MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*

914 WEST PATAPSCO AVENUE ● BALTIMORE, MARYLAND 21230-3432 ● PHONE (410) 354-3300 ● FAX (410) 354-3313
33439 WESTERN AVENUE ● UNION CITY, CALIFORNIA 94587 ● PHONE (510) 489-6300 ● FAX (510) 489-6372
3162 BELICK STREET ● SANTA CLARA, CALIFORNIA 95054 ● PHONE (408) 748-3585 ● FAX (510) 489-6372
13501 MCCALLEN PASS ● AUSTIN, TX 78753 ● PHONE (512) 287-2500 ● FAX (512) 287-2513

July 22, 2016

ARRIS Group Inc.
3871 Lakefield Drive Suite 300
Suwanee, GA 30024

Dear Tony Figueiredo,

Enclosed is the EMC Wireless test report for compliance testing of the ARRIS Group Inc., TG2492LG as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), Title 47 of the CFR, Part 15.407, Subpart E (UNII 2).

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.

Jennifer Warnell
Documentation Department

Reference: (\ARRIS Group Inc.\EMC89081-FCC407 UNII 2 Rev. 2)

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Electromagnetic Compatibility Criteria
Test Report

for the

ARRIS Group Inc.
Model TG2492LG

Tested under
theFCC Certification Rules
contained in
Title 47 of the CFR
15.407 Subpart E

MET Report: EMC89081-FCC407 UNII 2 Rev. 2

July 22, 2016

Prepared For:

ARRIS Group Inc.
3871 Lakefield Drive Suite 300
Suwanee, GA 30024

Prepared By:
MET Laboratories, Inc.
914 W. Patapsco Ave.
Baltimore, MD 21230

Electromagnetic Compatibility Criteria
Test Report

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Title 47 of the CFR
15.407 Subpart E

Surinder Singh, Project Engineer
Electromagnetic Compatibility Lab

Jennifer Warnell
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of 15.407 of the FCC Rules under normal use and maintenance.

Asad Bajwa,
Director, Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	June 7, 2016	Initial Issue.
1	July 7, 2016	Engineer corrections.
2	July 22, 2016	Updated MPE.

Table of Contents

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List of Terms and Abbreviations

AC	**A**lternating **C**urrent
ACF	**A**ntenna **C**orrection **F**actor
Cal	**Cal**ibration
d	**M**easurement **D**istance
dB	**D**eci**b**els
dBµA	**D**eci**b**els above one **micro**amp
dBµV	**D**eci**b**els above one **micro**volt
dBµA/m	**D**eci**b**els above one **micro**amp **per m**eter
dBµV/m	**D**eci**b**els above one **micro**volt **per m**eter
DC	**D**irect **C**urrent
E	**E**lectric Field
DSL	**D**igital **S**ubscriber **L**ine
ESD	**E**lectro**s**tatic **D**ischarge
EUT	**E**quipment **U**nder **T**est
f	**F**requency
FCC	**F**ederal **C**ommunications **C**ommission
GRP	**G**round **R**eference **P**lane
H	Magnetic Field
HCP	**H**orizontal **C**oupling **P**lane
Hz	**H**ert**z**
IEC	**I**nternational **E**lectrotechnical **C**ommission
kHz	**k**ilo**h**ert**z**
kPa	**k**ilo**pa**scal
kV	**k**ilo**v**olt
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
MHz	**M**ega**h**ertz
µH	**microh**enry
µ	**microf**arad
µs	**micros**econds
PRF	**P**ulse **R**epetition **F**requency
RF	**R**adio **F**requency
RMS	**R**oot-**M**ean-**S**quare
TWT	**T**raveling **W**ave **T**ube
V/m	**V**olts **per m**eter
VCP	**V**ertical **C**oupling **P**lane

I. Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the ARRIS Group Inc. TG2492LG, with the requirements of Part 15, §15.407. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the TG2492LG. ARRIS Group Inc. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the TG2492LG, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, §15.407, in accordance with ARRIS Group Inc., purchase order number AR1079103. All tests were conducted using measurement procedure ANSI C63.4-2014.

FCC Reference	Description	Results
§15.203	Antenna Requirement	Compliant
§15.403(i)	26 dB Occupied Bandwidth	Compliant
§15.407 (a)(2)	Maximum Conducted Output Power	Compliant
§15.407 (a)(2)	Maximum Power Spectral Density	Compliant
§15.407 (b)(2 – 3)& (6 - 7)	Undesirable Emissions	Compliant
§15.407(b)(6)	Conducted Emission	Compliant
§15.407(f)	RF Exposure	Compliant
15.40 (h)(2)	U-NII Detection Bandwidth	Compliant
15.407(h)(2)(ii)	Channel Availability Check Time	Compliant
15.407(h)(2)(ii-iii)	In-Service Monitoring	Compliant
15.407(h)(2)	Statistical Performance Check	Compliant

Table 1. Executive Summary of EMC Part 15.407 ComplianceTesting

II. Equipment Configuration

A. Overview

MET Laboratories, Inc. was contracted by ARRIS Group Inc. to perform testing on the TG2492LG, under ARRIS Group Inc.'s purchase order number AR1079103.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the ARRIS Group Inc. TG2492LG.

The results obtained relate only to the item(s) tested.

Model(s) Tested:	TG2492LG	
Model(s) Covered:	TG2492LG	
EUT Specifications:	Primary Power: 120 VAC, 60 Hz	
	FCC ID: UIDTG2492	
	Type of Modulations:	OFDM, MCS, MNSS
	Equipment Code:	NII
	Peak RF Output Power:	24 dBm
	EUT Frequency Ranges:	5260 – 5320 MHz 5500 – 5720 MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35º C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Type of Filing:	Original	
Evaluated by:	Surinder Singh	
Report Date(s):	July 22, 2016	

Table 2. EUT Summary

B. References

CFR 47, Part 15, Subpart E	Unlicensed National Information Infrastructure Devices (UNII)
ANSI C63.4:2014	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
789033 D02 General UNII Test Procedures New Rules v01 r02	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E
905462 DO2 UNII DFS Compliance Procedures New Rules v01r02	Compliance Measurement Procedures for Unlicensed-National Information Infrastructure Devices Operating in the 5250-5350 MHz and 5470-5725 MHz Bands Incorporating Dynamic Frequency Selection

Table 3. References

C. Test Site

All testing was performed at MET Laboratories, Inc., 914 W. Patapsco Ave., Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 3 meter semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

D. Description of Test Sample

The ARRIS Group, Inc. TG2492LG, Equipment Under Test (EUT), is a DOCSIS® 3.0 Dual Band Concurrent 802.11ac Wireless Telephony Gateway with MoCA®2.0.

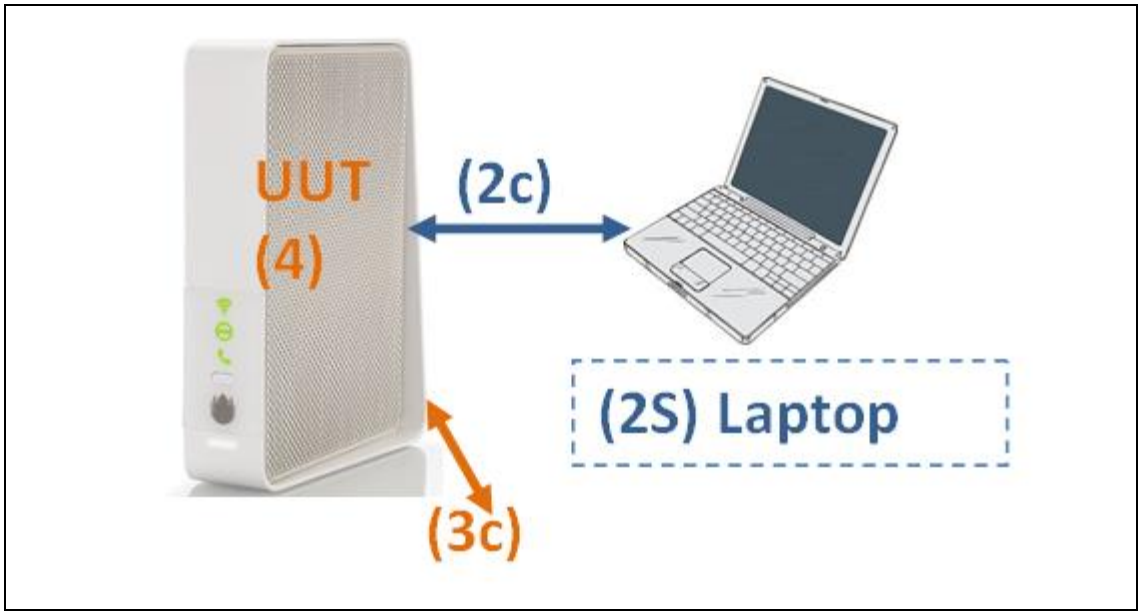


Figure 1. Block Diagram of Test Configuration

E. Equipment Configuration

Ref. ID	Name / Description	Model Number	Part Number	Serial Number	Revision
4	UUT	TG2492	--	--	--

Table 4. Equipment Configuration

F. Antenna Configuration

Part Number	Type	Frequency Range MHz	Efficiency %	Peak Gain dBi	Return Loss dB
AAAD00179PB	Omni	5150-5350	75%	1.9	<-10
AAAD00179PB	Omni	5725-5850	65%	2.0	<-10

Table 5. Antenna Configuration

TG2492 transmit correlated signal in 802.11b , 802.11g and 802.11a mode.
TG2492 transmit un correlated signal in 802.11n and 802.11ac mode.

Referenced from OET KDB 662911 D01

Total Antenna gain in 802.11b , 802.11g and 802.11a mode: Peak Gain +10*log(Number of Antenna)

Frequency Range MHz	Total Antenna Gain dBi
5150-5350	1.9+4.77= 6.67
5725-5850	2.0+4.77= 6.77

Total Antenna gain in 802.11n and 802.11ac mode is equal to Peak Gain value of one antenna.

Frequency Range MHz	Total Antenna Gain dBi
5150-5350	1.9
5725-5850	2.0

Determination of test mode reduction:
Based upon the preliminary testing results on all data rate for all modulation type- lowest data rate for each modulation type produce maximum emission at the band edge, which happens to be a limiting factor for this EUT to transmit more power. So based upon this determination all other data rate are expected to produce lesser band edge emission when operate with same power level as low data rate modulation.

EUT duty cycle: Manufacturer provided software that placed the radio in a 100% duty cycle transmit mode.

G. Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

Ref. ID	Name / Description	Manufacturer	Model Number
2s	Laptop	Assorted	--

Table 6. Support Equipment

H. Ports and Cabling Information

Ref. ID	Port Name on EUT	Cable Description	Qty.	Length (m)	Shielded (Y/N)	Termination Point
2C	Ethernet	5e Modular 8 pin	1	1	No	--
3C	DC Input	2 conductor	1	2	No	--

Table 7. Ports and Cabling Information

I. Mode of Operation

The provided instructions and software will configure the unit for operation at each required test mode.

J. Method of Monitoring EUT Operation

All indicator lights are active, both Wi-Fi 2.4G and 5 G passing traffic.

K. Modifications

a) Modifications to EUT

No modifications were made to the EUT.

b) Modifications to Test Standard

No modifications were made to the test standard.

L. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to ARRIS Group Inc. upon completion of testing.

III. Electromagnetic Compatibility Criteria for Intentional Radiators

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.203 Antenna Requirement

Test Requirement: **§ 15.203:** An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

a.) Antenna must be permanently attached to the unit.

b.) Antenna must use a unique type of connector to attach to the EUT.

c.) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

Results: The EUT as tested is compliant the criteria of §15.203. The EUT has integral antenna.

Test Engineer(s): Surinder Singh

Test Date(s): 04/21/16

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15. 403(i) 26dB Bandwidth

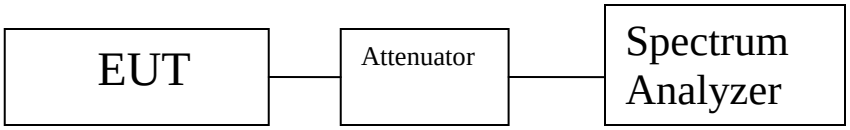
Test Requirements: **§ 15.403(i):** For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

Test Procedure: The transmitter was set to low, mid, and high operating frequencies at the highest output power and connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using a RBW approximately equal to 1% of the total emission bandwidth, VBW > RBW. The 26 dB Bandwidth was measured and recorded.

Test Results The 26 dB Bandwidth was compliant with the requirements of this section.
Note: Occupied Bandwidth measurement was taken at Port 1 of EUT. All ports run of the same radio chip and preliminary testing showed the 26 dB bandwidth was the same on all ports. Therefore, final measurements were only made on Port 1 of the EUT.

Test Engineer(s): Surinder Singh

Test Date(s): 04/22/16



Frequency MHz	Mode	Occupied Bandwidth MHz
5260	a	22.746
5300	a	22.274
5320	a	22.635
5500	a	22.787
5580	a	22.92
5720	a	22.618
5260	n	24.017
5300	n	23.426
5320	n	23.709
5500	n	23.387
5580	n	23.645
5720	n	24.165
5260	ac	23.238
5300	ac	23.384
5320	ac	23.654
5500	ac	23.987
5580	ac	23.912
5720	ac	23.672
5270	n	45.417
5310	n	45.771
5510	n	46.05
5630	n	45.211
5710	n	45.579
5270	ac	45.741
5310	ac	45.931
5510	ac	45.364
5630	ac	45.682
5710	ac	45.443
5290	ac	88.63
5530	ac	88.528
5610	ac	88.507
5690	ac	88.742

Table 8. Occupied Bandwidth, Test Results

Electromagnetic Compatibility Criteria for Intentional Radiators

§15. 407(a)(2) Maximum Conducted Output Power

Test Requirements: **§15.407(a)(2):** For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.
If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.407(h)(1): Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

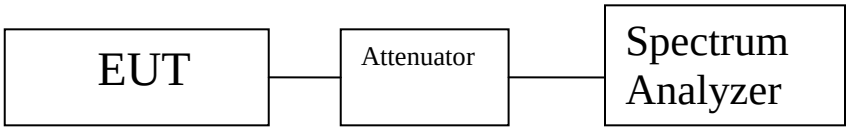
Test Procedure: The EUT was connected to a spectrum analyzer through a cable and attenuator. Measurements were taken with the EUT set to transmit continuously on its low, mid, and high channels. Its power was measured according to measurement method SA-1, as described in 789033 D02 General UNII Test Procedures v01 r02.

To verify the TPC requirement of the rule part, observations using the same measurement method were made with the EUT set to a lower power setting.

Test Results: The EUT as tested is compliant with the requirements of this section.

Test Engineer(s): Surinder Singh

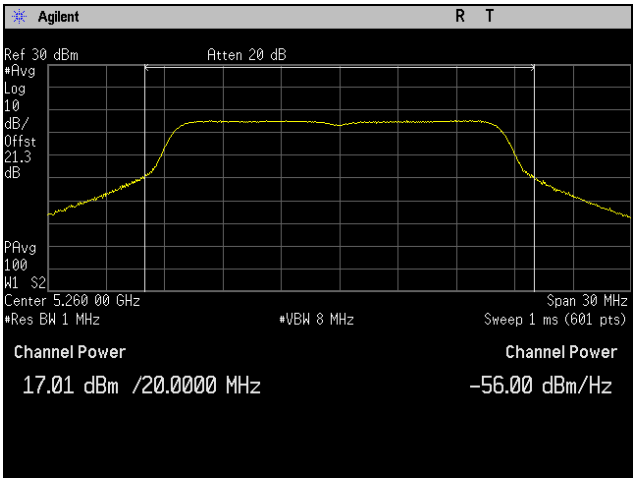
Test Date(s): 04/22/16



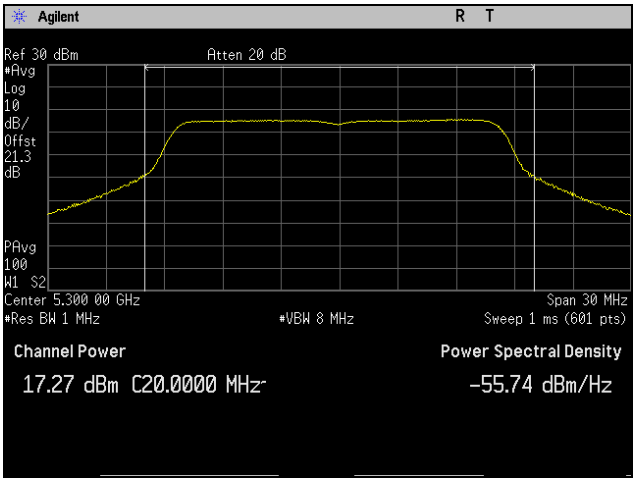
Center Frequency MHz	Bandwidth MHz	Mode	Port 1 Data dBm	Port 2 Data dBm	Port 3 Data dBm	Sum of Three Port dBm	Limit dBm	Antenna Gain dBi	Final limit dBm	Margin dB
Ch 5260M	BW 20M	a mode	17.01	17.51	17.53	22.13	24	6.77	23.23	-1.87
Ch 5260M	BW 20M	ac mode	18.08	18.17	17.31	22.65	24	2	24	-1.35
Ch 5260M	BW 20M	n mode	18.21	18.79	17.48	22.97	24	2	24	-1.03
Ch 5300M	BW 20M	a mode	17.27	17.49	17.59	22.23	24	6.77	23.23	-1.77
Ch 5300M	BW 20M	ac mode	18.46	17.64	17.43	22.64	24	2	24	-1.36
Ch 5300M	BW 20M	n mode	18.52	18.8	17.4	23.06	24	2	24	-0.94
Ch 5320M	BW 20M	a mode	17.32	17.53	17.34	22.17	24	6.77	23.23	-1.83
Ch 5320M	BW 20M	ac mode	18.57	17.44	17.02	22.5	24	2	24	-1.5
Ch 5320M	BW 20M	n mode	18.48	17.43	17.3	22.55	24	2	24	-1.45
Ch 5500M	BW 20M	a mode	17.49	17.92	16.32	22.07	24	6.77	23.23	-1.93
Ch 5500M	BW 20M	ac mode	17.33	18.12	17.18	22.34	24	2	24	-1.66
Ch 5500M	BW 20M	n mode	17.3	17.77	17.22	22.21	24	2	24	-1.79
Ch 5580M	BW 20M	a mode	16.37	15.53	16.83	21.05	24	6.77	23.23	-2.95
Ch 5580M	BW 20M	ac mode	17.25	18.23	16.4	22.13	24	2	24	-1.87
Ch 5580M	BW 20M	n mode	17.1	18.2	17.34	22.35	24	2	24	-1.65
Ch 5700M	BW 20M	a mode	16.6	17.27	15.53	21.3	24	6.77	23.23	-2.7
Ch 5700M	BW 20M	ac mode	16.58	17.85	16.29	21.74	24	2	24	-2.26
Ch 5700M	BW 20M	n mode	16.24	18.19	16.06	21.72	24	2	24	-2.28
Ch 5720M	BW 20M	a mode	16.37	16.79	15.53	21.04	24	6.77	23.23	-2.96
Ch 5720M	BW 20M	ac mode	16.45	17.03	15.53	21.16	24	2	24	-2.84
Ch 5720M	BW 20M	n mode	16.74	17.44	15.94	21.53	24	2	24	-2.47
Ch 5270M	BW 40M	ac mode	18.4	18.74	18.95	23.48	24	2	24	-0.52
Ch 5270M	BW 40M	n mode	18.62	18.58	18.92	23.49	24	2	24	-0.51
Ch 5310M	BW 40M	ac mode	17.34	16.88	16.95	21.84	24	2	24	-2.16
Ch 5310M	BW 40M	n mode	17.25	16.45	17.1	21.72	24	2	24	-2.28
Ch 5510M	BW 40M	ac mode	18.61	19.08	18.55	23.53	24	2	24	-0.47
Ch 5510M	BW 40M	n mode	18.7	18.69	18.52	23.41	24	2	24	-0.59
Ch 5550M	BW 40M	ac mode	18.99	18.88	19.48	23.9	24	2	24	-0.1
Ch 5550M	BW 40M	n mode	18.82	18.49	19.46	23.72	24	2	24	-0.28
Ch 5670M	BW 40M	ac mode	18.42	18.18	19.01	23.33	24	2	24	-0.67
Ch 5670M	BW 40M	n mode	18.47	18.34	18.24	23.13	24	2	24	-0.87
Ch 5710M	BW 40M	ac mode	18.89	19.8	19.25	24	24	2	24	0
Ch 5710M	BW 40M	n mode	18.99	19.61	19.33	24	24	2	24	0
Ch 5290M	BW 80M	ac mode	16.47	16.17	16.49	21.16	24	2	24	-2.84
Ch 5530M	BW 80M	ac mode	15.62	14.93	15.09	20	24	2	24	-4
Ch 5610M	BW 80M	ac mode	18.76	19.7	19.1	24	24	2	24	0
Ch 5690M	BW 80M	ac mode	18.66	19.27	19.35	23.88	24	2	24	-0.12

Table 9. Conducted Output Power, Test Results

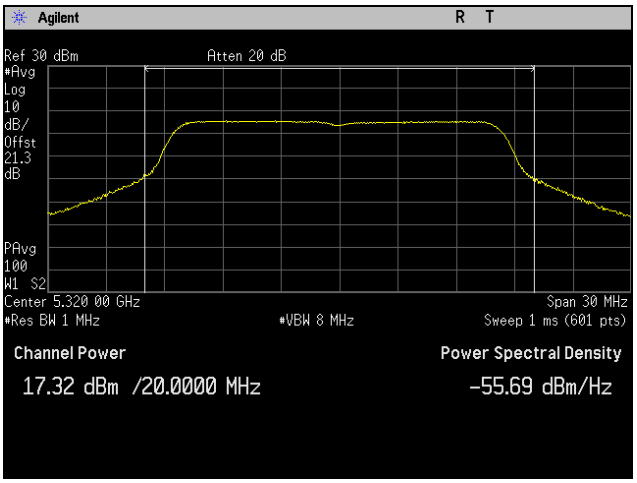
Conducted Output Power, 802.11a 20 MHz, Port 1



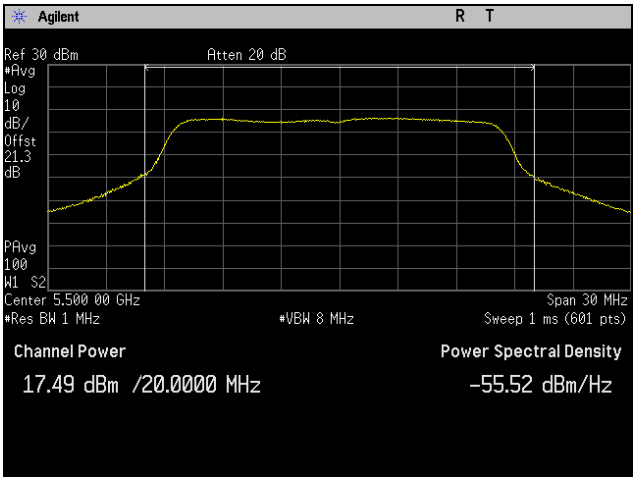
Plot 1. Conducted Output Power, 5260 MHz, 802.11a 20 MHz, Port 1



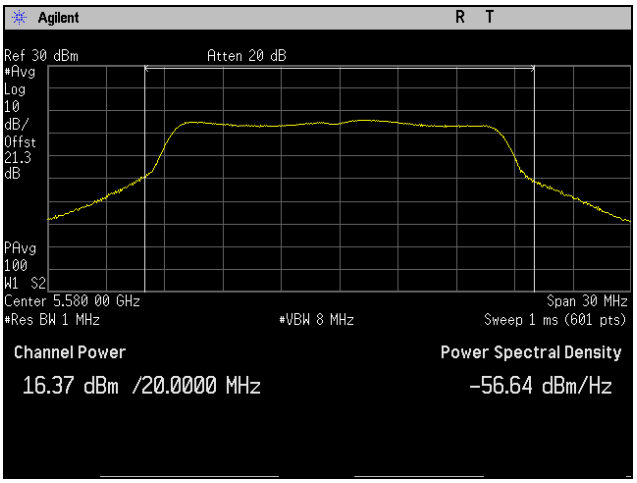
Plot 2. Conducted Output Power, 5300 MHz, 802.11a 20 MHz, Port 1



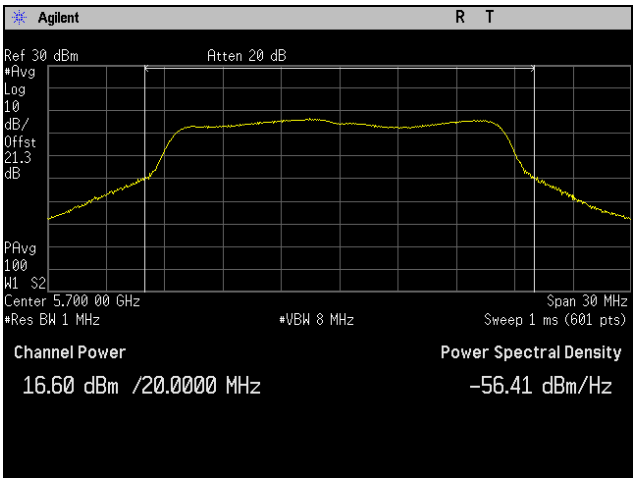
Plot 3. Conducted Output Power, 5320 MHz, 802.11a 20 MHz, Port 1



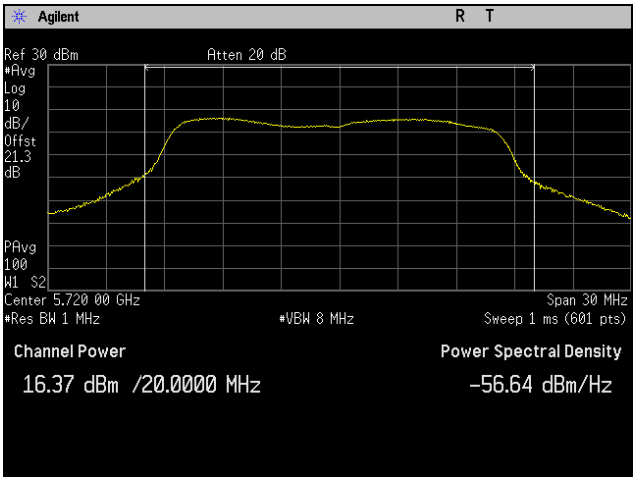
Plot 4. Conducted Output Power, 5500 MHz, 802.11a 20 MHz, Port 1



Plot 5. Conducted Output Power, 5580 MHz, 802.11a 20 MHz, Port 1

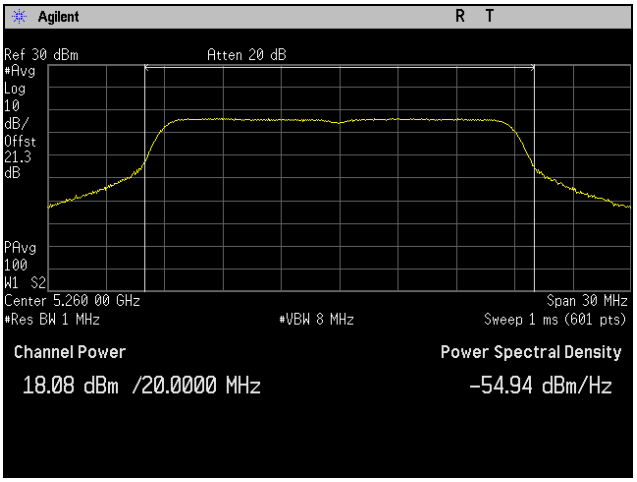


Plot 6. Conducted Output Power, 5700 MHz, 802.11a 20 MHz, Port 1

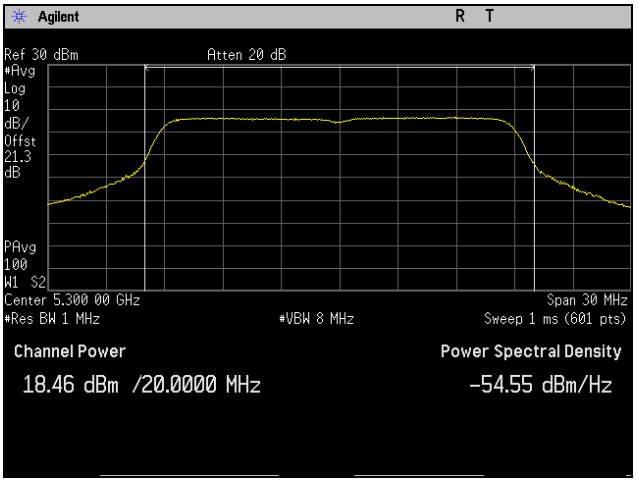


Plot 7. Conducted Output Power, 5720 MHz, 802.11a 20 MHz, Port 1

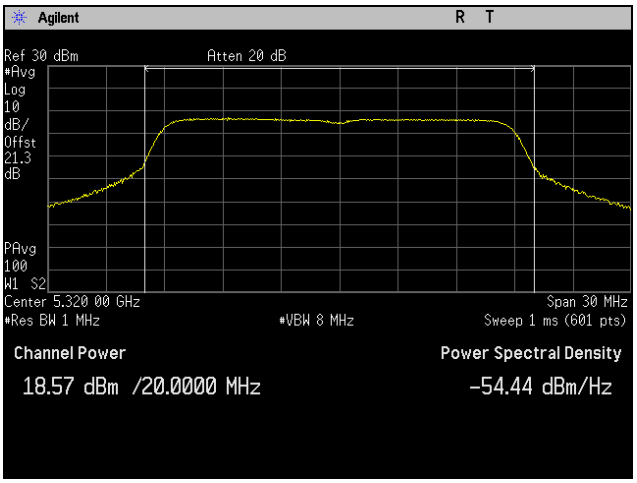
Conducted Output Power, 802.11ac 20 MHz, Port 1



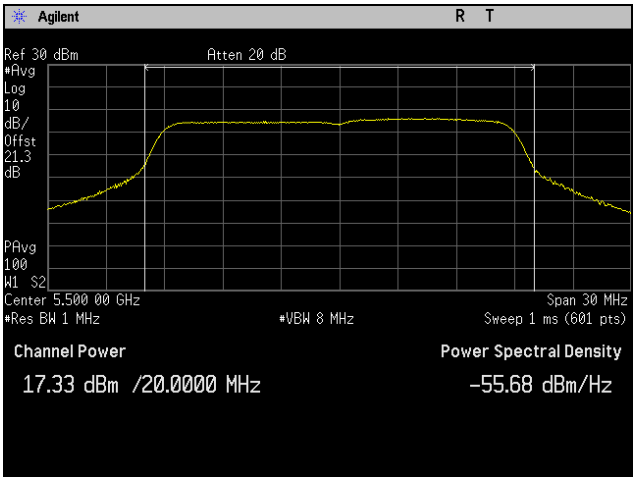
Plot 8. Conducted Output Power, 5260 MHz, 802.11ac 20 MHz, Port 1



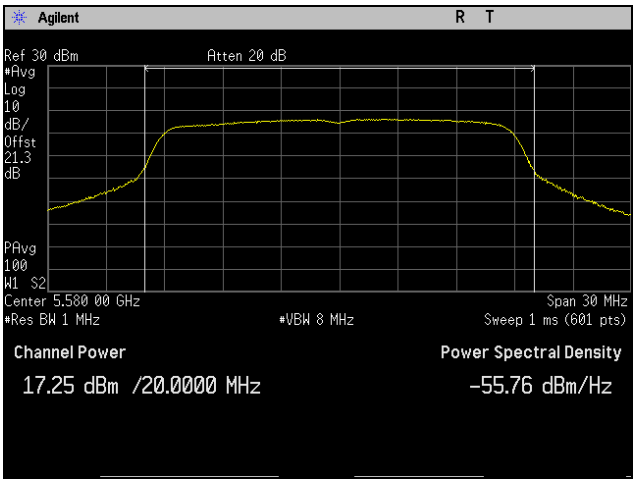
Plot 9. Conducted Output Power, 5300 MHz, 802.11ac 20 MHz, Port 1



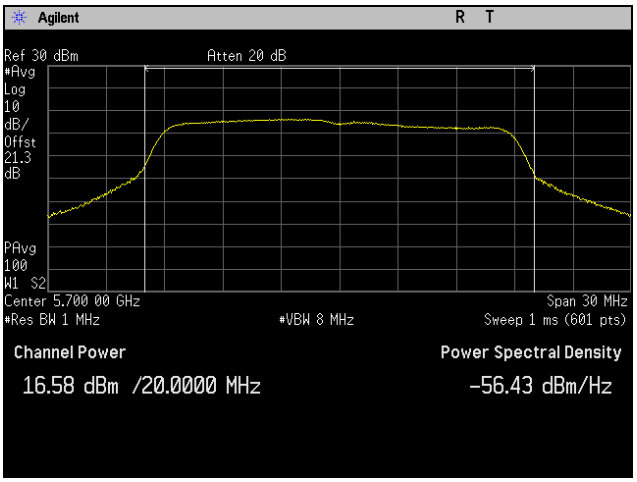
Plot 10. Conducted Output Power, 5320 MHz, 802.11ac 20 MHz, Port 1



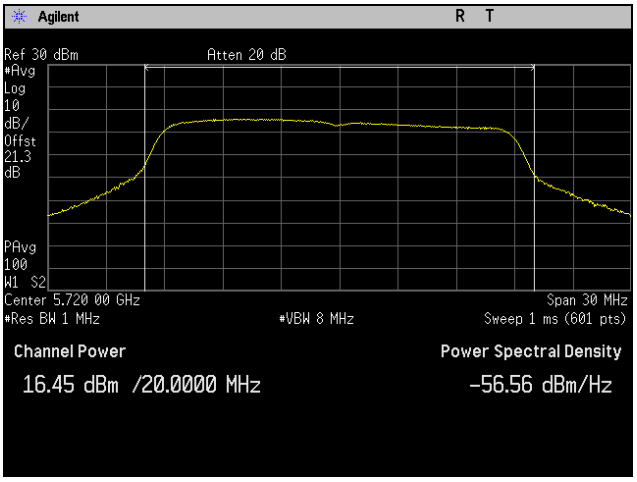
Plot 11. Conducted Output Power, 5500 MHz, 802.11ac 20 MHz, Port 1



Plot 12. Conducted Output Power, 5580 MHz, 802.11ac 20 MHz, Port 1

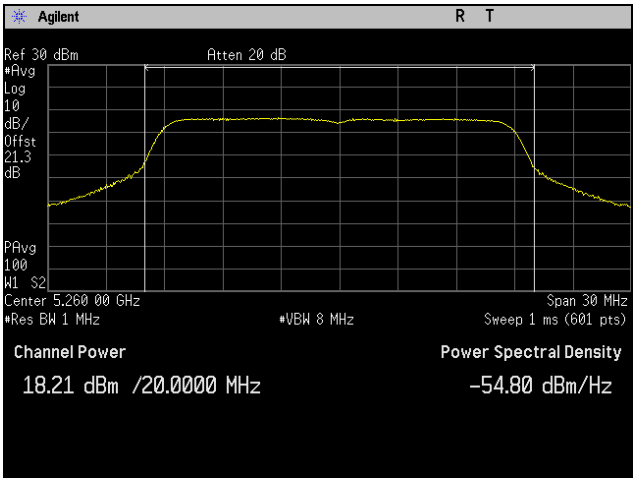


Plot 13. Conducted Output Power, 5700 MHz, 802.11ac 20 MHz, Port 1

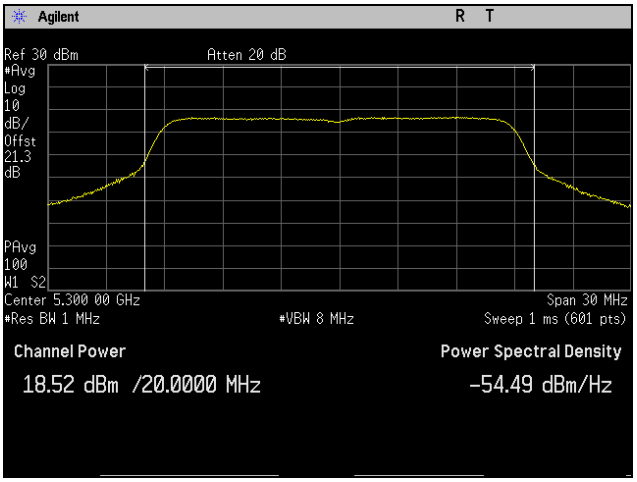


Plot 14. Conducted Output Power, 5720 MHz, 802.11ac 20 MHz, Port 1

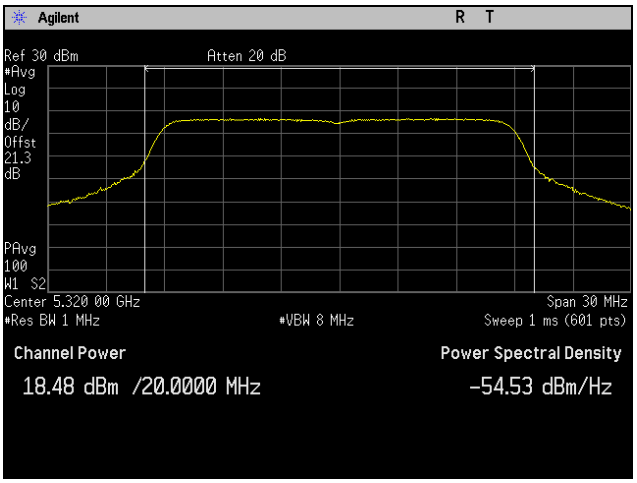
Conducted Output Power, 802.11n 20 MHz, Port 1



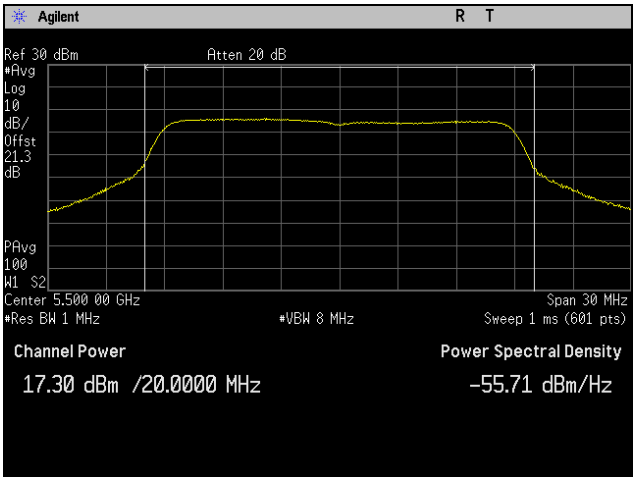
Plot 15. Conducted Output Power, 5260 MHz, 802.11n 20 MHz, Port 1



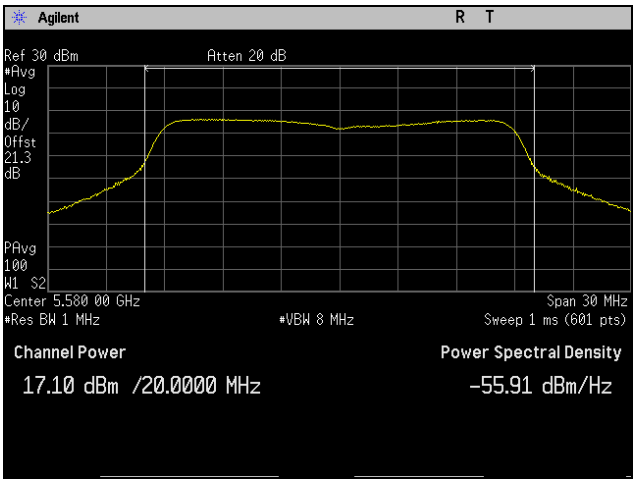
Plot 16. Conducted Output Power, 5300 MHz, 802.11n 20 MHz, Port 1



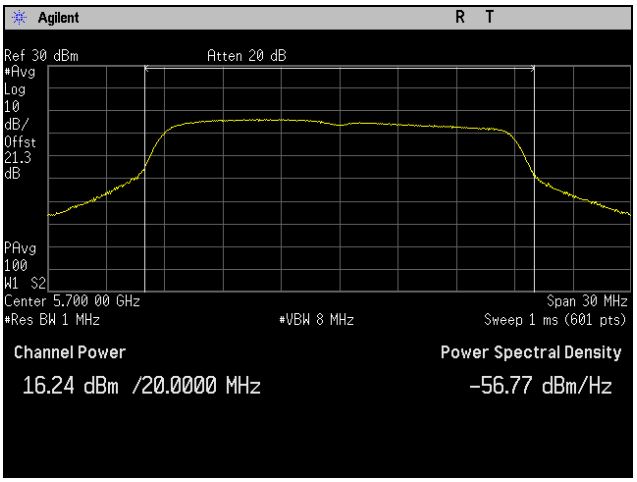
Plot 17. Conducted Output Power, 5320 MHz, 802.11n 20 MHz, Port 1



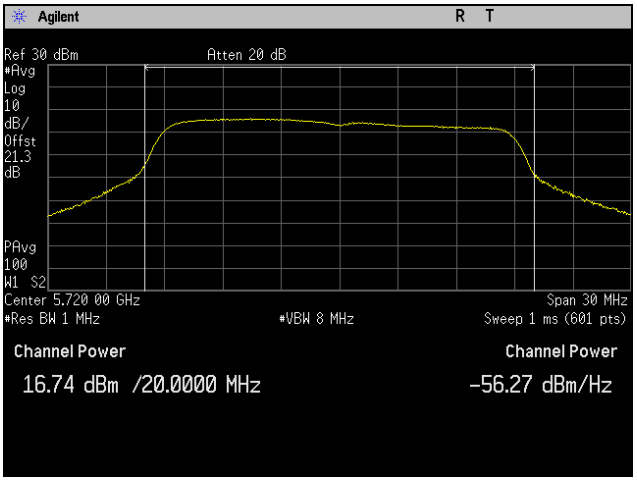
Plot 18. Conducted Output Power, 5500 MHz, 802.11n 20 MHz, Port 1



Plot 19. Conducted Output Power, 5580 MHz, 802.11n 20 MHz, Port 1

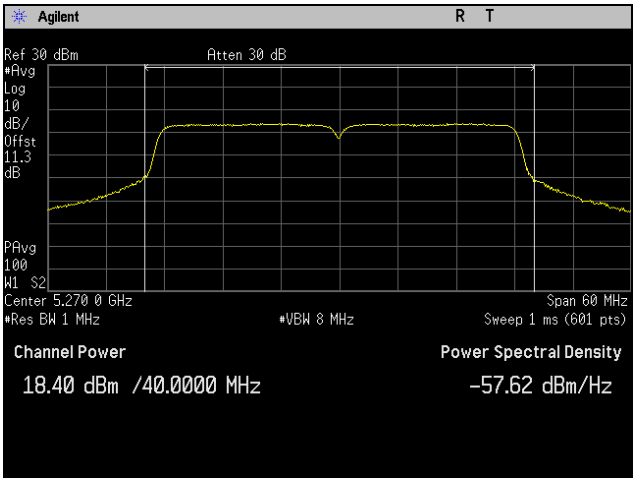


Plot 20. Conducted Output Power, 5700 MHz, 802.11n 20 MHz, Port 1

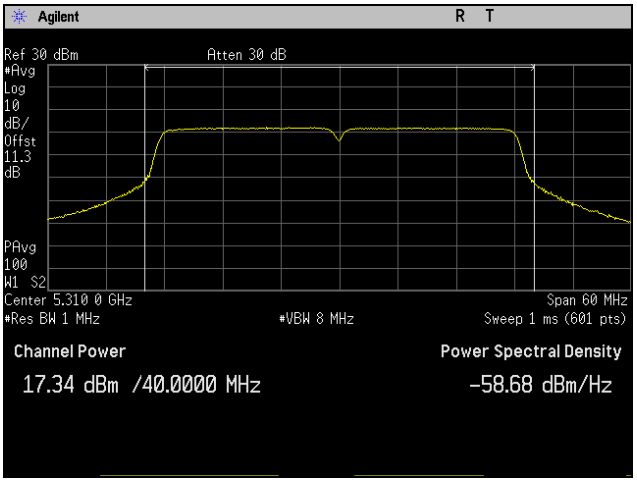


Plot 21. Conducted Output Power, 5720 MHz, 802.11n 20 MHz, Port 1

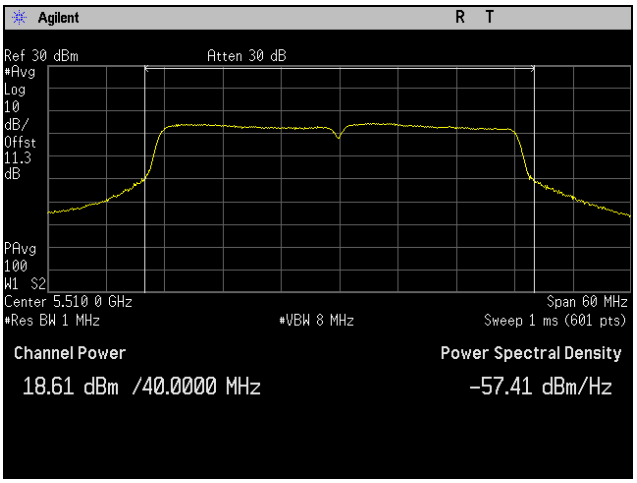
Conducted Output Power, 802.11ac 40 MHz, Port 1



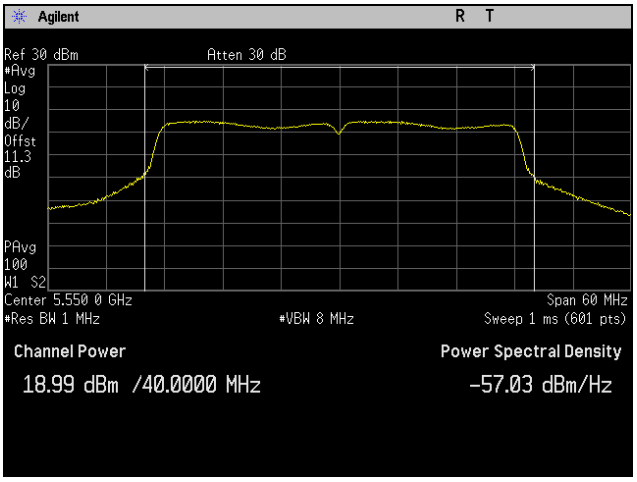
Plot 22. Conducted Output Power, 5270 MHz, 802.11ac 40 MHz, Port 1



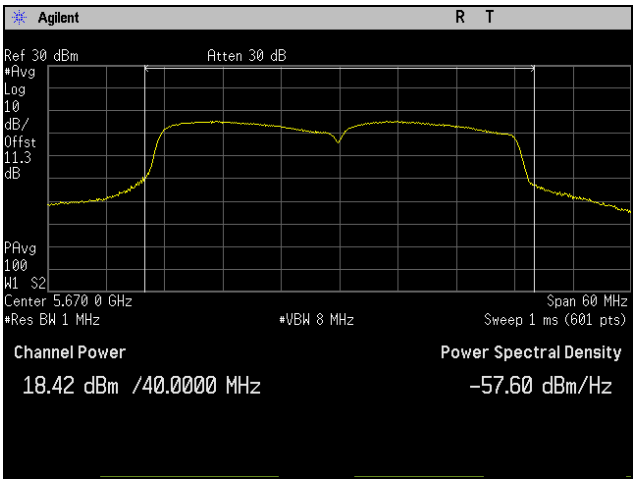
Plot 23. Conducted Output Power, 5310 MHz, 802.11ac 40 MHz, Port 1



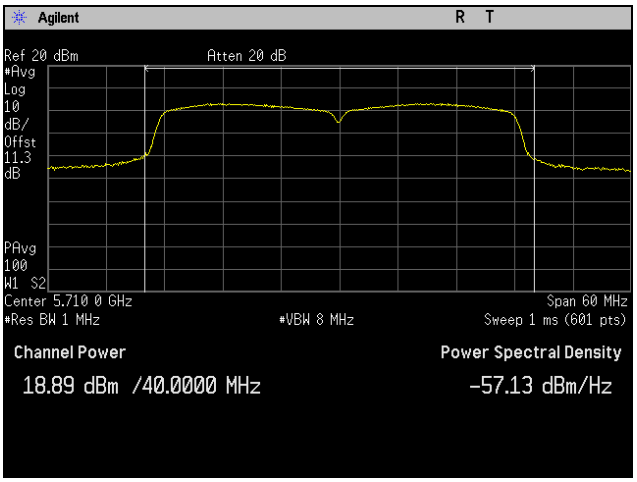
Plot 24. Conducted Output Power, 5510 MHz, 802.11ac 40 MHz, Port 1



Plot 25. Conducted Output Power, 5550 MHz, 802.11ac 40 MHz, Port 1

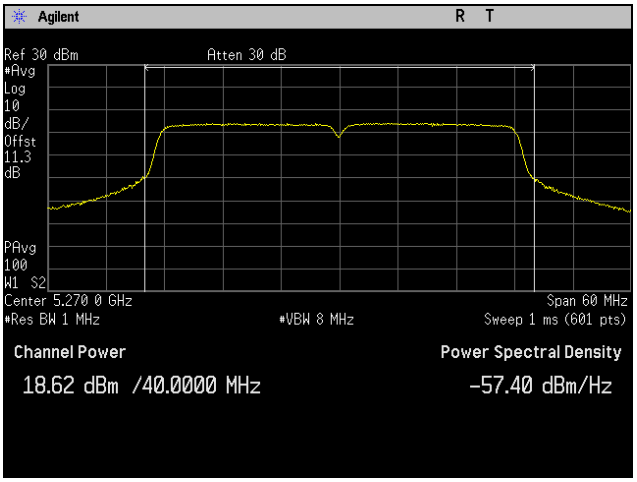


Plot 26. Conducted Output Power, 5670 MHz, 802.11ac 40 MHz, Port 1

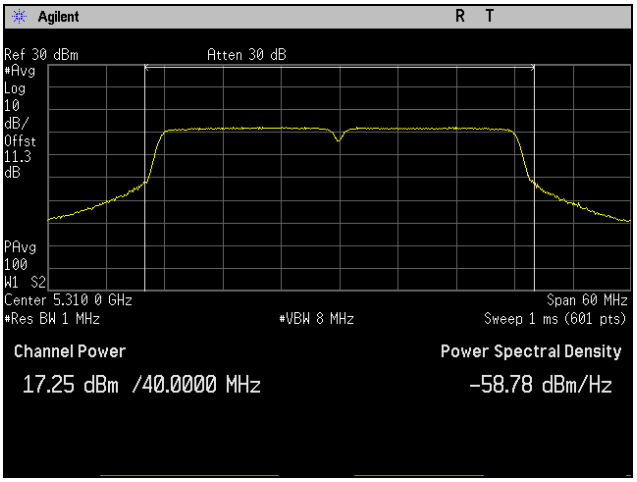


Plot 27. Conducted Output Power, 5710 MHz, 802.11ac 40 MHz, Port 1

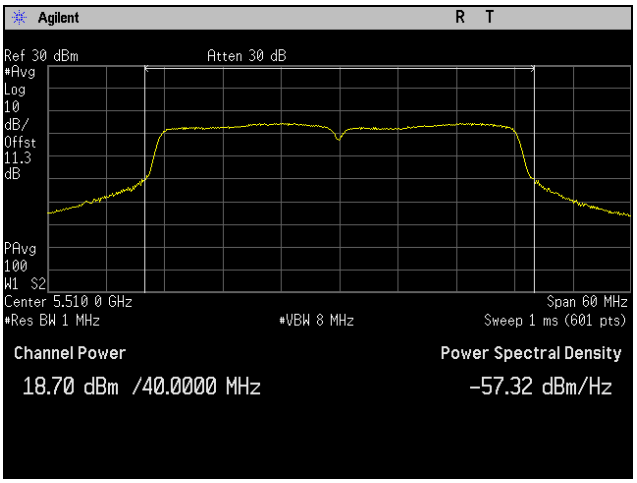
Conducted Output Power, 802.11n 40 MHz, Port 1



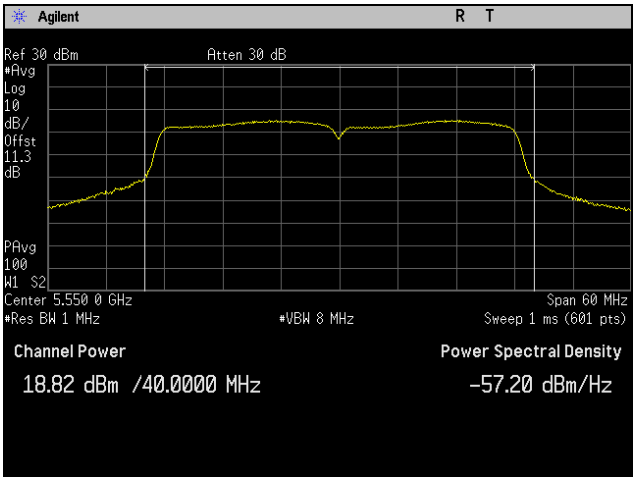
Plot 28. Conducted Output Power, 5270 MHz, 802.11n 40 MHz, Port 1



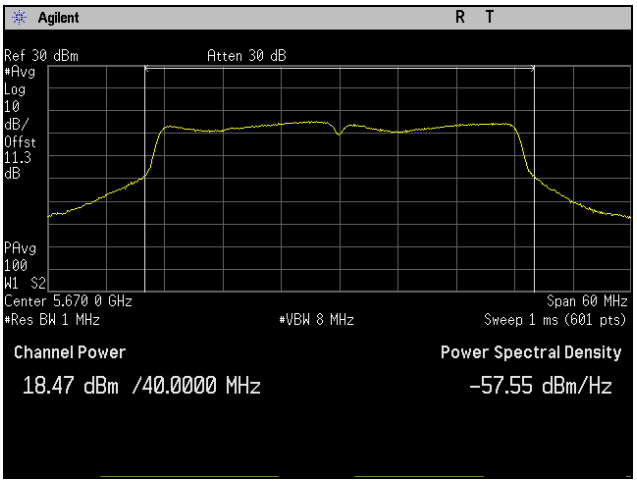
Plot 29. Conducted Output Power, 5310 MHz, 802.11n 40 MHz, Port 1



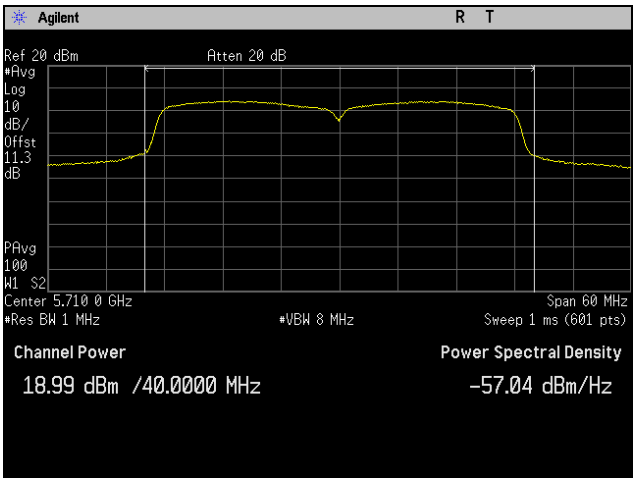
Plot 30. Conducted Output Power, 5510 MHz, 802.11n 40 MHz, Port 1



Plot 31. Conducted Output Power, 5550 MHz, 802.11n 40 MHz, Port 1

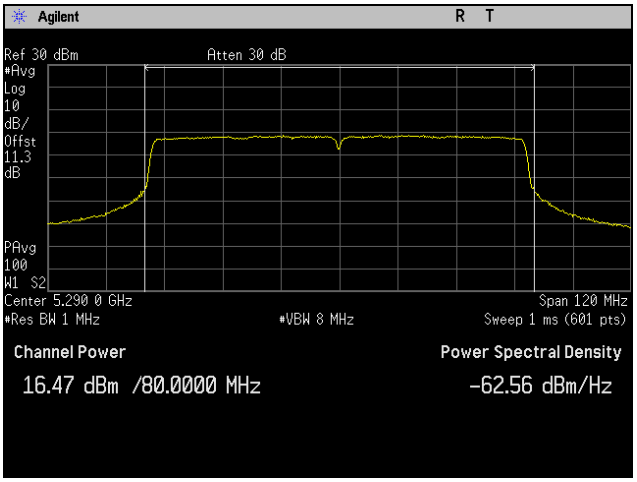


Plot 32. Conducted Output Power, 5670 MHz, 802.11n 40 MHz, Port 1

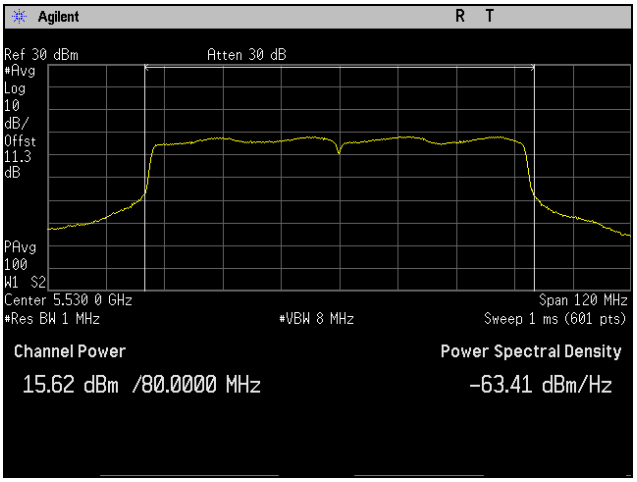


Plot 33. Conducted Output Power, 5710 MHz, 802.11n 40 MHz, Port 1

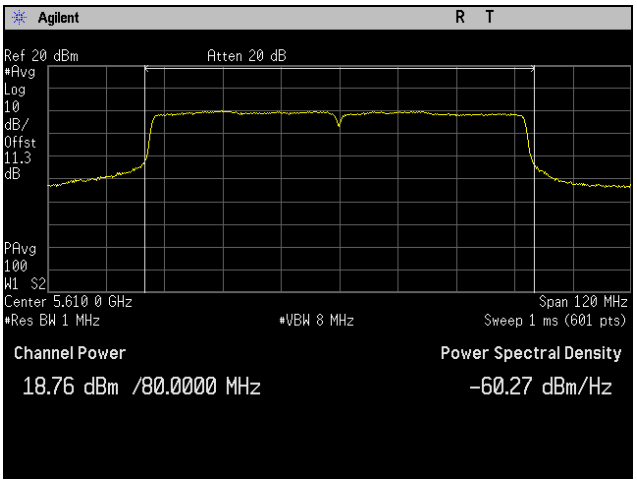
Conducted Output Power, 802.11ac 80 MHz, Port 1



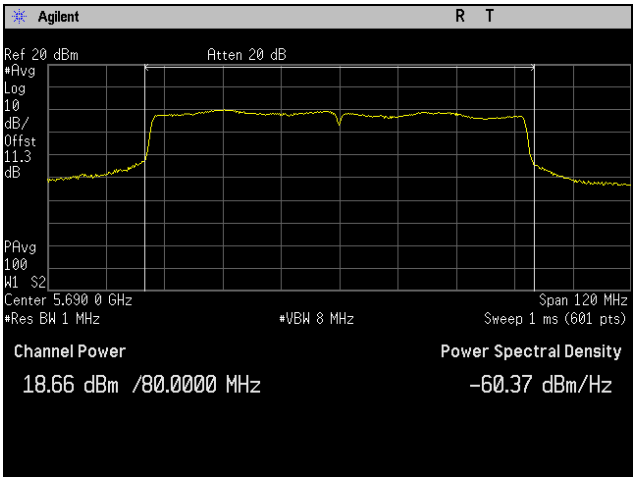
Plot 34. Conducted Output Power, 5290 MHz, 802.11ac 80 MHz, Port 1



Plot 35. Conducted Output Power, 5530 MHz, 802.11ac 80 MHz, Port 1

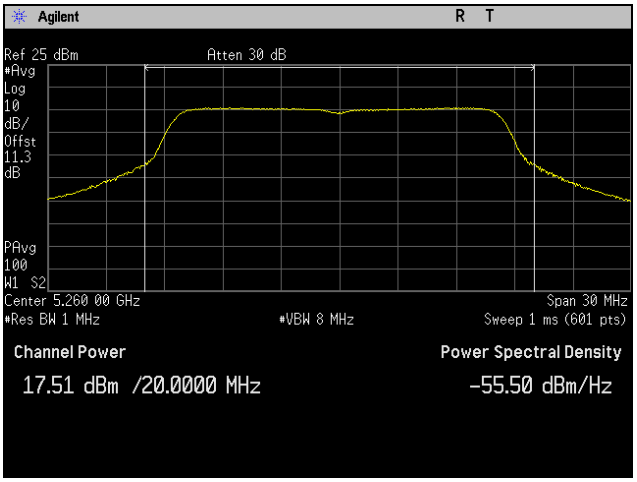


Plot 36. Conducted Output Power, 5610 MHz, 802.11ac 80 MHz, Port 1

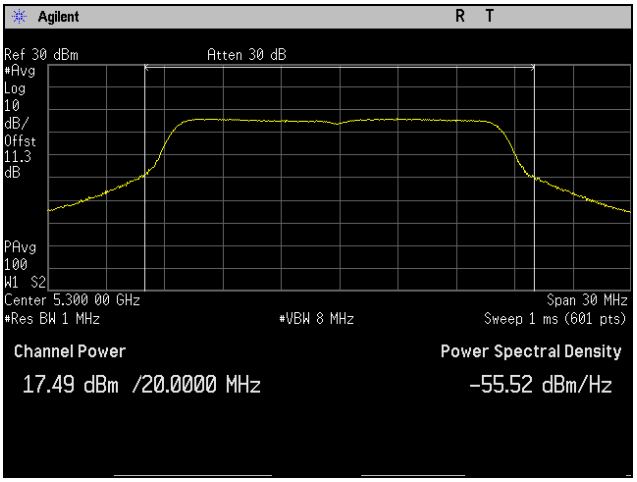


Plot 37. Conducted Output Power, 5690 MHz, 802.11ac 80 MHz, Port 1

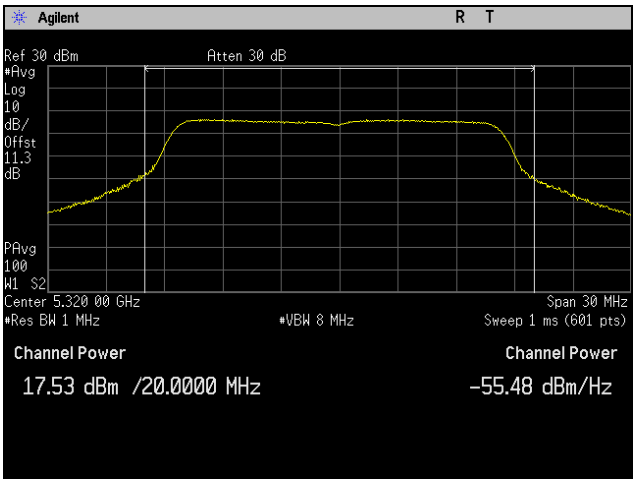
Conducted Output Power, 802.11a 20 MHz, Port 2



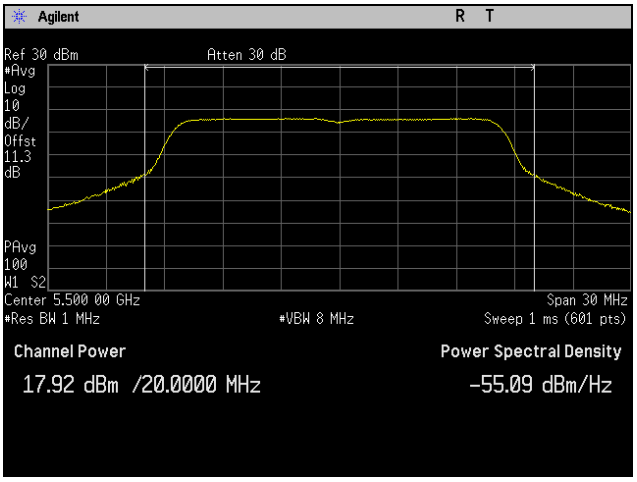
Plot 38. Conducted Output Power, 5260 MHz, 802.11a 20 MHz, Port 2



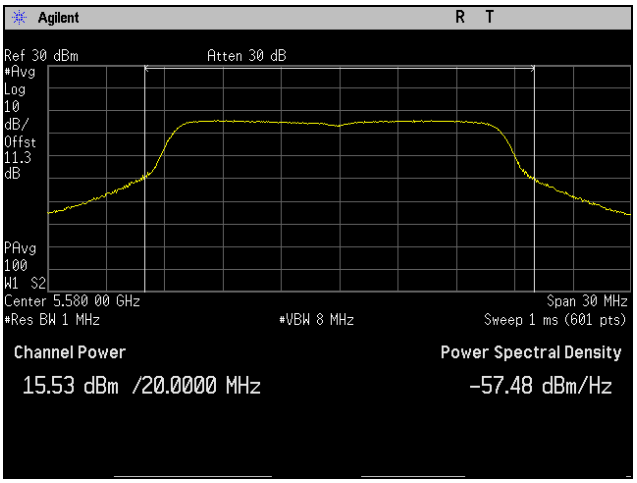
Plot 39. Conducted Output Power, 5300 MHz, 802.11a 20 MHz, Port 2



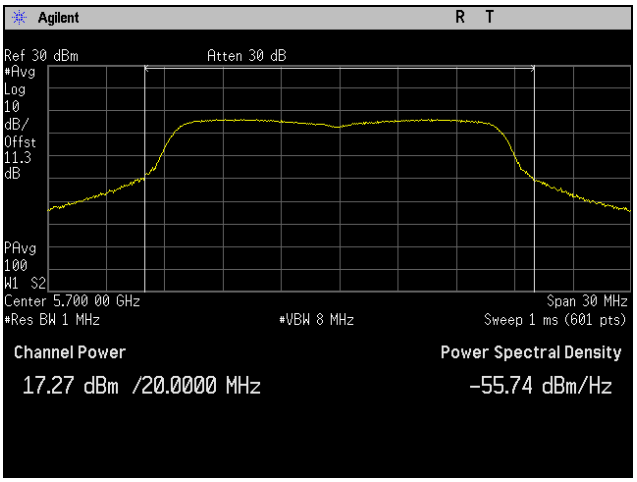
Plot 40. Conducted Output Power, 5320 MHz, 802.11a 20 MHz, Port 2



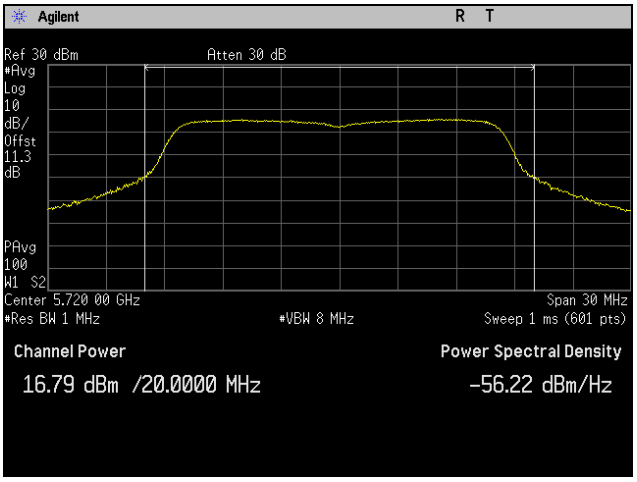
Plot 41. Conducted Output Power, 5500 MHz, 802.11a 20 MHz, Port 2



Plot 42. Conducted Output Power, 5580 MHz, 802.11a 20 MHz, Port 2

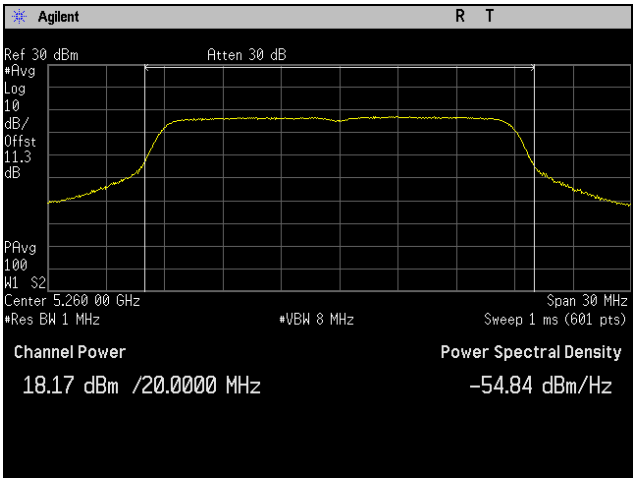


Plot 43. Conducted Output Power, 5700 MHz, 802.11a 20 MHz, Port 2

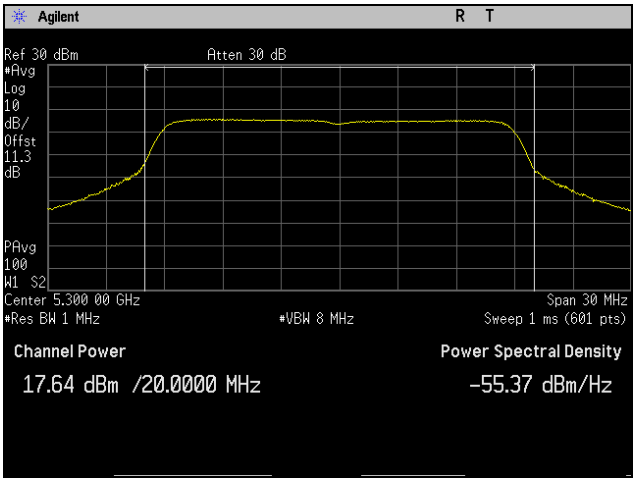


Plot 44. Conducted Output Power, 5720 MHz, 802.11a 20 MHz, Port 2

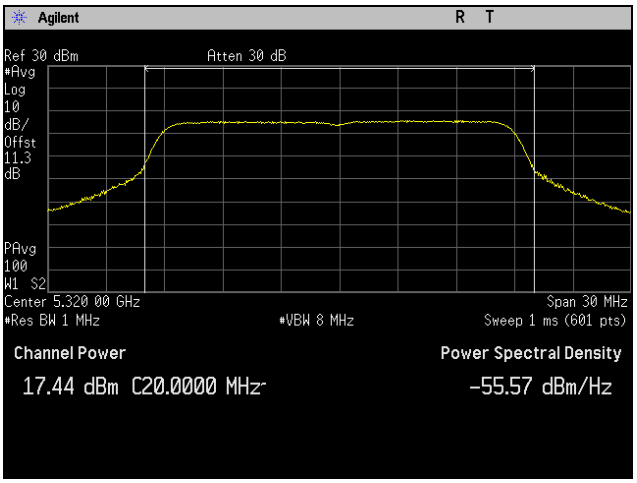
Conducted Output Power, 802.11ac 20 MHz, Port 2



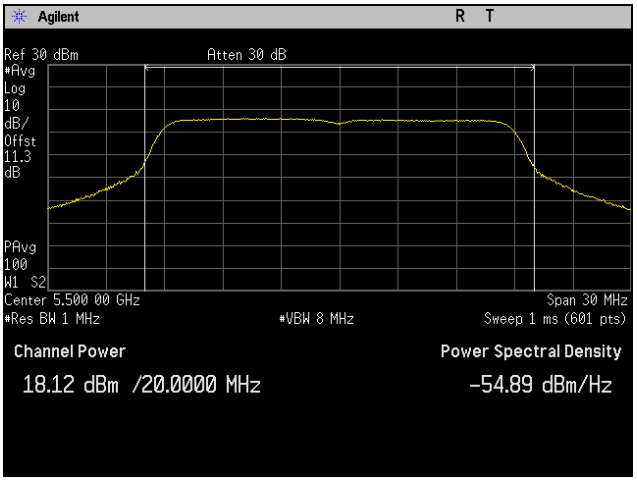
Plot 45. Conducted Output Power, 5260 MHz, 802.11ac 20 MHz, Port 2



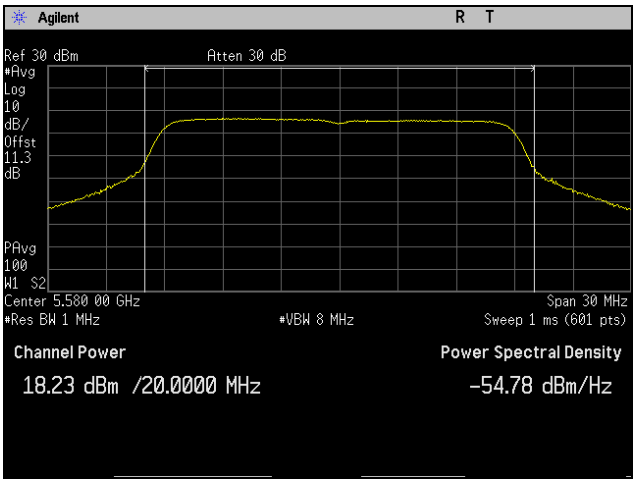
Plot 46. Conducted Output Power, 5300 MHz, 802.11ac 20 MHz, Port 2



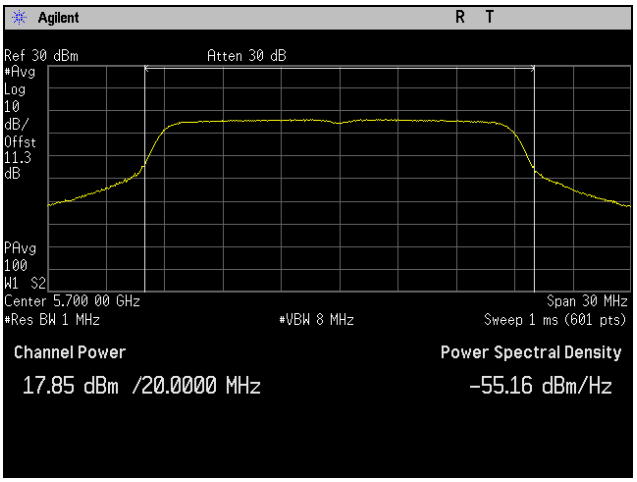
Plot 47. Conducted Output Power, 5320 MHz, 802.11ac 20 MHz, Port 2



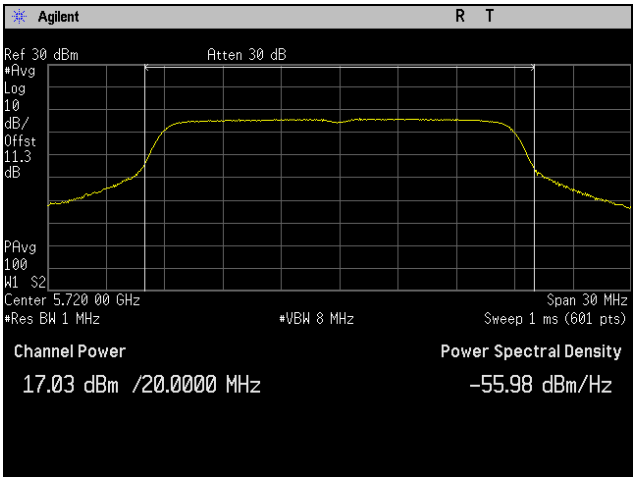
Plot 48. Conducted Output Power, 5500 MHz, 802.11ac 20 MHz, Port 2



Plot 49. Conducted Output Power, 5580 MHz, 802.11ac 20 MHz, Port 2

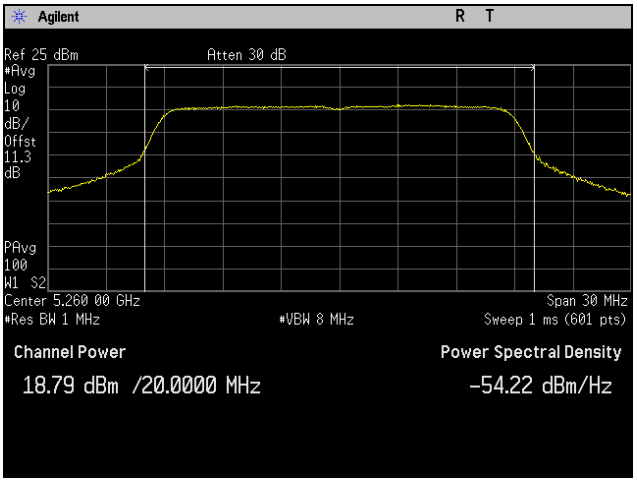


Plot 50. Conducted Output Power, 5700 MHz, 802.11ac 20 MHz, Port 2

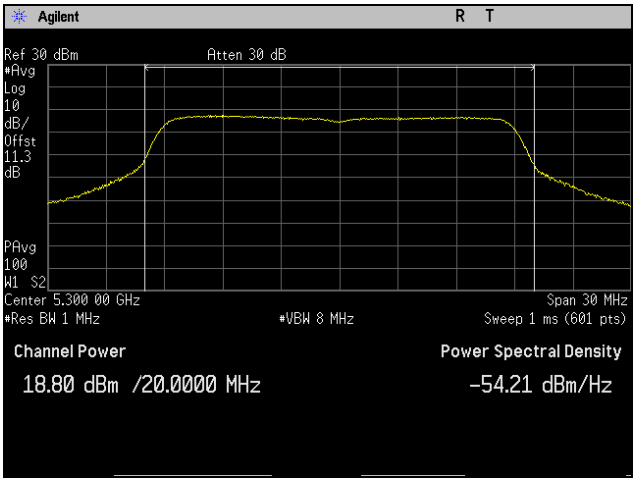


Plot 51. Conducted Output Power, 5720 MHz, 802.11ac 20 MHz, Port 2

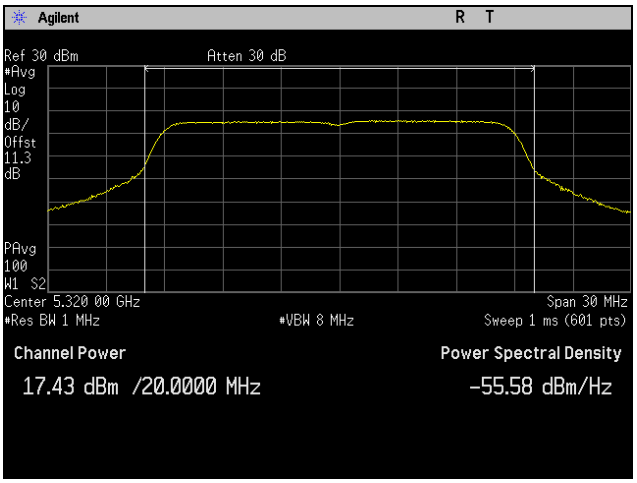
Conducted Output Power, 802.11n 20 MHz, Port 2



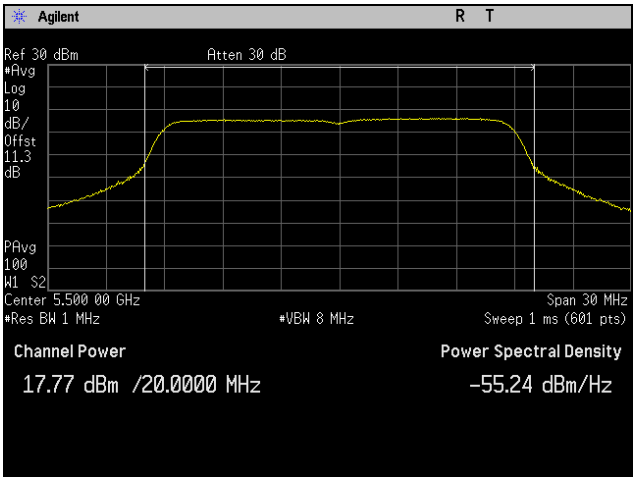
Plot 52. Conducted Output Power, 5260 MHz, 802.11n 20 MHz, Port 2



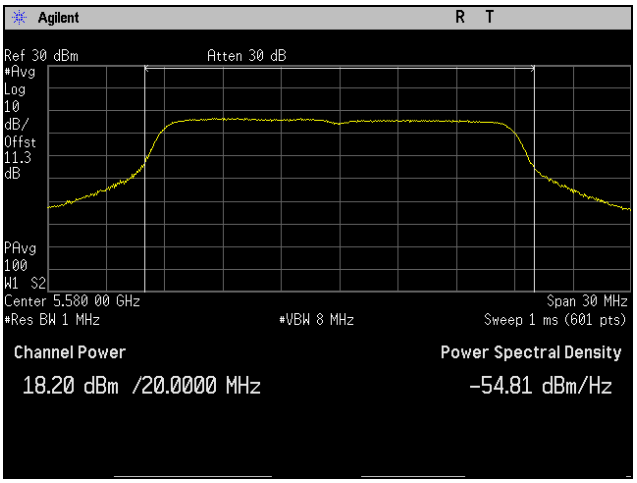
Plot 53. Conducted Output Power, 5300 MHz, 802.11n 20 MHz, Port 2



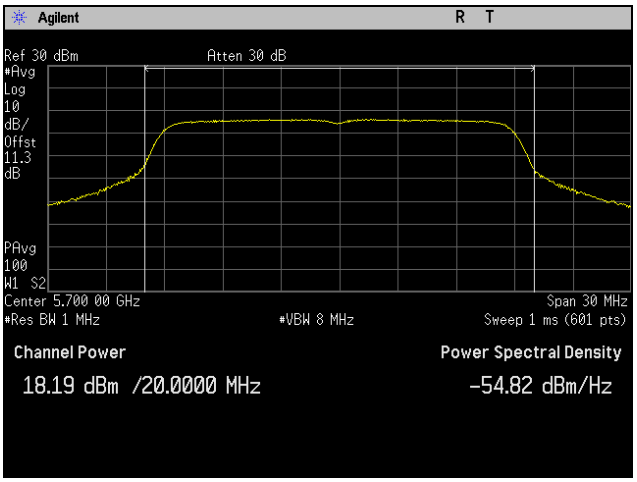
Plot 54. Conducted Output Power, 5320 MHz, 802.11n 20 MHz, Port 2



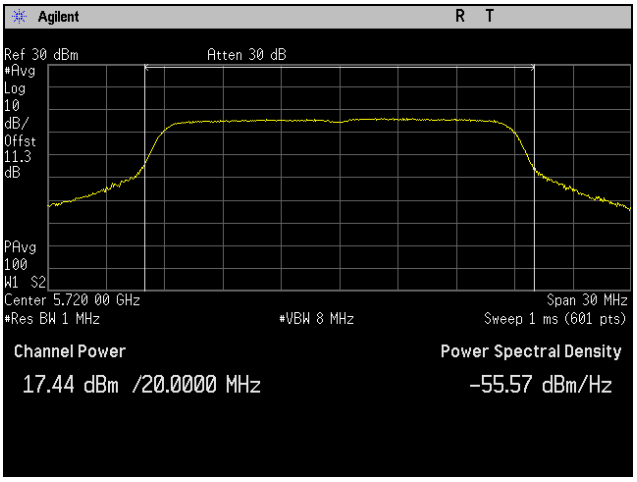
Plot 55. Conducted Output Power, 5500 MHz, 802.11n 20 MHz, Port 2



Plot 56. Conducted Output Power, 5580 MHz, 802.11n 20 MHz, Port 2

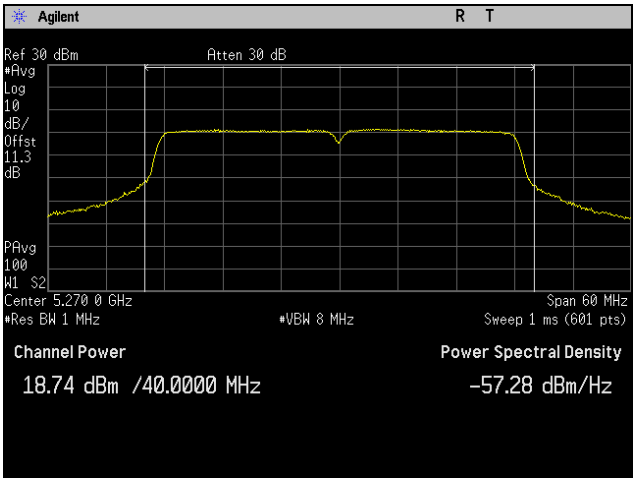


Plot 57. Conducted Output Power, 5700 MHz, 802.11n 20 MHz, Port 2

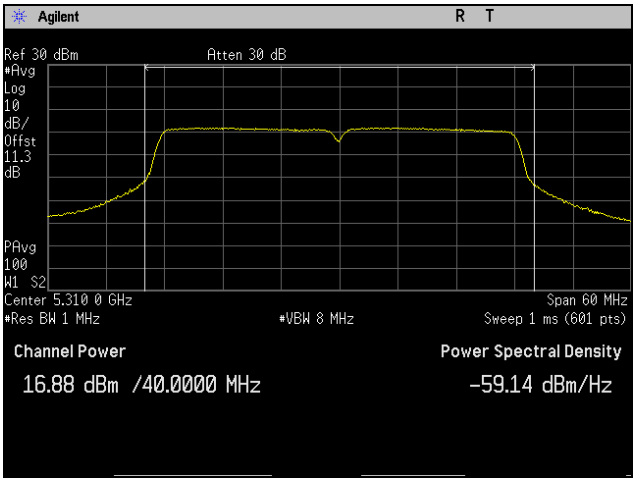


Plot 58. Conducted Output Power, 5720 MHz, 802.11n 20 MHz, Port 2

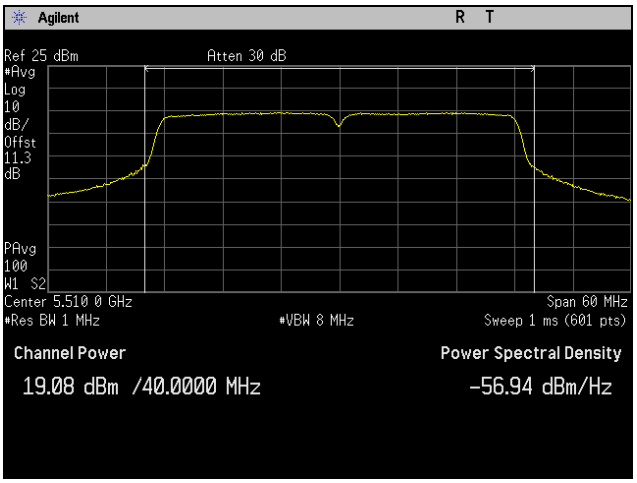
Conducted Output Power, 802.11ac 40 MHz, Port 2



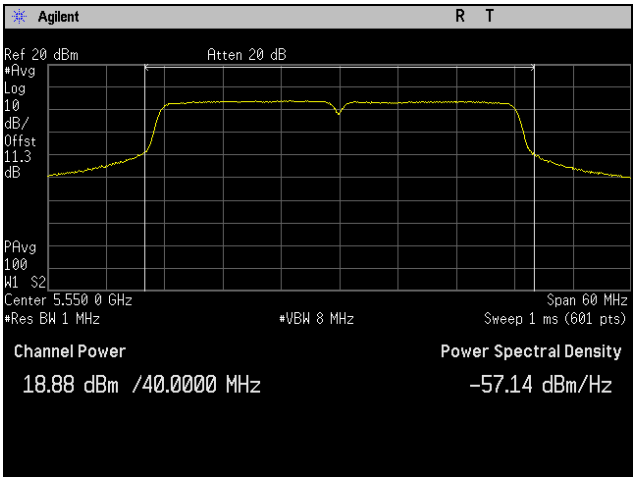
Plot 59. Conducted Output Power, 5270 MHz, 802.11ac 40 MHz, Port 2



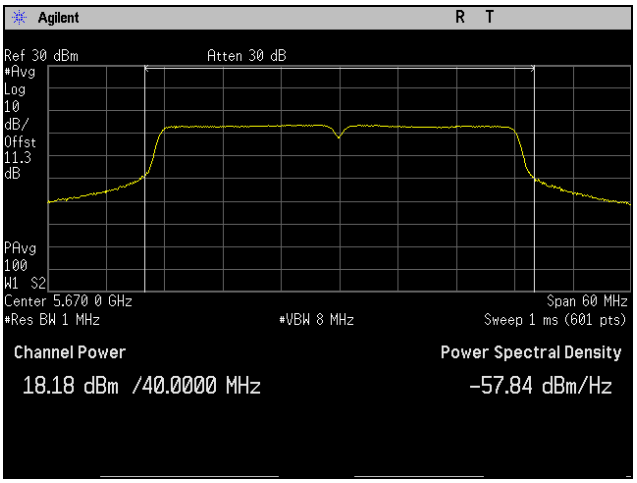
Plot 60. Conducted Output Power, 5310 MHz, 802.11ac 40 MHz, Port 2



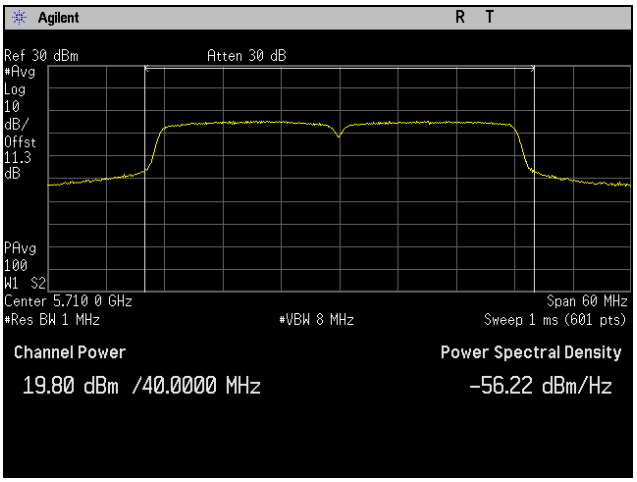
Plot 61. Conducted Output Power, 5510 MHz, 802.11ac 40 MHz, Port 2



Plot 62. Conducted Output Power, 5550 MHz, 802.11ac 40 MHz, Port 2

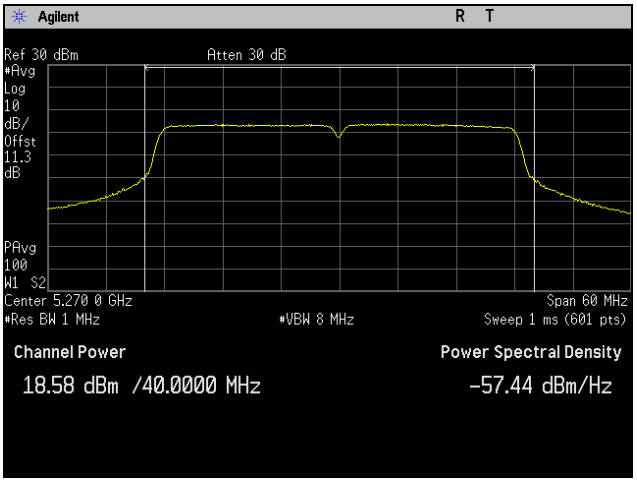


Plot 63. Conducted Output Power, 5670 MHz, 802.11ac 40 MHz, Port 2

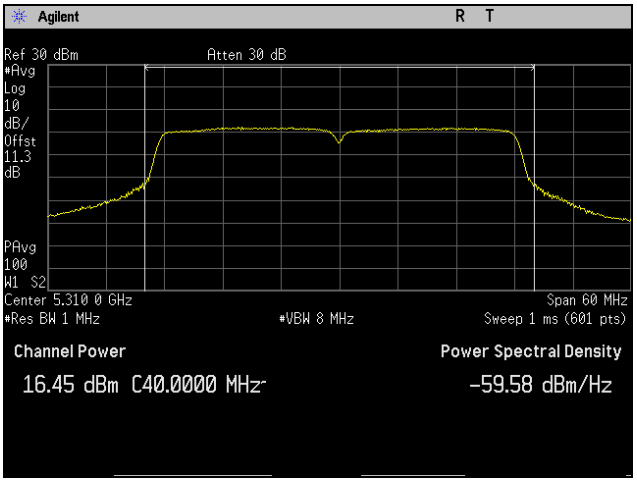


Plot 64. Conducted Output Power, 5710 MHz, 802.11ac 40 MHz, Port 2

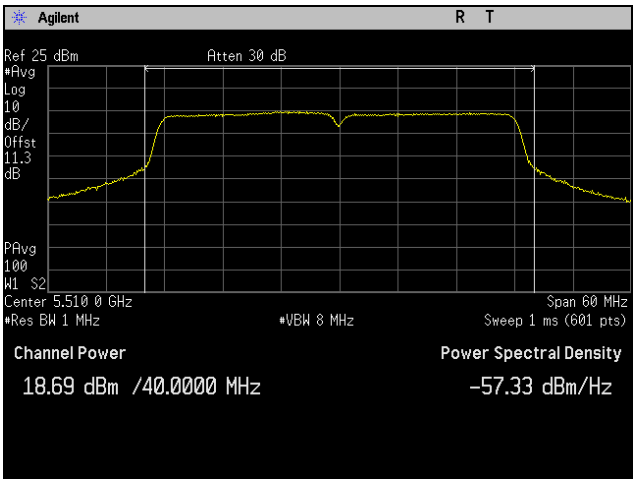
Conducted Output Power, 802.11n 40 MHz, Port 2



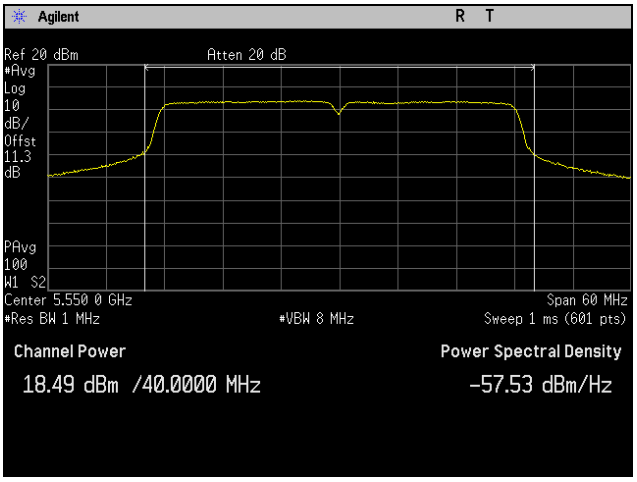
Plot 65. Conducted Output Power, 5270 MHz, 802.11n 40 MHz, Port 2



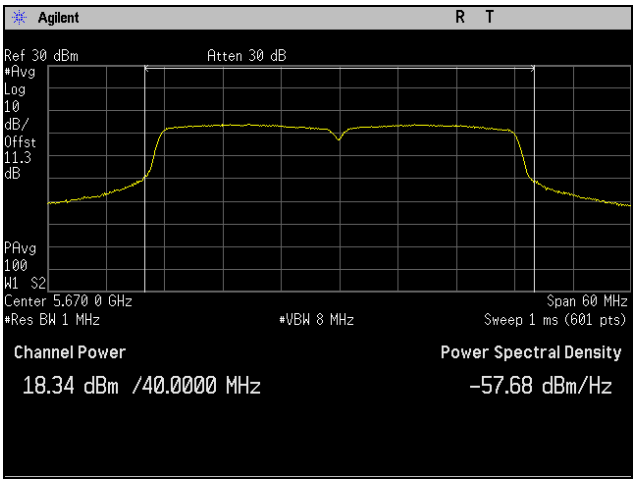
Plot 66. Conducted Output Power, 5310 MHz, 802.11n 40 MHz, Port 2



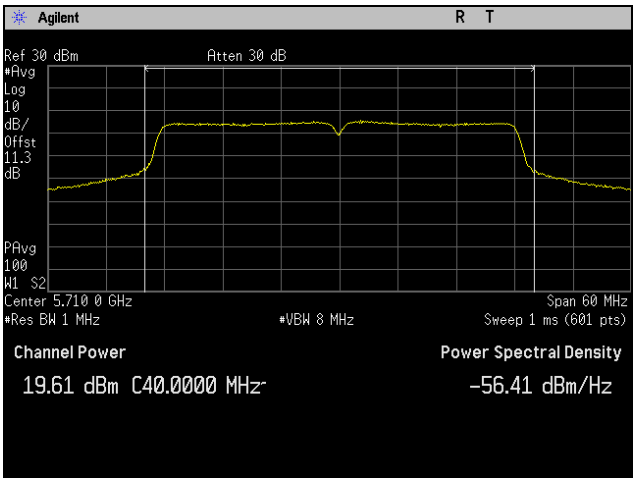
Plot 67. Conducted Output Power, 5510 MHz, 802.11n 40 MHz, Port 2



Plot 68. Conducted Output Power, 5550 MHz, 802.11n 40 MHz, Port 2

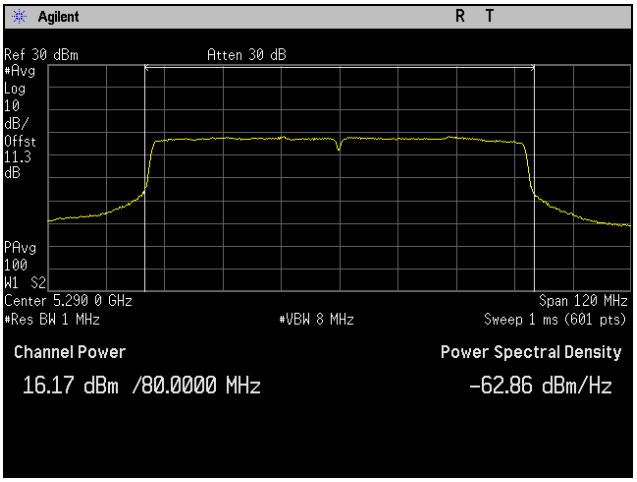


Plot 69. Conducted Output Power, 5670 MHz, 802.11n 40 MHz, Port 2

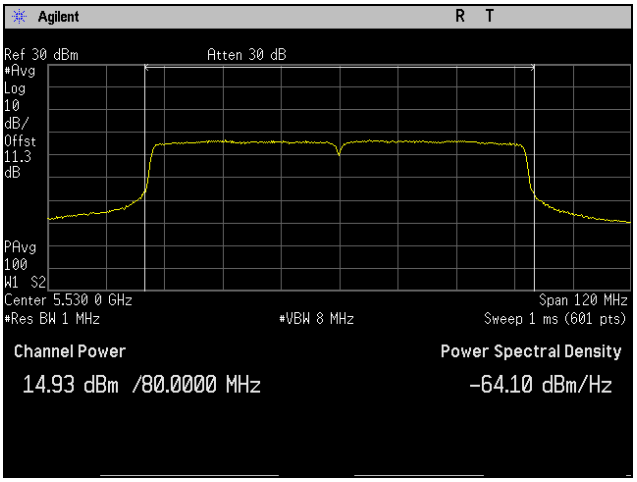


Plot 70. Conducted Output Power, 5710 MHz, 802.11n 40 MHz, Port 2

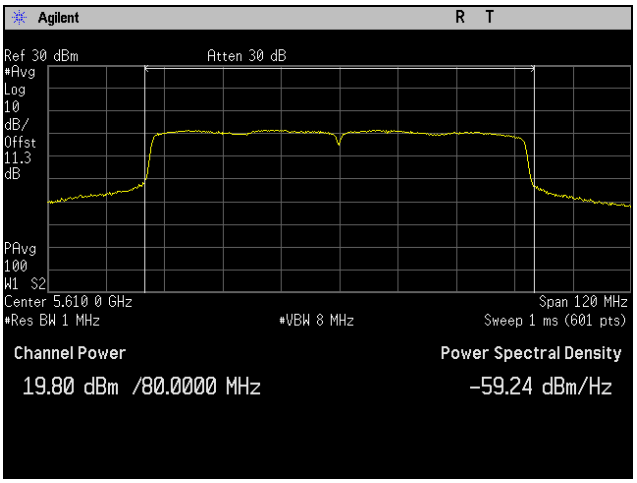
Conducted Output Power, 802.11ac 80 MHz, Port 2



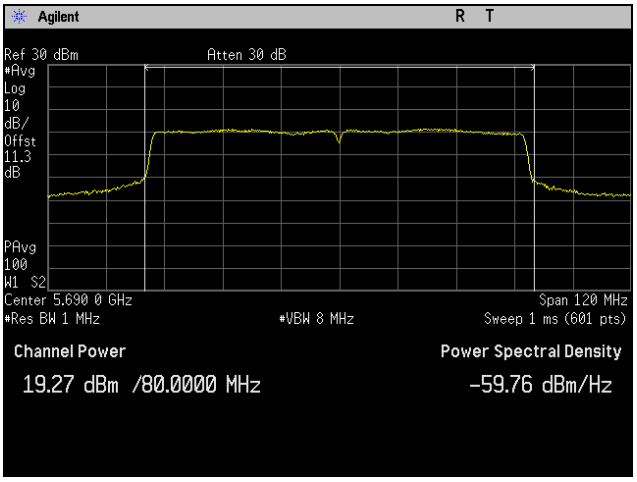
Plot 71. Conducted Output Power, 5290 MHz, 802.11ac 80 MHz, Port 2



Plot 72. Conducted Output Power, 5530 MHz, 802.11ac 80 MHz, Port 2

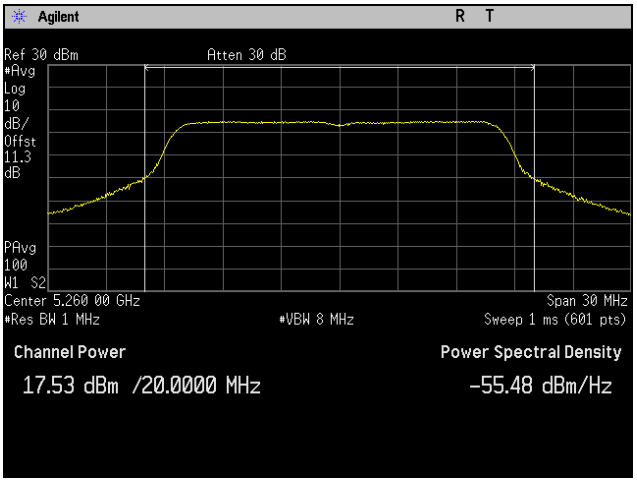


Plot 73. Conducted Output Power, 5610 MHz, 802.11ac 80 MHz, Port 2

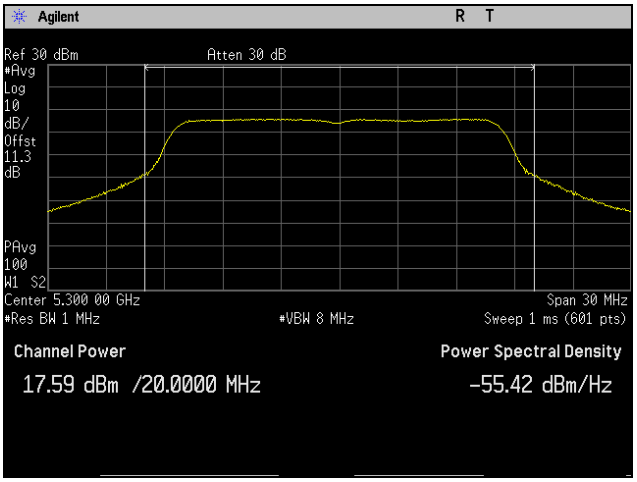


Plot 74. Conducted Output Power, 5690 MHz, 802.11ac 80 MHz, Port 2

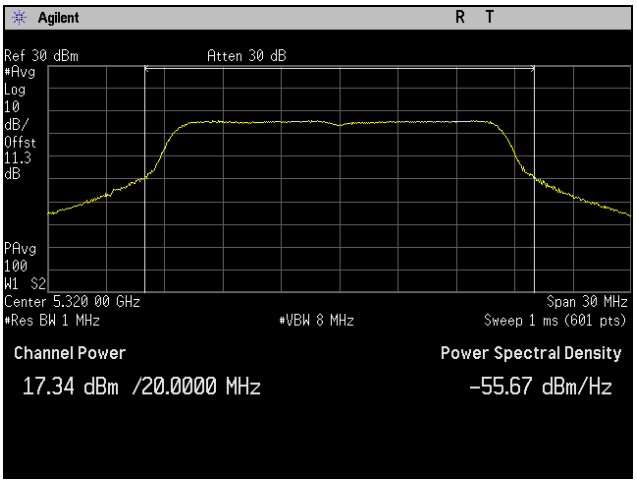
Conducted Output Power, 802.11a 20 MHz, Port 3



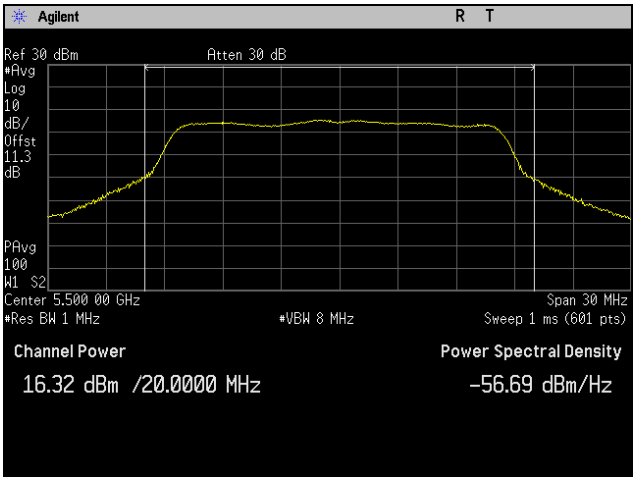
Plot 75. Conducted Output Power, 5260 MHz, 802.11a 20 MHz, Port 3



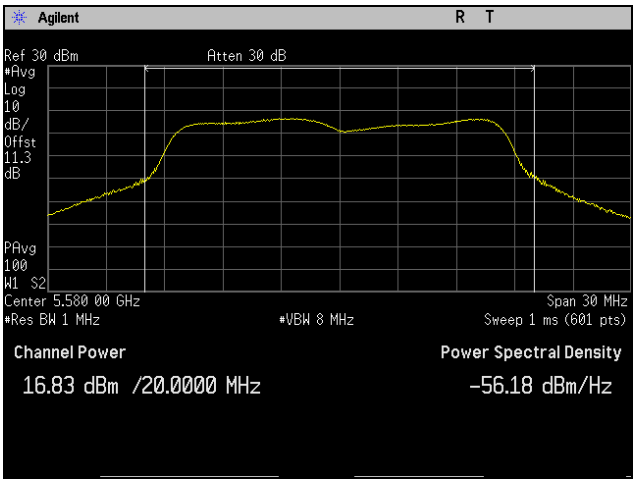
Plot 76. Conducted Output Power, 5300 MHz, 802.11a 20 MHz, Port 3



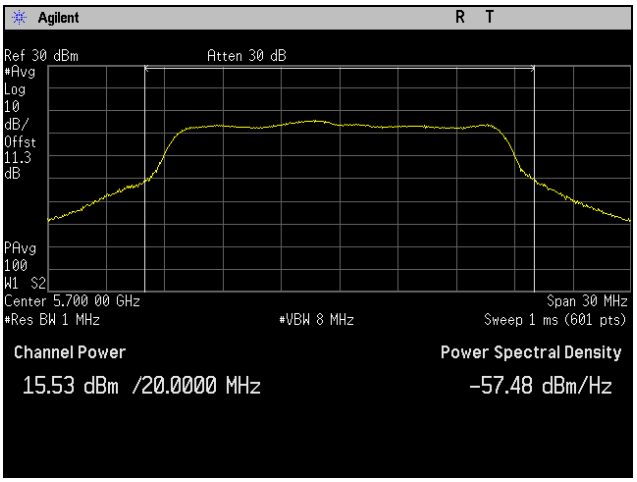
Plot 77. Conducted Output Power, 5320 MHz, 802.11a 20 MHz, Port 3



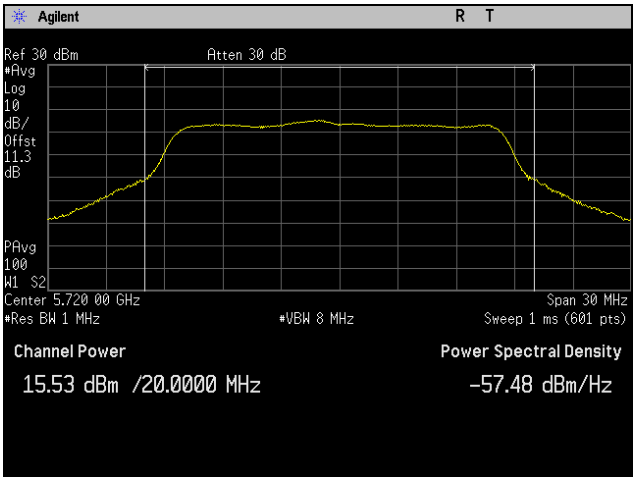
Plot 78. Conducted Output Power, 5500 MHz, 802.11a 20 MHz, Port 3



Plot 79. Conducted Output Power, 5580 MHz, 802.11a 20 MHz, Port 3

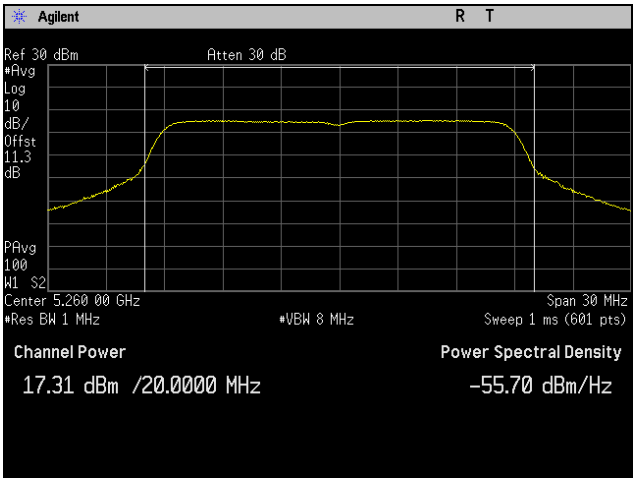


Plot 80. Conducted Output Power, 5700 MHz, 802.11a 20 MHz, Port 3

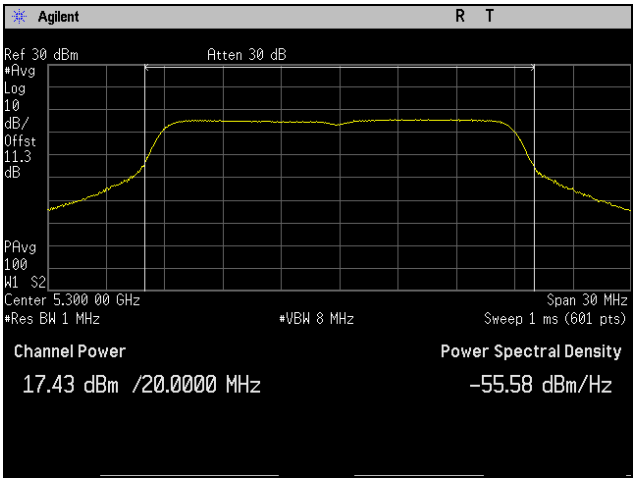


Plot 81. Conducted Output Power, 5720 MHz, 802.11a 20 MHz, Port 3

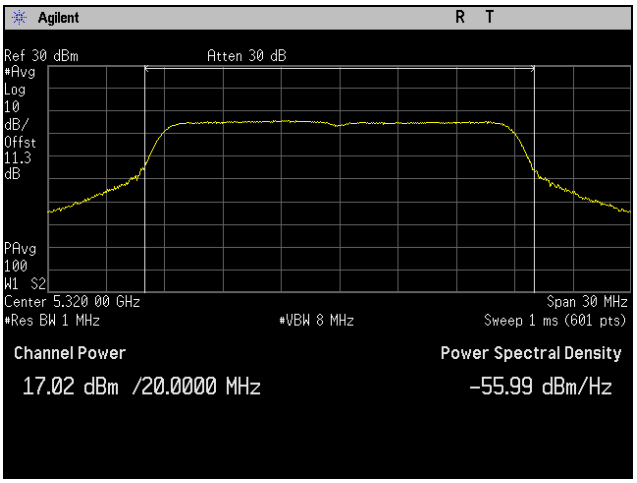
Conducted Output Power, 802.11ac 20 MHz, Port 3



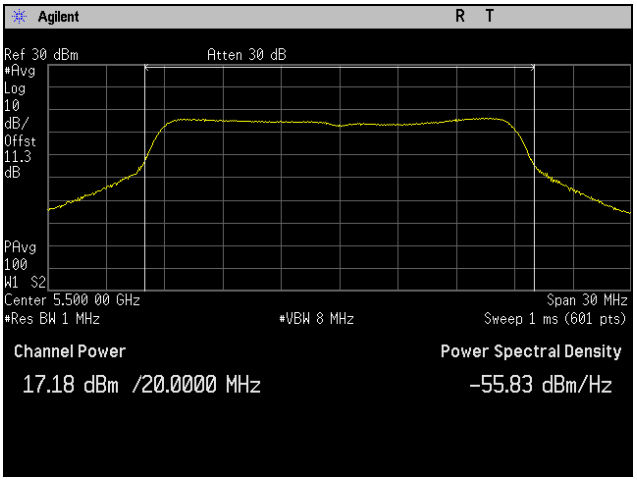
Plot 82. Conducted Output Power, 5260 MHz, 802.11ac 20 MHz, Port 3



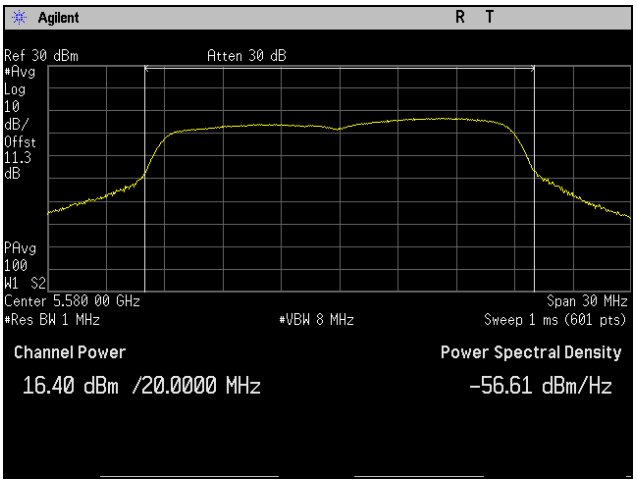
Plot 83. Conducted Output Power, 5300 MHz, 802.11ac 20 MHz, Port 3



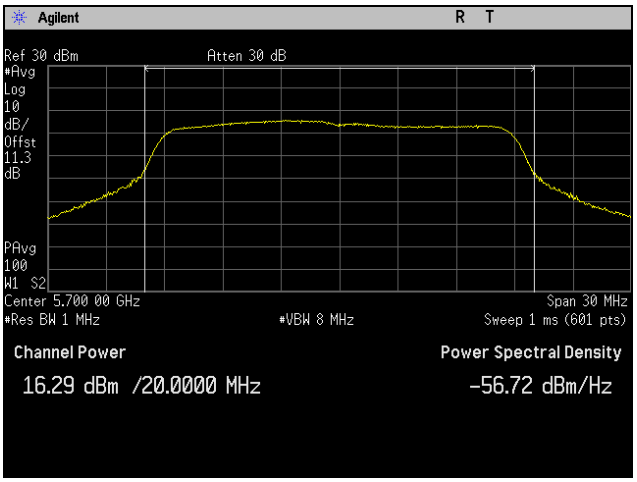
Plot 84. Conducted Output Power, 5320 MHz, 802.11ac 20 MHz, Port 3



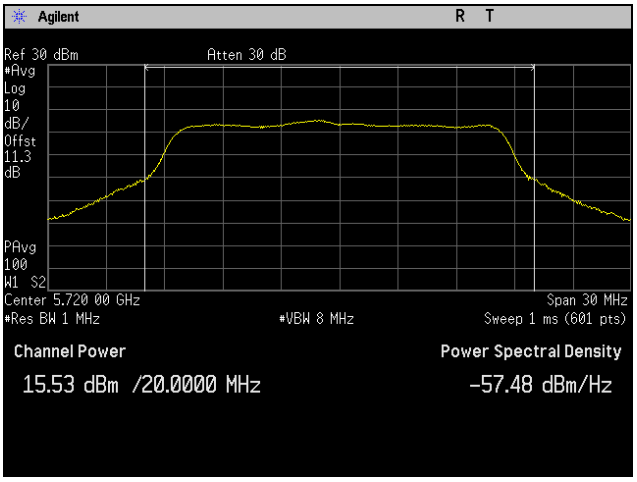
Plot 85. Conducted Output Power, 5500 MHz, 802.11ac 20 MHz, Port 3



Plot 86. Conducted Output Power, 5580 MHz, 802.11ac 20 MHz, Port 3

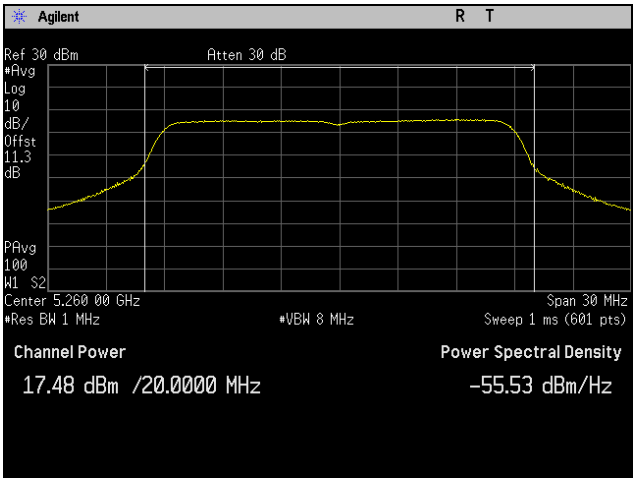


Plot 87. Conducted Output Power, 5700 MHz, 802.11ac 20 MHz, Port 3

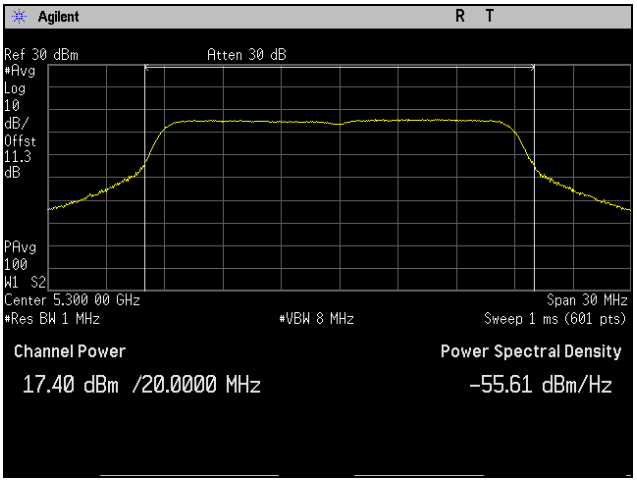


Plot 88. Conducted Output Power, 5720 MHz, 802.11ac 20 MHz, Port 3

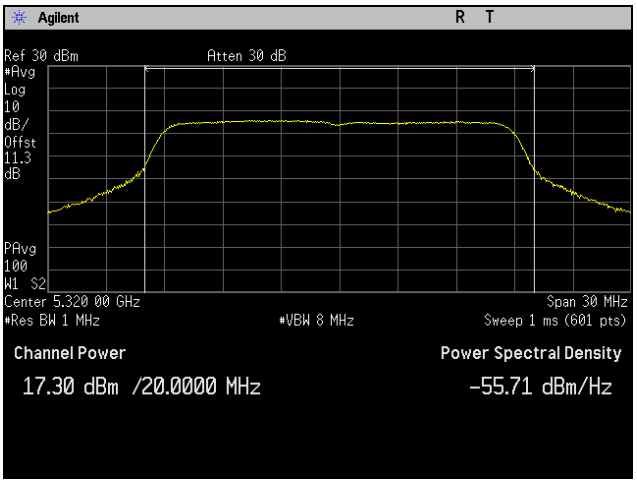
Conducted Output Power, 802.11n 20 MHz, Port 3



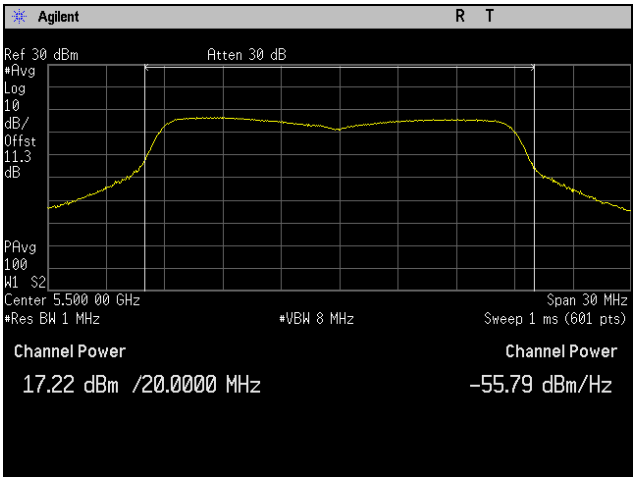
Plot 89. Conducted Output Power, 5260 MHz, 802.11n 20 MHz, Port 3



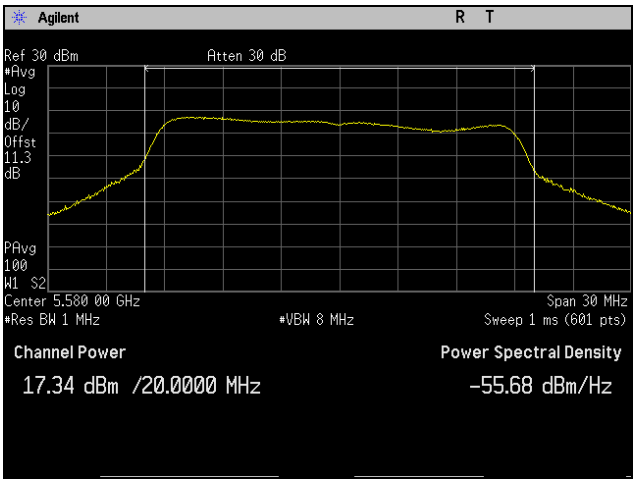
Plot 90. Conducted Output Power, 5300 MHz, 802.11n 20 MHz, Port 3



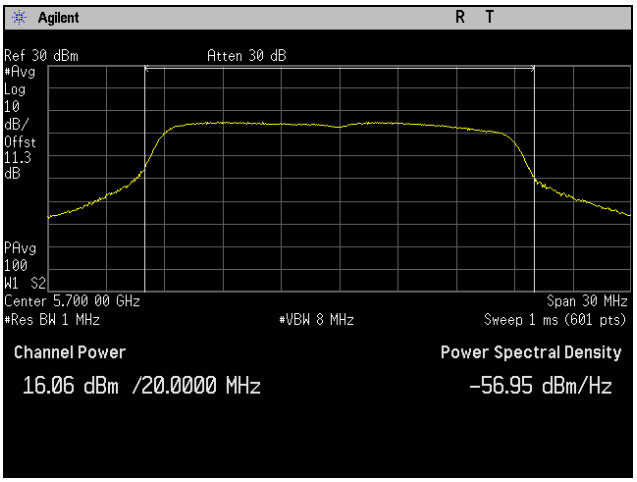
Plot 91. Conducted Output Power, 5320 MHz, 802.11n 20 MHz, Port 3



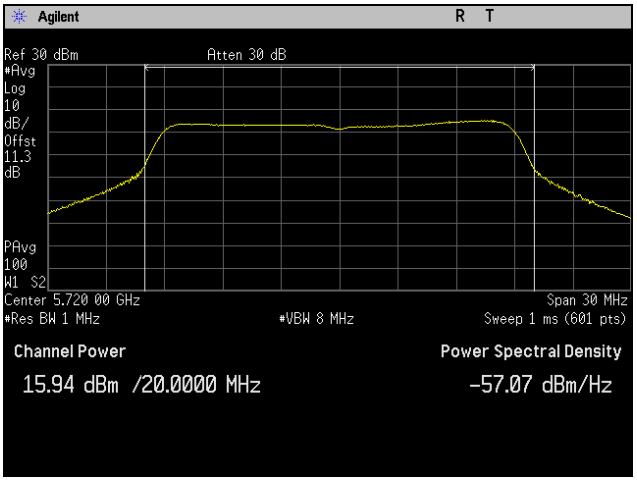
Plot 92. Conducted Output Power, 5500 MHz, 802.11n 20 MHz, Port 3



Plot 93. Conducted Output Power, 5580 MHz, 802.11n 20 MHz, Port 3

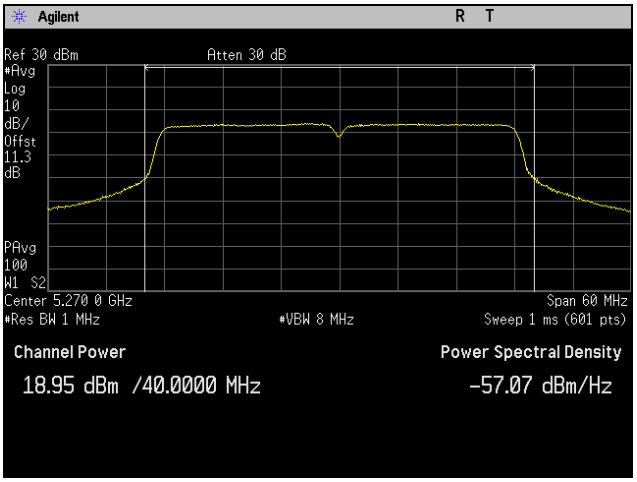


Plot 94. Conducted Output Power, 5700 MHz, 802.11n 20 MHz, Port 3

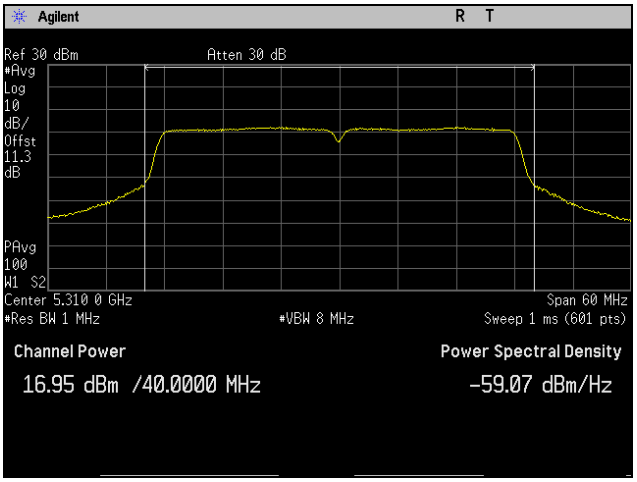


Plot 95. Conducted Output Power, 5720 MHz, 802.11n 20 MHz, Port 3

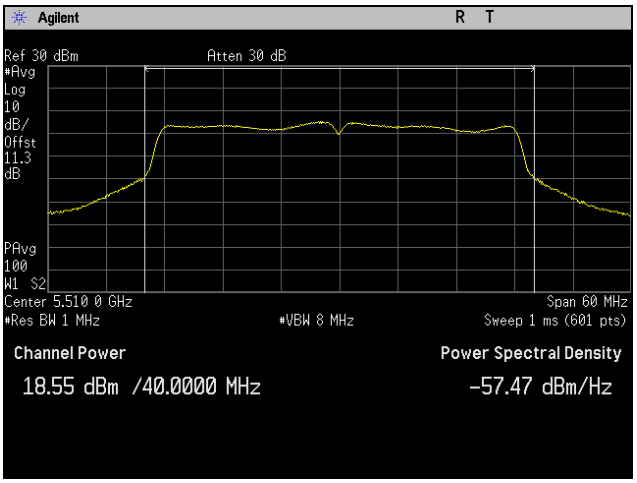
Conducted Output Power, 802.11ac 40 MHz, Port 3



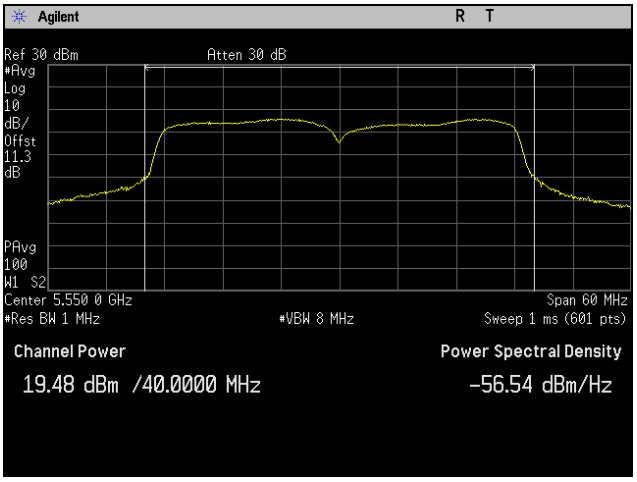
Plot 96. Conducted Output Power, 5270 MHz, 802.11ac 40 MHz, Port 3



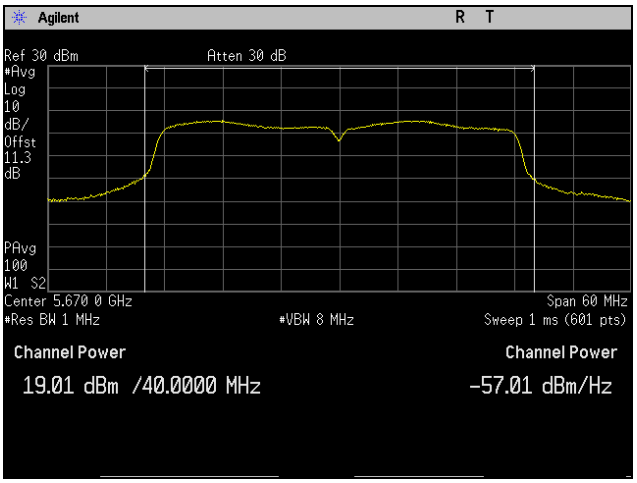
Plot 97. Conducted Output Power, 5310 MHz, 802.11ac 40 MHz, Port 3



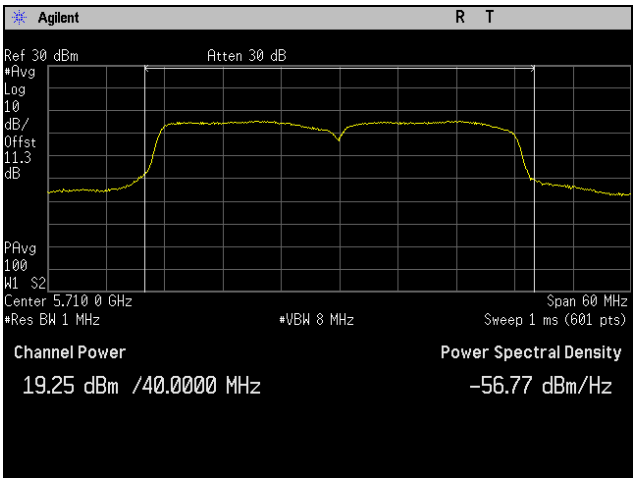
Plot 98. Conducted Output Power, 5510 MHz, 802.11ac 40 MHz, Port 3



Plot 99. Conducted Output Power, 5550 MHz, 802.11ac 40 MHz, Port 3

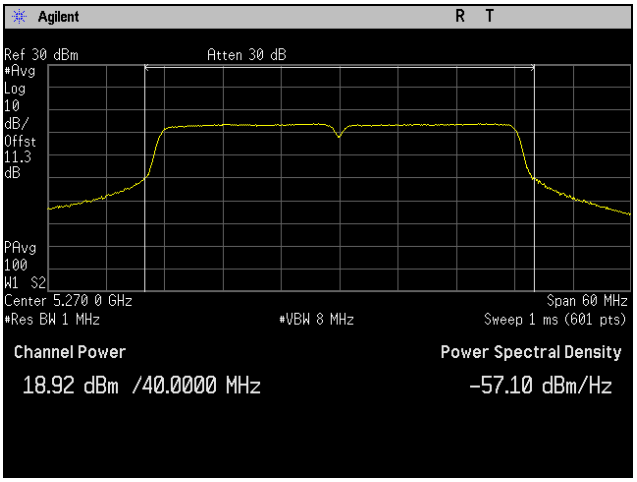


Plot 100. Conducted Output Power, 5670 MHz, 802.11ac 40 MHz, Port 3

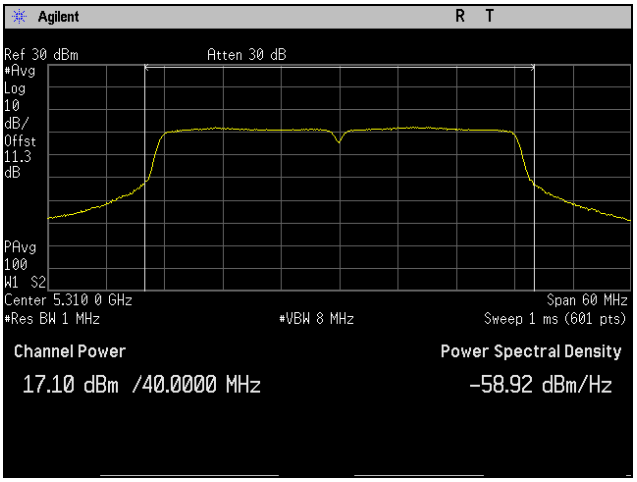


Plot 101. Conducted Output Power, 5710 MHz, 802.11ac 40 MHz, Port 3

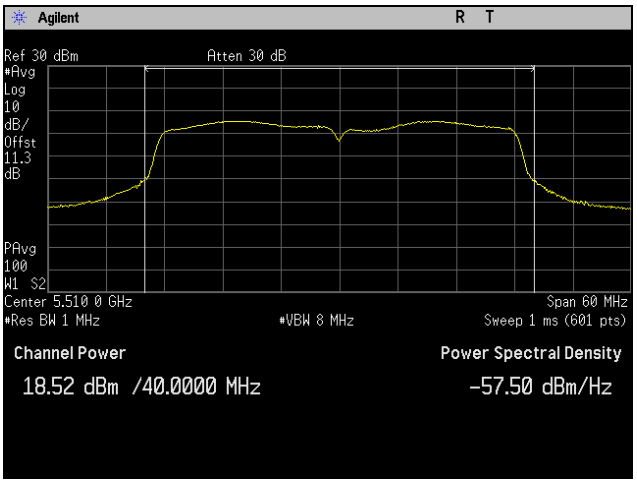
Conducted Output Power, 802.11n 40 MHz, Port 3



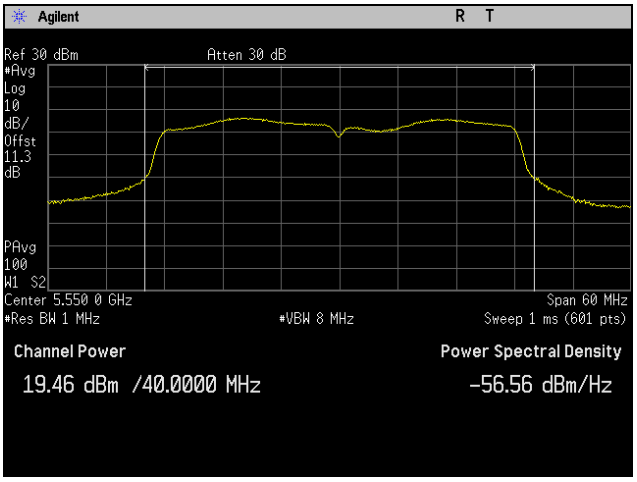
Plot 102. Conducted Output Power, 5270 MHz, 802.11n 40 MHz, Port 3



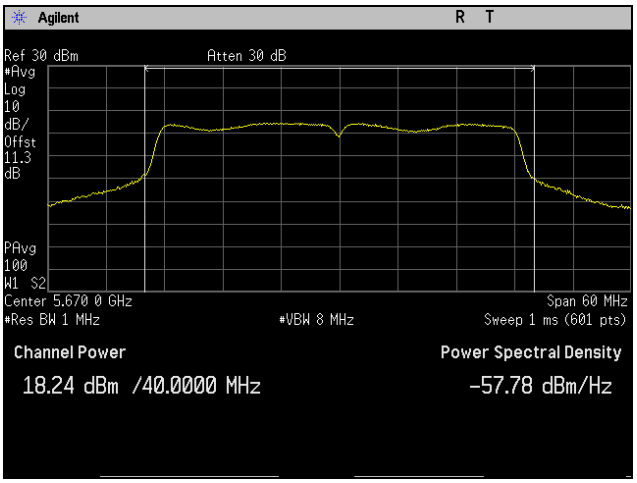
Plot 103. Conducted Output Power, 5310 MHz, 802.11n 40 MHz, Port 3



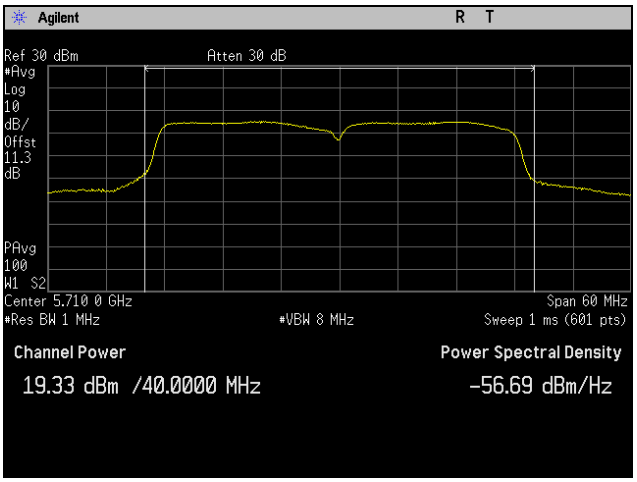
Plot 104. Conducted Output Power, 5510 MHz, 802.11n 40 MHz, Port 3



Plot 105. Conducted Output Power, 5550 MHz, 802.11n 40 MHz, Port 3

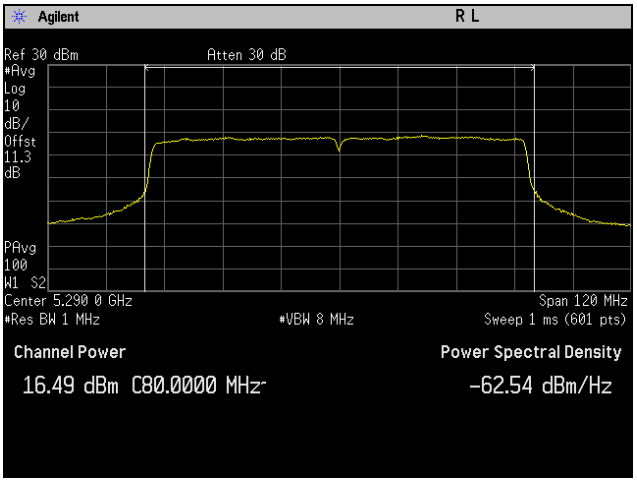


Plot 106. Conducted Output Power, 5670 MHz, 802.11n 40 MHz, Port 3

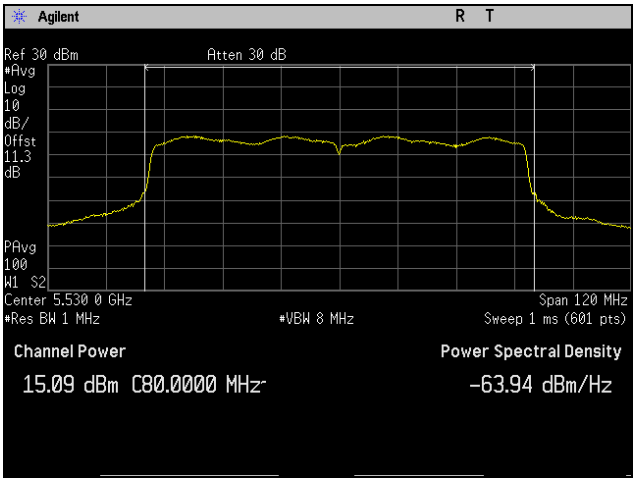


Plot 107. Conducted Output Power, 5710 MHz, 802.11n 40 MHz, Port 3

Conducted Output Power, 802.11ac 80 MHz, Port 3

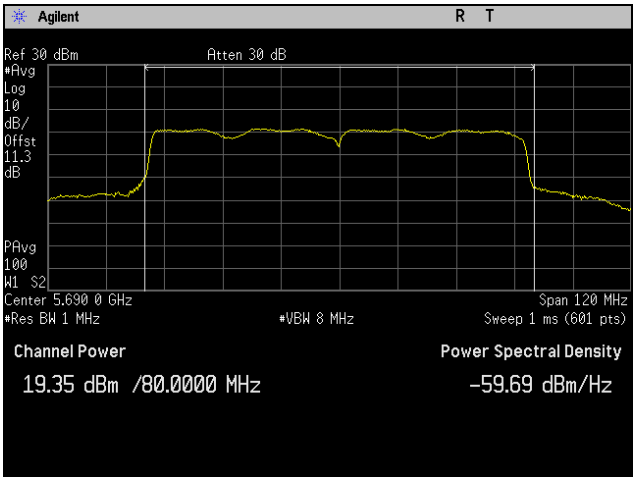


Plot 108. Conducted Output Power, 5290 MHz, 802.11ac 80 MHz, Port 3



Plot 109. Conducted Output Power, 5530 MHz, 802.11ac 80 MHz, Port 3

Plot 110. Conducted Output Power, 5610 MHz, 802.11ac 80 MHz, Port 3



Plot 111. Conducted Output Power, 5690 MHz, 802.11ac 80 MHz, Port 3

Electromagnetic Compatibility Criteria for Intentional Radiators

§15.407(a)(2) Maximum Power Spectral Density

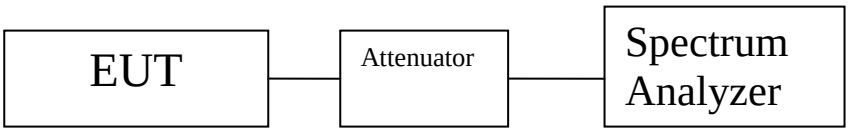
Test Requirements: **§15.407(a)(2):** In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Procedure: The EUT was connected to a spectrum analyzer through a cable and attenuator. Measurements were taken with the EUT set to transmit continuously on its low, mid, and high channels. Its power was measured according KDB 789033 D02 General UNII Test Procedures v01 r02.
Sum of three Port(PSD) = 10*Log10(10^(Port1(dBm)/10)+ 10^(Port2(dBm)/10)+ 10^(Port3(dBm)/10))

Test Results: The EUT as tested is compliant with the requirements of this section.

Test Engineer(s): Surinder Singh

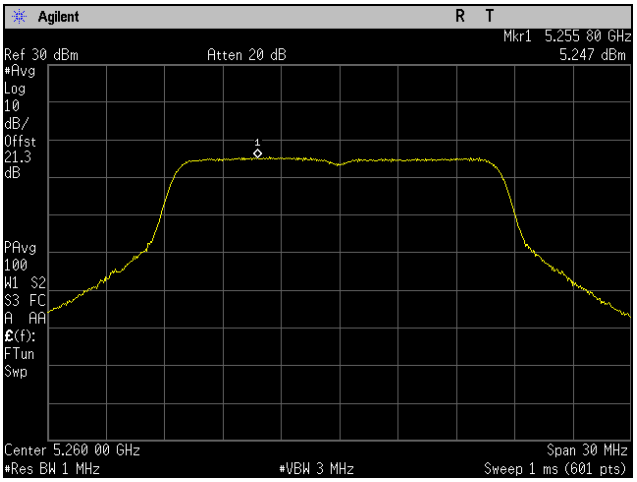
Test Date(s): 04/20/16



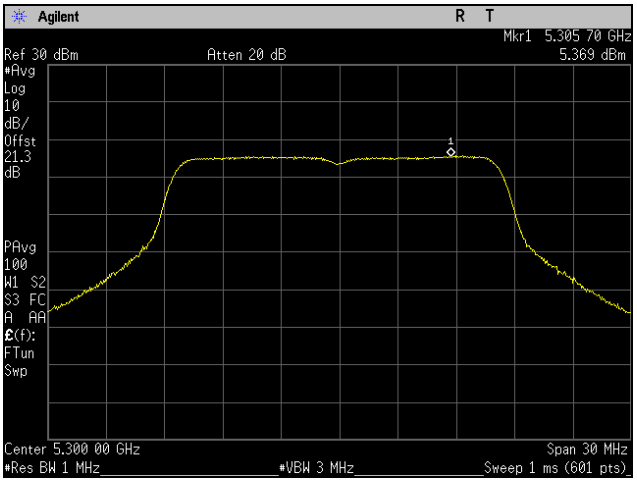
Center Frequency MHz	Bandwidth MHz	Mode	Port 1 Data dBm	Port 2 Data dBm	Port 3 Data dBm	Sum of Three Port dBm	Limit dBm	Antenna Gain dBi	Final limit dBm	Margin dB
Ch 5260M	BW 20M	a mode	5.247	4.062	5.502	9.76	11	6.77	10.23	-0.47
Ch 5260M	BW 20M	ac mode	6.013	6.629	5.187	10.76	11	2	11	-0.24
Ch 5260M	BW 20M	n mode	6.019	6.547	5.881	10.93	11	2	11	-0.07
Ch 5300M	BW 20M	a mode	5.369	4.593	5.822	10.07	11	6.77	10.23	-0.16
Ch 5300M	BW 20M	ac mode	6.448	5.727	5.597	10.72	11	2	11	-0.28
Ch 5300M	BW 20M	n mode	6.448	5.432	5.822	10.7	11	2	11	-0.3
Ch 5320M	BW 20M	a mode	5.58	4.957	5.672	10.16	11	6.77	10.23	-0.07
Ch 5320M	BW 20M	ac mode	6.288	5.677	5.697	10.67	11	2	11	-0.33
Ch 5320M	BW 20M	n mode	6.757	5.368	5.763	10.78	11	2	11	-0.22
Ch 5500M	BW 20M	a mode	5.34	5.1	5.56	10.11	11	6.77	10.23	-0.12
Ch 5500M	BW 20M	ac mode	5.989	6.218	6.355	10.97	11	2	11	-0.03
Ch 5500M	BW 20M	n mode	5.552	6.115	6.312	10.78	11	2	11	-0.22
Ch 5580M	BW 20M	a mode	5.604	4.898	5.721	10.2	11	6.77	10.23	-0.03
Ch 5580M	BW 20M	ac mode	5.85	6.143	6.217	10.85	11	2	11	-0.15
Ch 5580M	BW 20M	n mode	6.08	6.145	6.264	10.94	11	2	11	-0.06
Ch 5700M	BW 20M	a mode	5.234	4.712	5.652	9.99	11	6.77	10.23	-0.24
Ch 5700M	BW 20M	ac mode	6.31	5.669	5.729	10.69	11	2	11	-0.31
Ch 5700M	BW 20M	n mode	5.86	5.908	5.099	10.41	11	2	11	-0.59
Ch 5720M	BW 20M	a mode	4.281	5.442	5.122	9.75	11	2	11	-1.25
Ch 5720M	BW 20M	ac mode	5.957	6.066	5.331	10.57	11	2	11	-0.43
Ch 5720M	BW 20M	n mode	5.949	5.908	5.18	10.47	11	2	11	-0.53
Ch 5270M	BW 40M	ac mode	3.97	6.023	4.096	9.58	11	2	11	-1.42
Ch 5270M	BW 40M	n mode	4.225	6.526	3.82	9.8	11	2	11	-1.2
Ch 5310M	BW 40M	ac mode	2.252	1.884	2.035	6.84	11	2	11	-4.16
Ch 5310M	BW 40M	n mode	2.22	2.065	2.158	6.92	11	2	11	-4.08
Ch 5510M	BW 40M	ac mode	4.449	4.028	5.276	9.39	11	2	11	-1.61
Ch 5510M	BW 40M	n mode	4.882	3.828	5.75	9.67	11	2	11	-1.33
Ch 5550M	BW 40M	ac mode	4.898	3.885	5.95	9.77	11	2	11	-1.23
Ch 5550M	BW 40M	n mode	5.326	5.774	6.21	10.56	11	2	11	-0.44
Ch 5670M	BW 40M	ac mode	5.3	3.377	6.013	9.81	11	2	11	-1.19
Ch 5670M	BW 40M	n mode	5.196	4.276	4.811	9.55	11	2	11	-1.45
Ch 5710M	BW 40M	ac mode	6.705	5.33	5.33	10.61	11	2	11	-0.39
Ch 5710M	BW 40M	n mode	5.556	5.194	5.174	10.09	11	2	11	-0.91
Ch 5290M	BW 80M	ac mode	1.662	1.9	1.13	6.35	11	2	11	-4.65
Ch 5530M	BW 80M	ac mode	1.664	2.867	1.399	6.8	11	2	11	-4.2
Ch 5610M	BW 80M	ac mode	2.026	1.376	2.984	6.96	11	2	11	-4.04
Ch 5690M	BW 80M	ac mode	3.133	1.185	1.185	6.71	11	2	11	-4.29

Table 10. Peak Power Spectrum Density, Test Results

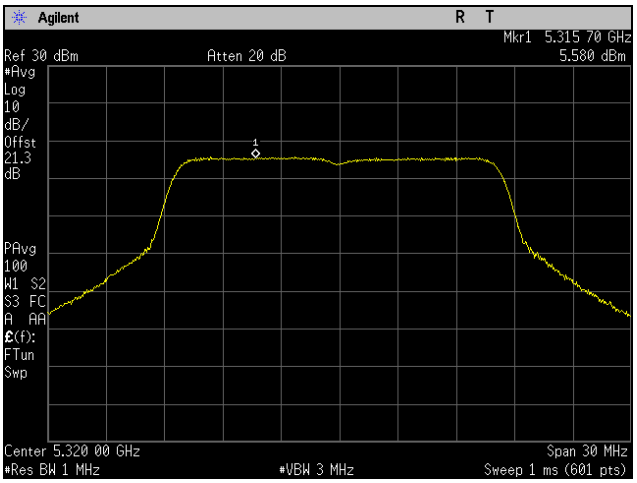
Peak Power Spectral Density, 802.11a 20 MHz, Port 1



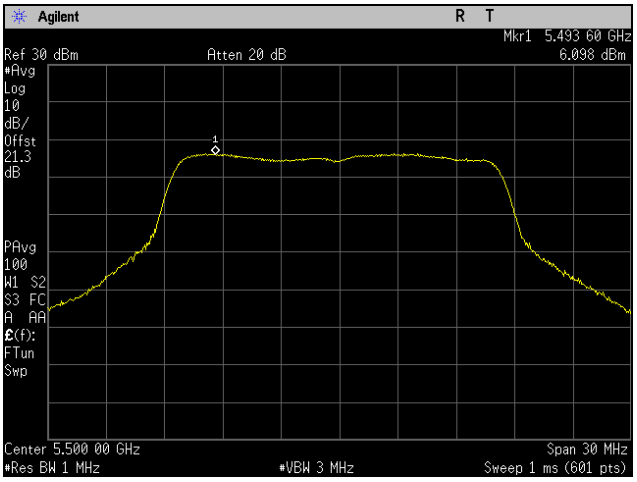
Plot 112. Peak Power Spectral Density, 5260 MHz, 802.11a 20 MHz, Port 1



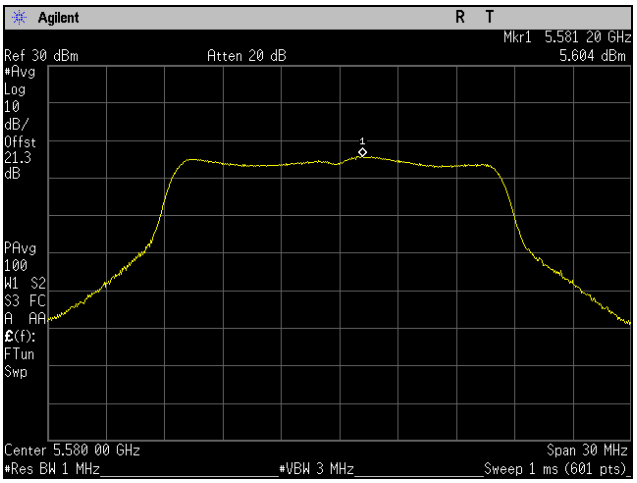
Plot 113. Peak Power Spectral Density, 5300 MHz, 802.11a 20 MHz, Port 1



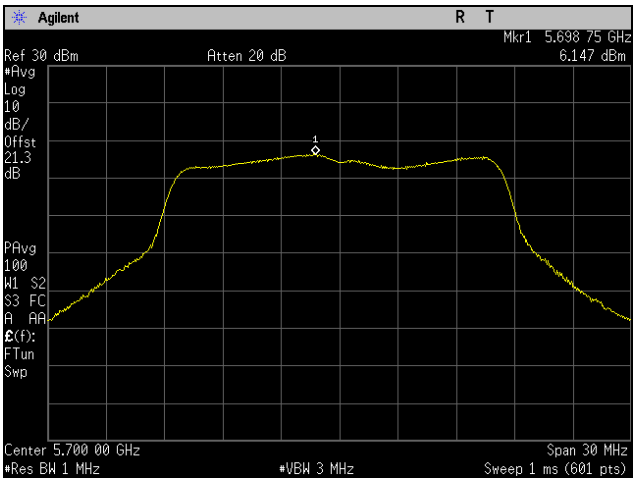
Plot 114. Peak Power Spectral Density, 5320 MHz, 802.11a 20 MHz, Port 1



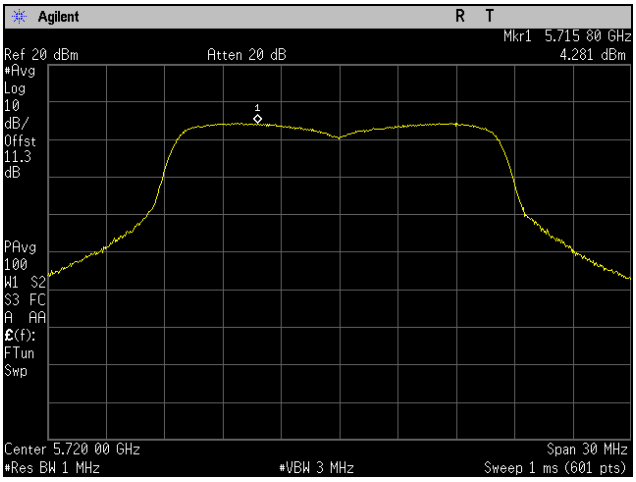
Plot 115. Peak Power Spectral Density, 5500 MHz, 802.11a 20 MHz, Port 1



Plot 116. Peak Power Spectral Density, 5580 MHz, 802.11a 20 MHz, Port 1

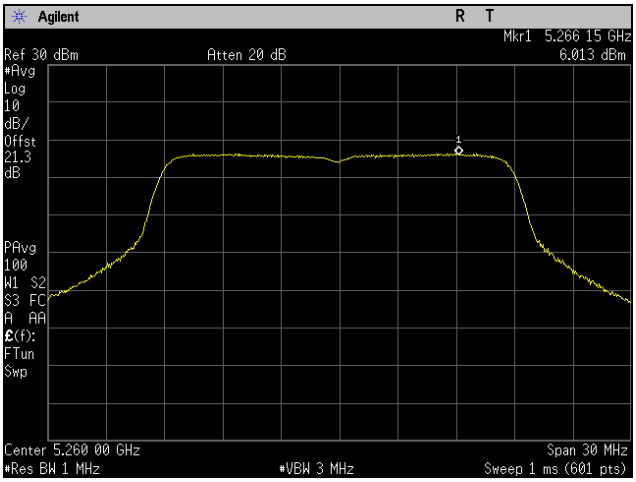


Plot 117. Peak Power Spectral Density, 5700 MHz, 802.11a 20 MHz, Port 1

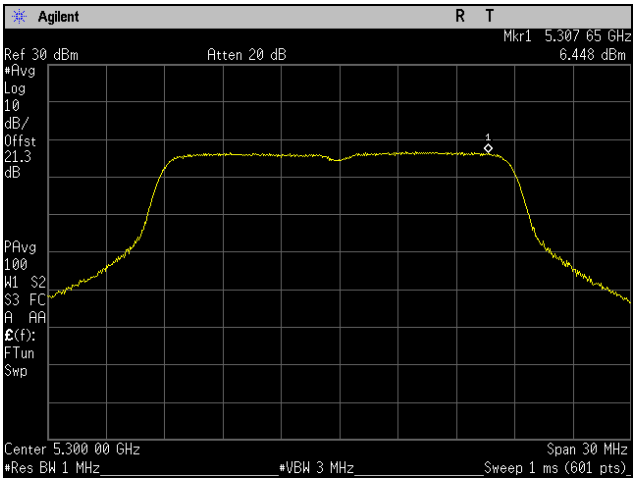


Plot 118. Peak Power Spectral Density, 5720 MHz, 802.11a 20 MHz, Port 1

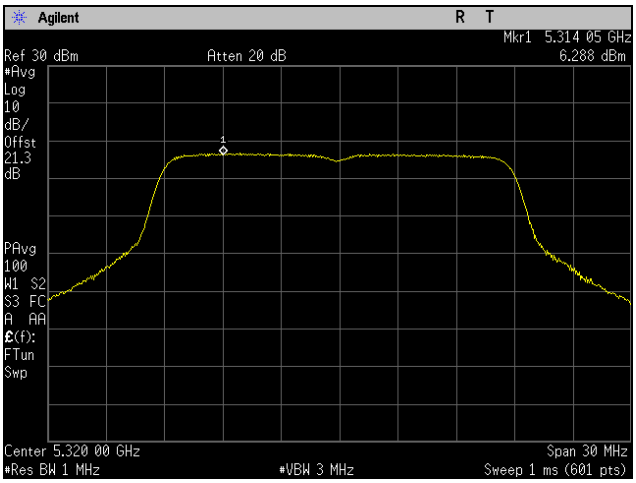
Peak Power Spectral Density, 802.11ac 20 MHz, Port 1



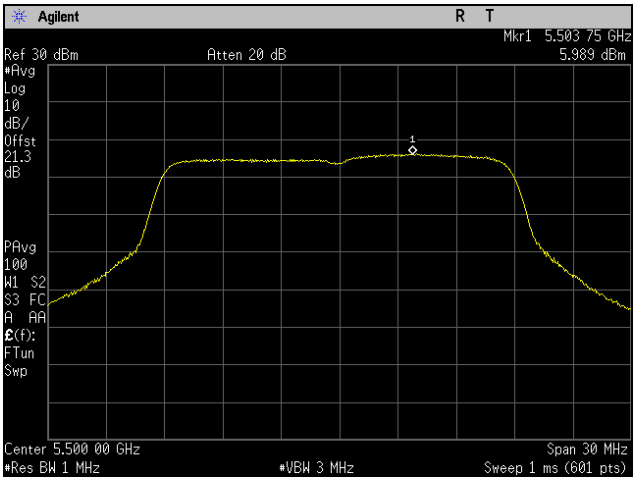
Plot 119. Peak Power Spectral Density, 5260 MHz, 802.11ac 20 MHz, Port 1



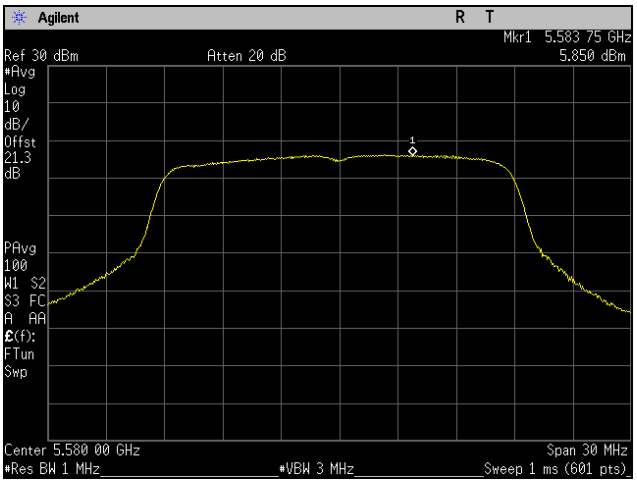
Plot 120. Peak Power Spectral Density, 5300 MHz, 802.11ac 20 MHz, Port 1



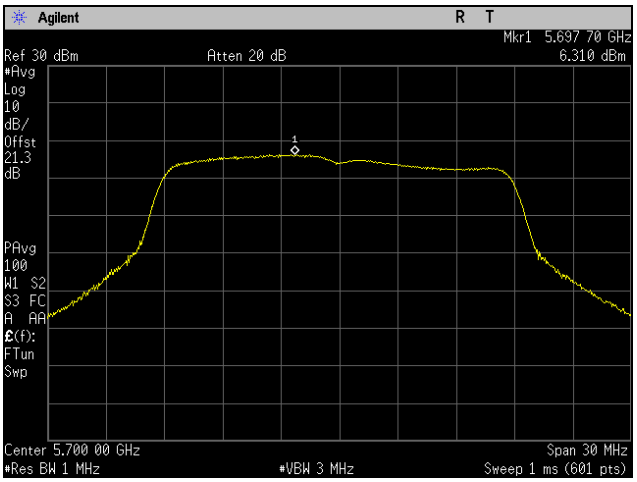
Plot 121. Peak Power Spectral Density, 5320 MHz, 802.11ac 20 MHz, Port 1



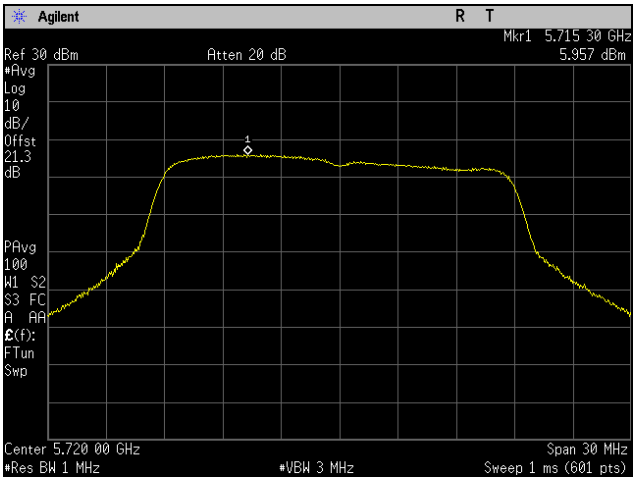
Plot 122. Peak Power Spectral Density, 5500 MHz, 802.11ac 20 MHz, Port 1



Plot 123. Peak Power Spectral Density, 5580 MHz, 802.11ac 20 MHz, Port 1

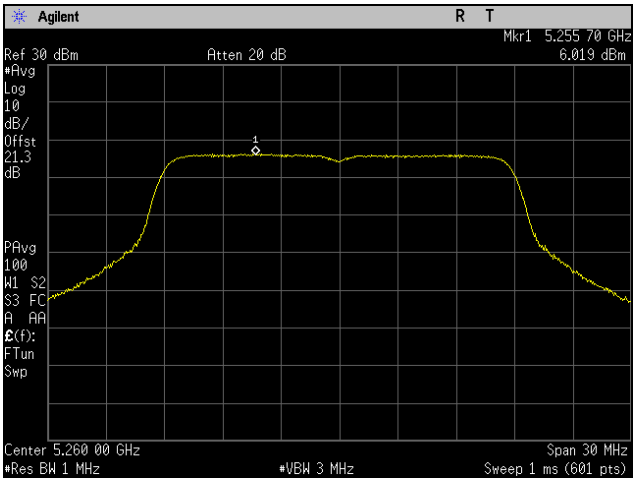


Plot 124. Peak Power Spectral Density, 5700 MHz, 802.11ac 20 MHz, Port 1

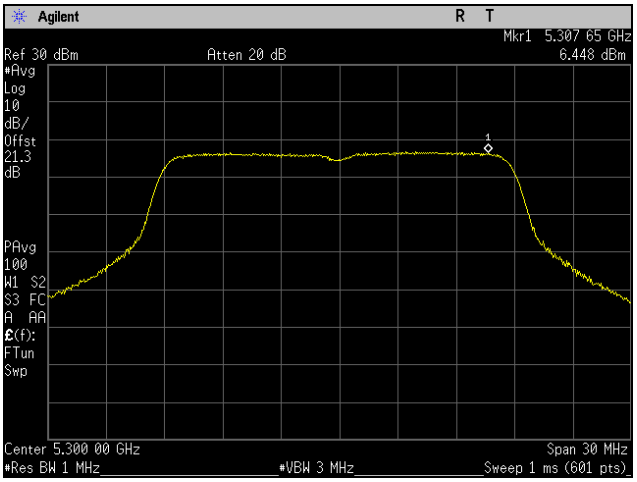


Plot 125. Peak Power Spectral Density, 5720 MHz, 802.11ac 20 MHz, Port 1

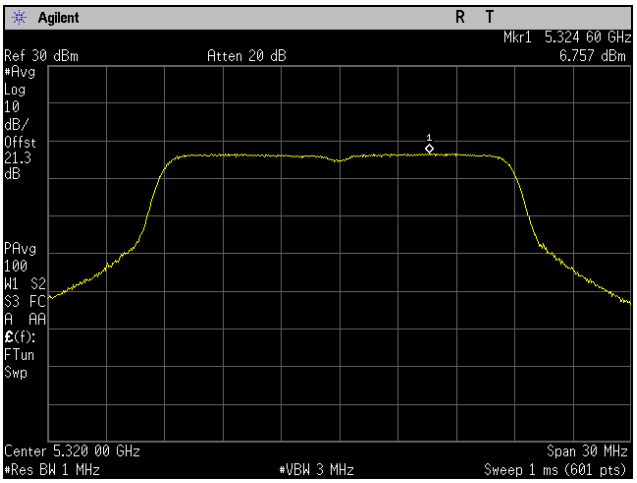
Peak Power Spectral Density, 802.11n 20 MHz, Port 1



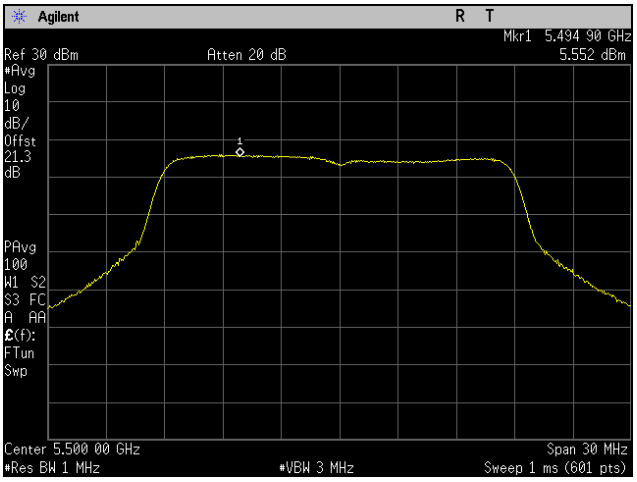
Plot 126. Peak Power Spectral Density, 5260 MHz, 802.11n 20 MHz, Port 1



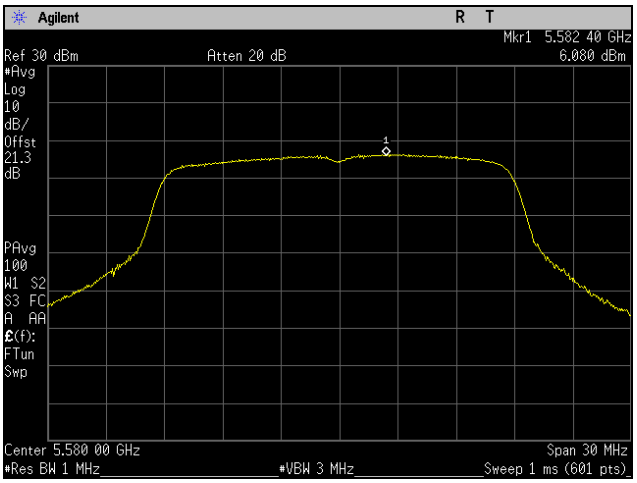
Plot 127. Peak Power Spectral Density, 5300 MHz, 802.11n 20 MHz, Port 1



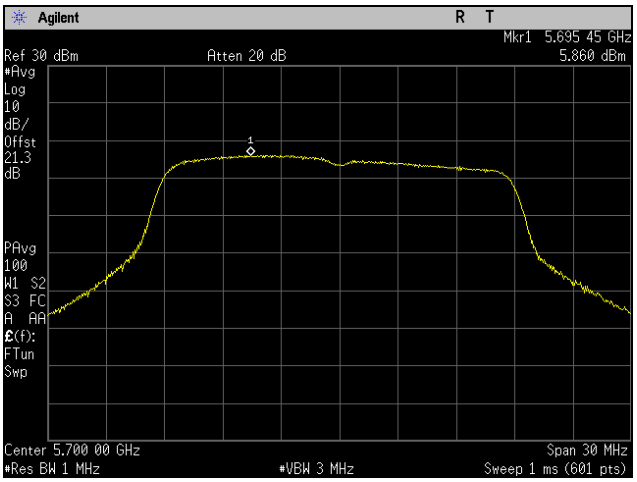
Plot 128. Peak Power Spectral Density, 5320 MHz, 802.11n 20 MHz, Port 1



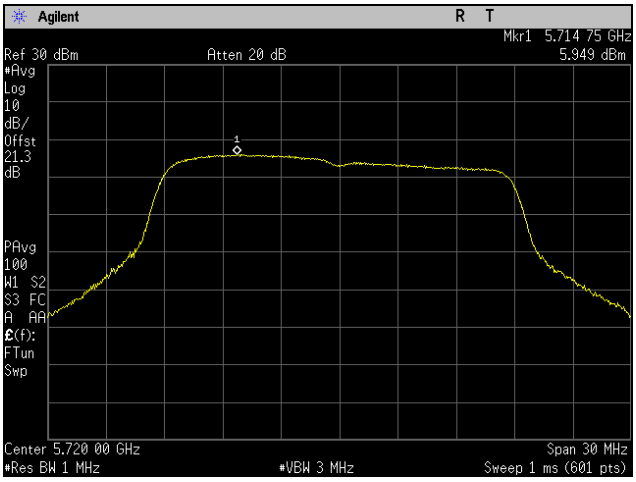
Plot 129. Peak Power Spectral Density, 5500 MHz, 802.11n 20 MHz, Port 1



Plot 130. Peak Power Spectral Density, 5580 MHz, 802.11n 20 MHz, Port 1

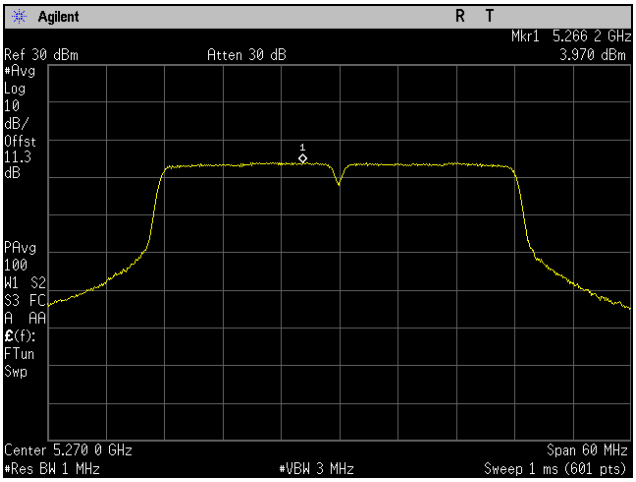


Plot 131. Peak Power Spectral Density, 5700 MHz, 802.11n 20 MHz, Port 1

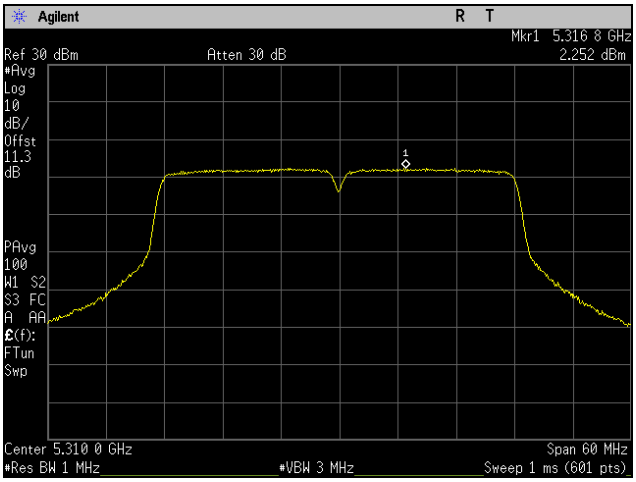


Plot 132. Peak Power Spectral Density, 5720 MHz, 802.11n 20 MHz, Port 1

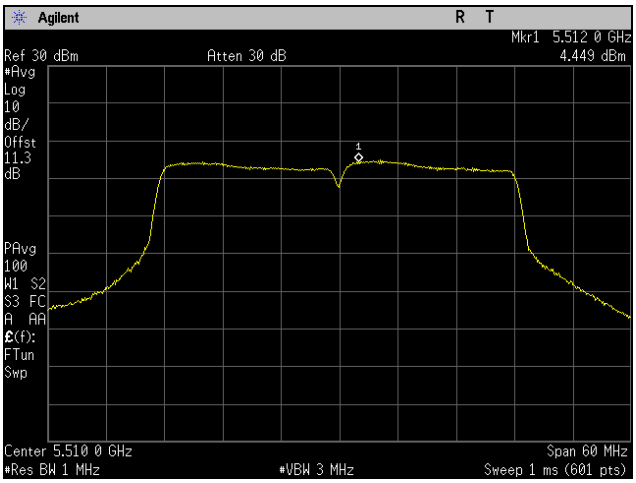
Peak Power Spectral Density, 802.11ac 40 MHz, Port 1



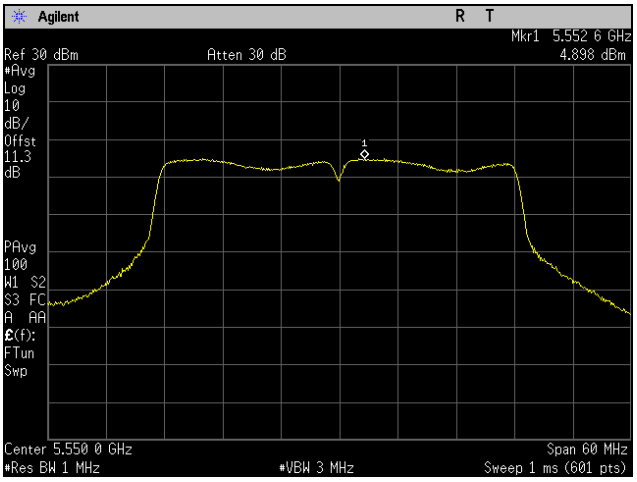
Plot 133. Peak Power Spectral Density, 5270 MHz, 802.11ac 40 MHz, Port 1



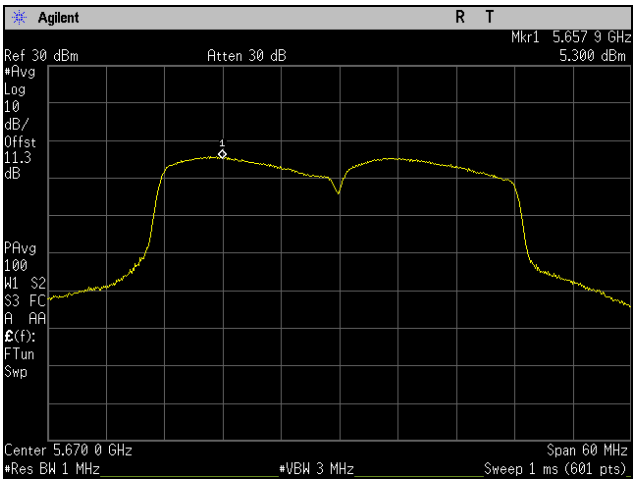
Plot 134. Peak Power Spectral Density, 5310 MHz, 802.11ac 40 MHz, Port 1



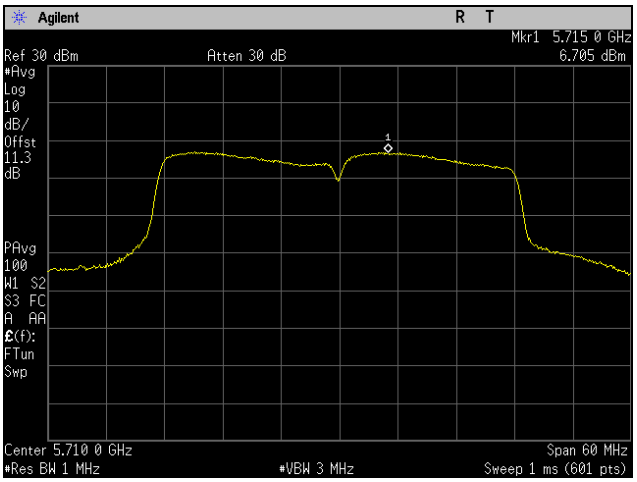
Plot 135. Peak Power Spectral Density, 5510 MHz, 802.11ac 40 MHz, Port 1



Plot 136. Peak Power Spectral Density, 5550 MHz, 802.11ac 40 MHz, Port 1

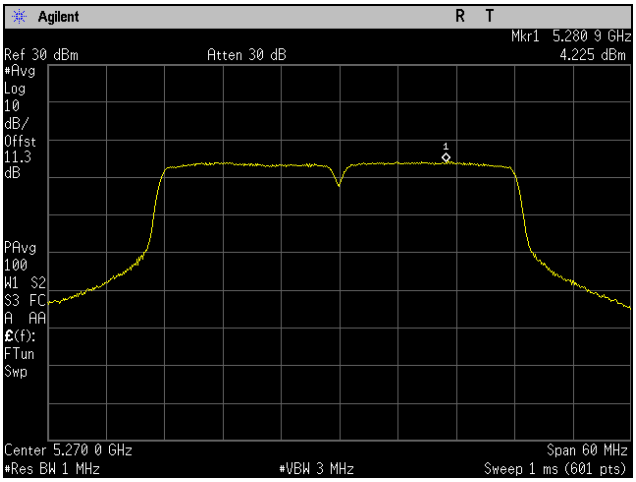


Plot 137. Peak Power Spectral Density, 5670 MHz, 802.11ac 40 MHz, Port 1

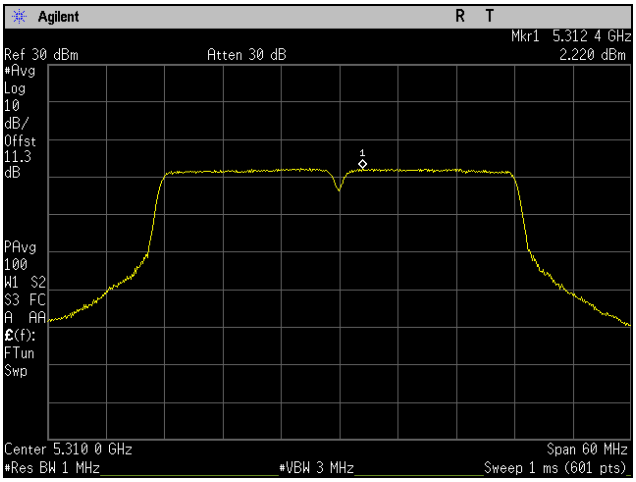


Plot 138. Peak Power Spectral Density, 5710 MHz, 802.11ac 40 MHz, Port 1

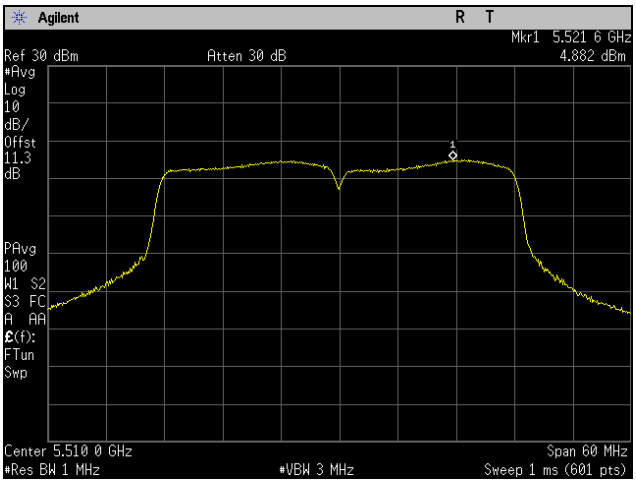
Peak Power Spectral Density, 802.11n 40 MHz, Port 1



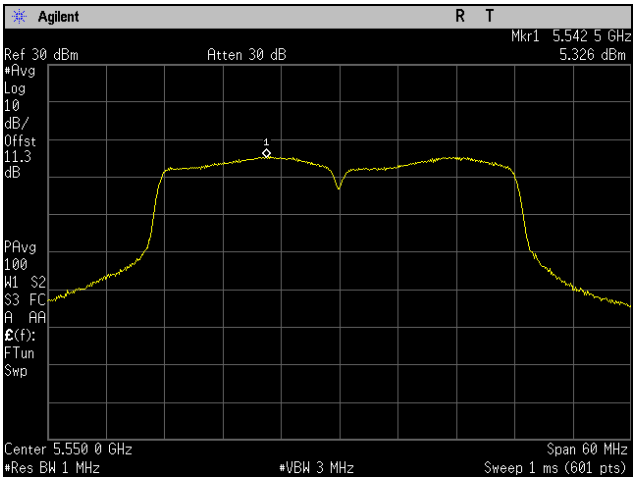
Plot 139. Peak Power Spectral Density, 5270 MHz, 802.11n 40 MHz, Port 1



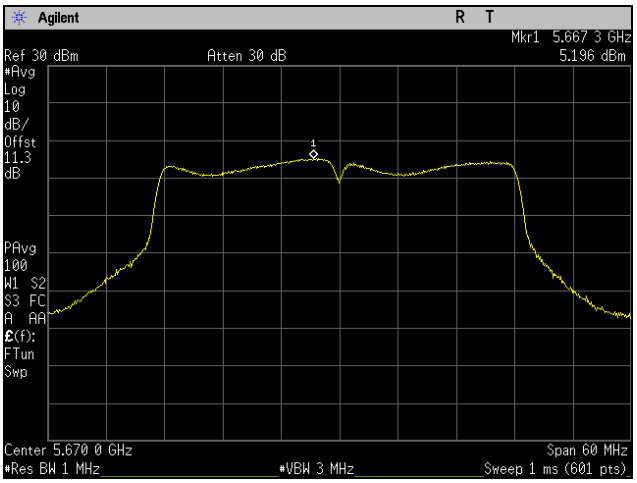
Plot 140. Peak Power Spectral Density, 5310 MHz, 802.11n 40 MHz, Port 1



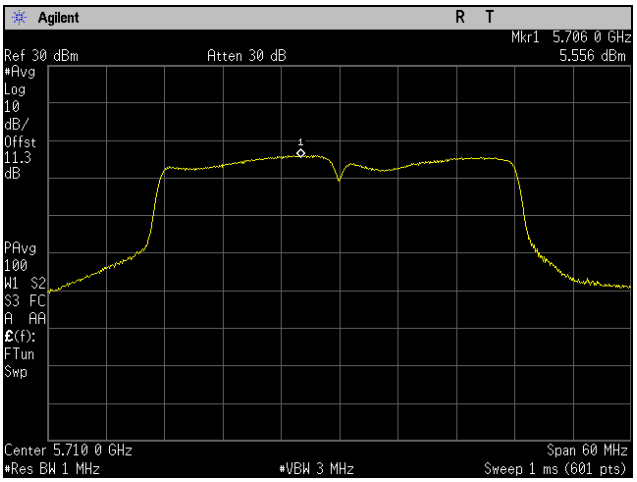
Plot 141. Peak Power Spectral Density, 5510 MHz, 802.11n 40 MHz, Port 1



Plot 142. Peak Power Spectral Density, 5550 MHz, 802.11n 40 MHz, Port 1

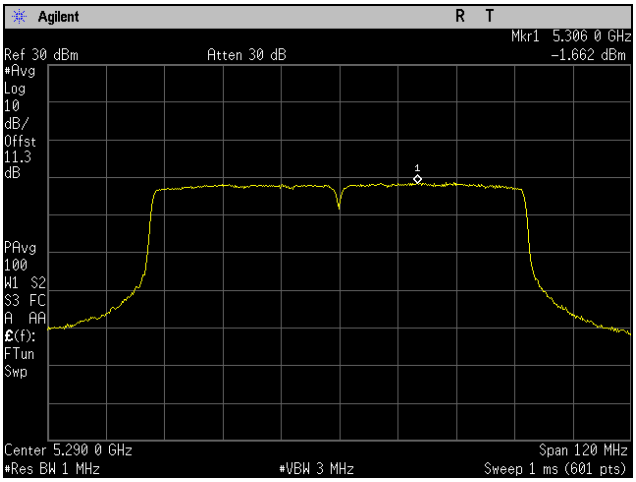


Plot 143. Peak Power Spectral Density, 5670 MHz, 802.11n 40 MHz, Port 1

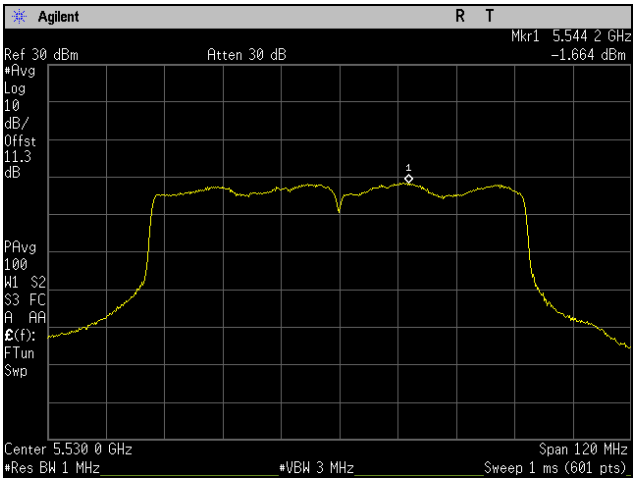


Plot 144. Peak Power Spectral Density, 5710 MHz, 802.11n 40 MHz, Port 1

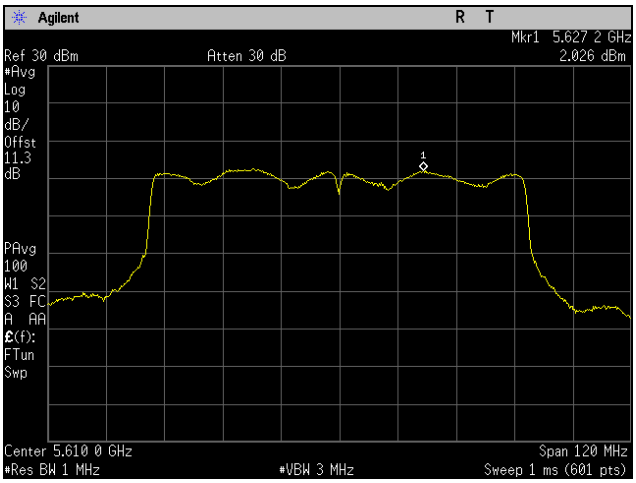
Peak Power Spectral Density, 802.11ac 80 MHz, Port 1



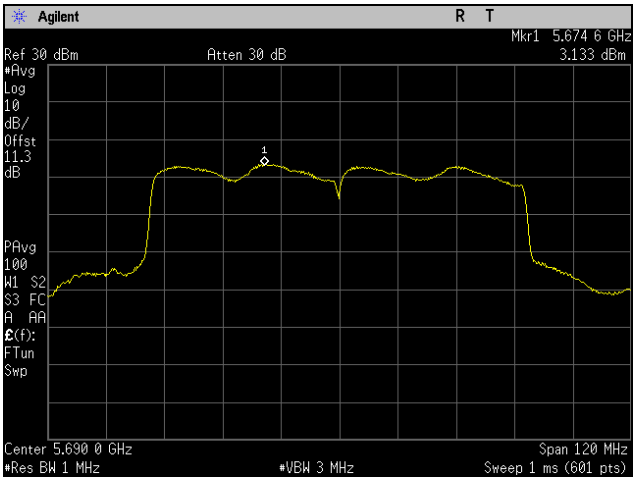
Plot 145. Peak Power Spectral Density, 5290 MHz, 802.11ac 80 MHz, Port 1



Plot 146. Peak Power Spectral Density, 5530 MHz, 802.11ac 80 MHz, Port 1

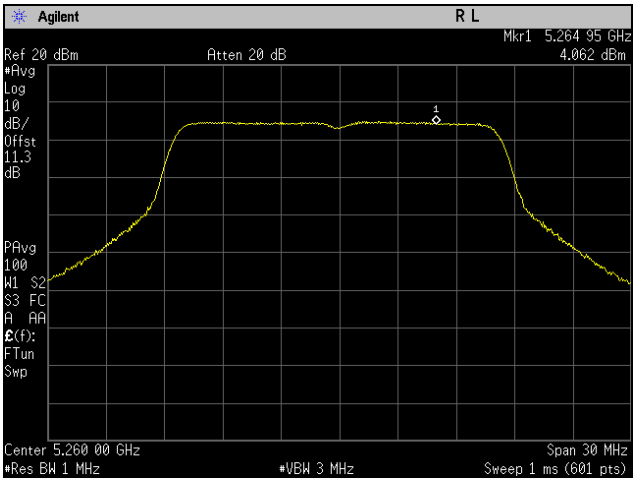


Plot 147. Peak Power Spectral Density, 5610 MHz, 802.11ac 80 MHz, Port 1

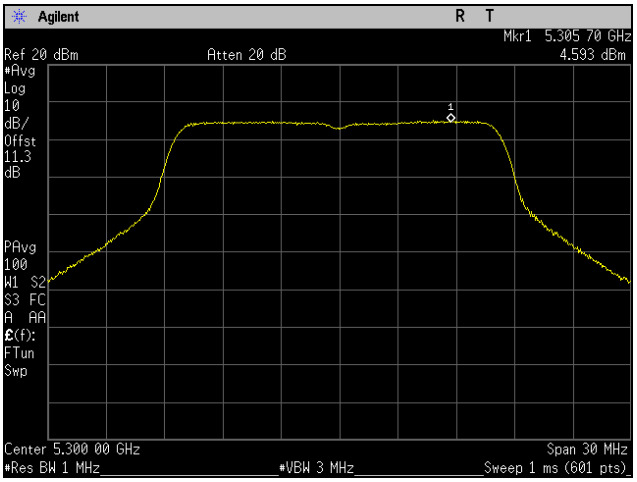


Plot 148. Peak Power Spectral Density, 5690 MHz, 802.11ac 80 MHz, Port 1

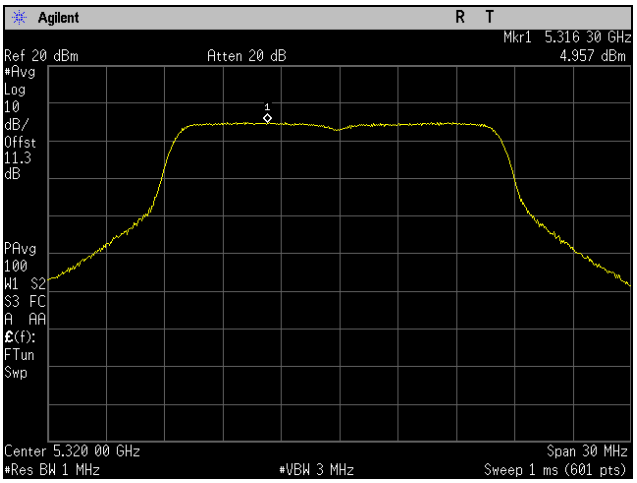
Peak Power Spectral Density, 802.11a 20 MHz, Port 2



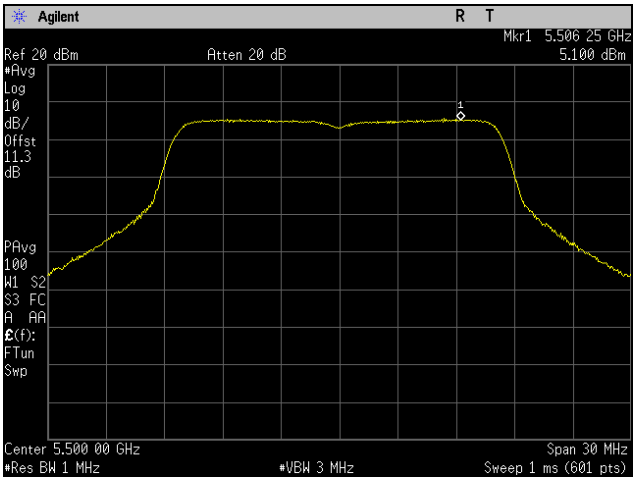
Plot 149. Peak Power Spectral Density, 5260 MHz, 802.11a 20 MHz, Port 2



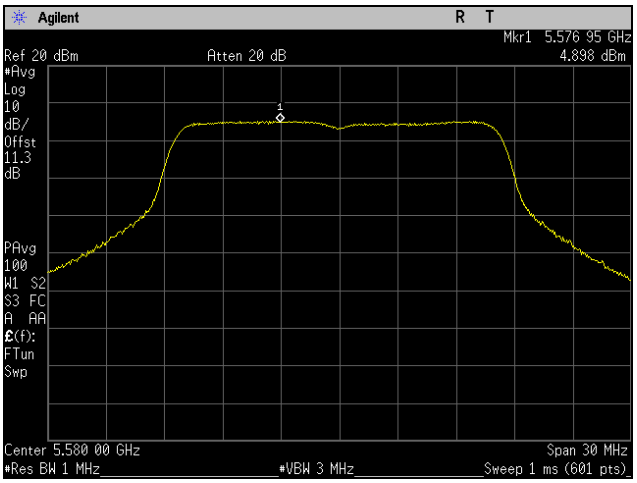
Plot 150. Peak Power Spectral Density, 5300 MHz, 802.11a 20 MHz, Port 2



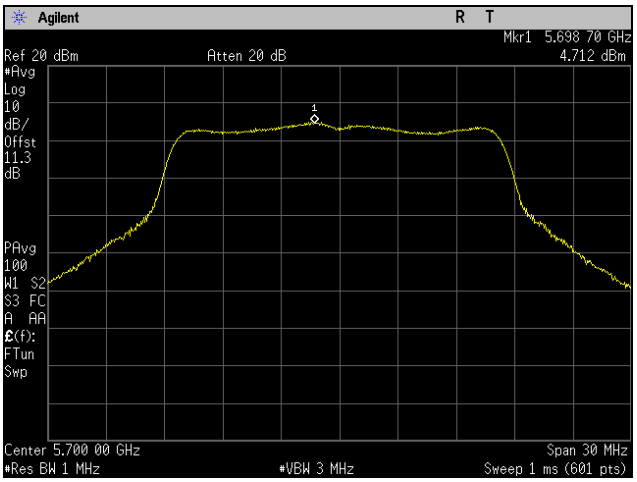
Plot 151. Peak Power Spectral Density, 5320 MHz, 802.11a 20 MHz, Port 2



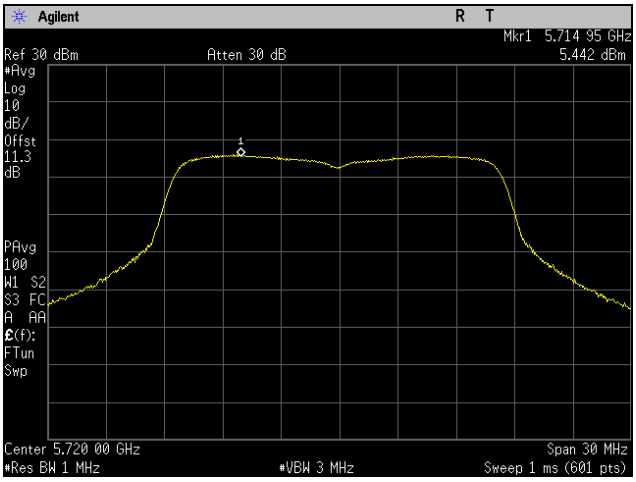
Plot 152. Peak Power Spectral Density, 5500 MHz, 802.11a 20 MHz, Port 2



Plot 153. Peak Power Spectral Density, 5580 MHz, 802.11a 20 MHz, Port 2

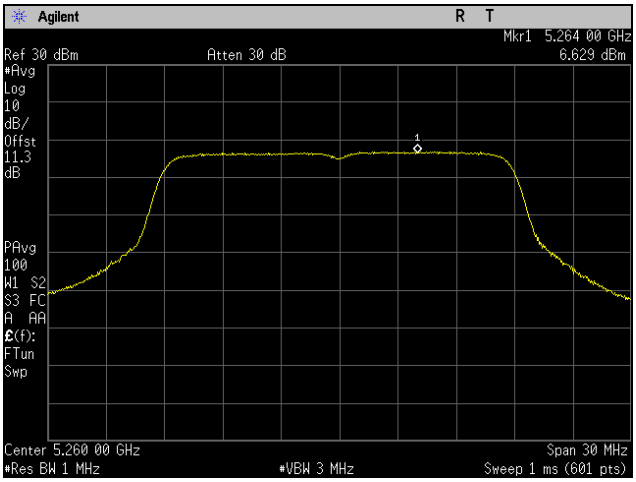


Plot 154. Peak Power Spectral Density, 5700 MHz, 802.11a 20 MHz, Port 2

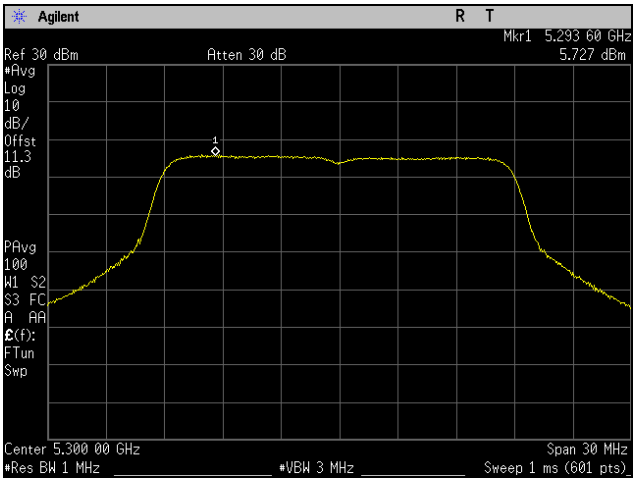


Plot 155. Peak Power Spectral Density, 5720 MHz, 802.11a 20 MHz, Port 2

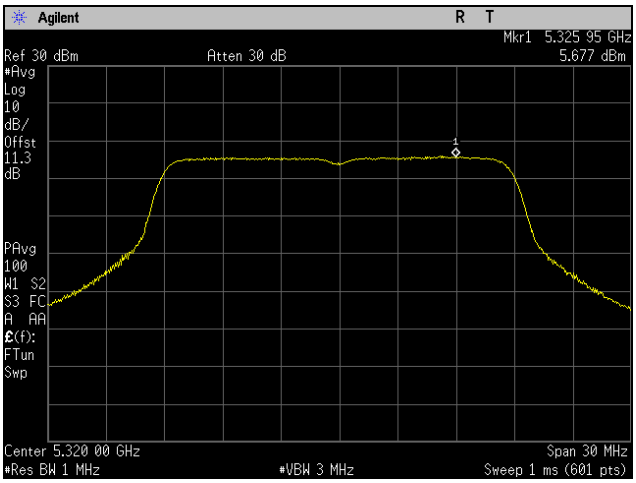
Peak Power Spectral Density, 802.11ac 20 MHz, Port 2



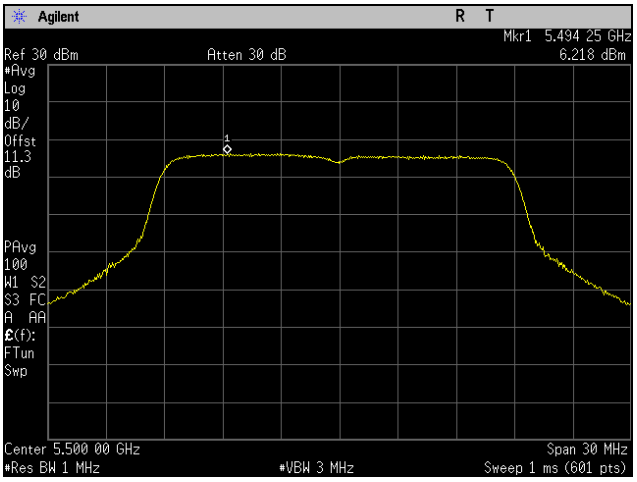
Plot 156. Peak Power Spectral Density, 5260 MHz, 802.11ac 20 MHz, Port 2



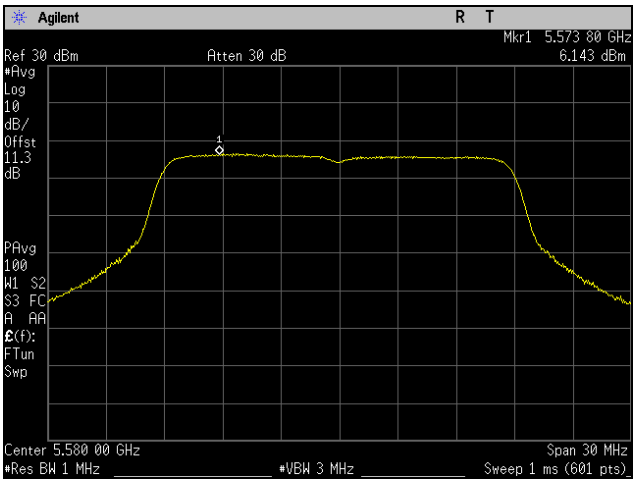
Plot 157. Peak Power Spectral Density, 5300 MHz, 802.11ac 20 MHz, Port 2



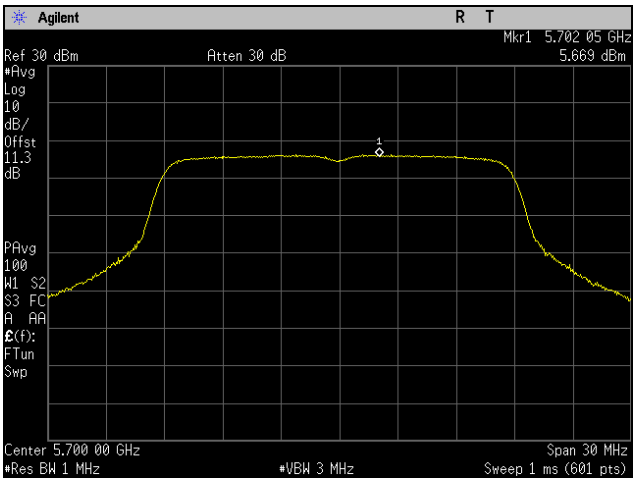
Plot 158. Peak Power Spectral Density, 5320 MHz, 802.11ac 20 MHz, Port 2



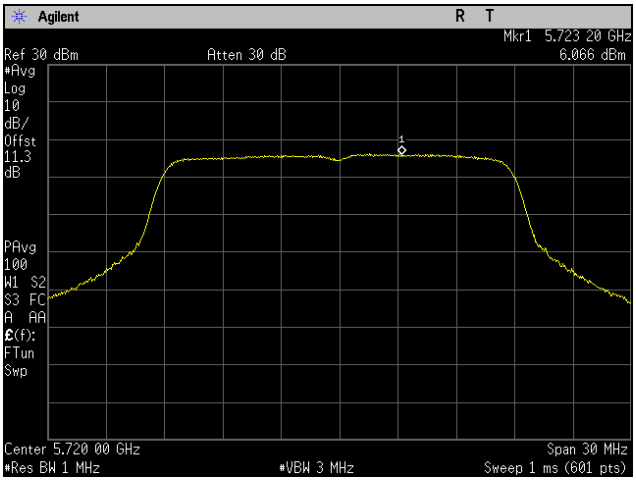
Plot 159. Peak Power Spectral Density, 5500 MHz, 802.11ac 20 MHz, Port 2



Plot 160. Peak Power Spectral Density, 5580 MHz, 802.11ac 20 MHz, Port 2

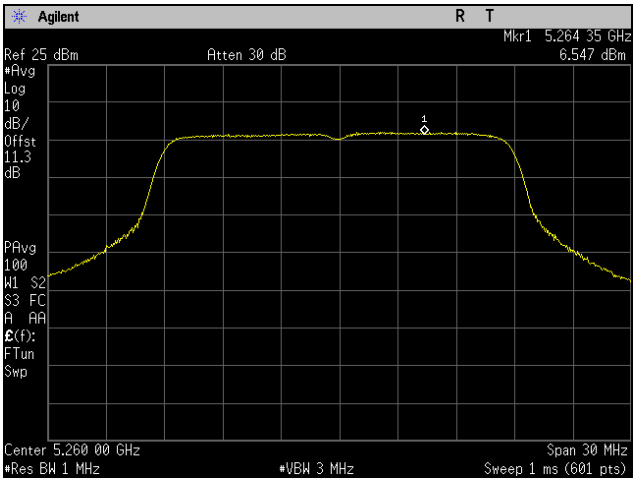


Plot 161. Peak Power Spectral Density, 5700 MHz, 802.11ac 20 MHz, Port 2

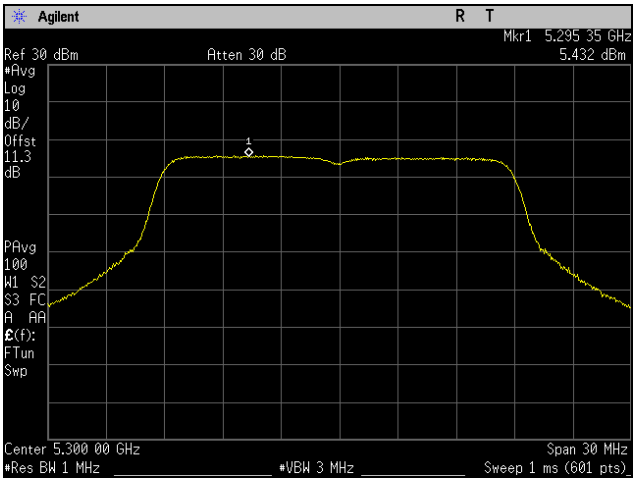


Plot 162. Peak Power Spectral Density, 5720 MHz, 802.11ac 20 MHz, Port 2

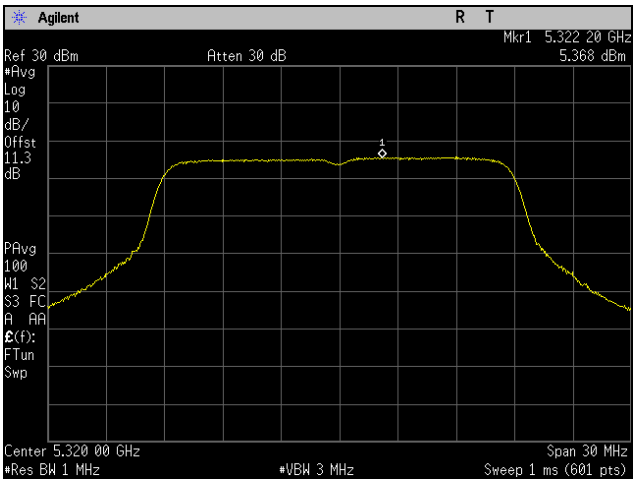
Peak Power Spectral Density, 802.11n 20 MHz, Port 2



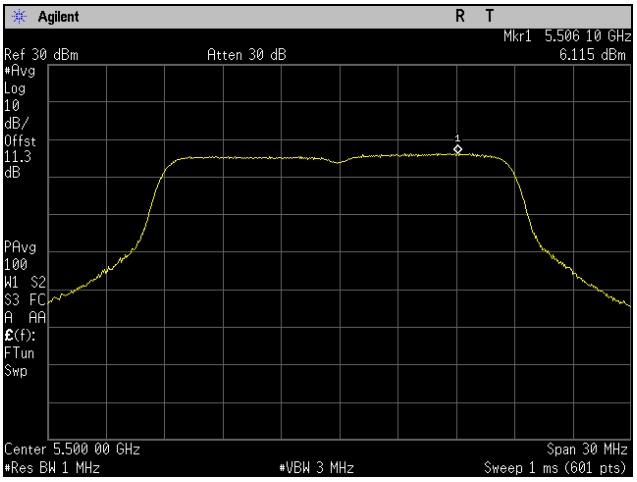
Plot 163. Peak Power Spectral Density, 5260 MHz, 802.11n 20 MHz, Port 2



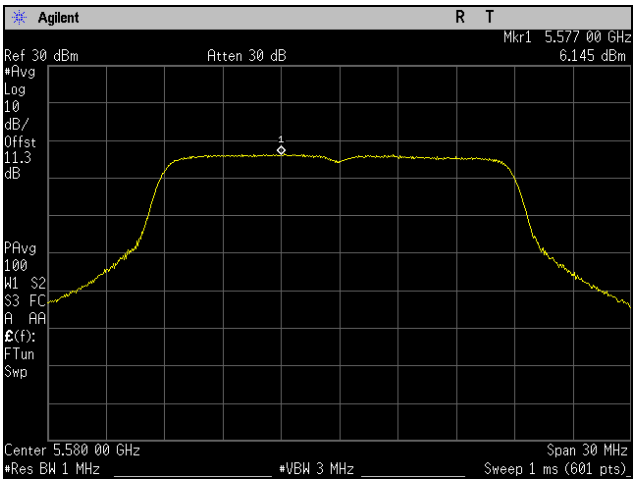
Plot 164. Peak Power Spectral Density, 5300 MHz, 802.11n 20 MHz, Port 2



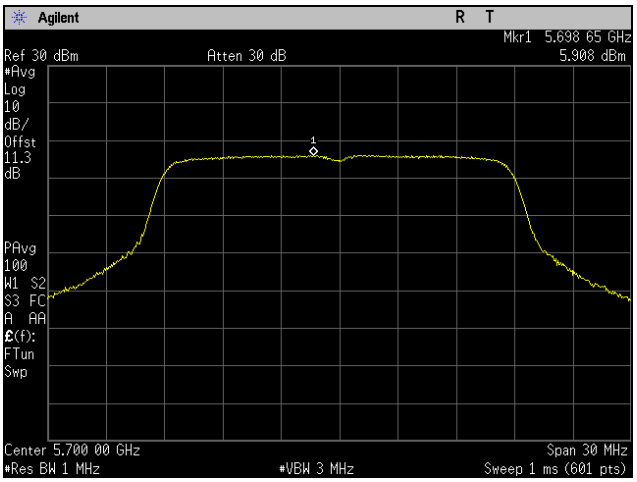
Plot 165. Peak Power Spectral Density, 5320 MHz, 802.11n 20 MHz, Port 2



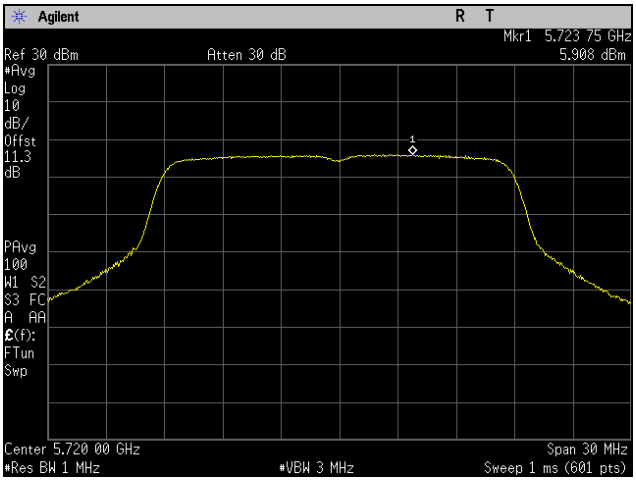
Plot 166. Peak Power Spectral Density, 5500 MHz, 802.11n 20 MHz, Port 2



Plot 167. Peak Power Spectral Density, 5580 MHz, 802.11n 20 MHz, Port 2

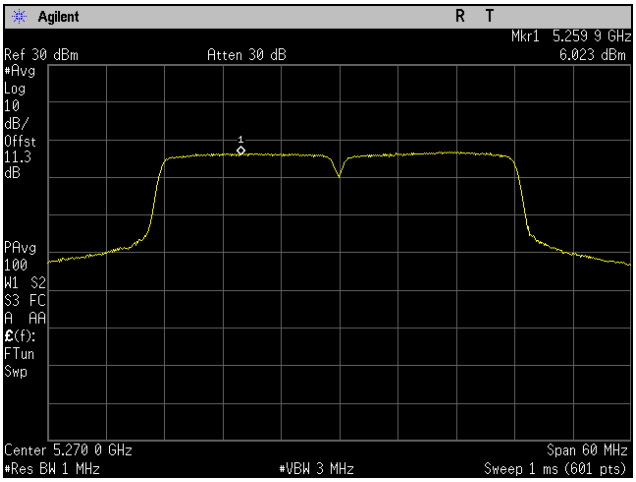


Plot 168. Peak Power Spectral Density, 5700 MHz, 802.11n 20 MHz, Port 2

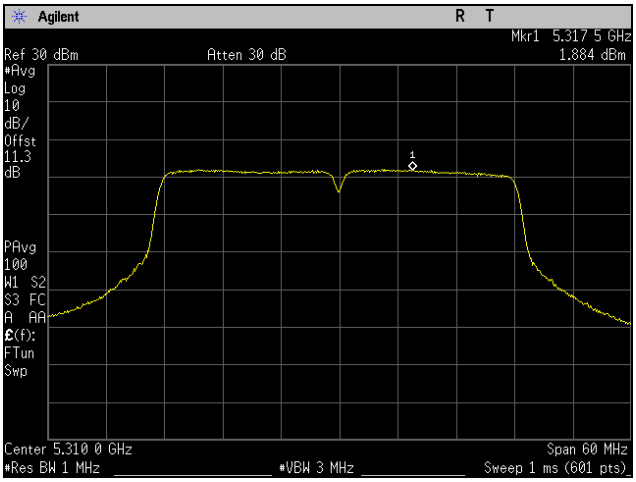


Plot 169. Peak Power Spectral Density, 5720 MHz, 802.11n 20 MHz, Port 2

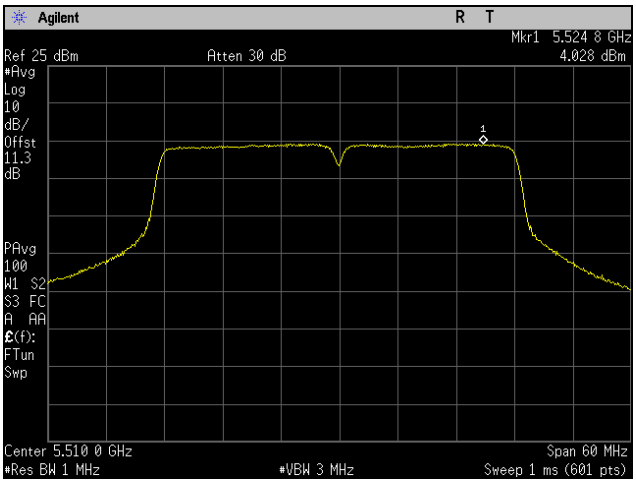
Peak Power Spectral Density, 802.11ac 40 MHz, Port 2



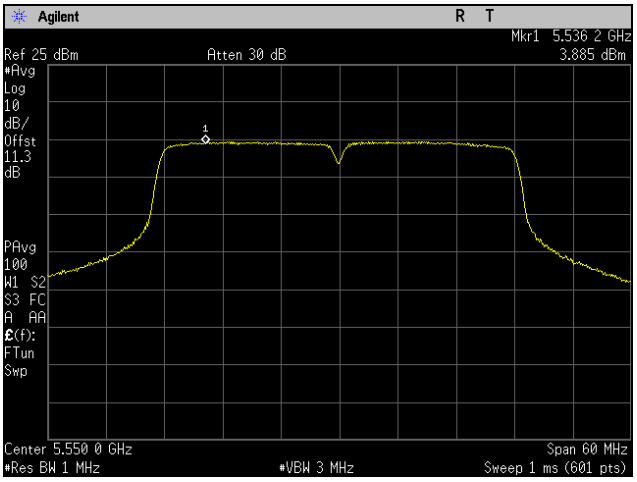
Plot 170. Peak Power Spectral Density, 5270 MHz, 802.11ac 40 MHz, Port 2



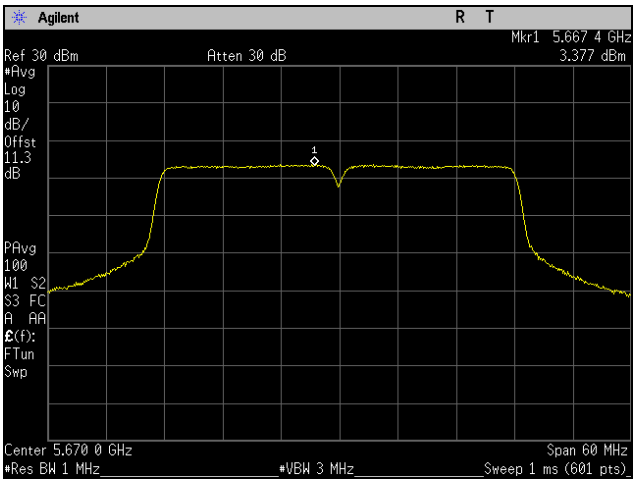
Plot 171. Peak Power Spectral Density, 5310 MHz, 802.11ac 40 MHz, Port 2



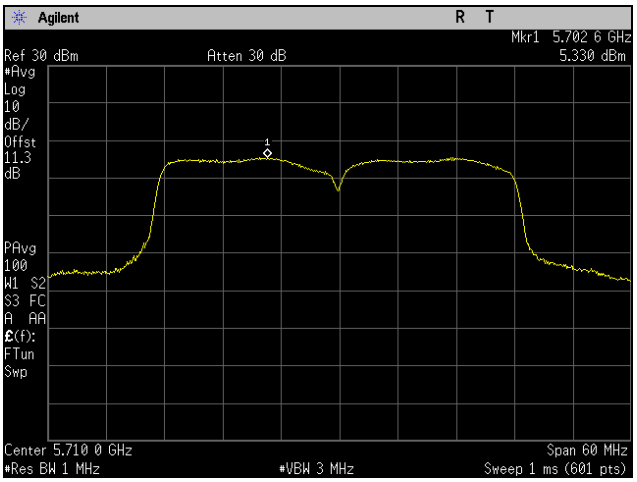
Plot 172. Peak Power Spectral Density, 5510 MHz, 802.11ac 40 MHz, Port 2



Plot 173. Peak Power Spectral Density, 5550 MHz, 802.11ac 40 MHz, Port 2

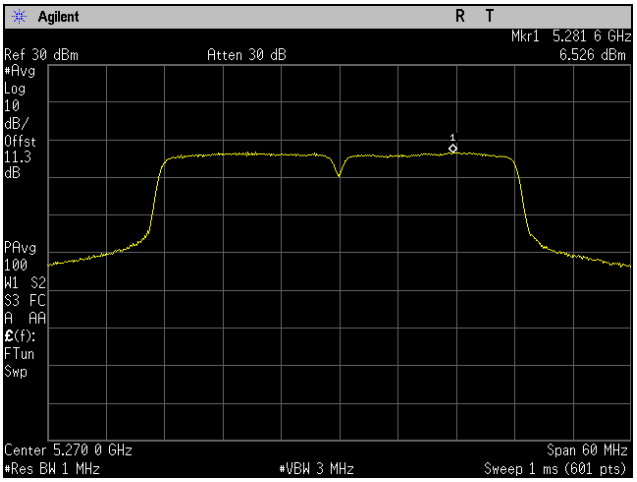


Plot 174. Peak Power Spectral Density, 5670 MHz, 802.11ac 40 MHz, Port 2

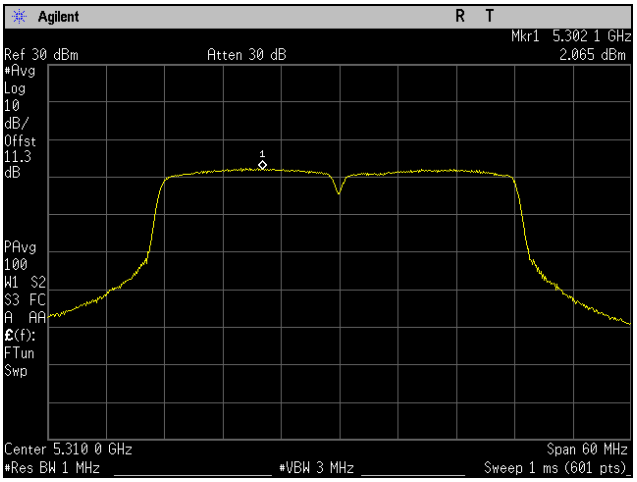


Plot 175. Peak Power Spectral Density, 5710 MHz, 802.11ac 40 MHz, Port 2

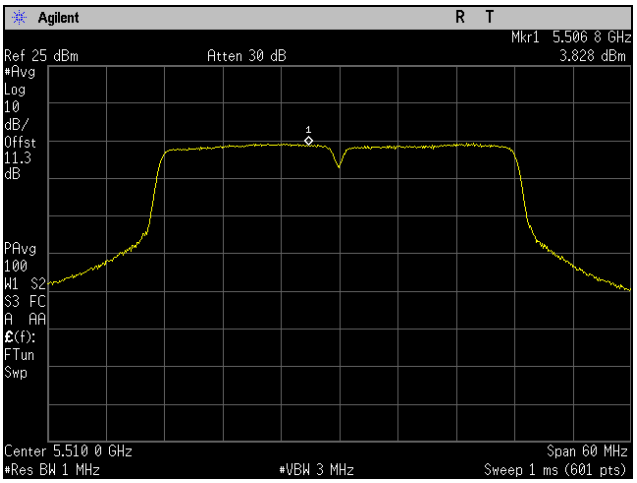
Peak Power Spectral Density, 802.11n 40 MHz, Port 2



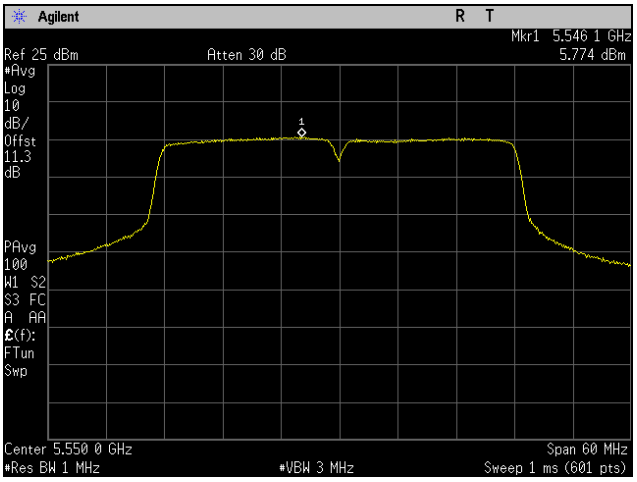
Plot 176. Peak Power Spectral Density, 5270 MHz, 802.11n 40 MHz, Port 2



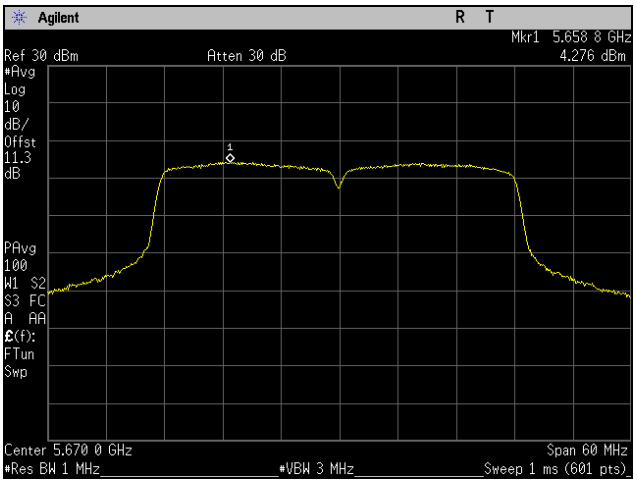
Plot 177. Peak Power Spectral Density, 5310 MHz, 802.11n 40 MHz, Port 2



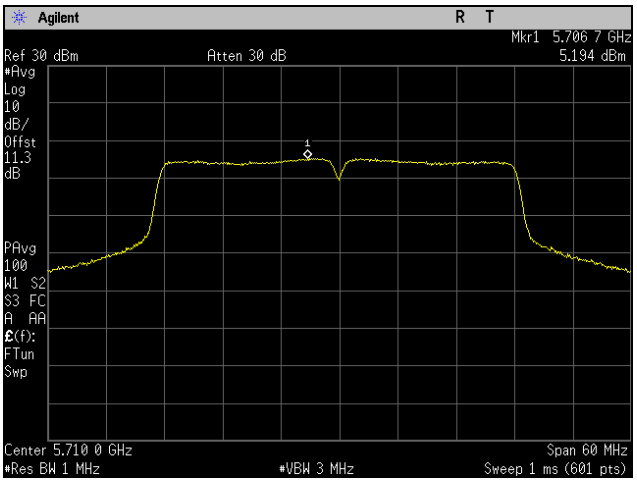
Plot 178. Peak Power Spectral Density, 5510 MHz, 802.11n 40 MHz, Port 2



Plot 179. Peak Power Spectral Density, 5550 MHz, 802.11n 40 MHz, Port 2

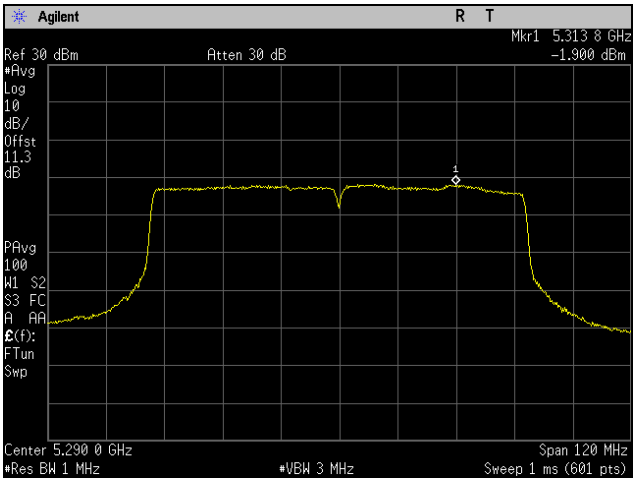


Plot 180. Peak Power Spectral Density, 5670 MHz, 802.11n 40 MHz, Port 2

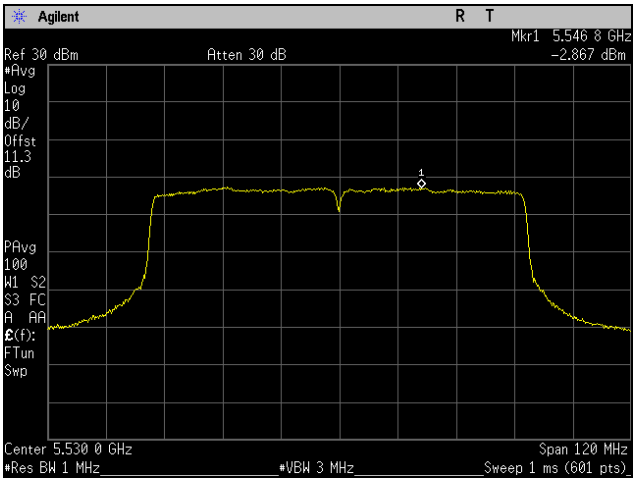


Plot 181. Peak Power Spectral Density, 5710 MHz, 802.11n 40 MHz, Port 2

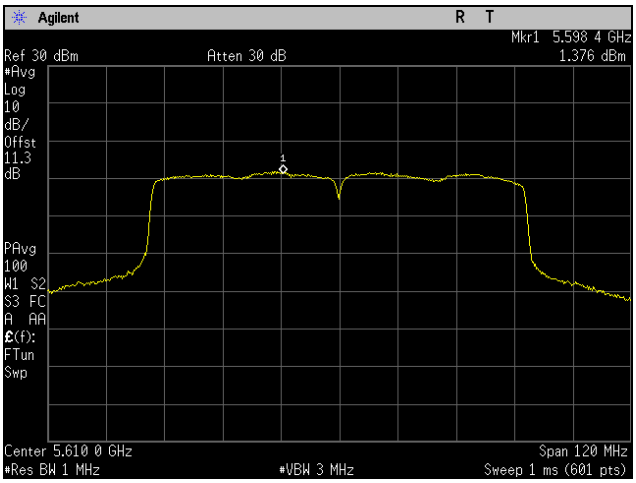
Peak Power Spectral Density, 802.11ac 80 MHz, Port 2



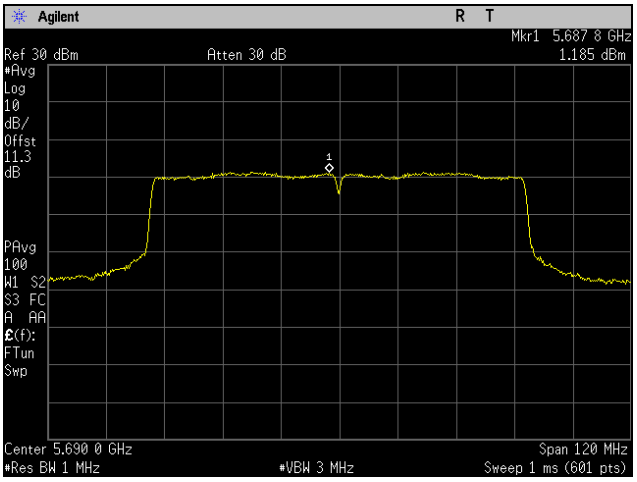
Plot 182. Peak Power Spectral Density, 5290 MHz, 802.11ac 80 MHz, Port 2



Plot 183. Peak Power Spectral Density, 5530 MHz, 802.11ac 80 MHz, Port 2

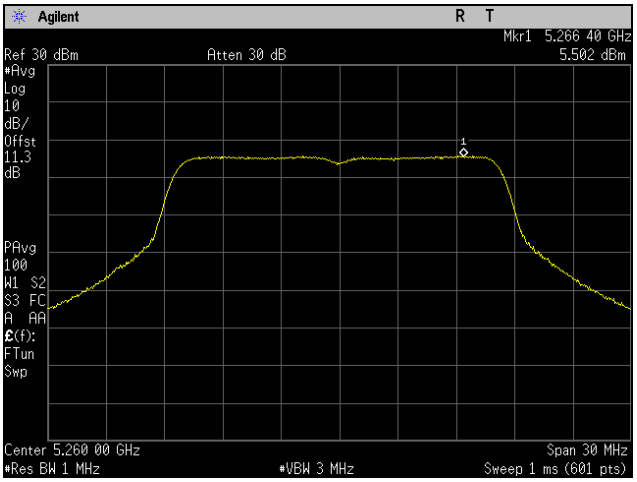


Plot 184. Peak Power Spectral Density, 5610 MHz, 802.11ac 80 MHz, Port 2

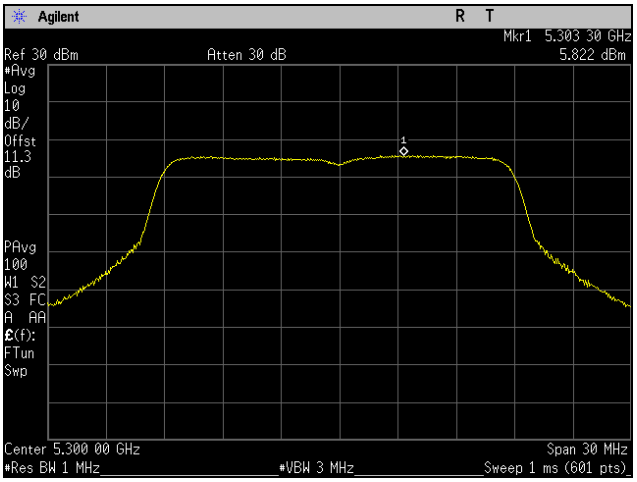


Plot 185. Peak Power Spectral Density, 5690 MHz, 802.11ac 80 MHz, Port 2

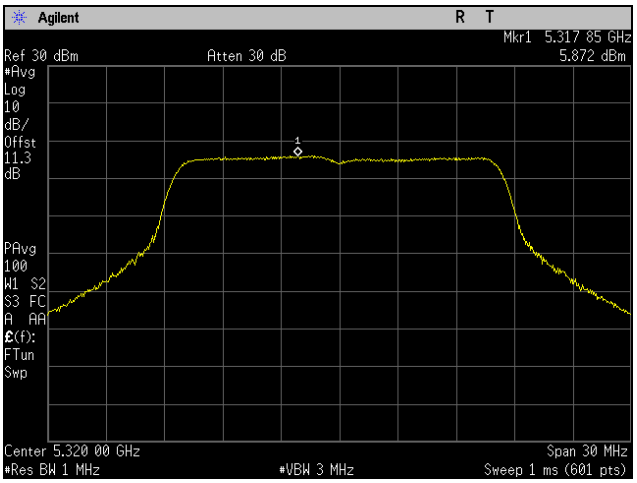
Peak Power Spectral Density, 802.11a 20 MHz, Port 3



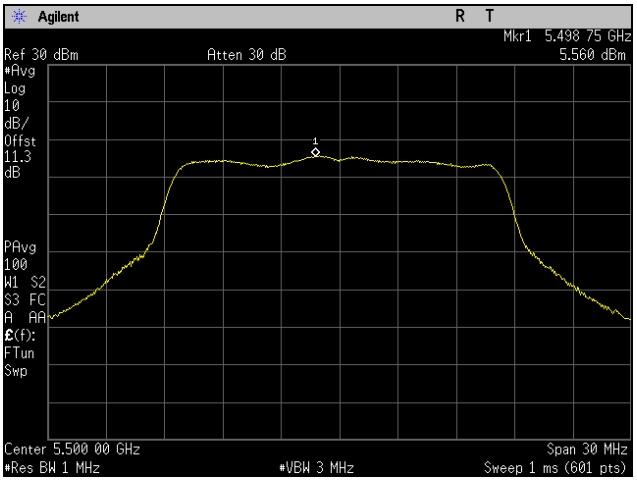
Plot 186. Peak Power Spectral Density, 5260 MHz, 802.11a 20 MHz, Port 3



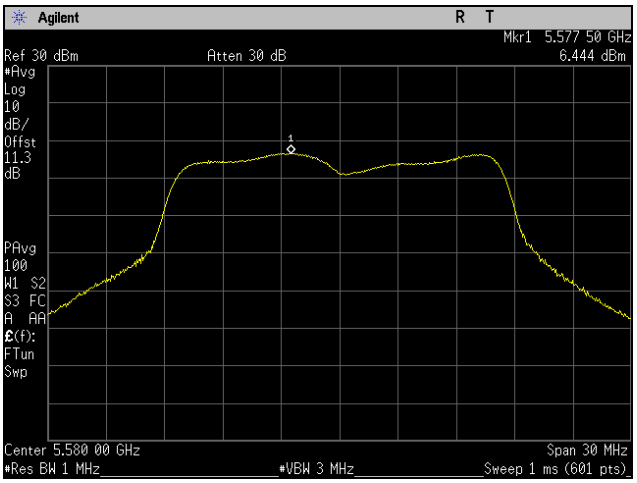
Plot 187. Peak Power Spectral Density, 5300 MHz, 802.11a 20 MHz, Port 3



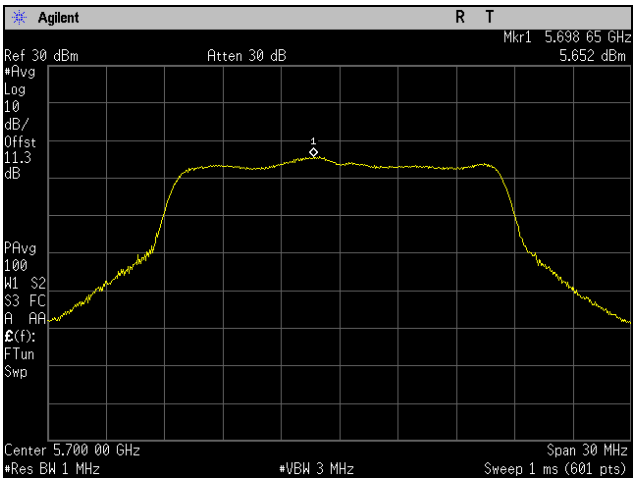
Plot 188. Peak Power Spectral Density, 5320 MHz, 802.11a 20 MHz, Port 3



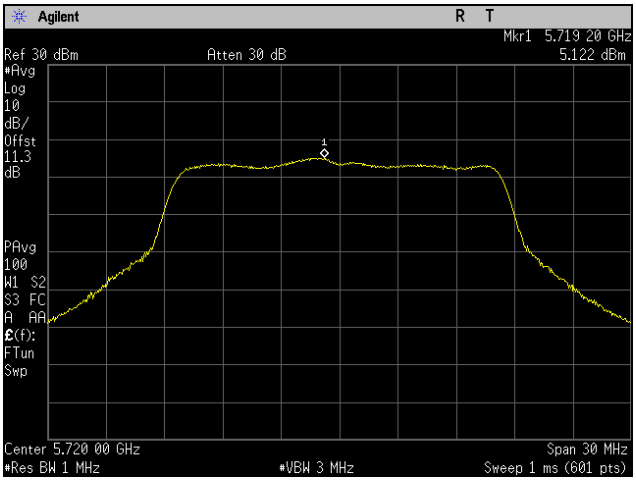
Plot 189. Peak Power Spectral Density, 5500 MHz, 802.11a 20 MHz, Port 3



Plot 190. Peak Power Spectral Density, 5580 MHz, 802.11a 20 MHz, Port 3

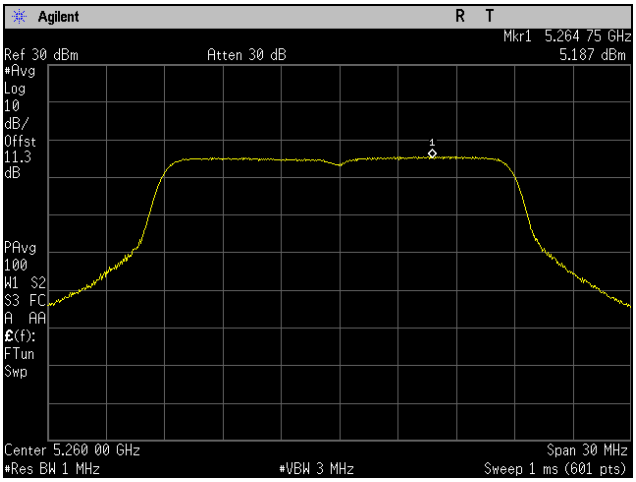


Plot 191. Peak Power Spectral Density, 5700 MHz, 802.11a 20 MHz, Port 3

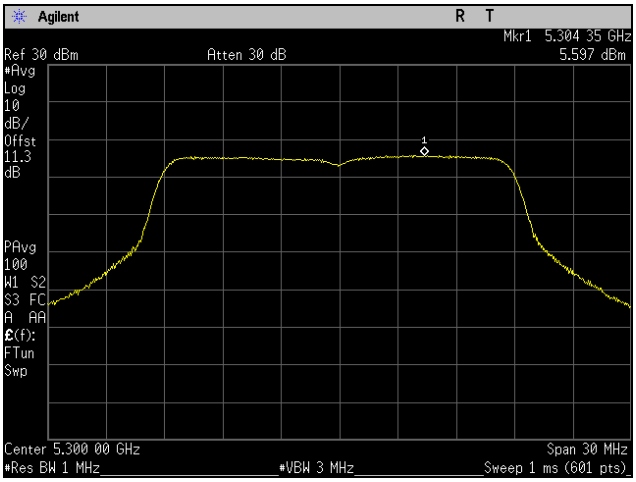


Plot 192. Peak Power Spectral Density, 5720 MHz, 802.11a 20 MHz, Port 3

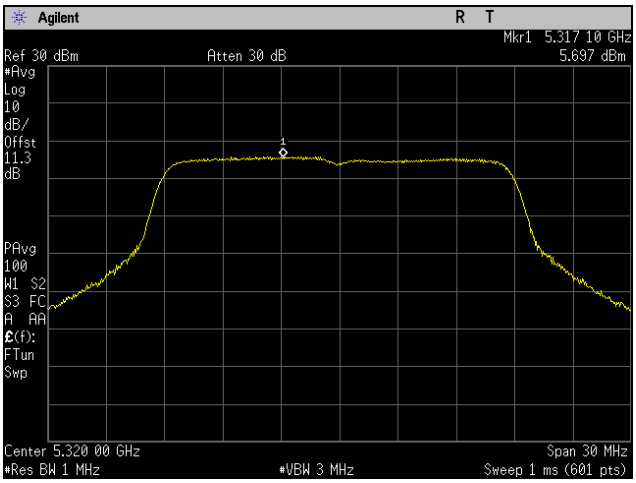
Peak Power Spectral Density, 802.11ac 20 MHz, Port 3



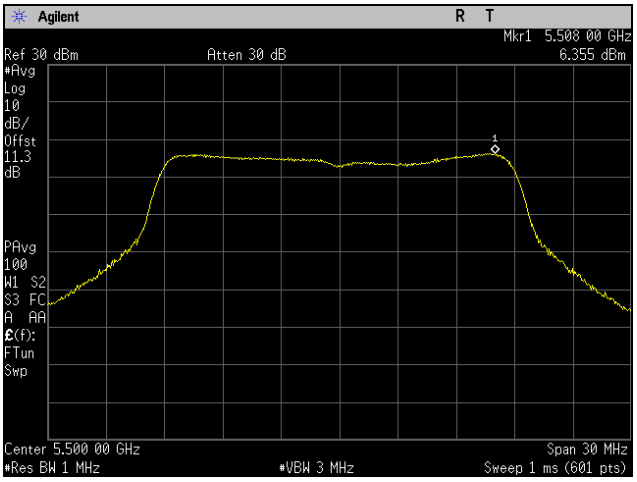
Plot 193. Peak Power Spectral Density, 5260 MHz, 802.11ac 20 MHz, Port 3



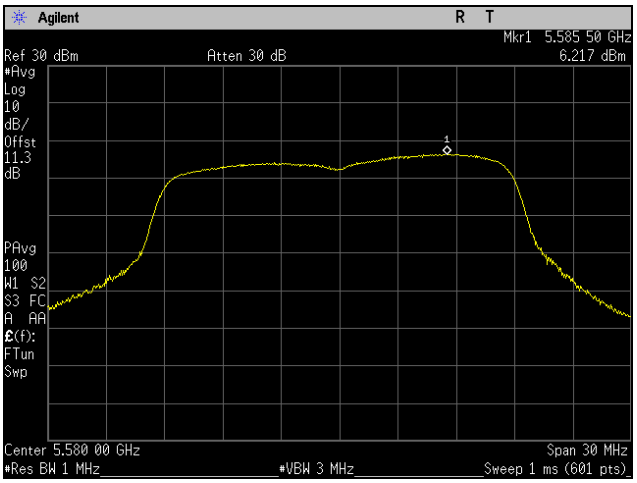
Plot 194. Peak Power Spectral Density, 5300 MHz, 802.11ac 20 MHz, Port 3



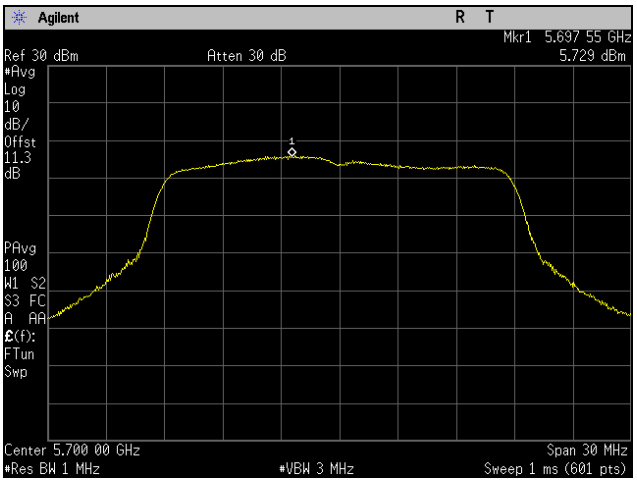
Plot 195. Peak Power Spectral Density, 5320 MHz, 802.11ac 20 MHz, Port 3



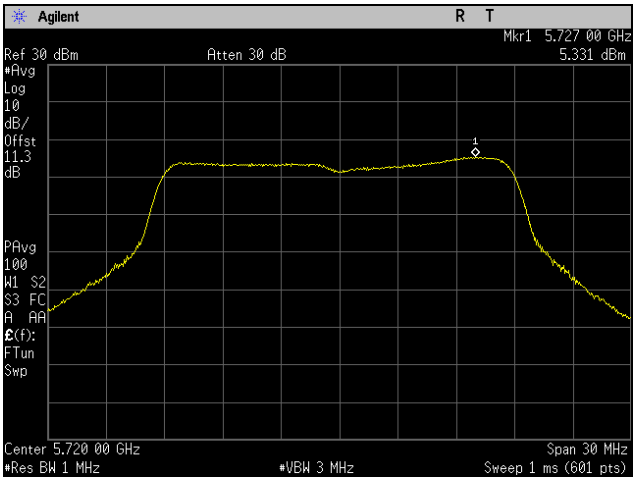
Plot 196. Peak Power Spectral Density, 5500 MHz, 802.11ac 20 MHz, Port 3



Plot 197. Peak Power Spectral Density, 5580 MHz, 802.11ac 20 MHz, Port 3

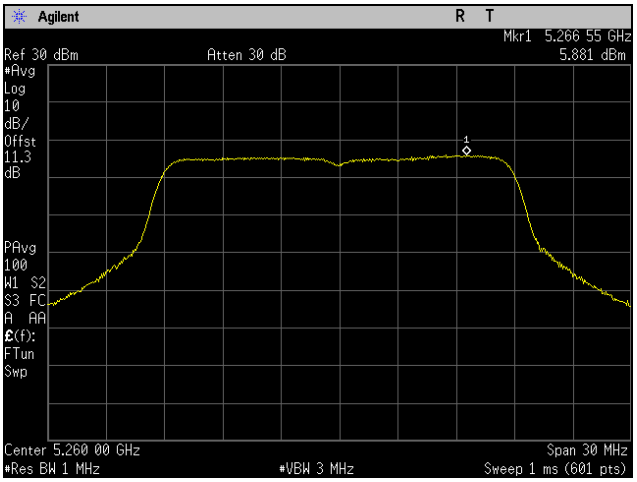


Plot 198. Peak Power Spectral Density, 5700 MHz, 802.11ac 20 MHz, Port 3

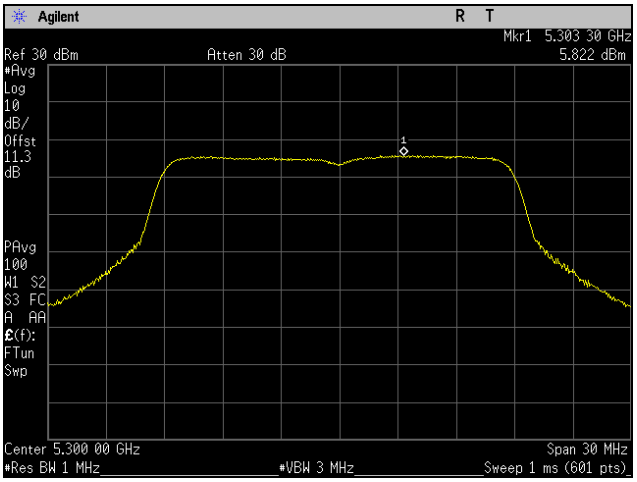


Plot 199. Peak Power Spectral Density, 5720 MHz, 802.11ac 20 MHz, Port 3

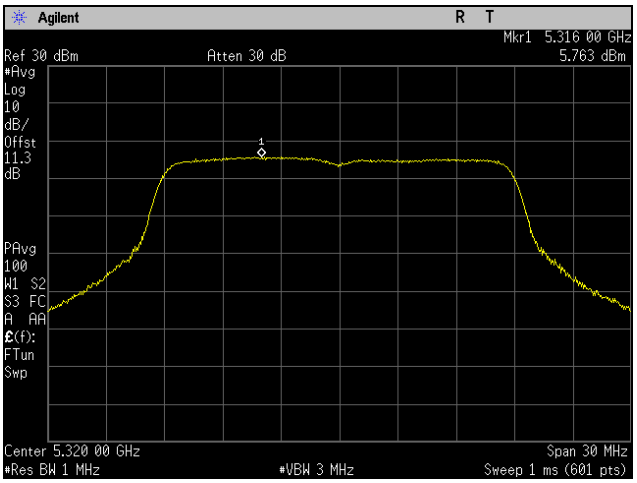
Peak Power Spectral Density, 802.11n 20 MHz, Port 3



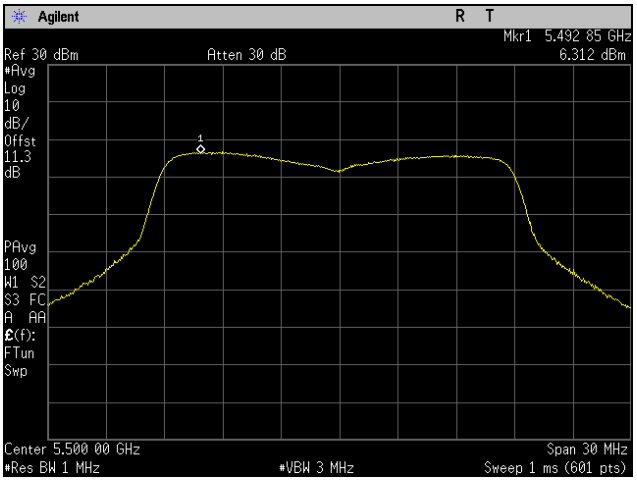
Plot 200. Peak Power Spectral Density, 5260 MHz, 802.11n 20 MHz, Port 3



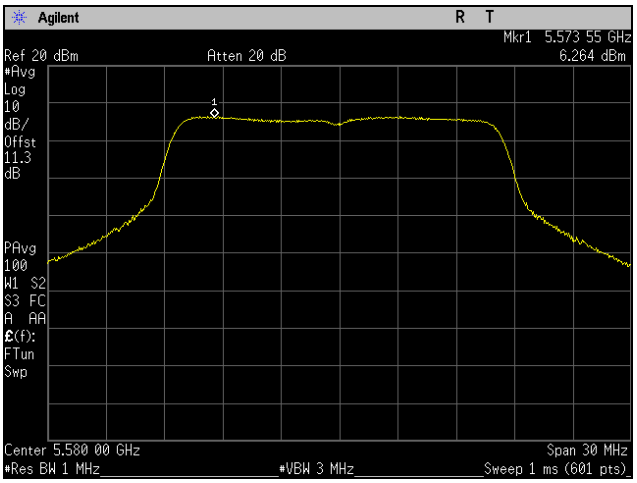
Plot 201. Peak Power Spectral Density, 5300 MHz, 802.11n 20 MHz, Port 3



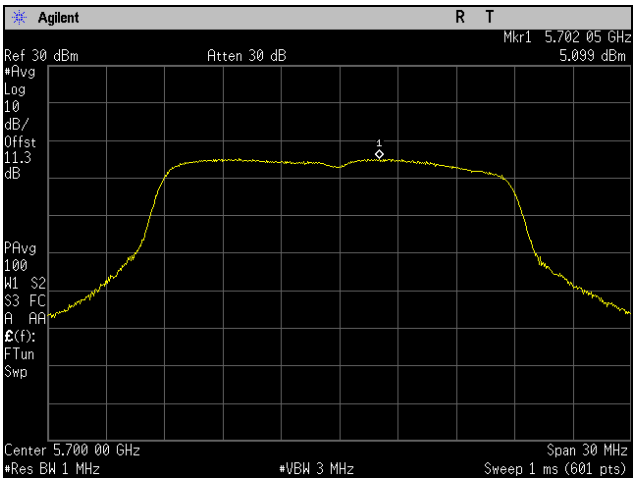
Plot 202. Peak Power Spectral Density, 5320 MHz, 802.11n 20 MHz, Port 3



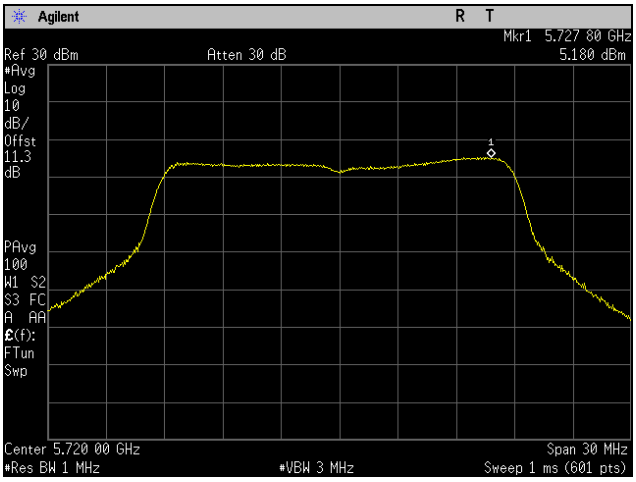
Plot 203. Peak Power Spectral Density, 5500 MHz, 802.11n 20 MHz, Port 3



Plot 204. Peak Power Spectral Density, 5580 MHz, 802.11n 20 MHz, Port 3

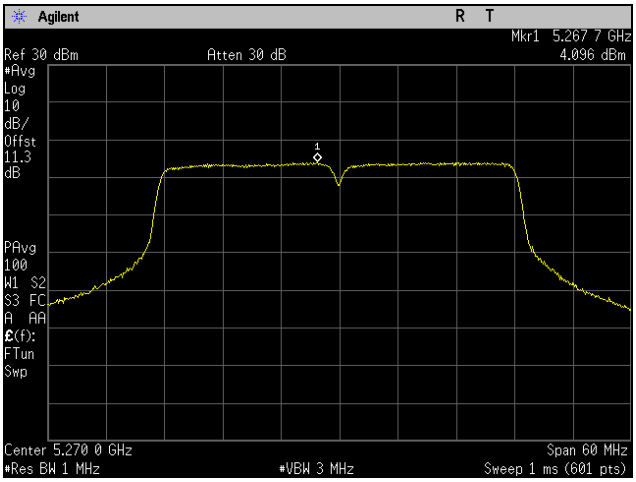


Plot 205. Peak Power Spectral Density, 5700 MHz, 802.11n 20 MHz, Port 3

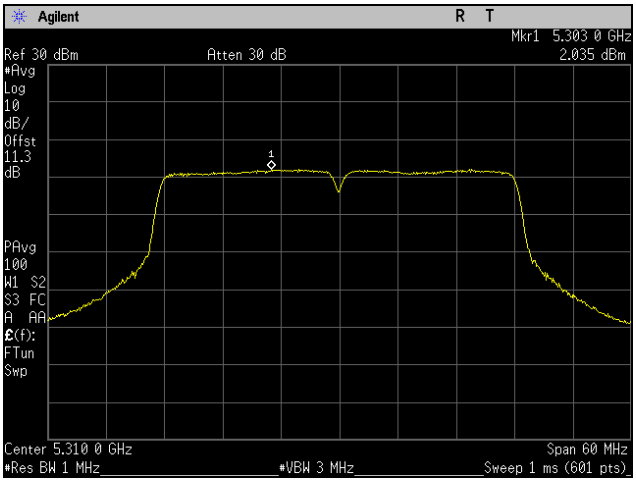


Plot 206. Peak Power Spectral Density, 5720 MHz, 802.11n 20 MHz, Port 3

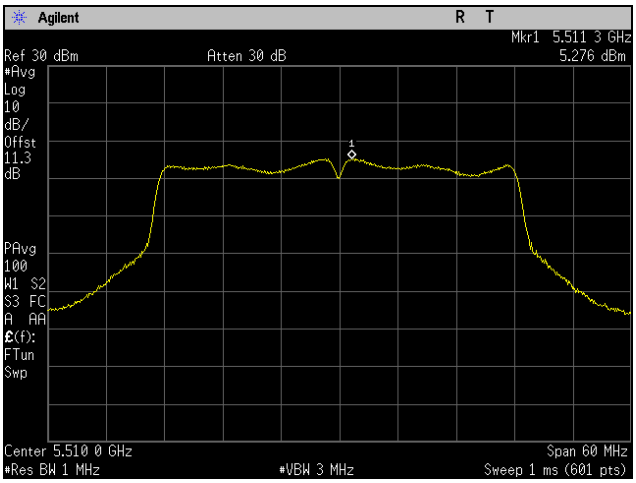
Peak Power Spectral Density, 802.11ac 40 MHz, Port 3



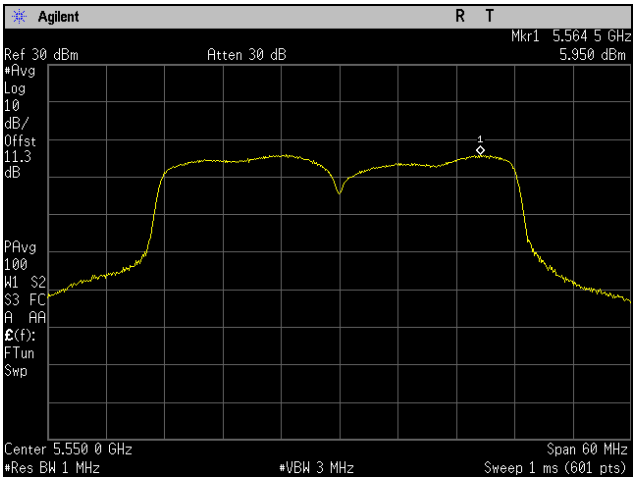
Plot 207. Peak Power Spectral Density, 5270 MHz, 802.11ac 40 MHz, Port 3



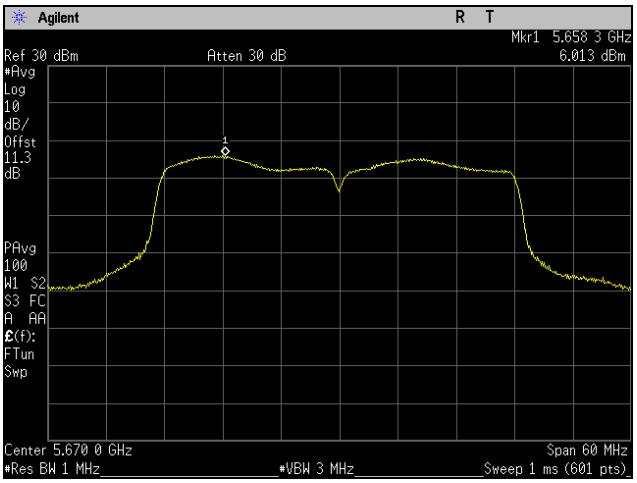
Plot 208. Peak Power Spectral Density, 5310 MHz, 802.11ac 40 MHz, Port 3



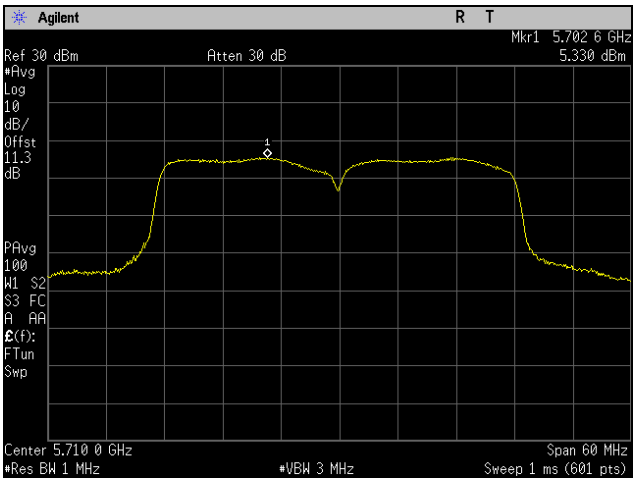
Plot 209. Peak Power Spectral Density, 5510 MHz, 802.11ac 40 MHz, Port 3



Plot 210. Peak Power Spectral Density, 5550 MHz, 802.11ac 40 MHz, Port 3

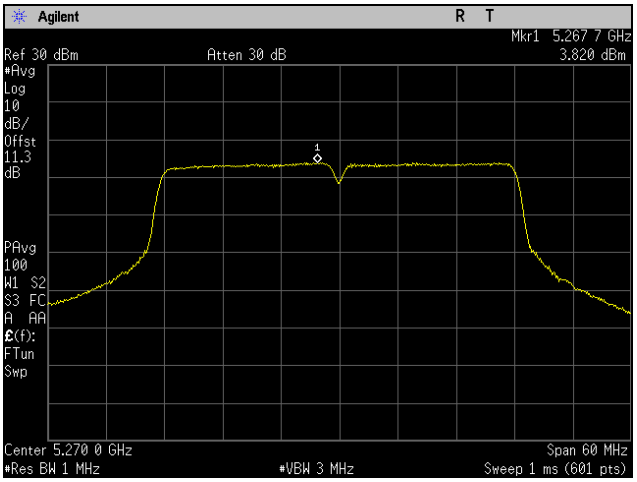


Plot 211. Peak Power Spectral Density, 5670 MHz, 802.11ac 40 MHz, Port 3

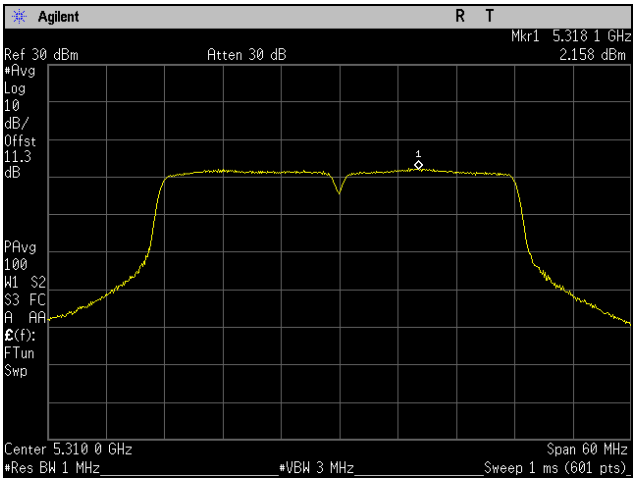


Plot 212. Peak Power Spectral Density, 5710 MHz, 802.11ac 40 MHz, Port 3

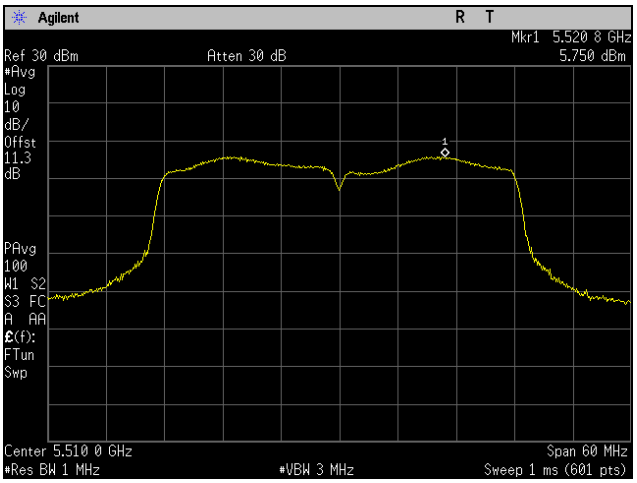
Peak Power Spectral Density, 802.11n 40 MHz, Port 3



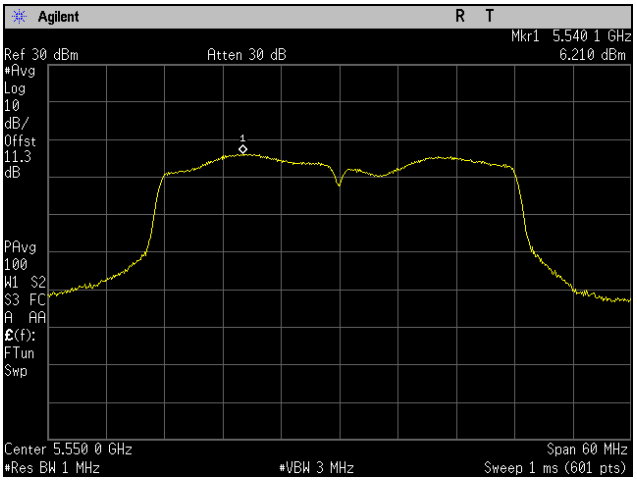
Plot 213. Peak Power Spectral Density, 5270 MHz, 802.11n 40 MHz, Port 3



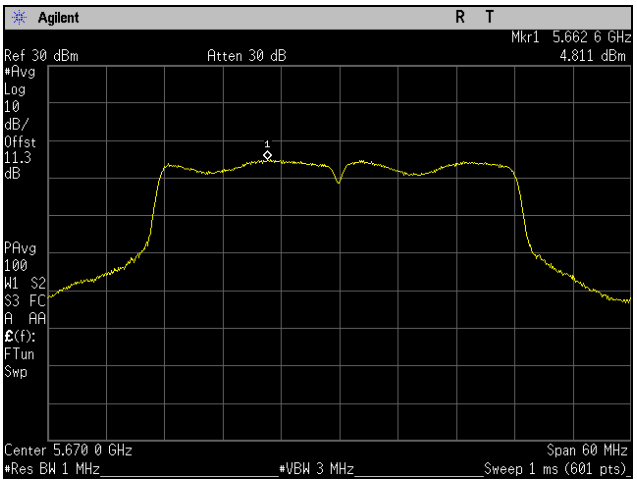
Plot 214. Peak Power Spectral Density, 5310 MHz, 802.11n 40 MHz, Port 3



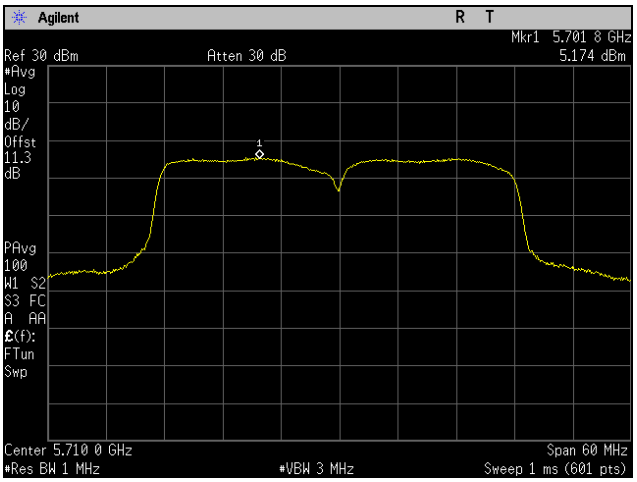
Plot 215. Peak Power Spectral Density, 5510 MHz, 802.11n 40 MHz, Port 3



Plot 216. Peak Power Spectral Density, 5550 MHz, 802.11n 40 MHz, Port 3

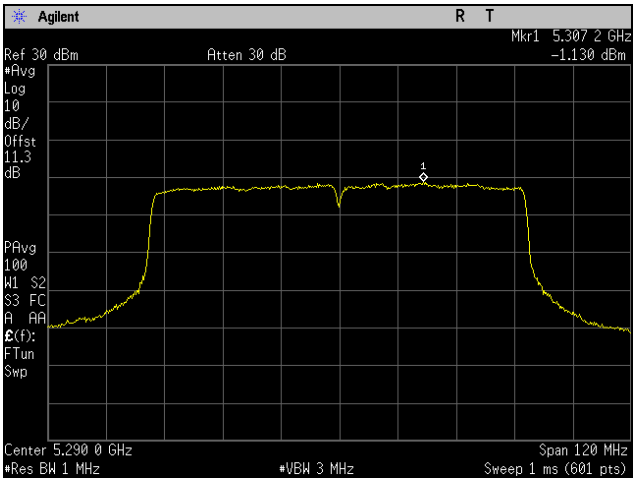


Plot 217. Peak Power Spectral Density, 5670 MHz, 802.11n 40 MHz, Port 3

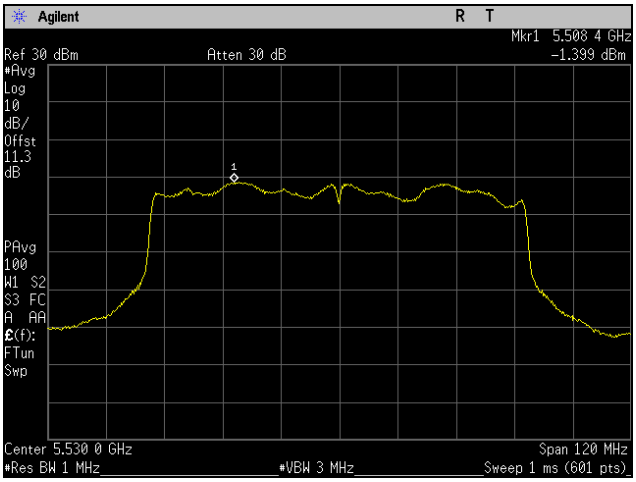


Plot 218. Peak Power Spectral Density, 5710 MHz, 802.11n 40 MHz, Port 3

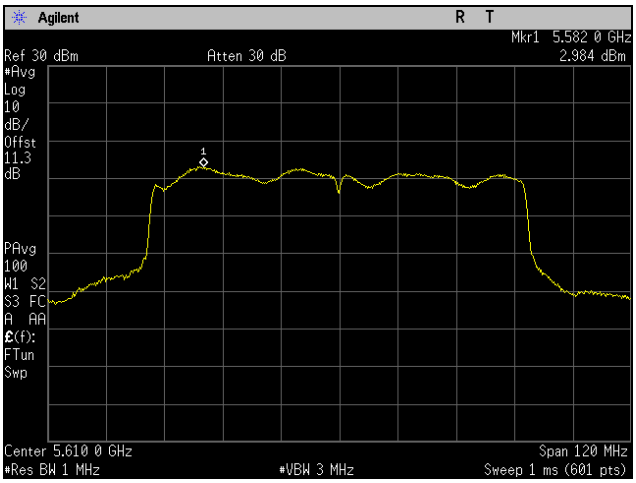
Peak Power Spectral Density, 802.11ac 80 MHz, Port 3



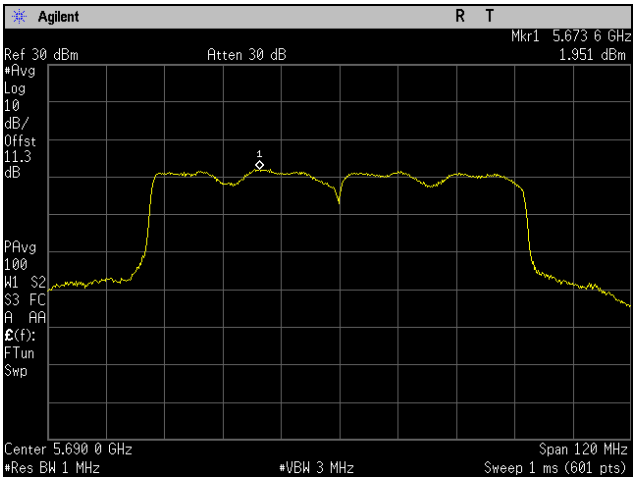
Plot 219. Peak Power Spectral Density, 5290 MHz, 802.11ac 80 MHz, Port 3



Plot 220. Peak Power Spectral Density, 5530 MHz, 802.11ac 80 MHz, Port 3



Plot 221. Peak Power Spectral Density, 5610 MHz, 802.11ac 80 MHz, Port 3



Plot 222. Peak Power Spectral Density, 5690 MHz, 802.11ac 80 MHz, Port 3

Electromagnetic Compatibility Criteria for Intentional Radiators

§15.407(b)(2 – 3) & (6 – 7) Undesirable Emissions

Test Requirements:

§ 15.407(b)(2): For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

§ 15.407(b)(3): For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

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

§ 15.407(b)(7): The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Test Procedure:

The EUT was placed on a non-conducting stand on a turntable in a chamber. To find the maximum emission the EUT was set to transmit on low, mid, and high channels. Additionally, the turntable was rotated 360 degrees, the EUT was oriented through its three orthogonal axes, and the receive antenna height was varied in order to maximize emissions.

For frequencies from 30 MHz to 1 GHz, measurements were first made using a peak detector with a 100 kHz resolution bandwidth. Emissions which exceeded the limits were re-measured using a quasi-peak detector with a 120 kHz resolution bandwidth.

Above 1 GHz, measurements were made pursuant the method described in FCC KDB 789033 D02 General UNII Test Procedure New Rules v01 r02. The equation, **EIRP= E + 20 log D – 104.8** was used to convert field strength to EIRP (**E** = field strength (dBµV/m) and **D** = Reference measurement distance**).**

For emissions above 1 GHz and in restricted bands, measurements of the field strength were made with a peak detector and an average detector and compared with the limits of 15.209.

As an alternative, according to FCC KDB 789033 D02 General UNII Test Procedure New Rules v01 r02, all emissions above 1 GHz that comply with the peak and average limits of 15.209 satisfy the requirements of unwanted emissions in 15.407.

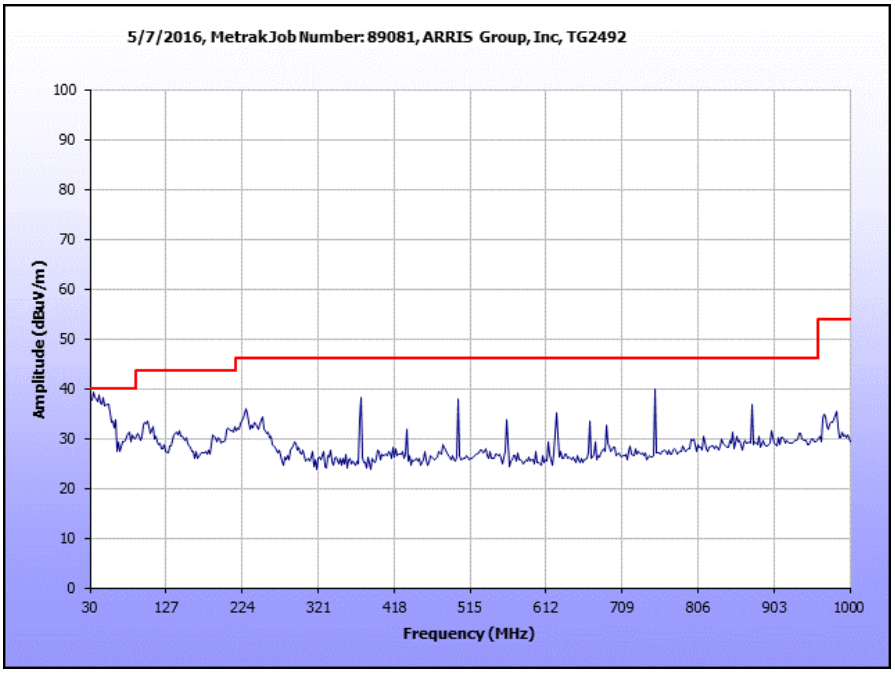
Test Results:

For below 1 GHz, the EUT was compliant with the requirements of this section.

For above 1 GHz, the EUT was compliant with the requirements of this section. Only noise floor was observed above 18GHz.
Note: ,The Amplitude scale on all emission plots referenced to Electric field strength(dBuV) level @ 3 meter measurement distance

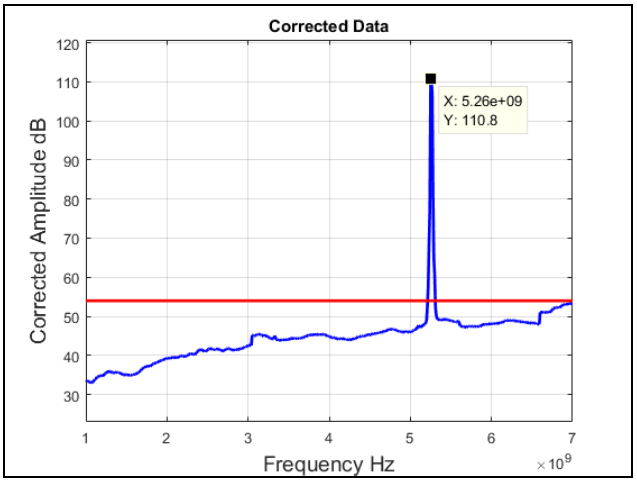
Test Engineer(s): Surinder Singh

Test Date(s): 04/22/16

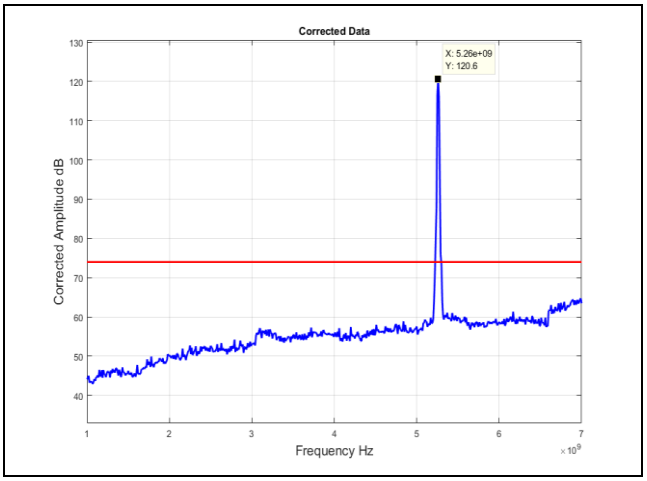


Plot 223. Radiated Spurious Emissions, 30 MHz – 1 GHz, Worst Case

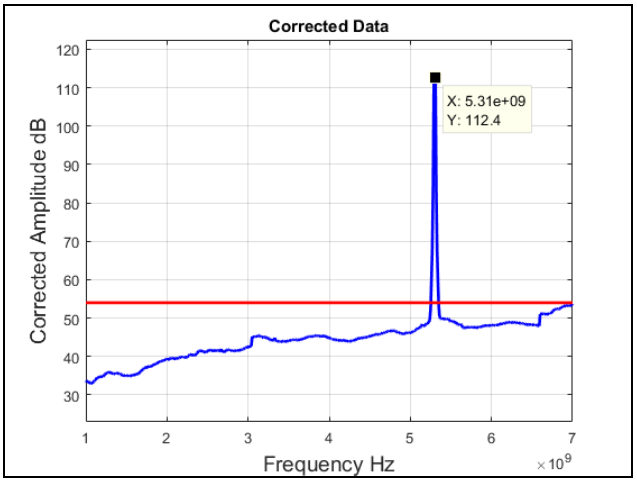
Radiated Spurious Emissions, 802.11a



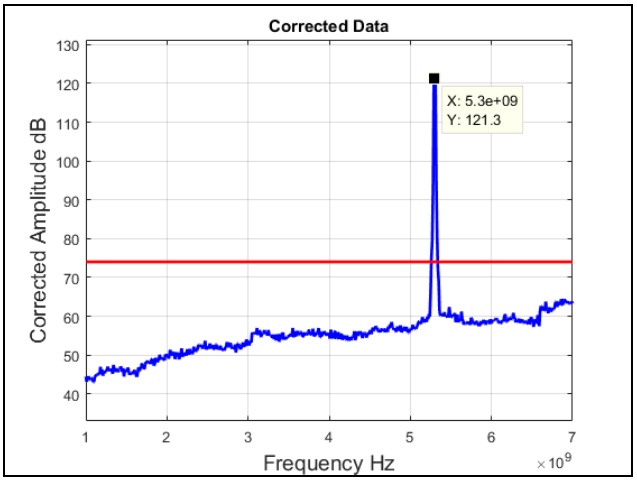
Plot 224. Radiated Spurious Emissions, 5260 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Average



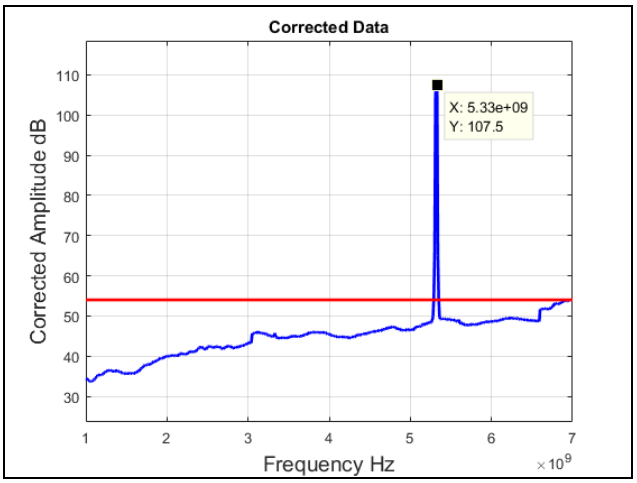
Plot 225. Radiated Spurious Emissions, 5260 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Peak



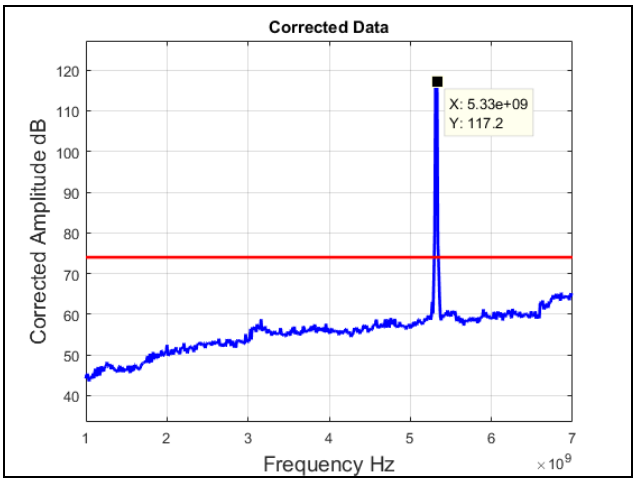
Plot 226. Radiated Spurious Emissions, 5300 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Average



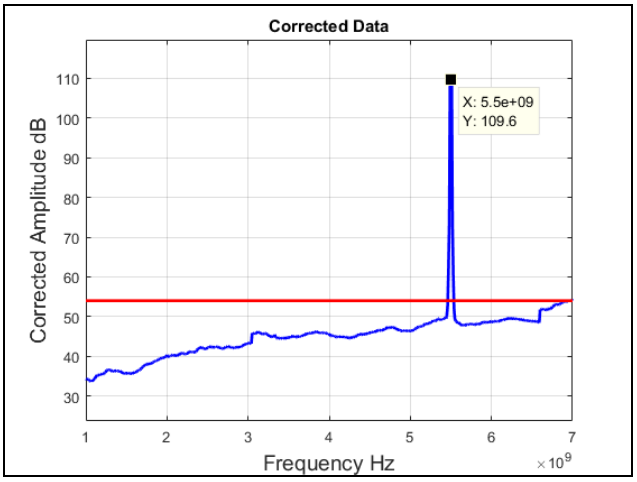
Plot 227. Radiated Spurious Emissions, 5300 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Peak



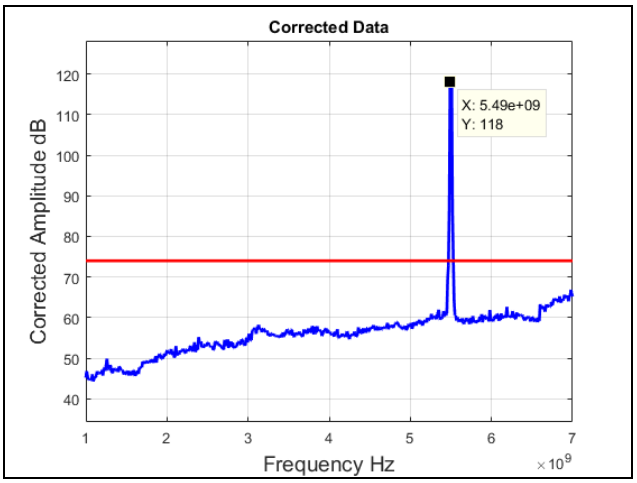
Plot 228. Radiated Spurious Emissions, 5320 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Average



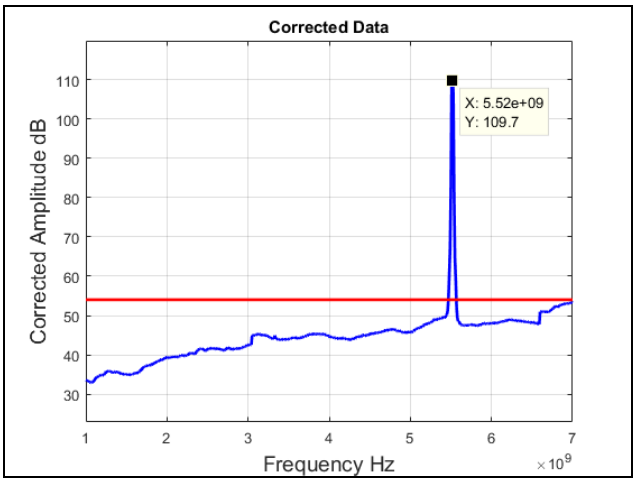
Plot 229. Radiated Spurious Emissions, 5320 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Peak



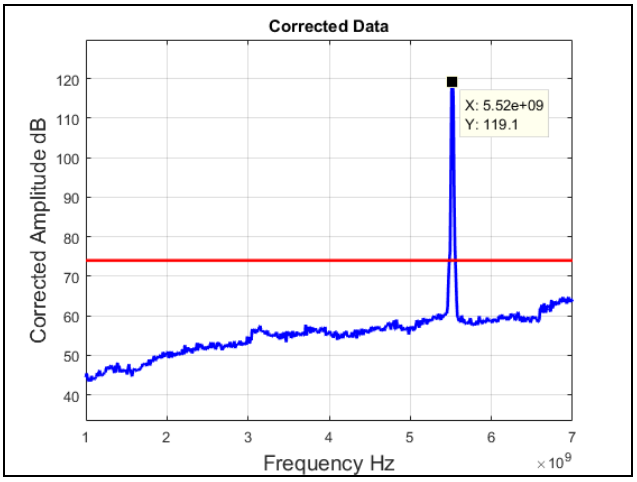
Plot 230. Radiated Spurious Emissions, 5500 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Average



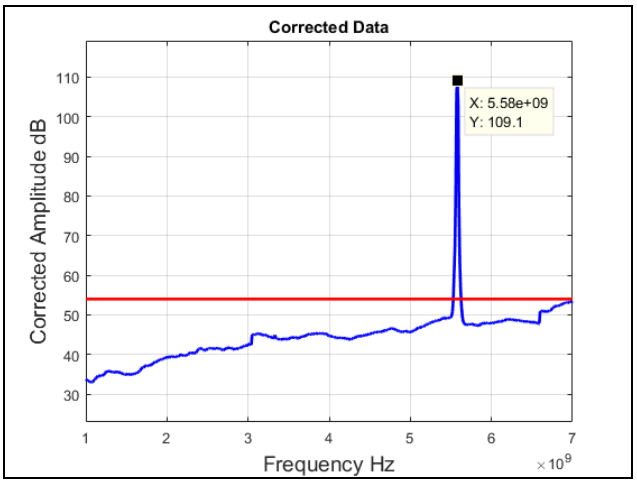
Plot 231. Radiated Spurious Emissions, 5500 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Peak



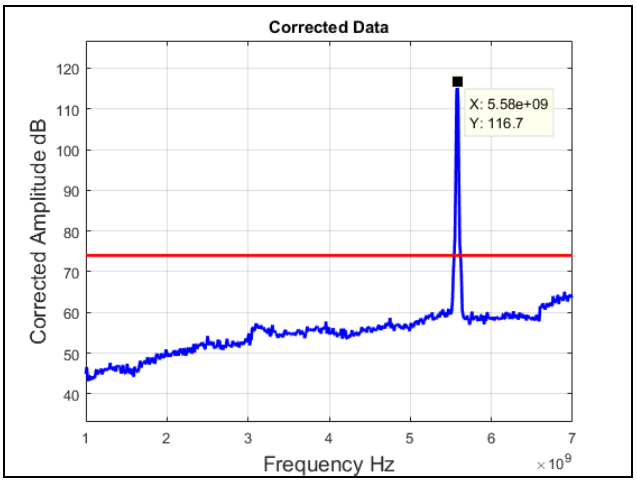
Plot 232. Radiated Spurious Emissions, 5520 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Average



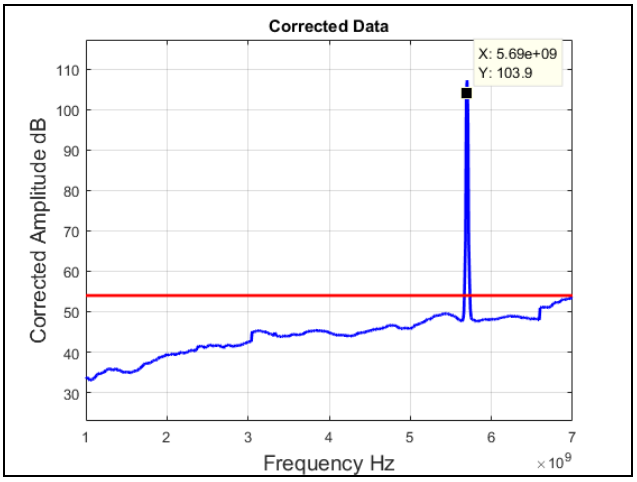
Plot 233. Radiated Spurious Emissions, 5520 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Peak



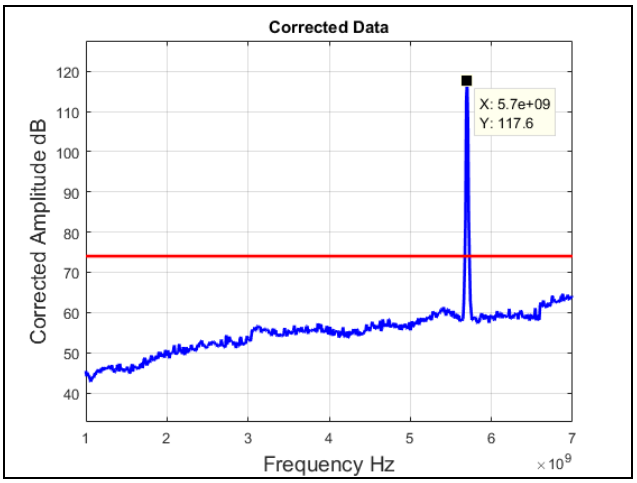
Plot 234. Radiated Spurious Emissions, 5580 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Average



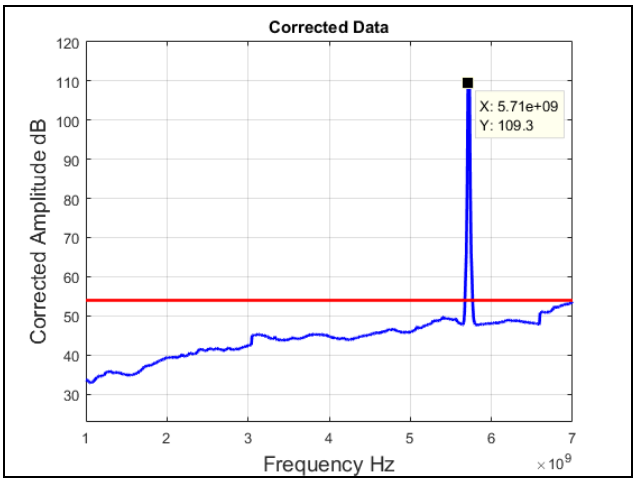
Plot 235. Radiated Spurious Emissions, 5580 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Peak



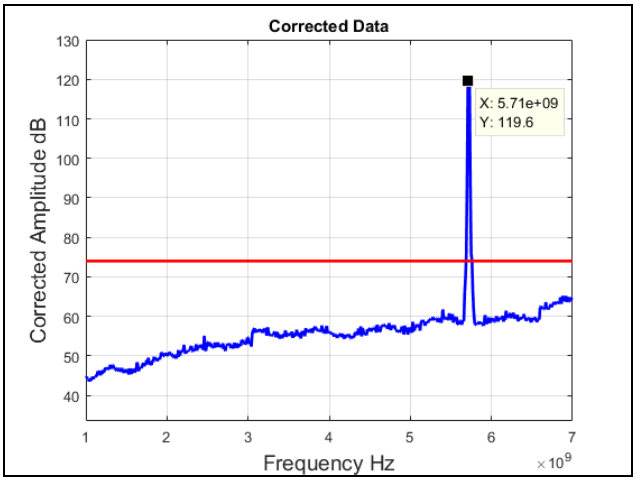
Plot 236. Radiated Spurious Emissions, 5700 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Average



Plot 237. Radiated Spurious Emissions, 5700 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Peak

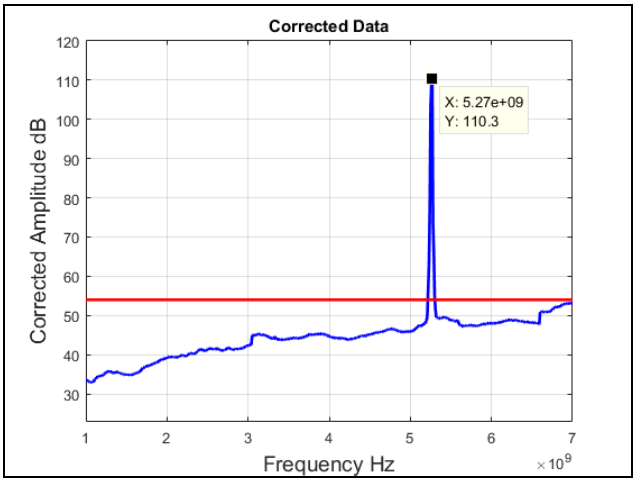


Plot 238. Radiated Spurious Emissions, 5720 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Average

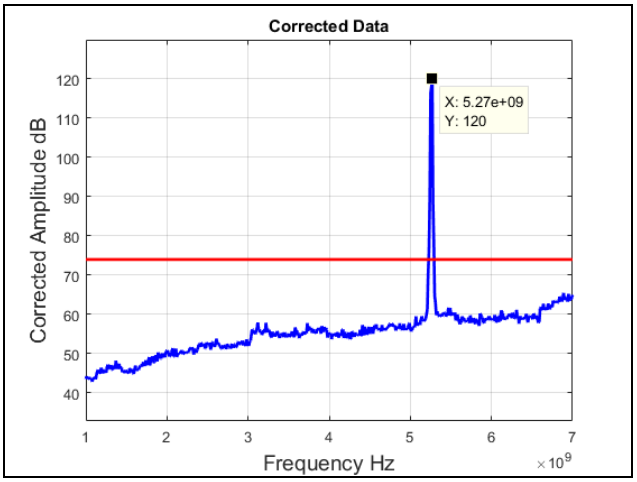


Plot 239. Radiated Spurious Emissions, 5720 MHz, 802.11a 20 MHz, 1 GHz – 7 GHz, Peak

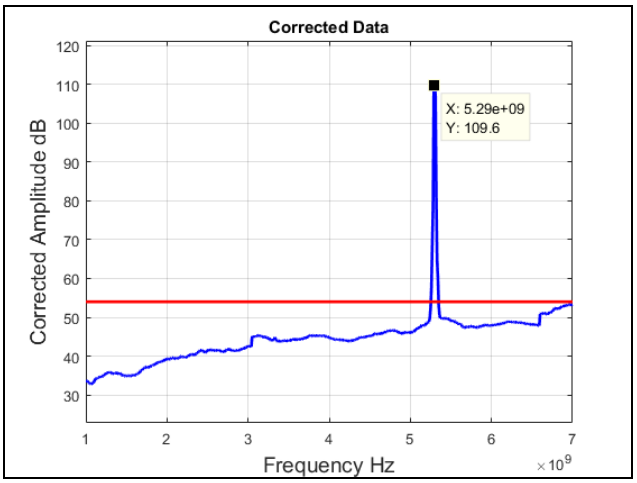
Radiated Spurious Emissions, 802.11ac 20 MHz



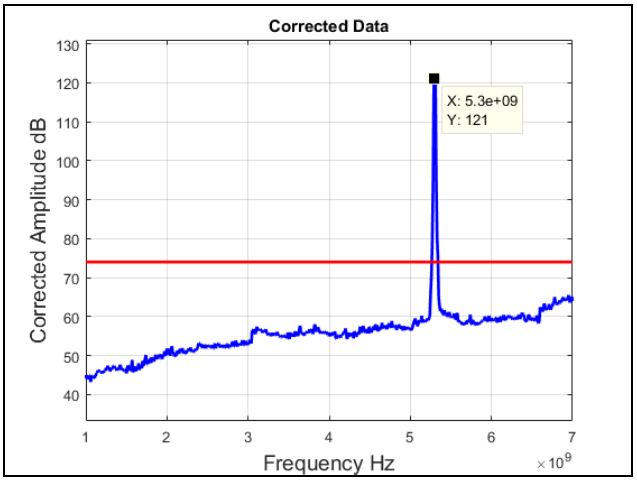
Plot 240. Radiated Spurious Emissions, 5260 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Average



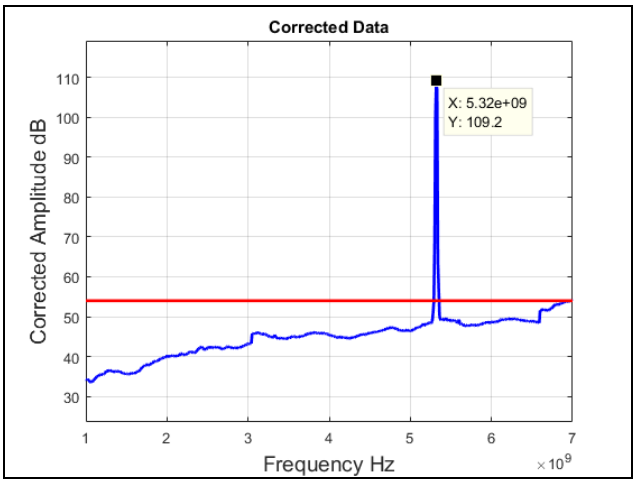
Plot 241. Radiated Spurious Emissions, 5260 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Peak



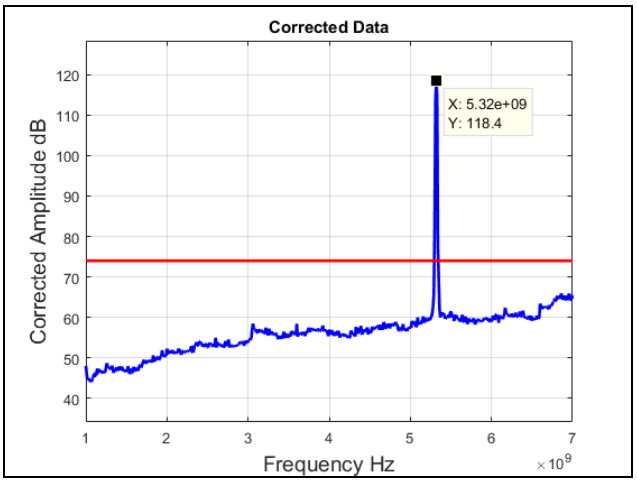
Plot 242. Radiated Spurious Emissions, 5300 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Average



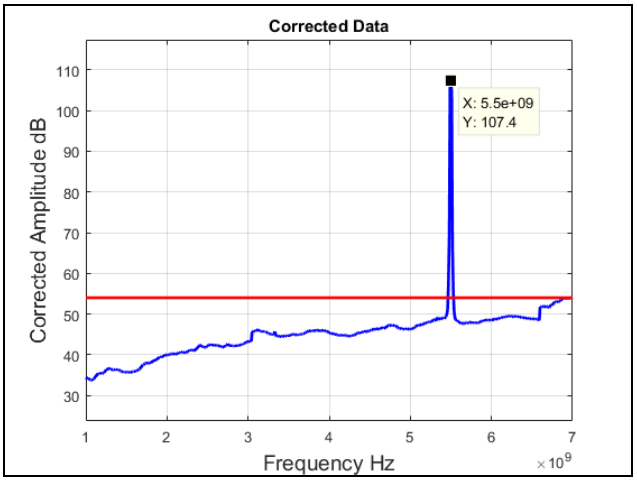
Plot 243. Radiated Spurious Emissions, 5300 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Peak



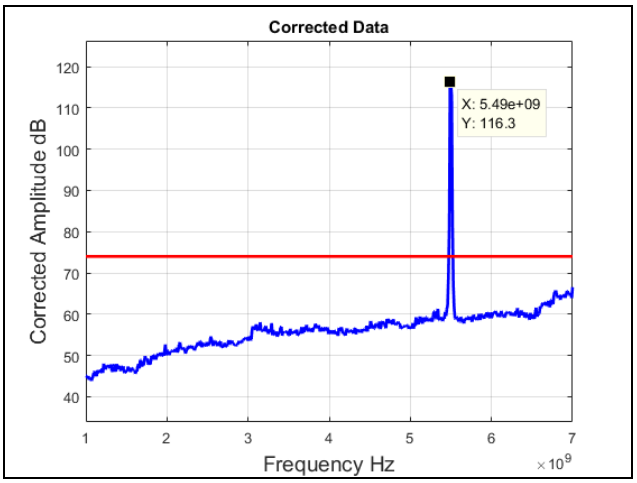
Plot 244. Radiated Spurious Emissions, 5320 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Average



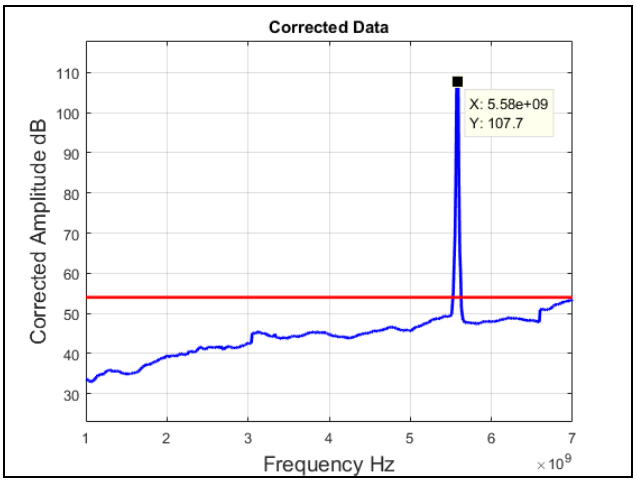
Plot 245. Radiated Spurious Emissions, 5320 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Peak



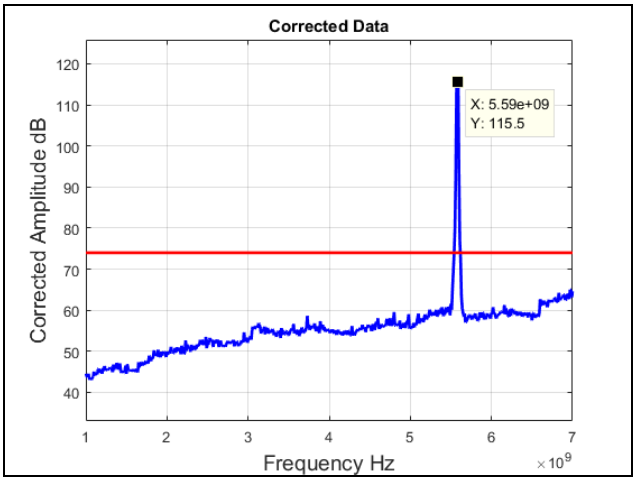
Plot 246. Radiated Spurious Emissions, 5500 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Average



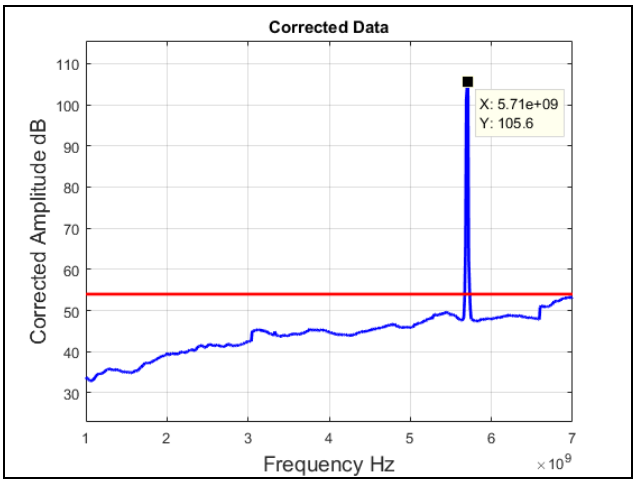
Plot 247. Radiated Spurious Emissions, 5500 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Peak



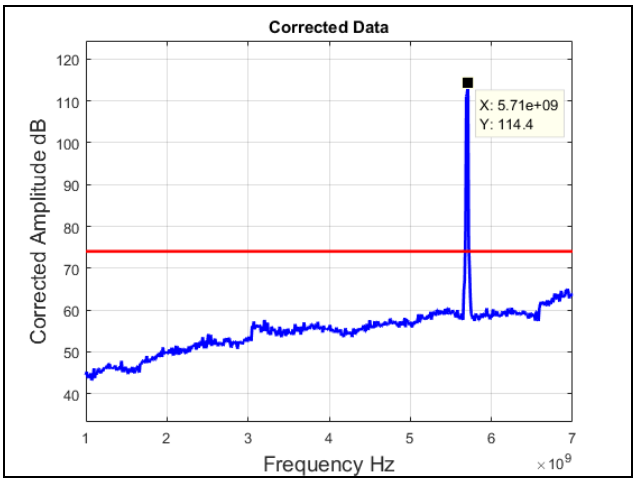
Plot 248. Radiated Spurious Emissions, 5580 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Average



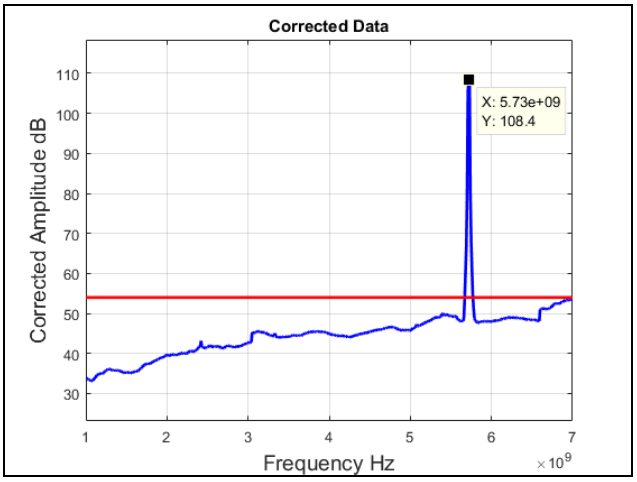
Plot 249. Radiated Spurious Emissions, 5580 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Peak



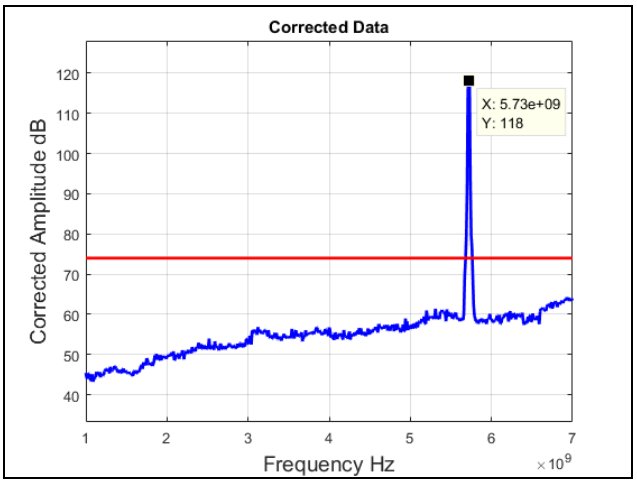
Plot 250. Radiated Spurious Emissions, 5700 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Average



Plot 251. Radiated Spurious Emissions, 5700 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Peak

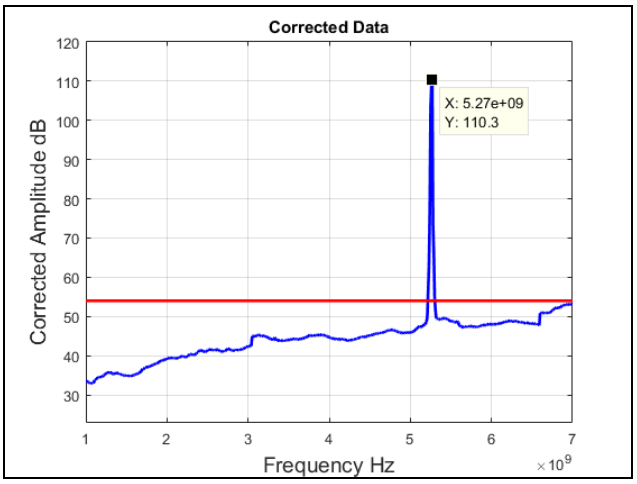


Plot 252. Radiated Spurious Emissions, 5720 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Average

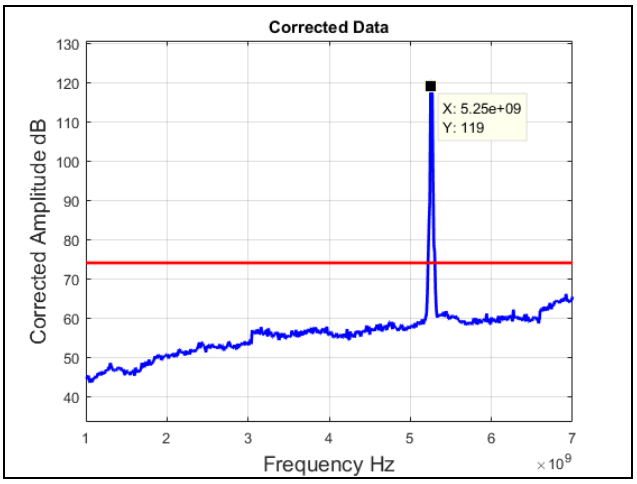


Plot 253. Radiated Spurious Emissions, 5720 MHz, 802.11ac 20 MHz, 1 GHz – 7 GHz, Peak

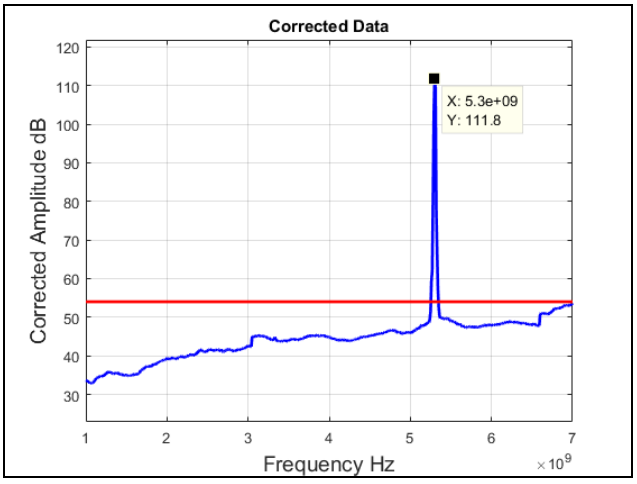
Radiated Spurious Emissions, 802.11n 20 MHz



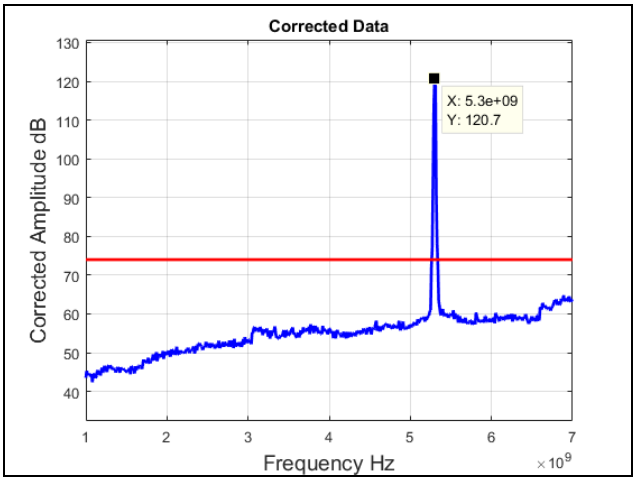
Plot 254. Radiated Spurious Emissions, 5260 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Average



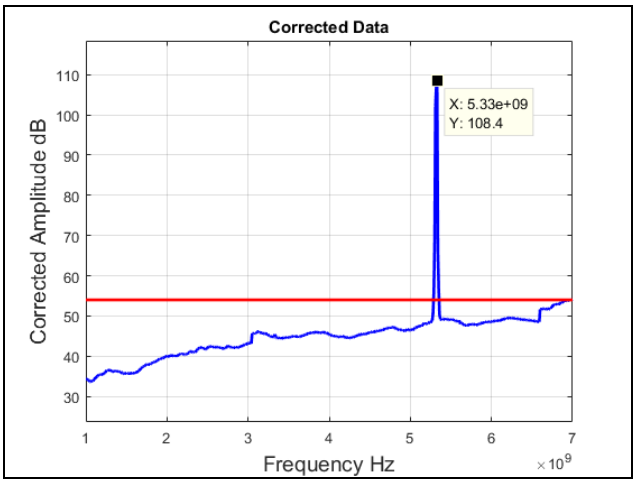
Plot 255. Radiated Spurious Emissions, 5260 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Peak



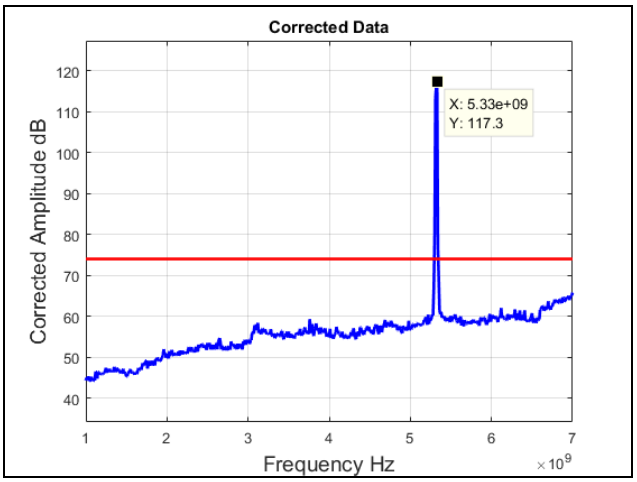
Plot 256. Radiated Spurious Emissions, 5300 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Average



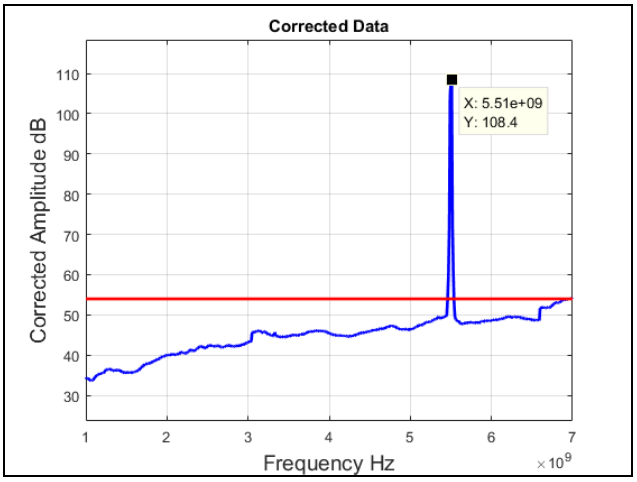
Plot 257. Radiated Spurious Emissions, 5300 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Peak



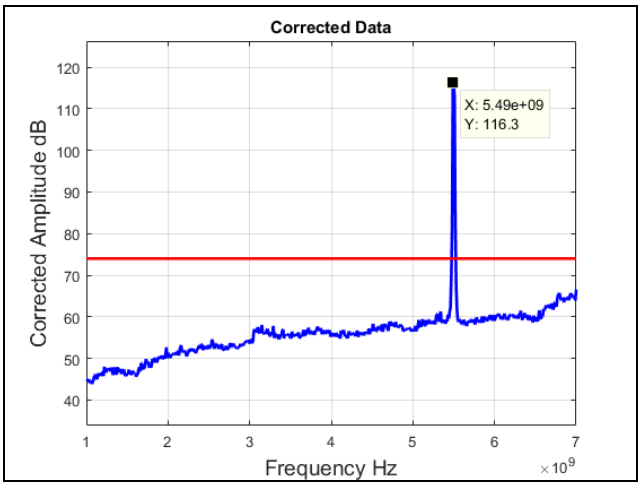
Plot 258. Radiated Spurious Emissions, 5320 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Average



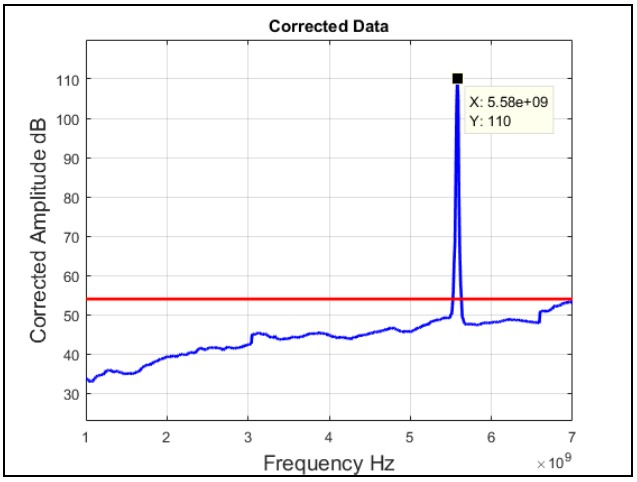
Plot 259. Radiated Spurious Emissions, 5320 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Peak



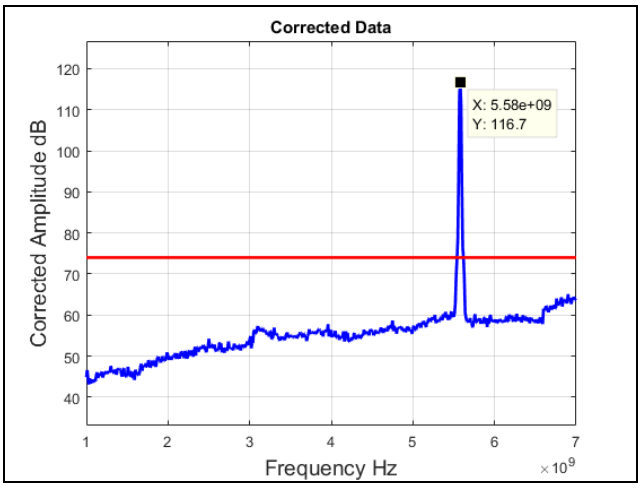
Plot 260. Radiated Spurious Emissions, 5500 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Average



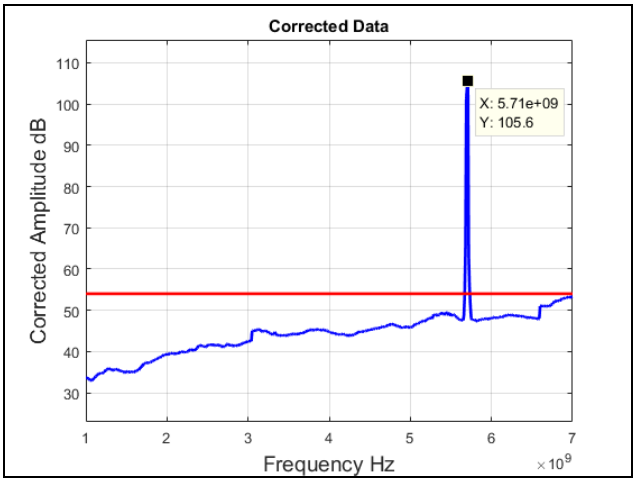
Plot 261. Radiated Spurious Emissions, 5500 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Peak



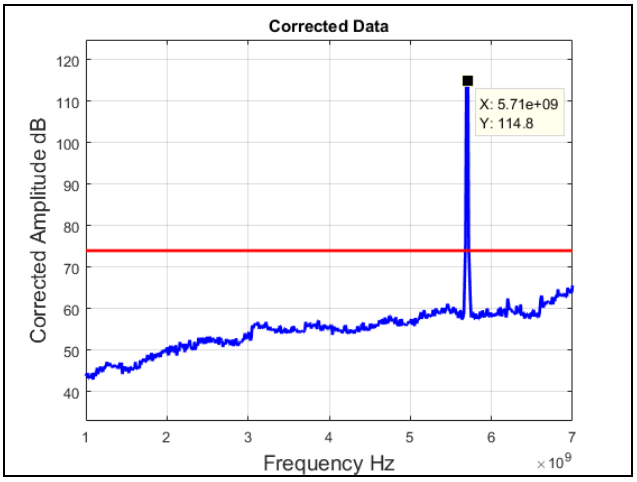
Plot 262. Radiated Spurious Emissions, 5580 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Average



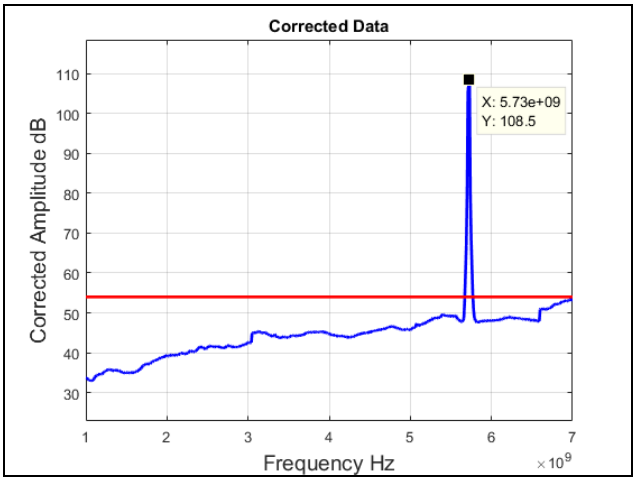
Plot 263. Radiated Spurious Emissions, 5580 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Peak



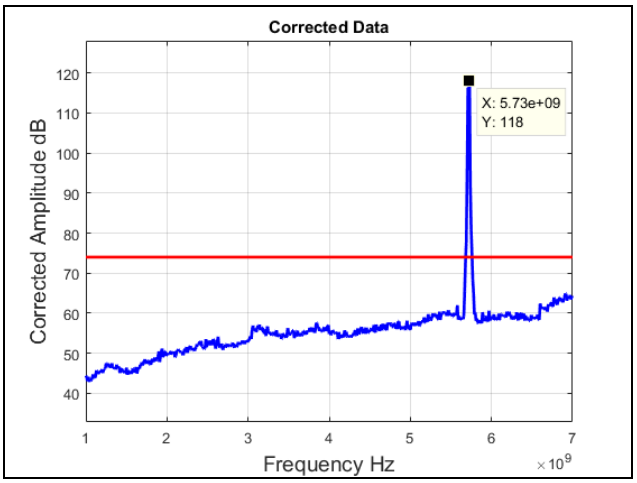
Plot 264. Radiated Spurious Emissions, 5700 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Average



Plot 265. Radiated Spurious Emissions, 5700 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Peak

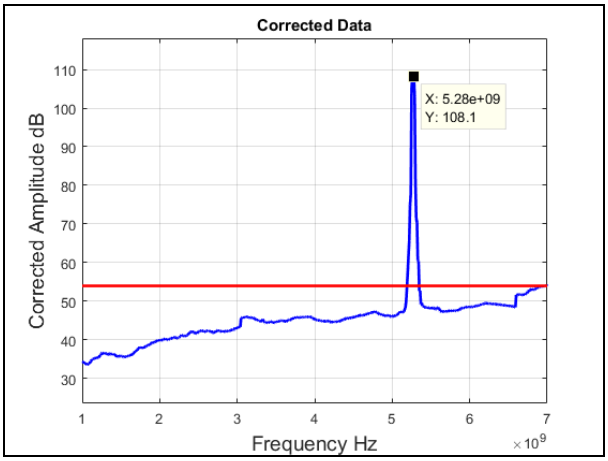


Plot 266. Radiated Spurious Emissions, 5720 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Average

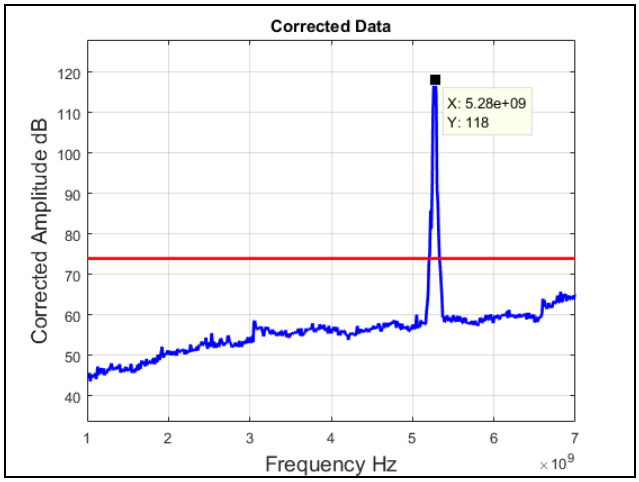


Plot 267. Radiated Spurious Emissions, 5720 MHz, 802.11n 20 MHz, 1 GHz – 7 GHz, Peak

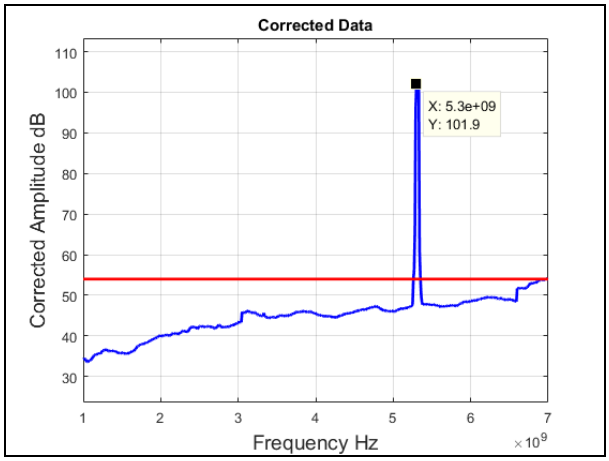
Radiated Spurious Emissions, 802.11ac 40 MHz



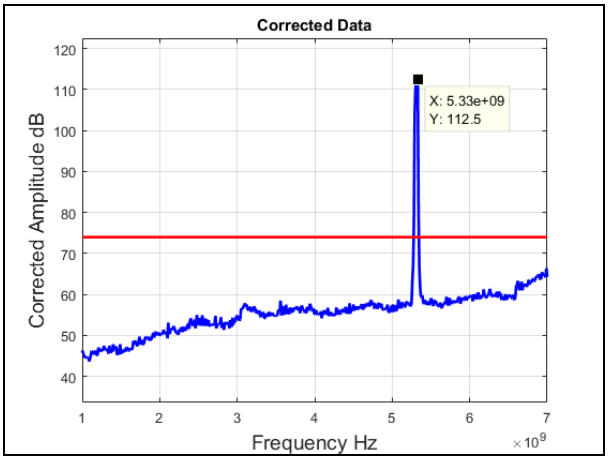
Plot 268. Radiated Spurious Emissions, 5270 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Average



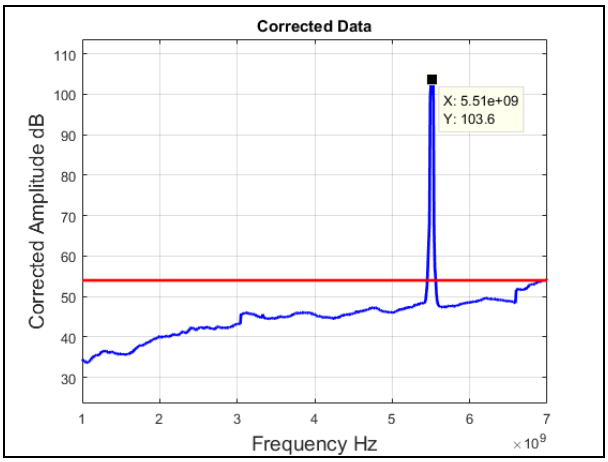
Plot 269. Radiated Spurious Emissions, 5270 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Peak



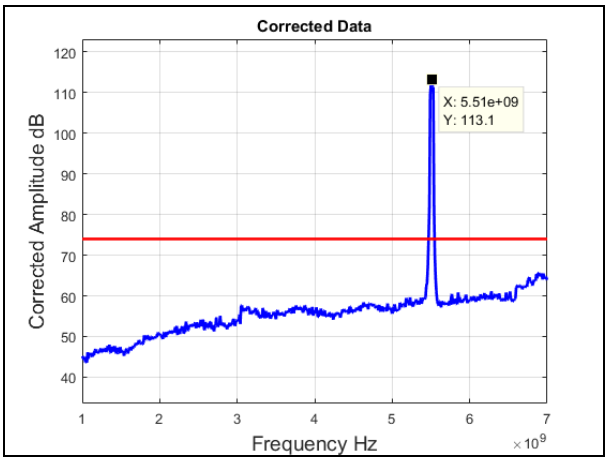
Plot 270. Radiated Spurious Emissions, 5310 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Average



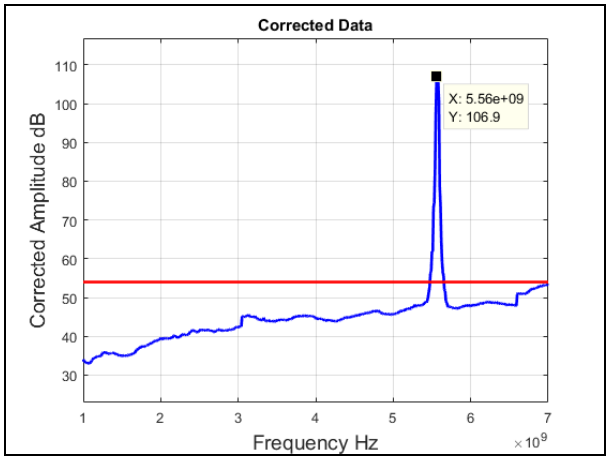
Plot 271. Radiated Spurious Emissions, 5310 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Peak



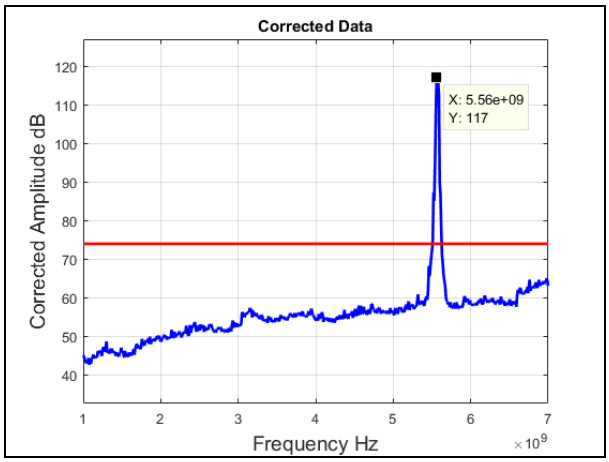
Plot 272. Radiated Spurious Emissions, 5510 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Average



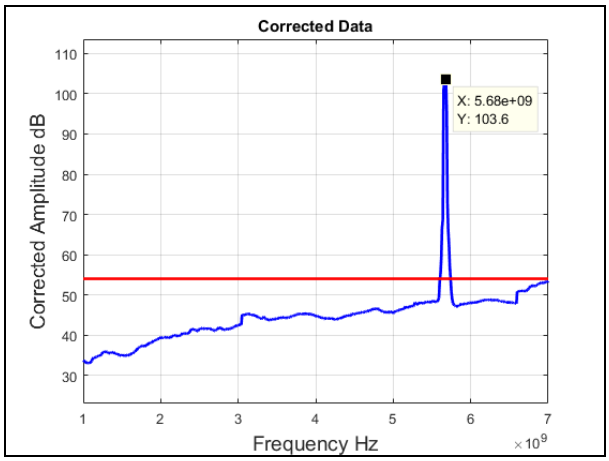
Plot 273. Radiated Spurious Emissions, 5510 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Peak



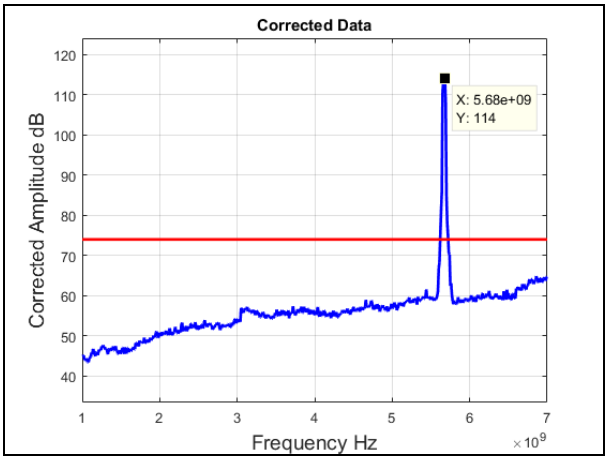
Plot 274. Radiated Spurious Emissions, 5570 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Average



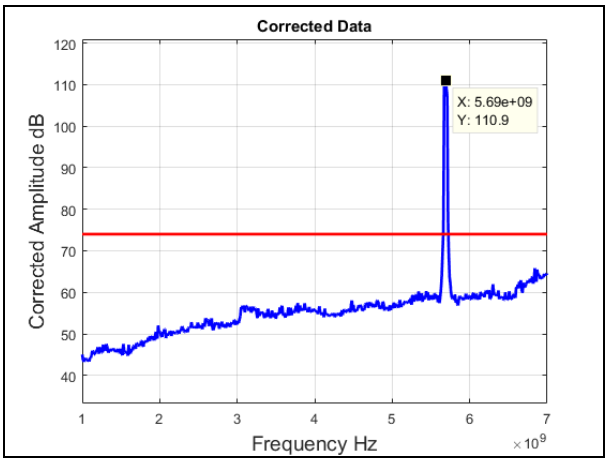
Plot 275. Radiated Spurious Emissions, 5570 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Peak



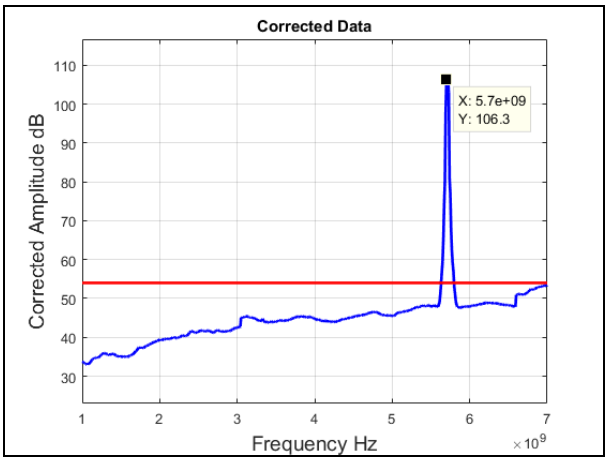
Plot 276. Radiated Spurious Emissions, 5670 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Average



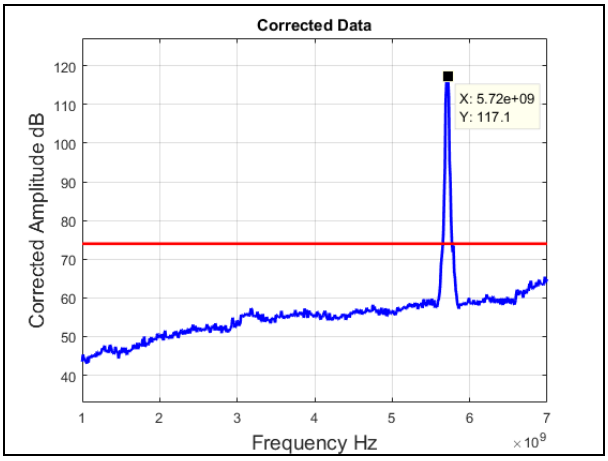
Plot 277. Radiated Spurious Emissions, 5670 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Peak



Plot 278. Radiated Spurious Emissions, 5690 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Peak

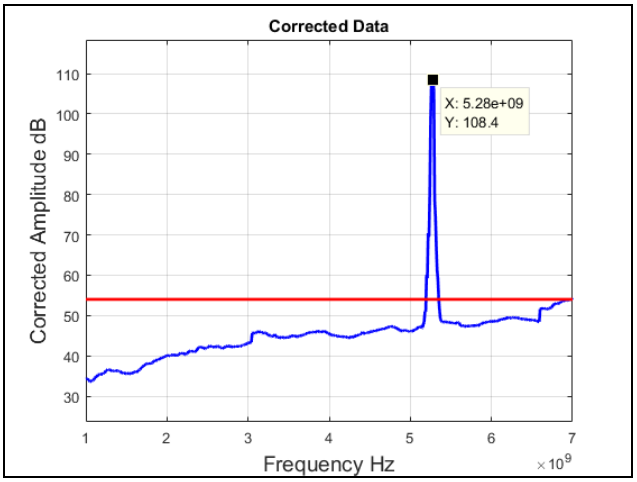


Plot 279. Radiated Spurious Emissions, 5710 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Average

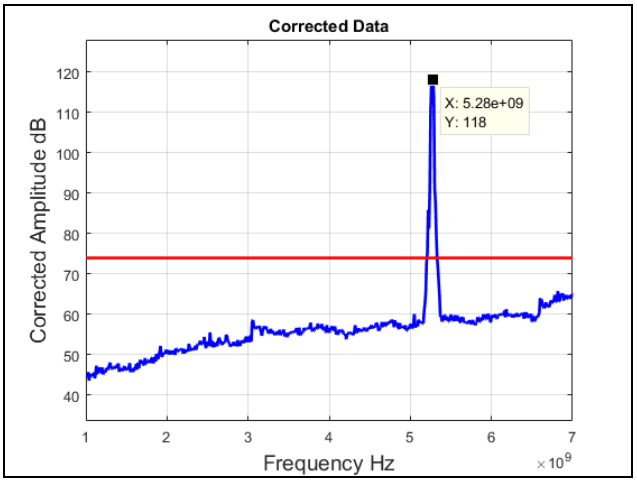


Plot 280. Radiated Spurious Emissions, 5710 MHz, 802.11ac 40 MHz, 1 GHz – 7 GHz, Peak

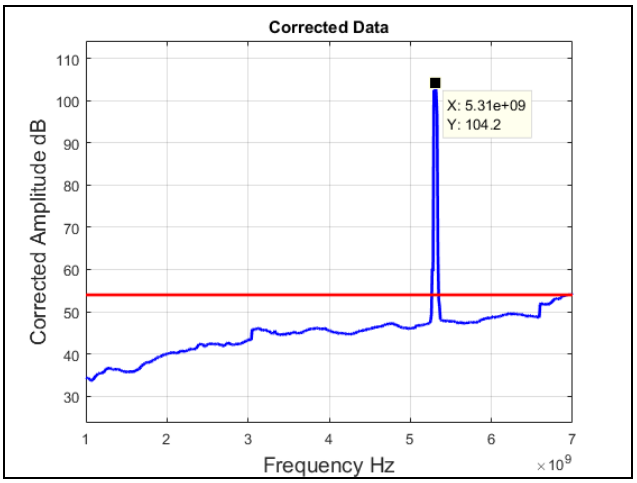
Radiated Spurious Emissions, 802.11n 40 MHz



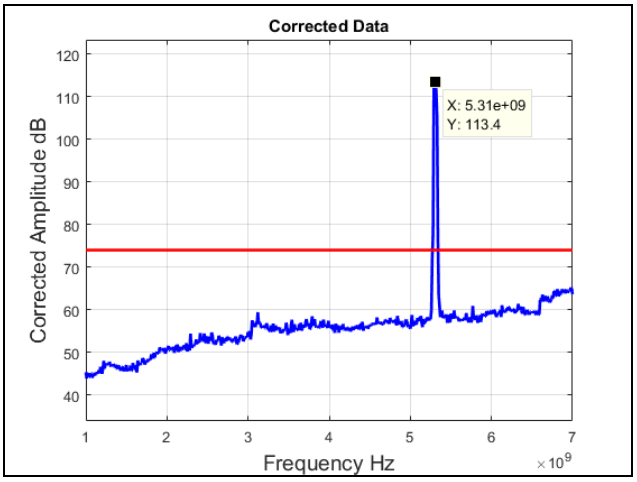
Plot 281. Radiated Spurious Emissions, 5270 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Average



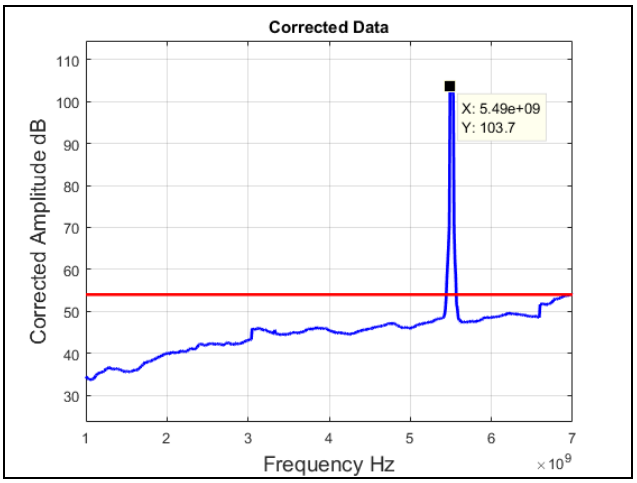
Plot 282. Radiated Spurious Emissions, 5270 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Peak



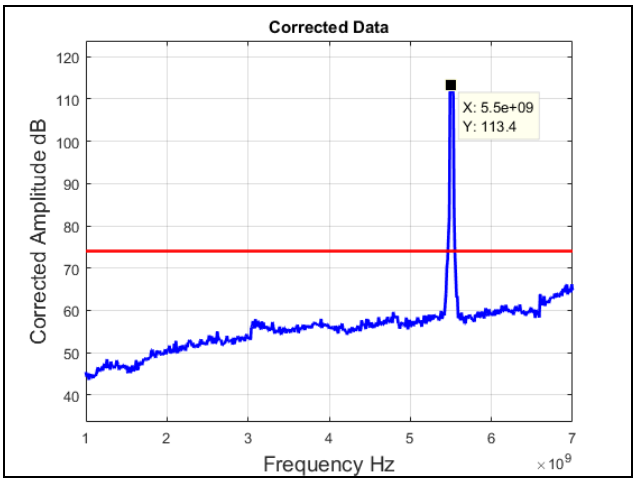
Plot 283. Radiated Spurious Emissions, 5310 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Average



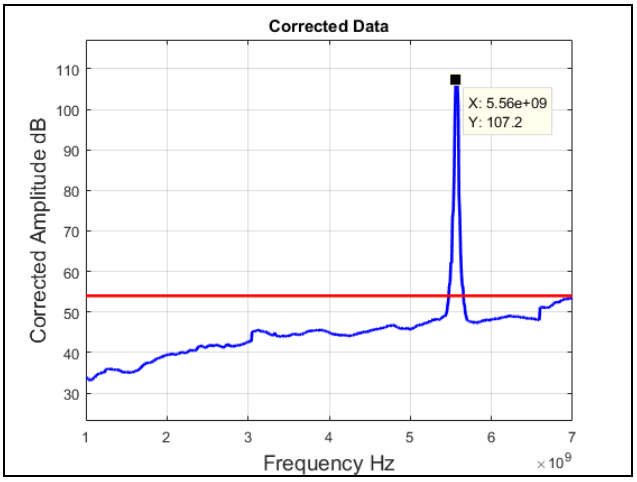
Plot 284. Radiated Spurious Emissions, 5310 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Peak



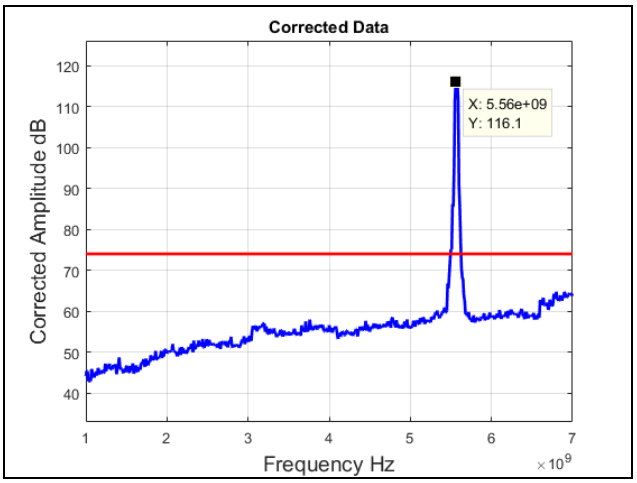
Plot 285. Radiated Spurious Emissions, 5510 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Average



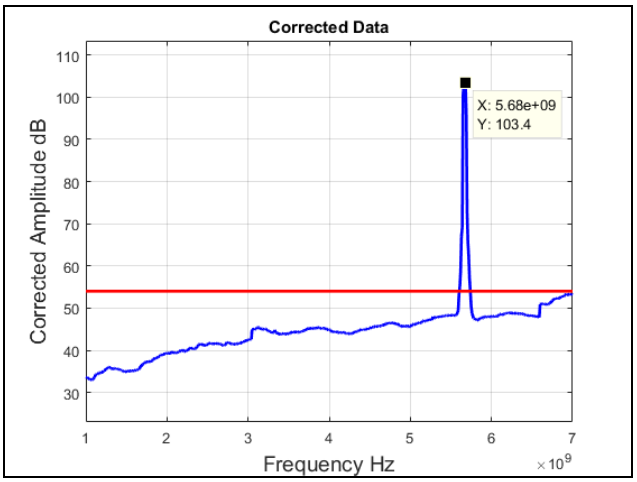
Plot 286. Radiated Spurious Emissions, 5510 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Peak



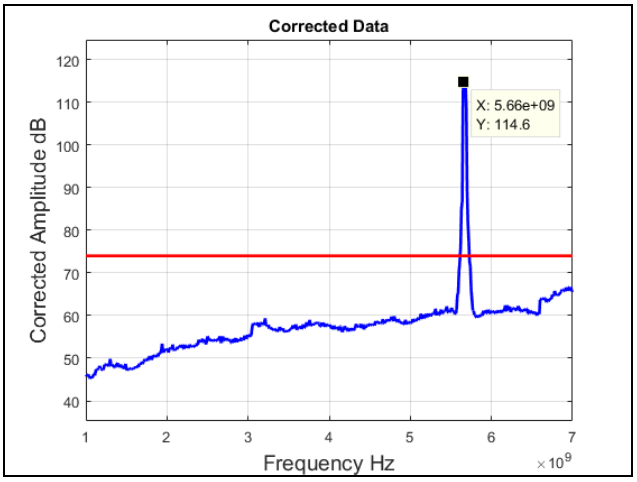
Plot 287. Radiated Spurious Emissions, 5570 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Average



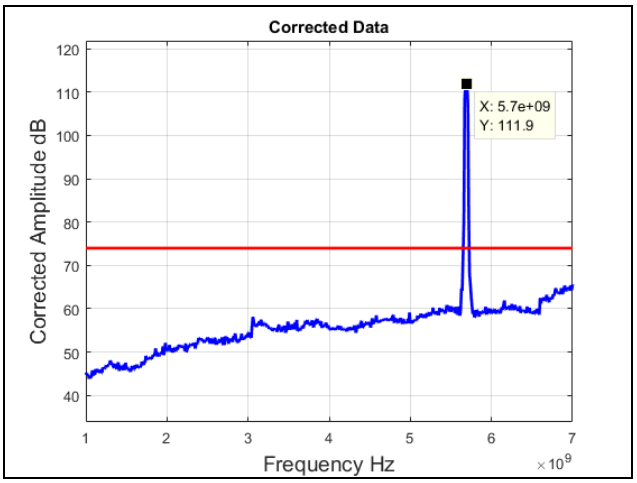
Plot 288. Radiated Spurious Emissions, 5570 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Peak



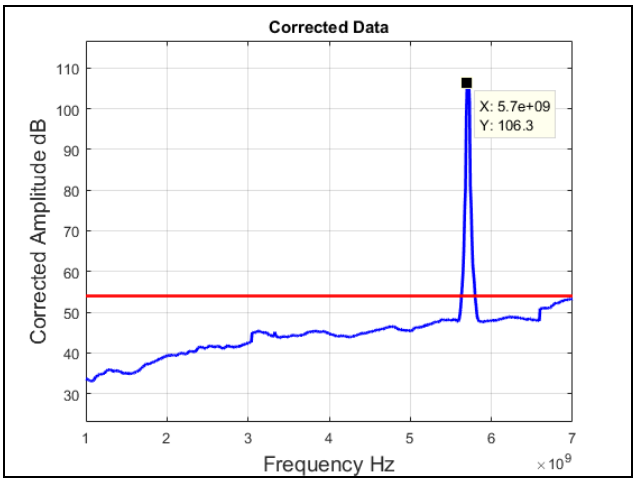
Plot 289. Radiated Spurious Emissions, 5670 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Average



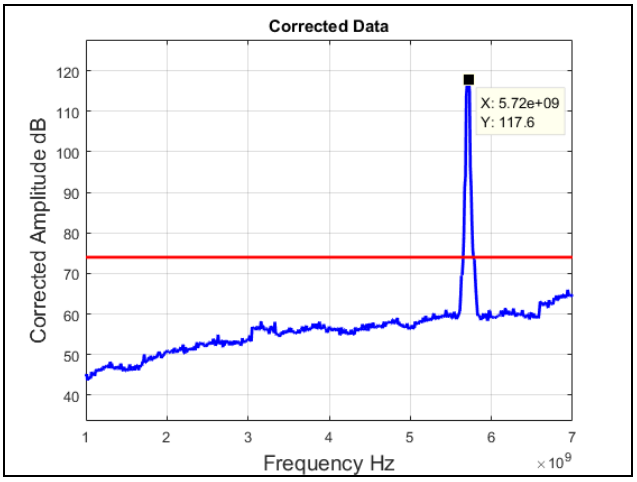
Plot 290. Radiated Spurious Emissions, 5670 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Peak



Plot 291. Radiated Spurious Emissions, 5690 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Peak

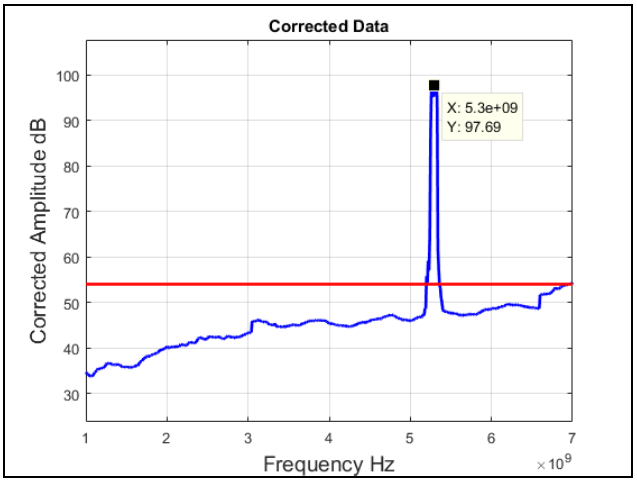


Plot 292. Radiated Spurious Emissions, 5710 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Average

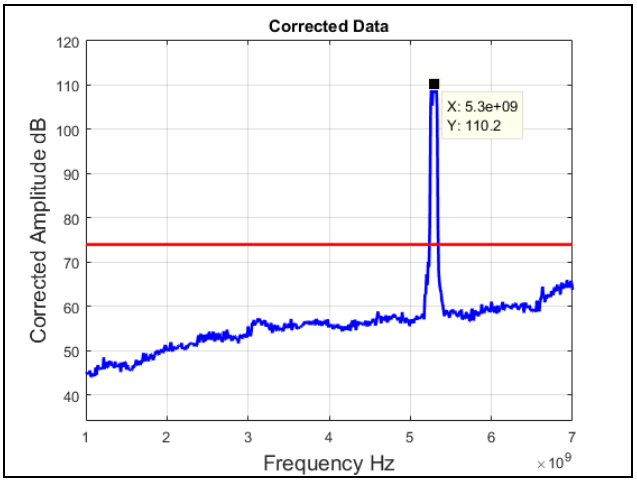


Plot 293. Radiated Spurious Emissions, 5710 MHz, 802.11n 40 MHz, 1 GHz – 7 GHz, Peak

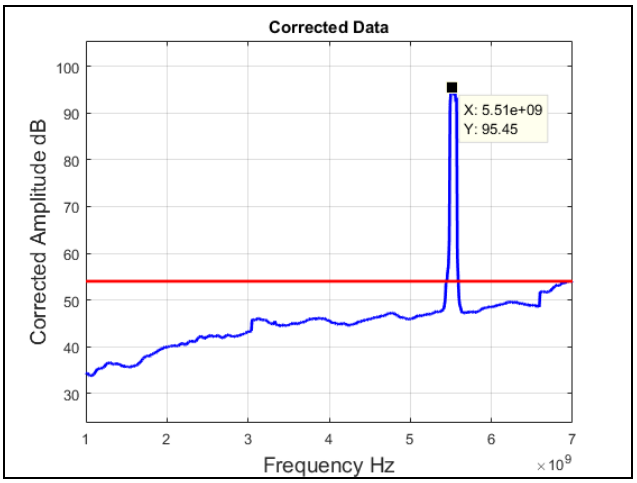
Radiated Spurious Emissions, 802.11ac 80 MHz



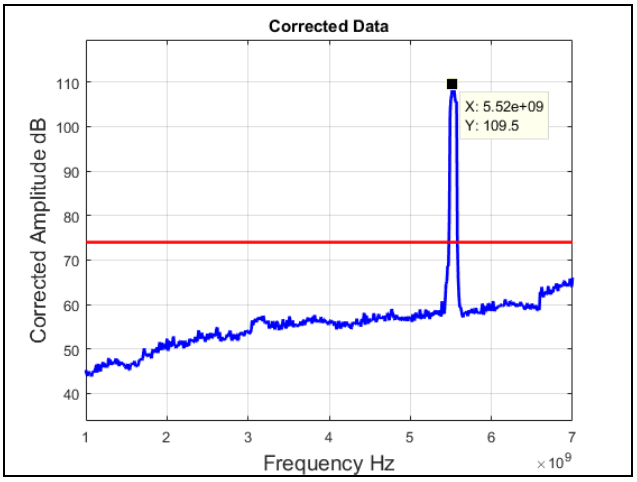
Plot 294. Radiated Spurious Emissions, 5290 MHz, 802.11ac 80 MHz, 1 GHz – 7 GHz, Average



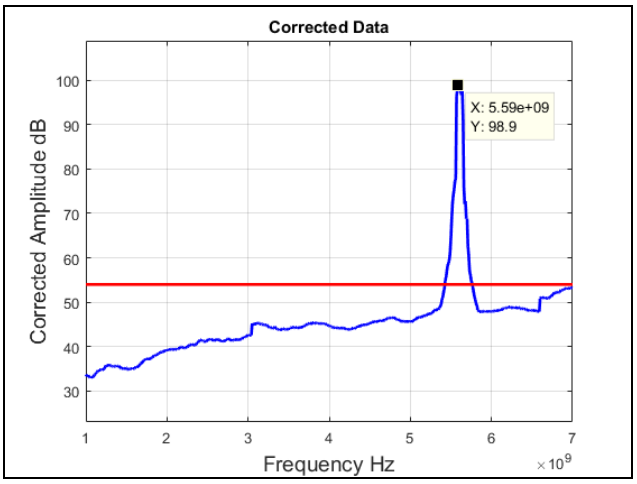
Plot 295. Radiated Spurious Emissions, 5290 MHz, 802.11ac 80 MHz, 1 GHz – 7 GHz, Peak



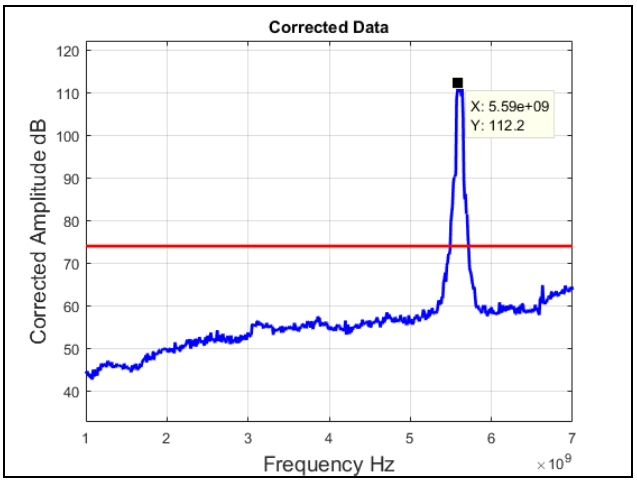
Plot 296. Radiated Spurious Emissions, 5330 MHz, 802.11ac 80 MHz, 1 GHz – 7 GHz, Average



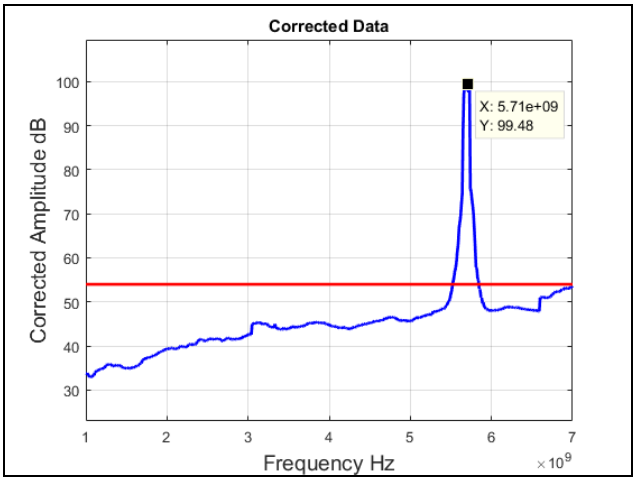
Plot 297. Radiated Spurious Emissions, 5330 MHz, 802.11ac 80 MHz, 1 GHz – 7 GHz, Peak



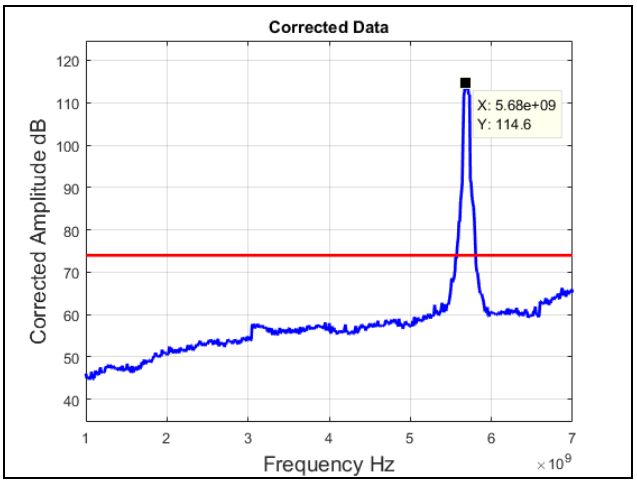
Plot 298. Radiated Spurious Emissions, 5610 MHz, 802.11ac 80 MHz, 1 GHz – 7 GHz, Average



Plot 299. Radiated Spurious Emissions, 5610 MHz, 802.11ac 80 MHz, 1 GHz – 7 GHz, Peak

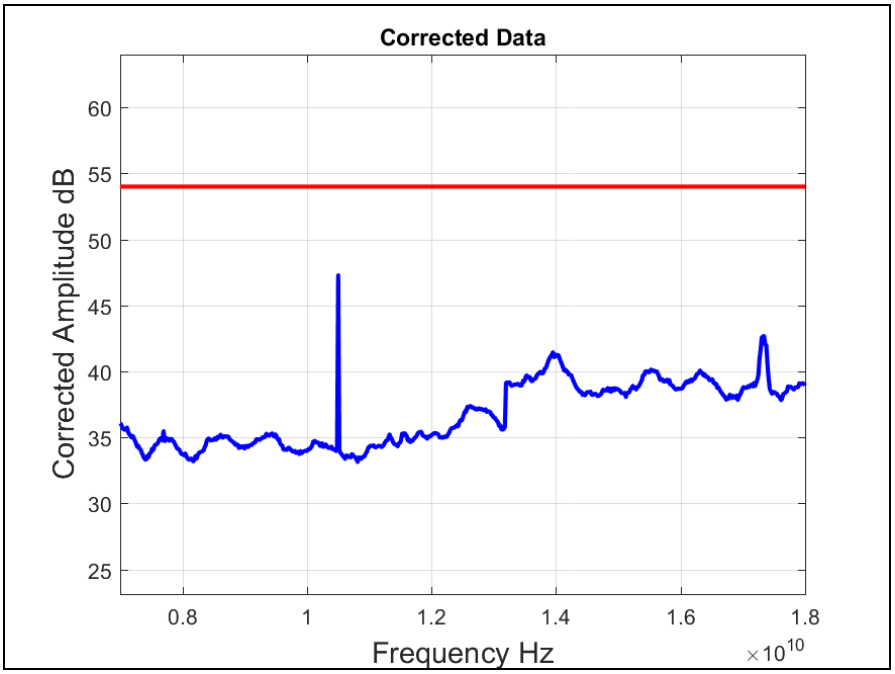


Plot 300. Radiated Spurious Emissions, 5690 MHz, 802.11ac 80 MHz, 1 GHz – 7 GHz, Average

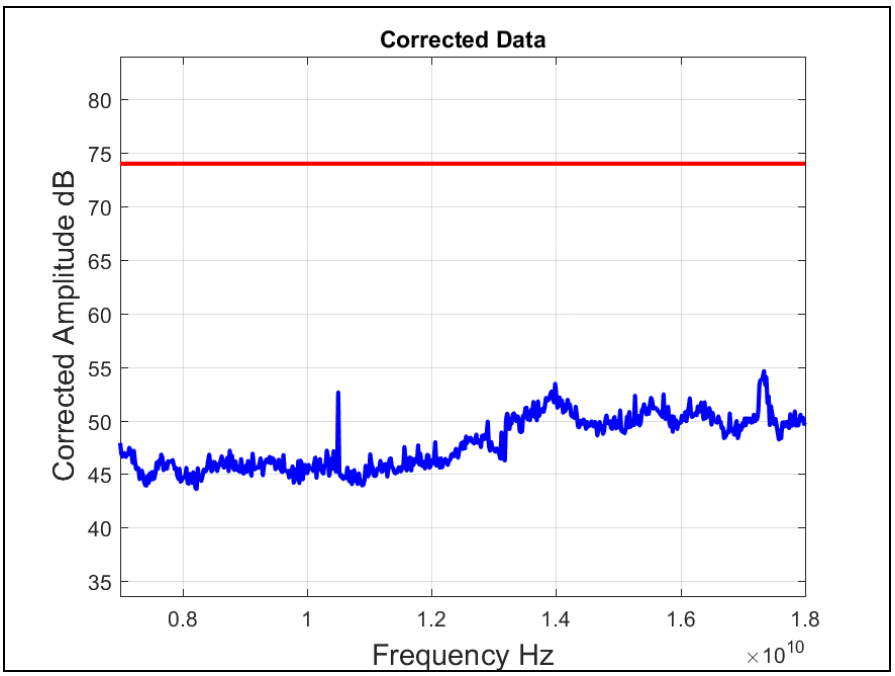


Plot 301. Radiated Spurious Emissions, 5690 MHz, 802.11ac 80 MHz, 1 GHz – 7 GHz, Peak

Radiated Spurious Emissions, 7 GHz – 18 GHz, Worst Case Emissions

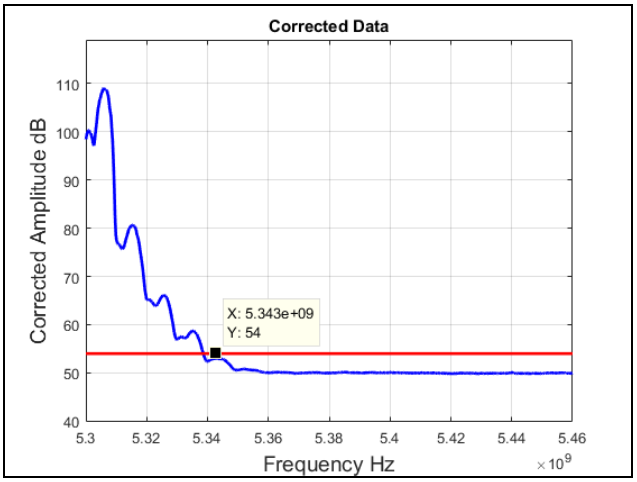


Plot 302. Radiated Spurious Emissions, Worst Case, 7 GHz – 18 GHz, Average

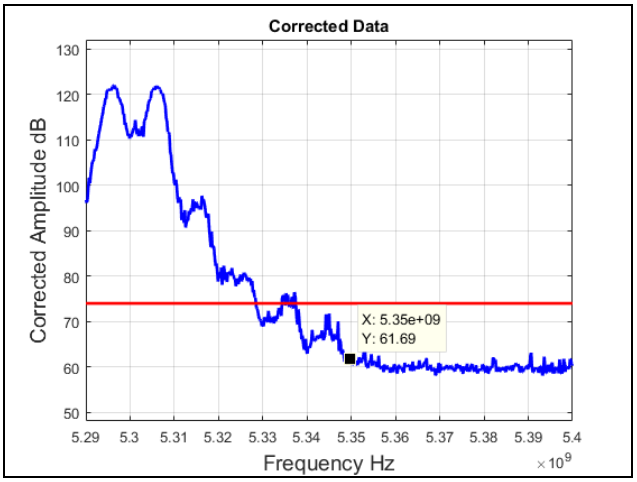


Plot 303. Radiated Spurious Emissions, Worst Case, 7 GHz – 18 GHz, Peak

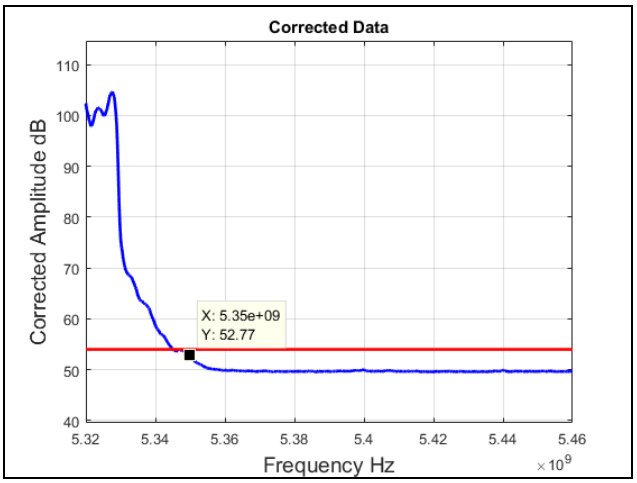
Radiated Spurious Emissions, Band Edge, 802.11a 20 MHz



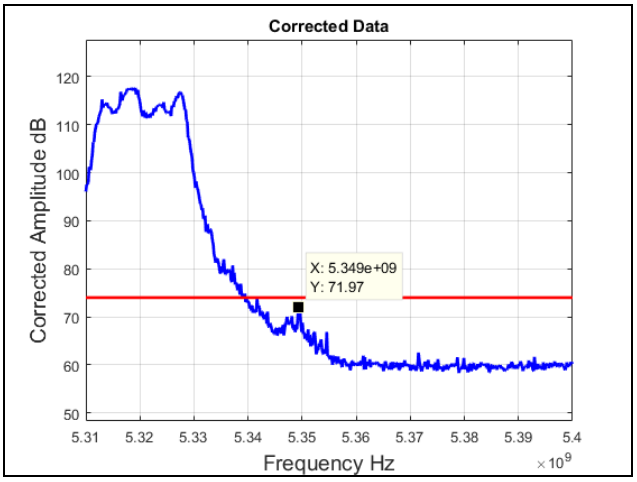
Plot 304. Radiated Band Edge, 5300 MHz, 802.11a 20 MHz, Average



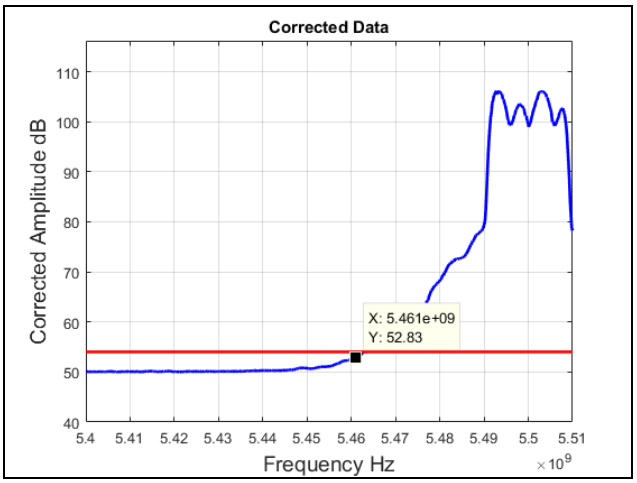
Plot 305. Radiated Band Edge, 5300 MHz, 802.11a 20 MHz, Peak



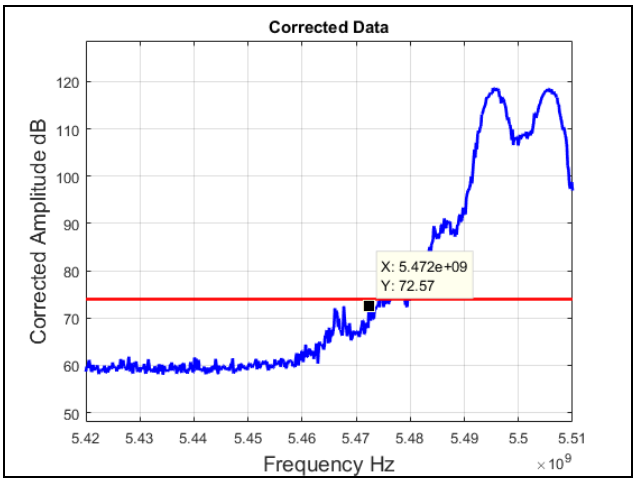
Plot 306. Radiated Band Edge, 5320 MHz, 802.11a 20 MHz, Average



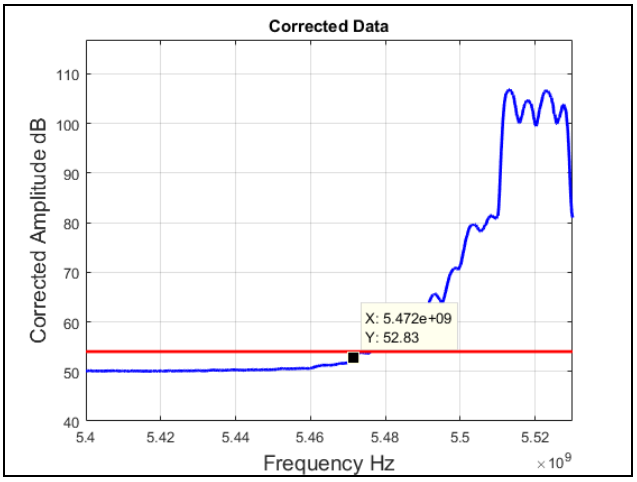
Plot 307. Radiated Band Edge, 5320 MHz, 802.11a 20 MHz, Peak



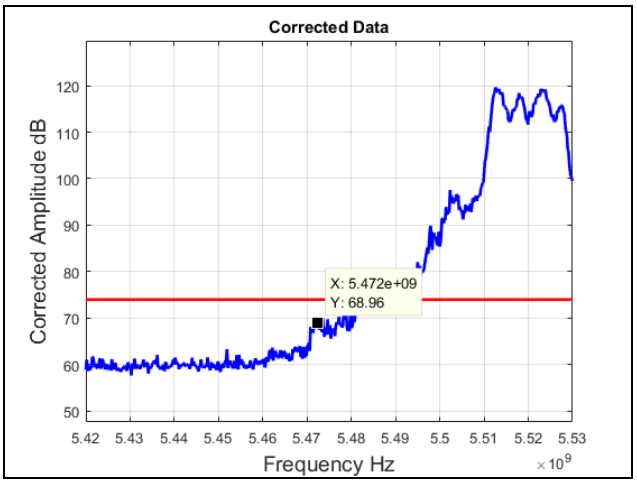
Plot 308. Radiated Band Edge, 5500 MHz, 802.11a 20 MHz, Average



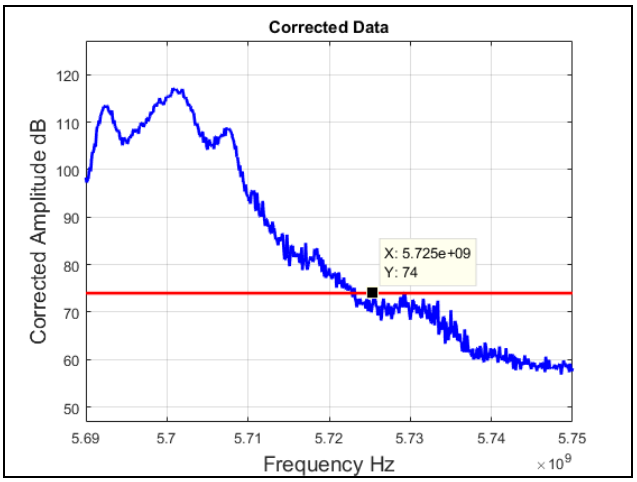
Plot 309. Radiated Band Edge, 5500 MHz, 802.11a 20 MHz, Peak



Plot 310. Radiated Band Edge, 5520 MHz, 802.11a 20 MHz, Average

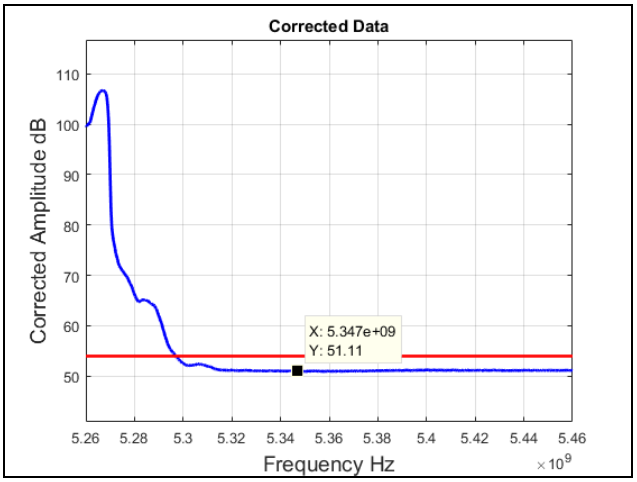


Plot 311. Radiated Band Edge, 5520 MHz, 802.11a 20 MHz, Peak

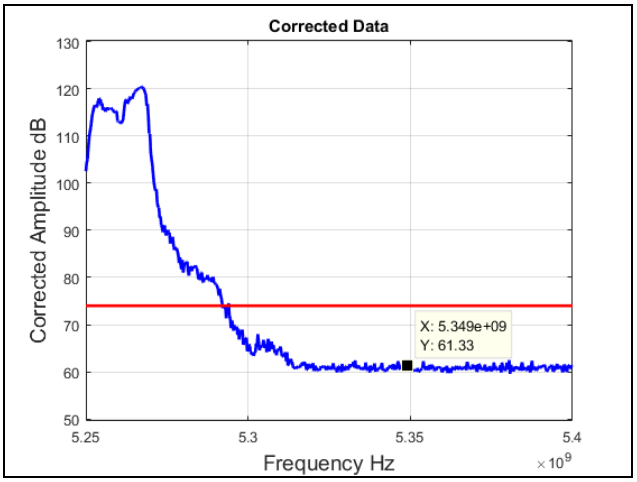


Plot 312. Radiated Band Edge, 5700 MHz, 802.11a 20 MHz, Peak

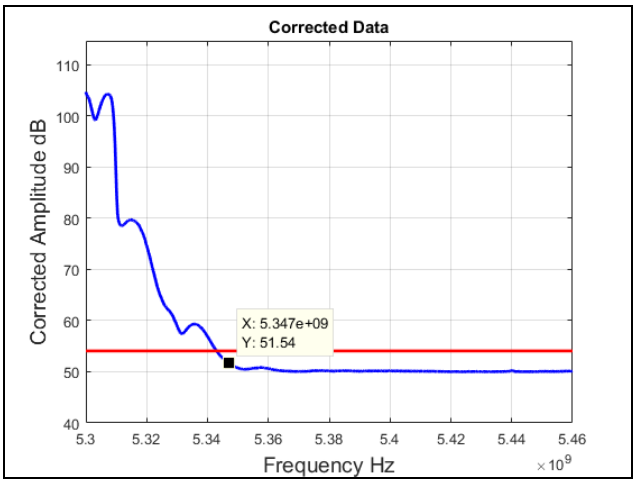
Radiated Spurious Emissions, Band Edge, 802.11ac 20 MHz



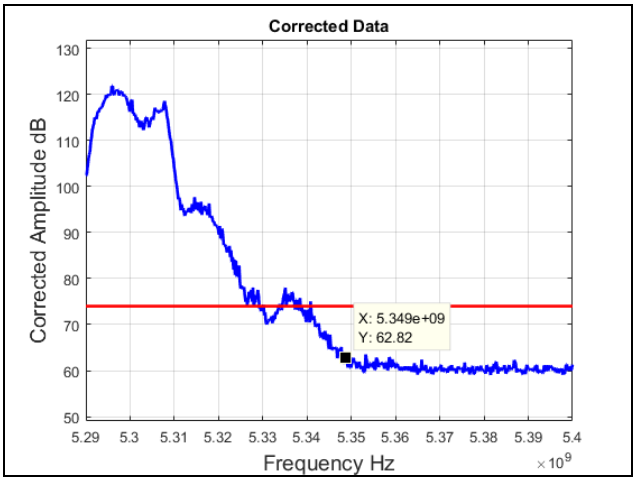
Plot 313. Radiated Band Edge, 5260 MHz, 802.11ac 20 MHz, Average



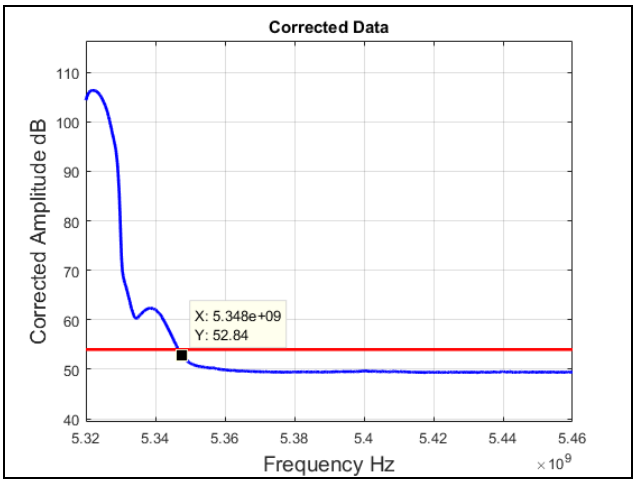
Plot 314. Radiated Band Edge, 5260 MHz, 802.11ac 20 MHz, Peak



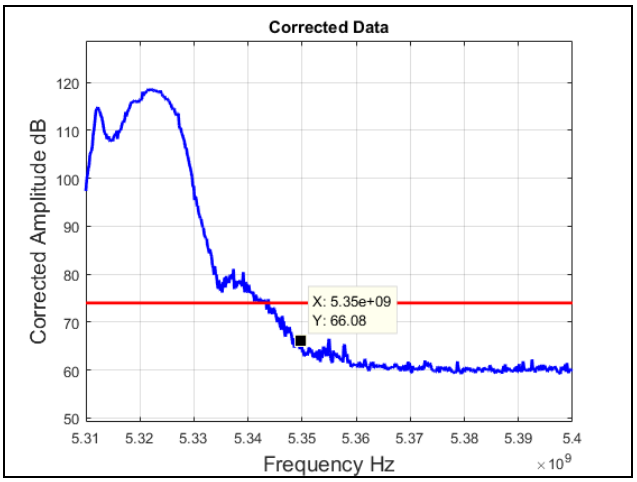
Plot 315. Radiated Band Edge, 5300 MHz, 802.11ac 20 MHz, Average



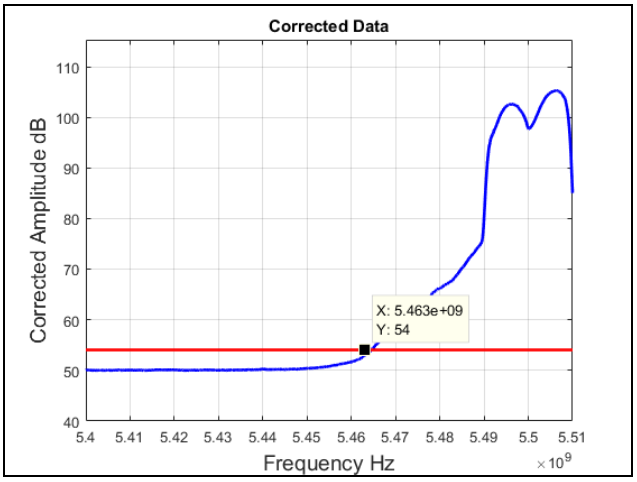
Plot 316. Radiated Band Edge, 5300 MHz, 802.11ac 20 MHz, Peak



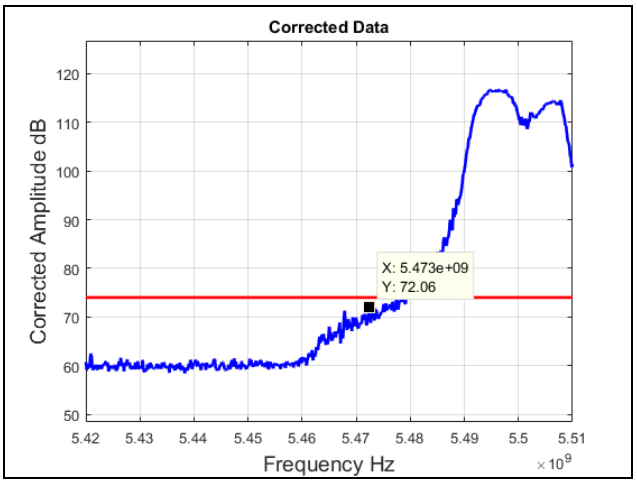
Plot 317. Radiated Band Edge, 5320 MHz, 802.11ac 20 MHz, Average



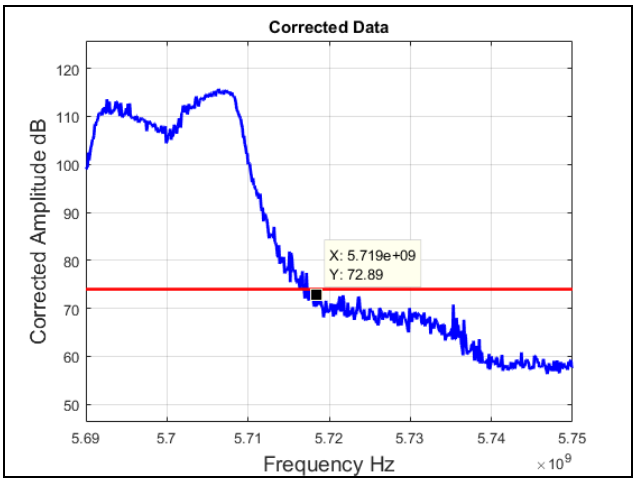
Plot 318. Radiated Band Edge, 5320 MHz, 802.11ac 20 MHz, Peak



Plot 319. Radiated Band Edge, 5500 MHz, 802.11ac 20 MHz, Average

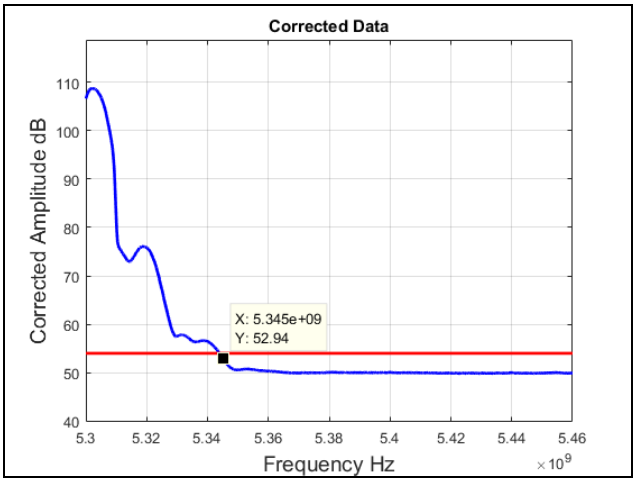


Plot 320. Radiated Band Edge, 5500 MHz, 802.11ac 20 MHz, Peak

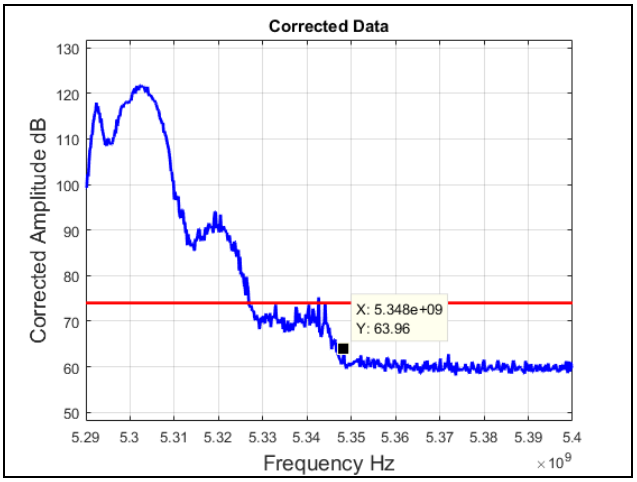


Plot 321. Radiated Band Edge, 5700 MHz, 802.11ac 20 MHz, Peak

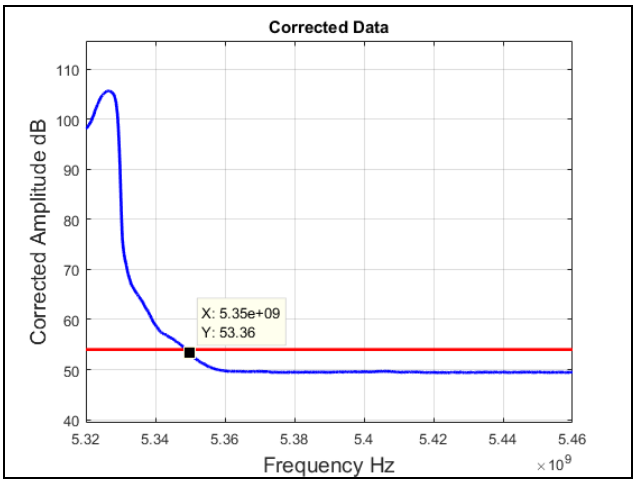
Radiated Spurious Emissions, Band Edge, 802.11n 20 MHz



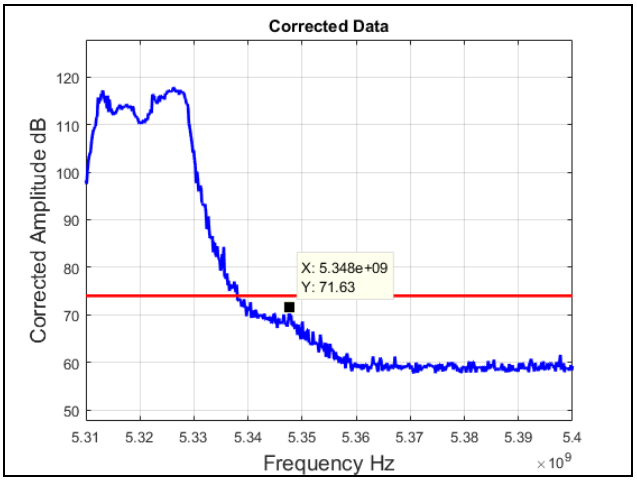
Plot 322. Radiated Band Edge, 5300 MHz, 802.11n 20 MHz, Average



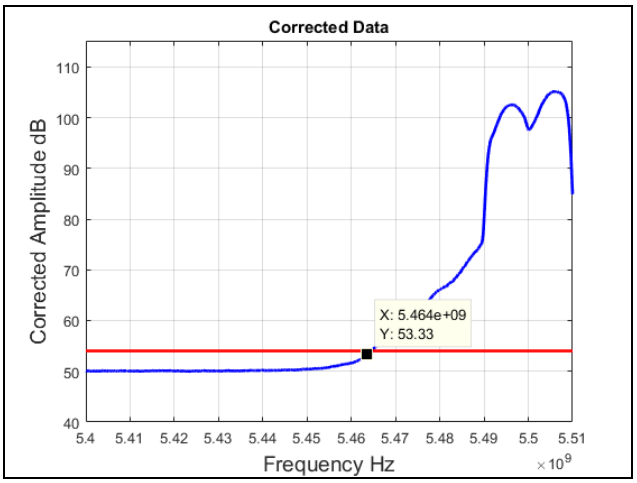
Plot 323. Radiated Band Edge, 5300 MHz, 802.11n 20 MHz, Peak



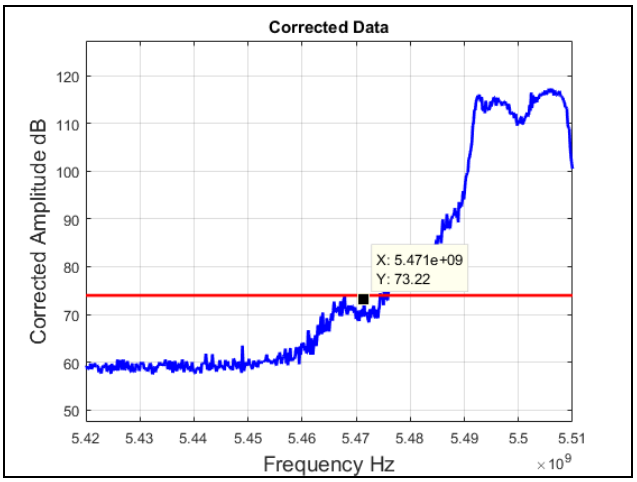
Plot 324. Radiated Band Edge, 5320 MHz, 802.11n 20 MHz, Average



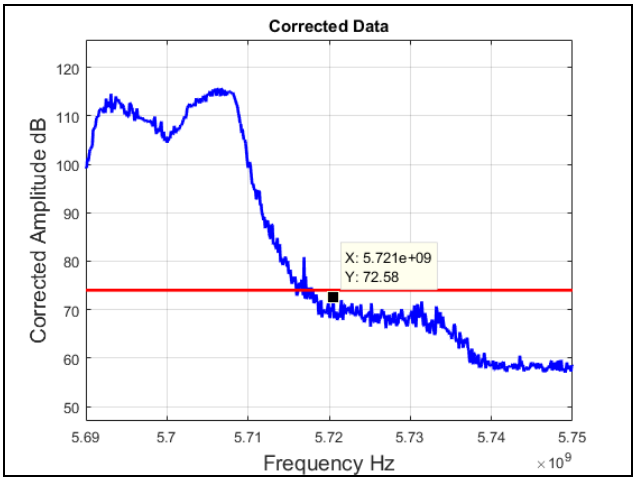
Plot 325. Radiated Band Edge, 5320 MHz, 802.11n 20 MHz, Peak



Plot 326. Radiated Band Edge, 5500 MHz, 802.11n 20 MHz, Average

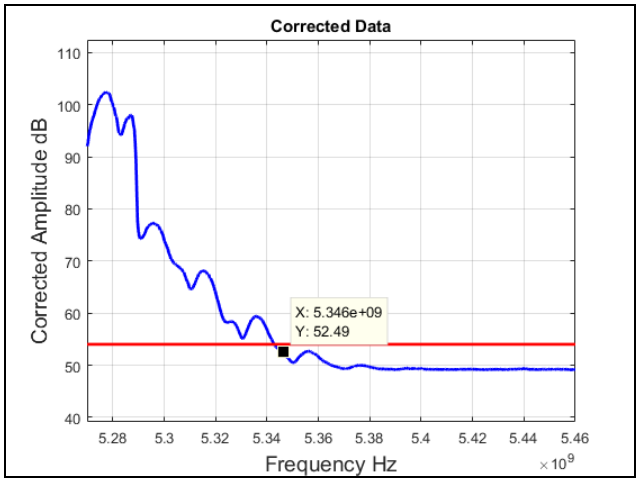


Plot 327. Radiated Band Edge, 5500 MHz, 802.11n 20 MHz, Peak

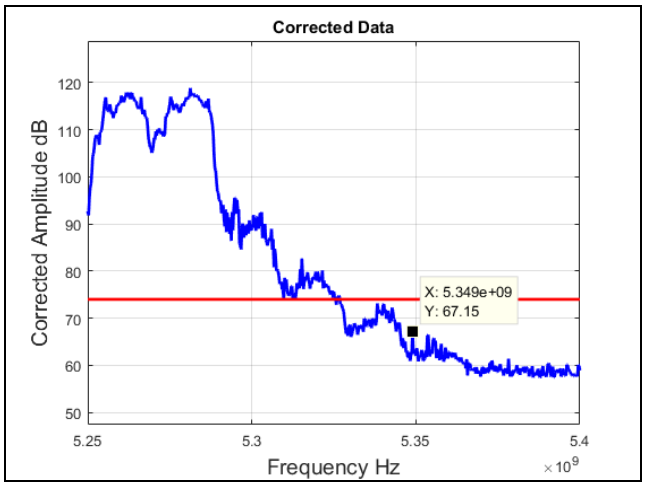


Plot 328. Radiated Band Edge, 5700 MHz, 802.11n 20 MHz, Peak

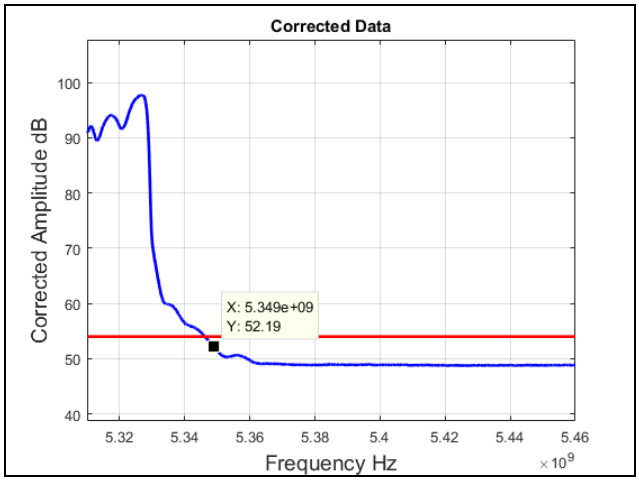
Radiated Spurious Emissions, Band Edge, 802.11ac 40 MHz



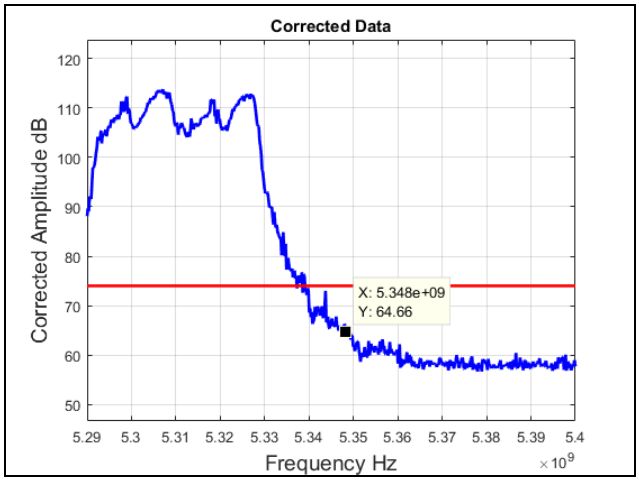
Plot 329. Radiated Band Edge, 5270 MHz, 802.11ac 40 MHz, Average



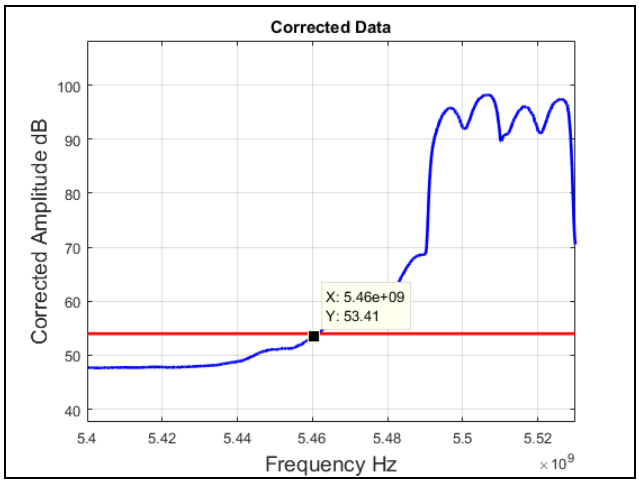
Plot 330. Radiated Band Edge, 5270 MHz, 802.11ac 40 MHz, Peak



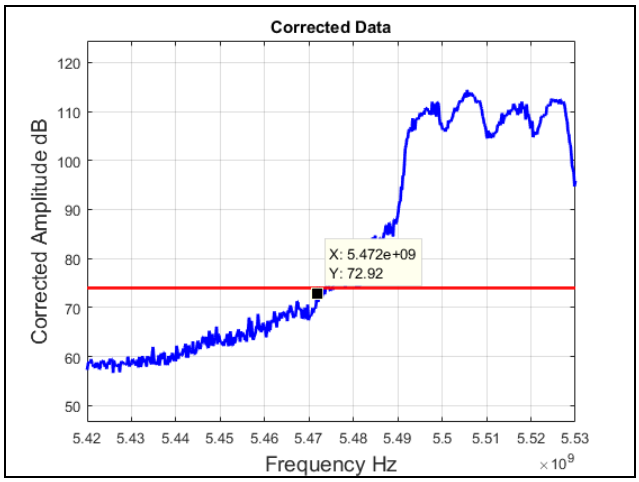
Plot 331. Radiated Band Edge, 5310 MHz, 802.11ac 40 MHz, Average



Plot 332. Radiated Band Edge, 5310 MHz, 802.11ac 40 MHz, Peak

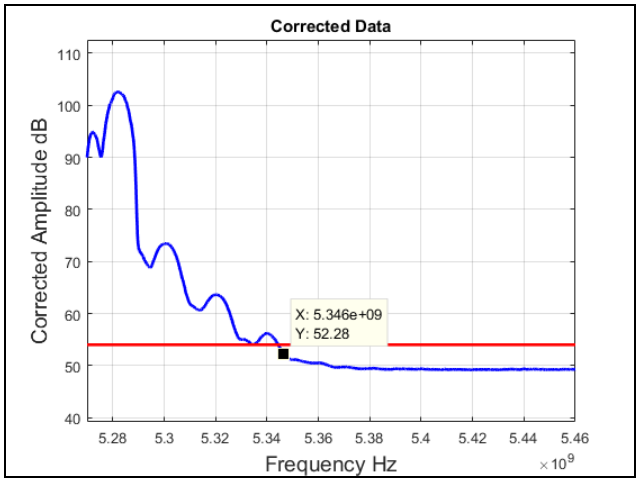


Plot 333. Radiated Band Edge, 5510 MHz, 802.11ac 40 MHz, Average

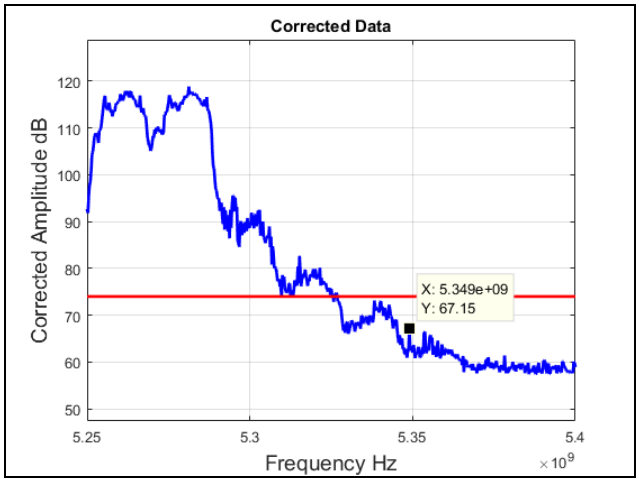


Plot 334. Radiated Band Edge, 5510 MHz, 802.11ac 40 MHz, Peak

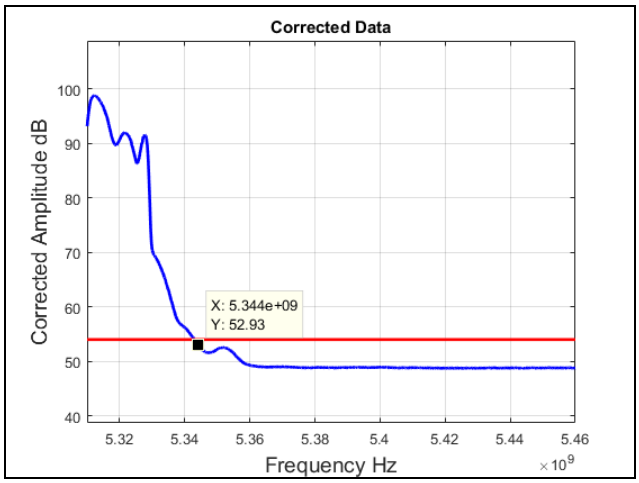
Radiated Spurious Emissions, Band Edge, 802.11n 40 MHz



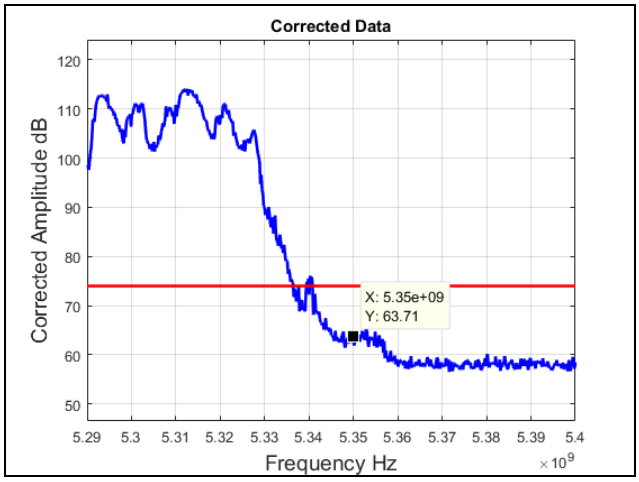
Plot 335. Radiated Band Edge, 5270 MHz, 802.11n 40 MHz, Average



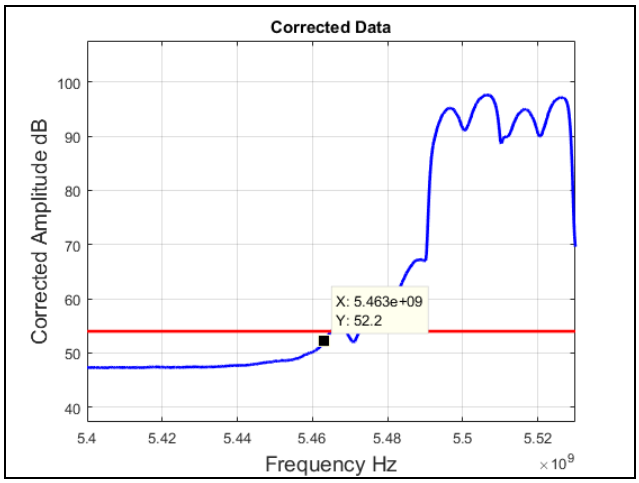
Plot 336. Radiated Band Edge, 5270 MHz, 802.11n 40 MHz, Peak



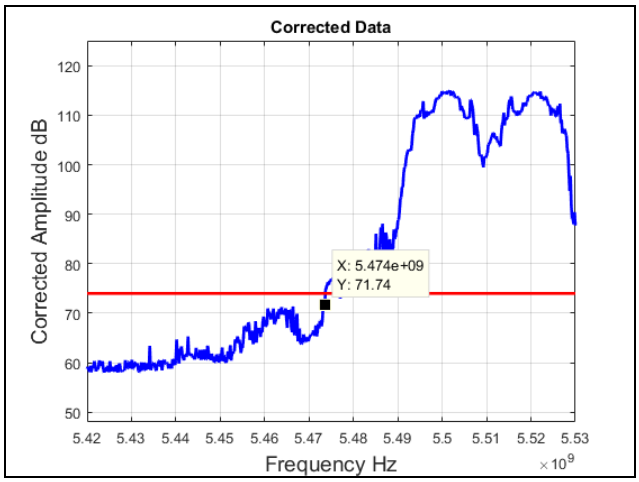
Plot 337. Radiated Band Edge, 5310 MHz, 802.11n 40 MHz, Average



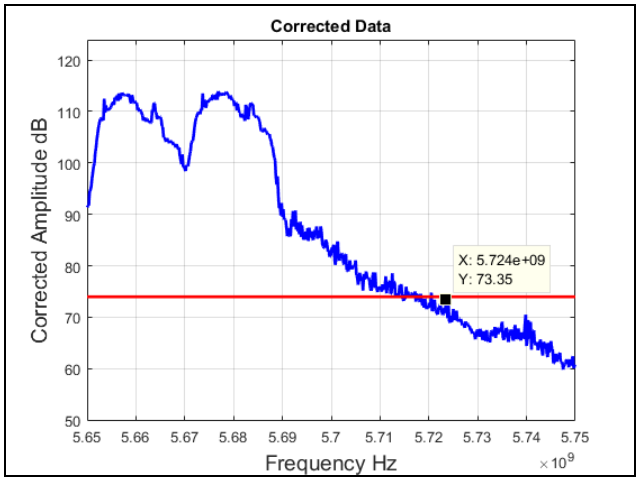
Plot 338. Radiated Band Edge, 5310 MHz, 802.11n 40 MHz, Peak



Plot 339. Radiated Band Edge, 5510 MHz, 802.11n 40 MHz, Average

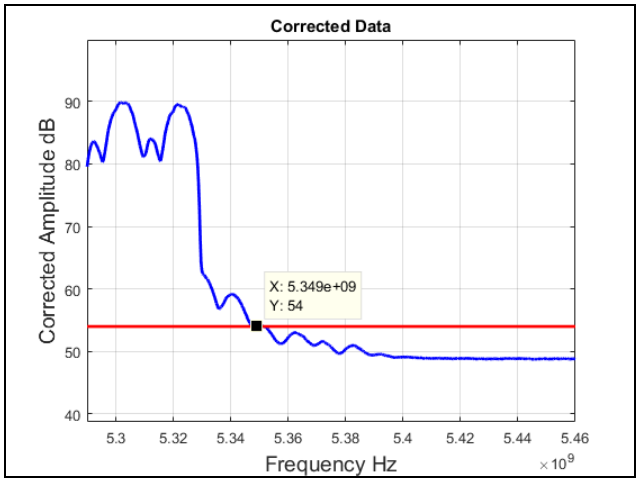


Plot 340. Radiated Band Edge, 5510 MHz, 802.11n 40 MHz, Peak

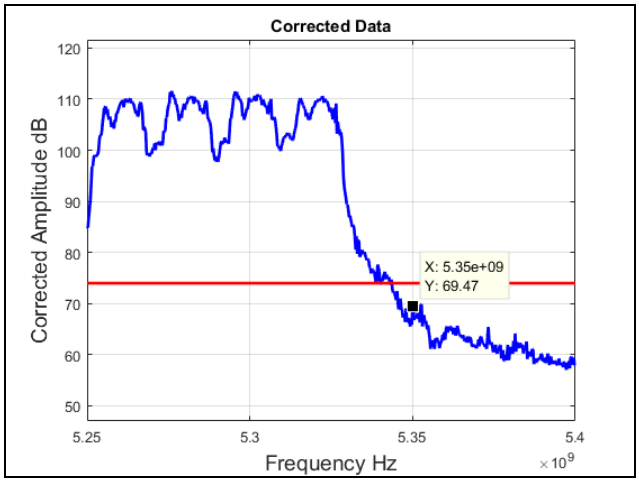


Plot 341. Radiated Band Edge, 5670 MHz, 802.11n 40 MHz, Peak

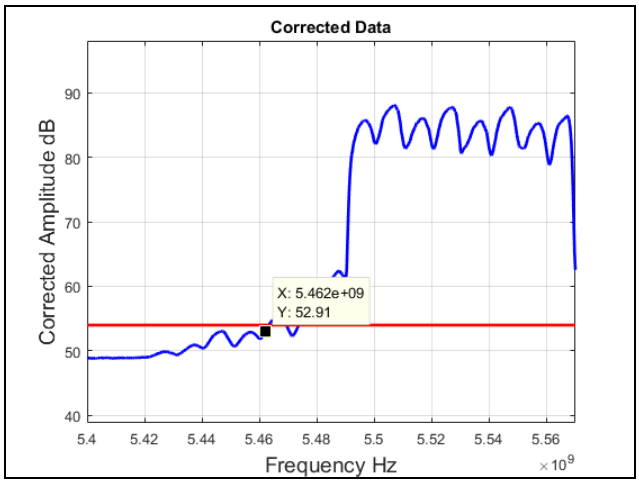
Radiated Spurious Emissions, Band Edge, 802.11ac 80 MHz



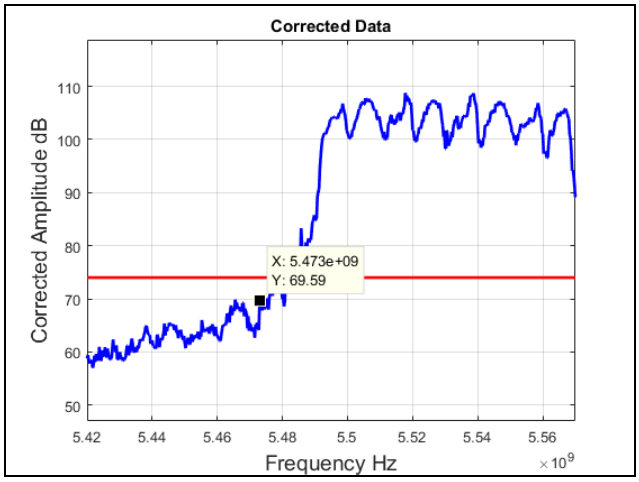
Plot 342. Radiated Band Edge, 5290 MHz, 802.11ac 80 MHz, Average



Plot 343. Radiated Band Edge, 5290 MHz, 802.11ac 80 MHz, Peak



Plot 344. Radiated Band Edge, 5530 MHz, 802.11ac 80 MHz, Average



Plot 345. Radiated Band Edge, 5530 MHz, 802.11ac 80 MHz, Peak

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(b)(6) Conducted Emissions

Test Requirement(s): **§ 15.407 (b)(6):** Any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

§ 15.207 (a): For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 Σ line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency range (MHz)	§ 15.207(a), Conducted Limit (dBμV)	
	Quasi-Peak	Average
* 0.15- 0.45	66 – 56	56 - 46
0.45 - 0.5	56	46
0.5 - 30	60	50

Table 11. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)

Test Procedure: The EUT was placed on a non-metallic table inside a screen room. The EUT was situated such that the back of the EUT was 0.4 m from one wall of the vertical ground plane, and the remaining sides of the EUT were no closer than 0.8 m from any other conductive surface. The EUT was powered from a 50 Ω/50 μH Line Impedance Stabilization Network (LISN). The EMC receiver scanned the frequency range from 150 kHz to 30 MHz. Conducted Emissions measurements were made in accordance with *ANSI C63.4-2014 "Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40 GHz"*. Scans were performed with the transmitter on.

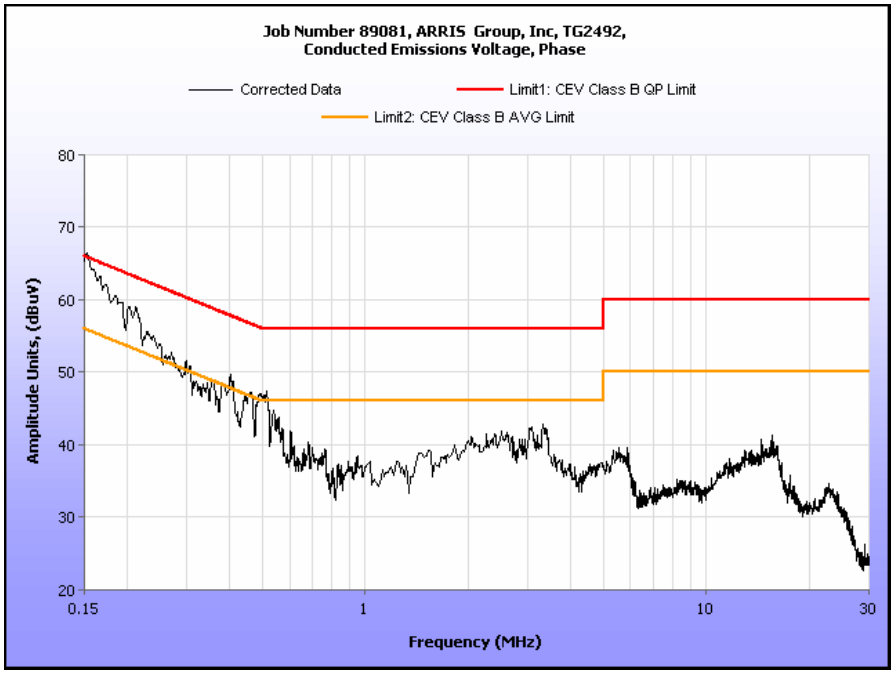
Test Results: The EUT was compliant with requirements of this section.

Test Engineer(s): Surinder Singh

Test Date(s): 04/20/2016

Frequency (MHz)	Uncorrected Meter Reading (dBµV) QP	Cable Loss (dB)	Corrected Measurement (dBµV) QP	Limit (dBµV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBµV) Avg.	Cable Loss (dB)	Corrected Measurement (dBµV) AVG	Limit (dBµV) AVG	Margin (dB) AVG
0.15	52.34	0	52.34	66	-13.66	41.31	0	41.31	56	-14.69
0.9	44.37	0	44.37	56	-11.63	30.78	0	30.78	46	-15.22
2.3	32.45	0	32.45	56	-23.55	23.45	0	23.45	46	-22.55
6.7	29.19	0	29.19	60	-30.81	19.63	0	19.63	50	-30.37
15.67	26.48	0.12	26.6	60	-33.4	18.64	0.12	18.76	50	-31.24
25.44	20.19	0.2	20.39	60	-39.61	10.78	0.2	10.98	50	-39.02

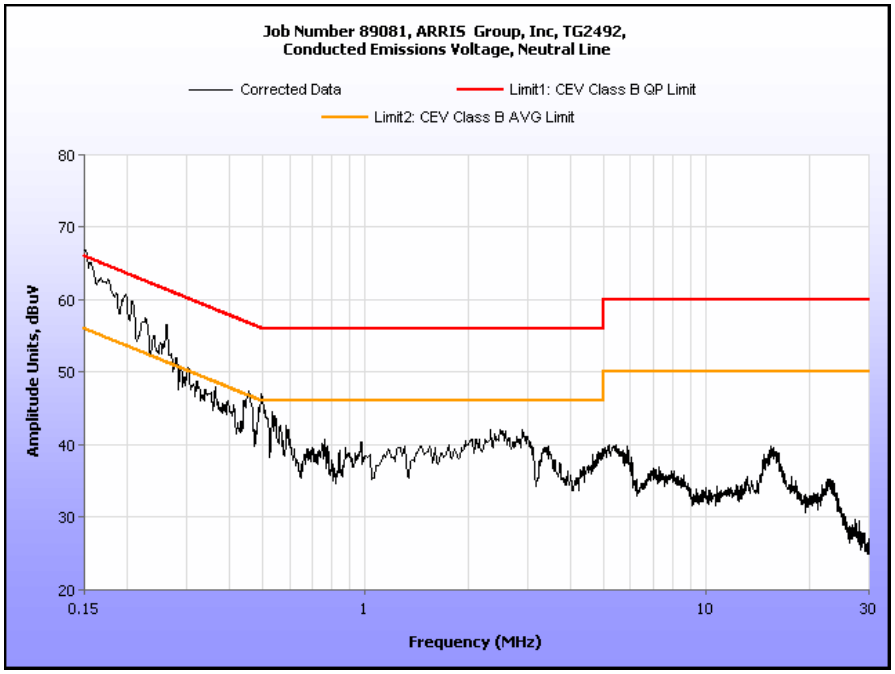
Table 12. Conducted Emissions, Test Results, Phase Line



Plot 346. Conducted Emissions, Phase Line

Frequency (MHz)	Uncorrected Meter Reading (dBµV) QP	Cable Loss (dB)	Corrected Measurement (dBµV) QP	Limit (dBµV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBµV) Avg.	Cable Loss (dB)	Corrected Measurement (dBµV) AVG	Limit (dBµV) AVG	Margin (dB) AVG
0.15	51.23	0	51.23	66	-14.77	38.16	0	38.16	56	-17.84
0.8	46.35	0	46.35	56	-9.65	29.64	0	29.64	46	-16.36
2.8	30.78	0	30.78	56	-25.22	21.85	0	21.85	46	-24.15
7.2	25.64	0	25.64	60	-34.36	13.69	0	13.69	50	-36.31
16.89	23.89	0.13	24.02	60	-35.98	17.28	0.13	17.41	50	-32.59
26.3	19.84	0.19	20.03	60	-39.97	10.1	0.19	10.29	50	-39.71

Table 13. Conducted Emissions, Test Results, Neutral Line



Plot 347. Conducted Emissions, Phase Line

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(f) Maximum Permissible Exposure

Test Requirement(s): **§15.407(f):** U-NII devices are subject to the radio frequency radiation exposure requirements specified in §1.1307(b), §2.1091 and §2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment.

RF Exposure Requirements: **§1.1307(b)(1) and §1.1307(b)(2):** Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

RF Radiation Exposure Limit: **§1.1310:** As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

MPE Limit: EUT's operating frequencies @ 5250-5350 MHz and 5470 – 5725 MHz; **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

Equation from page 18 of OET 65, Edition 97-01

$S = PG / 4\pi R^2$ or $R = \sqrt{(PG / 4\pi S)}$

where, S = Power Density (mW/cm^2)
P = Power Input to antenna (mW)
G = Antenna Gain (numeric value)
R = Distance (cm)

Test Results:

FCC									
Frequency (MHz)	**Con. Pwr. (dBm)**	**Con. Pwr. (mW)**	**Ant. Gain (dBi)**	**Ant. Gain numeric**	**Pwr. Density (mW/cm^2)**	**Limit (mW/cm^2)**	**Margin**	**Distance (cm)**	**Result**
5260	24	251.189	6.77	4.753	0.23754	1	0.76246	20	Pass

Co-Location MPE

MPE (F1)	MPE (F2)	Calculation	Result
Frequency MHz	Frequency MHz	MPE(F1)/limit+MPE(F2)/limit	mW/cm^2
2412-2462	5260-5320, 5500-5720	0.23754/1+0.1226/1	0.36014

The safe distance where Power Density is less than the MPE Limit listed above was found to be 20 cm.

IV. DFS Requirements and Radar Waveform Description & Calibration

A. DFS Requirements

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 14. Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

Table 15. Applicability of DFS Requirements During Normal Operation

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. **Note 2:** Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. **Note3:** EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

Table 16. DFS Detection Thresholds for Master or Client Devices Incorporating DFS

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **Note 2:** The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. **Note 3:** During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Table 17. DFS Response Requirement Values

B. Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup $\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{PRI_{\mu sec}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 µsec, with a minimum increment of 1 µsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

Table 18. Pulse Repetition Intervals Values for Test A

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Number of Pulses per Bursts	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse radar test signal. If more than 30 waveforms are used for the Long Pulse radar test signal, then each additional waveform must also be unique and not repeated from the previous waveforms.

Each waveform is defined as follows:

1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
2) There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst_Count.
3) Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
5) Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a Burst will have the same chirp width. Pulses in different Bursts may have different chirp widths. The chirp is centered on the pulse. For example, with radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
6) If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst_Count. Each interval is of length (12,000,000 / Burst_Count) microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and [(12,000,000 / Burst_Count) – (Total Burst Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen independently.

A representative example of a Long Pulse radar test waveform:

1) The total test signal length is 12 seconds.
2) 8 Bursts are randomly generated for the Burst_Count.
3) Burst 1 has 2 randomly generated pulses.
4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.
5) The PRI is randomly selected to be at 1213 microseconds.
6) Bursts 2 through 8 are generated using steps 3 – 5.
7) Each Burst is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, Burst 1 is randomly generated (1 to 1,500,000 minus the total Burst 1 length + 1 random PRI interval) at the 325,001 microsecond step. Bursts 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. Burst 2 falls in the 1,500,001 – 3,000,000 microsecond range).

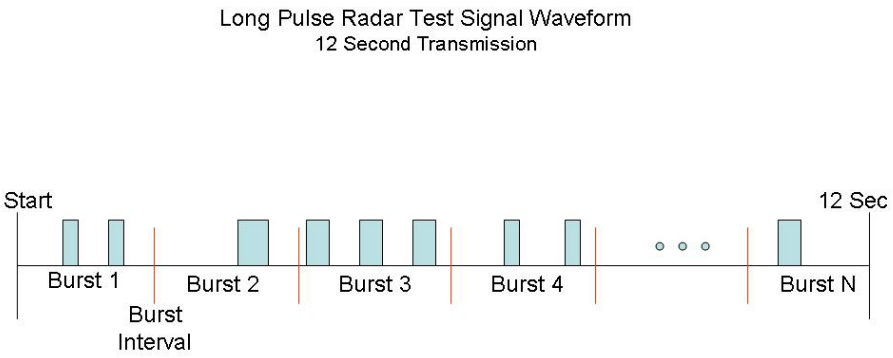


Figure 2. Long Pulse Radar Test Signal Waveform

Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	.333	300	70%	30

For the Frequency Hopping Radar Type, the same *Burst* parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected1 from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

C. Radar Waveform Calibration

Calibration of the DFS test was done using a radiated method. A signal generator capable of producing all radar pulse types (0-6) was connected to a transmitting antenna. A receive antenna, through an external pre-amp was connected to a spectrum analyzer. The spectrum analyzer was set to a zero span with a peak detector and an RBW and VBW of 3 MHz. The transmit and receive antennas were vertically polarized during this calibration.

With the signal generator and spectrum analyzer tuned to the test frequency, each radar pulse was triggered and observed on the spectrum analyzer. The DFS Detection Threshold was verified for each radar pulse type (0-6).

During this process there were no transmissions by either the Master or Client Device.

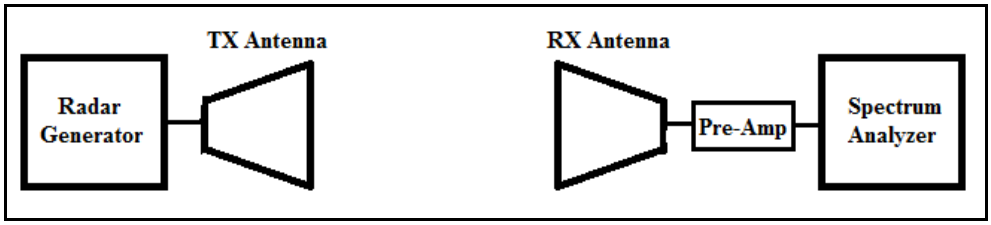
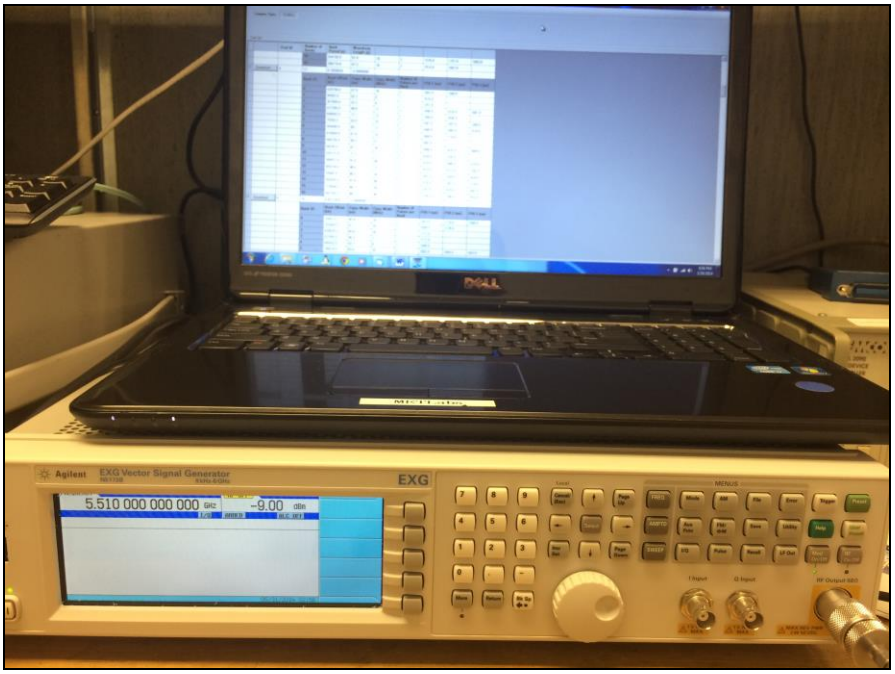
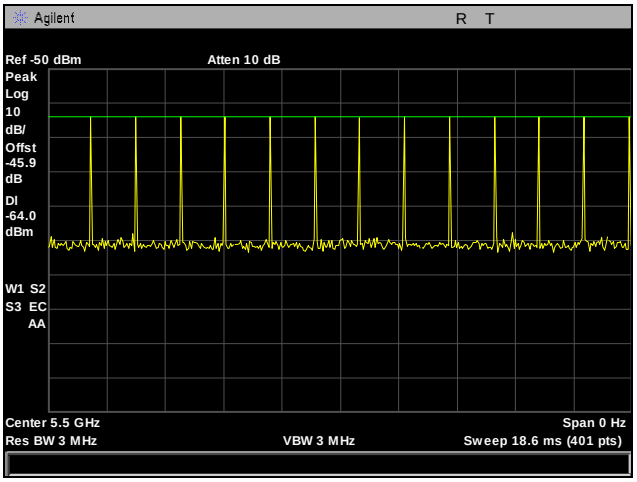


Figure 3. Radiated DFS Calibration Block Diagram

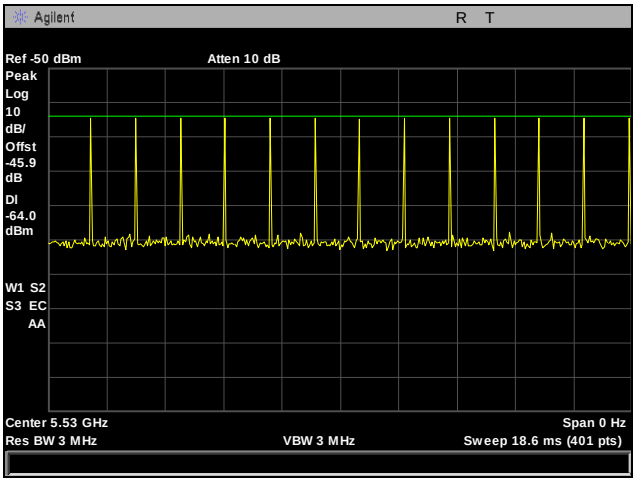


Photograph 1. DFS Radar Test Signal Generator

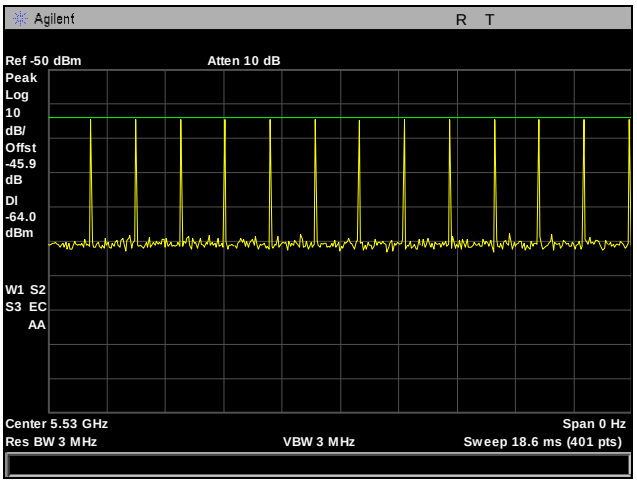
Radar Waveform Calibration, Type 0



Plot 348. Radar Waveform Calibration, 5500 MHz, Type 0

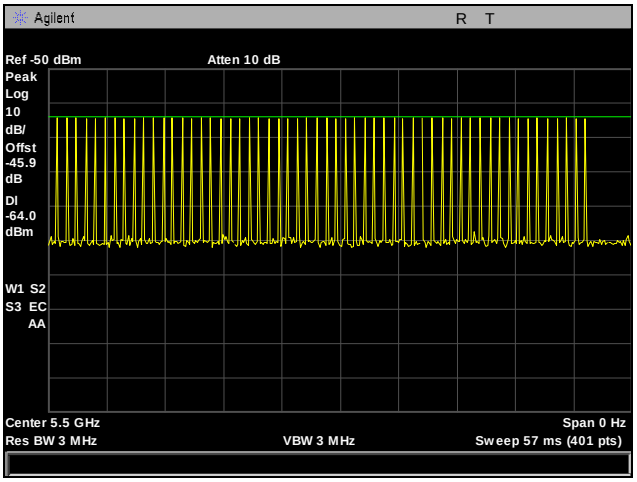


Plot 349. Radar Waveform Calibration, 5510 MHz, Type 0

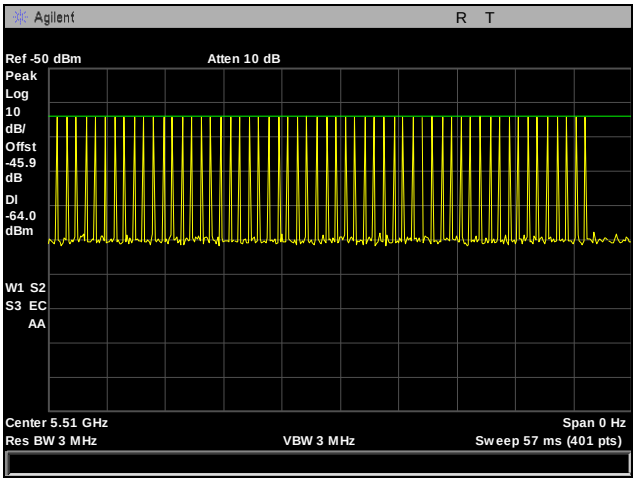


Plot 350. Radar Waveform Calibration, 5530 MHz, Type 0

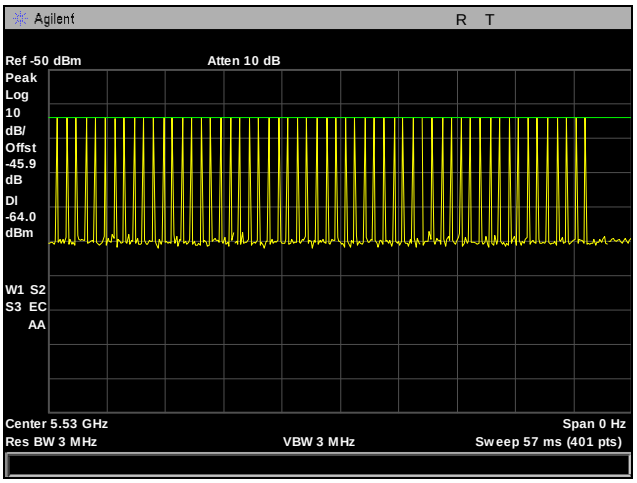
Radar Waveform Calibration, Type 1



Plot 351. Radar Waveform Calibration, 5500 MHz, Type 1

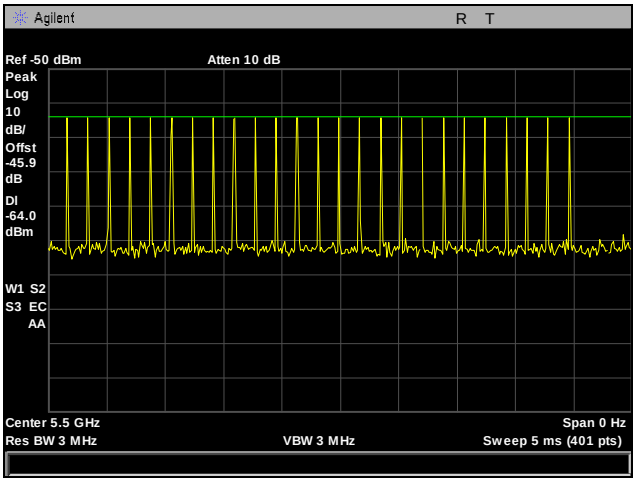


Plot 352. Radar Waveform Calibration, 5510 MHz, Type 1

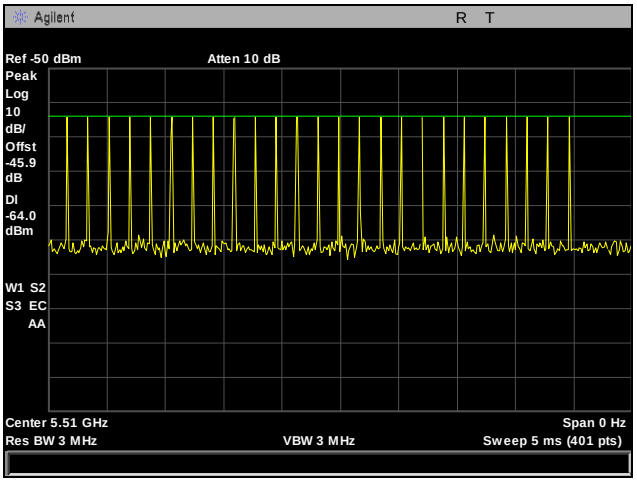


Plot 353. Radar Waveform Calibration, 5530 MHz, Type 1

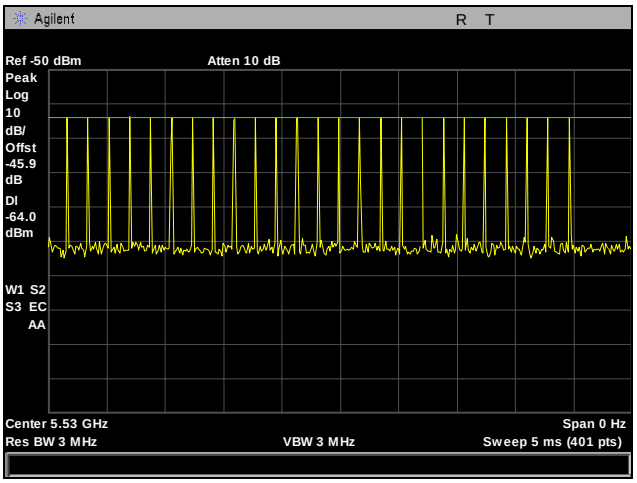
Radar Waveform Calibration, Type 2



Plot 354. Radar Waveform Calibration, 5500 MHz, Type 2

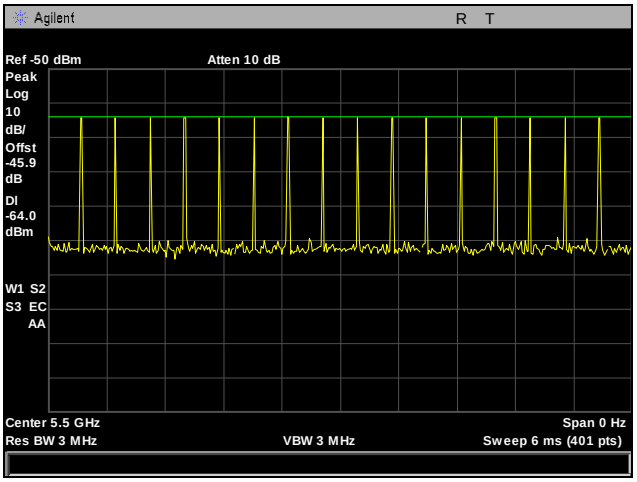


Plot 355. Radar Waveform Calibration, 5510 MHz, Type 2

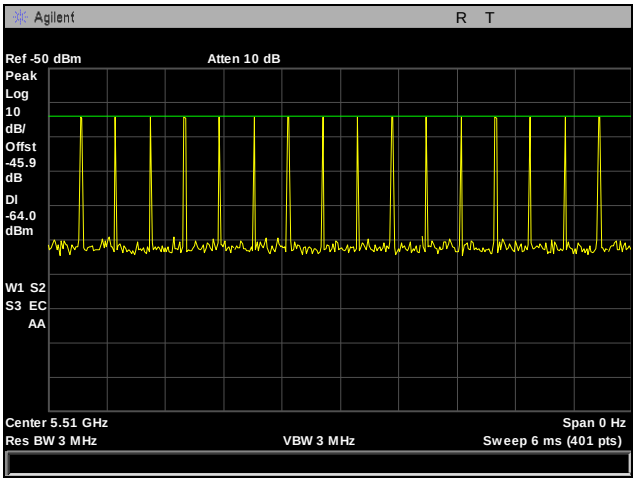


Plot 356. Radar Waveform Calibration, 5530 MHz, Type 2

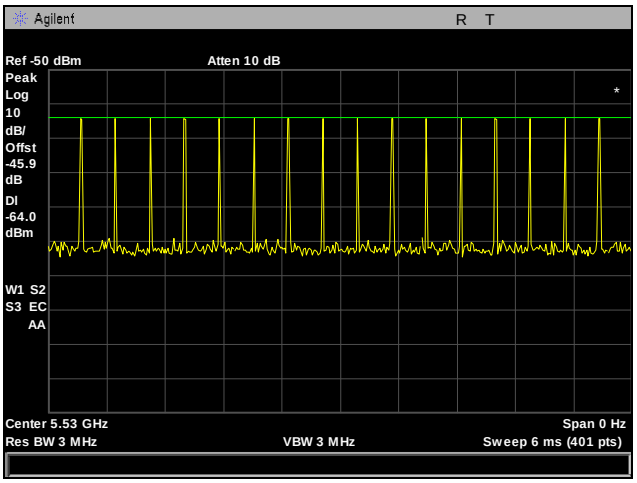
Radar Waveform Calibration, Type 3



Plot 357. Radar Waveform Calibration, 5500 MHz, Type 3

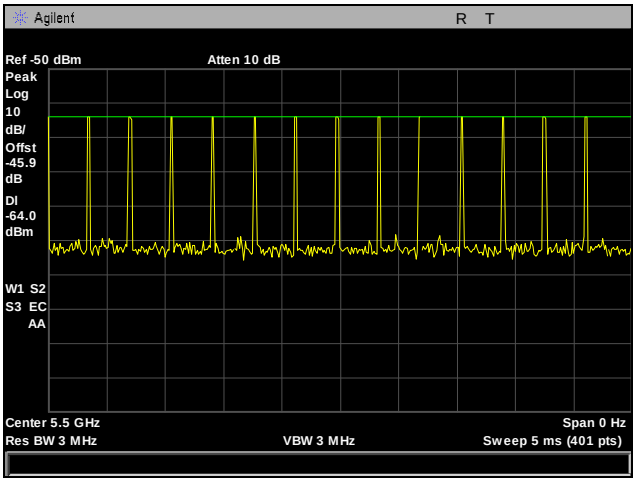


Plot 358. Radar Waveform Calibration, 5510 MHz, Type 3

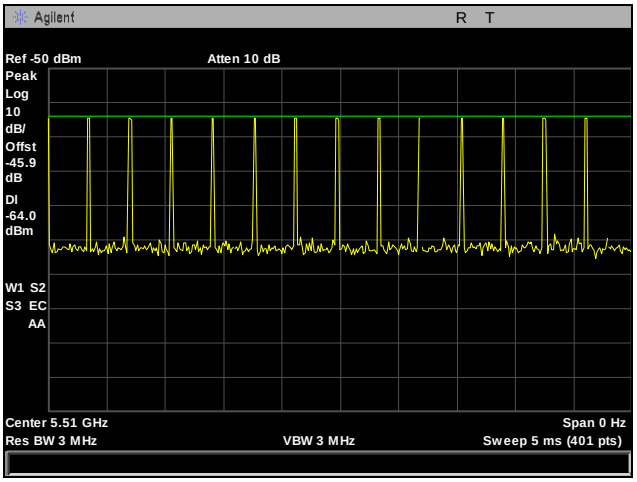


Plot 359. Radar Waveform Calibration, 5530 MHz, Type 3

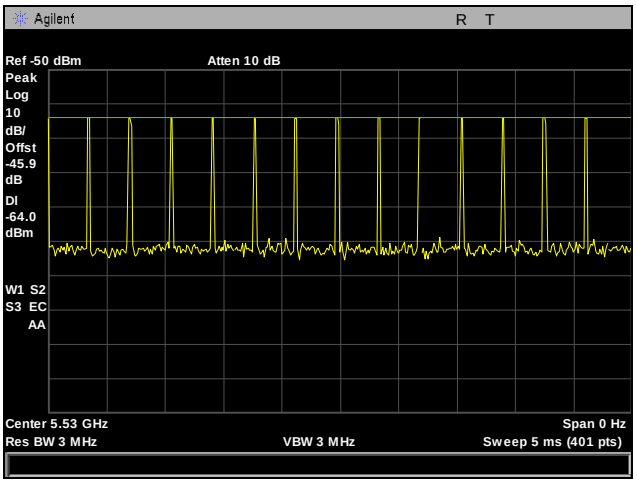
Radar Waveform Calibration, Type 4



Plot 360. Radar Waveform Calibration, 5500 MHz, Type 4

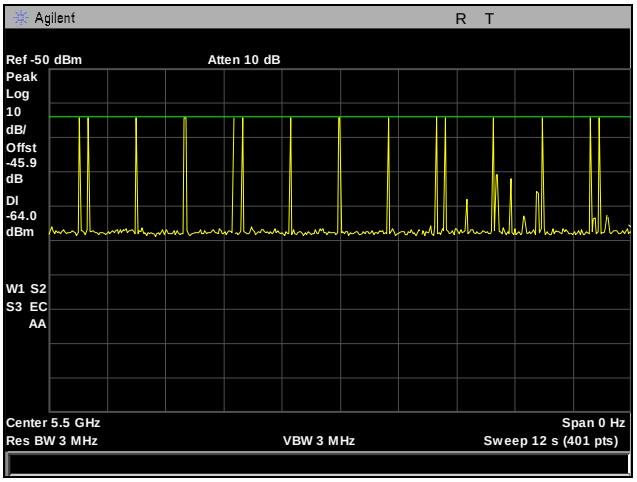


Plot 361. Radar Waveform Calibration, 5510 MHz, Type 4

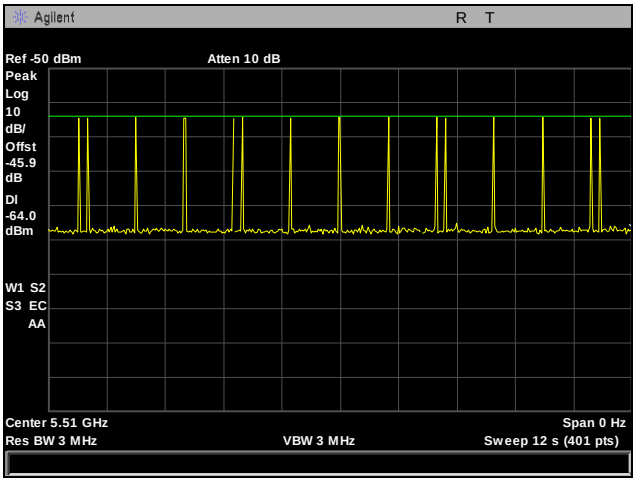


Plot 362. Radar Waveform Calibration, 5530 MHz, Type 4

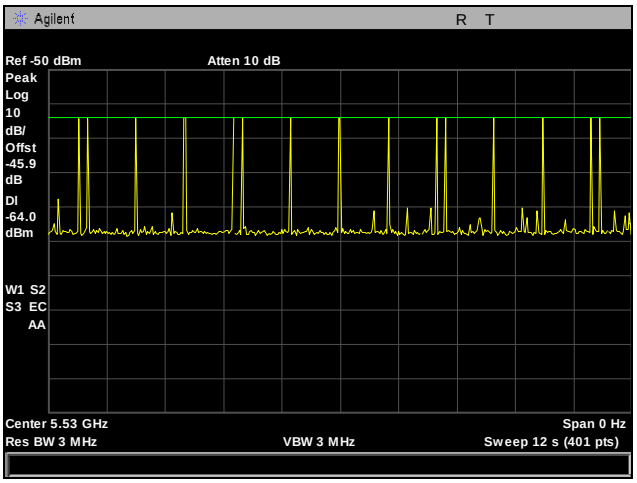
Radar Waveform Calibration, Type 5



Plot 363. Radar Waveform Calibration, 5500 MHz, Type 5

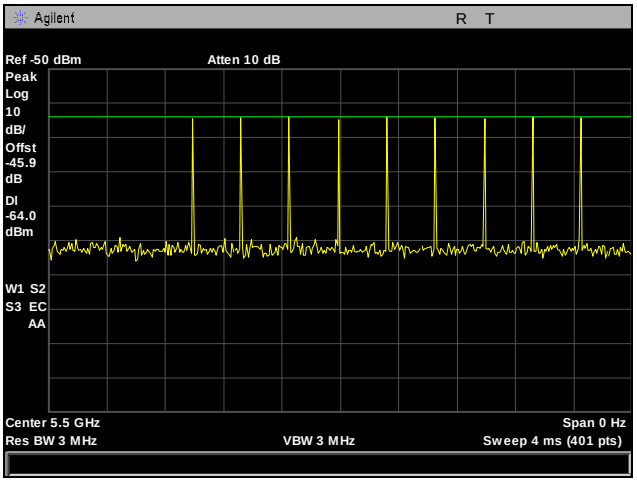


Plot 364. Radar Waveform Calibration, 5510 MHz, Type 5

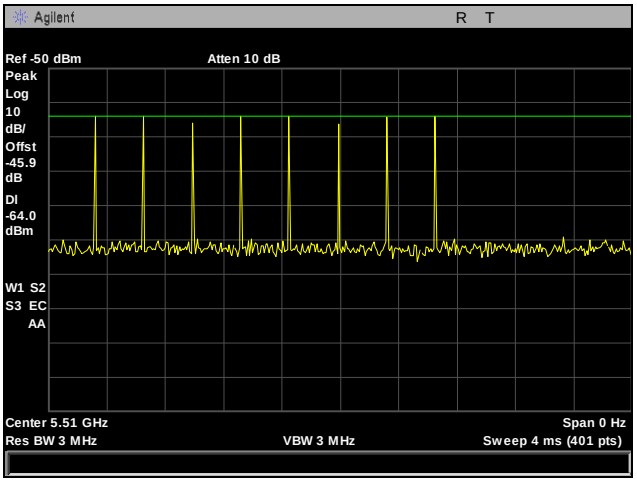


Plot 365. Radar Waveform Calibration, 5530 MHz, Type 5

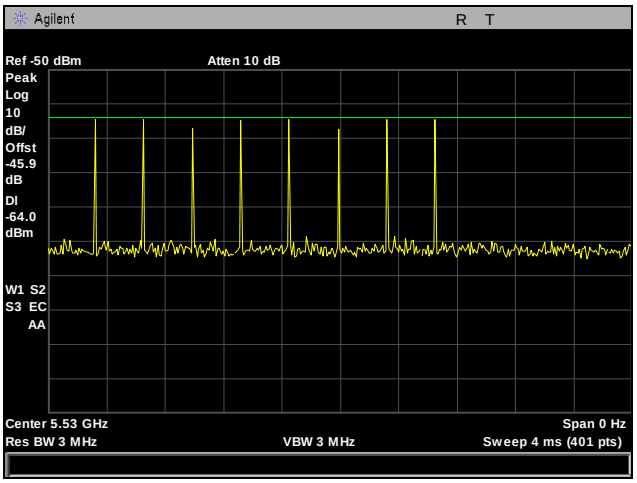
Radar Waveform Calibration, Type 6



Plot 366. Radar Waveform Calibration, 5500 MHz, Type 6



Plot 367. Radar Waveform Calibration, 5510 MHz, Type 6



Plot 368. Radar Waveform Calibration, 5530 MHz, Type 6

V. DFS Test Procedure and Test Results

A. DFS Test Setup

1. A spectrum analyzer is used as a monitor to verify that the Unit Under Test (EUT) has vacated the Channel within the Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and subsequent Channel move. It is also used to monitor EUT transmissions during the Channel Availability Check Time.
2. The test setup, which consists of test equipment and equipment under test (EUT), is diagrammed in Figure 4.

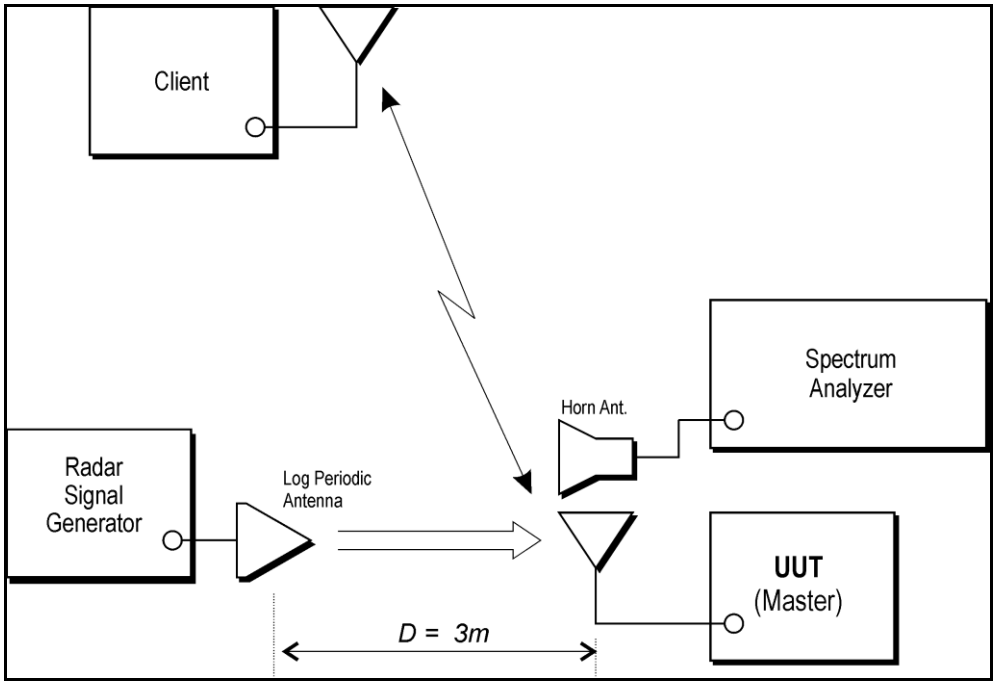


Figure 4. Test Setup Diagram

B. Description of Master Device

1. Operating Frequency Range: 5260-5320MHz, 5500-5710MHz
2. Modes of Operation: The unit is a master device
3. List all antennas and associated gains: 2dBi, 6.77dBi
4. List output power ranges: 20dBm-24dBm
5. List antenna impedance: 50 Ohm
6. Antenna gain verification: See antenna datasheet
7. State test file that is transmitted: 6.5 Magic Hours
8. Time for master to complete its power-on-cycle: 60s

C. UNII Detection Bandwidth

Test Requirement(s): **KDB 905462 §5.1** All BW modes must be tested.

§5.3 A minimum 100% detection rate is required across a EUT's 99% bandwidth.

Test Procedure: The EUT was set up as a standalone device (no associated Client or Master, as appropriate) and no traffic.

A single radar burst of type 0 and the center frequency was generated and the response of the EUT was noted. This was repeated for a minimum of 10 trials. The minimum percentage of detection was 90%, as per the KDB 905462.

Starting at the center frequency of the EUT operating Channel, the radar frequency was increased in 5 MHz steps, repeating the minimum of 10 trials, until the detection rate fell below the U-NII Detection Bandwidth criterion (90%). The measurement was repeated in 1MHz steps at frequencies 5 MHz below where the detection rate began to fall. The highest frequency (denoted as F_H) at which detection was greater or equal than the U-NII Detection Bandwidth criterion (90%) was recorded.

Starting at the center frequency of the EUT operating Channel, the radar frequency was decreased in 5 MHz steps, repeating the minimum of 10 trials, until the detection rate fell below the U-NII Detection Bandwidth criterion (90%). The measurement was repeated in 1MHz steps at frequencies 5 MHz below where the detection rate began to fall. The lowest frequency (denoted as F_L) at which detection was greater or equal than the U-NII Detection Bandwidth criterion (90%) was recorded.

The U-NII Detection Bandwidth was calculated as follow:

U-NII Detection Bandwidth = FH – FL

Test Results: The EUT was compliant with the requirements of this section.

Test Engineer(s): Hadid Jones

Test Date(s): 04/21/16

UNII Detection Bandwidth

EUT Frequency- 5500MHz											
	DFS Detection Trials (1=Detection, 0= No Detection)										
Radar Frequency (MHz)	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5489	0	0	0	0	0	0	0	0	0	0	0
5490	1	1	1	1	1	1	1	1	1	1	100
5495	1	1	1	1	1	1	1	1	1	1	100
5500	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**100**
5505	1	1	1	1	1	1	1	1	1	1	100
5510	1	1	1	1	1	1	1	1	1	1	100
5511	0	0	0	0	0	0	0	0	0	0	0
											100%
Detection Bandwidth = f_h - f_l = 5510 MHz-5490MHz = 20MHz											
EUT 99% Bandwidth = 20MHz											

Table 19. UNII Detection Bandwidth, 5500 MHz

EUT Frequency- 5510MHz											
	DFS Detection Trials (1=Detection, 0= No Detection)										
Radar Frequency (MHz)	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5488	0	0	0	0	0	0	0	0	0	0	0
5489	1	1	1	1	1	1	1	1	1	1	100
5490	1	1	1	1	1	1	1	1	1	1	100
5495	1	1	1	1	1	1	1	1	1	1	100
5500	1	1	1	1	1	1	1	1	1	1	100
5505	1	1	1	1	1	1	1	1	1	1	100
Center 5510	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**100**
5515	1	1	1	1	1	1	1	1	1	1	100
5520	1	1	1	1	1	1	1	1	1	1	100
5525	1	1	1	1	1	1	1	1	1	1	100
5530	1	1	1	1	1	1	1	1	1	1	100
5531	1	1	1	1	1	1	1	1	1	1	100
5532	0	0	0	0	0	0	0	0	0	0	0
											100%
Detection Bandwidth = f_h - f_l = 5531 MHz-5489MHz = 42MHz											
EUT 99% Bandwidth = 40MHz											

Table 20. UNII Detection Bandwidth, 5510 MHz

EUT Frequency- 5530MHz											
	DFS Detection Trials (1=Detection, 0= No Detection)										
Radar Frequency (MHz)	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5489	0	0	0	0	0	0	0	0	0	0	0
5490	1	1	1	1	1	1	1	1	1	1	100
5495	1	1	1	1	1	1	1	1	1	1	100
5500	1	1	1	1	1	1	1	1	1	1	100
5505	1	1	1	1	1	1	1	1	1	1	100
5510	1	1	1	1	1	1	1	1	1	1	100
5515	1	1	1	1	1	1	1	1	1	1	100
5520	1	1	1	1	1	1	1	1	1	1	100
5525	1	1	1	1	1	1	1	1	1	1	100
5530	1	1	1	1	1	1	1	1	1	1	100
5535	1	1	1	1	1	1	1	1	1	1	100
5540	1	1	1	1	1	1	1	1	1	1	100
5545	1	1	1	1	1	1	1	1	1	1	100
5550	1	1	1	1	1	1	1	1	1	1	100
5555	1	1	1	1	1	1	1	1	1	1	100
5560	1	1	1	1	1	1	1	1	1	1	100
5565	1	1	1	1	1	1	1	1	1	1	100
5570	1	1	1	1	1	1	1	1	1	1	100
5571	0	0	0	0	0	0	0	0	0	0	0
											100%
Detection Bandwidth = f_h - f_l = 5570 MHz-5490MHz = 80MHz											
EUT 99% Bandwidth = 80MHz											

Table 21. UNII Detection Bandwidth, 5530 MHz

D. Channel Availability Check Time

Test Requirements: **§15.407(h)(2)(ii)** A U-NII device shall check if there is a radar system already operating on the channel before it can initiate a transmission on a channel and when it has to move to a new channel. The U-NII device may start using the channel if no radar signal with a power level greater than the interference threshold values listed in paragraph (h)(2) of this section, is detected within 60 seconds.

Test Procedure: The spectrum analyzer was set to a zero span mode with a 3 MHz RBW and 3 MHz VBW on the test channel with a >2.5 minute sweep time. The spectrum analyzer's sweep was started at the same time power was applied to the U-NII device.

For the initial Channel Availability Check Time no radar burst was generated and the EUT was monitored for how long after startup transmission started.

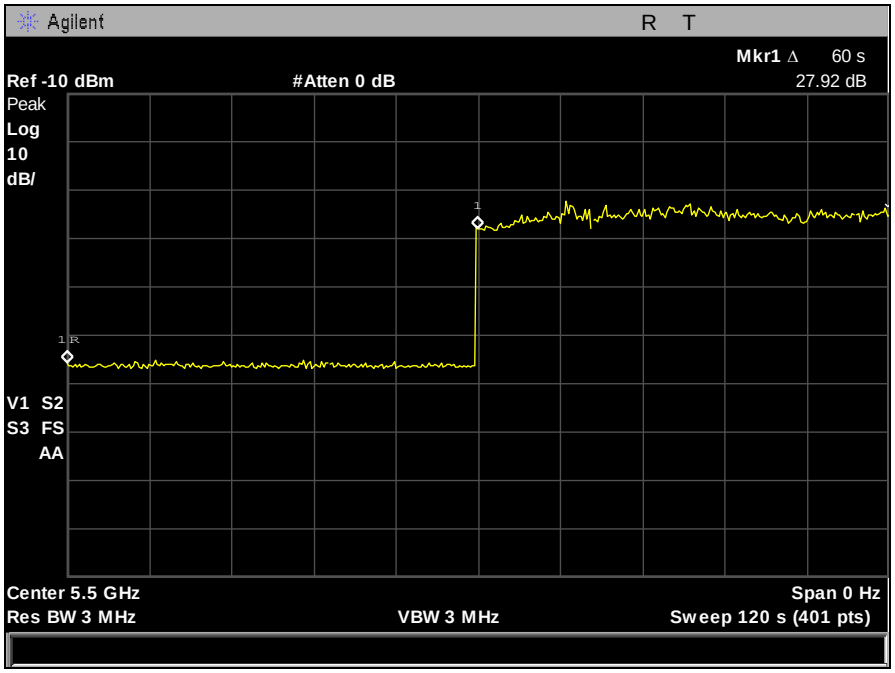
For radar burst at the beginning of the Channel Availability Check Time a short pulse radar type (0-4) with a level equal to the DFS Detection Threshold + 1 dB was generated within the first 6 seconds of the EUT's channel availability check. The EUT was monitored to ensure that it did not start transmitting on the channel.

For radar burst at the end of the Channel Availability Check Time a short pulse radar type (0-4) with a level equal to the DFS Detection Threshold + 1 dB was generated within the last 6 seconds of the EUT's channel availability check. The EUT was monitored to ensure that it did not start transmitting on the channel.

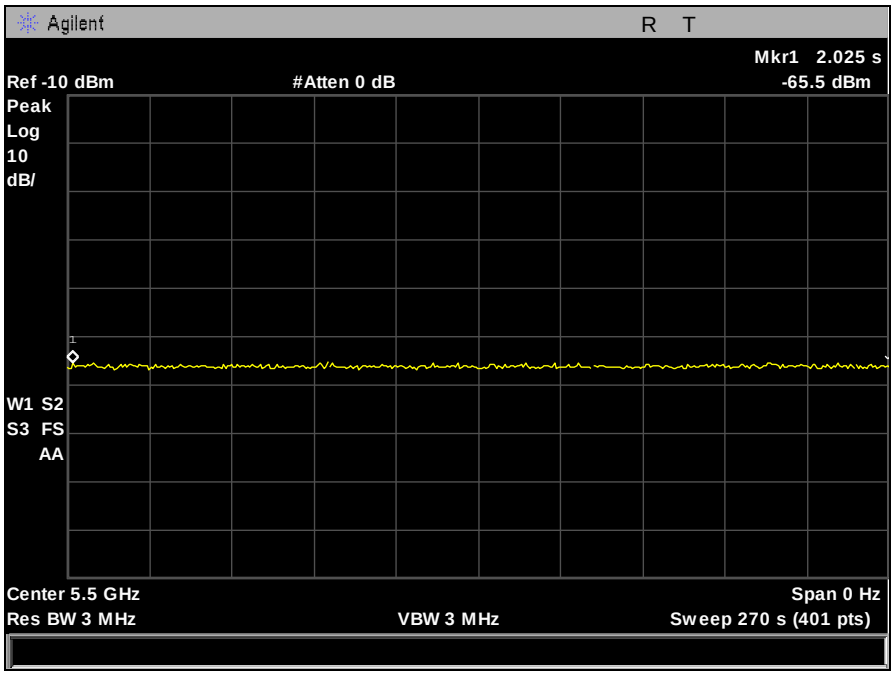
Test Results: The EUT was compliant with the requirements of this section.

Test Engineer(s): Hadid Jones

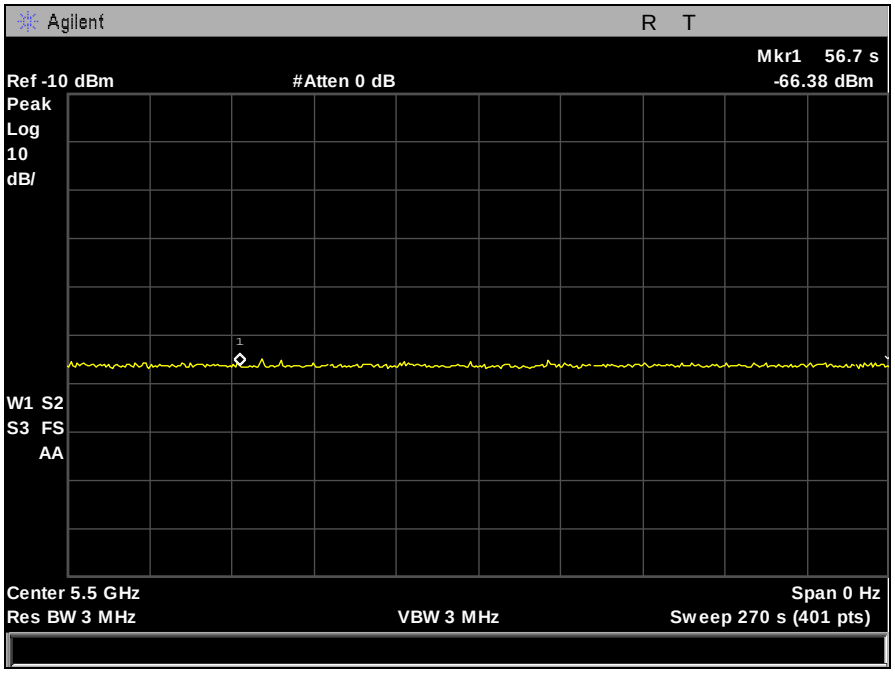
Test Date(s): 04/21/16



Plot 369. Initial Channel Availability Check Time (CACT)



Plot 370. Pulse at Channel Availability Check (CAC) Beginning



Plot 371. Pulse at Channel Availability Check (CAC) End

E. In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time, and Non-Occupancy Period

Test Requirements: **§15.407(h)(2)(iii)** Channel Move Time. After a radar's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.

§15.407(h)(2)(iv) Non-occupancy Period. A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

KDB 905462 §5.1 Test using widest BW mode available.

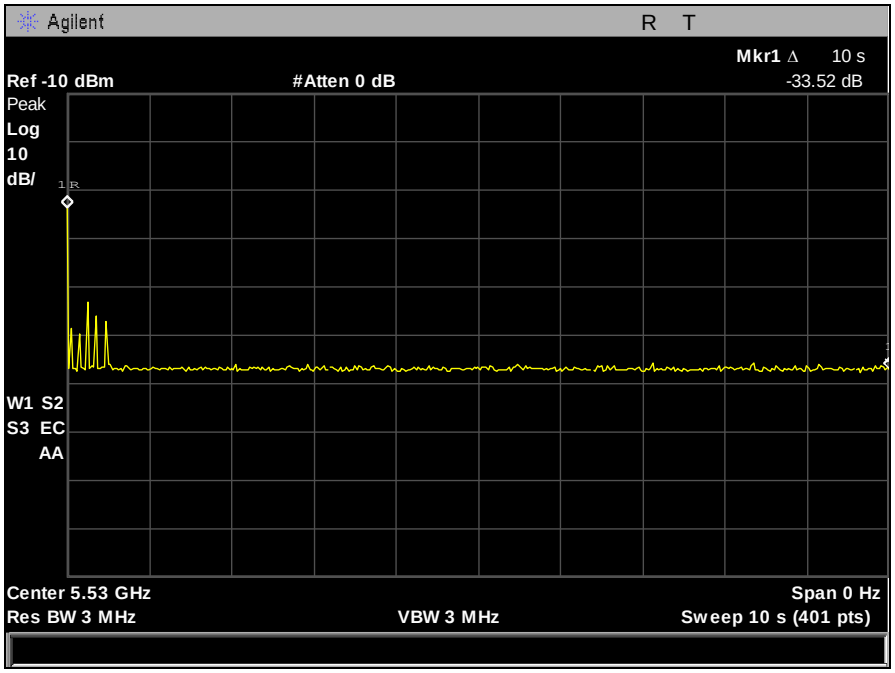
Test Procedure: The EUT was setup as a Master device and associated with a Client device. A test file was streamed from the Master device to the Client device for the entire period of the test. A Radar Burst of type 0 with a level equal to the DFS Detection Threshold + 1 dB was used.

A radar pulse was generated while the EUT was transmitting. A spectrum analyzer set to a zero span was used to observe the transmission of the EUT at the end of the burst.

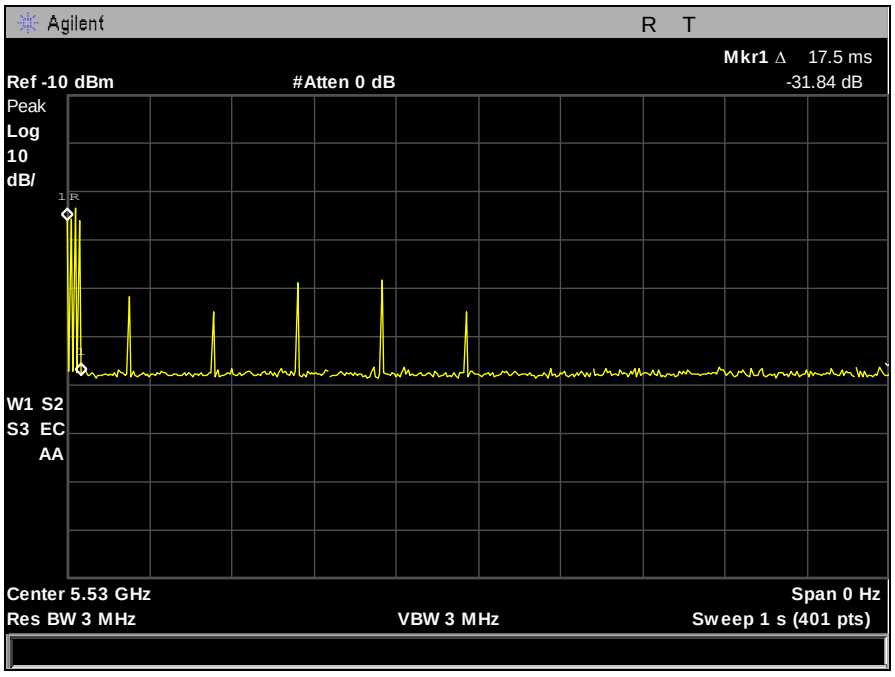
Test Results: The EUT was compliant with the requirements of this section.

Test Engineer(s): Hadid Jones

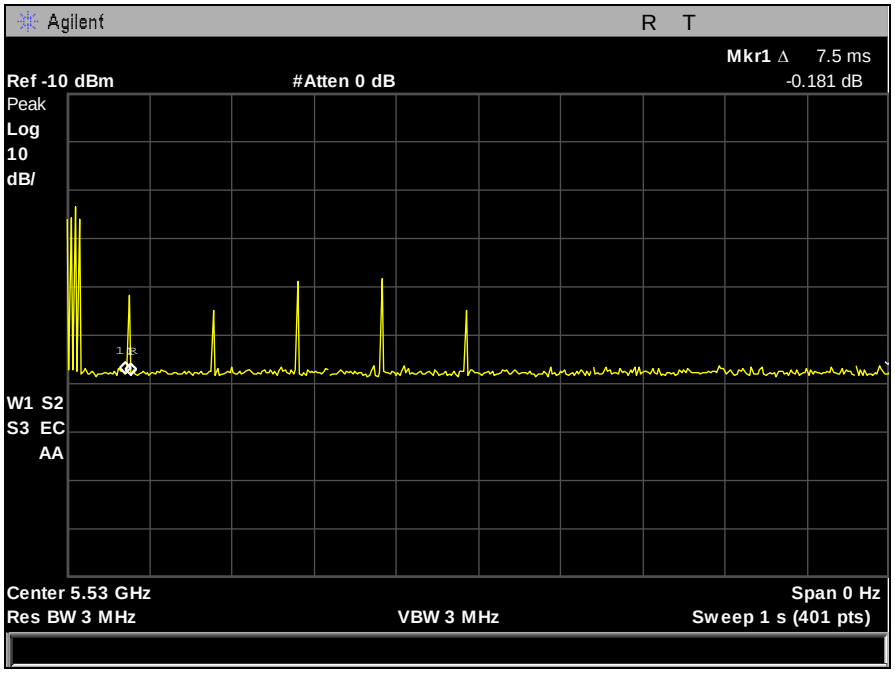
Test Date(s): 4/21/16



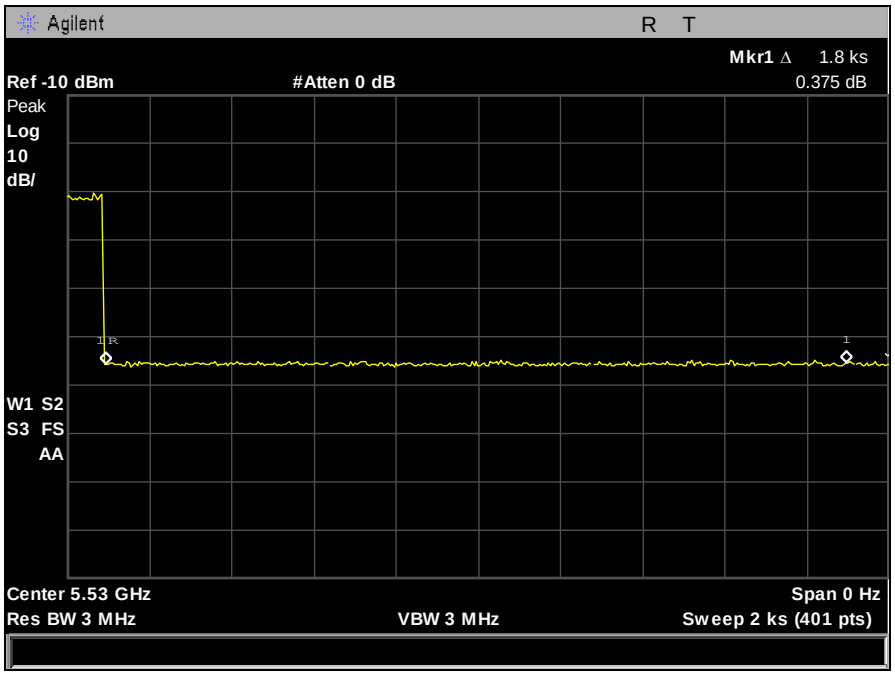
Plot 372. Channel Move Time



Plot 373. Channel Close Time, A



Plot 374. Channel Close Time, B



Plot 375. Non-Occupancy Period

F. Statistical Performance Check

Test Requirements: **KDB 905462 §5.1** All BW modes must be tested.

KDB 905462: Each of the Radar Pulse types requires a minimum percentage of detections while the EUT is transmitting and listening for potential radar systems operating within the DFS Detection Bandwidth.
For Short Pulse Radar types the aggregate minimum percentage of detections is 80 percent.
Fort the Long Pulse Radar types the minimum percentage of detections is 80 percent.
For the Frequency Hopping Radar type the minimum percentage of detections is 70 percent.

Test Procedure: The EUT was setup as a Master device and associated with a Client device. A test file was streamed from the Master device to the Client device for the entire period of the test. The EUT was also set to a test mode as to demonstrate when the detection occurred without reseting the device between trials.
A Radar Burst of each type (1-6) with a level equal to the DFS Detection Threshold + 1 dB was used. The frequencies selected for the radar burst included several frequencies within the DFS Detection Bandwidth and frequencies near the edge of the bandwidth.
For Short Pulse Radar types, an observation of the EUT's transmission was made for a duration greater than 10 seconds after the burst to ensure detection occurred.
For Long Pulse Radar types, an observation of the EUT's transmission was made for a duration greater than 10 seconds after the burst to ensure detection occurred. Also, center frequencies for the 30 trials were randomly selected within 80% of the Occupied Bandwidth.
Once the performance check was completed, statistical data was gathered as to determine the ability of the EUT to detect radar waveforms. An aggregate total for the Short Pulse Radar detections was calculated.

Test Results: The EUT was compliant with the requirements of this section.

Test Engineer(s): Hadid Jones

Test Date(s): 04/21/16

Statistical Performance Check, 20 MHz

Radar Type	Trial #	Pulses Repetition Frequency Number (1-23)	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (µsec)	Detection
					1 = Yes, 0 = No
1	1	9	1139.0	878	1
	2	14	1567.4	638	1
	3	2	1792.1	558	1
	4	5	1165.5	858	1
	5	15	1253.1	798	1
	6	19	1519.8	658	1
	7	8	1432.7	698	1
	8	1	1730.1	578	1
	9	11	1618.1	618	1
	10	18	1319.3	758	1
	11	3	1858.7	538	1
	12	22	1222.5	818	1
	13	7	1193.3	838	1
	14	17	326.2	3066	1
	15	4	1355.0	738	1
	16	n/a	545.3	1834	1
	17	n/a	445.0	2247	1
	18	n/a	522.7	1913	1
	19	n/a	441.9	2263	1
	20	n/a	1455.6	687	1
	21	n/a	397.1	2518	1
	22	n/a	362.8	2756	1
	23	n/a	1572.3	636	1
	24	n/a	564.0	1773	1
	25	n/a	335.6	2980	1
	26	n/a	390.5	2561	1
	27	n/a	459.3	2177	1
	28	n/a	371.6	2691	1
	29	n/a	457.5	2186	1
	30	n/a	563.1	1776	1
Detection Percentage					**100% (> 60%)**
EUT Test Frequency					**5490 - 5510 MHz**
Radar Frequency					**5490 - 5510 MHz**

Table 22. Statistical Performance Check, 5500 MHz 20 MHz, Radar Type 1

Radar Type	Trial #	Pulse Width 1- 5 µsec	PRI 150-230 µsec	Number of Pulses 23-29	Detection 1 = Yes, 0 = No
2	1	2	171	24	1
	2	1.4	170	23	1
	3	2.9	174	26	1
	4	4.1	185	28	1
	5	3.6	187	27	1
	6	2.7	195	26	1
	7	2.4	203	25	1
	8	4.8	181	29	1
	9	1.4	213	23	1
	10	3.6	155	27	1
	11	1.1	180	23	1
	12	2	218	24	1
	13	2.3	226	25	1
	14	5	167	29	1
	15	3.7	217	27	1
	16	3.6	229	27	1
	17	2.1	211	24	1
	18	3.5	186	27	1
	19	3.8	161	27	1
	20	3.8	157	27	1
	21	4.8	193	29	1
	22	1.3	194	23	1
	23	1.6	177	24	1
	24	2.5	225	25	1
	25	4.2	230	28	1
	26	1.6	150	24	1
	27	4.2	206	28	1
	28	2.2	163	25	1
	29	4.3	158	28	1
	30	4.6	209	29	1
	Detection Percentage				**100% (>60%)**

Table 23. Statistical Performance Check, 5500 MHz 20 MHz, Radar Type 2

Radar Type	Trial #	Pulse Width 6-10 µsec	PRI 200-500 µsec	Number of Pulses 16-18	Detection 1 = Yes, 0 = No
3	1	7	418	16	1
	2	6.4	308	16	1
	3	7.9	392	17	1
	4	9.1	478	18	1
	5	8.6	306	17	1
	6	7.7	235	17	1
	7	7.4	404	17	1
	8	9.8	435	18	1
	9	6.4	469	16	1
	10	8.6	461	17	1
	11	6.1	423	16	1
	12	7	428	16	1
	13	7.3	349	16	1
	14	10	348	18	1
	15	8.7	463	18	1
	16	8.6	380	17	1
	17	7.1	383	16	1
	18	8.5	249	17	1
	19	8.8	270	18	1
	20	8.8	210	18	1
	21	9.8	477	18	1
	22	6.3	389	16	1
	23	6.6	370	16	1
	24	7.5	449	17	1
	25	9.2	322	18	1
	26	6.6	361	16	1
	27	9.2	204	18	1
	28	7.2	395	16	1
	29	9.3	298	18	1
	30	9.6	236	18	1
	Detection Percentage				100% (>60%)

Table 24. Statistical Performance Check, 5500 MHz 20 MHz, Radar Type 3

Radar Type	Trial #	Pulse Width 11-20 µsec	PRI 200-500 µsec	Number of Pulses 12-16	Detection 1 = Yes, 0 = No
4	1	13.2	418	13	1
	2	12	308	12	1
	3	15.2	392	14	1
	4	18	478	15	1
	5	16.9	306	15	1
	6	14.9	235	14	1
	7	14.2	404	13	1
	8	19.5	435	16	1
	9	11.9	469	12	1
	10	16.8	461	15	1
	11	11.2	423	12	1
	12	13.2	428	13	1
	13	13.9	349	13	1
	14	20	348	16	1
	15	17.2	463	15	1
	16	16.9	380	15	1
	17	13.5	383	13	1
	18	16.5	249	15	1
	19	17.4	270	15	1
	20	17.3	210	15	1
	21	19.6	477	16	1
	22	11.8	389	12	1
	23	12.4	370	12	1
	24	14.4	449	13	1
	25	18.2	322	15	1
	26	12.5	361	12	1
	27	18.2	204	15	1
	28	13.7	395	13	1
	29	18.4	298	16	1
	30	9.6	236	18	1
	Detection Percentage				100% (> 60%)

Table 25. Statistical Performance Check, 5500 MHz 20 MHz, Radar Type 4

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detections
1	30	30	100%
2	30	30	100%
3	30	30	100%
4	30	30	100%
Aggregate = (100% + 100% + 100% + 100%)/4 = 100%			

Table 26. Statistical Performance Check, 5500 MHz 20 MHz, Aggregate

Radar Type	Trial #	Pulse Width (µsec) 50-100	PRI (µsec) 1000-2000	Number of Bursts 8-20	Detection 1 = Yes, 0 = No
5	1	11	1.0909091	12	1
	2	9	1.3333333	12	1
	3	14	0.8571429	12	0
	4	18	0.6666667	12	0
	5	16	0.75	12	0
	6	13	0.9230769	12	1
	7	12	1	12	0
	8	20	0.6	12	1
	9	9	1.3333333	12	1
	10	16	0.75	12	1
	11	8	1.5	12	1
	12	11	1.0909091	12	1
	13	12	1	12	1
	14	20	0.6	12	1
	15	16	0.75	12	1
	16	16	0.75	12	1
	17	11	1.0909091	12	1
	18	15	0.8	12	1
	19	17	0.7058824	12	1
	20	17	0.7058824	12	1
	21	20	0.6	12	1
	22	9	1.3333333	12	1
	23	10	1.2	12	1
	24	12	1	12	1
	25	18	0.6666667	12	1
	26	10	1.2	12	1
	27	18	0.6666667	12	0
	28	11	1.0909091	12	1
	29	18	0.6666667	12	1
	30	19	0.6315789	12	1
	Detection Percentage				**83% (> 80%)**

Table 27. Statistical Performance Check, 5500 MHz 20 MHz, Radar Type 5

Radar Type	Trial #	Frequency (MHz)	Pulses/Hop	Pulse Width (µsec)	PRI (µsec)	Detection
						1 = Yes, 0 = No
6	1	5494-5526	9	1	333	1
	2	5494-5526	9	1	333	1
	3	5494-5526	9	1	333	1
	4	5494-5526	9	1	333	1
	5	5494-5526	9	1	333	1
	6	5494-5526	9	1	333	1
	7	5494-5526	9	1	333	1
	8	5494-5526	9	1	333	1
	9	5494-5526	9	1	333	1
	10	5494-5526	9	1	333	1
	11	5494-5526	9	1	333	1
	12	5494-5526	9	1	333	1
	13	5494-5526	9	1	333	1
	14	5494-5526	9	1	333	1
	15	5494-5526	9	1	333	1
	16	5494-5526	9	1	333	1
	17	5494-5526	9	1	333	1
	18	5494-5526	9	1	333	1
	19	5494-5526	9	1	333	1
	20	5494-5526	9	1	333	1
	21	5494-5526	9	1	333	1
	22	5494-5526	9	1	333	1
	23	5494-5526	9	1	333	1
	24	5494-5526	9	1	333	1
	25	5494-5526	9	1	333	1
	26	5494-5526	9	1	333	1
	27	5494-5526	9	1	333	1
	28	5494-5526	9	1	333	1
	29	5494-5526	9	1	333	1
	30	5494-5526	9	1	333	1
	Detection Percentage					100% (> 70%)

Table 28. Statistical Performance Check, 5500 MHz 20 MHz, Radar Type 6

Statistical Performance Check, 40 MHz

Radar Type	Trial #	Pulses Repetition Frequency Number (1-23)	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (µsec)	Detection
					1 = Yes, 0 = No
1	1	9	1139.0	878	1
	2	14	1567.4	638	1
	3	2	1792.1	558	1
	4	5	1165.5	858	1
	5	15	1253.1	798	1
	6	19	1519.8	658	1
	7	8	1432.7	698	1
	8	1	1730.1	578	1
	9	11	1618.1	618	1
	10	18	1319.3	758	1
	11	3	1858.7	538	1
	12	22	1222.5	818	1
	13	7	1193.3	838	1
	14	17	326.2	3066	1
	15	4	1355.0	738	1
	16	n/a	545.3	1834	1
	17	n/a	445.0	2247	1
	18	n/a	522.7	1913	1
	19	n/a	441.9	2263	1
	20	n/a	1455.6	687	1
	21	n/a	397.1	2518	1
	22	n/a	362.8	2756	1
	23	n/a	1572.3	636	1
	24	n/a	564.0	1773	1
	25	n/a	335.6	2980	1
	26	n/a	390.5	2561	1
	27	n/a	459.3	2177	1
	28	n/a	371.6	2691	1
	29	n/a	457.5	2186	1
	30	n/a	563.1	1776	1
Detection Percentage					**100% (> 60%)**
EUT Test Frequency					**5494 - 5526 MHz**
Radar Frequency					**5494 - 5526 MHz**

Table 29. Statistical Performance Check, 5510 MHz 40 MHz, Radar Type 1

Radar Type	Trial #	Pulse Width 1- 5 µsec	PRI 150-230 µsec	Number of Pulses 23-29	Detection 1 = Yes, 0 = No
2	1	2	171	24	1
	2	1.4	170	23	1
	3	2.9	174	26	1
	4	4.1	185	28	1
	5	3.6	187	27	1
	6	2.7	195	26	1
	7	2.4	203	25	1
	8	4.8	181	29	1
	9	1.4	213	23	1
	10	3.6	155	27	1
	11	1.1	180	23	1
	12	2	218	24	1
	13	2.3	226	25	1
	14	5	167	29	1
	15	3.7	217	27	1
	16	3.6	229	27	1
	17	2.1	211	24	1
	18	3.5	186	27	1
	19	3.8	161	27	1
	20	3.8	157	27	1
	21	4.8	193	29	1
	22	1.3	194	23	1
	23	1.6	177	24	1
	24	2.5	225	25	1
	25	4.2	230	28	1
	26	1.6	150	24	1
	27	4.2	206	28	1
	28	2.2	163	25	1
	29	4.3	158	28	1
	30	4.6	209	29	1
	Detection Percentage				**100% (>60%)**

Table 30. Statistical Performance Check, 5510 MHz 40 MHz, Radar Type 2

Radar Type	Trial #	Pulse Width 6-10 µsec	PRI 200-500 µsec	Number of Pulses 16-18	Detection 1 = Yes, 0 = No
3	1	7	418	16	1
	2	6.4	308	16	1
	3	7.9	392	17	1
	4	9.1	478	18	1
	5	8.6	306	17	1
	6	7.7	235	17	1
	7	7.4	404	17	1
	8	9.8	435	18	1
	9	6.4	469	16	1
	10	8.6	461	17	1
	11	6.1	423	16	1
	12	7	428	16	1
	13	7.3	349	16	1
	14	10	348	18	1
	15	8.7	463	18	1
	16	8.6	380	17	1
	17	7.1	383	16	1
	18	8.5	249	17	1
	19	8.8	270	18	1
	20	8.8	210	18	1
	21	9.8	477	18	1
	22	6.3	389	16	1
	23	6.6	370	16	1
	24	7.5	449	17	1
	25	9.2	322	18	1
	26	6.6	361	16	1
	27	9.2	204	18	1
	28	7.2	395	16	1
	29	9.3	298	18	1
	30	9.6	236	18	1
	Detection Percentage				100% (>60%)

Table 31. Statistical Performance Check, 5510 MHz 40 MHz, Radar Type 3

Radar Type	Trial #	Pulse Width 11-20 µsec	PRI 200-500 µsec	Number of Pulses 12-16	Detection 1 = Yes, 0 = No
4	1	13.2	418	13	1
	2	12	308	12	1
	3	15.2	392	14	1
	4	18	478	15	1
	5	16.9	306	15	1
	6	14.9	235	14	1
	7	14.2	404	13	1
	8	19.5	435	16	1
	9	11.9	469	12	1
	10	16.8	461	15	1
	11	11.2	423	12	1
	12	13.2	428	13	1
	13	13.9	349	13	1
	14	20	348	16	1
	15	17.2	463	15	1
	16	16.9	380	15	1
	17	13.5	383	13	1
	18	16.5	249	15	1
	19	17.4	270	15	1
	20	17.3	210	15	1
	21	19.6	477	16	1
	22	11.8	389	12	1
	23	12.4	370	12	1
	24	14.4	449	13	1
	25	18.2	322	15	1
	26	12.5	361	12	1
	27	18.2	204	15	1
	28	13.7	395	13	1
	29	18.4	298	16	1
	30	9.6	236	18	1
	Detection Percentage				100% (> 60%)

Table 32. Statistical Performance Check, 5510 MHz 40 MHz, Radar Type 4

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detections
1	30	30	100%
2	30	30	100%
3	30	30	100%
4	30	30	100%
Aggregate = (100% + 100% + 100% + 100%)/4 = 100%			

Table 33. Statistical Performance Check, 5510 MHz 40 MHz, Aggregate

Radar Type	Trial #	Pulse Width (µsec) 50-100	PRI (µsec) 1000-2000	Number of Bursts 8-20	Detection 1 = Yes, 0 = No
5	1	11	1.0909091	12	1
	2	9	1.3333333	12	1
	3	14	0.8571429	12	0
	4	18	0.6666667	12	1
	5	16	0.75	12	0
	6	13	0.9230769	12	1
	7	12	1	12	1
	8	20	0.6	12	1
	9	9	1.3333333	12	1
	10	16	0.75	12	1
	11	8	1.5	12	1
	12	11	1.0909091	12	1
	13	12	1	12	1
	14	20	0.6	12	1
	15	16	0.75	12	1
	16	16	0.75	12	1
	17	11	1.0909091	12	1
	18	15	0.8	12	1
	19	17	0.7058824	12	1
	20	17	0.7058824	12	1
	21	20	0.6	12	1
	22	9	1.3333333	12	1
	23	10	1.2	12	1
	24	12	1	12	1
	25	18	0.6666667	12	1
	26	10	1.2	12	1
	27	18	0.6666667	12	1
	28	11	1.0909091	12	1
	29	18	0.6666667	12	1
	30	19	0.6315789	12	1
	Detection Percentage				**93% (> 80%)**

Table 34. Statistical Performance Check, 5510 MHz 40 MHz, Radar Type 5

Radar Type	Trial #	Frequency (MHz)	Pulses/Hop	Pulse Width (µsec)	PRI (µsec)	Detection
						1 = Yes, 0 = No
6	1	5494-5526	9	1	333	1
	2	5494-5526	9	1	333	1
	3	5494-5526	9	1	333	1
	4	5494-5526	9	1	333	1
	5	5494-5526	9	1	333	1
	6	5494-5526	9	1	333	1
	7	5494-5526	9	1	333	1
	8	5494-5526	9	1	333	1
	9	5494-5526	9	1	333	1
	10	5494-5526	9	1	333	1
	11	5494-5526	9	1	333	1
	12	5494-5526	9	1	333	1
	13	5494-5526	9	1	333	1
	14	5494-5526	9	1	333	1
	15	5494-5526	9	1	333	1
	16	5494-5526	9	1	333	1
	17	5494-5526	9	1	333	1
	18	5494-5526	9	1	333	1
	19	5494-5526	9	1	333	1
	20	5494-5526	9	1	333	1
	21	5494-5526	9	1	333	1
	22	5494-5526	9	1	333	1
	23	5494-5526	9	1	333	1
	24	5494-5526	9	1	333	1
	25	5494-5526	9	1	333	1
	26	5494-5526	9	1	333	1
	27	5494-5526	9	1	333	1
	28	5494-5526	9	1	333	1
	29	5494-5526	9	1	333	1
	30	5494-5526	9	1	333	1
	Detection Percentage					100% (> 70%)

Table 35. Statistical Performance Check, 5510 MHz 40 MHz, Radar Type 6

Statistical Performance Check, 80 MHz

Radar Type	Trial #	Pulses Repetition Frequency Number (1-23)	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (µsec)	Detection
					1 = Yes, 0 = No
1	1	9	1139.0	878	1
	2	14	1567.4	638	1
	3	2	1792.1	558	1
	4	5	1165.5	858	1
	5	15	1253.1	798	1
	6	19	1519.8	658	1
	7	8	1432.7	698	1
	8	1	1730.1	578	1
	9	11	1618.1	618	1
	10	18	1319.3	758	1
	11	3	1858.7	538	1
	12	22	1222.5	818	1
	13	7	1193.3	838	1
	14	17	326.2	3066	1
	15	4	1355.0	738	1
	16	n/a	545.3	1834	1
	17	n/a	445.0	2247	1
	18	n/a	522.7	1913	1
	19	n/a	441.9	2263	1
	20	n/a	1455.6	687	1
	21	n/a	397.1	2518	1
	22	n/a	362.8	2756	1
	23	n/a	1572.3	636	1
	24	n/a	564.0	1773	1
	25	n/a	335.6	2980	1
	26	n/a	390.5	2561	1
	27	n/a	459.3	2177	1
	28	n/a	371.6	2691	1
	29	n/a	457.5	2186	1
	30	n/a	563.1	1776	1
Detection Percentage					**100% (> 60%)**
EUT Test Frequency					**5500 - 5560 MHz**
Radar Frequency					**5500 - 5560 MHz**

Table 36. Statistical Performance Check, 5530 80 MHz, Radar Type 1

Radar Type	Trial #	Pulse Width 1- 5 µsec	PRI 150-230 µsec	Number of Pulses 23-29	Detection 1 = Yes, 0 = No
2	1	2	171	24	1
	2	1.4	170	23	1
	3	2.9	174	26	1
	4	4.1	185	28	1
	5	3.6	187	27	1
	6	2.7	195	26	1
	7	2.4	203	25	1
	8	4.8	181	29	1
	9	1.4	213	23	1
	10	3.6	155	27	1
	11	1.1	180	23	1
	12	2	218	24	1
	13	2.3	226	25	1
	14	5	167	29	1
	15	3.7	217	27	1
	16	3.6	229	27	1
	17	2.1	211	24	1
	18	3.5	186	27	1
	19	3.8	161	27	1
	20	3.8	157	27	1
	21	4.8	193	29	1
	22	1.3	194	23	1
	23	1.6	177	24	1
	24	2.5	225	25	1
	25	4.2	230	28	1
	26	1.6	150	24	1
	27	4.2	206	28	1
	28	2.2	163	25	1
	29	4.3	158	28	1
	30	4.6	209	29	1
	Detection Percentage				100% (>60%)

Table 37. Statistical Performance Check, 5530 80 MHz, Radar Type 2

Radar Type	Trial #	Pulse Width 6-10 µsec	PRI 200-500 µsec	Number of Pulses 16-18	Detection 1 = Yes, 0 = No
3	1	7	418	16	1
	2	6.4	308	16	1
	3	7.9	392	17	1
	4	9.1	478	18	1
	5	8.6	306	17	1
	6	7.7	235	17	1
	7	7.4	404	17	1
	8	9.8	435	18	1
	9	6.4	469	16	1
	10	8.6	461	17	1
	11	6.1	423	16	1
	12	7	428	16	1
	13	7.3	349	16	1
	14	10	348	18	1
	15	8.7	463	18	1
	16	8.6	380	17	1
	17	7.1	383	16	1
	18	8.5	249	17	1
	19	8.8	270	18	1
	20	8.8	210	18	1
	21	9.8	477	18	1
	22	6.3	389	16	1
	23	6.6	370	16	1
	24	7.5	449	17	1
	25	9.2	322	18	1
	26	6.6	361	16	1
	27	9.2	204	18	1
	28	7.2	395	16	1
	29	9.3	298	18	1
	30	9.6	236	18	1
	Detection Percentage				100% (>60%)

Table 38. Statistical Performance Check, 5530 80 MHz, Radar Type 3

Radar Type	Trial #	Pulse Width 11-20 µsec	PRI 200-500 µsec	Number of Pulses 12-16	Detection 1 = Yes, 0 = No
4	1	13.2	418	13	1
	2	12	308	12	1
	3	15.2	392	14	1
	4	18	478	15	1
	5	16.9	306	15	1
	6	14.9	235	14	1
	7	14.2	404	13	1
	8	19.5	435	16	1
	9	11.9	469	12	1
	10	16.8	461	15	1
	11	11.2	423	12	1
	12	13.2	428	13	1
	13	13.9	349	13	1
	14	20	348	16	1
	15	17.2	463	15	1
	16	16.9	380	15	1
	17	13.5	383	13	1
	18	16.5	249	15	1
	19	17.4	270	15	1
	20	17.3	210	15	1
	21	19.6	477	16	1
	22	11.8	389	12	1
	23	12.4	370	12	1
	24	14.4	449	13	1
	25	18.2	322	15	1
	26	12.5	361	12	1
	27	18.2	204	15	1
	28	13.7	395	13	1
	29	18.4	298	16	1
	30	9.6	236	18	1
	Detection Percentage				100% (> 60%)

Table 39. Statistical Performance Check, 5530 80 MHz, Radar Type 4

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detections
1	30	30	100%
2	30	30	100%
3	30	30	100%
4	30	30	100%
Aggregate = (100% + 100% + 100% + 100%)/4 = 100%			

Table 40. Statistical Performance Check, 5530 80 MHz, Aggregate

Radar Type	Trial #	Pulse Width (µsec) 50-100	PRI (µsec) 1000-2000	Number of Bursts 8-20	Detection 1 = Yes, 0 = No
5	1	11	1.0909091	12	1
	2	9	1.3333333	12	1
	3	14	0.8571429	12	1
	4	18	0.6666667	12	1
	5	16	0.75	12	1
	6	13	0.9230769	12	1
	7	12	1	12	1
	8	20	0.6	12	1
	9	9	1.3333333	12	1
	10	16	0.75	12	1
	11	8	1.5	12	1
	12	11	1.0909091	12	1
	13	12	1	12	1
	14	20	0.6	12	1
	15	16	0.75	12	1
	16	16	0.75	12	1
	17	11	1.0909091	12	1
	18	15	0.8	12	0
	19	17	0.7058824	12	1
	20	17	0.7058824	12	1
	21	20	0.6	12	1
	22	9	1.3333333	12	1
	23	10	1.2	12	1
	24	12	1	12	1
	25	18	0.6666667	12	1
	26	10	1.2	12	1
	27	18	0.6666667	12	1
	28	11	1.0909091	12	1
	29	18	0.6666667	12	1
	30	19	0.6315789	12	1
	Detection Percentage				**97% (> 80%)**

Table 41. Statistical Performance Check, 5530 80 MHz, Radar Type 5

Radar Type	Trial #	Frequency (MHz)	Pulses/Hop	Pulse Width (µsec)	PRI (µsec)	Detection
						1 = Yes, 0 = No
6	1	5494-5526	9	1	333	1
	2	5494-5526	9	1	333	1
	3	5494-5526	9	1	333	1
	4	5494-5526	9	1	333	1
	5	5494-5526	9	1	333	1
	6	5494-5526	9	1	333	1
	7	5494-5526	9	1	333	1
	8	5494-5526	9	1	333	1
	9	5494-5526	9	1	333	1
	10	5494-5526	9	1	333	1
	11	5494-5526	9	1	333	1
	12	5494-5526	9	1	333	1
	13	5494-5526	9	1	333	1
	14	5494-5526	9	1	333	1
	15	5494-5526	9	1	333	1
	16	5494-5526	9	1	333	1
	17	5494-5526	9	1	333	1
	18	5494-5526	9	1	333	1
	19	5494-5526	9	1	333	1
	20	5494-5526	9	1	333	1
	21	5494-5526	9	1	333	1
	22	5494-5526	9	1	333	1
	23	5494-5526	9	1	333	1
	24	5494-5526	9	1	333	1
	25	5494-5526	9	1	333	1
	26	5494-5526	9	1	333	1
	27	5494-5526	9	1	333	1
	28	5494-5526	9	1	333	1
	29	5494-5526	9	1	333	1
	30	5494-5526	9	1	333	1
	Detection Percentage					100% (> 70%)

Table 42. Statistical Performance Check, 5530 80 MHz, Radar Type 6

VI. Test Equipment

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2005.

MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1T4751	ANTENNA - BILOG	SUNOL SCIENCES	JB6	2/26/2016	8/26/2017
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	10/29/2014	10/29/2016
1T4818	COMB GENERATOR	COM-POWER	CGO-520	SEE NOTE	
1T4483	ANTENNA; HORN	ETS-LINDGREN	3117	10/8/2015	4/8/2017
1T4442	PRE-AMPLIFIER, MICROWAVE	MITEQ	AFS42-01001800-30-10P	SEE NOTE	
1T6658	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4407B	12/9/2015	12/9/2016
1T4745	ANTENNA, HORN	ETS-LINDGREN	3116	6/27/2015	12/27/2016
1T4752	PRE-AMPLIFIER	MITEQ	JS44-18004000-35-8P	SEE NOTE	
1T4300A	SEMI-ANECHOIC CHAMBER # 1 (FCC)	EMC TEST SYSTEMS	NONE	1/31/2014	1/31/2017
1T4504	SHIELDED ROOM	UNIVERSAL SHIELDING CORP	N/A	NOT REQUIRED	
1T4563	LISN (10 AMP)	SOLAR ELECTRONICS COMPANY	9322-50-R-10-BNC	8/27/2015	2/27/2017

Table 43. Test Equipment List

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.

VII. Certification & User's Manual Information

Certification & User's Manual Information

M. Certification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

§ 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of Emitting radio-frequency energy by radiation, conduction, or other means. Radio- frequency devices include, but are not limited to:

(a) The various types of radio communication transmitting devices described throughout this chapter.

(b) The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.

(c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.

(d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

§ 2.803 Marketing of radio frequency devices prior to equipment authorization.

(a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:

(1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or

(2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.

(d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.

(e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:

(i) Compliance testing;

(ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;

(iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;

(iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production states; or

(v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.

(e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.

(f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a proviso that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.

Certification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart J — Equipment Authorization Procedures:

§ 2.901 Basis and Purpose

(a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.[1] *In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer*, be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.

(b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant.

§ 2.907 Certification.

(a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.

(b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

[1] In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.

Certification & User's Manual Information

§ 2.948 Description of measurement facilities.

(a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.

(1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.

(i) If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.

(ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.

(2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.

Certification & User's Manual Information

Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

§ 15.19 Labeling requirements.

(a) In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

§ 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Verification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

§ 15.105 Information to the user.

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.

– Increase the separation between the equipment and receiver.

– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

– Consult the dealer or an experienced radio/TV technician for help.

End of Report

