP
2	0.1620	36.10	9.95	46.05	55.36	-9.31	AVG
3	0.1940	34.17	9.97	44.14	53.86	-9.72	AVG
4	0.1980	50.30	9.97	60.27	63.69	-3.42	QP
5	0.2420	31.62	10.00	41.62	52.03	-10.41	AVG
6	0.2940	47.18	10.01	57.19	60.41	-3.22	QP

6. Power Spectral Density

6.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

6.2 Test Procedure

According to 789033 D02 v02r01 General UNII Test Procedures New Rules v02, the following is the measurement procedure.

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500kHz bandwidth, the following adjustments to the procedures apply:

- a) Set RBW $\geq 1/T$, where T is defined in section II.B.1.a).
- b) Set VBW ≥ 3 RBW.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/\text{RBW})$ to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10\log(1\text{MHz}/\text{RBW})$ to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since RBW=100 kHz is available on nearly all spectrum analyzers.

6.3 Summary of Test Results/Plots

U-NII-1:5150-5250MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5180	7.848	11
	5200	7.572	11
	5240	7.730	11
802.11n-HT20	5180	7.903	11
	5200	7.024	11
	5240	7.226	11
802.11n-HT40	5190	5.192	11
	5230	3.572	11
802.11ac-HT80	5210	1.043	11

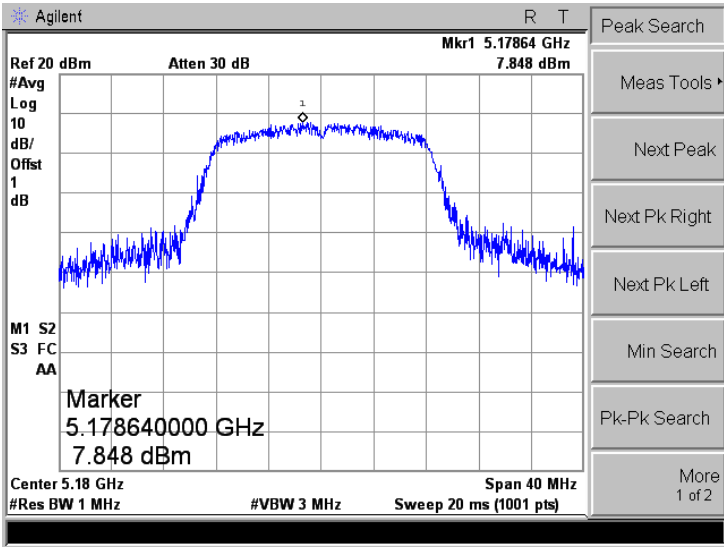
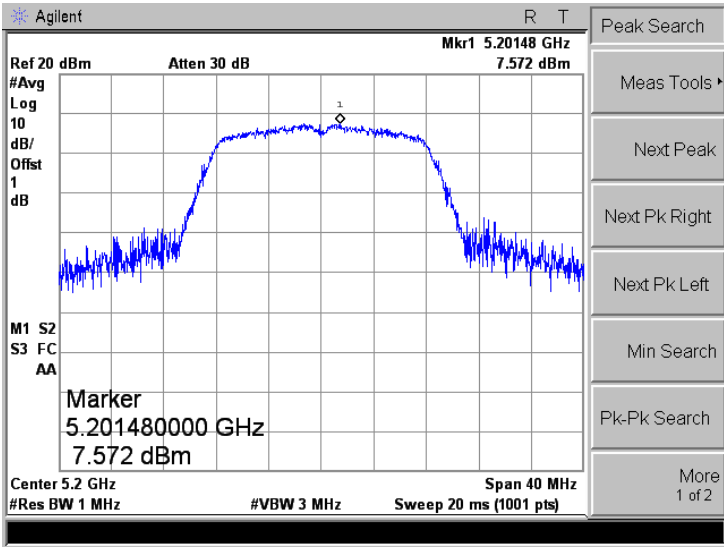
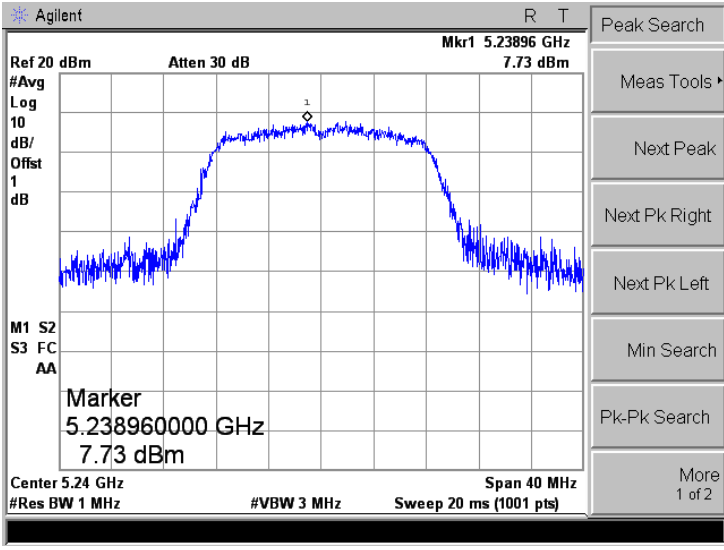
U-NII-2A: 5250-5350MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5260	7.659	11
	5280	7.122	11
	5320	7.533	11
802.11n-HT20	5260	7.143	11
	5280	7.424	11
	5320	7.497	11
802.11n-HT40	5270	4.729	11
	5310	2.368	11
802.11ac-HT80	5290	0.179	11

U-NII-2C: 5470-5725MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5500	8.303	11
	5600	8.743	11
	5700	6.956	11
802.11n-HT20	5500	7.161	11
	5600	7.270	11
	5700	6.860	11
802.11n-HT40	5510	6.229	11
	5590	4.053	11
	5670	3.102	11
802.11ac-HT80	5530	1.540	11
	5610	-0.107	11

U-NII-3: 5725-5850MHz					
Operating mode	Test Channel	Power Spectral Density dBm/300kHz	Factor	Power Spectral Density* dBm/500kHz	Limit dBm/500kHz
802.11a	5745	3.523	2.22	5.743	30
	5785	2.745	2.22	4.965	30
	5825	1.557	2.22	3.777	30
802.11n-HT20	5745	4.031	2.22	6.251	30
	5785	2.798	2.22	5.018	30
	5825	2.088	2.22	4.308	30
802.11n HT40	5755	-1.666	2.22	0.554	30
	5795	-0.054	2.22	2.166	30
802.11ac VH80	5775	-5.437	2.22	-3.217	30

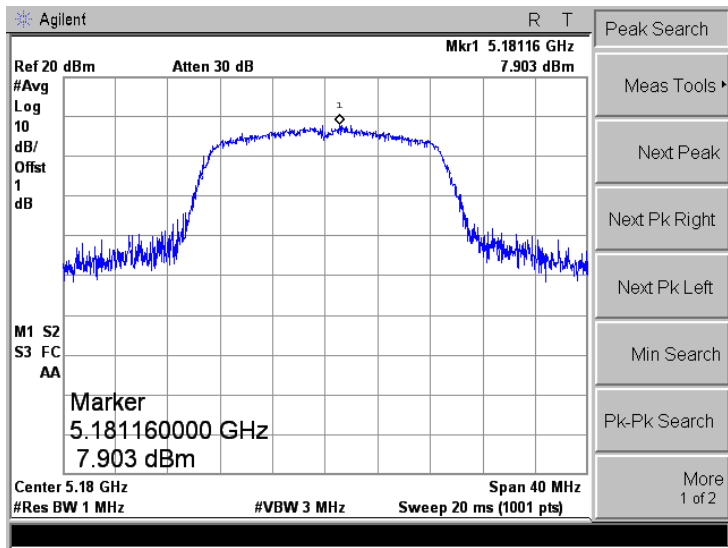
*Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)=2.22

➤ 5150-5250MHz

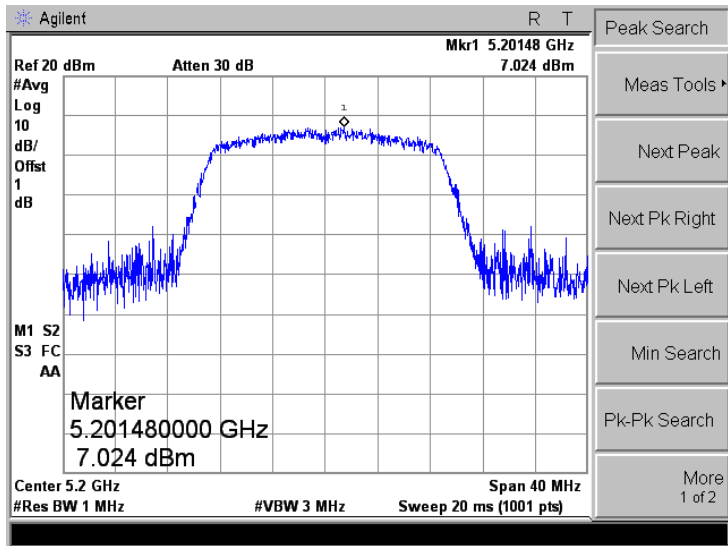
Mode:		802.11a
5180MHz		
5200MHz		
5240MHz		

Mode: 802.11n-HT20

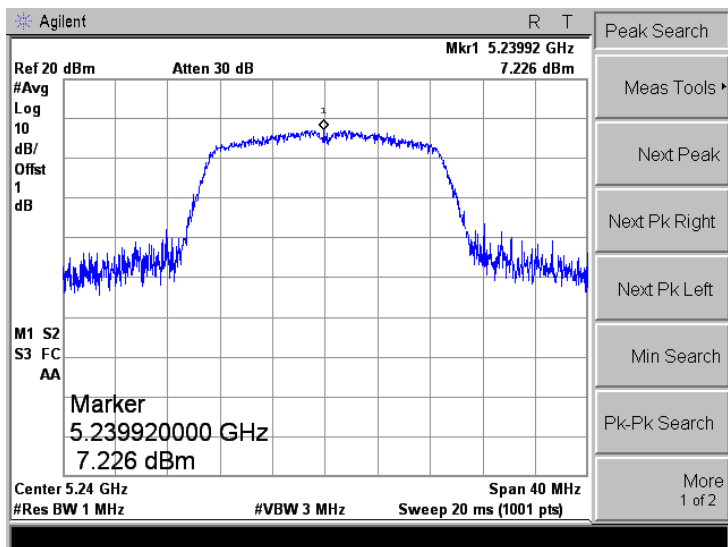
5180MHz

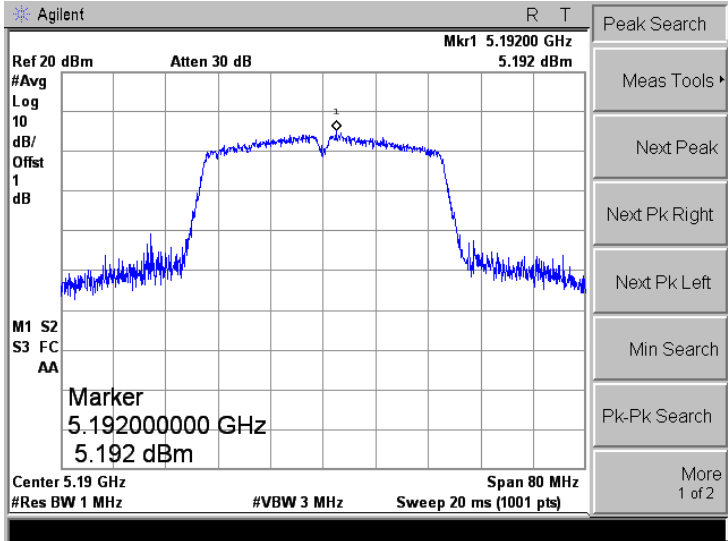
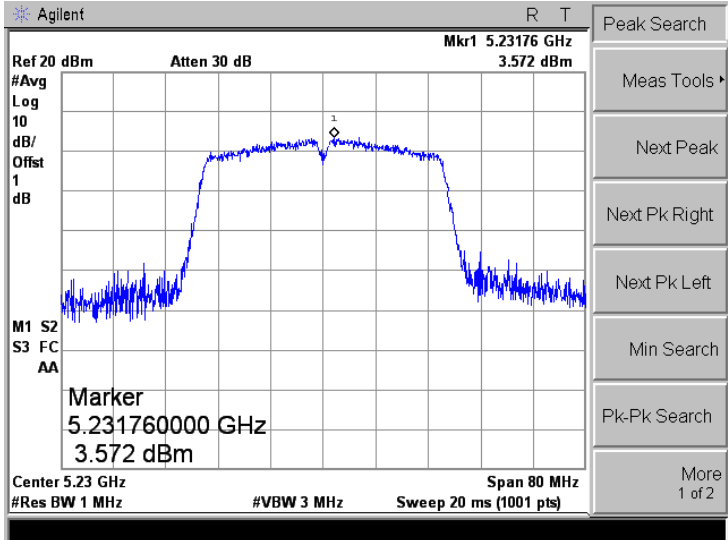


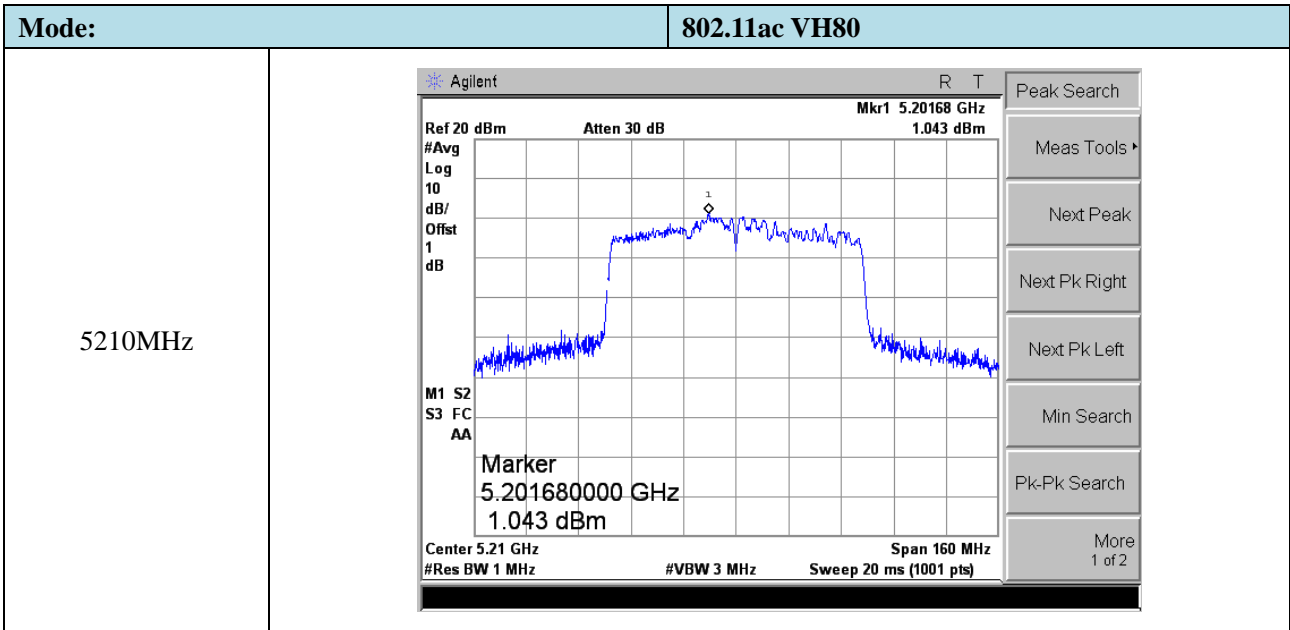
5200MHz



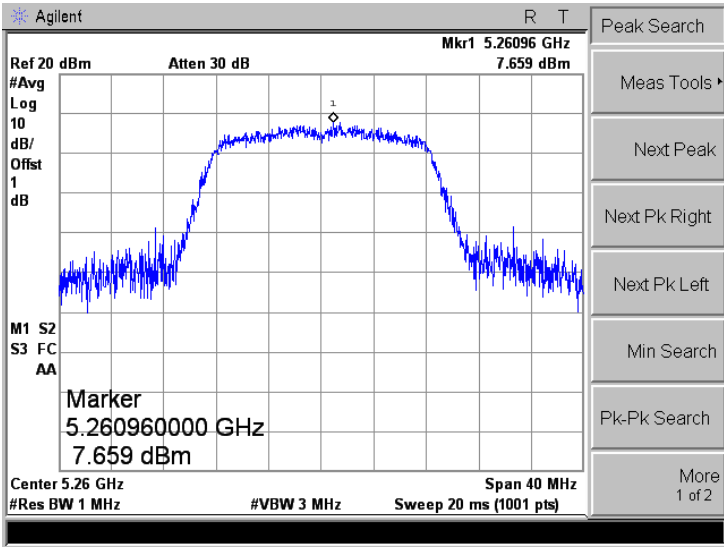
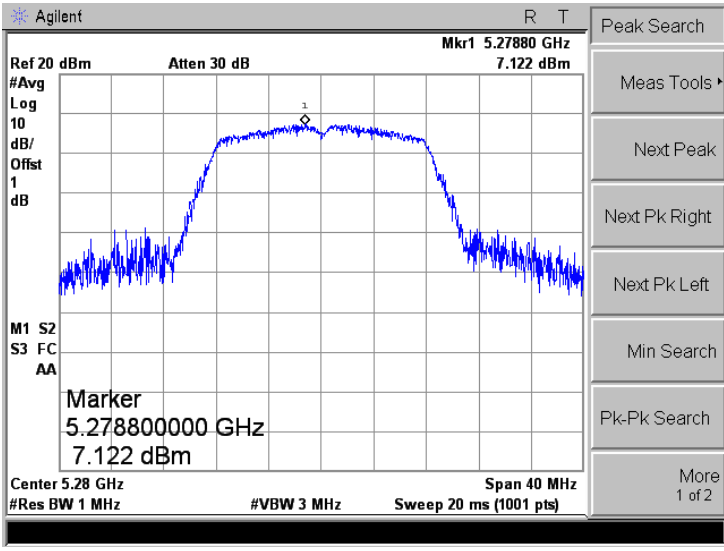
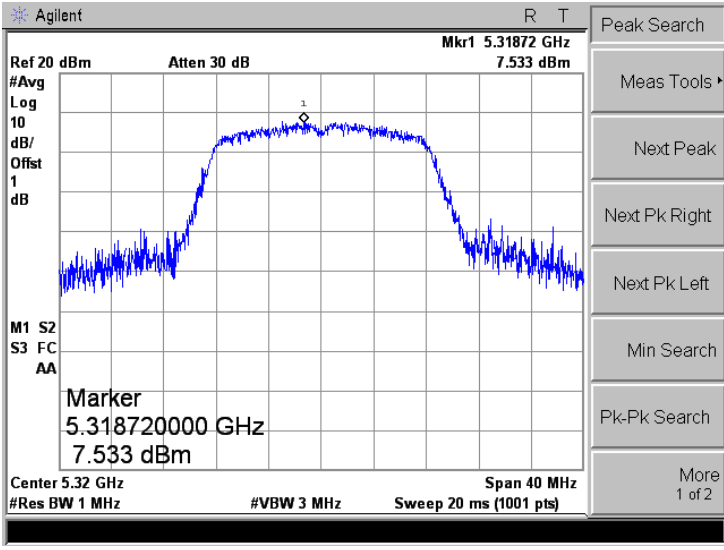
5240MHz



Mode:	802.11n-HT40
5190 MHz	
5230 MHz	

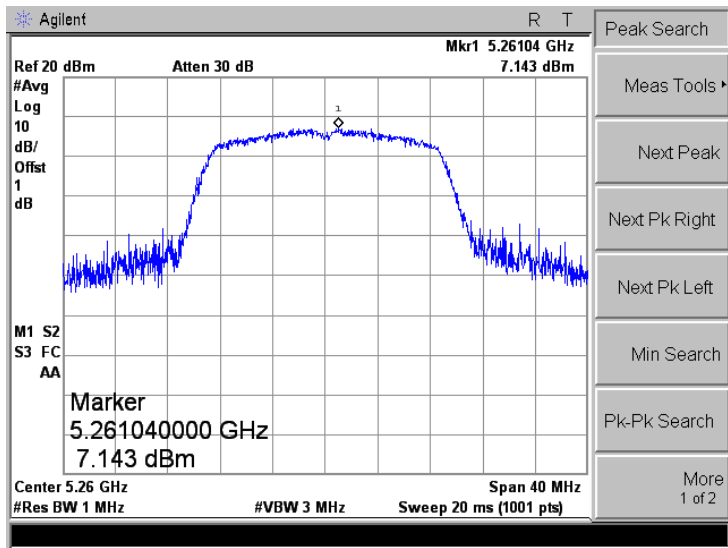


➤ 5250-5350MHz

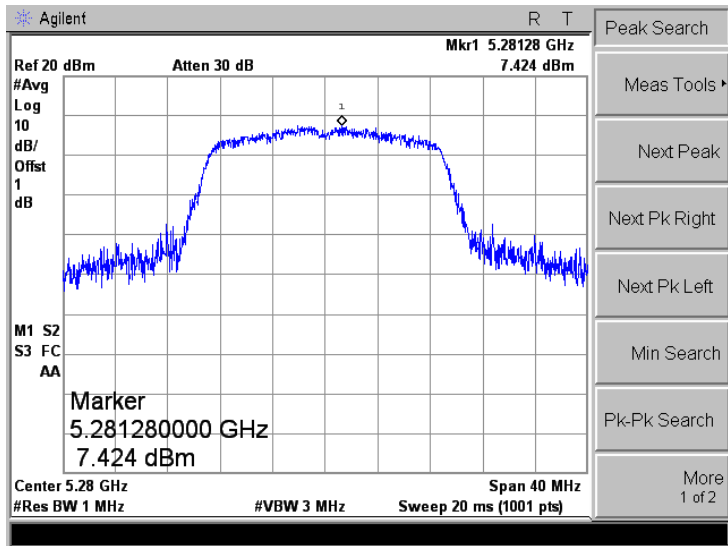
Mode:		802.11a
5260MHz		
5280MHz		
5320MHz		

Mode: 802.11n-HT20

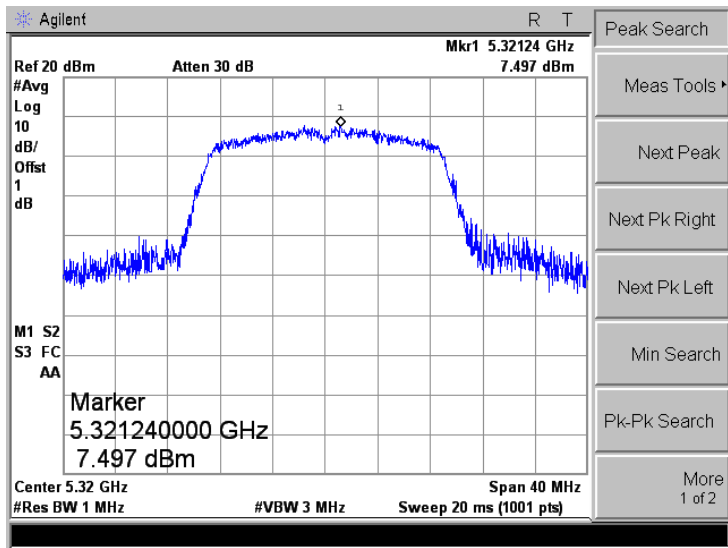
5260MHz

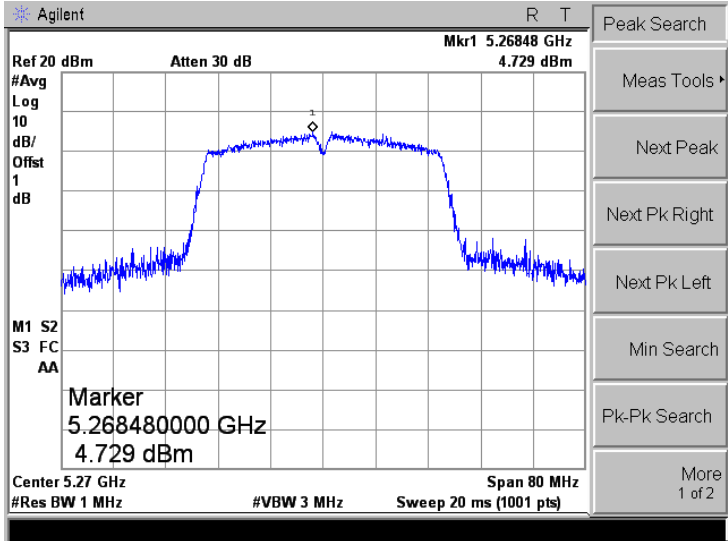
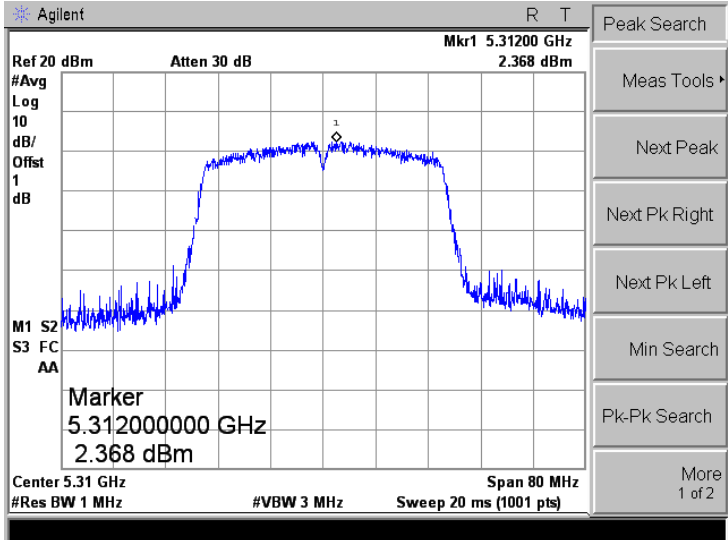


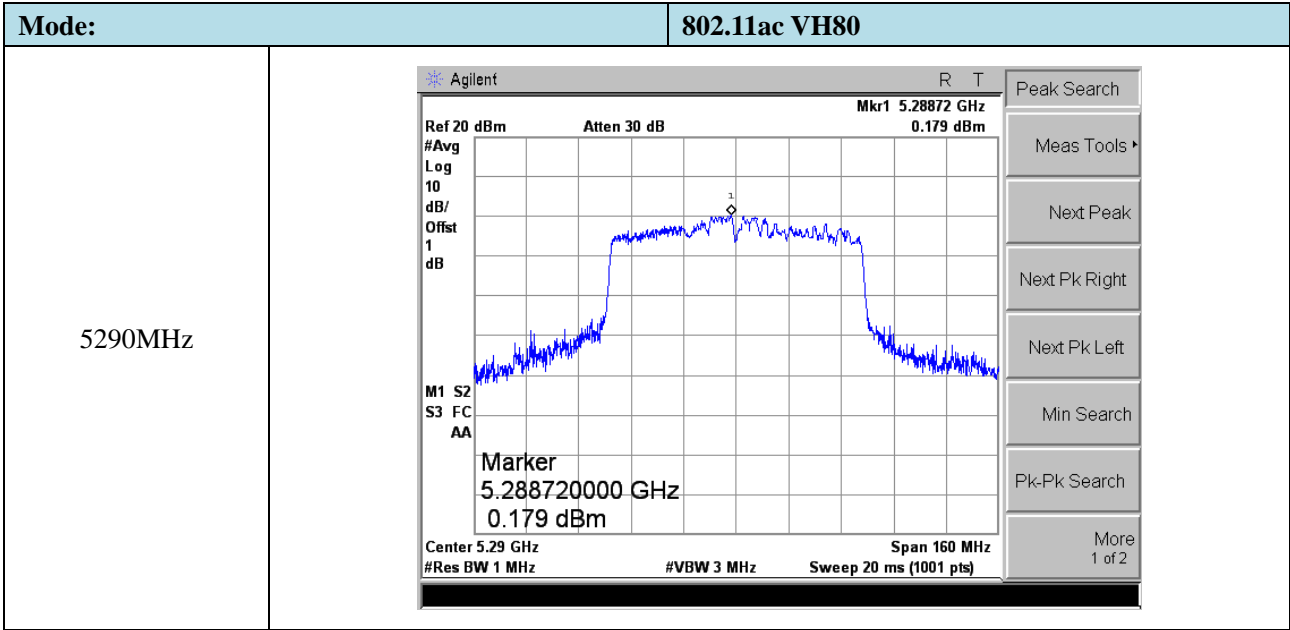
5280MHz



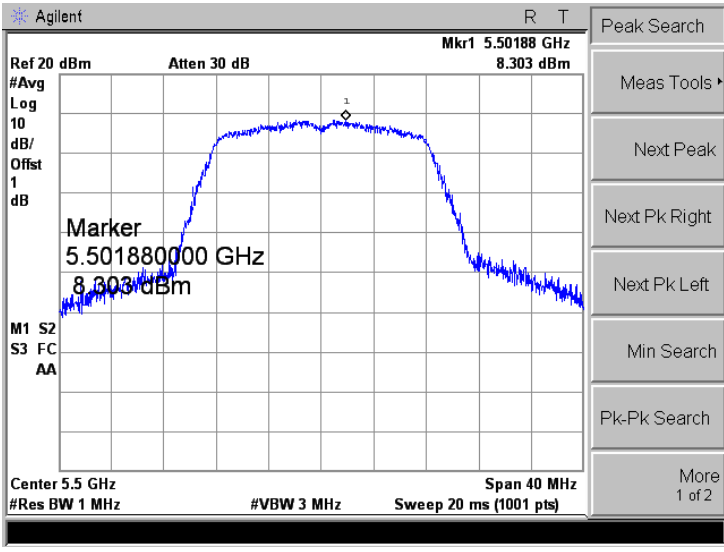
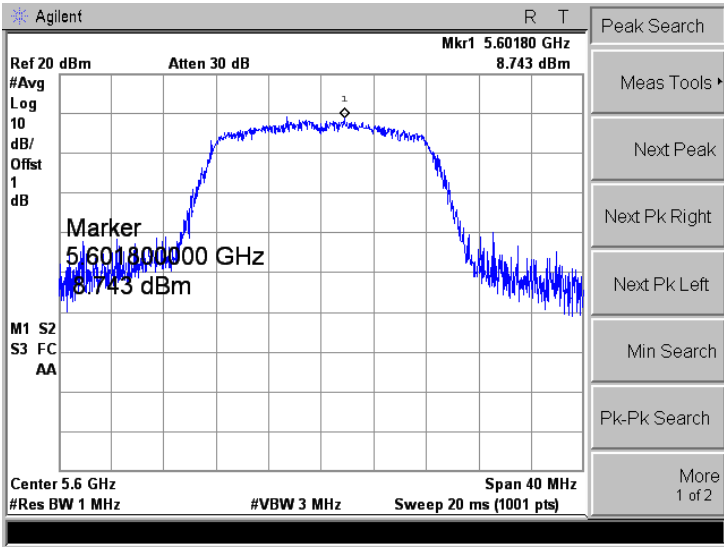
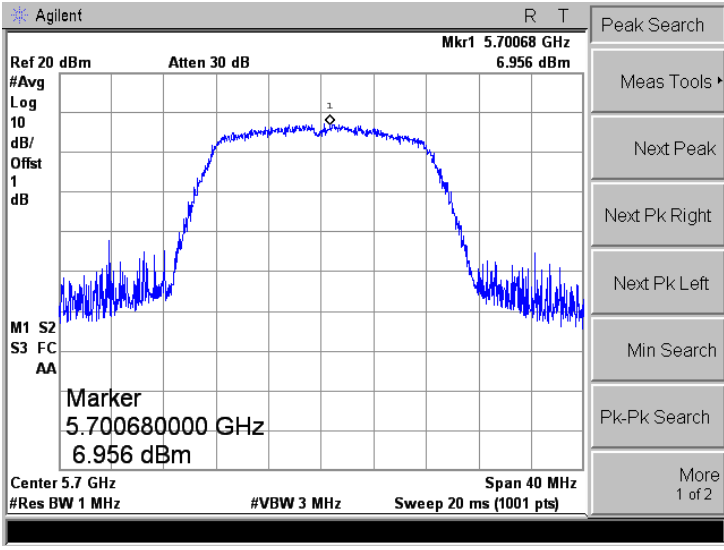
5320MHz



Mode:	802.11n-HT40
5270MHz	
5310MHz	

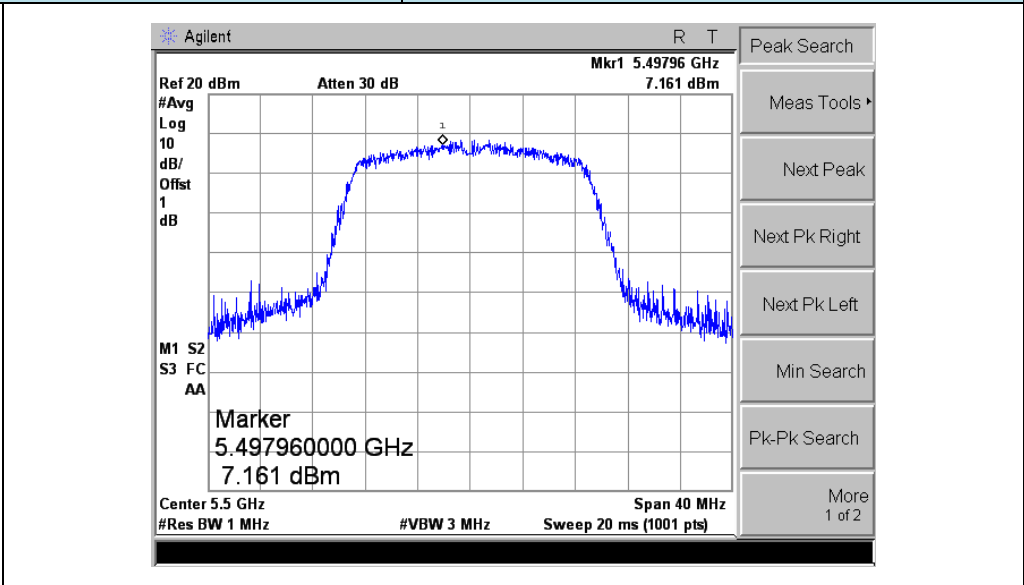


➤ 5470-5725MHz

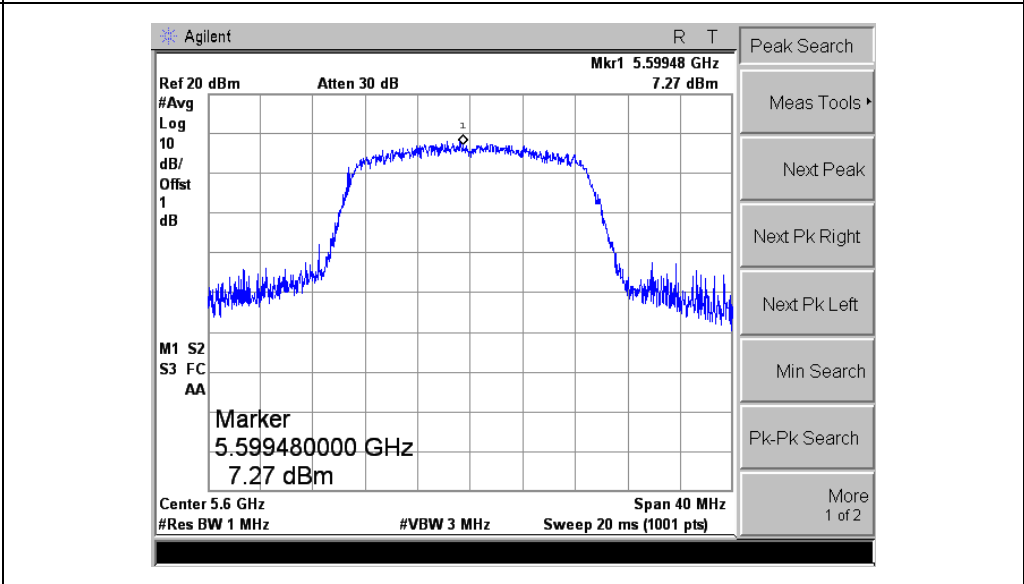
Mode:		802.11a
5500MHz		
5600MHz		
5700MHz		

Mode: 802.11n-HT20

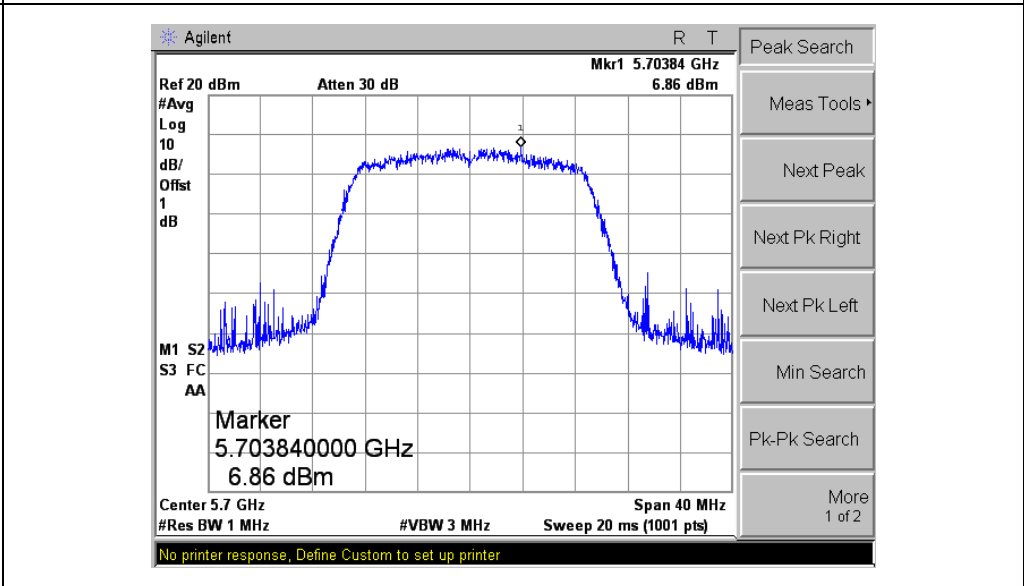
5500MHz

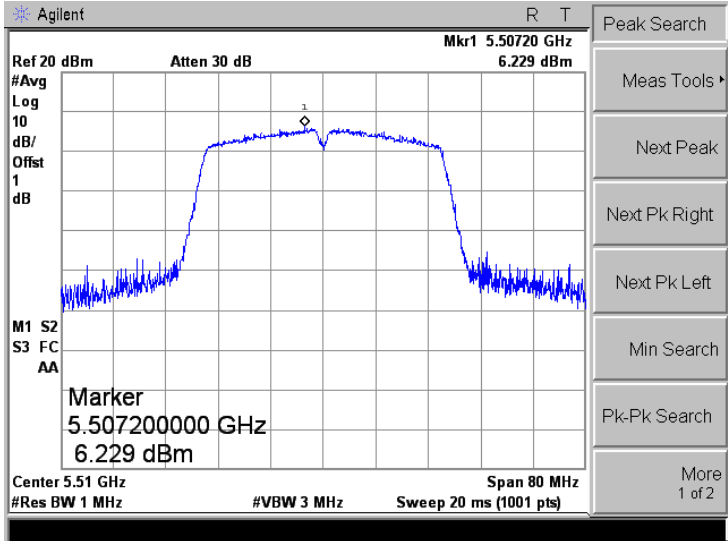
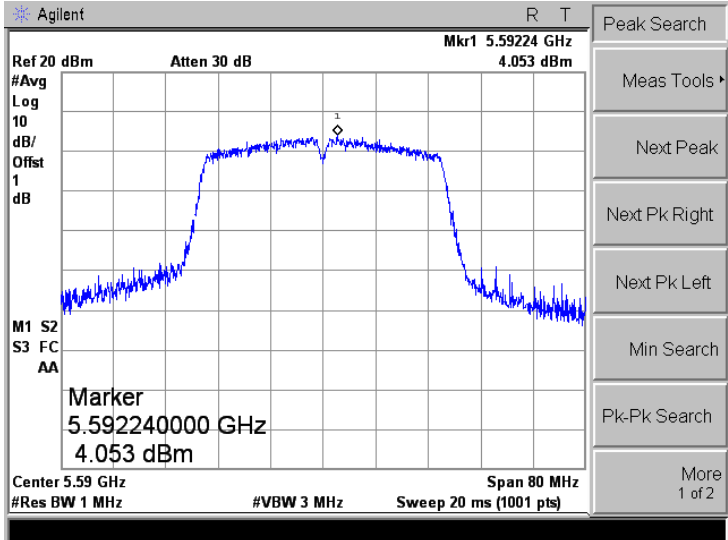
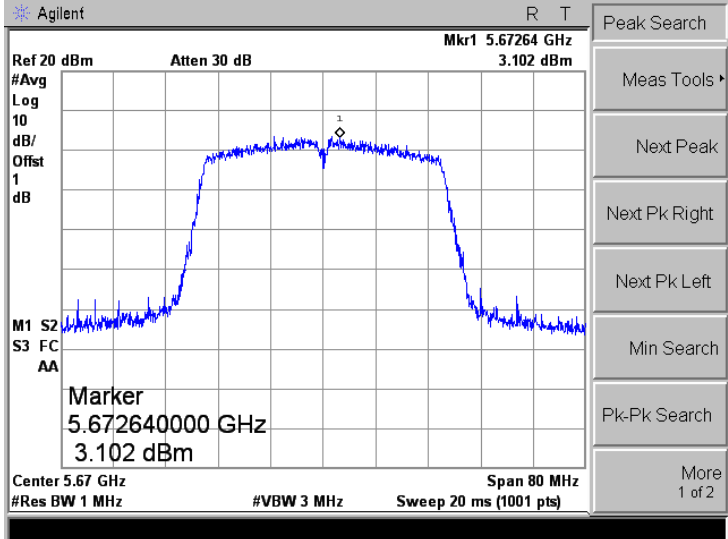


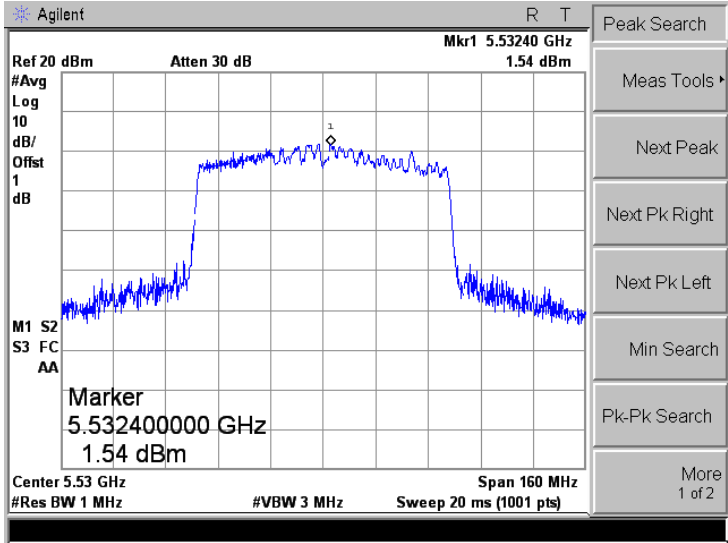
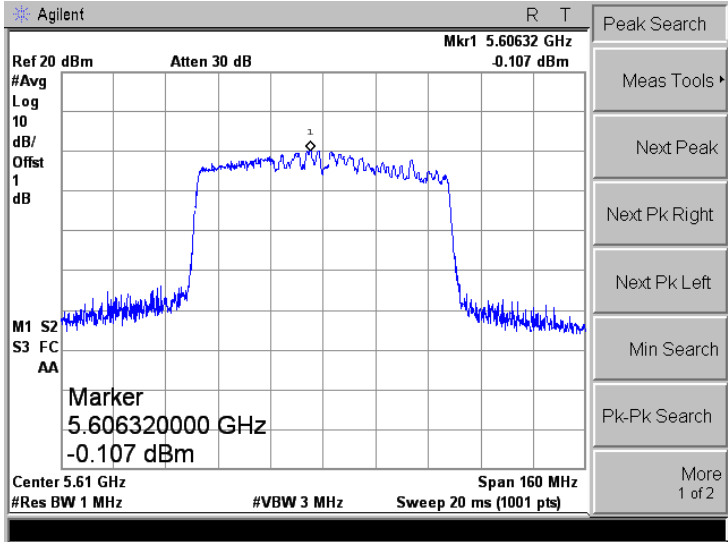
5600MHz



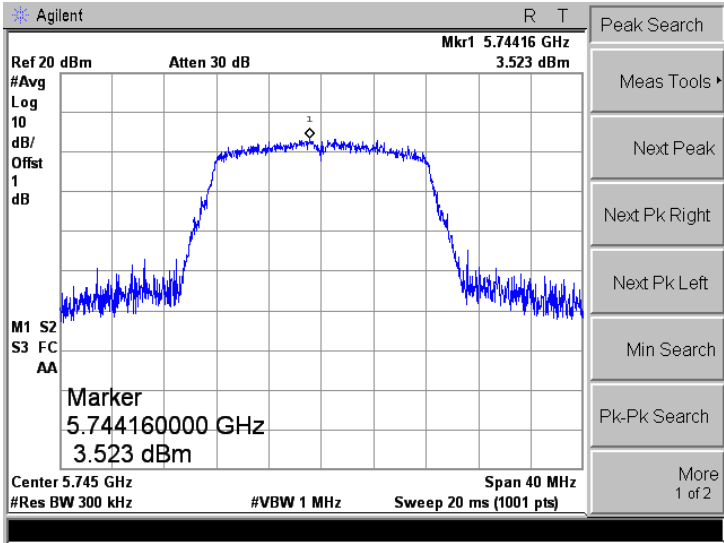
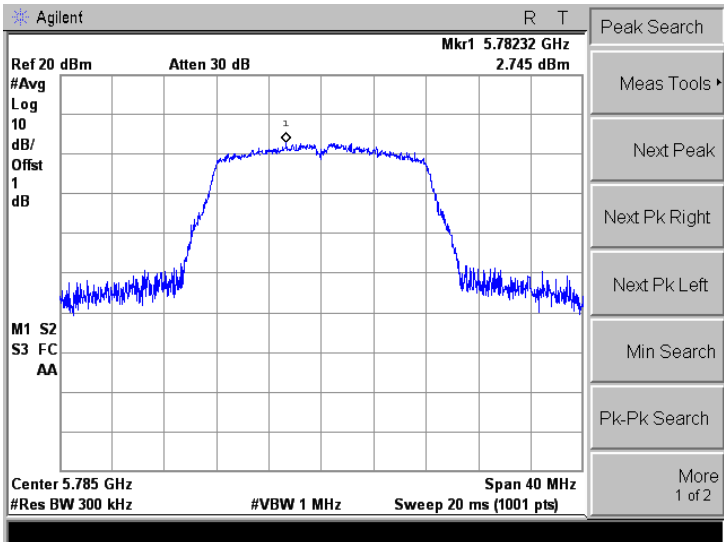
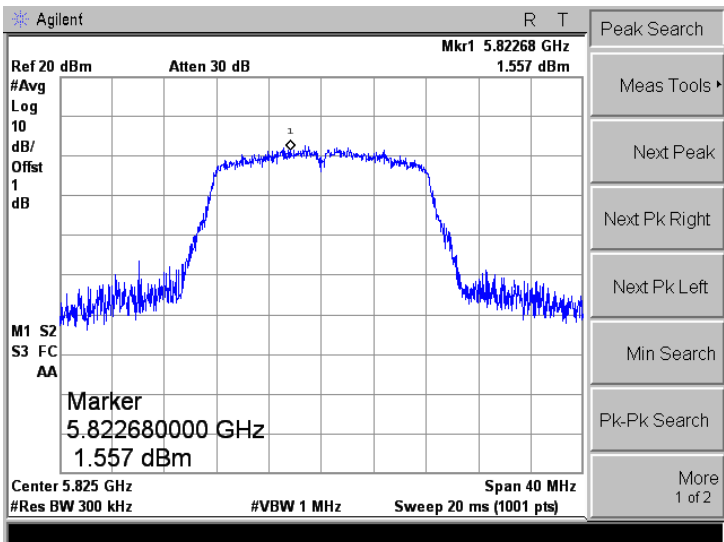
5700MHz



Mode:	802.11n-HT40
5510MHz	
5590MHz	
5670MHz	

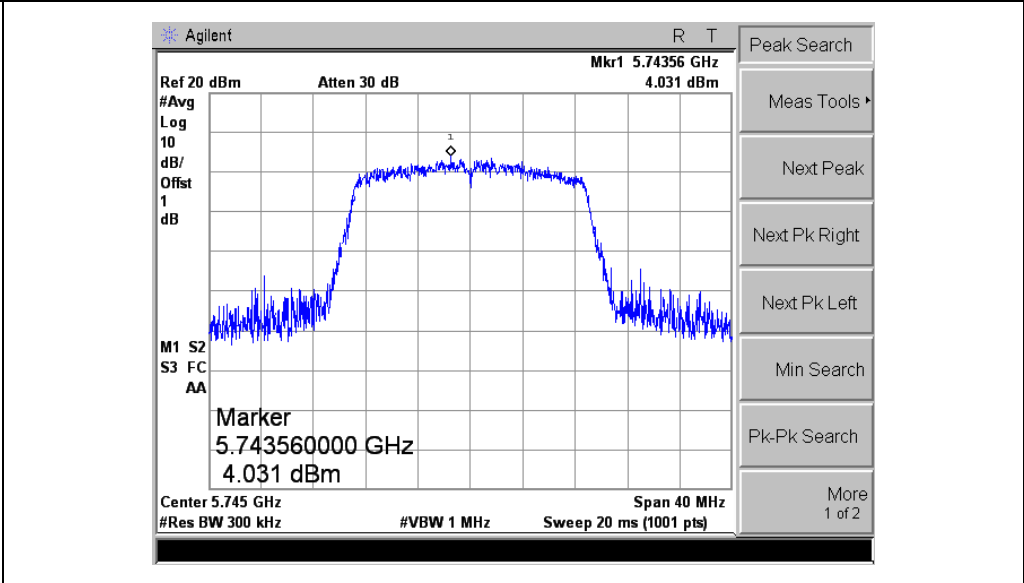
Mode:		802.11ac VH80
5530MHz		
5610MHz		

➤ 5725-5850MHz

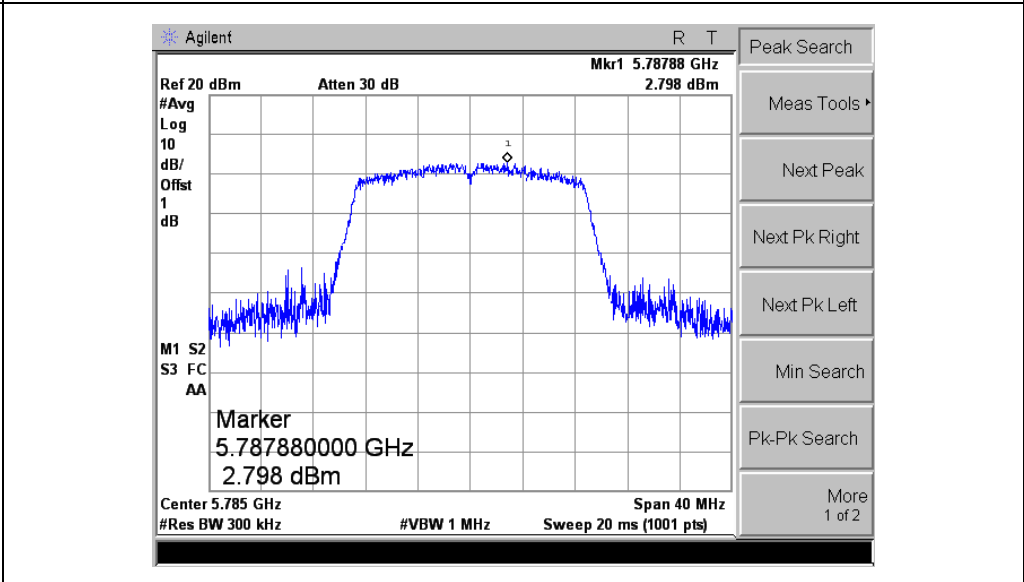
Mode:	802.11a
5745MHz	 <p>Agilent R T</p> <p>Ref 20 dBm Atten 30 dB Mkr1 5.74416 GHz 3.523 dBm</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>M1 S2 S3 FC AA</p> <p>Marker 5.744160000 GHz 3.523 dBm</p> <p>Center 5.745 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (1001 pts)</p> <p>Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2</p>
5785MHz	 <p>Agilent R T</p> <p>Ref 20 dBm Atten 30 dB Mkr1 5.78232 GHz 2.745 dBm</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>M1 S2 S3 FC AA</p> <p>Marker 5.782320000 GHz 2.745 dBm</p> <p>Center 5.785 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (1001 pts)</p> <p>Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2</p>
5825MHz	 <p>Agilent R T</p> <p>Ref 20 dBm Atten 30 dB Mkr1 5.82268 GHz 1.557 dBm</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>M1 S2 S3 FC AA</p> <p>Marker 5.822680000 GHz 1.557 dBm</p> <p>Center 5.825 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (1001 pts)</p> <p>Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2</p>

Mode: 802.11n-HT20

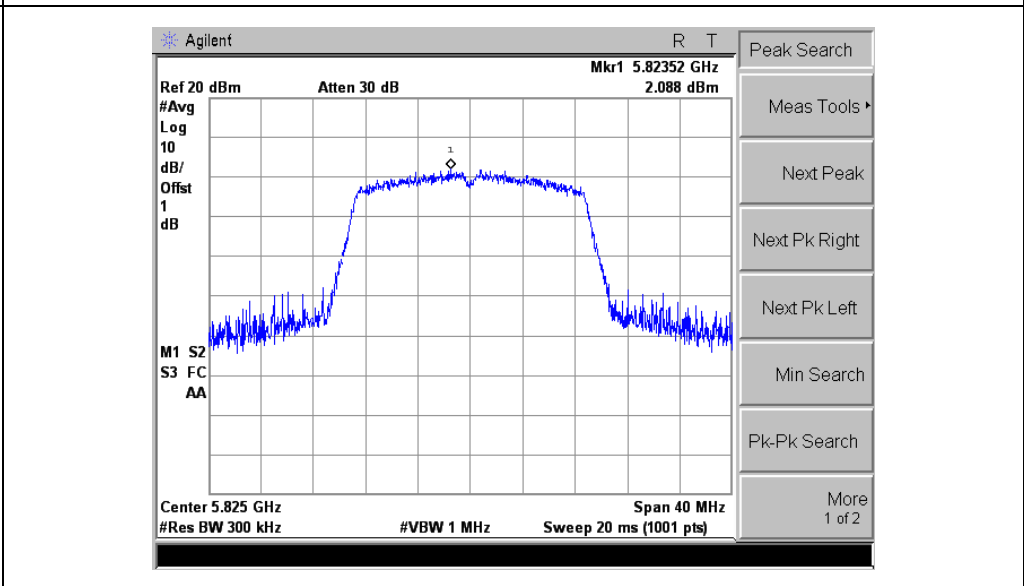
5745MHz

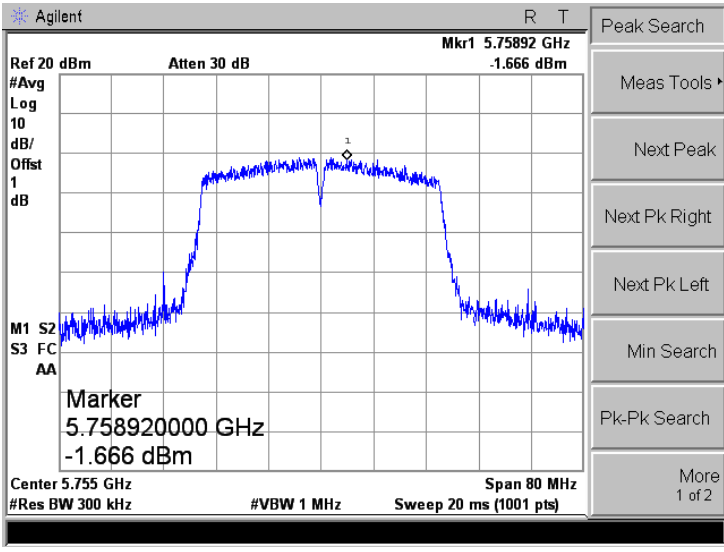
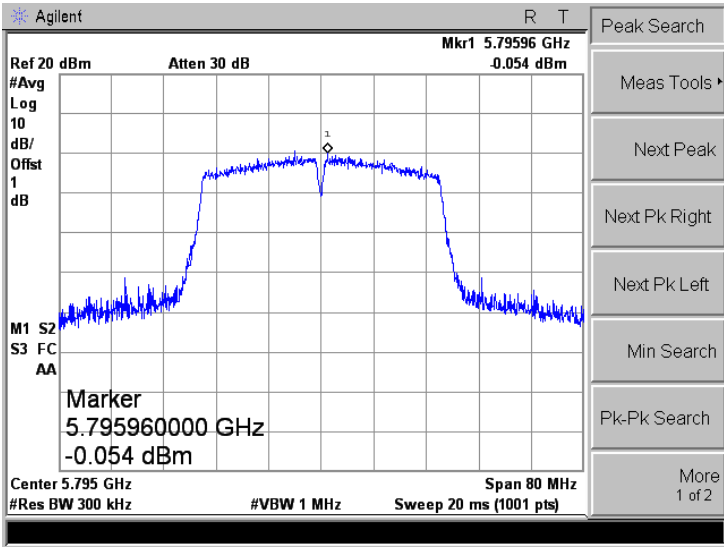


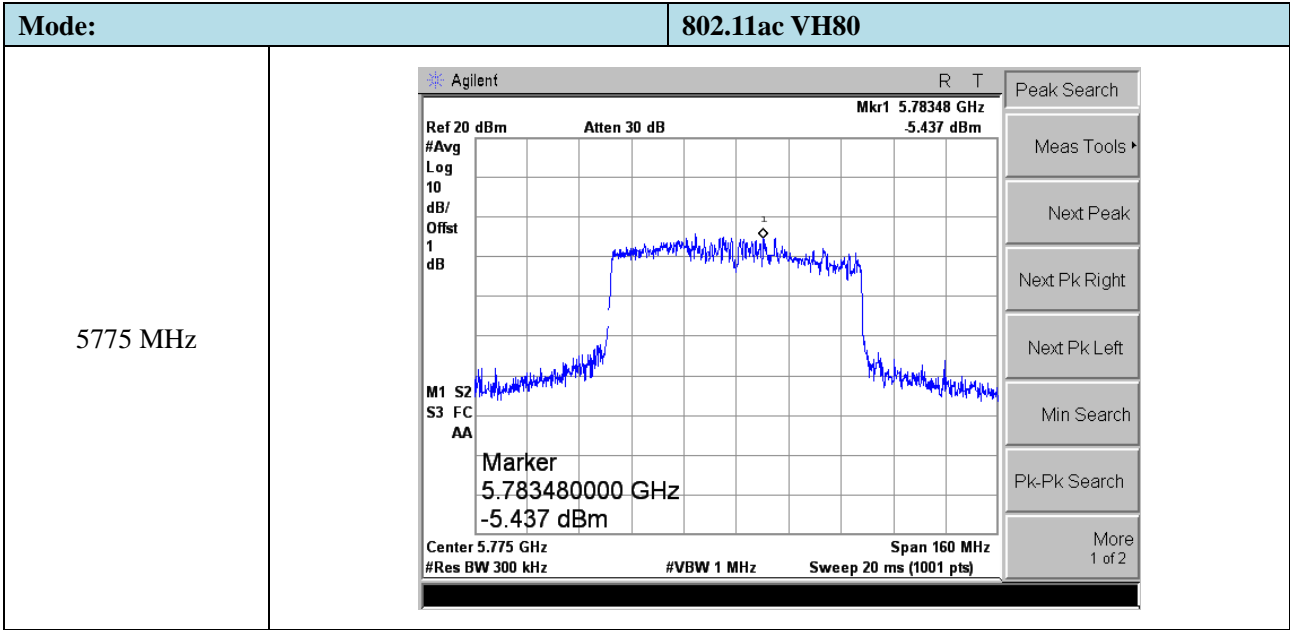
5785MHz



5825MHz



Mode:		802.11n-HT40
5755 MHz		
5795 MHz		



7. Emission Bandwidth and Occupied Bandwidth

7.1 Standard Applicable

According to 15.407(a) and (e):

(1) For the band 5.15-5.25 GHz.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

7.2 Test Procedure

According to 789033 D02 v02r0r section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)

a) Set RBW = approximately 1% of the emission bandwidth.

b) Set the VBW > RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare

this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- 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.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v02r01 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW $\geq 3 * RBW$
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

7.3 Summary of Test Results/Plots

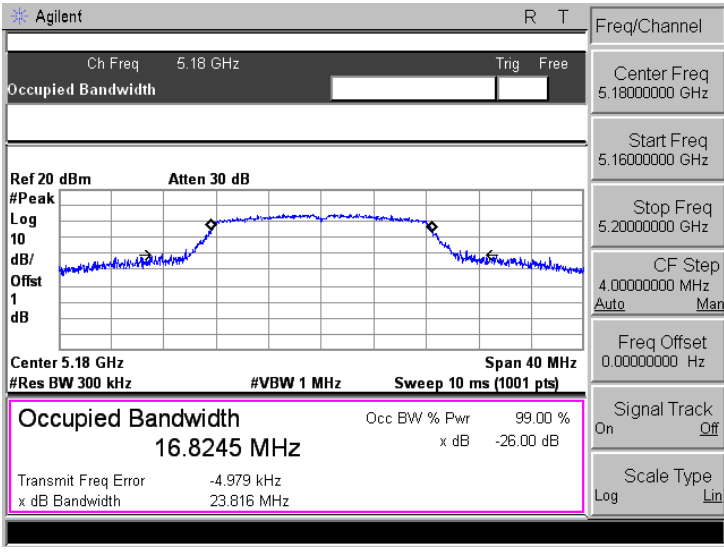
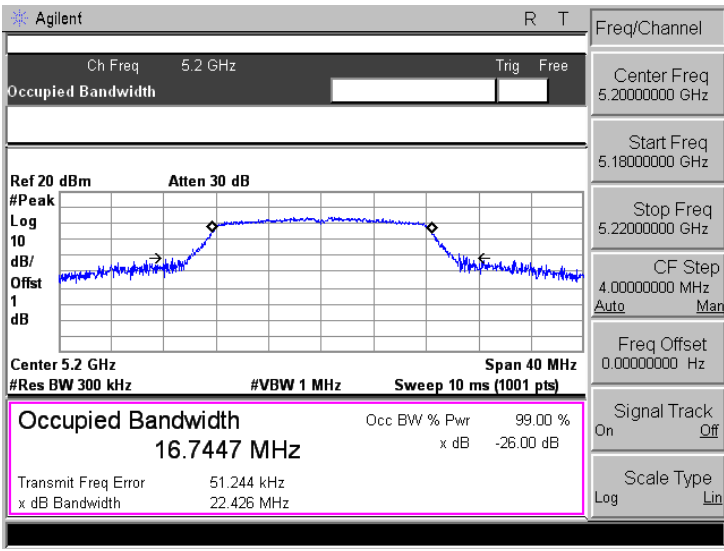
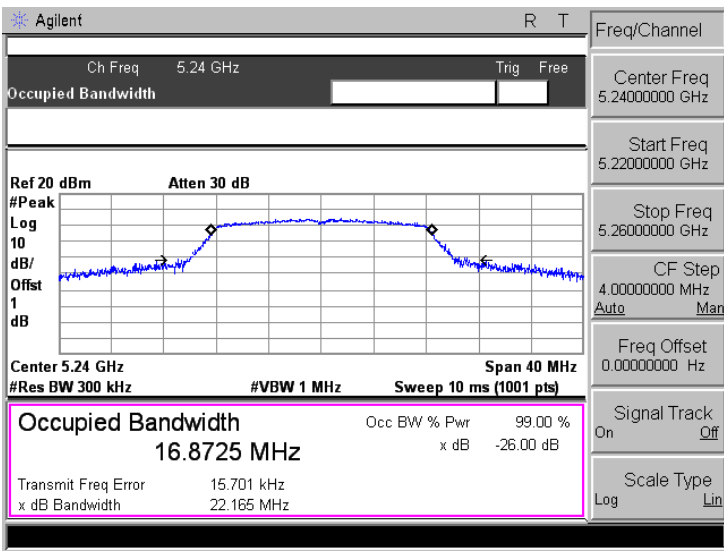
U-NII-1:5150-5250MHz				
Test Mode	Test Channel MHz	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5180	23.816	16.8245	Pass
	5200	22.426	16.7447	Pass
	5240	22.165	16.8725	Pass
802.11n-HT20	5180	25.177	17.7913	Pass
	5200	25.804	17.7101	Pass
	5240	22.334	17.7899	Pass
802.11n-HT40	5190	52.117	36.5185	Pass
	5230	45.613	36.3121	Pass
802.11ac-HT80	5210	79.521	75.4705	Pass

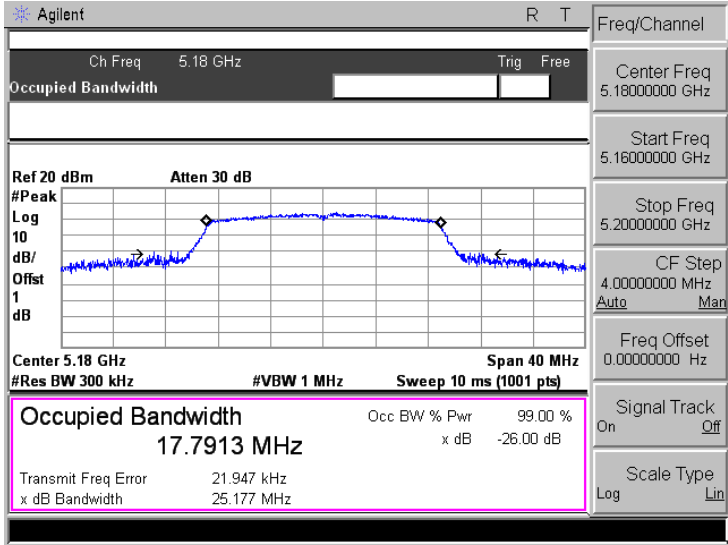
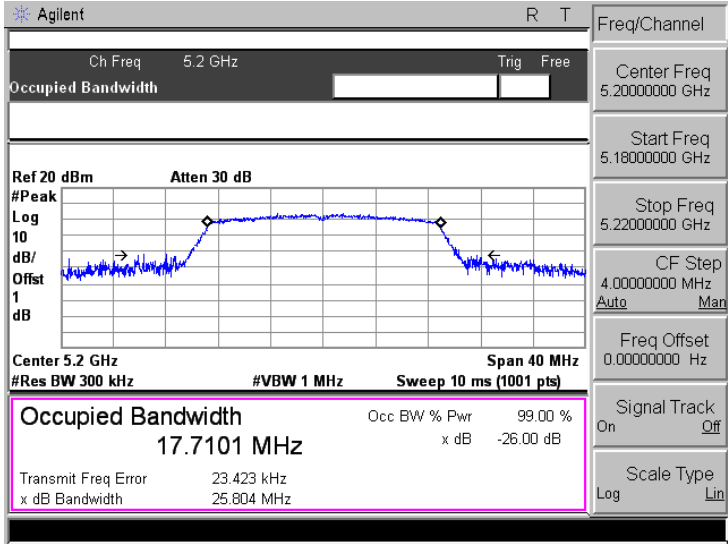
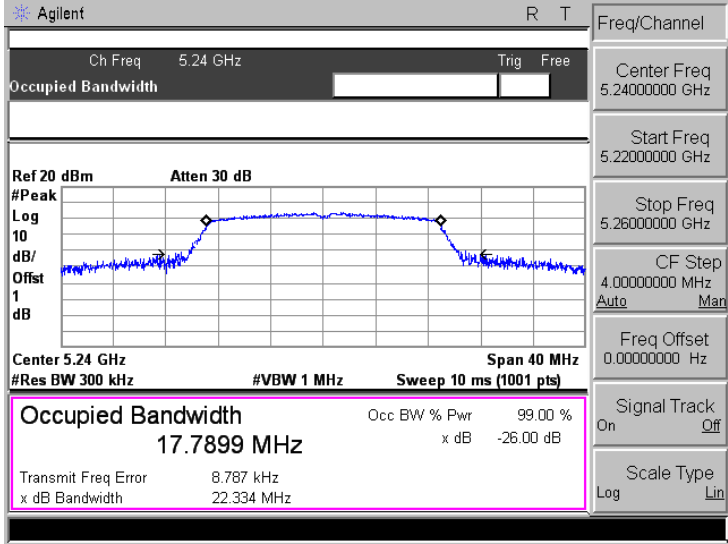
U-NII-2A: 5250-5350MHz				
Test Mode	Test Channel MHz	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5260	20.353	16.7104	Pass
	5280	21.468	16.6760	Pass
	5320	22.892	16.8094	Pass
802.11n-HT20	5260	25.503	17.7920	Pass
	5280	23.148	17.7589	Pass
	5320	24.314	17.8193	Pass
802.11n-HT40	5270	51.078	36.5176	Pass
	5310	41.629	36.2918	Pass
802.11ac-HT80	5290	82.508	75.4297	Pass

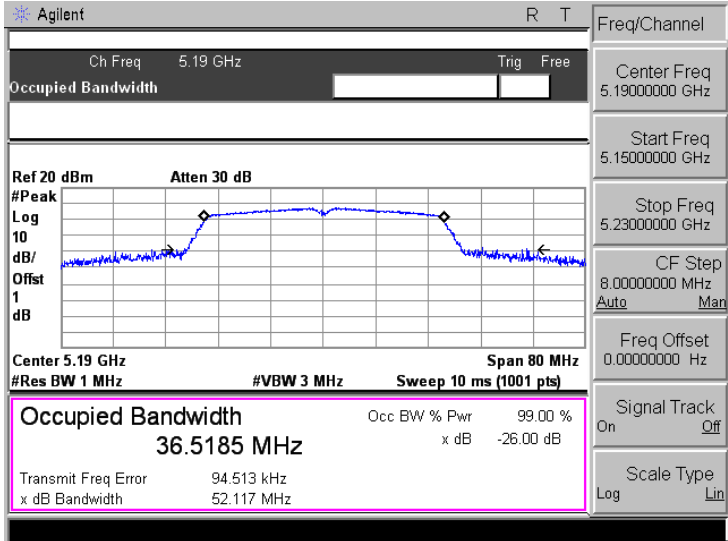
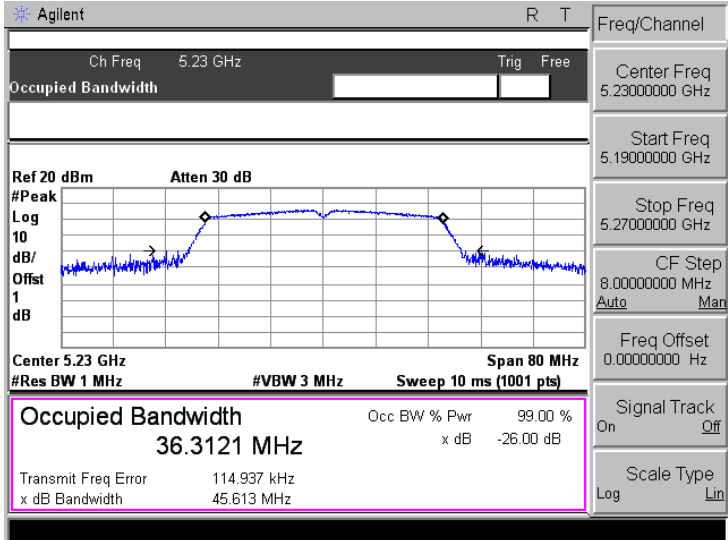
U-NII-2C: 5470-5725MHz				
Test Mode	Test Channel MHz	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5500	20.088	16.6816	Pass
	5600	20.206	16.7481	Pass
	5700	20.153	16.7043	Pass
802.11n-HT20	5500	20.457	17.7204	Pass
	5600	20.512	17.7251	Pass
	5700	20.466	17.7325	Pass
802.11n-HT40	5510	41.588	36.4256	Pass
	5590	41.665	36.3252	Pass
	5670	41.746	36.4170	Pass
802.11ac-HT80	5530	79.243	75.3198	Pass
	5610	79.392	75.1758	Pass

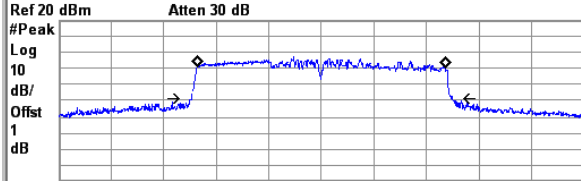
U-NII-3: 5725-5850MHz				
Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5745	16.081	16.7847	≥500
	5785	16.052	16.7002	≥500
	5825	16.097	16.7647	≥500
802.11n-HT20	5745	17.204	17.7354	≥500
	5785	17.220	17.7101	≥500
	5825	17.355	17.7781	≥500
802.11n-HT40	5755	35.300	36.2809	≥500
	5795	35.386	36.3217	≥500
802.11ac VH80	5775	65.254	75.1499	≥500

➤ 5150-5250MHz

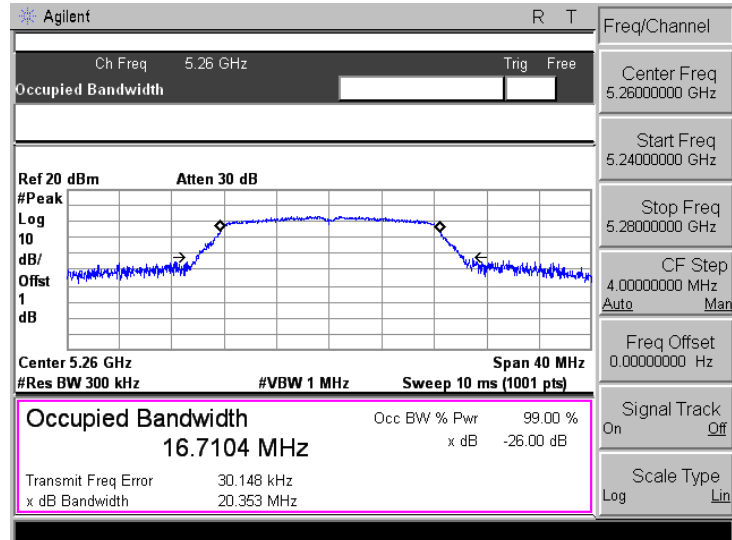
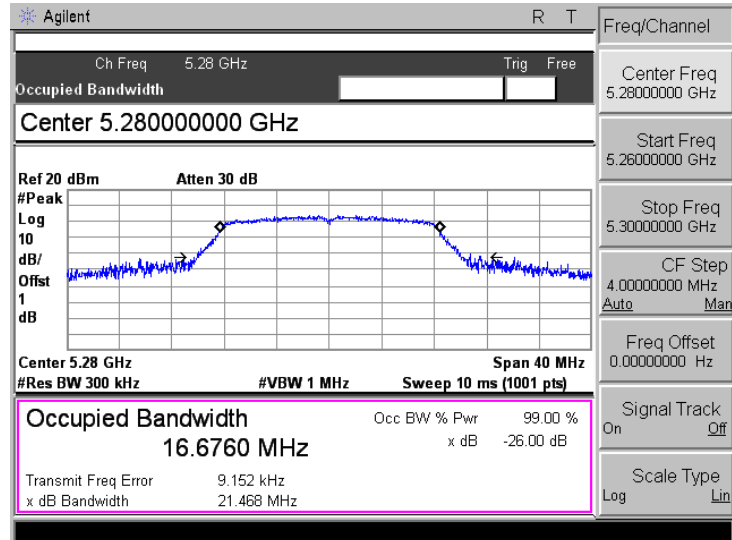
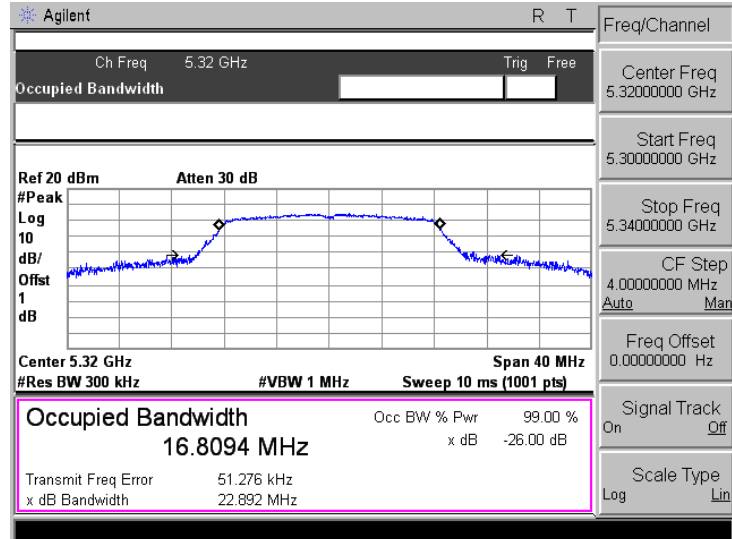
Mode:	802.11a
5180MHz	 <p>Agilent R T</p> <p>Ch Freq 5.18 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.18 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>16.8245 MHz x dB -26.00 dB</p> <p>Transmit Freq Error -4.979 kHz</p> <p>x dB Bandwidth 23.816 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.18000000 GHz</p> <p>Start Freq 5.16000000 GHz</p> <p>Stop Freq 5.20000000 GHz</p> <p>CF Step 4.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>
5200MHz	 <p>Agilent R T</p> <p>Ch Freq 5.2 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.2 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>16.7447 MHz x dB -26.00 dB</p> <p>Transmit Freq Error 51.244 kHz</p> <p>x dB Bandwidth 22.426 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.20000000 GHz</p> <p>Start Freq 5.18000000 GHz</p> <p>Stop Freq 5.22000000 GHz</p> <p>CF Step 4.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>
5240MHz	 <p>Agilent R T</p> <p>Ch Freq 5.24 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.24 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>16.8725 MHz x dB -26.00 dB</p> <p>Transmit Freq Error 15.701 kHz</p> <p>x dB Bandwidth 22.165 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.24000000 GHz</p> <p>Start Freq 5.22000000 GHz</p> <p>Stop Freq 5.26000000 GHz</p> <p>CF Step 4.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>

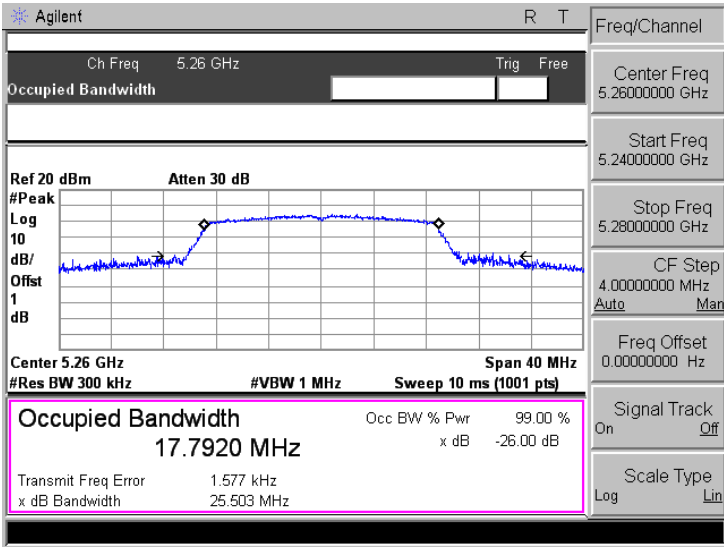
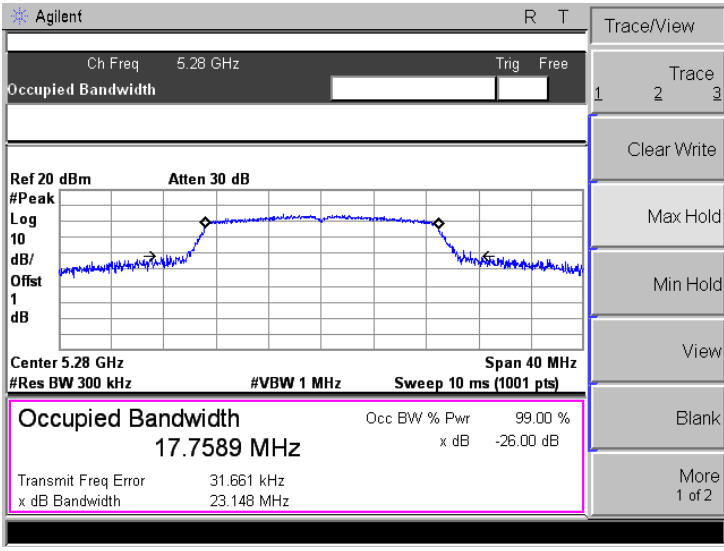
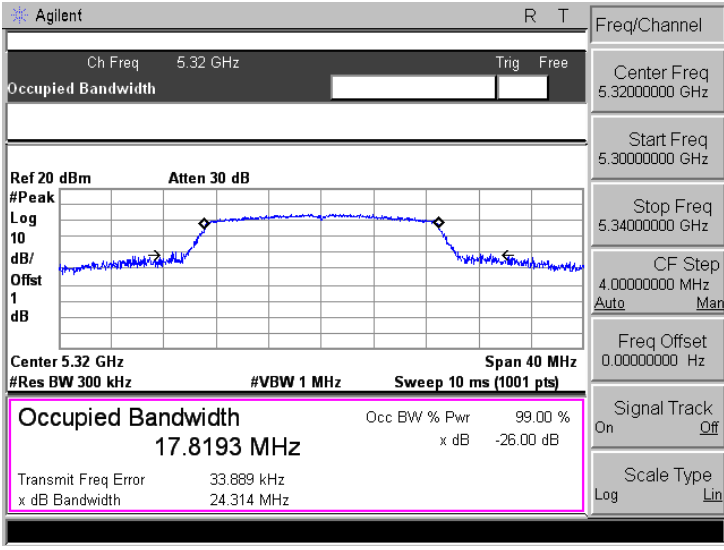
Mode:		802.11n-HT20
5180MHz		
5200MHz		
5240MHz		

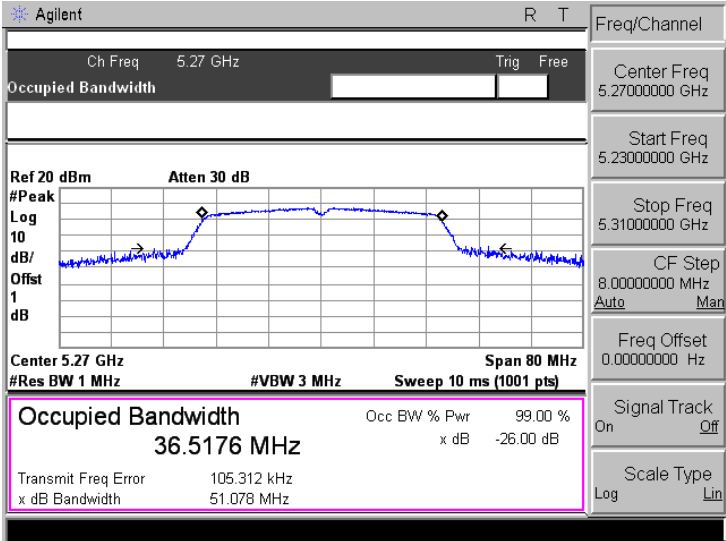
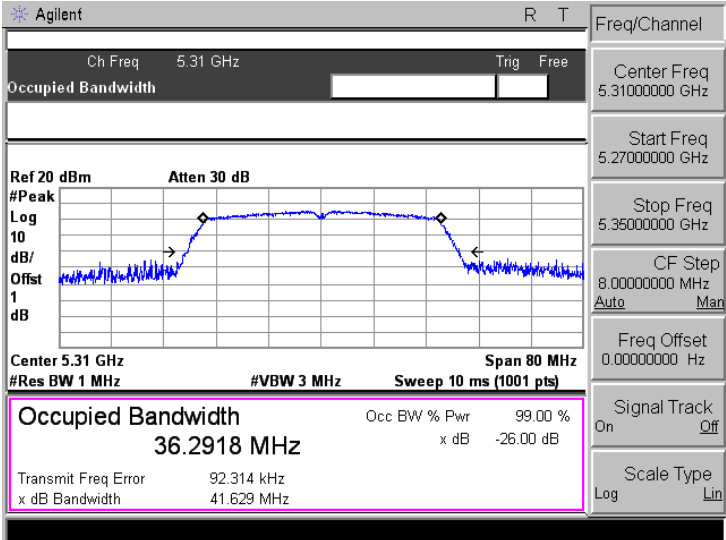
<p>Mode:</p>	<p>802.11n-HT40</p>
<p>5190 MHz</p>	
<p>5230 MHz</p>	

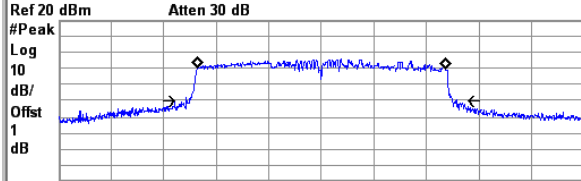
Mode:	802.11ac VH80																																																				
5210MHz	<div style="border: 1px solid #ccc; padding: 5px;"> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid #ccc;"> Agilent R T </div> <div style="border-bottom: 1px solid #ccc; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Ch Freq</td> <td style="width: 20%;">5.21 GHz</td> <td style="width: 10%;">Trig</td> <td style="width: 10%;">Free</td> </tr> <tr> <td>Occupied Bandwidth</td> <td></td> <td></td> <td></td> </tr> </table> </div> <div style="padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Ref 20 dBm</td> <td style="width: 30%;">Atten 30 dB</td> <td style="width: 40%;"></td> </tr> <tr> <td>#Peak</td> <td></td> <td></td> </tr> <tr> <td>Log</td> <td></td> <td></td> </tr> <tr> <td>dB/</td> <td></td> <td></td> </tr> <tr> <td>Offst</td> <td></td> <td></td> </tr> <tr> <td>1</td> <td></td> <td></td> </tr> <tr> <td>dB</td> <td></td> <td></td> </tr> </table>  </div> <div style="border-bottom: 1px solid #ccc; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Center 5.21 GHz</td> <td style="width: 30%;">Span 160 MHz</td> <td style="width: 40%;"></td> </tr> <tr> <td>#Res BW 300 kHz</td> <td>#VBW 1 MHz</td> <td>Sweep 10 ms (1001 pts)</td> </tr> </table> </div> <div style="border: 2px solid #ff00ff; padding: 5px; margin: 5px 0;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Occupied Bandwidth</td> <td style="width: 50%;">Occ BW % Pwr 99.00 %</td> </tr> <tr> <td style="text-align: center; font-size: 1.2em;">75.4705 MHz</td> <td style="text-align: center;">x dB -26.00 dB</td> </tr> <tr> <td>Transmit Freq Error</td> <td>-63.303 kHz</td> </tr> <tr> <td>x dB Bandwidth</td> <td>79.521 MHz</td> </tr> </table> </div> <div style="border-bottom: 1px solid #ccc; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 100%;">Freq/Channel</td> </tr> <tr> <td>Center Freq 5.21000000 GHz</td> </tr> <tr> <td>Start Freq 5.13000000 GHz</td> </tr> <tr> <td>Stop Freq 5.29000000 GHz</td> </tr> <tr> <td>CF Step 16.00000000 MHz</td> </tr> <tr> <td>Auto Man</td> </tr> <tr> <td>Freq Offset 0.00000000 Hz</td> </tr> <tr> <td>Signal Track On Off</td> </tr> <tr> <td>Scale Type Log Lin</td> </tr> </table> </div> </div>	Ch Freq	5.21 GHz	Trig	Free	Occupied Bandwidth				Ref 20 dBm	Atten 30 dB		#Peak			Log			dB/			Offst			1			dB			Center 5.21 GHz	Span 160 MHz		#Res BW 300 kHz	#VBW 1 MHz	Sweep 10 ms (1001 pts)	Occupied Bandwidth	Occ BW % Pwr 99.00 %	75.4705 MHz	x dB -26.00 dB	Transmit Freq Error	-63.303 kHz	x dB Bandwidth	79.521 MHz	Freq/Channel	Center Freq 5.21000000 GHz	Start Freq 5.13000000 GHz	Stop Freq 5.29000000 GHz	CF Step 16.00000000 MHz	Auto Man	Freq Offset 0.00000000 Hz	Signal Track On Off	Scale Type Log Lin
Ch Freq	5.21 GHz	Trig	Free																																																		
Occupied Bandwidth																																																					
Ref 20 dBm	Atten 30 dB																																																				
#Peak																																																					
Log																																																					
dB/																																																					
Offst																																																					
1																																																					
dB																																																					
Center 5.21 GHz	Span 160 MHz																																																				
#Res BW 300 kHz	#VBW 1 MHz	Sweep 10 ms (1001 pts)																																																			
Occupied Bandwidth	Occ BW % Pwr 99.00 %																																																				
75.4705 MHz	x dB -26.00 dB																																																				
Transmit Freq Error	-63.303 kHz																																																				
x dB Bandwidth	79.521 MHz																																																				
Freq/Channel																																																					
Center Freq 5.21000000 GHz																																																					
Start Freq 5.13000000 GHz																																																					
Stop Freq 5.29000000 GHz																																																					
CF Step 16.00000000 MHz																																																					
Auto Man																																																					
Freq Offset 0.00000000 Hz																																																					
Signal Track On Off																																																					
Scale Type Log Lin																																																					

➤ 5250-5350MHz

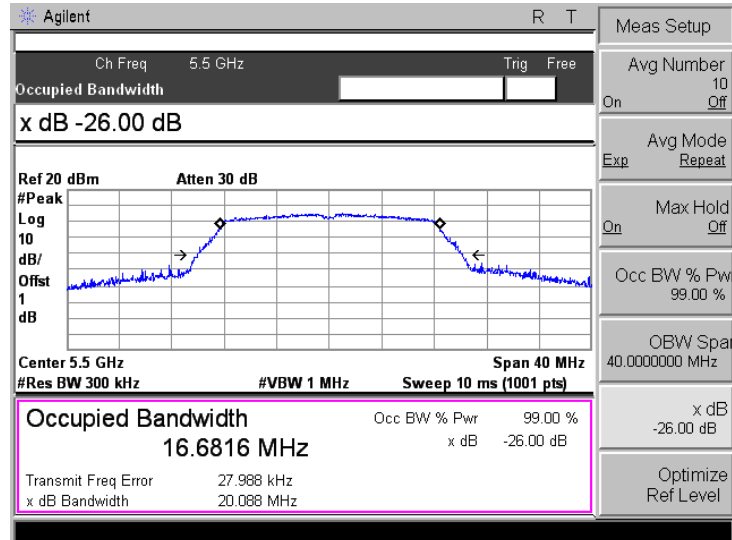
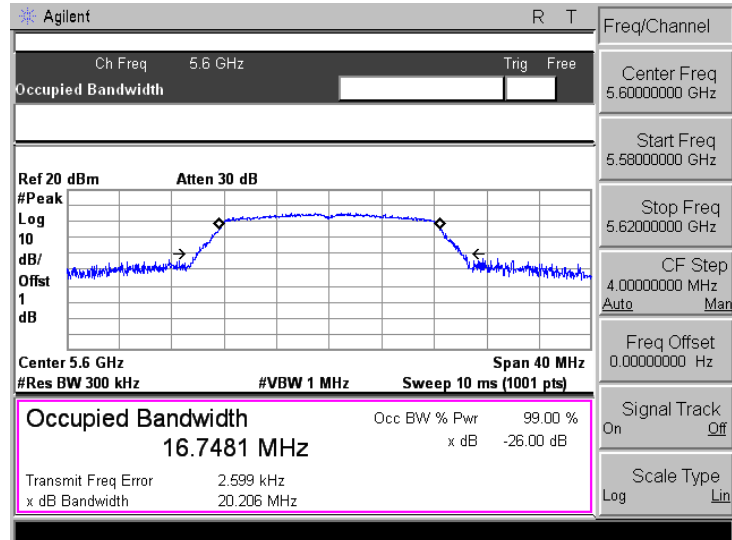
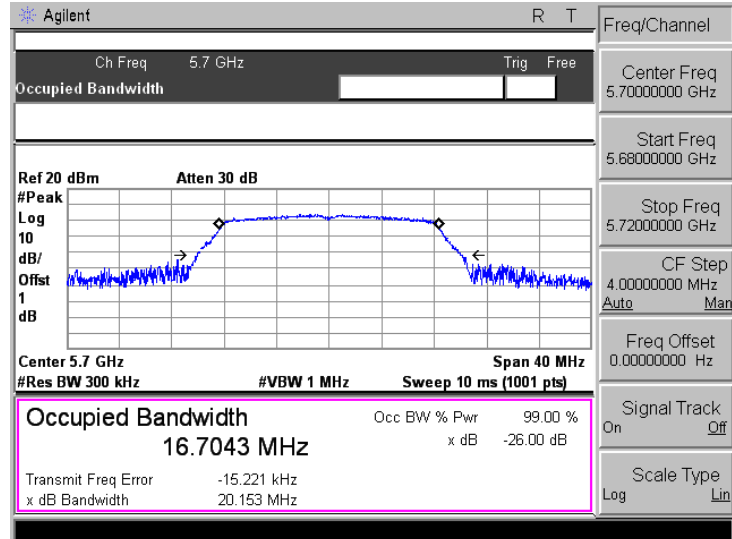
Mode:	802.11a
5260MHz	
5280MHz	
5320MHz	

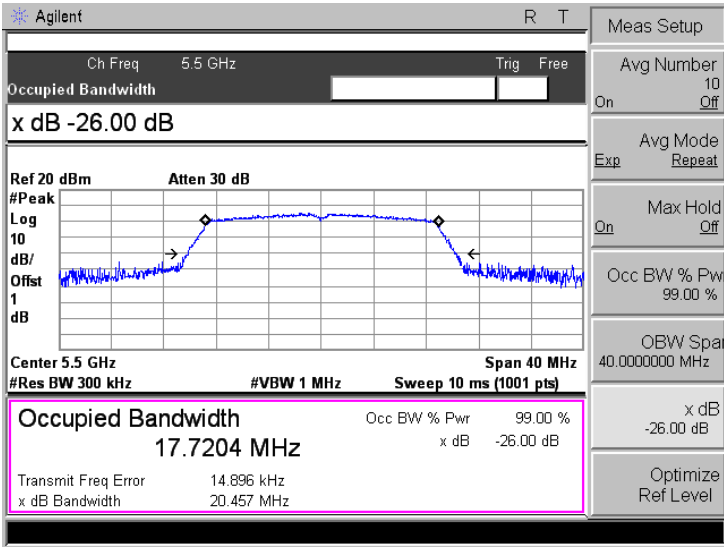
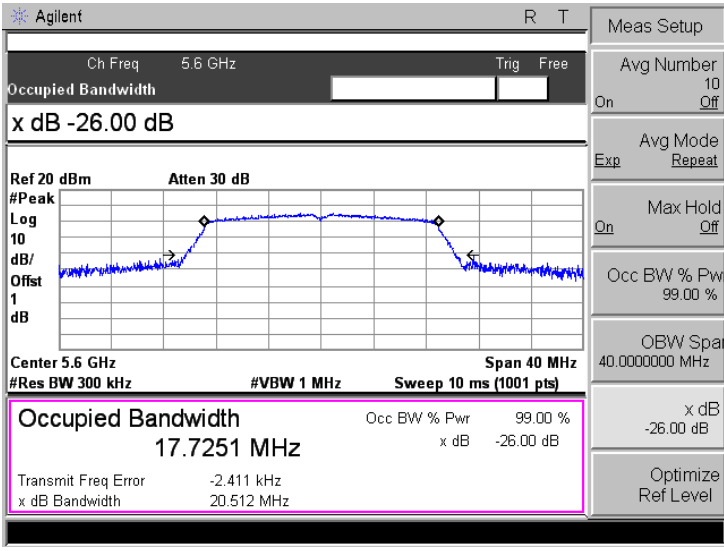
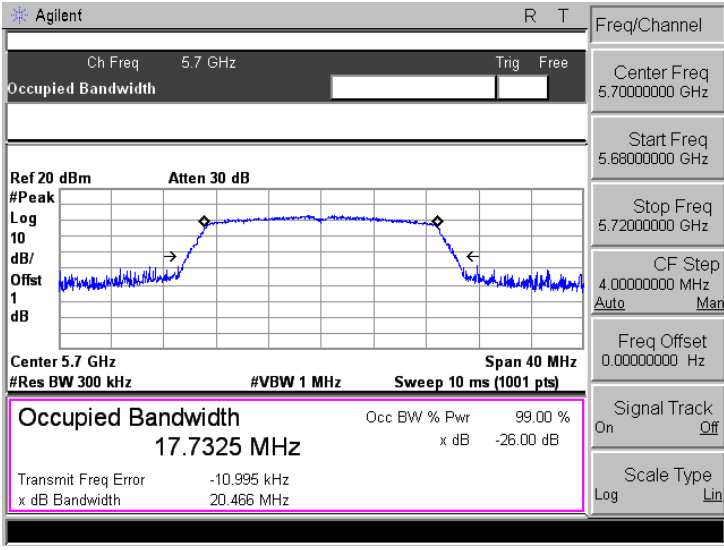
Mode:		802.11n-HT20
5260MHz	 <p>Agilent R T</p> <p>Ch Freq 5.26 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>dB/</p> <p>Offst</p> <p>dB</p> <p>Center 5.26 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>17.7920 MHz x dB -26.00 dB</p> <p>Transmit Freq Error 1.577 kHz</p> <p>x dB Bandwidth 25.503 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.2600000 GHz</p> <p>Start Freq 5.2400000 GHz</p> <p>Stop Freq 5.2800000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>	
5280MHz	 <p>Agilent R T</p> <p>Ch Freq 5.28 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>dB/</p> <p>Offst</p> <p>dB</p> <p>Center 5.28 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>17.7589 MHz x dB -26.00 dB</p> <p>Transmit Freq Error 31.661 kHz</p> <p>x dB Bandwidth 23.148 MHz</p> <p>Trace/View</p> <p>Trace 1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p>	
5320MHz	 <p>Agilent R T</p> <p>Ch Freq 5.32 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>dB/</p> <p>Offst</p> <p>dB</p> <p>Center 5.32 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>17.8193 MHz x dB -26.00 dB</p> <p>Transmit Freq Error 33.889 kHz</p> <p>x dB Bandwidth 24.314 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.3200000 GHz</p> <p>Start Freq 5.3000000 GHz</p> <p>Stop Freq 5.3400000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>	

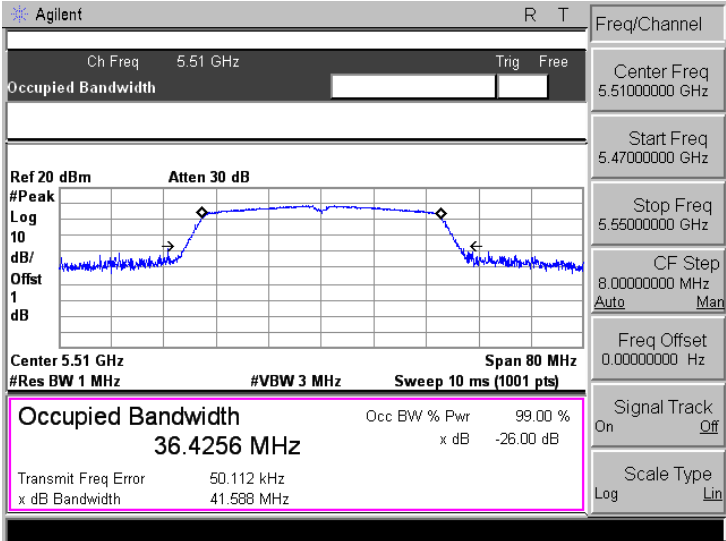
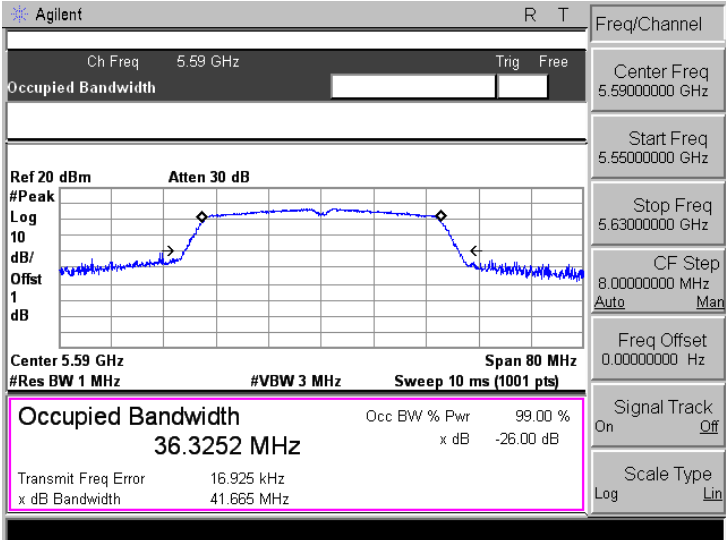
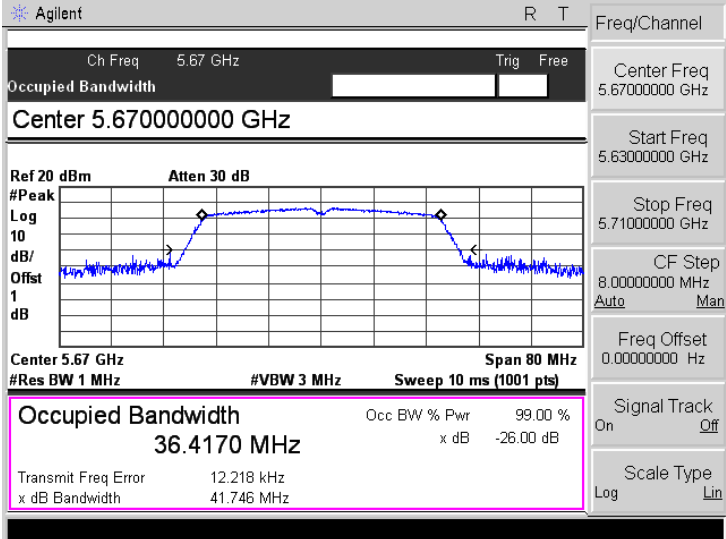
Mode:	802.11n-HT40
5270MHz	 <p>Agilent R T</p> <p>Ch Freq 5.27 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.27 GHz Span 80 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>36.5176 MHz x dB -26.00 dB</p> <p>Transmit Freq Error 105.312 kHz</p> <p>x dB Bandwidth 51.078 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.2700000 GHz</p> <p>Start Freq 5.2300000 GHz</p> <p>Stop Freq 5.3100000 GHz</p> <p>CF Step 8.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>
5310MHz	 <p>Agilent R T</p> <p>Ch Freq 5.31 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.31 GHz Span 80 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>36.2918 MHz x dB -26.00 dB</p> <p>Transmit Freq Error 92.314 kHz</p> <p>x dB Bandwidth 41.629 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.3100000 GHz</p> <p>Start Freq 5.2700000 GHz</p> <p>Stop Freq 5.3500000 GHz</p> <p>CF Step 8.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>

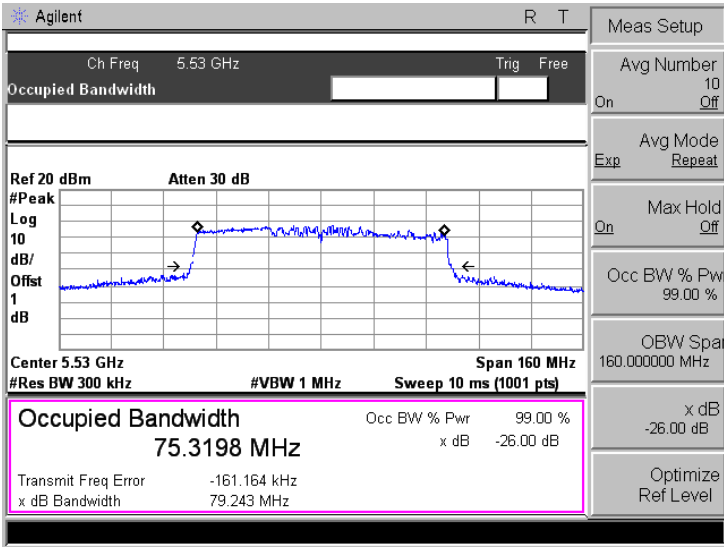
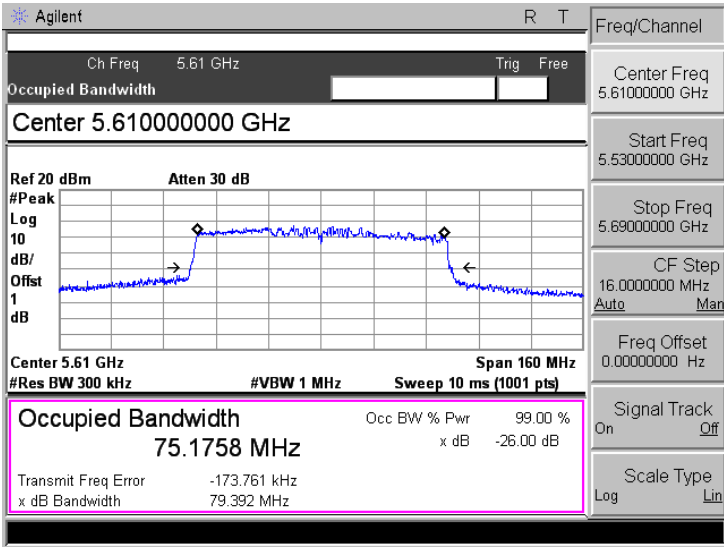
Mode:	802.11ac VH80
5290MHz	<div style="border: 1px solid gray; padding: 5px;"> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid gray;"> Agilent R T </div> <div style="border-bottom: 1px solid gray; padding: 2px;"> <p style="font-size: small;">Ch Freq 5.29 GHz Trig Free</p> </div> <div style="border-bottom: 1px solid gray; padding: 2px;"> <p style="font-size: small;">Occupied Bandwidth</p> </div> <div style="padding: 5px;"> <p style="font-size: x-small;">Ref 20 dBm Atten 30 dB</p>  <p style="font-size: x-small;">#Peak Log 10 dB/ Offst 1 dB</p> <p style="font-size: x-small;">Center 5.29 GHz Span 160 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <div style="border: 2px solid magenta; padding: 2px; margin: 5px 0;"> <p style="font-size: small; margin: 0;">Occupied Bandwidth</p> <p style="font-size: small; margin: 0; text-align: center;">75.4297 MHz</p> </div> <p style="font-size: x-small; margin: 0;">Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p style="font-size: x-small; margin: 0;">Transmit Freq Error -1.292 kHz x dB Bandwidth 82.508 MHz</p> </div> <div style="border: 1px solid gray; padding: 2px; font-size: x-small;"> <p style="margin: 0;">Freq/Channel</p> <p style="margin: 0;">Center Freq 5.2900000 GHz</p> <p style="margin: 0;">Start Freq 5.2100000 GHz</p> <p style="margin: 0;">Stop Freq 5.3700000 GHz</p> <p style="margin: 0;">CF Step 16.0000000 MHz Auto Man</p> <p style="margin: 0;">Freq Offset 0.0000000 Hz</p> <p style="margin: 0;">Signal Track On Off</p> <p style="margin: 0;">Scale Type Log Lin</p> </div> </div>

➤ 5470-5725MHz

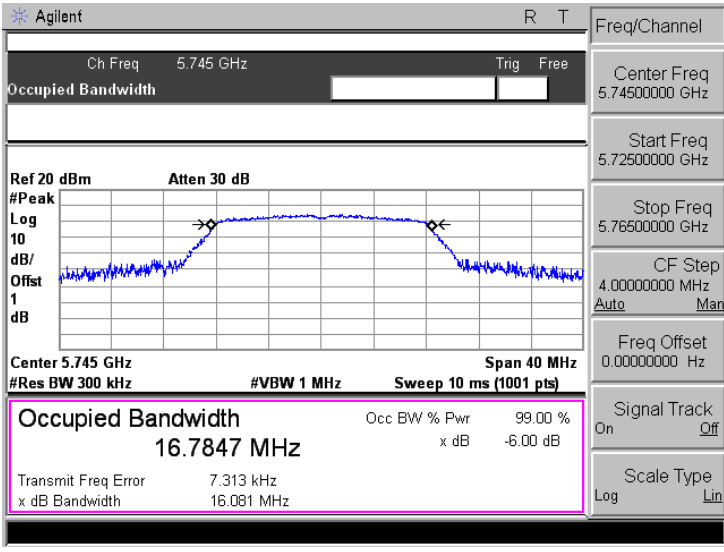
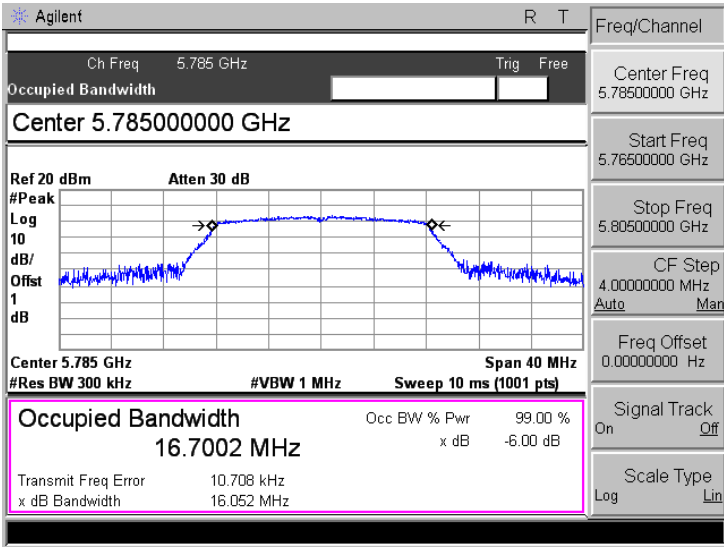
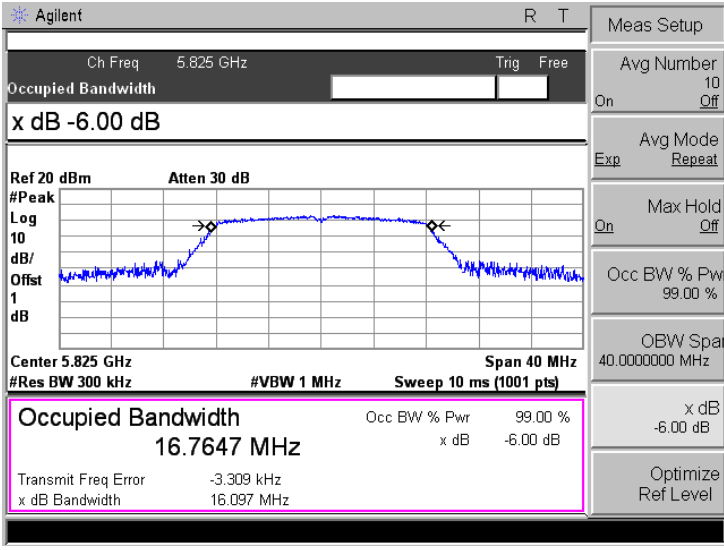
Mode:	802.11a
5500MHz	 <p>Agilent R T</p> <p>Ch Freq 5.5 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>x dB -26.00 dB</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>1</p> <p>dB</p> <p>Center 5.5 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 16.6816 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 27.988 kHz</p> <p>x dB Bandwidth 20.088 MHz</p> <p>Meas Setup</p> <p>Avg Number 10 On Off</p> <p>Avg Mode Repeat Exp</p> <p>Max Hold On Off</p> <p>Occ BW % Pwr 99.00 %</p> <p>OBW Spar 40.0000000 MHz</p> <p>x dB -26.00 dB</p> <p>Optimize Ref Level</p>
5600MHz	 <p>Agilent R T</p> <p>Ch Freq 5.6 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>1</p> <p>dB</p> <p>Center 5.6 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 16.7481 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 2.599 kHz</p> <p>x dB Bandwidth 20.206 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.6000000 GHz</p> <p>Start Freq 5.5800000 GHz</p> <p>Stop Freq 5.6200000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>
5700MHz	 <p>Agilent R T</p> <p>Ch Freq 5.7 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>1</p> <p>dB</p> <p>Center 5.7 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 16.7043 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error -15.221 kHz</p> <p>x dB Bandwidth 20.153 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.7000000 GHz</p> <p>Start Freq 5.6800000 GHz</p> <p>Stop Freq 5.7200000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>

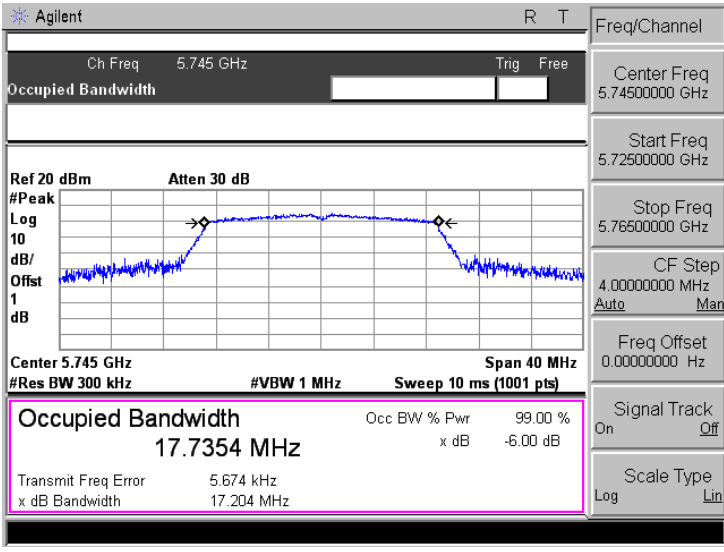
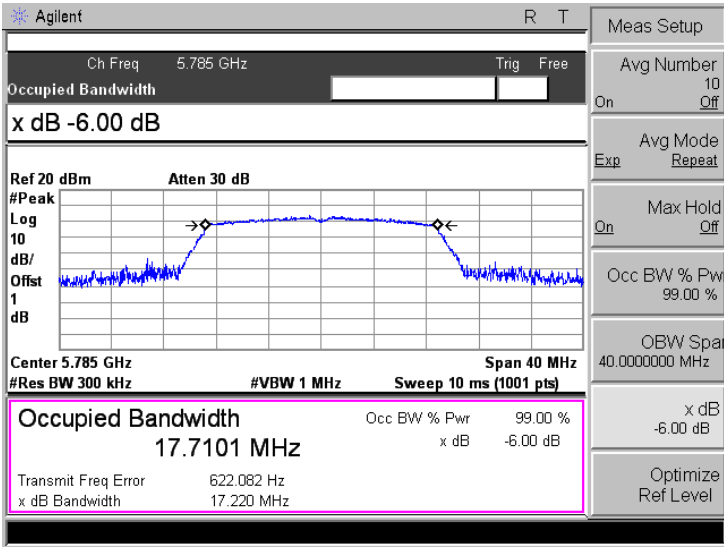
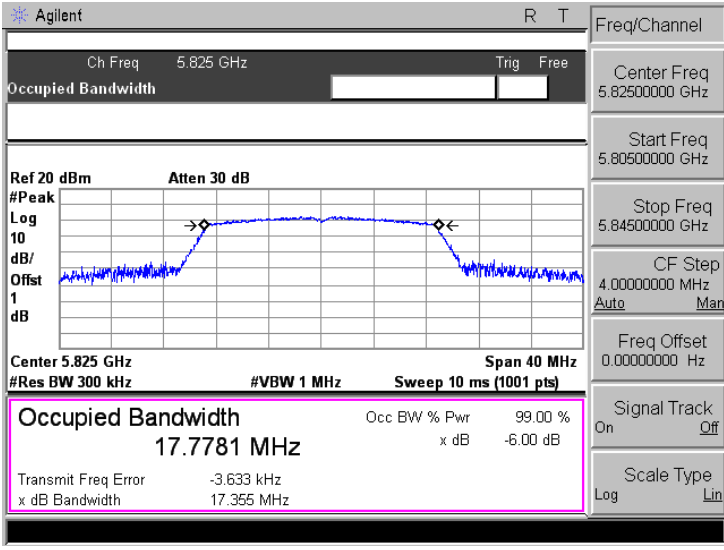
Mode:		802.11n-HT20
5500MHz		
5600MHz		
5700MHz		

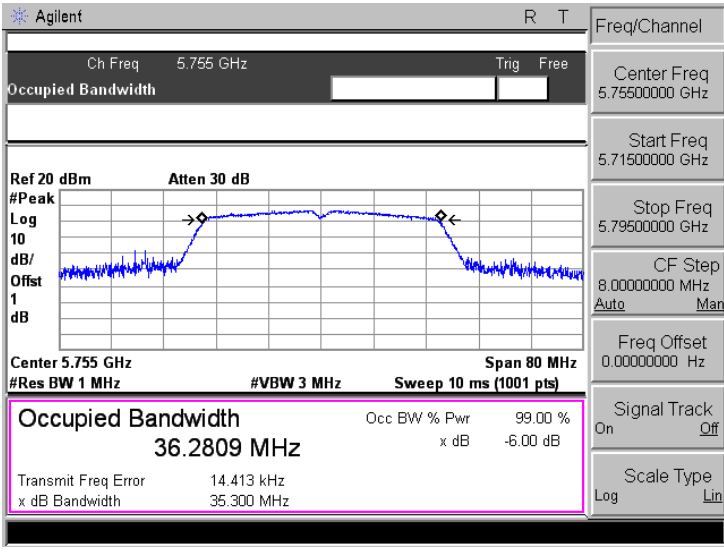
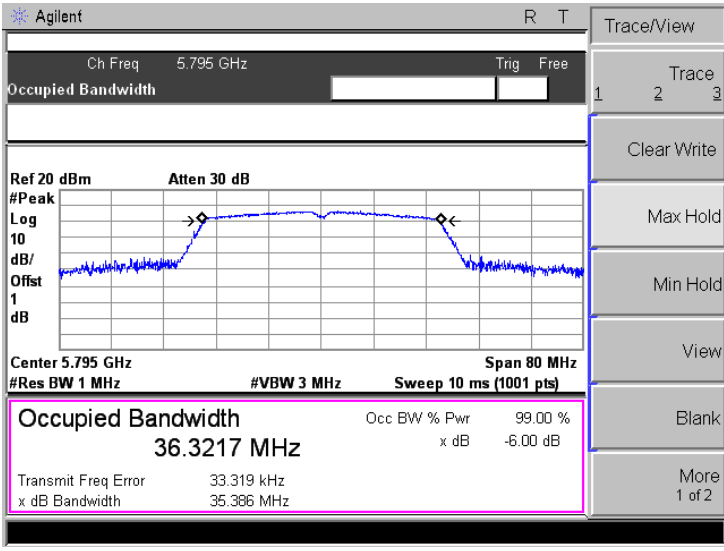
Mode:	802.11n-HT40
5510MHz	 <p>Agilent R T</p> <p>Ch Freq 5.51 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.51 GHz Span 80 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 36.4256 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 50.112 kHz x dB Bandwidth 41.588 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.51000000 GHz</p> <p>Start Freq 5.47000000 GHz</p> <p>Stop Freq 5.55000000 GHz</p> <p>CF Step 8.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>
5590MHz	 <p>Agilent R T</p> <p>Ch Freq 5.59 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.59 GHz Span 80 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 36.3252 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 16.925 kHz x dB Bandwidth 41.665 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.59000000 GHz</p> <p>Start Freq 5.55000000 GHz</p> <p>Stop Freq 5.63000000 GHz</p> <p>CF Step 8.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>
5670MHz	 <p>Agilent R T</p> <p>Ch Freq 5.67 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Center 5.670000000 GHz</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.67 GHz Span 80 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 36.4170 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 12.218 kHz x dB Bandwidth 41.746 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.67000000 GHz</p> <p>Start Freq 5.63000000 GHz</p> <p>Stop Freq 5.71000000 GHz</p> <p>CF Step 8.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>

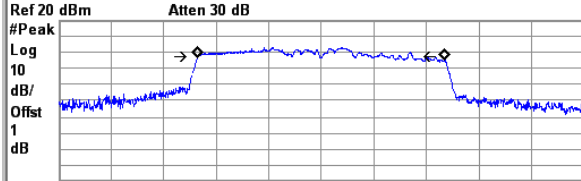
Mode:		802.11ac VH80
5530MHz	 <p>Agilent R T</p> <p>Ch Freq 5.53 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak Log dB/Offst 10 1 dB</p> <p>Center 5.53 GHz Span 160 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 75.3198 MHz</p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -26.00 dB</p> <p>Transmit Freq Error -161.164 kHz</p> <p>x dB Bandwidth 79.243 MHz</p> <p>Meas Setup</p> <p>Avg Number 10</p> <p>On Off</p> <p>Avg Mode Repeat</p> <p>Exp</p> <p>Max Hold On Off</p> <p>Occ BW % Pwr 99.00 %</p> <p>OBW Spar 160.000000 MHz</p> <p>x dB -26.00 dB</p> <p>Optimize Ref Level</p>	
5610MHz	 <p>Agilent R T</p> <p>Ch Freq 5.61 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Center 5.610000000 GHz</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak Log dB/Offst 10 1 dB</p> <p>Center 5.61 GHz Span 160 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 75.1758 MHz</p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -26.00 dB</p> <p>Transmit Freq Error -173.761 kHz</p> <p>x dB Bandwidth 79.392 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.61000000 GHz</p> <p>Start Freq 5.53000000 GHz</p> <p>Stop Freq 5.69000000 GHz</p> <p>CF Step 16.000000 MHz</p> <p>Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>	

➤ 5725-5850MHz

Mode:		802.11a
5745MHz	 <p>Agilent R T</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>1</p> <p>dB</p> <p>Center 5.745 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>16.7847 MHz x dB -6.00 dB</p> <p>Transmit Freq Error 7.313 kHz</p> <p>x dB Bandwidth 16.081 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.74500000 GHz</p> <p>Start Freq 5.72500000 GHz</p> <p>Stop Freq 5.76500000 GHz</p> <p>CF Step 4.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>	
5785MHz	 <p>Agilent R T</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Center 5.785000000 GHz</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>1</p> <p>dB</p> <p>Center 5.785 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>16.7002 MHz x dB -6.00 dB</p> <p>Transmit Freq Error 10.708 kHz</p> <p>x dB Bandwidth 16.052 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.78500000 GHz</p> <p>Start Freq 5.76500000 GHz</p> <p>Stop Freq 5.80500000 GHz</p> <p>CF Step 4.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>	
5825MHz	 <p>Agilent R T</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>x dB -6.00 dB</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>1</p> <p>dB</p> <p>Center 5.825 GHz Span 40 MHz</p> <p>#Res BW 300 kHz #VBW 1 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>16.7647 MHz x dB -6.00 dB</p> <p>Transmit Freq Error -3.309 kHz</p> <p>x dB Bandwidth 16.097 MHz</p> <p>Meas Setup</p> <p>Avg Number 10 On Off</p> <p>Avg Mode Exp Repeat</p> <p>Max Hold On Off</p> <p>Occ BW % Pwr 99.00 %</p> <p>OBW Spar 40.00000000 MHz</p> <p>x dB -6.00 dB</p> <p>Optimize Ref Level</p>	

Mode:		802.11n-HT20
5745MHz		
5785MHz		
5825MHz		

Mode:		802.11n-HT40
5755 MHz		
5795 MHz		

Mode:	802.11ac VH80									
5775 MHz	<div style="border: 1px solid #ccc; padding: 5px;"> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid #ccc; margin-bottom: 5px;"> Agilent R T </div> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid #ccc; margin-bottom: 5px;"> Ch Freq 5.775 GHz Trig Free </div> <div style="border-bottom: 1px solid #ccc; margin-bottom: 5px;"> <p>Occupied Bandwidth</p> </div> <div style="margin-bottom: 5px;"> <p>Ref 20 dBm Atten 30 dB</p> </div> <div style="margin-bottom: 5px;">  </div> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid #ccc; margin-bottom: 5px;"> Center 5.775 GHz Span 160 MHz </div> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid #ccc; margin-bottom: 5px;"> #Res BW 1 MHz #VBW 3 MHz Sweep 10 ms (1001 pts) </div> <div style="border: 2px solid #ff00ff; padding: 5px; margin-bottom: 5px;"> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p style="text-align: center; font-size: 1.2em;">75.1499 MHz</p> <p style="text-align: right;">x dB -6.00 dB</p> </div> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid #ccc; margin-bottom: 5px;"> Transmit Freq Error -220.941 kHz </div> <div style="display: flex; justify-content: space-between;"> x dB Bandwidth 65.254 MHz </div> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 100%;">Freq/Channel</td> </tr> <tr> <td>Center Freq 5.77500000 GHz</td> </tr> <tr> <td>Start Freq 5.69500000 GHz</td> </tr> <tr> <td>Stop Freq 5.85500000 GHz</td> </tr> <tr> <td>CF Step 16.00000000 MHz</td> </tr> <tr> <td>Auto Man</td> </tr> <tr> <td>Freq Offset 0.00000000 Hz</td> </tr> <tr> <td>Signal Track On Off</td> </tr> <tr> <td>Scale Type Log Lin</td> </tr> </table> </div>	Freq/Channel	Center Freq 5.77500000 GHz	Start Freq 5.69500000 GHz	Stop Freq 5.85500000 GHz	CF Step 16.00000000 MHz	Auto Man	Freq Offset 0.00000000 Hz	Signal Track On Off	Scale Type Log Lin
Freq/Channel										
Center Freq 5.77500000 GHz										
Start Freq 5.69500000 GHz										
Stop Freq 5.85500000 GHz										
CF Step 16.00000000 MHz										
Auto Man										
Freq Offset 0.00000000 Hz										
Signal Track On Off										
Scale Type Log Lin										

8. Maximum Conducted Output Power

8.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

8.2 Test Procedure

According to KDB789033 D02 v02r01 section E, the following is the measurement procedure.

- (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (ii) Set RBW = 1 MHz.
- (iii) Set VBW \geq 3 MHz.
- (iv) Number of points in sweep \geq 2 Span / RBW. (This ensures that bin-to-bin spacing is \leq RBW/2, so that narrowband signals are not lost between frequency bins.)
- (v) Sweep time = auto.

- (vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- (vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must 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 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
- (viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- (ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

8.3 Summary of Test Results/Plots

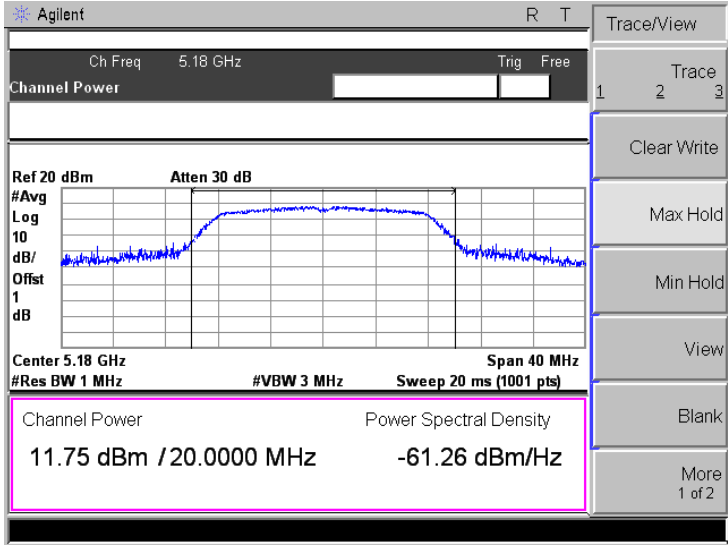
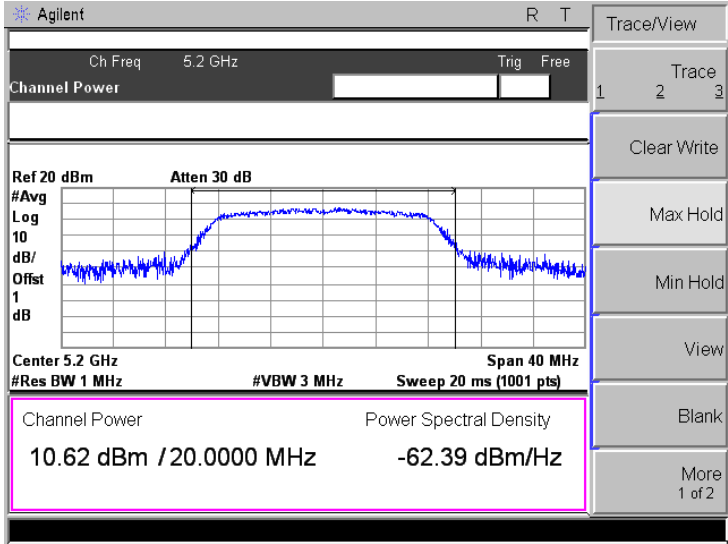
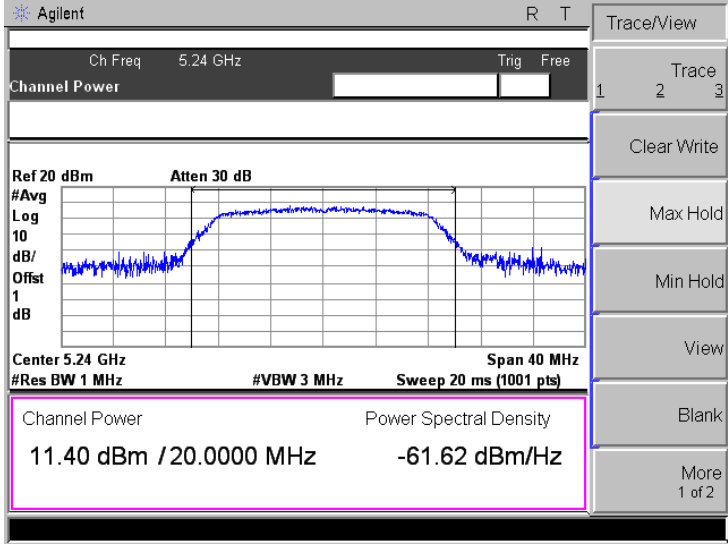
U-NII-1:5150-5250MHz				
Test mode	Frequency MHz	Output Power dBm	Output Power mW	Limit mW
802.11a	5180	11.75	14.96	250
	5200	10.62	11.53	250
	5240	11.40	13.80	250
802.11n-HT20	5180	10.59	11.46	250
	5200	10.33	10.79	250
	5240	10.52	11.27	250
802.11n-HT40	5190	9.99	9.98	250
	5230	9.27	8.45	250
802.11ac VH80	5210	8.28	6.73	250

U-NII-2A: 5250-5350MHz				
Test mode	Frequency MHz	Output Power dBm	Output Power mW	Limit mW
802.11a	5260	11.08	12.82	250
	5280	10.49	11.19	250
	5320	11.07	12.79	250
802.11n-HT20	5260	10.79	11.99	250
	5280	11.15	13.03	250
	5320	11.59	14.42	250
802.11n-HT40	5270	9.06	8.05	250
	5310	9.25	8.41	250
802.11ac VH80	5290	8.36	6.85	250

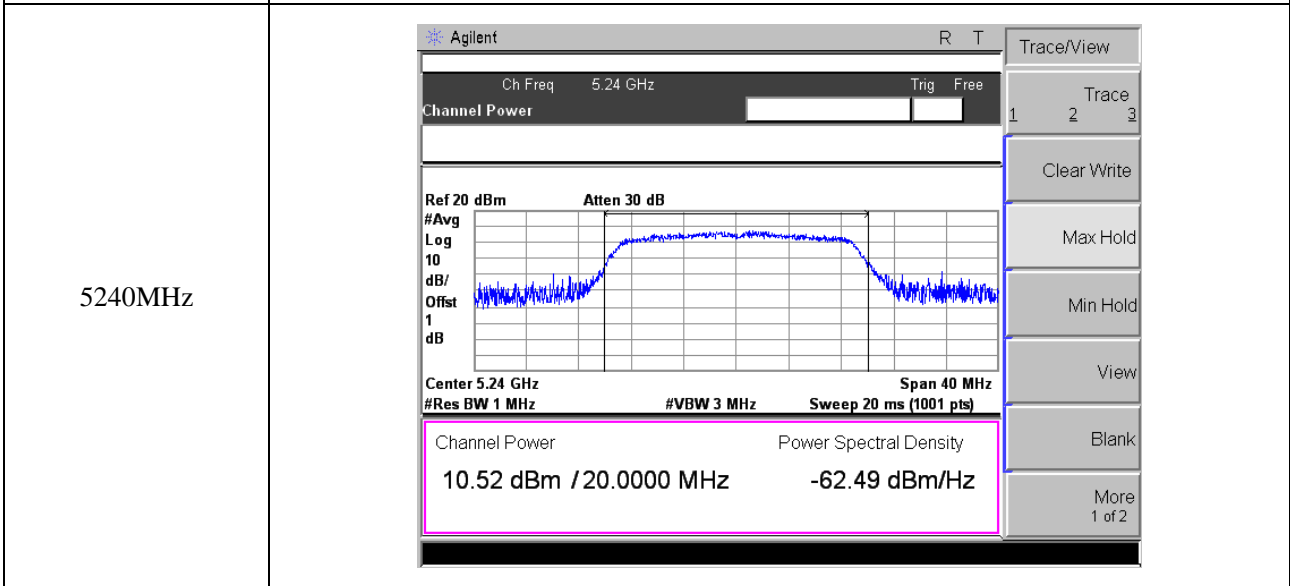
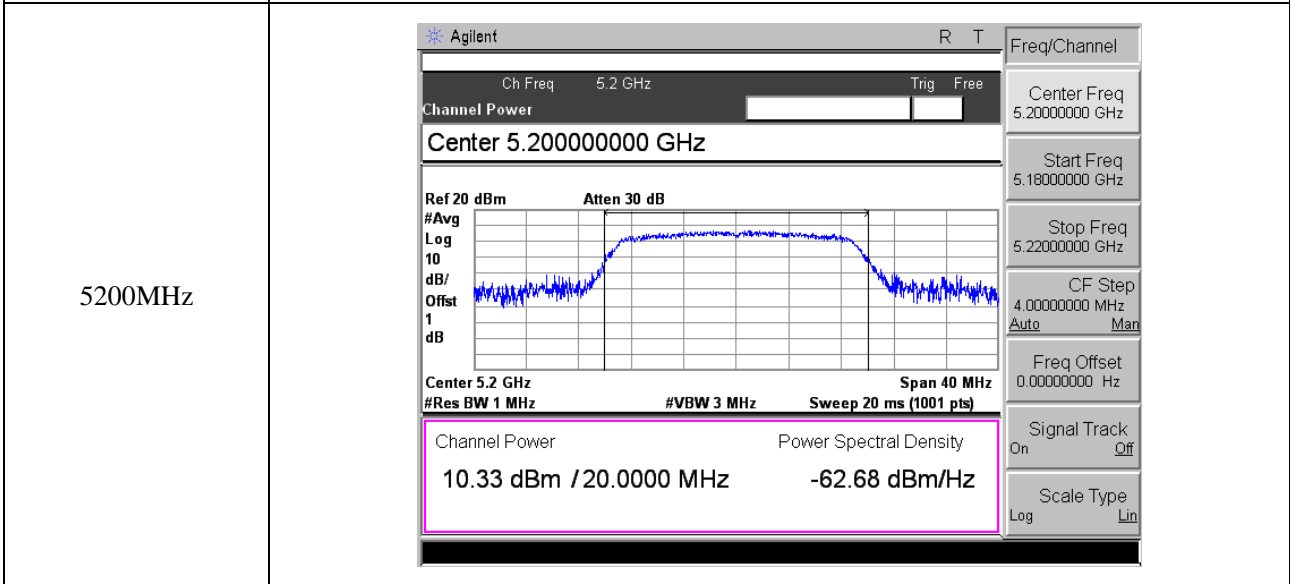
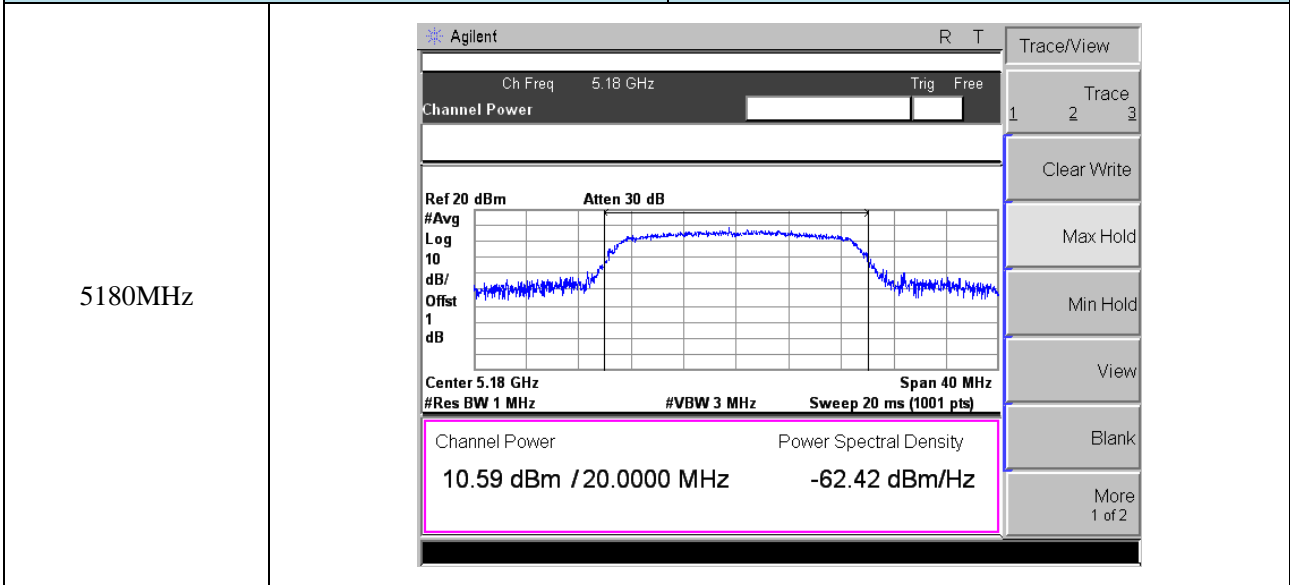
U-NII-2C: 5470-5725MHz				
Test mode	Frequency MHz	Output Power dBm	Output Power mW	Limit mW
802.11a	5500	11.86	15.35	250
	5600	11.97	15.74	250
	5700	10.80	12.02	250
802.11n-HT20	5500	11.45	13.96	250
	5600	11.84	15.28	250
	5700	10.29	10.69	250
802.11n-HT40	5510	11.10	12.88	250
	5590	10.37	10.89	250
	5670	9.94	9.86	250
802.11ac VH80	5530	10.07	10.16	250
	5610	9.13	8.18	250

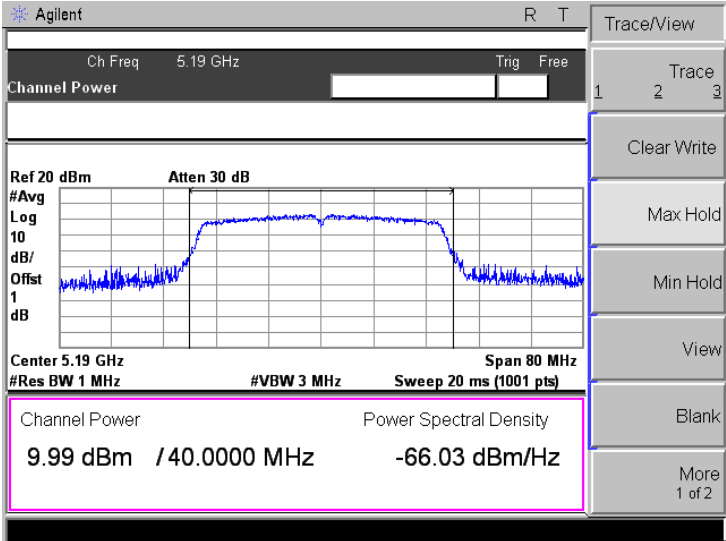
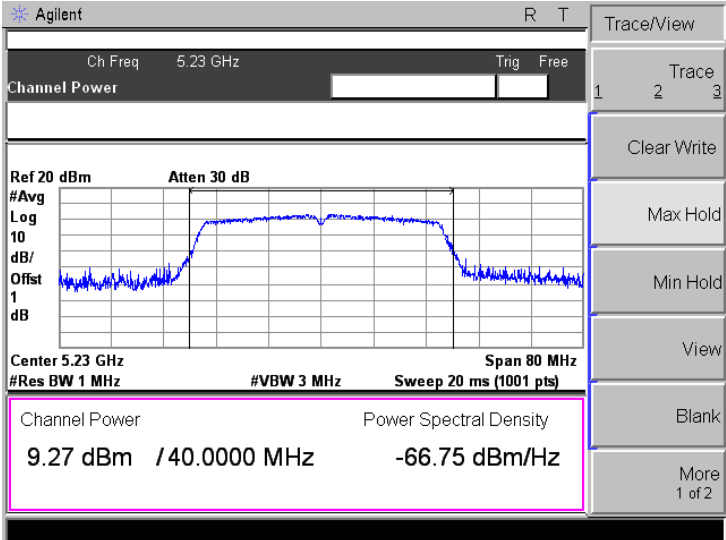
U-NII-3: 5725-5850MHz				
Test mode	Frequency MHz	Output Power dBm	Output Power mW	Limit mW
802.11a	5745	11.13	12.97	1000
	5785	10.00	10.00	1000
	5825	9.76	9.46	1000
802.11n-HT20	5745	11.33	13.58	1000
	5785	10.78	11.97	1000
	5825	9.16	8.24	1000
802.11n-HT40	5755	10.93	12.39	1000
	5795	9.86	9.68	1000
802.11ac VH80	5775	10.99	12.56	1000

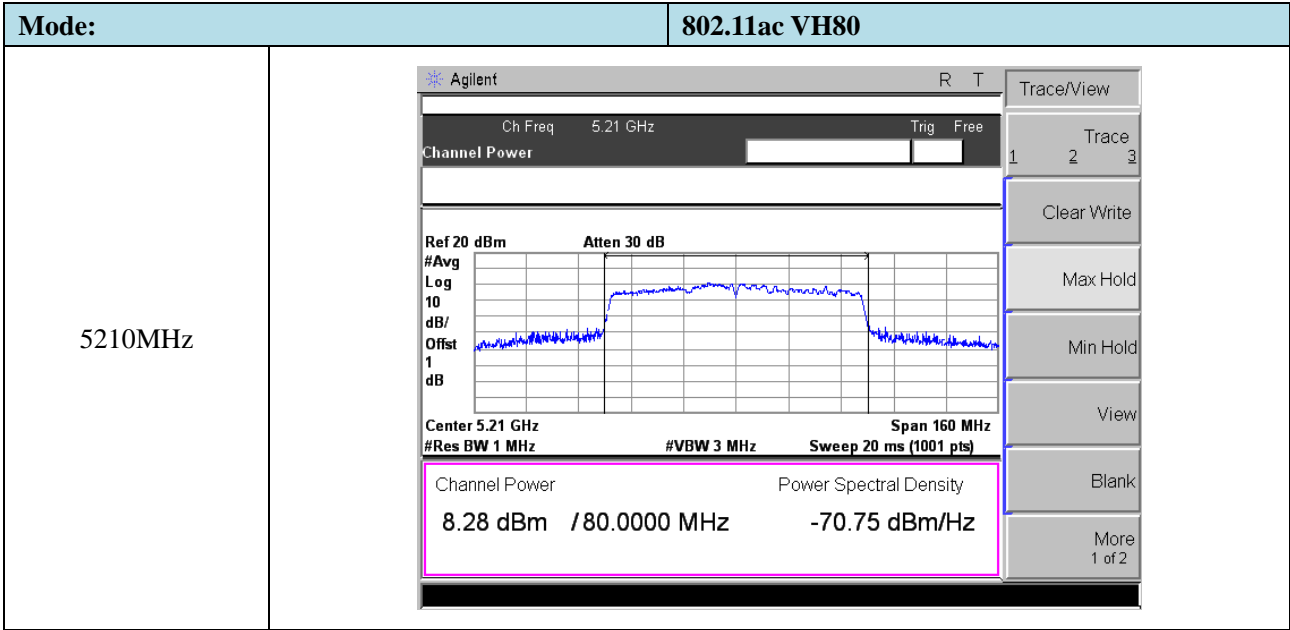
➤ 5150-5250MHz

Mode:		802.11a
5180MHz		
5200MHz		
5240MHz		

Mode:	802.11n-HT20
--------------	---------------------



Mode:	802.11n-HT40
5190 MHz	
5230 MHz	

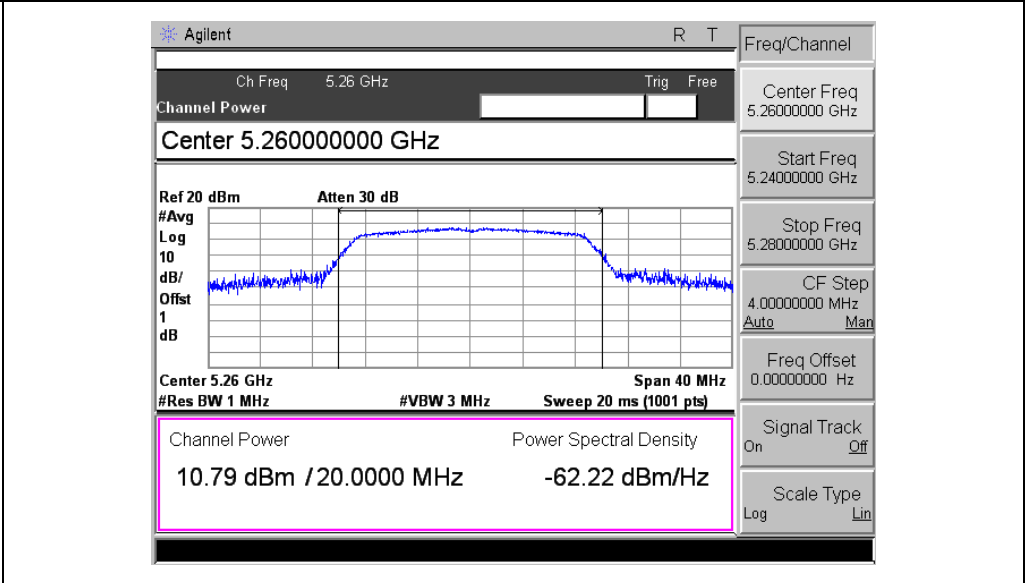


➤ 5250-5350MHz

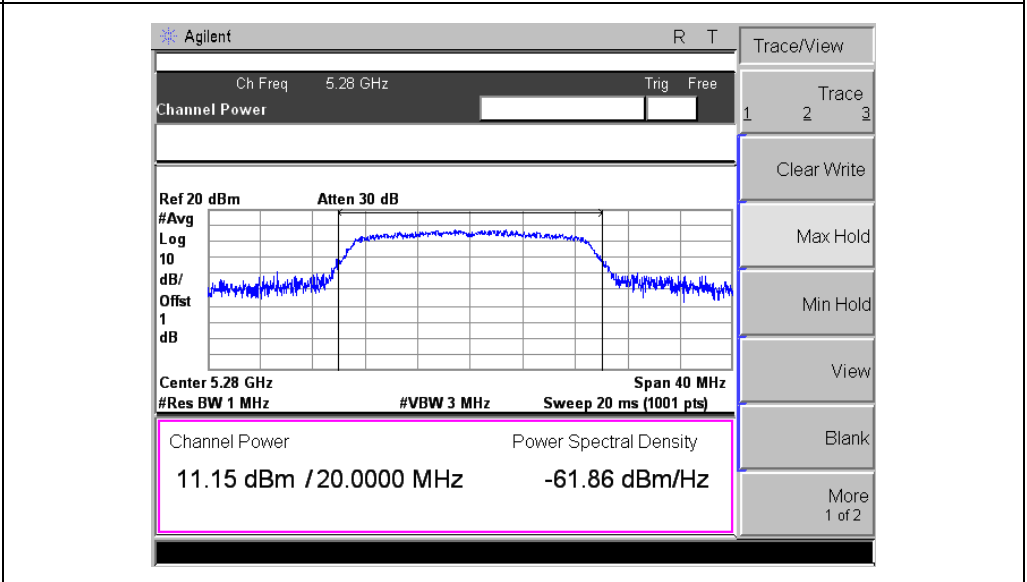
Mode:		802.11a
5260MHz		
5280MHz		
5320MHz		

Mode: 802.11n-HT20

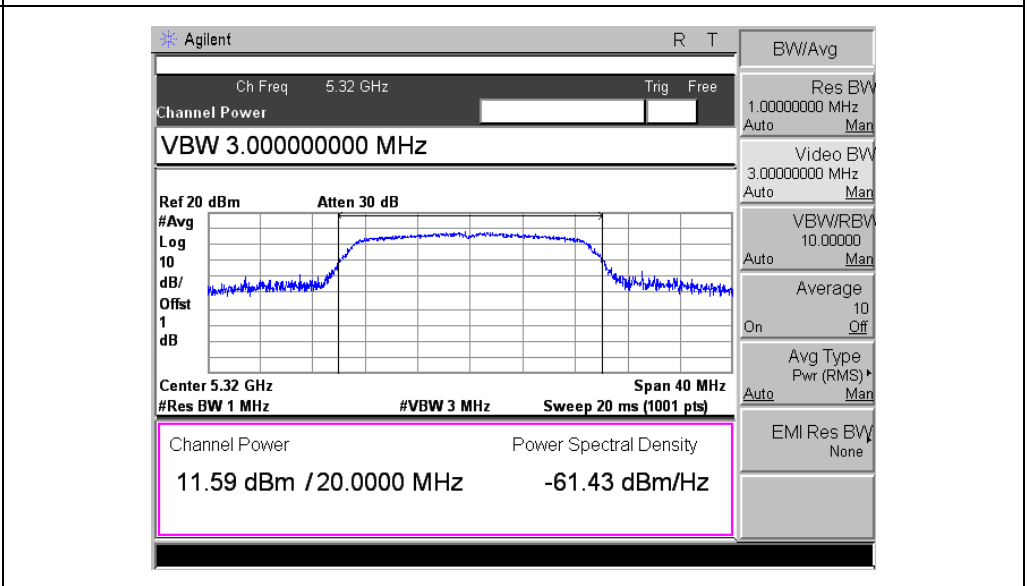
5260MHz

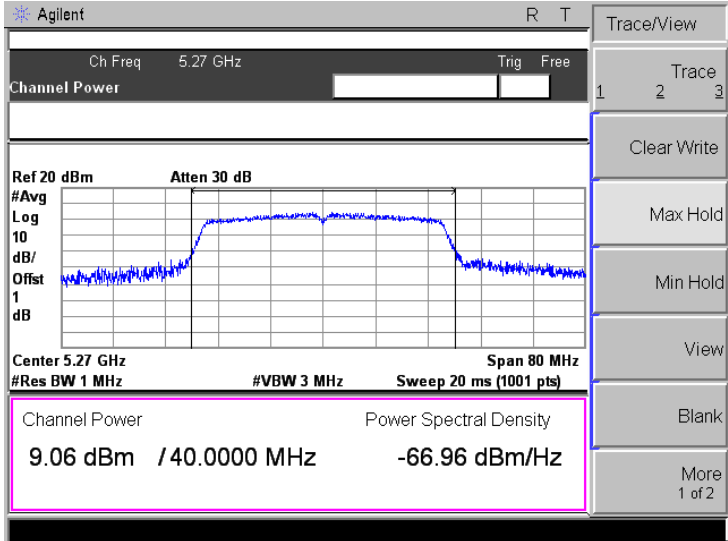
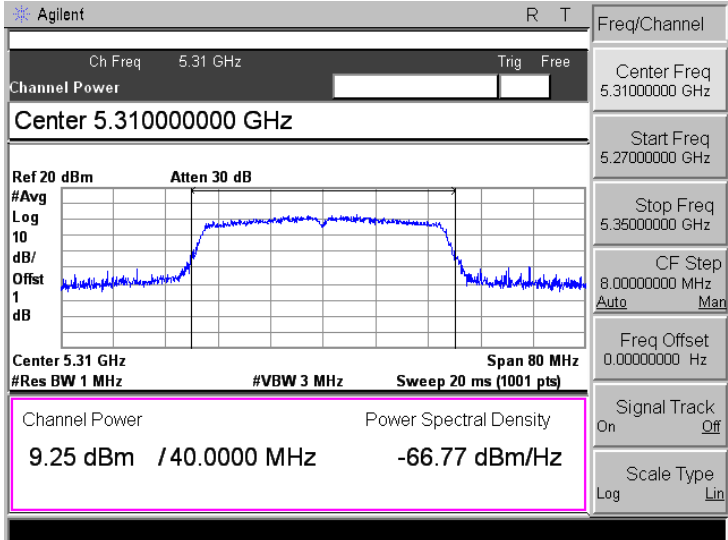


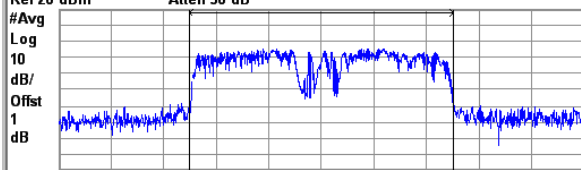
5280MHz



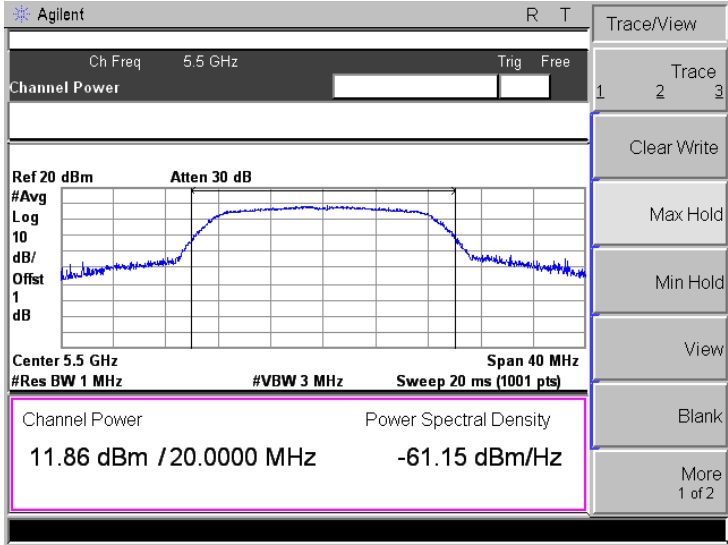
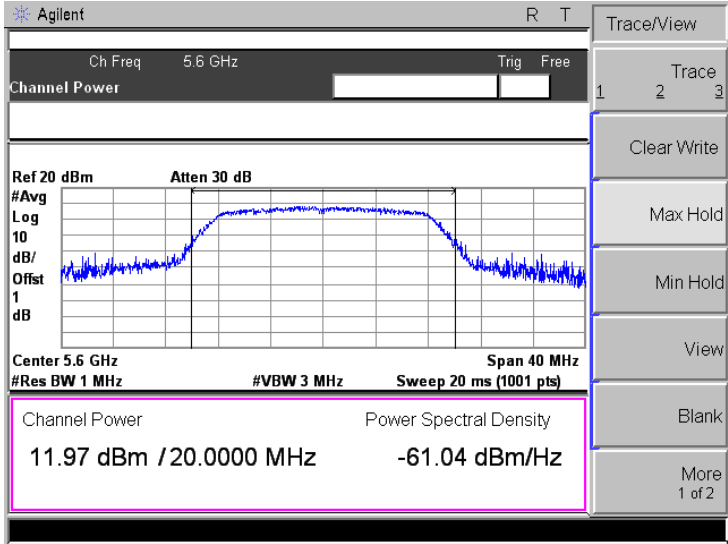
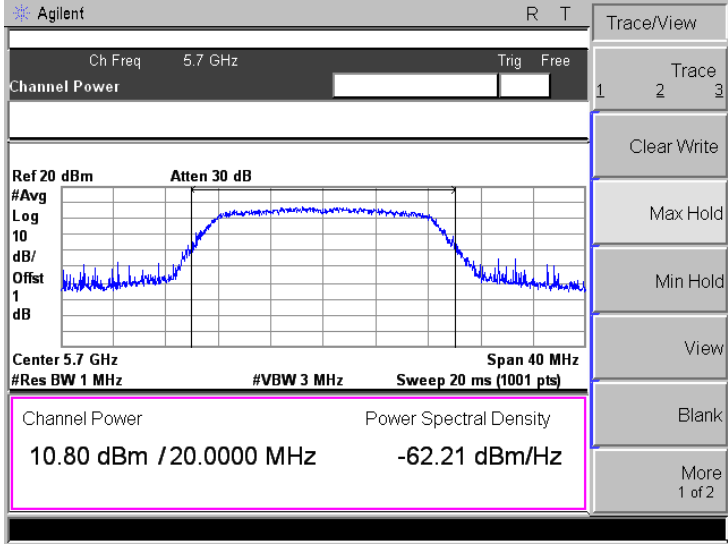
5320MHz

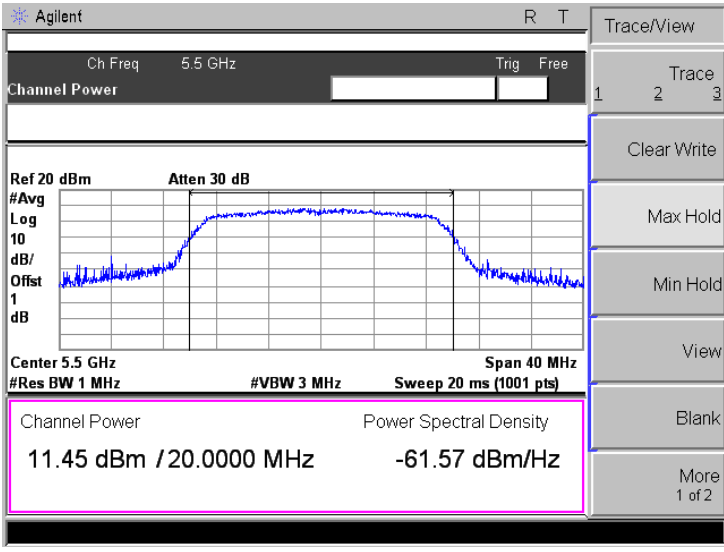
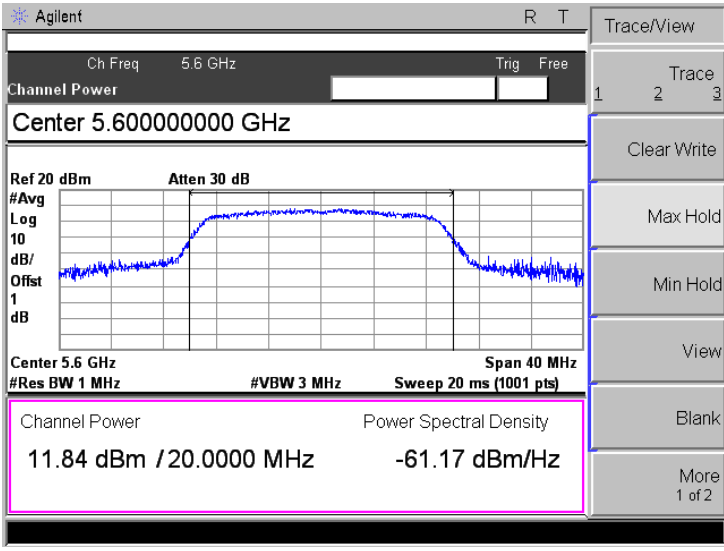
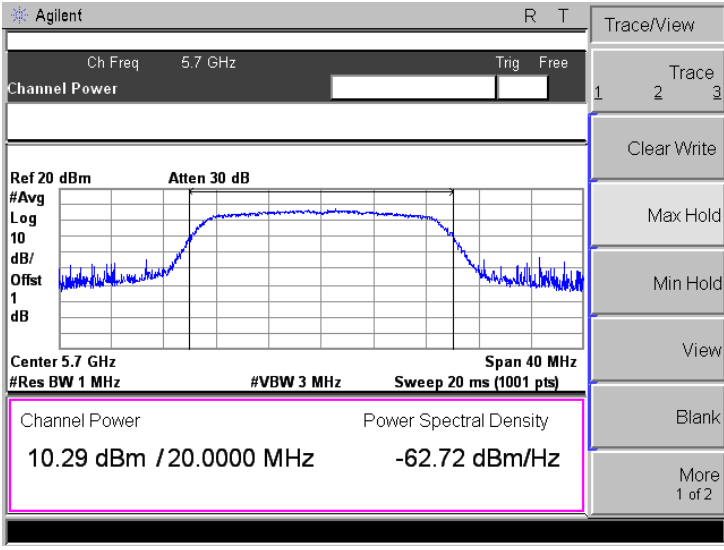


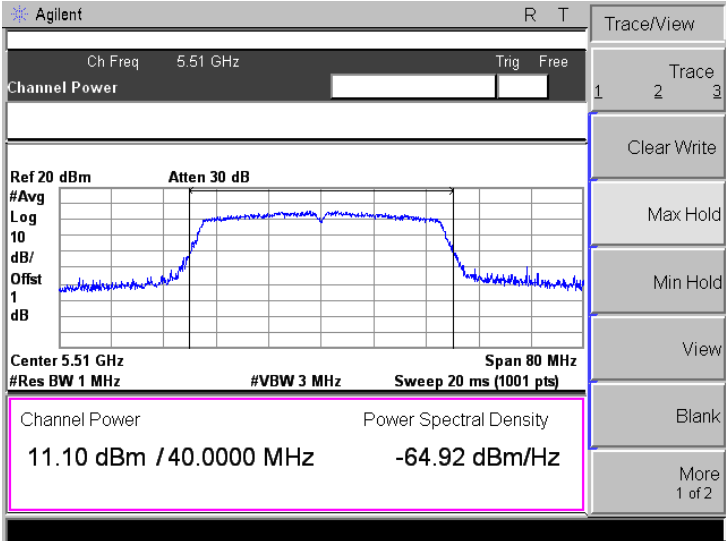
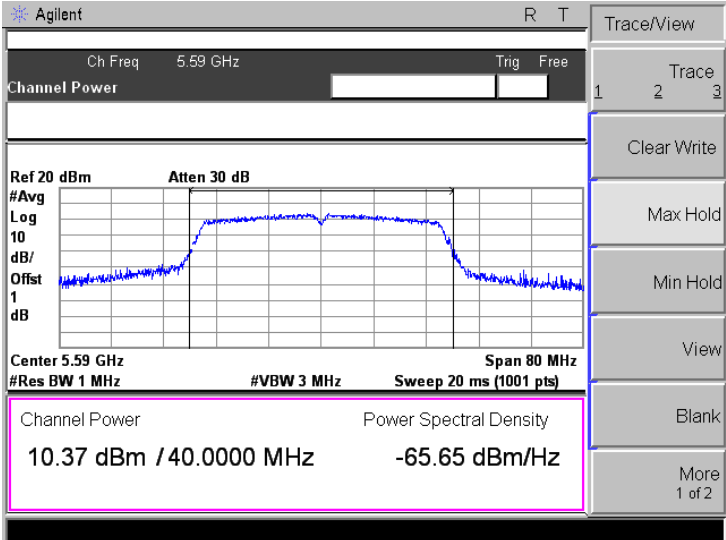
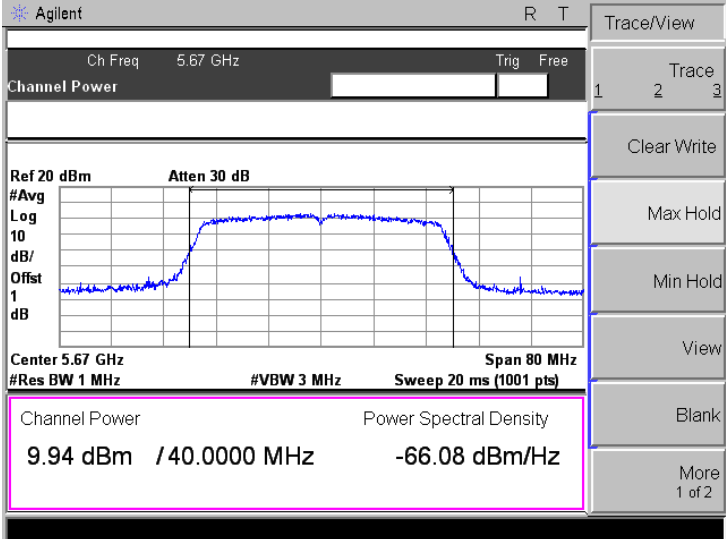
<p>Mode:</p>	<p>802.11n-HT40</p>
<p>5270MHz</p>	
<p>5310MHz</p>	

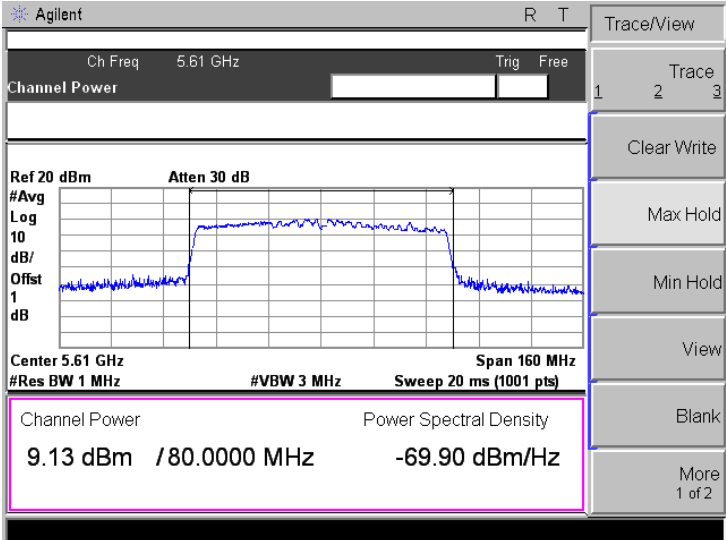
Mode:	802.11ac VH80
5290MHz	<div style="border: 1px solid gray; padding: 5px;"> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid gray;"> Agilent R T </div> <div style="border-bottom: 1px solid gray; padding: 2px;"> <p style="font-size: small;">Ch Freq 5.29 GHz Trig Free</p> <p>Channel Power </p> </div> <div style="padding: 5px;"> <p style="font-size: x-small;">Ref 20 dBm Atten 30 dB</p>  <p style="font-size: x-small;">#Avg Log dB/Ofst dB</p> <p style="font-size: x-small;">Center 5.29 GHz Span 160 MHz</p> <p style="font-size: x-small;">#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> </div> <div style="border: 2px solid magenta; padding: 2px; margin-top: 5px;"> <p style="font-size: x-small; margin: 0;">Channel Power Power Spectral Density</p> <p style="font-size: x-small; margin: 0;">8.36 dBm / 80.0000 MHz -70.67 dBm/Hz</p> </div> <div style="border-top: 1px solid gray; padding: 2px; font-size: x-small;"> <p style="margin: 0;">Freq/Channel</p> <p style="margin: 0;">Center Freq 5.2900000 GHz</p> <p style="margin: 0;">Start Freq 5.2100000 GHz</p> <p style="margin: 0;">Stop Freq 5.3700000 GHz</p> <p style="margin: 0;">CF Step 16.0000000 MHz</p> <p style="margin: 0;">Auto Man</p> <p style="margin: 0;">Freq Offset 0.0000000 Hz</p> <p style="margin: 0;">Signal Track On Off</p> <p style="margin: 0;">Scale Type Log Lin</p> </div> </div>

➤ 5470-5725MHz

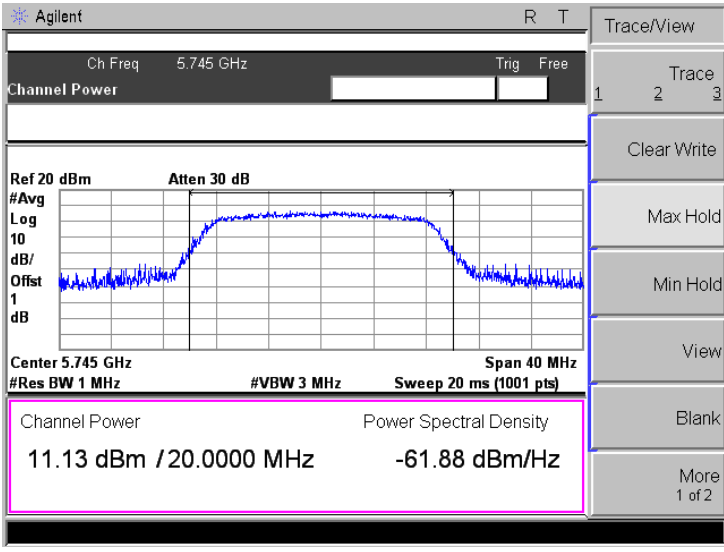
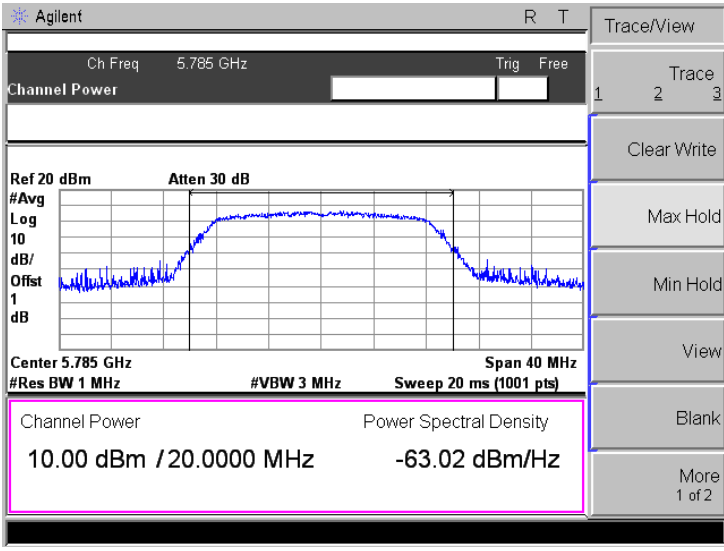
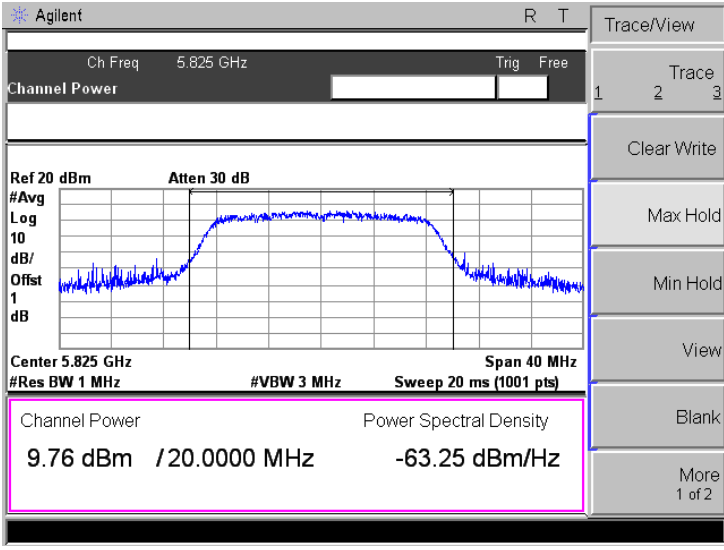
Mode:		802.11a
5500MHz		
5600MHz		
5700MHz		

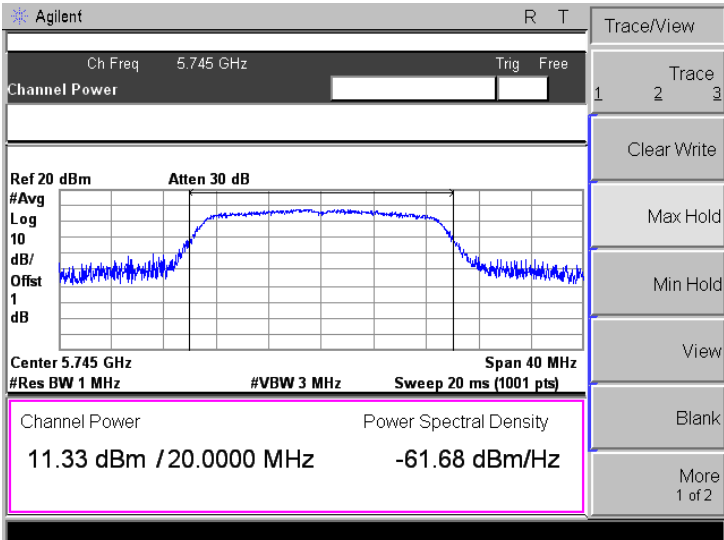
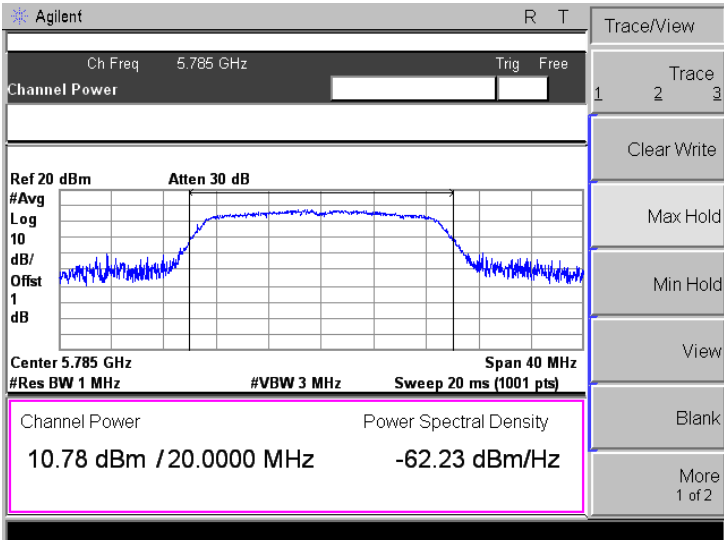
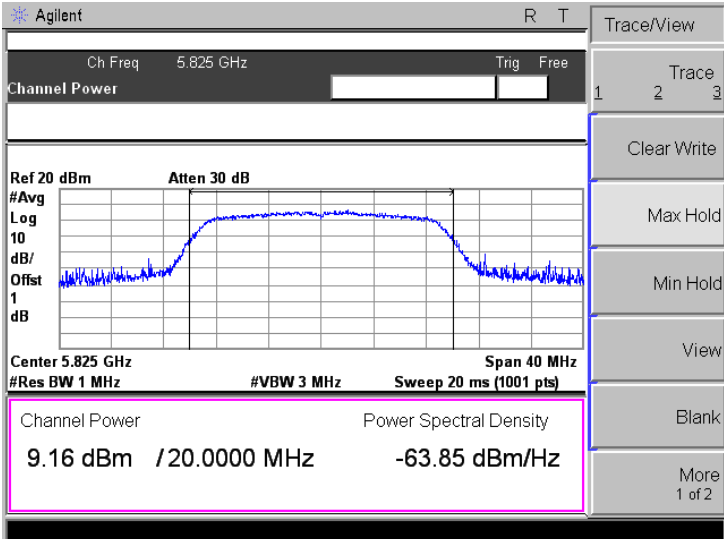
Mode:		802.11n-HT20
5500MHz		
5600MHz		
5700MHz		

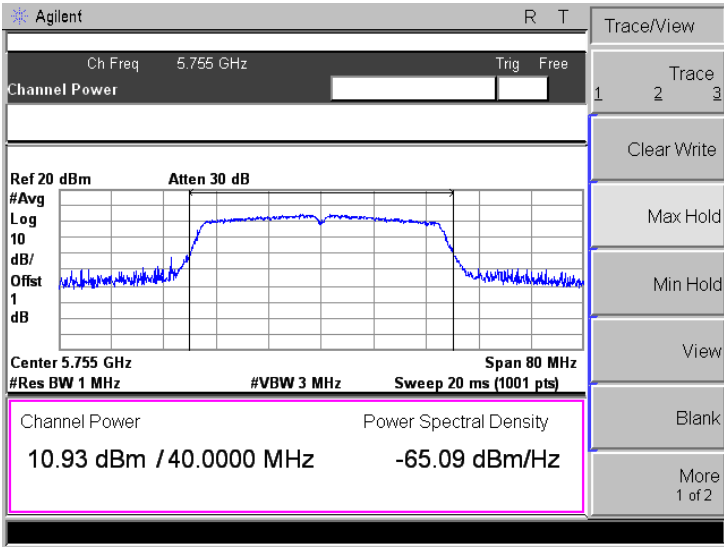
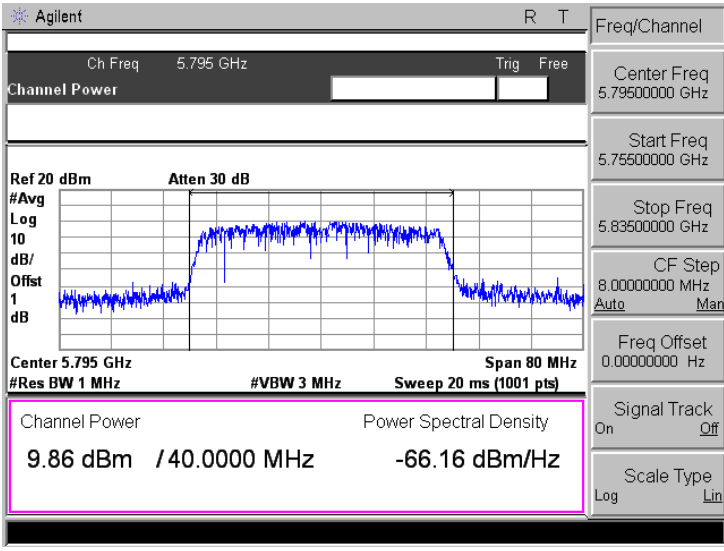
Mode:	802.11n-HT40
5510MHz	 <p>Agilent R T Trace/View</p> <p>Ch Freq 5.51 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log dB/ Offst 1 dB</p> <p>Center 5.51 GHz Span 80 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>11.10 dBm / 40.0000 MHz -64.92 dBm/Hz</p>
5590MHz	 <p>Agilent R T Trace/View</p> <p>Ch Freq 5.59 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log dB/ Offst 1 dB</p> <p>Center 5.59 GHz Span 80 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>10.37 dBm / 40.0000 MHz -65.65 dBm/Hz</p>
5670MHz	 <p>Agilent R T Trace/View</p> <p>Ch Freq 5.67 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log dB/ Offst 1 dB</p> <p>Center 5.67 GHz Span 80 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>9.94 dBm / 40.0000 MHz -66.08 dBm/Hz</p>

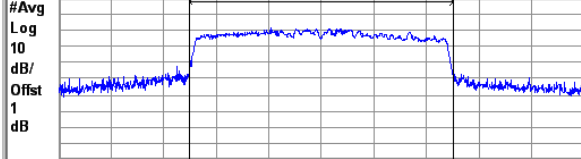
Mode:	802.11ac VH80
5530MHz	 <p>Agilent R T</p> <p>Ch Freq 5.53 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.53 GHz Span 160 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>10.07 dBm / 80.0000 MHz -68.96 dBm/Hz</p>
5610MHz	 <p>Agilent R T</p> <p>Ch Freq 5.61 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.61 GHz Span 160 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>9.13 dBm / 80.0000 MHz -69.90 dBm/Hz</p>

➤ 5725-5850MHz

Mode:		802.11a
5745MHz		
5785MHz		
5825MHz		

Mode:	802.11n-HT20
5745MHz	 <p>Agilent R T Trace/View</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.745 GHz Span 40 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>11.33 dBm / 20.0000 MHz -61.68 dBm/Hz</p> <p>Trace/View: Trace 1, 2, 3; Clear Write; Max Hold; Min Hold; View; Blank; More 1 of 2</p>
5785MHz	 <p>Agilent R T Trace/View</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.785 GHz Span 40 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>10.78 dBm / 20.0000 MHz -62.23 dBm/Hz</p> <p>Trace/View: Trace 1, 2, 3; Clear Write; Max Hold; Min Hold; View; Blank; More 1 of 2</p>
5825MHz	 <p>Agilent R T Trace/View</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.825 GHz Span 40 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>9.16 dBm / 20.0000 MHz -63.85 dBm/Hz</p> <p>Trace/View: Trace 1, 2, 3; Clear Write; Max Hold; Min Hold; View; Blank; More 1 of 2</p>

Mode:	802.11n-HT40				
5755 MHz	 <p>Agilent R T</p> <p>Ch Freq 5.755 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log dB/Offst 1 dB</p> <p>Center 5.755 GHz Span 80 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <table border="1"> <tr> <td>Channel Power</td> <td>Power Spectral Density</td> </tr> <tr> <td>10.93 dBm / 40.0000 MHz</td> <td>-65.09 dBm/Hz</td> </tr> </table> <p>Trace/View</p> <p>1 Trace 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p>	Channel Power	Power Spectral Density	10.93 dBm / 40.0000 MHz	-65.09 dBm/Hz
Channel Power	Power Spectral Density				
10.93 dBm / 40.0000 MHz	-65.09 dBm/Hz				
5795 MHz	 <p>Agilent R T</p> <p>Ch Freq 5.795 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log dB/Offst 1 dB</p> <p>Center 5.795 GHz Span 80 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <table border="1"> <tr> <td>Channel Power</td> <td>Power Spectral Density</td> </tr> <tr> <td>9.86 dBm / 40.0000 MHz</td> <td>-66.16 dBm/Hz</td> </tr> </table> <p>Freq/Channel</p> <p>Center Freq 5.79500000 GHz</p> <p>Start Freq 5.75500000 GHz</p> <p>Stop Freq 5.83500000 GHz</p> <p>CF Step 8.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p>	Channel Power	Power Spectral Density	9.86 dBm / 40.0000 MHz	-66.16 dBm/Hz
Channel Power	Power Spectral Density				
9.86 dBm / 40.0000 MHz	-66.16 dBm/Hz				

Mode:	802.11ac VH80				
5775 MHz	<div style="border: 1px solid gray; padding: 5px;"> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid gray;"> Agilent R T </div> <div style="border-bottom: 1px solid gray; padding: 2px;"> <p style="font-size: small;">Ch Freq 5.775 GHz Trig Free</p> </div> <div style="border-bottom: 1px solid gray; padding: 2px;"> <p style="font-size: small;">Channel Power</p> </div> <div style="border-bottom: 1px solid gray; padding: 5px;"> <p style="font-size: x-small;">Ref 20 dBm Atten 30 dB</p>  </div> <div style="border-bottom: 1px solid gray; padding: 2px;"> <p style="font-size: x-small;">Center 5.775 GHz Span 160 MHz</p> <p style="font-size: x-small;">#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> </div> <div style="border: 2px solid magenta; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; font-size: small;">Channel Power</td> <td style="width: 50%; font-size: small;">Power Spectral Density</td> </tr> <tr> <td style="font-size: large;">10.99 dBm / 80.0000 MHz</td> <td style="font-size: large;">-68.04 dBm/Hz</td> </tr> </table> </div> <div style="border-top: 1px solid gray; padding: 2px;"> <p style="font-size: x-small;">Trace/View</p> <p style="font-size: x-small;">1 Trace 3</p> <p style="font-size: x-small;">2</p> <p style="font-size: x-small;">3</p> <p style="font-size: x-small;">Clear Write</p> <p style="font-size: x-small;">Max Hold</p> <p style="font-size: x-small;">Min Hold</p> <p style="font-size: x-small;">View</p> <p style="font-size: x-small;">Blank</p> <p style="font-size: x-small;">More 1 of 2</p> </div> </div>	Channel Power	Power Spectral Density	10.99 dBm / 80.0000 MHz	-68.04 dBm/Hz
Channel Power	Power Spectral Density				
10.99 dBm / 80.0000 MHz	-68.04 dBm/Hz				

9. Radiated Spurious Emissions

9.1 Standard Applicable

According to §15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

According to §15.407(b)(6), Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

According to §15.407(b)(7), The provisions of §15.205 apply to intentional radiators operating under this section.
789033 D02 v02r01 General UNII Test Procedures New Rules v01

If radiated measurements are performed, field strength is then converted to EIRP as follows:

$$\text{EIRP} = ((E*d)^2) / 30$$

where:

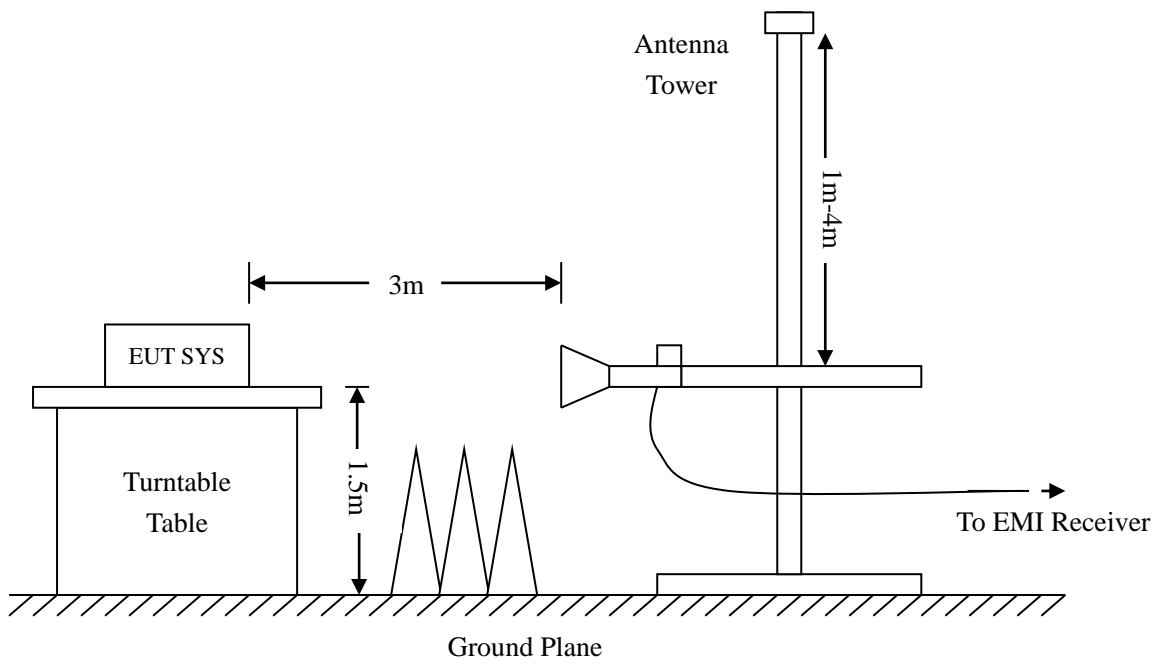
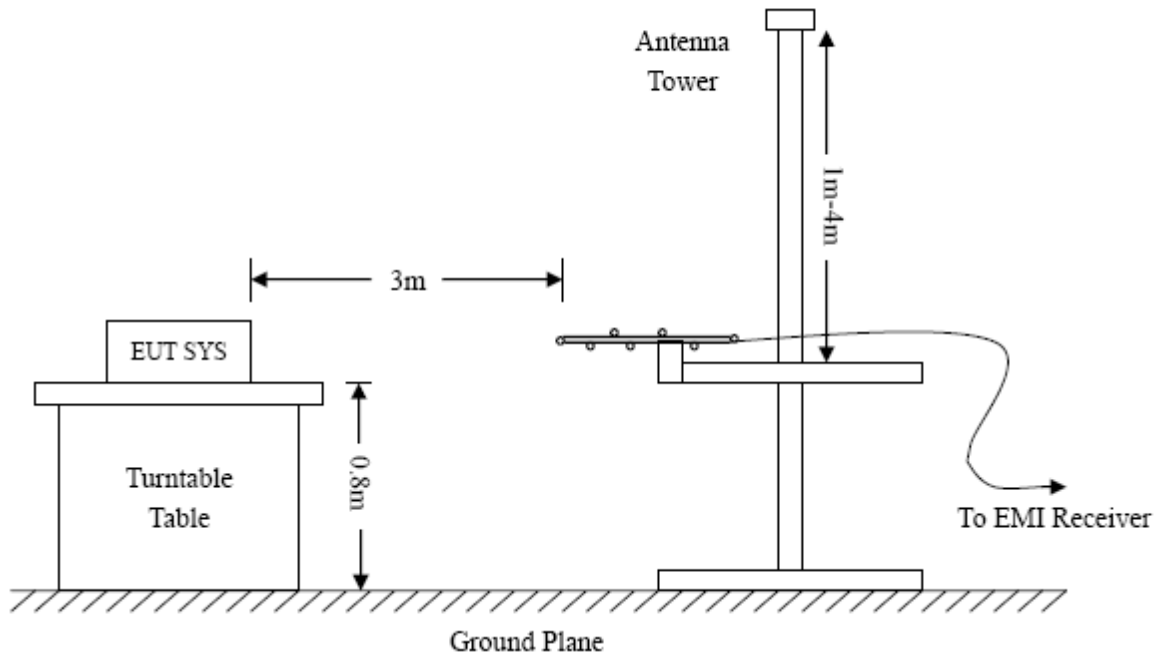
- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

9.2 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 15.407(b)(6) 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.



9.3 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:

RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:

RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

9.4 Corrected Amplitude & Margin Calculation

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

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

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

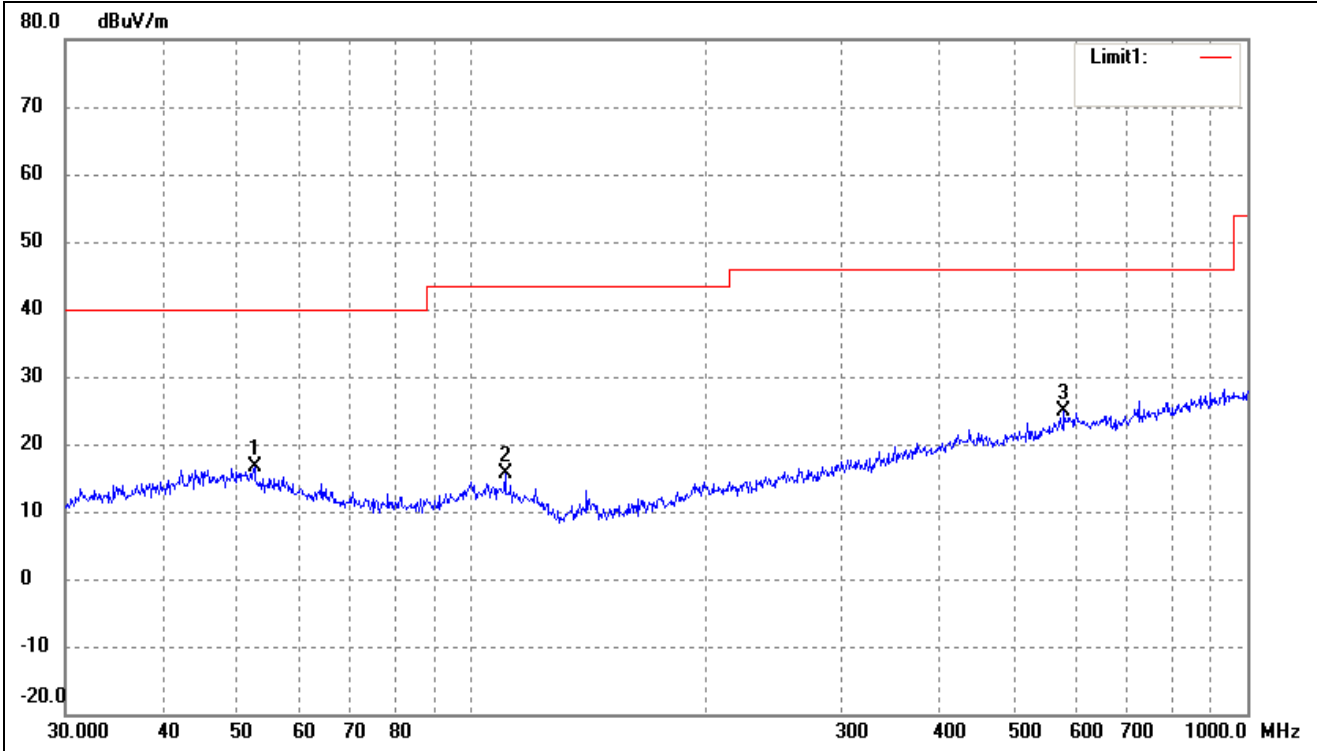
$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

9.5 Summary of Test Results/Plots

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

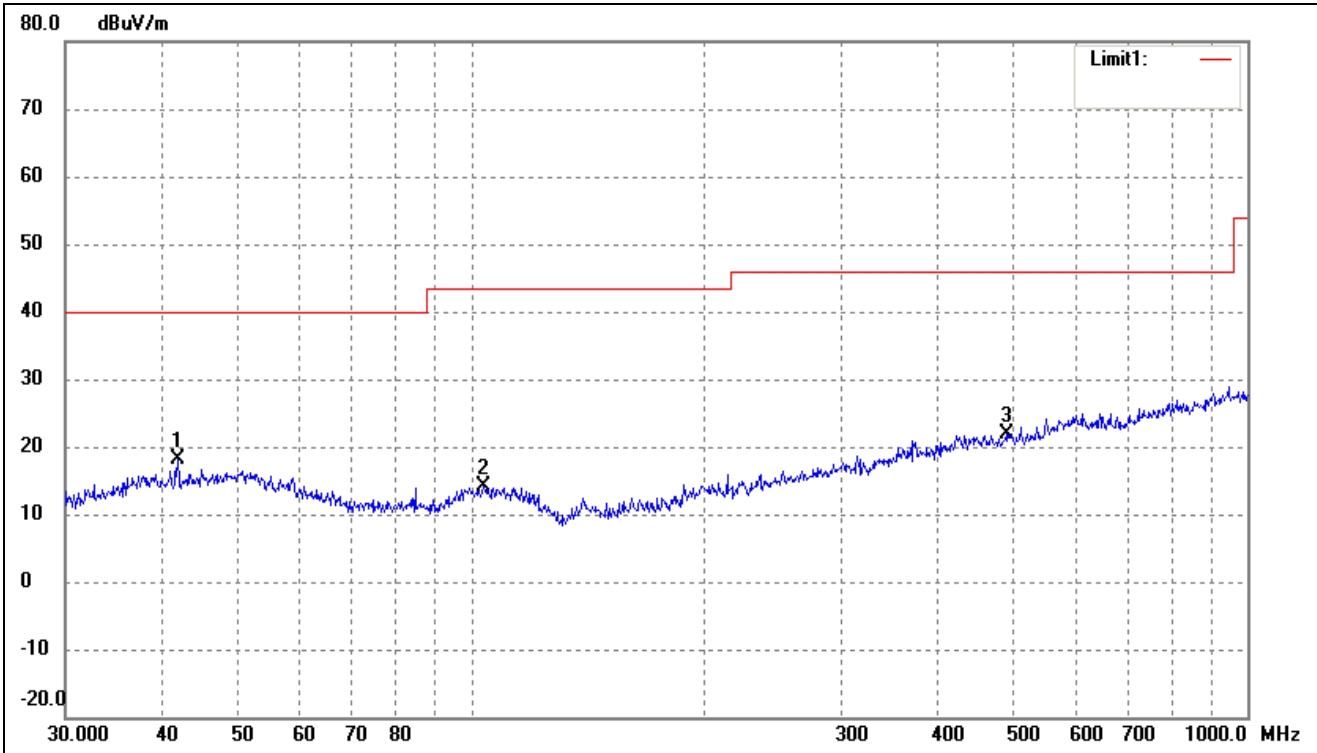
- Spurious Emission From 30 MHz to 1 GHz
- 5150-5250MHz

802.11a			
Test Channel	5180MHz(Worst case)	Polarity:	Horizontal



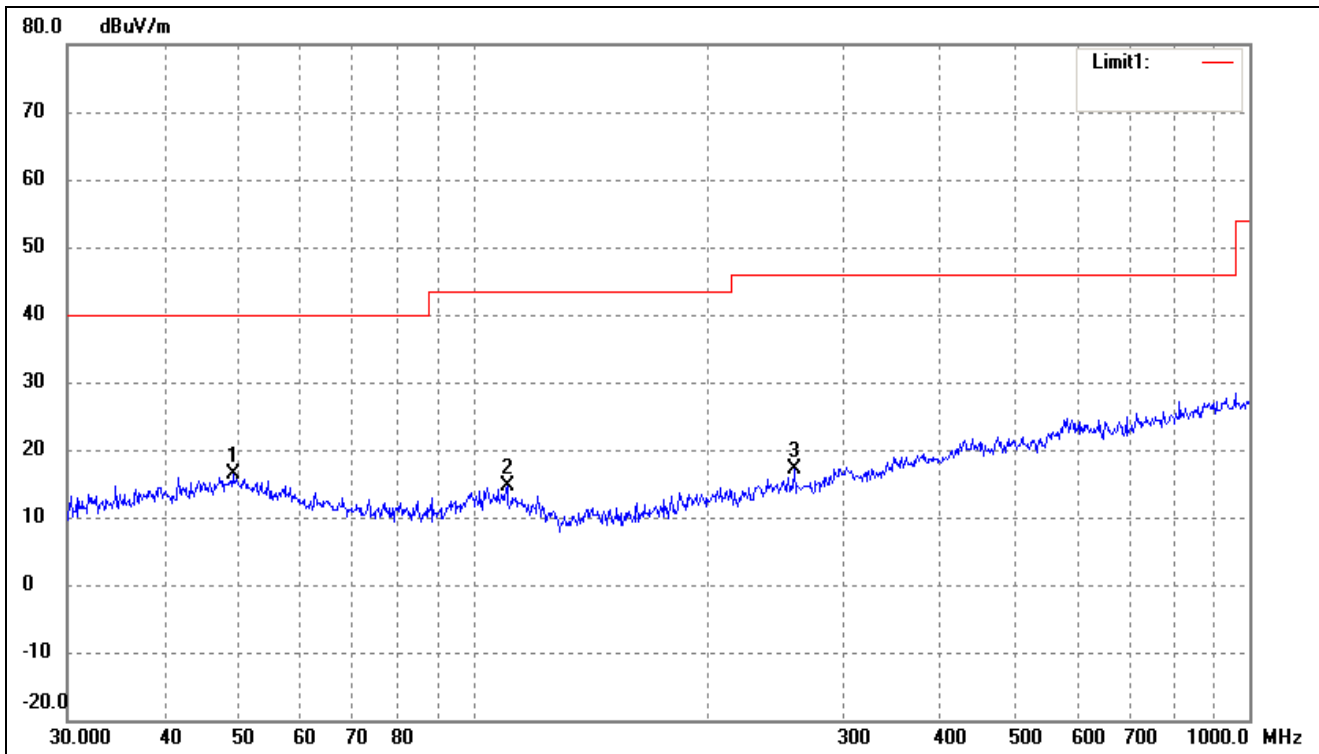
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.5753	28.33	-11.60	16.73	40.00	-23.27	211	100	peak
2	110.5687	28.69	-13.08	15.61	43.50	-27.89	101	100	peak
3	580.7026	29.17	-4.20	24.97	46.00	-21.03	118	100	peak

802.11a			
Test Channel	5180MHz(Worst case)	Polarity:	Vertical



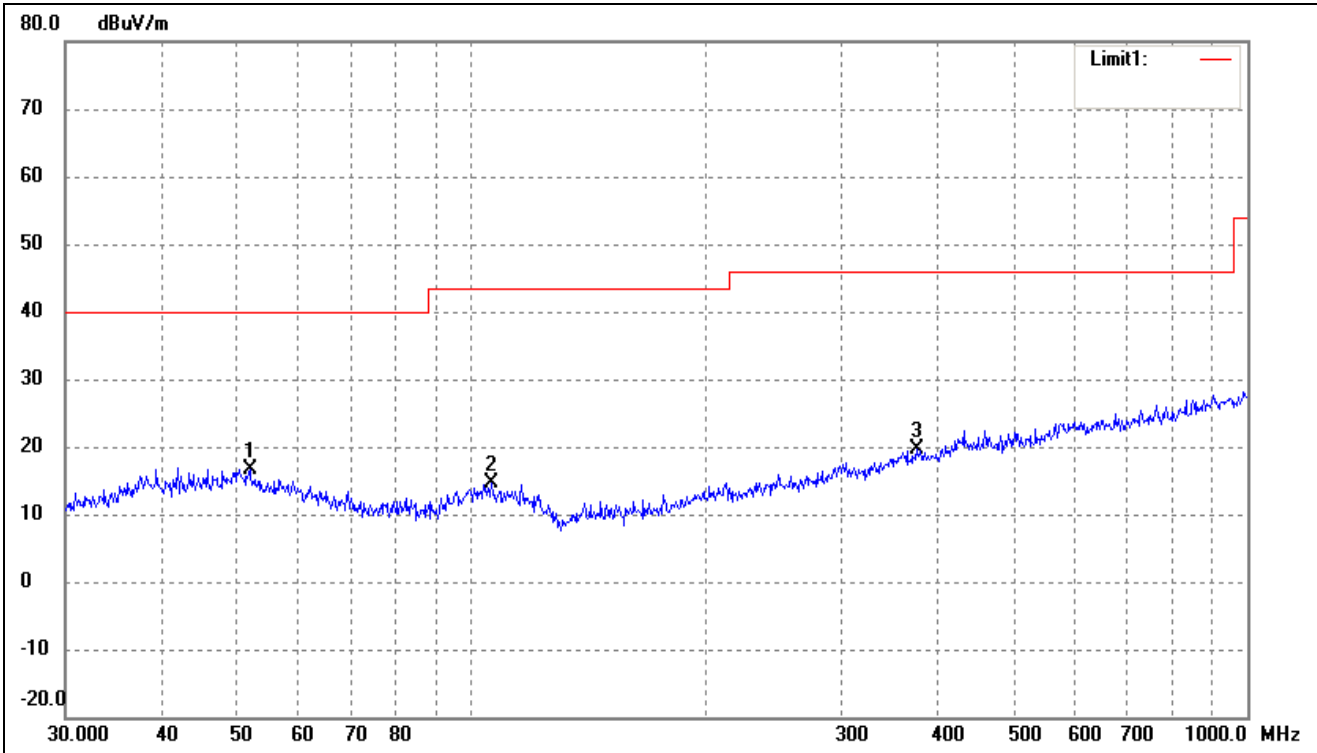
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	41.8596	30.10	-12.07	18.03	40.00	-21.97	95	100	peak
2	103.8055	27.14	-13.12	14.02	43.50	-29.48	86	100	peak
3	489.0269	28.32	-6.33	21.99	46.00	-24.01	218	100	peak

802.11n-HT20			
Test Channel	5180MHz(worst case)	Polarity:	Horizontal



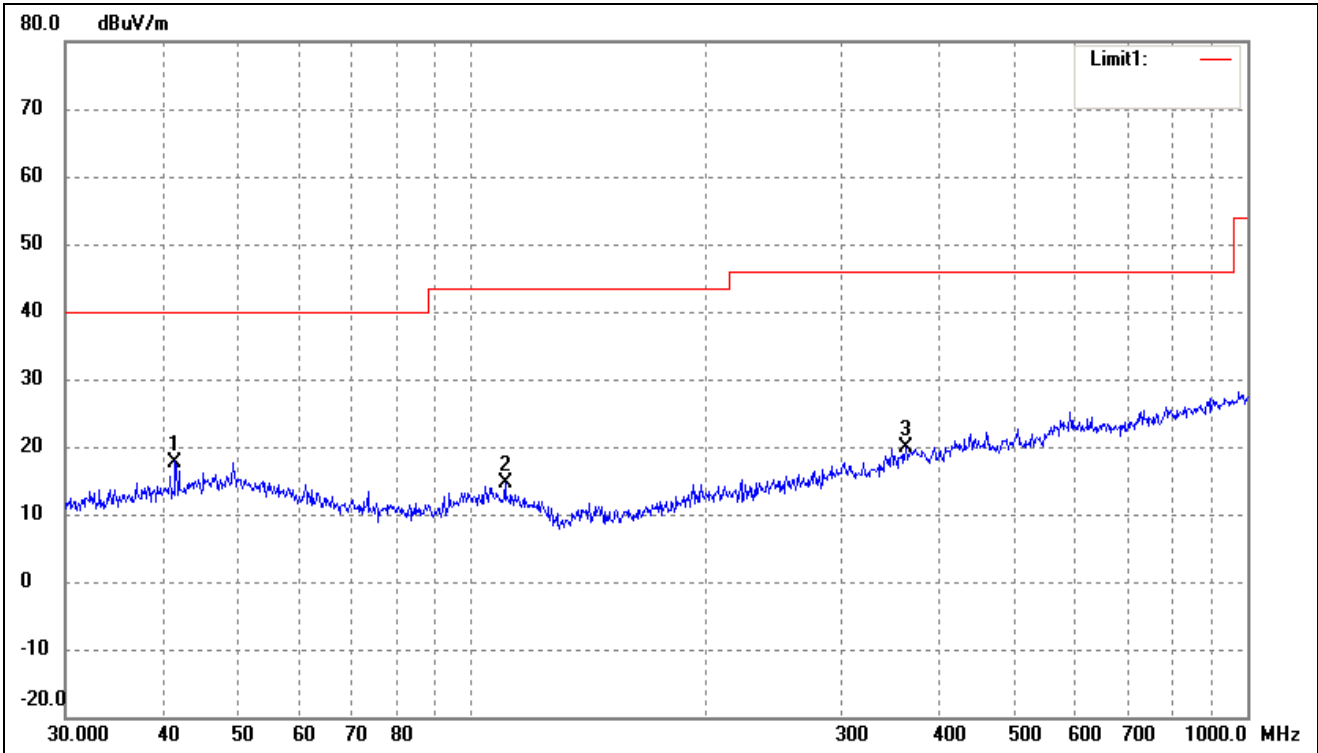
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	49.0145	27.56	-11.06	16.50	40.00	-23.50	74	100	peak
2	110.5687	27.62	-13.08	14.54	43.50	-28.96	154	100	peak
3	259.2338	27.84	-10.83	17.01	46.00	-28.99	82	100	peak

802.11n-HT20			
Test Channel	5180MHz(worst case)	Polarity:	Vertical



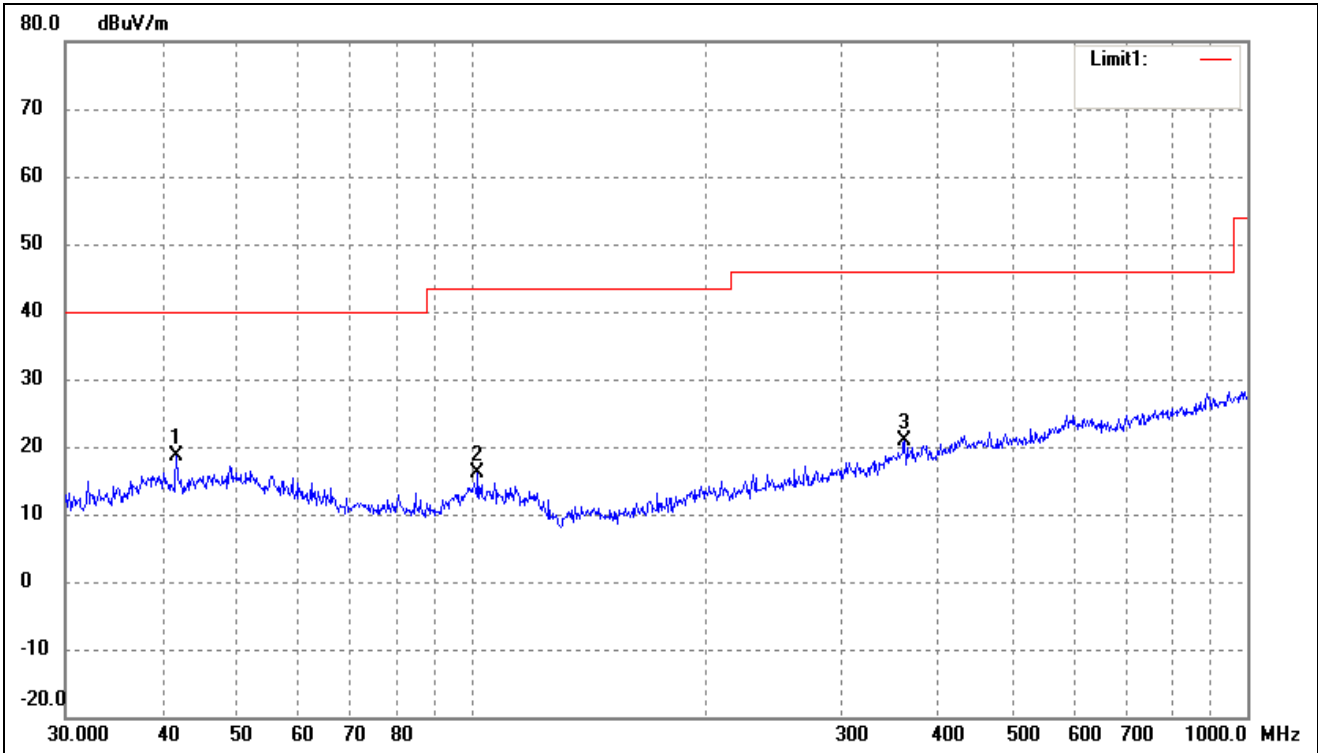
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.8430	28.03	-11.42	16.61	40.00	-23.39	67	100	peak
2	106.0126	27.61	-13.08	14.53	43.50	-28.97	140	100	peak
3	374.6226	27.22	-7.58	19.64	46.00	-26.36	159	100	peak

802.11n-HT40			
Test Channel	5190MHz(worst case)	Polarity:	Horizontal



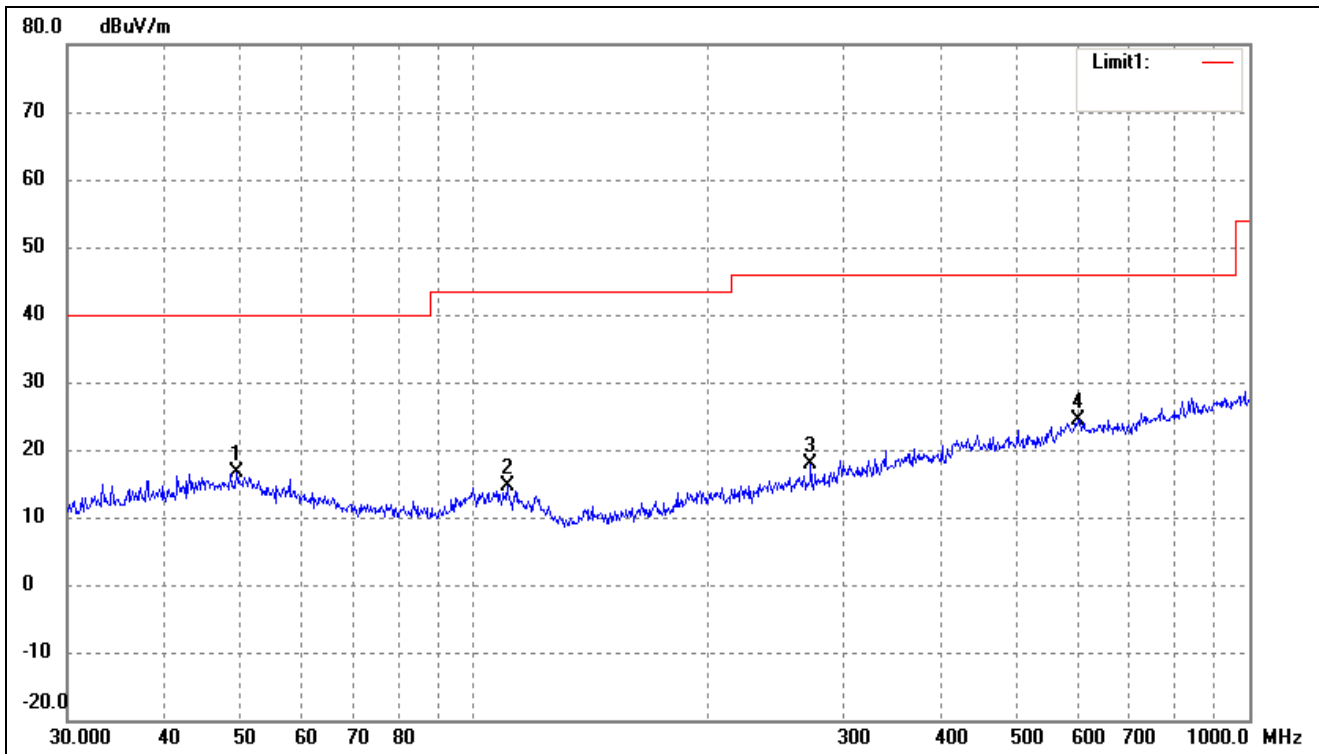
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	41.5670	29.89	-12.14	17.75	40.00	-22.25	129	100	peak
2	110.5687	27.82	-13.08	14.74	43.50	-28.76	108	100	peak
3	362.9845	27.80	-7.82	19.98	46.00	-26.02	89	100	peak

802.11n-HT40			
Test Channel	5190MHz(worst case)	Polarity:	Vertical



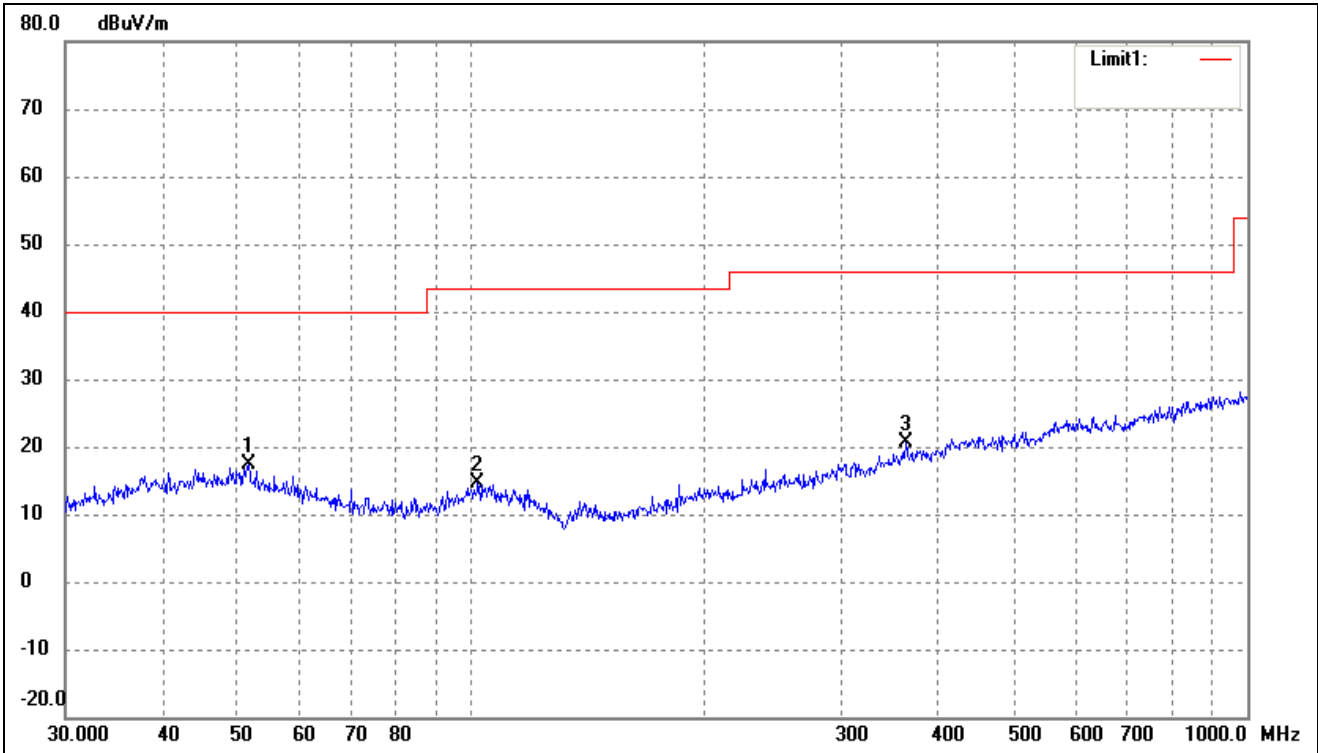
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	41.7130	30.81	-12.10	18.71	40.00	-21.29	209	100	peak
2	102.0014	29.39	-13.14	16.25	43.50	-27.25	302	100	peak
3	361.7139	28.74	-7.83	20.91	46.00	-25.09	86	100	peak

802.11ac-HT80			
Test Channel	5210MHz(worst case)	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	49.5328	27.70	-11.02	16.68	40.00	-23.32	79	100	peak
2	110.5687	27.68	-13.08	14.60	43.50	-28.90	92	100	peak
3	272.2776	28.52	-10.60	17.92	46.00	-28.08	75	100	peak
4	601.4265	28.41	-4.02	24.39	46.00	-21.61	148	100	peak

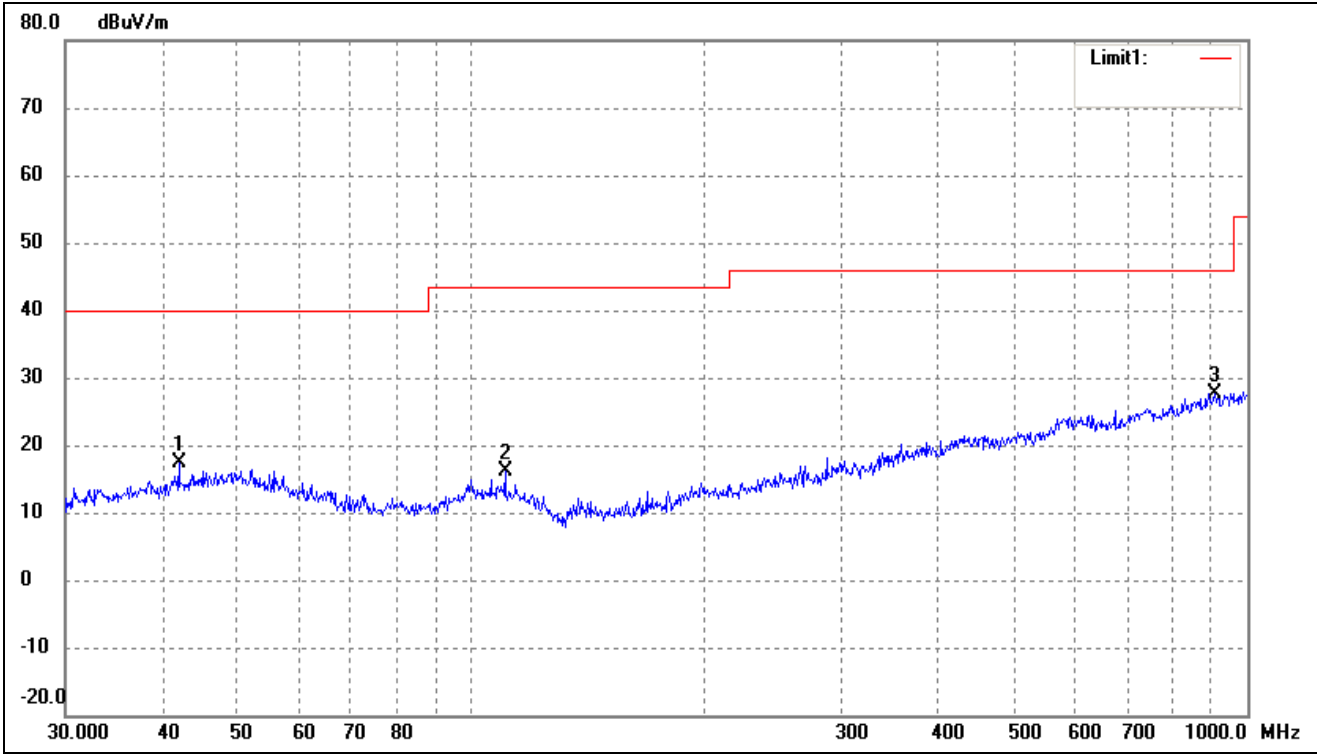
802.11ac-HT80			
Test Channel	5210MHz(worst case)	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.6616	28.66	-11.38	17.28	40.00	-22.72	94	100	peak
2	102.0014	27.68	-13.14	14.54	43.50	-28.96	143	100	peak
3	362.9845	28.39	-7.82	20.57	46.00	-25.43	91	100	peak

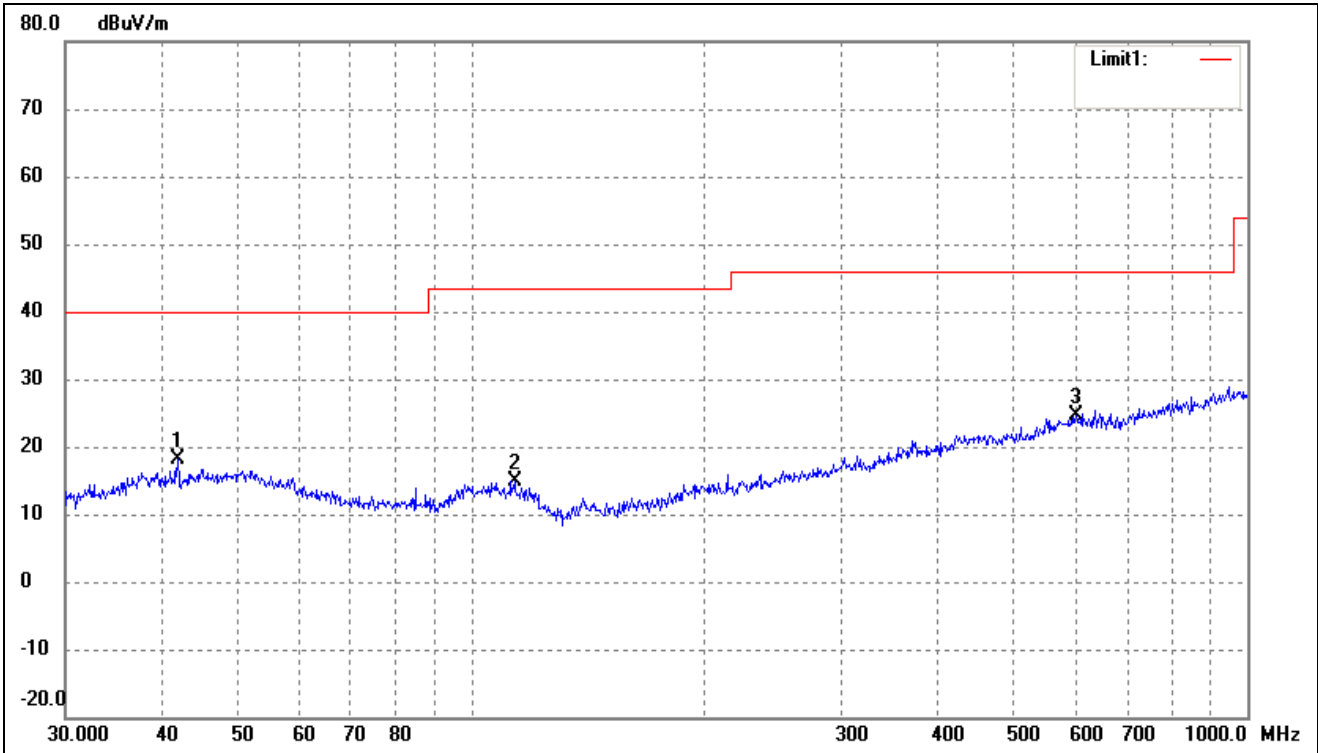
> 5250-5350MHz

802.11a			
Test Channel	5260MHz	Polarity:	Horizontal



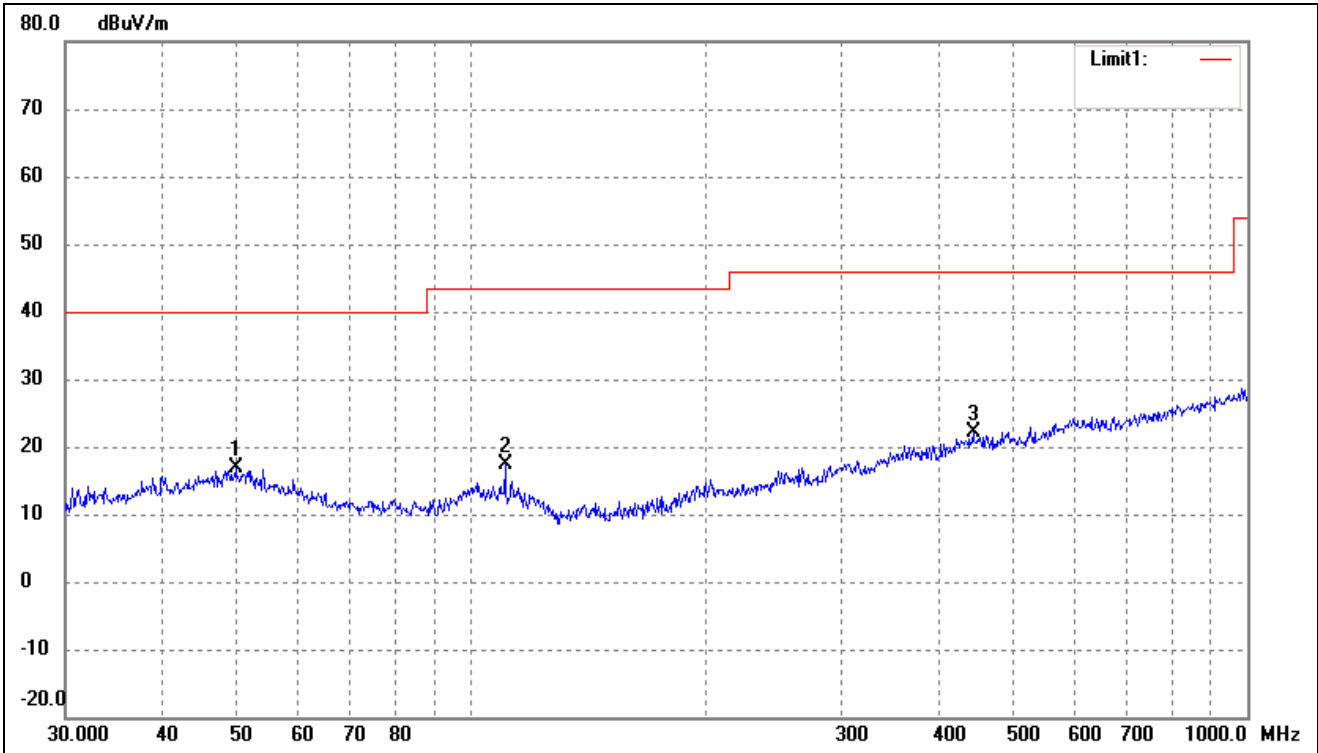
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	42.0066	29.40	-12.04	17.36	40.00	-22.64	96	100	peak
2	110.5687	29.25	-13.08	16.17	43.50	-27.33	211	100	peak
3	906.4824	28.20	-0.47	27.73	46.00	-18.27	121	100	peak

802.11a			
Test Channel	5260MHz(worst case)	Polarity:	Vertical



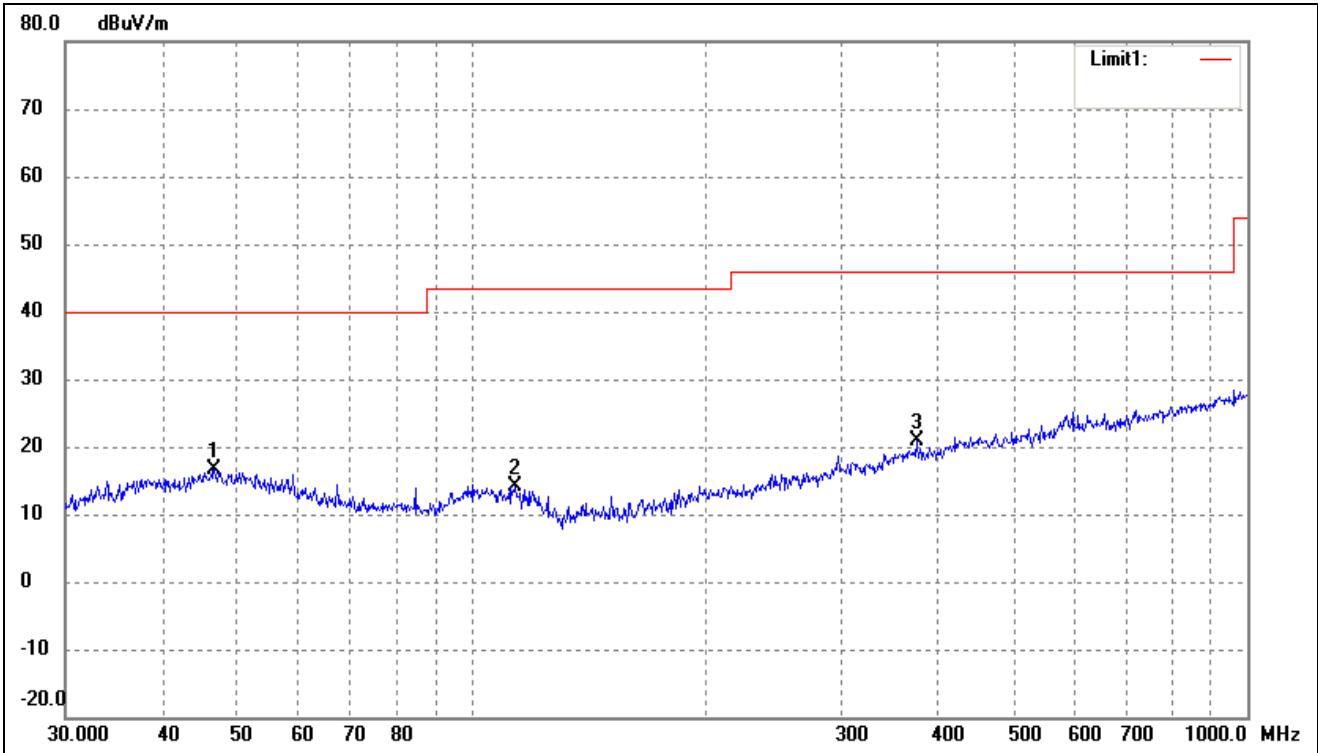
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	41.8596	30.10	-12.07	18.03	40.00	-21.97	244	100	peak
2	113.7143	28.38	-13.44	14.94	43.50	-28.56	219	100	peak
3	601.4265	28.53	-4.02	24.51	46.00	-21.49	50	100	peak

802.11n-HT20			
Test Channel	5260MHz(worst case)	Polarity:	Horizontal



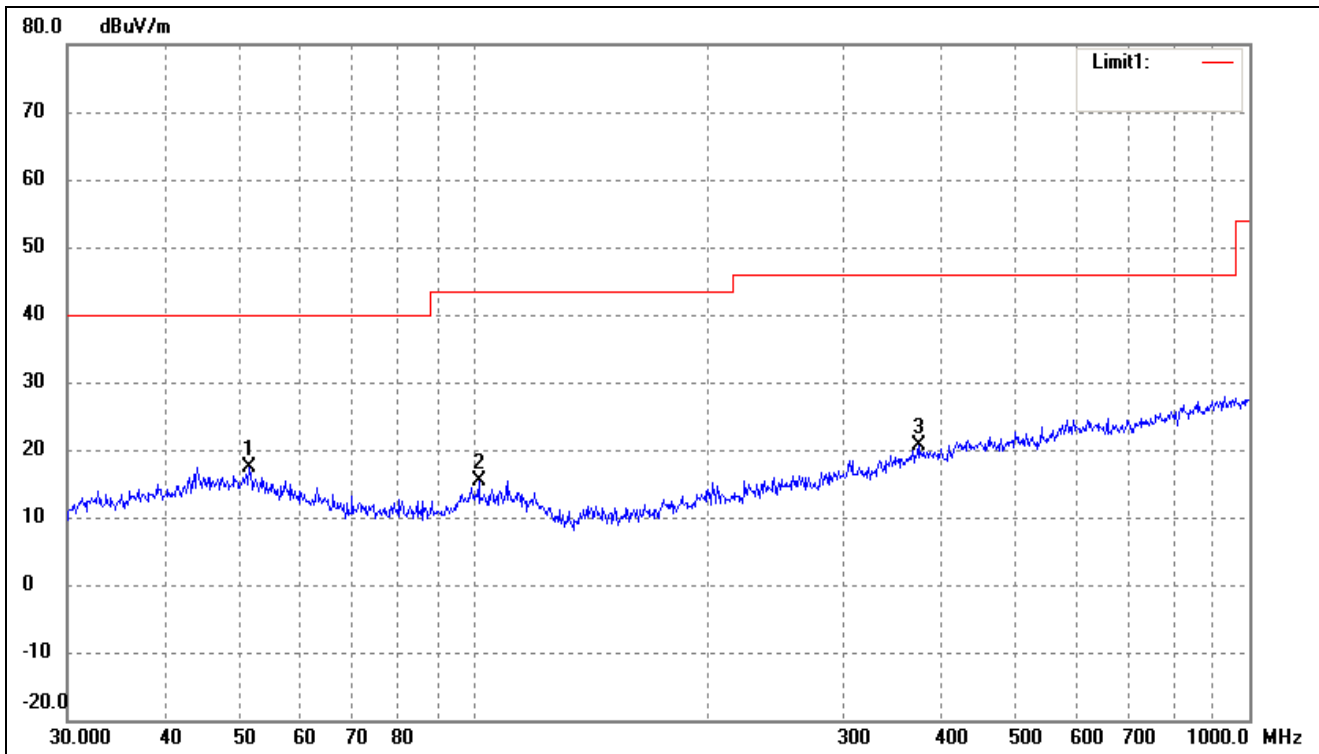
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	49.7068	27.85	-11.01	16.84	40.00	-23.16	142	100	peak
2	110.5687	30.34	-13.08	17.26	43.50	-26.24	58	100	peak
3	443.2943	28.29	-6.25	22.04	46.00	-23.96	195	100	peak

802.11n-HT20			
Test Channel	5260MHz(worst case)	Polarity:	Vertical



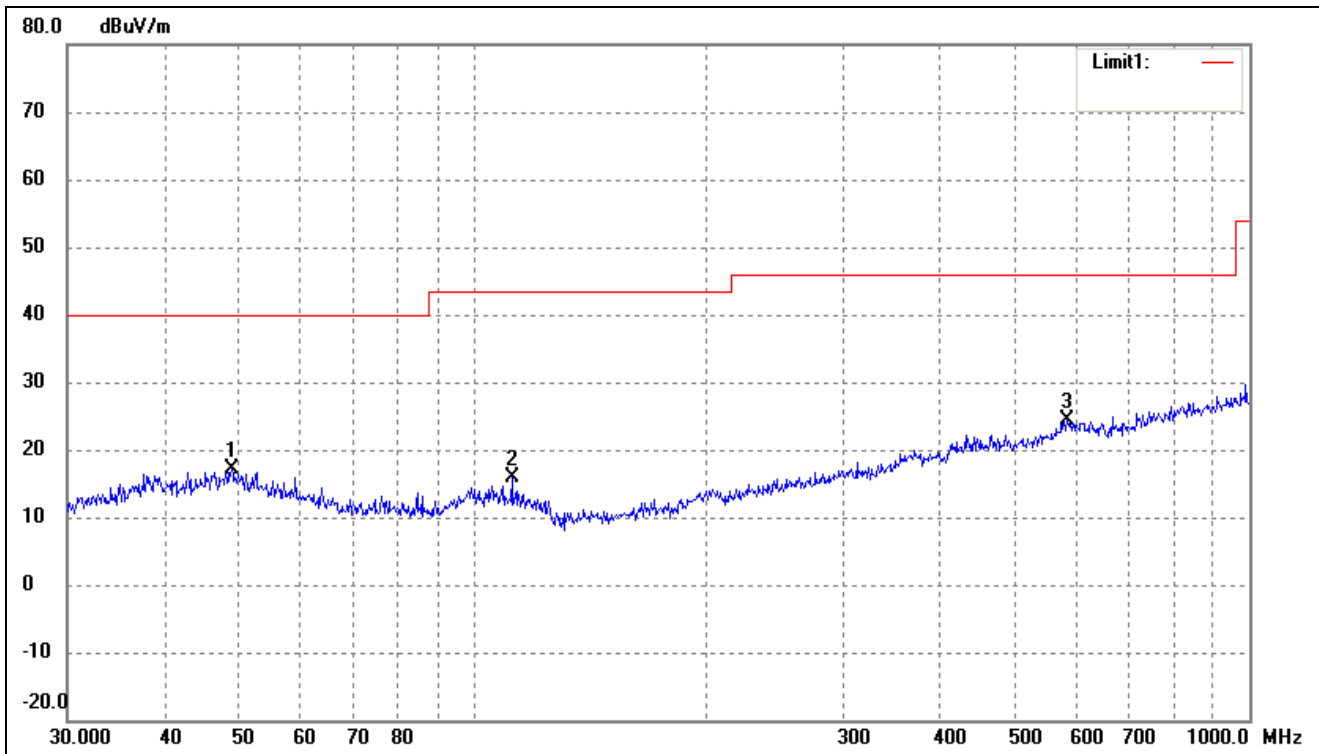
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.6664	27.94	-11.22	16.72	40.00	-23.28	333	100	peak
2	114.1138	27.50	-13.48	14.02	43.50	-29.48	268	100	peak
3	374.6226	28.36	-7.58	20.78	46.00	-25.22	57	100	peak

802.11n-HT40			
Test Channel	5270MHz(worst case)	Polarity:	Horizontal



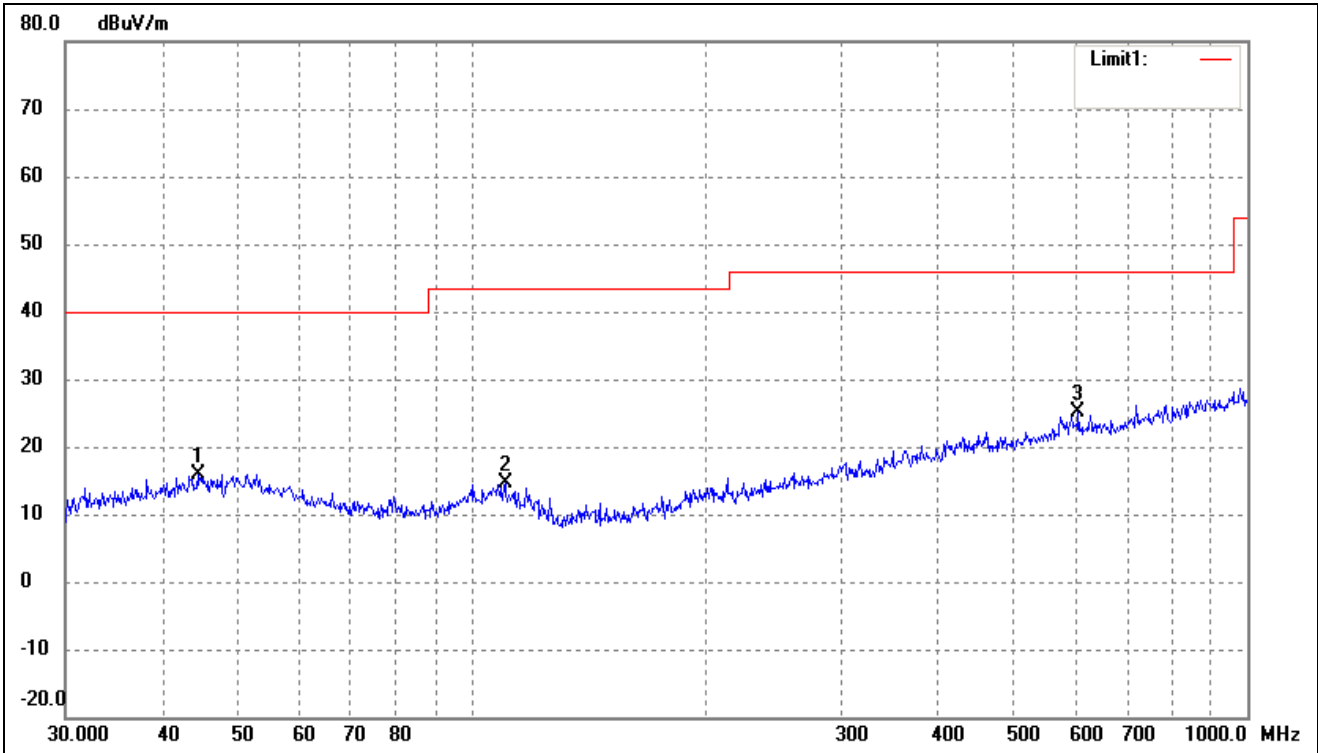
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.4807	28.71	-11.33	17.38	40.00	-22.62	316	100	peak
2	101.6443	28.62	-13.15	15.47	43.50	-28.03	92	100	peak
3	374.6226	28.11	-7.58	20.53	46.00	-25.47	103	100	peak

802.11n-HT40			
Test Channel	5270MHz(worst case)	Polarity:	Vertical



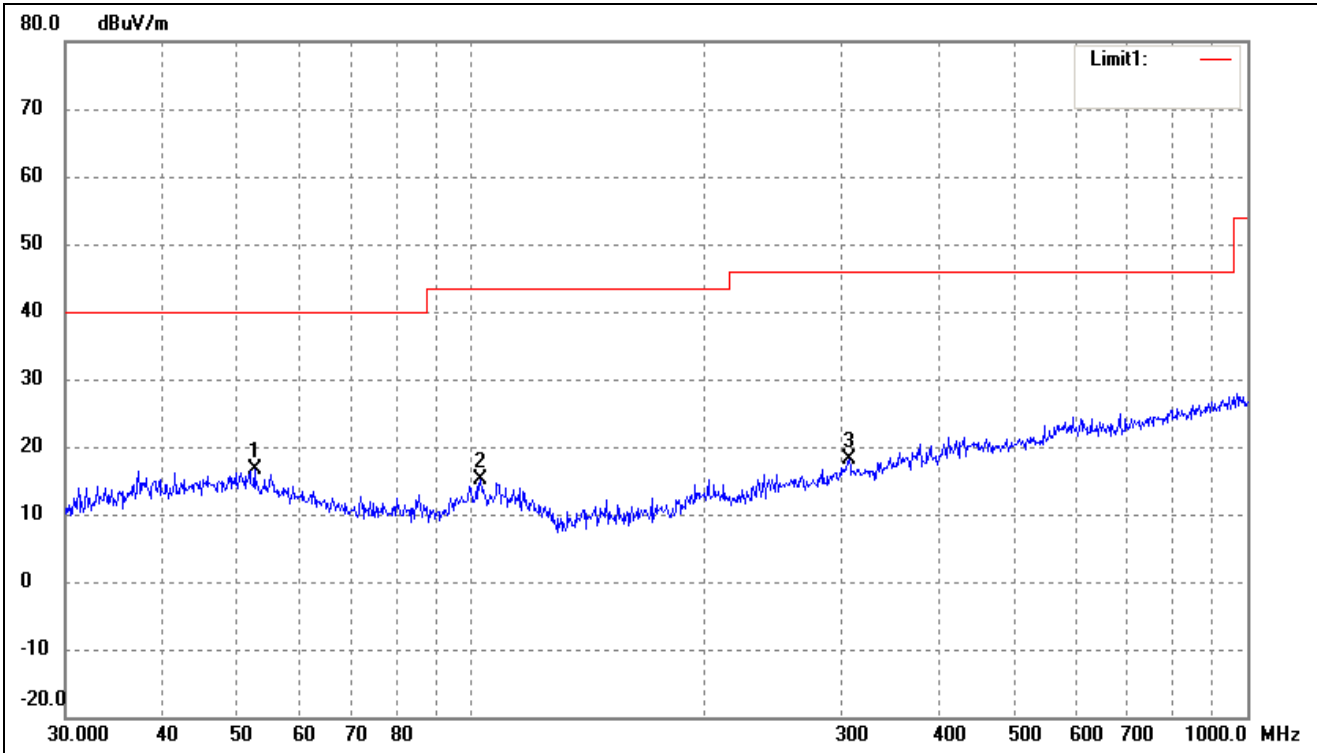
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	48.8429	28.24	-11.07	17.17	40.00	-22.83	282	100	peak
2	112.1305	29.26	-13.26	16.00	43.50	-27.50	154	100	peak
3	582.7425	28.65	-4.19	24.46	46.00	-21.54	93	100	peak

802.11ac-HT80			
Test Channel	5290MHz(worst case)	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	44.4308	27.41	-11.48	15.93	40.00	-24.07	339	100	peak
2	110.5687	27.63	-13.08	14.55	43.50	-28.95	94	100	peak
3	605.6592	29.20	-4.05	25.15	46.00	-20.85	251	100	peak

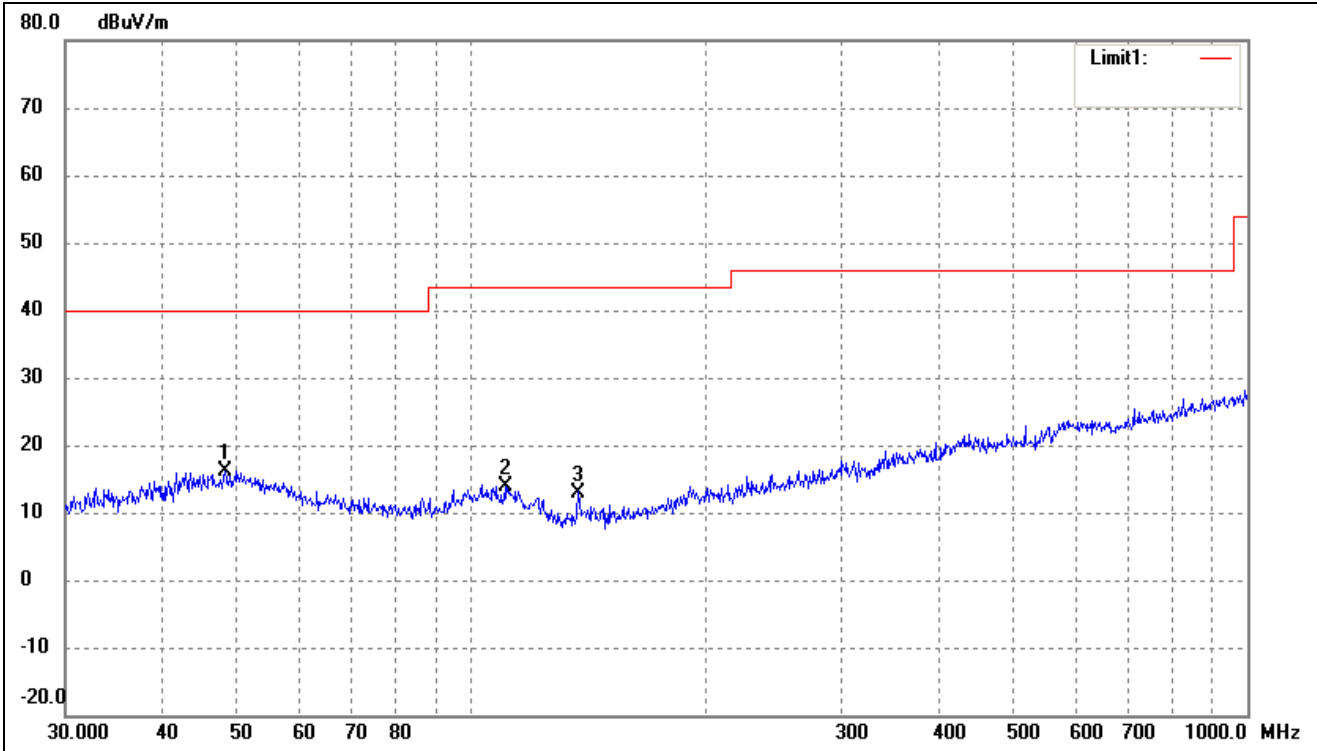
802.11ac-HT80			
Test Channel	5290MHz(worst case)	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.5753	28.15	-11.60	16.55	40.00	-23.45	245	100	peak
2	102.7192	28.16	-13.13	15.03	43.50	-28.47	78	100	peak
3	306.7537	27.29	-9.27	18.02	46.00	-27.98	211	100	peak

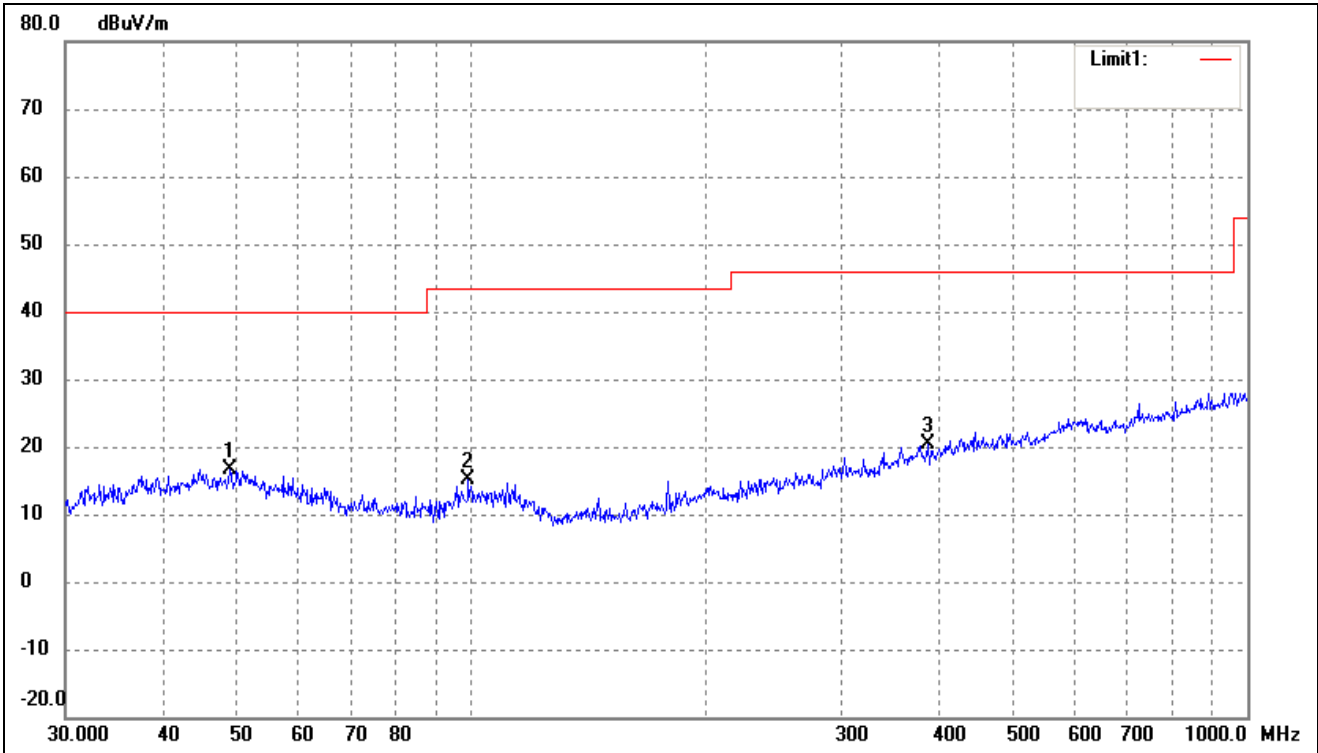
> 5470-5725MHz

802.11a			
Test Channel	5500MHz(worst case)	Polarity:	Horizontal



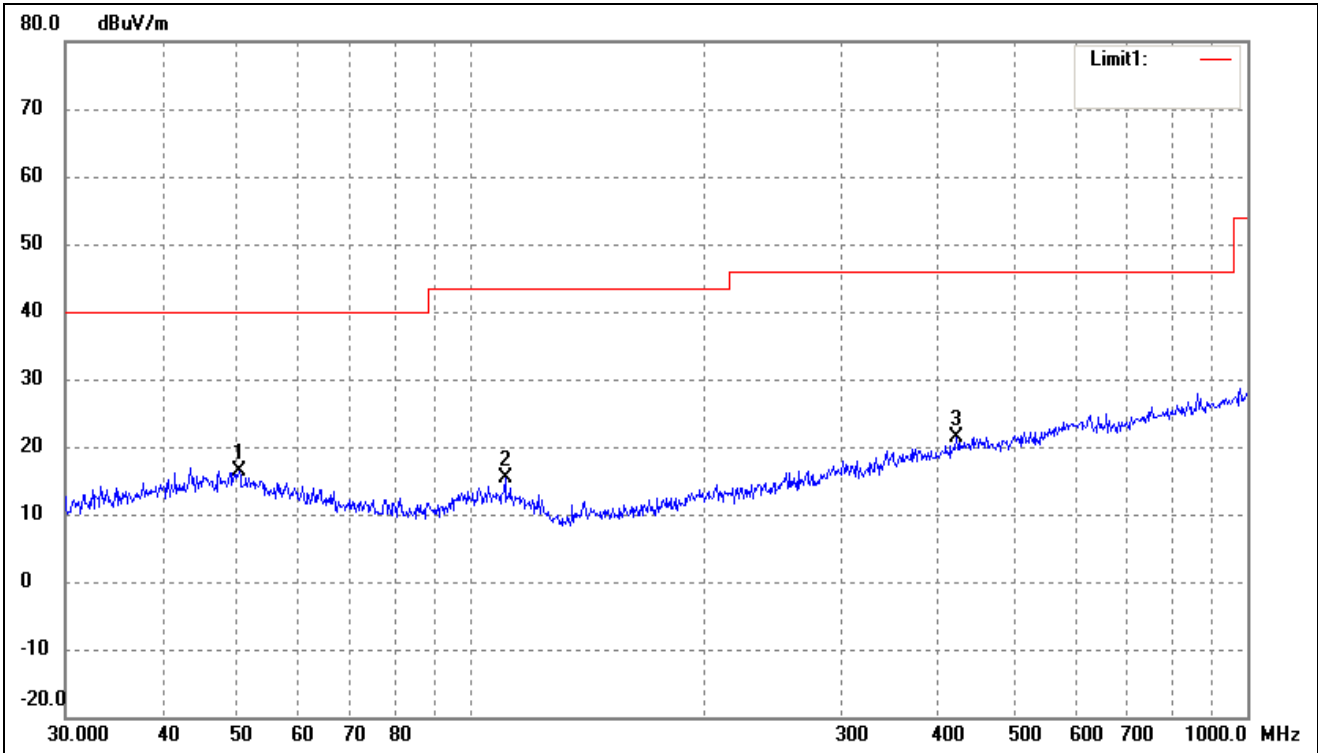
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	48.1626	27.14	-11.12	16.02	40.00	-23.98	218	100	peak
2	110.5687	27.00	-13.08	13.92	43.50	-29.58	112	100	peak
3	137.4202	28.86	-15.86	13.00	43.50	-30.50	71	100	peak

802.11a			
Test Channel	5500MHz(worst case)	Polarity:	Vertical



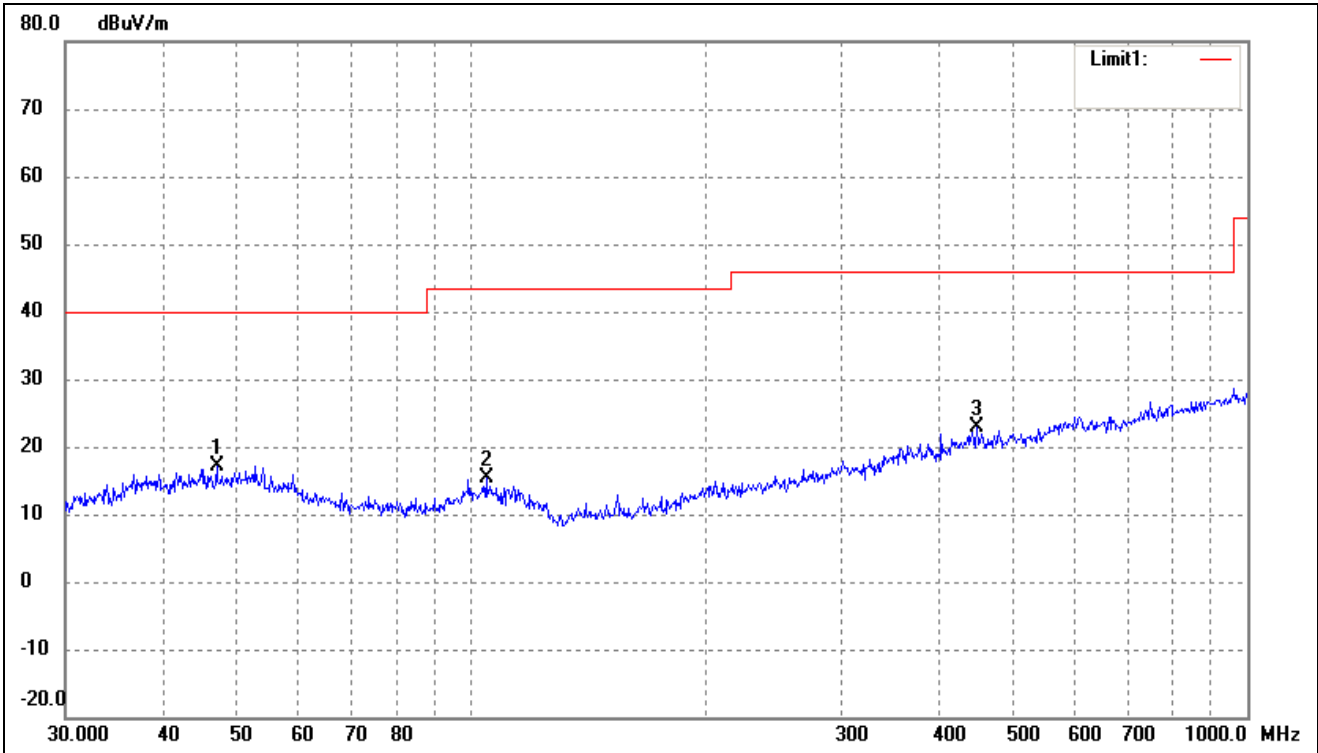
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	48.8429	27.60	-11.07	16.53	40.00	-23.47	54	100	peak
2	99.1797	28.39	-13.36	15.03	43.50	-28.47	170	100	peak
3	387.9920	28.02	-7.62	20.40	46.00	-25.60	87	100	peak

802.11n-HT20			
Test Channel	5500MHz(worst case)	Polarity:	Horizontal



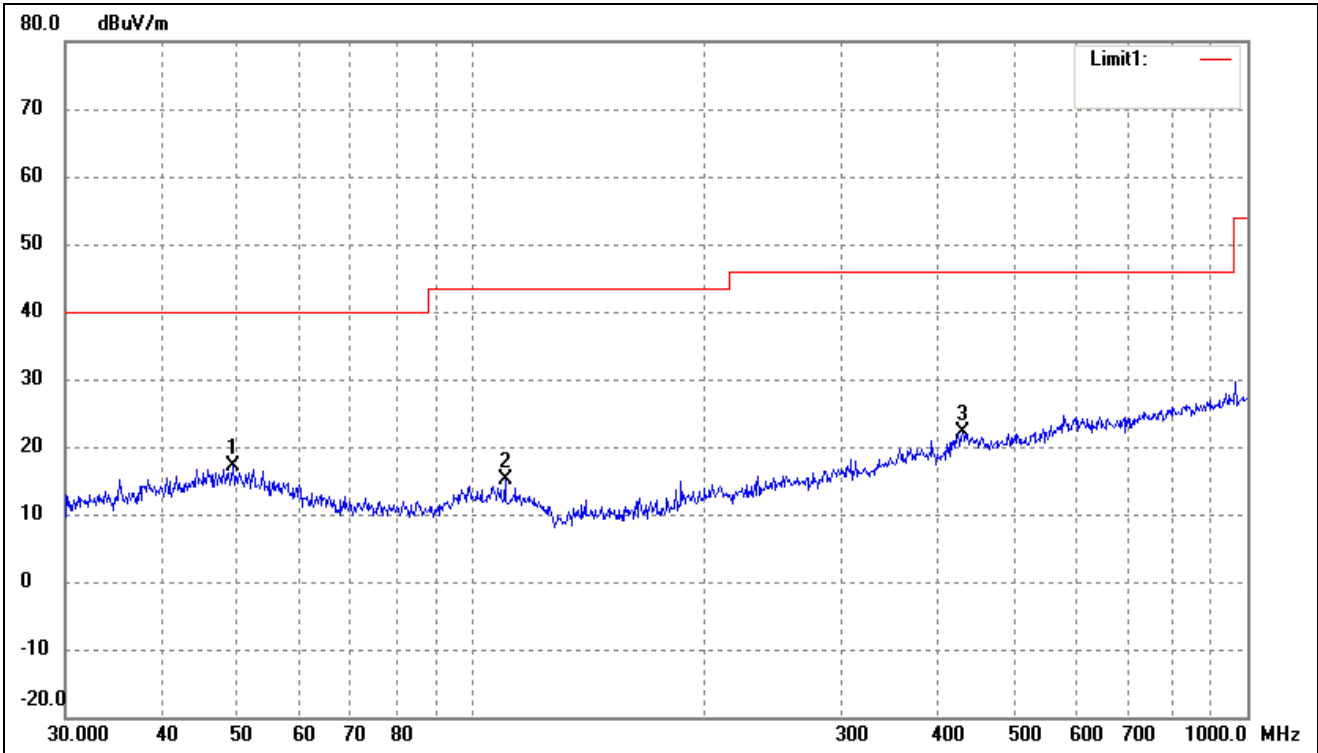
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	50.2325	27.51	-11.04	16.47	40.00	-23.53	78	100	peak
2	110.5687	28.43	-13.08	15.35	43.50	-28.15	211	100	peak
3	422.0577	27.68	-6.29	21.39	46.00	-24.61	139	100	peak

802.11n-HT20			
Test Channel	5500MHz(worst case)	Polarity:	Vertical



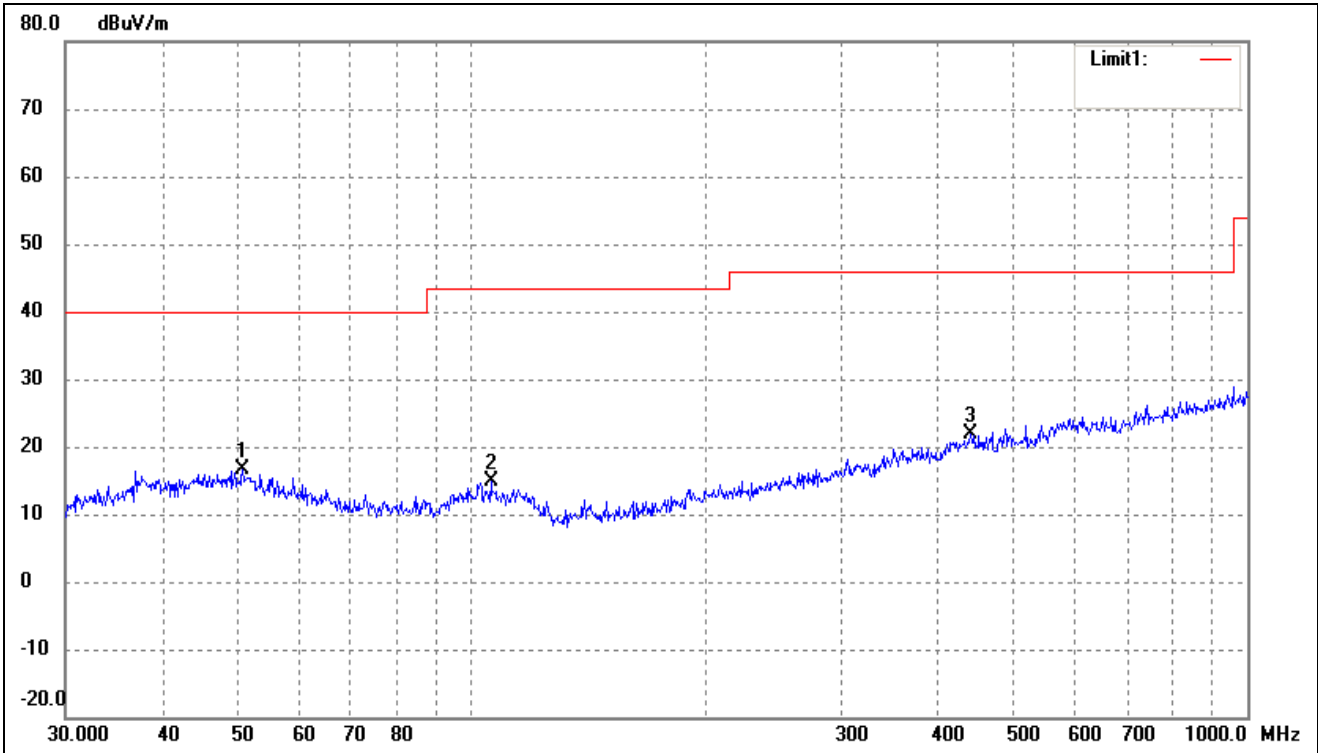
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.9948	28.43	-11.20	17.23	40.00	-22.77	166	100	peak
2	104.5361	28.45	-13.10	15.35	43.50	-28.15	245	100	peak
3	447.9822	29.28	-6.33	22.95	46.00	-23.05	78	100	peak

802.11n-HT40			
Test Channel	5510MHz(worst case)	Polarity:	Horizontal



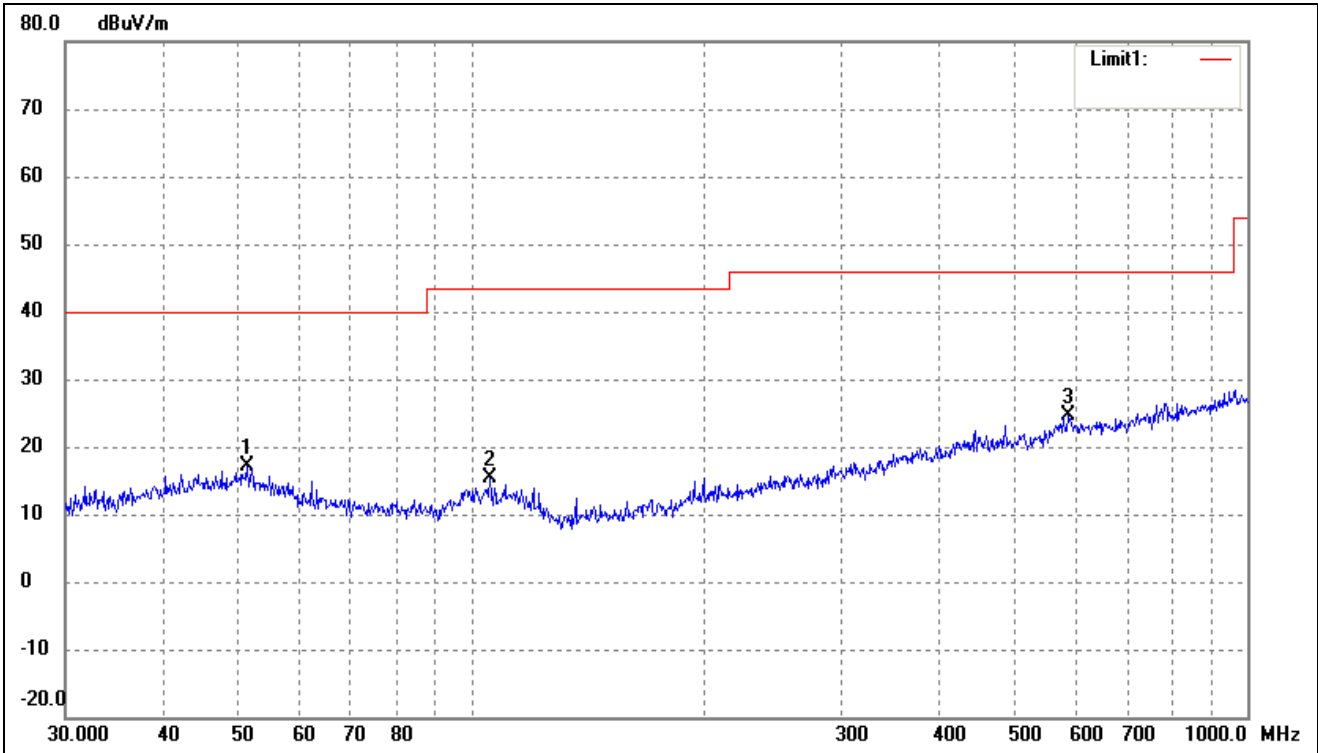
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	49.3594	28.29	-11.04	17.25	40.00	-22.75	214	100	peak
2	110.5687	28.29	-13.08	15.21	43.50	-28.29	96	100	peak
3	429.5228	28.22	-6.18	22.04	46.00	-23.96	176	100	peak

802.11n-HT40			
Test Channel	5510MHz(worst case)	Polarity:	Vertical



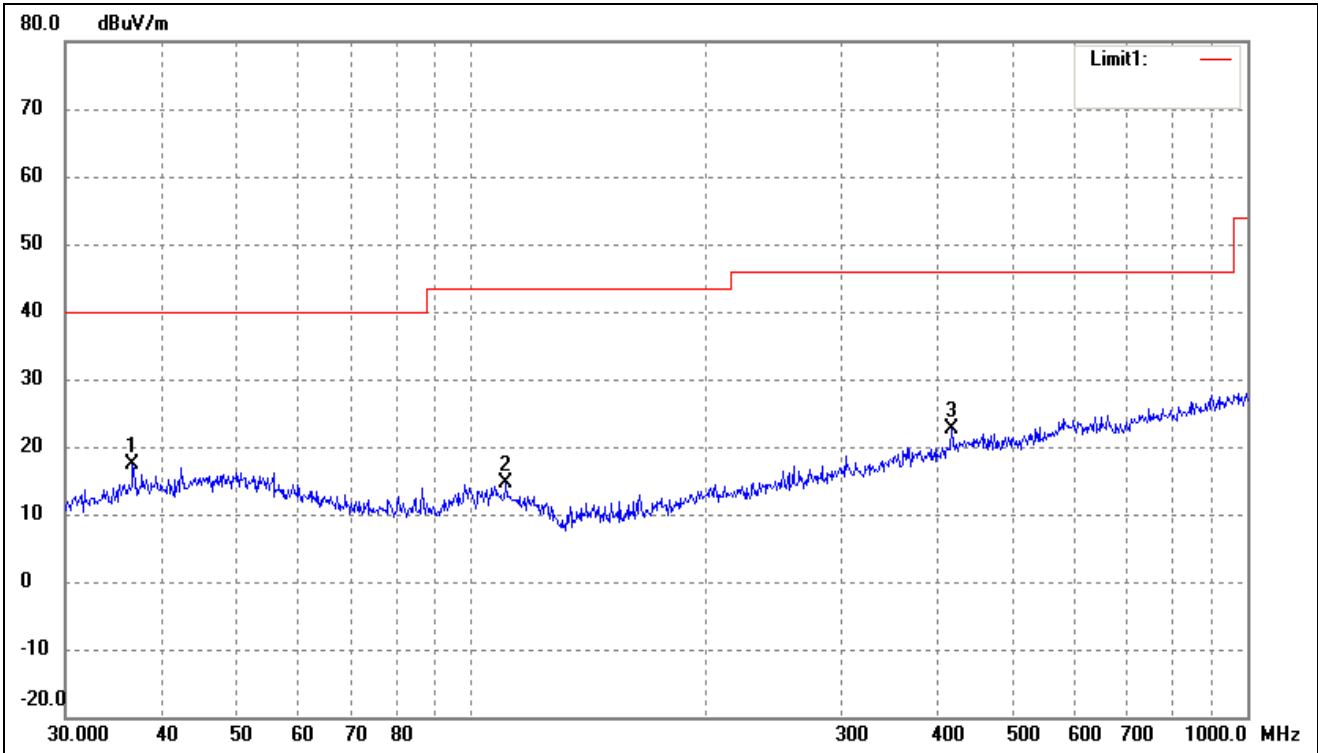
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	50.7637	27.75	-11.17	16.58	40.00	-23.42	96	100	peak
2	106.0126	27.84	-13.08	14.76	43.50	-28.74	231	100	peak
3	440.1963	27.97	-6.20	21.77	46.00	-24.23	104	100	peak

802.11ac-HT80			
Test Channel	5530MHz(worst case)	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.4807	28.46	-11.33	17.13	40.00	-22.87	323	100	peak
2	105.6415	28.51	-13.08	15.43	43.50	-28.07	232	100	peak
3	586.8437	28.74	-4.15	24.59	46.00	-21.41	78	100	peak

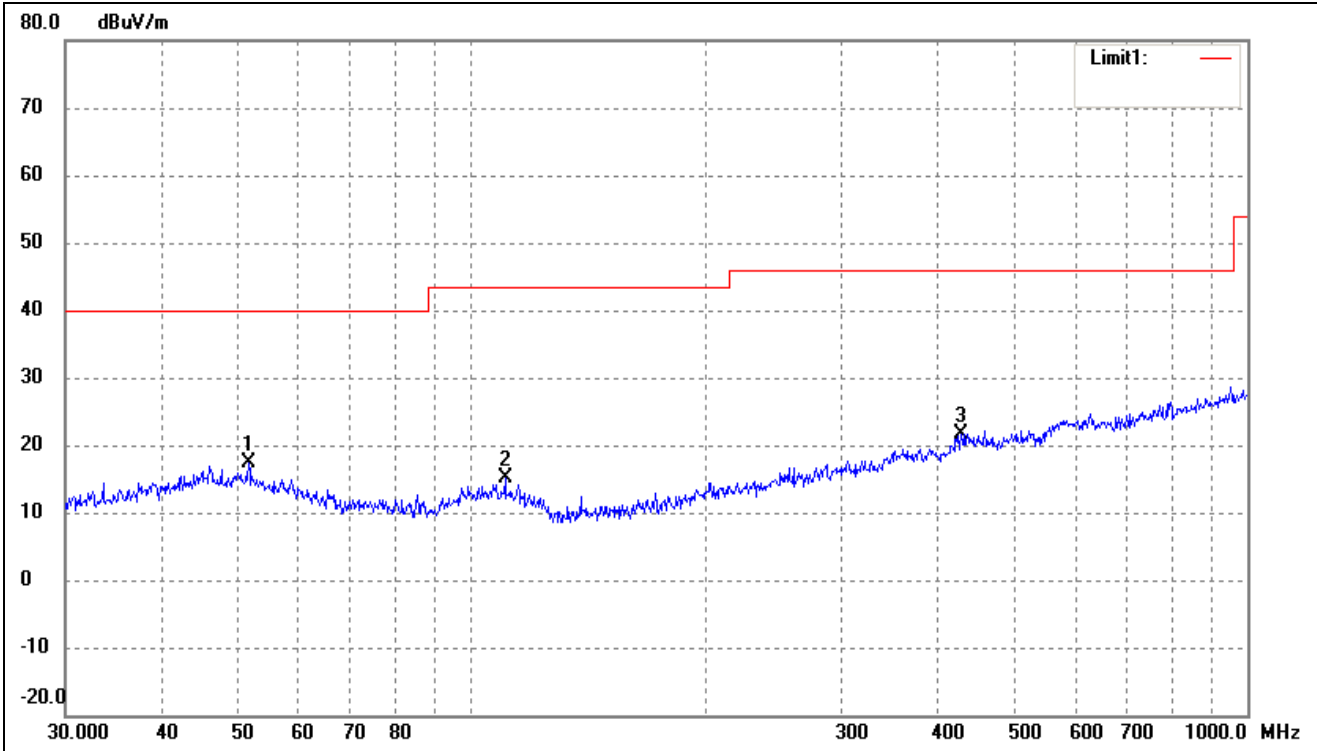
802.11ac-HT80			
Test Channel	5530MHz(worst case)	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	36.6375	30.37	-13.07	17.30	40.00	-22.70	257	100	peak
2	110.9571	27.66	-13.12	14.54	43.50	-28.96	133	100	peak
3	416.1791	29.29	-6.62	22.67	46.00	-23.33	127	100	peak

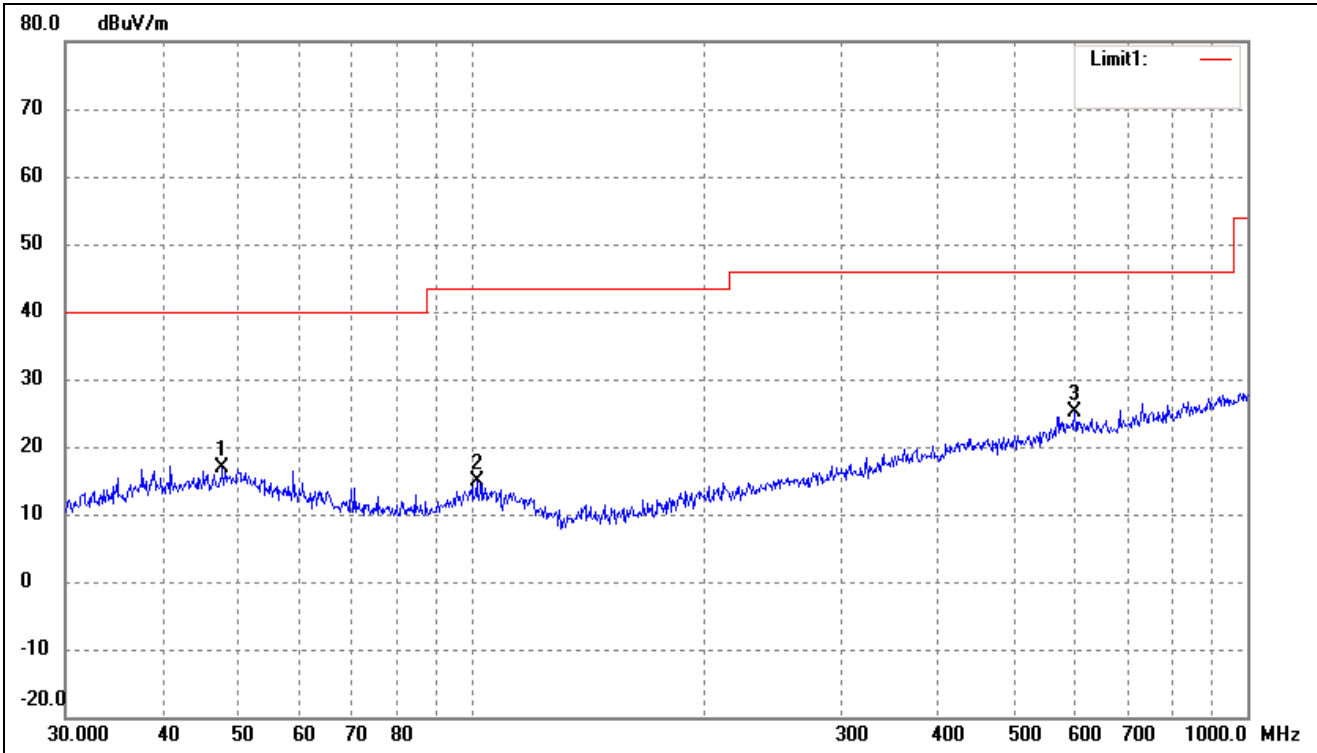
> 5725-5850MHz

802.11a			
Test Channel	5745MHz(worst case)	Polarity:	Horizontal



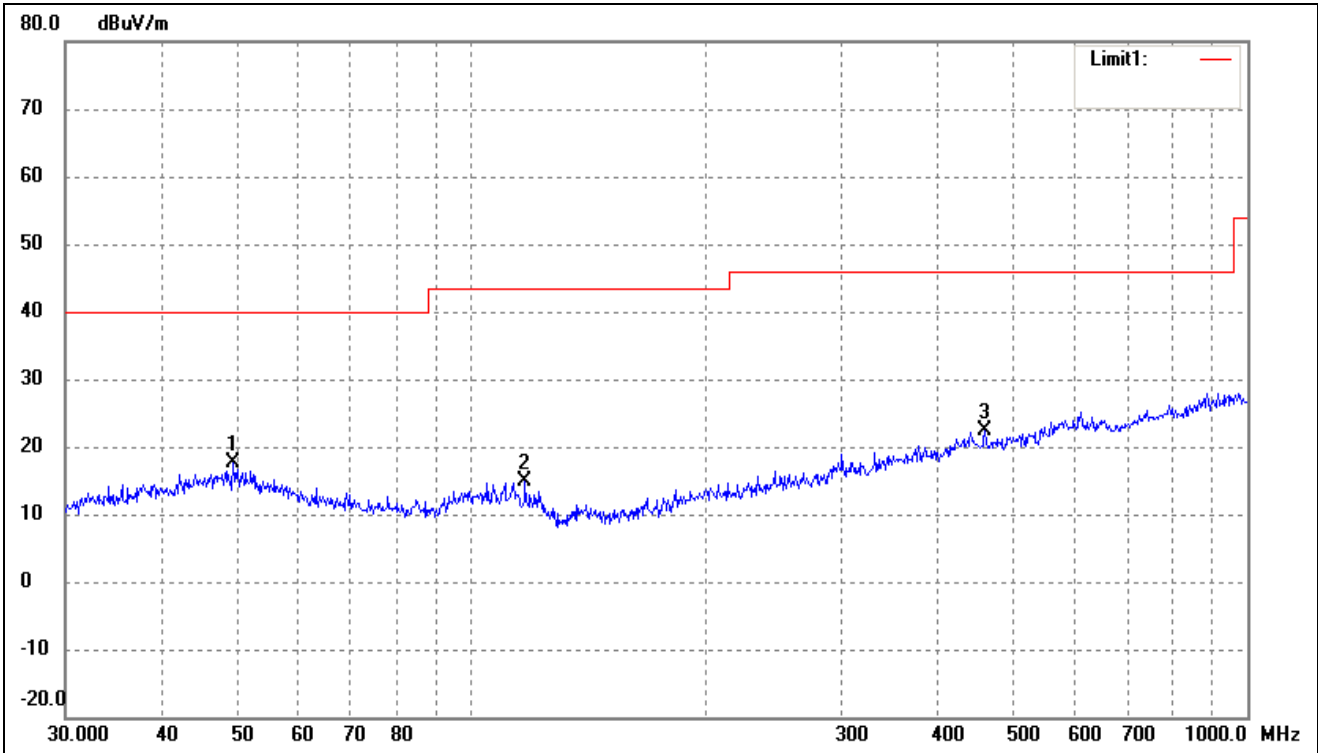
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.6616	28.84	-11.38	17.46	40.00	-22.54	304	100	peak
2	110.5687	28.27	-13.08	15.19	43.50	-28.31	50	100	peak
3	428.0193	27.90	-6.19	21.71	46.00	-24.29	320	100	peak

802.11a			
Test Channel	5745MHz(worst case)	Polarity:	Vertical



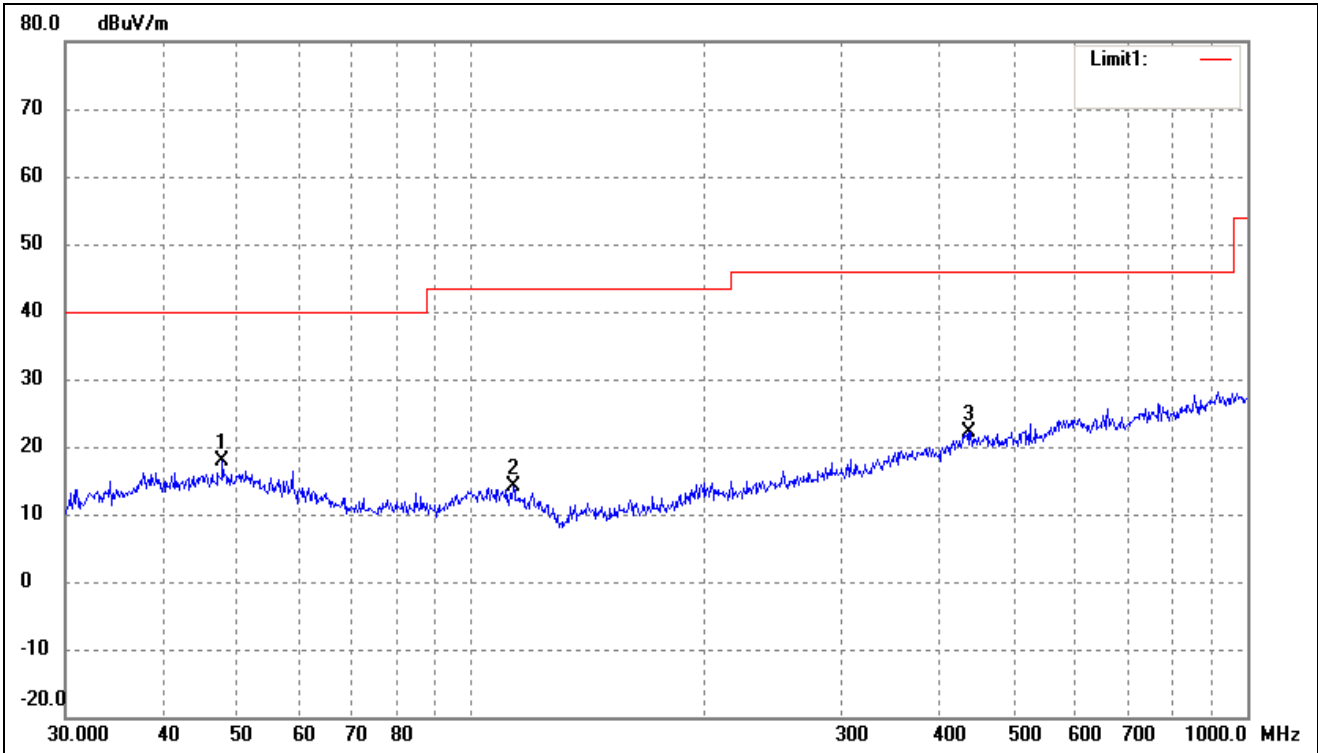
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	47.8260	28.07	-11.14	16.93	40.00	-23.07	61	100	peak
2	101.6443	27.93	-13.15	14.78	43.50	-28.72	186	100	peak
3	599.3213	29.04	-4.03	25.01	46.00	-20.99	76	100	peak

802.11n-HT20			
Test Channel	5745MHz(worst case)	Polarity:	Horizontal



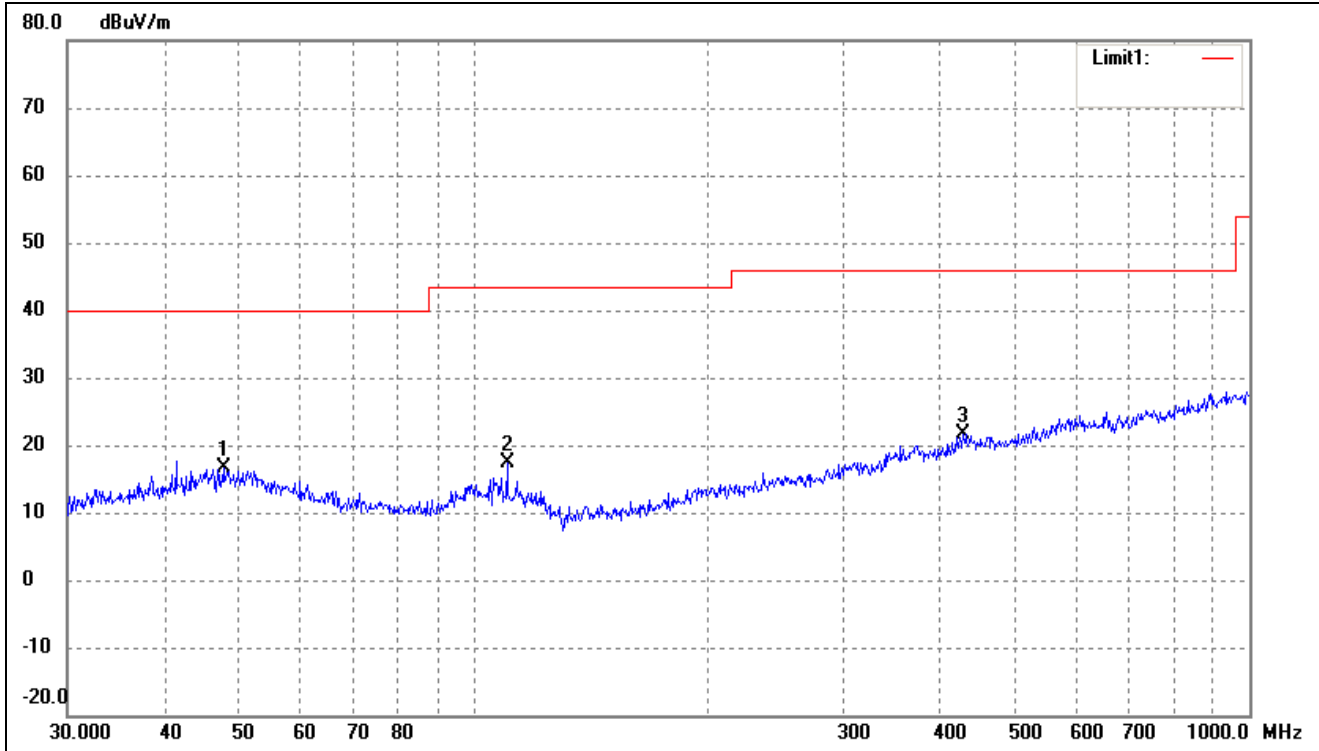
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	49.3594	28.57	-11.04	17.53	40.00	-22.47	212	100	peak
2	117.3603	28.79	-13.85	14.94	43.50	-28.56	72	100	peak
3	459.1144	28.85	-6.58	22.27	46.00	-23.73	208	100	peak

802.11n-HT20			
Test Channel	5745MHz(worst case)	Polarity:	Vertical



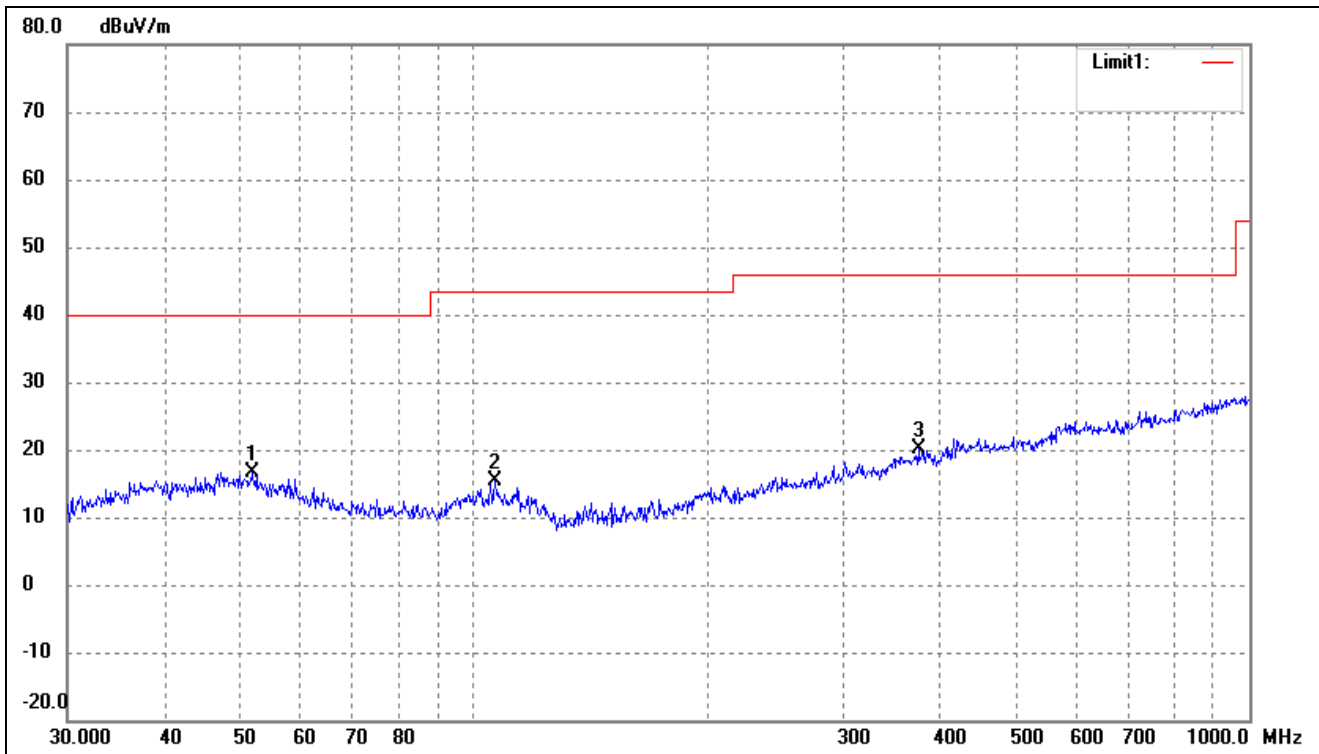
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	47.8260	29.04	-11.14	17.90	40.00	-22.10	95	100	peak
2	113.3163	27.53	-13.39	14.14	43.50	-29.36	274	100	peak
3	438.6554	28.32	-6.20	22.12	46.00	-23.88	105	100	peak

802.11n-HT40			
Test Channel	5755MHz(worst case)	Polarity:	Horizontal



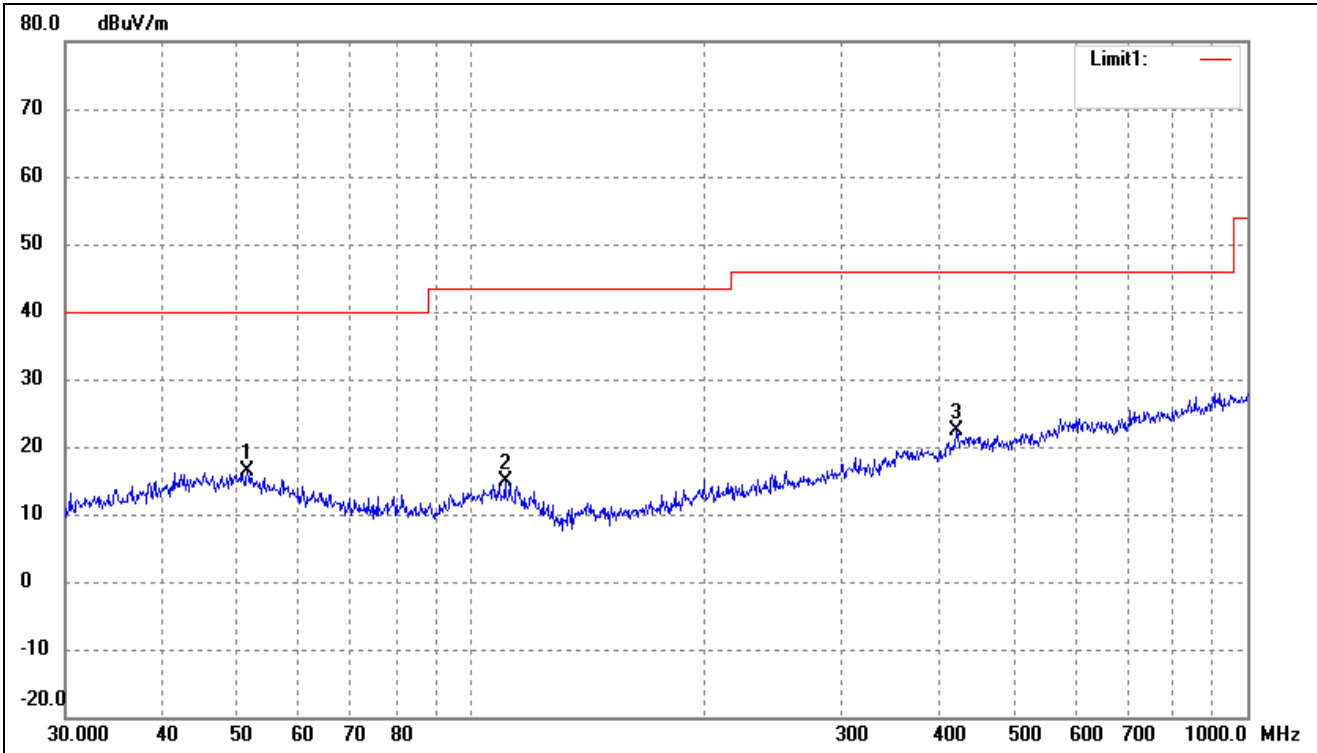
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	47.6586	27.81	-11.15	16.66	40.00	-23.34	347	100	peak
2	110.5687	30.53	-13.08	17.45	43.50	-26.05	70	100	peak
3	428.0193	27.74	-6.19	21.55	46.00	-24.45	103	100	peak

802.11n-HT40			
Test Channel	5755MHz(worst case)	Polarity:	Vertical



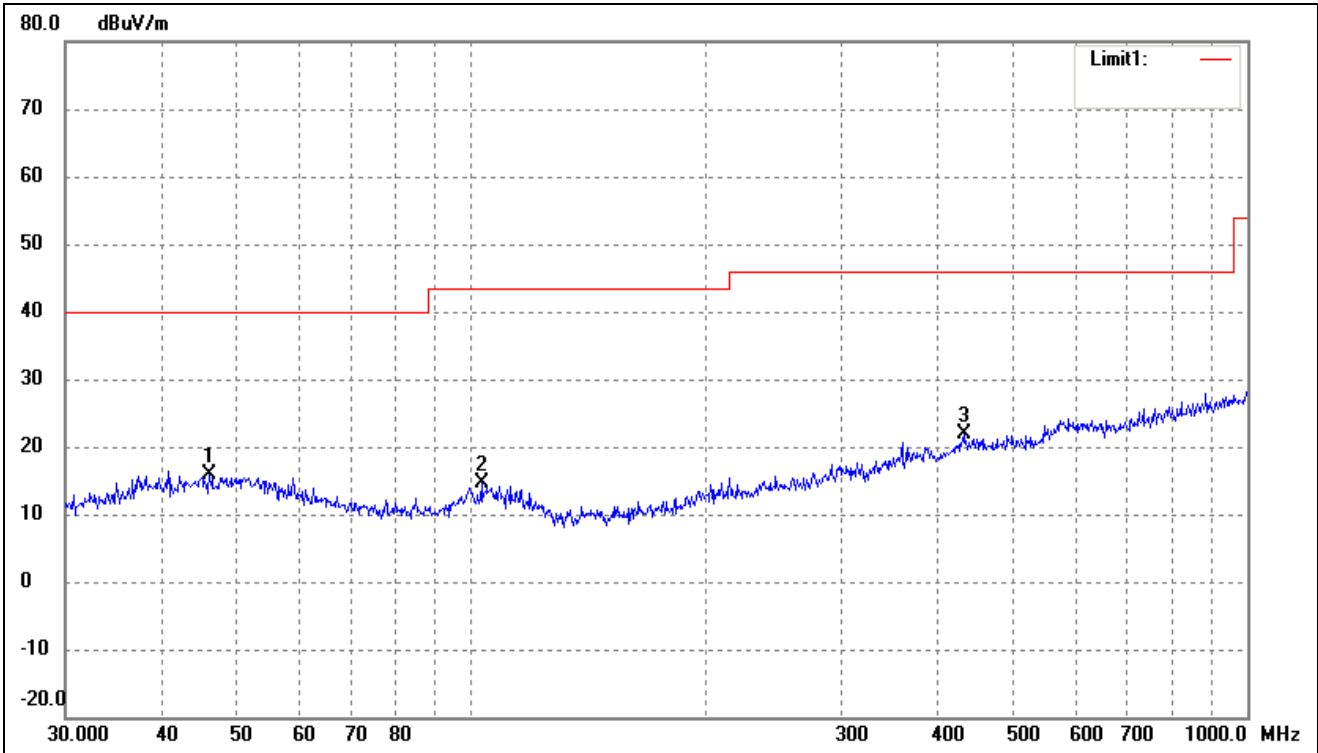
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.8430	28.15	-11.42	16.73	40.00	-23.27	339	100	peak
2	106.7587	28.42	-13.07	15.35	43.50	-28.15	137	100	peak
3	374.6226	27.79	-7.58	20.21	46.00	-25.79	95	100	peak

802.11ac-HT80			
Test Channel	5775MHz(worst case)	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.4807	27.63	-11.33	16.30	40.00	-23.70	319	100	peak
2	110.5687	27.97	-13.08	14.89	43.50	-28.61	97	100	peak
3	422.0577	28.62	-6.29	22.33	46.00	-23.67	95	100	peak

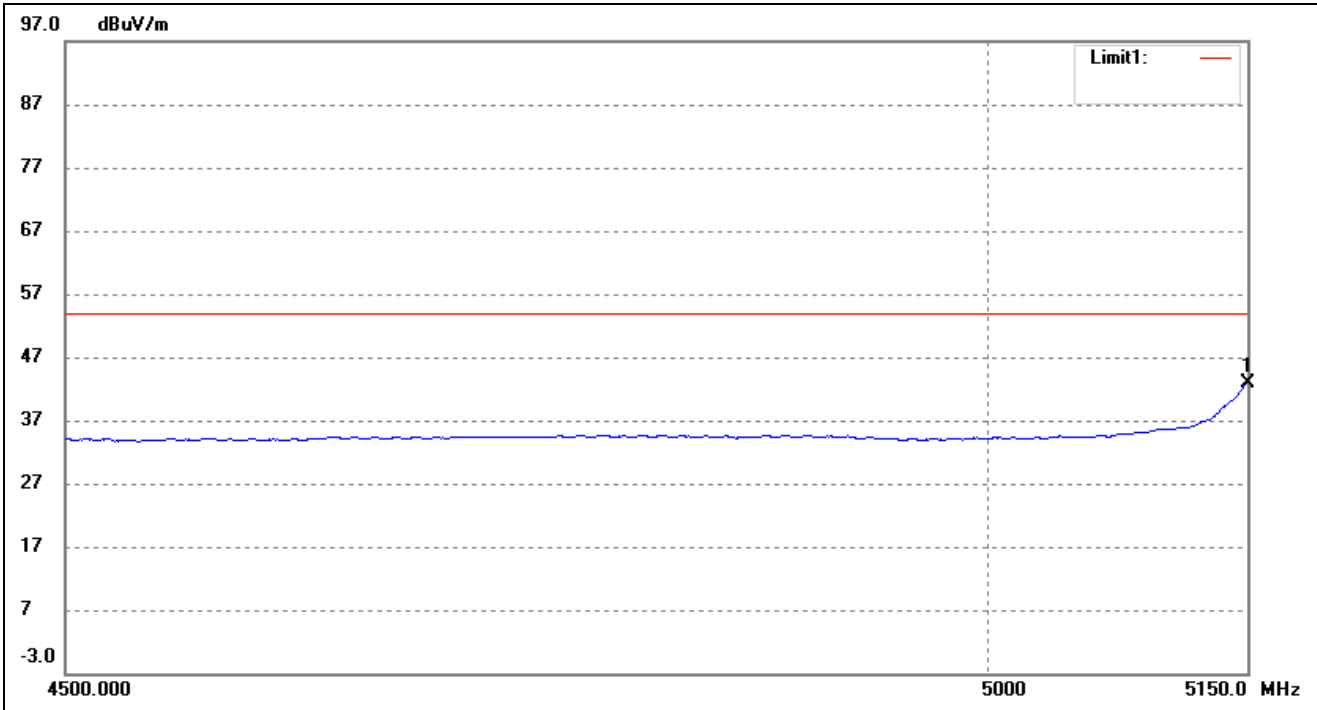
802.11ac-HT80			
Test Channel	5775MHz(worst case)	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.0164	27.04	-11.27	15.77	40.00	-24.23	224	100	peak
2	103.0800	27.83	-13.13	14.70	43.50	-28.80	99	100	peak
3	431.0316	28.12	-6.19	21.93	46.00	-24.07	128	100	peak

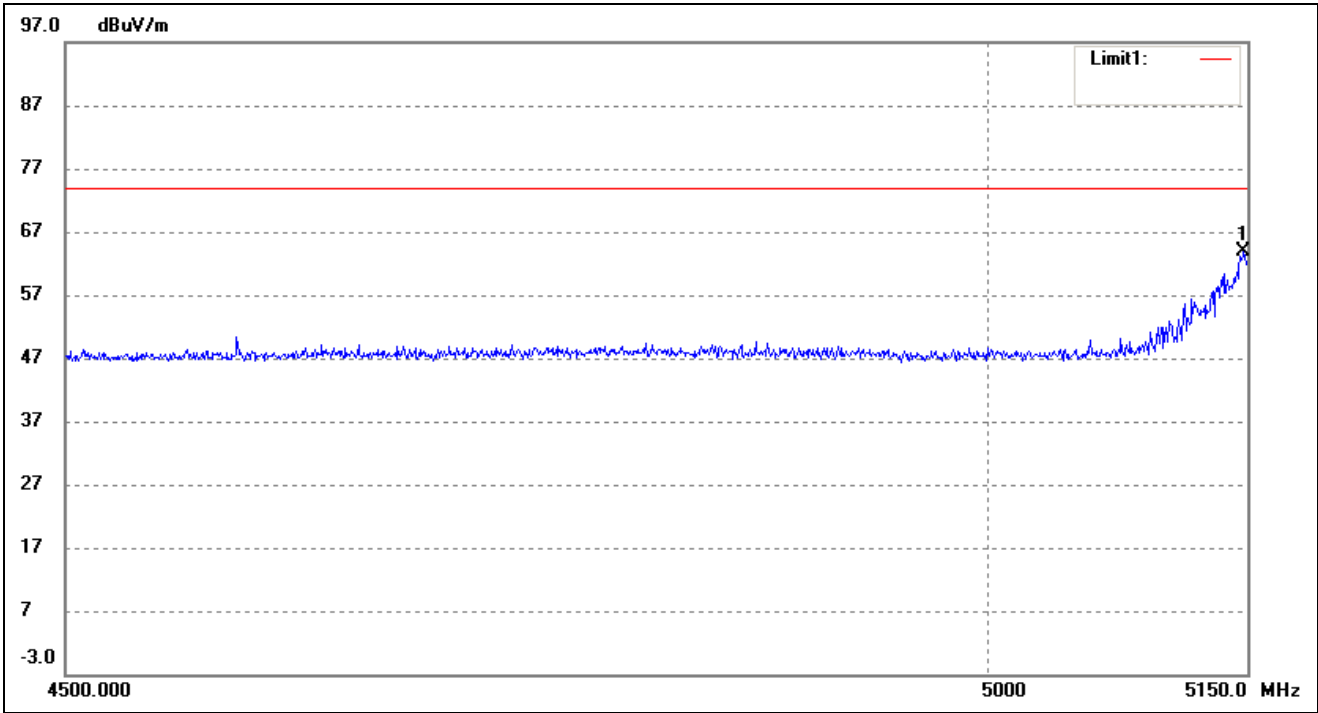
➤ Spurious Emission above 1GHz

802.11a- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



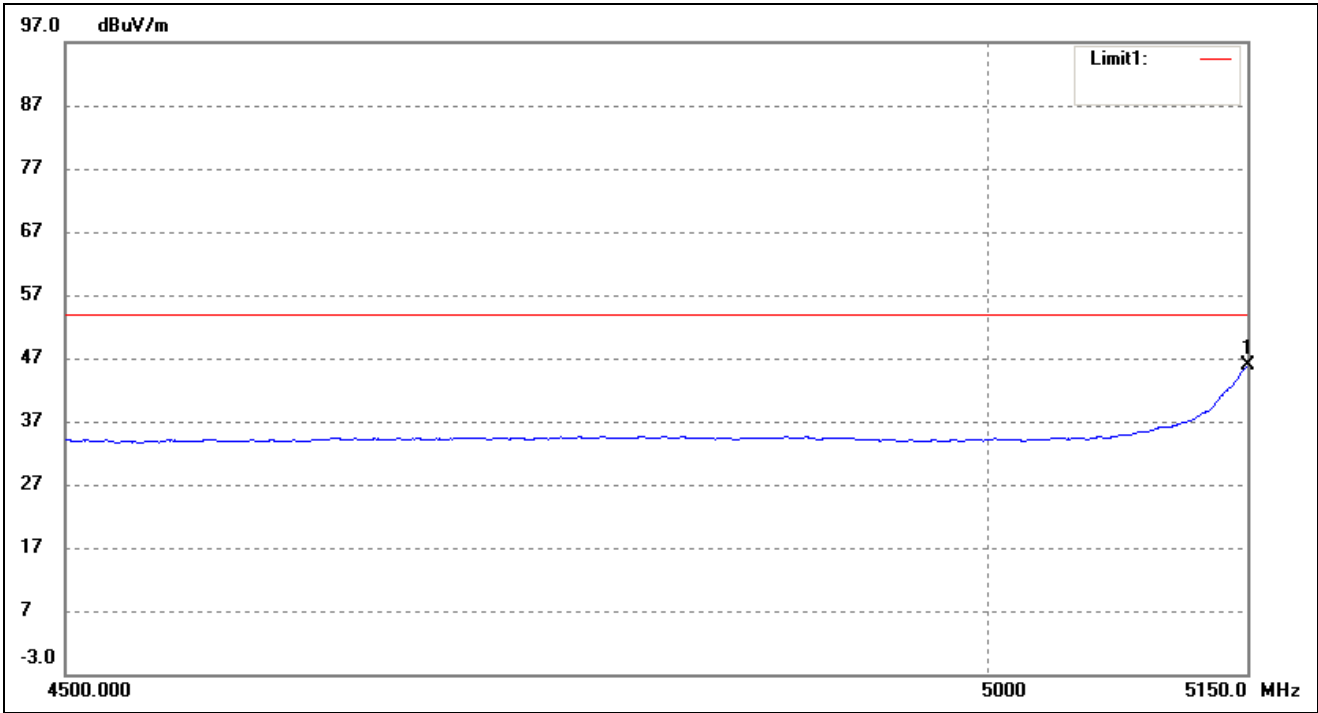
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	47.26	-4.32	42.94	54.00	-11.06	314	100	AVG

802.11a- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



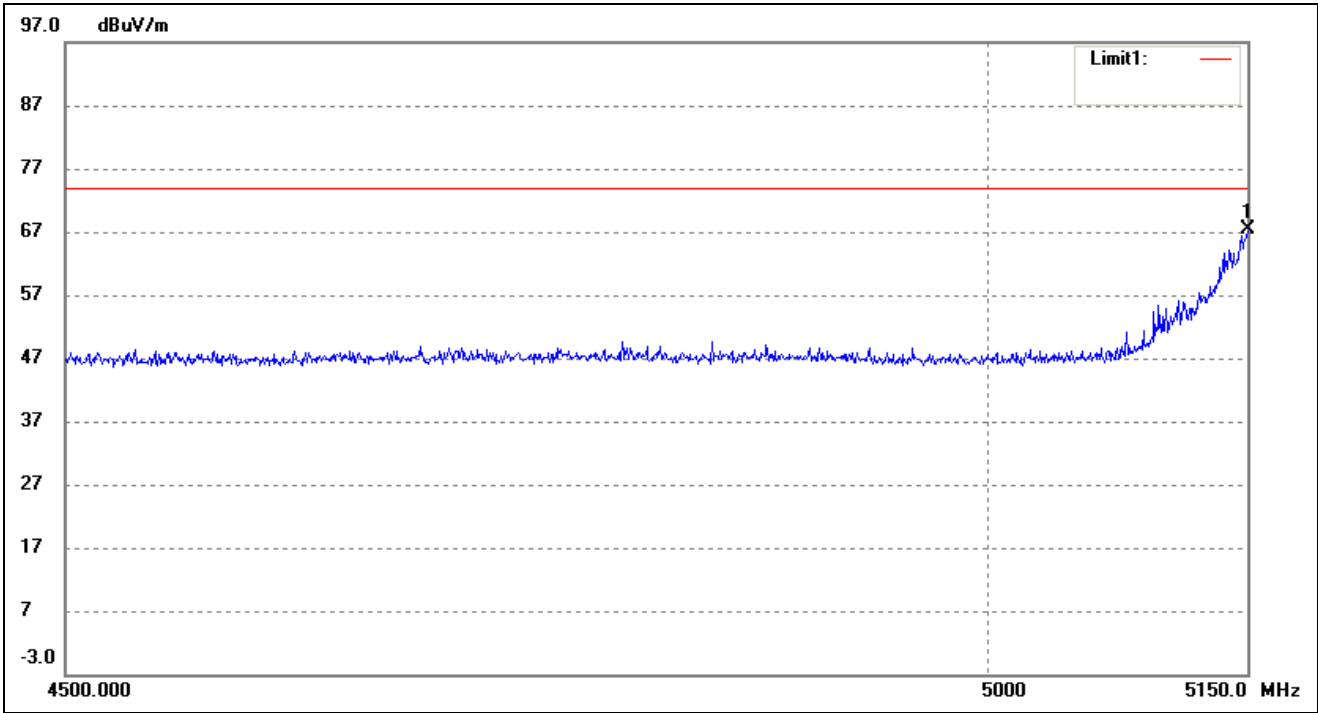
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5147.916	68.20	-4.32	63.88	74.00	-10.12	288	100	peak

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



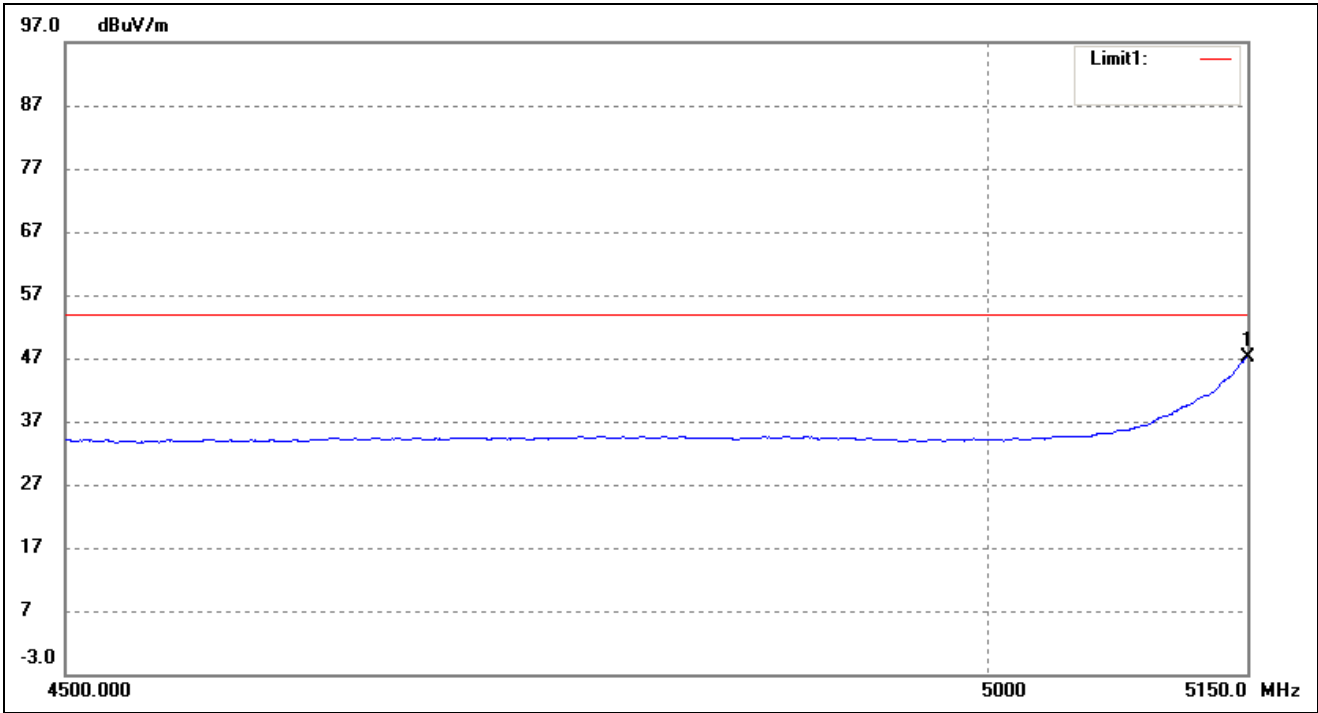
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	50.27	-4.32	45.95	54.00	-8.05	95	100	AVG

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



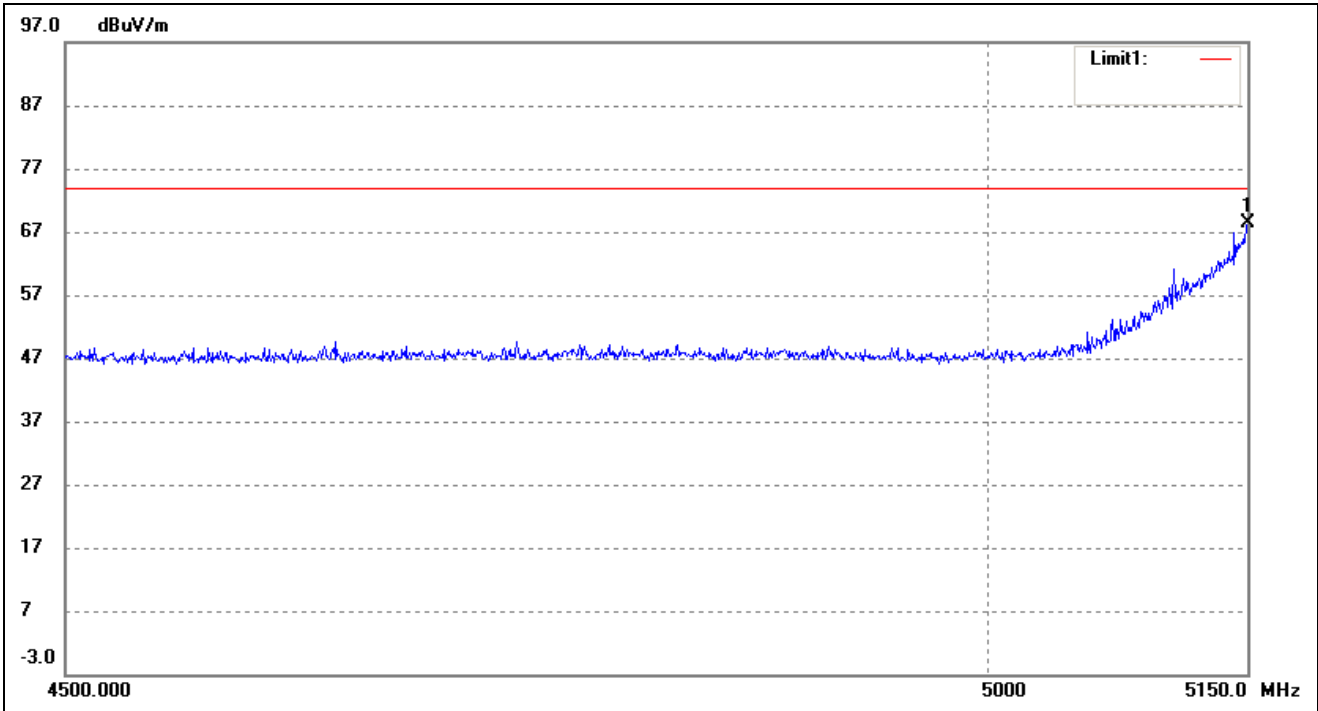
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	71.60	-4.32	67.28	74.00	-6.72	78	100	peak

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



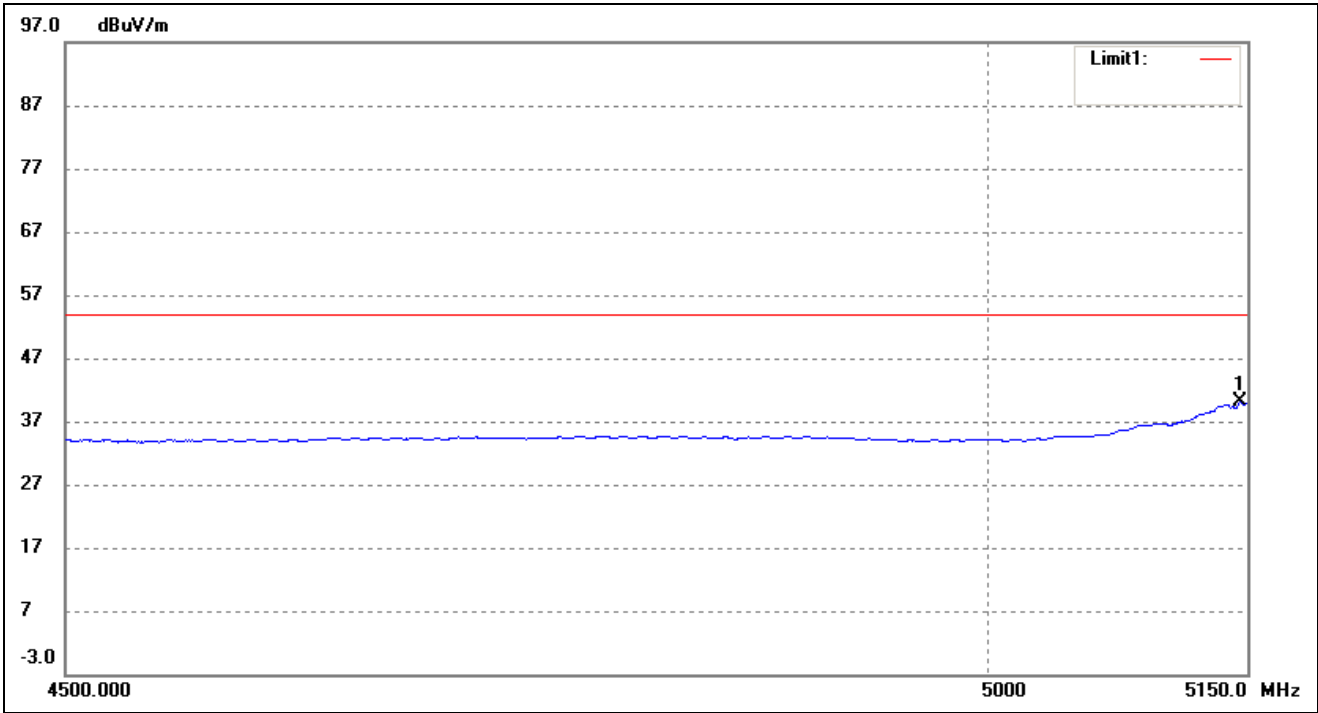
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	51.54	-4.32	47.22	54.00	-6.78	268	100	AVG

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



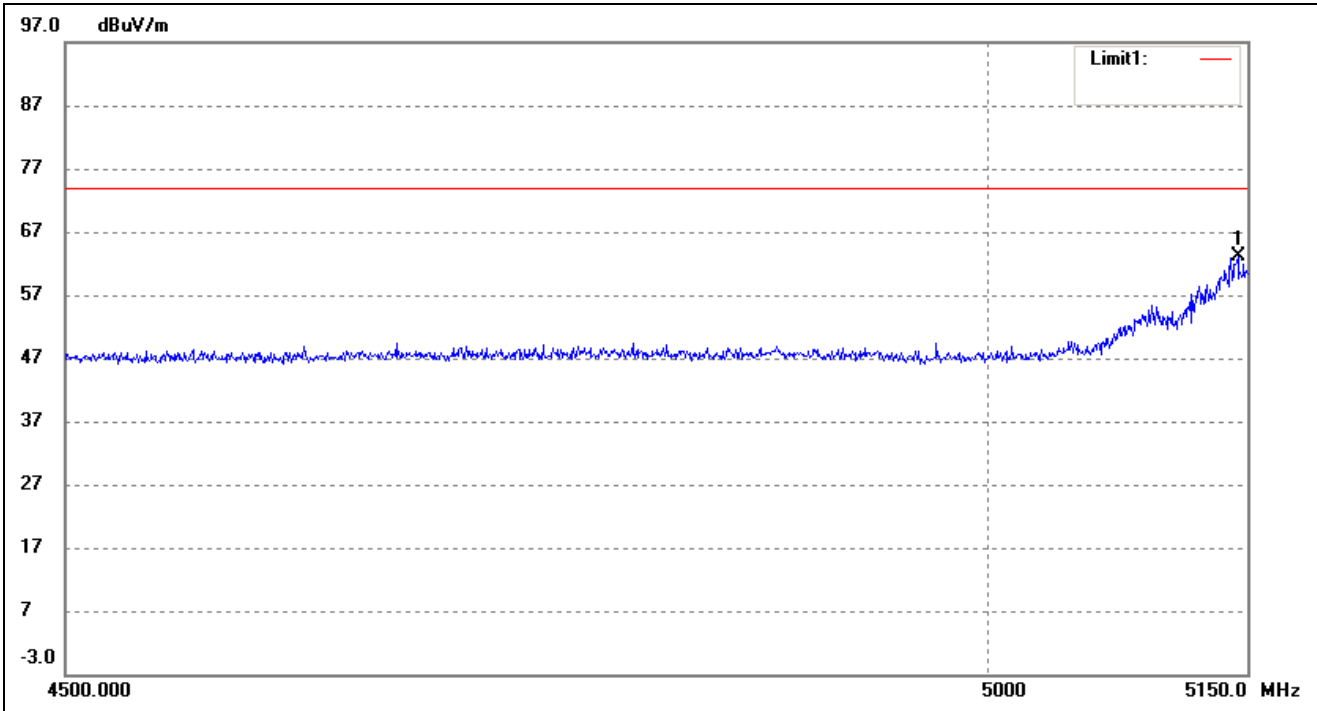
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	72.80	-4.32	68.48	74.00	-5.52	290	100	peak

802.11ac-HT80- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



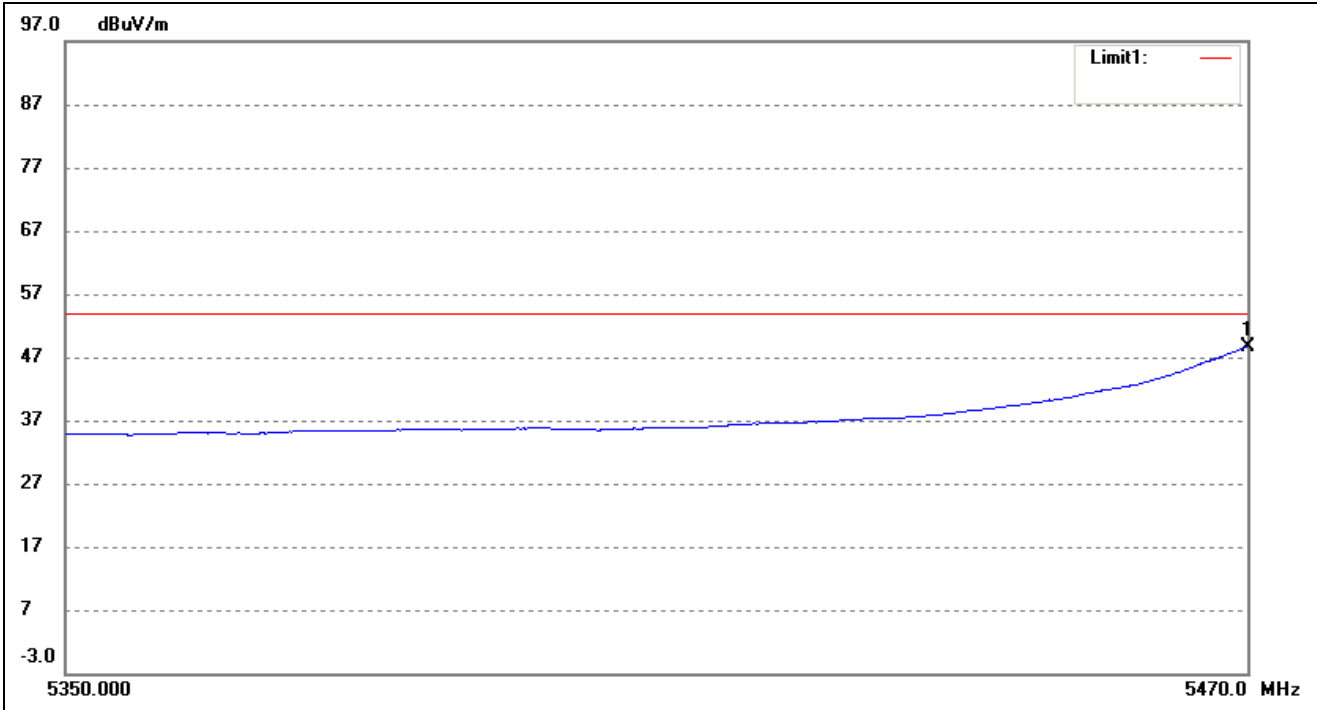
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5145.833	44.33	-4.32	40.01	54.00	-13.99	91	100	AVG

802.11ac-HT80- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



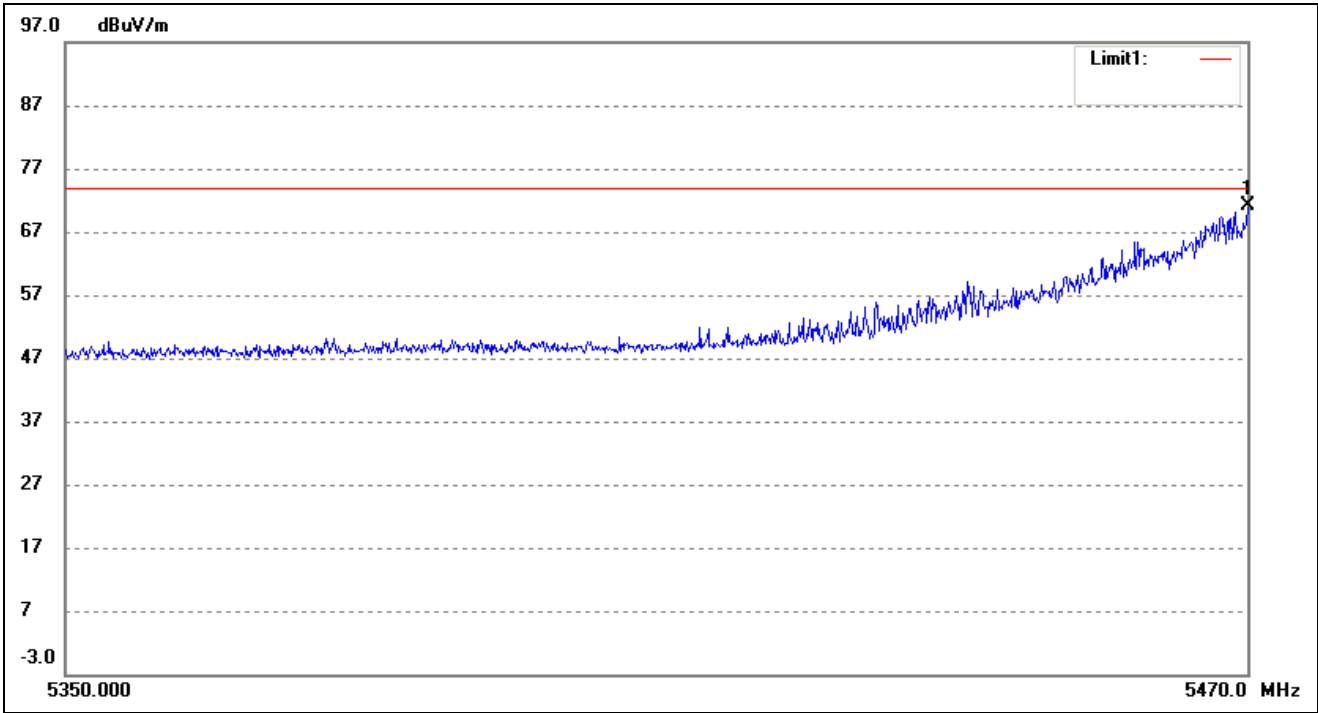
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5144.444	67.50	-4.32	63.18	74.00	-10.82	107	100	peak

802.11a- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Vertical(worst case)



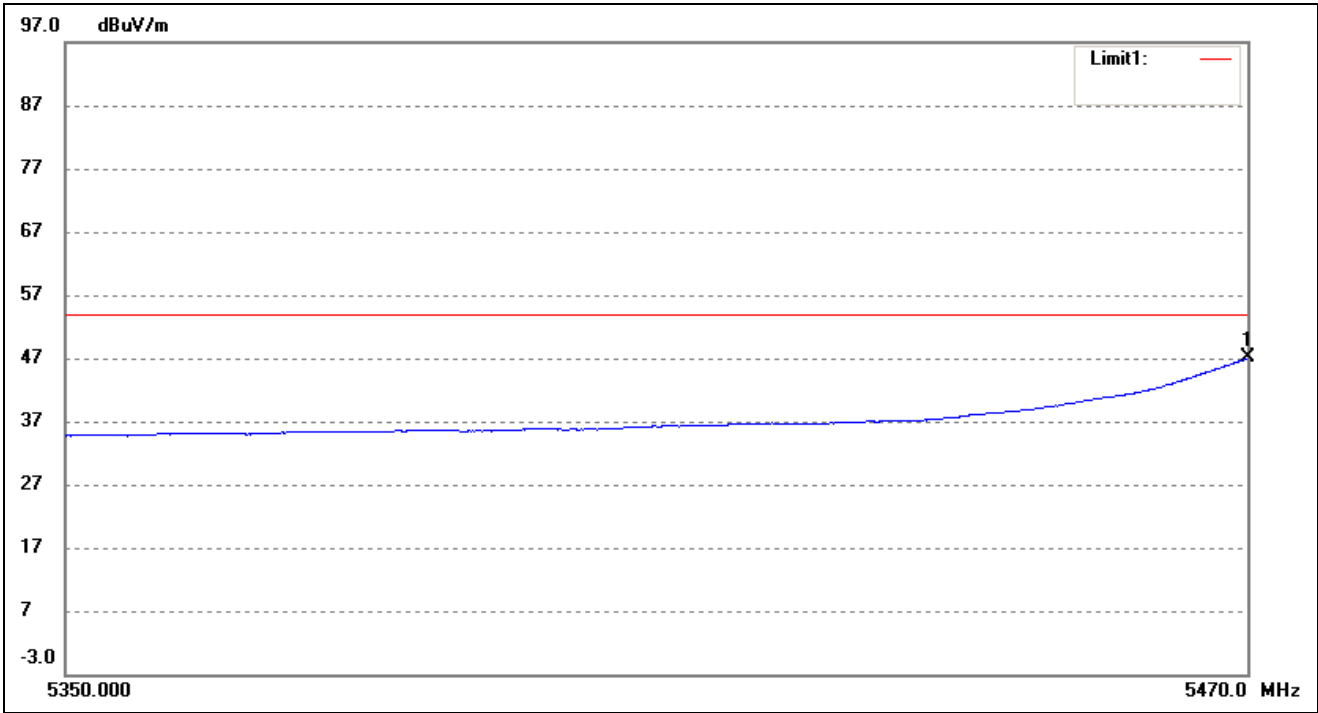
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5470.000	52.89	-4.16	48.73	54.00	-5.27	171	100	AVG

802.11a- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Vertical(worst case)



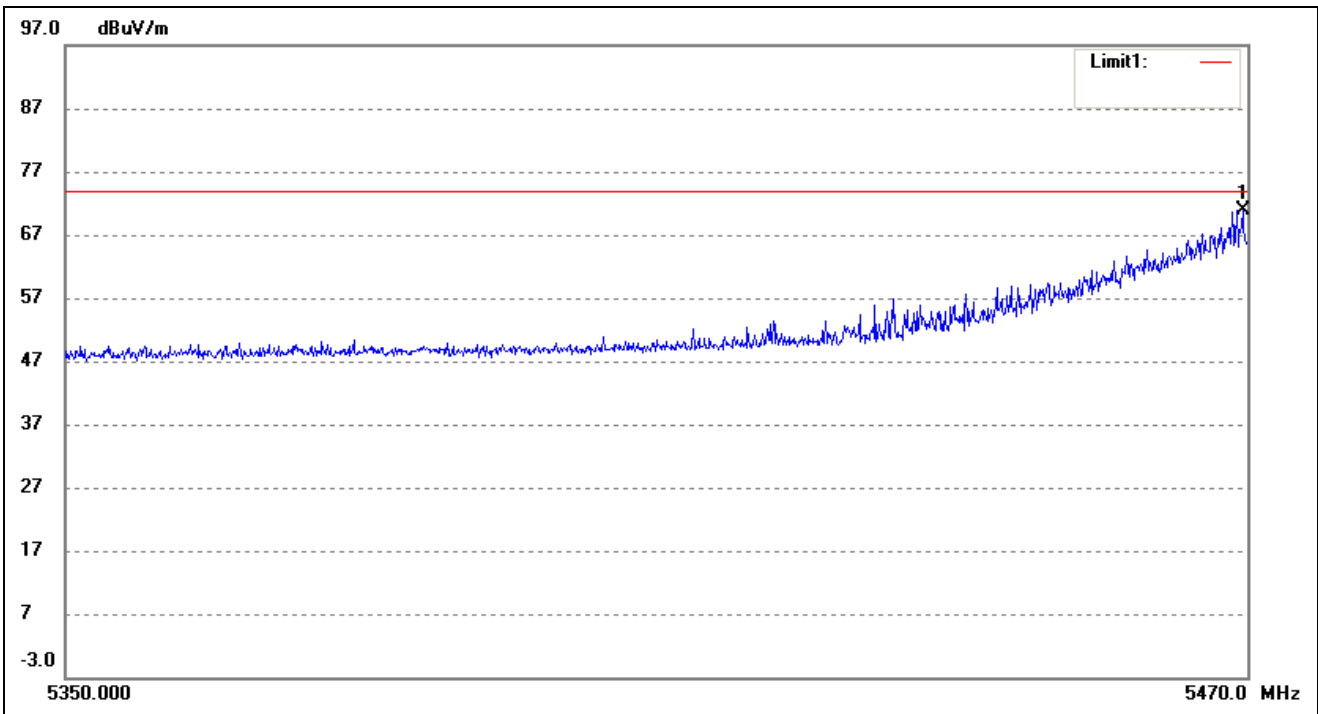
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5470.000	75.24	-4.16	71.08	74.00	-2.92	117	100	peak

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Vertical(worst case)



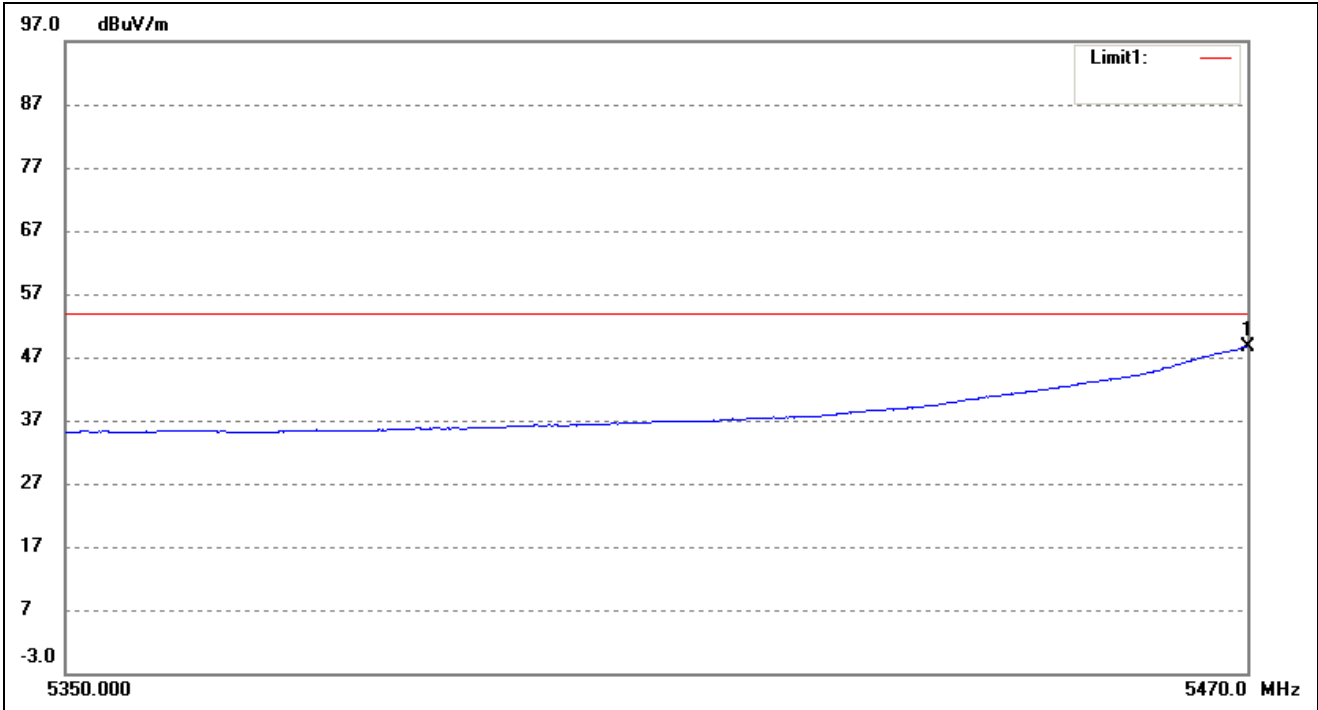
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5470.000	51.20	-4.16	47.04	54.00	-6.96	322	100	AVG

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Vertical(worst case)



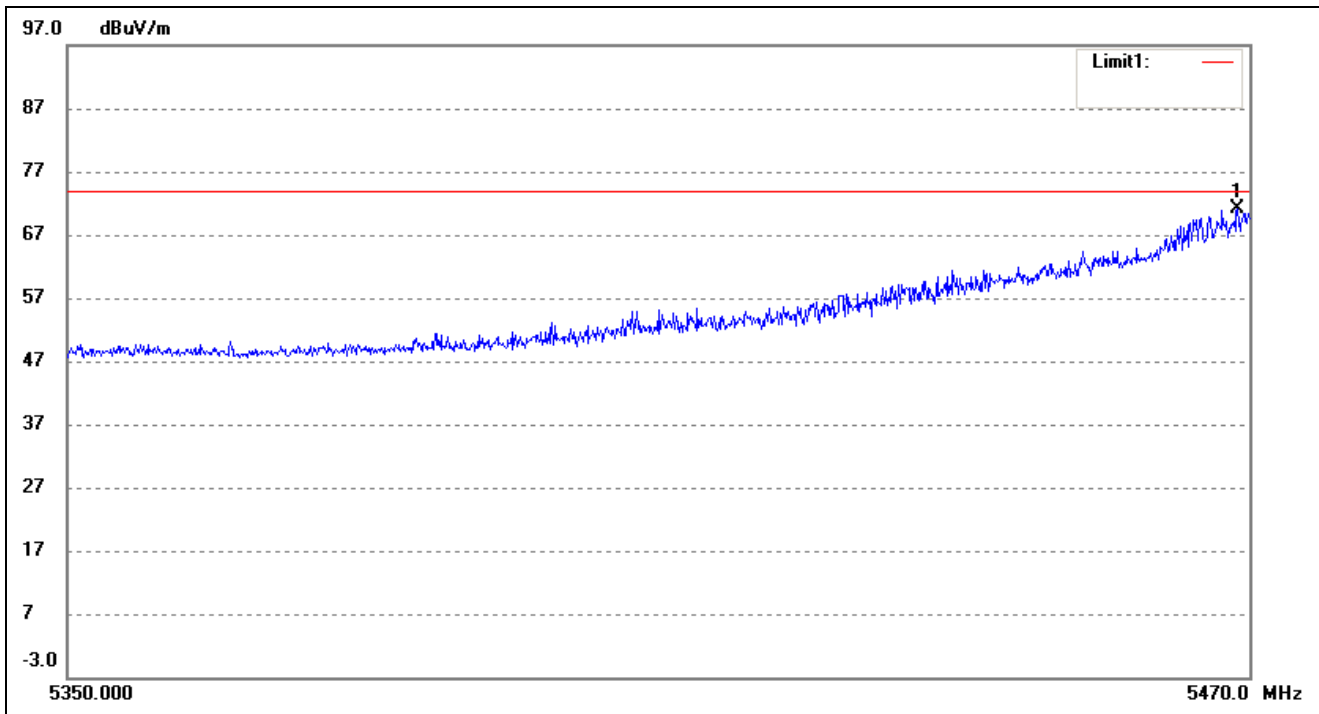
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5469.515	75.13	-4.16	70.97	74.00	-3.03	92	100	peak

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Vertical(worst case)



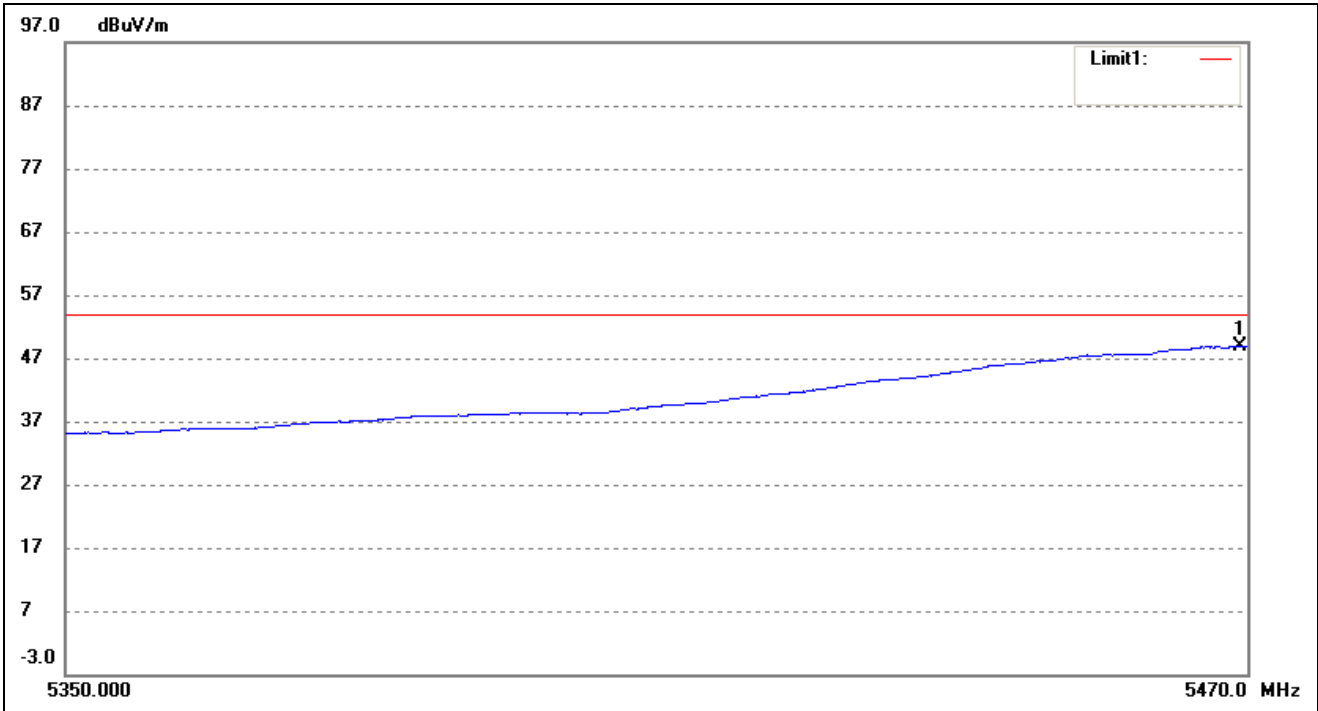
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5470.000	52.86	-4.16	48.70	54.00	-5.30	91	100	AVG

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Vertical(worst case)



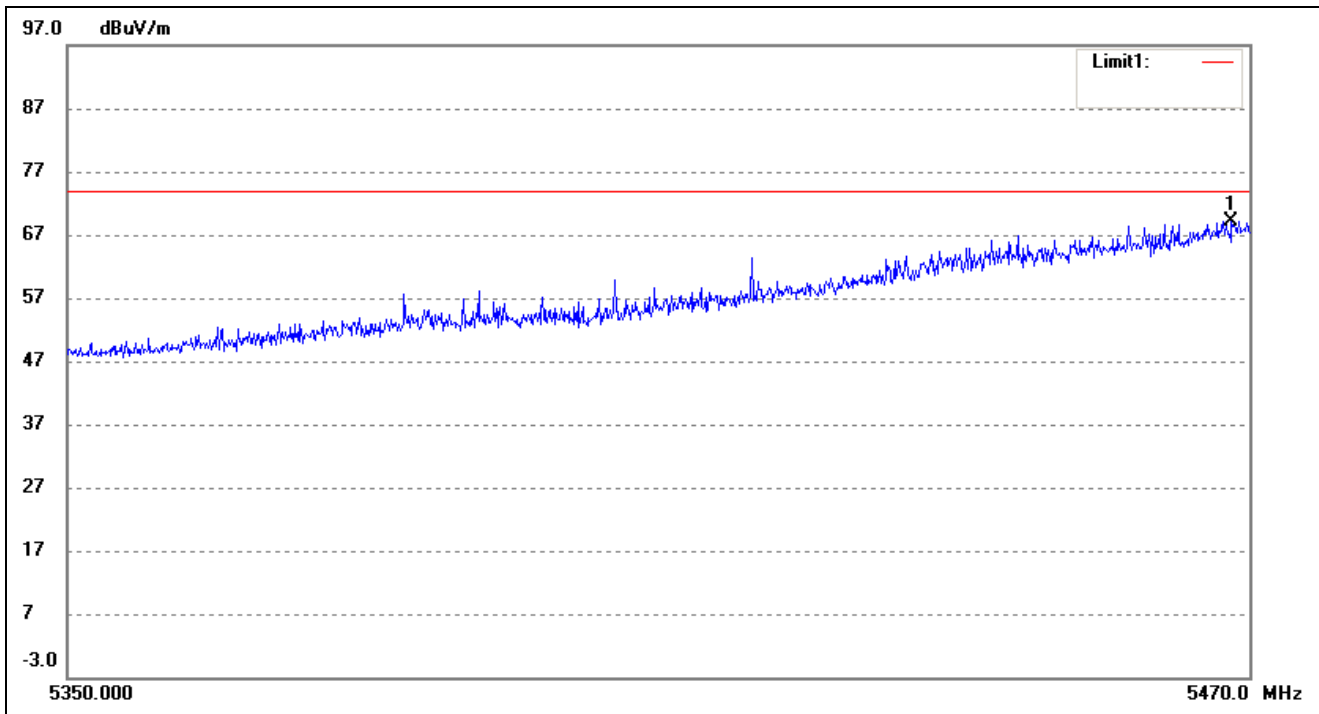
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5468.787	75.30	-4.16	71.14	74.00	-2.86	279	100	peak

802.11ac-HT80- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5469.272	53.03	-4.16	48.87	54.00	-5.13	314	100	AVG

802.11ac-HT80- Restricted Bandedge			
Test Channel	band 5.35-5.47GHz	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5468.180	73.38	-4.16	69.22	74.00	-4.78	98	100	peak

Note: The Restricted Bandedge was tested in Horizontal /Vertical and the worst case position data was reported.

- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11a)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5180MHz)							
10360	61.98	7.11	69.09	74	-4.91	H	PK
15540	38.9	8.22	47.12	54	-6.88	H	AV
10360	61.32	7.11	68.43	74	-5.57	V	PK
15540	39.6	8.22	47.82	54	-6.18	V	AV
Middle Channel (5200MHz)							
10400	58.44	7.22	65.66	74	-8.34	H	PK
15600	39.54	8.67	48.21	54	-5.79	H	AV
10400	60.5	7.22	67.72	74	-6.28	V	PK
15600	39.52	8.67	48.19	54	-5.81	V	AV
High Channel (5240MHz)							
10480	60.17	7.69	67.86	74	-6.14	H	PK
15720	39.01	8.93	47.94	54	-6.06	H	AV
10480	60.47	7.69	68.16	74	-5.84	V	PK
15720	38.54	8.93	47.47	54	-6.53	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5260MHz)							
10520	60.85	7.96	68.81	74	-5.19	H	PK
15780	38.52	9.02	47.54	54	-6.46	H	AV
10520	60.18	7.96	68.14	74	-5.86	V	PK
15780	38.38	9.02	47.4	54	-6.6	V	AV
Middle Channel (5280MHz)							
10560	59.3	8.02	67.32	74	-6.68	H	PK
15840	40.19	9.42	49.61	54	-4.39	H	AV
10560	61.85	8.02	69.87	74	-4.13	V	PK
15840	41.65	9.42	51.07	54	-2.93	V	AV
High Channel (5320MHz)							
10640	58.92	8.35	67.27	74	-6.73	H	PK
15960	39.87	9.63	49.5	54	-4.5	H	AV
10640	60.41	8.35	68.76	74	-5.24	V	PK
15960	38.19	9.63	47.82	54	-6.18	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5500MHz)							
11000	58.66	8.82	67.48	74	-6.52	H	PK
16500	40.39	9.88	50.27	54	-3.73	H	AV
11000	60.86	8.82	69.68	74	-4.32	V	PK
16500	38.33	9.88	48.21	54	-5.79	V	AV
Middle Channel (5600MHz)							
11200	60.17	8.92	69.09	74	-4.91	H	PK
16800	40.06	10.03	50.09	54	-3.91	H	AV
11200	61.95	8.92	70.87	74	-3.13	V	PK
16800	38.91	10.03	48.94	54	-5.06	V	AV
High Channel (5700MHz)							
11400	60.56	9.36	69.92	74	-4.08	H	PK
17100	41.19	10.25	51.44	54	-2.56	H	AV
11400	61.37	9.36	70.73	74	-3.27	V	PK
17100	40.34	10.25	50.59	54	-3.41	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5745MHz)							
11490	58.22	9.45	67.67	74	-6.33	H	PK
17235	38.56	10.36	48.92	54	-5.08	H	AV
11490	58.73	9.45	68.18	74	-5.82	V	PK
17235	40.83	10.36	51.19	54	-2.81	V	AV
Middle Channel (5785MHz)							
11570	58.43	9.62	68.05	74	-5.95	H	PK
17355	40.62	10.67	51.29	54	-2.71	H	AV
11570	58.66	9.62	68.28	74	-5.72	V	PK
17355	41.96	10.67	52.63	54	-1.37	V	AV
High Channel (5825MHz)							
11650	60.04	9.84	69.88	74	-4.12	H	PK
17475	38.03	10.95	48.98	54	-5.02	H	AV
11650	59.23	9.84	69.07	74	-4.93	V	PK
17475	38.31	10.95	49.26	54	-4.74	V	AV

➤ Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-36.69	-27
Highest	Above 5350	-42.17	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-36.98	-27
Highest	Above 5350	-35.47	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-37.13	-27
Highest	Above 5725	-35.67	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-36.98	-27
	5715 to 5725	-40.45	-17
Highest	5850 to 5860	-37.38	-17
	Above 5860	-41.14	-27

Note: the data just list the worst cases

- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11n HT20)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5180MHz)							
10360	59.24	7.11	66.35	74	-7.65	H	PK
15540	38.86	8.22	47.08	54	-6.92	H	AV
10360	59.87	7.11	66.98	74	-7.02	V	PK
15540	39.61	8.22	47.83	54	-6.17	V	AV
Middle Channel (5200MHz)							
10400	61.65	7.22	68.87	74	-5.13	H	PK
15600	39.28	8.67	47.95	54	-6.05	H	AV
10400	60.64	7.22	67.86	74	-6.14	V	PK
15600	41.22	8.67	49.89	54	-4.11	V	AV
High Channel (5240MHz)							
10480	60.23	7.69	67.92	74	-6.08	H	PK
15720	40.27	8.93	49.2	54	-4.8	H	AV
10480	59.28	7.69	66.97	74	-7.03	V	PK
15720	40.05	8.93	48.98	54	-5.02	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5260MHz)							
10520	61.96	7.96	69.92	74	-4.08	H	PK
15780	39.73	9.02	48.75	54	-5.25	H	AV
10520	59.96	7.96	67.92	74	-6.08	V	PK
15780	38.32	9.02	47.34	54	-6.66	V	AV
Middle Channel (5280MHz)							
10560	59.17	8.02	67.19	74	-6.81	H	PK
15840	39.72	9.42	49.14	54	-4.86	H	AV
10560	60.84	8.02	68.86	74	-5.14	V	PK
15840	38	9.42	47.42	54	-6.58	V	AV
High Channel (5320MHz)							
10640	59.01	8.35	67.36	74	-6.64	H	PK
15960	40.53	9.63	50.16	54	-3.84	H	AV
10640	59.49	8.35	67.84	74	-6.16	V	PK
15960	40.75	9.63	50.38	54	-3.62	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5500MHz)							
11000	58.31	8.82	67.13	74	-6.87	H	PK
16500	38.81	9.88	48.69	54	-5.31	H	AV
11000	58.81	8.82	67.63	74	-6.37	V	PK
16500	39.74	9.88	49.62	54	-4.38	V	AV
Middle Channel (5600MHz)							
11200	61.38	8.92	70.3	74	-3.7	H	PK
16800	41.59	10.03	51.62	54	-2.38	H	AV
11200	59.33	8.92	68.25	74	-5.75	V	PK
16800	39.18	10.03	49.21	54	-4.79	V	AV
High Channel (5700MHz)							
11400	58.48	9.36	67.84	74	-6.16	H	PK
17100	39.88	10.25	50.13	54	-3.87	H	AV
11400	59.82	9.36	69.18	74	-4.82	V	PK
17100	39.51	10.25	49.76	54	-4.24	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5745MHz)							
11490	61.01	9.45	70.46	74	-3.54	H	PK
17235	38.67	10.36	49.03	54	-4.97	H	AV
11490	60.55	9.45	70	74	-4	V	PK
17235	38.33	10.36	48.69	54	-5.31	V	AV
Middle Channel (5785MHz)							
11570	59.55	9.62	69.17	74	-4.83	H	PK
17355	38.28	10.67	48.95	54	-5.05	H	AV
11570	59.34	9.62	68.96	74	-5.04	V	PK
17355	40.97	10.67	51.64	54	-2.36	V	AV
High Channel (5825MHz)							
11650	61.75	9.84	71.59	74	-2.41	H	PK
17475	39.42	10.95	50.37	54	-3.63	H	AV
11650	60.85	9.84	70.69	74	-3.31	V	PK
17475	40.47	10.95	51.42	54	-2.58	V	AV

➤ Out of Band edge 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-37.52	-27
Highest	Above 5350	-36.19	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-39.50	-27
Highest	Above 5350	-36.12	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-37.31	-27
Highest	Above 5725	-34.58	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-43.64	-27
	5715 to 5725	-28.67	-17
Highest	5850 to 5860	-30.31	-17
	Above 5860	-41.93	-27

Note: the data just list the worst cases

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11n HT40)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5190MHz)							
10380	60.67	7.89	68.56	74	-5.44	H	PK
15570	41.64	8.56	50.2	54	-3.8	H	AV
10380	59.29	7.89	67.18	74	-6.82	V	PK
15570	38.95	8.56	47.51	54	-6.49	V	AV
High Channel (5230MHz)							
10460	61.37	7.97	69.34	74	-4.66	H	PK
15690	40.96	9.06	50.02	54	-3.98	H	AV
10460	61.54	7.97	69.51	74	-4.49	V	PK
15690	39.72	9.06	48.78	54	-5.22	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5270MHz)							
10540	61.89	8.16	70.05	74	-3.95	H	PK
15810	39.72	9.53	49.25	54	-4.75	H	AV
10540	61.26	8.16	69.42	74	-4.58	V	PK
15810	38.93	9.53	48.46	54	-5.54	V	AV
High Channel (5310MHz)							
10620	60.31	8.57	68.88	74	-5.12	H	PK
15930	41.48	9.74	51.22	54	-2.78	H	AV
10620	59.77	8.57	68.34	74	-5.66	V	PK
15930	39.2	9.74	48.94	54	-5.06	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5510MHz)							
11020	61.33	9.16	70.49	74	-3.51	H	PK
16530	40.74	10.25	50.99	54	-3.01	H	AV
11020	59.1	9.16	68.26	74	-5.74	V	PK
16530	39.14	10.25	49.39	54	-4.61	V	AV
Middle Channel (5590MHz)							
11180	61.72	9.08	70.8	74	-3.2	H	PK
16770	38.54	10.11	48.65	54	-5.35	H	AV
11180	58.91	9.08	67.99	74	-6.01	V	PK
16770	40.64	10.11	50.75	54	-3.25	V	AV
High Channel (5670MHz)							
11340	59.75	9.43	69.18	74	-4.82	H	PK
17010	38.28	10.39	48.67	54	-5.33	H	AV
11340	59.42	9.43	68.85	74	-5.15	V	PK
17010	38.05	10.39	48.44	54	-5.56	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5755MHz)							
11510	61.79	9.45	71.24	74	-2.76	H	PK
17265	39.73	10.62	50.35	54	-3.65	H	AV
11510	60.56	9.45	70.01	74	-3.99	V	PK
17265	39.02	10.62	49.64	54	-4.36	V	AV
High Channel (5795MHz)							
11590	61.06	9.27	70.33	74	-3.67	H	PK
17385	39.27	10.79	50.06	54	-3.94	H	AV
11590	59.26	9.27	68.53	74	-5.47	V	PK
17385	40.48	10.79	51.27	54	-2.73	V	AV

➤ Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-34.87	-27
Highest	Above 5350	-37.68	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-35.36	-27
Highest	Above 5350	-37.11	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-35.97	-27
Highest	Above 5725	-38.43	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-39.68	-27
	5715 to 5725	-37.61	-17
Highest	5850 to 5860	-41.14	-17
	Above 5860	-40.34	-27

Note: the data just list the worst cases

- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11ac VH80)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
5210MHz							
10420	58.57	7.36	65.93	74	-8.07	H	PK
15630	39.63	8.42	48.05	54	-5.95	H	AV
10420	61.05	7.36	68.41	74	-5.59	V	PK
15630	41.07	8.42	49.49	54	-4.51	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
5290MHz							
10580	60.92	8.6	69.52	74	-4.48	H	PK
15870	41.21	9.75	50.96	54	-3.04	H	AV
10580	60.86	8.6	69.46	74	-4.54	V	PK
15870	38.68	9.75	48.43	54	-5.57	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5530MHz)							
11060	60.66	9.46	70.12	74	-3.88	H	PK
16590	40.77	10.29	51.06	54	-2.94	H	AV
11060	60.72	9.46	70.18	74	-3.82	V	PK
16590	40.73	10.29	51.02	54	-2.98	V	AV
High Channel (5610MHz)							
11220	60.75	9.71	70.46	74	-3.54	H	PK
16830	39.86	10.83	50.69	54	-3.31	H	AV
11220	59.26	9.71	68.97	74	-5.03	V	PK
16830	41.72	10.83	52.55	54	-1.45	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
5775MHz							
11550	60.56	9.93	70.49	74	-3.51	H	PK
17325	41.96	10.96	52.92	54	-1.08	H	AV
11550	61.91	9.93	71.84	74	-2.16	V	PK
17325	41.55	10.96	52.51	54	-1.49	V	AV

➤ Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-34.87	-27
Highest	Above 5350	-35.74	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-41.08	-27
Highest	Above 5350	-39.47	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-40.19	-27
Highest	Above 5725	-37.25	-27

Note: the data just list the worst cases

➤ Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-37.65	-27
	5715 to 5725	-29.41	-17
Highest	5850 to 5860	-38.64	-17
	Above 5860	-30.12	-27

Note: the data just list the worst cases

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.

10. Frequency Stability

10.1 Standard Applicable

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

10.2 Test Procedure

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

10.3 Summary of Test Results/Plots

U-NII-1:5150-5250MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.85	-30	0.0250	0.0250
100%		-20	0.0250	0.0212
100%		-10	0.0250	0.0200
100%		0	0.0250	0.0254
100%		+10	0.0250	0.0342
100%		+20	0.0250	0.0269
100%		+30	0.0250	0.0315
100%		+40	0.0250	0.0304
100%		+50	0.0250	0.0229
Low Battery power		3.5	+20	0.0250
High Battery power	4.35	+20	0.0250	0.0246

U-NII-1: 5250-5350MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.85	-30	120	0.0228
100%		-20	168	0.0319
100%		-10	115	0.0219
100%		0	180	0.0342
100%		+10	120	0.0228
100%		+20	154	0.0293
100%		+30	163	0.0310
100%		+40	166	0.0316
100%		+50	152	0.0289
Low Battery power		3.5	+20	173
High Battery power	4.35	+20	145	0.0276

U-NII-1: 5470-5725MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.85	-30	146	0.0261
100%		-20	140	0.0250
100%		-10	165	0.0295
100%		0	178	0.0318
100%		+10	171	0.0305
100%		+20	102	0.0182
100%		+30	121	0.0216
100%		+40	114	0.0204
100%		+50	168	0.0300
Low Battery power		3.5	+20	103
High Battery power	4.35	+20	177	0.0316

U-NII-1:5725-5850MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.85	-30	167	0.0289
100%		-20	145	0.0251
100%		-10	137	0.0237
100%		0	132	0.0228
100%		+10	100	0.0173
100%		+20	116	0.0201
100%		+30	136	0.0235
100%		+40	100	0.0173
100%		+50	111	0.0192
Low Battery power		3.5	+20	125
High Battery power	4.35	+20	180	0.0311

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