FCC PART 15E TEST REPORT FOR CERTIFICATION
On Behalf of

AUDIO PRO AB

WIRELESS MULTIROOM LOUDSPEAKER

Model Number: A38

Additional Model: A28

FCC ID: 2AGNC-A38

Applicant:	Audio Pro AB
Address:	Garnisonsgatan 52, 25466 Helsingborg, Sweden
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
Tel: 86-769-83081888-808	

Report Number:	ESTE-R2112045
Date of Test:	Sep. 09~Dec. 07, 2021
Date of Report:	Dec. 09, 2021

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Description Page

EST Technology Co., Ltd.

Applicant: **Address:**	Audio Pro AB Garnisonsgatan 52, 25466 Helsingborg, Sweden
Manufacturer: **Address:**	Audio Pro AB Garnisonsgatan 52, 25466 Helsingborg, Sweden
E.U.T:	WIRELESS MULTIROOM LOUDSPEAKER
Model Number:	A38
Additional Model:	A28 Note: The products are only different the model number, power board and appearance of size, the rest is identical.
Power Supply:	AC 100~240V, 50-60Hz
Trade Name:	audio pro Serial No.: ------
Date of Receipt:	Sep. 09, 2021 Date of Test: Sep. 09~Dec. 07, 2021
Test Specification:	FCC Part 15 Subpart E 15.407 ANSI C63.10:2013 FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 FCC KDB 662911 D01 Multiple Transmitter Output v02r01
Test Result:	The device described above is tested by EST Technology Co., Ltd. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart E requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd. **Date: Dec. 09, 2021**

Prepared by:	Reviewed by:	Approved by:
Ring Yang / Assistant	Seven Wang / Engineer	Iceman Hu / Manager

Other Aspects:
None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

FCC ID	:	2AGNC-A38	
Product Name	:	WIRELESS MULTIROOM LOUDSPEAKER	
Model Number	:	A38	
Software Version	:	TR1	
Hardware Version	:	V1.0	
Operation frequency	:	U-NII-1: 5150 MHz~5250 MHz U-NII-3: 5725 MHz~5850 MHz	
Number of channel	:	U-NII-1: IEEE 802.11a / n HT20 / ac VHT20: 4 Channels; IEEE 802.11n HT40 / ac VHT40: 2 Channels; IEEE 802.11ac VHT80: 1 Channel. U-NII-3: IEEE 802.11a / n HT20 / ac VHT20: 5 Channels; IEEE 802.11n HT40 / ac VHT40: 2 Channels; IEEE 802.11ac VHT80: 1 Channel.	
Modulation	:	OFDM(QPSK, BPSK, 16-QAM, 64-QAM,256-QAM)	
Transmit Data Rate	:	IEEE 802.11a: 54, 48, 36, 24, 18, 12, 9, 6Mbps; IEEE 802.11n: up 150Mbps; IEEE 802.11ac: up to 433.3Mbps;	
Channels Spacing	:	IEEE 802.11a: 20MHz; IEEE 802.11n HT20: 20MHz; IEEE 802.11n HT40: 40MHz; IEEE 802.11ac VHT20: 20MHz; IEEE 802.11ac VHT40: 40MHz; IEEE 802.11ac VHT80: 80MHz;	
Transmit Power	:	U-NII-1	IEEE 802.11a: 14.41dBm IEEE 802.11n HT20: 16.93dBm IEEE 802.11n HT40: 14.96dBm IEEE 802.11ac VHT20: 16.91dBm IEEE 802.11ac VHT40: 15.23dBm IEEE 802.11ac VHT80: 14.84dBm
		U-NII-3	IEEE 802.11a: 14.37dBm IEEE 802.11n HT20: 16.46dBm IEEE 802.11n HT40: 15.01dBm IEEE 802.11ac VHT20: 16.41dBm IEEE 802.11ac VHT40: 15.09dBm IEEE 802.11ac VHT80: 13.82dBm
Sample Type	:	Prototype production	

Note:

For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

1.2. The antenna information for EUT

Ant No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	-	-	Internal antenna	-	2
2	-	-	Internal antenna	-	2

Remark:

(1) The EUT can work as CDD mode in IEEE 802.11n and IEEE 802.11ac,and can operate with one spatial stream.
According to KDB 662911 F 2) f) (i):
Directional gain=2dBi+10×log(2/1)dB=5.01dBi＜6dBi
So,the output power limit and power spectral density no need to be reduced.

(2) After pre-test all antenna configurations,the worst case configuration as list below.
(3) This information is provided by the applicant.

ANT No. / TX Mode	SISO Configuration	MIMO Configuration
IEEE 802.11a	ANT 1 and Ant 2	/
IEEE 802.11n HT20	/	ANT1+ANT2
IEEE 802.11n HT40	/	ANT1+ANT2
IEEE 802.11ac VHT20	/	ANT1+ANT2
IEEE 802.11ac VHT40	/	ANT1+ANT2
IEEE 802.11ac VHT80	/	ANT1+ANT2

1.3. Information of RF Cable

Cable Loss(dB)	Provided by
1.0	Audio Pro AB
Note: 1.The customer declared the loss value of the RF Cable, and the test results of this report only apply to the sample as received. 2. This information is provided by the applicant.	

2. SUMMARY OF TEST

2.1. Summary of test result

Report Section	Description of Test Item	FCC Standard Section	Results
3	6dB Bandwidth &26dB Bandwidth & 99% Occupied Bandwidth	15.407(a) 15.407(e)	PASS
4	Maximum Conducted Output Power	15.407(a)	PASS
5	Peak Power Spectral Density	15.407(a)	PASS
6	Unwanted Emissions and Band Edge	15.205 15.209 15.407(b)	PASS
7	Frequency Stability	15.407(g)	PASS
8	AC Power Line Conducted Emissions	15.207 15.407(b)(9)	PASS
9	Antenna Requirement	15.203	PASS

Note:

(1) "N/A" denotes test is not applicable in this test report.

(2) The only differences between the model A38 and A28 are that the size of appearance of the shell and the power supply PCB board. Their main PCB board, RF module and others are electrically identical. So A38 ran all the tests, A28 is only test radiated emission (30-1000MHz) and AC power conducted emission. The report only shows the worst case for the A38.

2.2. Test Facilities

EMC Lab : Certificated by CNAS, CHINA
Registration No.: L5288
This Certificate is valid until: November 12, 2023

Certificated by FCC, USA
Designation Number: CN1215
This Certificate is valid until: January 31, 2022

Certificated by A2LA, USA
Registration No.: 4366.01
This Certificate is valid until: January 31, 2022

Certificated by Industry Canada
CAB identifier No.: CN0035
This Certificate is valid until: January 31, 2022

Certificated by VCCI, Japan
Registration No.:C-14103; T-20073; R-13663;
R-20103; G-20097
Date of registration: Apr. 20, 2020
This Certificate is valid until: Apr. 19, 2023

Certificated by TUV Rheinland, Germany
Registration No.: UA 50413872 0001
Date of registration: July 31, 2018

Certificated by Intertek
Registration No.: 2011-RTL-L2-64
Date of registration: November 08, 2018

Name of Firm : EST Technology Co., Ltd.

Site Location : Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

2.3. Measurement uncertainty for EST Technology Co., Ltd.

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.54dB
Uncertainty for Radiation Emission test (30MHz-1GHz)	3.62
Uncertainty for Radiation Emission test (1GHz to 18GHz)	4.86
Uncertainty for spurious emissions test (18GHz to 40GHz)	4.67
Uncertainty for radio frequency	7×10-8
Uncertainty for conducted RF Power	1.08dB
Uncertainty for Power density test	0.26dB
Temperature	±0.6℃
Humidity	±4.0 %
Volatage DC	±1.0%
Volatage (AC, <10KHz)	±1.5%

Note:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

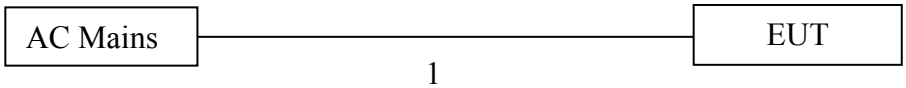
2.4. Assistant equipment used for test

Item	Equipment	Brand	Model Name/Type No.	FCC ID	Series No.
-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.8m	AC Cable

2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground.



AC 120V/60Hz

(EUT: WIRELESS MULTIROOM LOUDSPEAKER)

2.6. Test Mode

Pre-scan has been combined all possible modulations and date rates to determine the worst case test mode,the worst case test mode was selected for the final test as listed below.

Test Item	Test Mode	Channel	Modulation	Data rate
6dB Bandwidth	IEEE 802.11a	149/157/165	OFDM	6Mbps
	IEEE 802.11n HT20	149/157/165	OFDM	MCS0
	IEEE 802.11n HT40	151/159	OFDM	MCS0
	IEEE 802.11ac VHT20	149/157/165	OFDM	MCS0
	IEEE 802.11ac VHT40	151/159	OFDM	MCS0
	IEEE 802.11ac VHT80	155	OFDM	MCS0
26dB Bandwidth	IEEE 802.11a	36/40/48	OFDM	6Mbps
	IEEE 802.11n HT20	36/40/48	OFDM	MCS0
	IEEE 802.11n HT40	38/46	OFDM	MCS0
	IEEE 802.11ac VHT20	36/40/48	OFDM	MCS0
	IEEE 802.11ac VHT40	38/46	OFDM	MCS0
	IEEE 802.11ac VHT80	42	OFDM	MCS0
99% Occupied Bandwidth	IEEE 802.11a	36/40/48/149/157/165	OFDM	6Mbps
	IEEE 802.11n HT20	36/40/48/149/157/165	OFDM	MCS0
	IEEE 802.11n HT40	38/46/151/159	OFDM	MCS0
	IEEE 802.11ac VHT20	36/40/48/149/157/165	OFDM	MCS0
	IEEE 802.11ac VHT40	38/46/151/159	OFDM	MCS0
	IEEE 802.11ac VHT80	42/155	OFDM	MCS0
Maximum Conducted Output Power	IEEE 802.11a	36/40/48/149/157/165	OFDM	6Mbps
	IEEE 802.11n HT20	36/40/48/149/157/165	OFDM	MCS0
	IEEE 802.11n HT40	38/46/151/159	OFDM	MCS0
	IEEE 802.11ac VHT20	36/40/48/149/157/165	OFDM	MCS0
	IEEE 802.11ac VHT40	38/46/151/159	OFDM	MCS0
	IEEE 802.11ac VHT80	42/155	OFDM	MCS0

Peak Power Spectral Density	IEEE 802.11a	36/40/48/149/157/165	OFDM	6Mbps
	IEEE 802.11n HT20	36/40/48/149/157/165	OFDM	MCS0
	IEEE 802.11n HT40	38/46/151/159	OFDM	MCS0
	IEEE 802.11ac VHT20	36/40/48/149/157/165	OFDM	MCS0
	IEEE 802.11ac VHT40	38/46/151/159	OFDM	MCS0
	IEEE 802.11ac VHT80	42/155	OFDM	MCS0
Unwanted Emissions and Band Edge(Above 1GHz)	IEEE 802.11a	36/40/48/149/157/165	OFDM	6Mbps
	IEEE 802.11n HT20	36/40/48/149/157/165	OFDM	MCS0
	IEEE 802.11n HT40	38/46/151/159	OFDM	MCS0
	IEEE 802.11ac VHT20	36/40/48/149/157/165	OFDM	MCS0
	IEEE 802.11ac VHT40	38/46/151/159	OFDM	MCS0
	IEEE 802.11ac VHT80	42/155	OFDM	MCS0
Unwanted Emissions Below 1GHz	IEEE 802.11a	36	OFDM	6Mbps
Frequency Stability	Unmodulation	36/149	N/A	N/A
AC Power Line Conducted Emissions	IEEE 802.11a	36	OFDM	6Mbps

Note:

1. In radiated measurement,the EUT had been pre-scan on the positioned of each 3 axis(X,Y,Z), the worst case was found when positioned on **X-plane.**

2.7. Channel List

Band	Mode	Channel	Frequency (MHz)
U-NII-1	IEEE 802.11a & n HT20 & ac VHT20	36	5180
		40	5200
		44	5220
		48	5240
	IEEE 802.11n HT40 & ac VHT40	38	5190
		46	5230
	IEEE 802.11ac VHT80	42	5210
U-NII-3	IEEE 802.11a & n HT20 & ac VHT20	149	5745
		153	5765
		157	5785
		161	5805
		165	5825
	IEEE 802.11n HT40 & ac VHT40	151	5755
		159	5795
	IEEE 802.11ac VHT80	155	5775

2.8. Power Setting of Test Software

Software Name	ADB		
U-NII-1			
Frequency(MHz)	5180	5200	5240
IEEE 802.11a Setting	21	21	21
IEEE 802.11n HT20 Setting	21	21	21
IEEE 802.11ac VHT20 Setting	21	21	21
Frequency(MHz)	5190	5230	
IEEE 802.11n HT40 Setting	19	19	
IEEE 802.11ac VHT40 Setting	19	19	
Frequency(MHz)	5210		
IEEE 802.11ac VHT80 Setting	22		
U-NII-3			
Frequency(MHz)	5745	5785	5825
IEEE 802.11a Setting	21	21	21
IEEE 802.11n HT20 Setting	21	21	21
IEEE 802.11ac VHT20 Setting	21	21	21
Frequency(MHz)	5755	5795	
IEEE 802.11n HT40 Setting	19	19	
IEEE 802.11ac VHT40 Setting	19	19	
Frequency(MHz)	5775		
IEEE 802.11ac VHT80 Setting	22		

Note: This information is provided by the applicant.

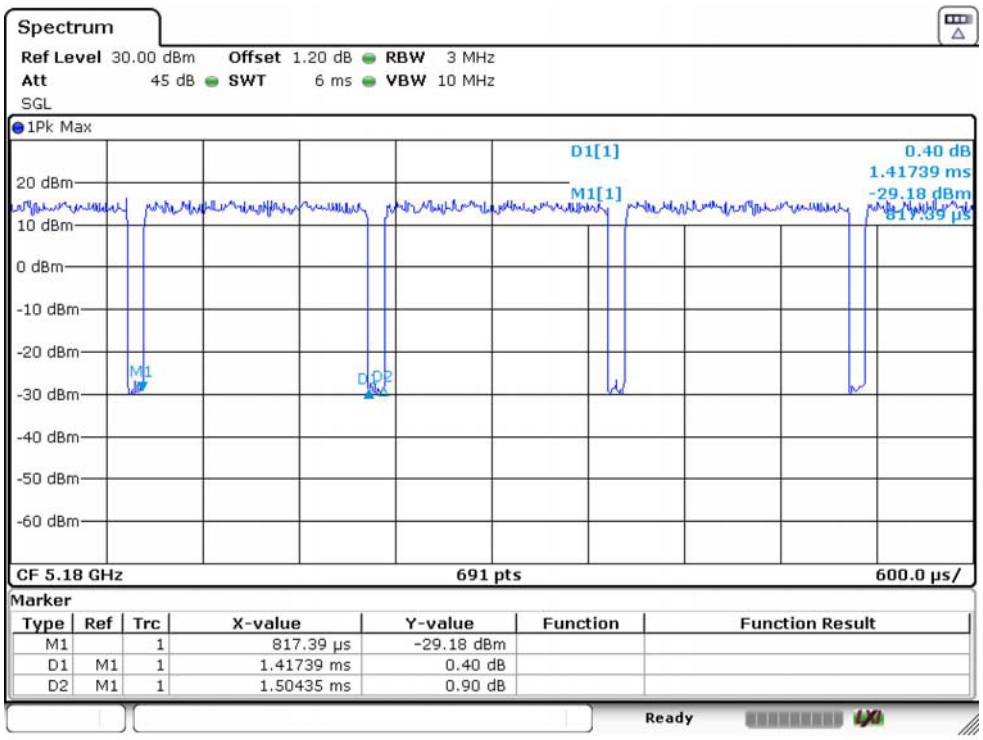
2.9. Duty Cycle of Test Signal

Temperature	25.3℃	Relative Humidity		52%	Test Voltage		AC 120V/60Hz
Mode	Frequency (MHz)	On time (ms)	Total Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T (Hz)	VBW Setting (dB)
IEEE 802.11a	5180	1.41739	1.50435	94.22	0.26	706	706
IEEE 802.11n HT20	5180	1.33043	1.41739	93.86	0.27	752	752
IEEE 802.11ac VHT20	5190	1.33913	1.41739	94.48	0.25	747	747
IEEE 802.11n HT40	5180	0.66087	0.74783	88.37	0.54	1513	1513
IEEE 802.11ac VHT40	5190	0.67246	0.75942	88.55	0.53	1487	1487
IEEE 802.11ac VHT80	5210	0.33478	0.42174	79.38	1.00	2987	2987

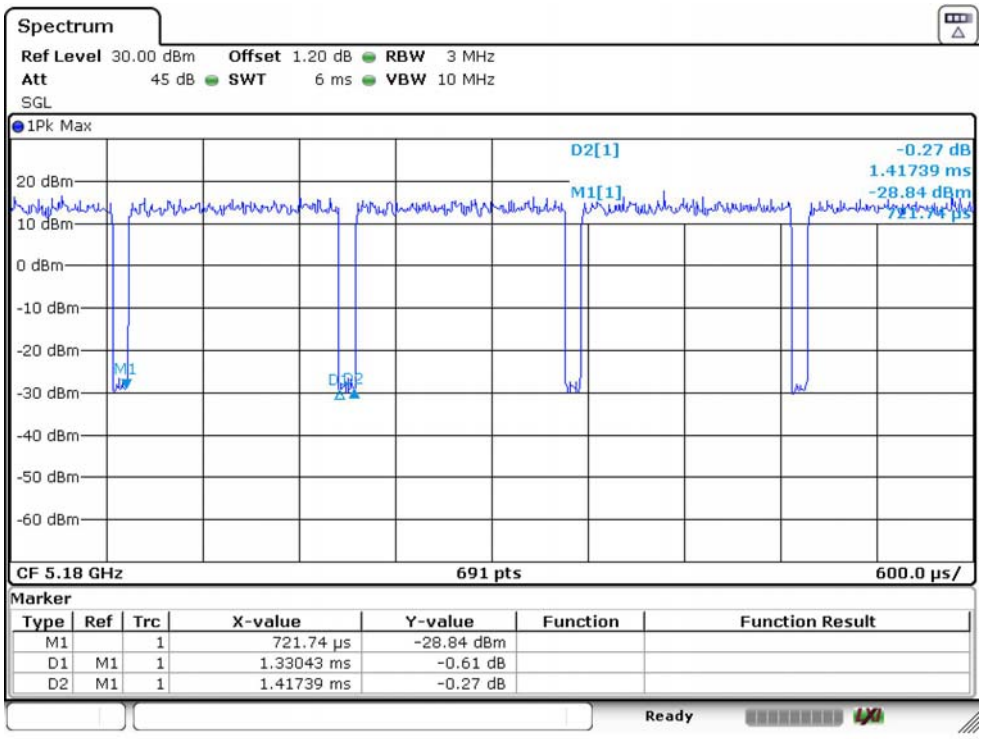
Note:

1. Duty Cycle=On Time/Total Time×100%.
2. Duty Factor=10×Log(1/Duty Cycle).
3. If duty cycle <98 %, the conducted average output power and average power spectral density should be add duty factor.
4. If duty cycle≥98 %,the EUT is consider to be transmitting continuously,the conducted average output power and average power spectral density no need to add duty factor.
5. The on-time time is transmission duration(T).
6. The VBW Setting is use for RMS measurement in unwanted emissions and band edge(Above 1GHz) test.

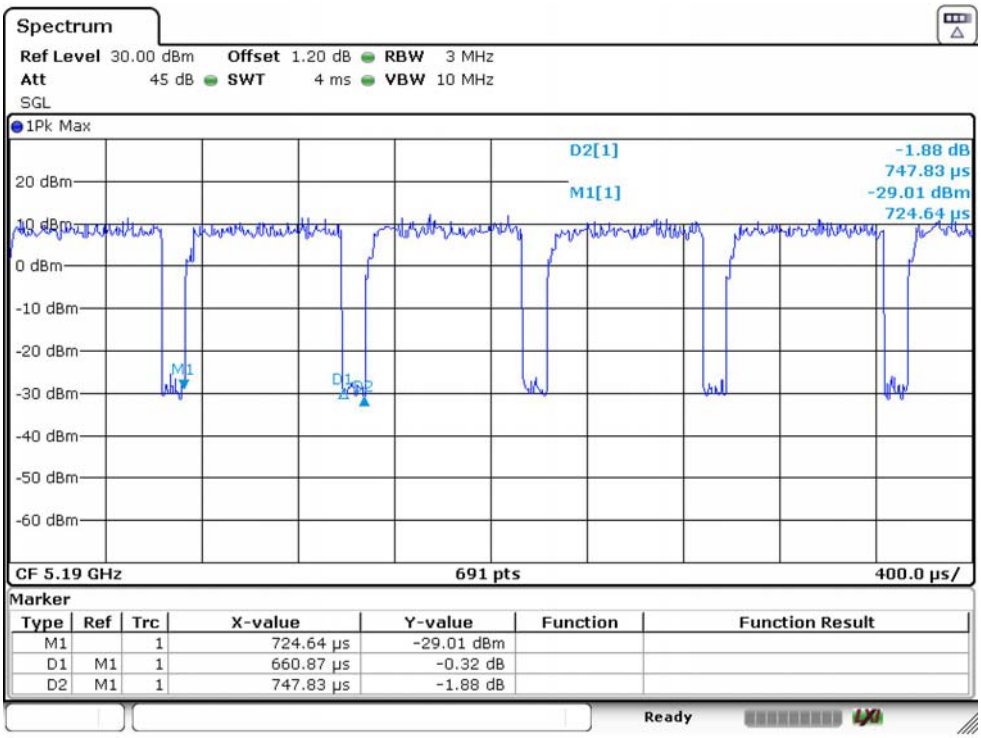
IEEE 802.11a 5180MHz



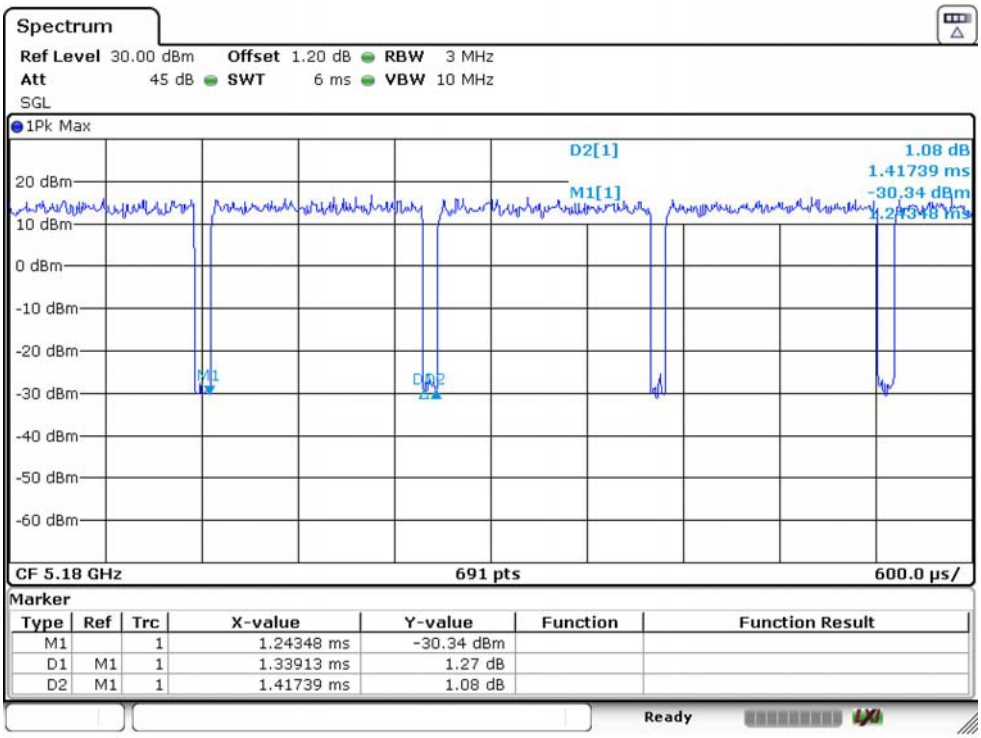
IEEE 802.11n HT20 5180MHz



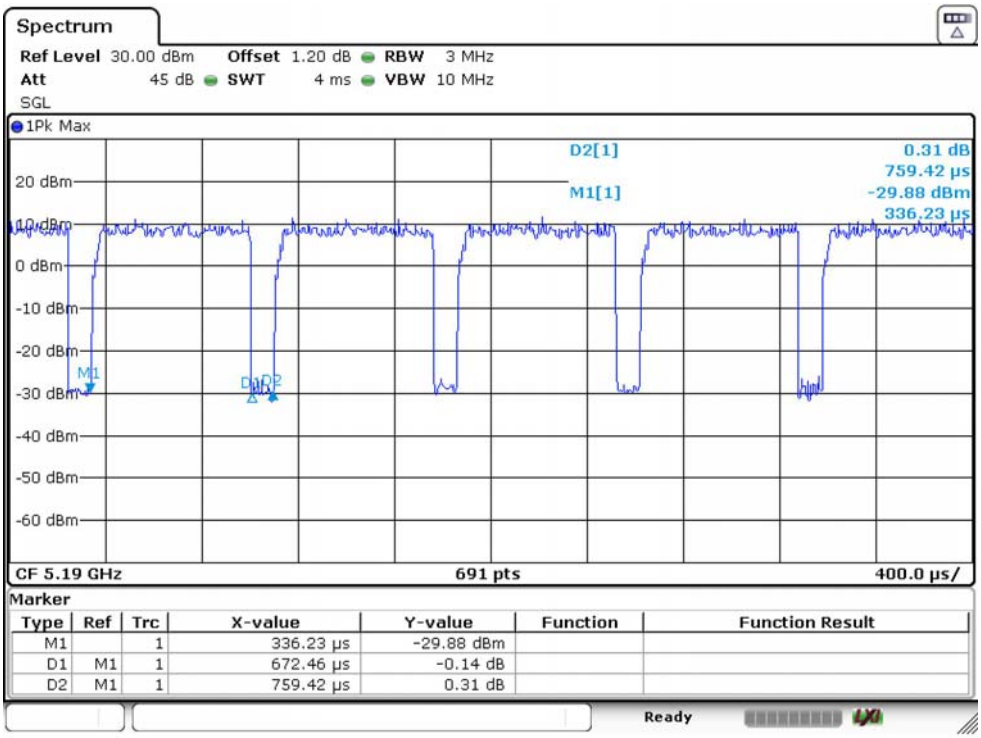
IEEE 802.11n HT40 5190MHz



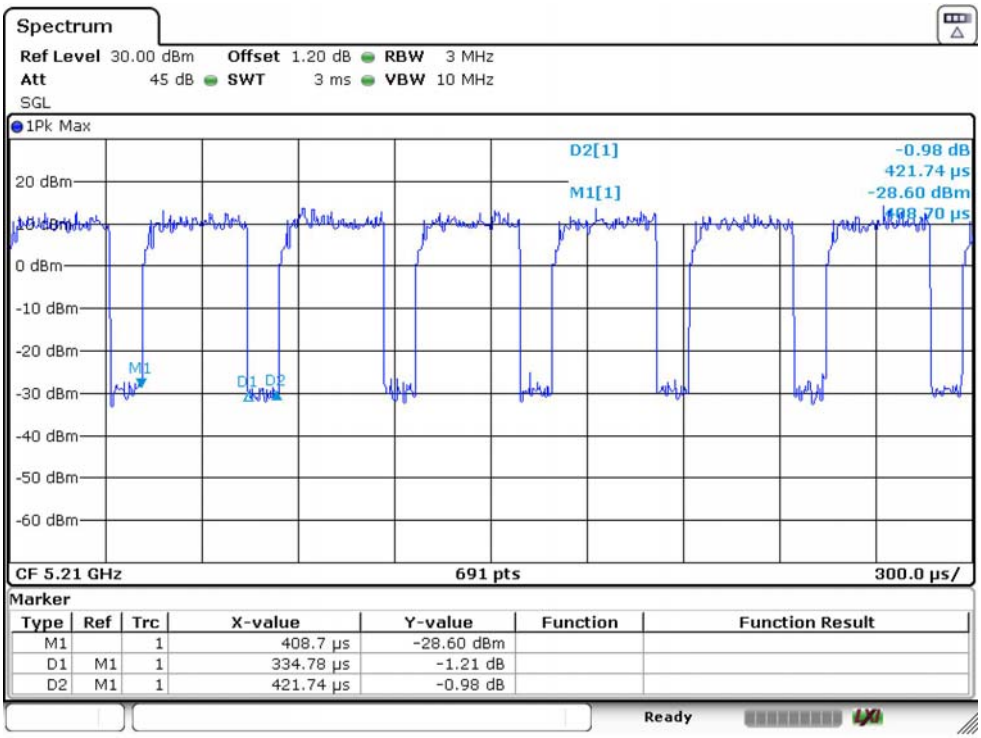
IEEE 802.11ac VHT20 5180MHz



IEEE 802.11ac VHT40 5190MHz



IEEE 802.11ac VHT80 5210MHz



2.10. Test Equipment List

For AC power conducted emissions test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESHS30	EST-E001	LISAI	June 13,21	1 Year
Artificial Mains Network	Rohde & Schwarz	ENV216	EST-E002	LISAI	June 13,21	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	EST-E078	LISAI	June 13,21	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

For radiated emissions test(9KHz-30MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	EST-E047	LISAI	June 13,21	1 Year
Active Loop Antenna	SCHWAREBECK	FMZB 1519B	EST-E054	LISAI	June 13,21	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
9kHz-30MHz Cable	N/A	EST-001	N/A	N/A	N/A	N/A

For radiated emissions test(30MHz-1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	EST-E047	LISAI	June 13,21	1 Year
Bilog Antenna	Teseq	CBL 6111D	EST-E034	LISAI	June 13,21	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
30-1000MHz Cable	N/A	EST-002	N/A	N/A	N/A	N/A

For radiated emissions test(Above 1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna	SCHWARZBECK	BBHA 9120 D	EST-E031	LISAI	June 13,21	1 Year
Horn Antenna	SCHWARZBECK	BBHA9170	N/A	LISAI	June 13,21	1 Year
Signal Amplifier	SCHWARZBECK	BBV9718	EST-E032	LISAI	June 13,21	1 Year
Spectrum Analyzer	Rohde &Schwarz	FSV40	EST-E069	LISAI	July 19,21	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
Above 1GHz Cable	N/A	EST-003	N/A	N/A	N/A	N/A

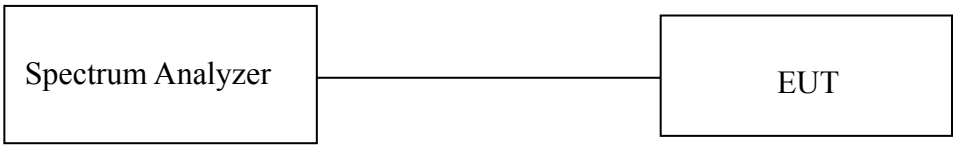
For connect EUT antenna terminal test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
TS 8997	Rohde &Schwarz	/	/	/	/	/
Open Switch and Control Unit	Rohde &Schwarz	OSP-B157WB	EST-E036	LISAI	June 13,21	1Year
Signal and Spectrum Analyzer	Rohde &Schwarz	FSV	EST-E037	LISAI	June 13,21	1 Year
Signal Generator	Rohde &Schwarz	SMB100A	EST-E038	LISAI	June 13,21	1 Year
Vector Signal Generator	Rohde &Schwarz	SMBV100A	EST-E039	LISAI	June 13,21	1Year
Test Software	Rohde &Schwarz	WMS32	V10.50.00	N/A	N/A	N/A
Temperature controller	Terchy	MHQ	EST-E101	LISAI	June 13,21	1 Year

3. 6DB BANDWIDTH &26DB BANDWIDTH & 99% OCCUPIED BANDWIDTH

3.1. Limit

Band	Frequency (MHz)	Test Item	Limit
U-NII-1	5150-5250	26dB Bandwidth&99% Occupied Bandwidth	N/A
U-NII-2A	5250-5350	26dB Bandwidth&99% Occupied Bandwidth	N/A
U-NII-2C	5470-5725	26dB Bandwidth&99% Occupied Bandwidth	N/A
U-NII-3	5725-5850	6dB Bandwidth&99% Occupied Bandwidth	6dB Bandwidth≥500KHz

3.2. Test Setup



3.3. Spectrum Analyzer Setting

6dB Bandwidth	
Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Span	40MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

26dB Bandwidth	
Spectrum Parameters	Setting
RBW	approximately 1% of the emission bandwidth
VBW	＞RBW
Span	40MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

99% Occupied Bandwidth	
Spectrum Parameters	Setting
RBW	1% to 5% of the OBW
VBW	approximately three times the RBW
Span	between 1.5 times and 5.0 times the OBW
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

3.4. Test Procedure

For 26dB Bandwidth Measurement :

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 3.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, measure the maximum width of the emission that is 26 dB down from the peak of the emission.Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report.

For 6dB Bandwidth Measurement :

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 3.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report.

For 99% Occupied Bandwidth Measurement :

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 3.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the 99% power bandwidth function to measure bandwidth.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report.

3.5. Test Result

Temperature	25.3℃	Relative Humidity	52%	Test Voltage	AC 120V/60Hz

26dB Bandwidth&99% Occupied Bandwidth						
AND	Test Mode	Fre (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth （MHz）	Calculate Power Limit (W)	Calculate Power Limit (dBm)
U-NII-1	IEEE 802.11a	5180	21.7058	17.4819		
		5200	21.3419	17.3661		
		5240	21.6978	17.3661		
	IEEE 802.11n HT20	5180	21.8138	18.5239		
		5200	21.4979	18.4660		
		5240	21.5218	18.3502		
	IEEE 802.11ac VHT20	5180	21.6218	18.2923		
		5200	21.6698	18.2344		
		5240	21.3899	18.4660		
	IEEE 802.11n HT40	5190	40.0340	36.7004		
		5230	39.9500	36.4689		
	IEEE 802.11ac VHT40	5190	39.7880	36.5847		
		5230	39.9200	36.8162		
	IEEE 802.11ac VHT80	5210	81.9400	75.3690		

Temperature	25.3℃	Relative Humidity	52%	Test Voltage	AC 120V/60Hz

6dB Bandwidth&99% Occupied Bandwidth

BAND	Test Mode	Fre (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	6dB BW Min Limit (MHz)	Result
U-NII-3	IEEE 802.11a	5745	16.3184	17.5398	0.5	PASS
		5785	16.3104	17.5398	0.5	PASS
		5825	16.3144	17.7135	0.5	PASS
	IEEE 802.11n HT20	5745	17.5462	18.4081	0.5	PASS
		5785	17.5382	18.4660	0.5	PASS
		5825	17.5542	18.4081	0.5	PASS
	IEEE 802.11ac VHT20	5745	17.5502	18.3502	0.5	PASS
		5785	17.5462	18.4660	0.5	PASS
		5825	17.5542	18.3502	0.5	PASS
	IEEE 802.11n HT40	5755	36.2924	36.7004	0.5	PASS
		5795	36.0304	36.5847	0.5	PASS
	IEEE 802.11ac VHT40	5755	36.2604	36.9320	0.5	PASS
		5795	36.0124	36.5847	0.5	PASS
	IEEE 802.11ac VHT80	5775	75.4600	75.3690	0.5	PASS

Note :

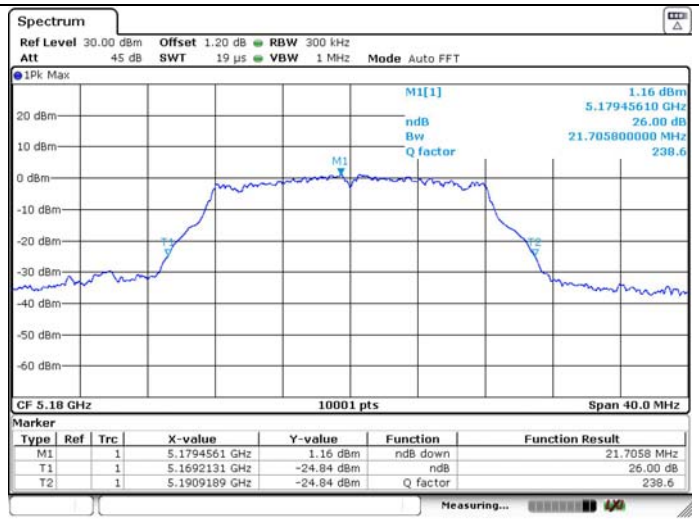
1.For Band U-NII-2A and U-NII-2C,the maximum conducted output power limit is 250mw or 11+10×Log B, which is lesser,where B is the 26dB Bandwidth in MHz.So in this section,the maximum conducted output power limit can calculate with 26dB Bandwidth.

2. only the worst case(Antenna 2) was recorded.

3.6. Test Result

U-NII-1 IEEE 802.11a 5180MHz

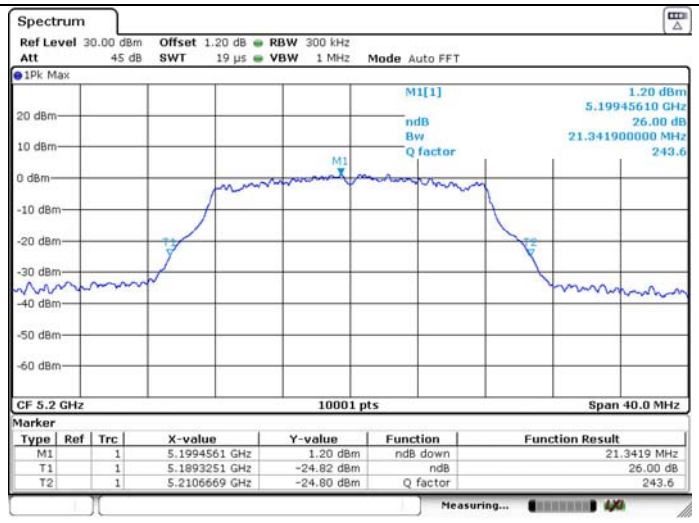
26dB Bandwidth



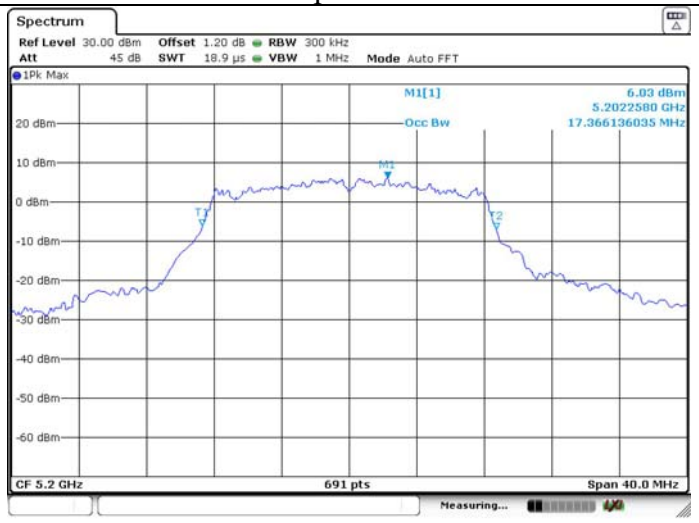
99% Occupied Bandwidth

U-NII-1 IEEE 802.11a 5200MHz

26dB Bandwidth

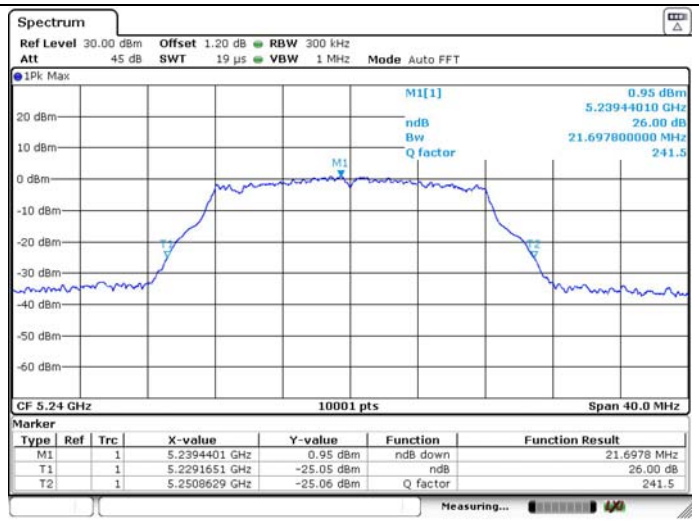


99% Occupied Bandwidth



U-NII-1 IEEE 802.11a 5240MHz

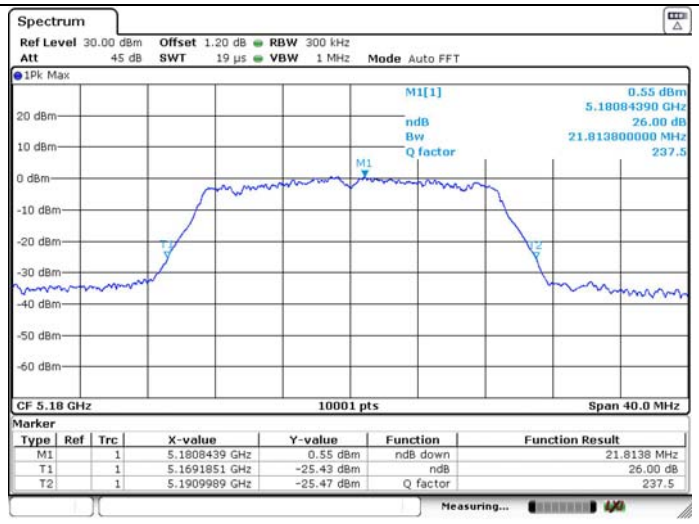
26dB Bandwidth



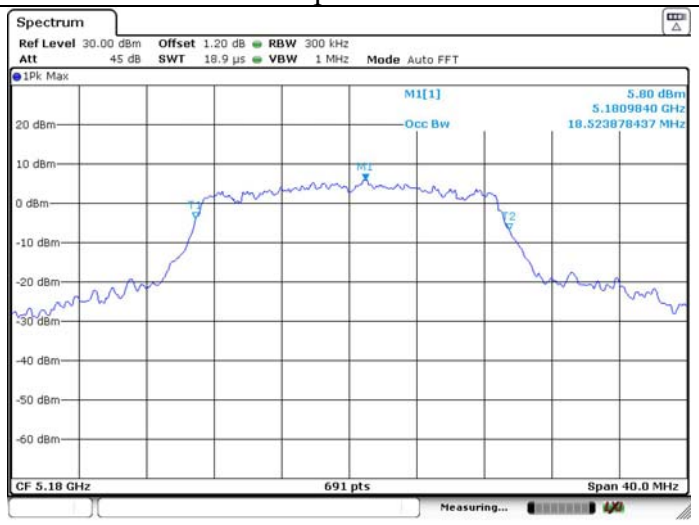
99% Occupied Bandwidth

U-NII-1 IEEE 802.11n HT20 5180MHz

26dB Bandwidth

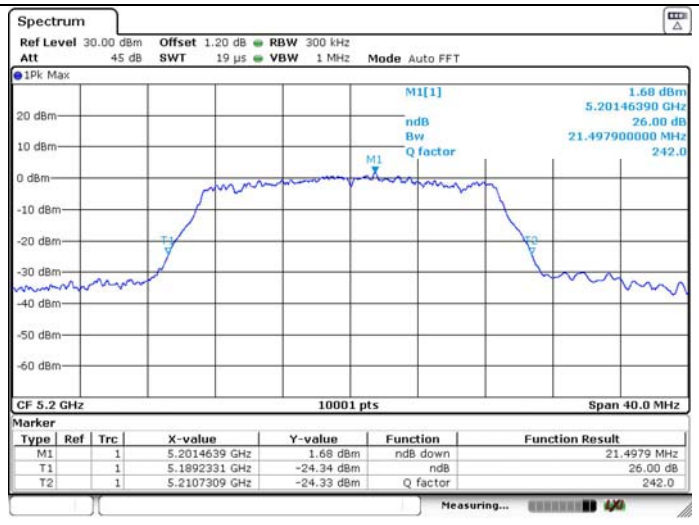


99% Occupied Bandwidth

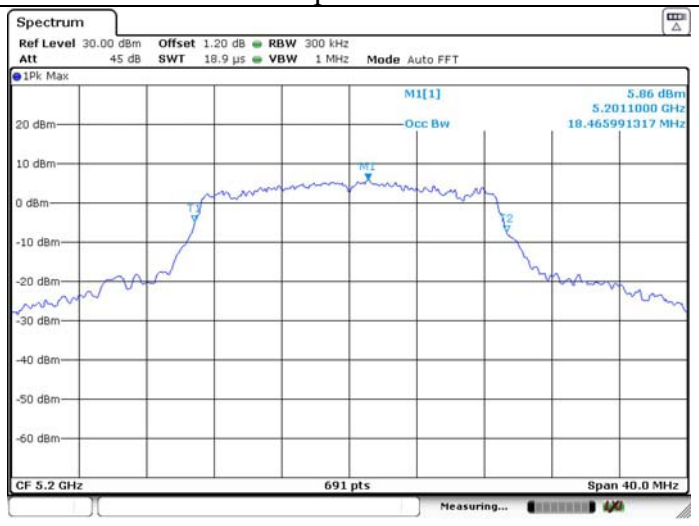


U-NII-1 IEEE 802.11n HT20 5200MHz

26dB Bandwidth

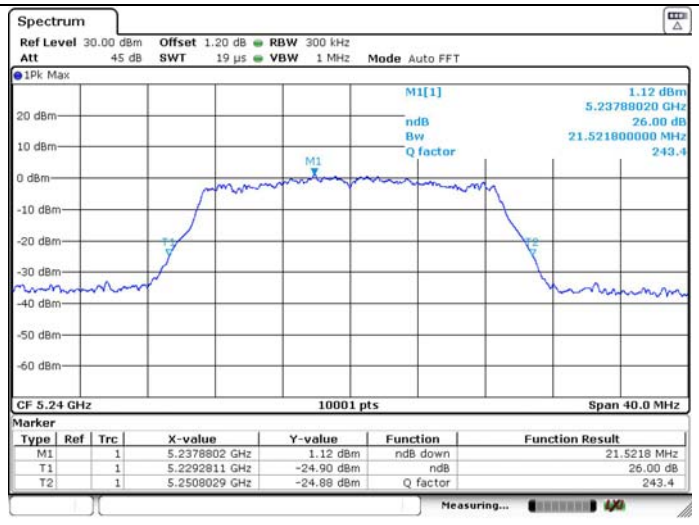


99% Occupied Bandwidth

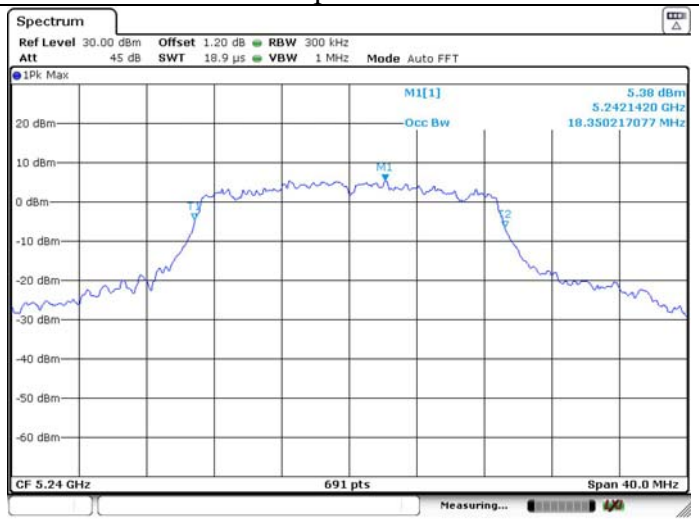


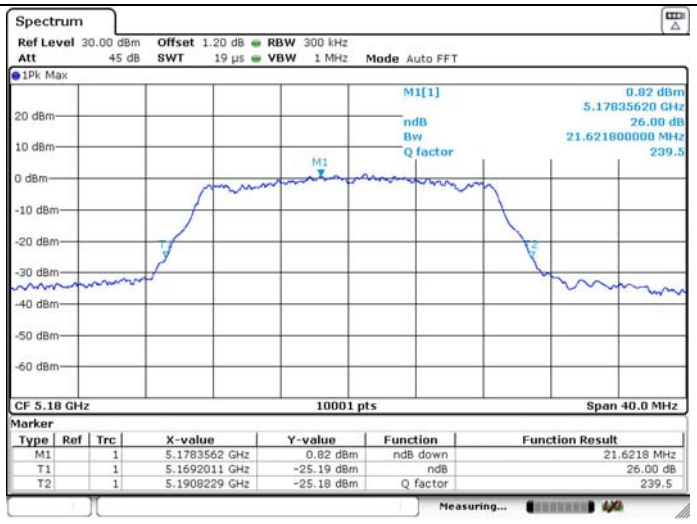
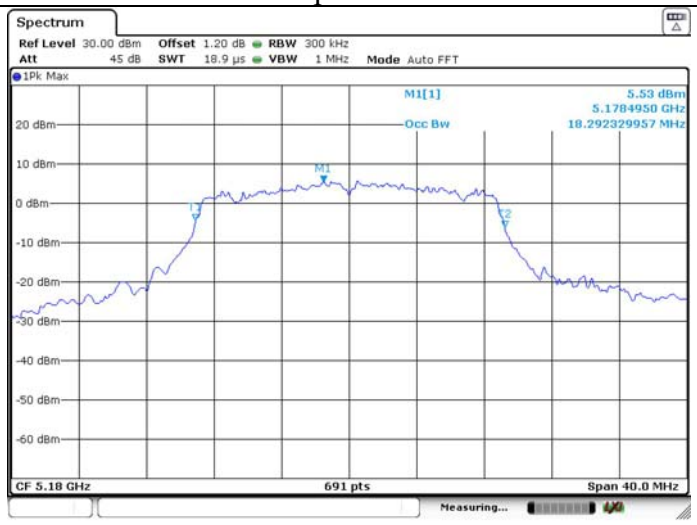
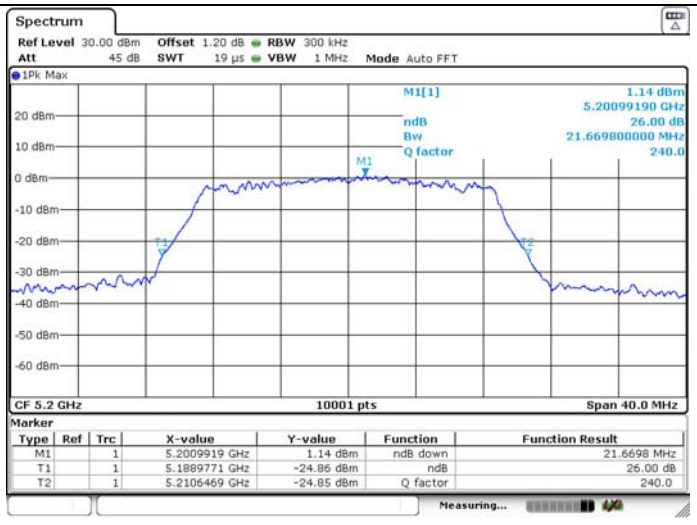
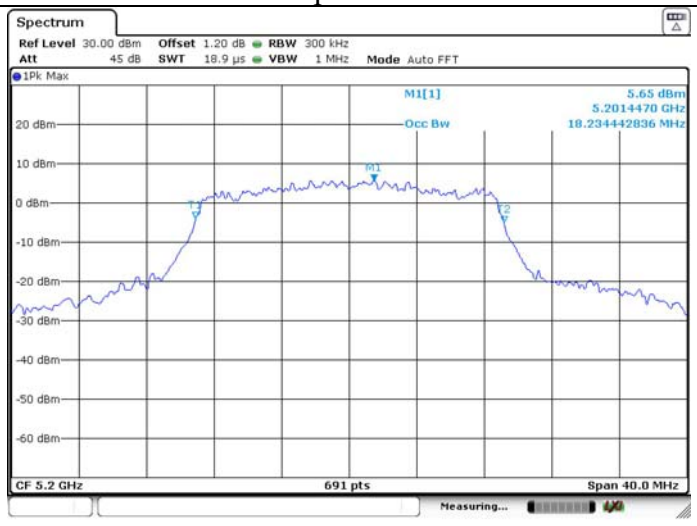
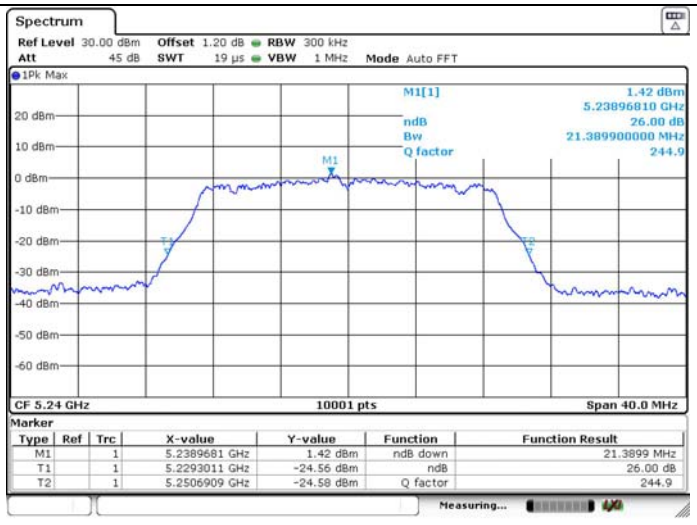
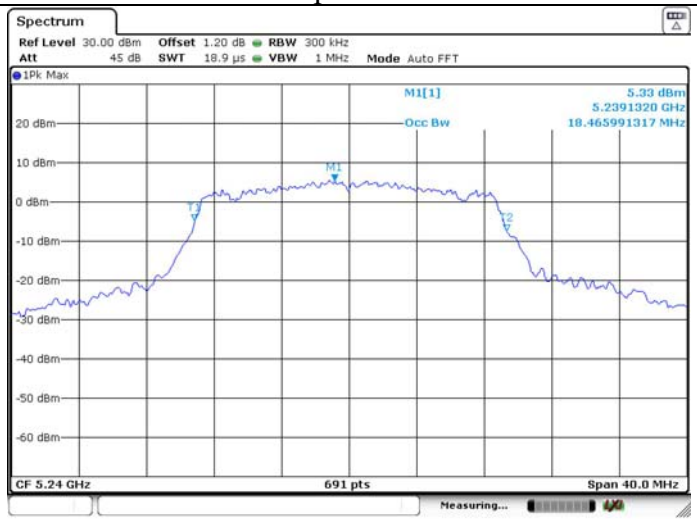
U-NII-1 IEEE 802.11n HT20 5240MHz

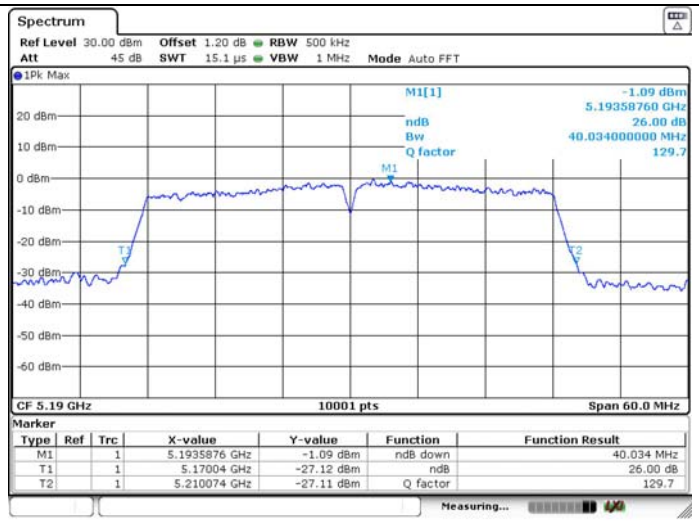
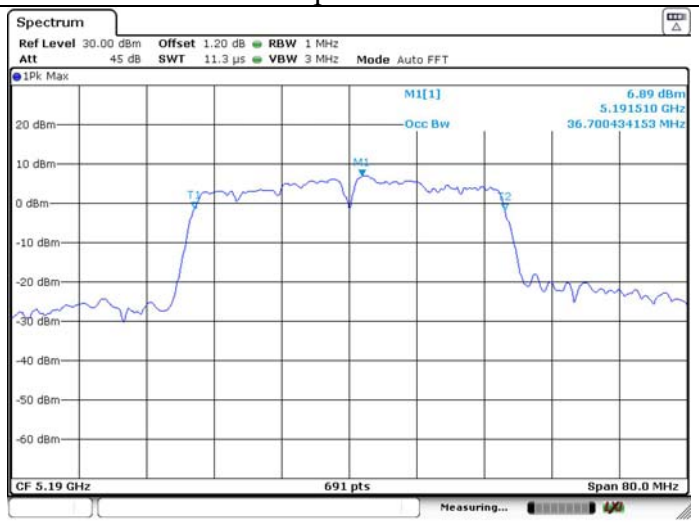
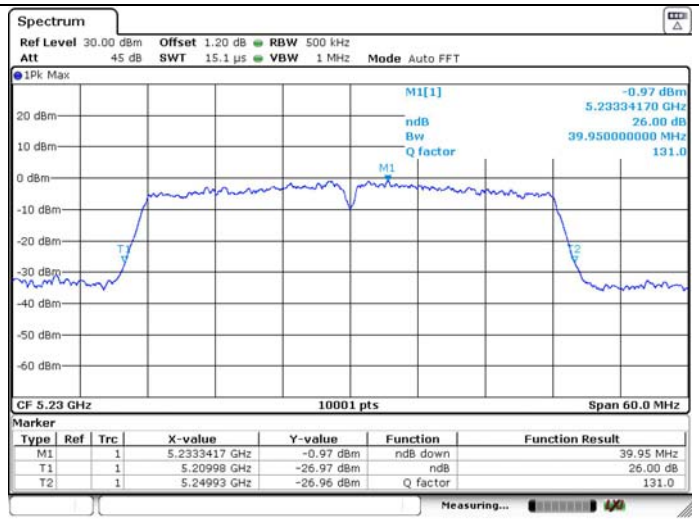
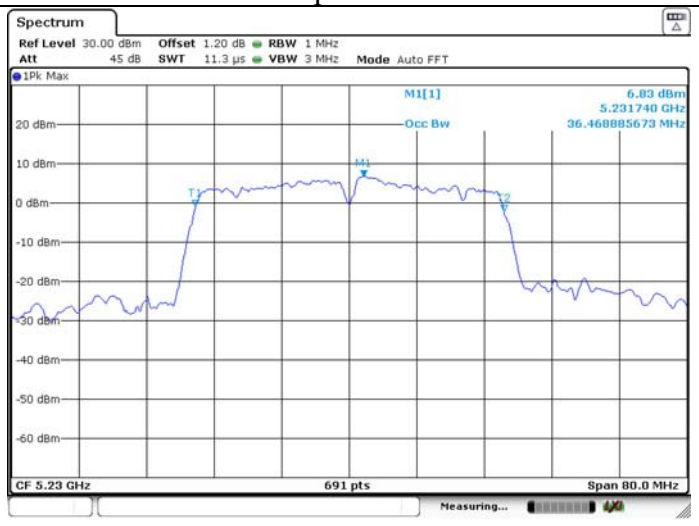
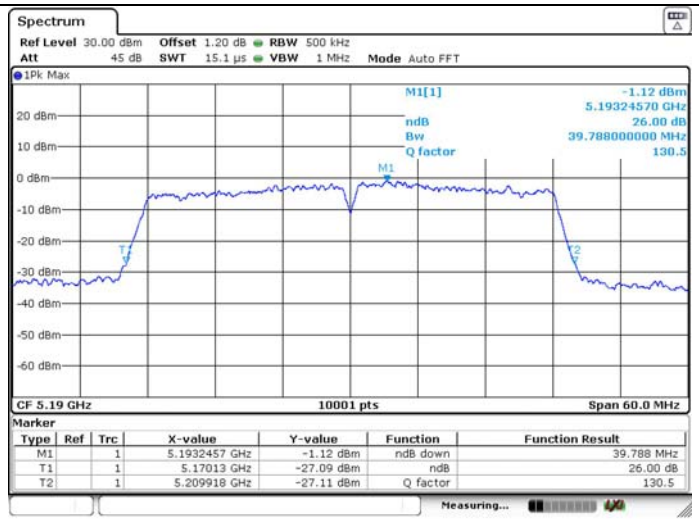
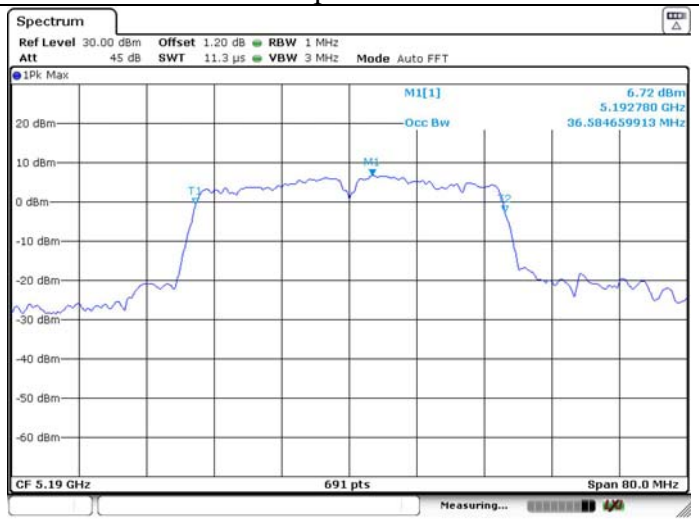
26dB Bandwidth

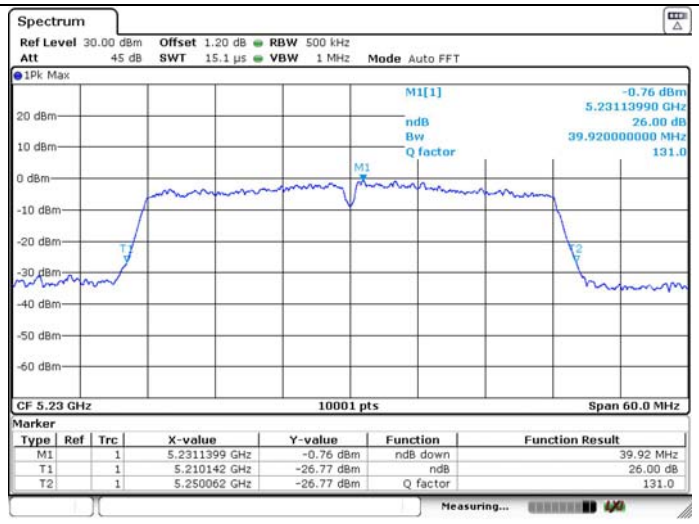
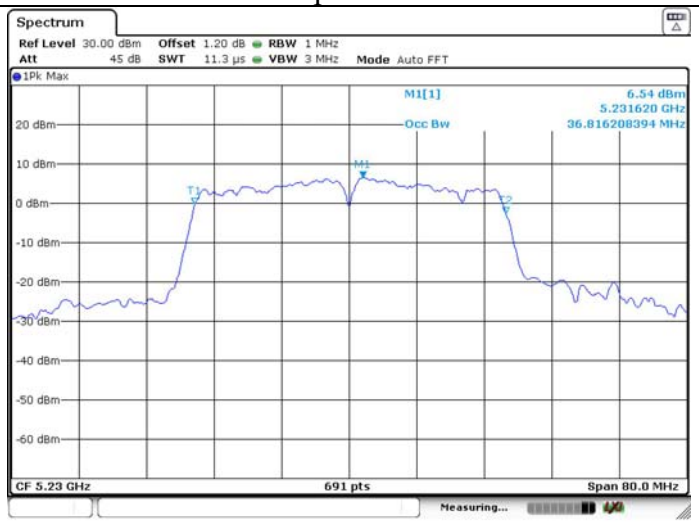
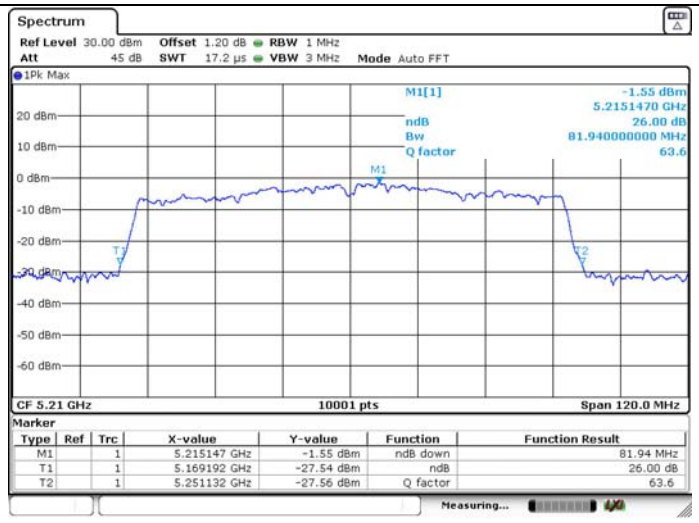
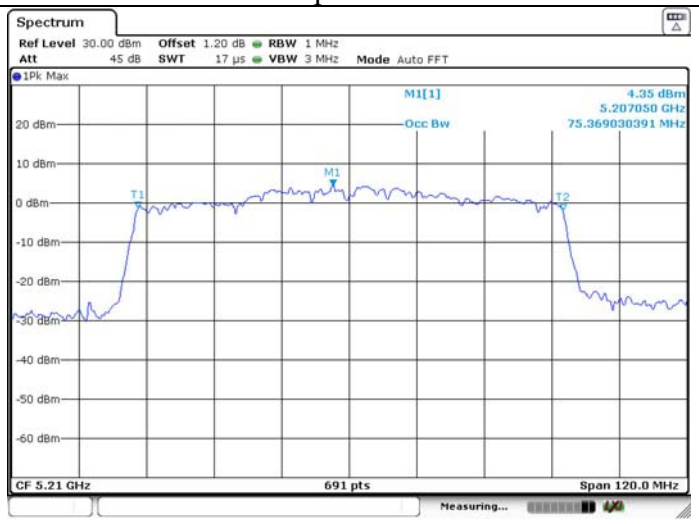


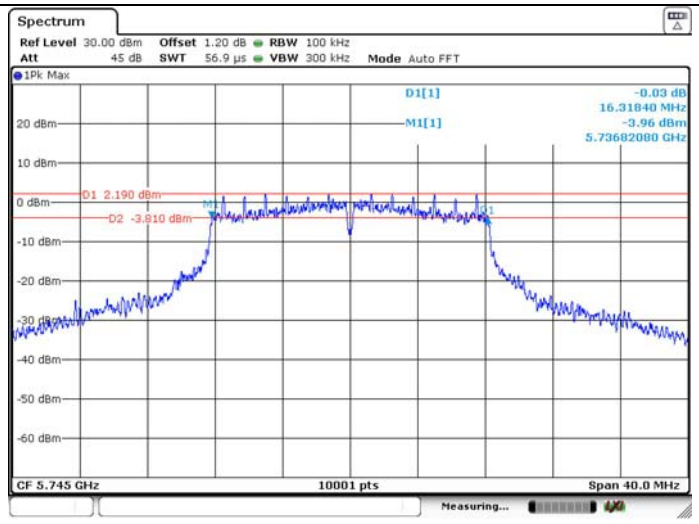
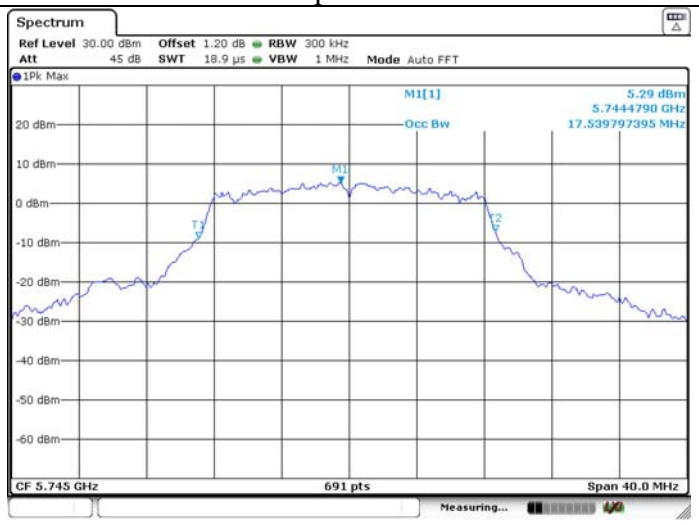
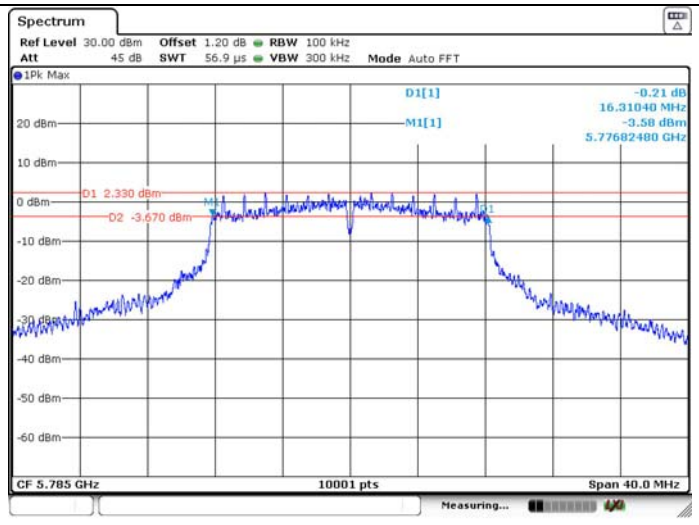
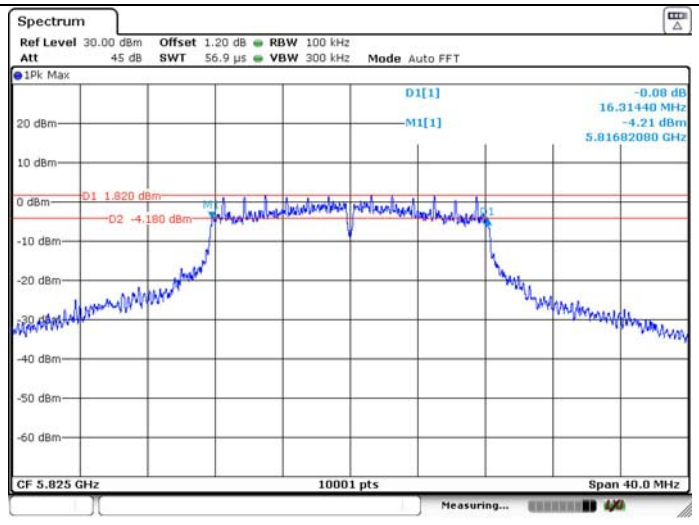
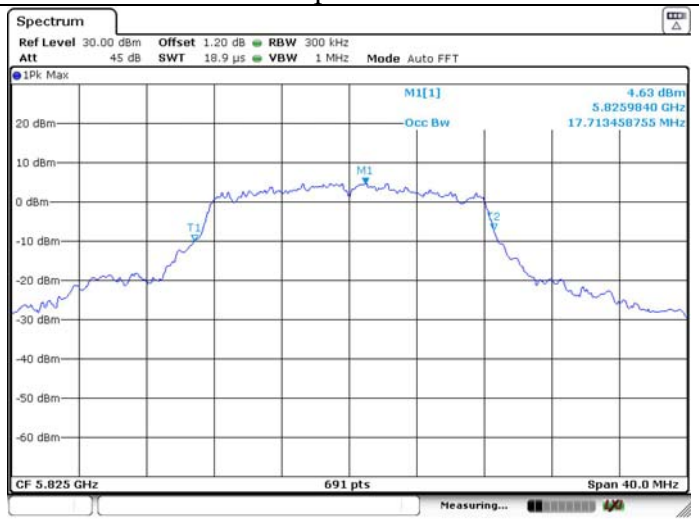
99% Occupied Bandwidth

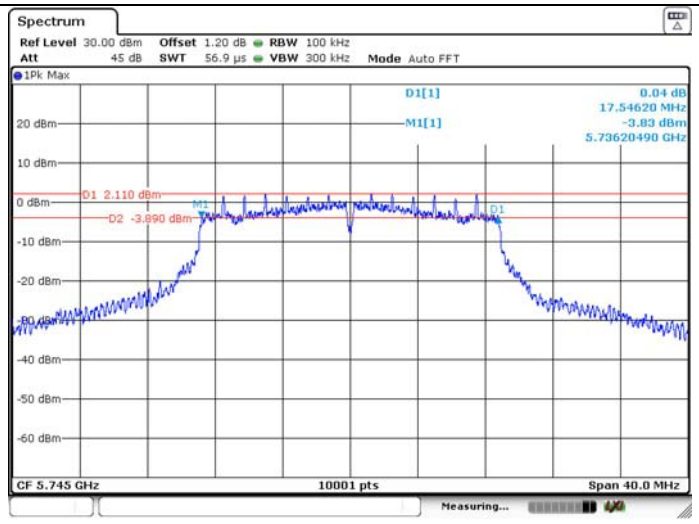
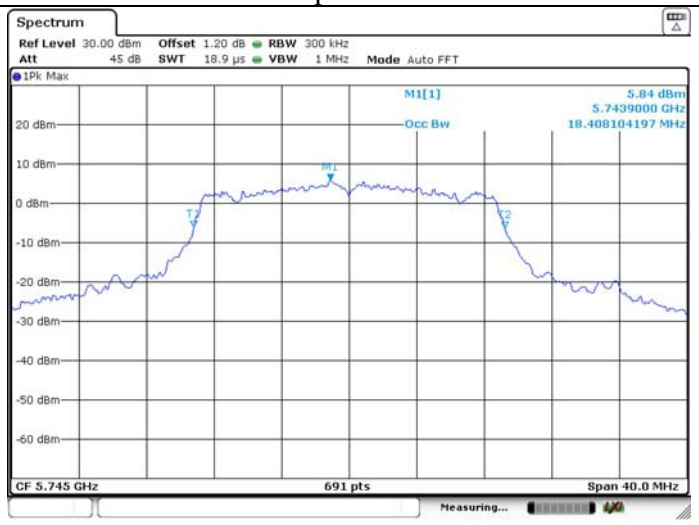
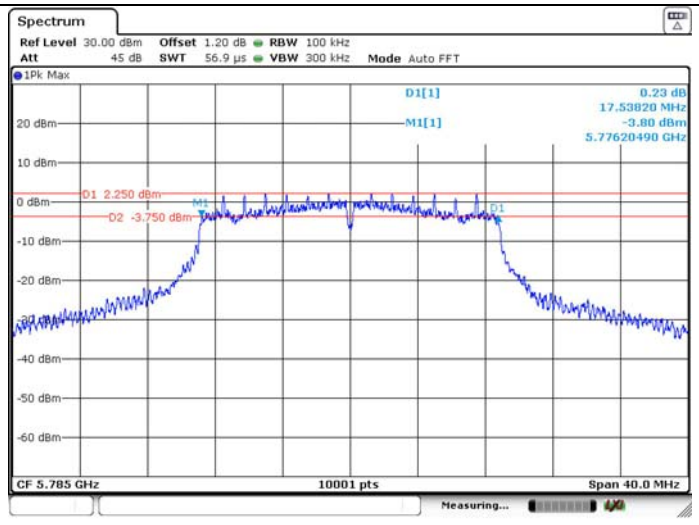
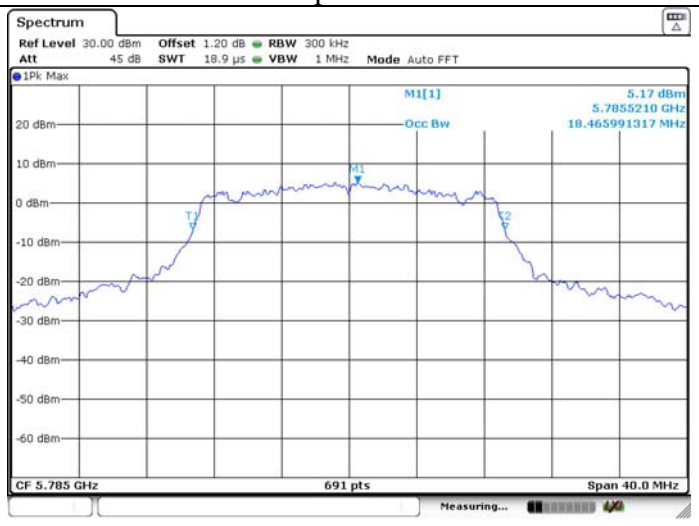
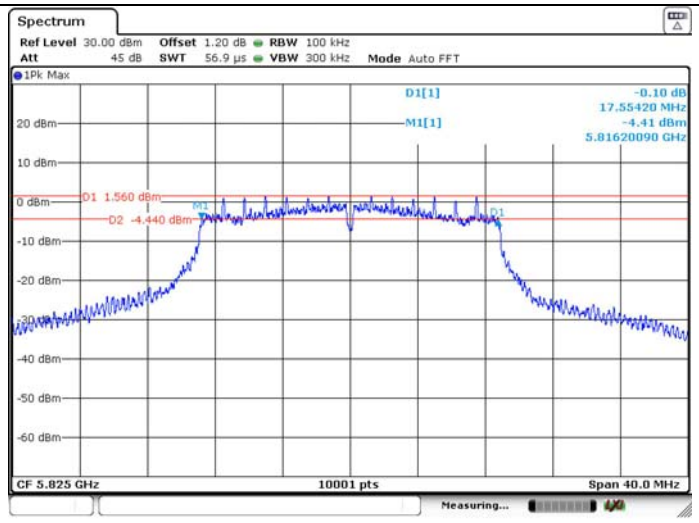
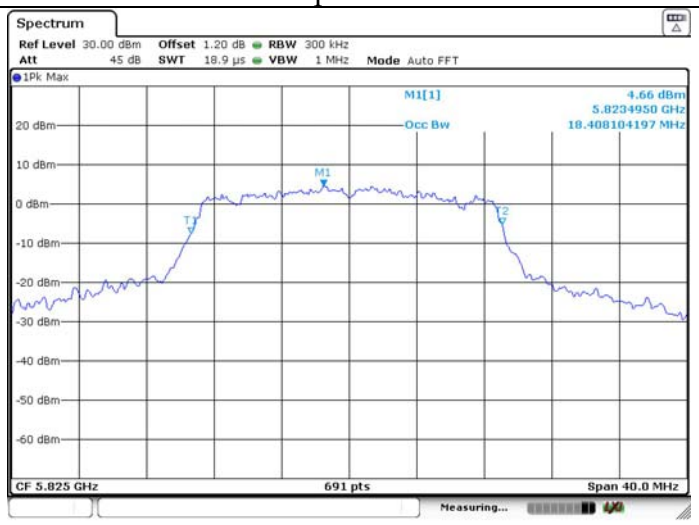


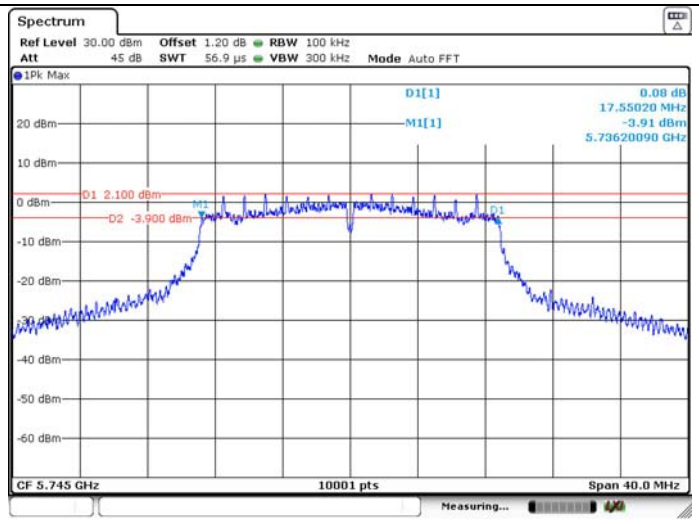
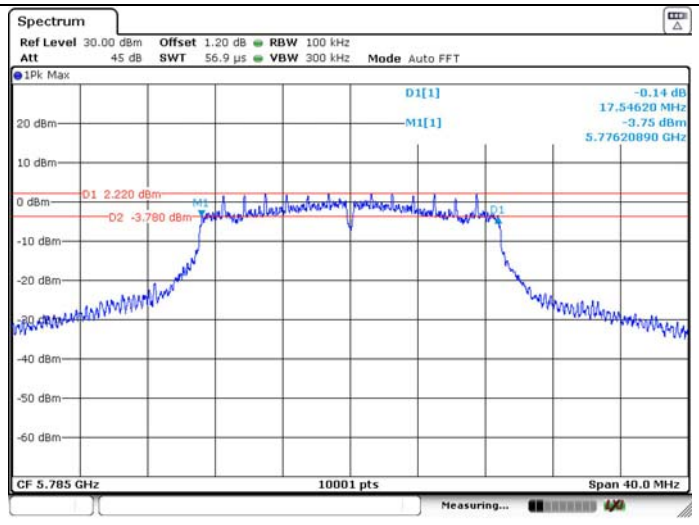
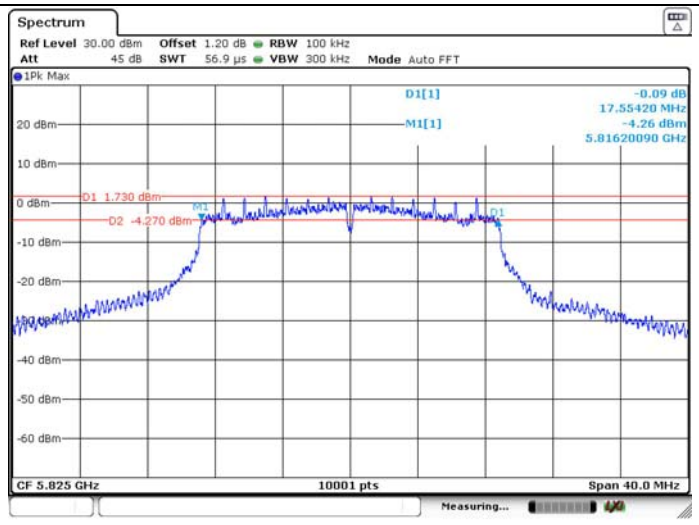
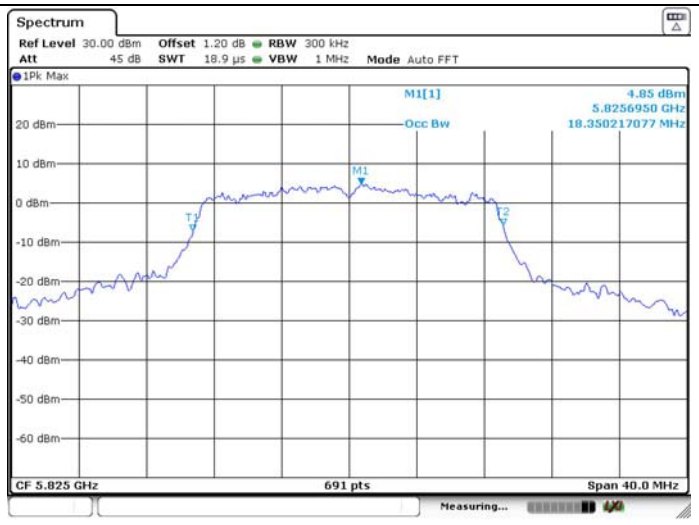
U-NII-1 IEEE 802.11ac VHT20 5180MHz	
26dB Bandwidth	99% Occupied Bandwidth
	
U-NII-1 IEEE 802.11ac VHT20 5200MHz	
26dB Bandwidth	99% Occupied Bandwidth
	
U-NII-1 IEEE 802.11ac VHT20 5240MHz	
26dB Bandwidth	99% Occupied Bandwidth
	

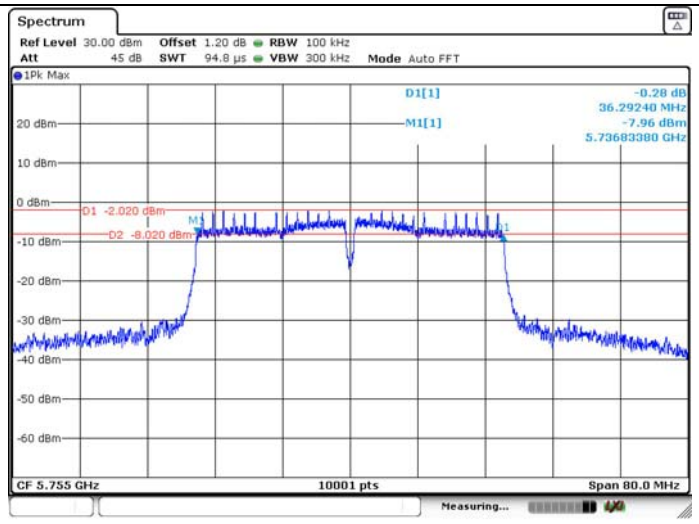
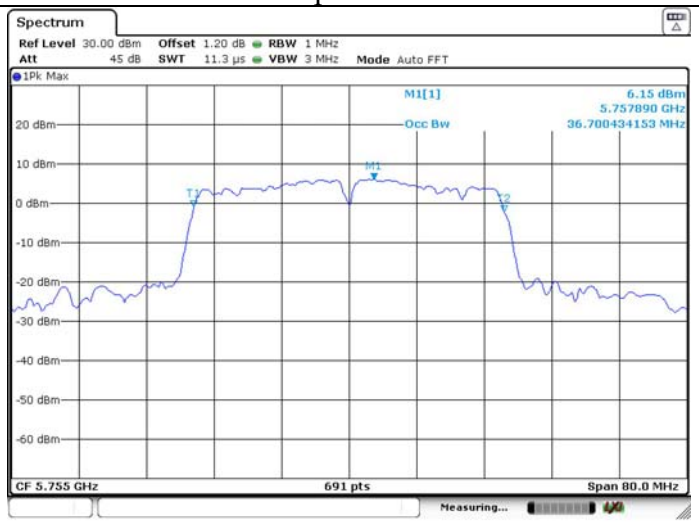
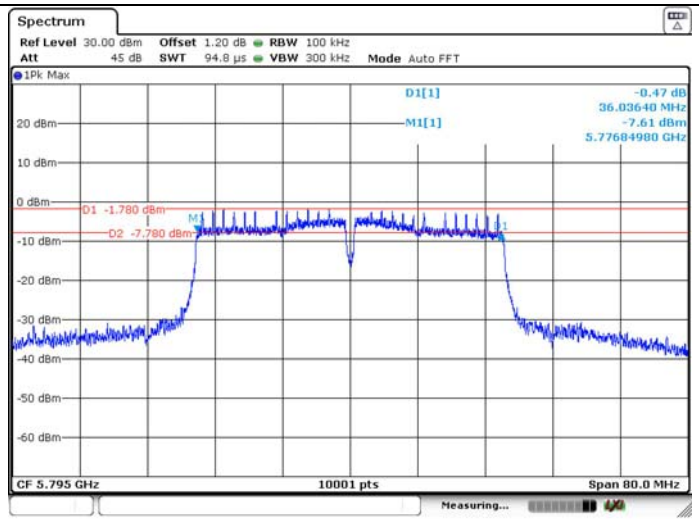
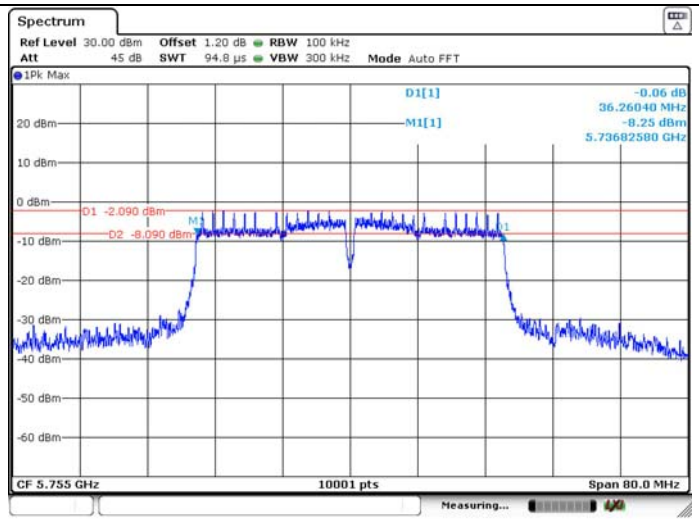
U-NII-1 IEEE 802.11n HT40 5190MHz	
26dB Bandwidth	99% Occupied Bandwidth
	
U-NII-1 IEEE 802.11n HT40 5230MHz	
26dB Bandwidth	99% Occupied Bandwidth
	
U-NII-1 IEEE 802.11ac VHT40 5190MHz	
26dB Bandwidth	99% Occupied Bandwidth
	

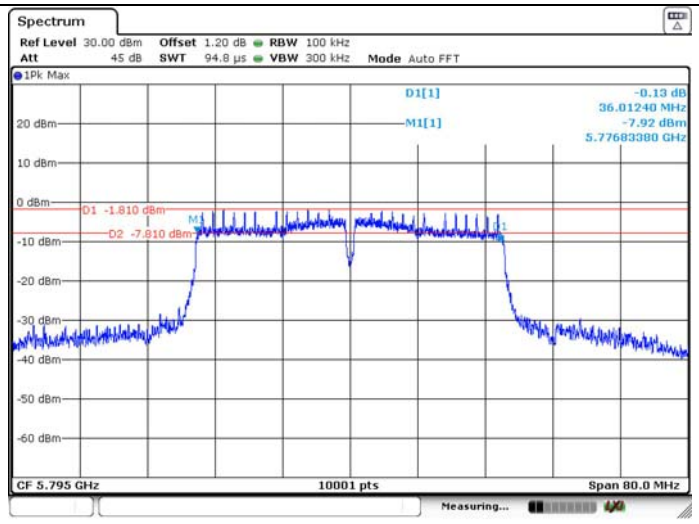
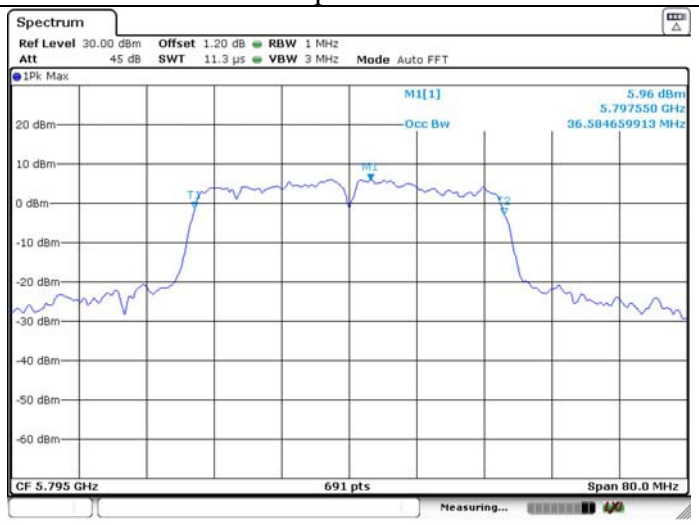
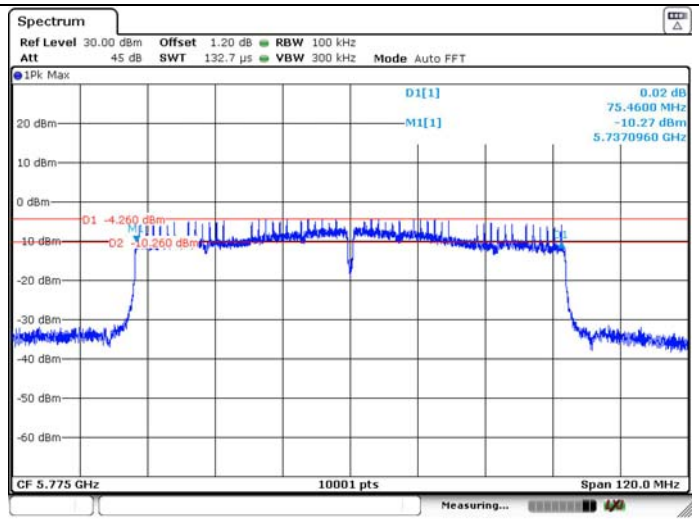
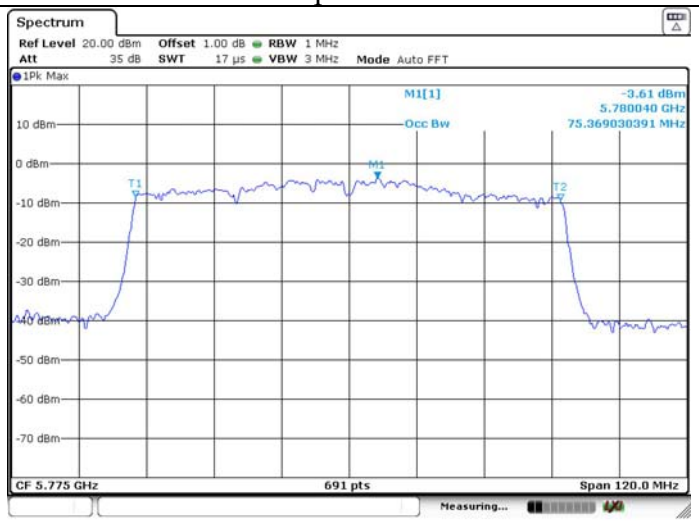
U-NII-1 IEEE 802.11ac VHT40 5230MHz	
26dB Bandwidth	99% Occupied Bandwidth
	
U-NII-1 IEEE 802.11ac VHT80 5210MHz	
26dB Bandwidth	99% Occupied Bandwidth
	

U-NII-3 IEEE 802.11a 5745MHz	
6dB Bandwidth	99% Occupied Bandwidth
	
U-NII-3 IEEE 802.11a 5785MHz	
6dB Bandwidth	99% Occupied Bandwidth
	
U-NII-3 IEEE 802.11a 5825MHz	
6dB Bandwidth	99% Occupied Bandwidth
	

U-NII-3 IEEE 802.11n HT20 5745MHz	
6dB Bandwidth	99% Occupied Bandwidth
	
U-NII-3 IEEE 802.11n HT20 5785MHz	
6dB Bandwidth	99% Occupied Bandwidth
	
U-NII-3 IEEE 802.11n HT20 5825MHz	
6dB Bandwidth	99% Occupied Bandwidth
	

U-NII-3 IEEE 802.11ac VHT20 5745MHz	
6dB Bandwidth	99% Occupied Bandwidth
	
U-NII-3 IEEE 802.11ac VHT20 5785MHz	
6dB Bandwidth	99% Occupied Bandwidth
	
U-NII-3 IEEE 802.11ac VHT20 5825MHz	
6dB Bandwidth	99% Occupied Bandwidth
	

U-NII-3 IEEE 802.11n HT40 5755MHz	
6dB Bandwidth	99% Occupied Bandwidth
	
U-NII-3 IEEE 802.11n HT40 5795MHz	
6dB Bandwidth	99% Occupied Bandwidth
	
U-NII-3 IEEE 802.11ac VHT40 5755MHz	
6dB Bandwidth	99% Occupied Bandwidth
	

U-NII-3 IEEE 802.11ac VHT40 5795MHz	
6dB Bandwidth	99% Occupied Bandwidth
	
U-NII-3 IEEE 802.11ac VHT80 5775MHz	
6dB Bandwidth	99% Occupied Bandwidth
	

4. MAXIMUM CONDUCTED OUTPUT POWER

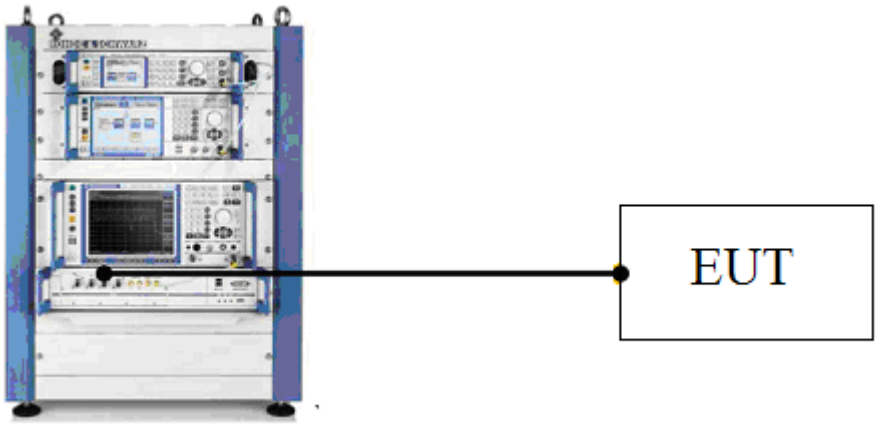
4.1. Limit

Band	EUT Type	Limit
U-NII-1	Outdoor Access Point	1W(30dBm) (Max. e.i.r.p≦125mW at any elevation angle above 30 degrees as measured from the horizon)
	Indoor Access Point	1W(30dBm)
	Fixed point-to-point Access Point	1W(30dBm)
	Mobile and Portable Client Device	250mW(23.98dBm)
U-NII-2A	All Device	250mW(23.98dBm) or 11dBm+10 log B,Which is lesser. (B is 26dB Bandwidth in MHz)
U-NII-2C	All Device	250mW(23.98dBm) or 11dBm+10 log B,Which is lesser. (B is 26dB Bandwidth in MHz)
U-NII-3	All Device	1W(30dBm)

Note:

For the Band U-NII-2A and U-NII-2C,the maximum conducted output power limit calculate result refer to section 3.5.

4.2. Test Setup



4.3. Test Procedure

a. Connect EUT antenna terminal to the OSP-B157WB with RF cable.
b. Set the EUT transmit continuously with maximum output power.
c. Through the test software in TS8897 to control a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
d. Repeat above procedures until all modes and channels were measured.
e. Record the results in the test report.

4.4. Test Result

Temperature	25.3℃	Relative Humidity			52%	Test Voltage	AC 120V/60Hz	
BAND	Test Mode	Fre (MHz)	Conducted AVG Output Power (dBm)		Total Conducted Output Power (W)	Total Conducted Output Power (dBm)	Limit (dBm)	Result
			Ant 1	Ant 2				
U-NII-1	IEEE 802.11a	5180	14.408	13.189	--	--	23.98	PASS
		5200	14.267	13.700	--	--	23.98	PASS
		5240	14.383	13.903	--	--	23.98	PASS
	IEEE 802.11n HT20	5180	14.225	12.904	0.04597	16.62	23.98	PASS
		5200	13.854	13.396	0.04615	16.64	23.98	PASS
		5240	14.180	13.649	0.04935	16.93	23.98	PASS
	IEEE 802.11ac VHT20	5180	14.213	12.903	0.04589	16.62	23.98	PASS
		5200	13.853	13.407	0.04620	16.65	23.98	PASS
		5240	14.143	13.632	0.04904	16.91	23.98	PASS
	IEEE 802.11n HT40	5190	12.286	11.521	0.03112	14.93	23.98	PASS
		5230	12.468	11.359	0.03133	14.96	23.98	PASS
	IEEE 802.11ac VHT40	5190	12.301	11.547	0.03127	14.95	23.98	PASS
		5230	12.479	11.951	0.03337	15.23	23.98	PASS
	IEEE 802.11ac VHT80	5210	12.130	11.508	0.03048	14.84	23.98	PASS

BAND	Test Mode	Fre (MHz)	Conducted AVG Output Power (dBm)		Total Conducted Output Power (W)	Total Conducted Output Power (dBm)	Limit (dBm)	Result
			Ant 1	Ant 2				
U-NII-3	IEEE 802.11a	5745	14.373	12.879	--	--	30.00	PASS
		5785	14.197	12.172	--	--	30.00	PASS
		5825	13.292	11.504	--	--	30.00	PASS
	IEEE 802.11n HT20	5745	14.030	12.775	0.04424	16.46	30.00	PASS
		5785	13.858	11.874	0.03971	15.99	30.00	PASS
		5825	13.066	11.179	0.03338	15.23	30.00	PASS
	IEEE 802.11ac VHT20	5745	13.990	12.713	0.04374	16.41	30.00	PASS
		5785	13.990	12.039	0.04105	16.13	30.00	PASS
		5825	13.033	11.265	0.03349	15.25	30.00	PASS
	IEEE 802.11n HT40	5755	12.647	11.231	0.03167	15.01	30.00	PASS
		5795	12.086	10.338	0.02698	14.31	30.00	PASS
	IEEE 802.11ac VHT40	5755	12.648	11.416	0.03225	15.09	30.00	PASS
		5795	12.142	10.101	0.02661	14.25	30.00	PASS
	IEEE 802.11ac VHT80	5775	11.567	9.883	0.02408	13.82	30.00	PASS

5. PEAK POWER SPECTRAL DENSITY

5.1. Limit

Band	EUT Type	Limit
U-NII-1	Outdoor Access Point	17dBm/MHz
	Indoor Access Point	17dBm/MHz
	Fixed point-to-point Access Point	17dBm/MHz
	Mobile and Portable Client Device	11dBm/MHz
U-NII-2A	All Device	11dBm/MHz
U-NII-2C	All Device	11dBm/MHz
U-NII-3	All Device	30dBm/500KHz

5.2. Test Setup

5.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	1MHz(For U-NII-1&U-NII-2A&U-NII-2C) 500KHz(For U-NII-3)
VBW	3MHz(For U-NII-1&U-NII-2A&U-NII-2C) 2MHz(For U-NII-3)
Span	encompass the entire 26 dB EBW or 99% OBW of the signal
Sweep Time	Auto
Number of Sweep Point	≥2×SPAN/RBW
Detector	RMS(power averaging)
Trace Average	≥100 traces

5.4. Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 5.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker-to-peak function to set the marker to the average of the emission.
e. If the duty cycle of test siganl＜98%,the result=max measured value+10×log(1/duty cycle);
If the duty cycle of test siganl≥98%,the esult=max measured value.
f. Repeat above procedures until all modes and channels were measured.
g. Record the results in the test report.

5.5. Test Result

Temperature		25.3℃	Relative Humidity		52%	Test Voltage	AC 120V/60Hz	
BAND	Test Mode	Fre (MHz)	Power Density (dBm/MHz)		Duty Factor (dB)	Total Power Density (dBm/MHz)	Limit (dBm/MHz)	Result
			Ant 1	Ant 2				
U-NII-1	IEEE 802.11a	5180	4.65	3.86	0.26	-	11.00	PASS
		5200	4.80	4.24	0.26	-	11.00	PASS
		5240	4.52	4.13	0.26	-	11.00	PASS
	IEEE 802.11n HT20	5180	4.36	3.35	0.27	7.17	11.00	PASS
		5200	4.15	3.62	0.27	7.18	11.00	PASS
		5240	4.03	3.42	0.27	7.02	11.00	PASS
	IEEE 802.11ac VHT20	5180	4.16	2.98	0.25	6.87	11.00	PASS
		5200	4.39	3.48	0.25	7.22	11.00	PASS
		5240	4.06	3.10	0.25	6.86	11.00	PASS
	IEEE 802.11n HT40	5190	-0.27	-1.28	0.54	2.80	11.00	PASS
		5230	-0.21	-1.11	0.54	2.91	11.00	PASS
	IEEE 802.11ac VHT40	5190	-0.21	-0.66	0.53	3.11	11.00	PASS
		5230	-0.29	-0.75	0.53	3.02	11.00	PASS
	IEEE 802.11ac VHT80	5210	-2.72	-3.43	1.00	0.95	11.00	PASS

BAND	Test Mode	Fre (MHz)	Power Density (dBm/500KHz)		Duty Factor (dB)	Total Power Density (dBm/500KHz)	Limit (dBm/500KHz)	Result
			Ant 1	Ant 2				
U-NII-3	IEEE 802.11a	5745	1.72	0.35	0.26	-	30.00	PASS
		5785	1.91	0.10	0.26	-	30.00	PASS
		5825	0.85	-0.51	0.26	-	30.00	PASS
	IEEE 802.11n HT20	5745	1.63	0.13	0.27	4.23	30.00	PASS
		5785	1.67	0.07	0.27	4.23	30.00	PASS
		5825	1.11	-0.84	0.27	3.53	30.00	PASS
	IEEE 802.11ac VHT20	5745	1.56	-0.18	0.25	4.03	30.00	PASS
		5785	1.46	-0.47	0.25	3.86	30.00	PASS
		5825	0.75	-1.08	0.25	3.19	30.00	PASS
	IEEE 802.11n HT40	5755	-3.06	-5.01	0.54	-0.38	30.00	PASS
		5795	-3.33	-5.21	0.54	-0.62	30.00	PASS
	IEEE 802.11ac VHT40	5755	-3.20	-4.48	0.53	-0.25	30.00	PASS
		5795	-3.08	-4.69	0.53	-0.27	30.00	PASS
	IEEE 802.11ac VHT80	5775	-6.72	-7.68	1.00	-3.16	30.00	PASS

U-NII-1 IEEE 802.11a 5180MHz	
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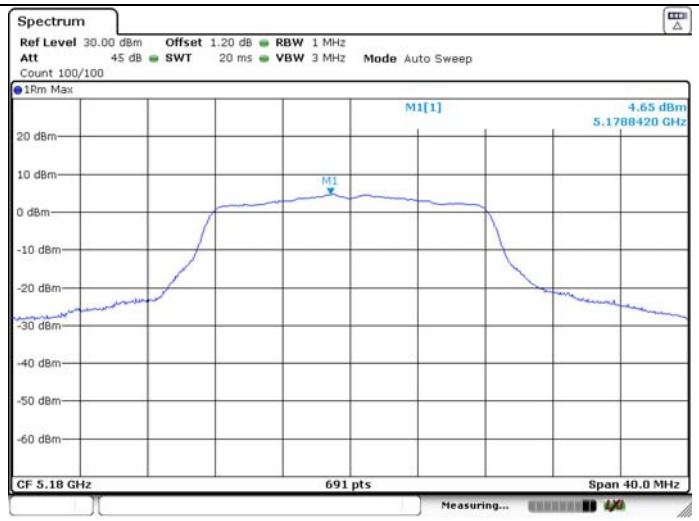	
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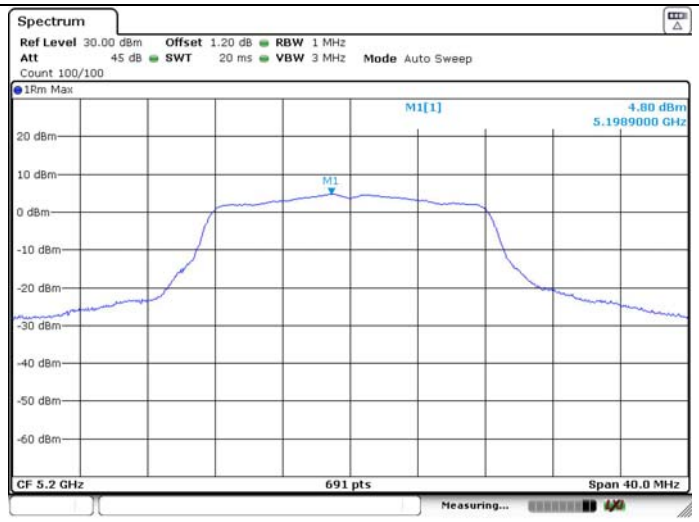	
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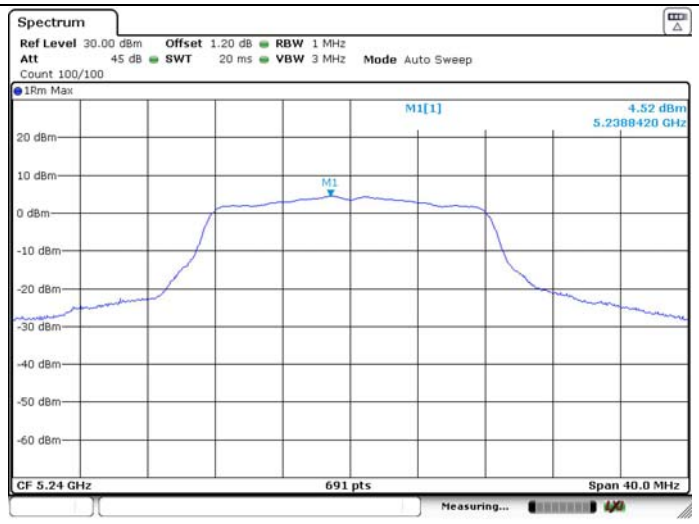	

U-NII-1 IEEE 802.11n HT20 5180MHz	
ANT 1	**ANT 2**
	

U-NII-1 IEEE 802.11n HT20 5200MHz	
ANT 1	**ANT 2**
	
U-NII-1 IEEE 802.11n HT20 5240MHz	
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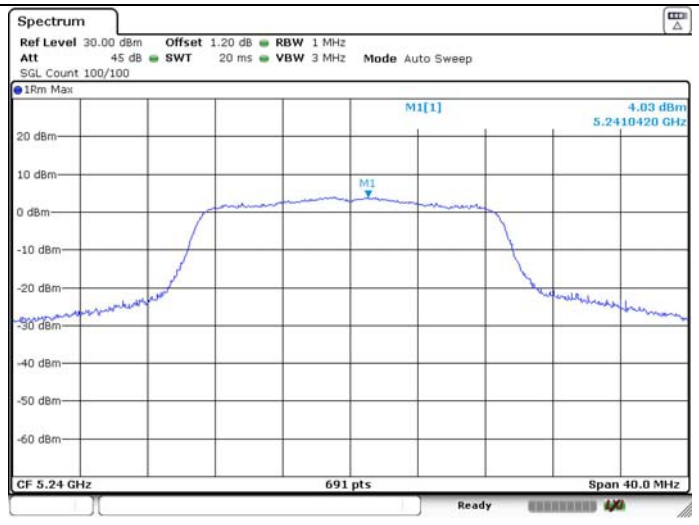	
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	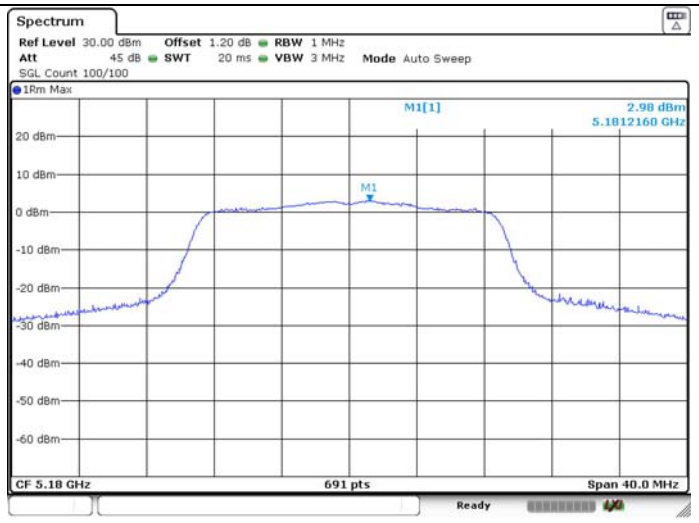

U-NII-1 IEEE 802.11ac VHT20 5200MHz	
ANT 1	**ANT 2**
	
U-NII-1 IEEE 802.11ac VHT20 5240MHz	
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	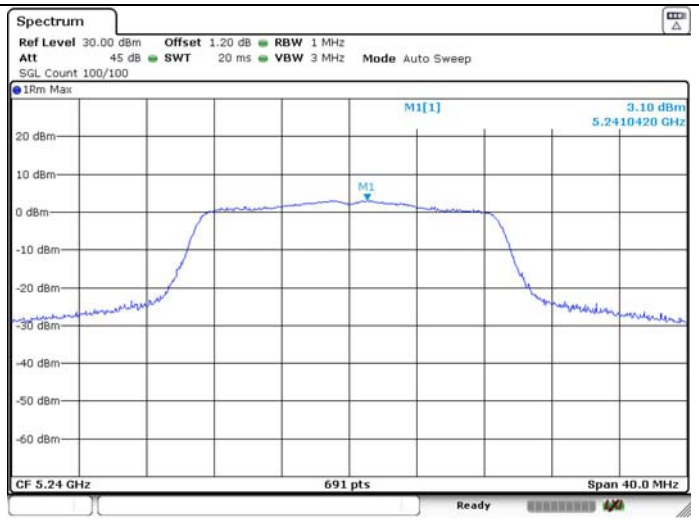
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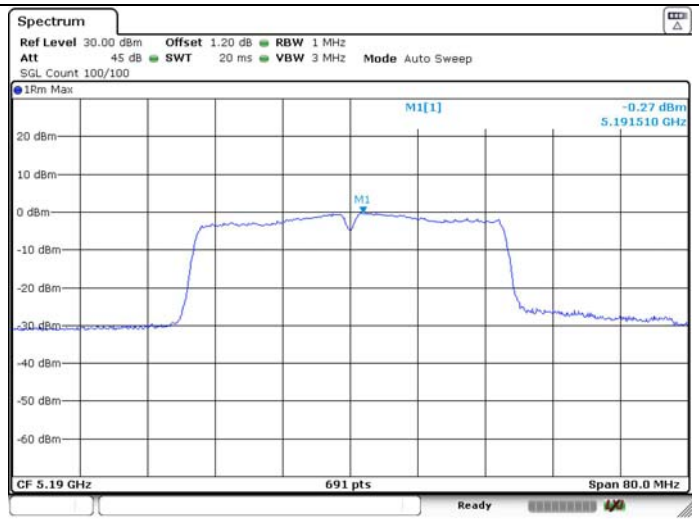	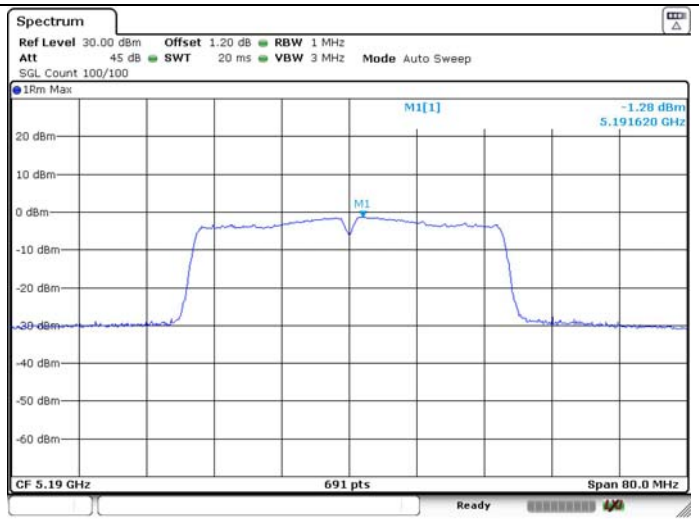

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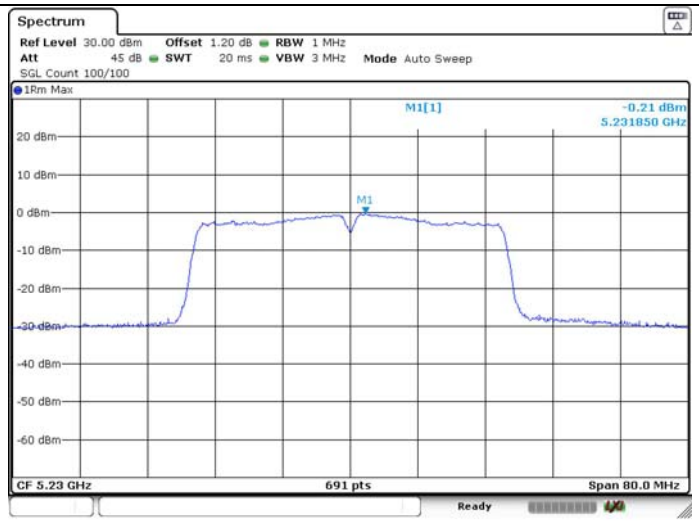	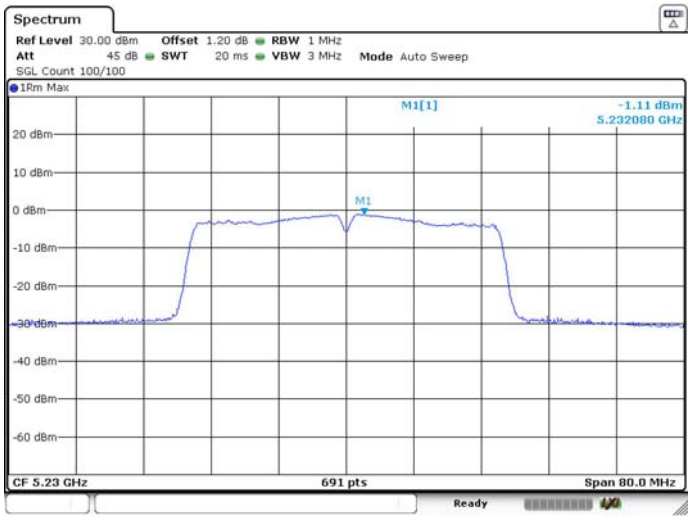
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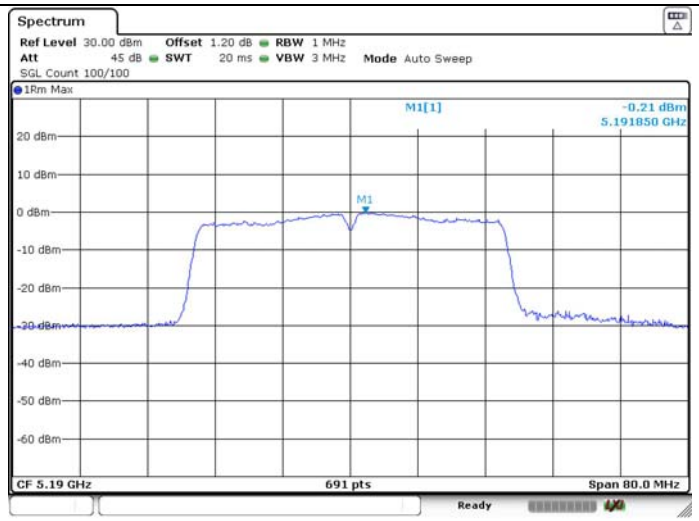	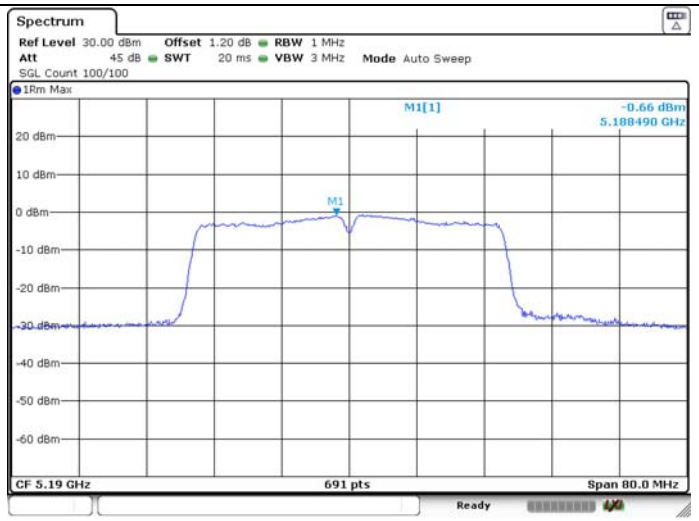
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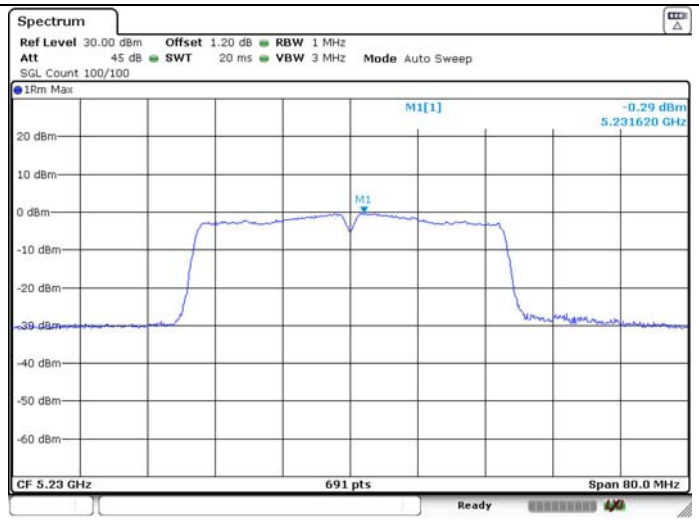	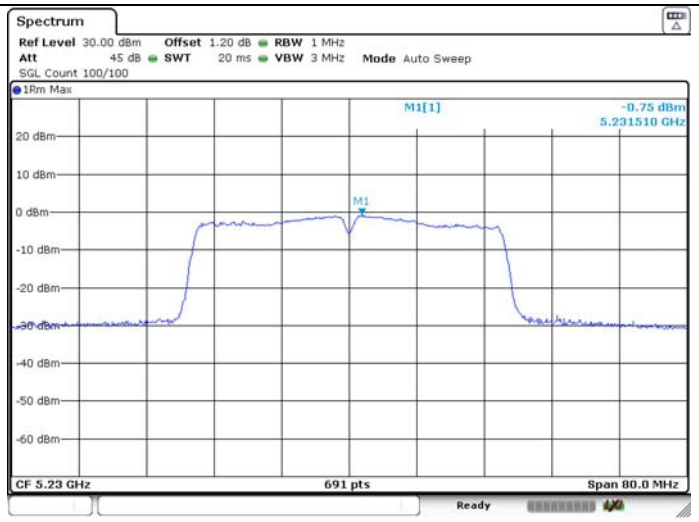

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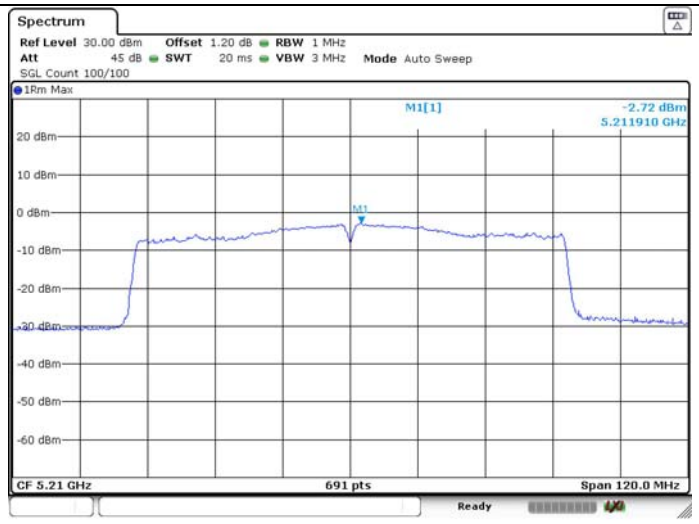	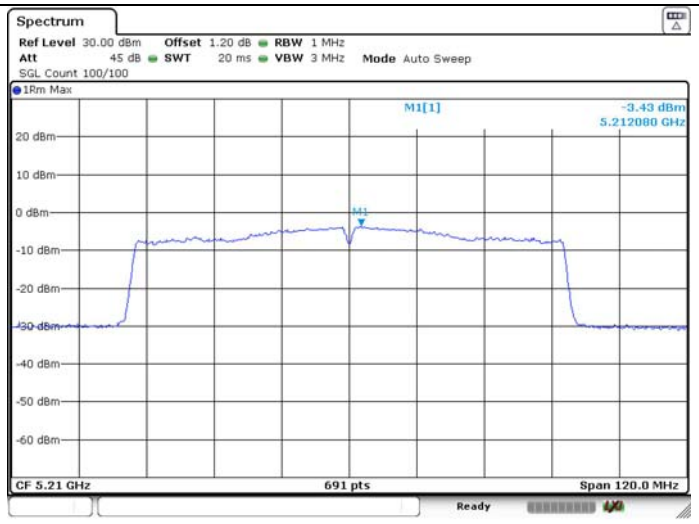

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	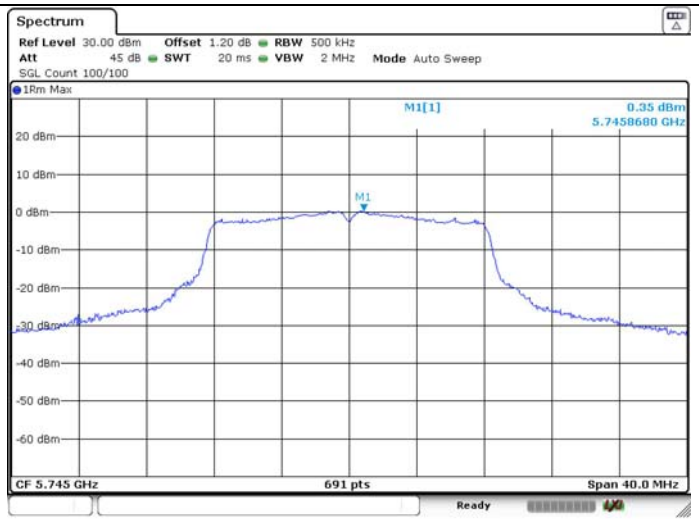
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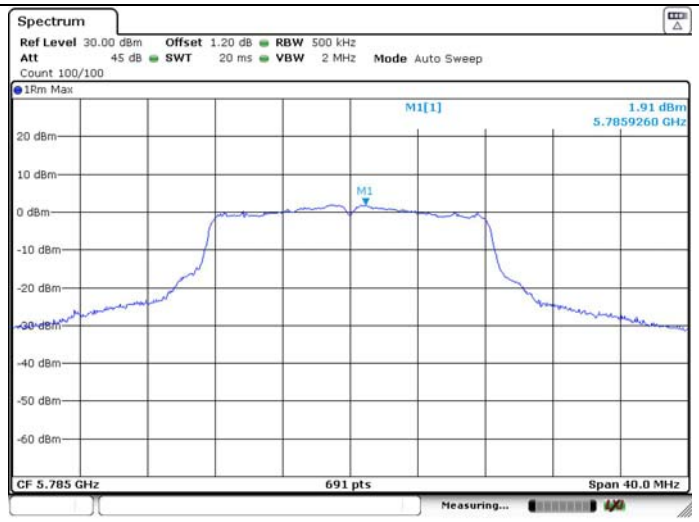	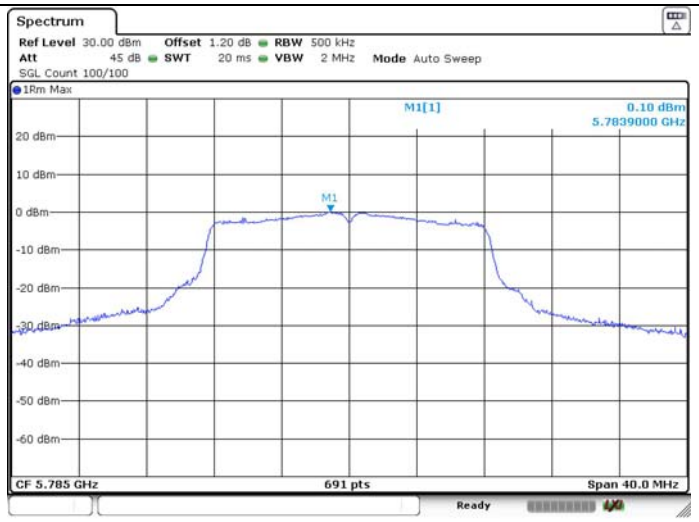
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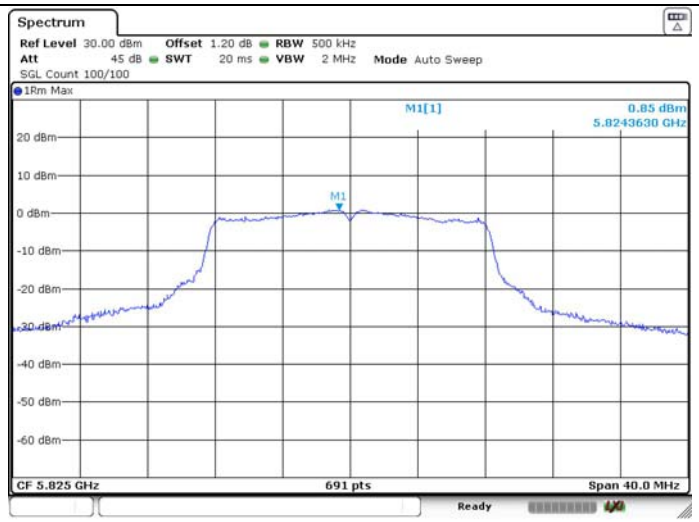	

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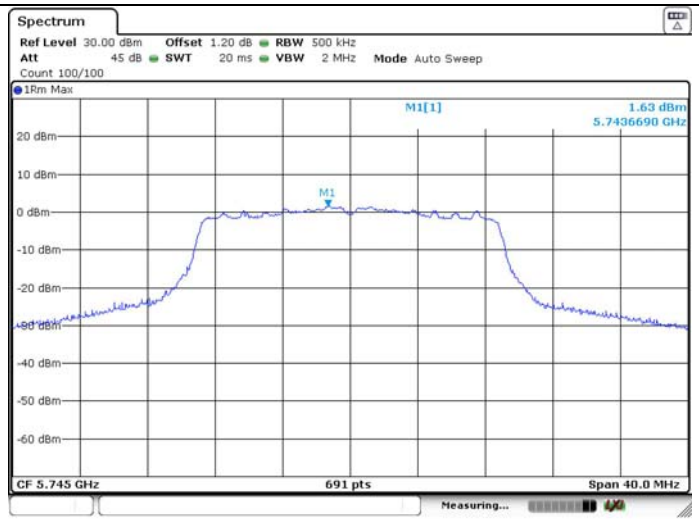	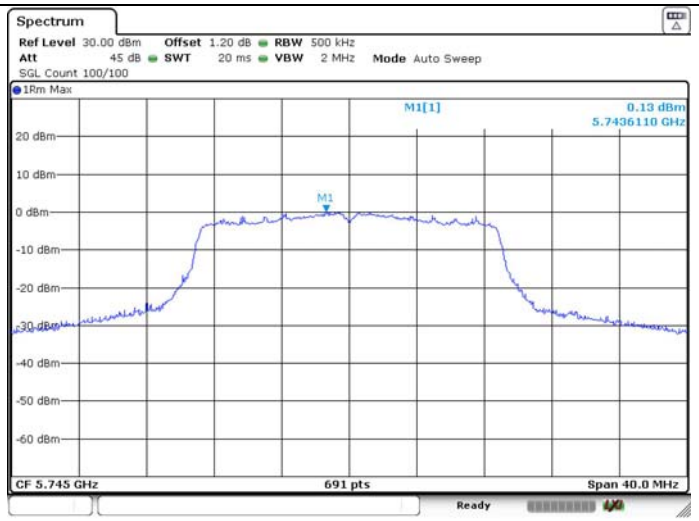

U-NII-3 IEEE 802.11n HT20 5785MHz	
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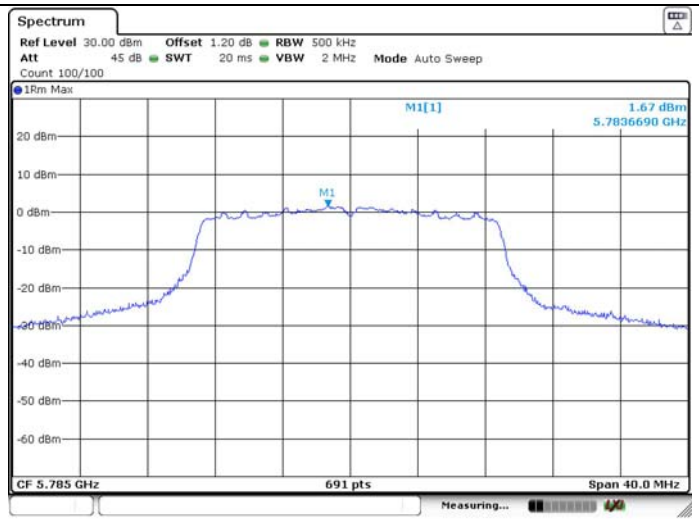	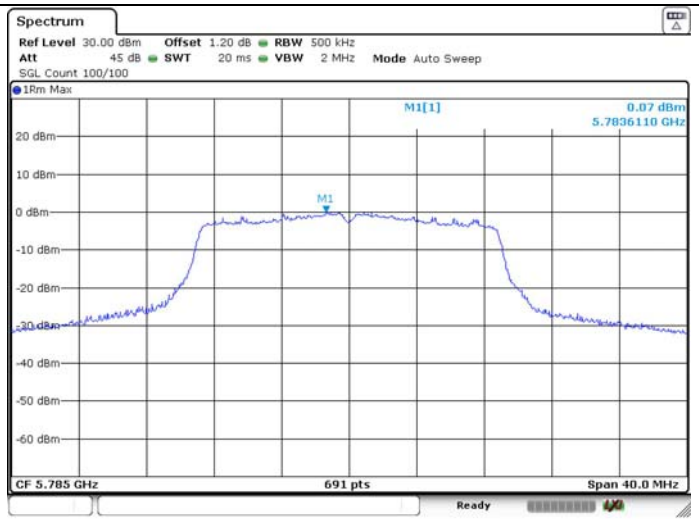
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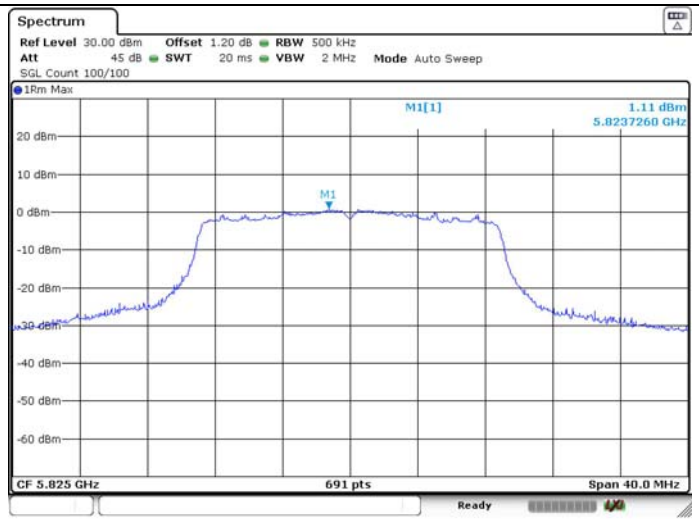	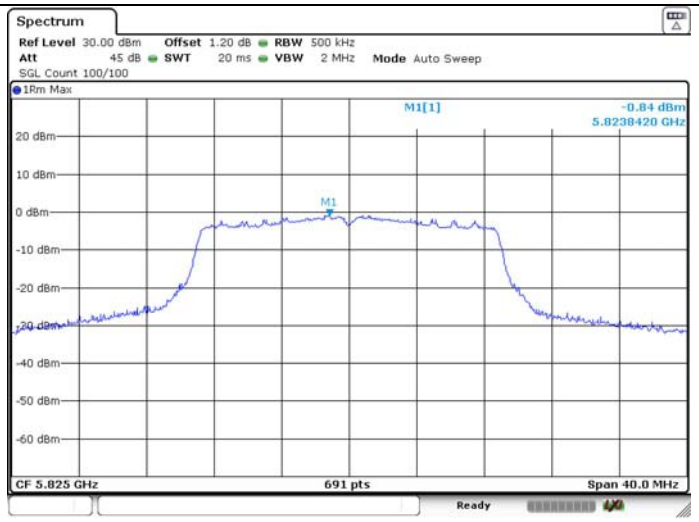
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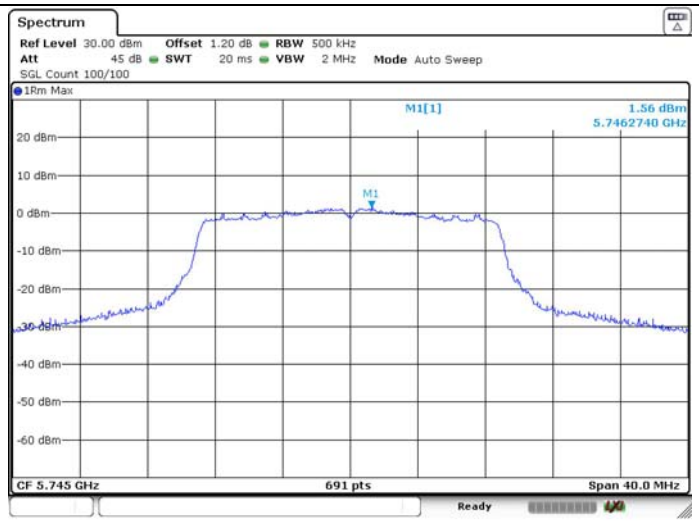	

U-NII-3 IEEE 802.11ac VHT20 5785MHz	
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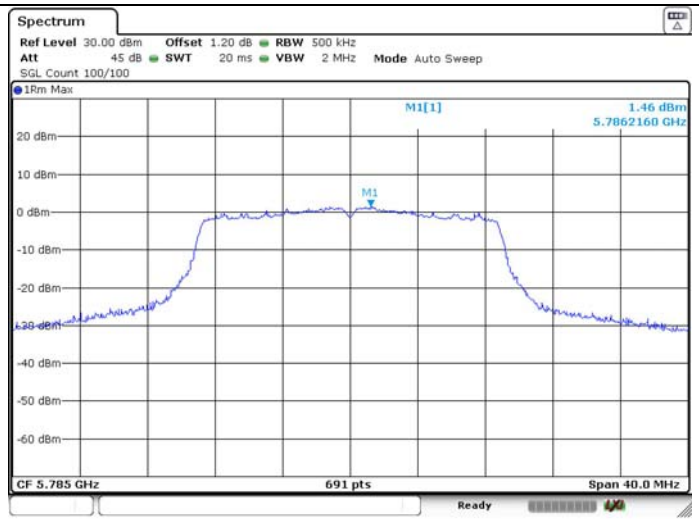	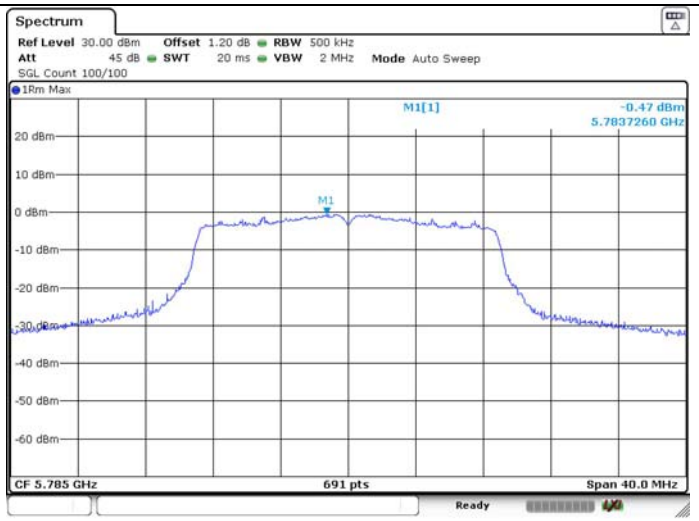
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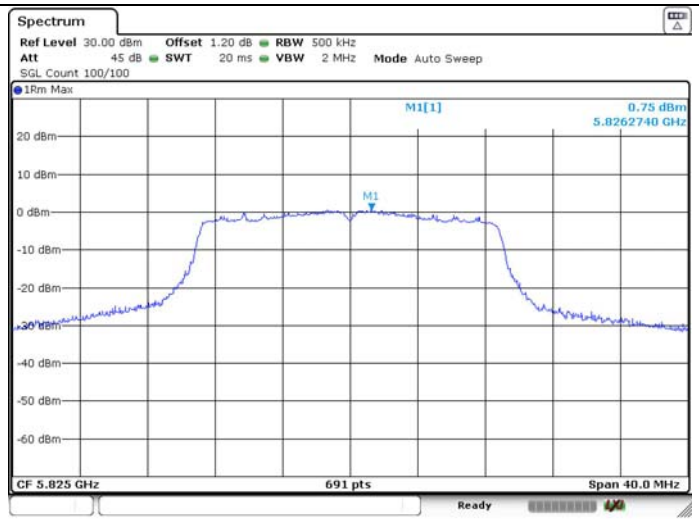	
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	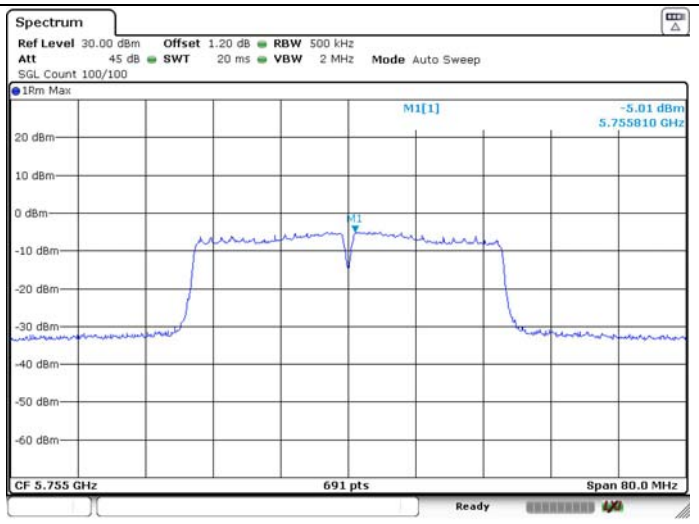

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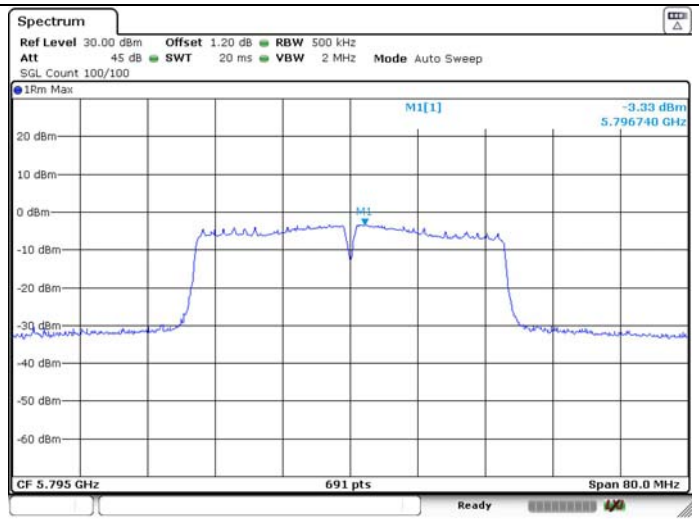	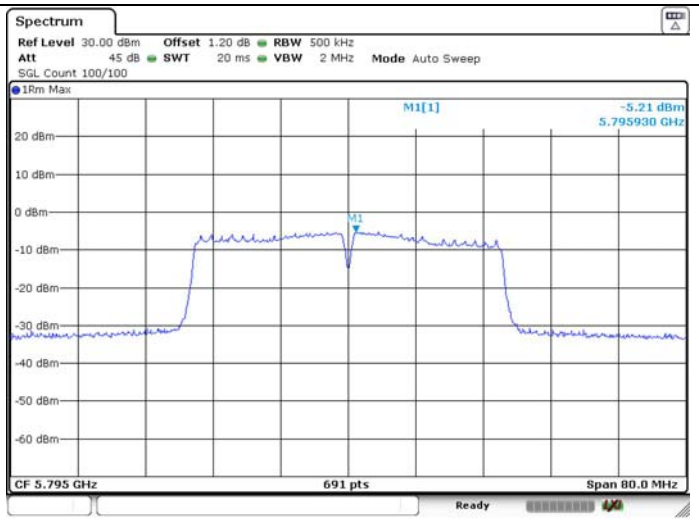
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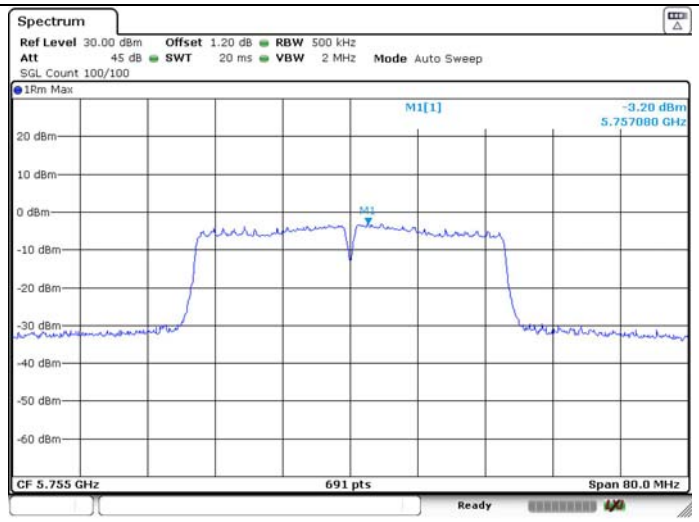
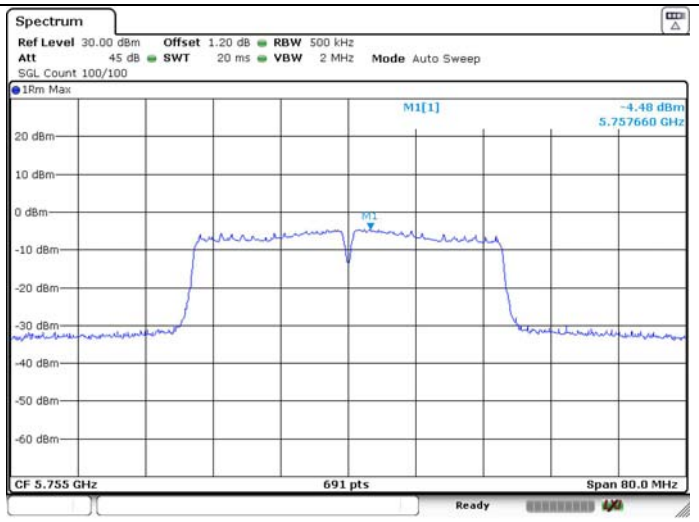
ANT 1	**ANT 2**
	
U-NII-3 IEEE 802.11ac VHT40 5795MHz	
ANT 1	**ANT 2**
	

U-NII-3 IEEE 802.11ac VHT80 5775MHz	
ANT 1	**ANT 2**