

FCC PART 15E TEST REPORT FOR CERTIFICATION

On Behalf of

Sceptre Inc.

LED TV

Model Number: G65

Additional Model: A65, A650CV-UMC, A651CV-UMC, A652CV-UMC, A653CV-UMC, A654CV-UMC, A655CV-UMC, A656CV-UMC, A657CV-UMC, A658CV-UMC, A659CV-UMC, A550CV-UMC, G55, A55, A551CV-UMC, A552CV-UMC, A553CV-UMC, A554CV-UMC, A555CV-UMC, A556CV-UMC, A557CV-UMC, A558CV-UMC, A559CV-UMC, G50, A50, A510CV-UMC, A511CV-UMC, A512CV-UMC, A513CV-UMC, A514CV-UMC, A515CV-UMC, A516CV-UMC, A517CV-UMC, A518CV-UMC, A519CV-UMC

FCC ID: 2AGEEG55

Prepared for:	Sceptre Inc.
	16800 E. Gale Ave.City of Industry, CA,91745,USA
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
	Tel: 86-769-83081888-808

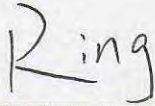
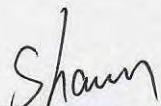
Report Number:	ESTE-R1912054
Date of Test:	Nov. 14~Dec. 17, 2019
Date of Report:	Dec. 18, 2019

TABLE OF CONTENTS

Description	Page
TEST REPORT VERIFICATION	3
1. GENERAL INFORMATION.....	5
1.1. Description of Device (EUT)	5
1.2. The antenna information for EUT	7
2. SUMMARY OF TEST	8
2.1. Summary of test result.....	8
2.2. Test Facilities.....	9
2.3. Measurement uncertainty for EST Technology Co., Ltd.	10
2.4. Assistant equipment used for test	10
2.5. Block Diagram.....	10
2.6. Test Mode	11
2.7. Channel List.....	13
2.8. Power Setting of Test Software	14
2.9. Duty Cycle of Test Signal	15
2.10. Test Equipment List	19
3. 6dB BANDWIDTH & 26dB BANDWIDTH & 99% OCCUPIED BANDWIDTH	21
3.1. Limit	21
3.2. Test Setup	21
3.3. Spectrum Analyzer Setting.....	21
3.4. Test Procedure	22
3.5. Test Result	23
3.6. Test Result	25
4. MAXIMUM CONDUCTED OUTPUT POWER	65
4.1. Limit	65
4.2. Test Setup	65
4.3. Test Procedure	65
4.4. Test Result	66
5. PEAK POWER SPECTRAL DENSITY	68
5.1. Limit	68
5.2. Test Setup	68
5.3. Spectrum Analyzer Setting.....	68
5.4. Test Procedure	68
5.5. Test Result	69
6. UNWANTED EMISSIONS AND BAND EDGE	95
6.1. Limit	95
6.2. Test Setup	96
6.3. Spectrum Analyzer Setting.....	97
6.4. Test Procedure	98
6.5. Test Result	99
7. FREQUENCY STABILITY	150
7.1. Limit	150
7.2. Test Setup	150
7.3. Spectrum Analyzer Setting.....	150
7.4. Test Procedure	151

7.5.	Test Result	152
8.	AC POWER LINE CONDUCTED EMISSIONS	156
8.1.	Limit	156
8.2.	Test Setup	156
8.3.	Spectrum Analyzer Setting.....	156
8.4.	Test Procedure	156
8.5.	Test Result	157
9.	ANTENNA REQUIREMENTS.....	169
9.1.	Limit	169
9.2.	Test Result	169
10.	TEST SETUP PHOTO.....	170
11.	EUT PHOTO	175

EST Technology Co., Ltd.

Applicant:	Sceptre Inc.		
Address:	16800 E. Gale Ave.City of Industry, CA,91745,USA		
Manufacturer:	Sceptre Inc.		
Address:	16800 E. Gale Ave.City of Industry, CA,91745,USA		
E.U.T:	LED TV		
Model Number:	G65		
Additional Model:	A65, A650CV-UMC, A651CV-UMC, A652CV-UMC, A653CV-UMC, A654CV-UMC, A655CV-UMC, A656CV-UMC, A657CV-UMC, A658CV-UMC, A659CV-UMC, A550CV-UMC, G55, A55, A551CV-UMC, A552CV-UMC, A553CV-UMC, A554CV-UMC, A555CV-UMC, A556CV-UMC, A557CV-UMC, A558CV-UMC, A559CV-UMC, G50, A50, A510CV-UMC, A511CV-UMC, A512CV-UMC, A513CV-UMC, A514CV-UMC, A515CV-UMC, A516CV-UMC, A517CV-UMC, A518CV-UMC, A519CV-UMC Note: The three TV sets are of different sizes with different power boards, all other parameters are the same.		
Power Supply:	AC 100-240V, 50/60Hz		
Trade Name:	-----	Serial No.:	-----
Date of Receipt:	Nov. 14, 2019	Date of Test:	Nov. 14~Dec. 17, 2019
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.		
Prepared by:	Reviewed by:	Date: Dec. 18, 2019	
 Ring / Assistant	 Shawn / 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	:	2AGEEG55
Product Name	:	LED TV
Model Number	:	G65
Software Version	:	N//A
Hardware Version	:	N/A
Operation frequency	:	U-NII-1: 5150 MHz~5250 MHz U-NII-2A: 5250 MHz~5350 MHz U-NII-2C: 5470 MHz~5725 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-2A: 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-2C: IEEE 802.11a / n HT20 / ac VHT20: 11 Channels; IEEE 802.11n HT40 / ac VHT40: 5 Channels; IEEE 802.11ac VHT80: 2 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 300Mbps; IEEE 802.11ac: up to 866.6Mbps;
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: 13.36dBm IEEE 802.11n HT20: 13.83dBm IEEE 802.11n HT40: 14.75dBm IEEE 802.11ac VHT20: 13.52dBm IEEE 802.11ac VHT40: 14.52dBm IEEE 802.11ac VHT80: 13.51dBm
		U-NII-2A	IEEE 802.11a: 13.22dBm IEEE 802.11n HT20: 14.27dBm IEEE 802.11n HT40: 15.11dBm IEEE 802.11ac VHT20: 14.01dBm IEEE 802.11ac VHT40: 14.96dBm IEEE 802.11ac VHT80: 14.35dBm
		U-NII-2C	IEEE 802.11a: 14.62dBm IEEE 802.11n HT20: 15.28dBm IEEE 802.11n HT40: 15.27dBm IEEE 802.11ac VHT20: 15.11dBm IEEE 802.11ac VHT40: 15.08dBm IEEE 802.11ac VHT80: 15.13dBm
		U-NII-3	IEEE 802.11a: 12.04dBm IEEE 802.11n HT20: 12.95dBm IEEE 802.11n HT40: 13.64dBm IEEE 802.11ac VHT20: 12.97dBm IEEE 802.11ac VHT40: 13.41dBm IEEE 802.11ac VHT80: 13.01dBm
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	N/A	N/A	Internal antenna	N/A	3.2
2	N/A	N/A	Internal antenna	N/A	3.2

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):

$$\text{Directional gain} = 3.2\text{dBi} + 10 \times \log(2/1)\text{dB} = 6.21\text{dBi} > 6\text{dBi}$$

For power spectral density:

U-NII-1 Limit is $11\text{dBm/MHz} - (6.21\text{dBi} - 6\text{dBi}) = 10.79\text{dBm/MHz}$

U-NII-2A&U-NII-2C Limit is $11\text{dBm/MHz} - (6.21\text{dBi} - 6\text{dBi}) = 10.79\text{dBm/MHz}$

U-NII-3 Limit is $30\text{dBm/500KHz} - (6.21\text{dBi} - 6\text{dBi}) = 29.79\text{dBm/500KHz}$

- (2) After pre-test all antenna configurations, the worst case configuration as list below.

TX Mode \ ANT No.	SISO Configuration	MIMO Configuration
IEEE 802.11a	ANT1, ANT2	/
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

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)(6)	PASS
9	Antenna Requirement	15.203	PASS

Note:

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

2.2. Test Facilities

EMC Lab

: Certificated by CNAS, CHINA
Registration No.: L5288
Date of registration: November 13, 2017

Certificated by FCC, USA
Designation Number: CN1215
Test Firm Registration Number: 722932
Date of registration: November 21, 2017

Certificated by A2LA, USA
Registration No.: 4366.01
Date of registration: November 07, 2017

Certificated by Industry Canada
CAB identifier No.: CN0035
Date of registration: January 04, 2019

Certificated by VCCI, Japan
Registration No.: R-13663; C-14103
Date of registration: July 25, 2017
This Certificate is valid until: July 24, 2020

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

Certificated by TUV/PS, Shenzhen
Registration No.: SCN1017
Date of registration: January 27, 2011

Certificated by Intertek ETL SEMKO
Registration No.: 2011-RTL-L2-64
Date of registration: April 28, 2011

Certificated by Nemko, Hong Kong
Registration No.: 175193
Date of registration: May 4, 2011

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	0.20dB
Uncertainty for Power density test	0.26dB
Temperature	$\pm 0.6^{\circ}\text{C}$
Humidity	$\pm 4.0\%$
Volatage DC	$\pm 1.0\%$
Volatage (AC, <10KHz)	$\pm 1.5\%$

Note:

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

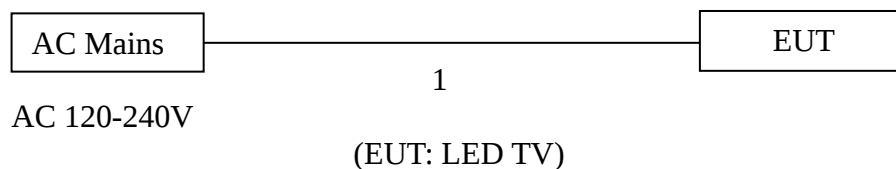
2.4. Assistant equipment used for test

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.



2.6. Test Mode

Pre-scan has been combined all possible modulations and data 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	36/40/48/52/60/64/100/116/140	OFDM	6Mbps
	IEEE 802.11n HT20	36/40/48/52/60/64/100/116/140	OFDM	MCS0
	IEEE 802.11n HT40	38/46/54/62/102/114/134	OFDM	MCS0
	IEEE 802.11ac VHT20	36/40/48/52/60/64/100/116/140	OFDM	MCS0
	IEEE 802.11ac VHT40	38/46/54/62/102/114/134	OFDM	MCS0
	IEEE 802.11ac VHT80	42/58/106/122	OFDM	MCS0
99% Occupied Bandwidth	IEEE 802.11a	36/40/48/52/60/64/100/116/140/ 149/157/165	OFDM	6Mbps
	IEEE 802.11n HT20	36/40/48/52/60/64/100/116/140/ 149/157/165	OFDM	MCS0
	IEEE 802.11n HT40	38/46/54/62/102/114/134/151/159	OFDM	MCS0
	IEEE 802.11ac VHT20	36/40/48/52/60/64/100/116/140/ 149/157/165	OFDM	MCS0
	IEEE 802.11ac VHT40	38/46/54/62/102/114/134/151/ 159	OFDM	MCS0
	IEEE 802.11ac VHT80	42/58/106/122/155	OFDM	MCS0
Maximum Conducted Output Power	IEEE 802.11a	36/40/48/52/60/64/100/116/140/ 149/157/165	OFDM	6Mbps
	IEEE 802.11n HT20	36/40/48/52/60/64/100/116/140/ 149/157/165	OFDM	MCS0
	IEEE 802.11n HT40	38/46/54/62/102/114/134/151/159	OFDM	MCS0
	IEEE 802.11ac VHT20	36/40/48/52/60/64/100/116/140/ 149/157/165	OFDM	MCS0
	IEEE 802.11ac VHT40	38/46/54/62/102/114/134/151/ 159	OFDM	MCS0
	IEEE 802.11ac VHT80	42/58/106/122/155	OFDM	MCS0

Peak Power Spectral Density	IEEE 802.11a	36/40/48/52/60/64/100/116/140/149/157/165	OFDM	6Mbps
	IEEE 802.11n HT20	36/40/48/52/60/64/100/116/140/149/157/165	OFDM	MCS0
	IEEE 802.11n HT40	38/46/54/62/102/114/134/151/159	OFDM	MCS0
	IEEE 802.11ac VHT20	36/40/48/52/60/64/100/116/140/149/157/165	OFDM	MCS0
	IEEE 802.11ac VHT40	38/46/54/62/102/114/134/151/159	OFDM	MCS0
	IEEE 802.11ac VHT80	42/58/106/122/155	OFDM	MCS0
Unwanted Emissions and Band Edge(Above 1GHz)	IEEE 802.11a	36/40/48/52/60/64/100/116/140/149/157/165	OFDM	6Mbps
	IEEE 802.11n HT20	36/40/48/52/60/64/100/116/140/149/157/165	OFDM	MCS0
	IEEE 802.11n HT40	38/46/54/62/102/114/134/151/159	OFDM	MCS0
	IEEE 802.11ac VHT20	36/40/48/52/60/64/100/116/140/149/157/165	OFDM	MCS0
	IEEE 802.11ac VHT40	38/46/54/62/102/114/134/151/159	OFDM	MCS0
	IEEE 802.11ac VHT80	42/58/106/122/155	OFDM	MCS0
Unwanted Emissions Below 1GHz	IEEE 802.11a	100	OFDM	6Mbps
Frequency Stability	Unmodulation	36/64/100/149	N/A	N/A
AC Power Line Conducted Emissions	IEEE 802.11a	100	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-2A	IEEE 802.11a & n HT20 & ac VHT20	52	5260
		56	5280
		60	5300
		64	5320
	IEEE 802.11n HT40 & ac VHT40	54	5270
		62	5310
	IEEE 802.11ac VHT80	58	5290
U-NII-2C	IEEE 802.11a & n HT20 & ac VHT20	100	5500
		104	5520
		108	5540
		112	5560
		116	5580
		120	5600
		124	5620
		128	5640
		132	5660
		136	5680
		140	5700
	IEEE 802.11n HT40 & ac VHT40	102	5510
		110	5550
		118	5590
		126	5630
		134	5670
	IEEE 802.11ac VHT80	106	5530
		122	5610
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	SecureCRT 5.50		
U-NII-1			
Frequency(MHz)	5180	5200	5240
IEEE 802.11a Setting	11	11	11
IEEE 802.11n HT20 Setting	11	11	11
IEEE 802.11ac VHT20 Setting	11	11	11
Frequency(MHz)	5190	5230	
IEEE 802.11n HT40 Setting	11	11	
IEEE 802.11ac VHT40 Setting	11	11	
Frequency(MHz)	5210		
IEEE 802.11ac VHT80 Setting	11		
U-NII-2A			
Frequency(MHz)	5260	5300	5320
IEEE 802.11a Setting	11	11	11
IEEE 802.11n HT20 Setting	11	11	11
IEEE 802.11ac VHT20 Setting	11	11	11
Frequency(MHz)	5270	5310	
IEEE 802.11n HT40 Setting	11	11	
IEEE 802.11ac VHT40 Setting	11	11	
Frequency(MHz)	5290		
IEEE 802.11ac VHT80 Setting	11		
U-NII-2C			
Frequency(MHz)	5500	5580	5700
IEEE 802.11a Setting	11	11	11
IEEE 802.11n HT20 Setting	11	11	11
IEEE 802.11ac VHT20 Setting	11	11	11
Frequency(MHz)	5510	5670	
IEEE 802.11n HT40 Setting	11	11	
IEEE 802.11ac VHT40 Setting	11	11	
Frequency(MHz)	5530	5610	
IEEE 802.11ac VHT80 Setting	11	11	
U-NII-3			
Frequency(MHz)	5745	5785	5825
IEEE 802.11a Setting	11	11	11
IEEE 802.11n HT20 Setting	11	11	11
IEEE 802.11ac VHT20 Setting	11	11	11
Frequency(MHz)	5755	5795	
IEEE 802.11n HT40 Setting	11	11	
IEEE 802.11ac VHT40 Setting	11	11	
Frequency(MHz)	5775		
IEEE 802.11ac VHT80 Setting	11		

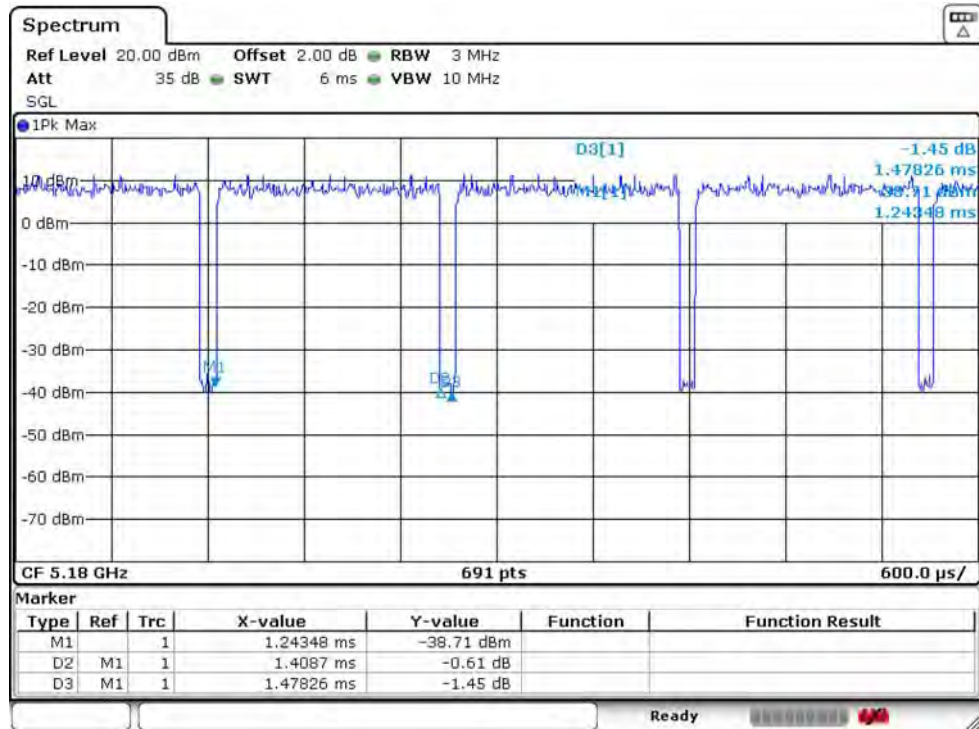
2.9. Duty Cycle of Test Signal

Temperature	22℃	Relative Humidity		31%	Test Voltage		120V/60Hz
Mode	Frequency (MHz)	On time (ms)	Total Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T (Hz)	VBW Setting (Hz)
IEEE 802.11a	5180	1.40870	1.47826	95.29	0.21	710	710
IEEE 802.11n HT20	5180	1.33043	1.40000	95.03	0.22	752	752
IEEE 802.11n HT40	5190	1.00000	1.59130	62.84	2.02	1000	1000
IEEE 802.11ac VHT20	5180	0.66957	0.74783	89.54	0.48	1493	1493
IEEE 802.11ac VHT40	5190	0.78258	1.65217	47.37	3.25	1278	1278
IEEE 802.11ac VHT80	5210	0.91301	1.76522	51.72	2.86	1095	1095

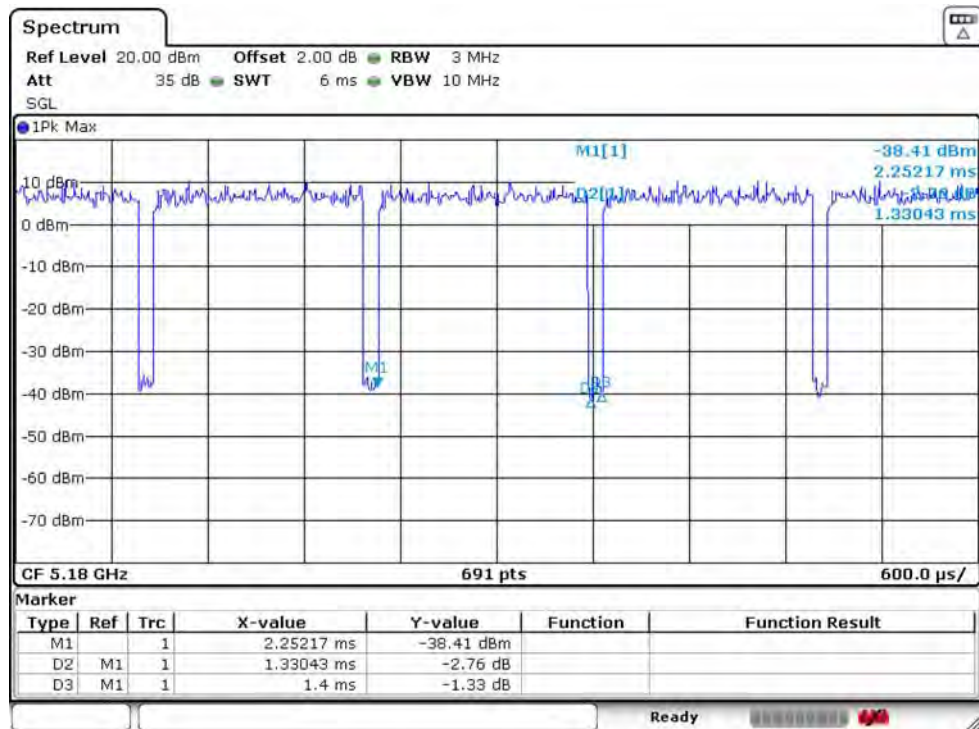
Note:

1. Duty Cycle=On Time/Total Time×100%.
2. Duty Factor= $10 \times \log(1/\text{Duty Cycle})$.
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.

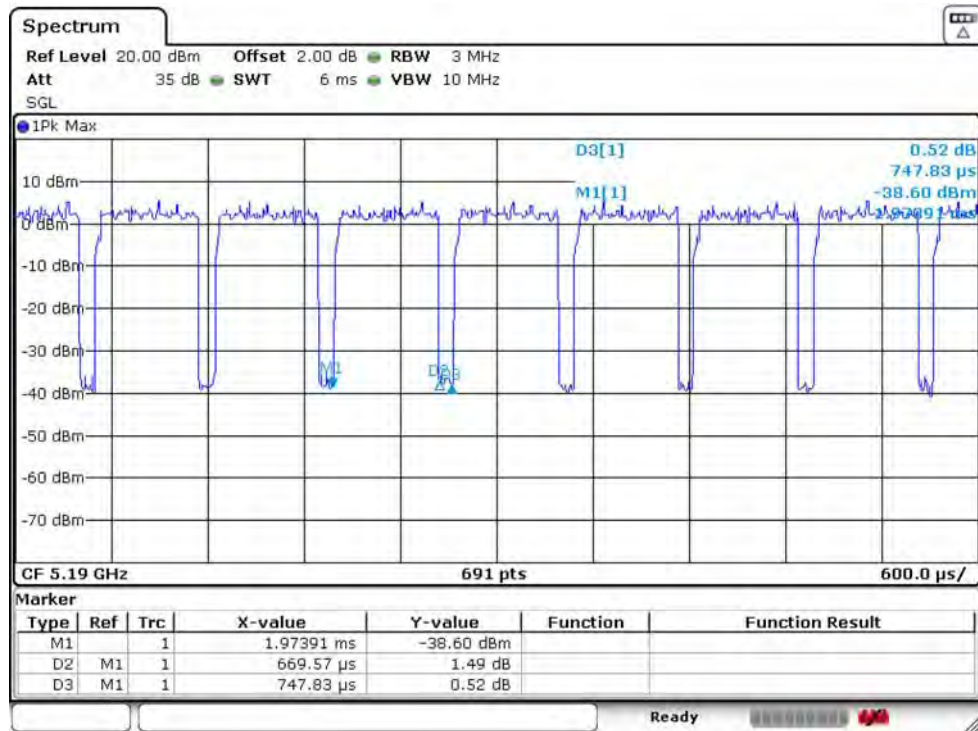
IEEE 802.11a 5180MHz



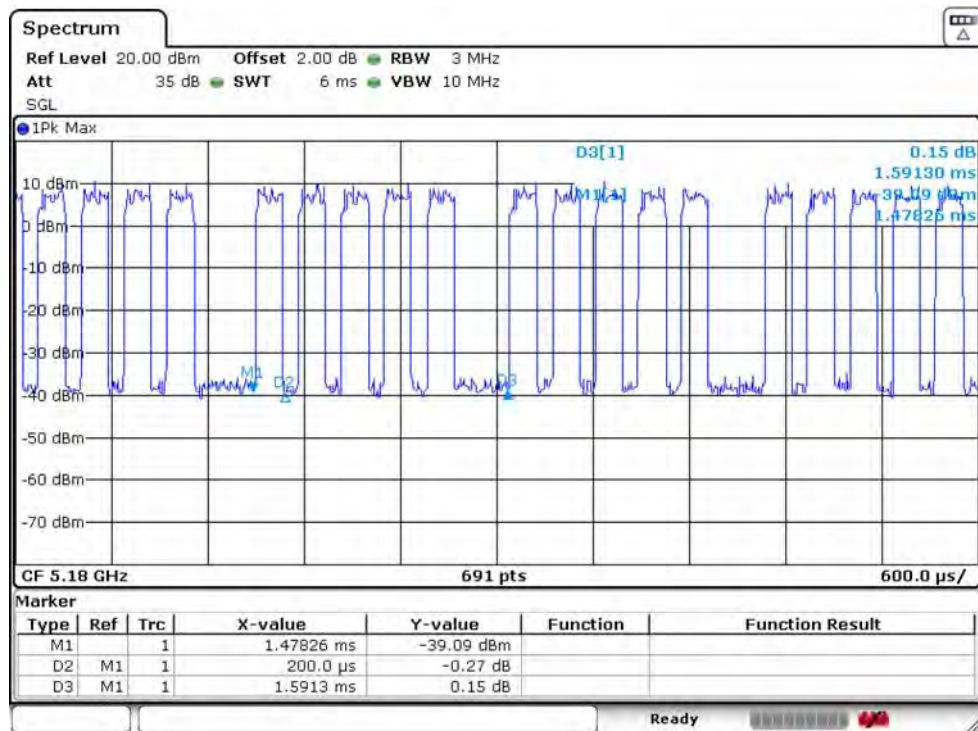
IEEE 802.11n HT20 5180MHz



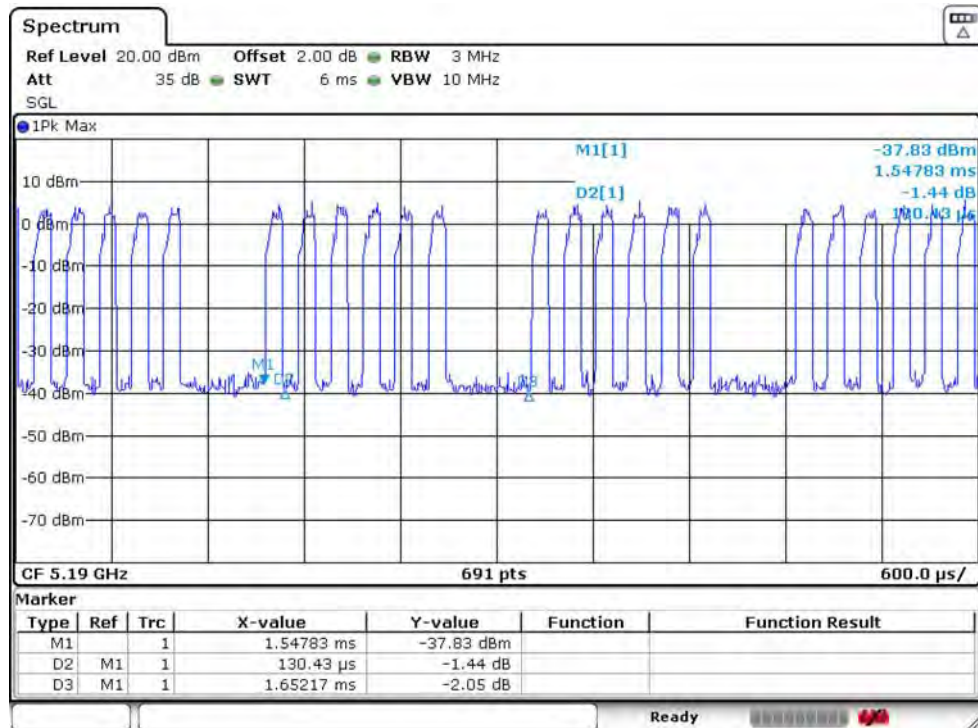
IEEE 802.11n HT40 5190MHz



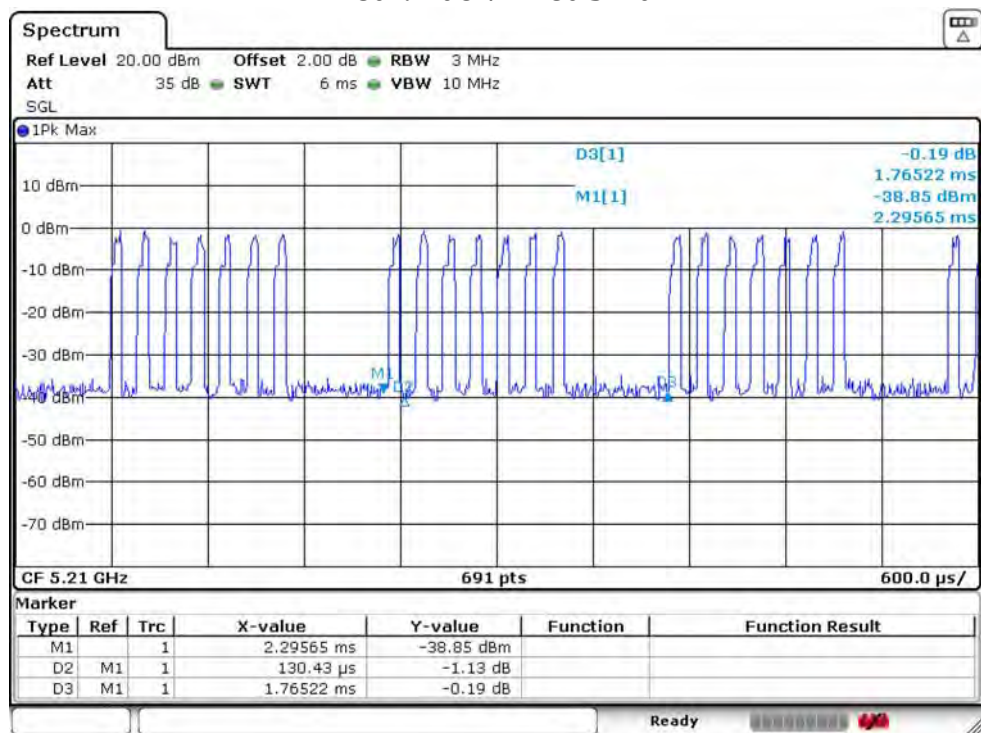
IEEE 802.11ac VHT20 5180MHz



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 14,19	1 Year
Artificial Mains Network	Rohde & Schwarz	ENV216	EST-E002	LISAI	June 14,19	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	EST-E078	LISAI	June 14,19	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 14,19	1 Year
Active Loop Antenna	SCHWARZB ECK	FMZB 1519B	EST-E054	LISAI	June 14,19	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 14,19	1 Year
Bilog Antenna	Teseq	CBL 6111D	EST-E034	LISAI	June 14,19	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	SCHWARZB ECK	BBHA 9120 D	EST-E031	LISAI	June 14,19	1 Year
Signal Amplifier	SCHWARZB ECK	BBV9718	EST-E032	LISAI	June 14,19	1 Year
Spectrum Analyzer	Rohde & Schwarz	FSV40	EST-E069	LISAI	June 14,19	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 14,19	1 Year
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV	EST-E037	LISAI	June 14,19	1 Year
Signal Generator	Rohde & Schwarz	SMB100A	EST-E038	LISAI	June 14,19	1 Year
Vector Signal Generator	Rohde & Schwarz	SMBV100A	EST-E039	LISAI	June 14,19	1 Year
Test Software	Rohde & Schwarz	WMS32	V10.50.00	N/A	N/A	N/A
Temperature controller	Terchy	MHQ	EST-E101	LISAI	June 14,19	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 $\geq$ 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 :

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 3.3.
- Set the EUT transmit continuously with maximum output power.
- 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%.
- Repeat above procedures until all modes and channels were measured.
- Record the results in the test report.

For 6dB Bandwidth Measurement :

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 3.3.
- Set the EUT transmit continuously with maximum output power.
- 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.
- Repeat above procedures until all modes and channels were measured.
- Record the results in the test report.

For 99% Occupied Bandwidth Measurement :

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

3.5. Test Result

Temperature	22℃	Relative Humidity			31%	Test Voltage	120V/60Hz	
26dB Bandwidth&99% Occupied Bandwidth								
BAND	Test Mode	Fre (MHz)	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Calcul ate Power Limit (W)	Calculate Power Limit (dBm)
			Ant 1	Ant 2	Ant 1	Ant 2		
U-NII-1	IEEE 802.11a	5180	19.74	19.95	16.38	16.79	0.2500	23.98
		5200	19.86	19.9	16.44	16.85	0.2500	23.98
		5240	19.80	20.02	16.44	16.79	0.2500	23.98
	IEEE 802.11n HT20	5180	20.38	20.32	17.48	17.71	0.2500	23.98
		5200	20.26	20.32	17.48	17.66	0.2500	23.98
		5240	20.38	20.49	17.54	17.83	0.2500	23.98
	IEEE 802.11ac VHT20	5180	20.03	20.04	17.66	17.60	0.2500	23.98
		5200	20.09	20.16	17.60	17.60	0.2500	23.98
		5240	20.03	20.08	17.60	17.66	0.2500	23.98
	IEEE 802.11n HT40	5190	40.81	40.81	36.70	36.58	0.2500	23.98
		5230	40.81	41.07	36.70	36.58	0.2500	23.98
	IEEE 802.11ac VHT40	5190	40.46	40.38	36.58	36.58	0.2500	23.98
		5230	40.55	40.72	36.58	36.58	0.2500	23.98
	IEEE 802.11ac VHT80	5210	81.27	82.14	75.89	75.89	0.2500	23.98
U-NII-2A	IEEE 802.11a	5260	19.80	20.06	16.44	16.79	0.2493	23.97
		5300	19.62	20.16	16.38	16.79	0.2470	23.93
		5320	19.74	20.08	16.44	16.85	0.2485	23.95
	IEEE 802.11n HT20	5260	20.32	20.38	17.54	17.77	0.2500	23.98
		5300	20.32	20.49	17.54	17.71	0.2500	23.98
		5320	20.32	20.43	17.54	17.66	0.2500	23.98
	IEEE 802.11ac VHT20	5260	20.09	19.95	17.66	17.6	0.2500	23.98
		5300	20.09	20.10	17.54	17.66	0.2500	23.98
		5320	20.15	20.08	17.66	17.54	0.2500	23.98
	IEEE 802.11n HT40	5270	40.81	41.07	36.70	36.70	0.2500	23.98
		5310	40.9	40.81	36.70	36.58	0.2500	23.98
	IEEE 802.11ac VHT40	5270	40.46	40.38	36.58	36.47	0.2500	23.98
		5310	40.46	40.38	36.47	36.58	0.2500	23.98
	IEEE 802.11ac VHT80	5290	80.93	82.14	75.89	75.89	0.2500	23.98
U-NII-2C	IEEE 802.11a	5500	20.03	20.41	16.56	16.85	0.2500	23.98
		5580	19.91	21.23	16.50	16.85	0.2500	23.98
		5700	19.80	20.01	16.44	16.85	0.2493	23.97
	IEEE 802.11n HT20	5500	20.38	20.43	17.54	17.71	0.2500	23.98
		5580	21.25	21.30	17.54	17.89	0.2500	23.98
		5700	20.26	20.38	17.54	17.66	0.2500	23.98
	IEEE 802.11ac VHT20	5500	20.09	19.99	17.60	17.66	0.2500	23.98
		5580	20.09	20.25	17.60	17.60	0.2500	23.98
		5700	20.03	19.99	17.60	17.60	0.2500	23.98
	IEEE 802.11n HT40	5510	41.42	41.33	36.93	36.82	0.2500	23.98
		5670	40.55	40.64	36.58	36.47	0.2500	23.98
	IEEE 802.11ac VHT40	5510	40.46	40.55	36.47	36.47	0.2500	23.98
		5670	40.29	40.46	36.35	36.47	0.2500	23.98
	IEEE 802.11ac	5530	81.10	81.79	75.89	76.23	0.2500	23.98

	VHT80	5610	82.14	76.06	76.06	81.27	0.2500	23.98
--	-------	------	-------	-------	-------	-------	--------	-------

Temperature	22℃	Relative Humidity			31%	Test Voltage		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
			Ant 1	Ant 2	Ant 1	Ant 2		
U-NII-3	IEEE 802.11a	5745	15.11	15.12	16.50	16.73	0.5	PASS
		5785	15.12	15.11	16.44	16.67	0.5	PASS
		5825	15.33	15.12	16.44	16.85	0.5	PASS
	IEEE 802.11n HT20	5745	16.29	16.29	17.54	17.71	0.5	PASS
		5785	16.27	16.27	17.54	17.71	0.5	PASS
		5825	16.33	16.33	17.54	17.71	0.5	PASS
	IEEE 802.11ac VHT20	5745	16.31	16.31	17.48	17.66	0.5	PASS
		5785	16.31	16.31	17.54	17.71	0.5	PASS
		5825	16.30	16.30	17.48	17.71	0.5	PASS
	IEEE 802.11n HT40	5755	35.70	35.12	36.70	36.70	0.5	PASS
		5795	35.11	35.12	36.82	36.70	0.5	PASS
	IEEE 802.11ac VHT40	5755	35.71	35.71	36.47	36.58	0.5	PASS
		5795	35.72	35.70	36.47	36.47	0.5	PASS
	IEEE 802.11ac VHT80	5775	75.45	76.41	75.89	75.89	0.5	PASS

Note :

For Band U-NII-2A and U-NII-2C,the maximum conducted output power limit is 250mw or $11+10 \times \log B$, 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.

3.6. Test Result

U-NII-1 IEEE 802.11a 5180MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11a 5200MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11a 5240MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11n HT20 5180MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11n HT20 5200MHz_Ant 1

26dB Bandwidth

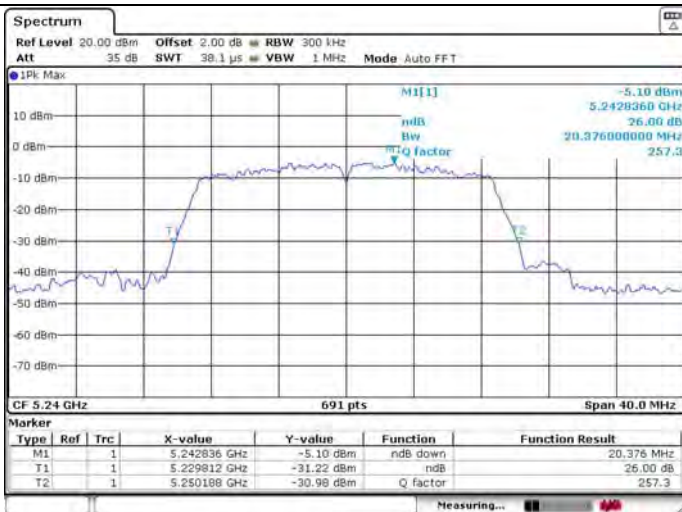


99% Occupied Bandwidth

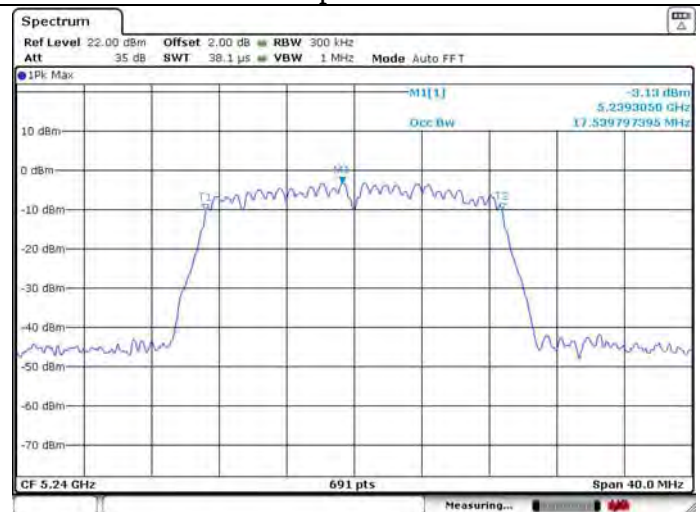


U-NII-1 IEEE 802.11n HT20 5240MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11ac VHT20 5180MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11ac VHT20 5200MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



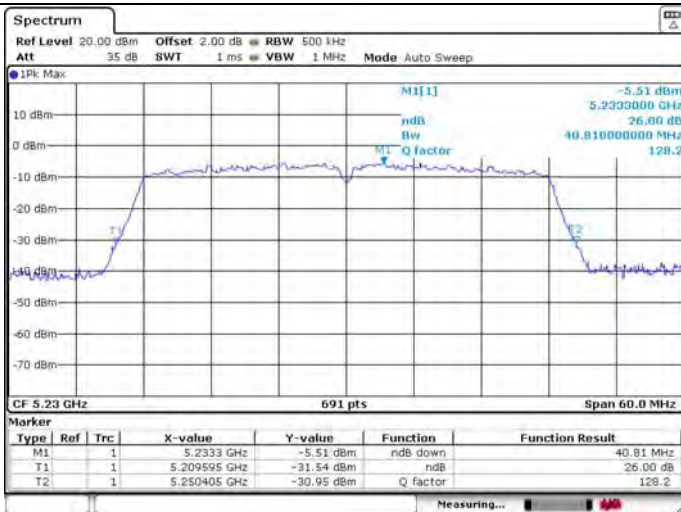
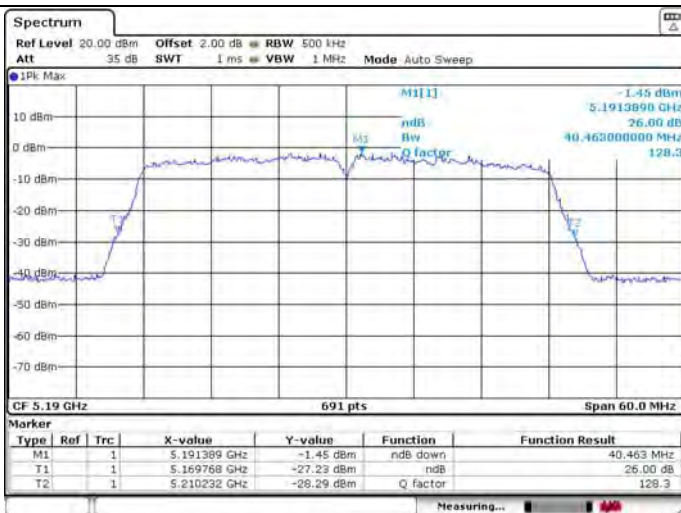
U-NII-1 IEEE 802.11ac VHT20 5240MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11n HT40 5190MHz_Ant 1**26dB Bandwidth****99% Occupied Bandwidth****U-NII-1 IEEE 802.11n HT40 5230MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth****U-NII-1 IEEE 802.11ac VH40 5190MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-1 IEEE 802.11ac VH40 5230MHz_Ant 1

26dB Bandwidth

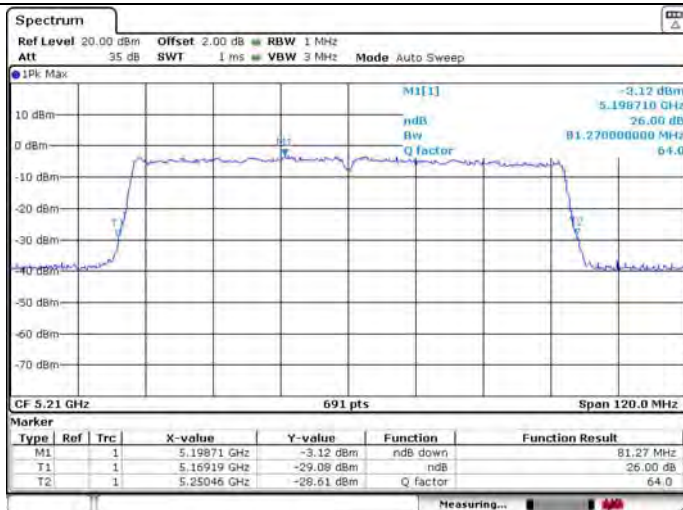


99% Occupied Bandwidth

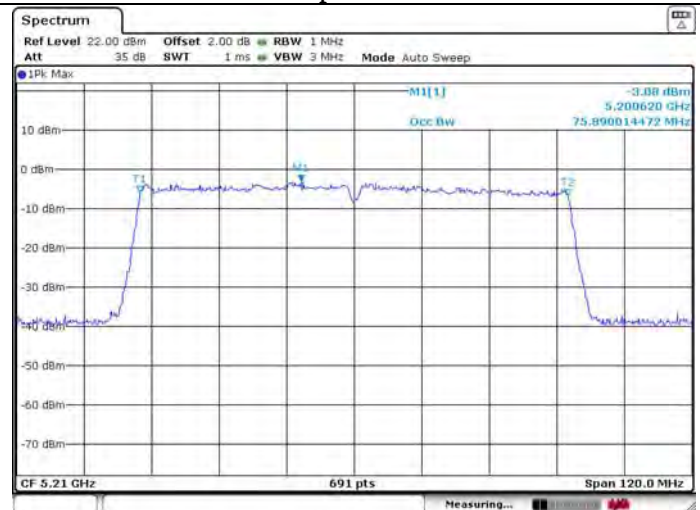


U-NII-1 IEEE 802.11ac VHT80 5210MHz_Ant 1

26dB Bandwidth

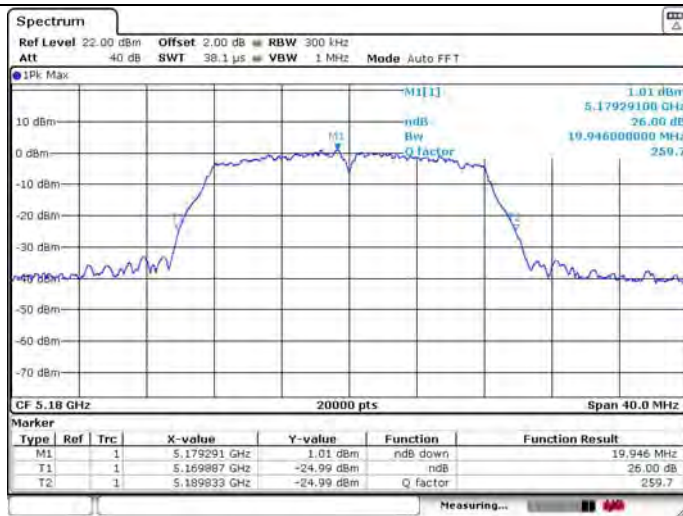


99% Occupied Bandwidth



U-NII-1 IEEE 802.11a 5180MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11a 5200MHz_Ant 2

26dB Bandwidth

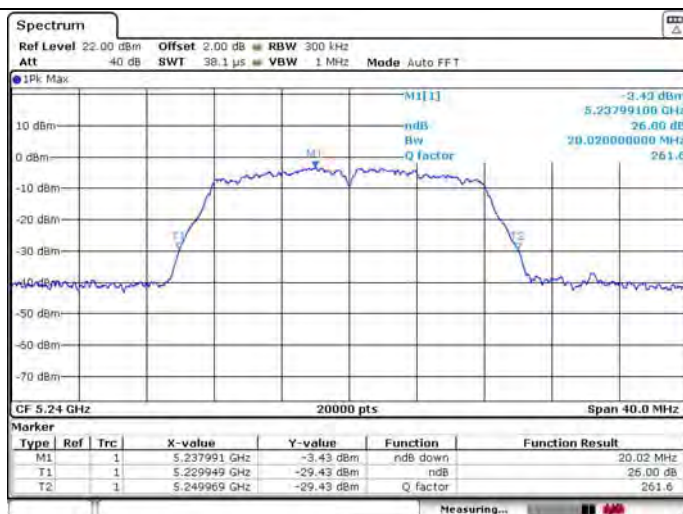


99% Occupied Bandwidth



U-NII-1 IEEE 802.11a 5240MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11n HT20 5180MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11n HT20 5200MHz_Ant 2

26dB Bandwidth

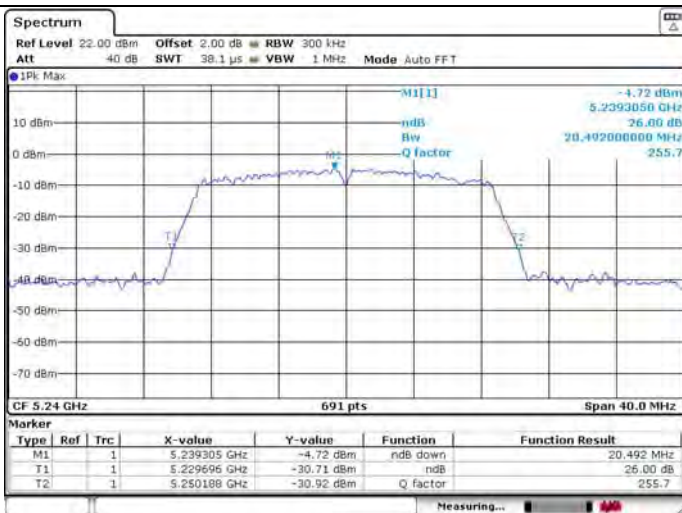


99% Occupied Bandwidth



U-NII-1 IEEE 802.11n HT20 5240MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11ac VHT20 5180MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11ac VHT20 5200MHz_Ant 2

26dB Bandwidth

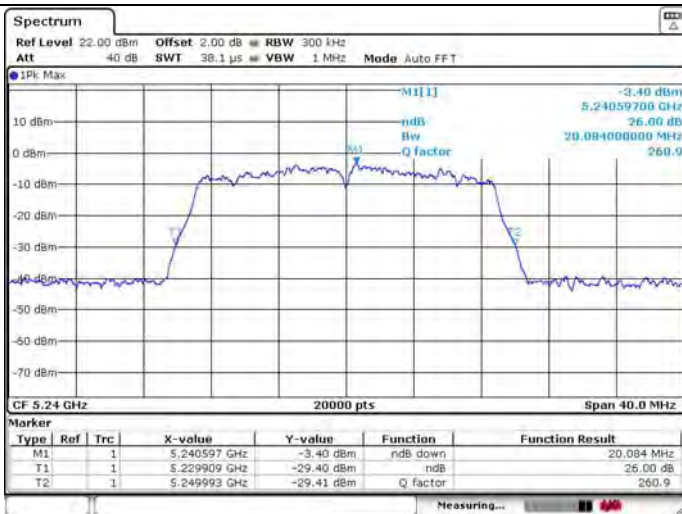


99% Occupied Bandwidth



U-NII-1 IEEE 802.11ac VHT20 5240MHz_Ant 2

26dB Bandwidth

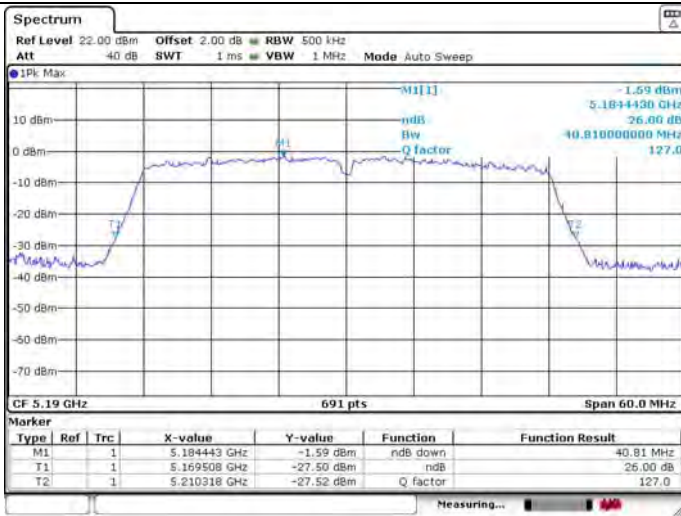


99% Occupied Bandwidth



U-NII-1 IEEE 802.11n HT40 5190MHz_Ant 2

26dB Bandwidth

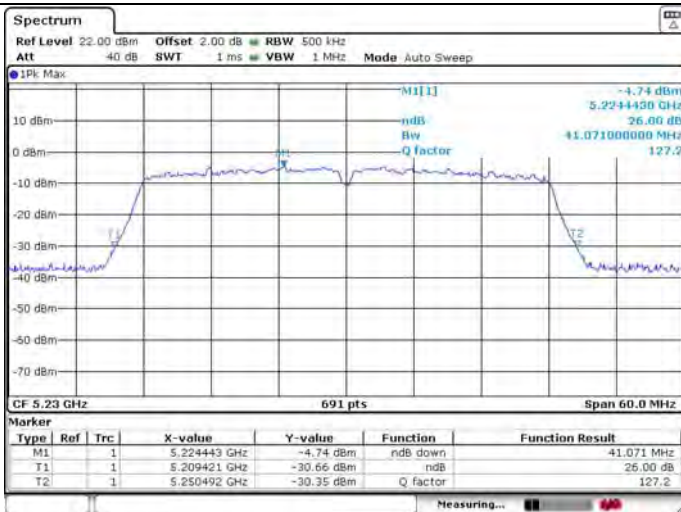


99% Occupied Bandwidth



U-NII-1 IEEE 802.11n HT40 5230MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-1 IEEE 802.11ac VH40 5190MHz_Ant 2

26dB Bandwidth

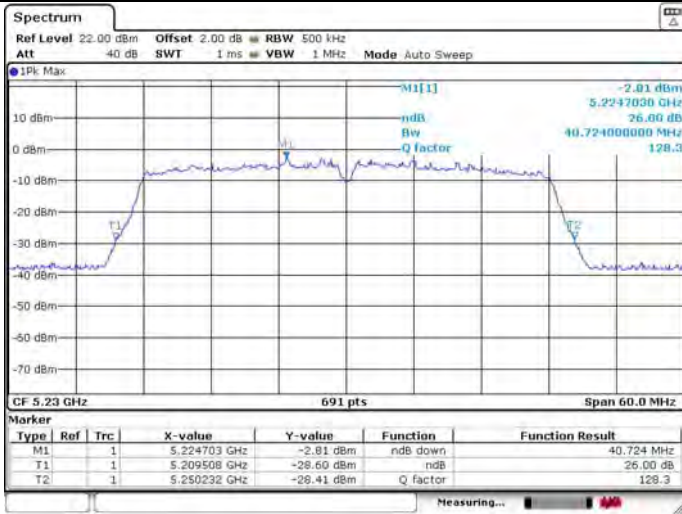


99% Occupied Bandwidth



U-NII-1 IEEE 802.11ac VH40 5230MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth

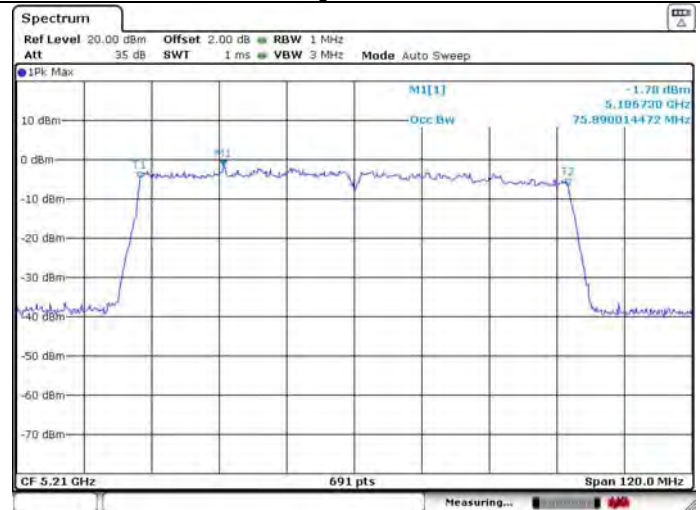


U-NII-1 IEEE 802.11ac VHT80 5210MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-2A IEEE 802.11a 5260MHz_Ant 1**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11a 5300MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11a 5320MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-2A IEEE 802.11a 5260MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-2A IEEE 802.11a 5300MHz_Ant 2

26dB Bandwidth

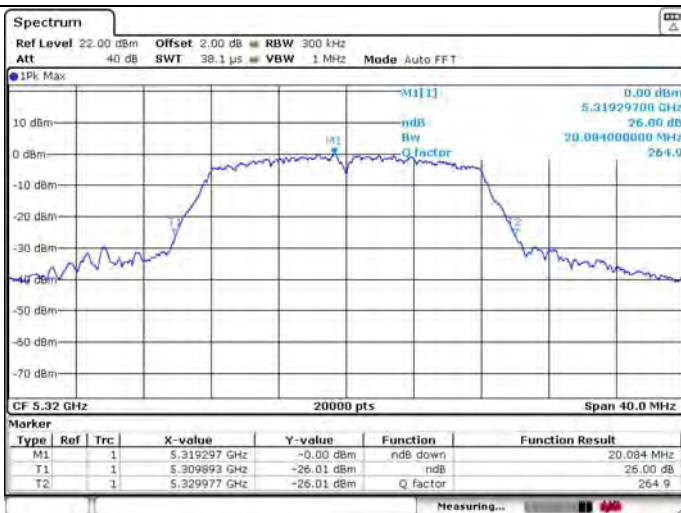


99% Occupied Bandwidth



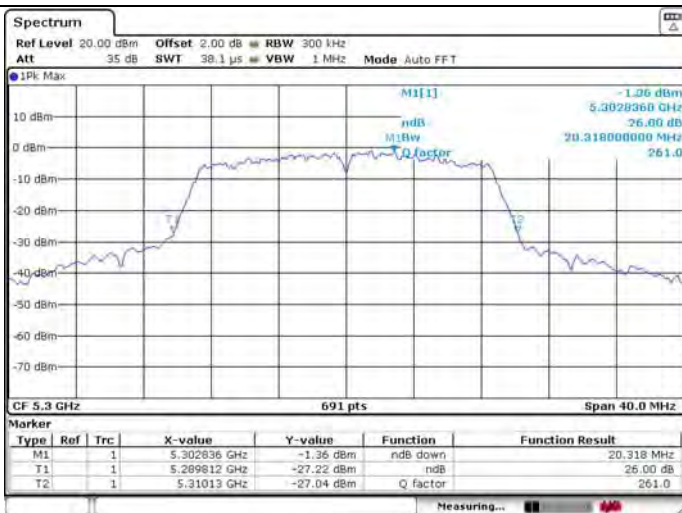
U-NII-2A IEEE 802.11a 5320MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-2A 802.11n HT20 5260MHz_Ant 1**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A 802.11n HT20 5260MHz_Ant 2****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A 802.11n HT20 5300MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-2A IEEE 802.11n HT20 5300MHz_Ant 2**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11n HT20 5320MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11n HT20 5320MHz_Ant 2****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-2A IEEE 802.11ac VHT20 5260MHz_Ant 1**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11ac VHT20 5260MHz_Ant 2****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11ac VHT20 5300MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-2A IEEE 802.11ac VHT20 5300MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-2A IEEE 802.11ac VHT20 5320MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



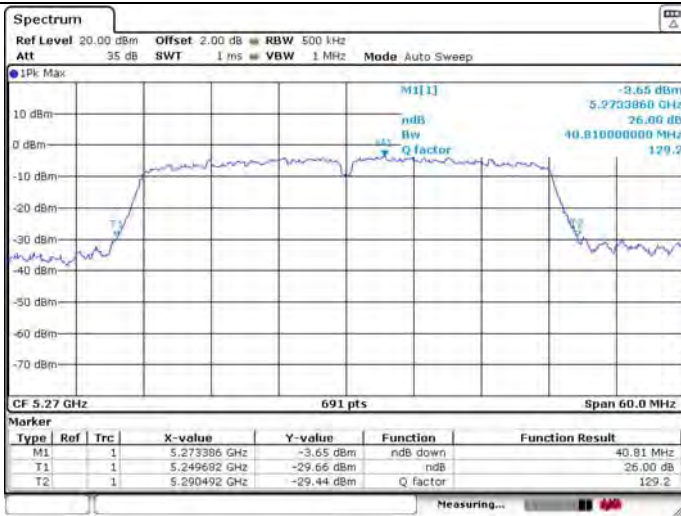
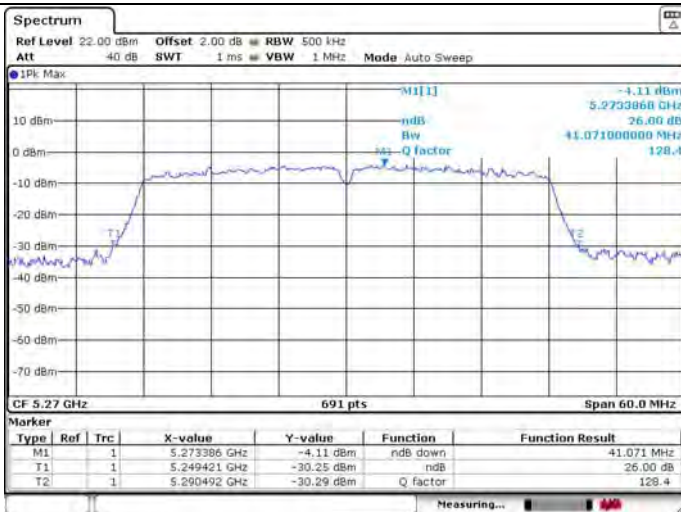
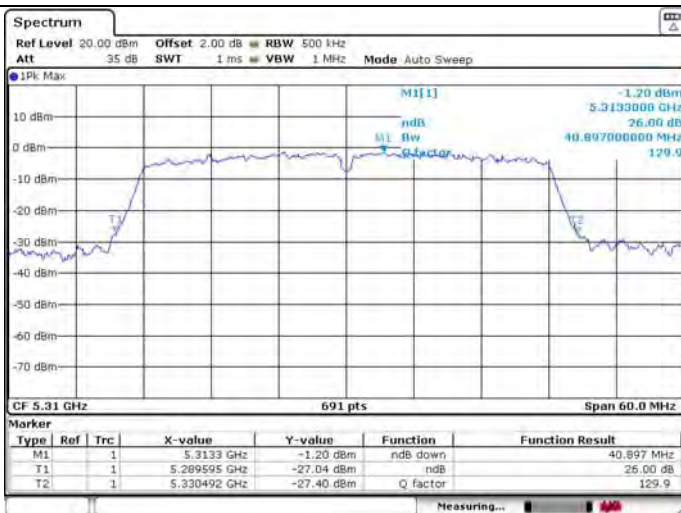
U-NII-2A IEEE 802.11ac VHT20 5320MHz_Ant 2

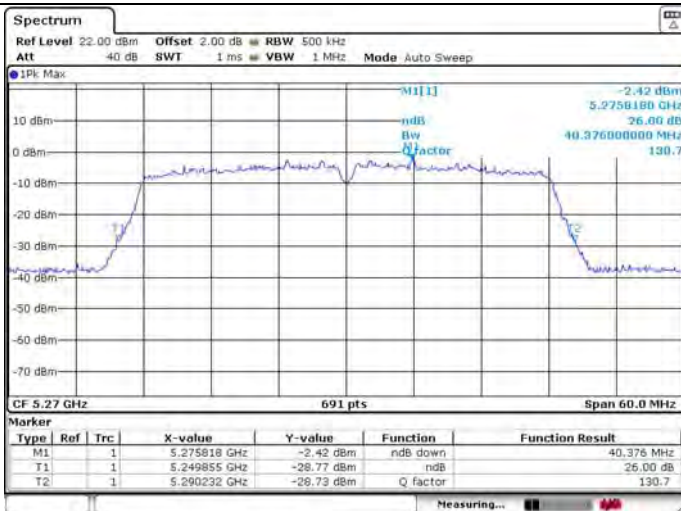
26dB Bandwidth

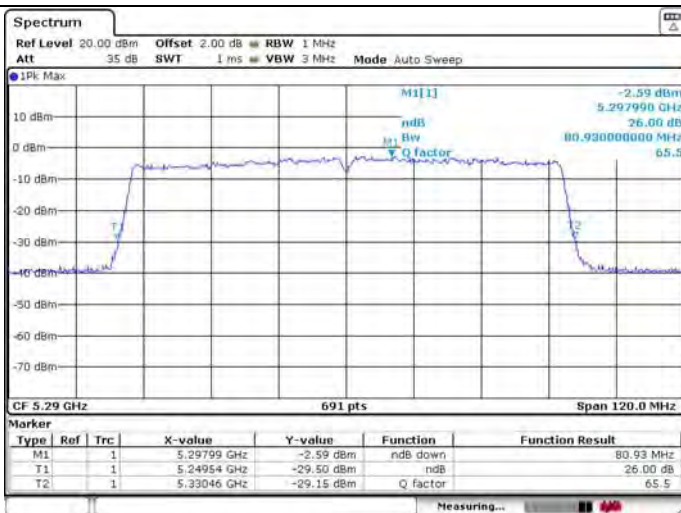
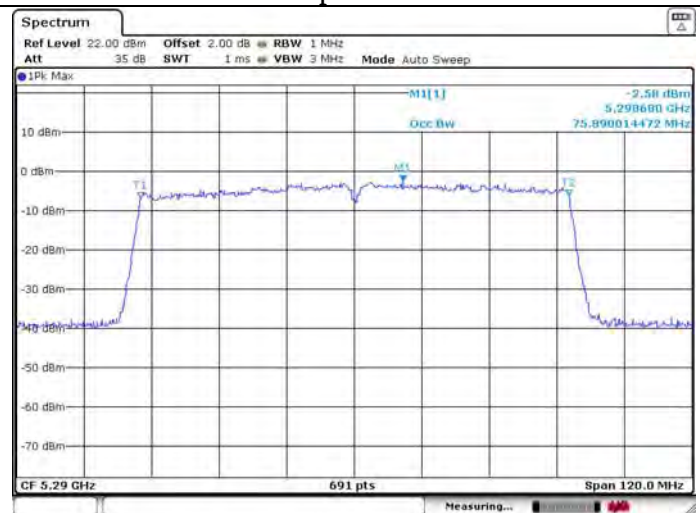


99% Occupied Bandwidth



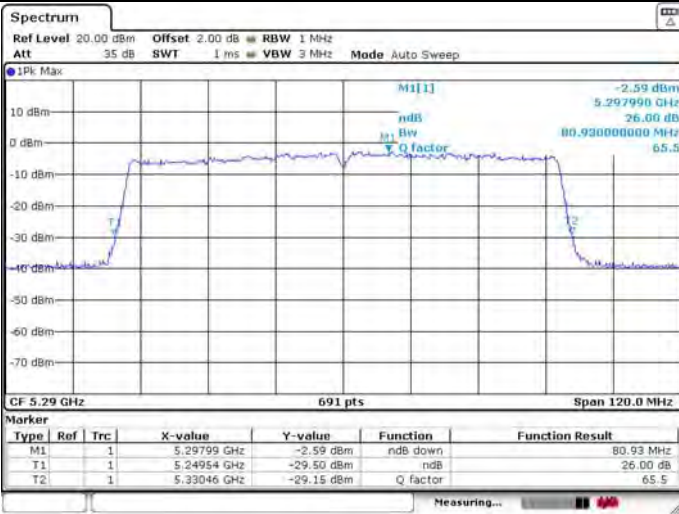
U-NII-2A IEEE 802.11n HT40 5270MHz_Ant 1**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11n HT40 5270MHz_Ant 2****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11n HT40 5310MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-2A IEEE 802.11n HT40 5310MHz_Ant 2**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11ac VHT40 5270MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11ac VHT40 5270MHz_Ant 2****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-2A IEEE 802.11ac VHT40 5310MHz_Ant 1**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11ac VHT40 5310MHz_Ant 2****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2A IEEE 802.11ac VHT80 5290MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth**

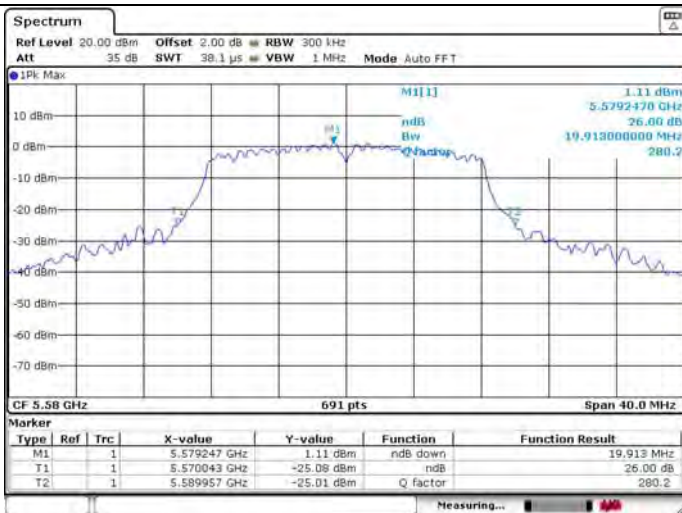
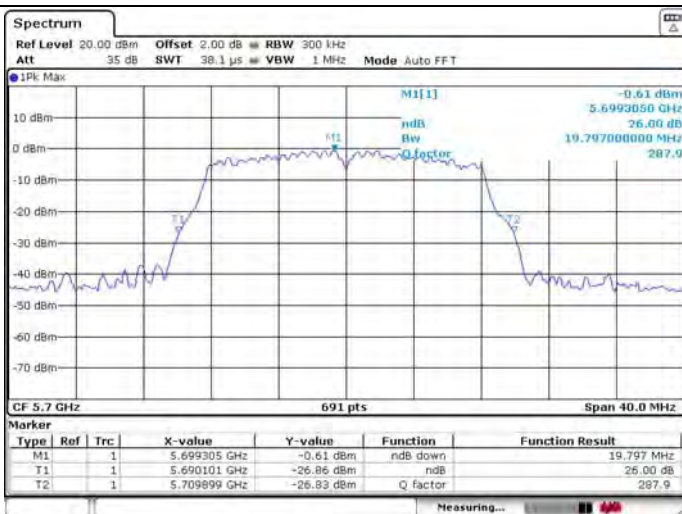
U-NII-2A IEEE 802.11ac VHT80 5290MHz_Ant 2

26dB Bandwidth



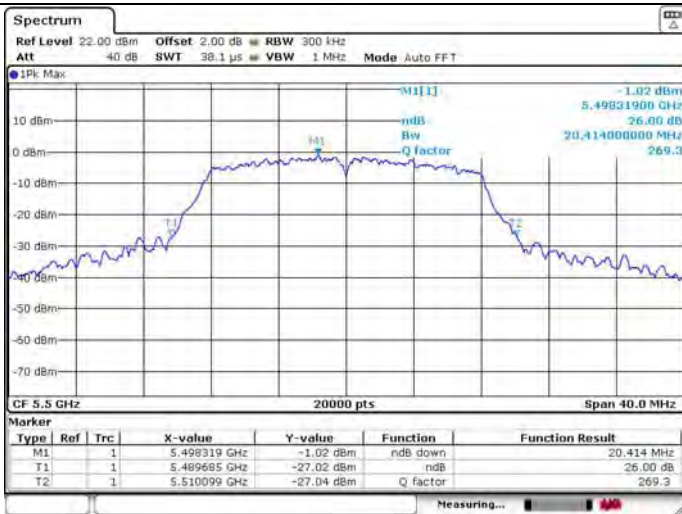
99% Occupied Bandwidth



U-NII-2C IEEE 802.11a 5500MHz_Ant 1**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2C IEEE 802.11a 5580MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2C IEEE 802.11a 5700MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-2C IEEE 802.11a 5500MHz_Ant 2

26dB Bandwidth

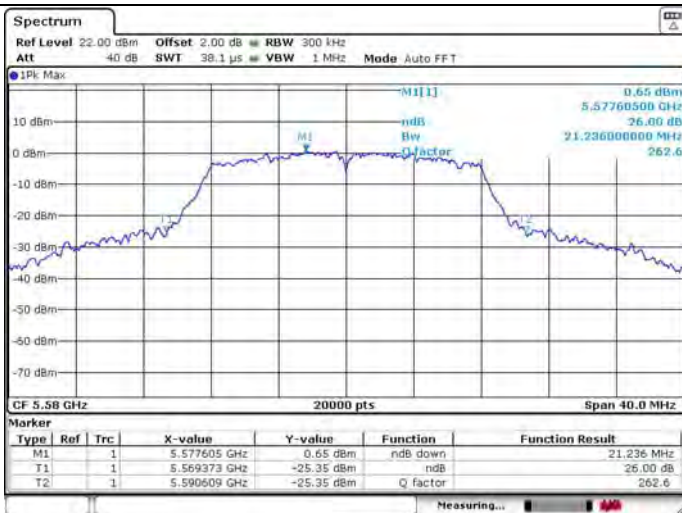


99% Occupied Bandwidth



U-NII-2C IEEE 802.11a 5580MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



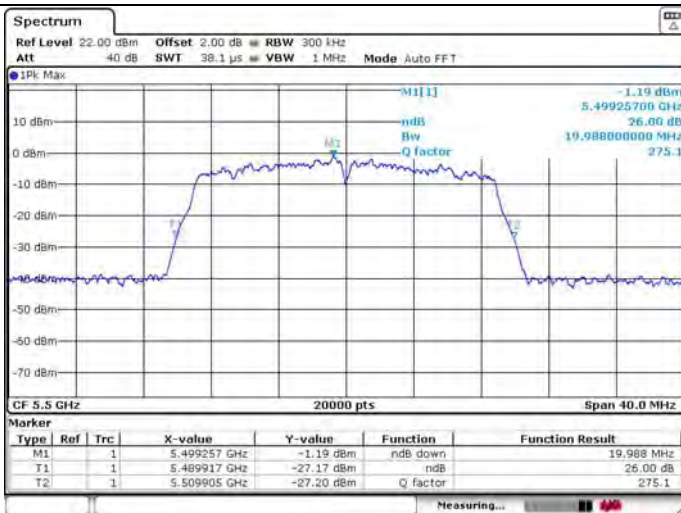
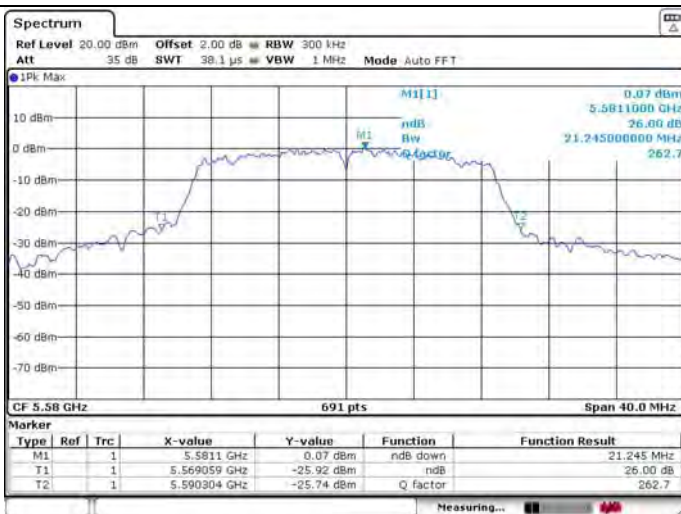
U-NII-2C IEEE 802.11a 5700MHz_Ant 2

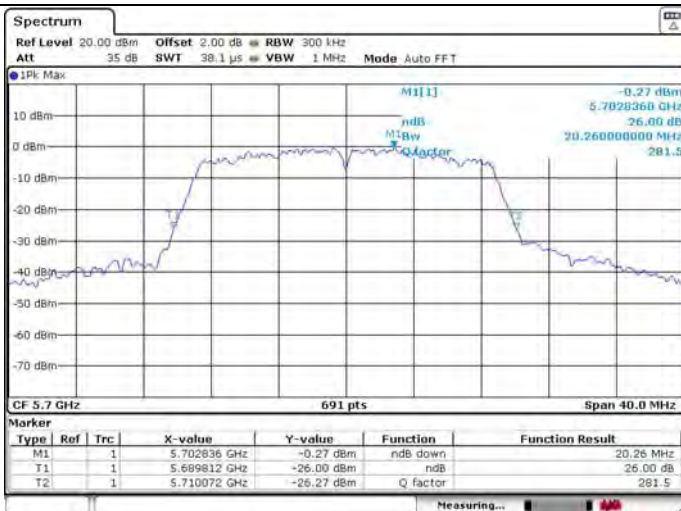
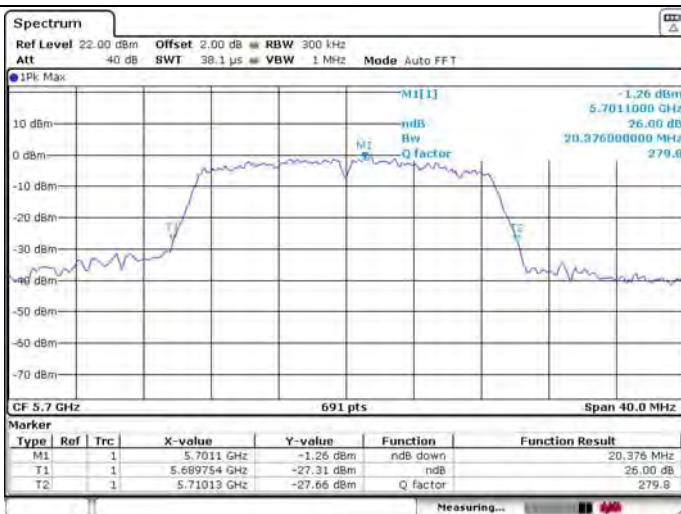
26dB Bandwidth



99% Occupied Bandwidth



U-NII-2C IEEE 802.11n HT20 5500MHz_Ant 1**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2C IEEE 802.11n HT20 5500MHz_Ant 2****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2C IEEE 802.11n HT20 5580MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-2C IEEE 802.11n HT20 5580MHz_Ant 2**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2C IEEE 802.11n HT20 5700MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2C IEEE 802.11n HT20 5700MHz_Ant 2****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-2C IEEE 802.11ac VHT20 5500MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



U-NII-2C IEEE 802.11ac VHT20 5500MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth

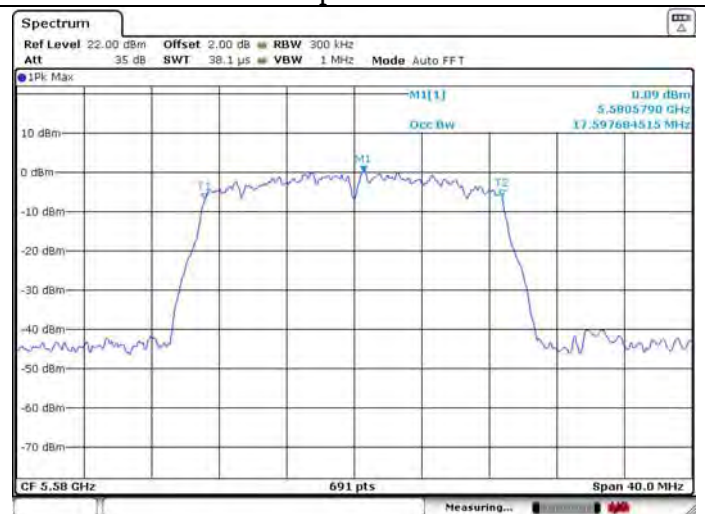


U-NII-2C IEEE 802.11ac VHT20 5580MHz_Ant 1

26dB Bandwidth



99% Occupied Bandwidth



U-NII-2C IEEE 802.11ac VHT20 5580MHz_Ant 2

26dB Bandwidth



99% Occupied Bandwidth



U-NII-2C IEEE 802.11ac VHT20 5700MHz_Ant 1

26dB Bandwidth

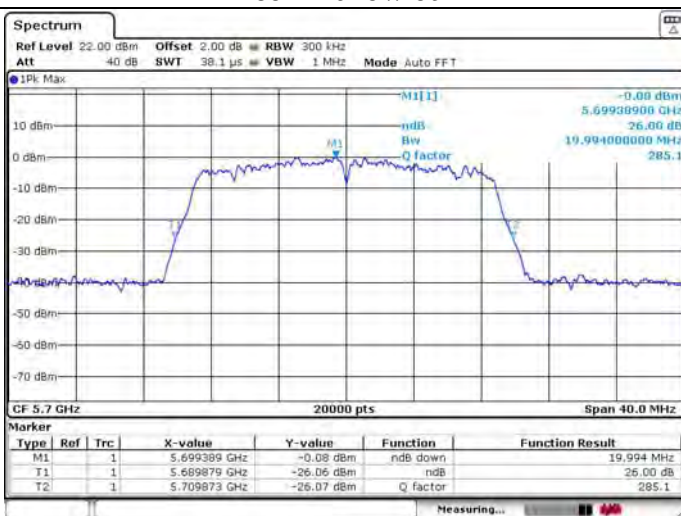


99% Occupied Bandwidth



U-NII-2C IEEE 802.11ac VHT20 5700MHz_Ant 2

26dB Bandwidth

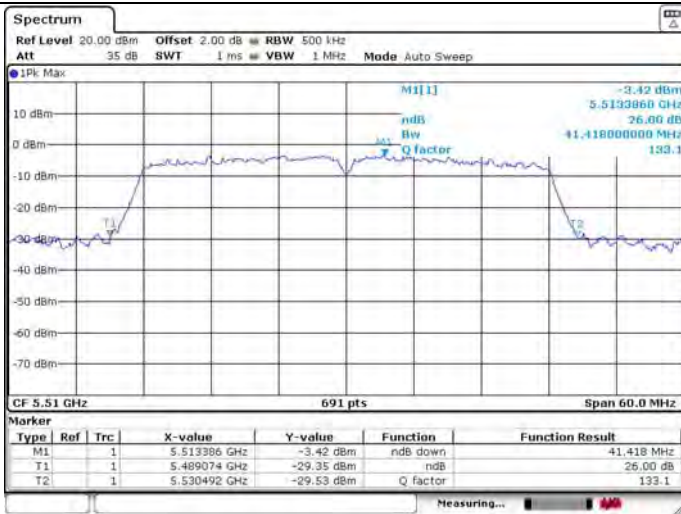


99% Occupied Bandwidth



U-NII-2C IEEE 802.11n HT40 5510MHz_Ant 1

26dB Bandwidth

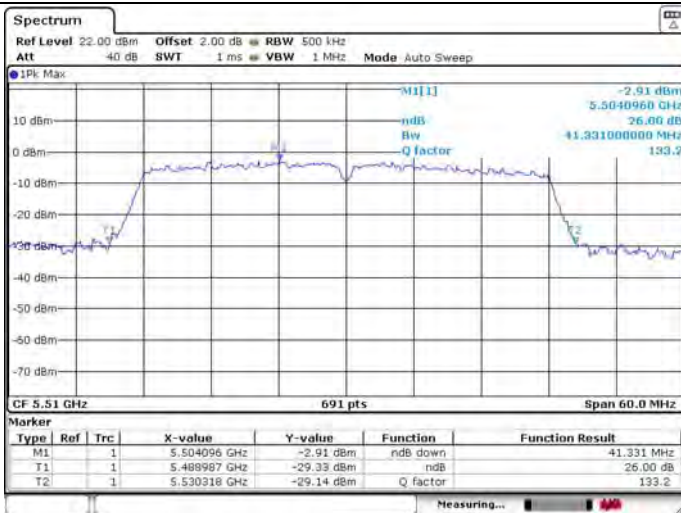


99% Occupied Bandwidth



U-NII-2C IEEE 802.11n HT40 5510MHz_Ant 2

26dB Bandwidth

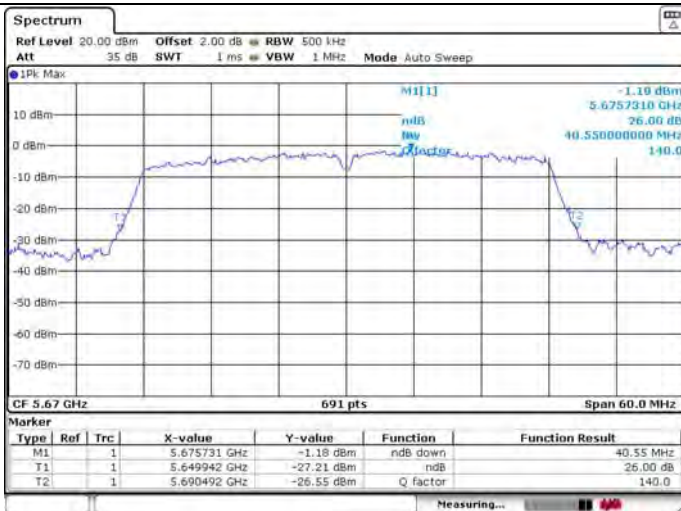


99% Occupied Bandwidth



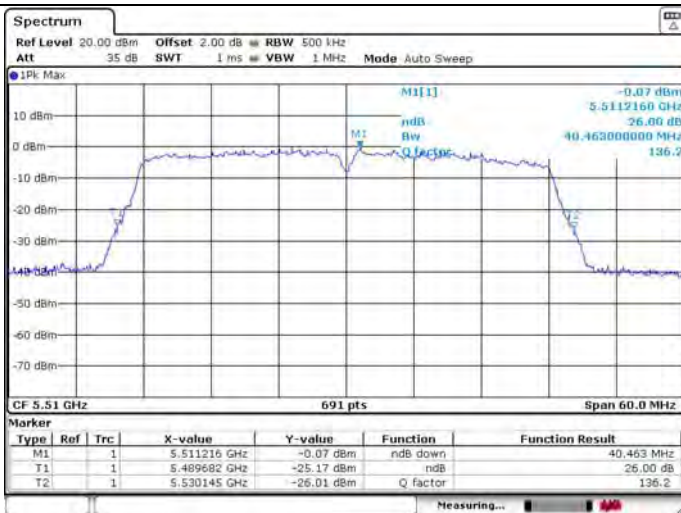
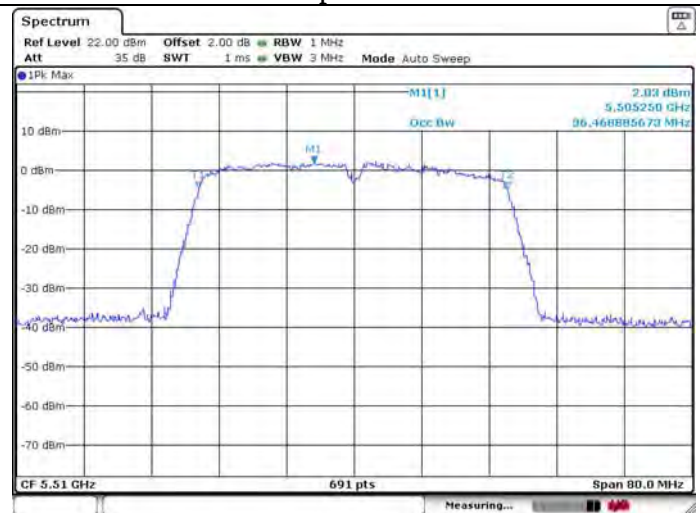
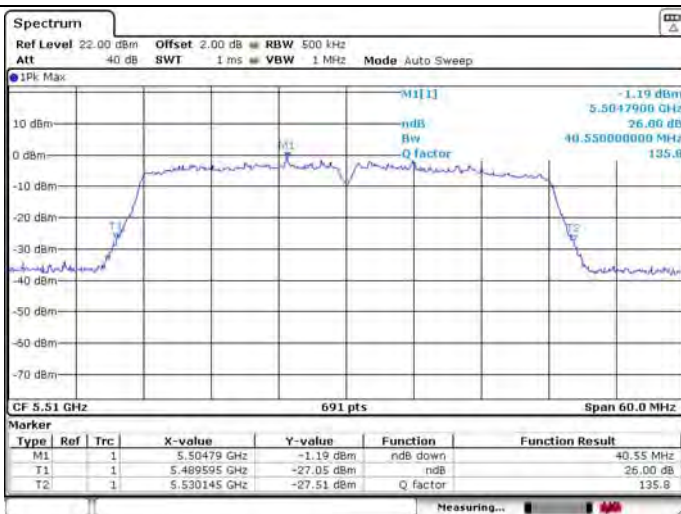
U-NII-2C IEEE 802.11n HT40 5670MHz_Ant 1

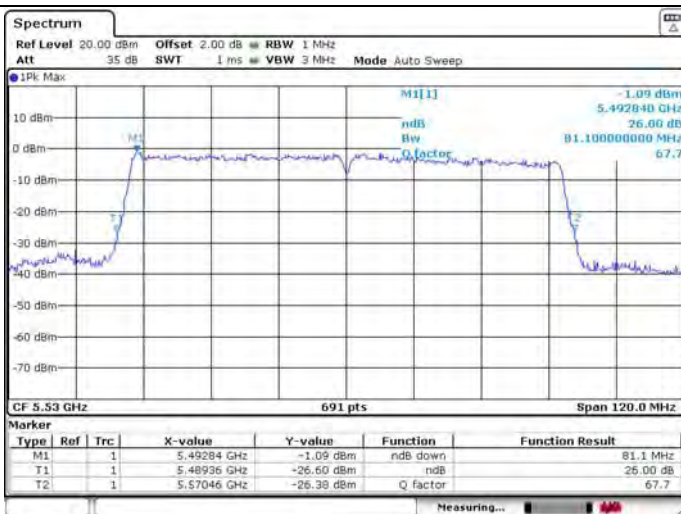
26dB Bandwidth



99% Occupied Bandwidth

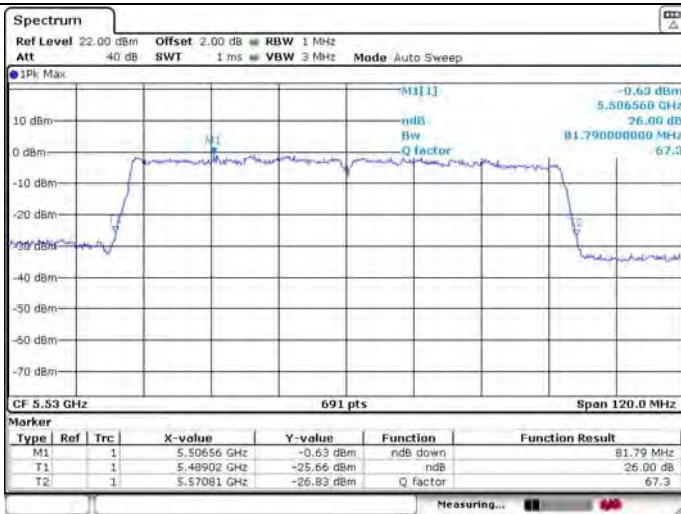


U-NII-2C IEEE 802.11n HT40 5670MHz_Ant 2**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2C IEEE 802.11ac VHT40 5510MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2C IEEE 802.11ac VHT40 5510MHz_Ant 2****26dB Bandwidth****99% Occupied Bandwidth**

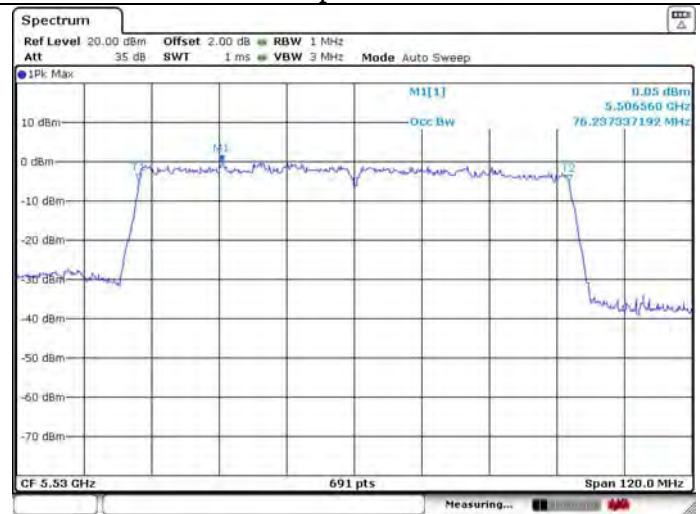
U-NII-2C IEEE 802.11ac VHT40 5670MHz_Ant 1**26dB Bandwidth****99% Occupied Bandwidth****U-NII-2C IEEE 802.11ac VHT40 5670MHz_Ant 2****26dB Bandwidth****99% Occupied Bandwidth****U-NII-2C IEEE 802.11ac VHT80 5530MHz_Ant 1****26dB Bandwidth****99% Occupied Bandwidth**

U-NII-2C IEEE 802.11ac VHT80 5530MHz_Ant 2

26dB Bandwidth

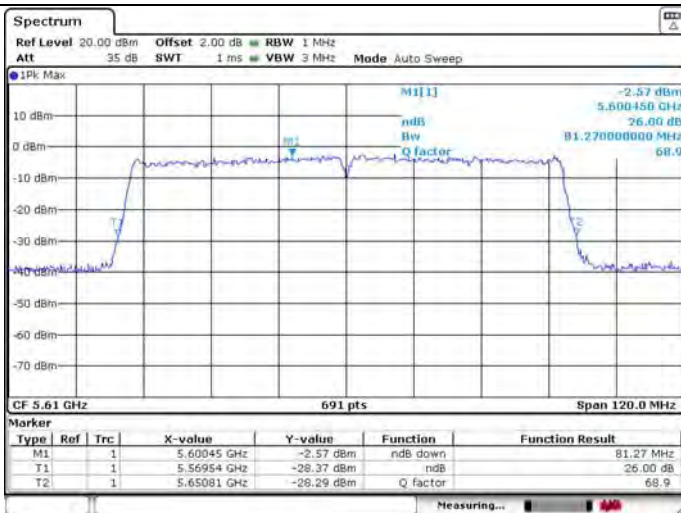


99% Occupied Bandwidth

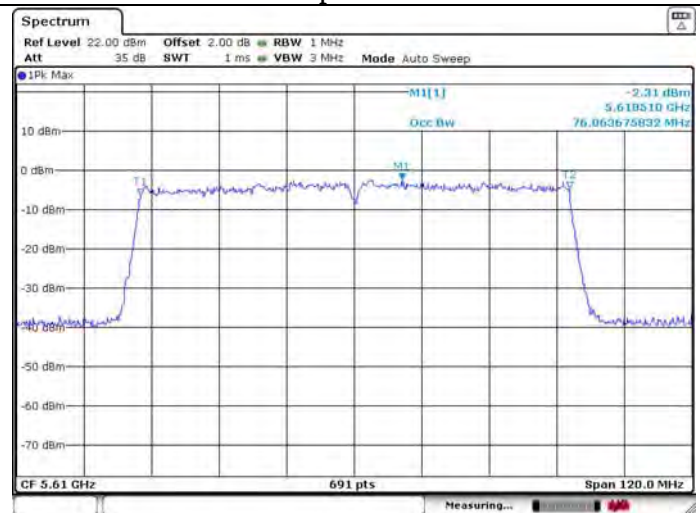


U-NII-2C IEEE 802.11ac VHT80 5610MHz_Ant 1

26dB Bandwidth

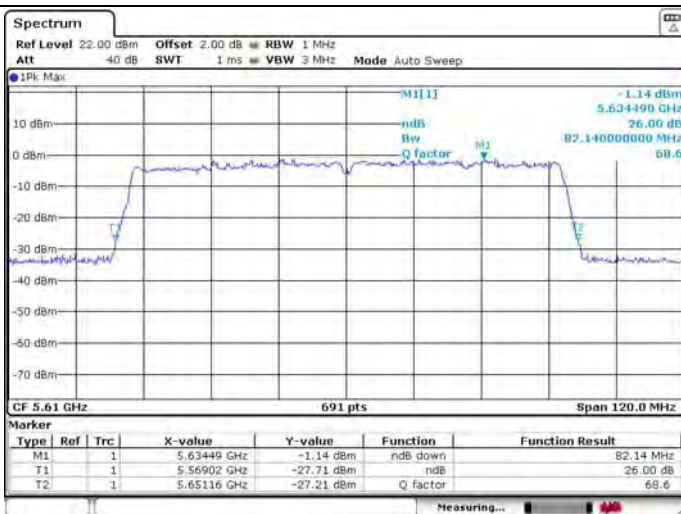


99% Occupied Bandwidth

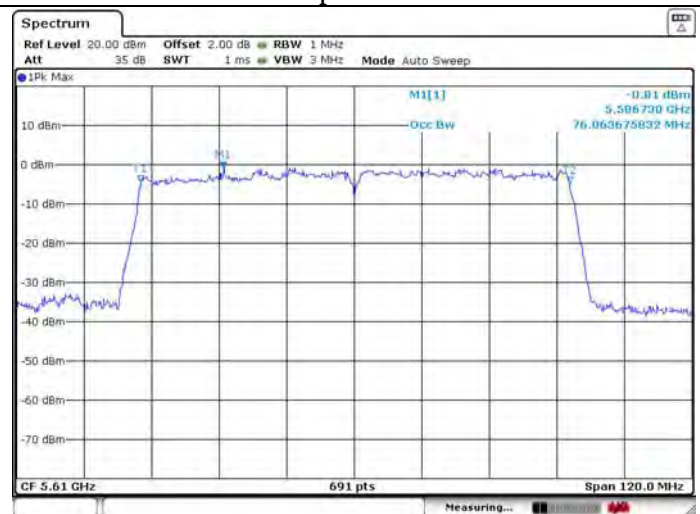


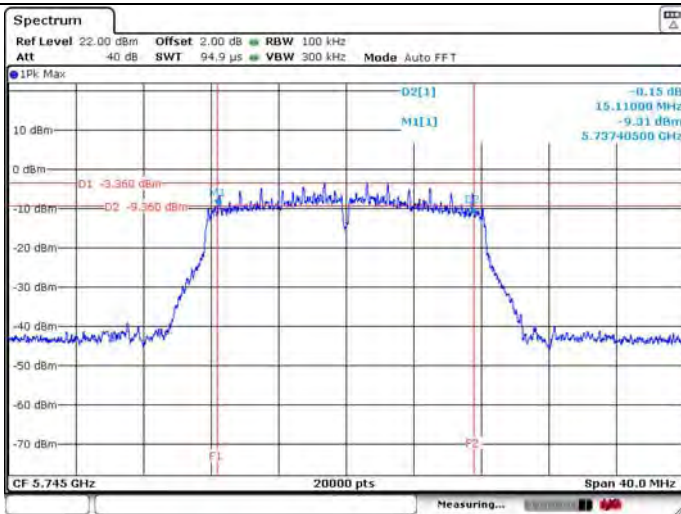
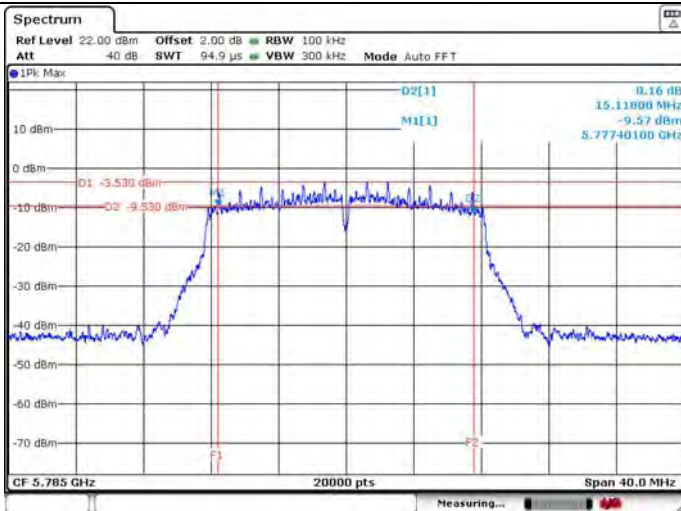
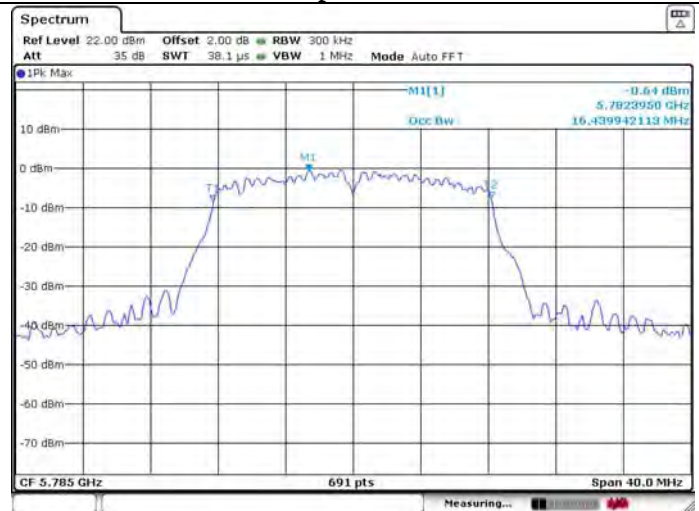
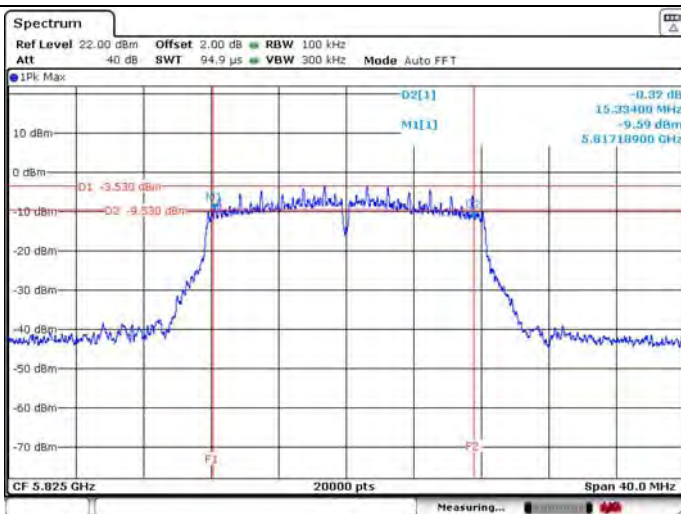
U-NII-2C IEEE 802.11ac VHT80 5610MHz_Ant 2

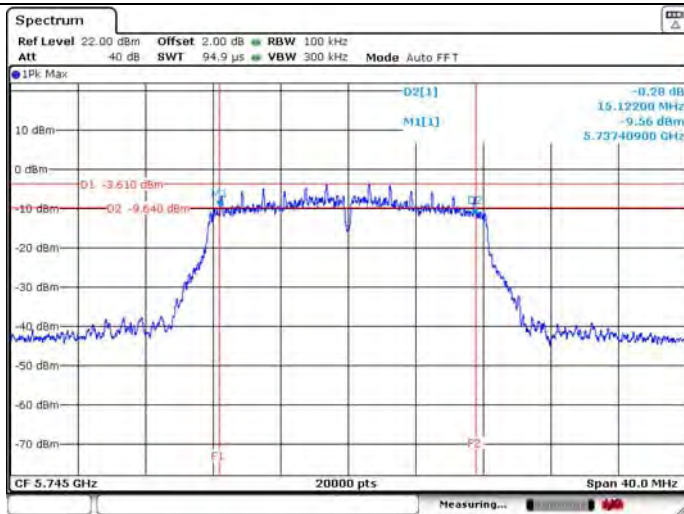
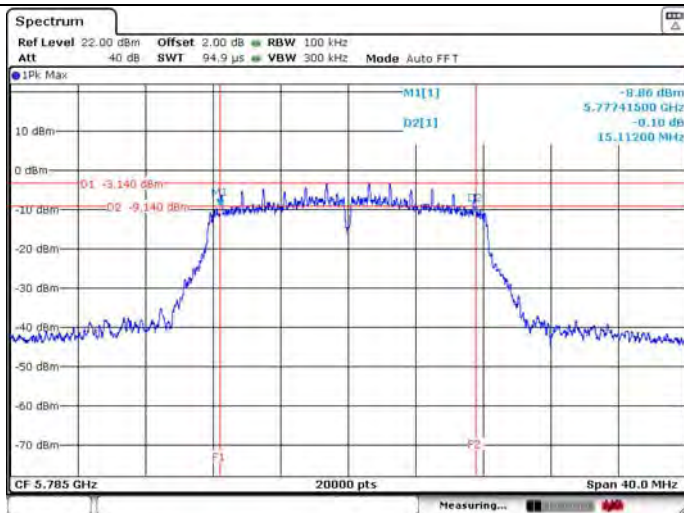
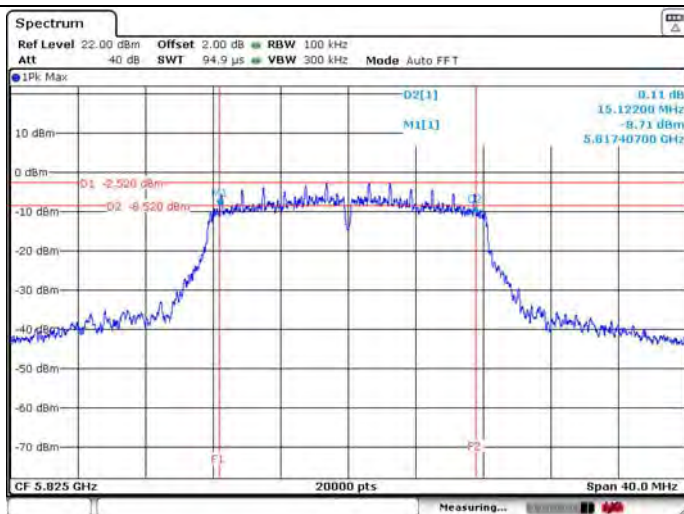
26dB Bandwidth



99% Occupied Bandwidth

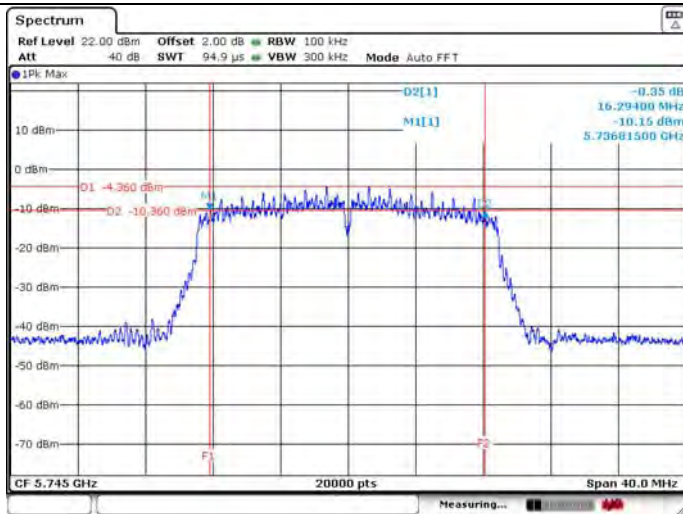


U-NII-3 IEEE 802.11a 5745MHz_Ant 1**6dB Bandwidth****99% Occupied Bandwidth****U-NII-3 IEEE 802.11a 5785MHz_Ant 1****6dB Bandwidth****99% Occupied Bandwidth****U-NII-3 IEEE 802.11a 5825MHz_Ant 1****6dB Bandwidth****99% Occupied Bandwidth**

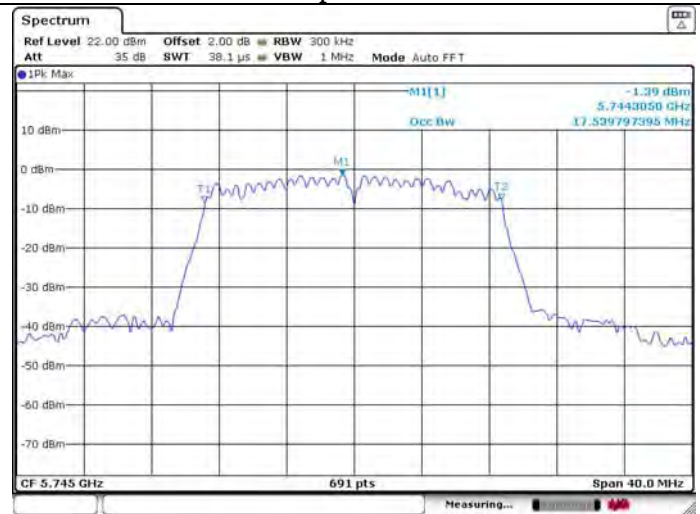
U-NII-3 IEEE 802.11a 5745MHz_Ant 2**6dB Bandwidth****99% Occupied Bandwidth****U-NII-3 IEEE 802.11a 5785MHz_Ant 2****6dB Bandwidth****99% Occupied Bandwidth****U-NII-3 IEEE 802.11a 5825MHz_Ant 2****6dB Bandwidth****99% Occupied Bandwidth**

U-NII-3 IEEE 802.11n HT20 5745MHz_Ant 1

6dB Bandwidth

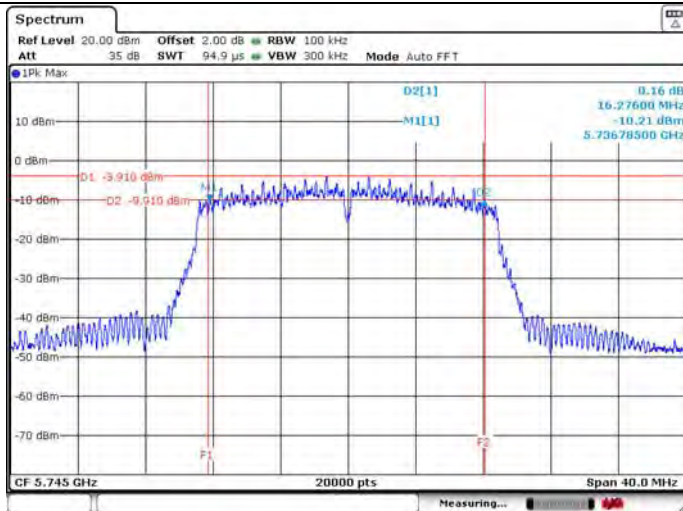


99% Occupied Bandwidth



U-NII-3 IEEE 802.11n HT20 5745MHz_Ant 2

6dB Bandwidth

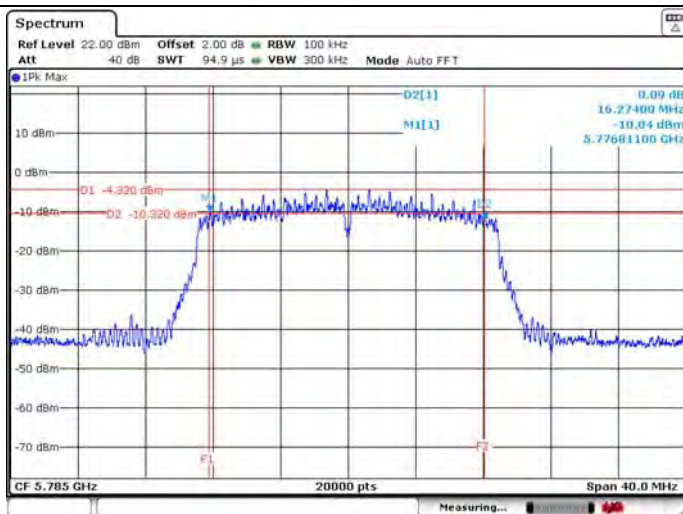


99% Occupied Bandwidth



U-NII-3 IEEE 802.11n HT20 5785MHz_Ant 1

6dB Bandwidth

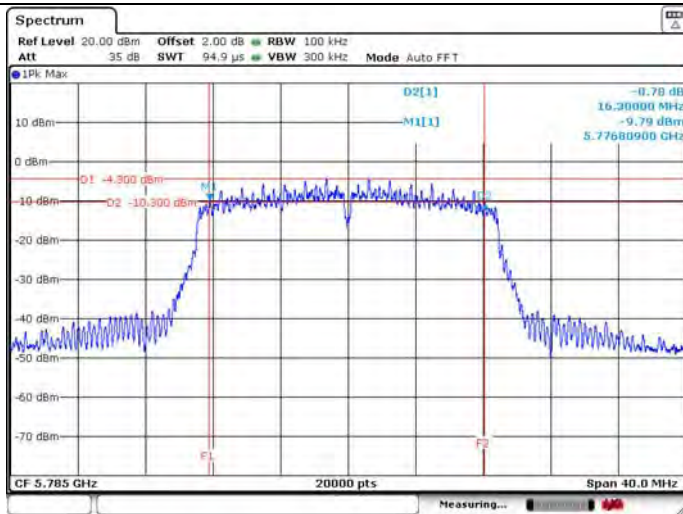


99% Occupied Bandwidth

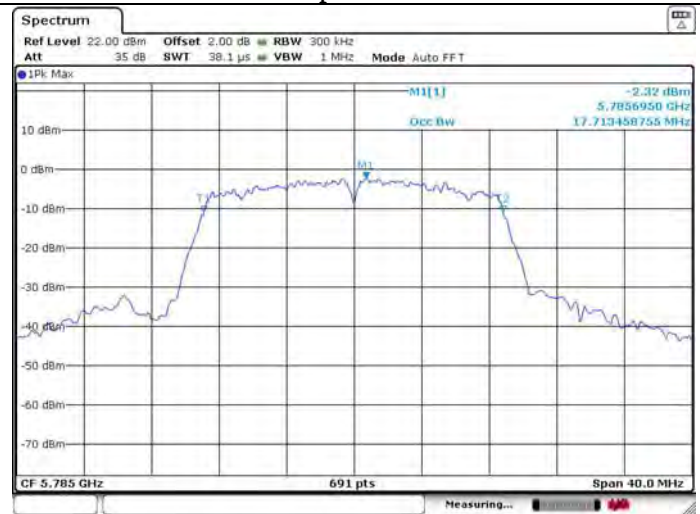


U-NII-3 IEEE 802.11n HT20 5785MHz_Ant 2

6dB Bandwidth

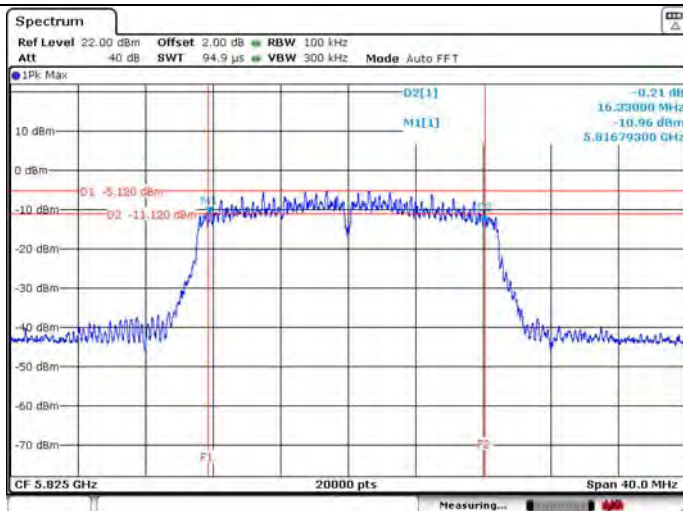


99% Occupied Bandwidth



U-NII-3 IEEE 802.11n HT20 5825MHz_Ant 1

6dB Bandwidth

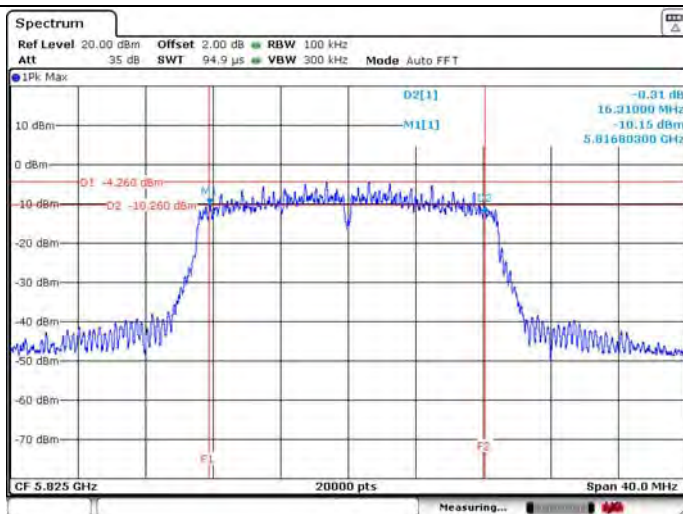


99% Occupied Bandwidth



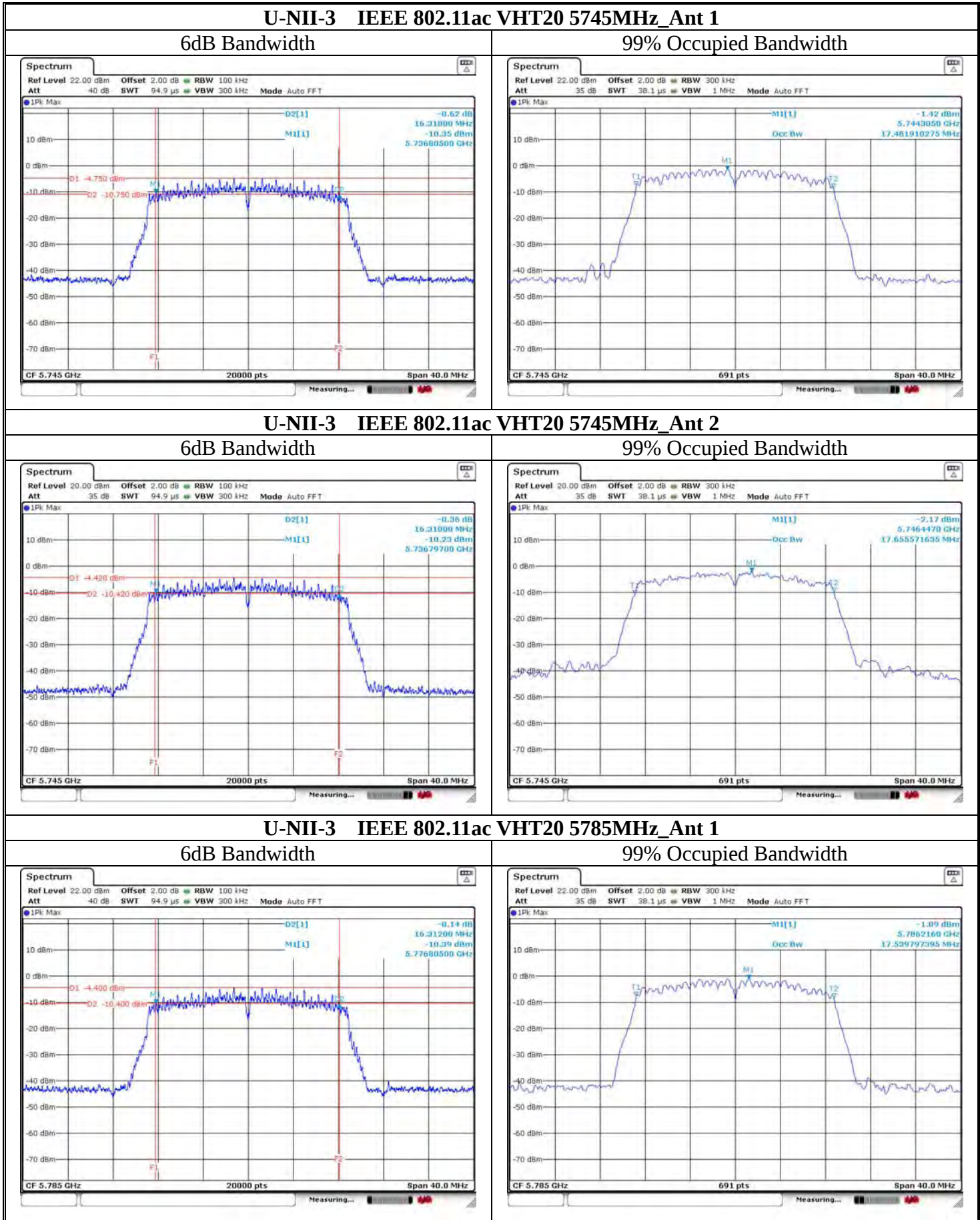
U-NII-3 IEEE 802.11n HT20 5825MHz_Ant 2

6dB Bandwidth



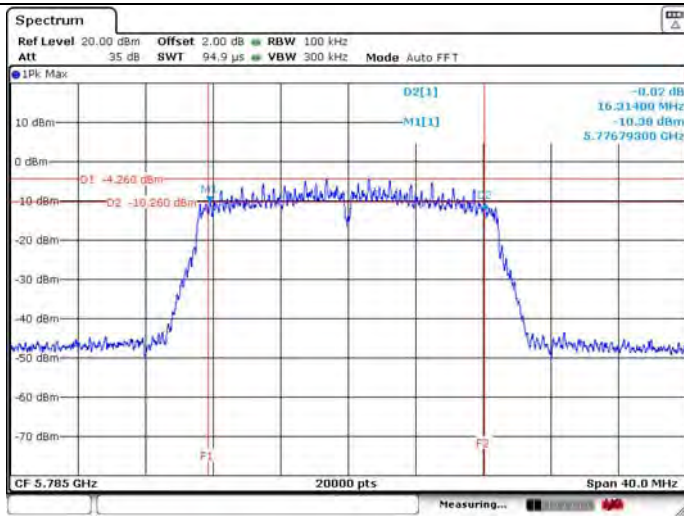
99% Occupied Bandwidth





U-NII-3 IEEE 802.11ac VHT20 5785MHz_Ant 2

6dB Bandwidth

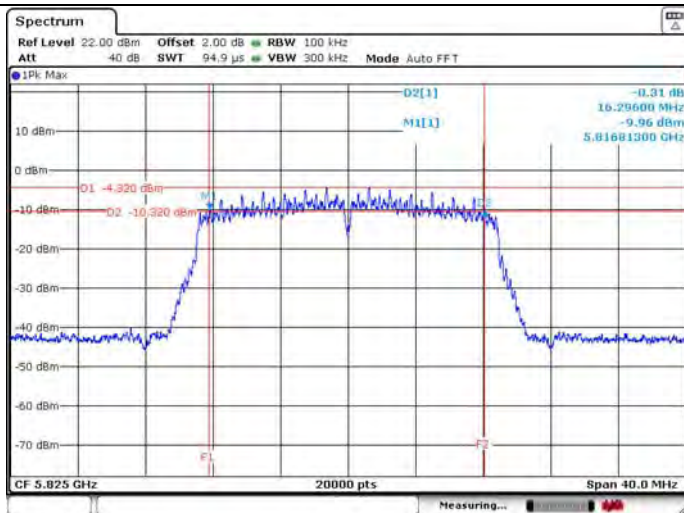


99% Occupied Bandwidth

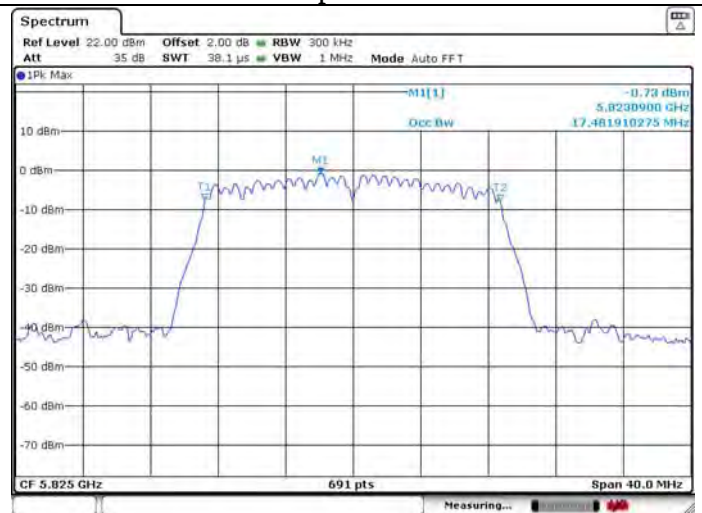


U-NII-3 IEEE 802.11ac VHT20 5825MHz_Ant 1

6dB Bandwidth

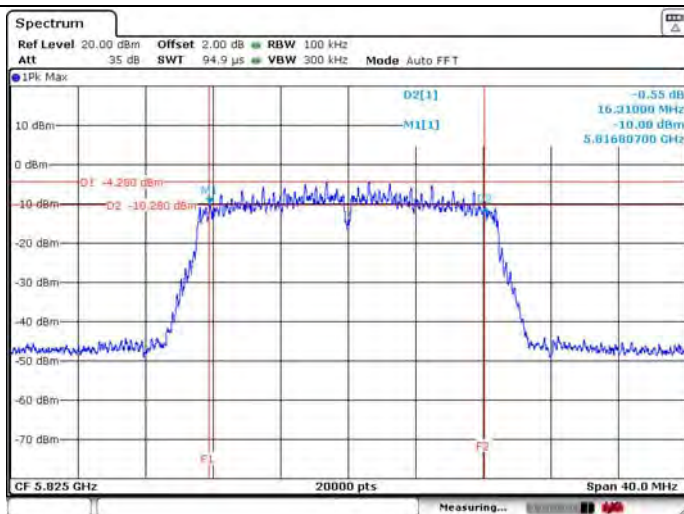


99% Occupied Bandwidth



U-NII-3 IEEE 802.11ac VHT20 5825MHz_Ant 2

6dB Bandwidth

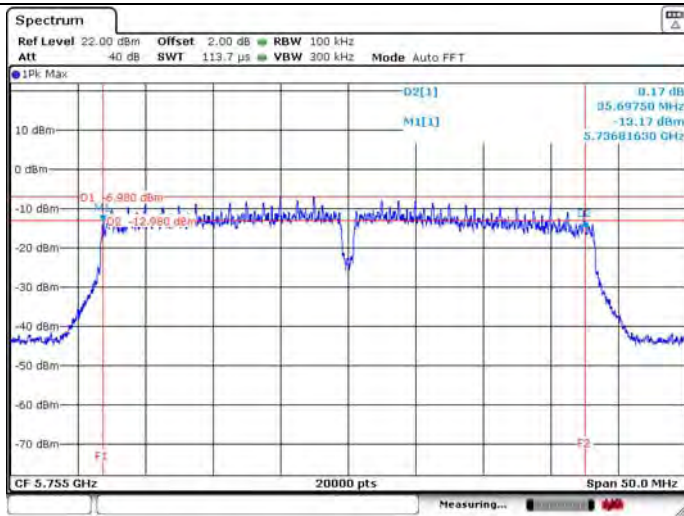


99% Occupied Bandwidth

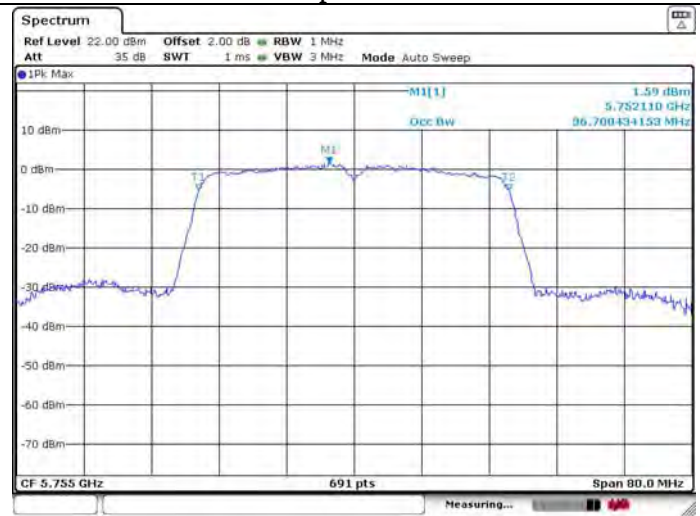


U-NII-3 IEEE 802.11n HT40 5755MHz_Ant 1

6dB Bandwidth

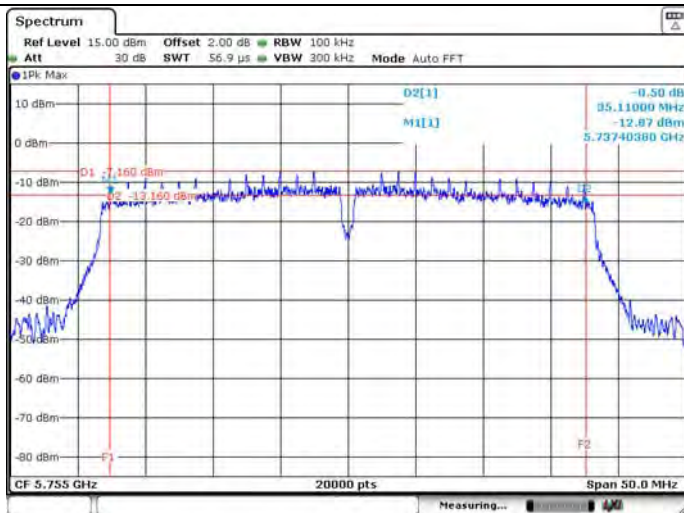


99% Occupied Bandwidth

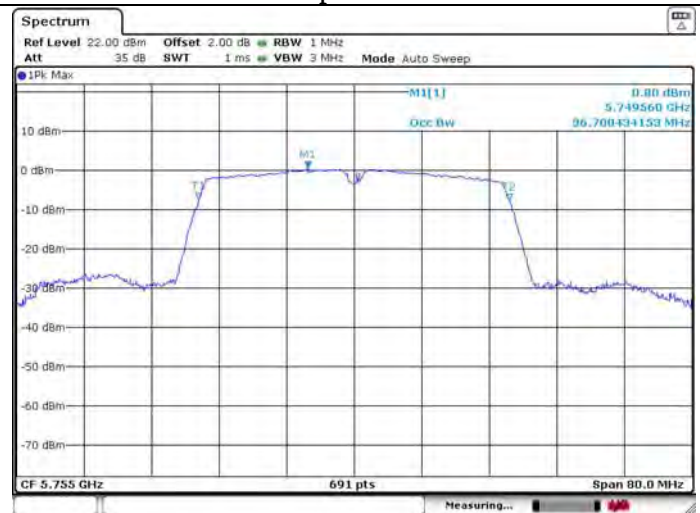


U-NII-3 IEEE 802.11n HT40 5755MHz_Ant 2

6dB Bandwidth

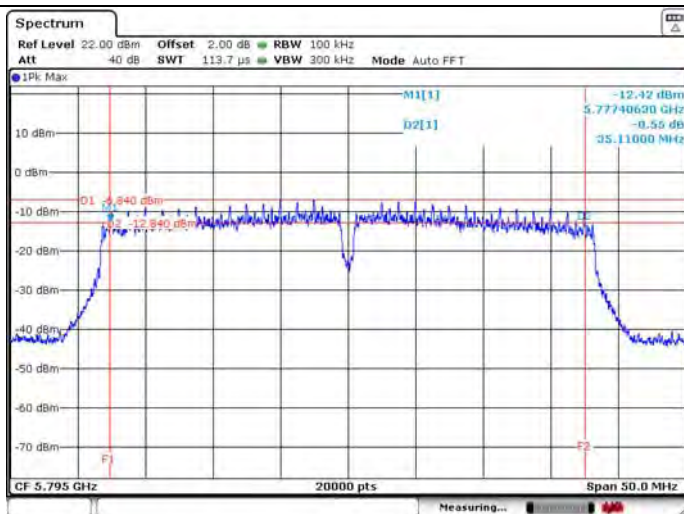


99% Occupied Bandwidth



U-NII-3 IEEE 802.11n HT40 5795MHz_Ant 1

6dB Bandwidth

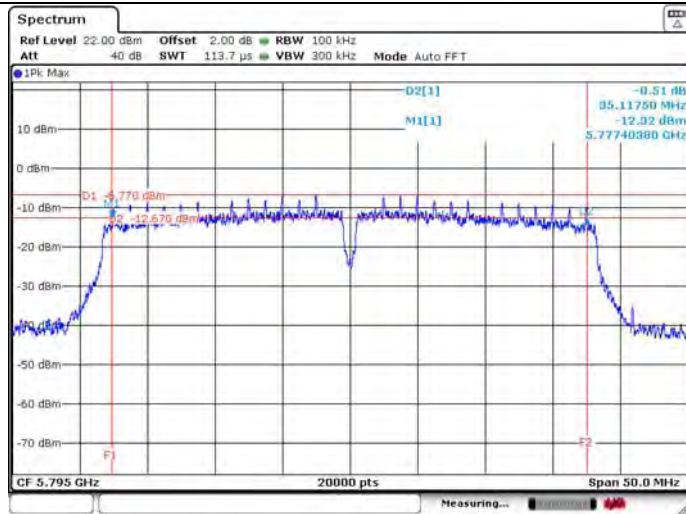


99% Occupied Bandwidth



U-NII-3 IEEE 802.11n HT40 5795MHz_Ant 2

6dB Bandwidth

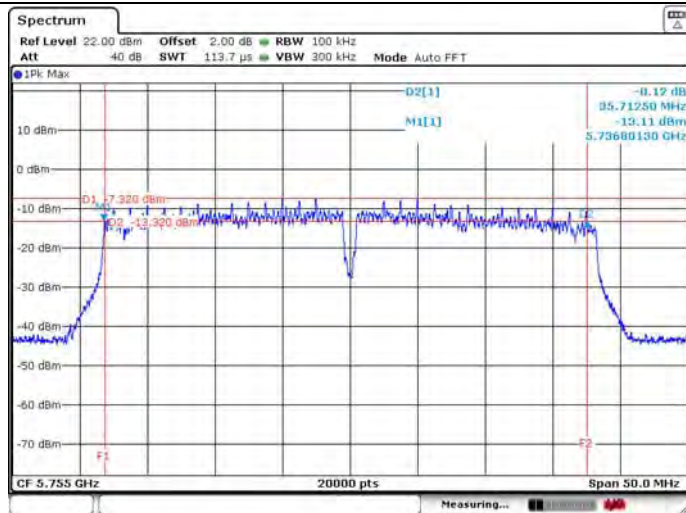


99% Occupied Bandwidth



U-NII-3 IEEE 802.11ac VHT40 5755MHz_Ant 1

6dB Bandwidth

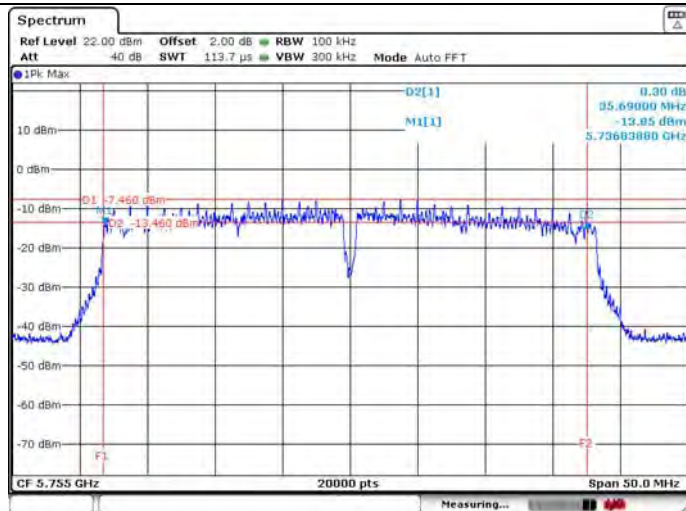


99% Occupied Bandwidth



U-NII-3 IEEE 802.11ac VHT40 5755MHz_Ant 2

6dB Bandwidth

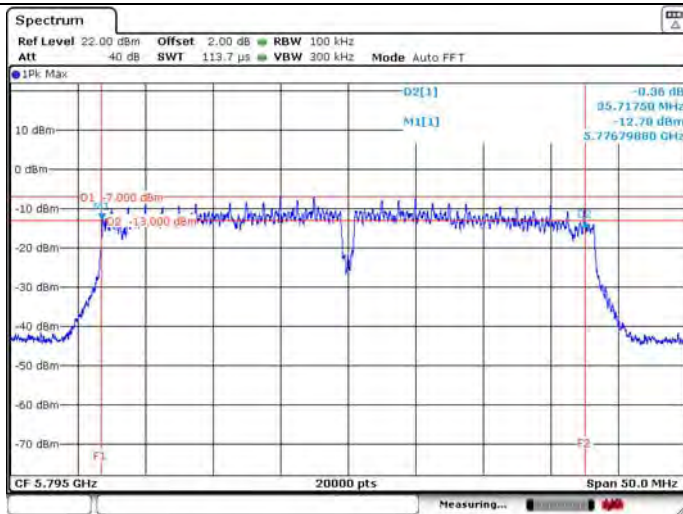


99% Occupied Bandwidth

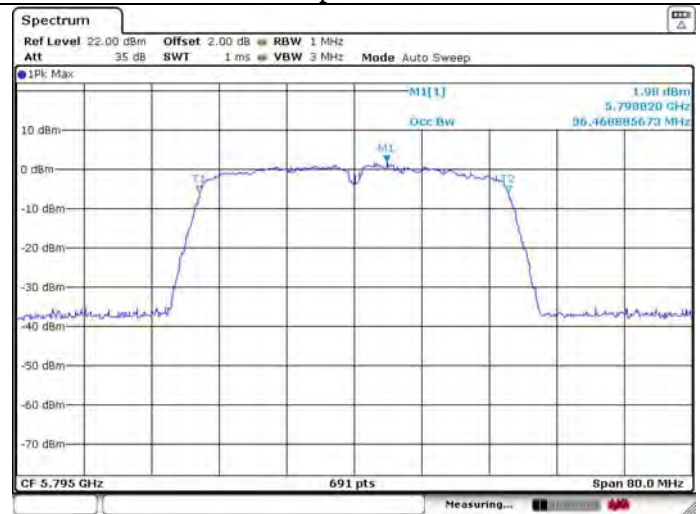


U-NII-3 IEEE 802.11ac VHT40 5795MHz_Ant 1

6dB Bandwidth

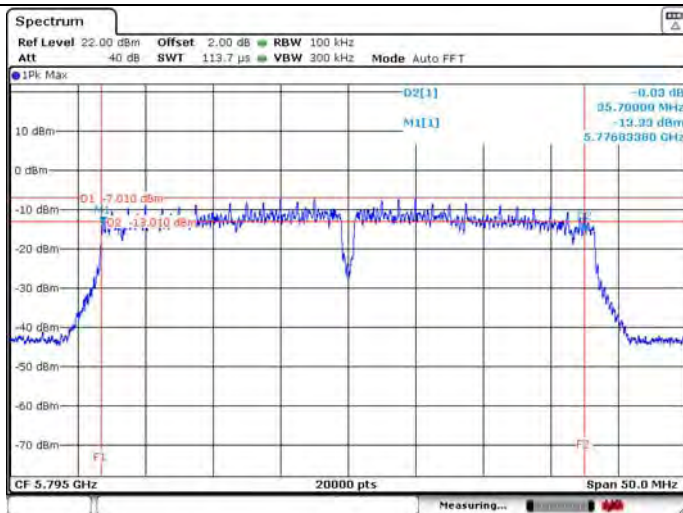


99% Occupied Bandwidth



U-NII-3 IEEE 802.11ac VHT40 5795MHz_Ant 2

6dB Bandwidth

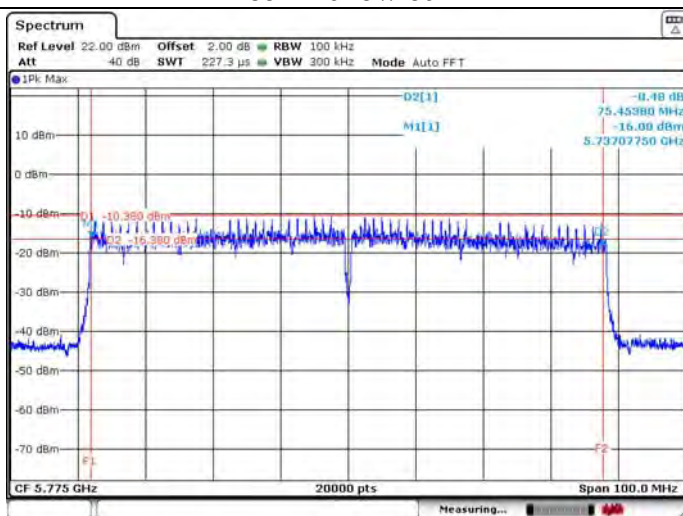


99% Occupied Bandwidth



U-NII-3 IEEE 802.11ac VHT80 5775MHz_Ant 1

6dB Bandwidth

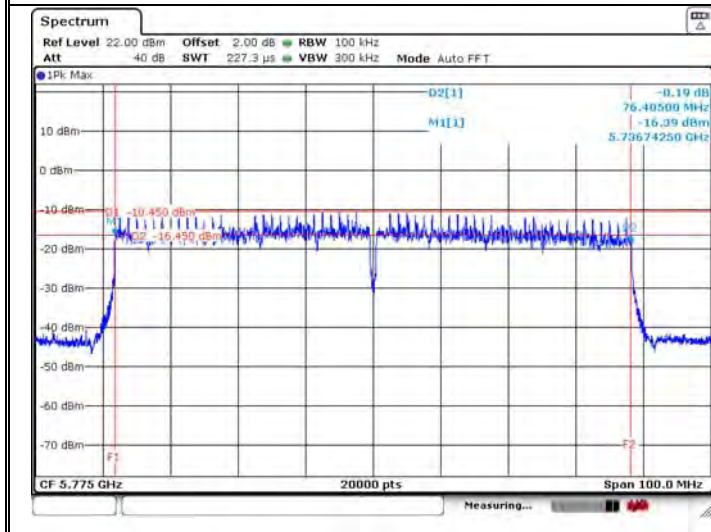


99% Occupied Bandwidth

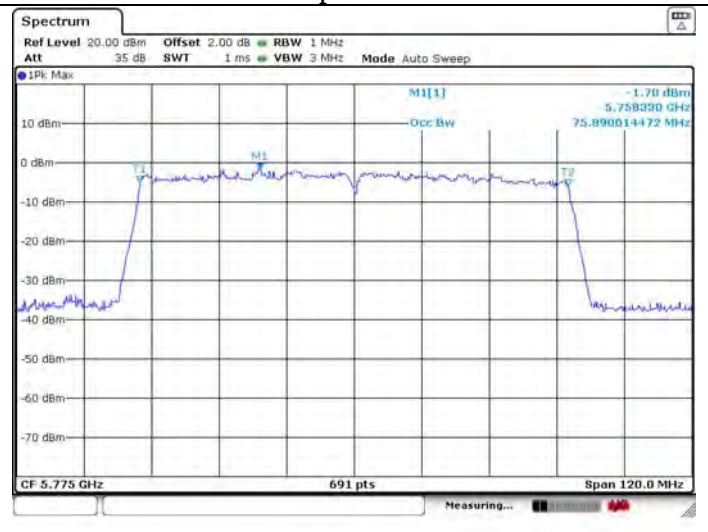


U-NII-3 IEEE 802.11ac VHT80 5775MHz_Ant 2

6dB Bandwidth



99% Occupied Bandwidth



4. MAXIMUM CONDUCTED OUTPUT POWER

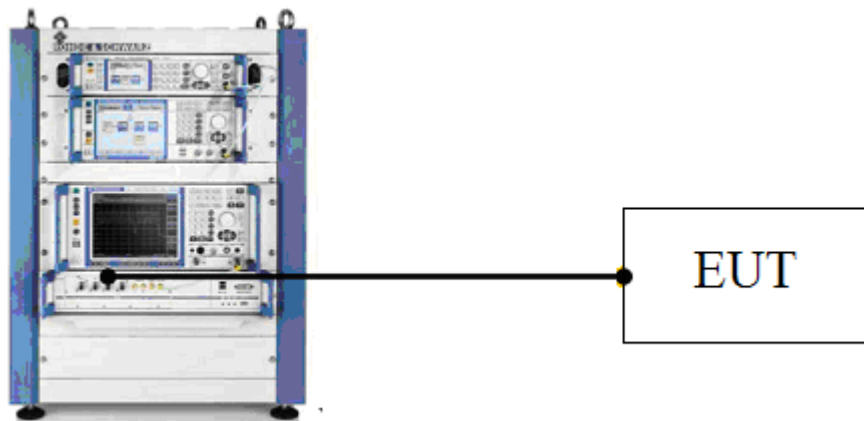
4.1. Limit

Band	EUT Type	Limit
U-NII-1	Outdoor Access Point	1W(30dBm) (Max. e.i.r.p $\leq 125\text{mW}$ 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 $11\text{dBm} + 10 \log B$, Which is lesser. (B is 26dB Bandwidth in MHz)
U-NII-2C	All Device	250mW(23.98dBm) or $11\text{dBm} + 10 \log B$, 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

- Connect EUT antenna terminal to the OSP-B157WB with RF cable.
- Set the EUT transmit continuously with maximum output power.
- 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.
- Repeat above procedures until all modes and channels were measured.
- Record the results in the test report.

4.4. Test Result

Temperature	22℃	Relative Humidity			31%	Test Voltage	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	13.36	12.20	0.0217	13.36	24.00	PASS
		5200	13.17	11.82	0.0207	13.17	24.00	PASS
		5240	11.91	11.89	0.0155	11.91	24.00	PASS
	IEEE 802.11n HT20	5180	10.20	11.36	0.02414	13.83	23.98	PASS
		5200	10.03	11.09	0.02293	13.60	23.98	PASS
		5240	8.68	10.96	0.01986	12.98	23.98	PASS
	IEEE 802.11ac VHT20	5180	10.04	10.94	0.02249	13.52	23.98	PASS
		5200	9.89	10.75	0.02162	13.35	23.98	PASS
		5240	8.62	10.68	0.01896	12.78	23.98	PASS
	IEEE 802.11n HT40	5190	12.41	10.95	0.02984	14.75	23.98	PASS
		5230	10.89	10.60	0.02375	13.76	23.98	PASS
	IEEE 802.11ac VHT40	5190	12.24	10.63	0.02830	14.52	23.98	PASS
		5230	10.75	10.41	0.02285	13.59	23.98	PASS
	IEEE 802.11ac VHT80	5210	10.76	10.22	0.02245	13.51	23.98	PASS
U-NII-2A	IEEE 802.11a	5260	13.22	12.92	0.02101	13.22	24.00	PASS
		5300	13.03	12.15	0.02010	13.03	24.00	PASS
		5320	12.69	11.99	0.01859	12.69	24.00	PASS
	IEEE 802.11n HT20	5260	10.17	12.13	0.02672	14.27	23.98	PASS
		5300	9.83	11.25	0.02294	13.61	23.98	PASS
		5320	9.51	11.14	0.02193	13.41	23.98	PASS
	IEEE 802.11ac VHT20	5260	10.01	11.81	0.02518	14.01	23.98	PASS
		5300	9.73	10.95	0.02184	13.39	23.98	PASS
		5320	9.41	10.86	0.02092	13.21	23.98	PASS
	IEEE 802.11n HT40	5270	12.49	11.68	0.03244	15.11	23.98	PASS
		5310	12.03	10.90	0.02824	14.51	23.98	PASS
	IEEE 802.11ac VHT40	5270	12.36	11.49	0.03133	14.96	23.98	PASS
		5310	11.74	10.66	0.02657	14.24	23.98	PASS
	IEEE 802.11ac VHT80	5290	11.86	10.76	0.02726	14.35	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-2C	IEEE 802.11a	5500	13.18	13.82	0.02080	13.18	24.00	PASS
		5580	14.62	13.89	0.02897	14.62	24.00	PASS
		5700	11.96	11.21	0.01570	11.96	24.00	PASS
	IEEE 802.11n HT20	5500	9.89	13.10	0.03016	14.79	23.98	PASS
		5580	11.39	12.99	0.03369	15.28	23.98	PASS
		5700	8.64	10.37	0.01821	12.60	23.98	PASS
	IEEE 802.11ac VHT20	5500	9.73	12.69	0.02799	14.47	23.98	PASS
		5580	11.40	12.70	0.03241	15.11	23.98	PASS
		5700	8.63	10.00	0.01729	12.38	23.98	PASS
	IEEE 802.11n HT40	5510	12.03	12.48	0.03367	15.27	23.98	PASS
		5670	11.55	11.39	0.02806	14.48	23.98	PASS
	IEEE 802.11ac VHT40	5510	11.81	12.32	0.03223	15.08	23.98	PASS
		5670	11.44	11.08	0.02675	14.27	23.98	PASS
	IEEE 802.11ac VHT80	5530	12.55	11.64	0.03255	15.13	23.98	
		5610	11.37	10.41	0.02471	13.93	23.98	PASS
U-NII-3	IEEE 802.11a	5745	10.92	10.97	0.01235	10.92	30.00	PASS
		5785	11.98	11.76	0.01576	11.98	30.00	PASS
		5825	12.04	11.53	0.01601	12.04	30.00	PASS
	IEEE 802.11n HT20	5745	7.65	10.12	0.01608	12.06	30.00	PASS
		5785	8.78	10.85	0.01971	12.95	30.00	PASS
		5825	8.84	10.66	0.01930	12.85	30.00	PASS
	IEEE 802.11ac VHT20	5745	7.58	10.14	0.01605	12.05	30.00	PASS
		5785	8.63	10.98	0.01982	12.97	30.00	PASS
		5825	8.66	10.81	0.01939	12.88	30.00	PASS
	IEEE 802.11n HT40	5755	10.36	10.08	0.02104	13.23	30.00	PASS
		5795	10.75	10.50	0.02310	13.64	30.00	PASS
	IEEE 802.11ac VHT40	5755	10.02	9.86	0.01972	12.95	30.00	PASS
		5795	10.62	10.17	0.02193	13.41	30.00	PASS
	IEEE 802.11ac VHT80	5775	10.12	9.88	0.02000	13.01	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	$\geq 2 \times \text{SPAN/RBW}$
Detector	RMS(power averaging)
Trace Average	≥ 100 traces

5.4. Test Procedure

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 5.3.
- Set the EUT transmit continuously with maximum output power.
- Allow trace to stabilize, use the marker-to-peak function to set the marker to the average of the emission.
- If the duty cycle of test signal $< 98\%$, the result = max measured value + $10 \times \log(1/\text{duty cycle})$;
If the duty cycle of test signal $\geq 98\%$, the result = max measured value.
- Repeat above procedures until all modes and channels were measured.
- Record the results in the test report.

5.5. Test Result

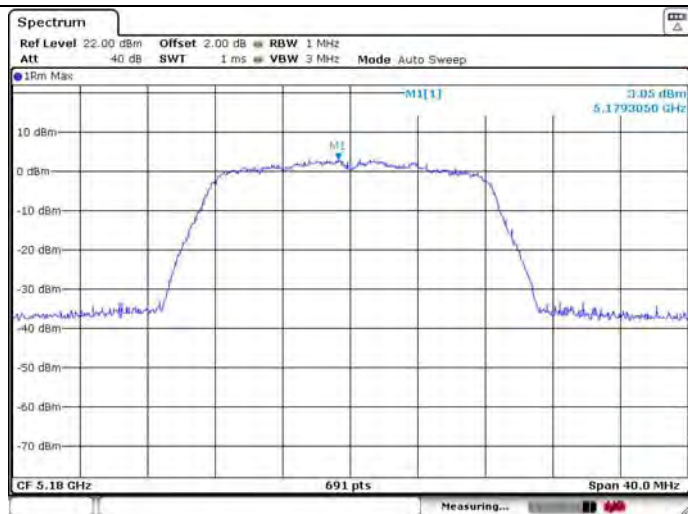
Temperature		22℃	Relative Humidity		31%	Test Voltage	120V/60Hz	
BAND	Test Mode	Fre (MHz)	Power Density (dBm/MHz)		Duty Factor (dB)	Total Power Density (dBm/MHz)	Limit (dBm/MHz)	Result
			Ant 1	Ant 2				
U-NII-1	IEEE 802.11a	5180	3.05	4.11	0.21	/	10.79	PASS
		5200	2.04	3.03	0.21	/	10.79	PASS
		5240	0.70	0.20	0.21	/	10.79	PASS
	IEEE 802.11n HT20	5180	3.43	2.65	0.22	6.29	10.79	PASS
		5200	2.61	1.68	0.22	5.40	10.79	PASS
		5240	1.59	-1.21	0.22	3.64	10.79	PASS
	IEEE 802.11ac VHT20	5180	2.02	4.38	2.02	8.39	10.79	PASS
		5200	0.95	3.44	2.02	7.40	10.79	PASS
		5240	-0.26	0.58	2.02	5.21	10.79	PASS
	IEEE 802.11n HT40	5190	-1.09	-0.70	0.48	2.60	10.79	PASS
		5230	-3.34	-3.95	0.48	-0.14	10.79	PASS
	IEEE 802.11ac VHT40	5190	-0.42	0.91	3.25	6.55	10.79	PASS
		5230	-2.06	-2.36	3.25	4.05	10.79	PASS
	IEEE 802.11ac VHT80	5210	-6.16	-5.35	2.86	0.14	10.79	PASS
U-NII-2A	IEEE 802.11a	5260	2.28	0.94	0.21	/	10.79	PASS
		5300	2.41	2.32	0.21	/	10.79	PASS
		5320	3.50	3.45	0.21	/	10.79	PASS
	IEEE 802.11n HT20	5260	1.56	-0.43	0.22	3.91	10.79	PASS
		5300	2.83	0.88	0.22	5.20	10.79	PASS
		5320	4.13	2.05	0.22	6.45	10.79	PASS
	IEEE 802.11ac VHT20	5260	0.21	1.16	2.02	5.74	10.79	PASS
		5300	1.50	2.74	2.02	7.19	10.79	PASS
		5320	2.50	3.77	2.02	8.21	10.79	PASS
	IEEE 802.11n HT40	5270	-1.10	-3.33	0.48	1.42	10.79	PASS
		5310	0.20	-1.59	0.48	2.89	10.79	PASS
	IEEE 802.11ac VHT40	5270	-2.54	-1.79	3.25	4.11	10.79	PASS
		5310	-0.85	0.50	3.25	6.13	10.79	PASS
	IEEE 802.11ac VHT80	5290	-5.35	-5.23	2.86	0.58	10.79	PASS

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-3C	IEEE 802.11a	5500	4.32	2.08	0.21	/	10.79	PASS
		5580	4.37	4.20	0.21	/	10.79	PASS
		5700	3.04	3.61	0.21	/	10.79	PASS
	IEEE 802.11n HT20	5500	4.38	0.87	0.22	6.20	10.79	PASS
		5580	4.54	2.79	0.22	6.98	10.79	PASS
		5700	3.43	2.21	0.22	6.09	10.79	PASS
	IEEE 802.11ac VHT20	5500	2.62	2.52	2.02	7.60	10.79	PASS
		5580	3.68	5.50	2.02	9.71	10.79	PASS
		5700	1.90	3.87	2.02	8.02	10.79	PASS
	IEEE 802.11n HT40	5510	0.80	-1.96	0.48	3.13	10.79	PASS
		5670	0.89	-0.31	0.48	3.82	10.79	PASS
	IEEE 802.11ac VHT40	5510	0.03	-0.52	3.25	6.02	10.79	PASS
		5670	-0.24	1.38	3.25	6.90	10.79	PASS
	IEEE 802.11ac VHT80	5530	-4.35	-2.86	2.86	2.33	10.79	PASS
		5610	-3.76	-5.65	2.86	1.27	10.79	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	1.13	0.24	0.21	1.34	29.79	PASS
		5785	1.32	0.68	0.21	1.53	29.79	PASS
		5825	1.49	1.65	0.21	1.70	29.79	PASS
	IEEE 802.11n HT20	5745	0.97	-0.84	0.22	3.39	29.79	PASS
		5785	1.46	-0.17	0.22	3.95	29.79	PASS
		5825	1.03	0.10	0.22	3.82	29.79	PASS
	IEEE 802.11ac VHT20	5745	0.56	-0.61	2.02	5.04	29.79	PASS
		5785	1.24	-0.90	2.02	5.33	29.79	PASS
		5825	1.28	0.15	2.02	5.78	29.79	PASS
	IEEE 802.11n HT40	5755	-2.41	-4.06	0.48	0.33	29.79	PASS
		5795	-2.02	-3.23	0.48	0.91	29.79	PASS
	IEEE 802.11ac VHT40	5755	-3.49	-2.25	3.25	3.43	29.79	PASS
		5795	-2.94	-1.90	3.25	3.87	29.79	PASS
	IEEE 802.11ac VHT80	5775	-5.31	-6.43	2.86	0.04	29.79	PASS

U-NII-1 IEEE 802.11a 5180MHz

ANT 1



ANT 2



U-NII-1 IEEE 802.11a 5200MHz

ANT 1



ANT 2



U-NII-1 IEEE 802.11a 5240MHz

ANT 1



ANT 2



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****ANT 1****ANT 2****U-NII-1 IEEE 802.11ac VHT20 5180MHz****ANT 1****ANT 2**

U-NII-1 IEEE 802.11ac VHT20 5200MHz

ANT 1



ANT 2



U-NII-1 IEEE 802.11ac VHT20 5240MHz

ANT 1



ANT 2



U-NII-1 IEEE 802.11n HT40 5190MHz

ANT 1



ANT 2



U-NII-1 IEEE 802.11n HT40 5230MHz

ANT 1



ANT 2



U-NII-1 IEEE 802.11ac VHT40 5190MHz

ANT 1



ANT 2



U-NII-1 IEEE 802.11ac VHT40 5230MHz

ANT 1



ANT 2



U-NII-1 IEEE 802.11ac VHT80 5210MHz

ANT 1

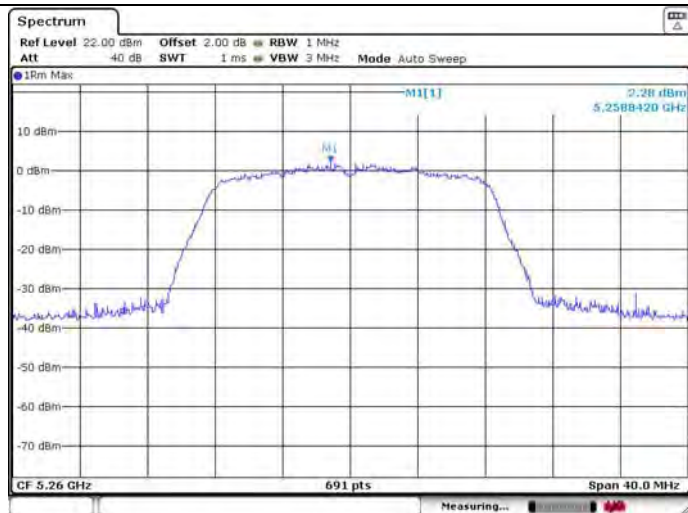


ANT 2



U-NII-2A IEEE 802.11a 5260MHz

ANT 1



ANT 2



U-NII-2A IEEE 802.11a 5300MHz

ANT 1



ANT 2



U-NII-2A IEEE 802.11a 5320MHz

ANT 1



ANT 2



U-NII-2A IEEE 802.11n HT20 5260MHz

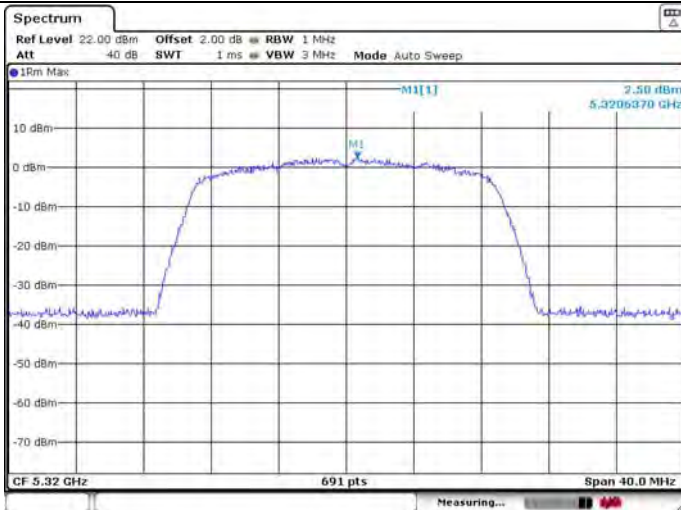
ANT 1



ANT 2



U-NII-2A IEEE 802.11n HT20 5300MHz**ANT 1****ANT 2****U-NII-2A IEEE 802.11n HT20 5320MHz****ANT 1****ANT 2****U-NII-2A IEEE 802.11ac VHT20 5260MHz****ANT 1****ANT 2**

U-NII-2A IEEE 802.11ac VHT20 5300MHz**ANT 1****ANT 2****U-NII-2A IEEE 802.11ac VHT20 5320MHz****ANT 1****ANT 2****U-NII-2A IEEE 802.11n HT40 5270MHz****ANT 1****ANT 2**

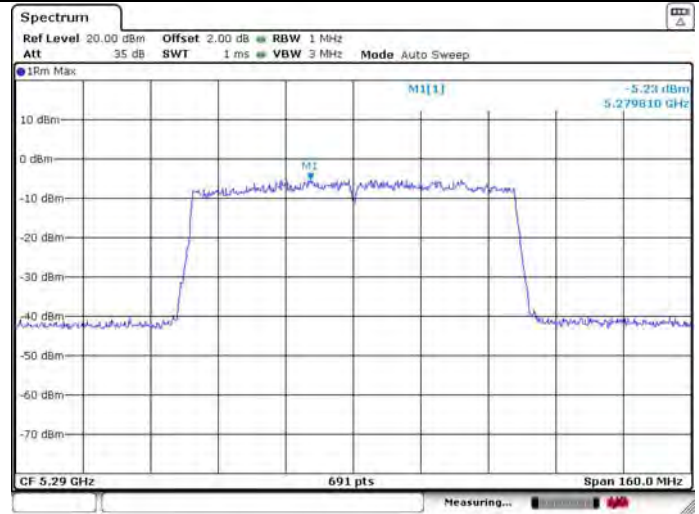
U-NII-2A IEEE 802.11n HT40 5310MHz**ANT 1****ANT 2****U-NII-2A IEEE 802.11ac VHT40 5270MHz****ANT 1****ANT 2****U-NII-2A IEEE 802.11ac VHT40 5310MHz****ANT 1****ANT 2**

U-NII-2A IEEE 802.11ac VHT80 5290MHz

ANT 1



ANT 2



U-NII-2C 802.11a IEEE 5500MHz

ANT 1

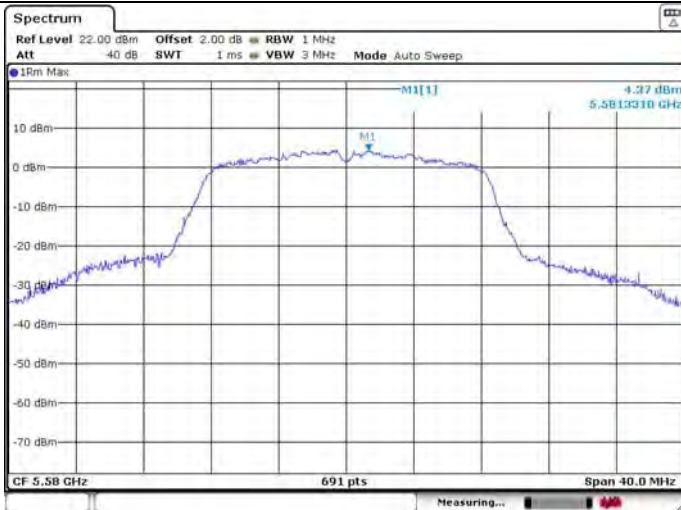


ANT 2



U-NII-2C IEEE 802.11a 5580MHz

ANT 1



ANT 2



U-NII-2C IEEE 802.11a 5700MHz

ANT 1

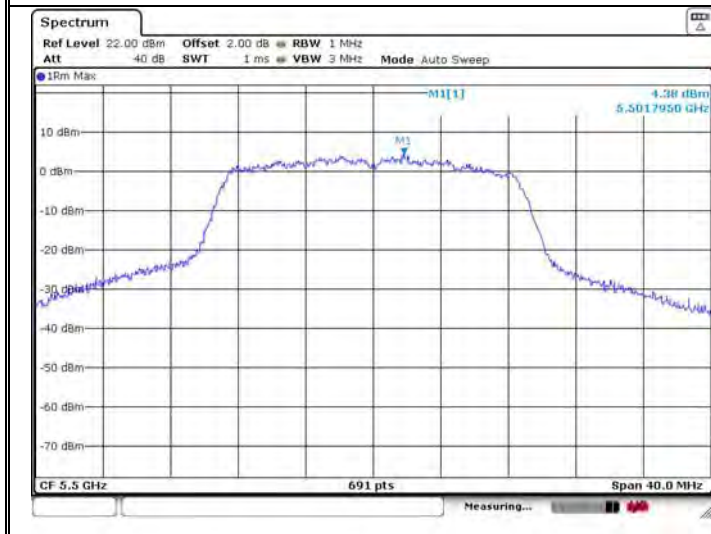


ANT 2



U-NII-2C IEEE 802.11n HT20 5500MHz

ANT 1



ANT 2



U-NII-2C IEEE 802.11n HT20 5580MHz**ANT 1****ANT 2****U-NII-2C IEEE 802.11n HT20 5700MHz****ANT 1****ANT 2****U-NII-2C IEEE 802.11ac VHT20 5500MHz****ANT 1****ANT 2**

U-NII-2C IEEE 802.11ac VHT20 5580MHz

ANT 1

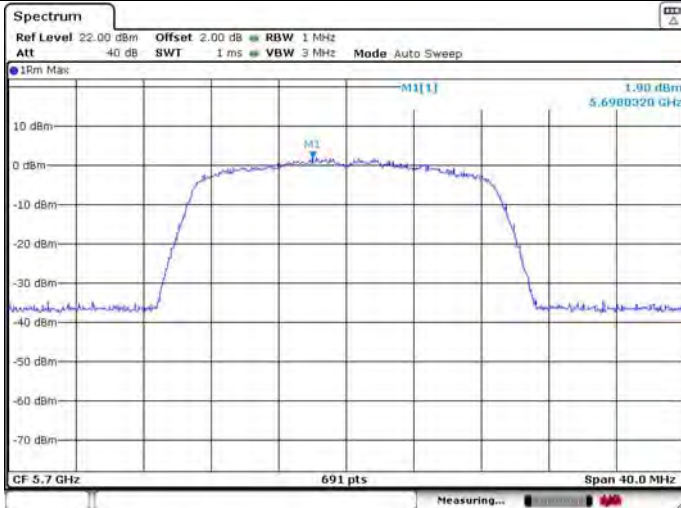


ANT 2



U-NII-2C IEEE 802.11ac VHT20 5700MHz

ANT 1



ANT 2

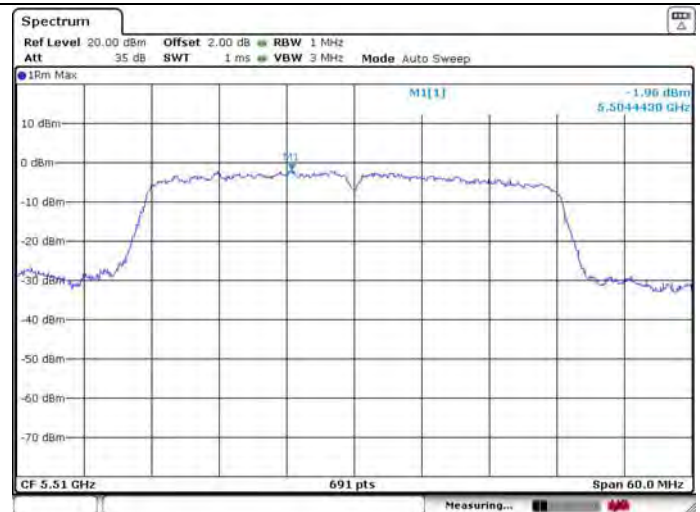


U-NII-2C IEEE 802.11n HT40 5510MHz

ANT 1



ANT 2



U-NII-2C IEEE 802.11n HT40 5670MHz

ANT 1



ANT 2



U-NII-2C IEEE 802.11ac VHT40 5510MHz

ANT 1



ANT 2



U-NII-2C IEEE 802.11ac VHT40 5670MHz

ANT 1

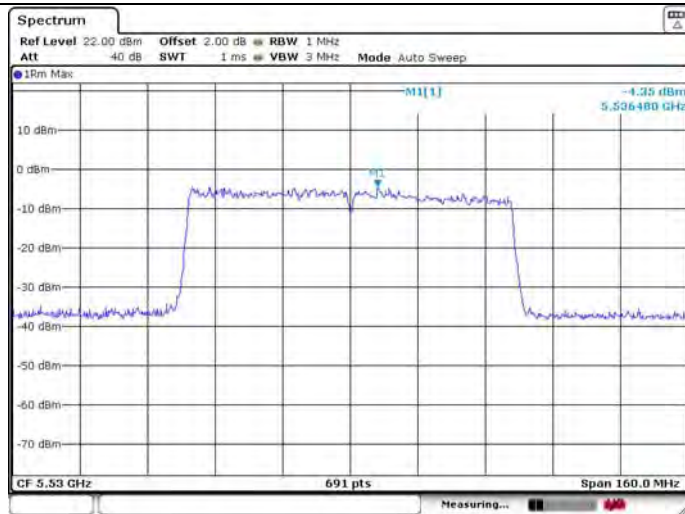


ANT 2

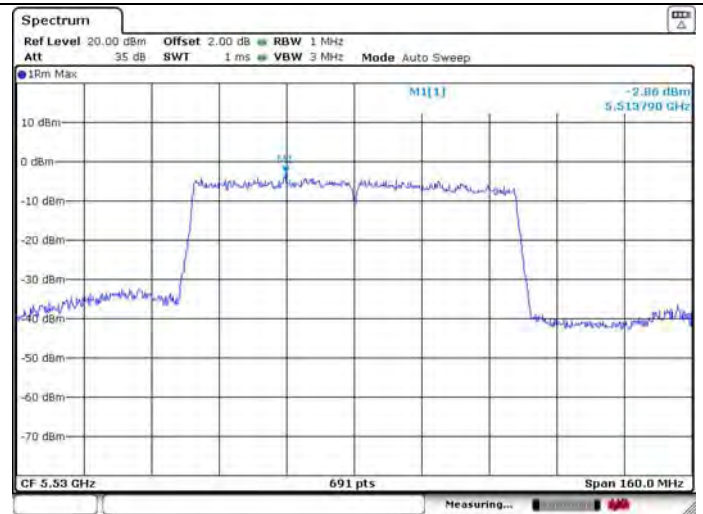


U-NII-2C IEEE 802.11ac VHT80 5530MHz

ANT 1

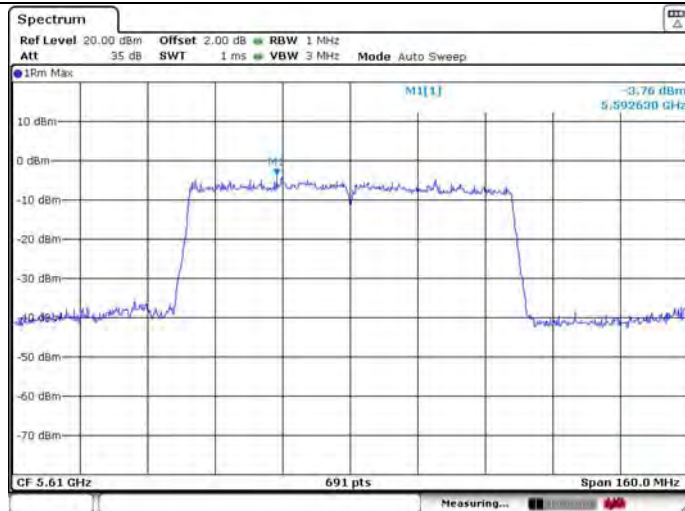


ANT 2



U-NII-2C IEEE 802.11ac VHT80 5610MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11a 5745MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11a 5785MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11a 5825MHz

ANT 1

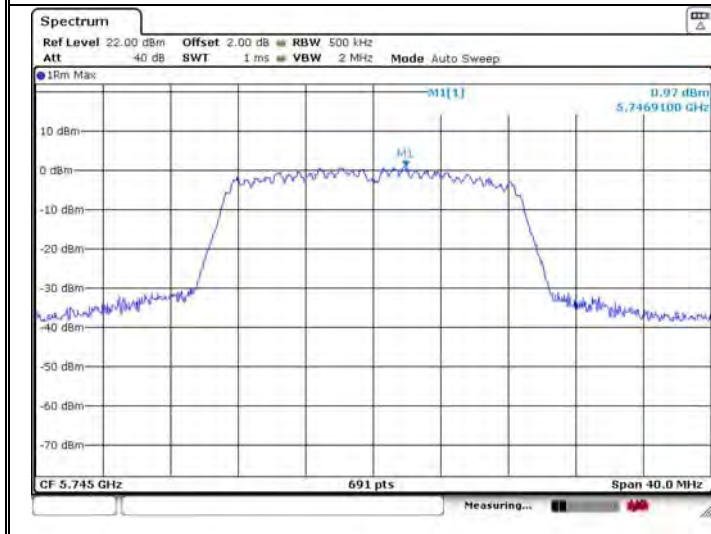


ANT 2

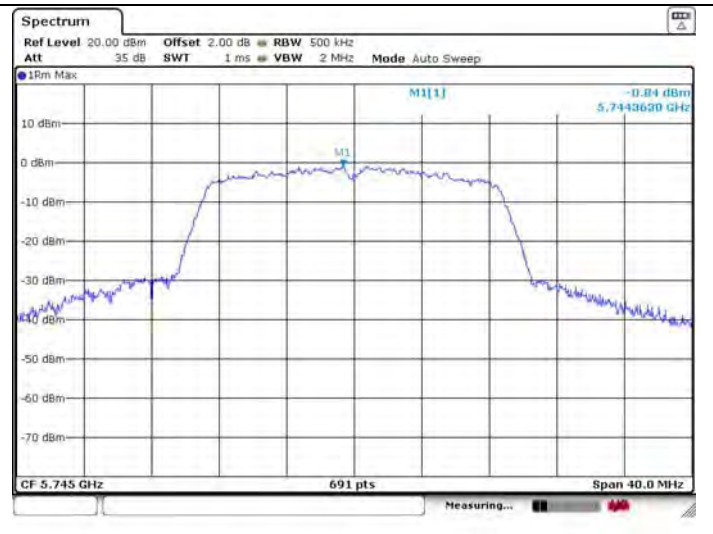


U-NII-3 IEEE 802.11n HT20 5745MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11n HT20 5785MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11n HT20 5825MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11ac VHT20 5745MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11ac VHT20 5785MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11ac VHT20 5825MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11n HT40 5755MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11n HT40 5795MHz

ANT 1



ANT 2



U-NII-3 IEEE 802.11ac VHT40 5755MHz

ANT 1

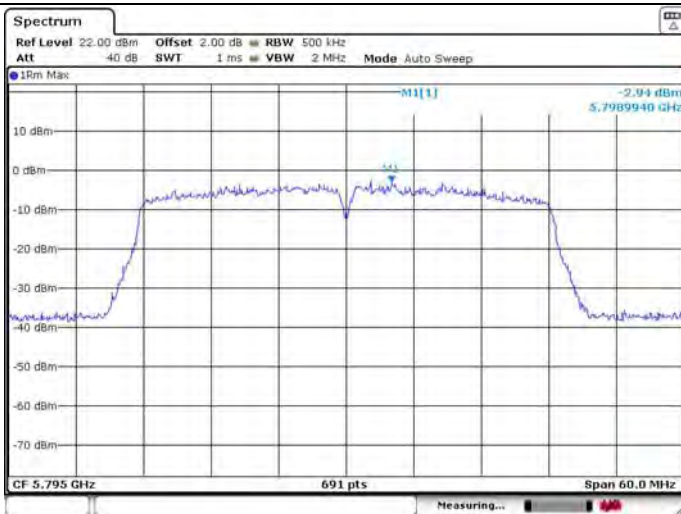


ANT 2



U-NII-3 IEEE 802.11ac VHT40 5795MHz

ANT 1

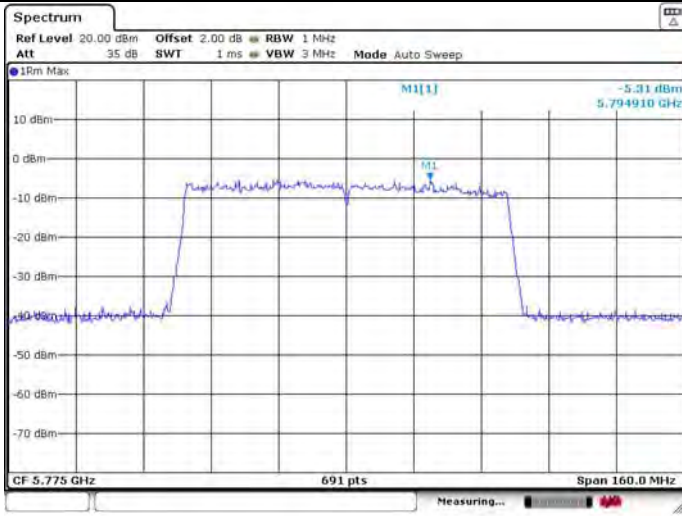


ANT 2



U-NII-3 IEEE 802.11ac VHT80 5775MHz

ANT 1



ANT 2

