

FCC Part 15E Measurement and Test Report

For

Shenzhen DOKE Electronic Co., Ltd

13th Floor, Weidonglong commercial building B, Meilong avenue, Longhua

New District, Shenzhen, China.

FCC ID: 2APMJBV9500

FCC Rule(s): FCC Part 15.407

Product Description: Smart phone

Tested Model: BV9500

Report No.: STR18078280I-3

Sample Receipt Date: 2018-07-25

Tested Date: 2018-07-26 to 2018-08-28

Issued Date: 2018-08-28

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.....	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 TEST STANDARDS.....	4
1.3 TEST METHODOLOGY	4
1.4 TABLE FOR PARAMETERS OF TEST SOFTWARE SETTING	4
1.5 EUT OPERATING DURING TEST	4
1.6 TEST FACILITY	5
1.7 EUT SETUP AND TEST MODE.....	5
1.8 MEASUREMENT UNCERTAINTY	6
1.9 TEST EQUIPMENT LIST AND DETAILS	7
2. SUMMARY OF TEST RESULTS	8
3. RF EXPOSURE	9
3.1 STANDARD APPLICABLE.....	9
3.2 TEST RESULT.....	9
4. ANTENNA REQUIREMENT	10
4.1 STANDARD APPLICABLE.....	10
4.2 EVALUATION INFORMATION	10
5. CONDUCTED EMISSIONS	11
5.1 TEST PROCEDURE.....	11
5.2 BASIC TEST SETUP BLOCK DIAGRAM.....	11
5.3 TEST RECEIVER SETUP	11
5.4 SUMMARY OF TEST RESULTS/PLOTS	11
6. POWER SPECTRAL DENSITY	14
6.1 STANDARD APPLICABLE.....	14
6.2 TEST PROCEDURE.....	14
6.3 SUMMARY OF TEST RESULTS/PLOTS	15
7. EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH.....	23
7.1 STANDARD APPLICABLE.....	23
7.2 TEST PROCEDURE.....	23
7.3 SUMMARY OF TEST RESULTS/PLOTS	25
8. MAXIMUM CONDUCTED OUTPUT POWER.....	32
8.1 STANDARD APPLICABLE.....	32
8.2 TEST PROCEDURE.....	32
8.3 SUMMARY OF TEST RESULTS/PLOTS	33
9. RADIATED SPURIOUS EMISSIONS.....	40
9.1 STANDARD APPLICABLE.....	40
9.2 TEST PROCEDURE.....	40
9.3 TEST RECEIVER SETUP	41
9.4 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	41
9.5 SUMMARY OF TEST RESULTS/PLOTS	41
10. FREQUENCY STABILITY	84
10.1 STANDARD APPLICABLE.....	84
10.2 TEST PROCEDURE.....	84
10.3 SUMMARY OF TEST RESULTS/PLOTS	84

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Shenzhen DOKE Electronic Co., Ltd
Address of applicant: 13th Floor, Weidonglong commercial building B, Meilong avenue, Longhua New District, Shenzhen, China.

Manufacturer: Shenzhen DOKE Electronic Co., Ltd
Address of manufacturer: 13th Floor, Weidonglong commercial building B, Meilong avenue, Longhua New District, Shenzhen, China.

General Description of EUT	
Product Name:	Smart phone
Brand Name:	Blackview
Model No.:	BV9500
Adding Model(s):	BV9500PRO
Rated Voltage:	DC 3.85V by Battery
Battery Capacity:	10000mAh
Adapter Model:	Model: HJ-FC018K7-US Input: AC100-240V 50/60Hz 0.6A; Output: DC5V 7V 9V 2A
Software Version:	BV_BV9500_V1.0_20180629
Hardware Version:	S32_V3.0
<i>The EUT Main board support GSM850/PCS1900, WCDMA Band 2/4/5, FDD LTE Band 2/4/5/7/12/13/17/25, TDD LTE Band 38/40/41 function. It is intended for speech, Multimedia Message Service (MMS) transmission. It is equipped with GPRS/EDGE class 12 for GSM850/PCS1900, GPS, FM, NFC, Bluetooth and Wi-Fi functions. For more information see the following datasheet.</i>	
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model BV9500, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n(HT20) , 802.11n-HT40
Frequency Range:	5150-5250MHz, 5725-5850MHz
RF Output Power:	11.54dBm (Conducted)
Type of Modulation:	QPSK, 16QAM, 64QAM
Data Rate:	6-54Mbps, up to 200Mbps
Quantity of Channels:	15
Type of Antenna:	Integral Antenna
Antenna Gain:	1.30dBi
Lowest Internal Frequency of EUT:	13.56MHz

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 “3646631+=” 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	8	8	8	/	/	/	/	/	/	/	12	12	12
802.11n-HT20 MCS0	8	8	8	/	/	/	/	/	/	/	12	12	12
Mode	NCB: 40MHz												
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795			
802.11n-HT40 MCS0	10	10	10	/	/	/	/	/	14	14			

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

FCC – Registration No.: 125990

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

Industry Canada (IC) Registration No.: 11464A

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

1.7 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, 5745MHz, 5785MHz,5825MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz,5745MHz, 5785MHz,5825MHz
TM3	802.11n-HT40	5190MHz,5230MHz,5755MHz,5795MHz
Note: All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report.		

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

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	1.0	Shielded	Without Core
Earphone	1.2	Unshielded	Without Core

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

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

1.8 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	2018-05-22	2019-05-21
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2018-05-22	2019-05-21
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2018-05-22	2019-05-21
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2018-05-22	2019-05-21
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2018-05-22	2019-05-21
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-08	2020-06-07
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-08	2020-06-07
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2017-06-08	2020-06-07
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2020-06-07
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2018-05-22	2019-05-21
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2018-05-22	2019-05-21
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2018-05-22	2019-05-21
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2017-08-15	2018-08-14
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2018-05-22	2019-05-21
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2018-05-22	2019-05-21
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2018-05-22	2019-05-21
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2018-05-22	2019-05-21
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2018-05-22	2019-05-21
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2018-05-22	2019-05-21
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2018-03-19	2019-03-18
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2018-03-19	2019-03-18
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2018-03-19	2019-03-18
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2018-03-19	2019-03-18
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2018-03-19	2019-03-18
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2018-03-19	2019-03-18

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 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)	Conducted Spurious 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)	N/A

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.

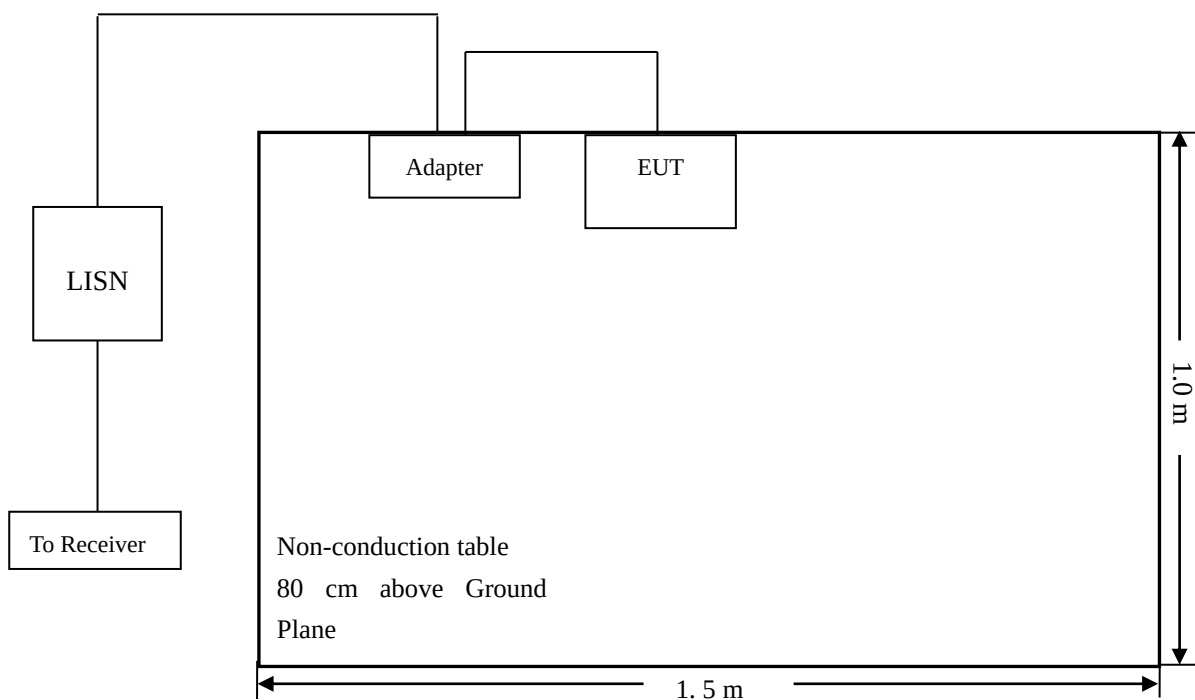
5. Conducted Emissions

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



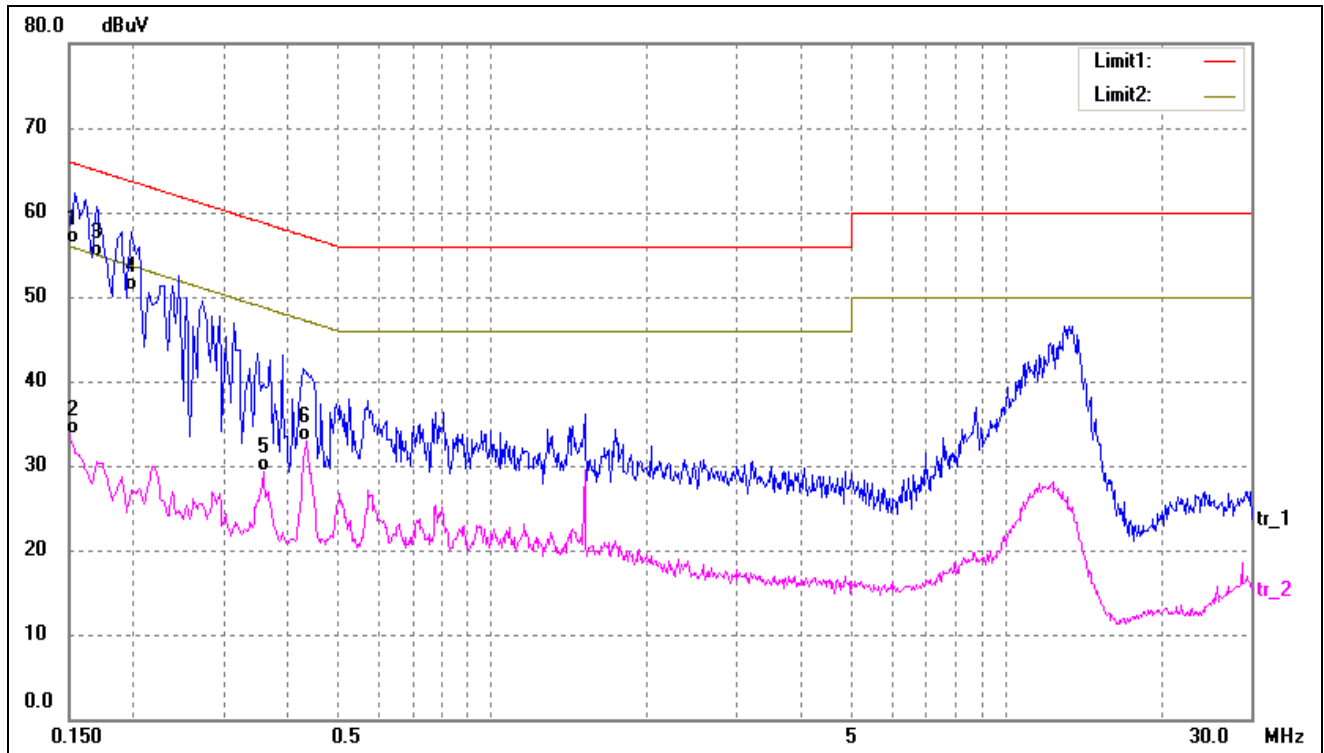
5.3 Test Receiver Setup

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

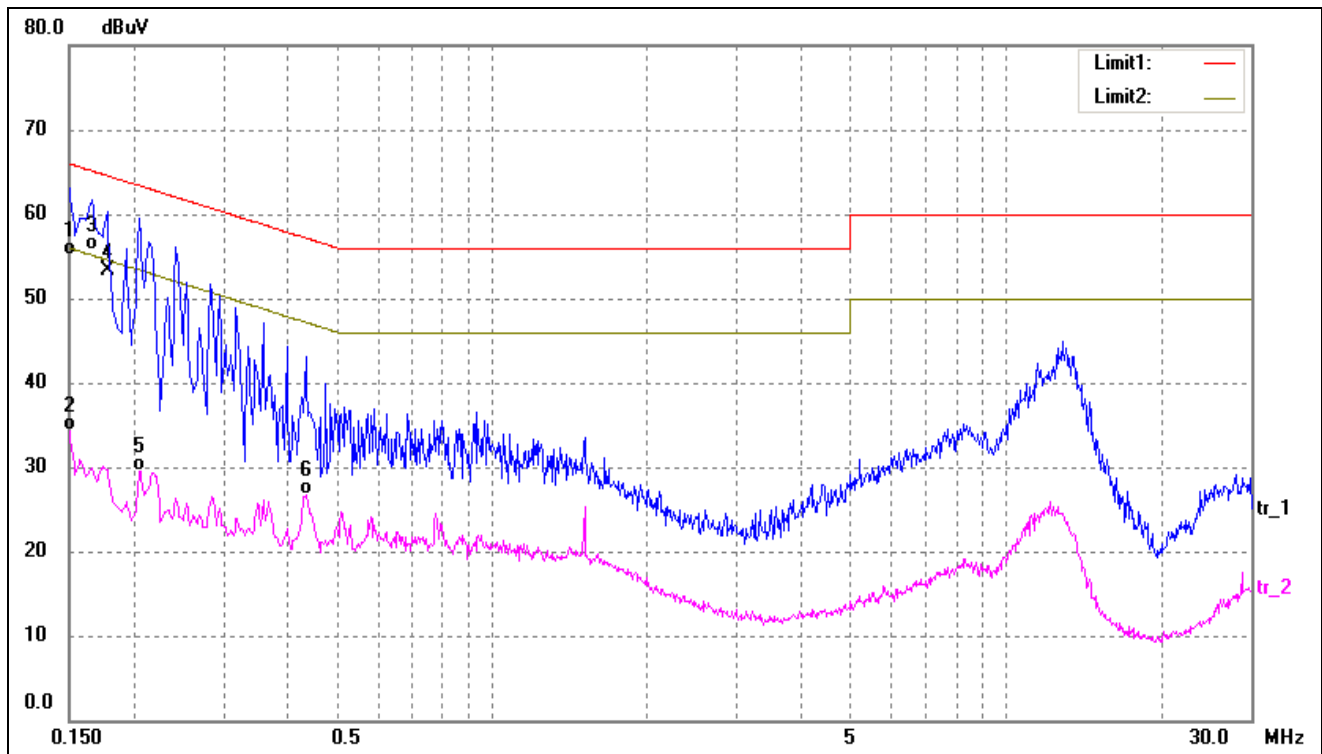
5.4 Summary of Test Results/Plots

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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1540	46.27	10.10	56.37	65.78	-9.41	QP
2	0.1540	23.60	10.10	33.70	55.78	-22.08	AVG
3	0.1700	44.65	10.11	54.76	64.96	-10.20	QP
4	0.1980	40.68	10.12	50.80	63.69	-12.89	QP
5	0.3580	19.10	10.23	29.33	48.77	-19.44	AVG
6	0.4340	22.64	10.26	32.90	47.18	-14.28	AVG

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	44.98	10.10	55.08	66.00	-10.92	QP
2	0.1500	24.22	10.10	34.32	56.00	-21.68	AVG
3*	0.1660	45.51	10.11	55.62	65.16	-9.54	QP
4	0.1780	43.27	10.11	53.38	64.58	-11.20	QP
5	0.2060	19.36	10.12	29.48	53.37	-23.89	AVG
6	0.4340	16.40	10.26	26.66	47.18	-20.52	AVG

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 ($< 1 \text{ MHz}$, or $< 500 \text{ kHz}$) 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 $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ kHz})$ 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 $10\log(1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ 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.

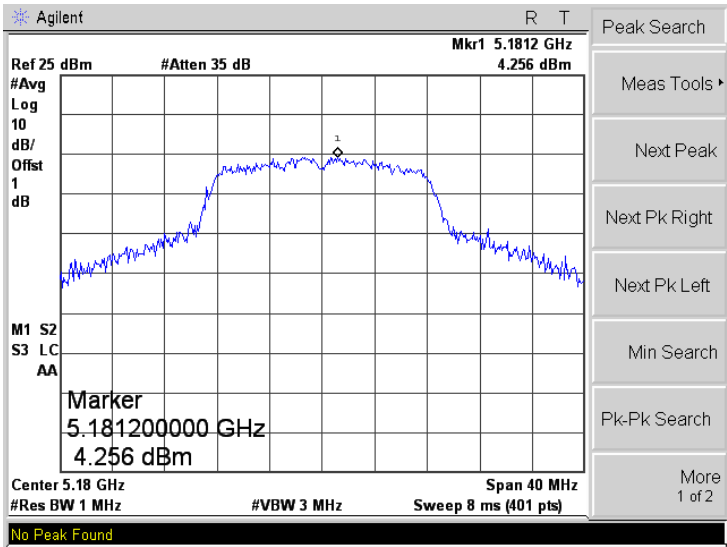
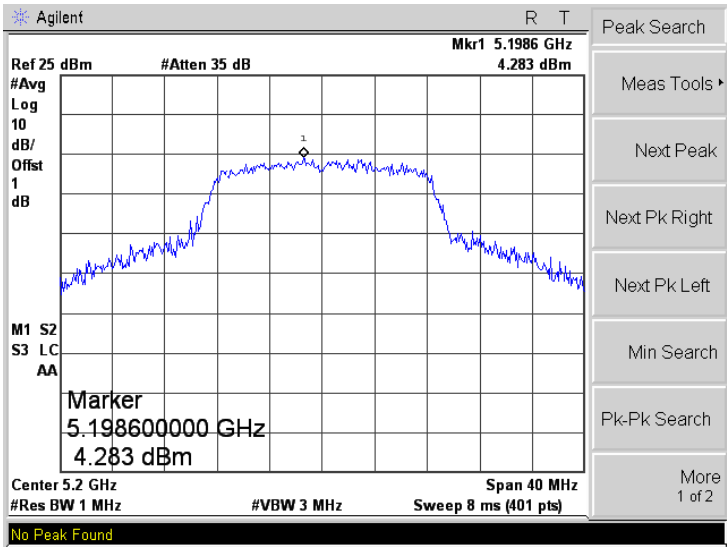
Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since $RBW=100 \text{ kHz}$ is available on nearly all spectrum analyzers.

6.3 Summary of Test Results/Plots

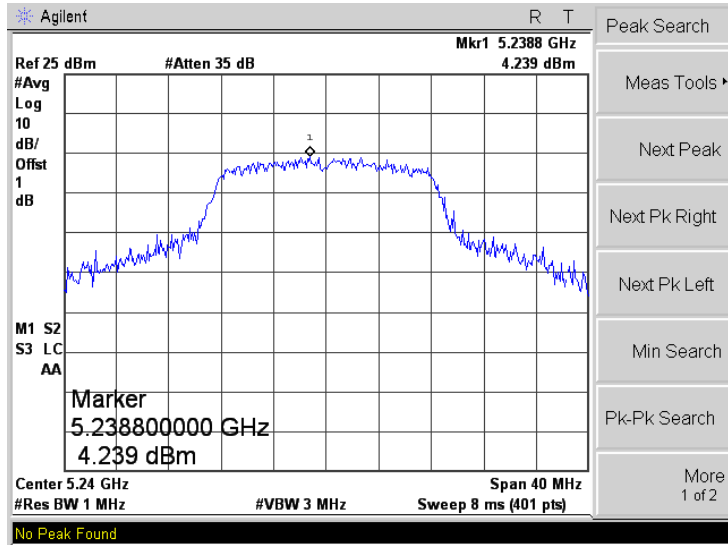
U-NII-1:5150-5250MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5180	4.256	11
	5200	4.283	11
	5240	4.239	11
802.11n-HT20	5180	3.940	11
	5200	3.870	11
	5240	3.752	11
802.11n-HT40	5190	1.181	11
	5230	0.980	11

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	3.148	2.22	5.368	30
	5785	3.766	2.22	5.986	30
	5825	3.734	2.22	5.954	30
802.11n-HT20	5745	2.597	2.22	4.817	30
	5785	2.852	2.22	5.072	30
	5825	3.572	2.22	5.792	30
802.11n HT40	5755	-0.683	2.22	1.537	30
	5795	-0.377	2.22	1.843	30
*Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)=2.22					

5150-5250MHz:

Mode:	802.11a
5180MHz	
5200MHz	

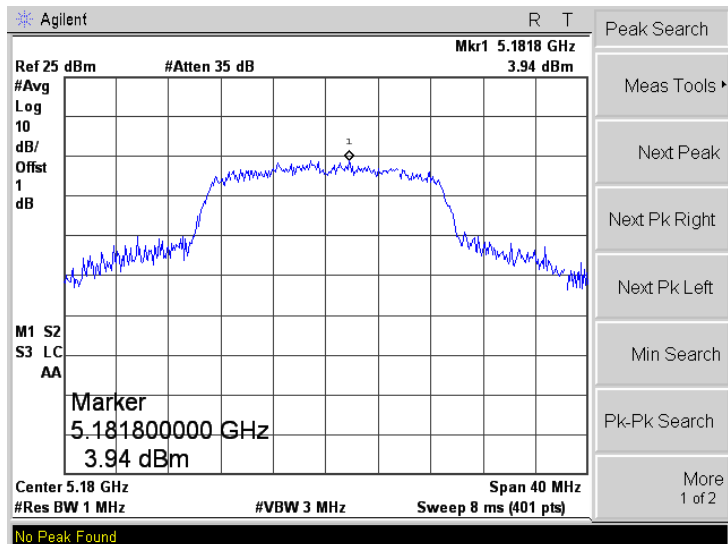
5240MHz



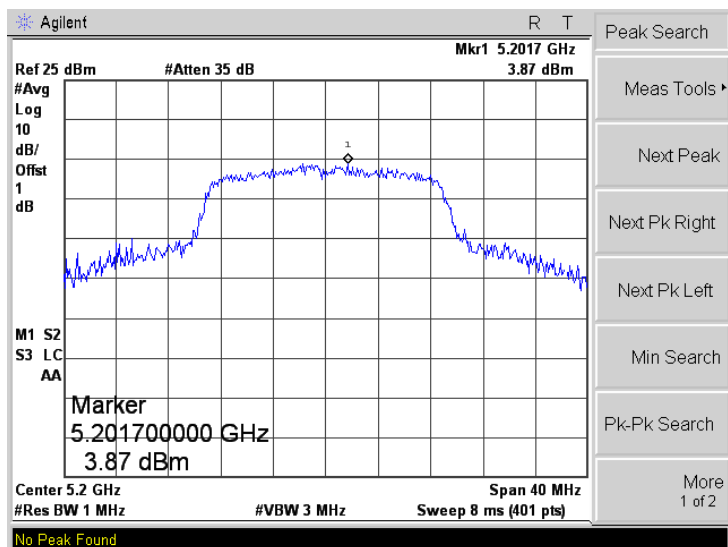
Mode:

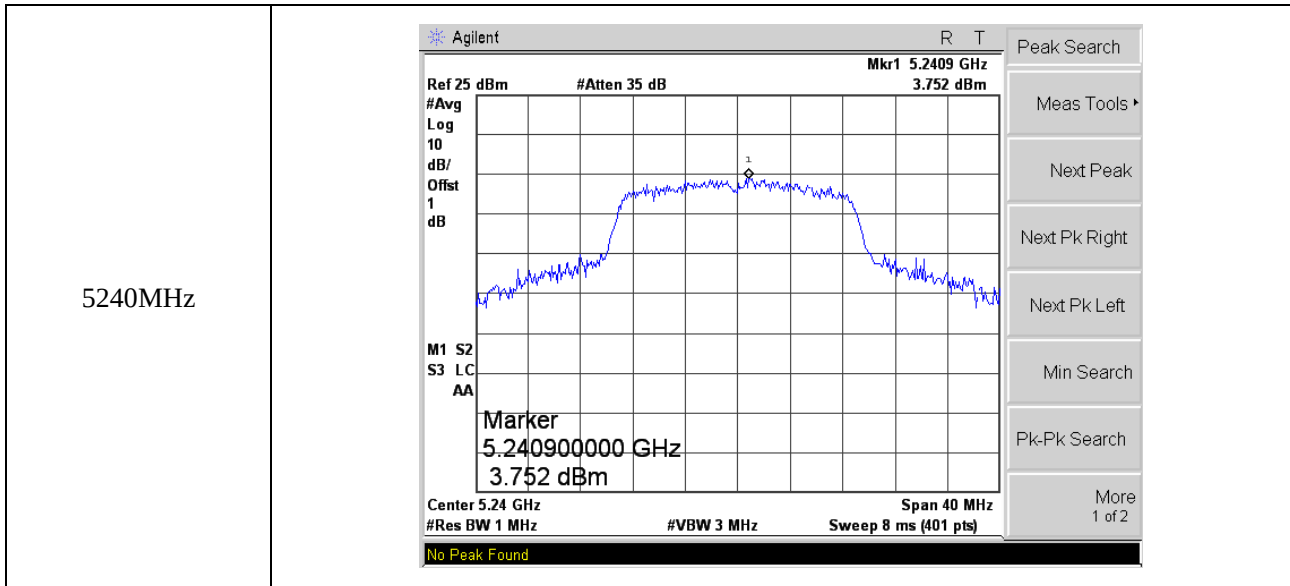
802.11n-HT20

5180MHz

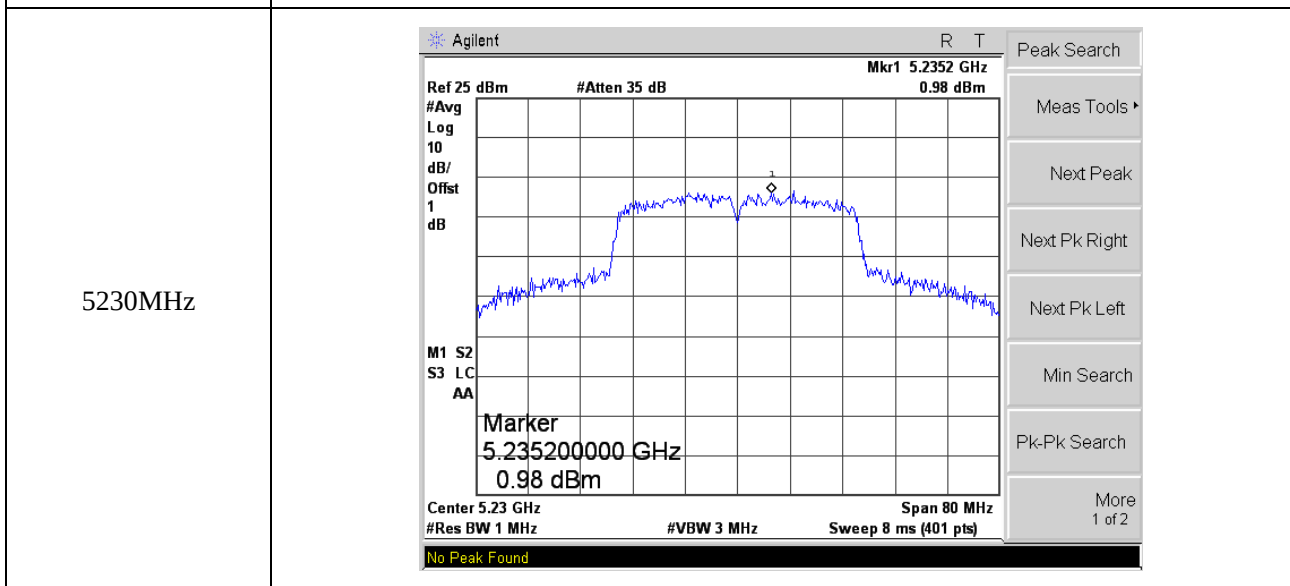
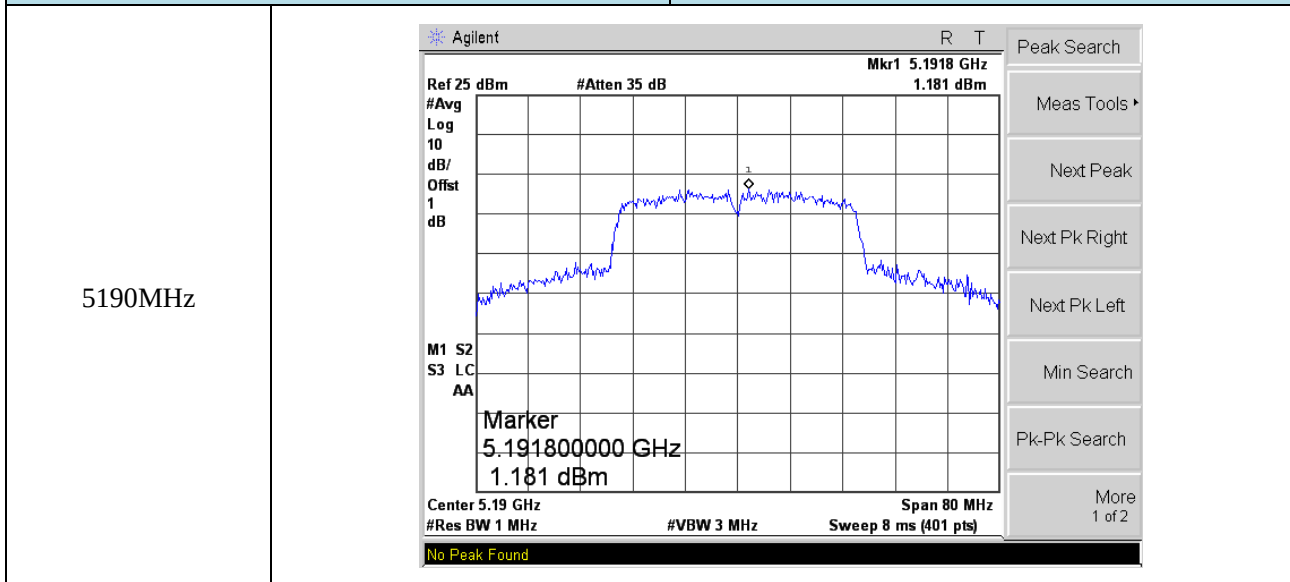


5200MHz

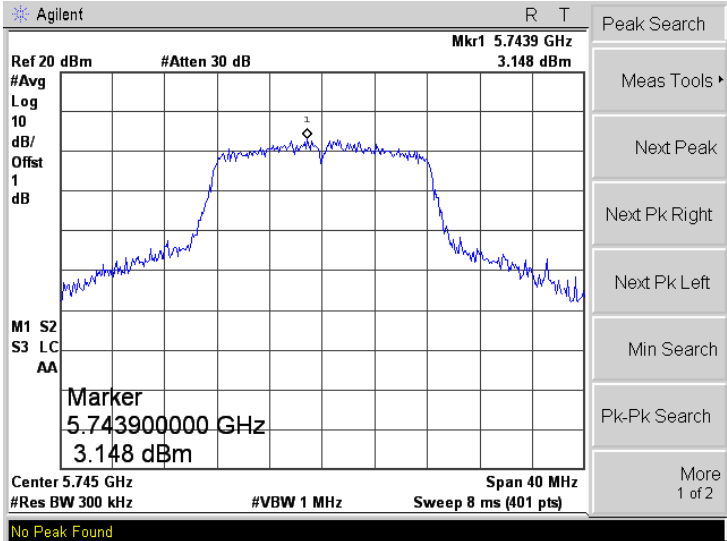
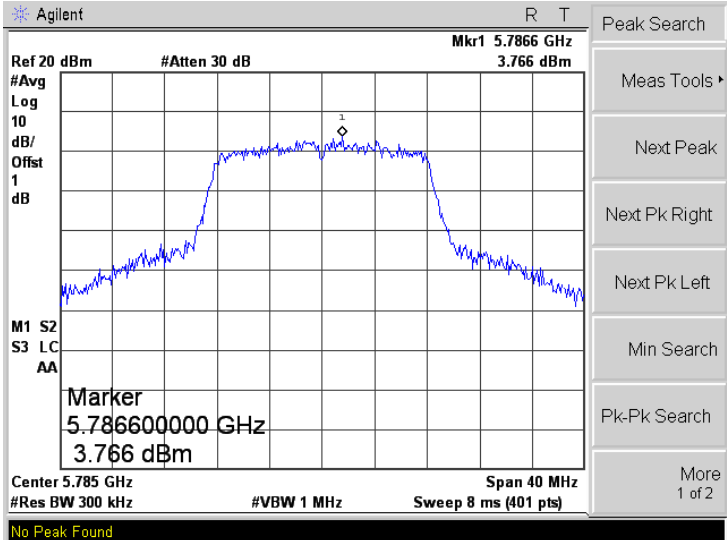
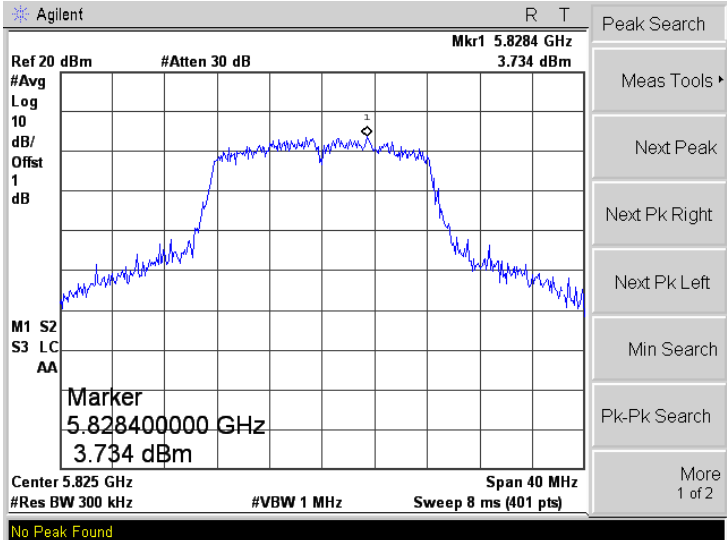


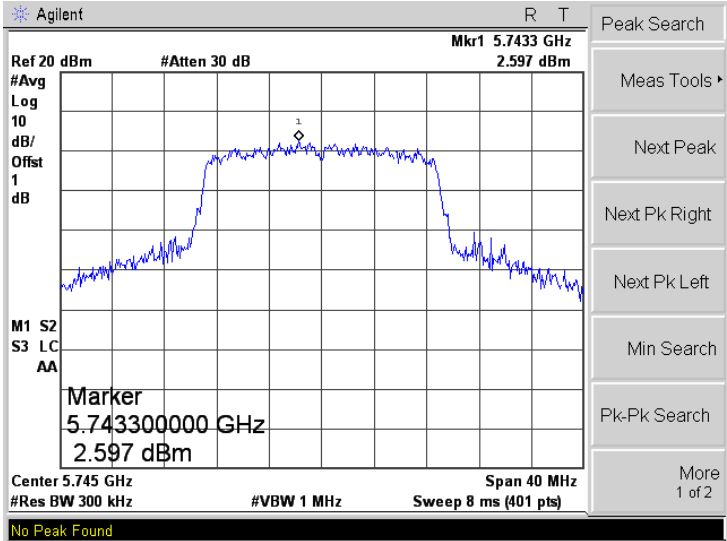
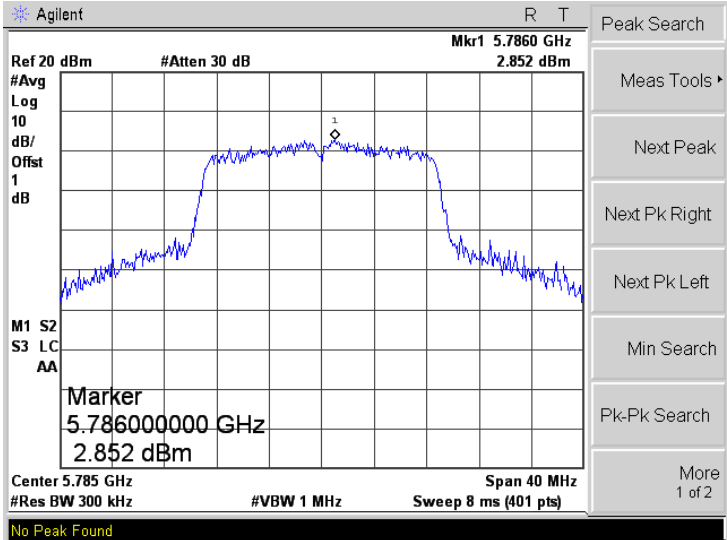
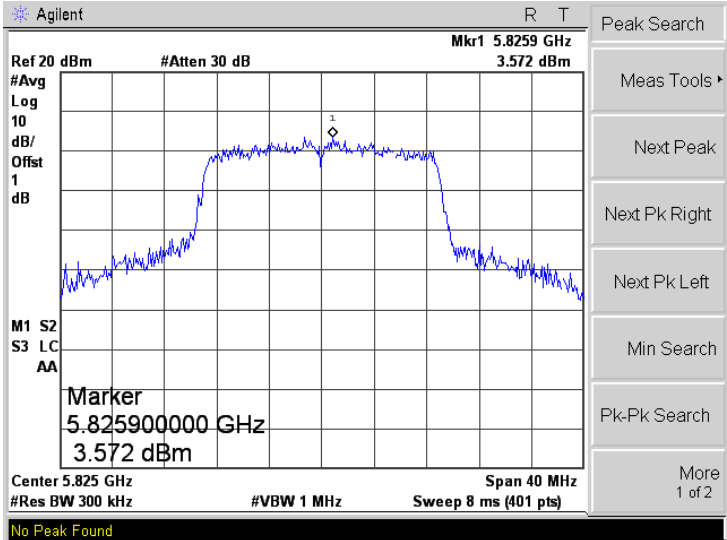


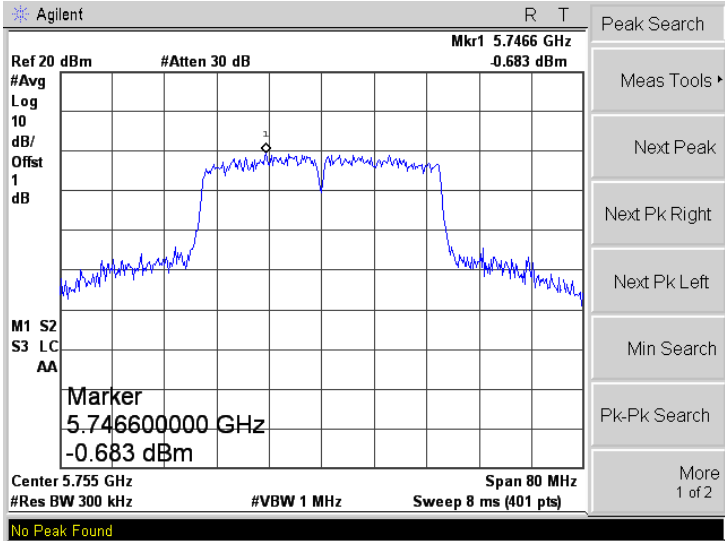
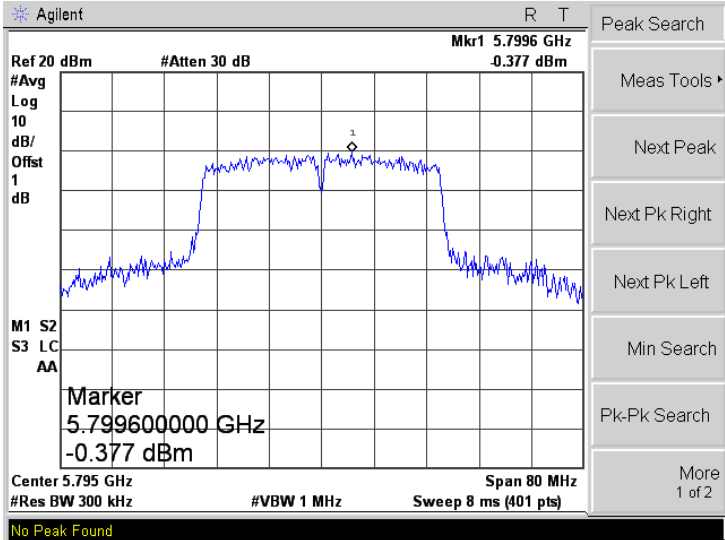
Mode:	802.11n-HT40
-------	--------------



5725-5850MHz:

Mode:	802.11a
5745MHz	
5785MHz	
5825MHz	

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

Mode:	802.11n-HT40
5755 MHz	 Agilent R T Ref 20 dBm #Atten 30 dB Mkr1 5.7466 GHz -0.683 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 LC AA Marker 5.74660000 GHz -0.683 dBm Center 5.755 GHz Span 80 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) No Peak Found Peak Search Meas Tools ▾ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
5795 MHz	 Agilent R T Ref 20 dBm #Atten 30 dB Mkr1 5.7996 GHz -0.377 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 LC AA Marker 5.79960000 GHz -0.377 dBm Center 5.795 GHz Span 80 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) No Peak Found Peak Search Meas Tools ▾ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2

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 v02r01 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) $\geq 3 \times \text{RBW}$.
- 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:

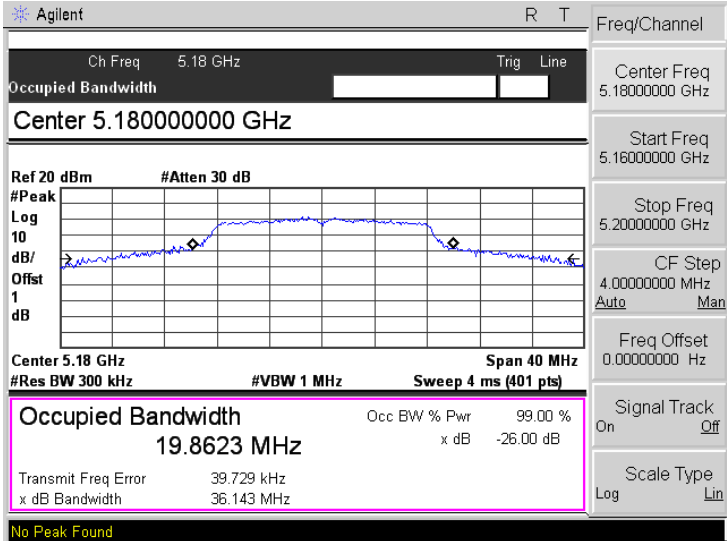
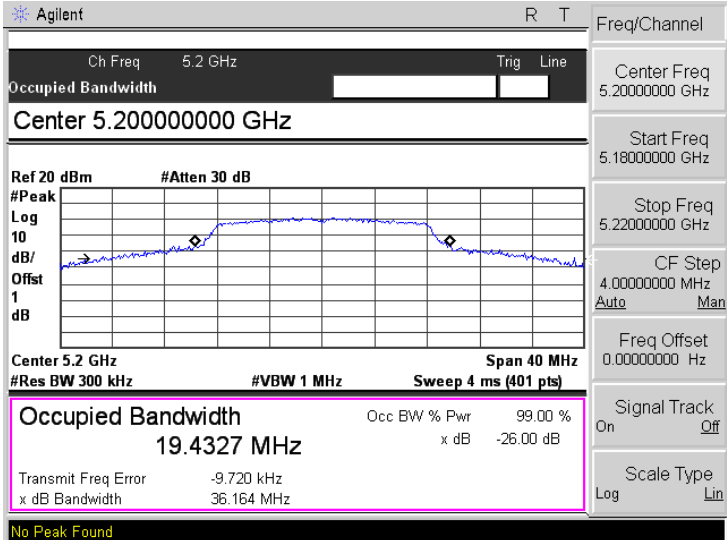
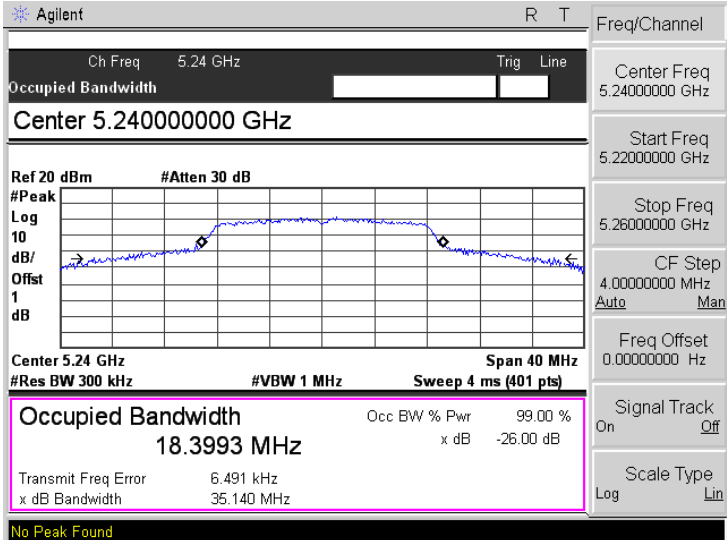
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW $\geq 3 * \text{RBW}$
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, 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.

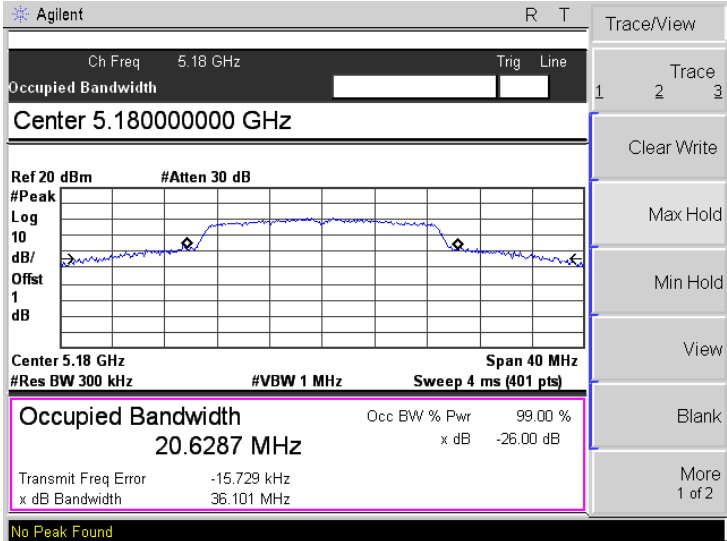
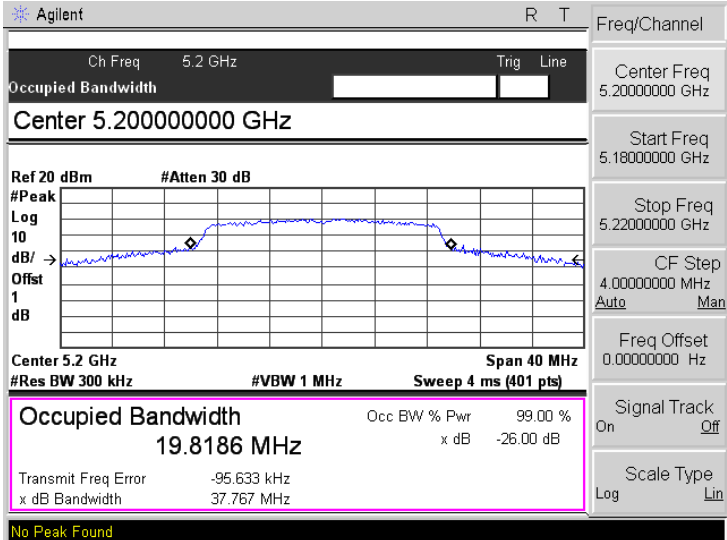
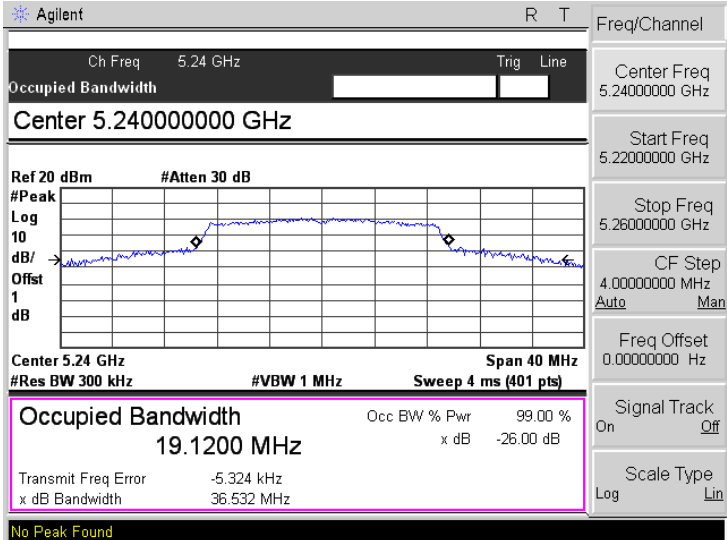
7.3 Summary of Test Results/Plots

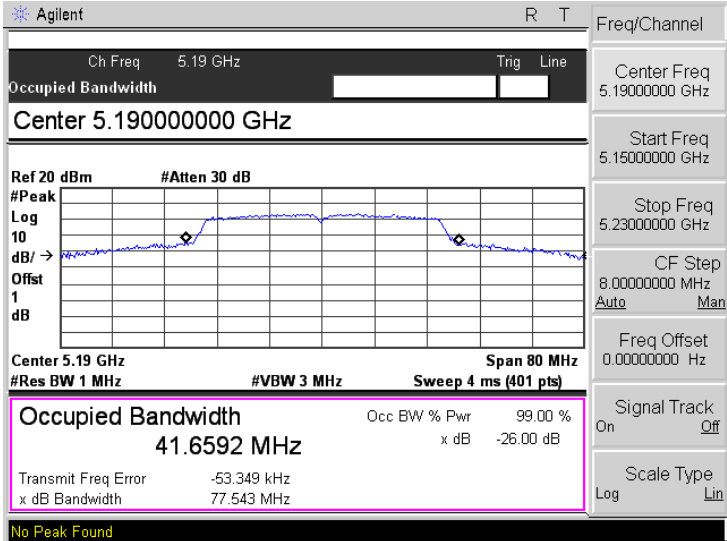
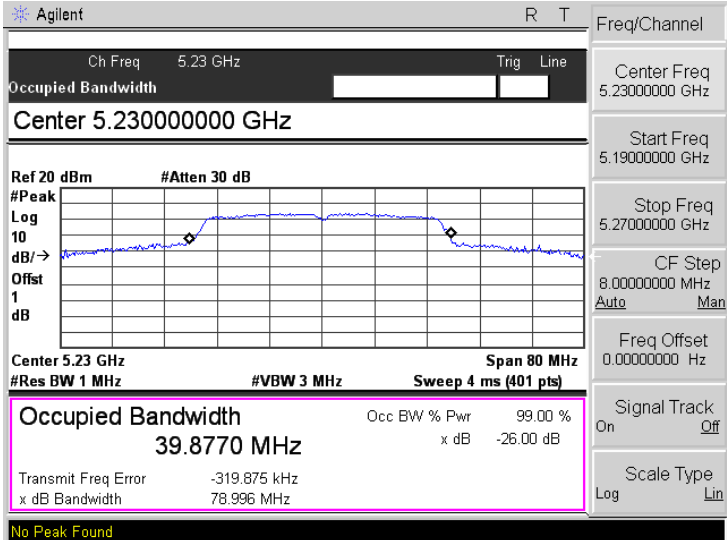
U-NII-1:5150-5250MHz				
Test Mode	Test Channel MHz	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5180	36.143	19.8623	Pass
	5200	36.164	19.4327	Pass
	5240	35.140	18.3993	Pass
802.11n-HT20	5180	36.101	20.6287	Pass
	5200	37.767	19.8186	Pass
	5240	36.532	19.1200	Pass
802.11n-HT40	5190	77.543	41.6592	Pass
	5230	78.996	39.8770	Pass

U-NII-3:5725-5850MHz				
Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5745	16.129	16.9777	≥500
	5785	16.264	16.8996	≥500
	5825	16.057	16.7538	≥500
802.11n-HT20	5745	17.432	17.7418	≥500
	5785	17.488	17.7411	≥500
	5825	17.366	17.7617	≥500
802.11n-HT40	5755	36.076	36.6217	≥500
	5795	36.031	36.6456	≥500

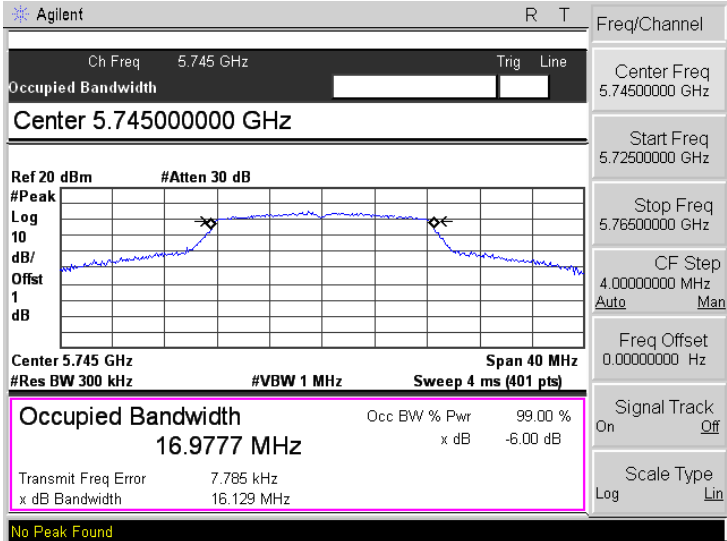
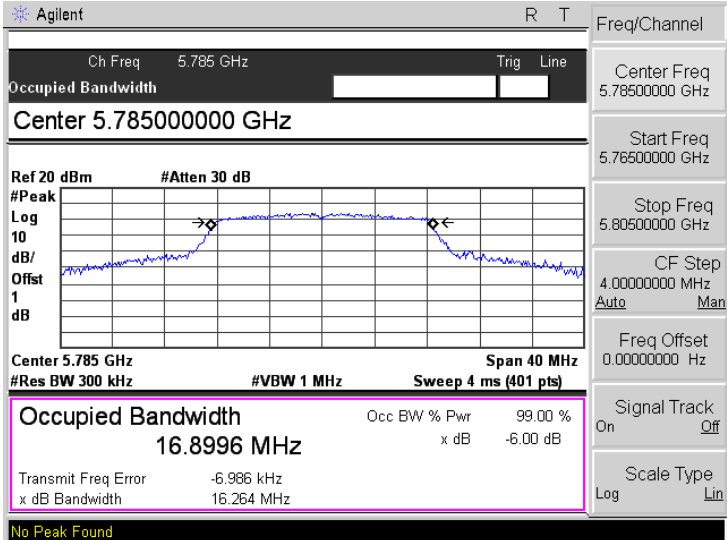
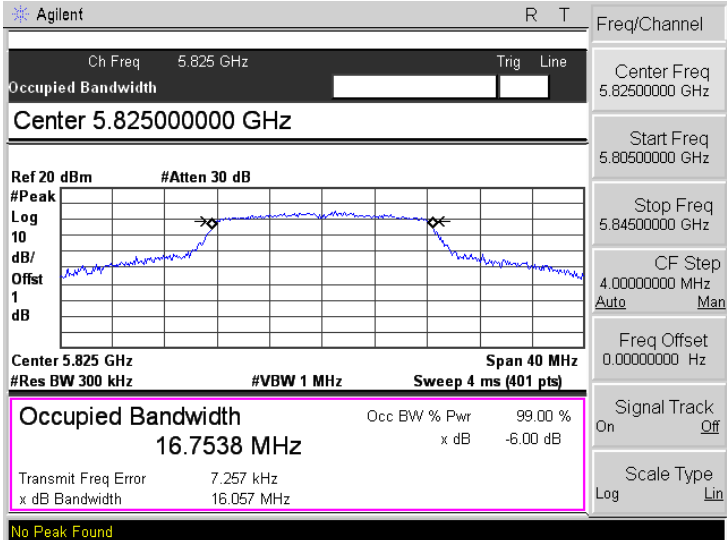
➤ 5150-5250MHz

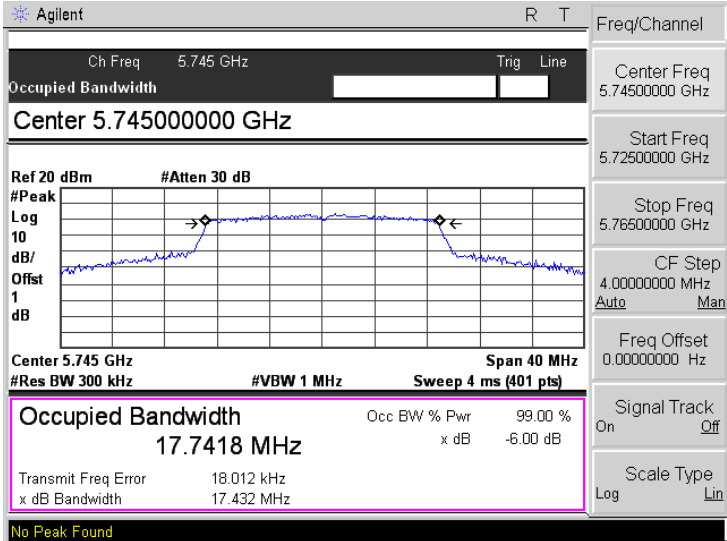
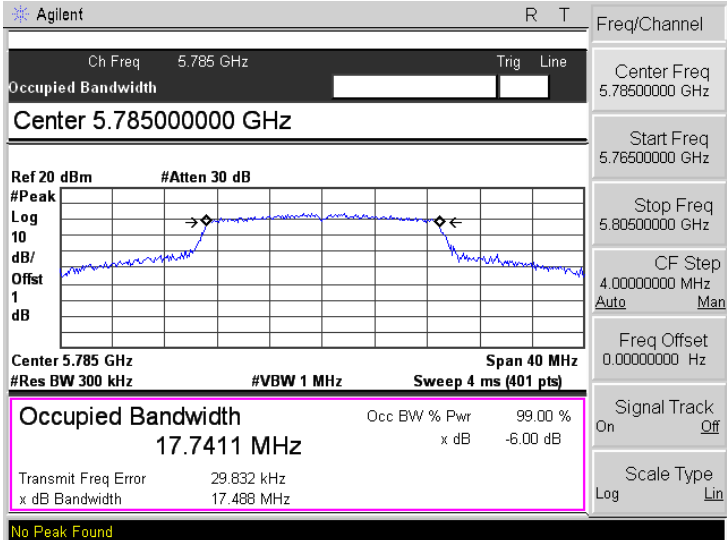
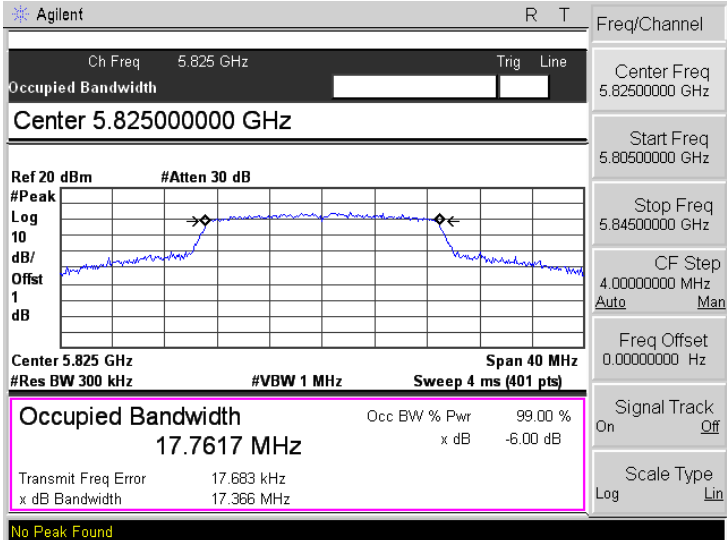
Mode:	802.11a
5180MHz	
5200MHz	
5240MHz	

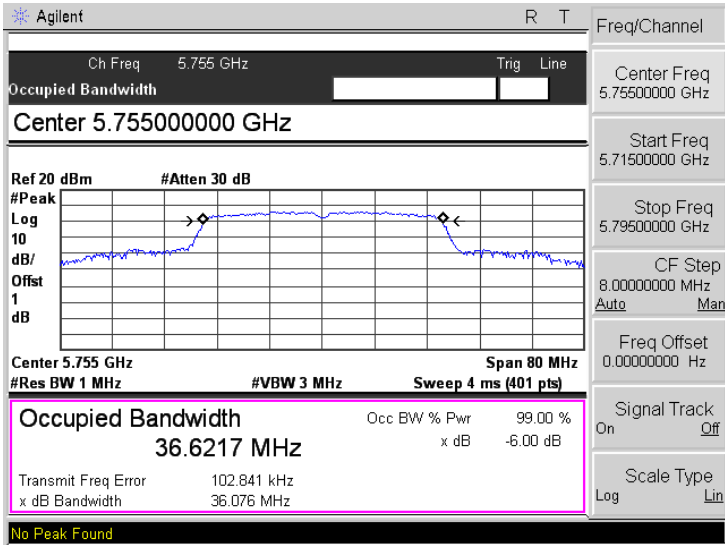
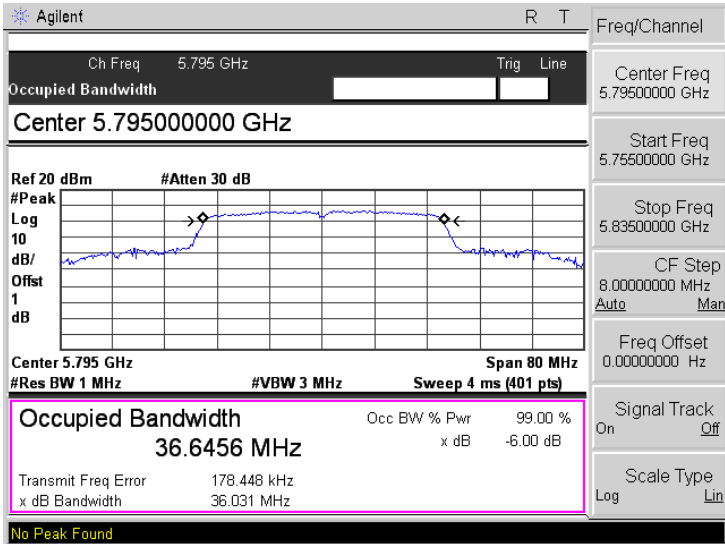
Mode:	802.11n-HT20
5180MHz	 Agilent R T Ch Freq 5.18 GHz Trig Line Occupied Bandwidth Center 5.18000000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 5.18 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 20.6287 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -15.729 kHz x dB Bandwidth 36.101 MHz No Peak Found Trace/View 1 2 3 Trace Clear Write Max Hold Min Hold View Blank More 1 of 2
5200MHz	 Agilent R T Ch Freq 5.2 GHz Trig Line Occupied Bandwidth Center 5.20000000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 5.2 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 19.8186 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -95.633 kHz x dB Bandwidth 37.767 MHz No Peak Found Freq/Channel Center Freq 5.20000000 GHz Start Freq 5.18000000 GHz Stop Freq 5.22000000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
5240MHz	 Agilent R T Ch Freq 5.24 GHz Trig Line Occupied Bandwidth Center 5.24000000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 5.24 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 19.1200 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -5.324 kHz x dB Bandwidth 36.532 MHz No Peak Found Freq/Channel Center Freq 5.24000000 GHz Start Freq 5.22000000 GHz Stop Freq 5.26000000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

Mode:	802.11n-HT40
5190MHz	 Agilent R T Ch Freq 5.19 GHz Trig Line Occupied Bandwidth Center 5.190000000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/→ Offst 1 dB Center 5.19 GHz Span 80 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 41.6592 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -53.349 kHz x dB Bandwidth 77.543 MHz No Peak Found Freq/Channel Center Freq 5.19000000 GHz Start Freq 5.15000000 GHz Stop Freq 5.23000000 GHz CF Step 8.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
5230MHz	 Agilent R T Ch Freq 5.23 GHz Trig Line Occupied Bandwidth Center 5.230000000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/→ Offst 1 dB Center 5.23 GHz Span 80 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 39.8770 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -319.875 kHz x dB Bandwidth 78.996 MHz No Peak Found Freq/Channel Center Freq 5.23000000 GHz Start Freq 5.19000000 GHz Stop Freq 5.27000000 GHz CF Step 8.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

➤ 5725-5850MHz

Mode:	802.11a
5745MHz	 Agilent R T Ch Freq 5.745 GHz Trig Line Occupied Bandwidth Center 5.74500000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 5.745 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 16.9777 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 7.785 kHz x dB Bandwidth 16.129 MHz No Peak Found Freq/Channel Center Freq 5.74500000 GHz Start Freq 5.72500000 GHz Stop Freq 5.76500000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
5785MHz	 Agilent R T Ch Freq 5.785 GHz Trig Line Occupied Bandwidth Center 5.78500000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 5.785 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 16.8996 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -6.986 kHz x dB Bandwidth 16.264 MHz No Peak Found Freq/Channel Center Freq 5.78500000 GHz Start Freq 5.76500000 GHz Stop Freq 5.80500000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
5825MHz	 Agilent R T Ch Freq 5.825 GHz Trig Line Occupied Bandwidth Center 5.82500000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/Offst 1 dB Center 5.825 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 16.7538 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 7.257 kHz x dB Bandwidth 16.057 MHz No Peak Found Freq/Channel Center Freq 5.82500000 GHz Start Freq 5.80500000 GHz Stop Freq 5.84500000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

Mode:	802.11n-HT20
5745MHz	 Agilent R T Ch Freq 5.745 GHz Trig Line Occupied Bandwidth Center 5.74500000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 5.745 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 17.7418 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 18.012 kHz x dB Bandwidth 17.432 MHz No Peak Found Freq/Channel Center Freq 5.74500000 GHz Start Freq 5.72500000 GHz Stop Freq 5.76500000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
5785MHz	 Agilent R T Ch Freq 5.785 GHz Trig Line Occupied Bandwidth Center 5.78500000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 5.785 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 17.7411 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 29.832 kHz x dB Bandwidth 17.488 MHz No Peak Found Freq/Channel Center Freq 5.78500000 GHz Start Freq 5.76500000 GHz Stop Freq 5.80500000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
5825MHz	 Agilent R T Ch Freq 5.825 GHz Trig Line Occupied Bandwidth Center 5.82500000 GHz Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 5.825 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 17.7617 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 17.683 kHz x dB Bandwidth 17.366 MHz No Peak Found Freq/Channel Center Freq 5.82500000 GHz Start Freq 5.80500000 GHz Stop Freq 5.84500000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

Mode:		802.11n-HT40
5755 MHz		
5795 MHz		

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 ≥ 3 MHz.
- (iv) Number of points in sweep $\geq 2 \text{ Span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)
- (v) Sweep time = auto.

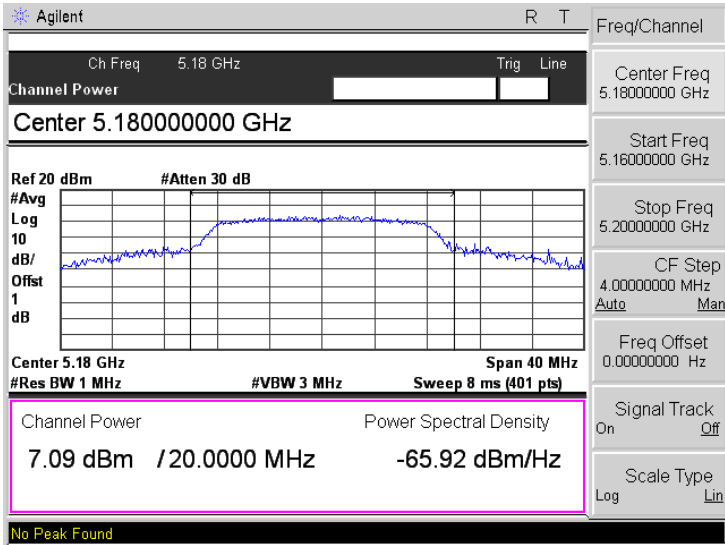
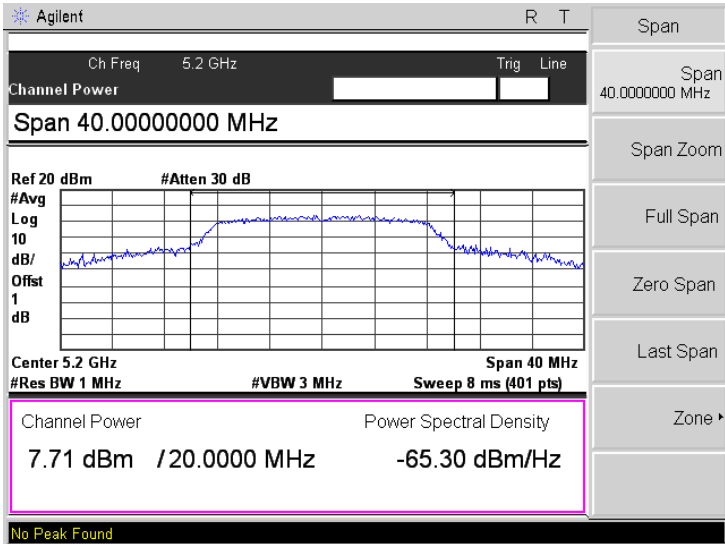
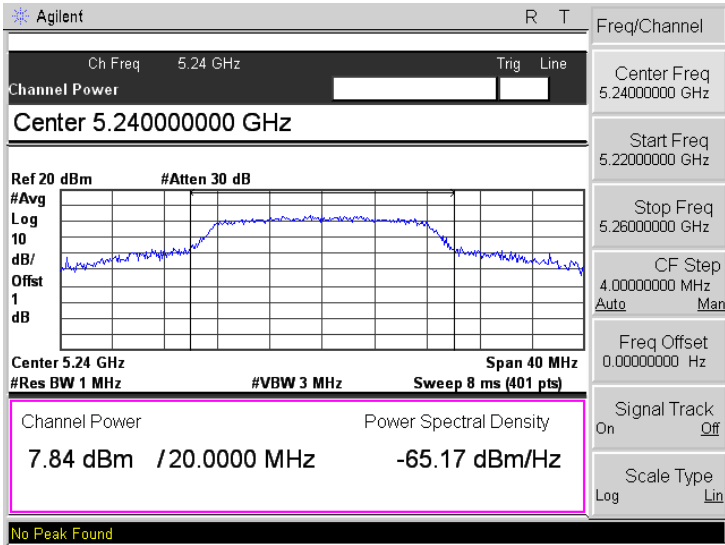
- (vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- (vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 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.

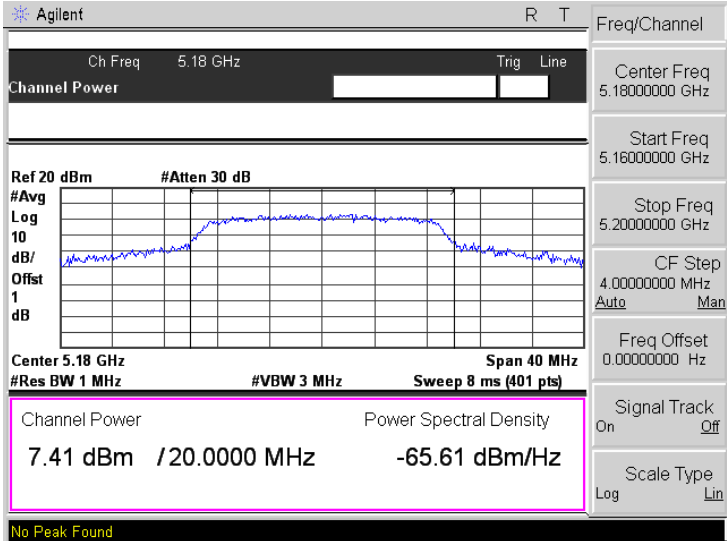
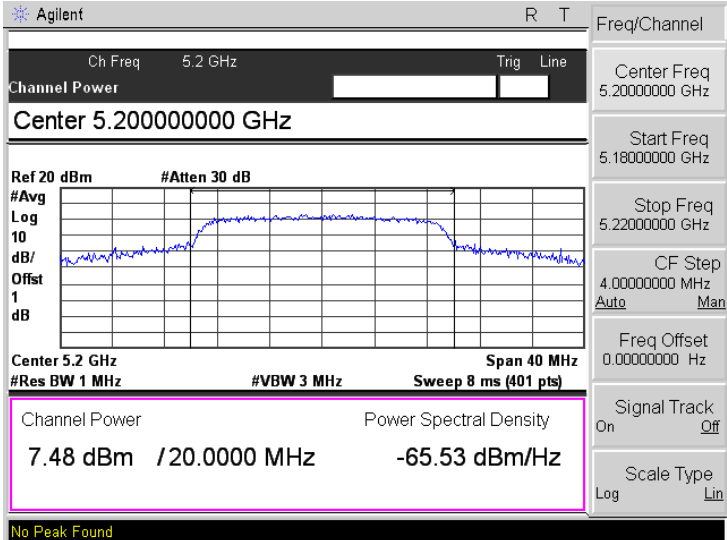
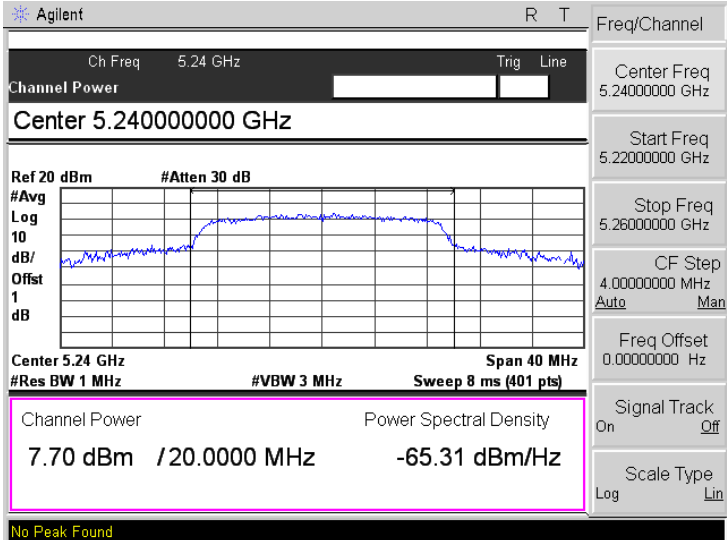
8.3 Summary of Test Results/Plots

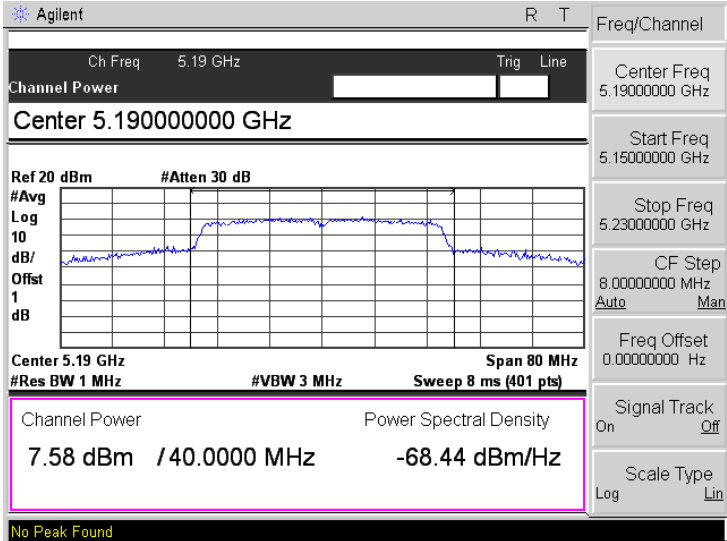
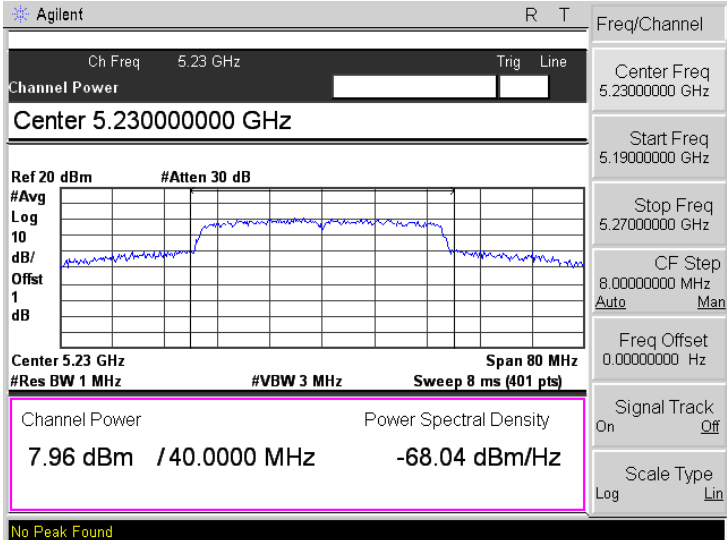
U-NII-1:5150-5250MHz				
Test mode	Frequency MHz	Output Power dBm	Output Power mW	Limit mW
802.11a	5180	7.09	5.12	250
	5200	7.71	5.90	250
	5240	7.84	6.08	250
802.11n-HT20	5180	7.41	5.51	250
	5200	7.48	5.60	250
	5240	7.70	5.89	250
802.11n-HT40	5190	7.58	5.73	250
	5230	7.96	6.25	250

U-NII-3:5725-5850MHz				
Test mode	Frequency MHz	Output Power dBm	Output Power mW	Limit mW
802.11a	5745	10.99	12.56	1000
	5785	11.23	13.27	1000
	5825	11.43	13.90	1000
802.11n-HT20	5745	11.16	13.06	1000
	5785	10.85	12.16	1000
	5825	11.54	14.26	1000
802.11n-HT40	5755	10.58	11.43	1000
	5795	11.14	13.00	1000

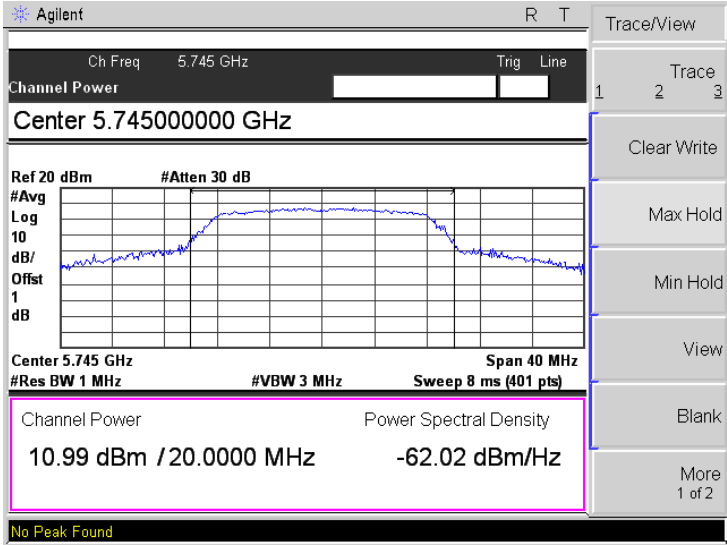
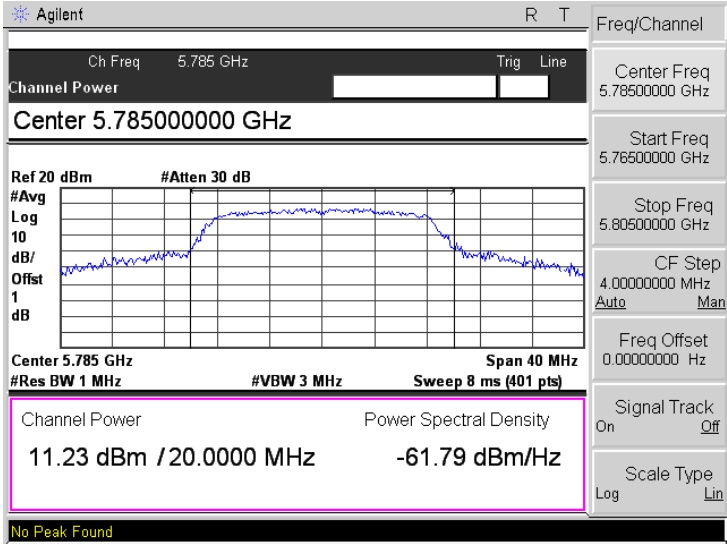
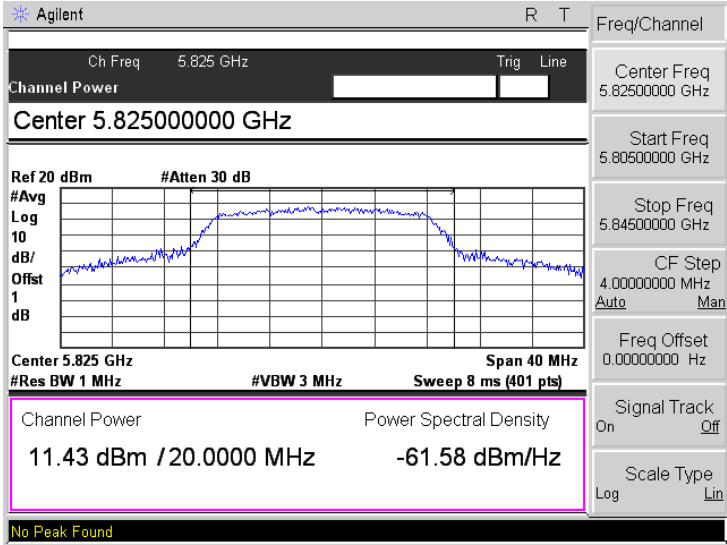
➤ 5150-5250MHz

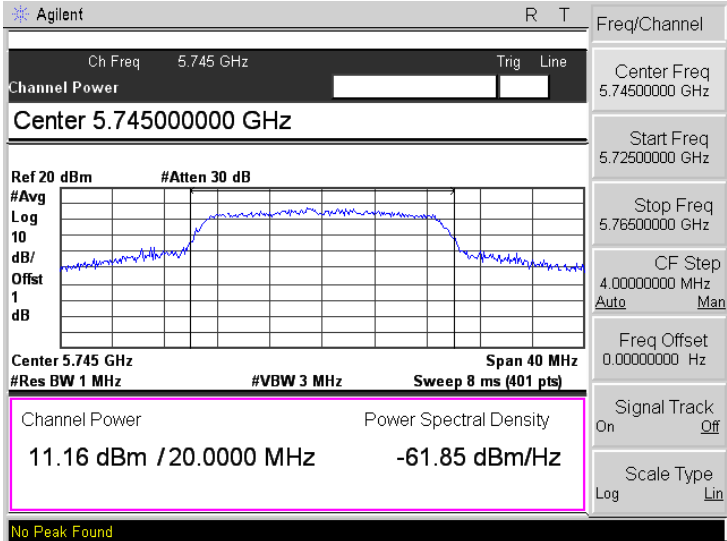
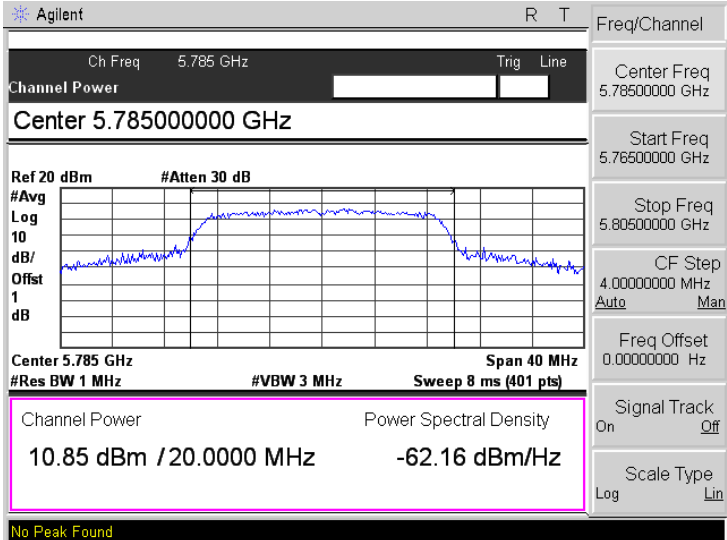
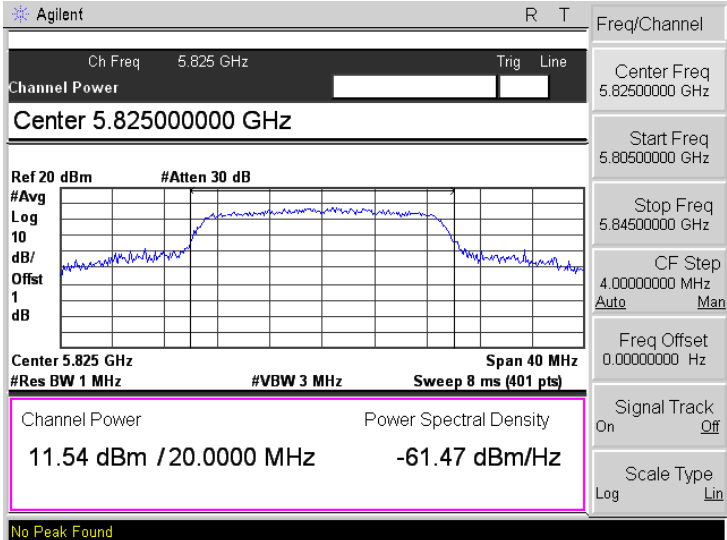
Mode:	802.11a
5180MHz	
5200MHz	
5240MHz	

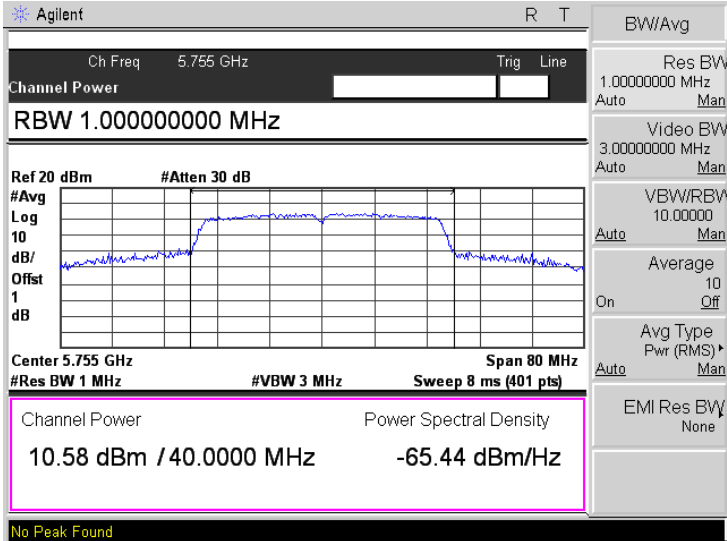
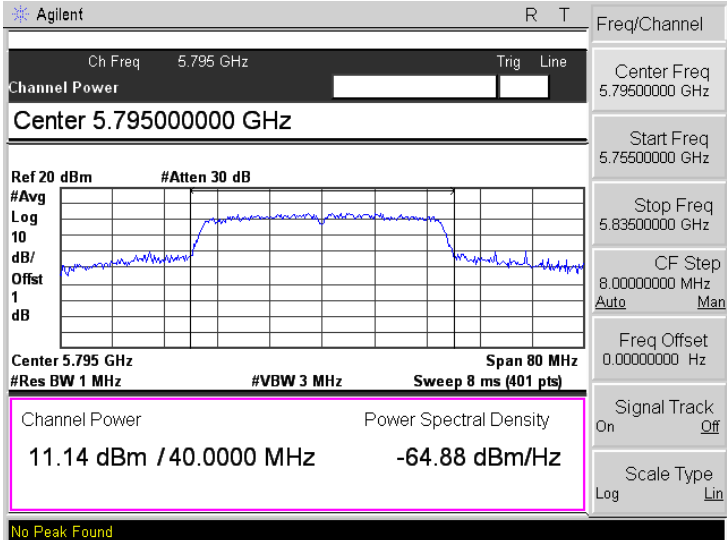
Mode:	802.11n-HT20
5180MHz	
5200MHz	
5240MHz	

Mode:	802.11n-HT40
5190MHz	 Agilent R T Freq/Channel Ch Freq 5.19 GHz Trig Line Channel Power Center 5.190000000 GHz Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 5.19 GHz Span 80 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 7.58 dBm / 40.0000 MHz -68.44 dBm/Hz No Peak Found Freq/Channel Center Freq 5.19000000 GHz Start Freq 5.15000000 GHz Stop Freq 5.23000000 GHz CF Step 8.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
5230MHz	 Agilent R T Freq/Channel Ch Freq 5.23 GHz Trig Line Channel Power Center 5.230000000 GHz Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 5.23 GHz Span 80 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 7.96 dBm / 40.0000 MHz -68.04 dBm/Hz No Peak Found Freq/Channel Center Freq 5.23000000 GHz Start Freq 5.19000000 GHz Stop Freq 5.27000000 GHz CF Step 8.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

➤ 5725-5850MHz

Mode:	802.11a
5745MHz	
5785MHz	
5825MHz	

Mode:	802.11n-HT20
5745MHz	 Agilent R T Ch Freq 5.745 GHz Trig Line Channel Power Center 5.74500000 GHz Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 5.745 GHz Span 40 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 11.16 dBm / 20.0000 MHz -61.85 dBm/Hz No Peak Found Freq/Channel Center Freq 5.74500000 GHz Start Freq 5.72500000 GHz Stop Freq 5.76500000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
5785MHz	 Agilent R T Ch Freq 5.785 GHz Trig Line Channel Power Center 5.78500000 GHz Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 5.785 GHz Span 40 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 10.85 dBm / 20.0000 MHz -62.16 dBm/Hz No Peak Found Freq/Channel Center Freq 5.78500000 GHz Start Freq 5.76500000 GHz Stop Freq 5.80500000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
5825MHz	 Agilent R T Ch Freq 5.825 GHz Trig Line Channel Power Center 5.82500000 GHz Ref 20 dBm #Atten 30 dB #Avg Log 10 dB/ Offst 1 dB Center 5.825 GHz Span 40 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 8 ms (401 pts) Channel Power Power Spectral Density 11.54 dBm / 20.0000 MHz -61.47 dBm/Hz No Peak Found Freq/Channel Center Freq 5.82500000 GHz Start Freq 5.80500000 GHz Stop Freq 5.84500000 GHz CF Step 4.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

Mode:	802.11n-HT40
5755MHz	
5795MHz	

9. Radiated Spurious Emissions

9.1 Standard Applicable

According to §15.407(b)(6), Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209.

According to §15.407(b)(7), The provisions of Section 15.205 of this part 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:

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

where:

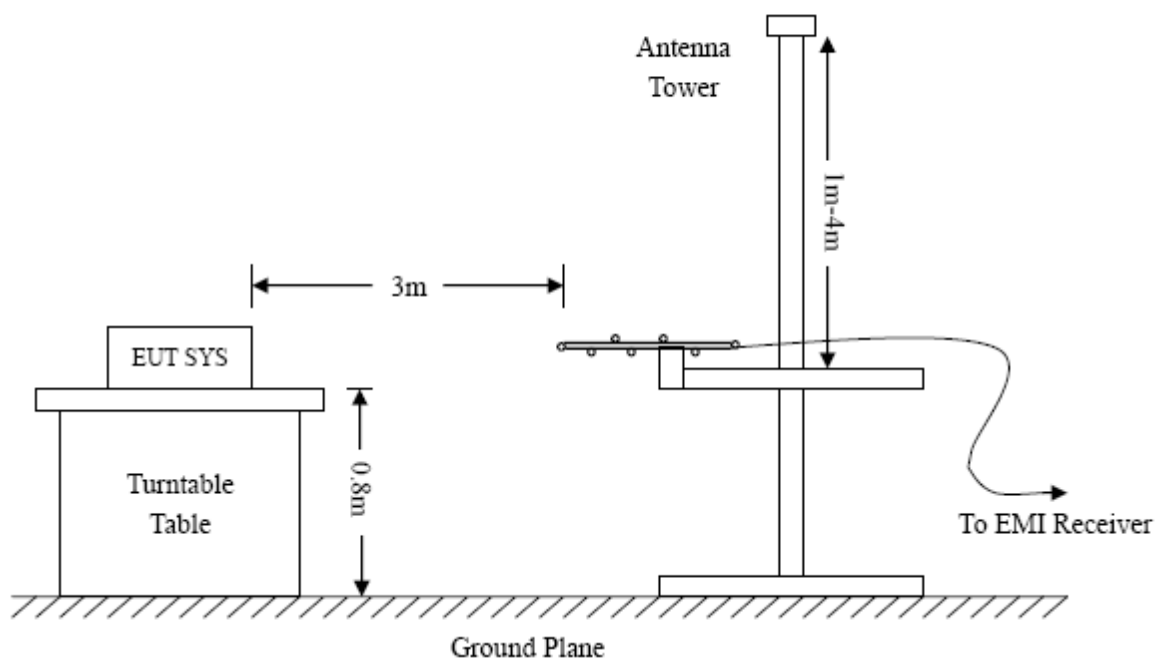
- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

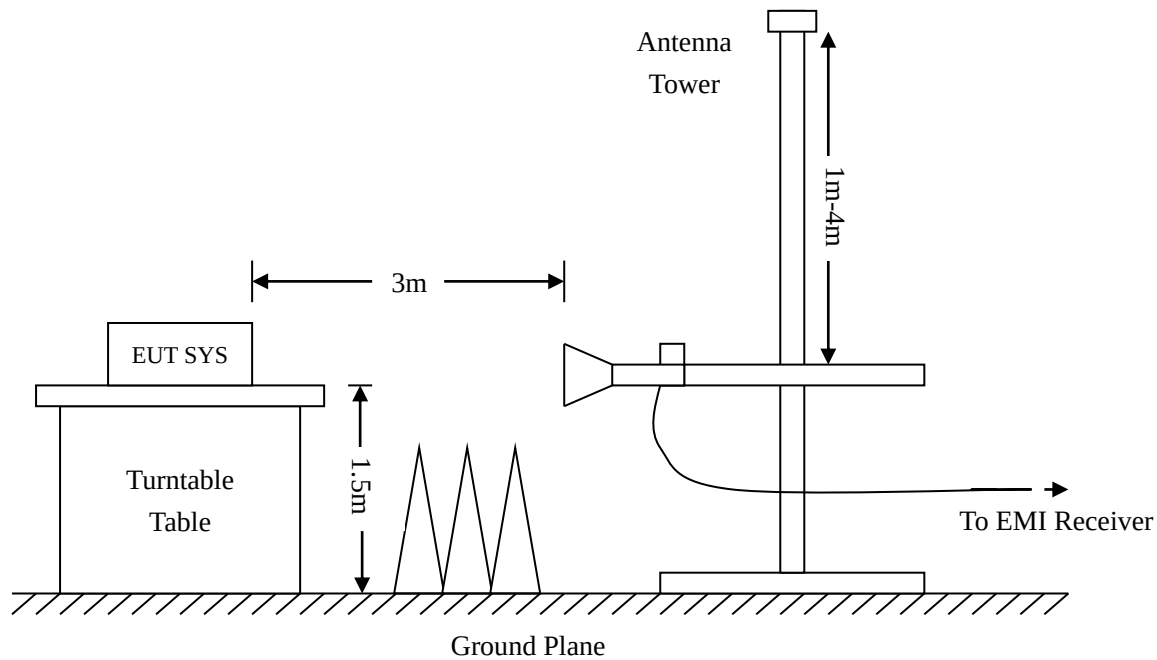
9.2 Test Procedure

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:

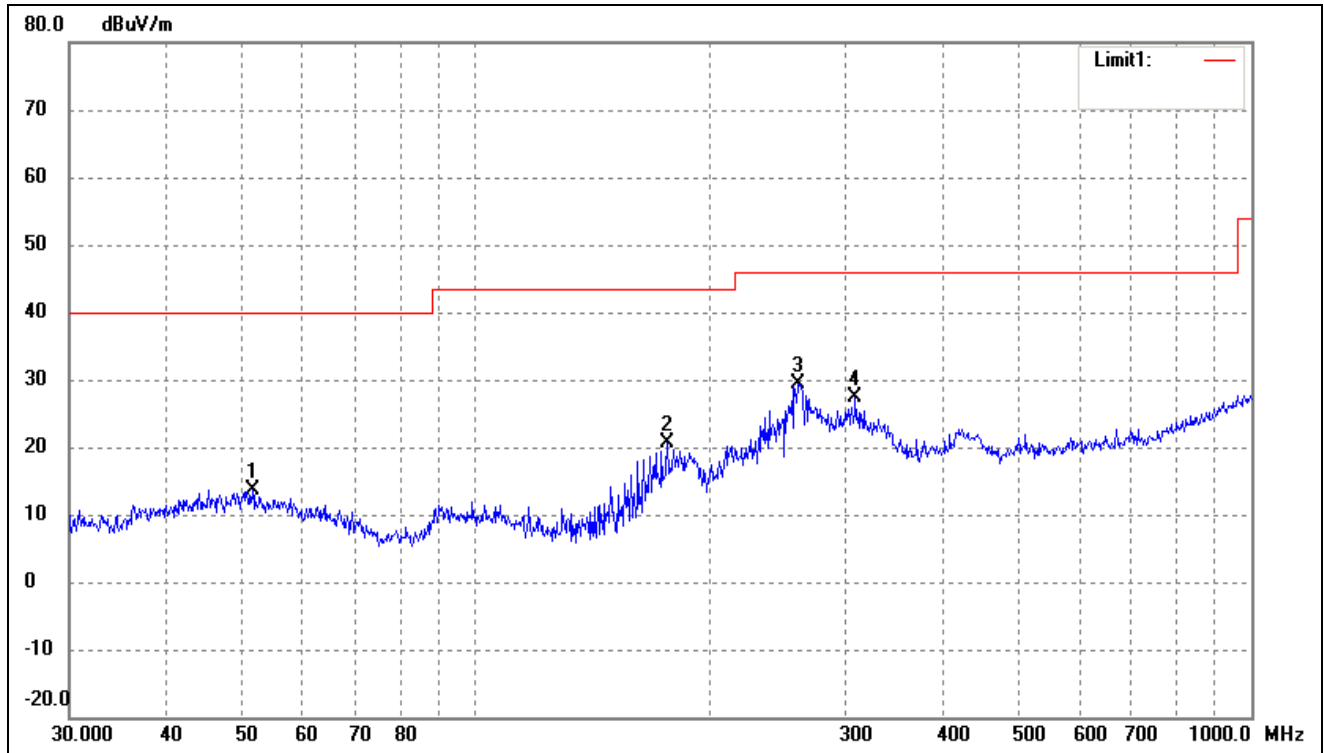
$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

9.5 Summary of Test Results/Plots

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

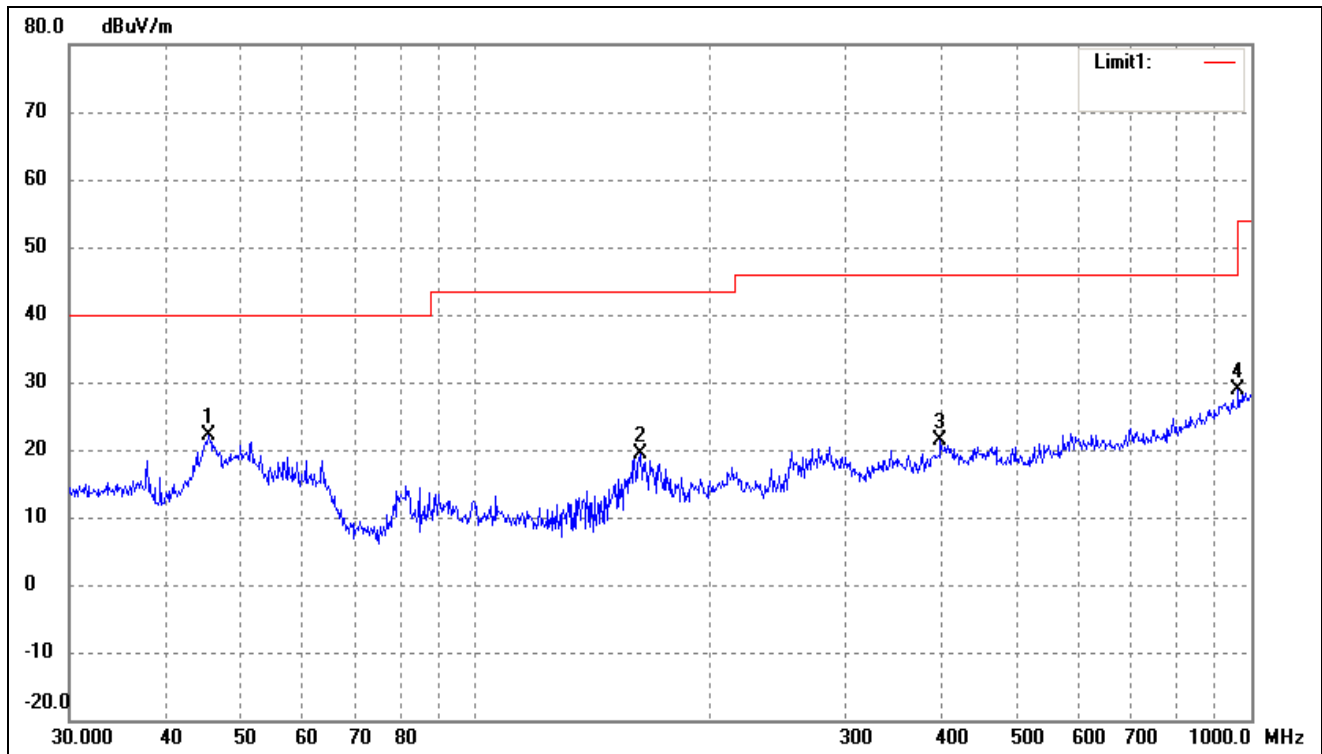
- Spurious Emission From 30 MHz to 1 GHz
- 5150-5250MHz

802.11a			
Test Channel	5180MHz	Polarity:	Horizontal



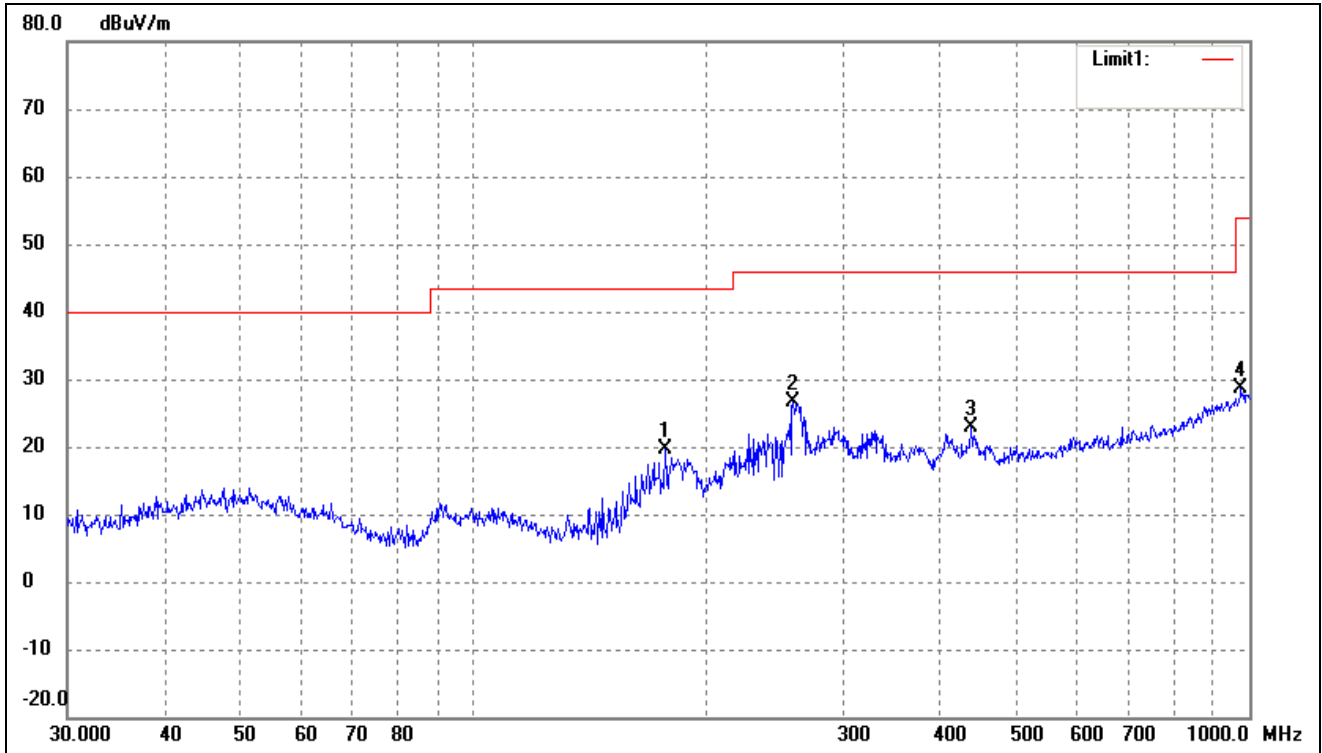
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.6616	27.33	-13.59	13.74	40.00	-26.26	82	100	peak
2	176.8878	37.21	-16.59	20.62	43.50	-22.88	135	100	peak
3	260.1444	40.40	-10.94	29.46	46.00	-16.54	100	100	peak
4	308.9126	36.79	-9.38	27.41	46.00	-18.59	112	100	peak

802.11a			
Test Channel	5180MHz	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.3755	35.87	-13.86	22.01	40.00	-17.99	128	100	peak
2	163.1818	36.70	-17.37	19.33	43.50	-24.17	118	100	peak
3	397.6334	30.15	-8.78	21.37	46.00	-24.63	82	100	peak
4	962.1623	28.07	0.72	28.79	54.00	-25.21	100	100	peak

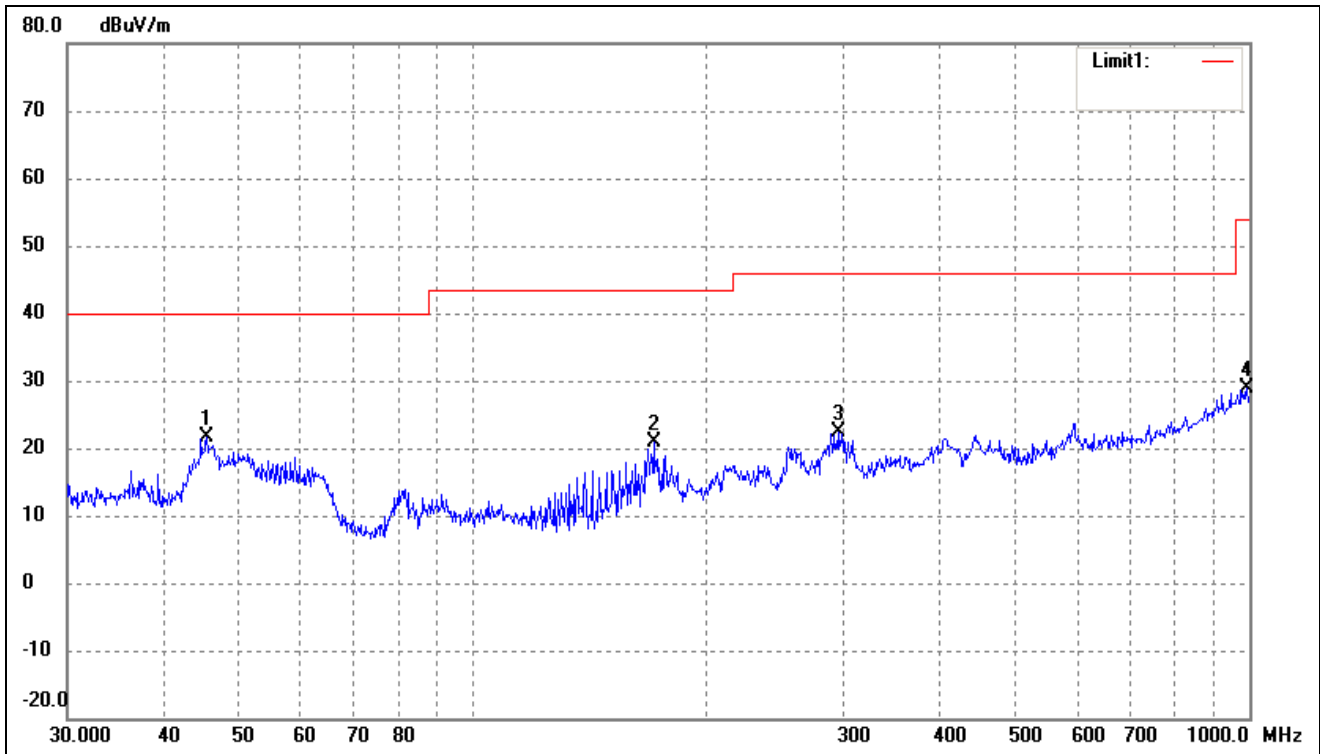
802.11a			
Test Channel	5200MHz	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	176.8878	36.27	-16.59	19.68	43.50	-23.82	110	100	peak
2	258.3264	37.71	-11.05	26.66	46.00	-19.34	232	100	peak
3	438.6554	31.23	-8.41	22.82	46.00	-23.18	75	100	peak
4	975.7529	27.39	1.13	28.52	54.00	-25.48	308	100	peak

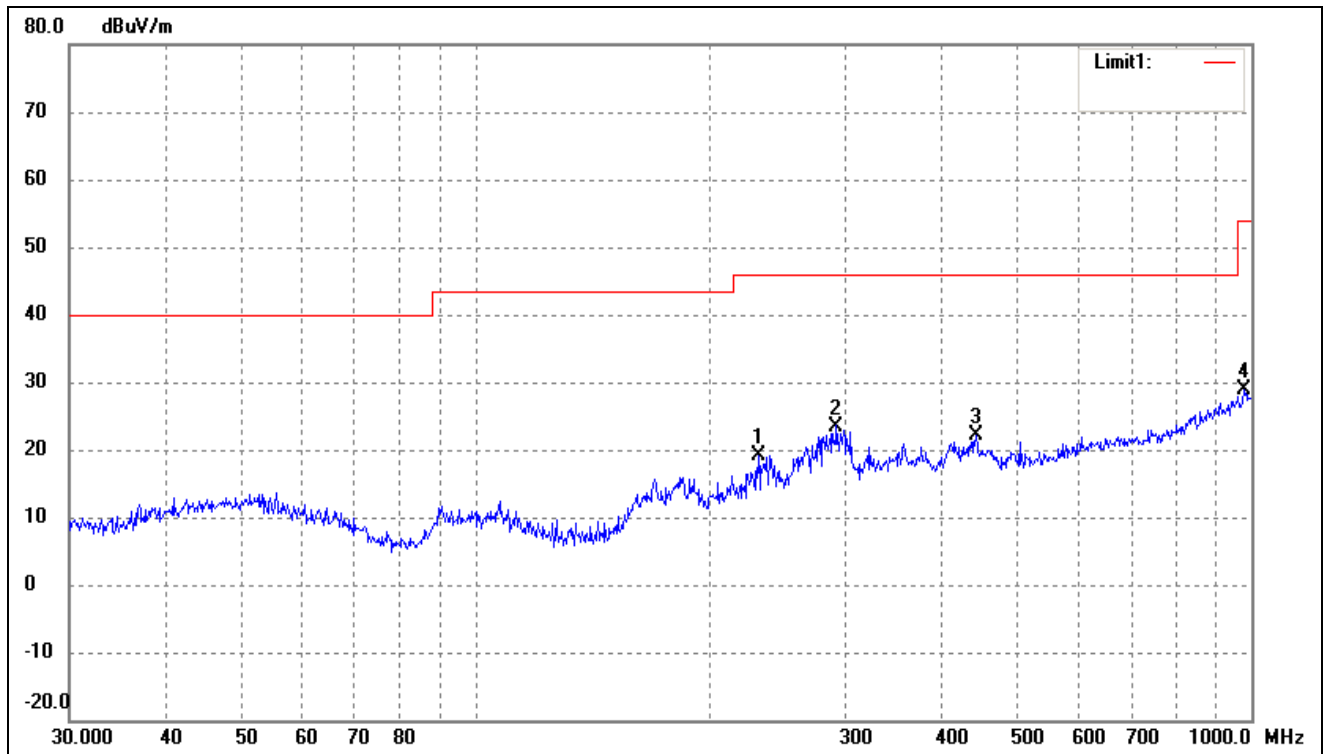
802.11a

Test Channel	5200MHz	Polarity:	Vertical
--------------	---------	-----------	----------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.3755	35.47	-13.86	21.61	40.00	-18.39	203	100	peak
2	170.7926	38.01	-17.10	20.91	43.50	-22.59	92	100	peak
3	295.1469	31.67	-9.24	22.43	46.00	-23.57	81	100	peak
4	993.0114	27.60	1.35	28.95	54.00	-25.05	98	100	peak

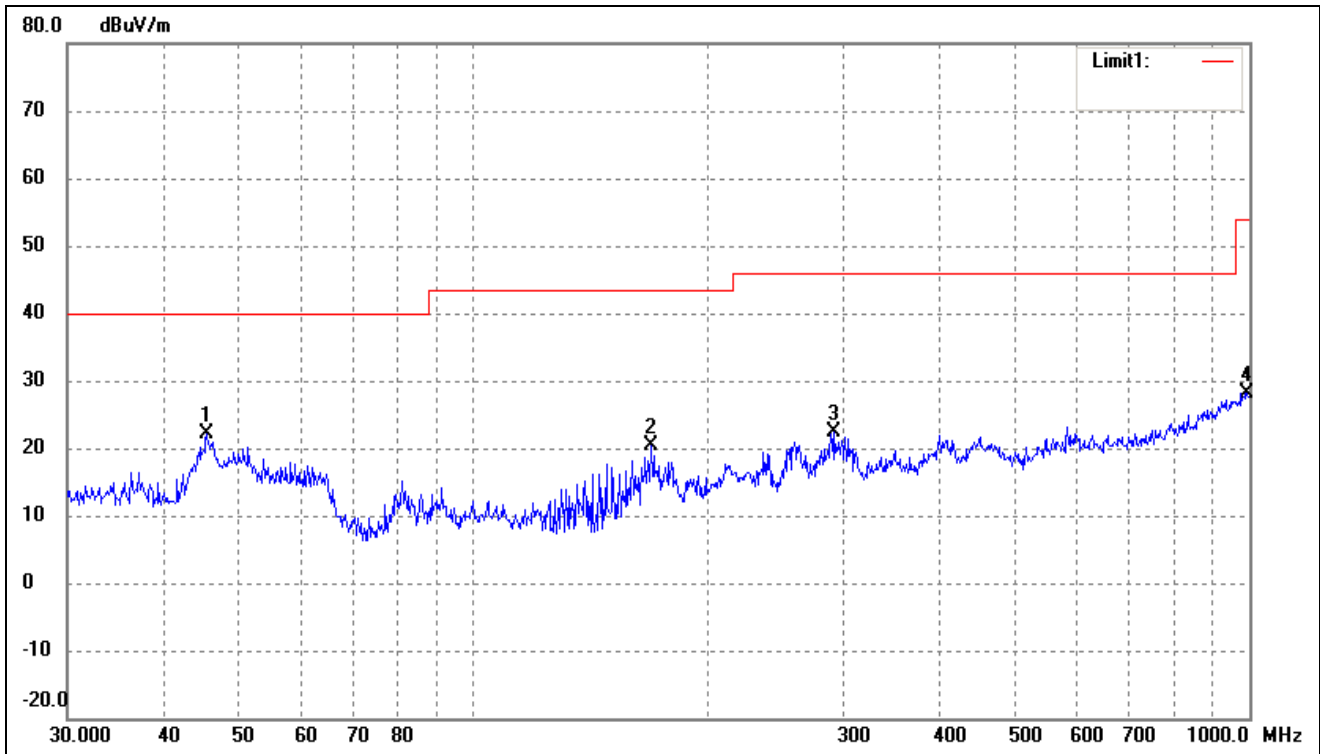
802.11a			
Test Channel	5240MHz	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	231.7179	31.39	-12.24	19.15	46.00	-26.85	169	100	peak
2	292.0583	32.99	-9.49	23.50	46.00	-22.50	194	100	peak
3	441.7426	30.54	-8.46	22.08	46.00	-23.92	71	100	peak
4	979.1804	27.63	1.31	28.94	54.00	-25.06	159	100	peak

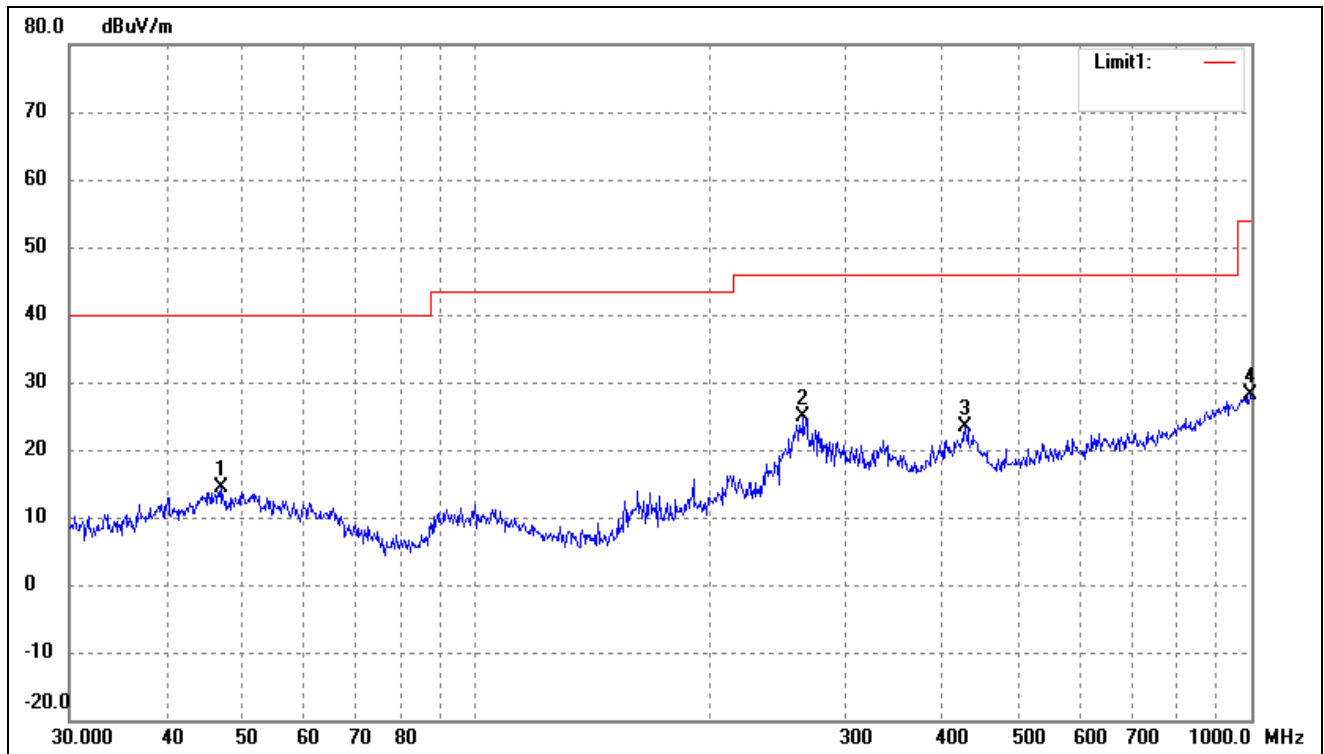
802.11a

Test Channel	5240MHz	Polarity:	Vertical
--------------	---------	-----------	----------



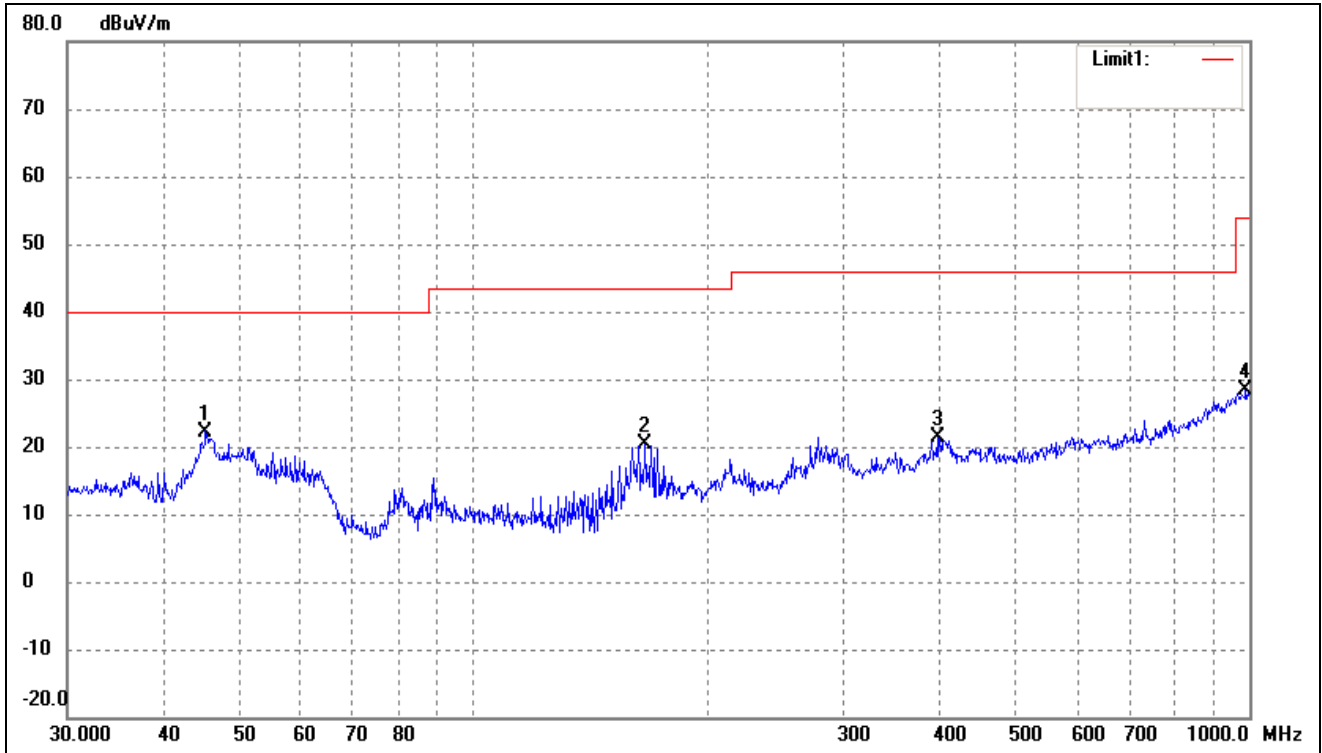
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.3755	35.88	-13.86	22.02	40.00	-17.98	58	100	peak
2	169.5990	37.54	-17.15	20.39	43.50	-23.11	145	100	peak
3	292.0583	31.82	-9.49	22.33	46.00	-23.67	87	100	peak
4	993.0114	26.83	1.35	28.18	54.00	-25.82	134	100	peak

802.11n-HT20			
Test Channel	5180MHz	Polarity:	Horizontal



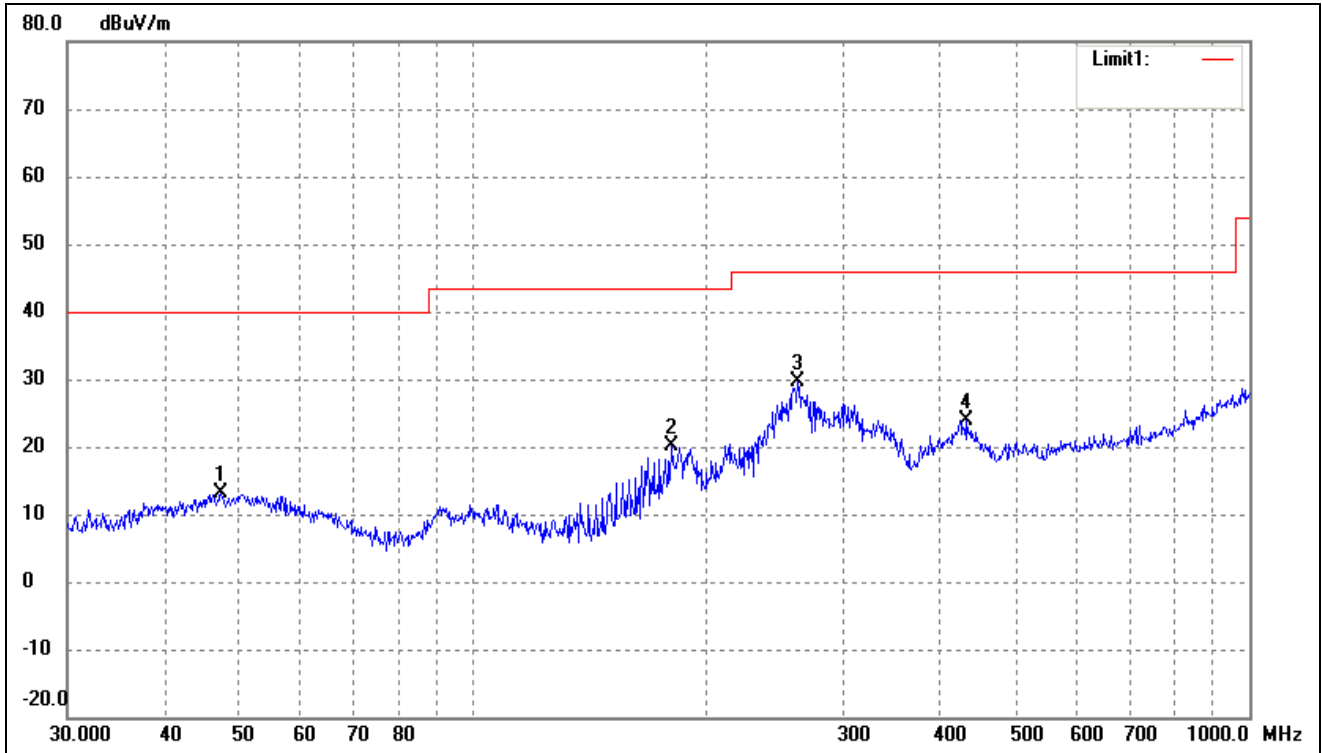
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	47.1599	28.08	-13.71	14.37	40.00	-25.63	105	100	peak
2	264.7457	35.42	-10.48	24.94	46.00	-21.06	177	100	peak
3	428.0193	31.79	-8.33	23.46	46.00	-22.54	82	100	peak
4	996.4996	26.78	1.41	28.19	54.00	-25.81	98	100	peak

802.11n-HT20			
Test Channel	5180MHz	Polarity:	Vertical



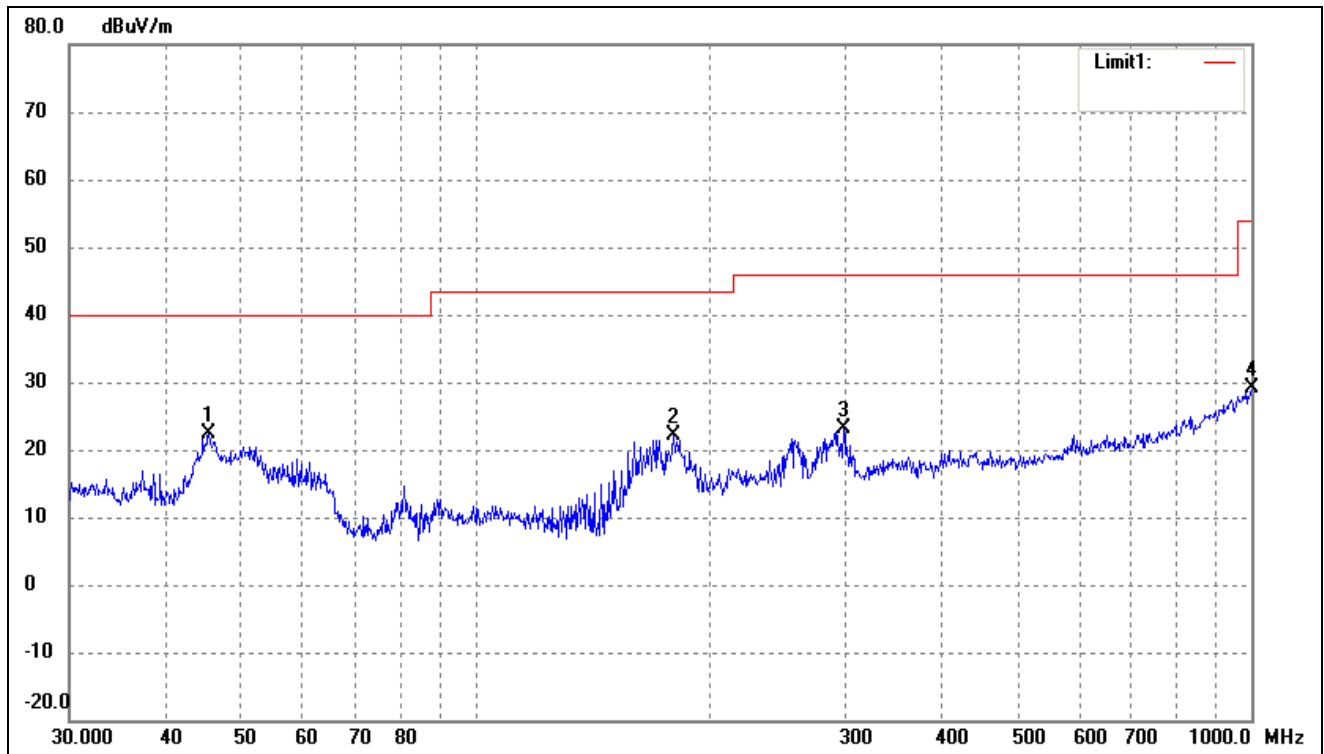
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.2166	36.14	-13.89	22.25	40.00	-17.75	245	100	peak
2	166.6514	37.50	-17.16	20.34	43.50	-23.16	209	100	peak
3	396.2415	30.23	-8.83	21.40	46.00	-24.60	59	100	peak
4	989.5355	27.05	1.28	28.33	54.00	-25.67	304	100	peak

802.11n-HT20			
Test Channel	5200MHz	Polarity:	Horizontal



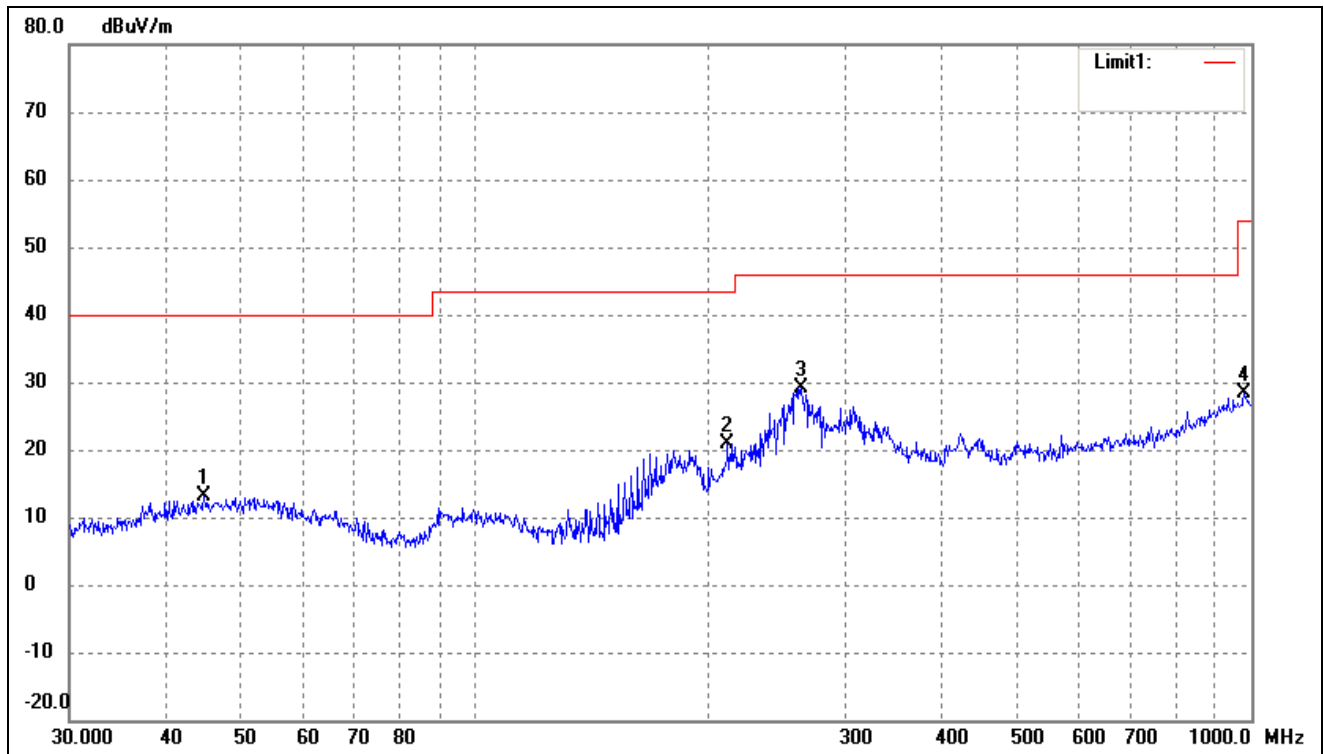
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	47.3255	26.73	-13.69	13.04	40.00	-26.96	254	100	peak
2	180.0165	36.44	-16.20	20.24	43.50	-23.26	90	100	peak
3	261.9753	40.30	-10.75	29.55	46.00	-16.45	351	100	peak
4	432.5457	32.25	-8.32	23.93	46.00	-22.07	91	100	peak

802.11n-HT20			
Test Channel	5200MHz	Polarity:	Vertical



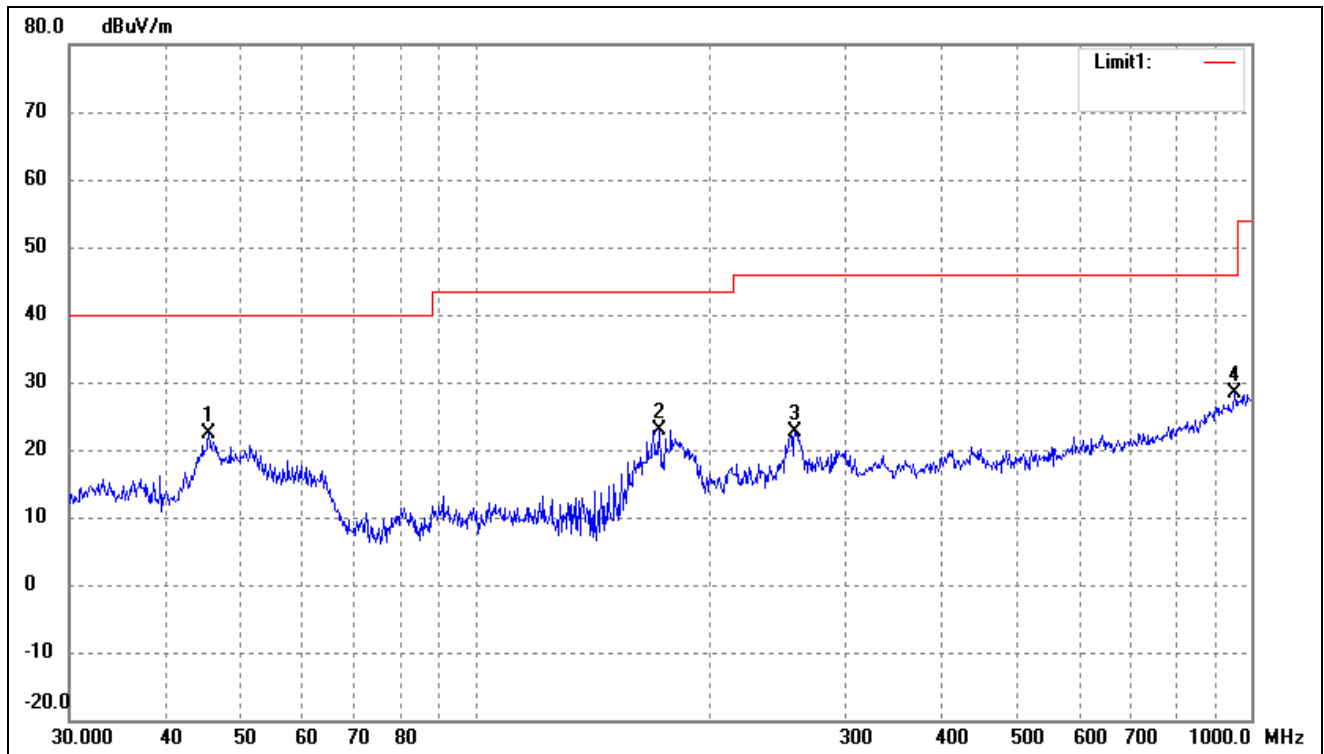
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.3755	36.24	-13.86	22.38	40.00	-17.62	91	100	peak
2	180.0165	38.30	-16.20	22.10	43.50	-21.40	92	100	peak
3	298.2681	32.27	-9.18	23.09	46.00	-22.91	79	100	peak
4	1000.0000	27.55	1.50	29.05	54.00	-24.95	319	100	peak

802.11n-HT20			
Test Channel	5240MHz	Polarity:	Horizontal



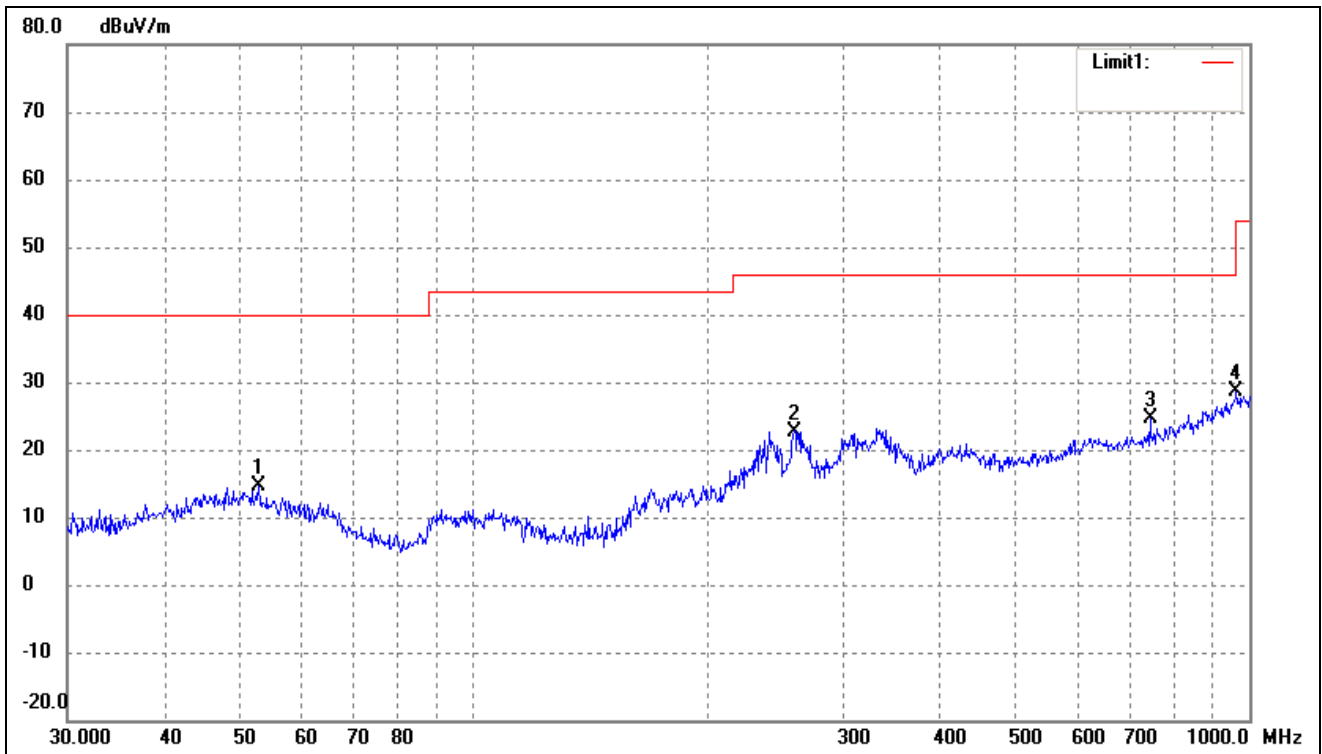
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	44.7434	26.96	-13.94	13.02	40.00	-26.98	295	100	peak
2	211.5265	34.62	-13.80	20.82	43.50	-22.68	98	100	peak
3	262.8955	39.88	-10.66	29.22	46.00	-16.78	64	100	peak
4	979.1804	27.03	1.31	28.34	54.00	-25.66	91	100	peak

802.11n-HT20			
Test Channel	5240MHz	Polarity:	Vertical



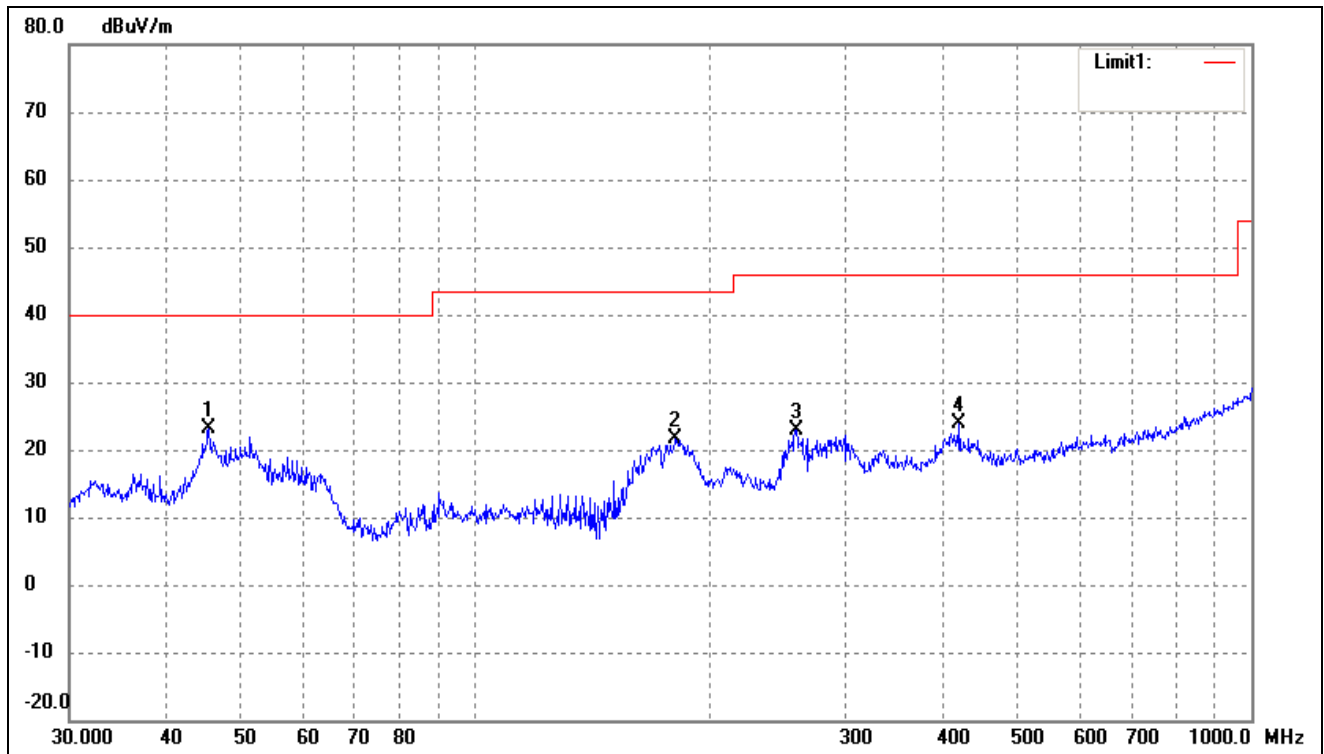
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.3755	36.21	-13.86	22.35	40.00	-17.65	219	100	peak
2	172.5988	39.90	-16.98	22.92	43.50	-20.58	290	100	peak
3	258.3264	33.79	-11.05	22.74	46.00	-23.26	65	100	peak
4	952.0937	28.03	0.36	28.39	46.00	-17.61	289	100	peak

802.11n-HT40			
Test Channel	5190MHz	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.9453	28.29	-13.73	14.56	40.00	-25.44	68	100	peak
2	259.2338	33.74	-10.99	22.75	46.00	-23.25	165	100	peak
3	744.8661	29.54	-4.93	24.61	46.00	-21.39	103	100	peak
4	962.1623	27.80	0.72	28.52	54.00	-25.48	97	100	peak

802.11n-HT40			
Test Channel	5190MHz	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.3755	37.01	-13.86	23.15	40.00	-16.85	224	100	peak
2	181.2834	37.64	-16.07	21.57	43.50	-21.93	188	100	peak
3	259.2338	33.81	-10.99	22.82	46.00	-23.18	59	100	peak
4	420.5803	32.21	-8.45	23.76	46.00	-22.24	105	100	peak

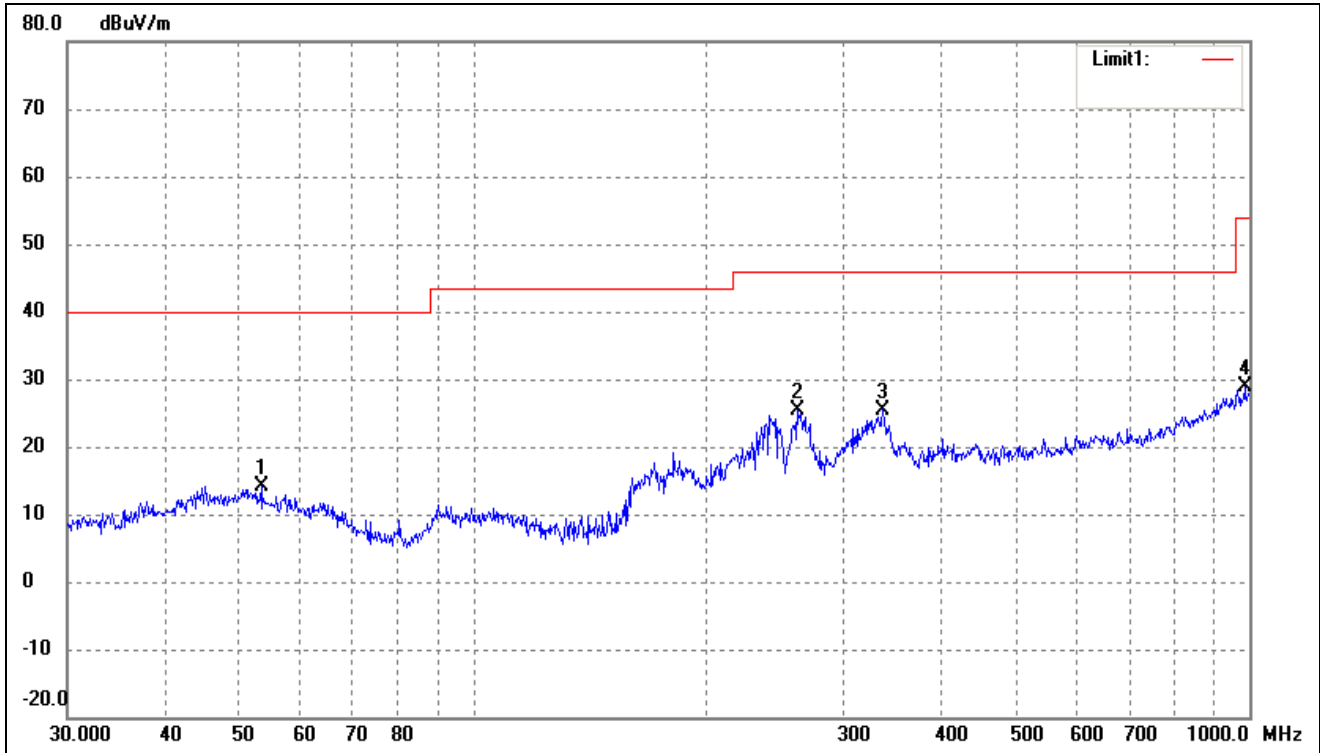
802.11n-HT40

Test Channel

5230MHz

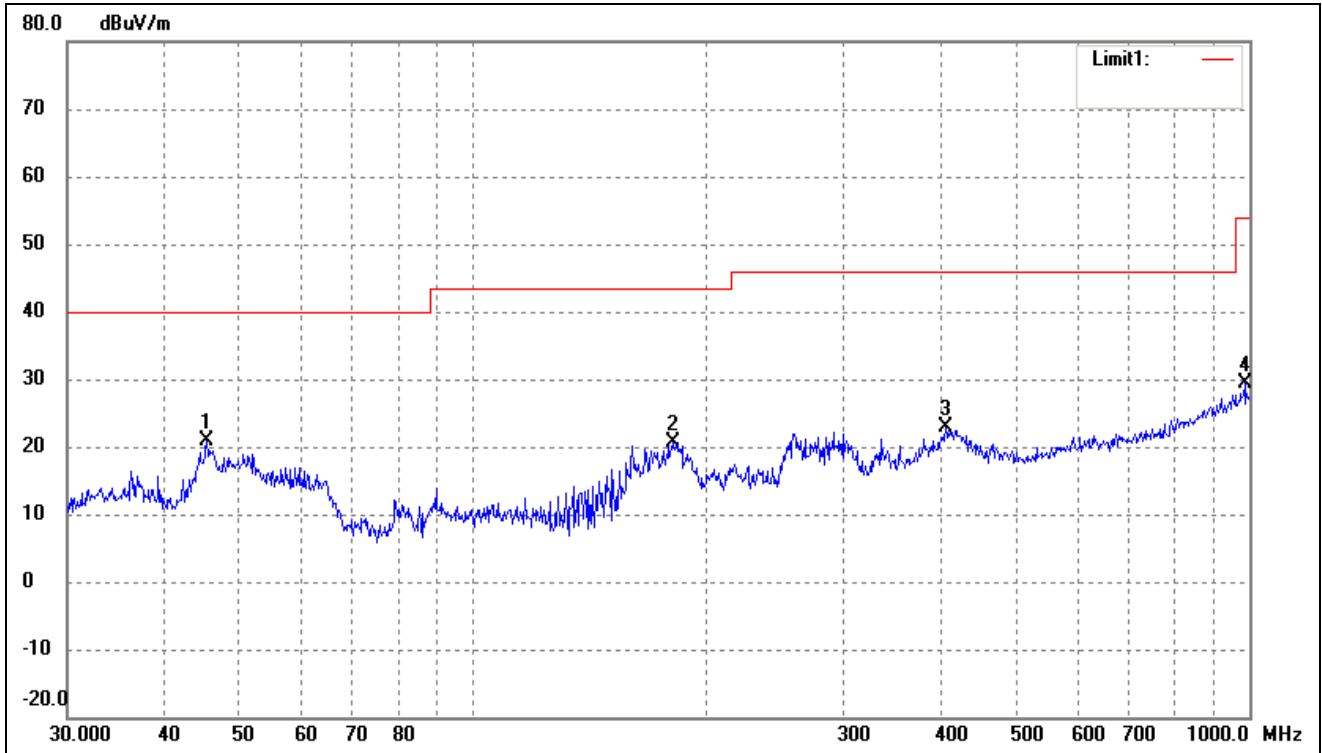
Polarity:

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	53.3179	27.84	-13.79	14.05	40.00	-25.95	167	100	peak
2	261.9753	36.17	-10.75	25.42	46.00	-20.58	165	100	peak
3	337.2155	34.25	-8.75	25.50	46.00	-20.50	88	100	peak
4	986.0717	27.46	1.30	28.76	54.00	-25.24	192	100	peak

802.11n-HT40			
Test Channel	5230MHz	Polarity:	Vertical

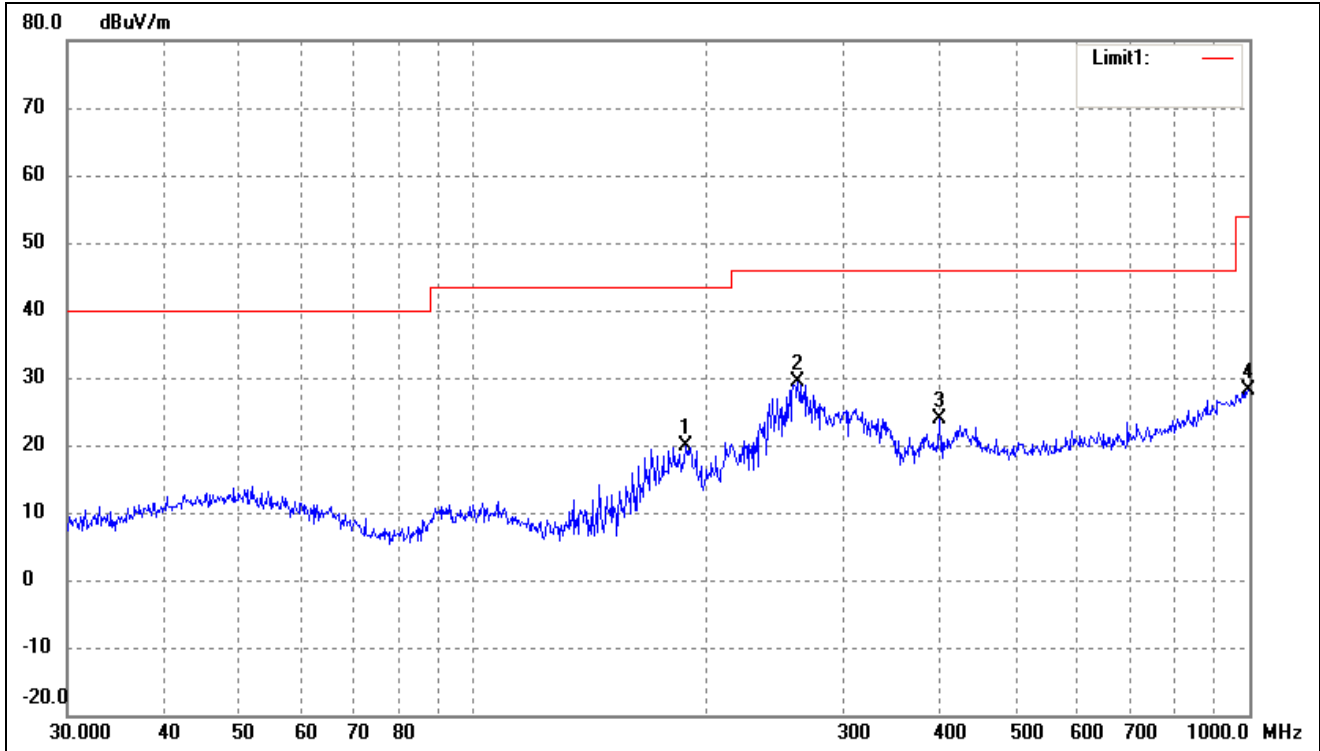


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.3755	34.79	-13.86	20.93	40.00	-19.07	70	100	peak
2	181.2834	36.82	-16.07	20.75	43.50	-22.75	183	100	peak
3	406.0880	31.55	-8.60	22.95	46.00	-23.05	89	100	peak
4	986.0717	28.04	1.30	29.34	54.00	-24.66	93	100	peak

➤ 5725-5850MHz

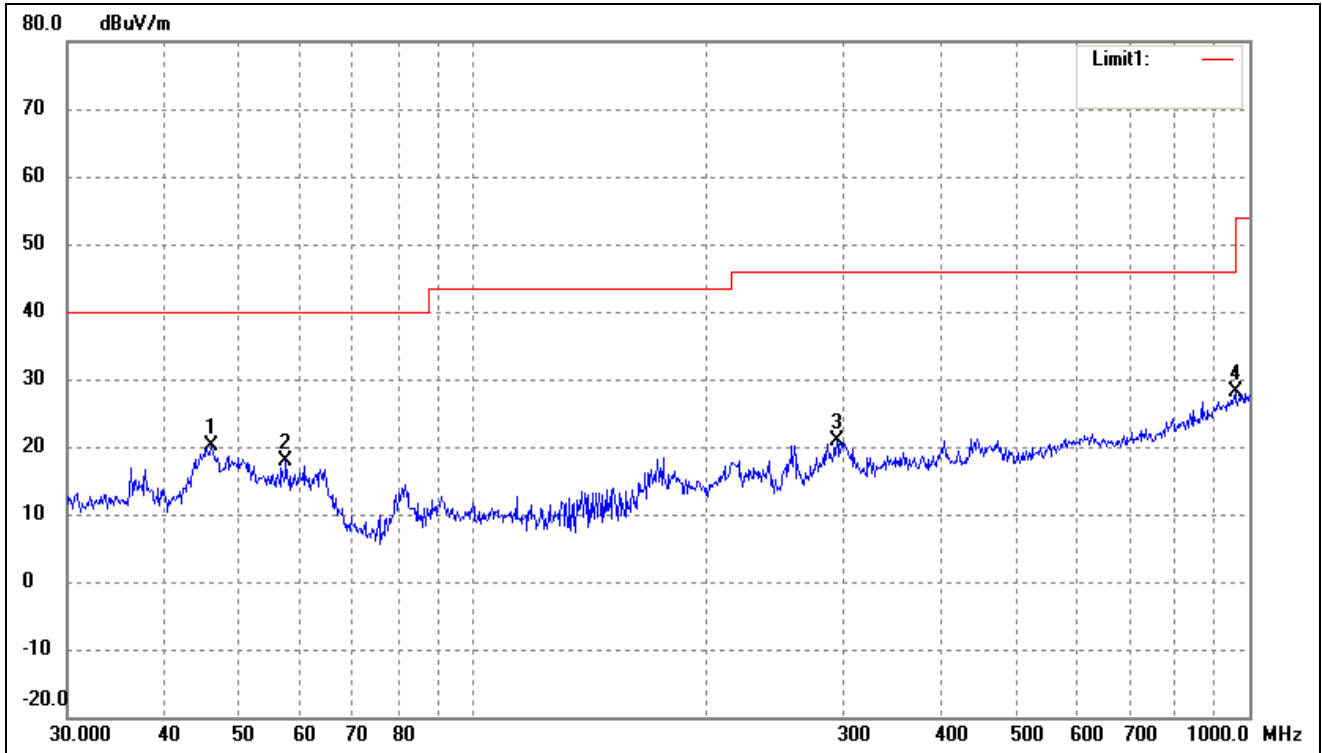
802.11a

Test Channel	5745MHz	Polarity:	Horizontal
--------------	---------	-----------	------------



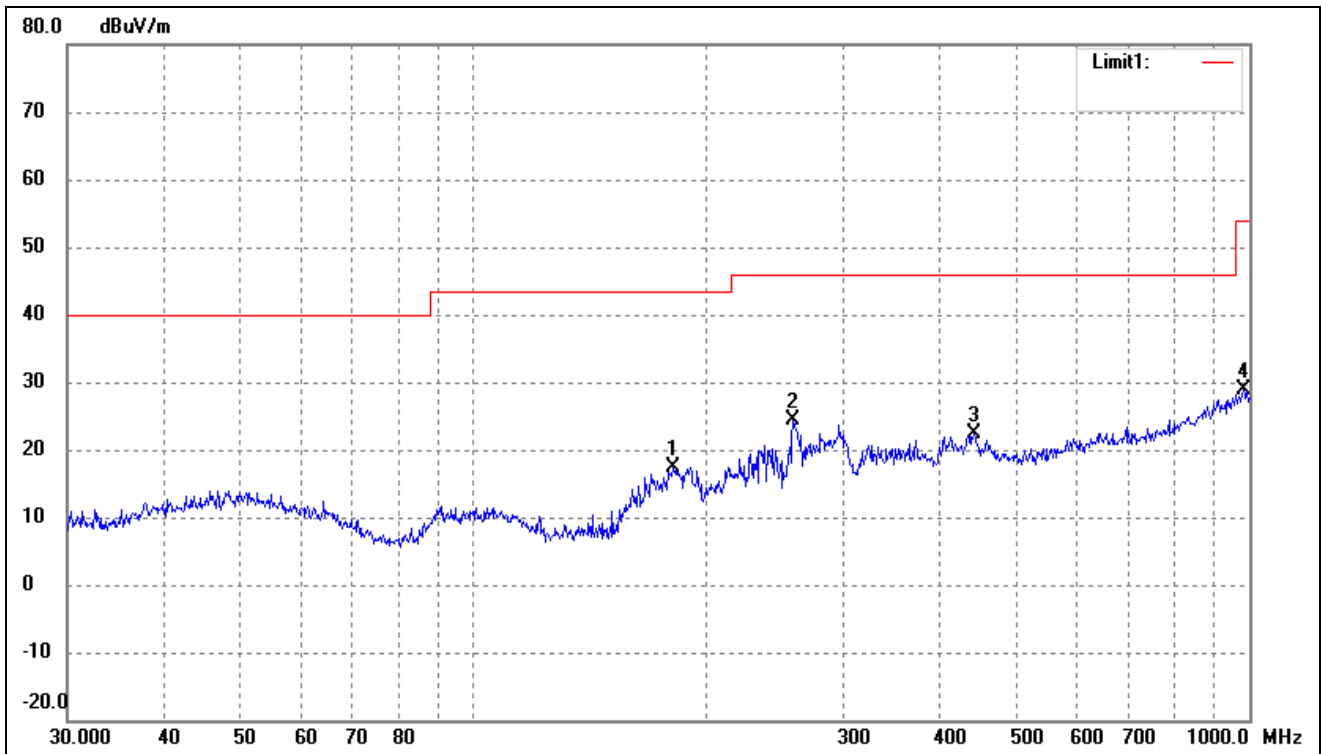
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	187.7530	35.25	-15.32	19.93	43.50	-23.57	319	100	peak
2	261.9753	40.24	-10.75	29.49	46.00	-16.51	95	100	peak
3	399.0302	32.53	-8.73	23.80	46.00	-22.20	326	100	peak
4	996.4996	26.81	1.41	28.22	54.00	-25.78	97	100	peak

802.11a			
Test Channel	5745MHz	Polarity:	Vertical



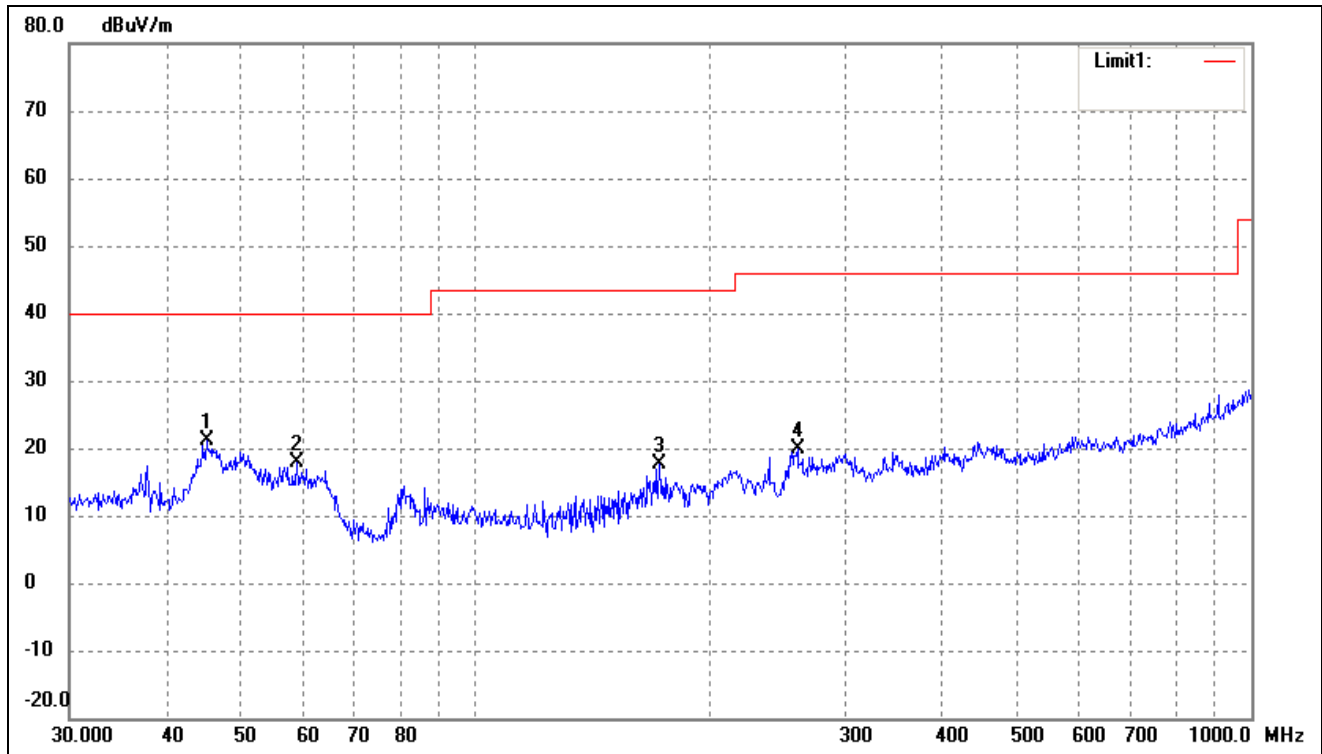
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.0164	33.87	-13.79	20.08	40.00	-19.92	63	100	peak
2	57.3923	32.86	-14.94	17.92	40.00	-22.08	135	100	peak
3	294.1137	30.13	-9.32	20.81	46.00	-25.19	98	100	peak
4	958.7943	27.41	0.65	28.06	46.00	-17.94	90	100	peak

802.11a			
Test Channel	5785MHz	Polarity:	Horizontal



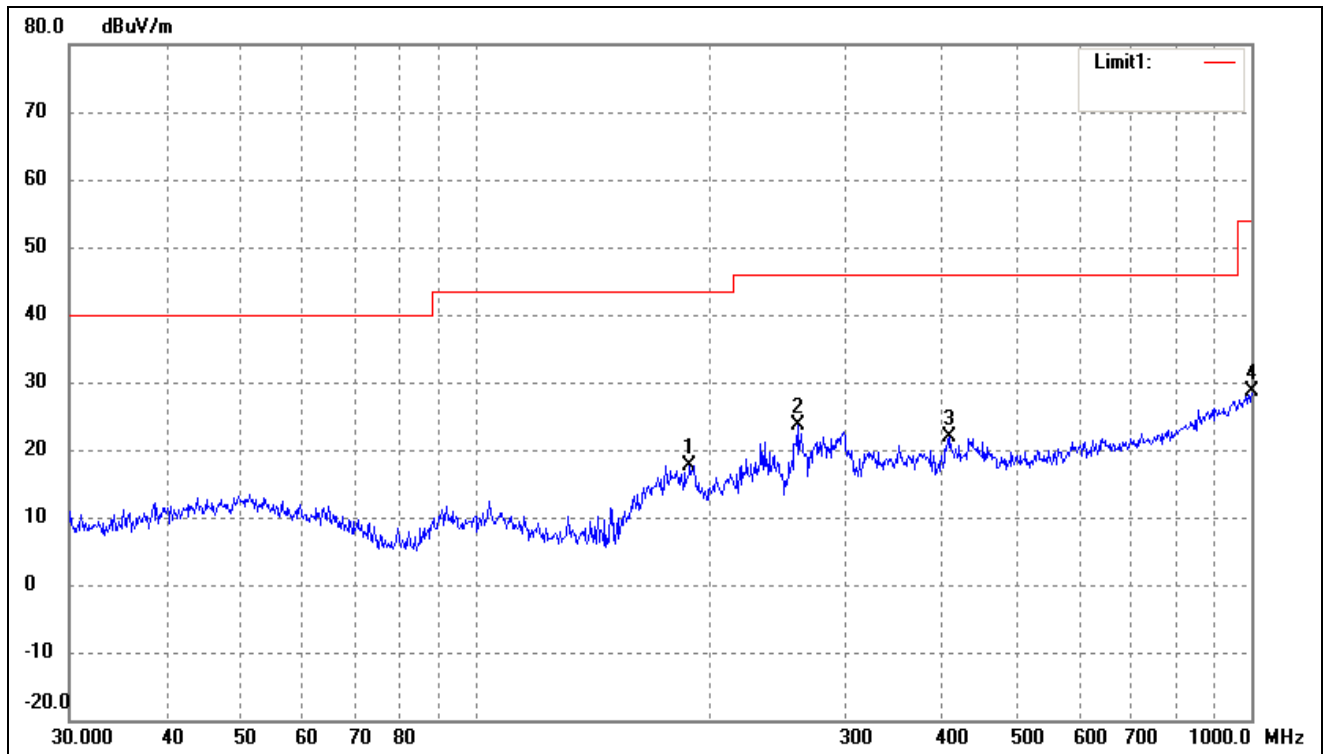
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	181.2834	33.56	-16.07	17.49	43.50	-26.01	129	100	peak
2	258.3264	35.41	-11.05	24.36	46.00	-21.64	163	100	peak
3	441.7426	30.91	-8.46	22.45	46.00	-23.55	107	100	peak
4	982.6200	27.46	1.34	28.80	54.00	-25.20	100	100	peak

802.11a			
Test Channel	5785MHz	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.0583	35.02	-13.90	21.12	40.00	-18.88	174	100	peak
2	58.8185	33.25	-15.25	18.00	40.00	-22.00	270	100	peak
3	172.5988	34.52	-16.98	17.54	43.50	-25.96	51	100	peak
4	260.1444	30.80	-10.94	19.86	46.00	-26.14	336	100	peak

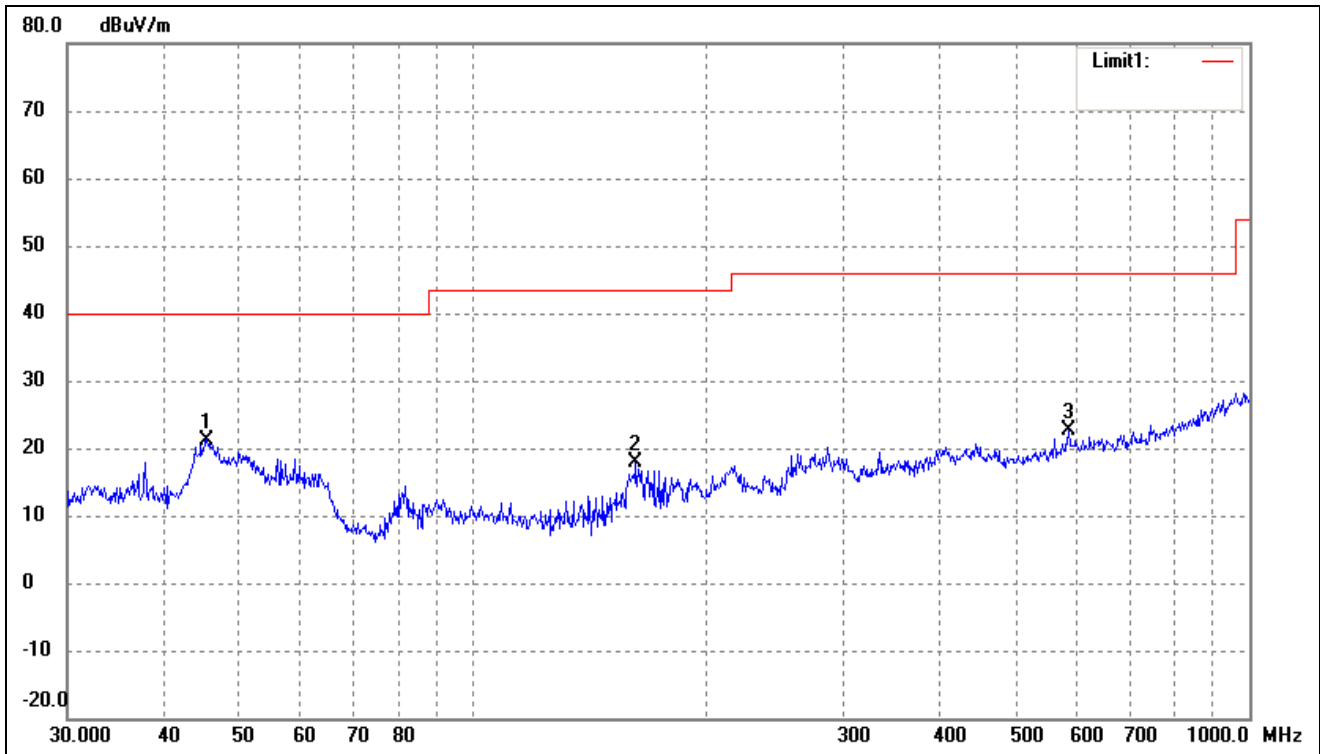
802.11a			
Test Channel	5825MHz	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	189.0743	32.88	-15.17	17.71	43.50	-25.79	98	100	peak
2	260.1444	34.59	-10.94	23.65	46.00	-22.35	238	100	peak
3	408.9460	30.37	-8.54	21.83	46.00	-24.17	93	100	peak
4	1000.0000	27.12	1.50	28.62	54.00	-25.38	80	100	peak

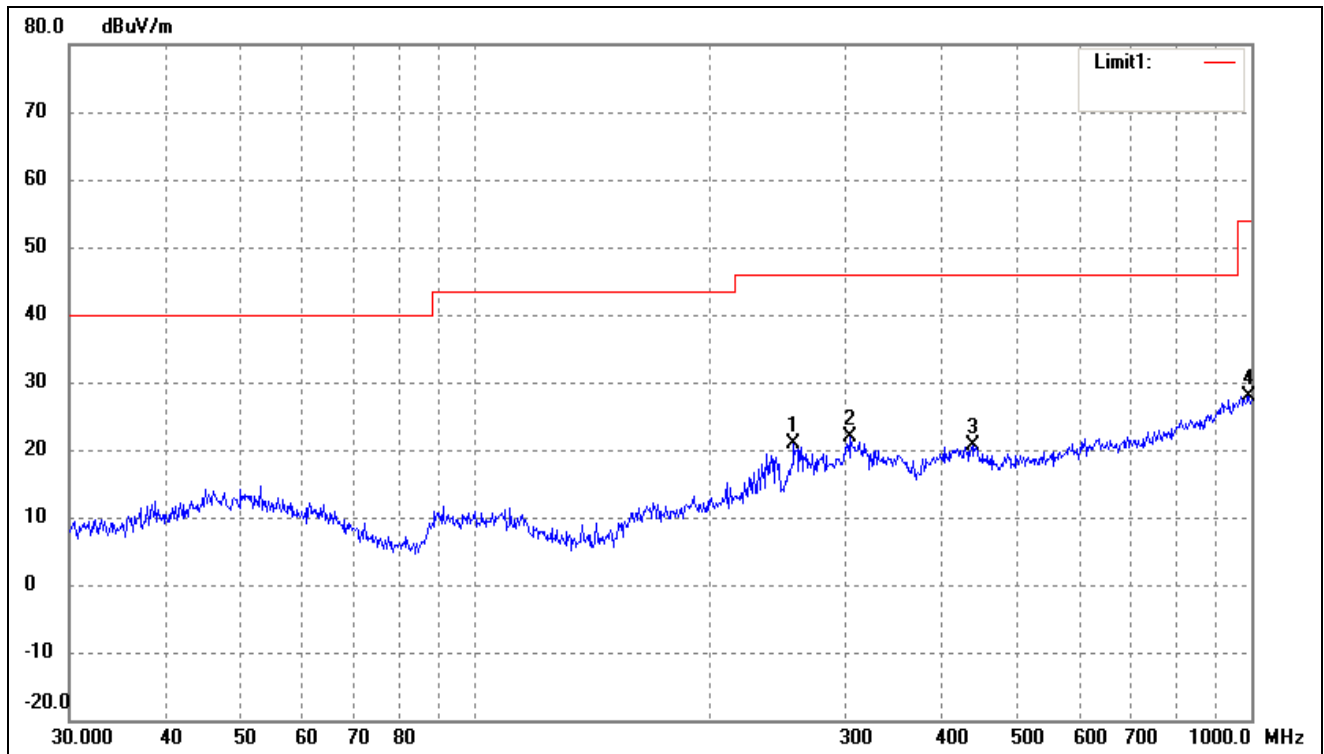
802.11a

Test Channel	5825MHz	Polarity:	Vertical
--------------	---------	-----------	----------



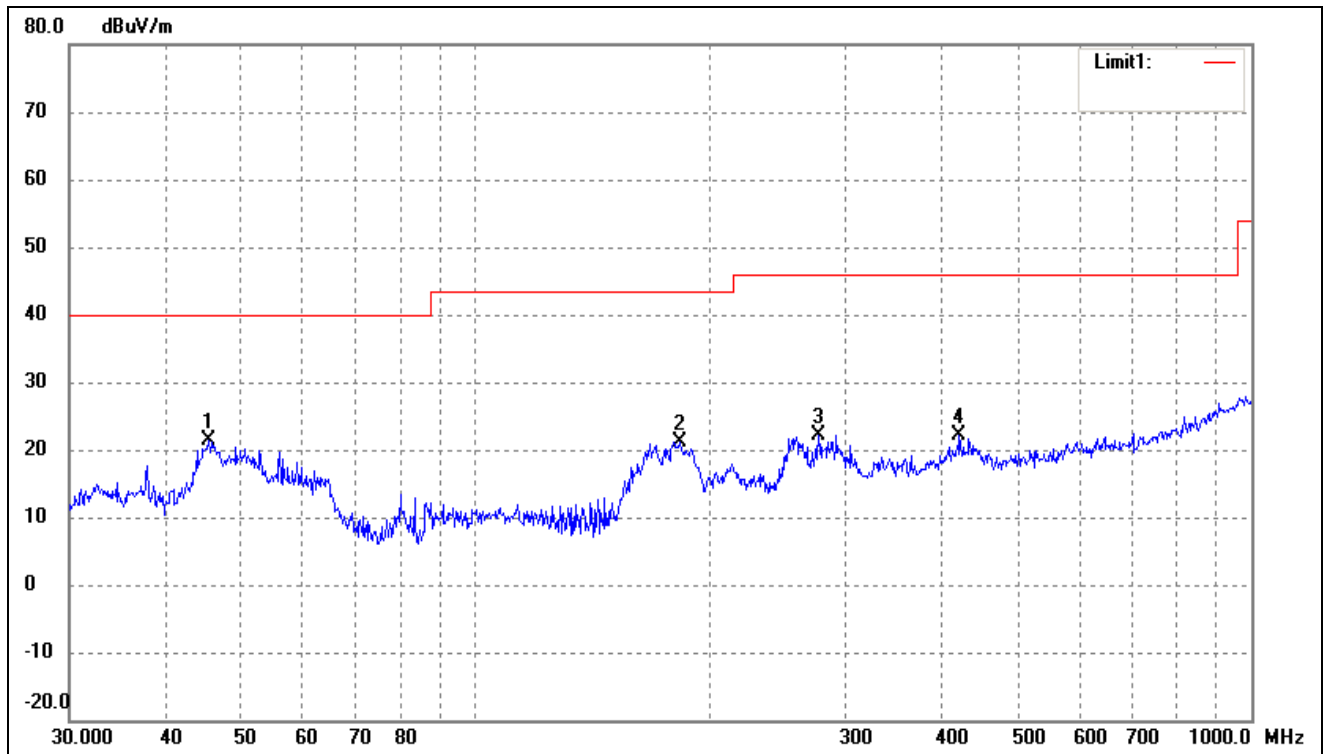
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.3755	35.11	-13.86	21.25	40.00	-18.75	281	100	peak
2	162.0414	35.43	-17.49	17.94	43.50	-25.56	94	100	peak
3	584.7895	29.41	-6.79	22.62	46.00	-23.38	330	100	peak

802.11n-HT20			
Test Channel	5745MHz	Polarity:	Horizontal



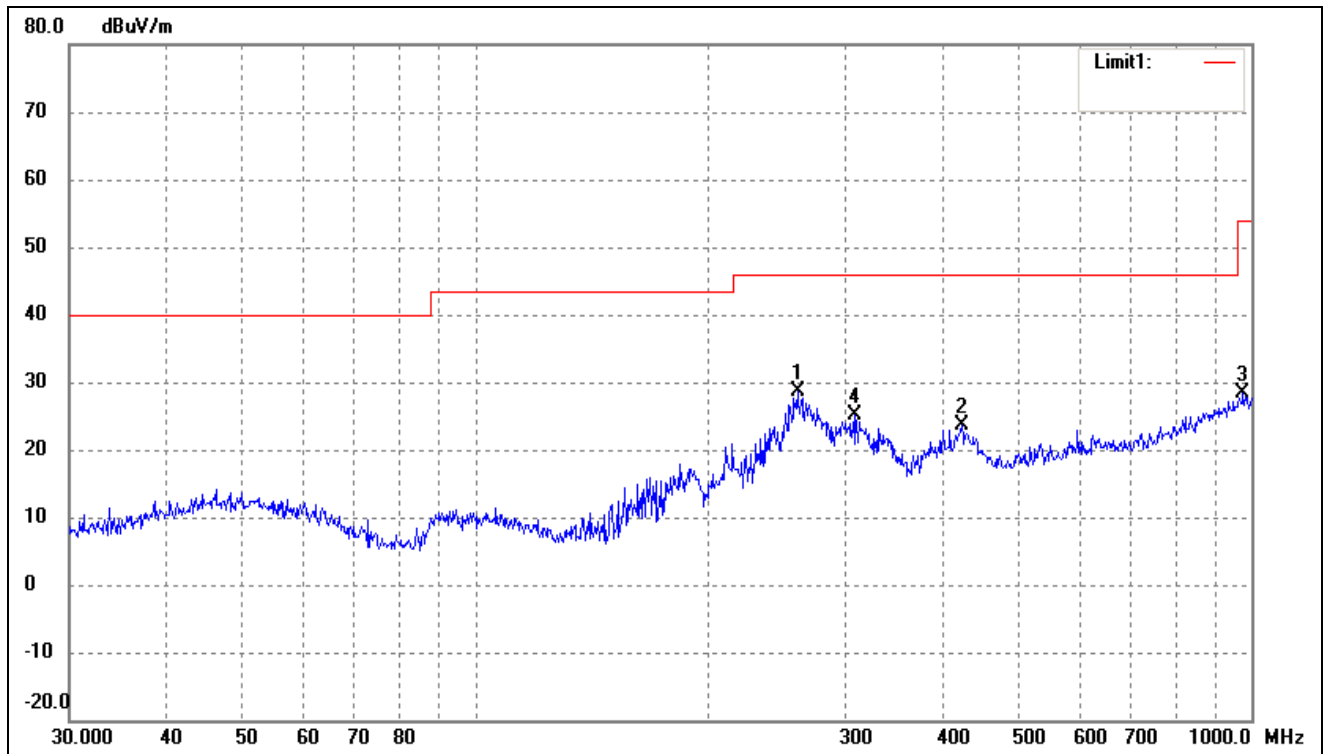
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	257.4222	31.88	-11.10	20.78	46.00	-25.22	63	100	peak
2	304.6099	31.21	-9.28	21.93	46.00	-24.07	199	100	peak
3	437.1199	29.09	-8.38	20.71	46.00	-25.29	66	100	peak
4	993.0114	26.57	1.35	27.92	54.00	-26.08	111	100	peak

802.11n-HT20			
Test Channel	5745MHz	Polarity:	Vertical



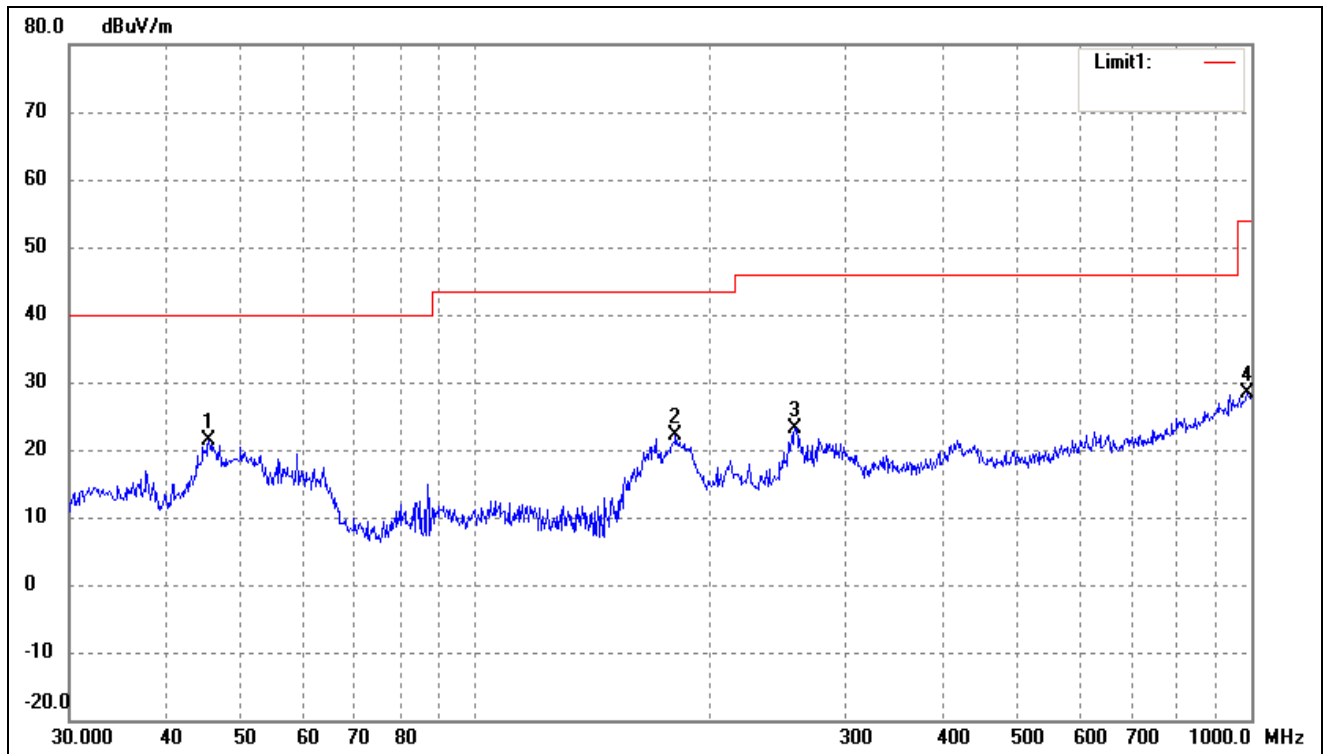
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.3755	35.36	-13.86	21.50	40.00	-18.50	216	100	peak
2	183.2005	36.99	-15.86	21.13	43.50	-22.37	126	100	peak
3	277.0935	32.34	-10.27	22.07	46.00	-23.93	84	100	peak
4	420.5803	30.65	-8.45	22.20	46.00	-23.80	188	100	peak

802.11n-HT20			
Test Channel	5785MHz	Polarity:	Horizontal



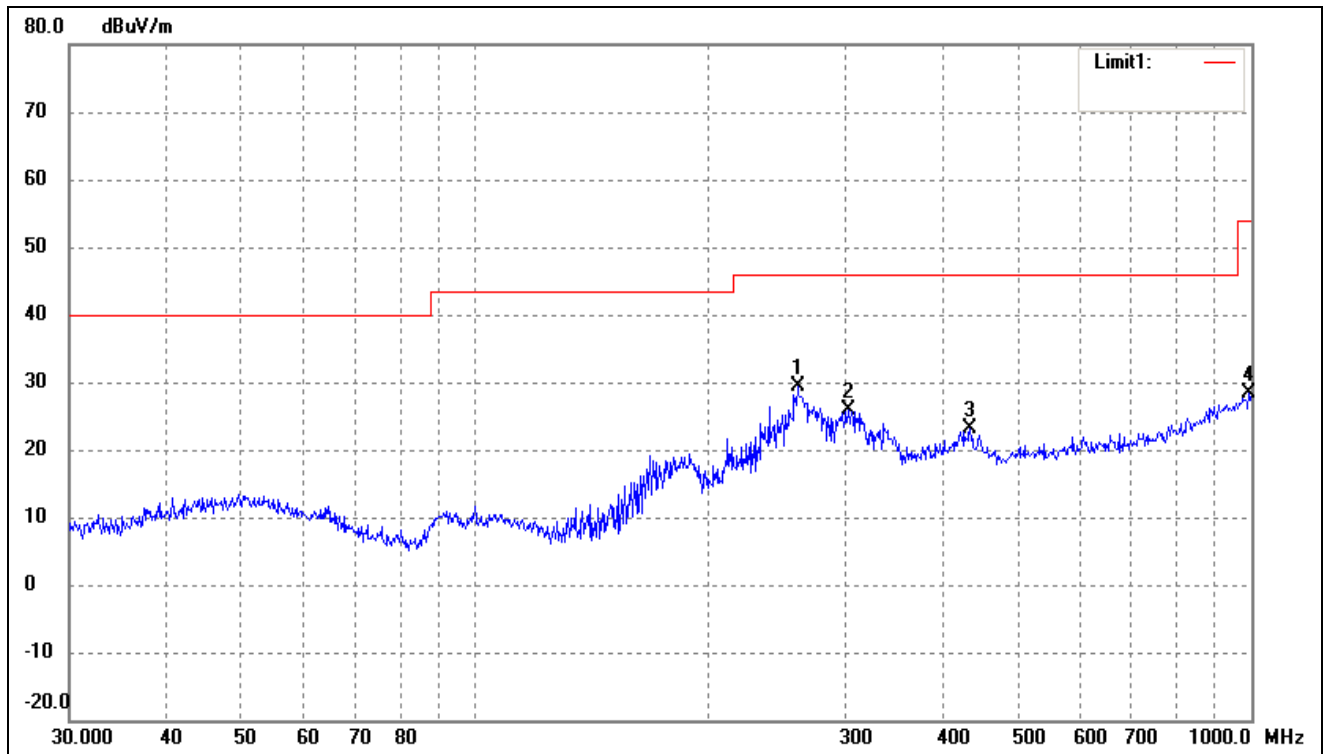
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	260.1444	39.45	-10.94	28.51	46.00	-17.49	94	100	peak
2	423.5403	31.95	-8.40	23.55	46.00	-22.45	138	100	peak
3	975.7529	27.28	1.13	28.41	54.00	-25.59	124	100	peak
4	308.9126	34.60	-9.38	25.22	46.00	-20.78	134	100	peak

802.11n-HT20			
Test Channel	5785MHz	Polarity:	Vertical



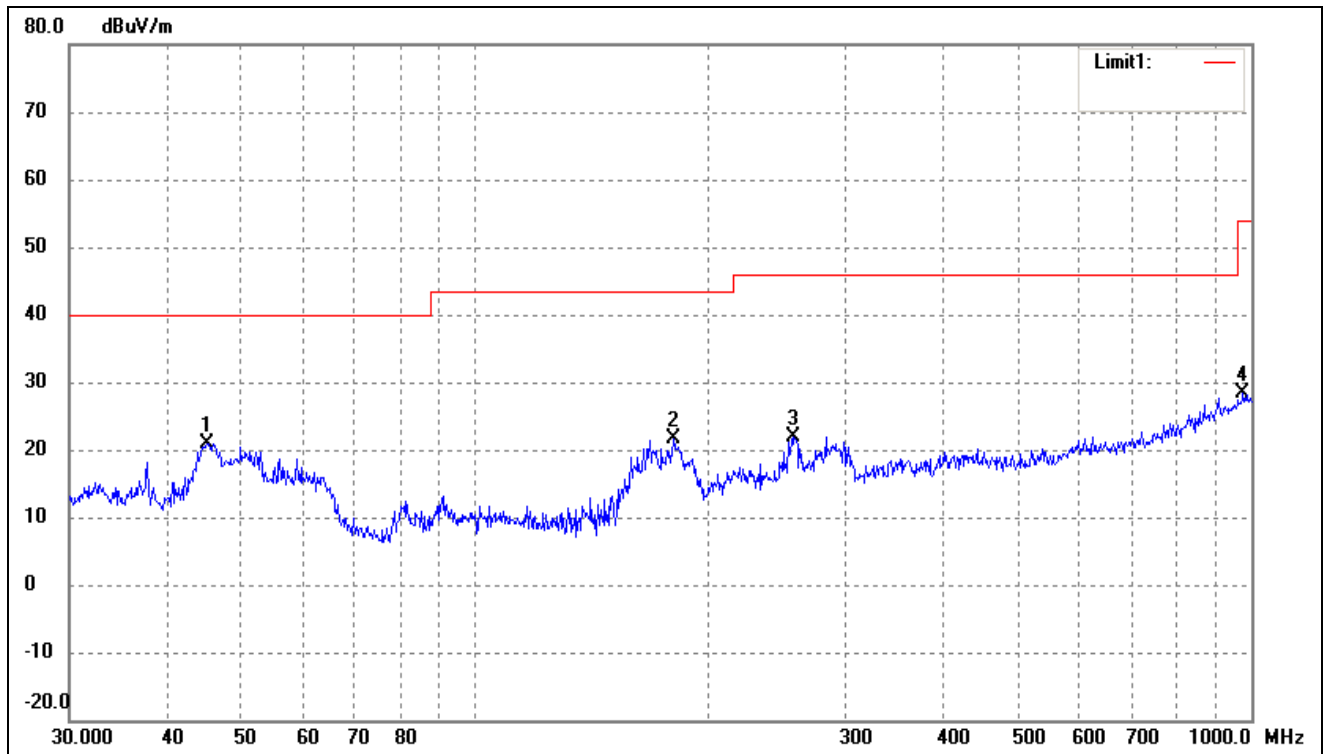
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.3755	35.18	-13.86	21.32	40.00	-18.68	205	100	peak
2	181.2834	38.32	-16.07	22.25	43.50	-21.25	144	100	peak
3	258.3264	34.17	-11.05	23.12	46.00	-22.88	92	100	peak
4	986.0717	27.18	1.30	28.48	54.00	-25.52	271	100	peak

802.11n-HT20			
Test Channel	5825MHz	Polarity:	Horizontal



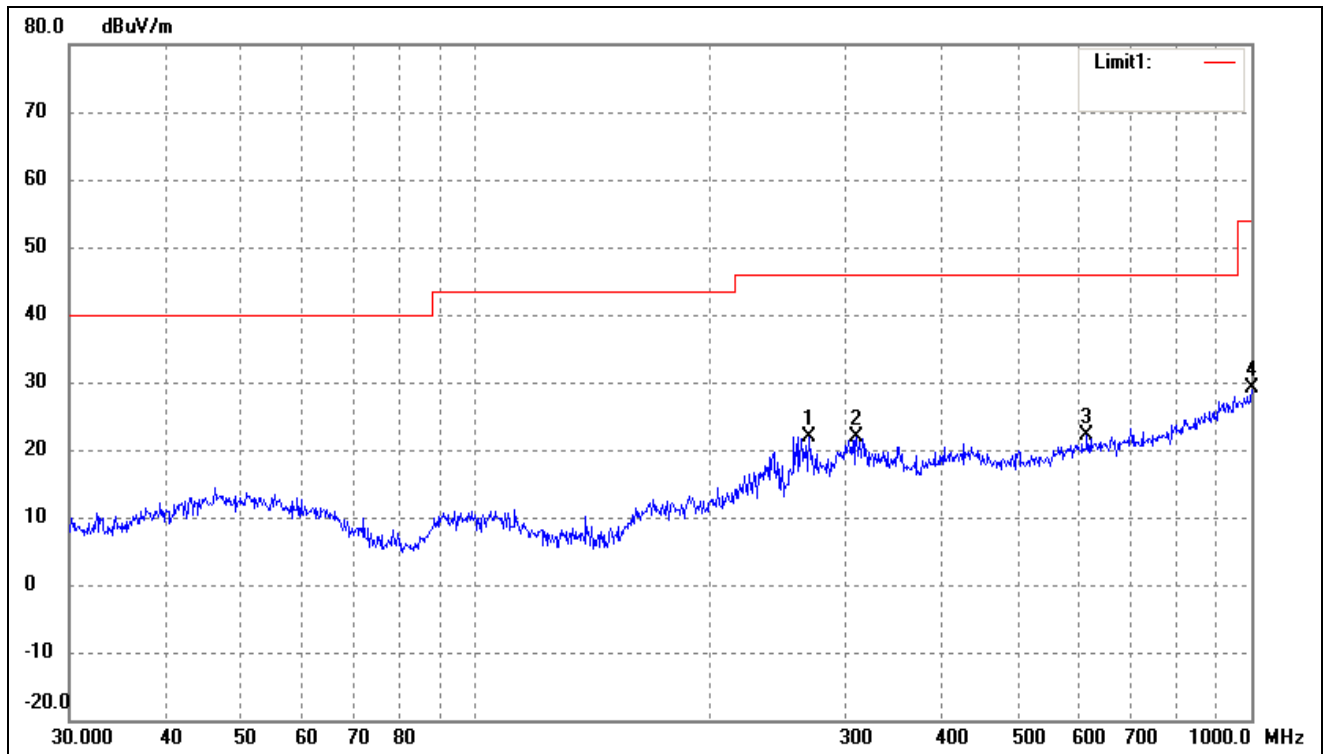
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	260.1444	40.41	-10.94	29.47	46.00	-16.53	94	100	peak
2	302.4812	35.08	-9.21	25.87	46.00	-20.13	138	100	peak
3	434.0651	31.53	-8.34	23.19	46.00	-22.81	124	100	peak
4	993.0114	26.93	1.35	28.28	54.00	-25.72	134	100	peak

802.11n-HT20			
Test Channel	5825MHz	Polarity:	Vertical



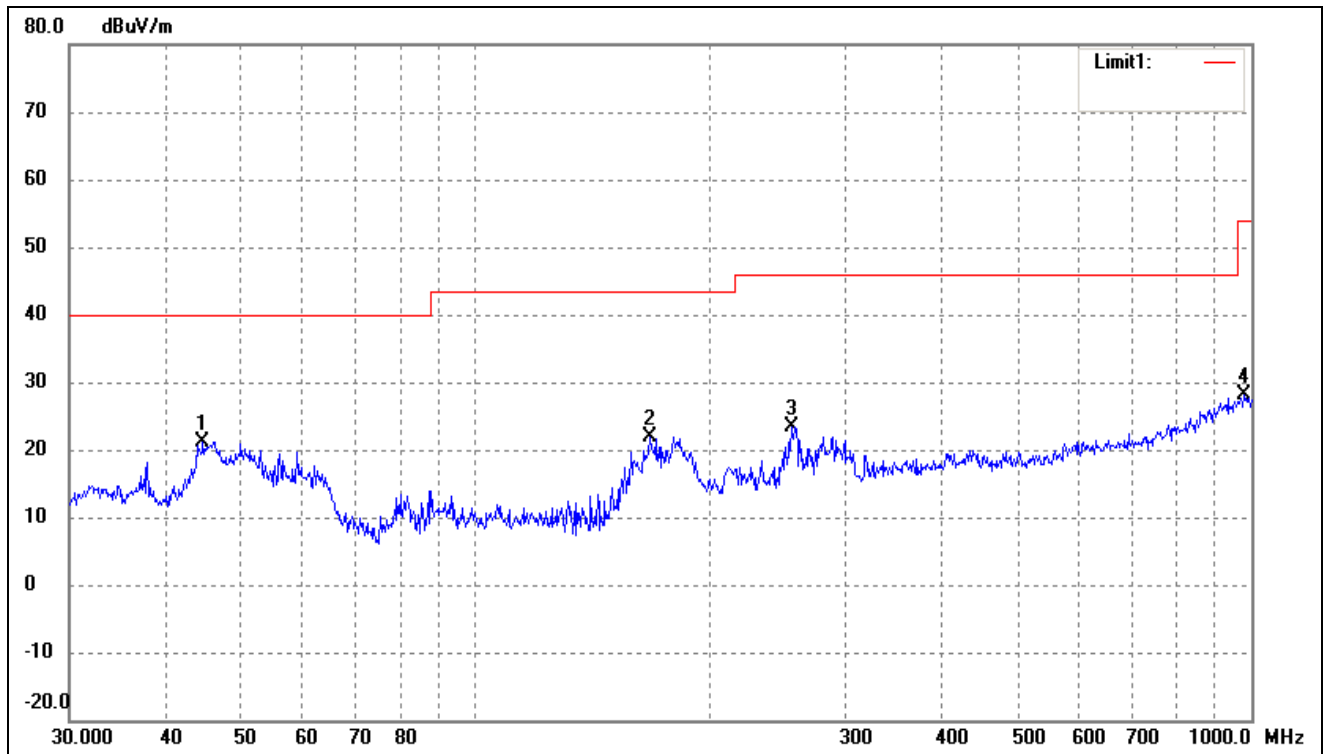
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.0583	34.87	-13.90	20.97	40.00	-19.03	205	100	peak
2	180.0165	37.79	-16.20	21.59	43.50	-21.91	144	100	peak
3	257.4222	33.00	-11.10	21.90	46.00	-24.10	92	100	peak
4	975.7529	27.18	1.13	28.31	54.00	-25.69	271	100	peak

802.11n-HT40			
Test Channel	5755MHz	Polarity:	Horizontal



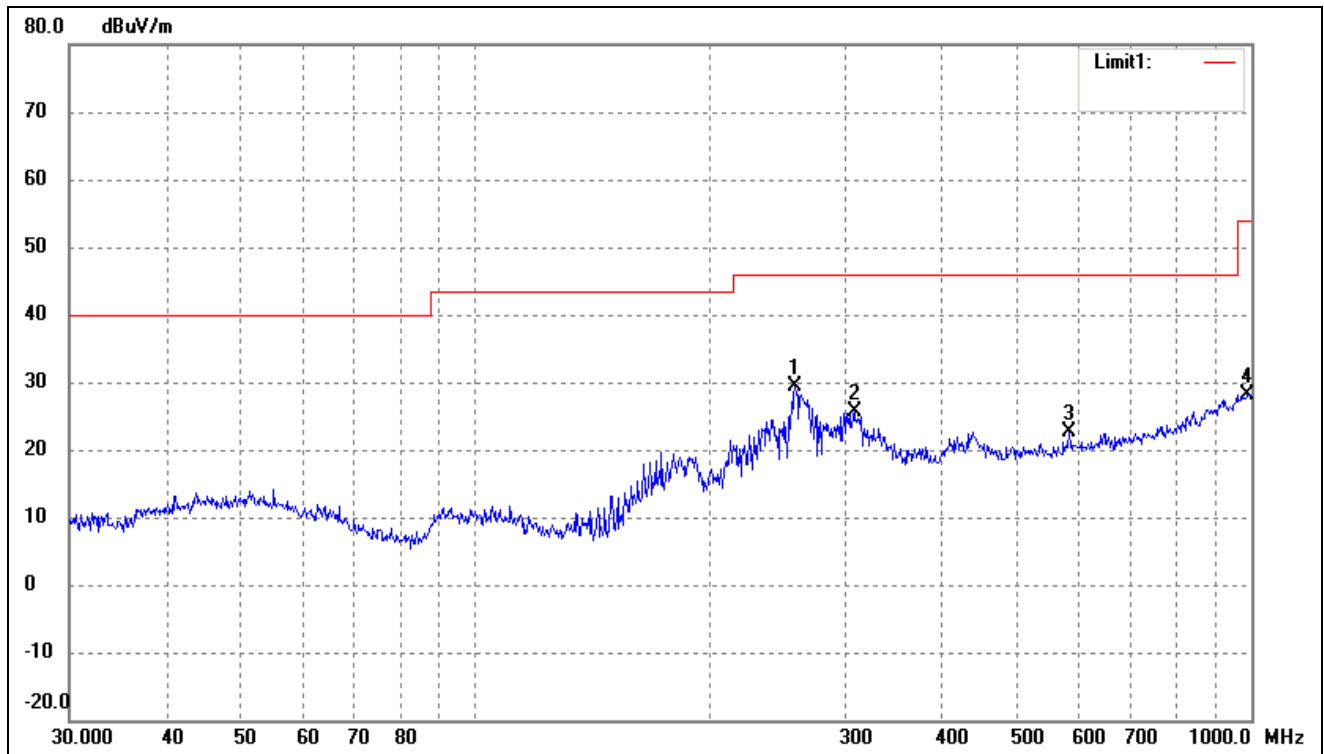
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	269.4284	32.47	-10.54	21.93	46.00	-24.07	94	100	peak
2	309.9977	31.34	-9.41	21.93	46.00	-24.07	138	100	peak
3	614.2142	28.67	-6.50	22.17	46.00	-23.83	124	100	peak
4	1000.0000	27.74	1.50	29.24	54.00	-24.76	134	100	peak

802.11n-HT40			
Test Channel	5755MHz	Polarity:	Vertical



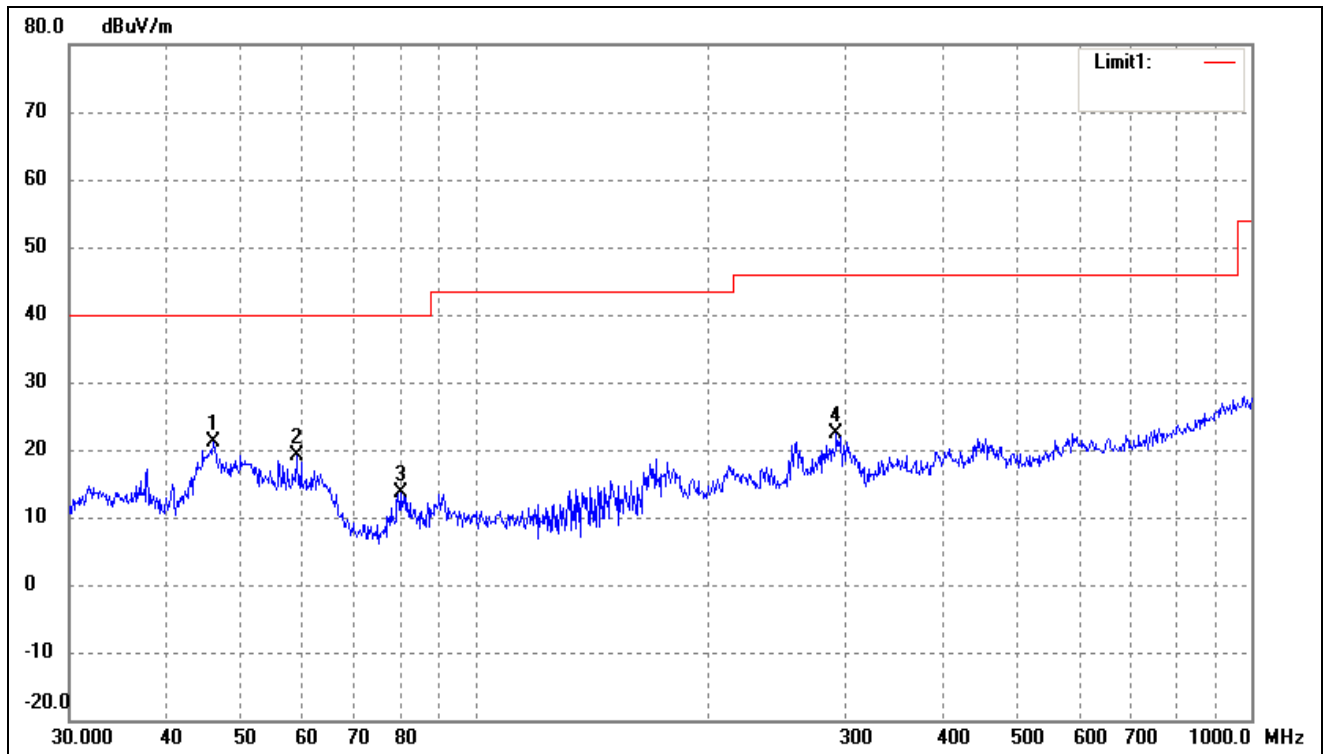
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	44.5868	35.19	-13.95	21.24	40.00	-18.76	244	100	peak
2	167.8243	39.12	-17.16	21.96	43.50	-21.54	161	100	peak
3	255.6231	34.65	-11.21	23.44	46.00	-22.56	143	100	peak
4	979.1804	26.71	1.31	28.02	54.00	-25.98	131	100	peak

802.11n-HT40			
Test Channel	5795MHz	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	258.3264	40.52	-11.05	29.47	46.00	-16.53	276	100	peak
2	307.8313	34.92	-9.35	25.57	46.00	-20.43	91	100	peak
3	582.7425	29.55	-6.84	22.71	46.00	-23.29	56	100	peak
4	989.5355	26.95	1.28	28.23	54.00	-25.77	262	100	peak

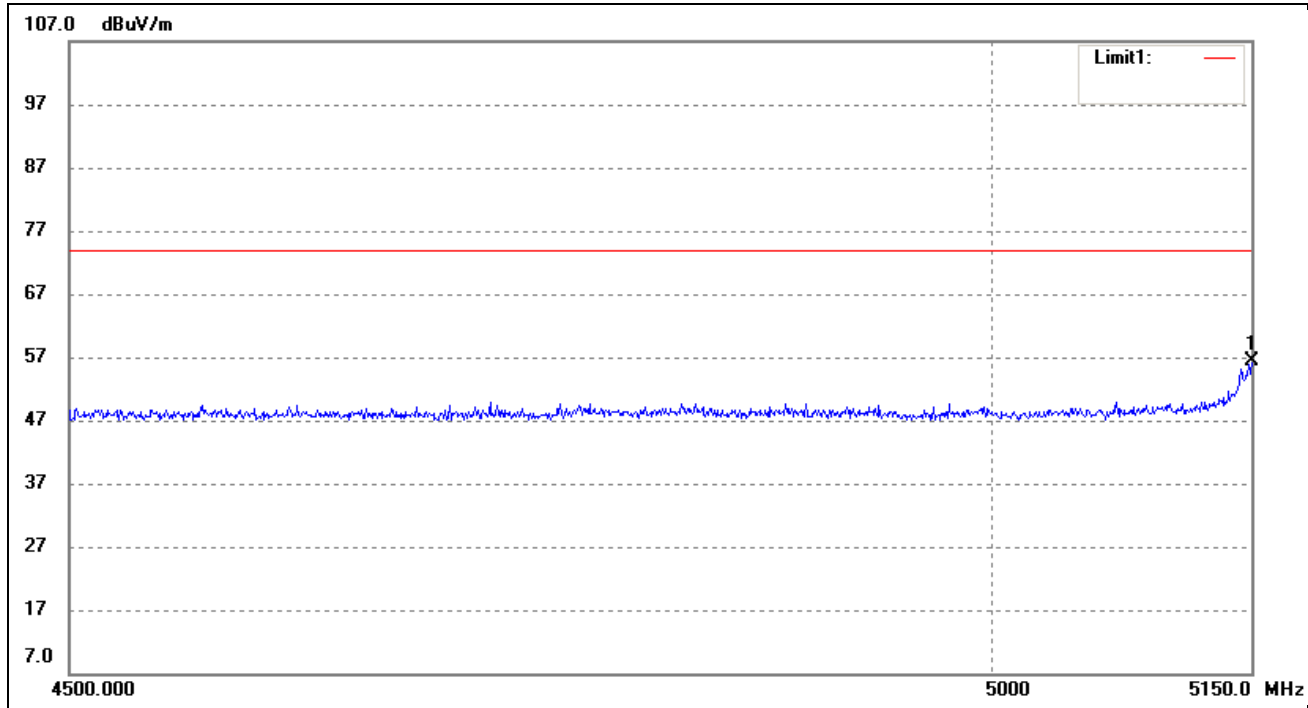
802.11n-HT40			
Test Channel	5795MHz	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.0164	34.85	-13.79	21.06	40.00	-18.94	316	100	peak
2	58.8185	34.46	-15.25	19.21	40.00	-20.79	99	100	peak
3	80.0806	33.63	-19.89	13.74	40.00	-26.26	205	100	peak
4	292.0583	31.92	-9.49	22.43	46.00	-23.57	120	100	peak

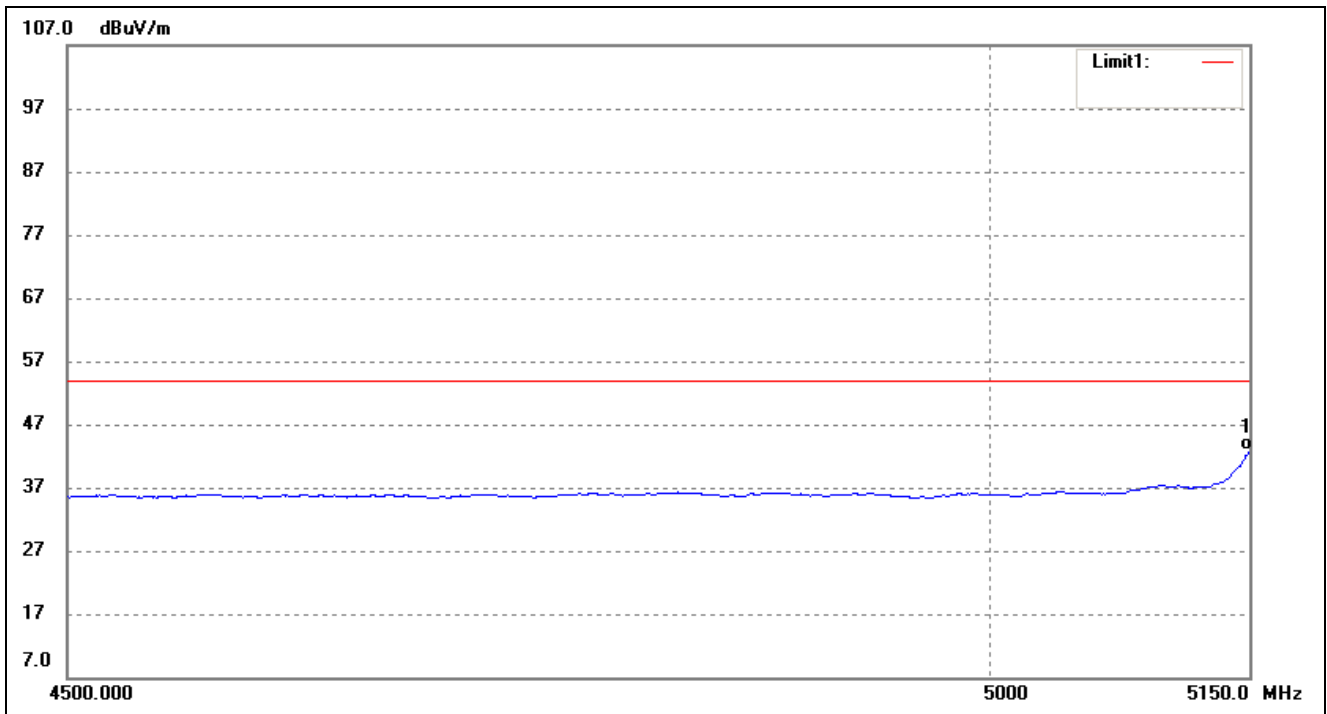
➤ Spurious Emission above 1GHz

802.11a- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	59.47	-2.99	56.48	74.00	-17.52	140	100	peak

802.11a- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Average



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	45.79	-2.99	42.80	54.00	-11.20	171	100	AVG

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

➤ Harmonics And Spurious Emissions for band 5.15-5.25GHz, band 5.725-5.850GHz (802.11a)

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (5180MHz)										
10360	PK	51.32	161	V	40.7	10.9	39.6	63.32	74	-10.68
10360	PK	52.70	325	H	40.7	10.9	39.6	64.70	74	-9.30
10360	AV	35.68	54	V	40.7	10.9	39.6	47.68	54	-6.32
10360	AV	36.21	147	H	40.7	10.9	39.6	48.21	54	-5.79
High Channel (5240MHz)										
10480	PK	52.68	261	V	40.7	10.9	39.6	64.68	74	-9.32
10480	PK	53.01	147	H	40.7	10.9	39.6	65.01	74	-8.99
10480	AV	32.25	296	V	40.7	10.9	39.6	44.25	54	-9.75
10480	AV	33.05	21	H	40.7	10.9	39.6	45.05	54	-8.95
Low Channel (5725MHz)										
11490	PK	51.68	126	V	38.9	9.8	40.1	60.28	74	-13.72
11490	PK	52.65	32	H	38.9	9.8	40.1	61.25	74	-12.75
11490	AV	33.58	147	V	38.9	9.8	40.1	42.18	54	-11.82
11490	AV	31.51	18	H	38.9	9.8	40.1	40.11	54	-13.89
High Channel (5825MHz)										
11610	PK	52.25	301	V	38.9	9.8	40.1	60.85	74	-13.15
11610	PK	51.75	102	H	38.9	9.8	40.1	60.35	74	-13.65
11610	AV	33.98	54	V	38.9	9.8	40.1	42.58	54	-11.42
11610	AV	33.47	325	H	38.9	9.8	40.1	42.07	54	-11.93

➤ Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-45.32	-27
Highest	Above 5350	-54.31	-27

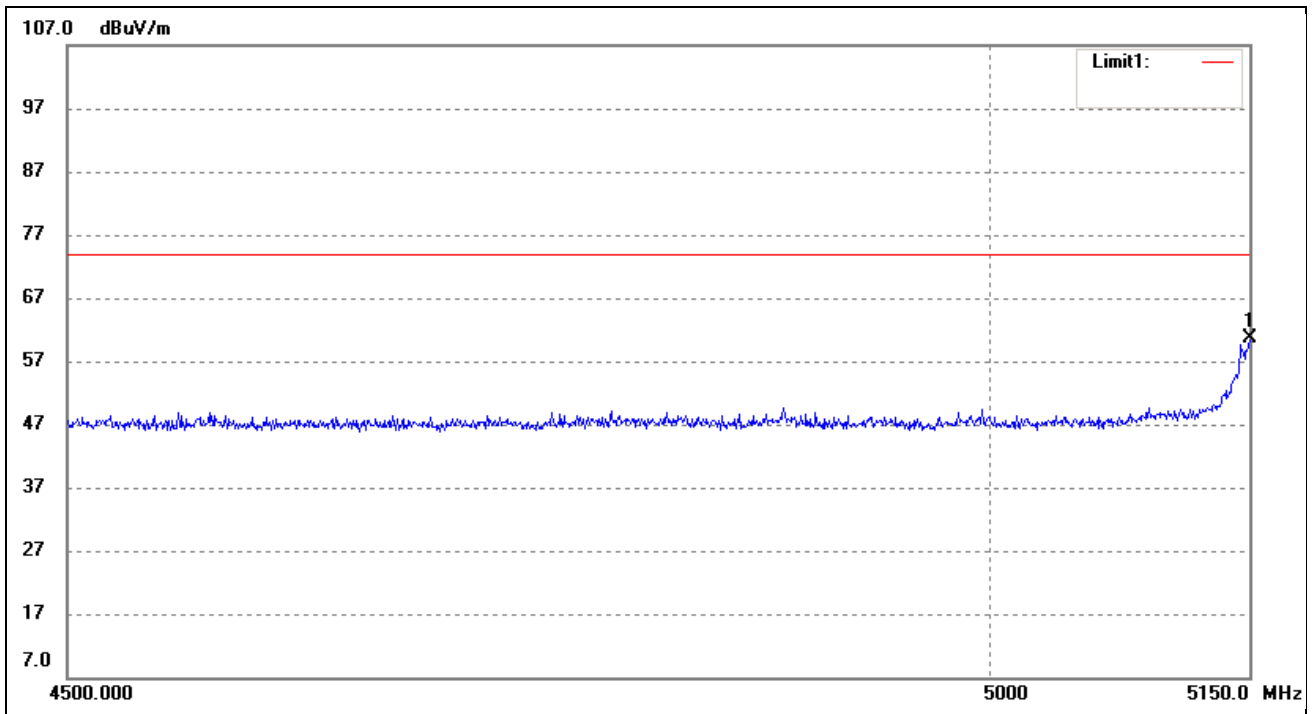
Note: the data just list the worst cases

➤ Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-45.32	-27
	5715 to 5725	-54.31	-17
Highest	5850 to 5860	-45.32	-17
	Above 5860	-54.31	-27

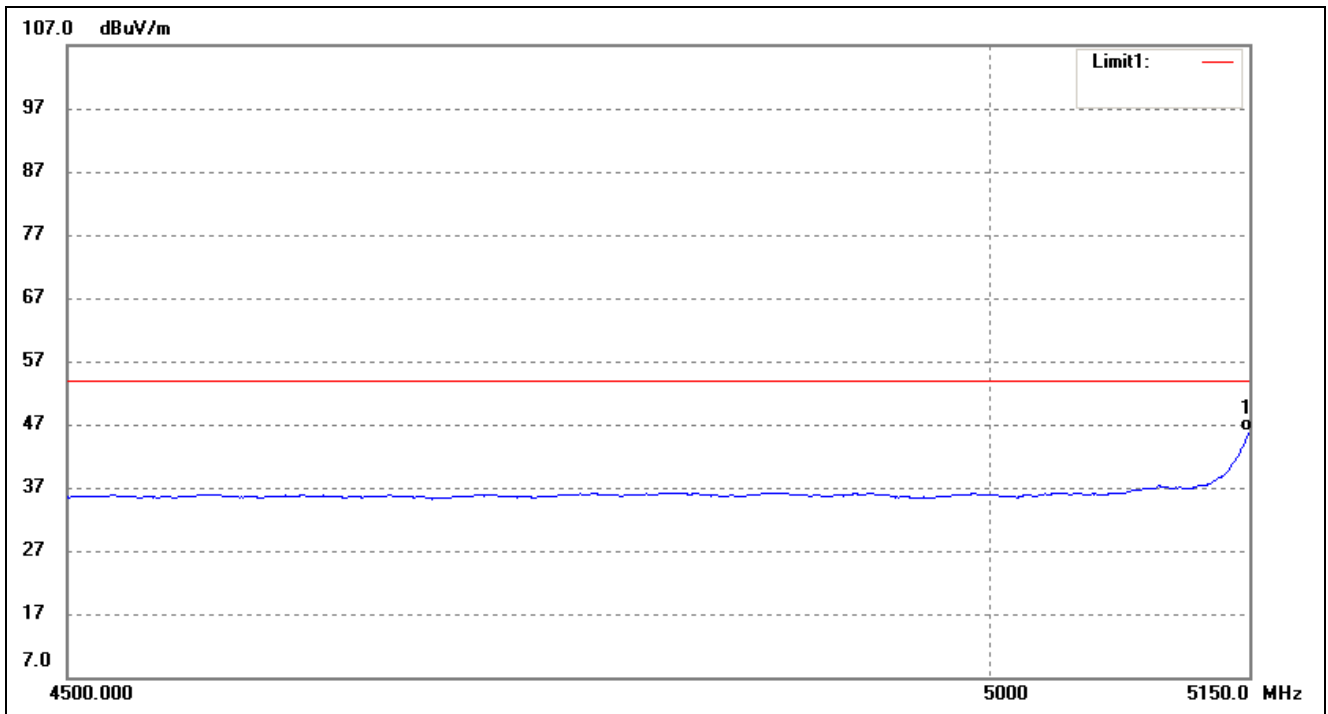
Note: the data just list the worst cases

802.11n HT20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	63.58	-2.99	60.59	74.00	-13.41	160	100	peak

802.11n HT20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Average



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	48.83	-2.99	45.84	54.00	-8.16	151	100	AVG

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

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

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (5180MHz)										
10360	PK	50.65	165	V	40.7	10.9	39.6	62.65	74	-11.35
10360	PK	51.41	223	H	40.7	10.9	39.6	63.41	74	-10.59
10360	AV	33.25	214	V	40.7	10.9	39.6	45.25	54	-8.75
10360	AV	33.71	54	H	40.7	10.9	39.6	45.71	54	-8.29
High Channel (5240MHz)										
10480	PK	51.32	265	V	40.7	10.9	39.6	63.32	74	-10.68
10480	PK	52.30	20	H	40.7	10.9	39.6	64.30	74	-9.70
10480	AV	34.05	115	V	40.7	10.9	39.6	46.05	54	-7.95
10480	AV	33.54	64	H	40.7	10.9	39.6	45.54	54	-8.46
Low Channel (5745MHz)										
11490	PK	52.14	250	V	38.9	9.8	40.1	60.74	74	-13.26
11490	PK	51.02	111	H	38.9	9.8	40.1	59.62	74	-14.38
11490	AV	33.65	148	V	38.9	9.8	40.1	42.25	54	-11.75
11490	AV	33.47	314	H	38.9	9.8	40.1	42.07	54	-11.93
High Channel (5825MHz)										
11610	PK	53.25	195	V	38.9	9.8	40.1	61.85	74	-12.15
11610	PK	51.14	125	H	38.9	9.8	40.1	59.74	74	-14.26
11610	AV	33.02	153	V	38.9	9.8	40.1	41.62	54	-12.38
11610	AV	33.21	120	H	38.9	9.8	40.1	41.81	54	-12.19

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-44.55	-27
Highest	Above 5350	-42.32	-27

Note: the data just list the worst cases

- Out of Band edge for 5725-5850MHz

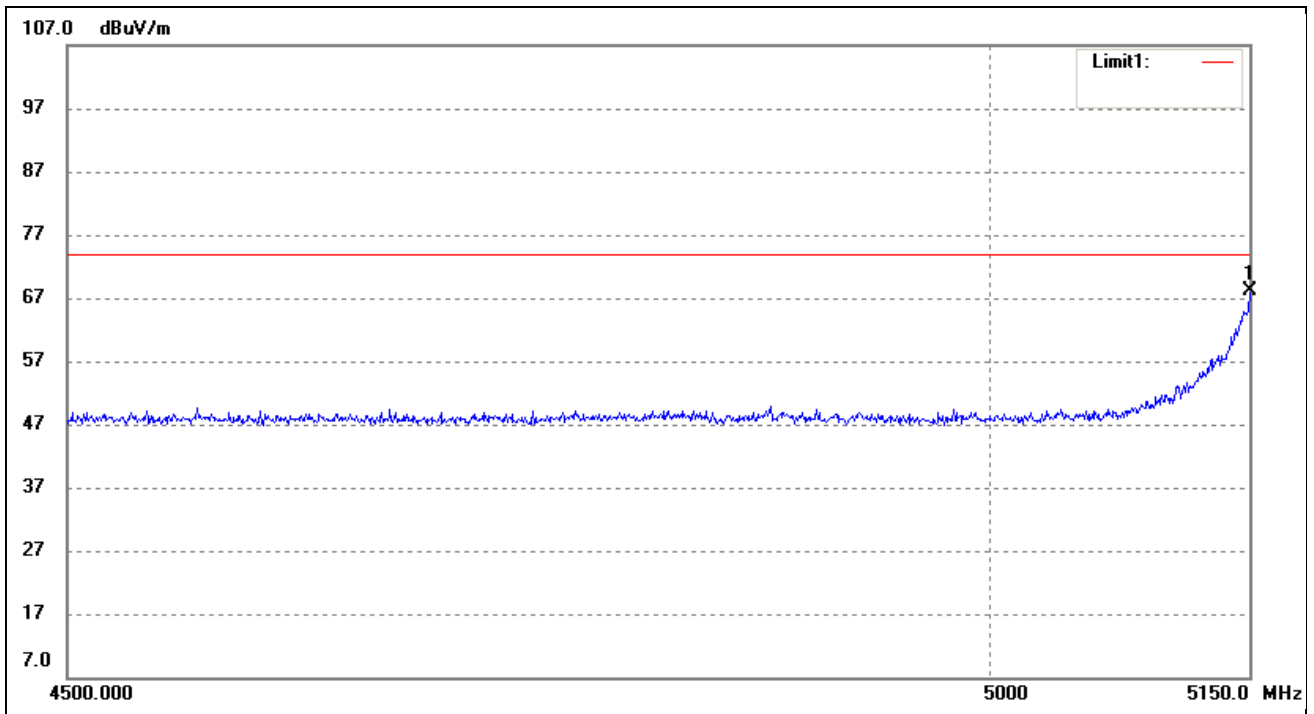
Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-39.63	-27
	5715 to 5725	-38.32	-17
Highest	5850 to 5860	-41.02	-17
	Above 5860	-42.36	-27

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.

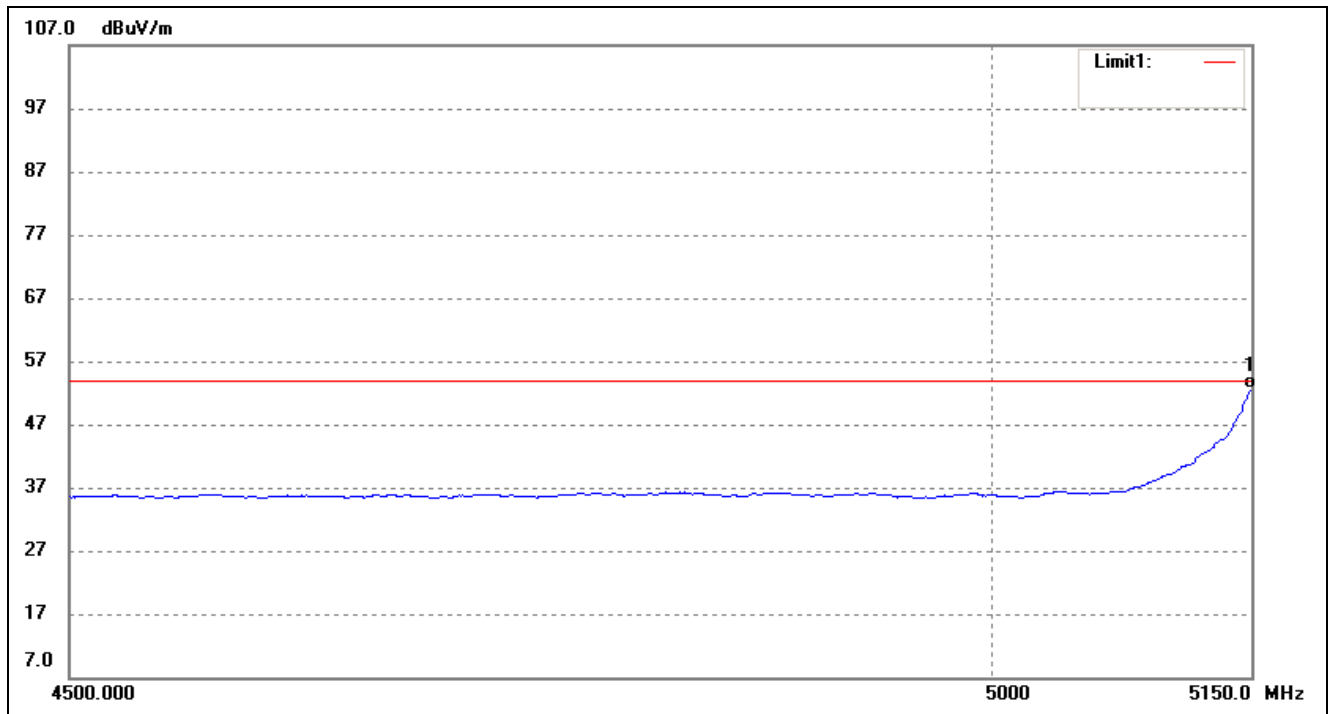
802.11n HT40- Restricted Bandedge

Test Channel	band 5.15-5.25GHz	Polarity:	Peak
--------------	-------------------	-----------	------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	71.19	-2.99	68.20	74.00	-5.80	137	100	peak

802.11n HT40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Average



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	5150.000	55.68	-2.99	52.69	54.00	-1.31	178	100	AVG

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

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

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (5190MHz)										
10380	PK	48.35	174	V	40.7	10.9	39.6	60.35	74	-13.65
10380	PK	49.02	12	H	40.7	10.9	39.6	61.02	74	-12.98
10380	AV	31.22	192	V	40.7	10.9	39.6	43.22	54	-10.78
10380	AV	32.02	221	H	40.7	10.9	39.6	44.02	54	-9.98
High Channel (5230MHz)										
10460	PK	47.65	155	V	38.9	9.8	40.1	56.25	74	-17.75
10460	PK	48.35	214	H	38.9	9.8	40.1	56.95	74	-17.05
10460	AV	31.28	26	V	38.9	9.8	40.1	39.88	54	-14.12
10460	AV	32.25	58	H	38.9	9.8	40.1	40.85	54	-13.15
Low Channel (5755MHz)										
11510	PK	47.14	159	V	38.9	9.8	40.1	55.74	74	-18.26
11510	PK	47.68	232	H	38.9	9.8	40.1	56.28	74	-17.72
11510	AV	33.62	147	V	38.9	9.8	40.1	42.22	54	-11.78
11510	AV	31.21	26	H	38.9	9.8	40.1	39.81	54	-14.19
High Channel (5795MHz)										
11590	PK	46.12	214	V	38.9	9.8	40.1	54.72	74	-19.28
11590	PK	48.32	147	H	38.9	9.8	40.1	56.92	74	-17.08
11590	AV	32.85	238	V	38.9	9.8	40.1	41.45	54	-12.55
11590	AV	33.52	128	H	38.9	9.8	40.1	42.12	54	-11.88

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-36.78	-27
Highest	Above 5350	-39.65	-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	-40.65	-27
	5715 to 5725	-38.25	-17
Highest	5850 to 5860	-42.35	-17
	Above 5860	-41.47	-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

802.11a

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	138	0.0265
100%		-20	121	0.0233
100%		-10	114	0.0219
100%		0	106	0.0204
100%		+10	87	0.0167
100%		+20	105	0.0202
100%		+30	121	0.0233
100%		+40	120	0.0231
100%		+50	97	0.0187
Low Battery power	3.50	+20	118	0.0227
High Battery power	4.35	+20	124	0.0238

802.11n_HT20

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	125	0.0240
100%		-20	132	0.0254
100%		-10	117	0.0225
100%		0	106	0.0204
100%		+10	97	0.0187
100%		+20	121	0.0233
100%		+30	105	0.0202
100%		+40	118	0.0227
100%		+50	135	0.0260
Low Battery power	3.50	+20	125	0.0240
High Battery power	4.35	+20	124	0.0238

802.11n_HT40

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	128	0.0245
100%		-20	147	0.0281
100%		-10	121	0.0231
100%		0	124	0.0237
100%		+10	132	0.0252
100%		+20	116	0.0222
100%		+30	108	0.0207
100%		+40	102	0.0195
100%		+50	134	0.0256
Low Battery power	3.50	+20	102	0.0195
High Battery power	4.35	+20	110	0.0210

802.11a

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	147	0.0254
100%		-20	125	0.0216
100%		-10	121	0.0209
100%		0	117	0.0202
100%		+10	105	0.0182
100%		+20	132	0.0228
100%		+30	124	0.0214
100%		+40	102	0.0176
100%		+50	152	0.0263
Low Battery power	3.50	+20	115	0.0199
High Battery power	4.35	+20	113	0.0195

802.11n_HT20

U-NII-3:5725-5850MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.85	-30	124	0.0214
100%		-20	122	0.0211
100%		-10	142	0.0245
100%		0	128	0.0221
100%		+10	121	0.0209
100%		+20	115	0.0199
100%		+30	125	0.0216
100%		+40	118	0.0204
100%		+50	112	0.0194
Low Battery power	3.50	+20	125	0.0216
High Battery power	4.35	+20	121	0.0209

802.11n_HT40

U-NII-3:5725-5850MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(°C)	Freq.Dev(Hz)	Deviation
100%	3.85	-30	114	0.0198
100%		-20	103	0.0179
100%		-10	145	0.0252
100%		0	144	0.0250
100%		+10	121	0.0210
100%		+20	123	0.0214
100%		+30	115	0.0200
100%		+40	121	0.0210
100%		+50	112	0.0195
Low Battery power	3.50	+20	114	0.0198
High Battery power	4.35	+20	132	0.0229

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