



Testing Tomorrow's Technology

Application

For

Part 2, Subpart J, Paragraph 2.907 Equipment Authorization of Certification for an Intentional Radiator per Part 15, Subpart E, paragraphs 15.401, 15.403, 15.405 and 15.407

And

RSS-247 Issue 1 of Industry Canada

For the

**Acuity Brands Lighting Inc. and
Acuity Brands Technology Services, Inc.**

Model: ACWIFI001

**FCC ID: 2ADCB-ACWIFI001
IC: 6715A-ACWIFI001**

**UST Project: 16-0141
Issue Date: September 23, 2016**

Total Pages in This Report: 266

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Testing Tomorrow's Technology

I certify that I am authorized to sign for the Test Agency and that all of the statements in this report and in the Exhibits attached hereto are true and correct to the best of my knowledge and belief:

US TECH (Agent Responsible For Test):

By: Alan Ghasiani

Name: *Alan Ghasiani*

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Date September 23, 2016



NVLAP LAB CODE 200162-0

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US Tech Test Report:
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FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

MEASUREMENT TECHNICAL REPORT

COMPANY NAME: Acuity Brands
MODEL: ACWIFI001
FCC ID: 2ADCB-ACWIFI001
IC: 6715A-ACWIFI001
DATE: September 23, 2016

This report concerns (check one): Original grant ☒
Class II change

Equipment type: 5.18-5.24, 5.26-5.32, 5.5-5.7 and 5.745-5.825 GHz Transmitter

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes _____ No X

If yes, defer until: N/A
date

agrees to notify the Commission by N/A
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

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List of Attachments

Agency Agreement
Application Forms
Letter of Confidentiality
Equipment Label(s)
Block Diagram(s)
Schematic(s)
Test Configuration Photographs
Internal Photographs
External Photographs
Antenna Photographs
Theory of Operation
RF Exposure
User's Manual

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1 General Information

1.1 Purpose of this Report

This report is prepared as a means of conveying test results and information concerning the suitability of this exact product for public distribution according to the FCC Rules and Regulations Part 15, Section 407 and IC RSS 247 Issue 1.

1.2 Characterization of Test Sample

The sample used for testing was received by US Tech on June 31, 2016 in good operating condition.

1.3 Product Description

The Equipment Under Test (EUT) is the Acuity Brands Technology Services, Inc. Model ACWIFI001 radio module. The ACWIFI001 radio module is an embedded wireless internet connectivity module that operates in the 2.4 and 5.0 GHz spectrums.

The EUT does have two antennas, however it can only broadcast on one or the other; never both at the same time. The antenna uses an RF switch that will attenuate the signal to the antenna that is not being used for transmission.

The 2.4 GHz Wi-Fi feature has been tested and results reported in a separate report.

Antenna Gain: 3.38 dBi (Flex trace), 2.4 dBi (Omni)

Modulation: DSSS

Bandwidth: 20 MHz and 40 MHz modulation

Maximum Output Power: a mode: 17.8 dBm (max)
a mode (40MHz): 16.8 dBm (max),
n mode 17.8 dBm (max)
n mode (40MHz): 16.5 dBm

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1.4 Configuration of Tested System

The Test Sample was tested per *ANSI C63.10:2013, Procedures for Compliance Testing of Unlicensed Wireless Devices(2013)* and following KDB 789033 D02 General U-NII Test Procedures New Rules v01r02.

A list of EUT and Peripherals is found in Table 1 below. A block diagram of the tested system is shown in Figure 1. Test configuration photographs are provided in separate Appendices.

1.5 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA 30004. This site has been fully described and registered with the FCC. Its designation number is 186022. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number 9900A-1.

1.6 Related Submittals

The EUT is subject to the following FCC authorizations:

a) Certification under section 15.247 as a transmitter. A separate test report has been provided for this evaluation.

No other related submittals apply.

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Table 1. EUT and Peripherals

PERIPHERAL MANUFACTURER.	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Acuity Brands Technology Services, Inc	ACWIFI001 SIP Application Module	Engineering Sample	2ADCB- ACWIFI001 (pending) 6715A- ACWIFI001 (pending)	N/A
Antenna See antenna details	--	--	--	--

U= Unshielded
S= Shielded
P= Power
D= Data

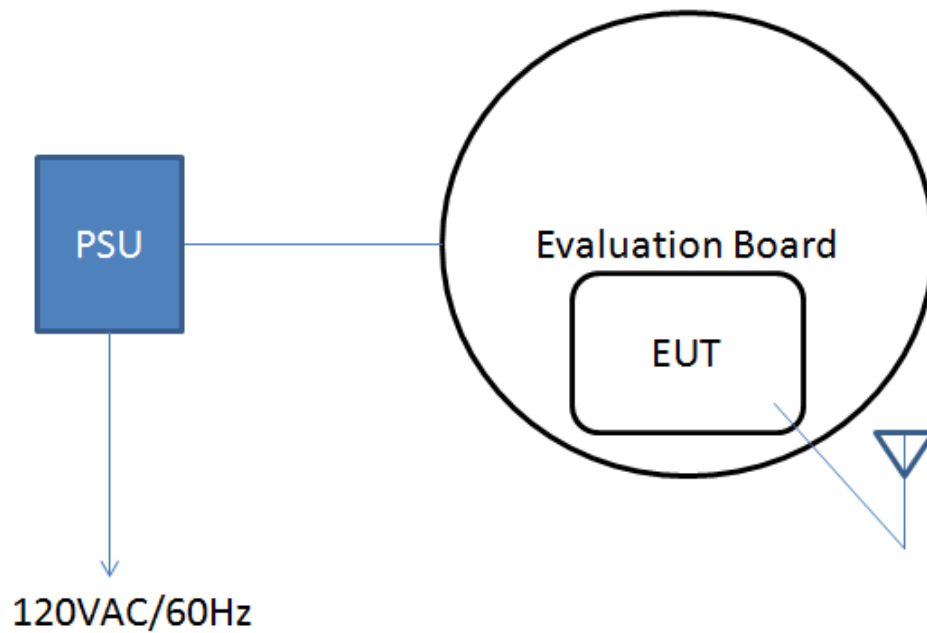


Figure 1. Block Diagram of Test Configuration

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2 Tests and Measurements

2.1 Test Equipment

The table below lists test equipment used to evaluate this product. Model numbers, serial numbers and their calibration status are indicated.

Table 2. Test Instruments

TEST INSTRUMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	CALIBRATION DUE DATE
SPECTRUM ANALYZER	8566B	HEWLETT-PACKARD	2410A00109	8/30/2016
SPECTRUM ANALYZER	DSA815	RIGOL	DSA8A18030 0138	6/30/2017
SPECTRUM ANALYZER	E4407B	AGILENT	US41442935	2/11/2017
LOOP ANTENNA	SAS-200/562	A.H. Systems	142	9/28/2017
BICONICAL ANTENNA	3110B	EMCO	9306-1708	11/24/2016
LOG PERIODIC ANTENNA	3146	EMCO	9110-3236	11/19/2016
LOG PERIODIC ANTENNA	3146	EMCO	9305-3600	10/01/2016
HORN ANTENNA	SAS-571	A.H. Systems	605	8/25/2017
HORN ANTENNA	3115	EMCO	9107-3723	10/8/2016
HORN ANTENNA	3116	EMCO	9505-2255	1/27/2017

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AMPLIFIER	11975A	HEWLETT- PACKARD	2517A00647	12/05/2016
HARMONIC MIXER	11970K	HEWLETT- PACKARD	2332A01241	Not Required
PRE-AMPLIFIER	8449B	HEWLETT- PACKARD	3008A00480	12/01/2016
PRE-AMPLIFIER	8447D	HEWLETT- PACKARD	1937A02980	12/02/2016
LISN x 2	9247-50- TS-50-N	SOLAR ELECTRONICS	955824 and 955825	11/30/2016

Note: The calibration interval of the above test instruments are 12 months unless stated otherwise and all calibrations are traceable to NIST/USA.

2.2 Modifications to EUT Hardware

No physical modifications were made by US Tech in order to bring the EUT into compliance with FCC Part 15, Subpart C Intentional Radiator Limits for the transmitter portion of the EUT or the Subpart B Unintentional Radiator Limits (Receiver and Digital Device) Requirements.

2.3 Number of Measurements for Intentional Radiators (15.31(m))

Measurements of intentional radiators or receivers shall be performed and reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in Table 3 below.

Table 3. Number of Test Frequencies for Intentional Radiators

Frequency Range over which the device operates	Number of Frequencies	Location in the Range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near the top 1 near the bottom
Greater than 10 MHz	3	1 near top 1 near middle 1 near bottom

Because the EUT operates at 5.15 GHz to 5.85 MHz, at least 3 test frequencies were used.

2.4 Frequency Range of Radiated Measurements (Part 15.33)

2.4.1 Intentional Radiator

The spectrum shall be investigated for the intentional radiator from the lowest RF signal generated in the EUT, without going below 9 kHz to the 10th harmonic of the highest fundamental frequency generated or 40 GHz, whichever is the lowest.

2.4.2 Unintentional Radiator

For the digital device, an unintentional radiator, the frequency range shall be 30 MHz to 1000 MHz, or to 5 times the highest internal clock frequency.

2.5 Measurement Detector Function and Bandwidth (Part 15.35)

The radiated and conducted emissions limits shown herein are based on the following:

2.5.1 Detector Function and Associated Bandwidth

On frequencies below 1000 MHz, the limits herein are based upon measurement equipment employing a CISPR Quasi-peak detector function and related measurement bandwidths (i.e. 9 kHz from 150 kHz to 30 MHz and 120 kHz from 30 MHz to 1000 MHz). Alternatively, measurements may be made with equipment employing a peak detector function as long as the same bandwidths specified for the Quasi-peak device are used.

2.5.2 Corresponding Peak and Average Requirements

Above 1000 MHz, radiated limits are based on measuring instrumentation employing an average detector function. When average radiated emissions are specified there is also a corresponding Peak requirement, as measured using a peak detector, of 20 dB greater than the average limit. For all measurements above 1000 MHz the Resolution Bandwidth shall be at least 1 MHz.

2.5.3 Pulsed Transmitter Averaging

When the radiated emissions limit is expressed as an average value, and the transmitter is pulsed, the measured field strength shall be determined by applying a Duty Cycle Correction Factor based upon dividing the total ON time during the first 100 ms period by 100 ms (or by the period if less than 100 ms). The duty cycle may be expressed logarithmically in dB.

NOTE: If the transmitter was programmed to transmit at >98% duty cycle, then, wherever applicable (where the detection mode was AVG) the duty cycle factor calculated will be applied.

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2.6 Duty Cycle Verification (Part 15.35 (c))

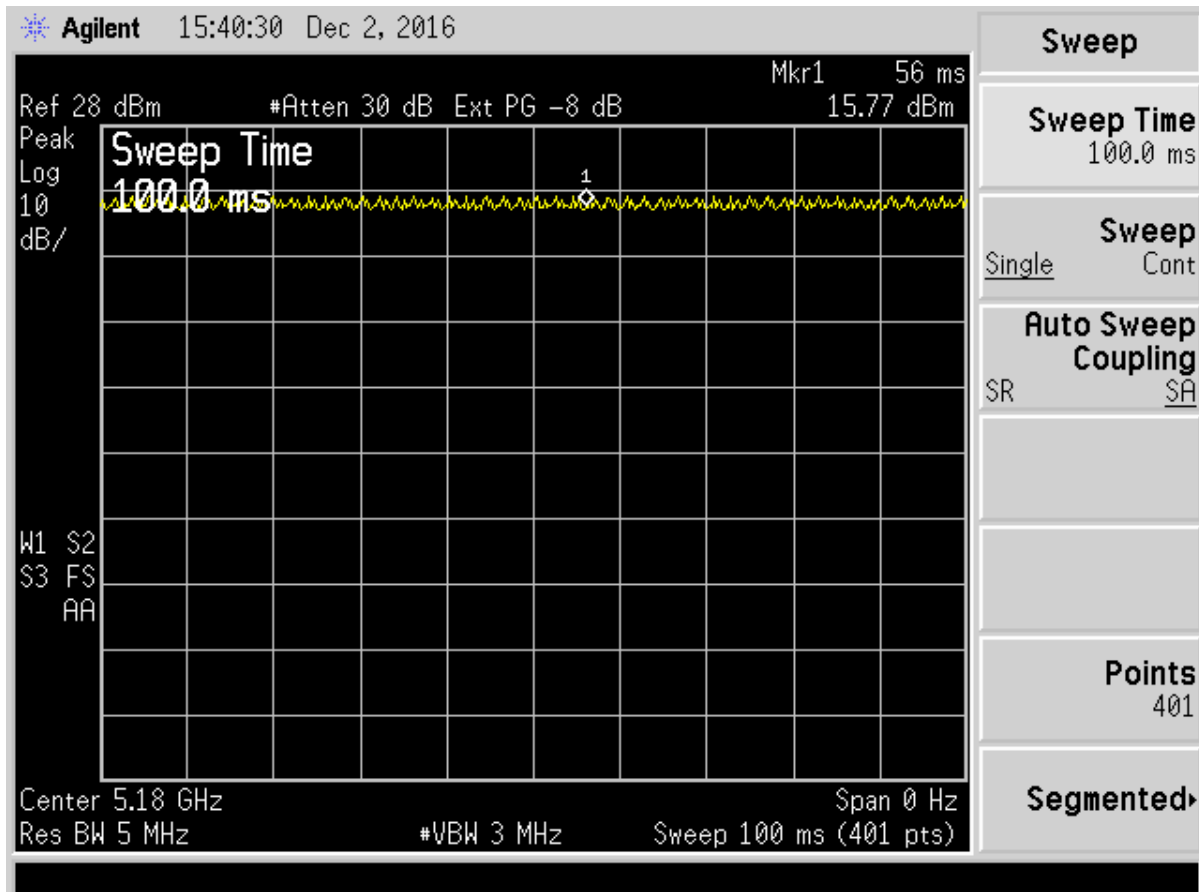


Figure 2. 802.11a(20), Ch 36 6 Mbps

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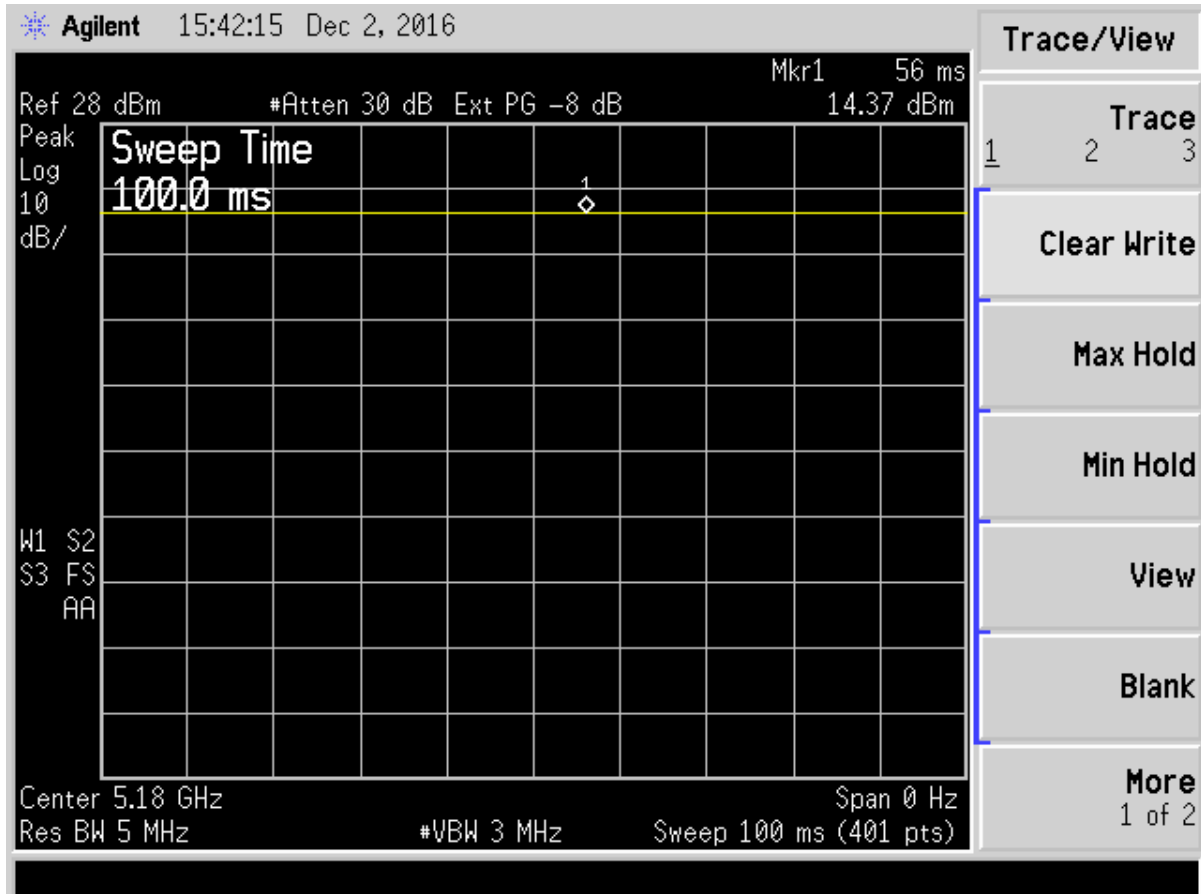


Figure 3. 802.11a(20), Ch 36, 72 Mbps

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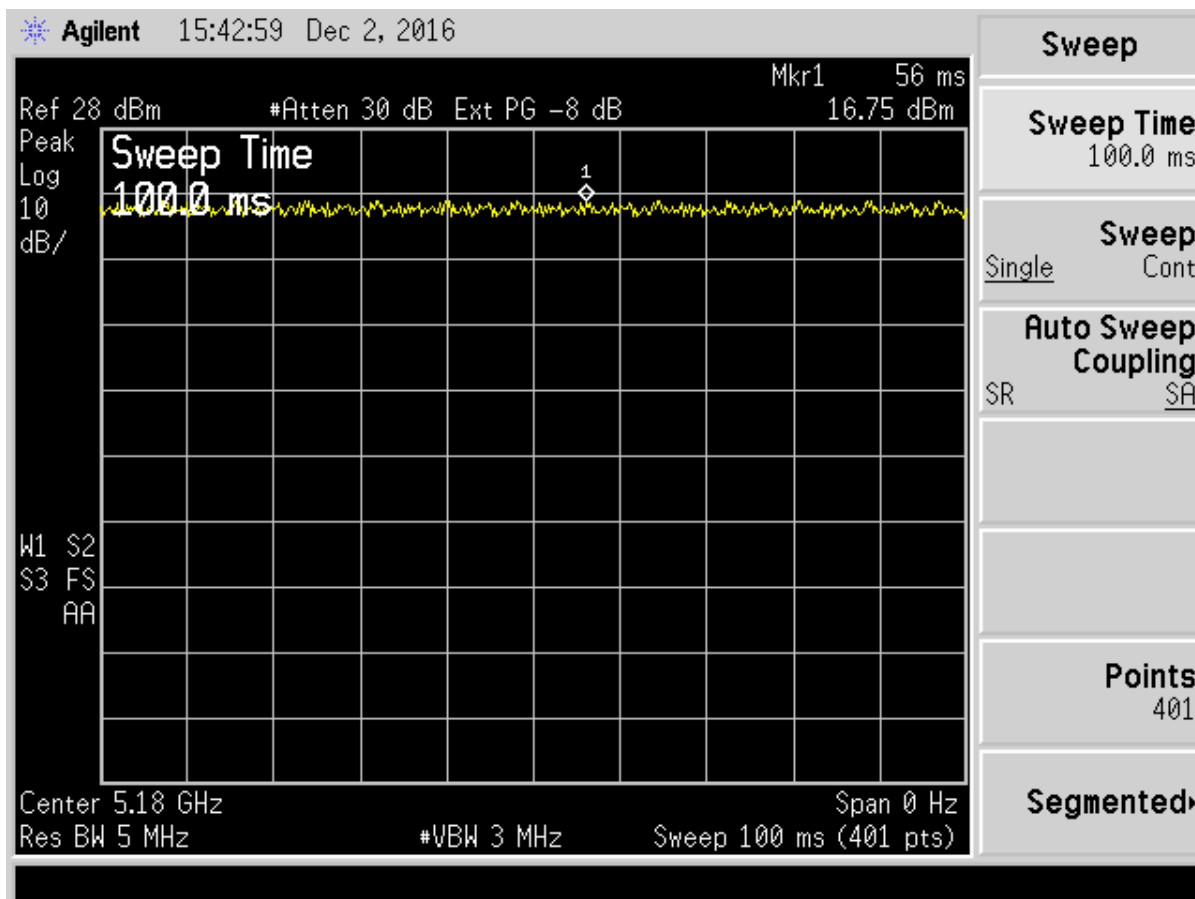


Figure 4. 802.11n(20), Ch 36, MCS0

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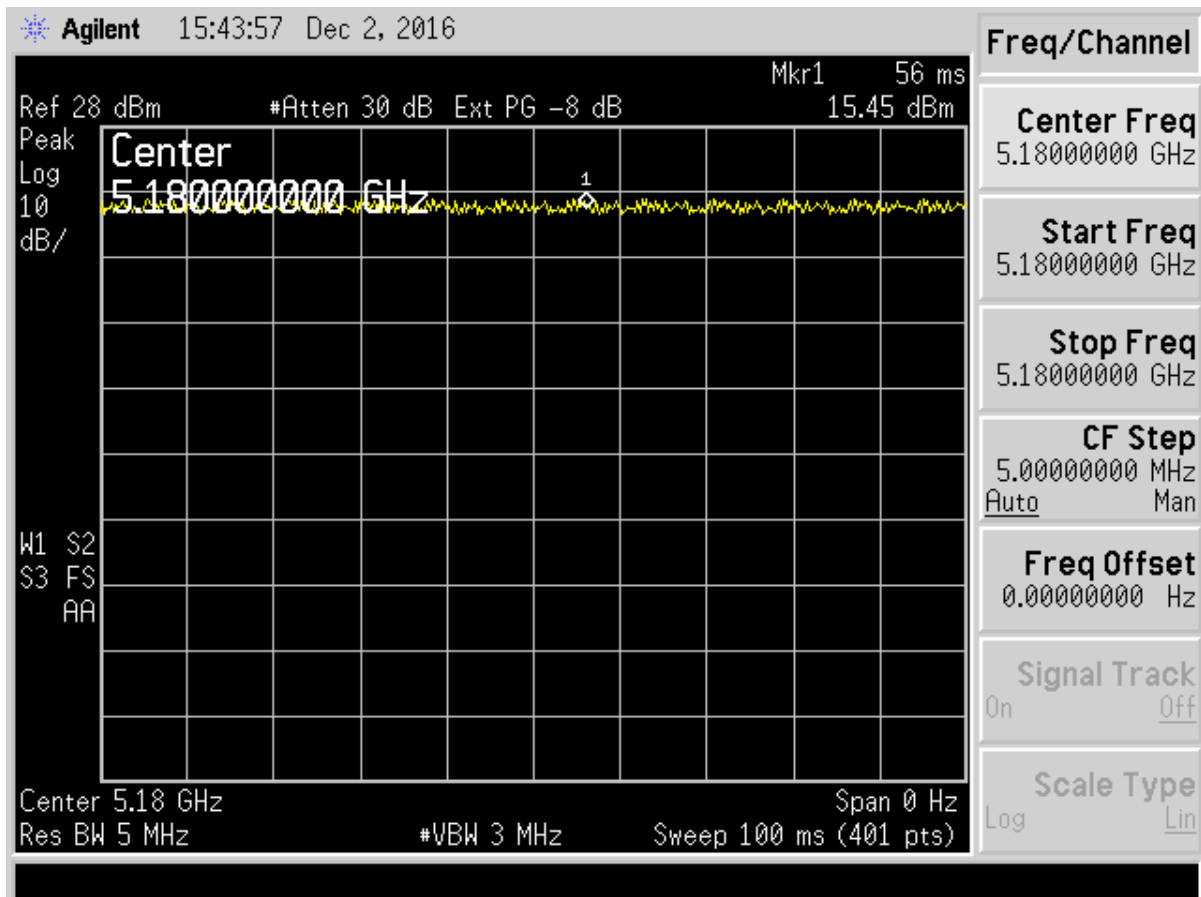


Figure 5. 802.11n(20), Ch 36, MCS7

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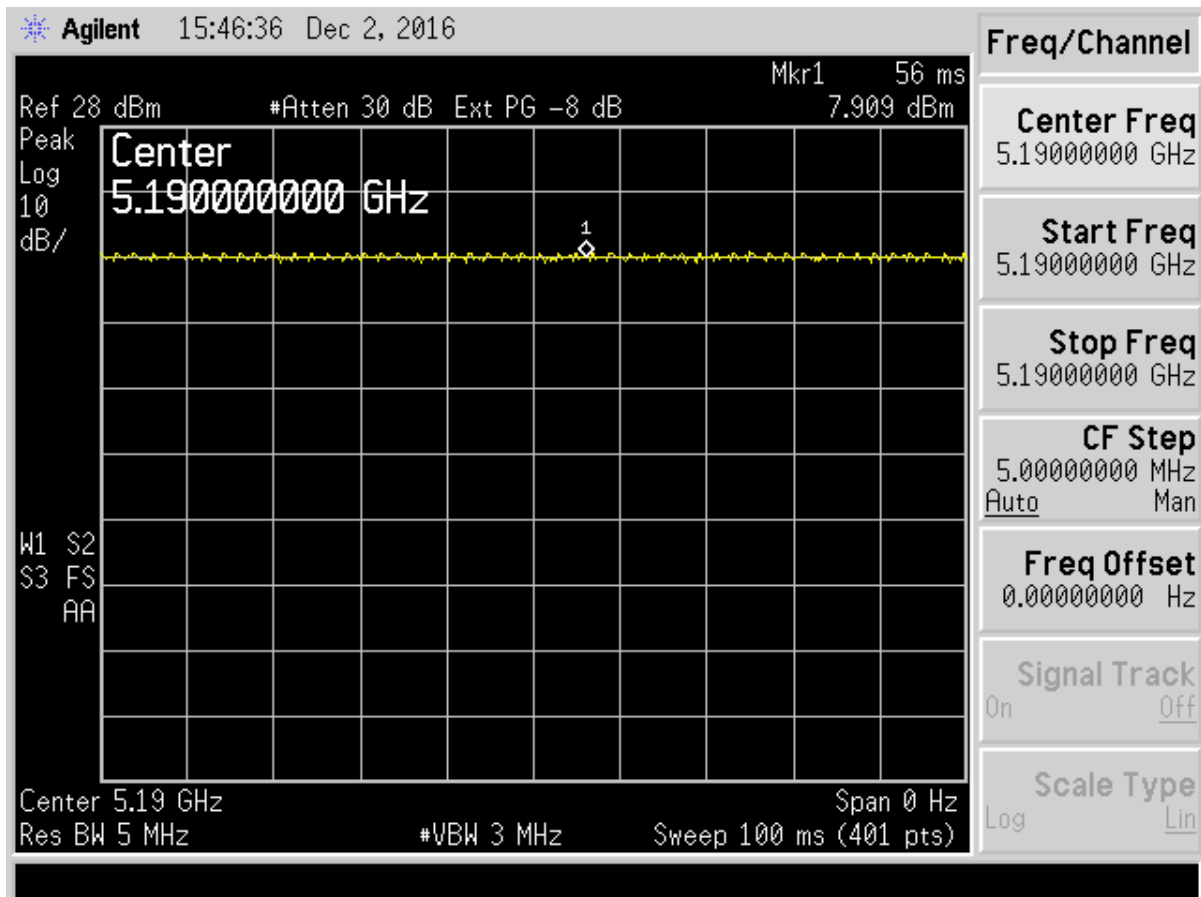


Figure 6. 802.11a(40), Ch 38, 6 Mbps

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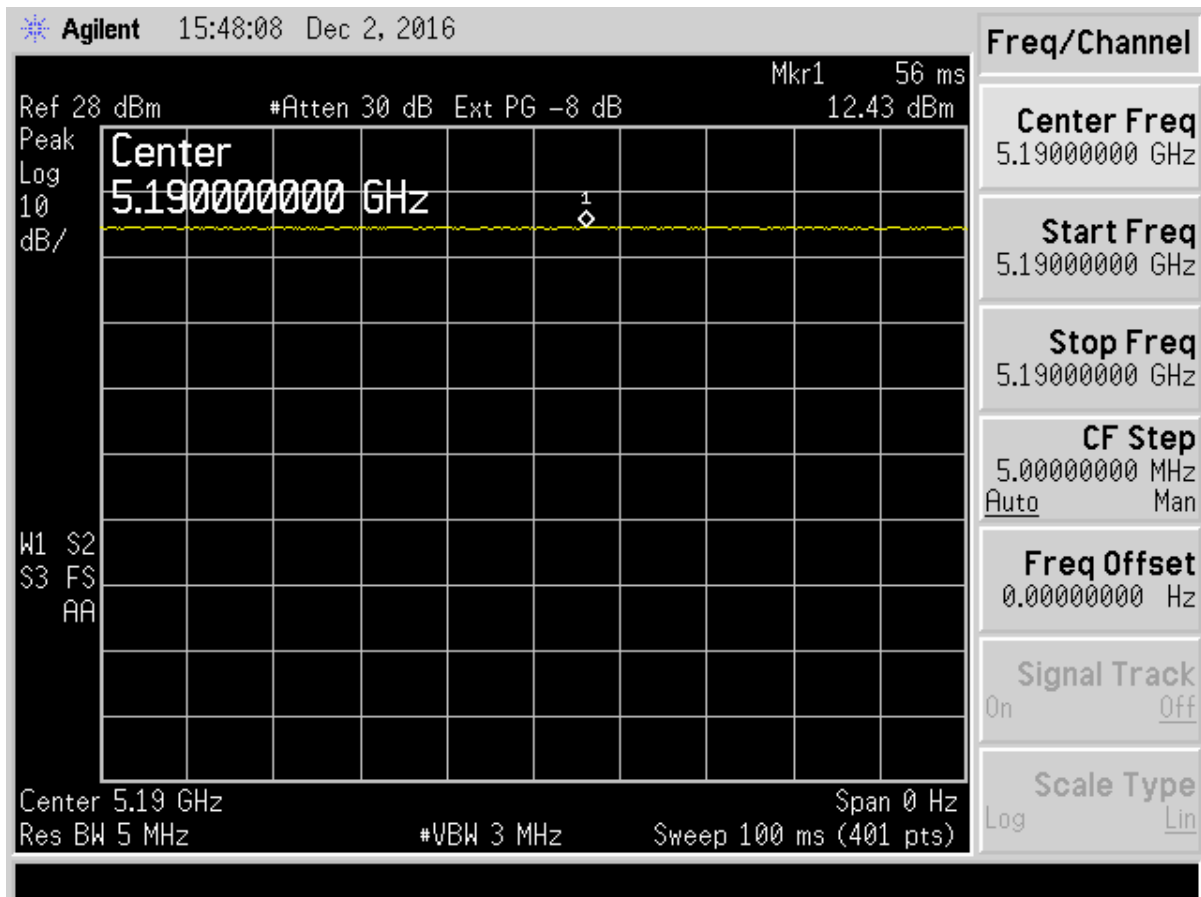


Figure 7. 802.11a(40), Ch 38, 72 Mbps

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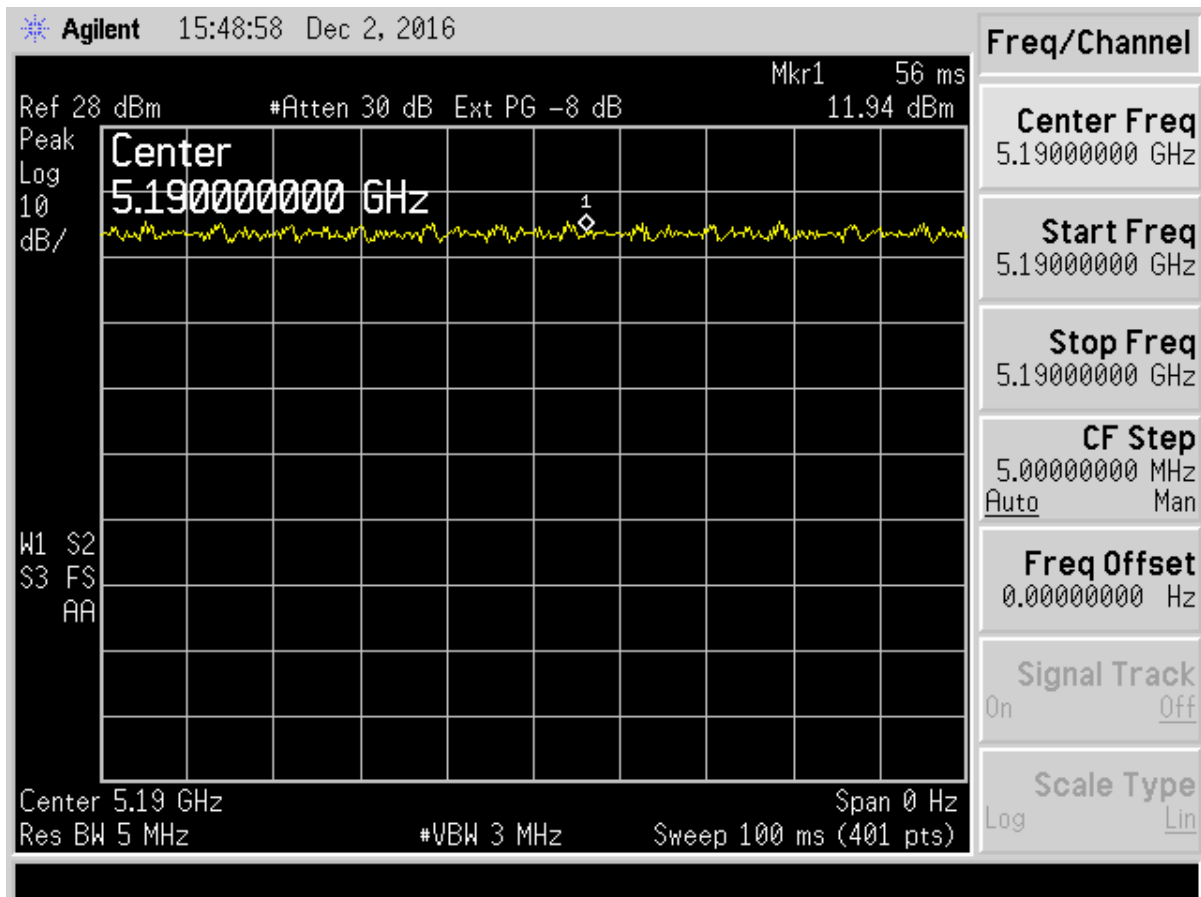


Figure 8. 802.11n(40), Ch 38, MCS0

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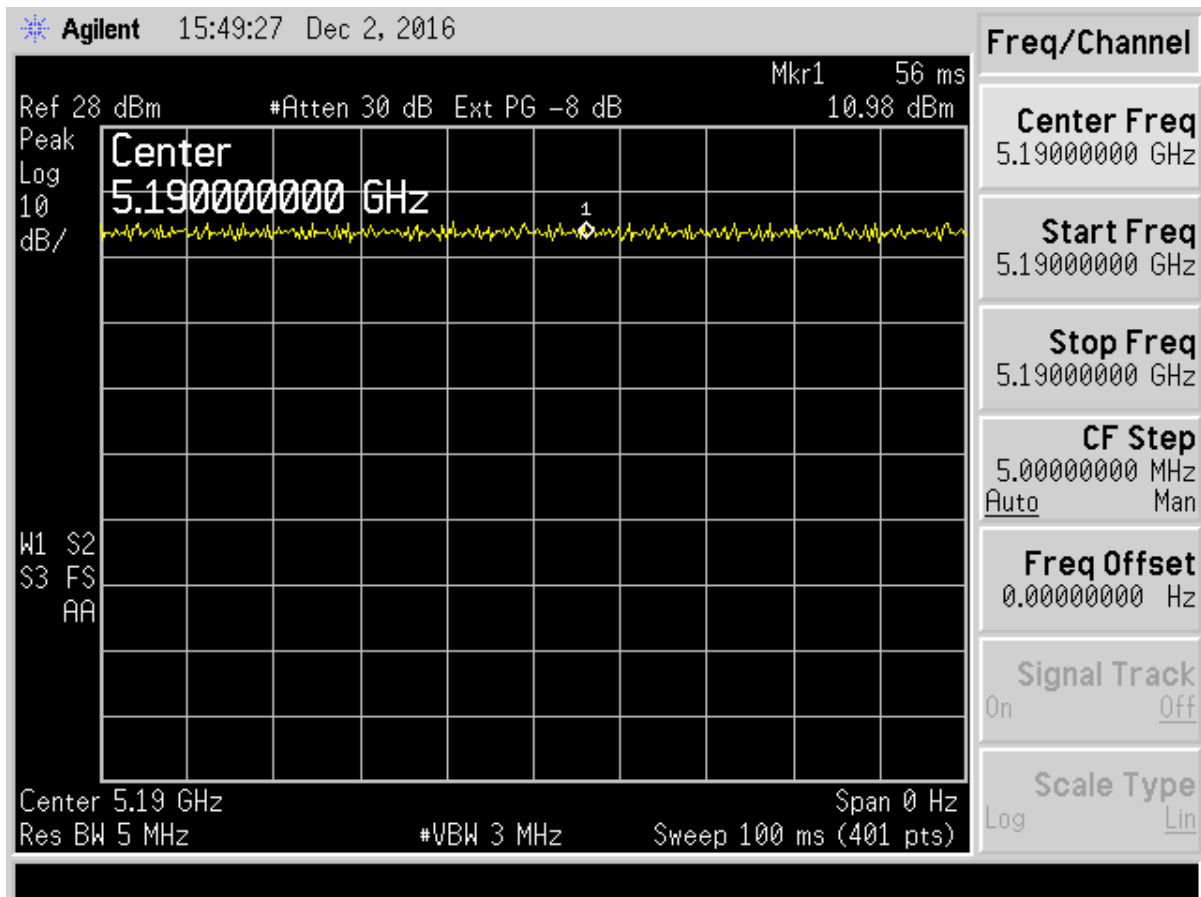


Figure 9. 802.11n(40), Ch 38, MCS7

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2.7 EUT Antenna Requirements (Part 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. Only the antenna(s) listed in Table 4 will be used with this module.

Table 4. Allowed Antenna(s)

REPORT REFERENCE	MANUFACTURER	TYPE OF ANTENNA	MODEL	GAIN dB _i	TYPE OF CONNECTOR
Antenna 1	Laird	Flex trace	MAF95310 Mini NanoBlade	3.38	u.fl
Antenna 2	Laird	Omni	DCF5151C- FNM	2.4	N-type to u.fl

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2.8 Maximum Peak Conducted Output Power (Part 15.407 (a) (1,2,3))

The transmitter was programmed to operate at a maximum output power across the bandwidth. The EUT is considered a client device.

Peak power within the transmitting bands was measured per FCC KDB Publication 789033 D02 and ANSI C63.10 section 12.3.2.2 as an Antenna Conducted test with a spectrum analyzer by connecting the spectrum analyzer directly, via a short RF cable, and attenuators to the antenna output terminals on the EUT. The spectrum analyzer was set for an impedance of $50\ \Omega$ with the RBW set to 1 MHz, the VBW $\geq 3 \times$ RBW, and span large enough to encompass the entire 99 % bandwidth and the channel power was integrated over the whole band. Peak antenna conducted output power is tabulated in the table below.

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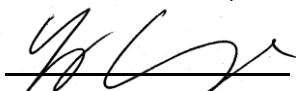
Table 5. Antenna Conducted Output Power per 15.407 (a) (1,2,3) for 802.11a

Frequency of Fundamental (MHz)	Peak Test Data (dBm)	FCC Limit (dBm)	IC Limit (dBm)	Verdict
5180	13.39	23.98	23.00	Pass
5220	12.35	23.98	23.00	Pass
5240	12.31	23.98	23.00	Pass
5260	13.66	23.98	23.98	Pass
5280	12.94	23.98	23.98	Pass
5320	16.20	23.98	23.98	Pass
5500	15.92	23.98	23.98	Pass
5560	14.41	23.98	23.98	Pass
5660	14.51	23.98	23.98	Pass
5700	16.08	23.98	23.98	Pass
5745	15.19	30.00	30.00	Pass
5785	10.29	30.00	30.00	Pass
5825	15.85	30.00	30.00	Pass

Test Date: December 5-16, 2016, January 12-13, 2017

Tested By

Signature:



Name: George Yang

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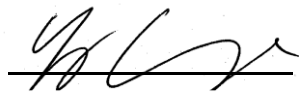
Table 6. Antenna Conducted Output Power per 15.407 (a) (1,2,3) for 802.11n

Frequency of Fundamental (MHz)	Peak Test Data (dBm)	FCC Limit (dBm)	IC Limit (dBm)	Verdict
5180	14.46	23.98	23.00	Pass
5220	11.57	23.98	23.00	Pass
5240	14.52	23.98	23.00	Pass
5260	12.29	23.98	23.98	Pass
5280	13.18	23.98	23.98	Pass
5320	17.25	23.98	23.98	Pass
5500	16.79	23.98	23.98	Pass
5560	14.51	23.98	23.98	Pass
5660	14.69	23.98	23.98	Pass
5700	16.92	23.98	23.98	Pass
5745	16.08	30.00	30.00	Pass
5785	11.36	30.00	30.00	Pass
5825	16.46	30.00	30.00	Pass

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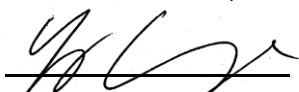
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Table 7. Antenna Conducted Output Power per 15.407 (a) (1,2,3) for 802.11a 40 MHz BW

Frequency of Fundamental (MHz)	Test Data (dBm)	FCC Limit (dBm)	IC Limit (dBm)	Verdict
5190	15.61	23.98	23.00	Pass
5230	12.15	23.98	23.00	Pass
5270	12.34	23.98	23.00	Pass
5310	15.66	23.98	23.98	Pass
5510	11.59	23.98	23.98	Pass
5550	14.99	23.98	23.98	Pass
5670	11.92	23.98	23.98	Pass
5755	11.46	23.98	23.98	Pass
5795	16.10	30.00	30.00	Pass

Test Date: December 5-16, 2016, January 12-13, 2016

Tested By

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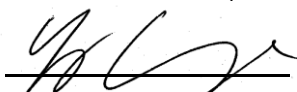
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Table 8. Antenna Conducted Output Power per 15.407 (a) (1,2,3) for 802.11n 40 MHz BW

Frequency of Fundamental (MHz)	Test Data (dBm)	FCC Limit (dBm)	IC Limit (dBm)	Verdict
5190	14.86	23.98	23.00	Pass
5230	14.86	23.98	23.00	Pass
5270	13.38	23.98	23.00	Pass
5310	15.40	23.98	23.98	Pass
5510	12.15	23.98	23.98	Pass
5550	16.45	23.98	23.98	Pass
5670	12.75	23.98	23.98	Pass
5755	11.23	23.98	23.98	pass
5795	15.81	30.00	30.00	Pass

Test Date: December 5-16, 2016, January 12-13, 2016

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2.9 Power Spectral Density (Part 15.407(a) (1-5)) (IC RSS 247 5.1, 5.2)

The transmitter was placed into a continuous mode of operation at all applicable frequencies. The measurements were performed per the procedures of FCC KDB Procedure 789033 D02 and ANSI C63.10 section 12.5. The RBW was set to 1 MHz and the Video Bandwidth was set to $\geq 3 \times \text{RBW}$. The span was set to encompass the OBW. The averaging detector was used on the spectrum analyzer was used to determine the maximum PSD over the corresponding bandwidth

In the operating bands 5.15 – 5.25 GHz, 5.25 - 5.35 GHz, and 5.47 - 5.725 GHz, the maximum power spectral density shall not exceed 11 dBm in any 1 MHz band.

In the operating band 5.725 - 5.85 GHz the maximum conducted output power spectral density shall not exceed 30 dBm in any 500 kHz band. Since the spectrum analyzer used for testing does not have a 500 kHz RBW, the RBW was set to 1 MHz for a worst case testing configuration.

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Table 9. Power Spectral Density for 802.11a in the Lower Frequency Bands

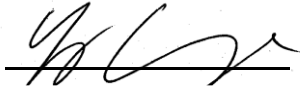
Frequency (MHz)	Test Data (dBm/1 MHz)	FCC Limit (dBm/1 MHz)	IC Limit (dBm/1 MHz)	Verdict
5180	6.78	11.00	10.00	Pass
5220	7.20	11.00	10.00	Pass
5240	5.84	11.00	10.00	Pass
5260	8.69	11.00	11.00	Pass
5280	7.90	11.00	11.00	Pass
5320	10.59	11.00	11.00	Pass
5500	10.87	11.00	11.00	Pass
5560	9.10	11.00	11.00	Pass
5660	9.40	11.00	11.00	Pass
5700	10.57	11.00	11.00	Pass

Table 10. Power Spectral Density for 802.11a in the Upper Frequency Bands

Frequency (MHz)	Test Data (dBm/1 MHz)	FCC Limit (dBm/500 kHz)	IC Limit (dBm/500 kHz)	Verdict
5745	9.55	30.00	30.00	Pass
5785	3.96	30.00	30.00	Pass
5825	10.59	30.00	30.00	Pass

Test Date: December 5-16, 2016, January 12-13, 2016

Tested By

Signature:  Name: George Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 11. Power Spectral Density for 802.11n in the Lower Frequency Bands

Frequency (MHz)	Test Data (dBm/1 MHz)	FCC Limit (dBm/1 MHz)	IC Limit (dBm/1 MHz)	Verdict
5180	6.45	11.00	10.00	Pass
5220	7.40	11.00	10.00	Pass
5240	6.11	11.00	10.00	Pass
5260	7.06	11.00	11.00	Pass
5280	6.11	11.00	11.00	Pass
5320	10.77	11.00	11.00	Pass
5500	8.72	11.00	11.00	Pass
5560	9.41	11.00	11.00	Pass
5660	9.38	11.00	11.00	Pass
5700	10.08	11.00	11.00	Pass

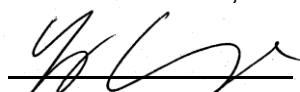
Table 12. Power Spectral Density for 802.11n in the Upper Frequency Bands

Frequency (MHz)	Test Data (dBm/1 MHz)	FCC Limit (dBm/500 kHz)	IC Limit (dBm/500 kHz)	Verdict
5745	7.74	30.00	30.00	Pass
5785	6.47	30.00	30.00	Pass
5825	8.79	30.00	30.00	Pass

Test Date: December 5-16, 2016, January 12-13, 2016

Tested By

Signature:



Name: George Yang

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

Table 13. Power Spectral Density for 802.11a 40 MHz BW in the Lower Frequency Bands

Frequency (MHz)	Test Data (dBm/1 MHz)	FCC Limit (dBm/1 MHz)	IC Limit (dBm/1 MHz)	Verdict
5190	8.36	11.00	10.00	Pass
5230	4.64	11.00	10.00	Pass
5270	4.91	11.00	10.00	Pass
5310	8.05	11.00	11.00	Pass
5510	4.52	11.00	11.00	Pass
5550	7.50	11.00	11.00	Pass
5670	4.37	11.00	11.00	Pass

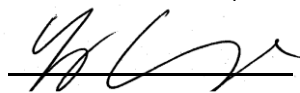
Table 14. Power Spectral Density for 802.11a 40 MHz BW in the Upper Frequency Bands

Frequency (MHz)	Test Data (dBm/1 MHz)	FCC Limit (dBm/500 kHz)	IC Limit (dBm/500 kHz)	Verdict
5755	3.35	30.00	30.00	Pass
5795	8.80	30.00	30.00	Pass

Test Date: December 5-16, 2016, January 12-13, 2016

Tested By

Signature:



Name: George Yang

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

Table 15. Power Spectral Density for 802.11n 40 MHz BW in the Lower Frequency Bands

Frequency (MHz)	Test Data (dBm/1 MHz)	FCC Limit (dBm/1 MHz)	IC Limit (dBm/1 MHz)	Verdict
5190	6.83	11.00	10.00	Pass
5230	7.60	11.00	10.00	Pass
5270	4.70	11.00	10.00	Pass
5310	6.54	11.00	11.00	Pass
5510	6.14	11.00	11.00	Pass
5550	8.00	11.00	11.00	Pass
5670	5.52	11.00	11.00	Pass

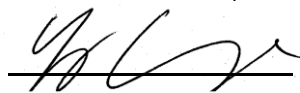
Table 16. Power Spectral Density for 802.11n 40 MHz BW in the Upper Frequency Bands

Frequency (MHz)	Test Data (dBm/1 MHz)	FCC Limit (dBm/500 kHz)	IC Limit (dBm/500 kHz)	Verdict
5755	2.92	30.00	30.00	Pass
5795	7.81	30.00	30.00	Pass

Test Date: December 5-16, 2016, January 12-13, 2016

Tested By

Signature:



Name: George Yang

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

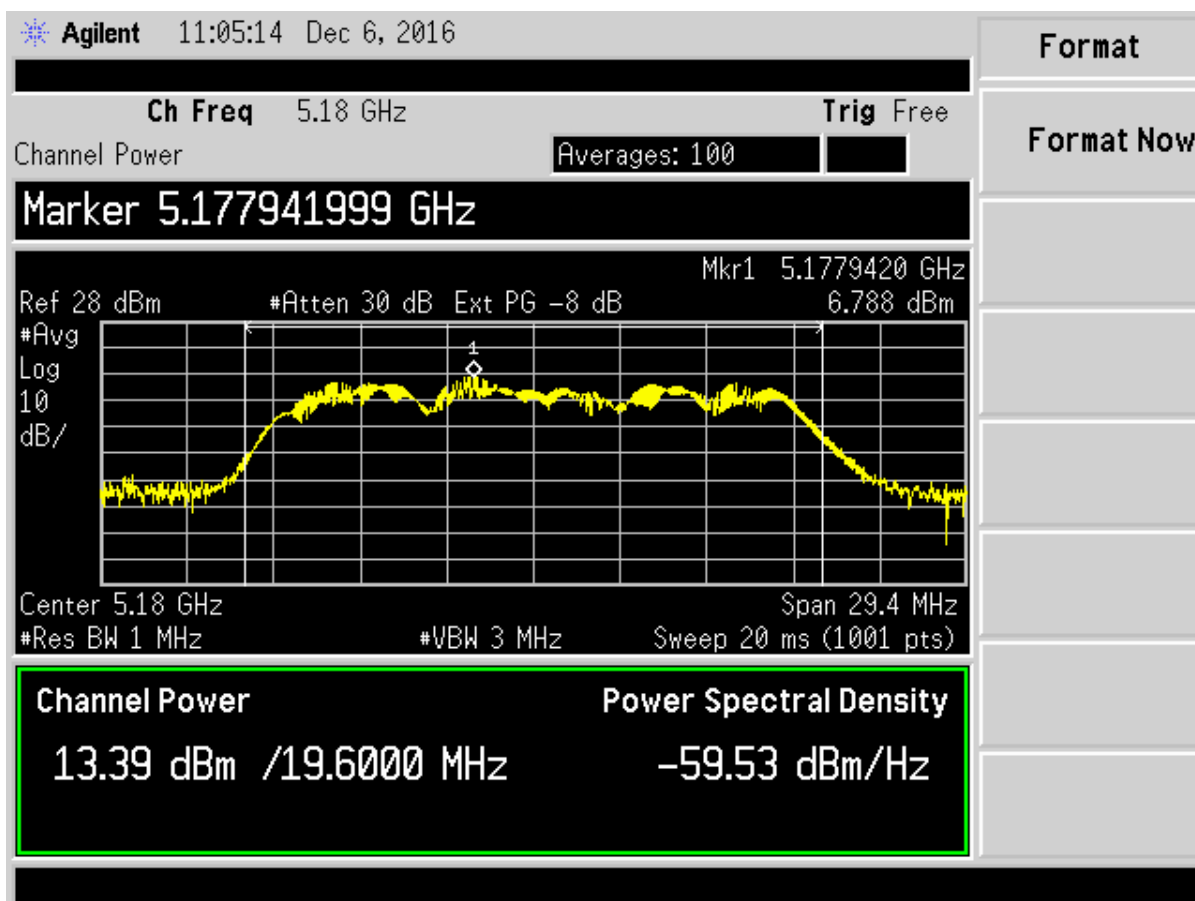


Figure 10. Antenna Conducted Output Power, 802.11a Channel 36

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

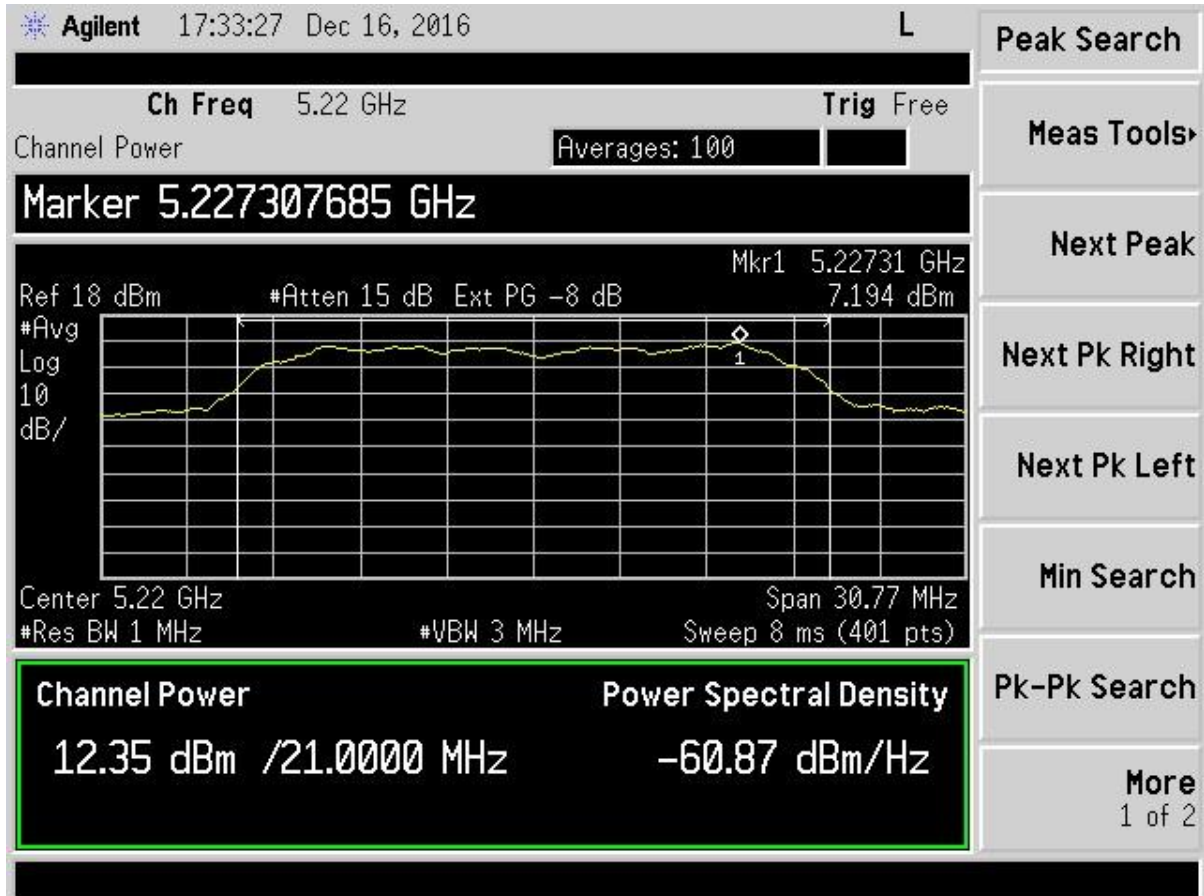


Figure 11. Antenna Conducted Output Power, 802.11a 5.22 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

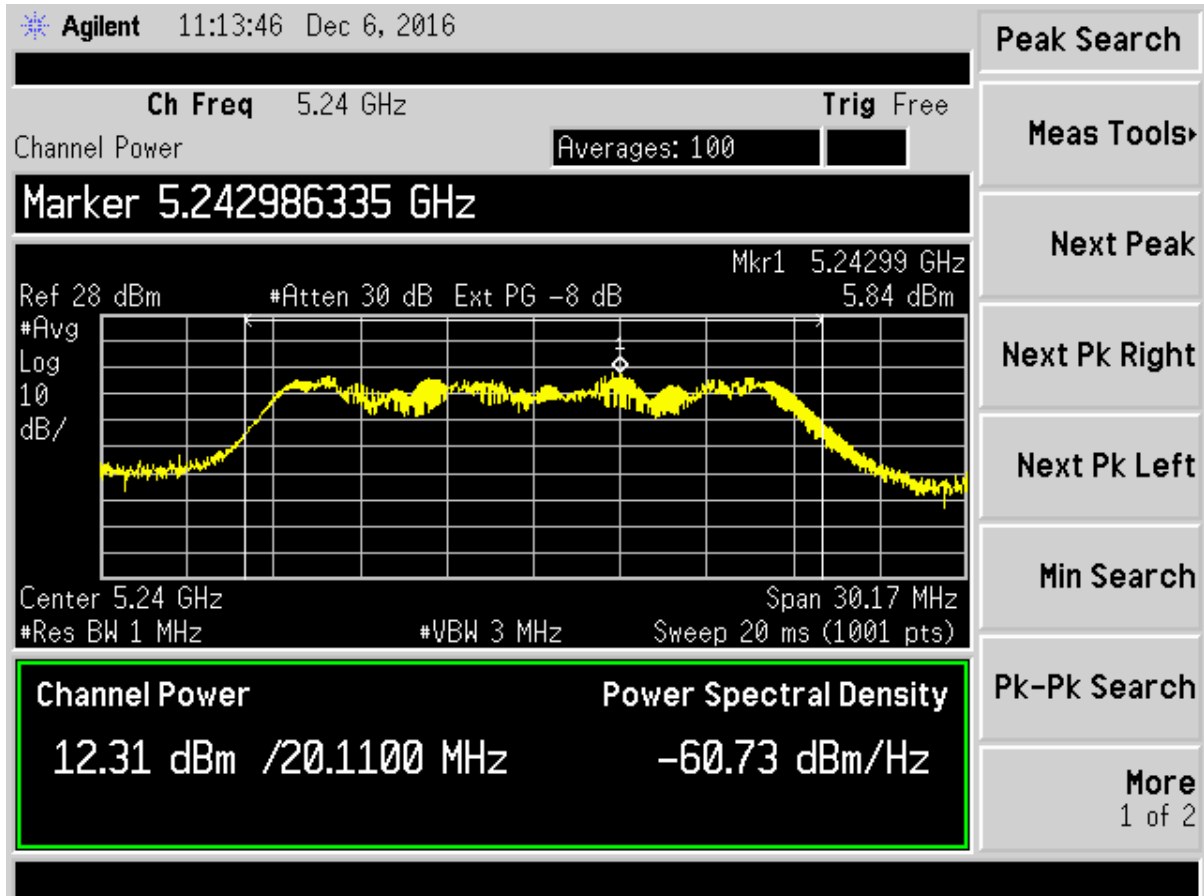


Figure 12. Antenna Conducted Output Power, 802.11a Channel 48

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

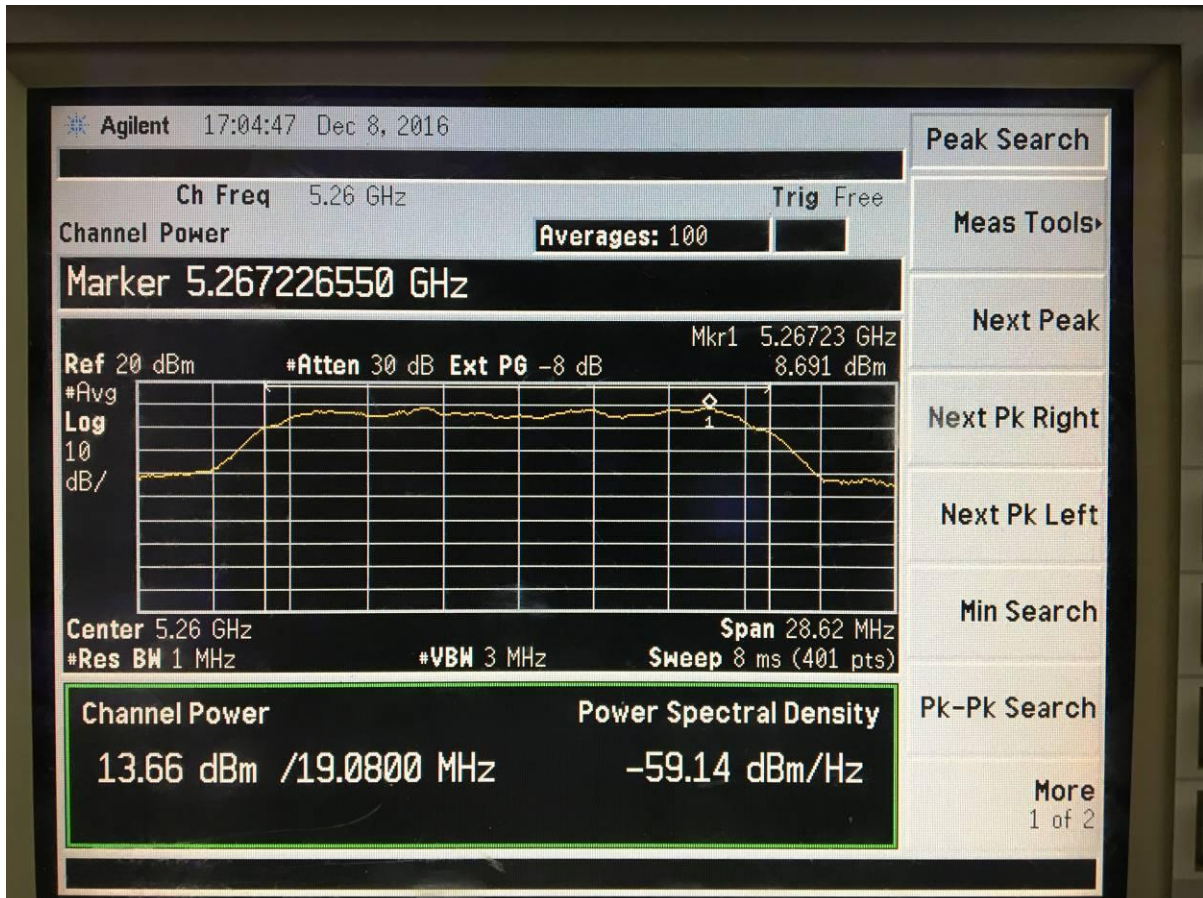


Figure 13. Antenna Conducted Output Power, 802.11a Channel 52

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

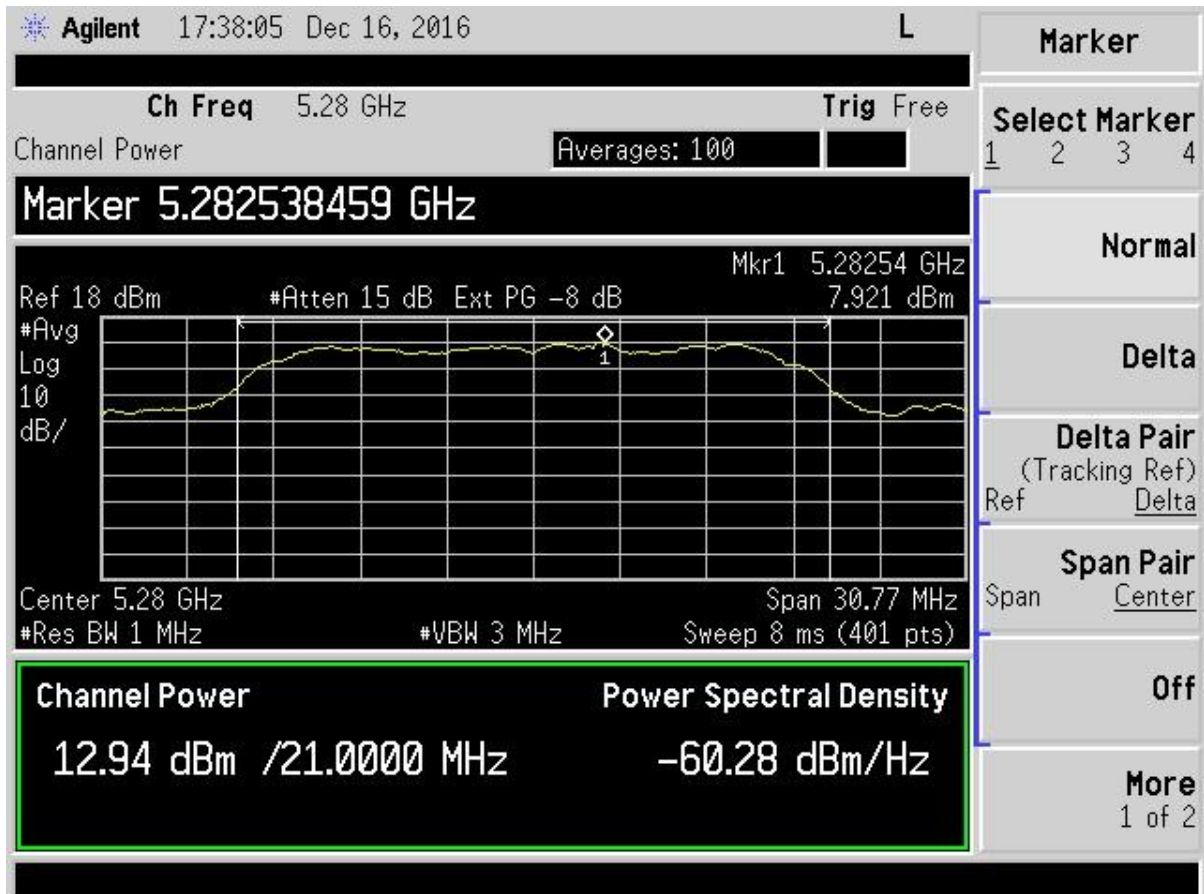


Figure 14. Antenna Conducted Output Power, 802.11a 5.28 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

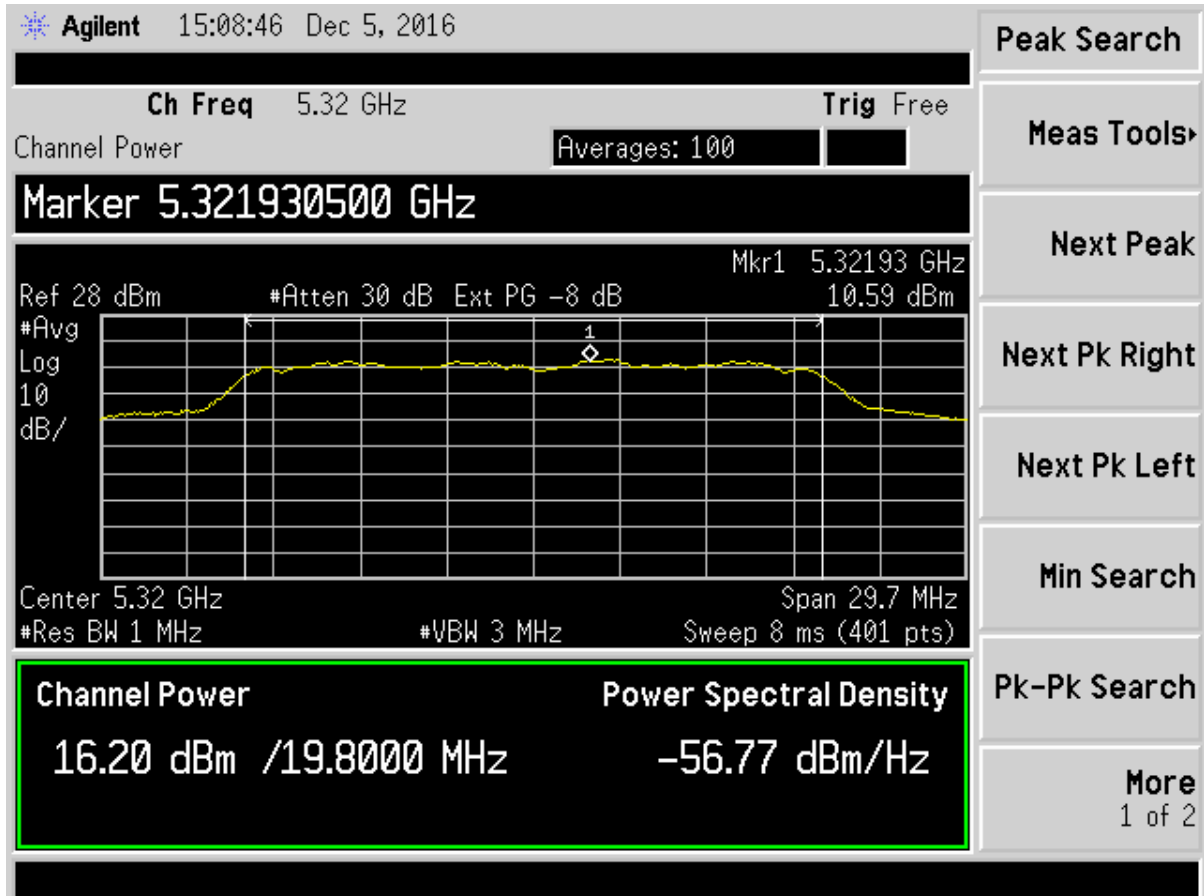


Figure 15. Antenna Conducted Output Power, 802.11a Channel 64

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

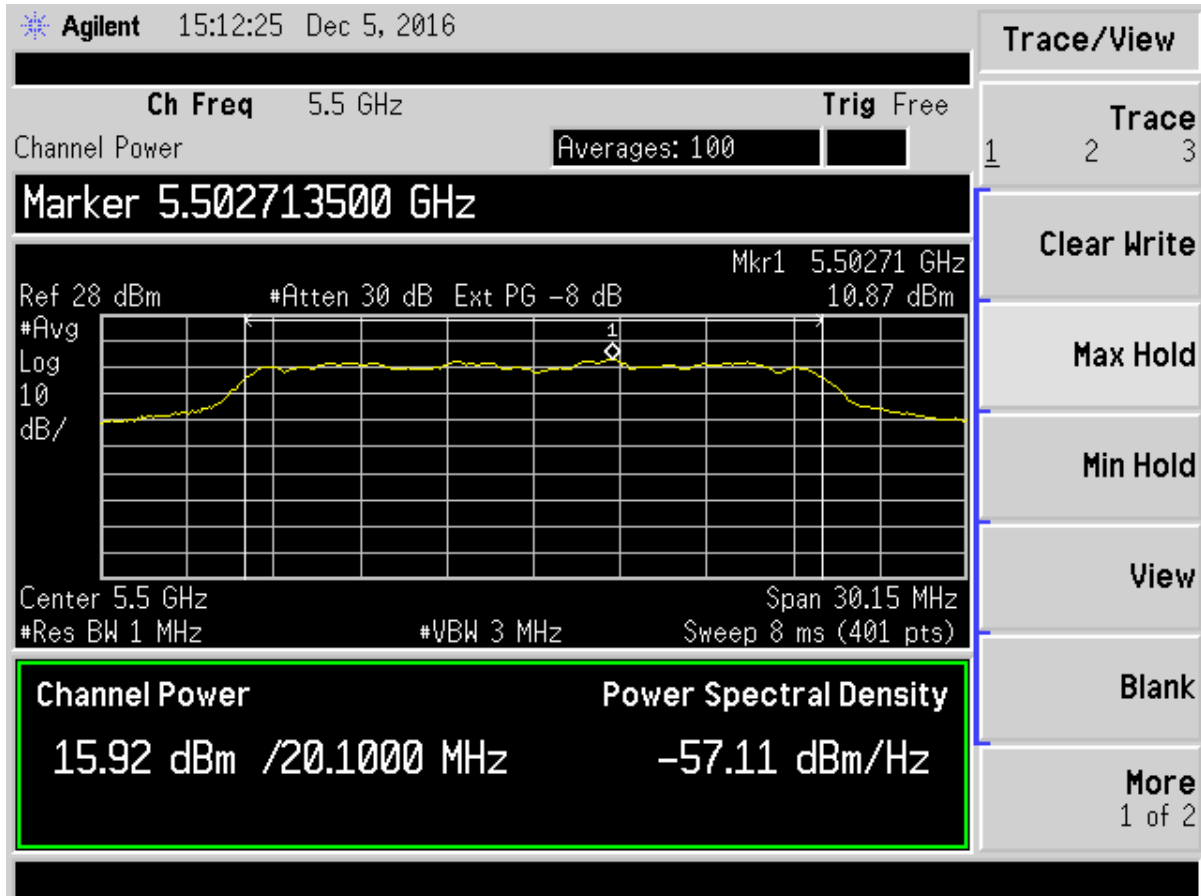


Figure 16. Antenna Conducted Output Power, 802.11a Channel 100

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

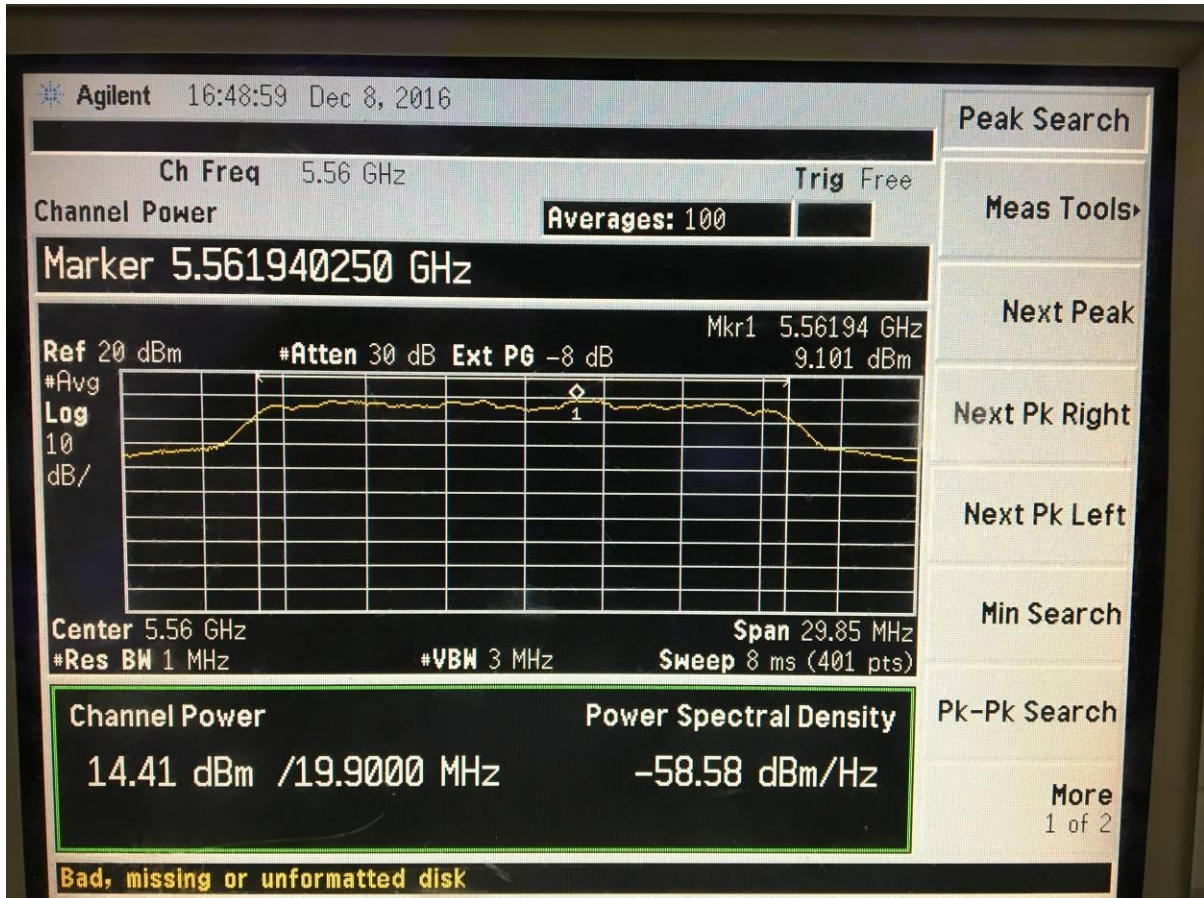


Figure 17. Antenna Conducted Output Power, 802.11a Channel 112

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

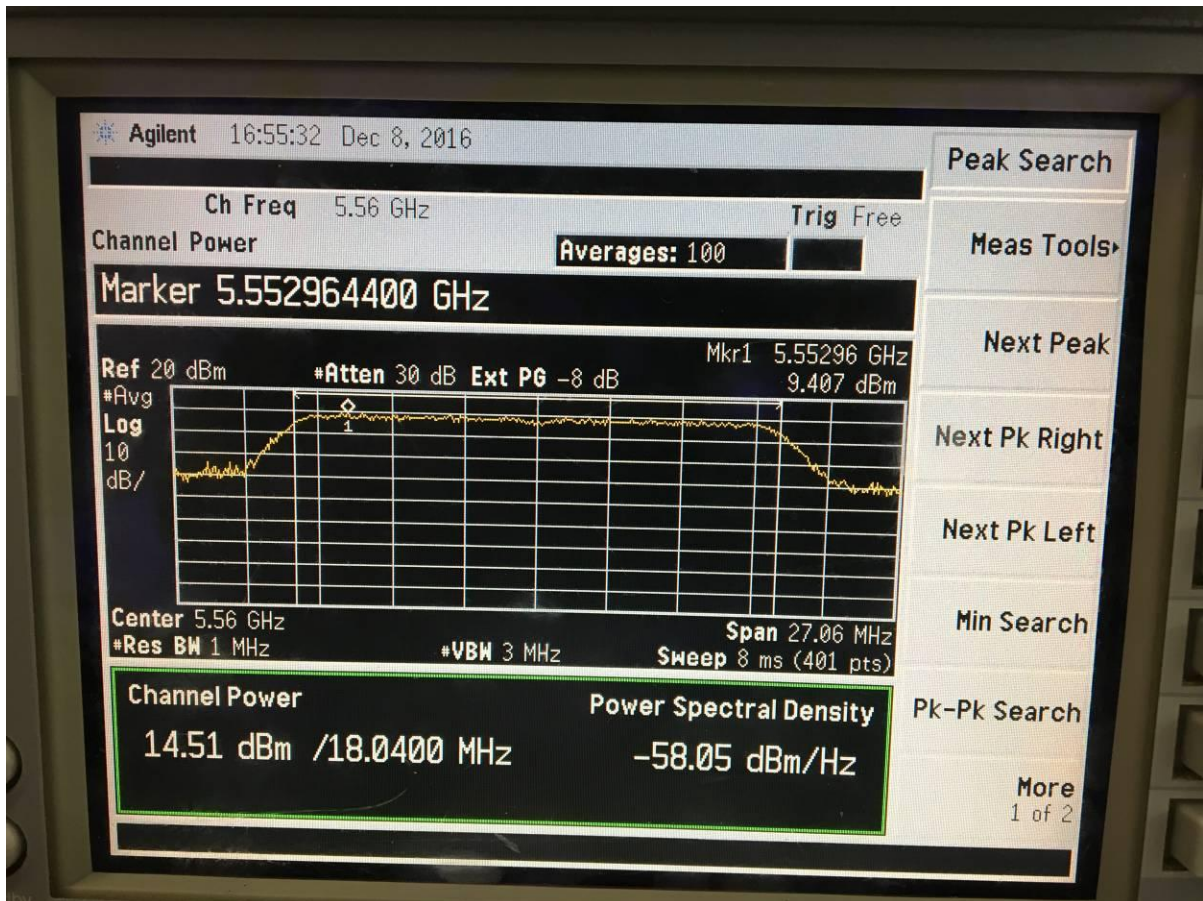


Figure 18. Antenna Conducted Output Power, 802.11a Channel 132

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

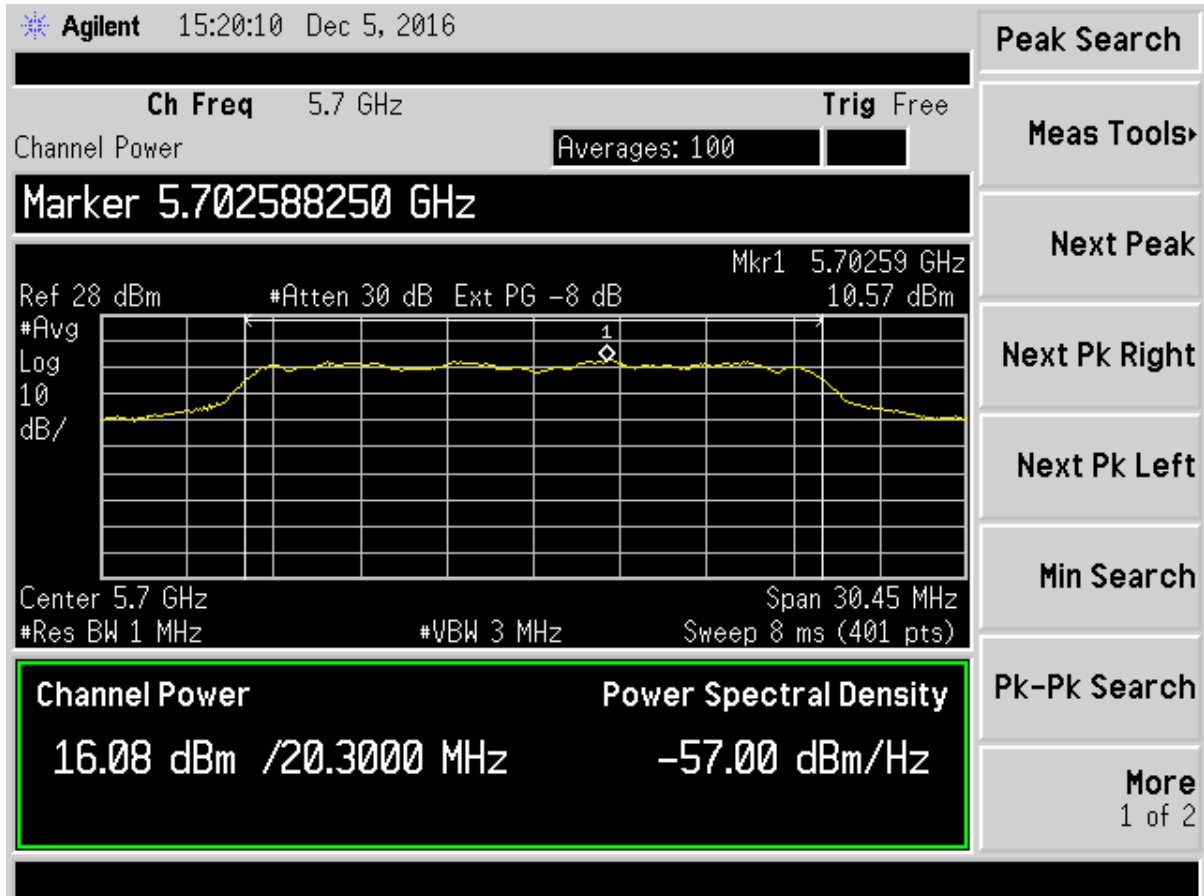


Figure 19. Antenna Conducted Output Power, 802.11a Channel 140

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

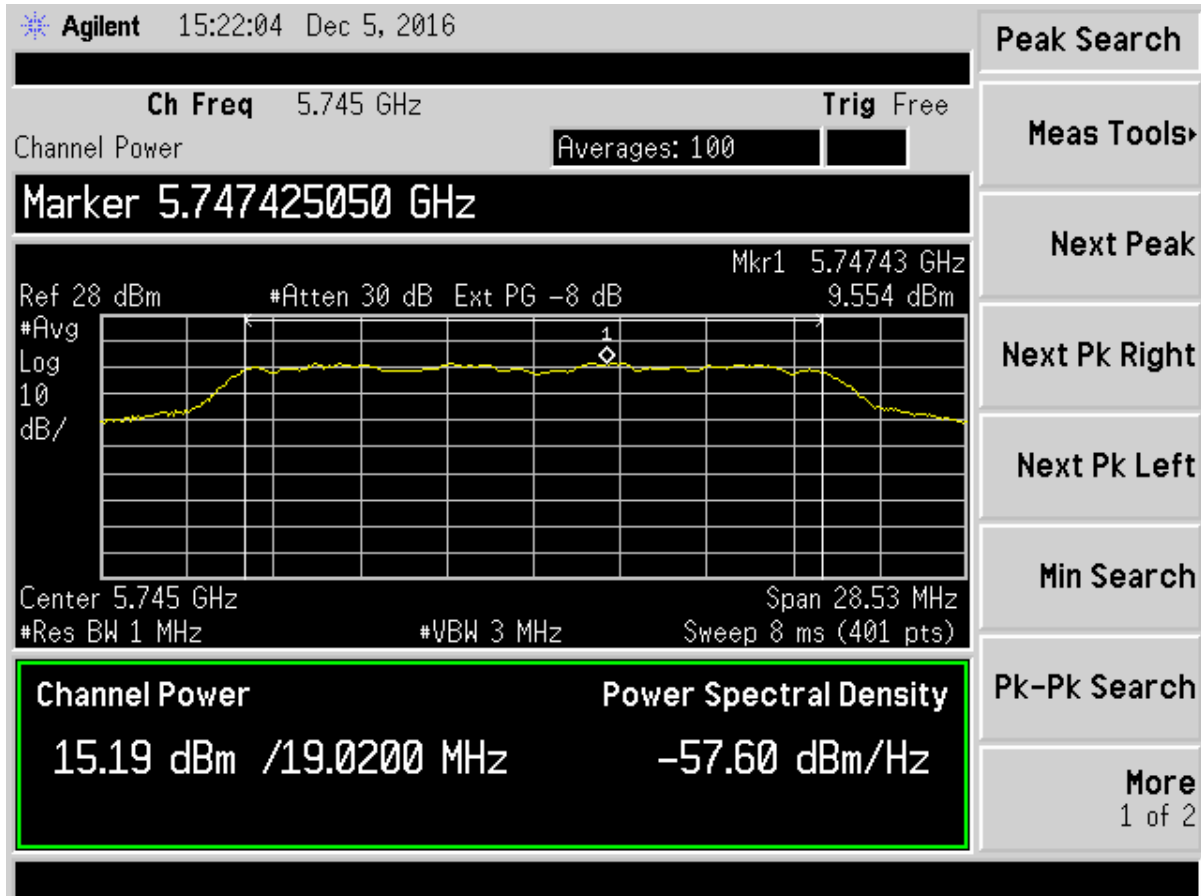


Figure 20. Antenna Conducted Output Power, 802.11a Channel 149

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

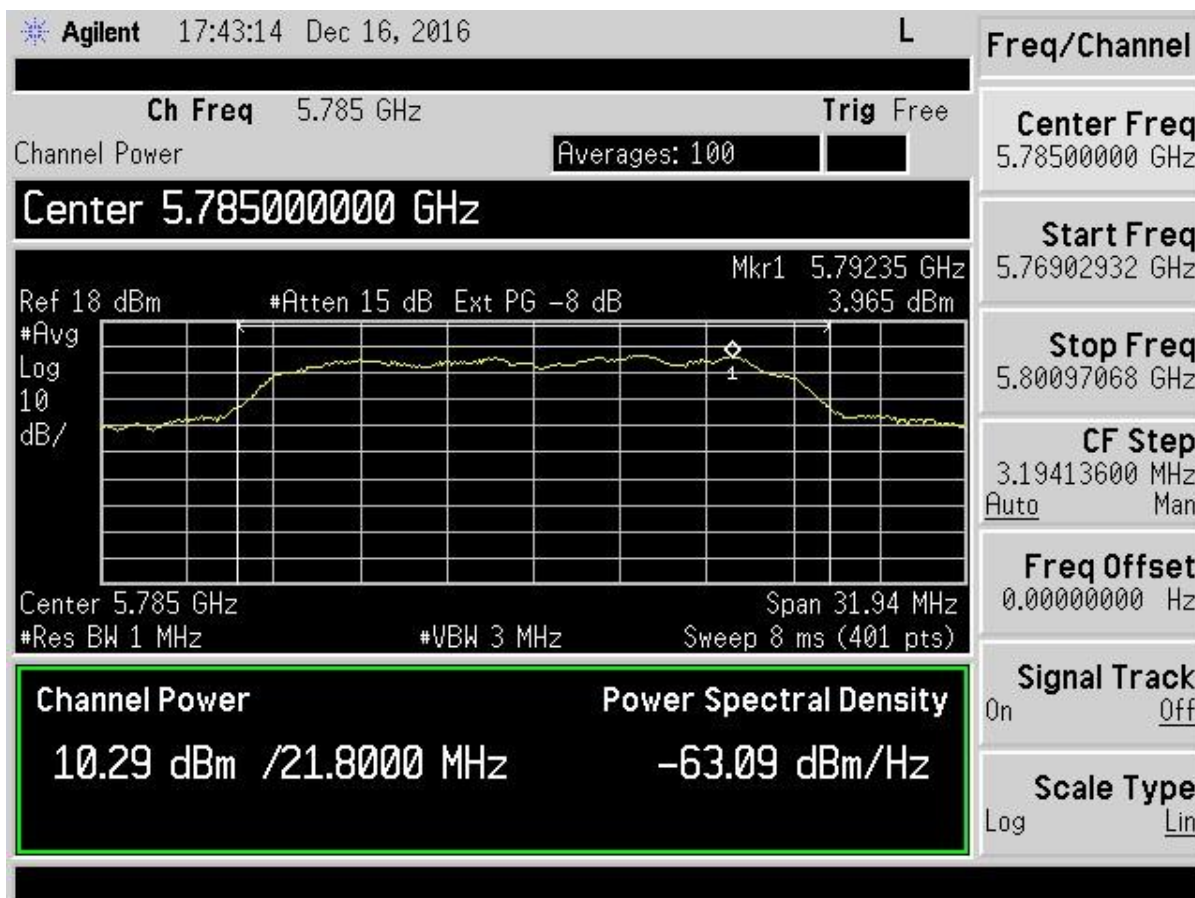


Figure 21. Antenna Conducted Output Power, 802.11a 5.785 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

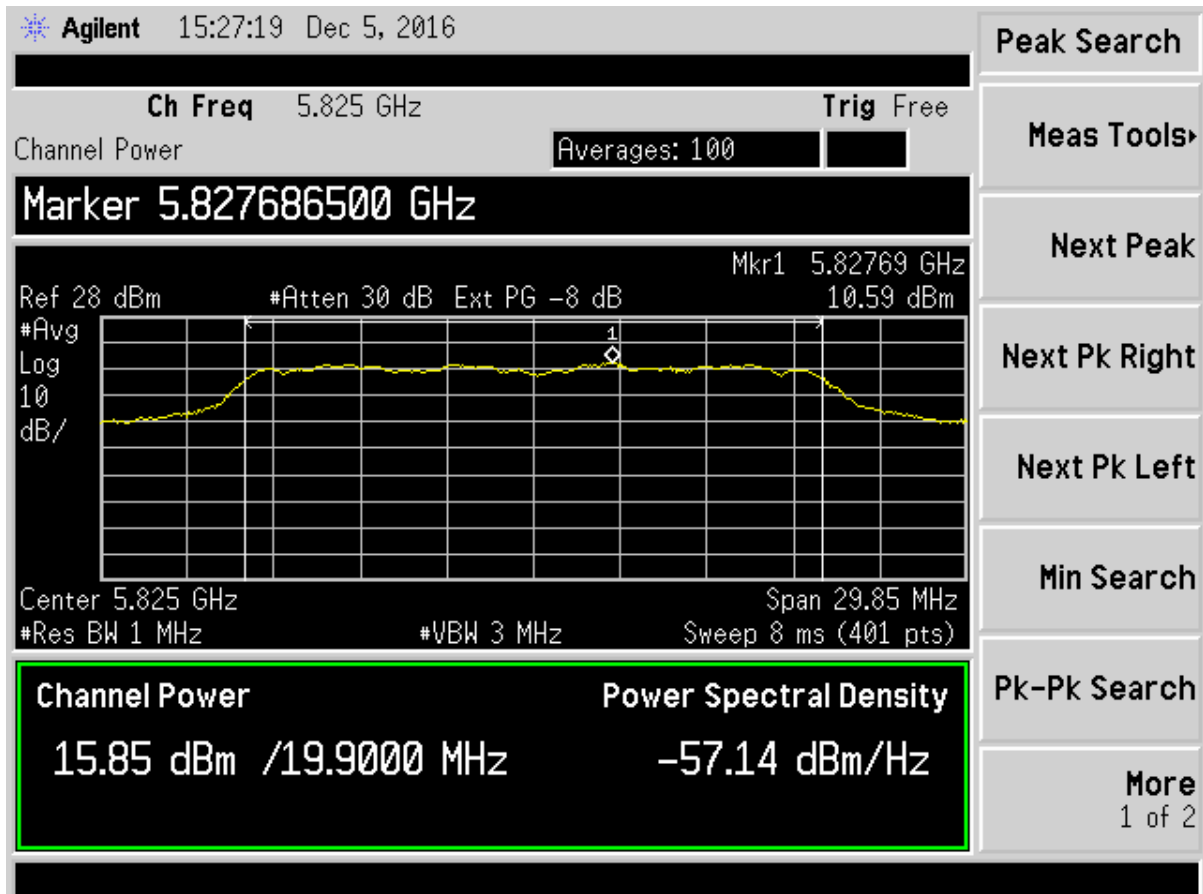


Figure 22. Antenna Conducted Output Power, 802.11a Channel 165

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

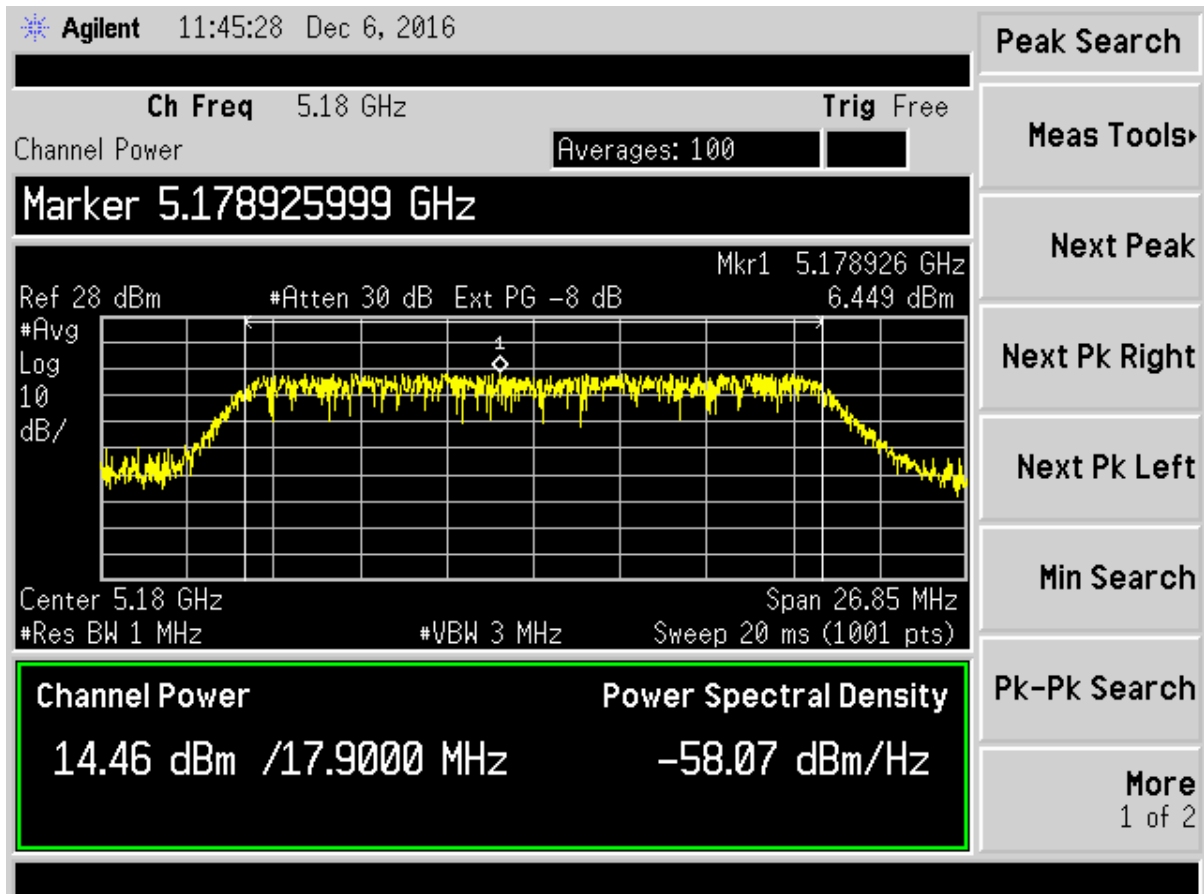


Figure 23. Antenna Conducted Output Power, 802.11n Channel 36

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

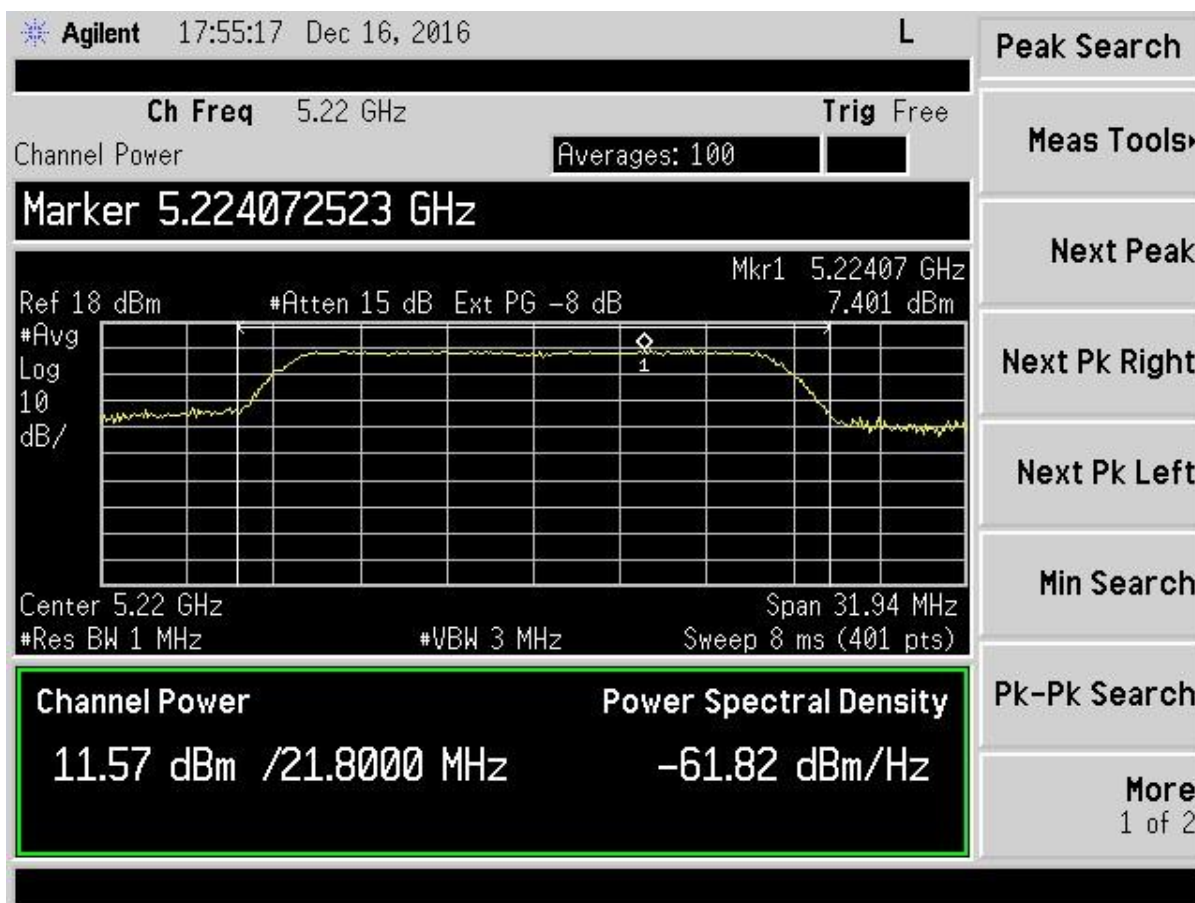


Figure 24. Antenna Conducted Output Power, 802.11n 5.22 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

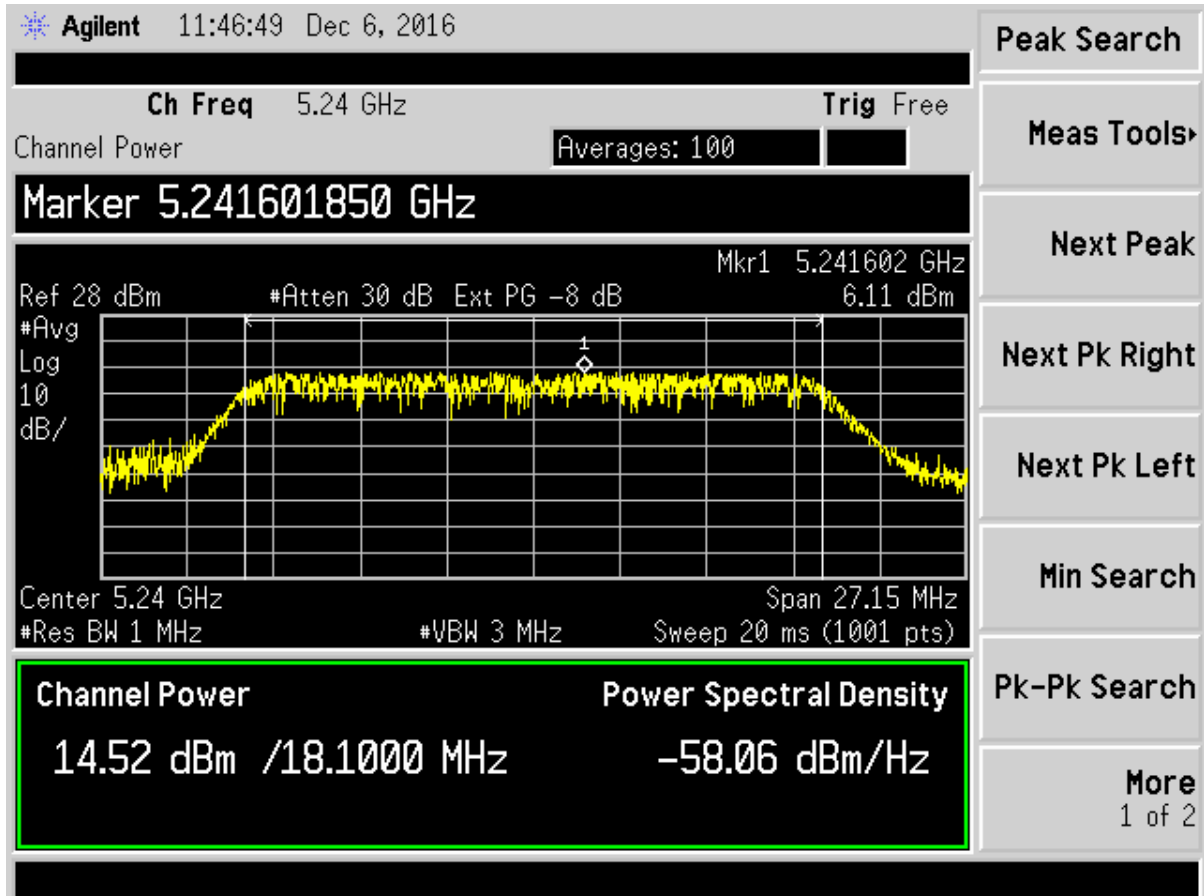


Figure 25. Antenna Conducted Output Power, 802.11n Channel 48

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

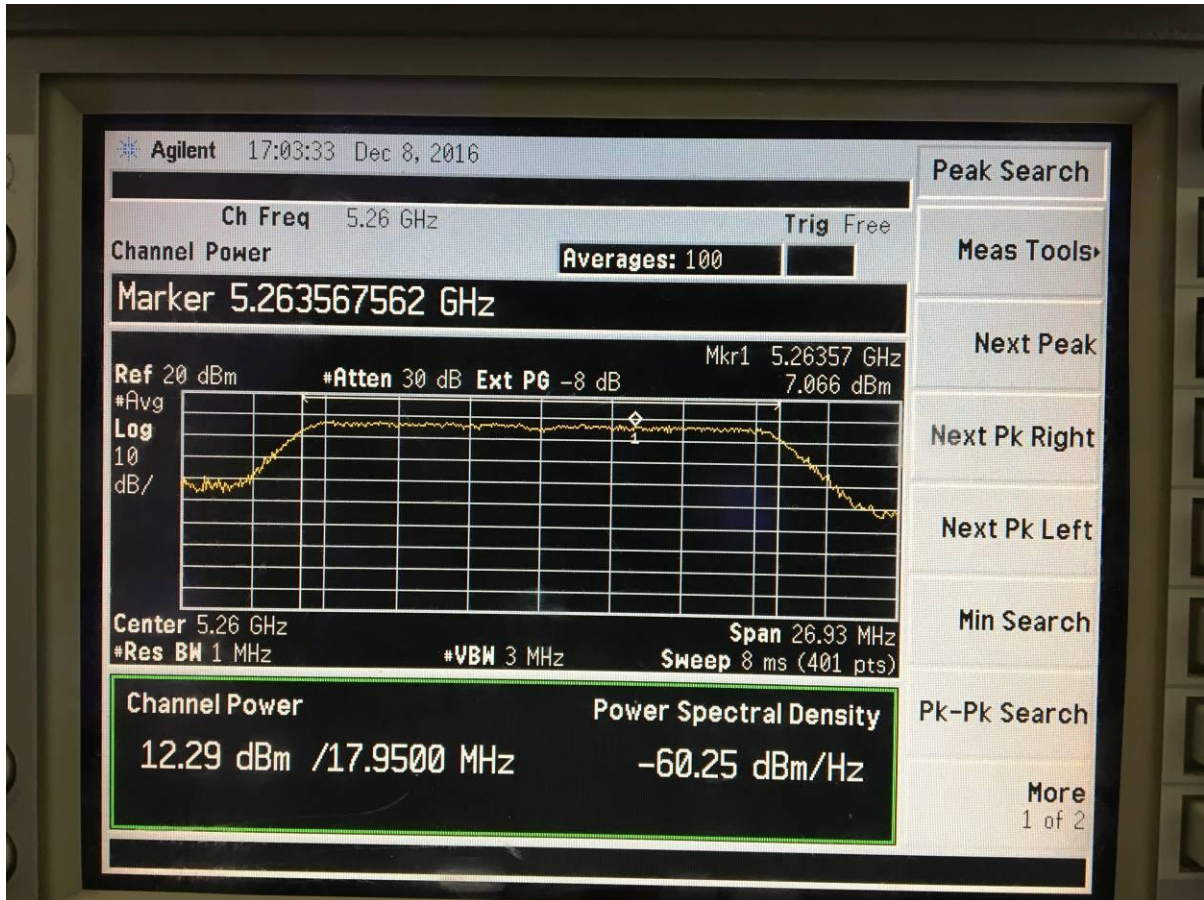


Figure 26. Antenna Conducted Output Power, 802.11n Channel 52

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

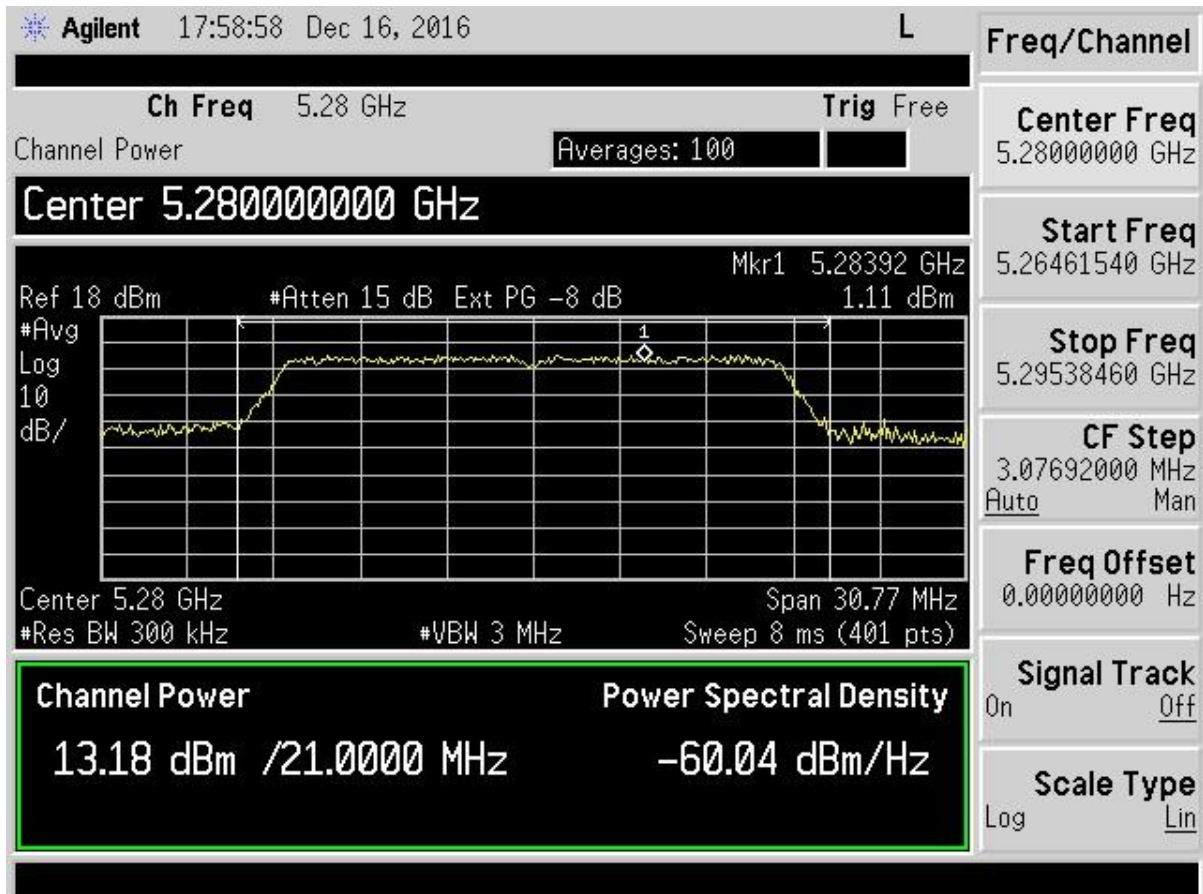


Figure 27. Antenna Conducted Output Power, 802.11n 5.28 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

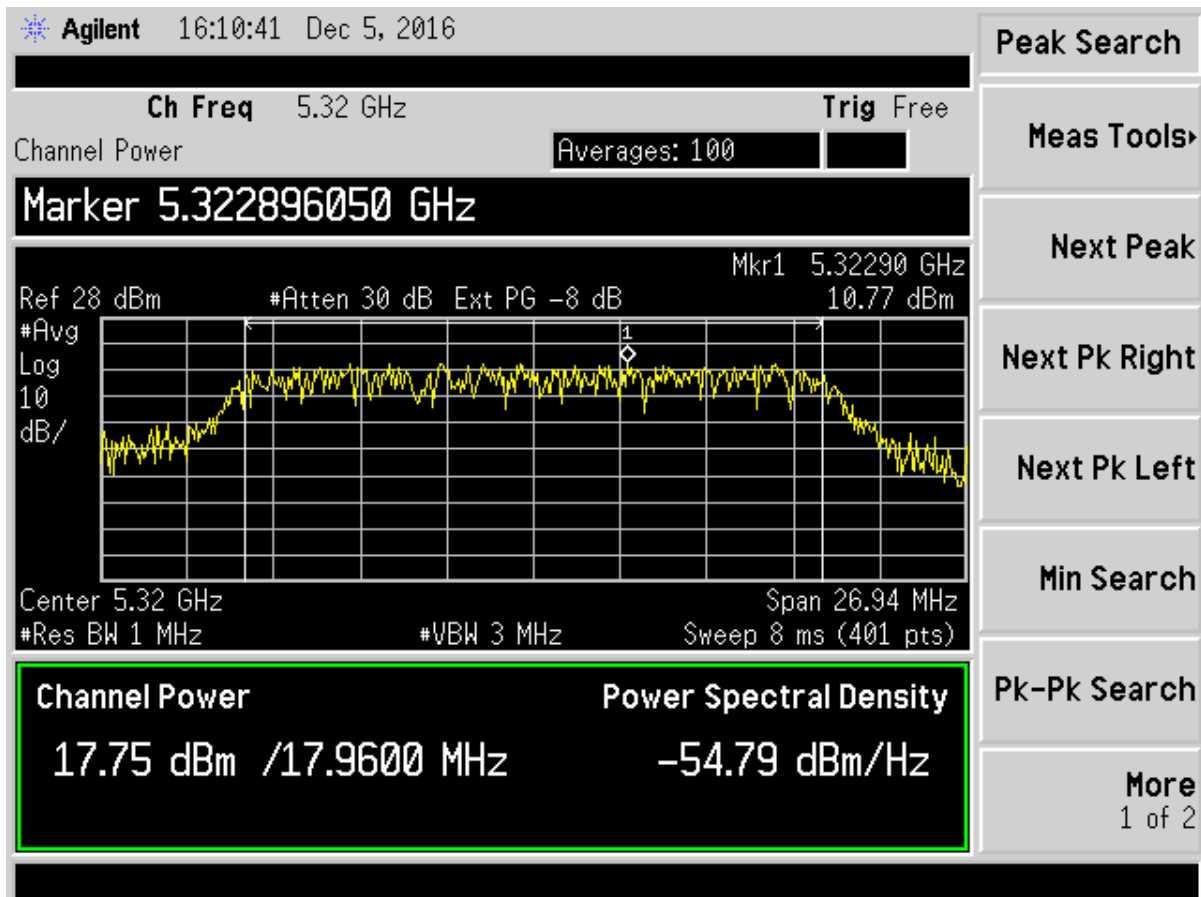


Figure 28. Antenna Conducted Output Power, 802.11n Channel 64

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

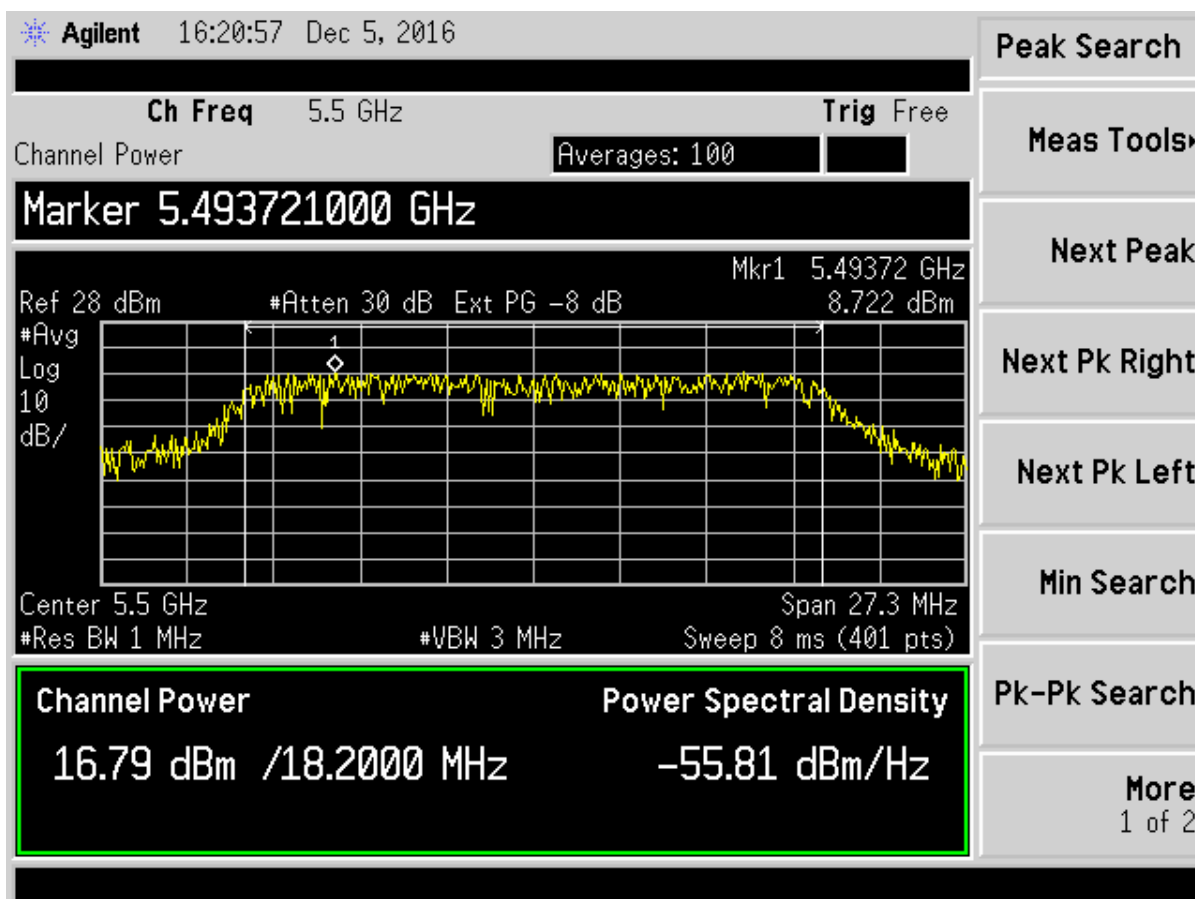


Figure 29. Antenna Conducted Output Power, 802.11n Channel 100

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

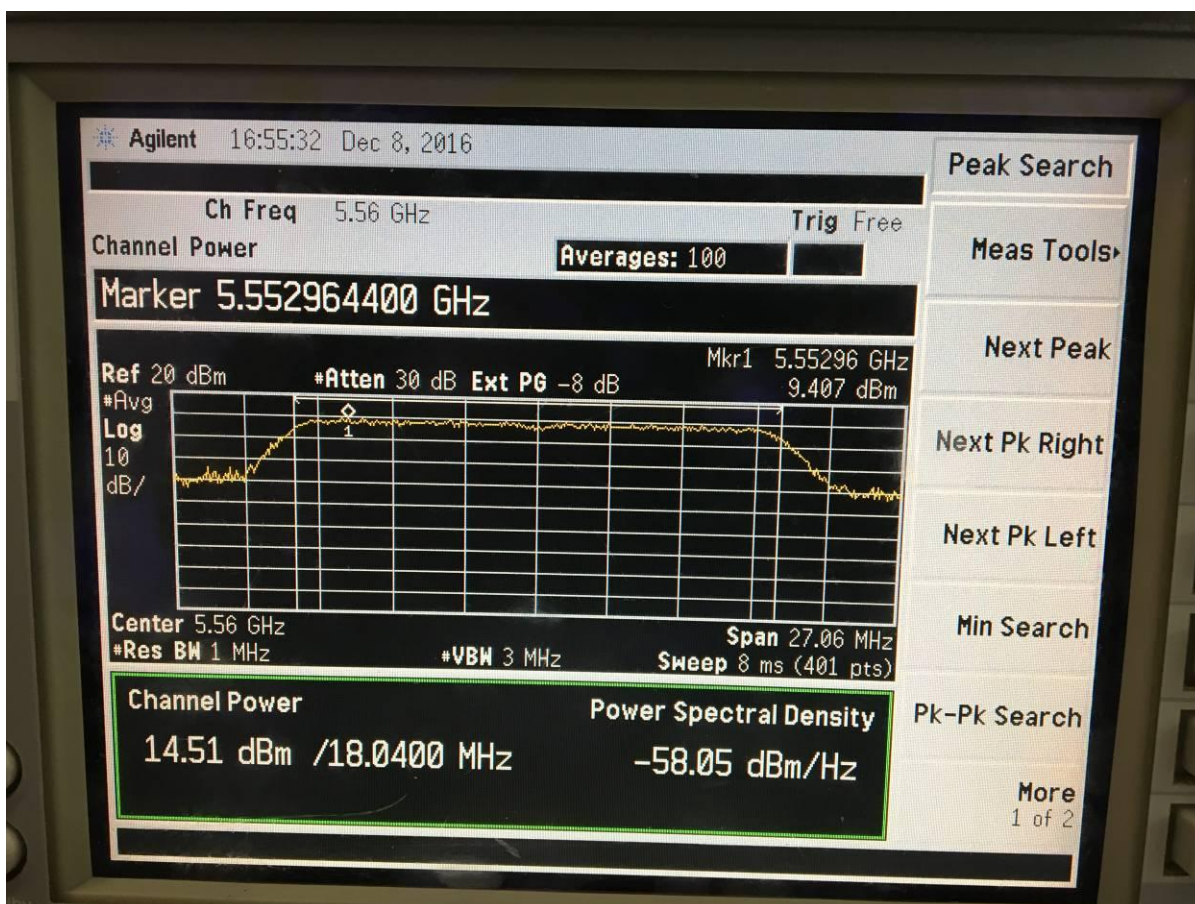


Figure 30. Antenna Conducted Output Power, 802.11n Channel 112

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

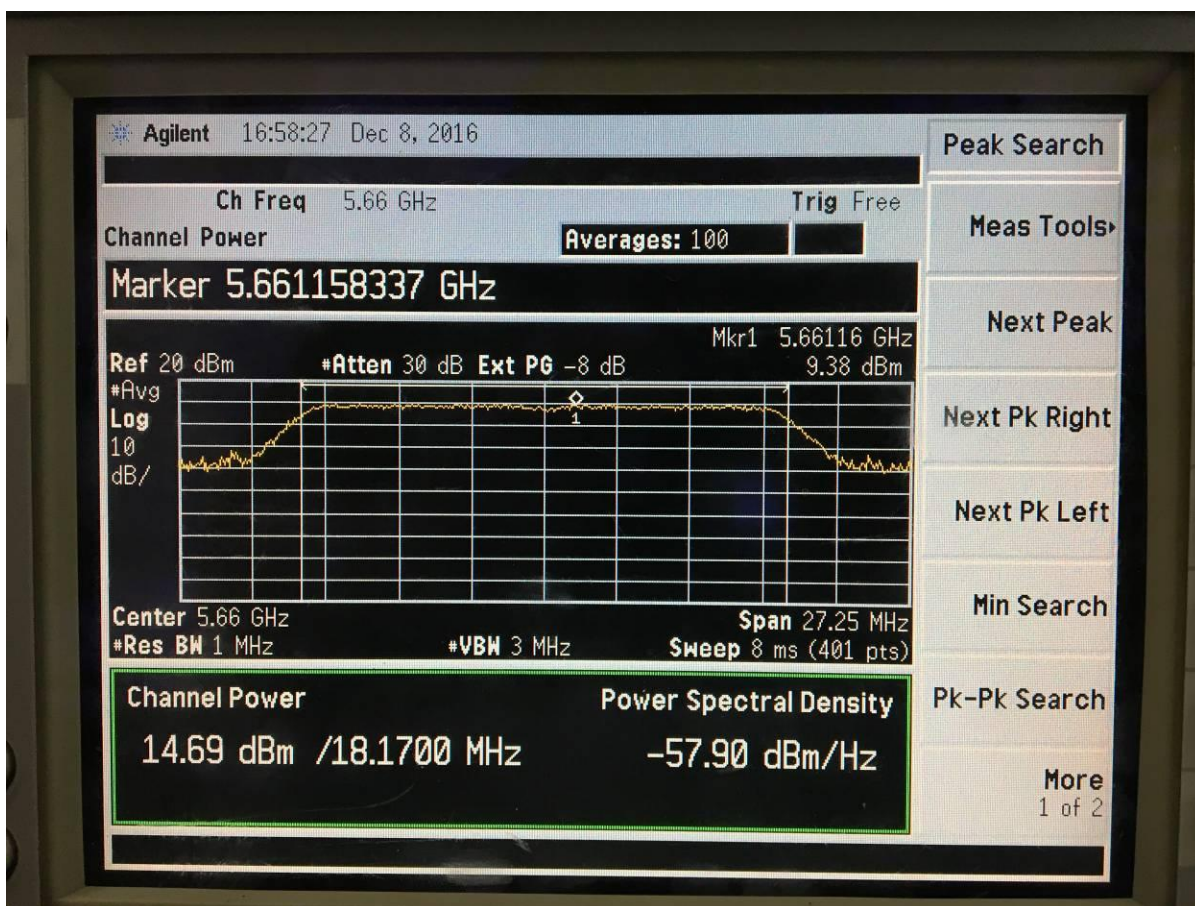


Figure 31. Antenna Conducted Output Power, 802.11n Channel 132

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

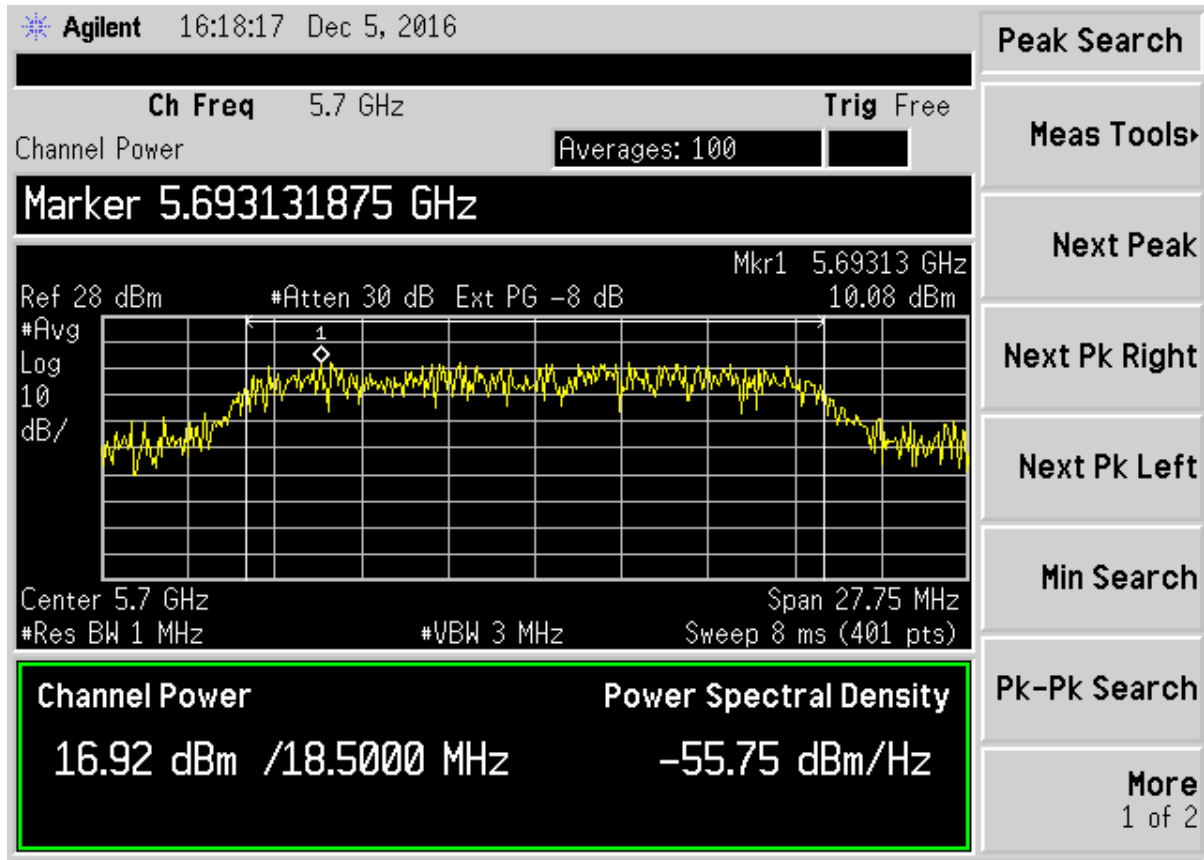
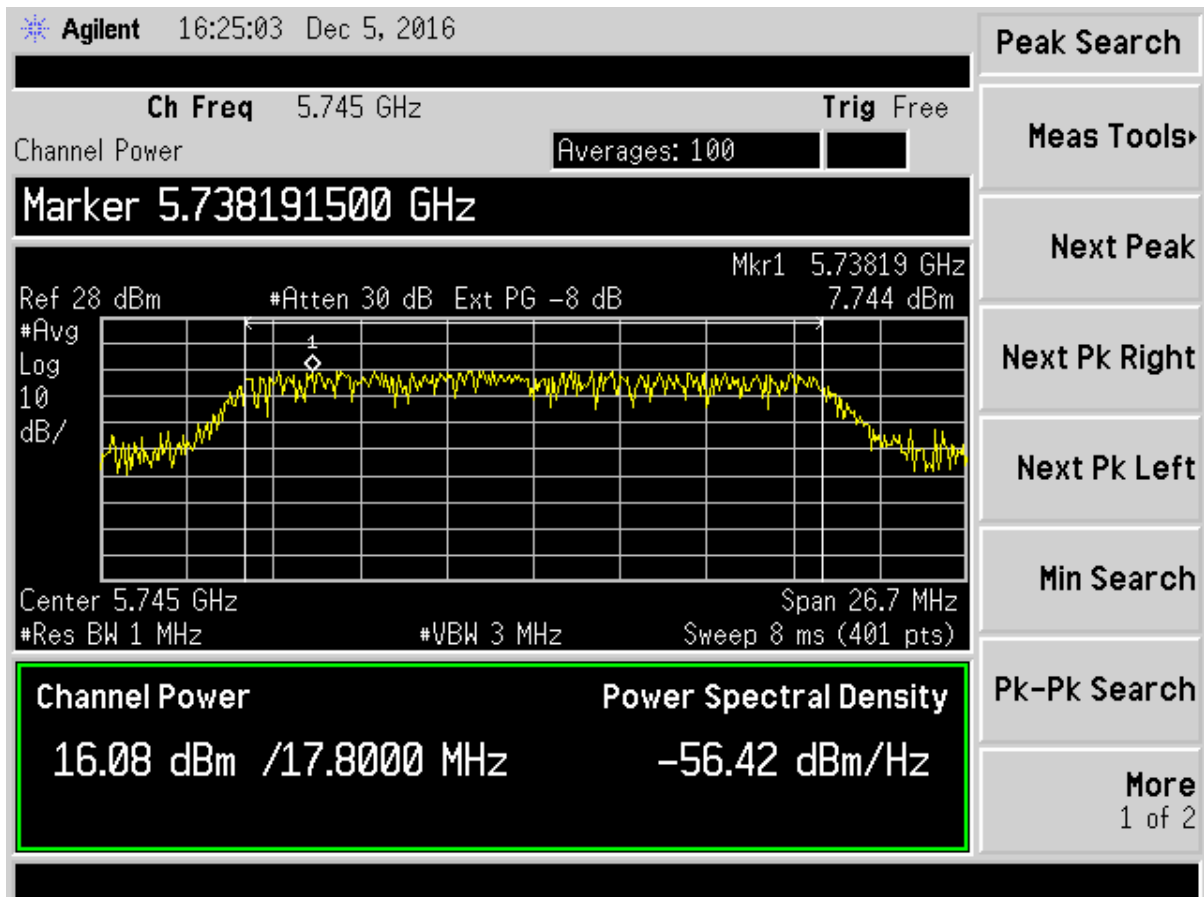


Figure 32. Antenna Conducted Output Power, 802.11n Channel 140

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
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16-0141
September 23, 2016
Acuity Brands
ACWIFI001



US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

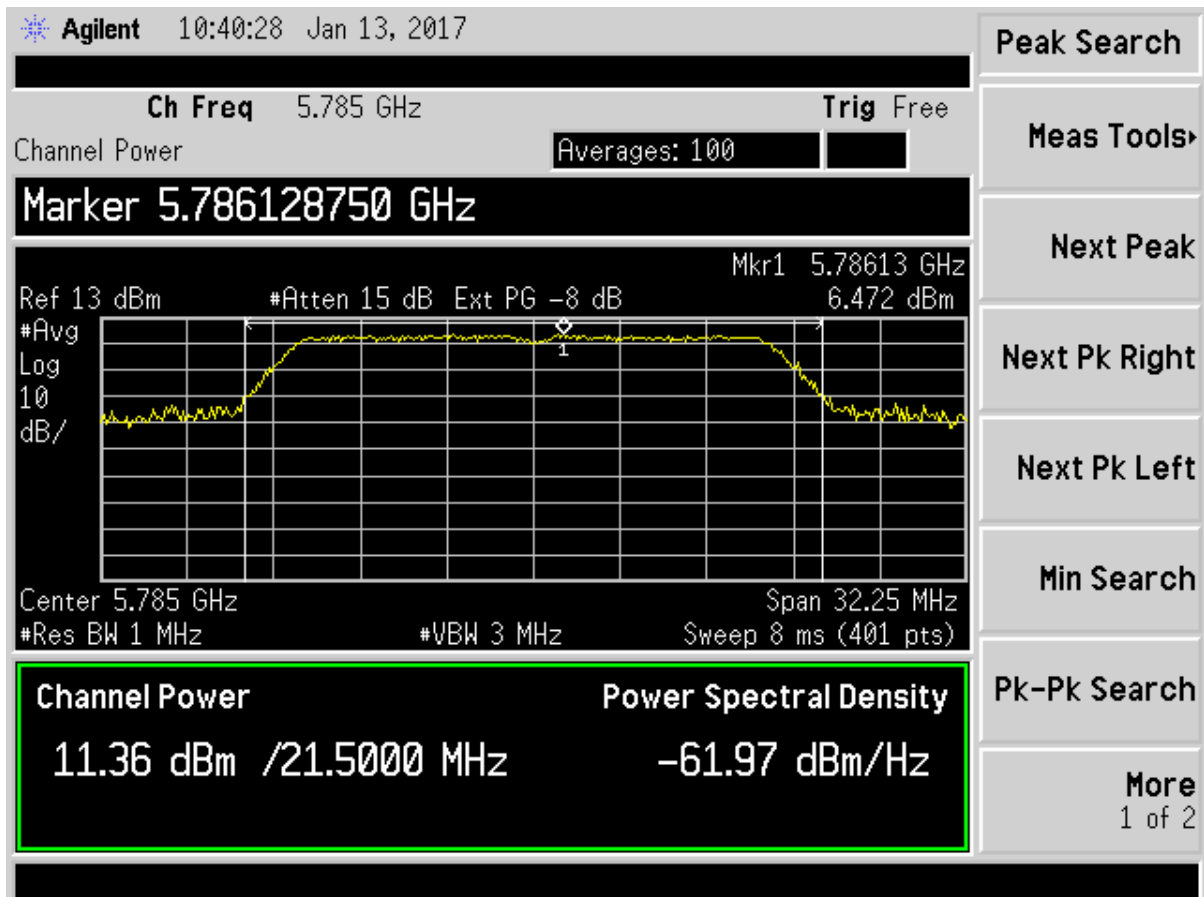


Figure 34. Antenna Conducted Output Power, 802.11n 5.785 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

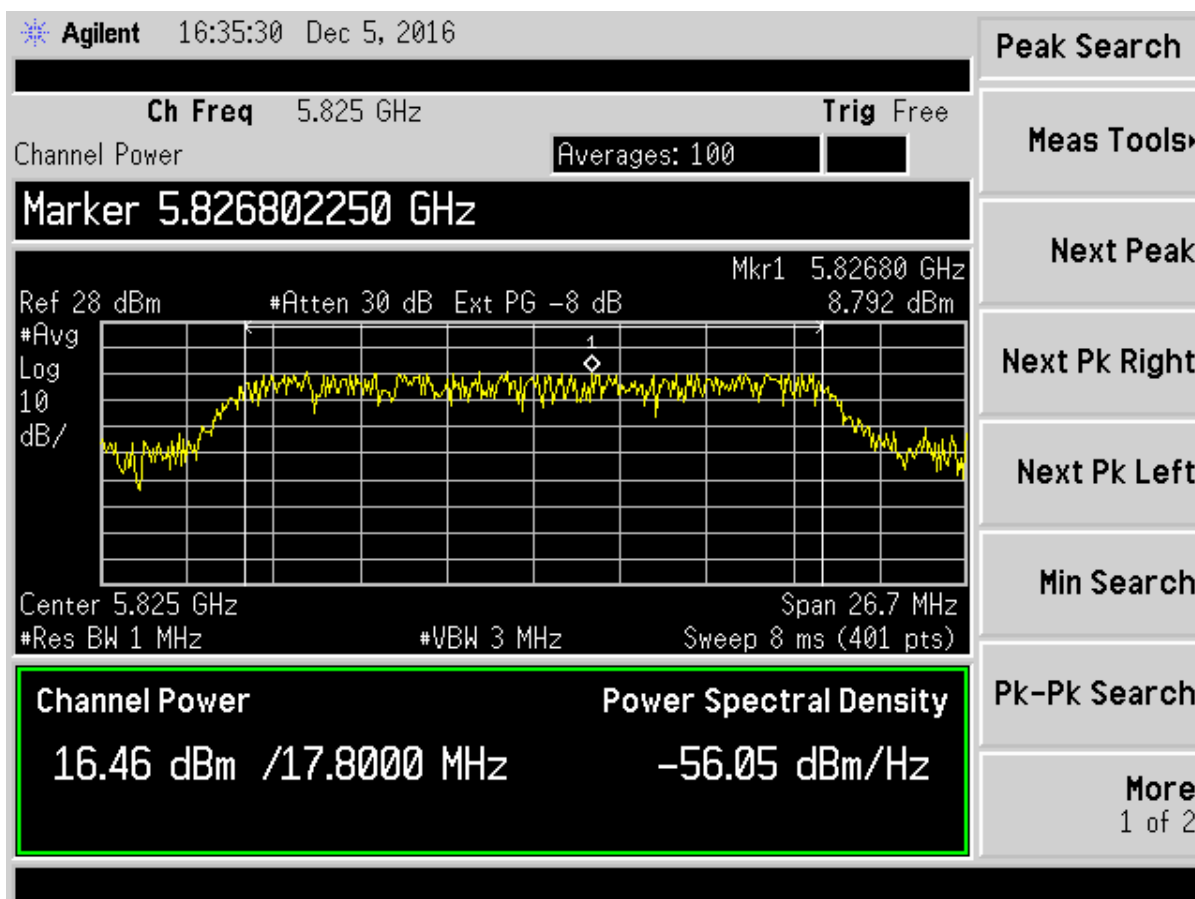


Figure 35. Antenna Conducted Output Power, 802.11n Channel 165

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

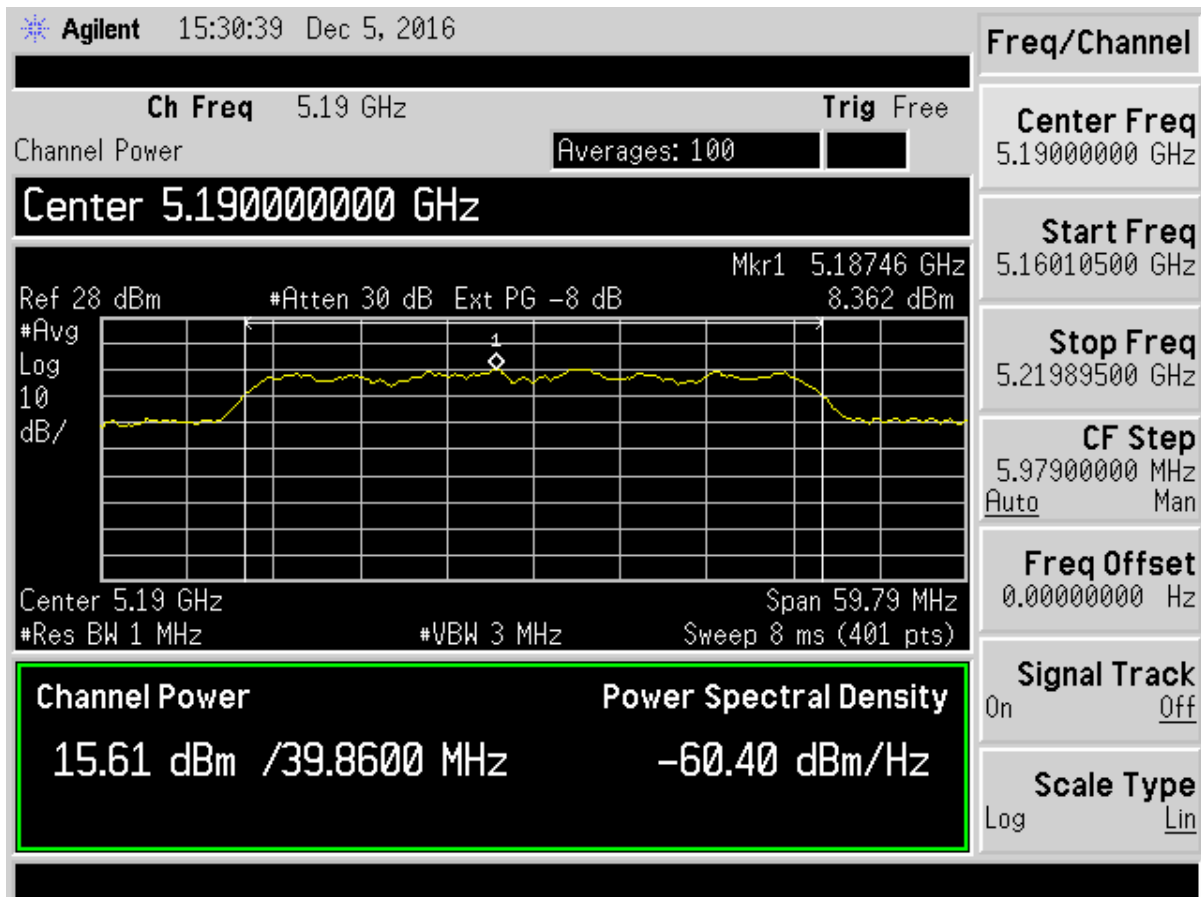


Figure 36. Antenna Conducted Output Power, 802.11a with 40 MHz BW
Channel 38

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

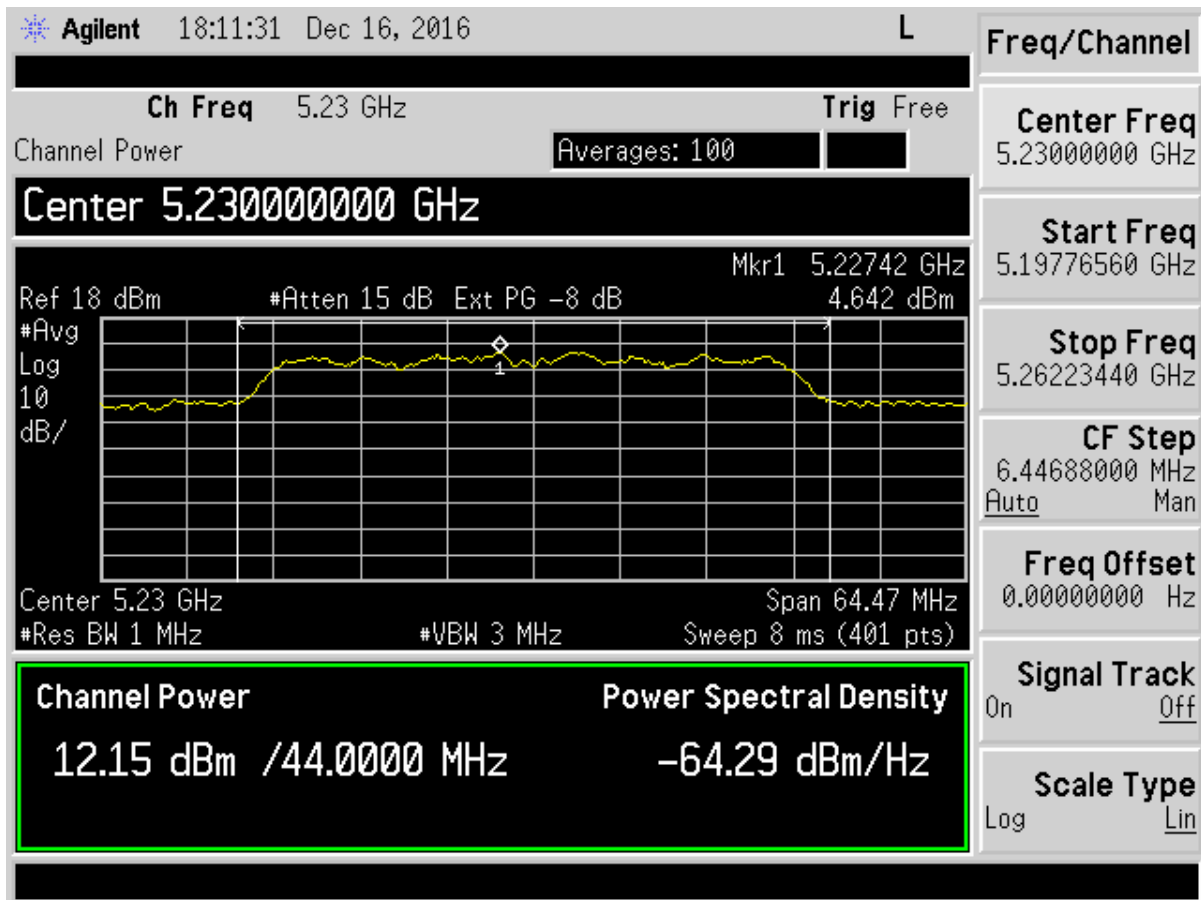


Figure 37. Antenna Conducted Output Power, 802.11a with 40 MHz BW
5.23 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

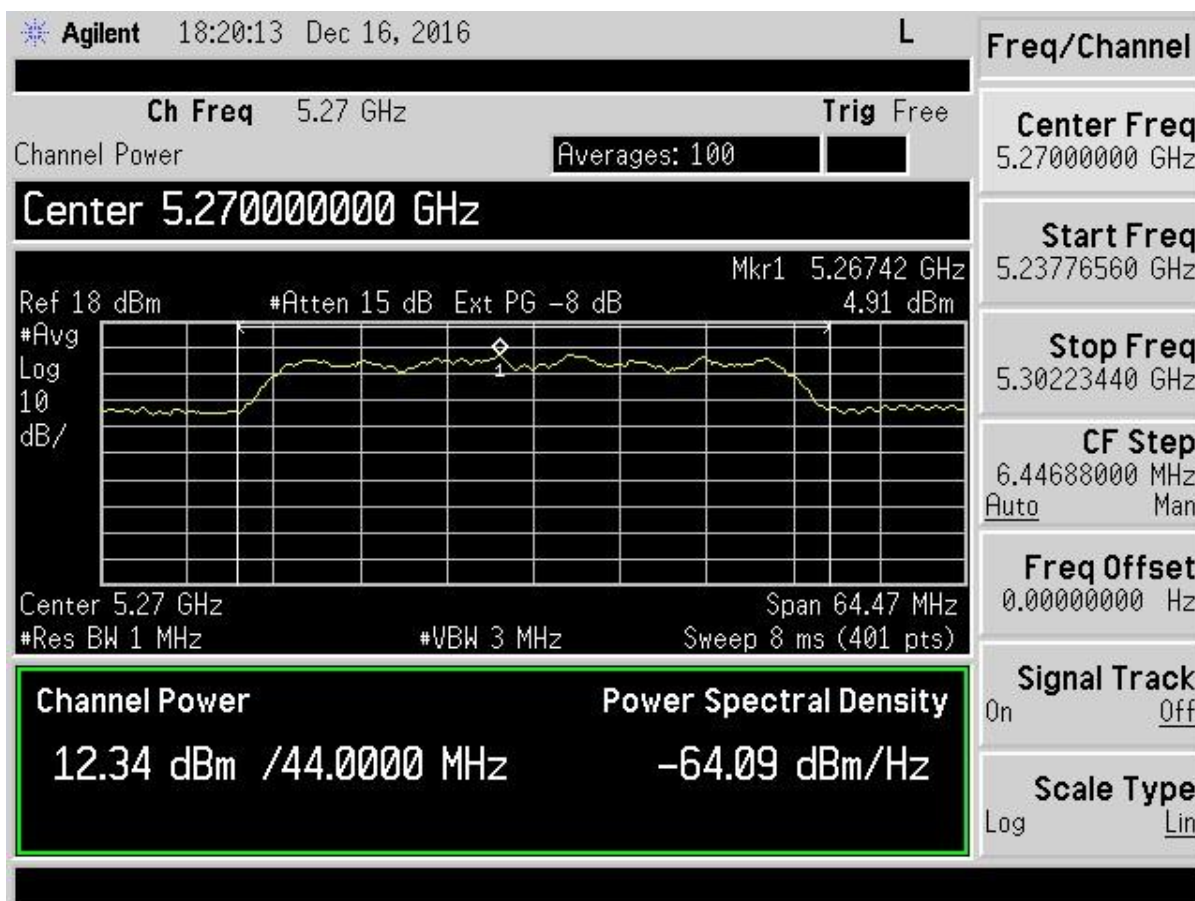


Figure 38. Antenna Conducted Output Power, 802.11a with 40 MHz BW
5.27 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

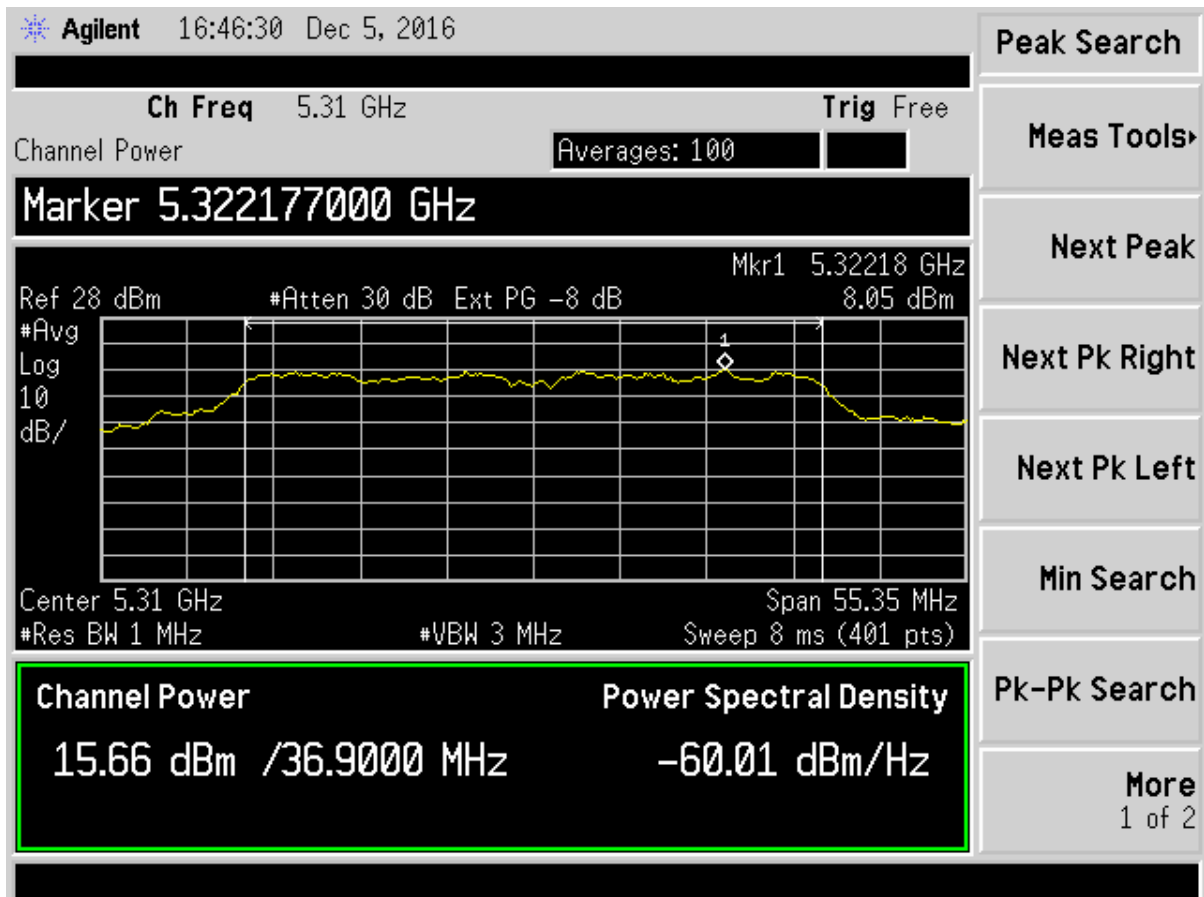


Figure 39. Antenna Conducted Output Power, 802.11a with 40 MHz BW
Channel 62

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001



US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

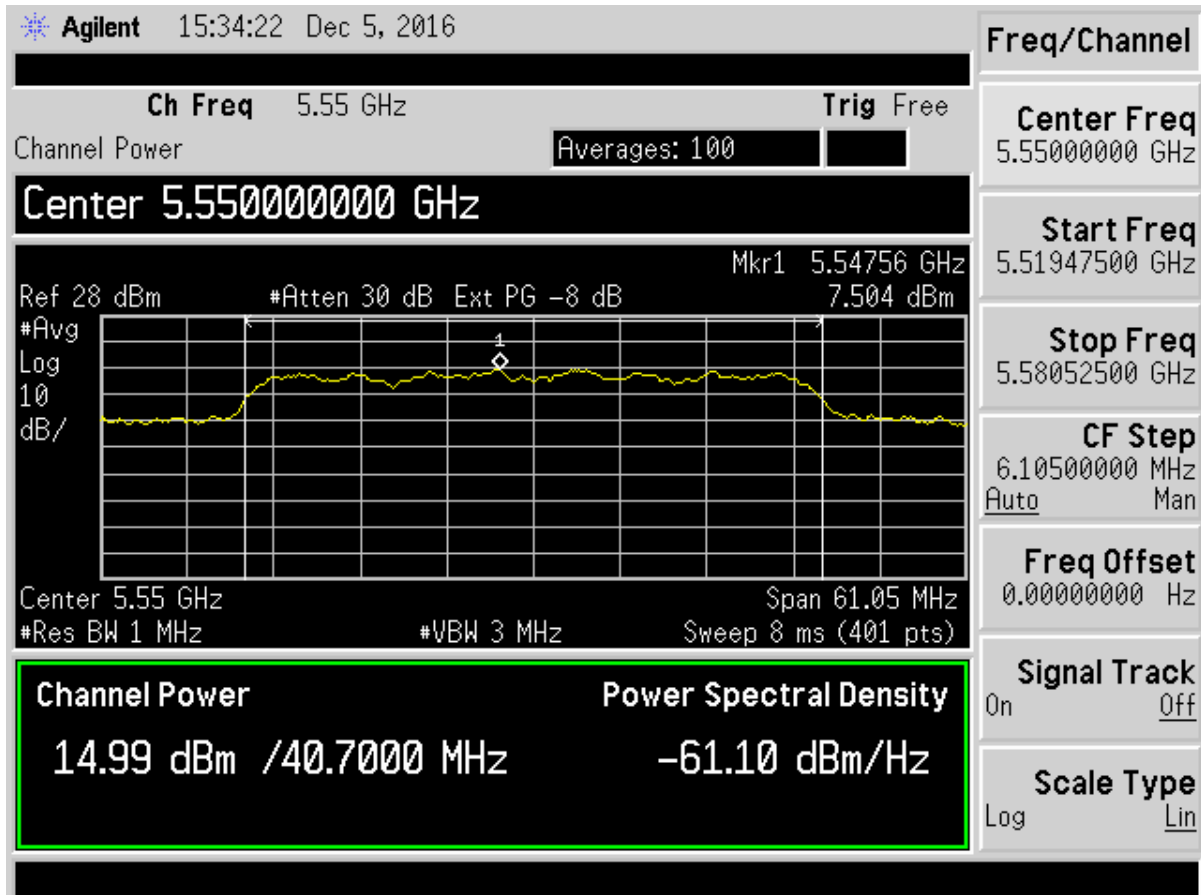


Figure 41. Antenna Conducted Output Power, 802.11a with 40 MHz BW
Channel 110

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

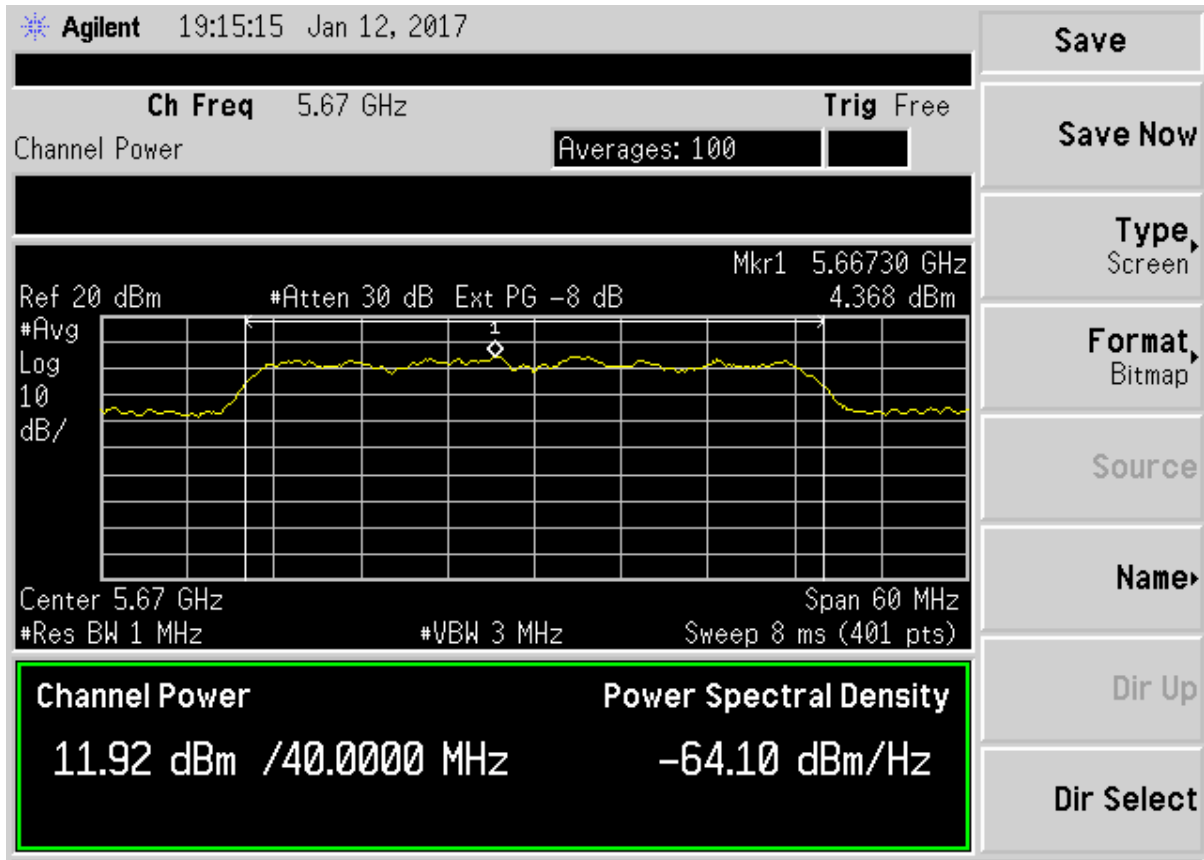


Figure 42. Antenna Conducted Output Power, 802.11a with 40 MHz BW
Channel 134

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

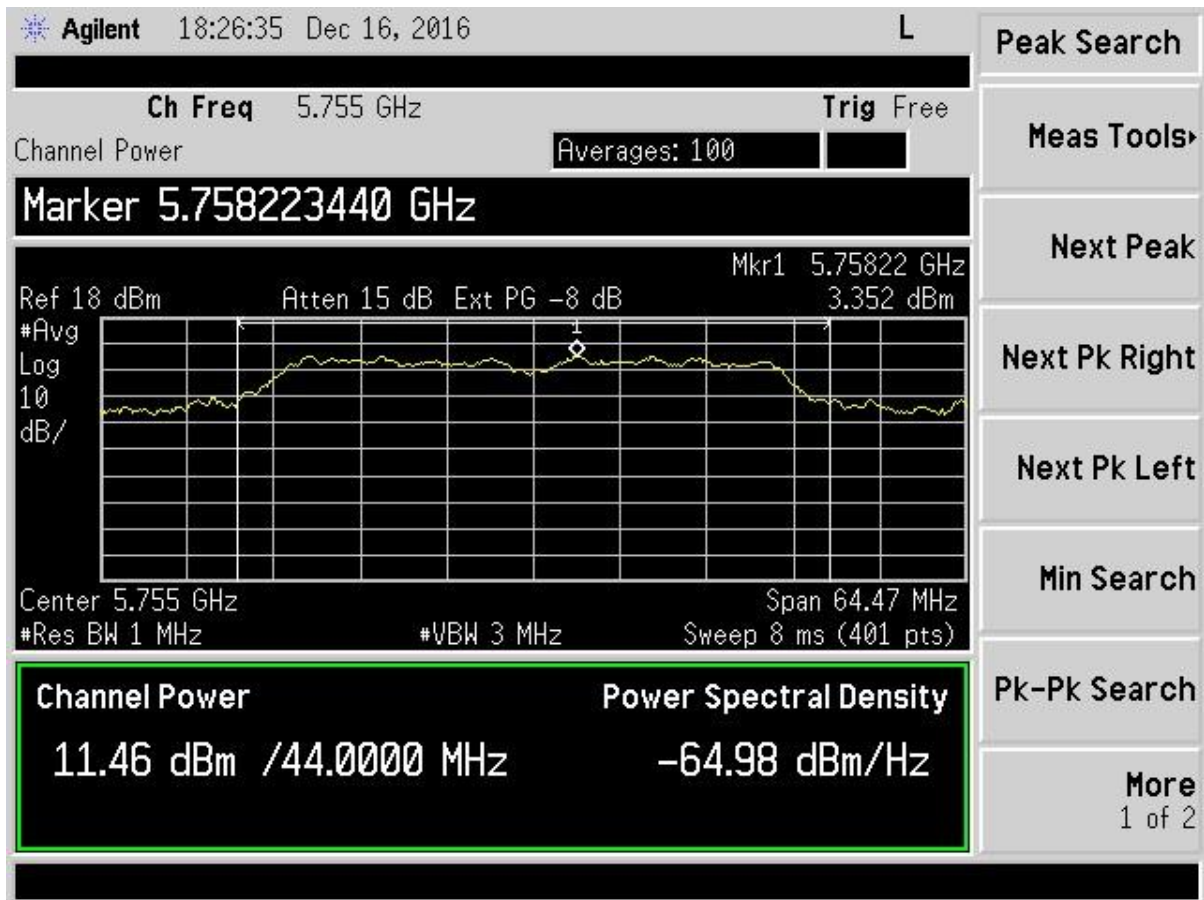


Figure 43. Antenna Conducted Output Power, 802.11a with 40 MHz BW
5.758 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

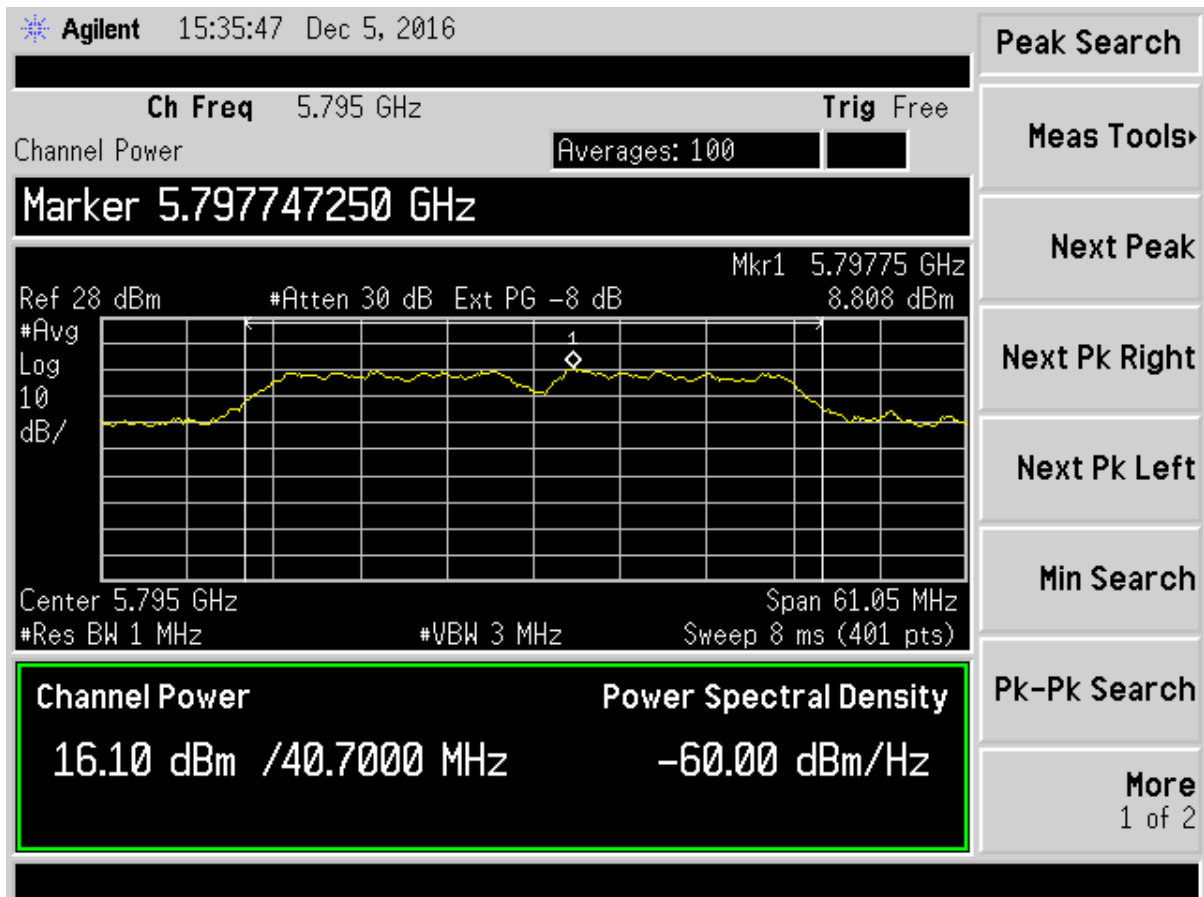


Figure 44. Antenna Conducted Output Power, 802.11a with 40 MHz BW
Channel 159

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

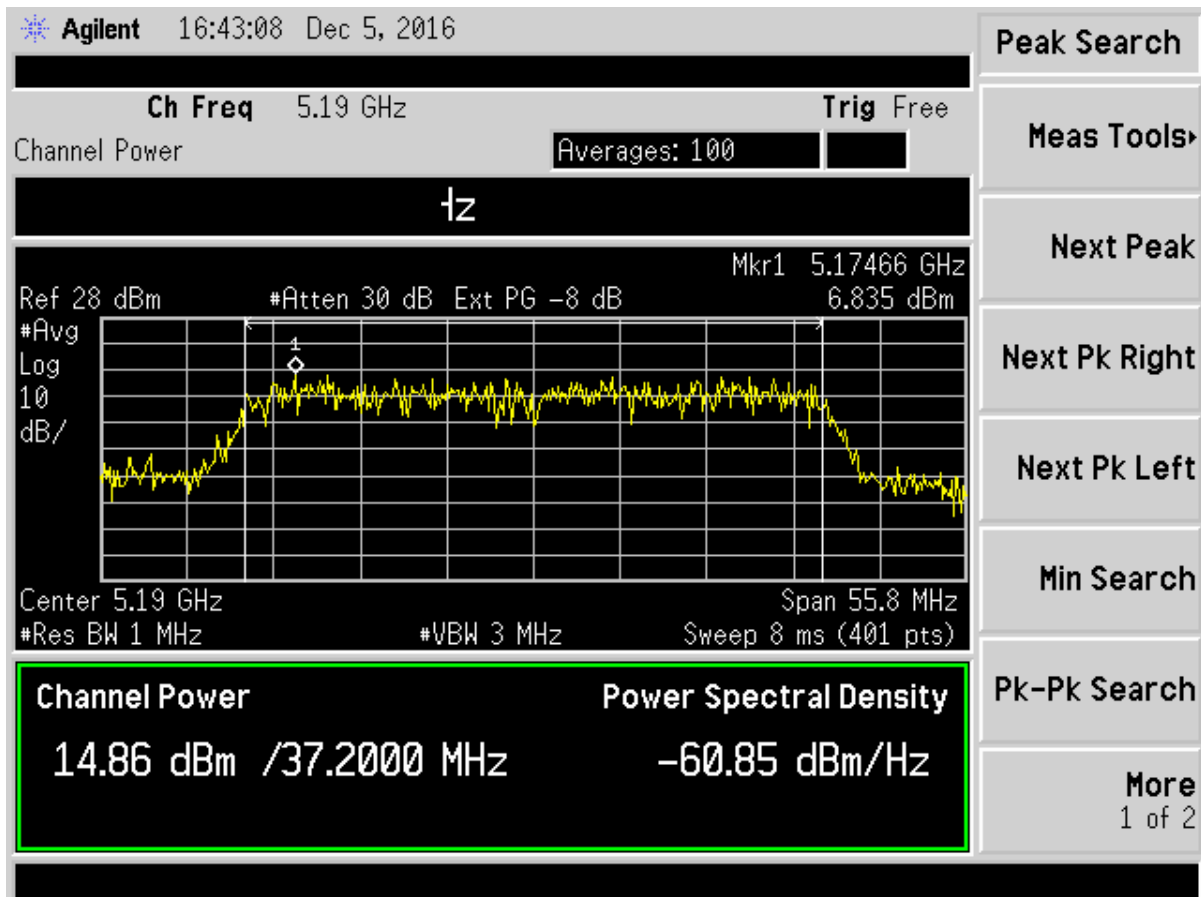


Figure 45. Antenna Conducted Output Power, 802.11n with 40 MHz BW
Channel 38

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

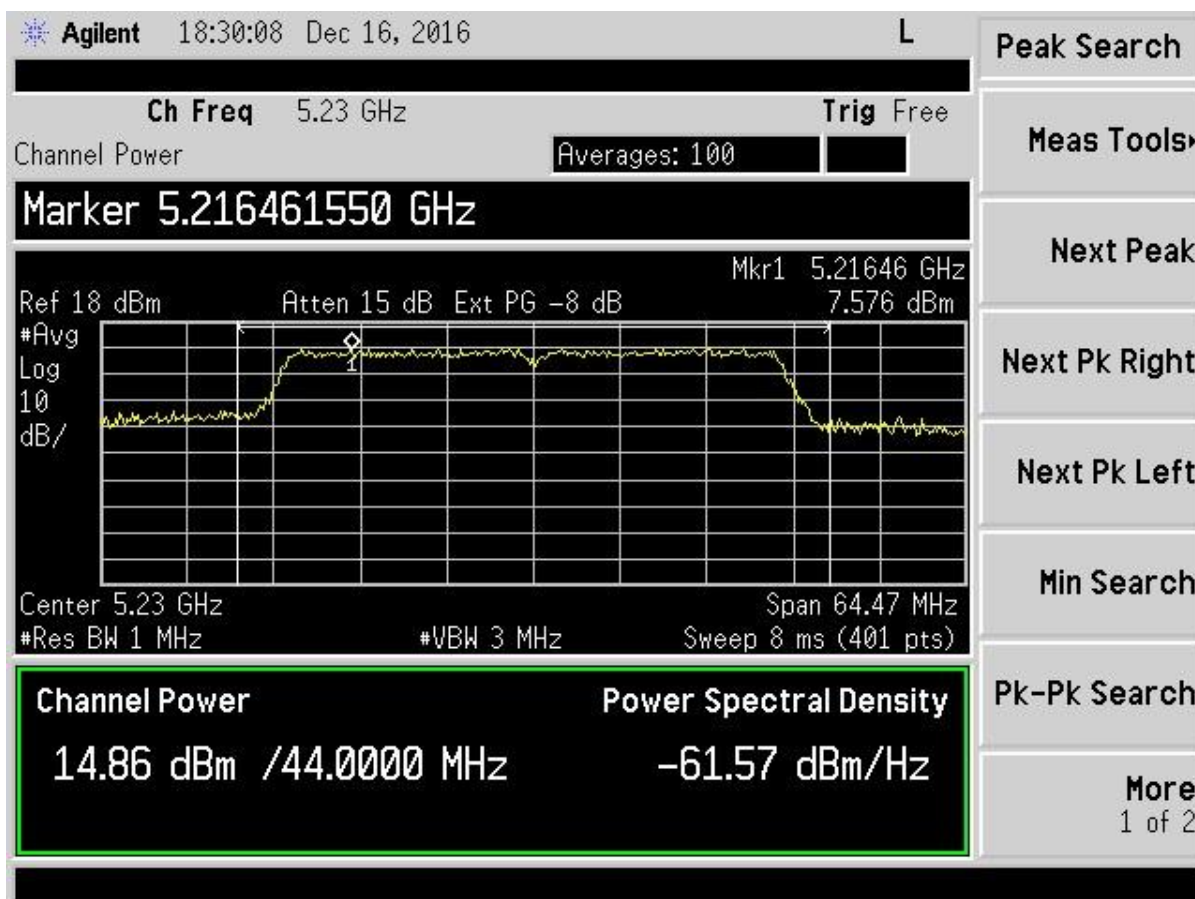


Figure 46. Antenna Conducted Output Power, 802.11n with 40 MHz BW
5.230 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

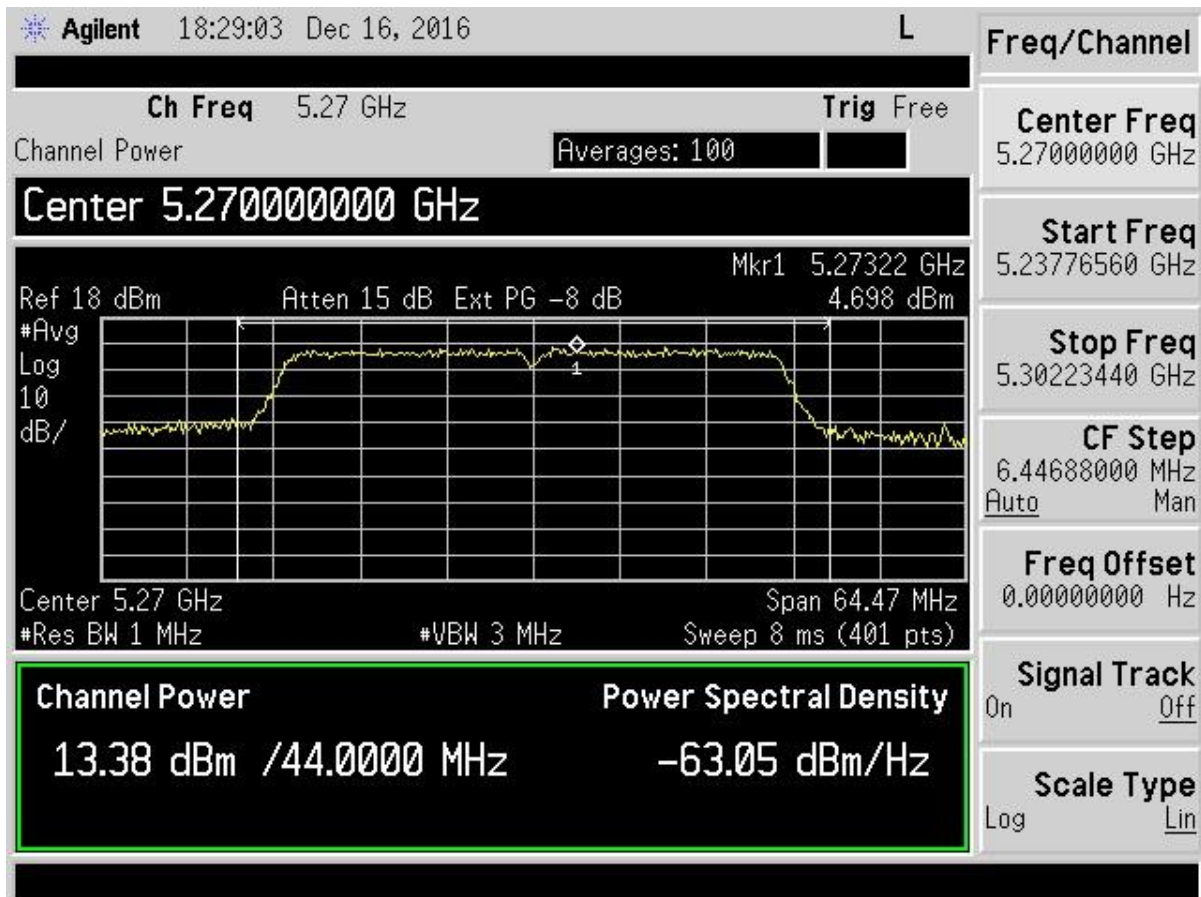


Figure 47. Antenna Conducted Output Power, 802.11n with 40 MHz BW
5.270 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

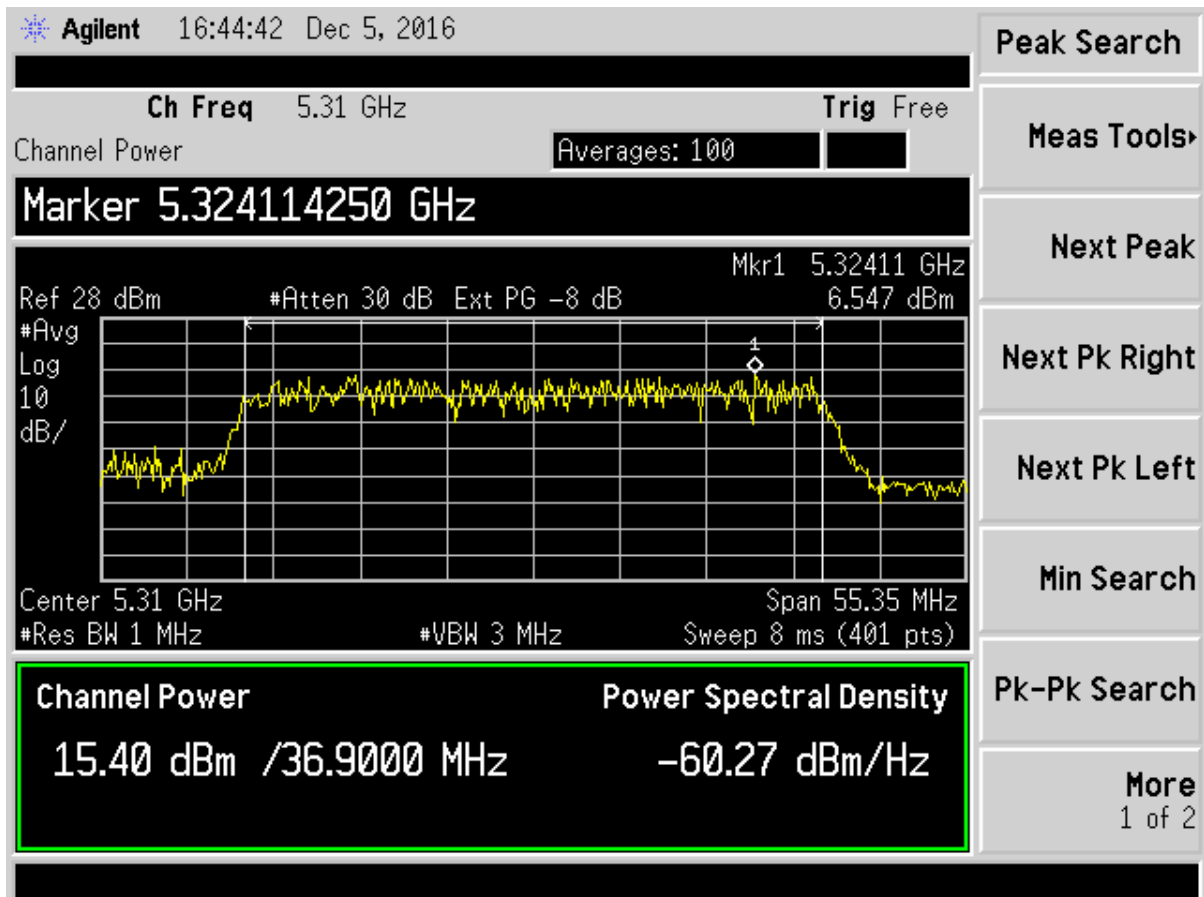


Figure 48. Antenna Conducted Output Power, 802.11n with 40 MHz BW
Channel 62

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
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16-0141
September 23, 2016
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ACWIFI001

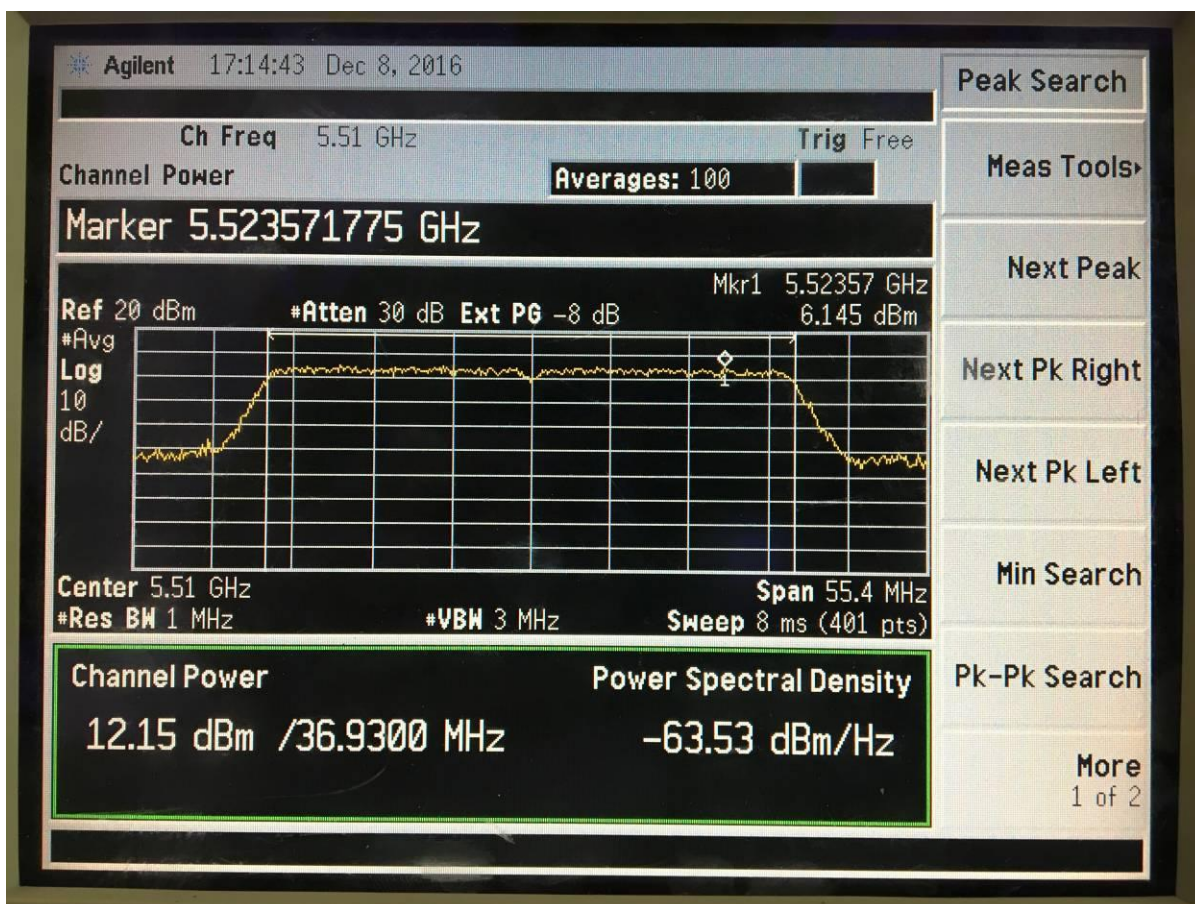


Figure 49. Antenna Conducted Output Power, 802.11n with 40 MHz BW
Channel 102

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
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16-0141
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Acuity Brands
ACWIFI001

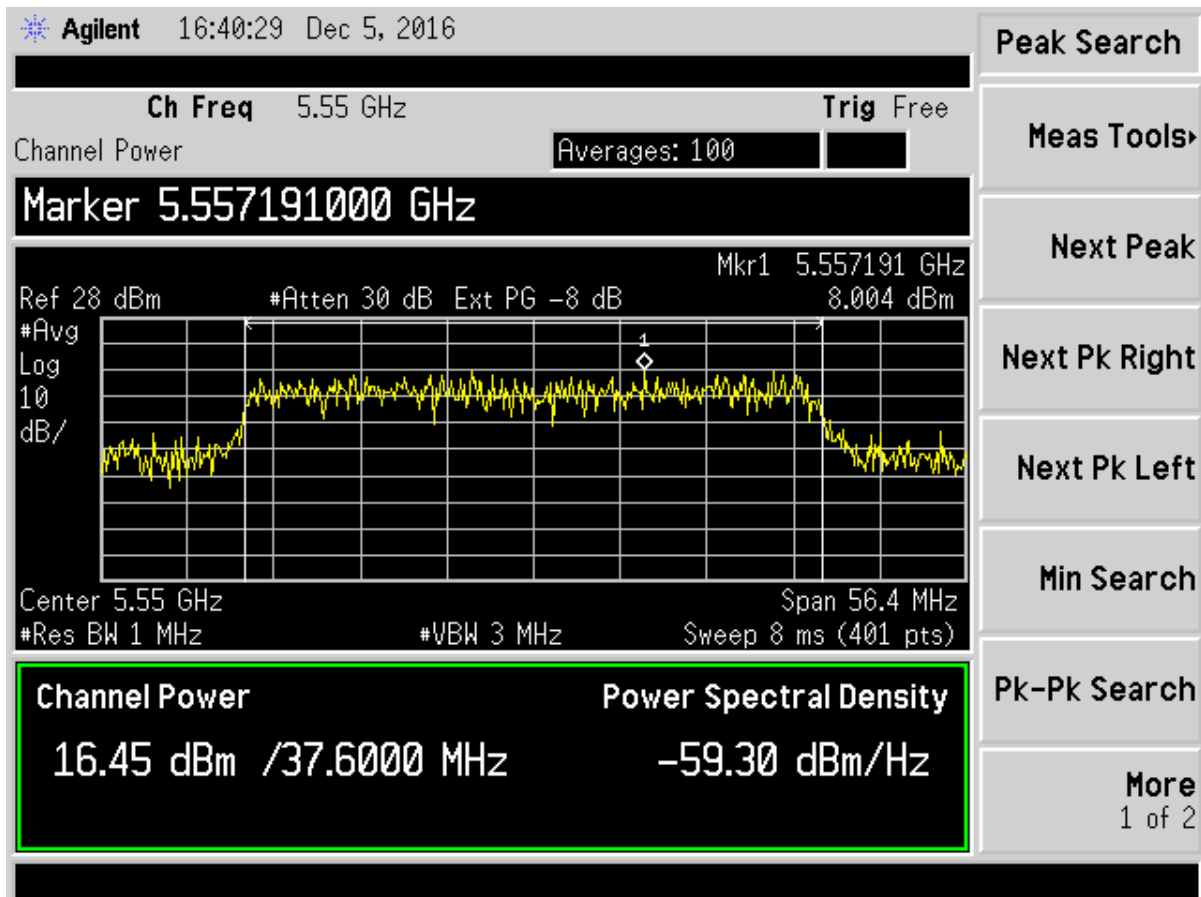


Figure 50. Antenna Conducted Output Power, 802.11n with 40 MHz BW
Channel 110

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
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6715A-ACWIFI001
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Acuity Brands
ACWIFI001

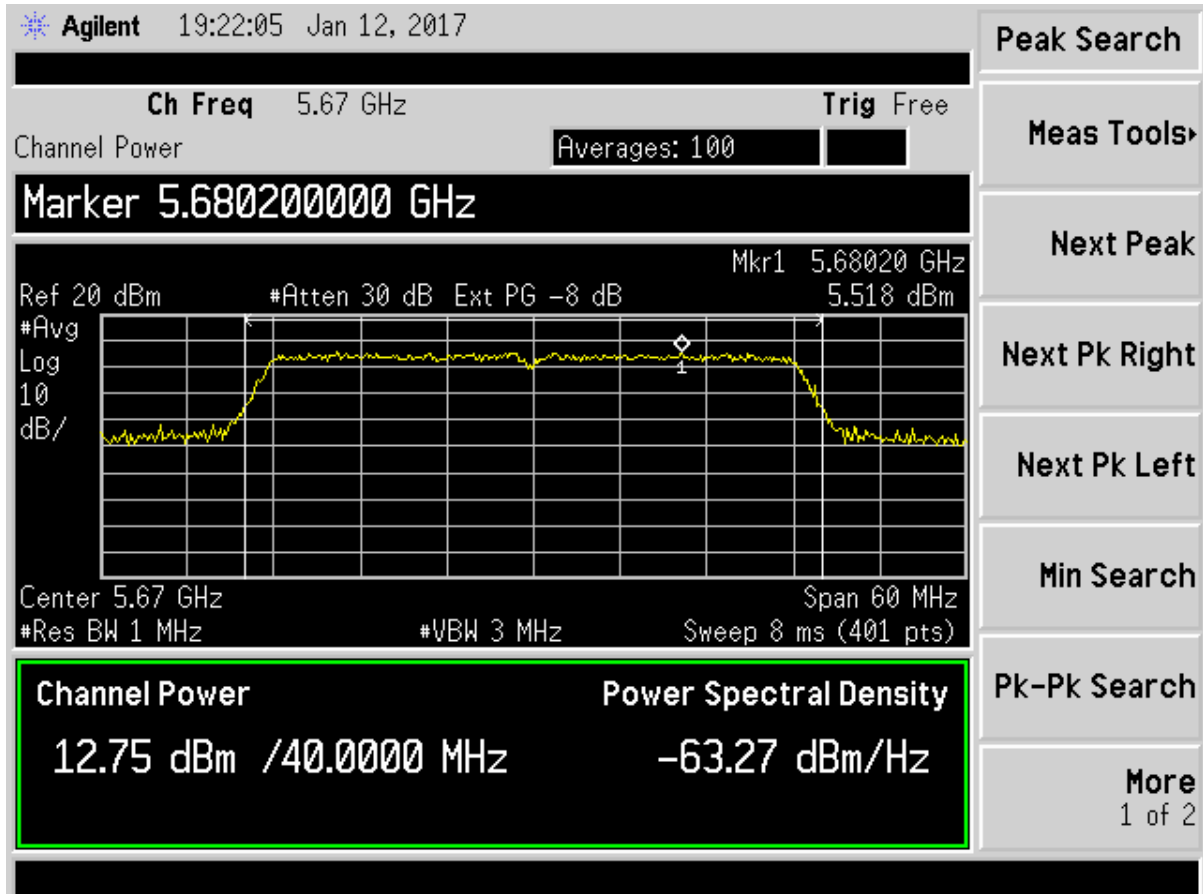


Figure 51. Antenna Conducted Output Power, 802.11n with 40 MHz BW
Channel 134

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
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6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

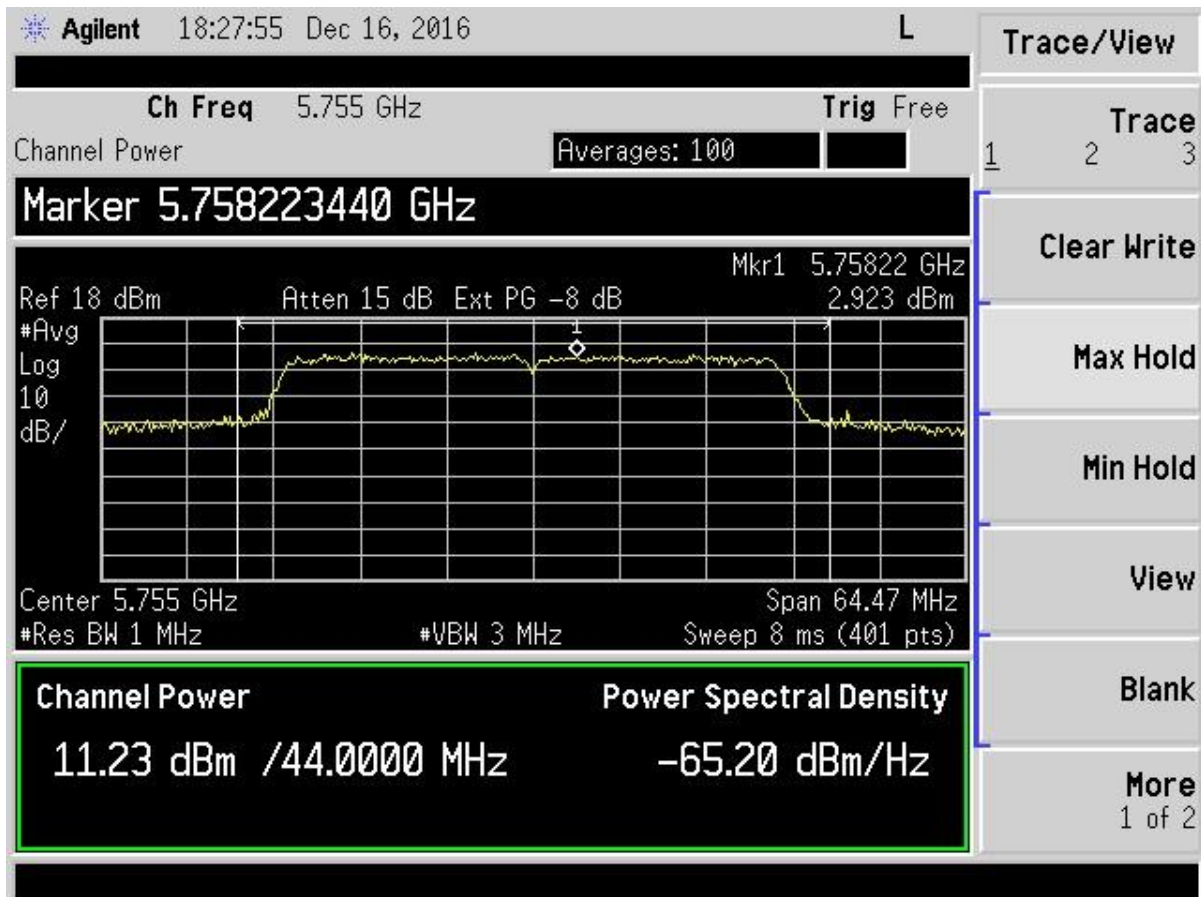


Figure 52. Antenna Conducted Output Power, 802.11n with 40 MHz BW
5.758 GHz

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
6715A-ACWIFI001
16-0141
September 23, 2016
Acuity Brands
ACWIFI001

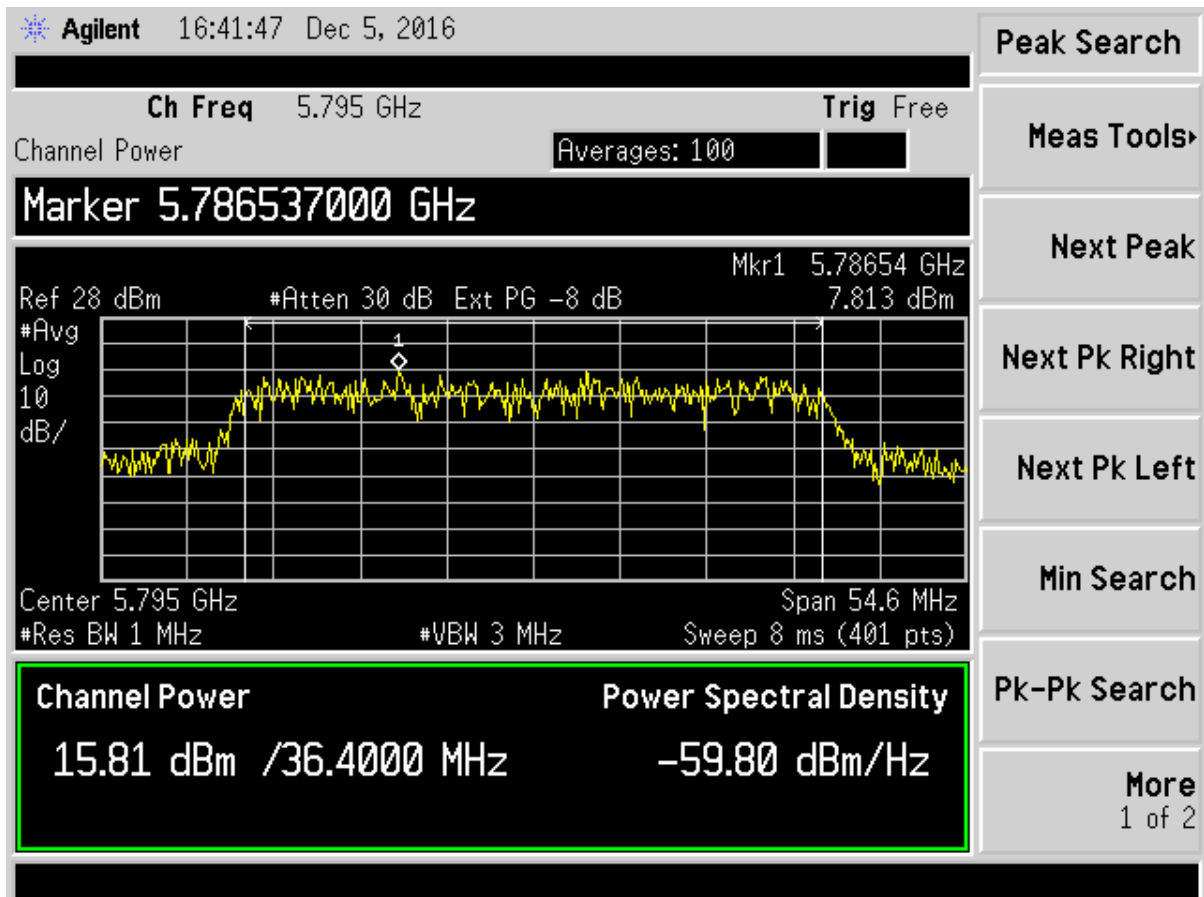


Figure 53. Antenna Conducted Output Power, 802.11n with 40 MHz BW
Channel 159

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
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16-0141
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Acuity Brands
ACWIFI001

2.10 Restricted Bands of Operation (Part 15.205)

Only spurious emissions can fall in the frequency bands of Part 15.205. The field strength of these spurious cannot exceed the limits of 15.209. Radiated harmonics and other Spurious are examined for this requirement, see the sections that follow.

2.11 Intentional Radiator, Power Line Conducted Emissions (Part 15.207)

The EUT is designed to operate with an input voltage of 3.3 VDC. An evaluation board was used during testing and it supplied the necessary 3.3 VDC voltage to the EUT. The EUT is considered to be indirectly connected to the AC mains during normal operation. Power line conducted emissions testing was performed to ensure that with the EUT in operation (exercising all transmitter functions), the complete system continues to meet the applicable requirements for Part 15.207. These measurements were completed and are displayed below.

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FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

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Acuity Brands
ACWIFI001

Table 17. Transmitter Power Line Conducted Emissions Test Data, Part 15.207

150 KHz to 30 MHz						
Test: Power Line Conducted Emissions				Client: Acuity Brands Technology Services, Inc.		
Project: 16-0139				Model: ACWIFI001		
Frequency (MHz)	Test Data (dBuV)	LISN+CL-PA (dB)	Results (dBuV)	AVG Limits (dBuV)	Margin (dB)	Detector PK, QP, or AVG
Positive lead						
0.1675	60.70	0.50	61.20	65.1*	3.9	QP
0.1675	32.87	0.50	33.37	55.1	21.7	AVG
0.6075	32.60	0.32	32.92	46.0	13.1	PK
4.9466	39.62	0.40	40.02	46.0	6.0	PK
6.6660	47.67	0.43	48.10	50.0	1.9	QP
10.3833	40.12	0.54	40.66	50.0	9.3	QP
24.9160	29.87	0.90	30.77	50.0	19.2	PK
Negative lead						
0.1517	59.66	0.42	60.08	65.9*	5.8	QP
0.1517	31.00	0.42	31.42	55.9	24.5	AVG
0.6666	35.86	0.15	36.01	46.0	10.0	PK
4.9533	36.03	0.28	36.31	46.0	9.7	QP
6.6250	47.71	0.31	48.02	50.0	2.0	QP
10.0000	43.51	0.40	43.91	50.0	6.1	PK
26.0833	32.69	0.73	33.42	50.0	16.6	PK

(*)= Quasi Peak limit applied.

SAMPLE CALCULATION at 0.1628 MHz:

Magnitude of Measured Frequency	39.40	dBuV
+ Cable Loss+ LISN Loss	0.49	dB
=Corrected Result	39.89	dBuV
Limit	55.30	dBuV
-Corrected Result	39.89	dBuV
Margin	15.40	dB

Test Date: November 30, 2016

Tested By

Signature: 

Name: George Yang

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

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2.12 Intentional Radiator, Radiated Emissions (Part 15.209, 15.407) (IC RSS 247, 6.2)

Radiated Spurious measurements: the EUT was placed into a continuous transmit mode of operation (>98% duty cycle) and tested per FCC KDB Publication 789033 D02 General UNII Test Procedures New Rules v01r02 and ANSI C63.10:2013. A preliminary scan was performed on the EUT to find signal frequencies that were caused by the transmitter part of the device. To obtain worse case results the EUT was tested in X, Y, and Z axis or in the orientation of normal operation if the device is designed to operation in a fixed position.

Radiated measurements were then performed between the frequency range of 9KHz (or lowest frequency used/generated by the device) up to the tenth harmonic of the device (no greater than 40 GHz). In the band below 30 MHz a resolution bandwidth (RBW) of 200 Hz or 9 kHz was used, emissions below 1 GHz were tested with a RBW of 120 KHz and emissions above 1 GHz were tested with a RBW of 1 MHz. All video bandwidth settings were at least three times the RBW value.

The EUT was investigated to Part 15.209, General requirements for unwanted spurious emissions.

The conducted spurious method as described in KDB 789033 D02 was used to investigate all other emissions emanating from the antenna port. Conducted Spurious measurements: the EUT was put into a continuous-transmit mode of operation (>98% duty cycle) and tested for conducted out of band emissions emanating from the antenna port over the frequency range of 30 MHz to 40 GHz. A conducted scan was performed on the EUT to identify and record spurious signals that were related to the transmitter.

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Test Report Number:
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Customer:
Model:

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Acuity Brands
ACWIFI001

2.12.1 Spurious Emissions, Radiated Measurements

Radiated emissions per Part 15.209 were performed to address the concerns of unwanted emissions that may radiate from the EUT cabinet, control circuits, or power leads. The results for this test can be found below.

Table 18. Intentional Radiator, Spurious Radiated Emissions (Part 15.209), 9 kHz to 1000 MHz

9 kHz to 30 MHz							
Test: Radiated Emissions				Client: Acuity Brands			
Project: 16-0141				Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	AF+CA-AMP (dB/m)	Results (dBuV/m)	QP Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector PK, or QP
All emissions found were greater than 20dB from the limit.							

Table 19. Intentional Radiator, Spurious Radiated Emissions (Part 15.209), 30 MHz to 1000 MHz

30 MHz to 1000 MHz							
Test: Radiated Emissions				Client: Acuity Brands			
Project: 16-0141				Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	AF+CA-AMP (dB/m)	Results (dBuV/m)	QP Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector PK, or QP
30.00	40.86	-13.82	27.04	40.0	3m./VERT	13.0	QP
48.28	49.61	-16.61	33.00	40.0	3m./VERT	7.0	PK
191.93	46.99	-11.57	35.42	43.5	3m./HORZ	8.1	PK
216.00	50.01	-13.52	36.49	43.5	3m./HORZ	7.0	PK
290.00	48.15	-10.22	37.93	46.0	3m./HORZ	8.1	PK
214.00	47.18	-14.02	33.16	43.5	3m./VERT	10.3	PK
314.00	44.61	-9.73	34.88	46.0	3m./VERT	11.1	PK
All other emissions found were greater than 20dB from the limit.							

Sample Calculation at 30.00 MHz:

Magnitude of Measured Frequency	40.86	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	-13.82	dB/m
Corrected Result	27.04	dBuV/m

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

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 2ADCB-ACWIFI001
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 September 23, 2016
 Acuity Brands
 ACWIFI001

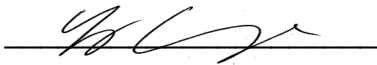
Table 20. Intentional Radiator, Spurious Radiated Emissions (Part 15.209), above 1 GHz

1 GHz to 40 GHz							
Test: Radiated Emissions				Client: Acuity Brands			
Project: 16-0141				Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	AF+CA-AMP (dB/m)	Results (dBuV/m)	QP Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector PK, or QP
1588.00	53.44	-7.82	45.62	54.0	3.0m./HORZ	8.4	PK
1637.50	47.59	-7.36	40.23	54.0	3.0m./VERT	13.8	PK
Fundamental and Harmonic emissions are presented in the tables that follow. No other emissions were seen greater than 20 dB from the limit.							

Sample Calculation at 1588.00 MHz:

Magnitude of Measured Frequency	53.44	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	-07.82	dB/m
Corrected Result	45.62	dBuV/m

Test Date: August 1, 2016

Tested By
 Signature:  Name: George Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
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 September 23, 2016
 Acuity Brands
 ACWIFI001

2.12.2 Spurious Emissions Radiated Measurements, Antenna 1

EUT fitted with Flex trace antenna.

Table 21. Peak Radiated Fundamental & Harmonic Emissions, 802.11a

Test: FCC Part 15, Para 15.209, 15.407					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 36								
5180.00	72.42	0.0	40.23	112.65	--	3.0m./HORZ	--	PK
Channel 48								
5240.00	71.52	0.0	40.47	111.99	--	3.0m./HORZ	--	PK
Channel 52								
5260.00	70.09	0.0	40.47	110.56	--	3.0m./HORZ	--	PK
Channel 64								
5320.00	72.81	0.0	40.56	113.37	--	3.0m./HORZ	--	PK
Channel 100								
5500.00	71.76	0.0	40.78	112.54	--	3.0m./HORZ	--	PK
Channel 140								
5700.00	72.78	0.0	41.83	114.61	--	3.0m./HORZ	--	PK
Channel 149								
5745.00	70.27	0.0	41.69	111.96	--	3.0m./HORZ	--	PK
Channel 165								
5825.00	68.85	0.0	41.71	110.56	--	3.0m./HORZ	--	PK

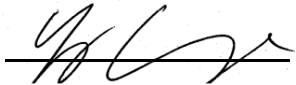
- (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
- No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
- The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.

Sample Calculation at 5180.00 MHz:

Magnitude of Measured Frequency	72.42	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.23	dB/m
Additional Factor	0.00	dB
Corrected Result	112.65	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

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 2ADCB-ACWIFI001
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 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 22. Average Radiated Fundamental & Harmonic Emissions 802.11a

Test: FCC Part 15, Para 15.209, 15.407(a)					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 36								
5180.00	62.05	0.0	40.23	102.28	--	3.0m./HORZ	--	AVG
Channel 48								
5240.00	61.30	0.0	40.47	101.77	--	3.0m./HORZ	--	AVG
Channel 52								
5260.00	62.15	0.0	40.47	102.62	--	3.0m./HORZ	--	AVG
Channel 64								
5320.00	64.32	0.0	40.56	104.88	--	3.0m./HORZ	--	AVG
Channel 100								
5500.00	63.31	0.0	40.78	104.09	--	3.0m./HORZ	--	AVG
Channel 140								
5700.00	63.31	0.0	41.83	105.14	--	3.0m./HORZ	--	AVG
Channel 149								
5745.00	60.83	0.0	41.69	102.52	--	3.0m./HORZ	--	AVG
Channel 165								
5825.00	60.14	0.0	41.71	101.85	--	3.0m./HORZ	--	AVG

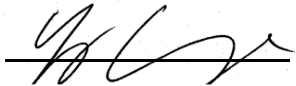
1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.
4. The Duty Cycle was not applied.

Sample Calculation at 5180.00MHz:

Magnitude of Measured Frequency	62.05	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.23	dB/m
Additional Factor	0.00	dB
Corrected Result	102.28	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

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Table 23. Peak Radiated Fundamental & Harmonic Emissions 802.11a 40 MHz BW

Test: FCC Part 15, Para 15.209, 15.407(a)					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 38								
5190	65.79	0.0	40.23	106.02	--	3.0m./HORZ	--	PK
Channel 62								
5310	69.86	0.0	40.56	110.42	--	3.0m./HORZ	--	PK
Channel 102								
5510	68.39	0.0	40.81	109.20	--	3.0m./HORZ	--	PK
Channel 110								
5550	68.02	0.0	40.81	108.83	--	3.0m./HORZ	--	PK
Channel 159								
5795	67.43	0.0	41.69	109.12	--	3.0m./HORZ	--	PK

1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.

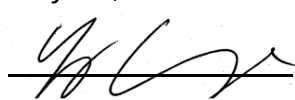
Sample Calculation at 5190.00 MHz:

Magnitude of Measured Frequency	65.79	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.23	dB/m
Additional Factor	0.00	dB
Corrected Result	106.02	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:



Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
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 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 24. Average Radiated Fundamental & Harmonic Emissions 802.11a 40 MHz BW

Test: FCC Part 15, Para 15.209, 15.407(a)					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 38								
5190	56.84	0.0	40.23	97.07	--	3.0m./HORZ	--	AVG
Channel 62								
5310	59.16	0.0	40.56	99.72	--	3.0m./HORZ	--	AVG
Channel 102								
5510	57.93	0.0	40.81	98.74	--	3.0m./HORZ	--	AVG
Channel 110								
5550	57.27	0.0	40.81	98.08	--	3.0m./HORZ	--	AVG
Channel 159								
5795	58.09	0.0	41.69	99.78	--	3.0m./HORZ	--	AVG

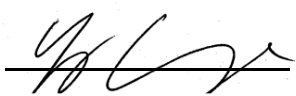
1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No harmonics detected, all other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.
4. The Duty Cycle factor was not applied.

Sample Calculation at 5190.00 MHz:

Magnitude of Measured Frequency	56.84	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.23	dB/m
Additional Factor	0.00	dB
Corrected Result	97.07	dBuV/m

Test Date: July 29, 2016

Tested By

Signature: 

Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 25. Peak Radiated Fundamental & Harmonic Emissions, 802.11n

Test: FCC Part 15, Para 15.209, 15.407(a)					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 36								
5180.00	72.51	0.0	40.57	113.08	--	3.0m./HORZ	--	PK
Channel 48								
5240.00	71.96	0.0	40.47	112.43	--	3.0m./HORZ	--	PK
Channel 52								
5260.00	72.12	0.0	40.47	112.59	--	3.0m./HORZ	--	PK
Channel 64								
5320.00	72.47	0.0	40.56	113.03	--	3.0m./HORZ	--	PK
Channel 100								
5500.00	71.37	0.0	40.78	112.15	--	3.0m./HORZ	--	PK
Channel 140								
5700.00	72.12	0.0	41.69	113.81	--	3.0m./HORZ	--	PK
Channel 149								
5745.00	71.46	0.0	41.69	113.15	--	3.0m./HORZ	--	PK
Channel 165								
5825.00	72.11	0.0	41.71	113.82	--	3.0m./HORZ	--	PK

1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No harmonics detected, all other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.

Sample Calculation at 5180.00 MHz:

Magnitude of Measured Frequency	72.51	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.57	dB/m
Additional Factor	0.00	dB
Corrected Result	113.08	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 26. Average Radiated Fundamental & Harmonic Emissions 802.11n

Test: FCC Part 15, Para 15.209, 15.407(a)					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 36								
5180.00	61.54	0.0	40.57	102.11	--	3.0m./HORZ	--	AVG
Channel 48								
5240.00	60.33	0.0	40.47	100.80	--	3.0m./HORZ	--	AVG
Channel 52								
5260.00	61.13	0.0	40.47	101.60	--	3.0m./HORZ	--	AVG
Channel 64								
5320.00	60.93	0.0	40.56	101.49	--	3.0m./HORZ	--	AVG
Channel 100								
5500.00	59.76	0.0	40.78	100.54	--	3.0m./HORZ	--	AVG
Channel 140								
5700.00	60.54	0.0	41.69	102.23	--	3.0m./HORZ	--	AVG
Channel 149								
5745.00	60.37	0.0	41.69	102.06	--	3.0m./HORZ	--	AVG
Channel 165								
5825.00	60.78	0.0	41.71	102.49	--	3.0m./HORZ	--	AVG

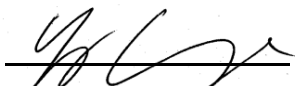
1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.
4. The Duty Cycle was not applied.

Sample Calculation at 5180.00MHz:

Magnitude of Measured Frequency	61.54	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.57	dB/m
Additional Factor	0.00	dB
Corrected Result	102.11	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 27. Peak Radiated Fundamental & Harmonic Emissions 802.11n 40 MHz BW

Test: FCC Part 15, Para 15.209, 15.407(a)					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 38								
5190	71.11	0.0	40.23	111.34	--	3.0m./HORZ	--	PK
Channel 62								
5310	69.92	0.0	40.47	110.39	--	3.0m./HORZ	--	PK
Channel 102								
5510	68.28	0.0	40.78	109.06	--	3.0m./HORZ	--	PK
Channel 110								
5550	68.89	0.0	41.96	110.85	--	3.0m./HORZ	--	PK
Channel 159								
5795	65.54	0.0	41.69	107.23	--	3.0m./HORZ	--	PK

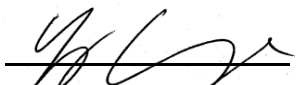
- (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
- No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
- The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.

Sample Calculation at 5190.00MHz:

Magnitude of Measured Frequency	71.11	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.23	dB/m
Additional Factor	0.00	dB
Corrected Result	111.34	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 28. Average Radiated Fundamental & Harmonic Emissions 802.11n 40 MHz BW

Test: FCC Part 15, Para 15.209, 15.407(a)					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 38								
5190	59.05	0.0	40.23	99.28	--	3.0m./HORZ	--	AVG
Channel 62								
5310	55.74	0.0	40.47	96.21	--	3.0m./HORZ	--	AVG
Channel 102								
5510	54.96	0.0	40.78	95.74	--	3.0m./HORZ	--	AVG
Channel 110								
5550	56.49	0.0	41.96	98.45	--	3.0m./HORZ	--	AVG
Channel 159								
5795	54.12	0.0	41.69	95.81	--	3.0m./HORZ	--	AVG

1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.
4. The Duty Cycle was not applied.

Sample Calculation at 5190.00MHz:

Magnitude of Measured Frequency	59.05	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.23	dB/m
Additional Factor	0.00	dB
Corrected Result	99.28	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

2.12.3 Spurious Emissions Radiated Measurements, Antenna 2

EUT fitted with Omni antenna.

Table 29. Peak Radiated Fundamental & Harmonic Emissions, 802.11a

Test: FCC Part 15, Para 15.209, 15.407(a)					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 36								
5180.00	71.29	0.0	40.57	111.86	--	3.0m./HORZ	--	PK
Channel 48								
5240.00	71.81	0.0	40.47	112.28	--	3.0m./HORZ	--	PK
Channel 52								
5260.00	71.36	0.0	40.47	111.83	--	3.0m./HORZ	--	PK
Channel 64								
5320.00	72.63	0.0	40.56	113.19	--	3.0m./HORZ	--	PK
Channel 100								
5500.00	70.37	0.0	40.78	111.15	--	3.0m./HORZ	--	PK
Channel 140								
5700.00	71.44	0.0	41.69	113.13	--	3.0m./HORZ	--	PK
Channel 149								
5745.00	70.65	0.0	41.69	112.34	--	3.0m./HORZ	--	PK
Channel 165								
5825.00	70.69	0.0	41.71	112.40	--	3.0m./HORZ	--	PK

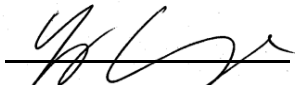
1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.

Sample Calculation at 5180.00MHz:

Magnitude of Measured Frequency	71.29	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.57	dB/m
Additional Factor	0.00	dB
Corrected Result	111.86	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 30. Average Radiated Fundamental & Harmonic Emissions 802.11a

Test: FCC Part 15, Para 15.209, 15.407					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 36								
5180.00	62.10	0.0	40.57	102.67	--	3.0m./HORZ	--	AVG
Channel 48								
5240.00	62.80	0.0	40.47	103.27	--	3.0m./HORZ	--	AVG
Channel 52								
5260.00	62.37	0.0	40.47	102.84	--	3.0m./HORZ	--	AVG
Channel 64								
5320.00	64.92	0.0	40.56	105.48	--	3.0m./HORZ	--	AVG
Channel 100								
5500.00	62.00	0.0	40.78	102.78	--	3.0m./HORZ	--	AVG
Channel 140								
5700.00	64.42	0.0	41.69	106.11	--	3.0m./HORZ	--	AVG
Channel 149								
5745.00	61.69	0.0	41.69	103.38	--	3.0m./HORZ	--	AVG
Channel 165								
5825.00	62.54	0.0	41.71	104.25	--	3.0m./HORZ	--	AVG

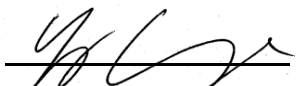
1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.
4. The Duty Cycle was not applied.

Sample Calculation at 5180.00MHz:

Magnitude of Measured Frequency	62.10	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.57	dB/m
Additional Factor	0.00	dB
Corrected Result	102.67	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 31. Peak Radiated Fundamental & Harmonic Emissions 802.11a 40 MHz BW

Test: FCC Part 15, Para 15.209, 15.407					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 38								
5190	69.77	0.0	40.23	110.00	--	3.0m./HORZ	--	PK
Channel 62								
5310	70.45	0.0	40.56	111.01	--	3.0m./HORZ	--	PK
Channel 102								
5510	67.23	0.0	40.81	108.04	--	3.0m./HORZ	--	PK
Channel 110								
5550	67.92	0.0	40.81	108.73	--	3.0m./HORZ	--	PK
Channel 159								
16650	67.07	0.0	41.69	108.76	--	3.0m./HORZ	--	PK

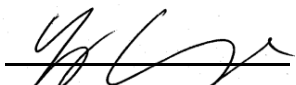
1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.

Sample Calculation at 5190.00MHz:

Magnitude of Measured Frequency	69.77	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.23	dB/m
Additional Factor	0.00	dB
Corrected Result	110.00	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 32. Average Radiated Fundamental & Harmonic Emissions 802.11a 40 MHz BW

Test: FCC Part 15, Para 15.209, 15.407					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 38								
5190	61.38	0.0	40.23	101.61	--	3.0m./HORZ	--	AVG
Channel 62								
5310	62.00	0.0	40.56	102.56	--	3.0m./HORZ	--	AVG
Channel 102								
5510	59.76	0.0	40.81	100.57	--	3.0m./HORZ	--	AVG
Channel 110								
5550	60.35	0.0	40.81	101.16	--	3.0m./HORZ	--	AVG
Channel 159								
5795	58.72	0.0	41.69	100.41	--	3.0m./HORZ	--	AVG

1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.
4. The Duty Cycle was not applied.

Sample Calculation at 5180.00MHz:

Magnitude of Measured Frequency	61.38	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.23	dB/m
Additional Factor	0.00	dB
Corrected Result	101.61	dBuV/m

Test Date: July 29, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 33. Peak Radiated Fundamental & Harmonic Emissions, 802.11n

Test: FCC Part 15, Para 15.209, 15.407					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 36								
5180.00	72.40	0.0	40.57	112.97	--	3.0m./HORZ	--	PK
Channel 48								
5240.00	72.15	0.0	40.47	112.62	--	3.0m./HORZ	--	PK
Channel 52								
5260.00	74.44	0.0	40.47	114.91	--	3.0m./HORZ	--	PK
Channel 64								
5320.00	74.91	0.0	40.56	115.47	--	3.0m./HORZ	--	PK
Channel 100								
5500.00	72.11	0.0	40.78	112.89	--	3.0m./HORZ	--	PK
Channel 140								
5700.00	72.55	0.0	41.83	114.38	--	3.0m./HORZ	--	PK
Channel 149								
5745.00	72.41	0.0	41.69	114.10	--	3.0m./HORZ	--	PK
Channel 165								
5825.00	72.55	0.0	41.71	114.26	--	3.0m./HORZ	--	PK

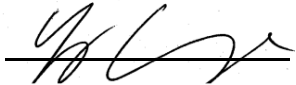
1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.

Sample Calculation at 5180.00MHz:

Magnitude of Measured Frequency	72.40	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.57	dB/m
Additional Factor	0.00	dB
Corrected Result	112.97	dBuV/m

Test Date: July 29, 2016 & August 1, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15 Certification/ RSS 247
 2ADCB-ACWIFI001
 6715A-ACWIFI001
 16-0141
 September 23, 2016
 Acuity Brands
 ACWIFI001

Table 34. Average Radiated Fundamental & Harmonic Emissions 802.11n

Test: FCC Part 15, Para 15.209, 15.407					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 36								
5180.00	61.38	0.0	40.57	101.95	--	3.0m./HORZ	--	AVG
Channel 48								
5240.00	61.00	0.0	40.47	101.47	--	3.0m./HORZ	--	AVG
Channel 52								
5260.00	63.48	0.0	40.47	103.95	--	3.0m./HORZ	--	AVG
Channel 64								
5320.00	64.26	0.0	40.56	104.82	--	3.0m./HORZ	--	AVG
Channel 100								
5500.00	61.29	0.0	40.78	102.07	--	3.0m./HORZ	--	AVG
Channel 140								
5700.00	61.84	0.0	41.83	103.67	--	3.0m./HORZ	--	AVG
Channel 149								
5745.00	61.35	0.0	41.69	103.04	--	3.0m./HORZ	--	AVG
Channel 165								
5825.00	61.91	0.0	41.71	103.62	--	3.0m./HORZ	--	AVG

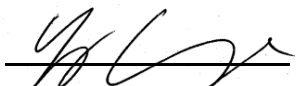
1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.
4. The Duty Cycle correction factor was not applied.

Sample Calculation at 5180.00MHz:

Magnitude of Measured Frequency	61.38	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.57	dB/m
Additional Factor	0.00	dB
Corrected Result	101.95	dBuV/m

Test Date: July 29, 2016 & August 1, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2ADCB-ACWIFI001
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Table 35. Peak Radiated Fundamental & Harmonic Emissions 802.11n 40 MHz BW

Test: FCC Part 15, Para 15.209, 15.407					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 38								
5190	71.25	0.0	40.23	111.48	--	3.0m./HORZ	--	PK
Channel 62								
5310	70.99	0.0	40.47	111.46	--	3.0m./HORZ	--	PK
Channel 102								
5510	69.92	0.0	40.78	110.70	--	3.0m./HORZ	--	PK
Channel 110								
5550	70.27	0.0	41.96	112.23	--	3.0m./HORZ	--	PK
Channel 159								
5795	70.21	0.0	41.69	111.90	--	3.0m./HORZ	--	PK

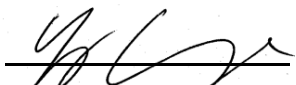
1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.

Sample Calculation at 5180.00MHz:

Magnitude of Measured Frequency	71.25	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.23	dB/m
Additional Factor	0.00	dB
Corrected Result	111.48	dBuV/m

Test Date: July 29, 2016 & August 1, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
 FCC ID:
 IC:
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 Customer:
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Table 36. Average Radiated Fundamental & Harmonic Emissions 802.11n 40 MHz BW

Test: FCC Part 15, Para 15.209, 15.407					Client: Acuity Brands Technology Services, Inc			
Project: 16-0141					Model: ACWIFI001			
Frequency (MHz)	Test Data (dBuV)	Factor (dB)	AF+CA -AMP (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Antenna Distance/ Polarization	Margin (dB)	Detector Mode
Channel 38								
5190	59.45	0.0	40.23	99.68	--	3.0m./HORZ	--	AVG
Channel 62								
5310	59.13	0.0	40.47	99.60	--	3.0m./HORZ	--	AVG
Channel 102								
5510	58.39	0.0	40.78	99.17	--	3.0m./HORZ	--	AVG
Channel 110								
5550	58.47	0.0	41.96	100.43	--	3.0m./HORZ	--	AVG
Channel 159								
5795	58.22	0.0	41.69	99.91	--	3.0m./HORZ	--	AVG

1. (*) Falls within the restricted bands of Part 15.205. Limits based on Part 15.209 & 15.407.
2. No other signals detected within 20 dB of specification limit. Harmonics investigated up to the 10th harmonic
3. The EUT was placed in three orthogonal positions and the transmitter was in constant broadcast mode, with a duty cycle of greater than 98%. The emissions were measured with the receive antenna in vertical and horizontal polarizations. The data listed in the above table was worst case.
4. The Duty Cycle correction factor was not applied.

Sample Calculation at 5180.00MHz:

Magnitude of Measured Frequency	59.45	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	40.23	dB/m
Additional Factor	0.00	dB
Corrected Result	99.68	dBuV/m

Test Date: July 29, 2016 & August 1, 2016

Tested By

Signature:  Name: George, Yang

US Tech Test Report:
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2.12.4 Undesirable emissions (Part 15.407(b))

The conducted output power (in dBm) was recorded. The maximum transmit antenna gain in dBi was added to determine the EIRP level. The appropriate maximum ground reflection factor to the EIRP level, 6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz – 1000 MHz, and 0 dB for frequencies > 1000 MHz, was also added to the EIRP calculation. The results are converted and compared to the applicable field strength level to show compliance. The data is presented below.

The test procedure was based on ANSI C63.10:2013 and KDB 789033 D02 v01r02.

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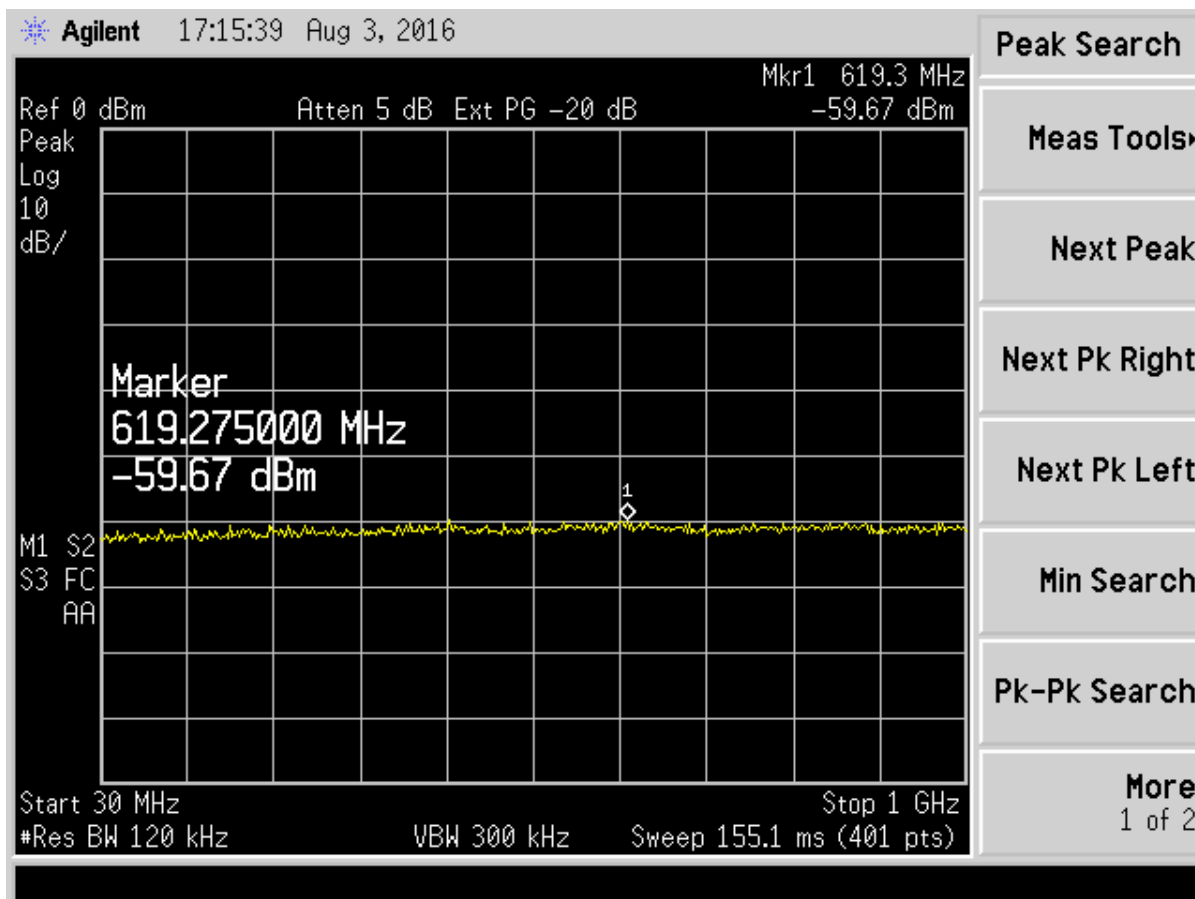


Figure 54. Antenna Conducted Emissions Channel 36 802.11a, Part 1

$EIRP = -59.67 \text{ dBm} + 3.4 \text{ dBi (applied antenna gain)} + 4.7 \text{ dB (ground reflection factor)} = -51.57 \text{ dBm}$

$Limit = -27 \text{ dBm/MHz (15.407 (b))}$

$Margin = -27 \text{ dBm/MHz} - (-51.57) \text{ dBm/MHz} = 24.6 \text{ dB} - 10 \text{ dB (correction factor for RBW: 120 k to 1 MHz)} = 14.6 \text{ dB}$

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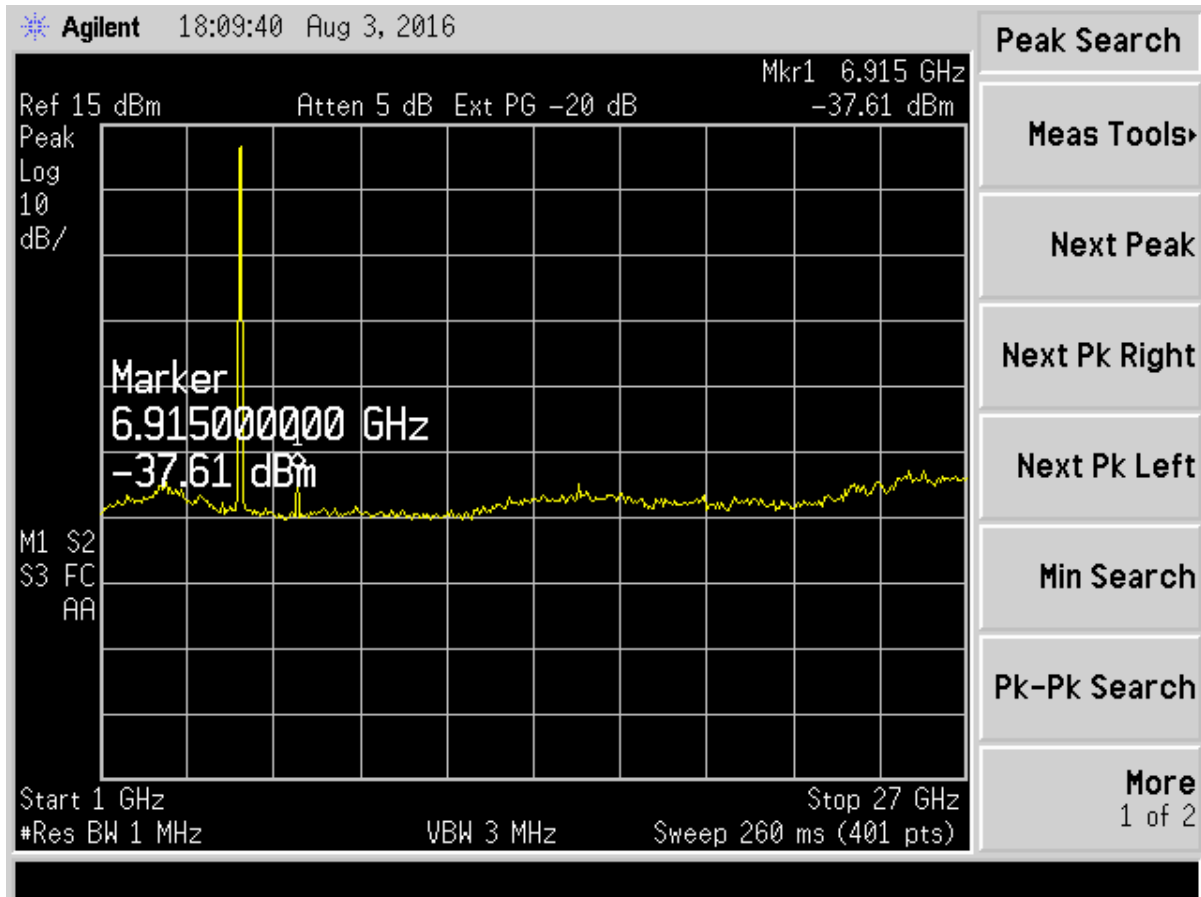


Figure 55. Antenna Conducted Emissions Channel 36 802.11a, Part 2

$EIRP = -37.61 \text{ dBm} + 3.4 \text{ dBi (applied antenna gain)} + 0 \text{ dB (ground reflection factor)} = -34.21 \text{ dBm}$

$Limit = -27 \text{ dBm/MHz (15.407 (b))}$

$Margin = -27 \text{ dBm/MHz} - (-34.21) \text{ dBm/MHz} = 7.2 \text{ dB}$

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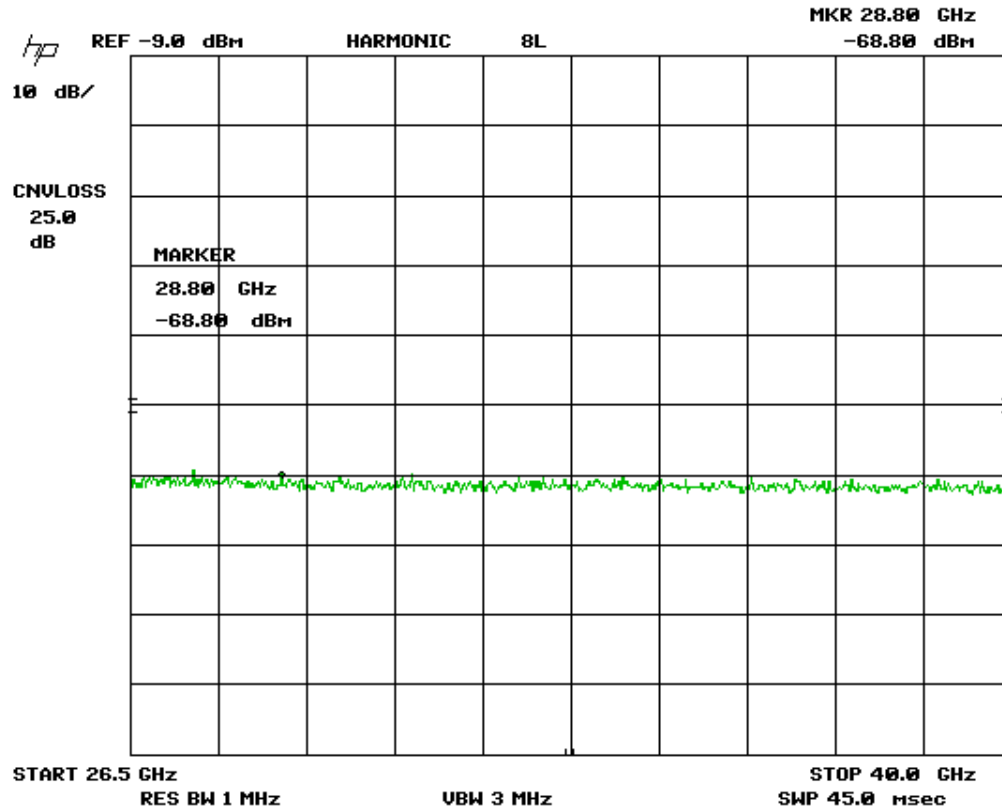


Figure 56. Antenna Conducted Emissions Channel 36 802.11a, Part 3

$EIRP = -68.80 \text{ dBm} + 3.4 \text{ dBi (applied antenna gain)} + 0 \text{ dB (ground reflection factor)} = -65.40 \text{ dBm}$

$\text{Limit} = -27 \text{ dBm/MHz (15.407 (b))}$

$\text{Margin} = -27 \text{ dBm/MHz} - (-65.40) \text{ dBm/MHz} = 38.4 \text{ dB}$

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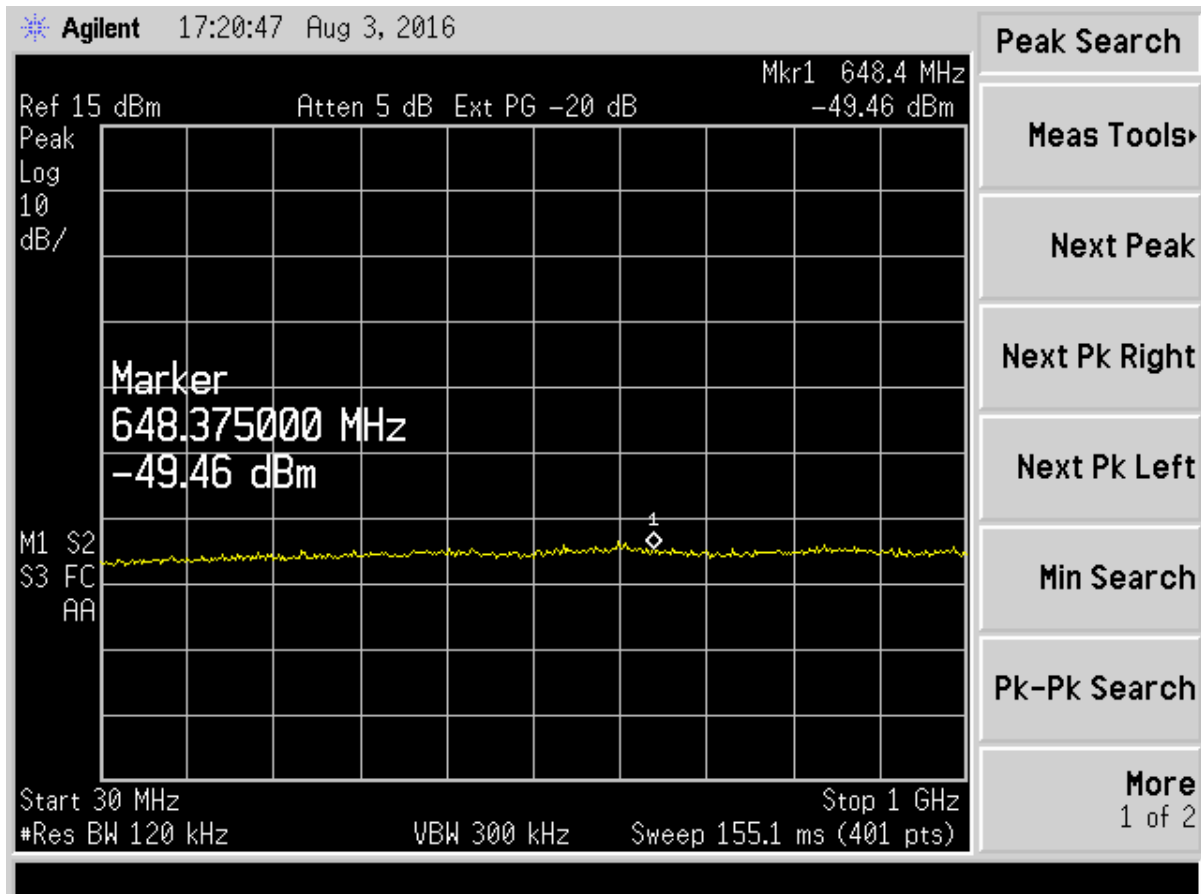


Figure 57. Antenna Conducted Emissions Channel 48 802.11a, Part 1

EIRP= -49.46 dBm + 3.4 dBi (applied antenna gain) + 4.7 dB (ground reflection factor)= -41.36 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-41.36) dBm/MHz= 14.4 dB– 10 dB (correction factor for RBW: 120 k to 1 MHz) = 4.4 dB

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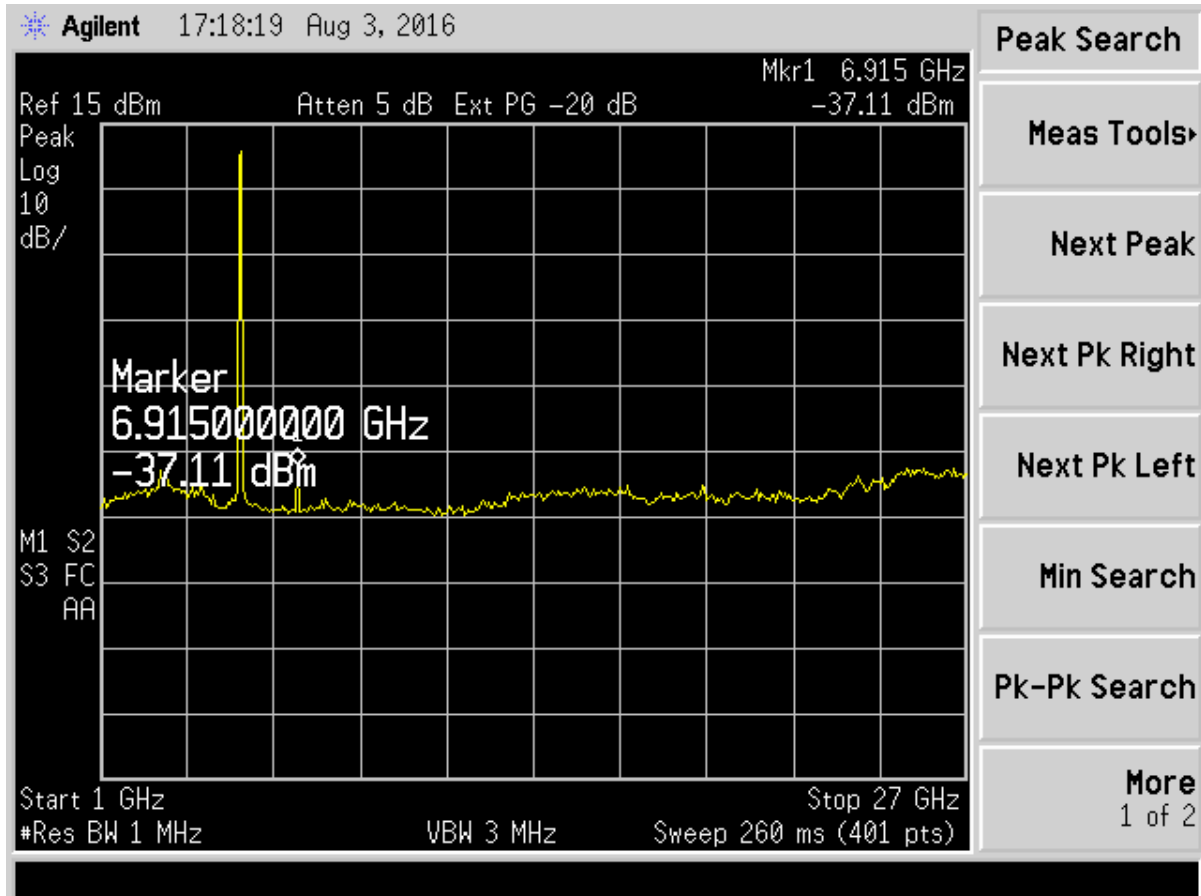


Figure 58. Antenna Conducted Emissions Channel 48 802.11a, Part 2

EIRP= -37.11 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -33.71 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-33.71) dBm/MHz = 6.7 dB

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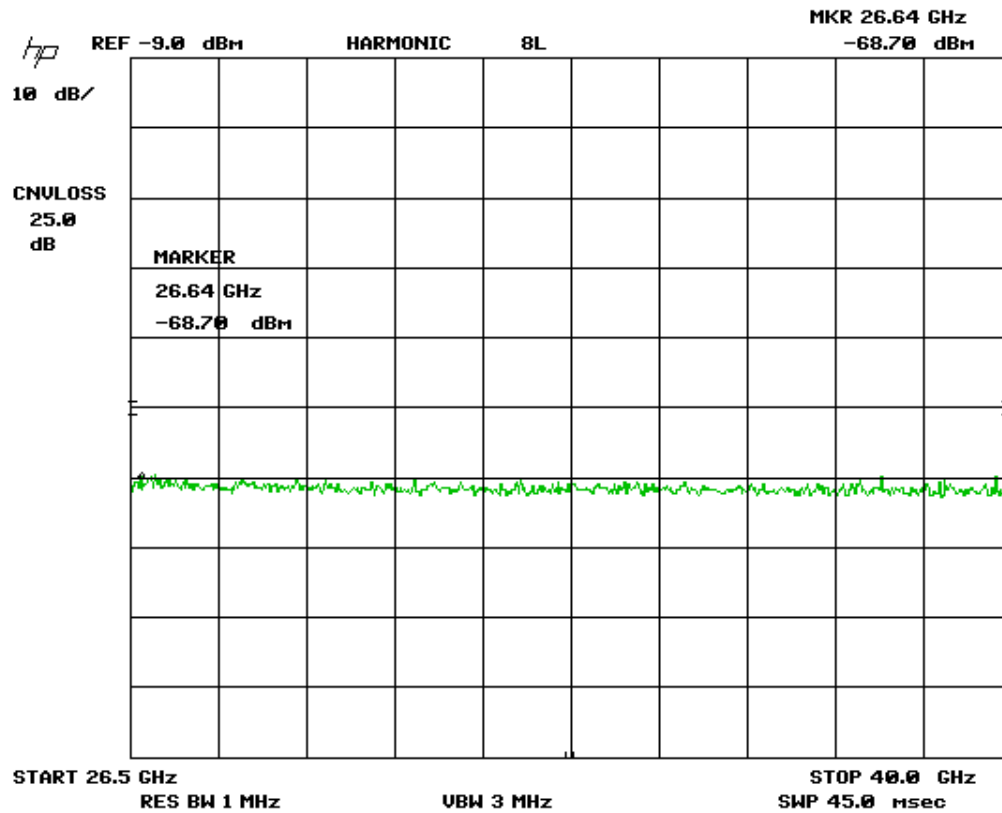


Figure 59. Antenna Conducted Emissions Channel 48 802.11a, Part 3

EIRP= -68.70 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -65.30 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-65.30) dBm/MHz = 38.3 dB

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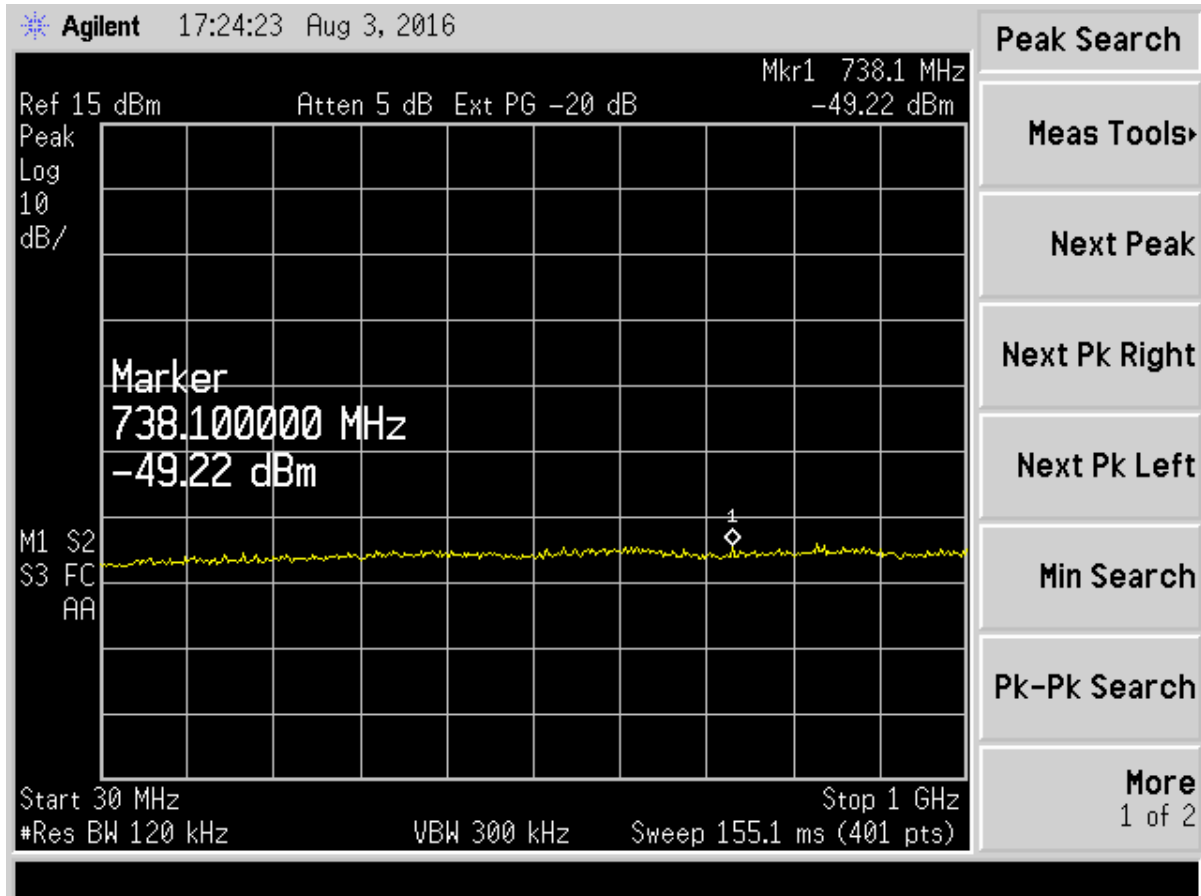


Figure 60. Antenna Conducted Emissions Channel 64 802.11a, Part 1

$EIRP = -49.22 \text{ dBm} + 3.4 \text{ dBi (applied antenna gain)} + 4.7 \text{ dB (ground reflection factor)} = -41.12 \text{ dBm}$

$Limit = -27 \text{ dBm/MHz (15.407 (b))}$

$Margin = -27 \text{ dBm/MHz} - (-41.12) \text{ dBm/MHz} = 14.12 \text{ dB} - 10 \text{ dB (correction factor for RBW: 120 k to 1 MHz)} = 4.1 \text{ dB}$

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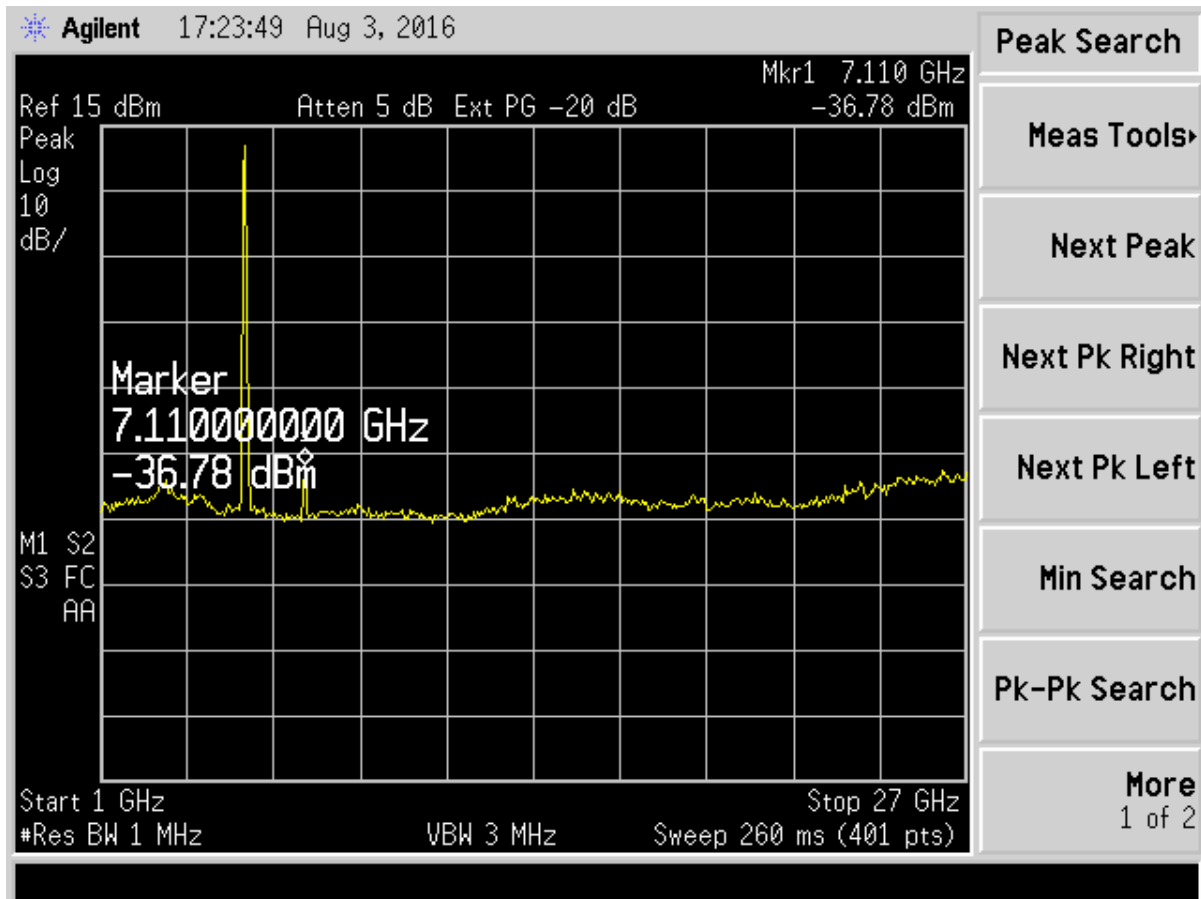


Figure 61. Antenna Conducted Emissions Channel 64 802.11a, Part 2

$EIRP = -36.78 \text{ dBm} + 3.4 \text{ dBi (applied antenna gain)} + 0 \text{ dB (ground reflection factor)} = -33.38 \text{ dBm}$

$Limit = -27 \text{ dBm/MHz (15.407 (b))}$

$Margin = -27 \text{ dBm/MHz} - (-33.38) \text{ dBm/MHz} = 6.4 \text{ dB}$

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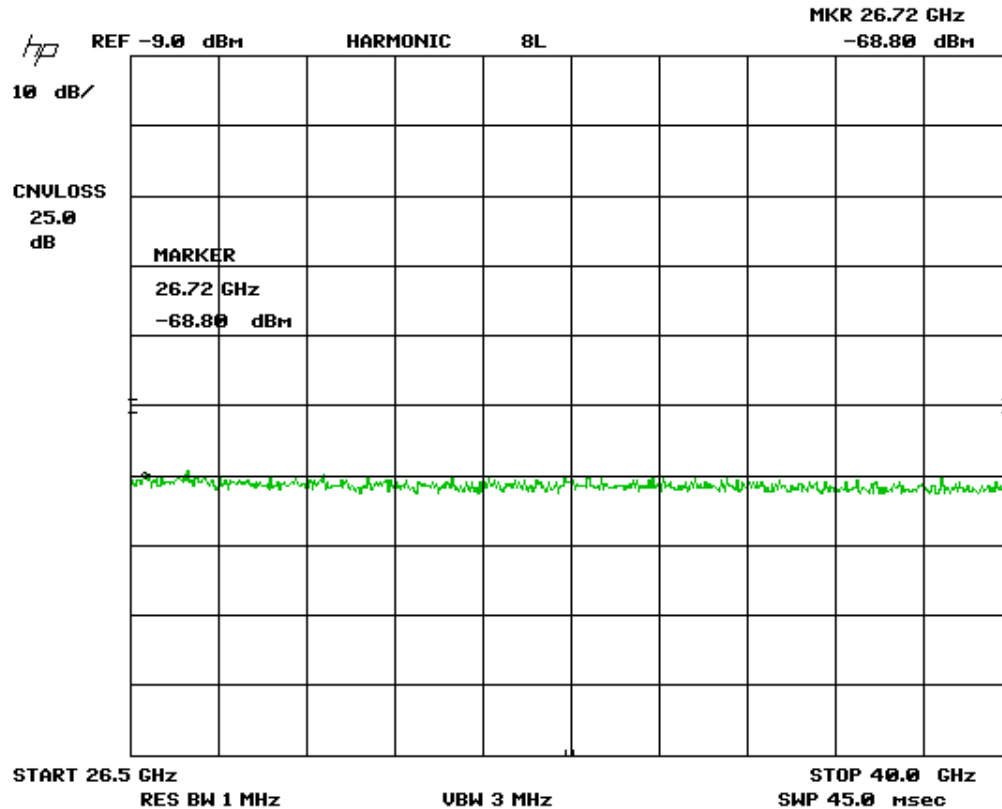


Figure 62. Antenna Conducted Emissions Channel 64 802.11a, Part 3

$EIRP = -68.80 \text{ dBm} + 3.4 \text{ dBi (applied antenna gain)} + 0 \text{ dB (ground reflection factor)} = -65.40 \text{ dBm}$

$Limit = -27 \text{ dBm/MHz (15.407 (b))}$

$Margin = -27 \text{ dBm/MHz} - (-65.40) \text{ dBm/MHz} = 38.4 \text{ dB}$

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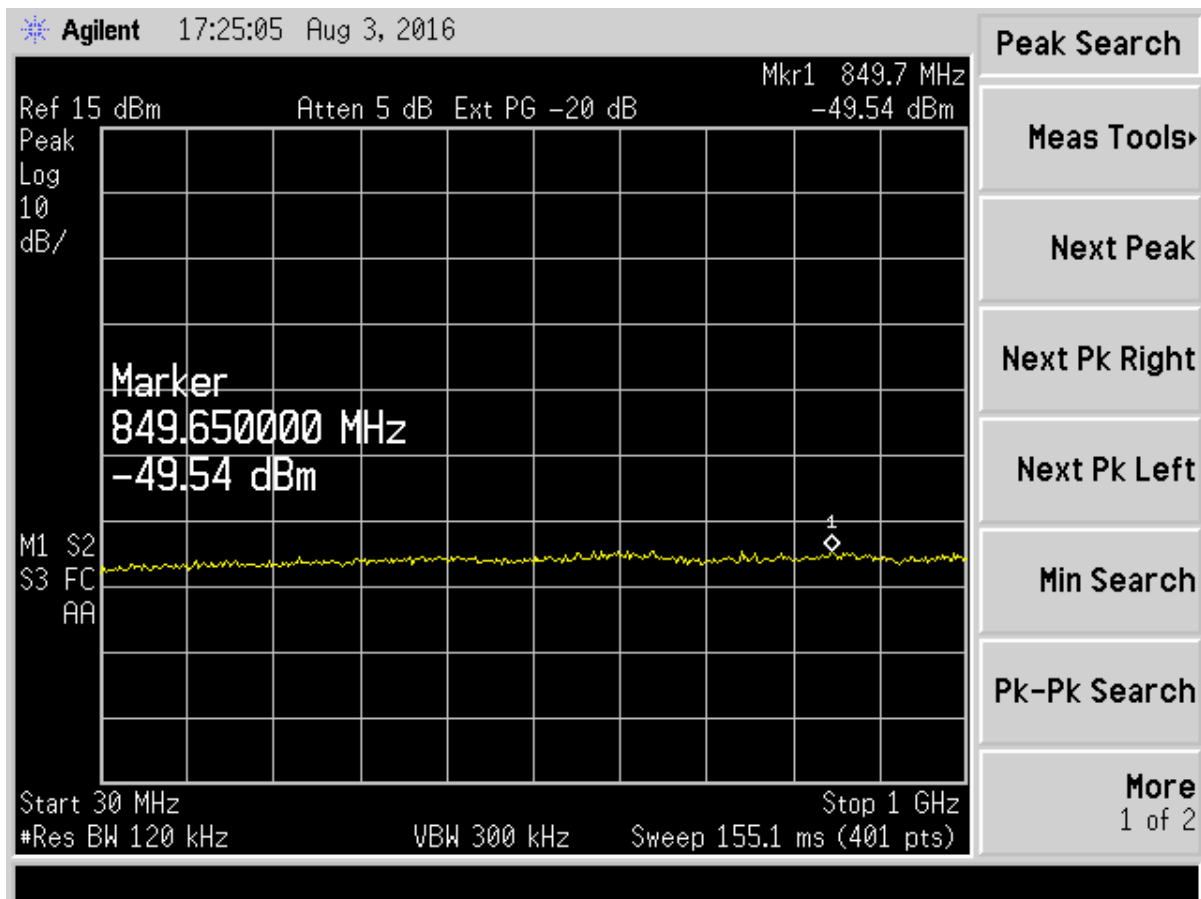


Figure 63. Antenna Conducted Emissions Channel 100 802.11a, Part 1

$EIRP = -49.54 \text{ dBm} + 3.4 \text{ dBi (applied antenna gain)} + 4.7 \text{ dB (ground reflection factor)} = -41.44 \text{ dBm}$

$Limit = -27 \text{ dBm/MHz (15.407 (b))}$

$Margin = -27 \text{ dBm/MHz} - (-41.44) \text{ dBm/MHz} = 14.4 \text{ dB} - 10 \text{ dB (correction factor for RBW: 120 k to 1 MHz)} = 4.4 \text{ dB}$

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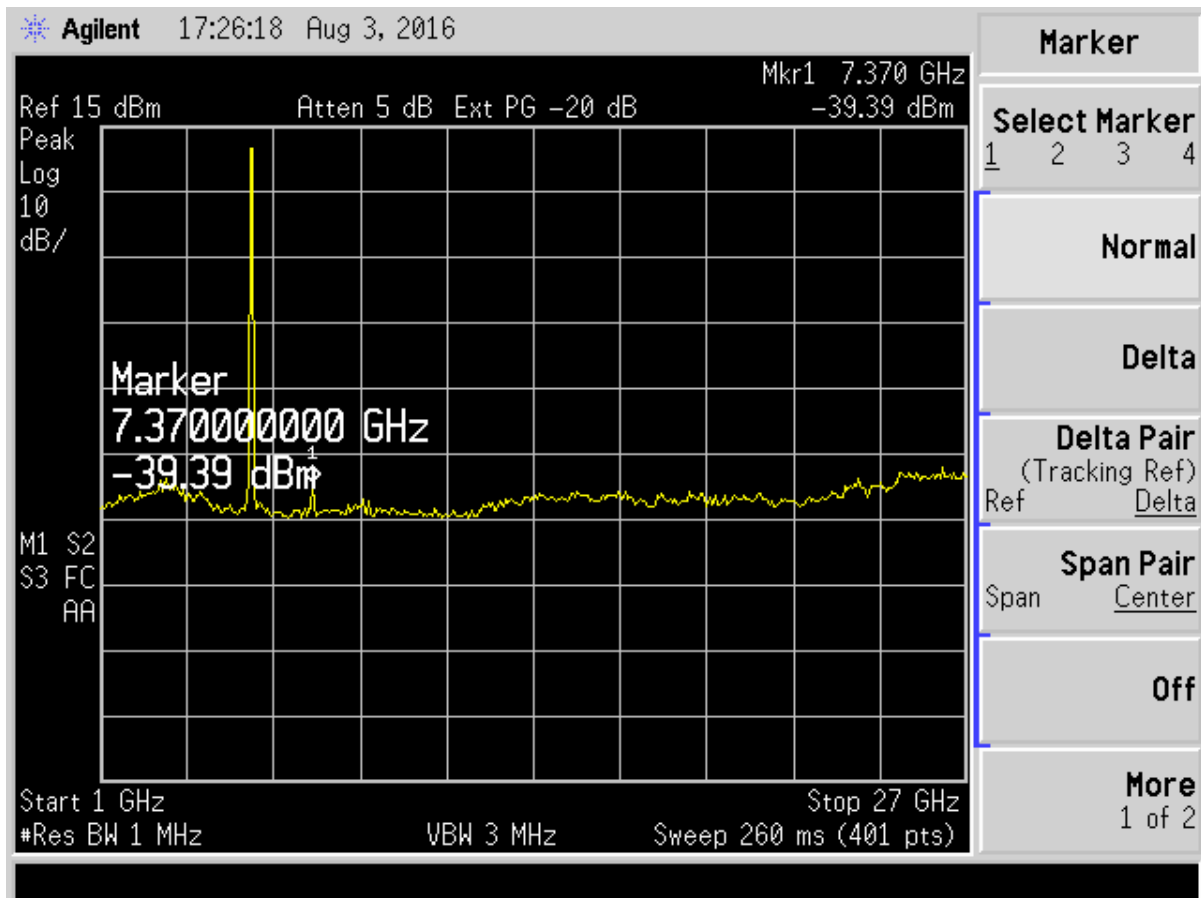


Figure 64. Antenna Conducted Emissions Channel 100 802.11a, Part 2

EIRP= -39.39 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -35.99 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-35.99) dBm/MHz = 8.9 dB

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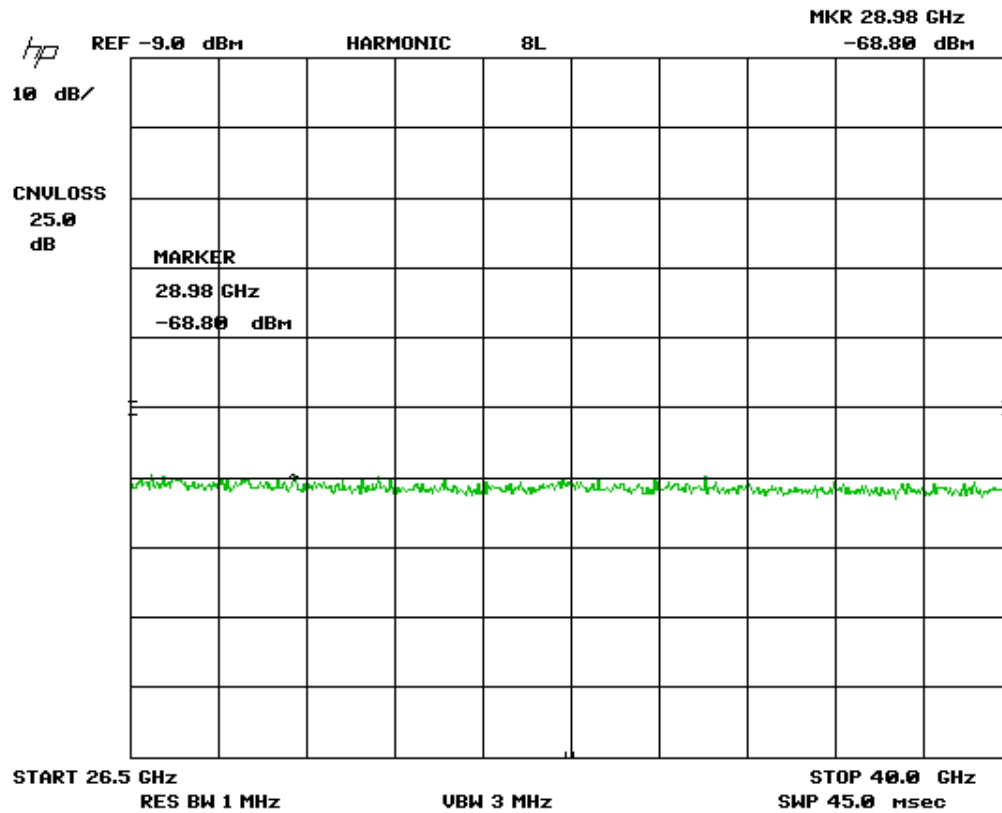


Figure 65. Antenna Conducted Emissions Channel 100 802.11a, Part 3

$EIRP = -68.80 \text{ dBm} + 3.4 \text{ dBi (max antenna gain)} + 0 \text{ dB (ground reflection factor)} = -65.4 \text{ dBm}$

$\text{Limit} = -27 \text{ dBm/MHz (15.407 (b))}$

$\text{Margin} = -27 \text{ dBm/MHz} - (-65.4) \text{ dBm/MHz} = 38.4 \text{ dB}$

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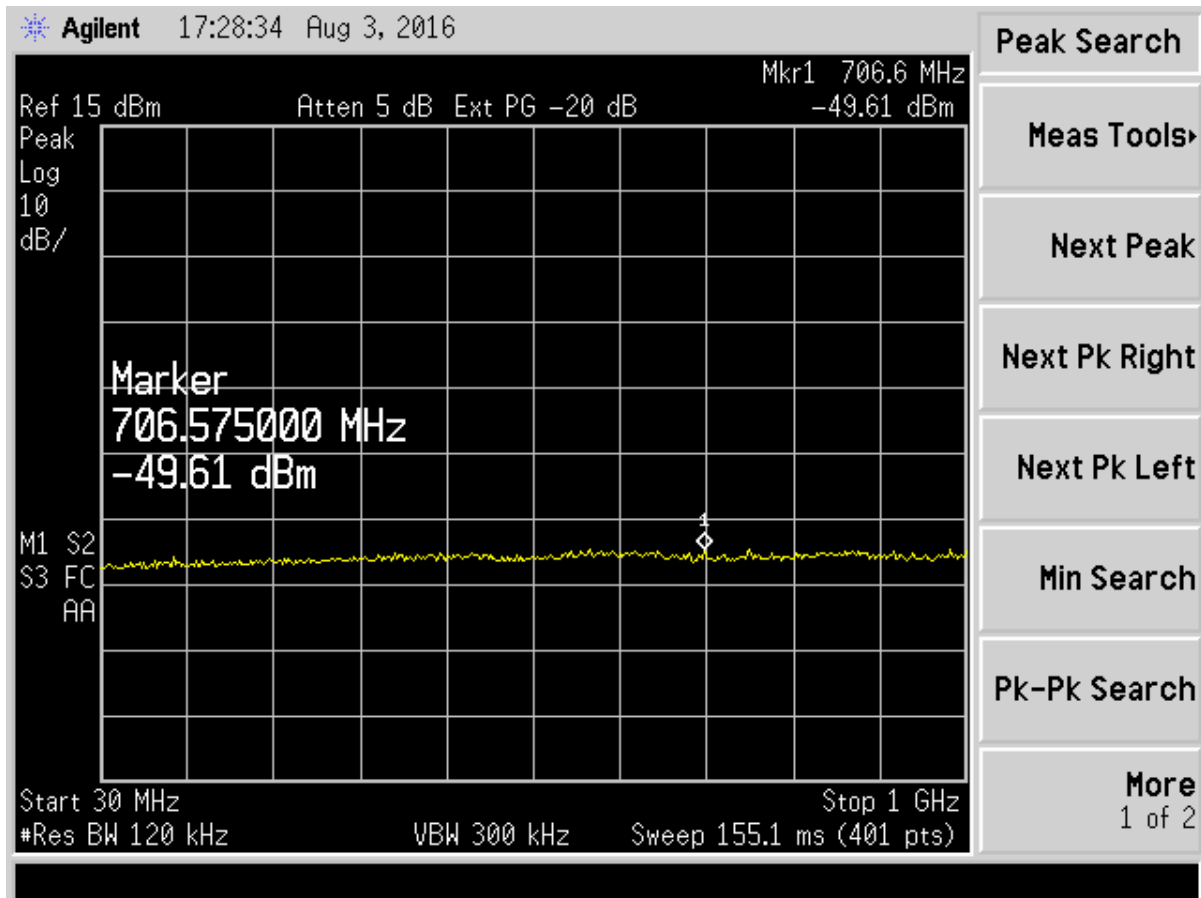


Figure 66. Antenna Conducted Emissions Channel 140 802.11a, Part 1

EIRP= -49.61 dBm + 3.4 dBi (applied antenna gain) + 4.7 dB (ground reflection factor)= -41.51 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-41.51) dBm/MHz= 14.5 dB– 10 dB (correction factor for RBW: 120 k to 1 MHz) = 4.5 dB

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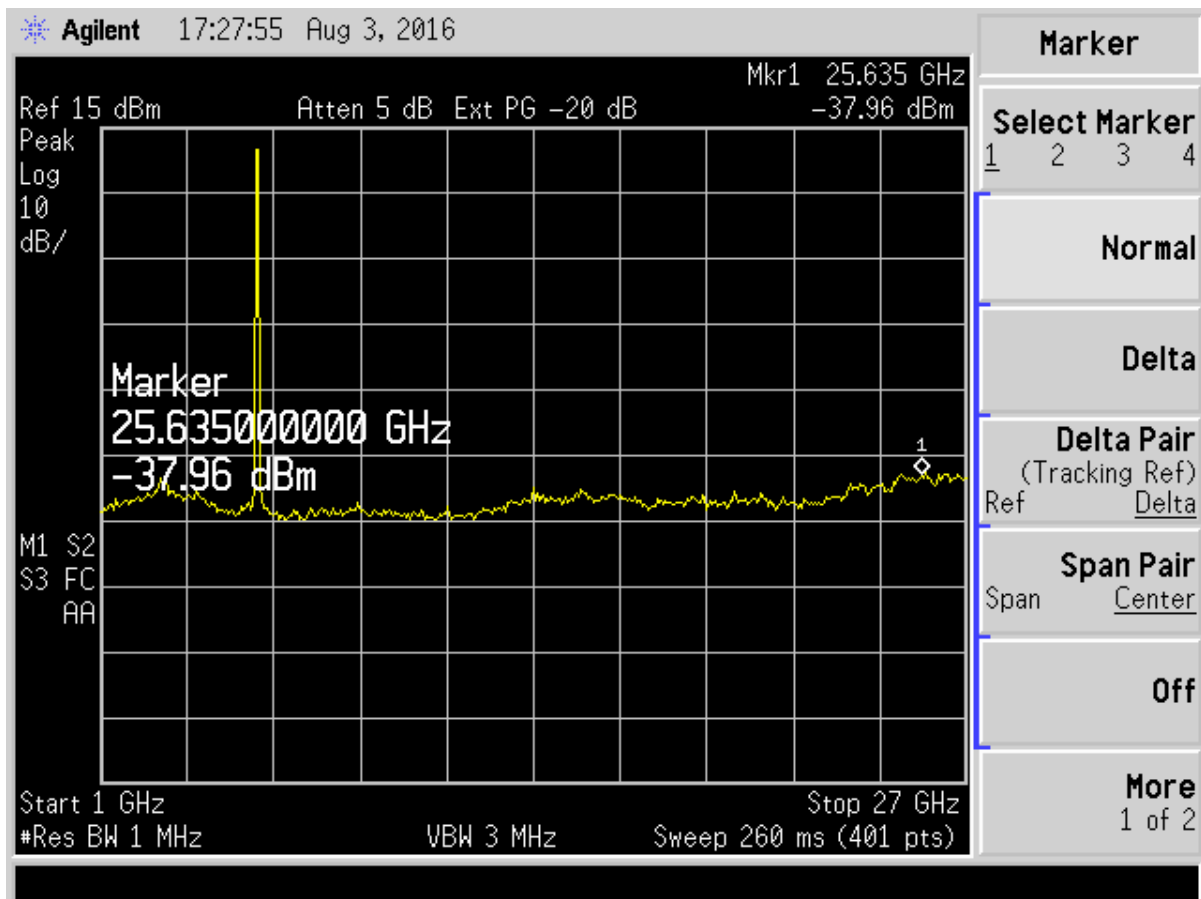


Figure 67. Antenna Conducted Emissions Channel 140 802.11a, Part 2

$EIRP = -37.96 \text{ dBm} + 3.4 \text{ dBi (applied antenna gain)} + 0 \text{ dB (ground reflection factor)} = -34.56 \text{ dBm}$

$Limit = -27 \text{ dBm/MHz (15.407 (b))}$

$Margin = -27 \text{ dBm/MHz} - (-34.56) \text{ dBm/MHz} = 7.6 \text{ dB}$

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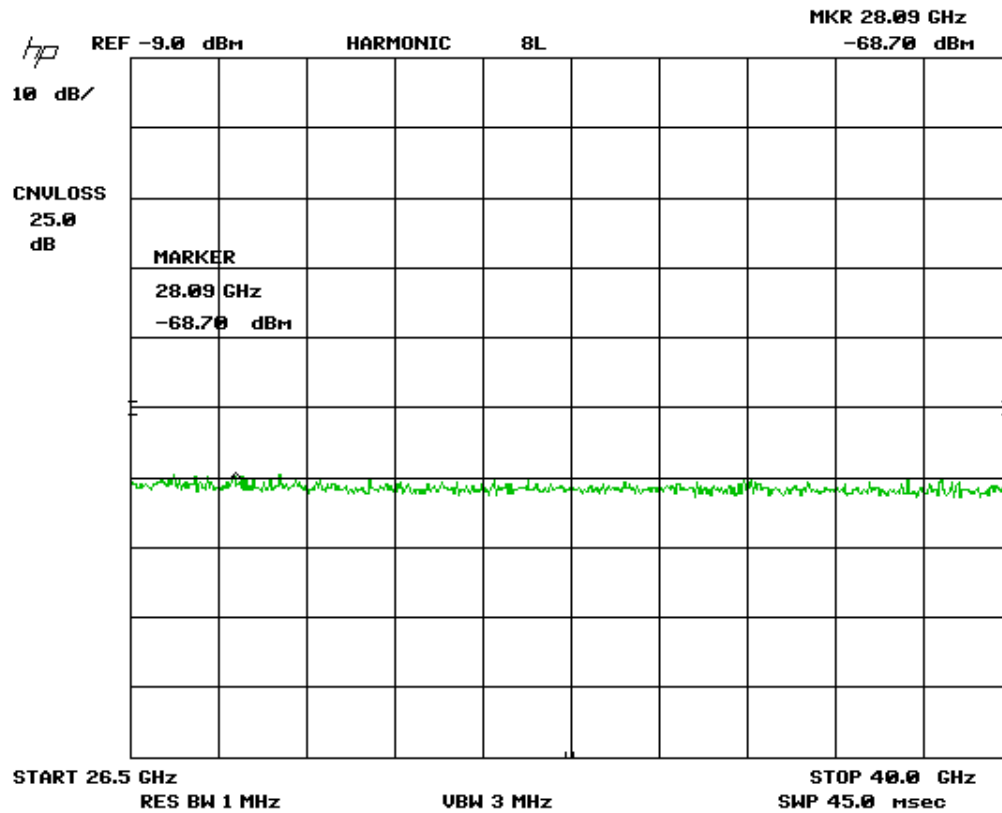


Figure 68. Antenna Conducted Emissions Channel 140 802.11a, Part 3

EIRP= -68.70 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -65.30 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-65.30) dBm/MHz= 38.3 dB

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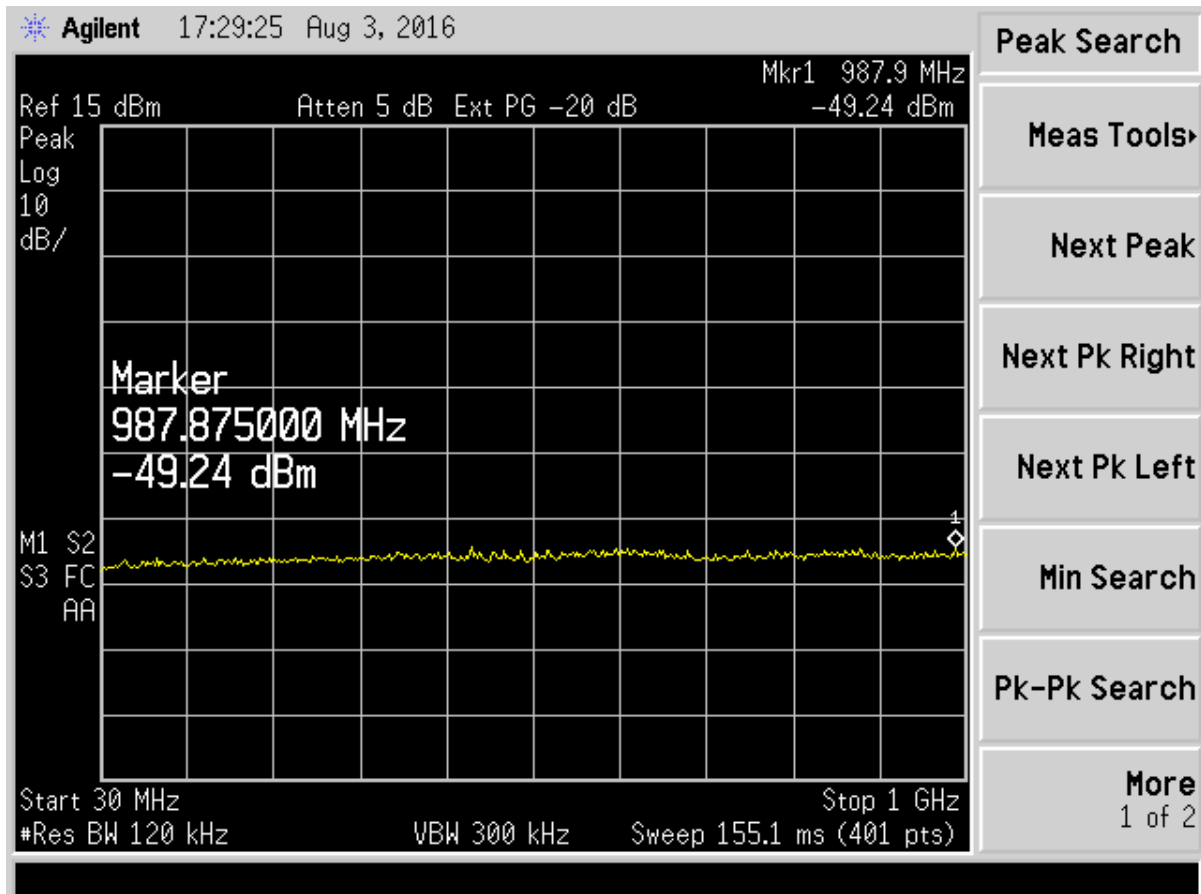


Figure 69. Antenna Conducted Emissions Channel 149 802.11a, Part 1

EIRP= -49.24 dBm + 3.4 dBi (applied antenna gain) + 4.7 dB (ground reflection factor)= -41.14 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-41.14) dBm/MHz= 14.1 dB– 10 dB (correction factor for RBW: 120 k to 1 MHz) = 4.1 dB

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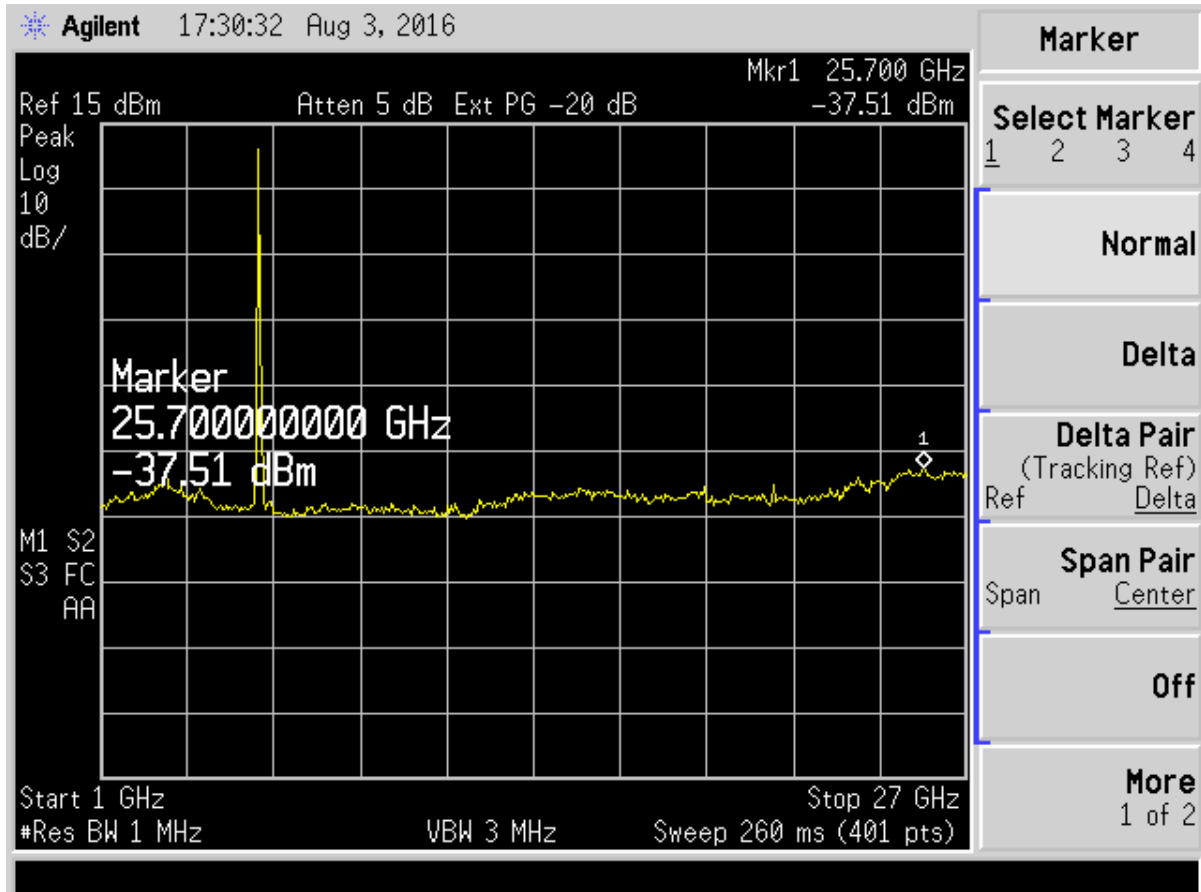


Figure 70. Antenna Conducted Emissions Channel 149 802.11a, Part 2

EIRP= -37.51 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -34.11 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-34.11) dBm/MHz = 7.1 dB

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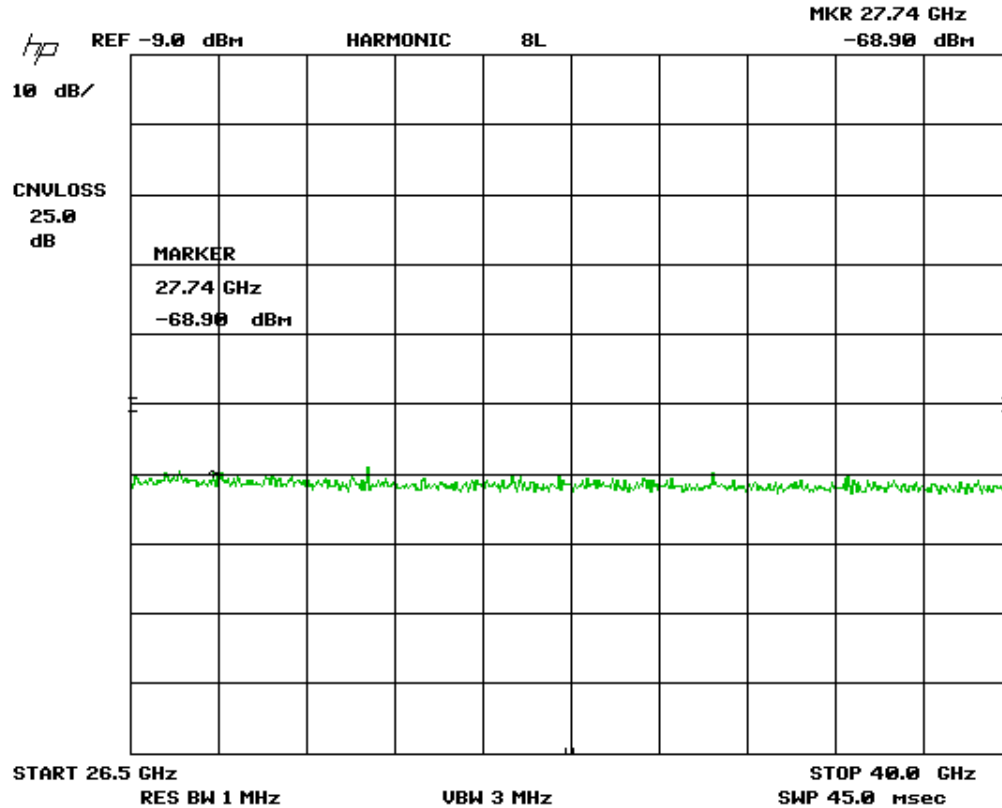


Figure 71. Antenna Conducted Emissions Channel 149 802.11a, Part 3

EIRP= -68.90 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -65.50 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-65.50) dBm/MHz= 38.5 dB

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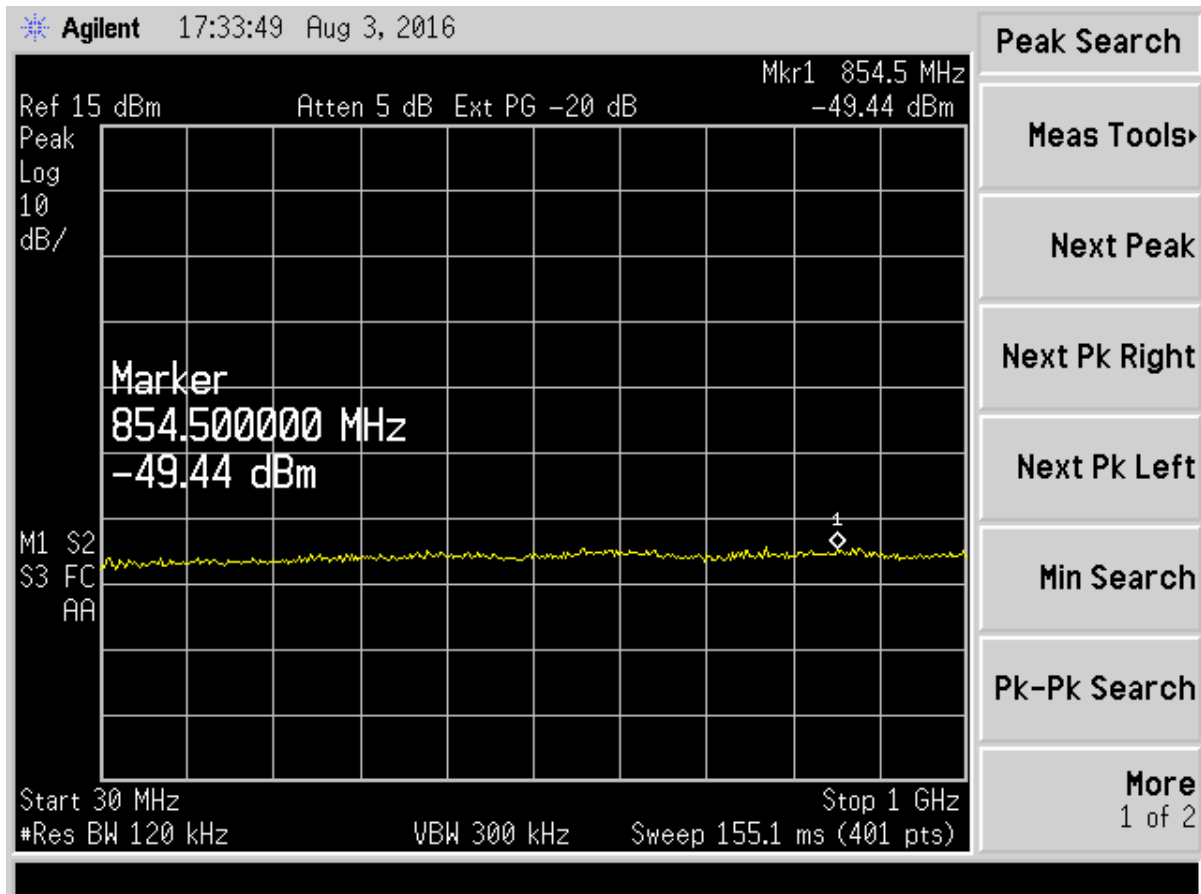


Figure 72. Antenna Conducted Emissions Channel 165 802.11a, Part 1

EIRP= -49.44 dBm + 3.4 dBi (applied antenna gain) + 4.7 dB (ground reflection factor)= -41.34 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-41.34) dBm/MHz= 14.3 dB– 10 dB (correction factor for RBW: 120 k to 1 MHz) = 4.3 dB

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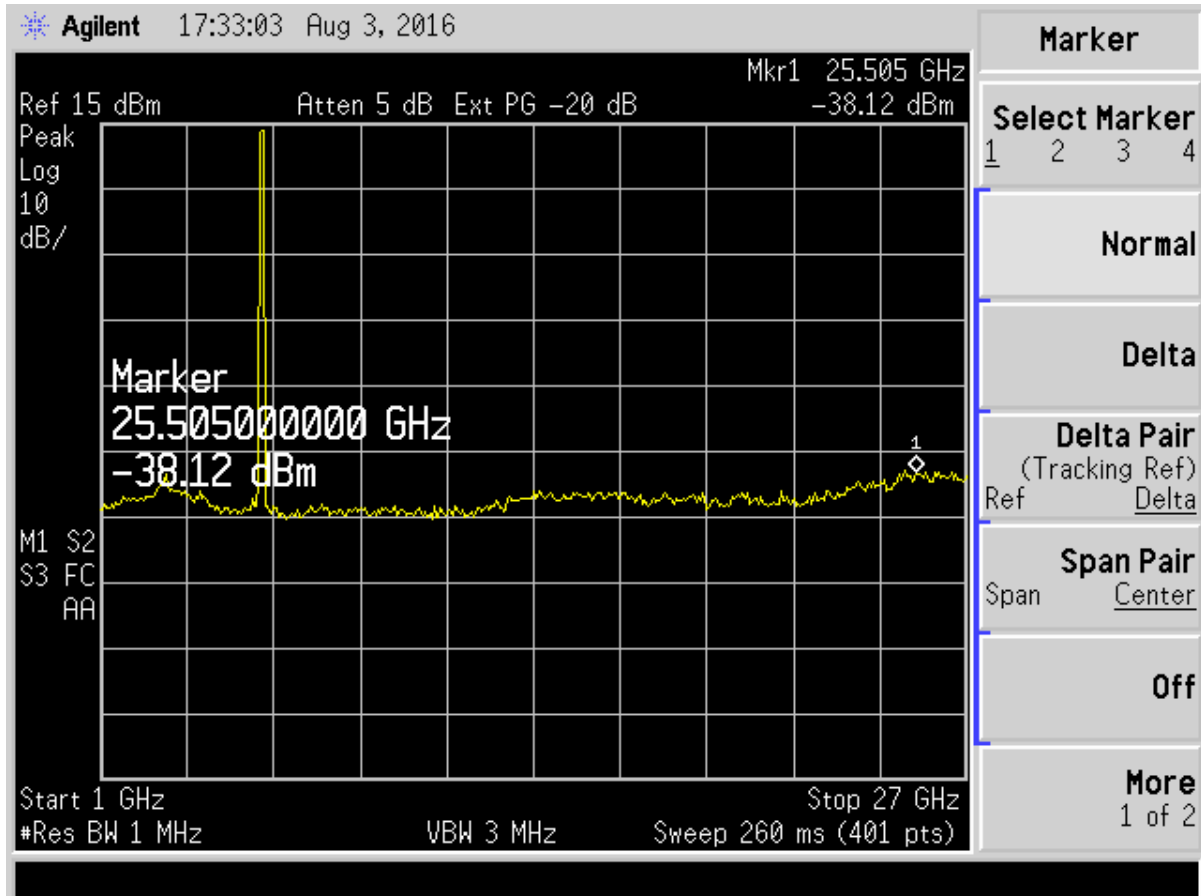


Figure 73. Antenna Conducted Emissions Channel 165 802.11a, Part 2

EIRP= -38.12 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -34.72 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz -(-34.72) dBm/MHz= 7.7 dB

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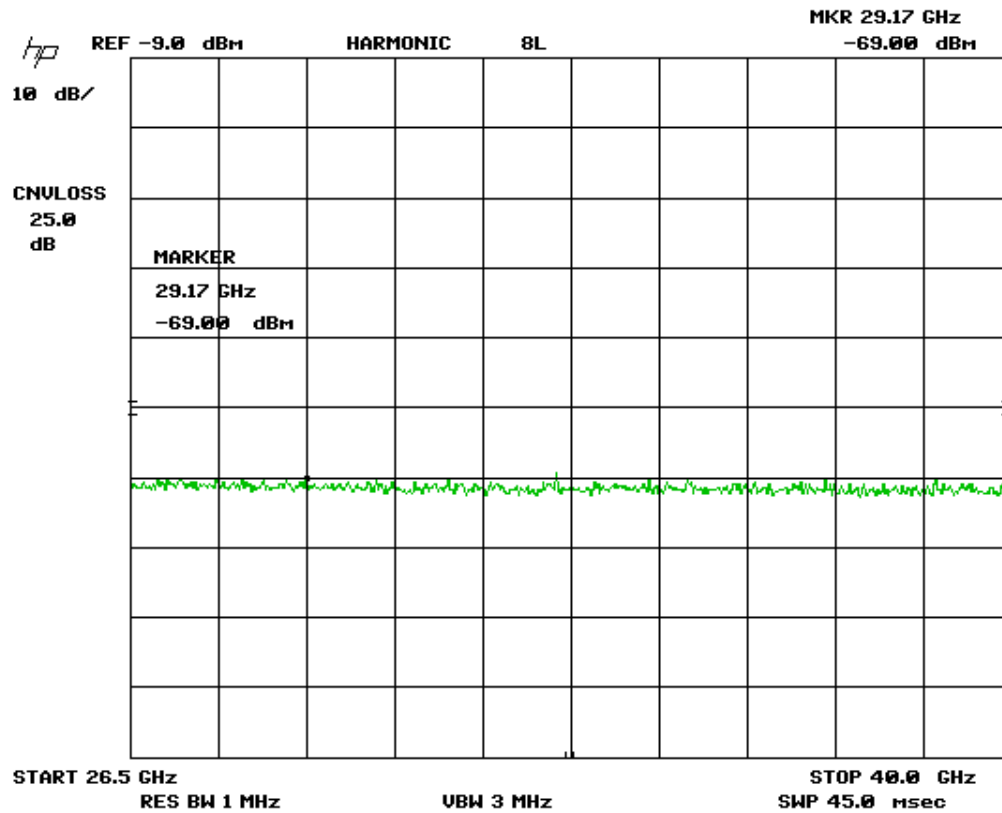


Figure 74. Antenna Conducted Emissions Channel 165 802.11a, Part 3

EIRP= -69.00 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -65.60 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-65.60) dBm/MHz= 38.6 dB

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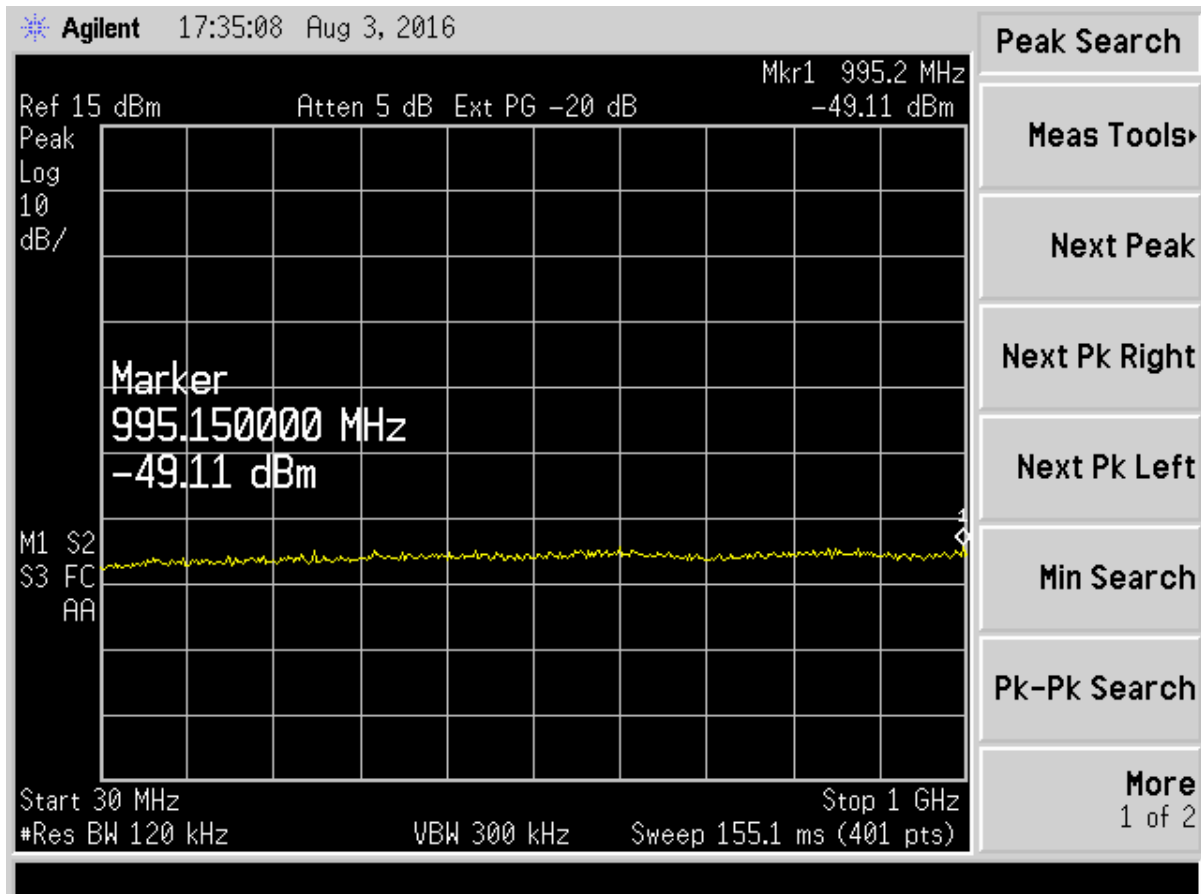


Figure 75. Antenna Conducted Emissions Channel 36 802.11n, Part 1

EIRP= -49.11 dBm + 3.4 dBi (applied antenna gain) + 4.7 dB (ground reflection factor)= -41.01 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-41.01) dBm/MHz= 14.0 dB– 10 dB (correction factor for RBW: 120 k to 1 MHz) = 4.0 dB

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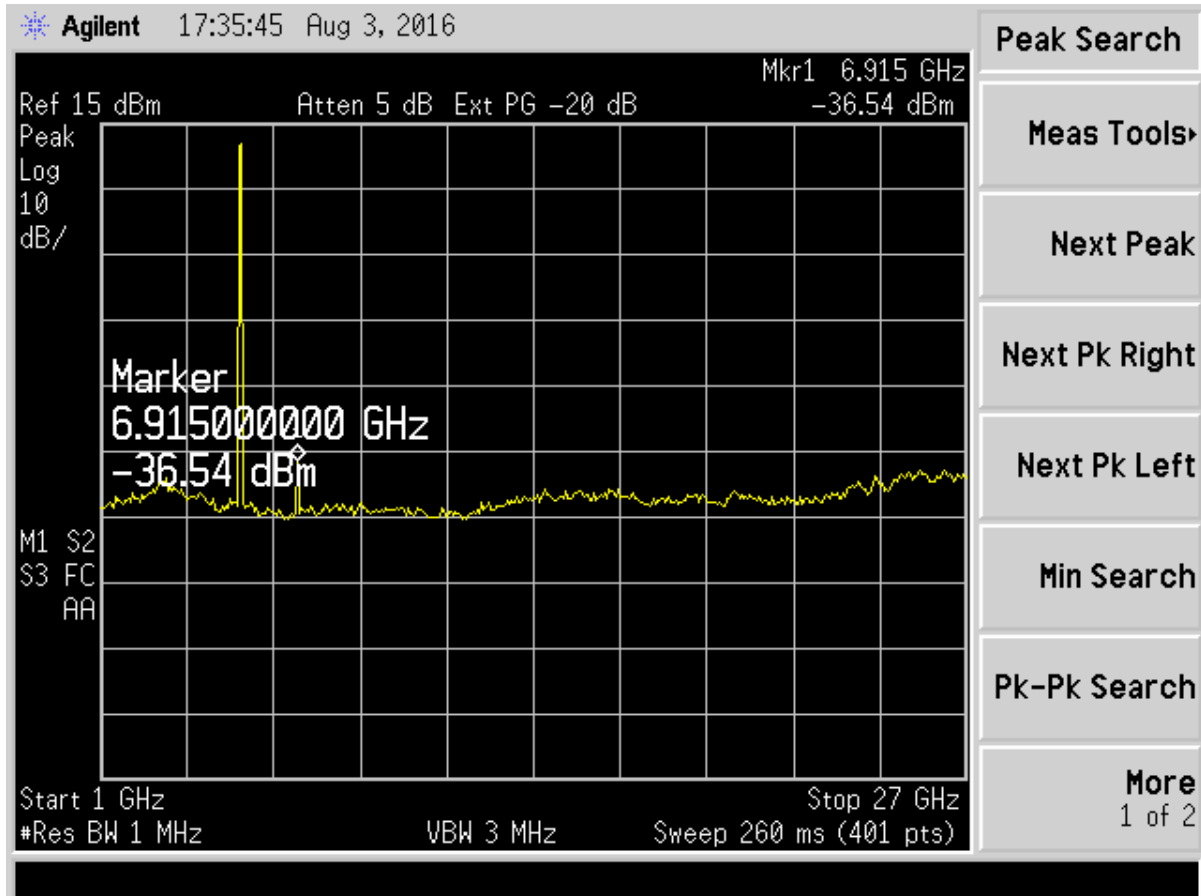


Figure 76. Antenna Conducted Emissions Channel 36 802.11n, Part 2

EIRP= -36.54 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -33.14 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-33.14) dBm/MHz= 6.1 dB

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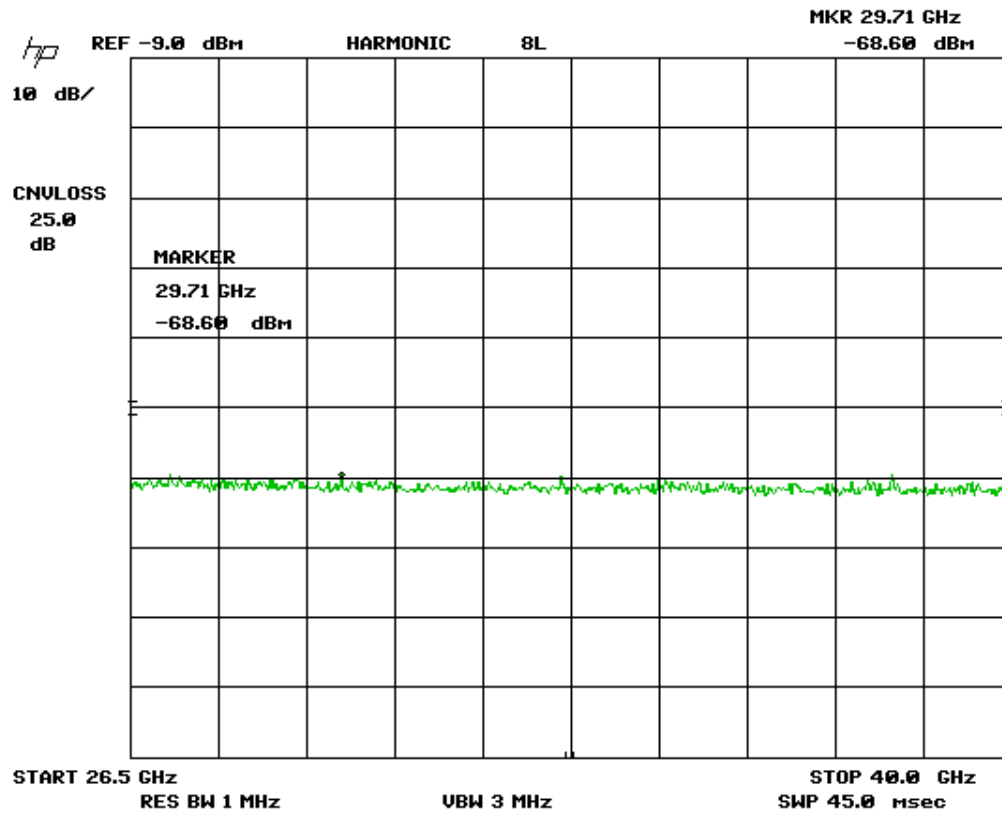


Figure 77. Antenna Conducted Emissions Channel 36 802.11n, Part 3

EIRP= -68.60 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -65.20 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-65.20) dBm/MHz= 38.2 dB

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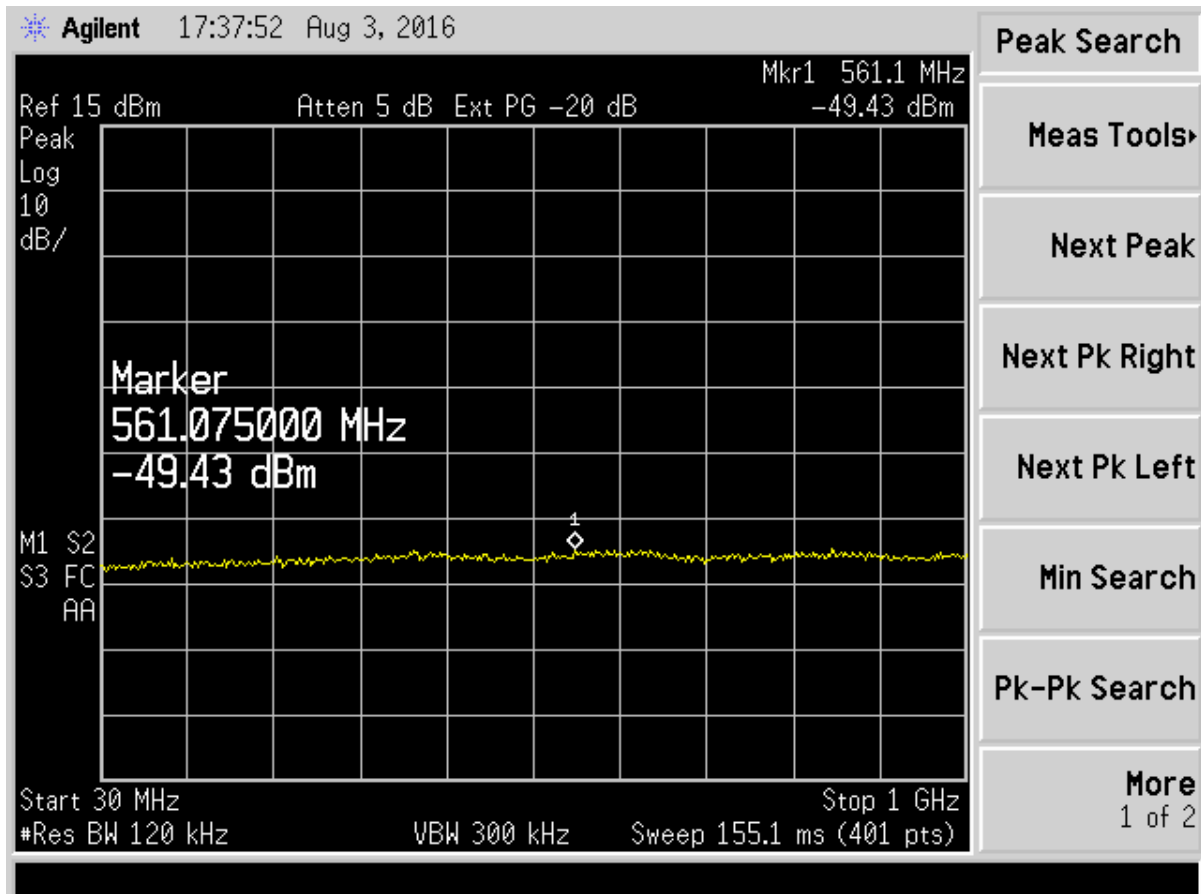


Figure 78. Antenna Conducted Emissions Channel 48 802.11n, Part 1

EIRP= -49.43 dBm + 3.4 dBi (applied antenna gain) + 4.7 dB (ground reflection factor)= -41.33 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-41.33) dBm/MHz= 14.3 dB– 10 dB (correction factor for RBW: 120 k to 1 MHz) = 4.3 dB

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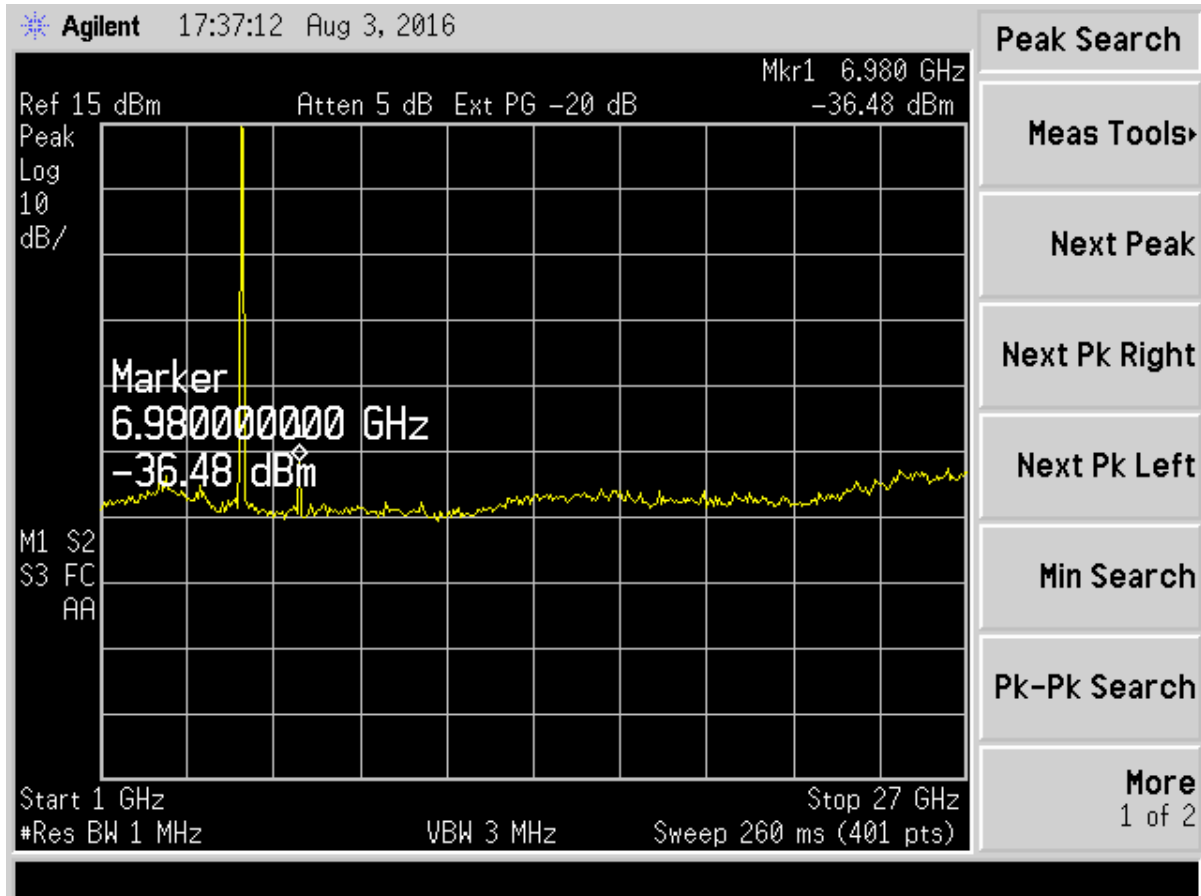


Figure 79. Antenna Conducted Emissions Channel 48 802.11n, Part 2

$EIRP = -36.48 \text{ dBm} + 3.4 \text{ dBi (applied antenna gain)} + 0 \text{ dB (ground reflection factor)} = -33.08 \text{ dBm}$

$Limit = -27 \text{ dBm/MHz (15.407 (b))}$

$Margin = -27 \text{ dBm/MHz} - (-33.08) \text{ dBm/MHz} = 6.1 \text{ dB}$

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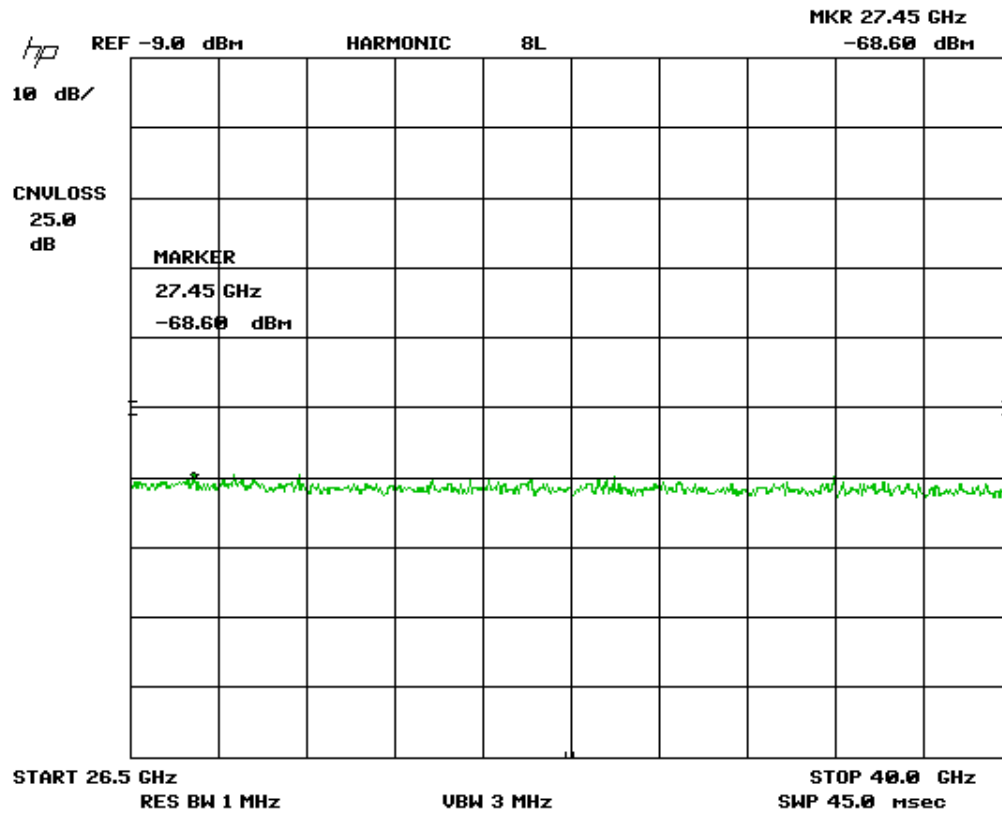


Figure 80. Antenna Conducted Emissions Channel 48 802.11n, Part 3

Note: Large signal seen in the above figure is the fundamental emission

EIRP= -68.60 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -65.20 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-65.20) dBm/MHz= 38.2 dB

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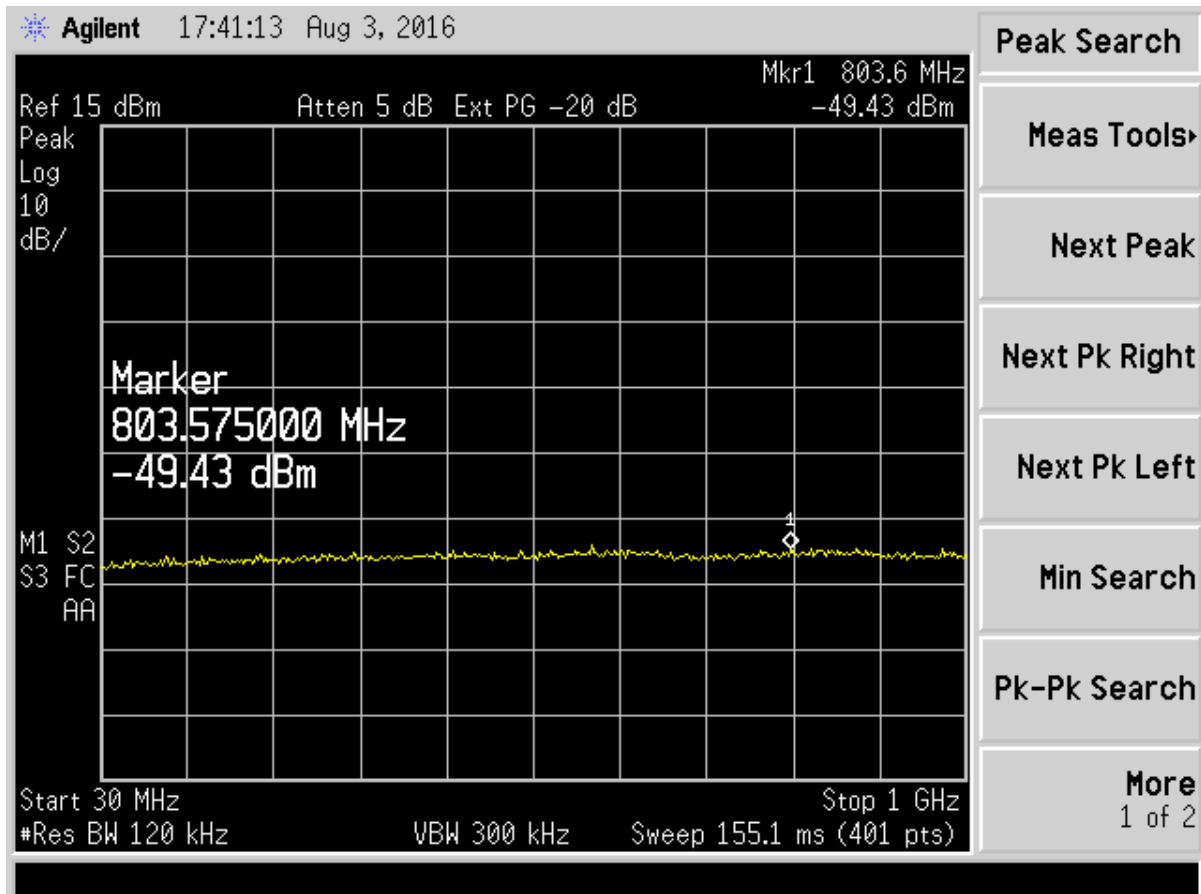


Figure 81. Antenna Conducted Emissions Channel 64 802.11n, Part 1

EIRP= -49.43 dBm + 3.4 dBi (applied antenna gain) + 4.7 dB (ground reflection factor)= -41.33 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-41.33) dBm/MHz= 14.3 dB– 10 dB (correction factor for RBW: 120 k to 1 MHz) = 4.3 dB

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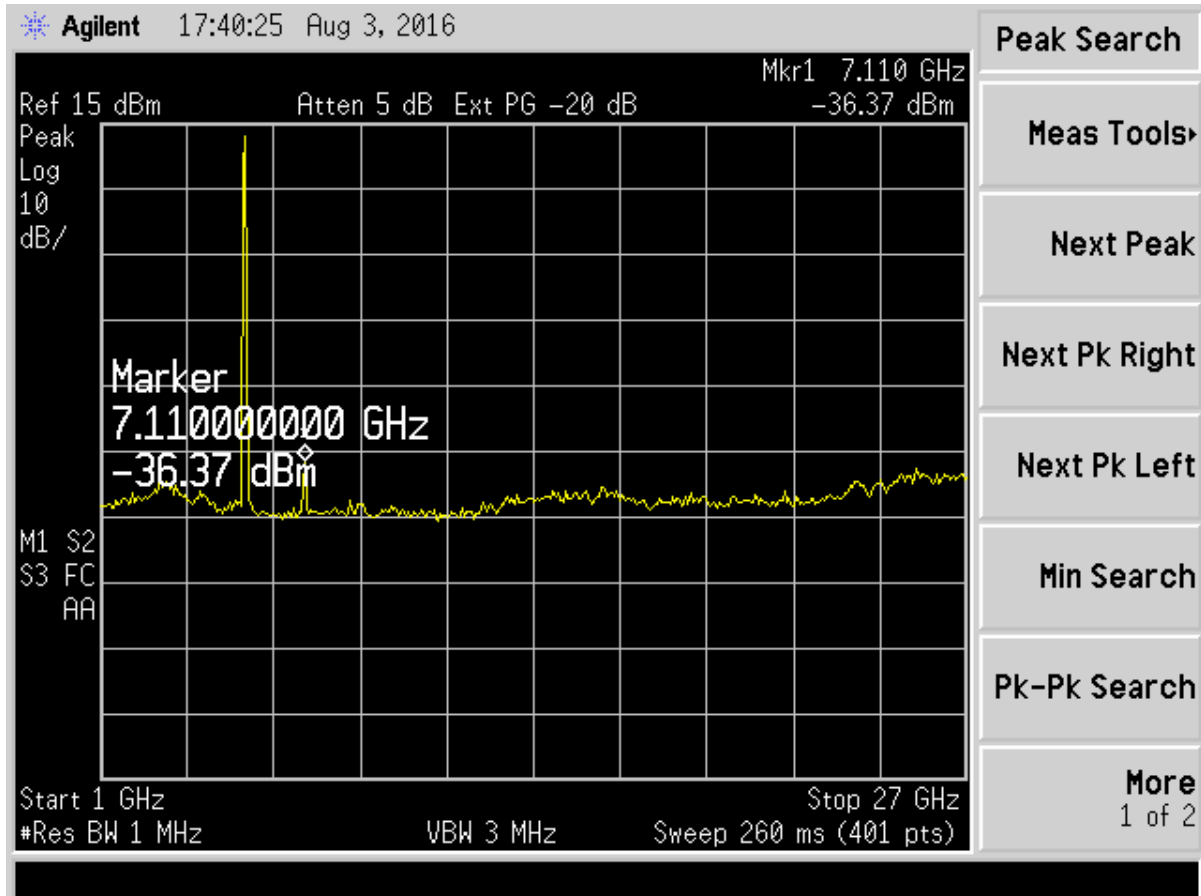


Figure 82. Antenna Conducted Emissions Channel 64 802.11n, Part 2

$EIRP = -36.37 \text{ dBm} + 3.4 \text{ dBi (applied antenna gain)} + 0 \text{ dB (ground reflection factor)} = -32.97 \text{ dBm}$

$Limit = -27 \text{ dBm/MHz (15.407 (b))}$

$Margin = -27 \text{ dBm/MHz} - (-32.97) \text{ dBm/MHz} = 5.9 \text{ dB}$

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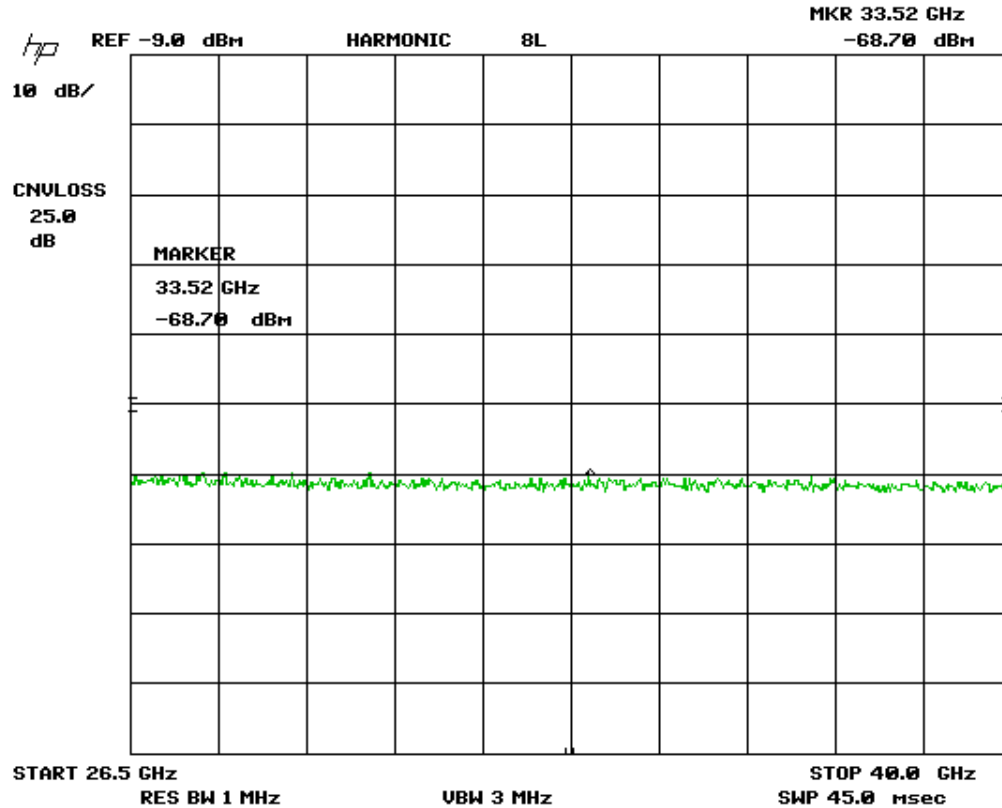


Figure 83. Antenna Conducted Emissions Channel 64 802.11n, Part 3

EIRP= -68.70 dBm + 3.4 dBi (applied antenna gain) + 0 dB (ground reflection factor)= -65.30 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-65.30) dBm/MHz= 38.3 dB

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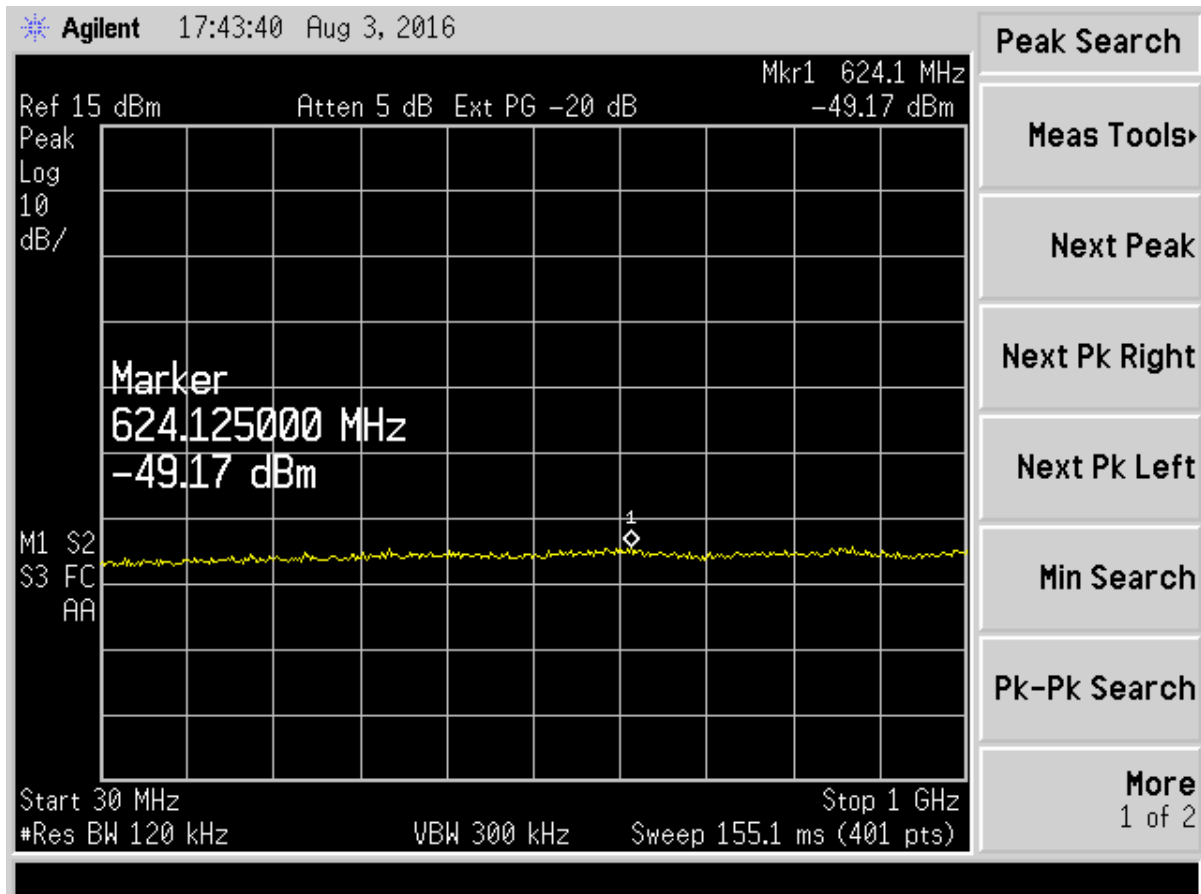


Figure 84. Antenna Conducted Emissions Channel 100 802.11n, Part 1

EIRP= -49.17 dBm + 3.4 dBi (applied antenna gain) + 4.7 dB (ground reflection factor)= -41.07 dBm

Limit= -27 dBm/MHz (15.407 (b))

Margin= -27 dBm/MHz – (-41.07) dBm/MHz= 14.1 dB– 10 dB (correction factor for RBW: 120 k to 1 MHz) = 4.1 dB