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 C, paragraphs 15.207, 15.209 and 15.247

And

RSS-247 Issue 1 for Industry Canada

For the

Aglogica Holdings, Inc.

Model: AGL2

FCC ID: 2AIYR-AGL2
IC: 21677-AGL2

UST Project: 16-0105
Issue Date: July 14, 2016

Total Pages in This Report: 117

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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: 

Title: Compliance Engineer – President

Date July 14, 2016

NVLAP LAB CODE 200162-0

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MEASUREMENT TECHNICAL REPORT

COMPANY NAME: Aglogica Holdings Inc.

MODEL: AGL2

FCC ID: 2AIYR-AGL2

IC: 21677-AGL2

DATE: July 14, 2016

This report concerns (check one): Original grant [X]
Class II change

Equipment type: 2412 - 2462 MHz WiFi 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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Alpharetta, GA 30004

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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 247 and IC RSS 247 Issue 1.

1.2 Characterization of Test Sample

The samples used for testing were received by US Tech on May 31, June 24, and July 11, 2016 in good operating condition.

1.3 Product Description

The Equipment Under Test (EUT) is the Aglogica Holdings, Inc. Model AGL2. The AGL2 sensor is a component of the AGL Vetrax™ medical analytics solution. The AGL2 is an animal wearable sensor that collects multi-dimensional sensor data – 9 axis data. The AGL Vetrax analytics system derives quantifying animal behaviors, such as running, walking, resting, scratching, shaking, etc. from the sensor data. From this data, AGL Vetrax Veterinarians are able to better track the effectiveness of their medical care programs. Conditions such as geriatric care, obesity, surgical rehabilitation and dermatology issues can all be observed through tracking and monitoring animal behavior.

The EUT incorporates both Bluetooth LE technology and WiFi technology.

The WiFi radio features are as follows:

Antenna Gain: -6.16 dBi (Trace Antenna)
Modulation: 20 MHz bandwidth modulation
Maximum Output Power: 17 dBm

1.4 Configuration of Tested System

The Test Sample was tested per *ANSI C63.4:2014, Methods of Measurement of Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (2014)*, *ANSI C63.10:2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices* and per FCC KDB Publication number 558074 for Digital Transmission Systems Operating Under section 15.247. Also, FCC, KDB Publication No. 558074 was used as a test procedure guide.

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

1.6.1 The EUT is subject to the following FCC authorizations:

a) Certification under section 15.247 as a transmitter.
b) Verification under 15.101 as a digital device and receiver.
c) Certification under section 15.249 as a transmitter.

1.6.2 Verification of the Digital apparatus

The Verification requirement shares many common report elements with the Certification report. Therefore, though this report is mostly intended to provide data for the Certification process, the Verification authorization report (part 15.107 and 15.109) for the EUT is included herein.

Table 1. EUT and Peripherals

PERIPHERAL MANUFACTURER.	MODEL NUMBER	SERIAL NUMBER	FCC/IC ID:	CABLES P/D
Aglogica Holdings Inc.	AGL2	Engineering Sample	2AIYR-AGL2 (pending) 21677-AGL2 (pending)	N/A
Antenna See antenna details	--	--	--	--

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

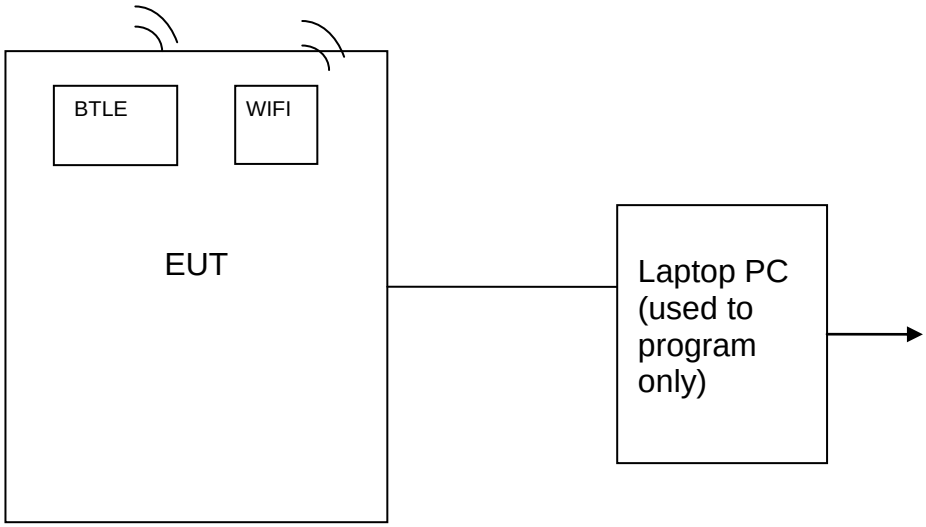


Figure 1. Block Diagram of Test Configuration

2 Tests and Measurements

2.1 Test Equipment

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

Table 2. Test Instruments

TEST INSTRUMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	DATE OF LAST CALIBRATION
SPECTRUM ANALYZER	8566B	HEWLETT-PACKARD	2747A05665	5/07/2015 Extended 90 days
SPECTRUM ANALYZER	E4407B	AGILENT	US41442935	2/11/2016
LOOP ANTENNA	SAS-200/562	A.H. Systems	142	9/28/2015 2 yr.
BICONICAL ANTENNA	3110B	EMCO	9306-1708	11/24/2014 2 yr.
LOG PERIODIC ANTENNA	3146	EMCO	9305-3600	7/01/2014 2 yr.
HORN ANTENNA	3115	EMCO	9107-3723	7/08/2014 2 yr. Extended 30 days
HORN ANTENNA	3116	EMO	9505-2255	1/27/2015 2 yr.
PRE-AMPLIFIER	8449B	HEWLETT-PACKARD	3008A00480	12/01/2015
PRE-AMPLIFIER	8447E	HEWLETT-PACKARD	1145A00307	12/03/2015
PRE-AMPLIFIER	8447D	HEWLETT-PACKARD	1937A02980	12/02/2015
LISN x 2	8028-50-TS24-BNC	SOLAR ELECTRONICS	910495 and 910494	11/20/2015

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 2412 MHz to 2462 MHz, 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 10^{th} 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 (CFR 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.

2.6 EUT Antenna Requirements (CFR 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	Aglogica Holdings, Inc.	PCB Trace	Inverted F type	-6.16	PCB Trace

2.7 Restricted Bands of Operation (Part 15.205)

Only spurious emissions can fall in the frequency bands of CFR 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 paragraph 2.1

2.8 Transmitter Duty Cycle (CFR 15.35 (c))

Unless otherwise specified, e.g., §§15.255(b), and 15.256(l)(5), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

In this case the pulse trains exceeded 0.1 second therefore the measured field strength was determined from the average absolute voltage.

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

2.9 Intentional Radiator, Power Line Conducted Emissions (CFR 15.207)

The EUT is powered by a 3.3 VDC Lithium Ion battery. The EUT can be charged via a micro USB cable and is indirectly connected to the AC mains. Since the host device was connected to the AC mains, the power line conducted emissions testing was performed. 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 CFR 15.207. These measurements were completed and are displayed below.

Table 5. Transmitter Power Line Conducted Emissions Test Data, Part 15.207

150 KHz to 30 MHz						
Test: Power Line Conducted Emissions				**Client:** Aglogica Holdings, Inc.		
Project: 16-0105				**Model:** AGL2		
Frequency (MHz)	**Test Data (dBuv)**	**LISN+CL-PA (dB)**	**Results (dBuV)**	**AVG Limits (dBuV)**	**Margin (dB)**	**Detector PK, QP, or AVG**
120 VAC, 60 Hz Phase						
0.2450	52.50	0.28	52.78	61.9*	9.1	**QP**
0.2550	32.00	0.25	32.25	51.6	19.3	**AVG**
0.7520	50.00	0.18	50.18	56.0*	5.8	**PK**
0.7510	22.10	0.18	22.28	46.0	23.7	**AVG**
1.7640	46.50	0.24	46.74	56.0*	9.3	**PK**
1.7540	19.30	0.23	19.53	46.0	26.5	**AVG**
5.0000	40.10	0.33	40.43	46.0	5.6	**PK**
11.8200	35.30	0.42	35.72	50.0	14.3	**PK**
21.5800	30.40	0.64	31.04	50.0	19.0	**PK**
120VAC, 60 Hz Neutral						
0.2460	60.00	0.37	60.37	61.9*	1.5	**PK**
0.2560	29.20	0.37	29.57	51.6	22.0	**AVG**
0.5250	49.00	0.32	49.32	56.0*	6.7	**PK**
0.5250	20.60	0.32	20.92	46.0	25.1	**AVG**
1.6640	45.00	0.30	45.30	46.0	0.7	**PK**
5.0050	40.90	0.40	41.30	50.0	8.7	**PK**
12.0400	34.00	0.56	34.56	50.0	15.4	**PK**
21.7200	30.00	0.78	30.78	50.0	19.2	**PK**

Note: * denotes QP Limits

SAMPLE CALCULATION at 0.2450 MHz:

Magnitude of Measured Frequency	52.50	dBuV
+ Cable Loss+ LISN Loss	0.28	dB
=Corrected Result	52.78	dBuV
Limit	61.90	dBuV
-Corrected Result	52.78	dBuV
Margin	9.10	dB

Test Date: June 15, 2016
Tested By
Signature: Hossein Rahnama Name: Hossein Rahnama

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 247, 5.4)

Radiated Spurious measurements: the EUT was placed into a continuous transmit mode of operation (>98% duty cycle) and tested per FCC KDB Publication 558074 D01 v03r05and 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 axes or in the orientation of normal operation if the device is designed to operation in a fixed position.

Radiated measurements were then conducted between the frequency range of 9 KHz (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 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 CFR 15.209, General requirements for unwanted spurious emissions. The conducted spurious method as described below was use 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 per FCC KDB Publication 558074 D01 v03r05for conducted out of band emissions emanating from the antenna port over the frequency range of 30 MHz to 25 GHz. A conducted scan was performed on the EUT to identify and record spurious signals that were related to the transmitter. The conducted spurious emissions were measured at both antenna ports, but the spurious emissions on the J3 port were minimal and not considered.

The results are displayed in the plots following. Radiated emissions per CFR 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 in the sections below.

Note 1: The results below are compared to Peak limits.
Note 2: For emissions levels below 1000 MHz, the restricted band limits were applied to show worst case

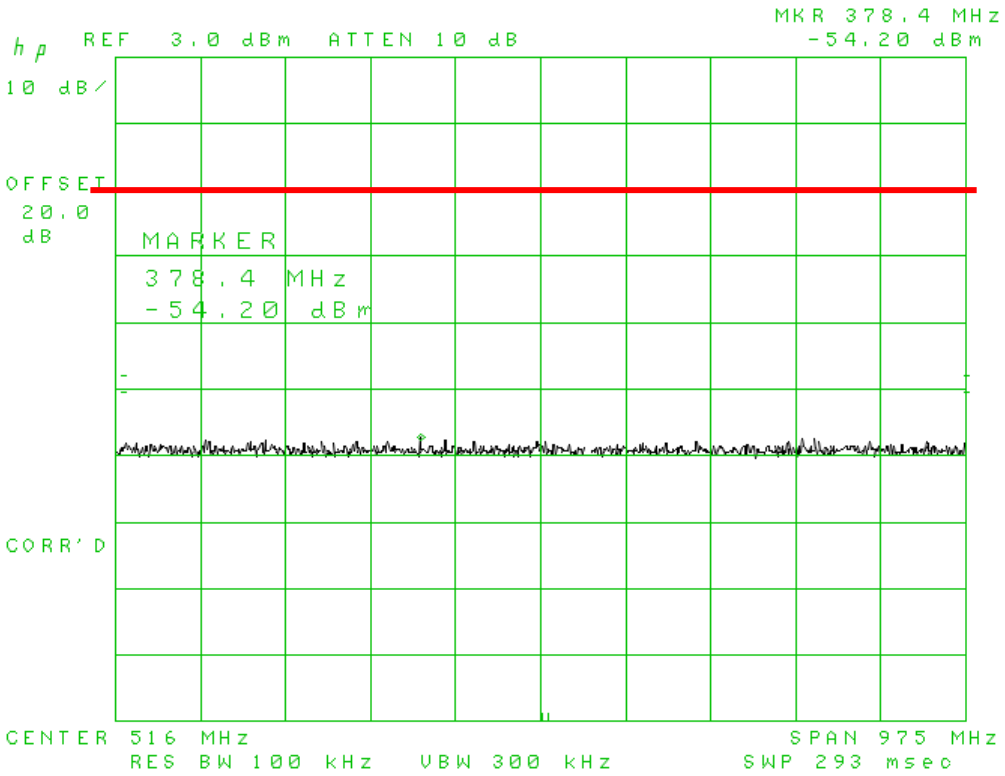


Figure 2. Antenna Conducted Emissions 802.11b Low, Part 1

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

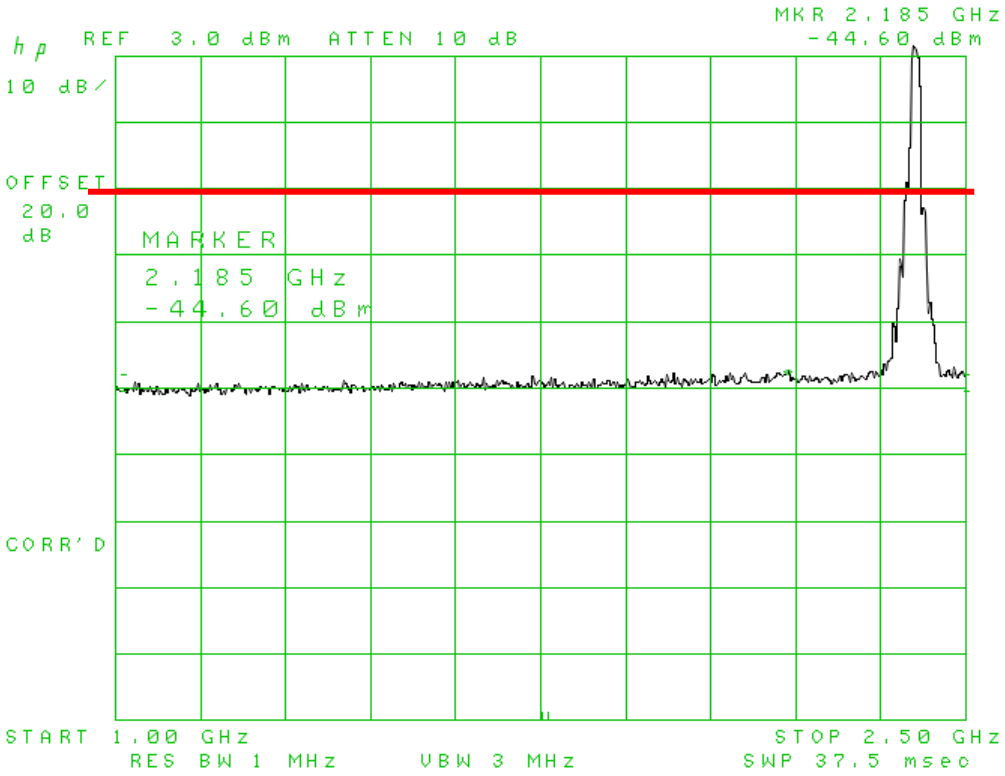


Figure 3. Antenna Conducted Emissions 802.11b Low, Part 2

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

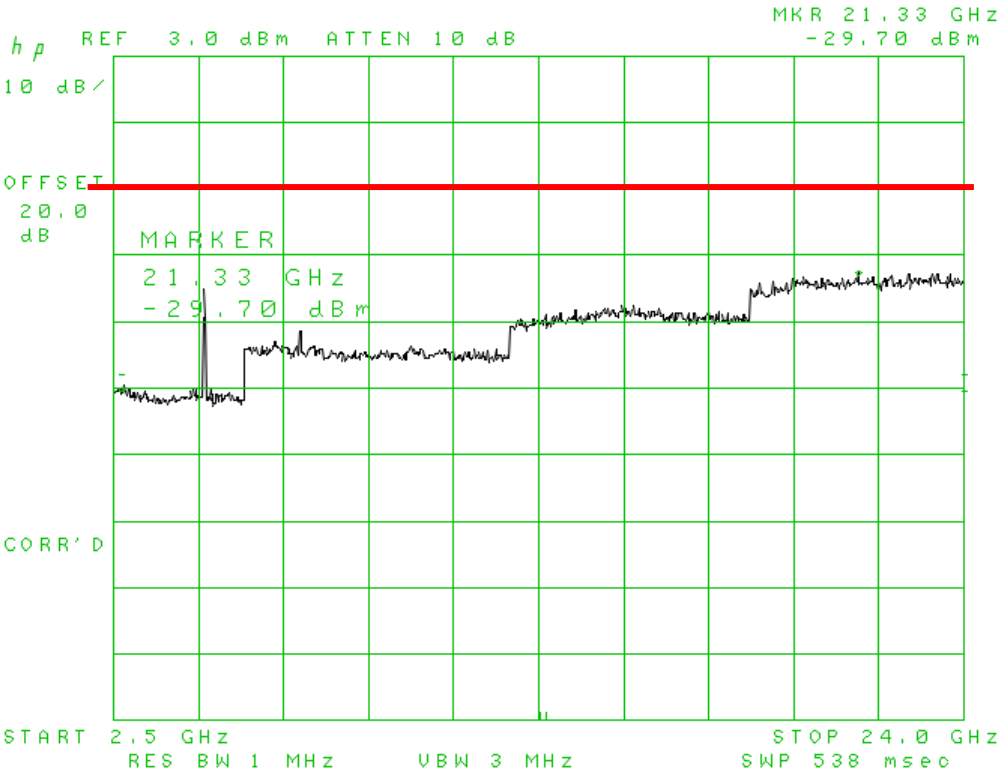


Figure 4. Antenna Conducted Emissions 802.11b Low, Part 3

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

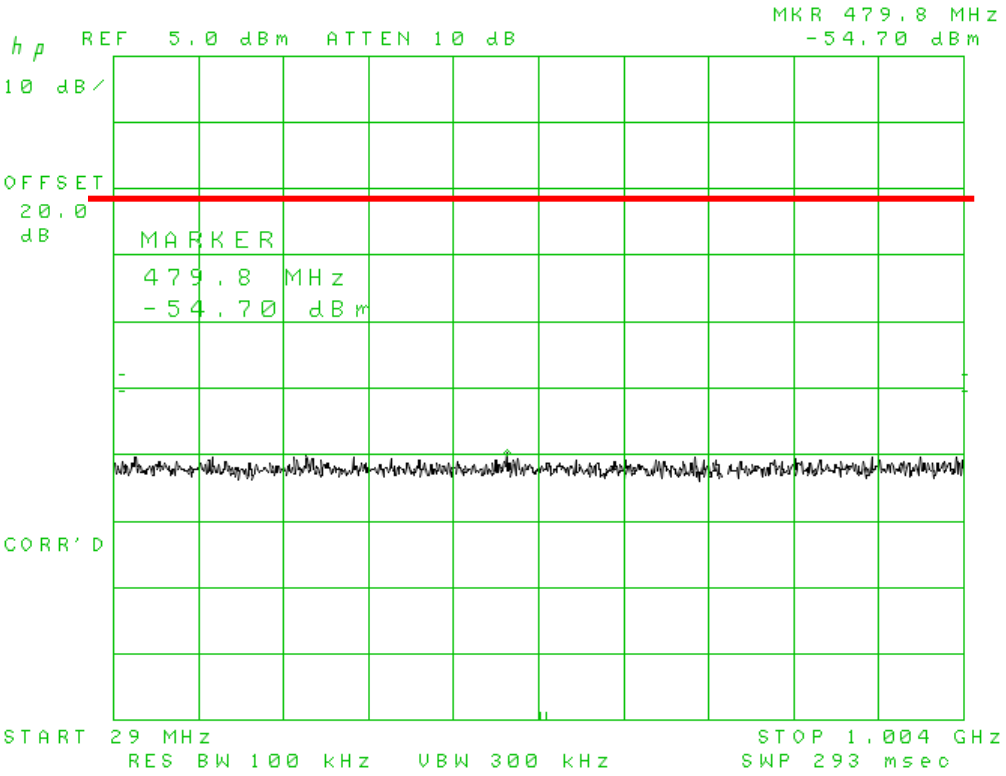


Figure 5. Antenna Conducted Emissions 802.11b Mid, Part 1

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

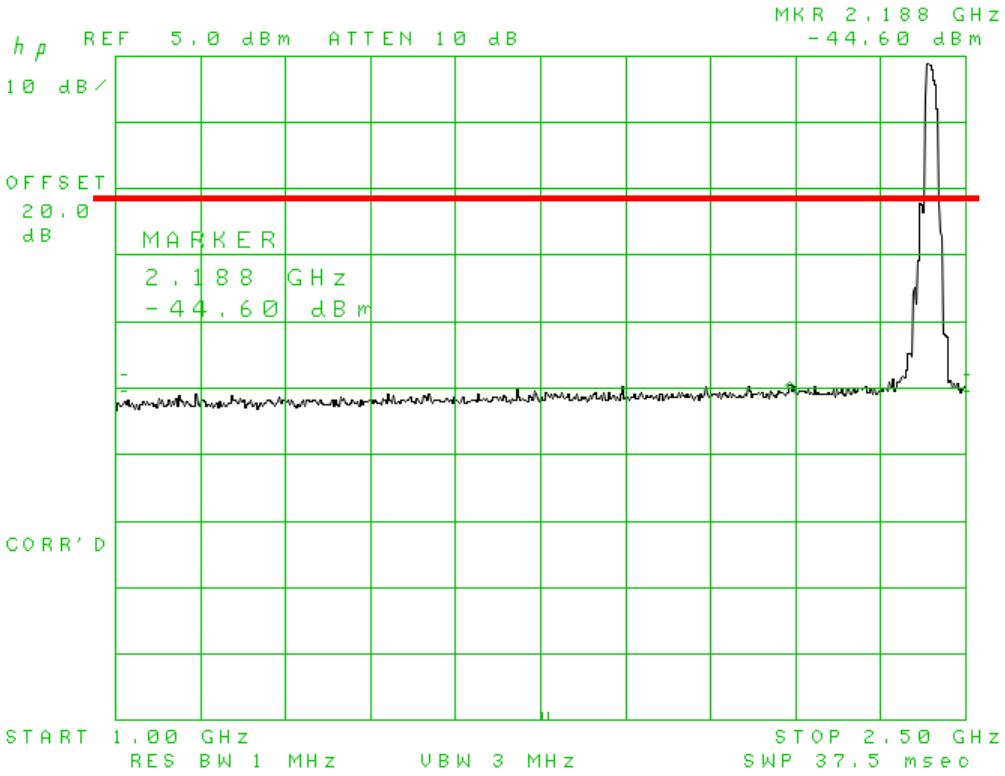


Figure 6. Antenna Conducted Emissions 802.11b Mid, Part 2

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental. The larger peak to the right is the fund mental emission.

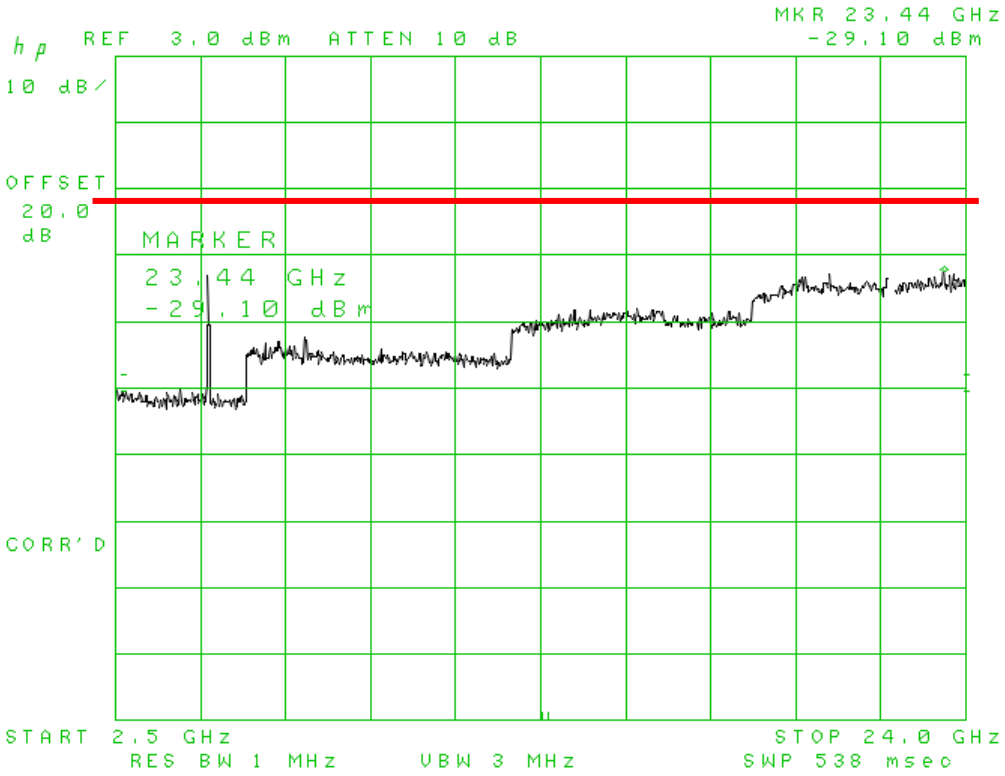


Figure 7. Antenna Conducted Emissions 802.11b Mid, Part 3

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

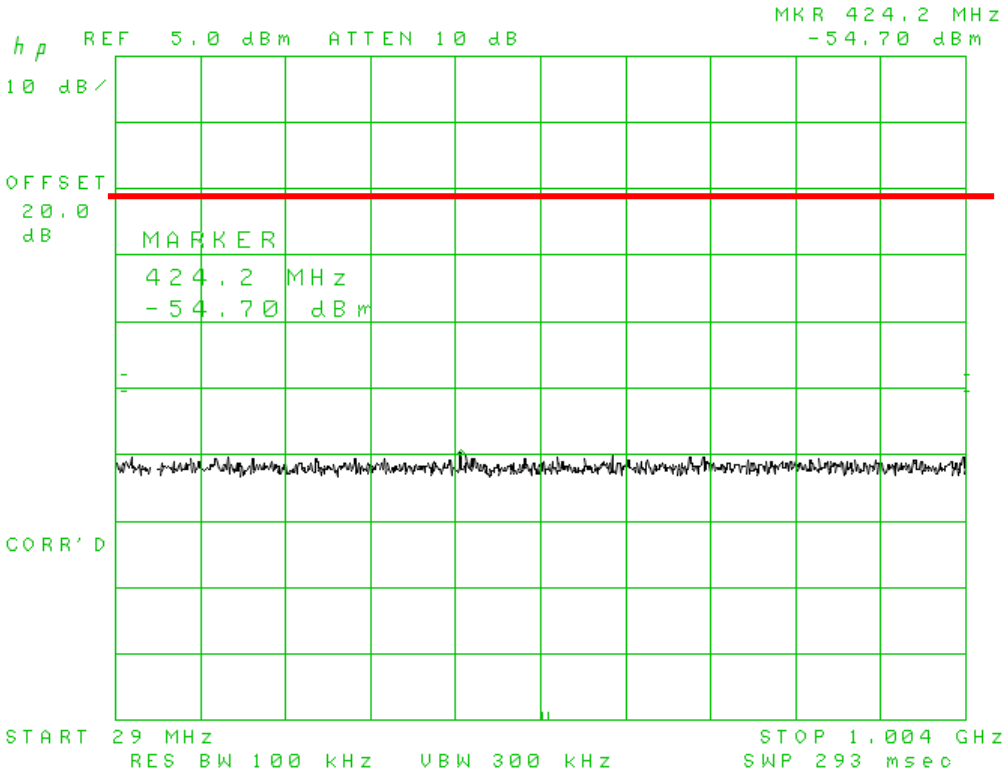


Figure 8. Antenna Conducted Emissions 802.11b High, Part 1

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

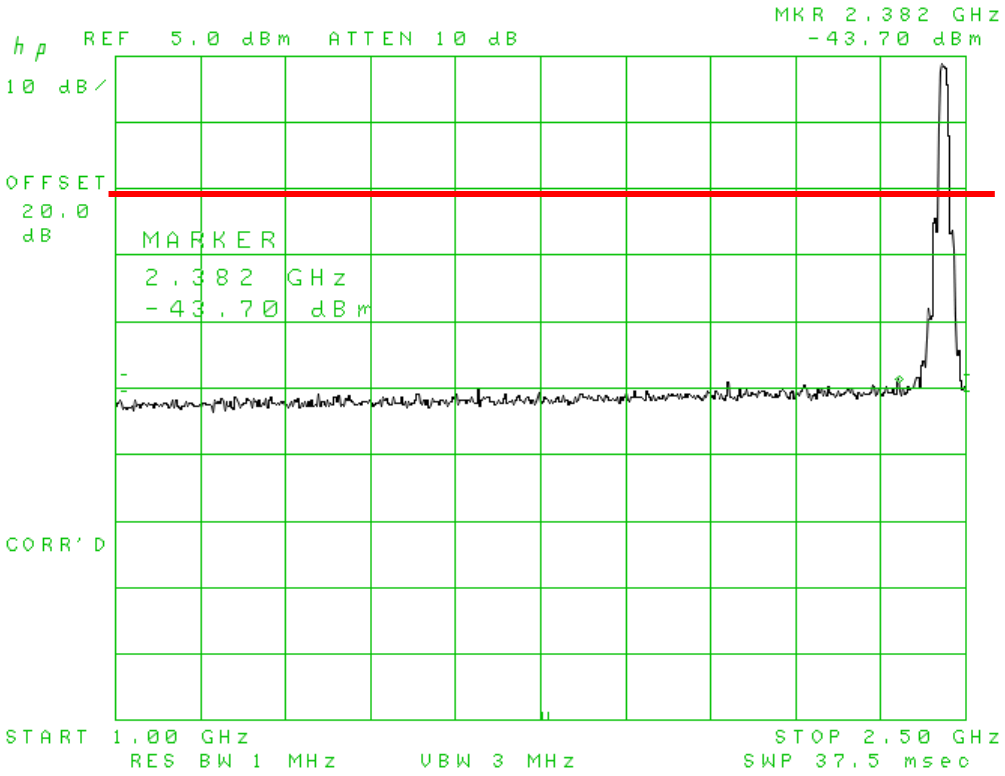


Figure 9. Antenna Conducted Emissions 802.11b High, Part 2

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental. The larger peak to the right is the fundamental emission.

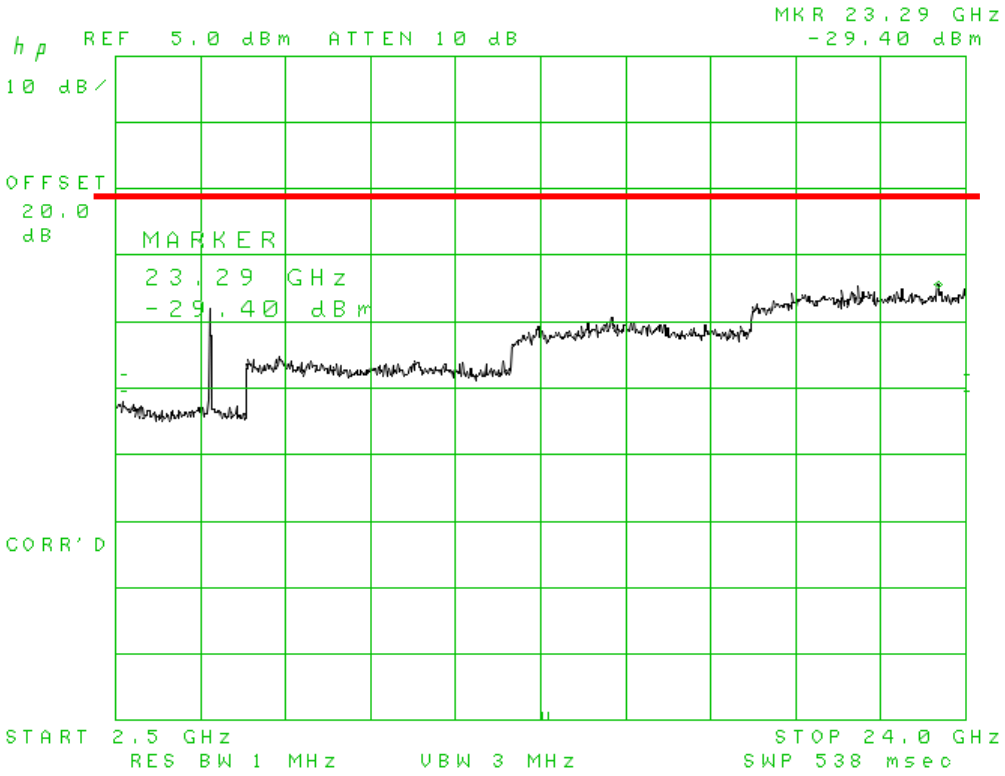


Figure 10. Antenna Conducted Emissions 802.11b High, Part 3

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

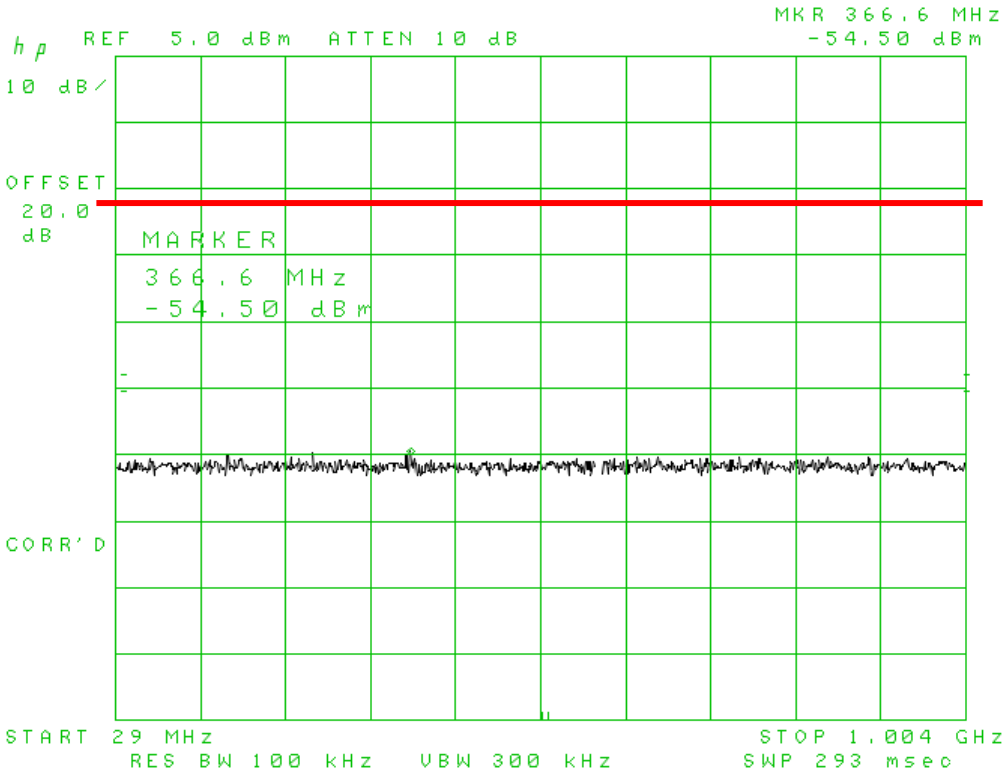


Figure 11. Antenna Conducted Emissions 802.11g Low, Part 1

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

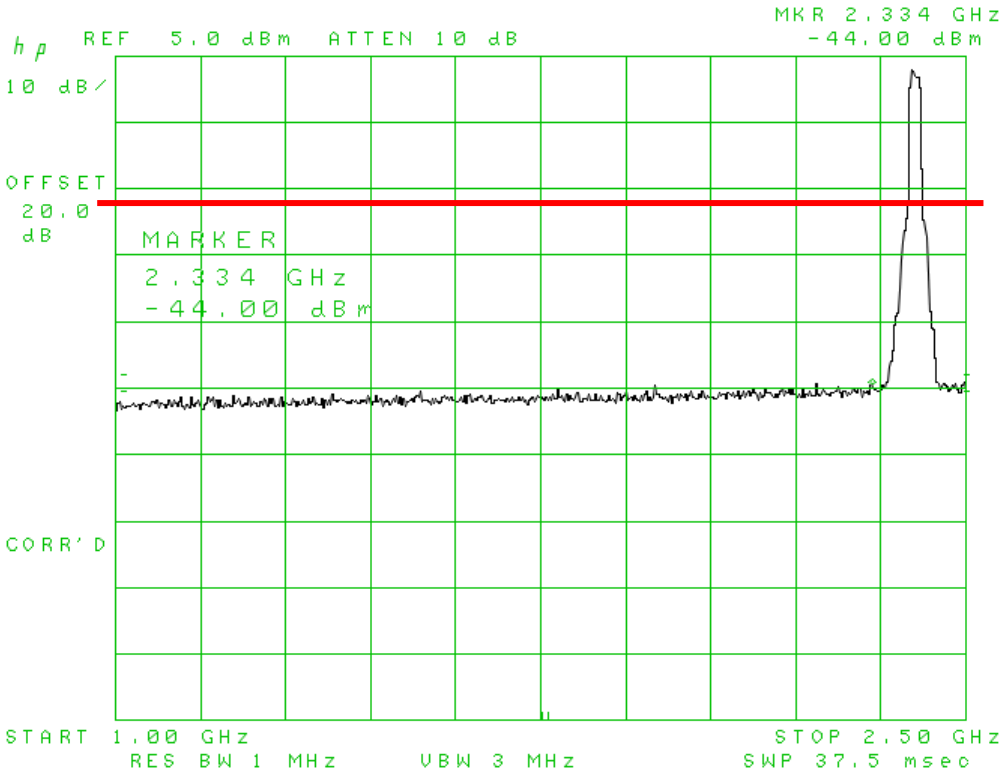


Figure 12. Antenna Conducted Emissions 802.11g Low, Part 2

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental. The larger peak to the right is the fund mental emission.

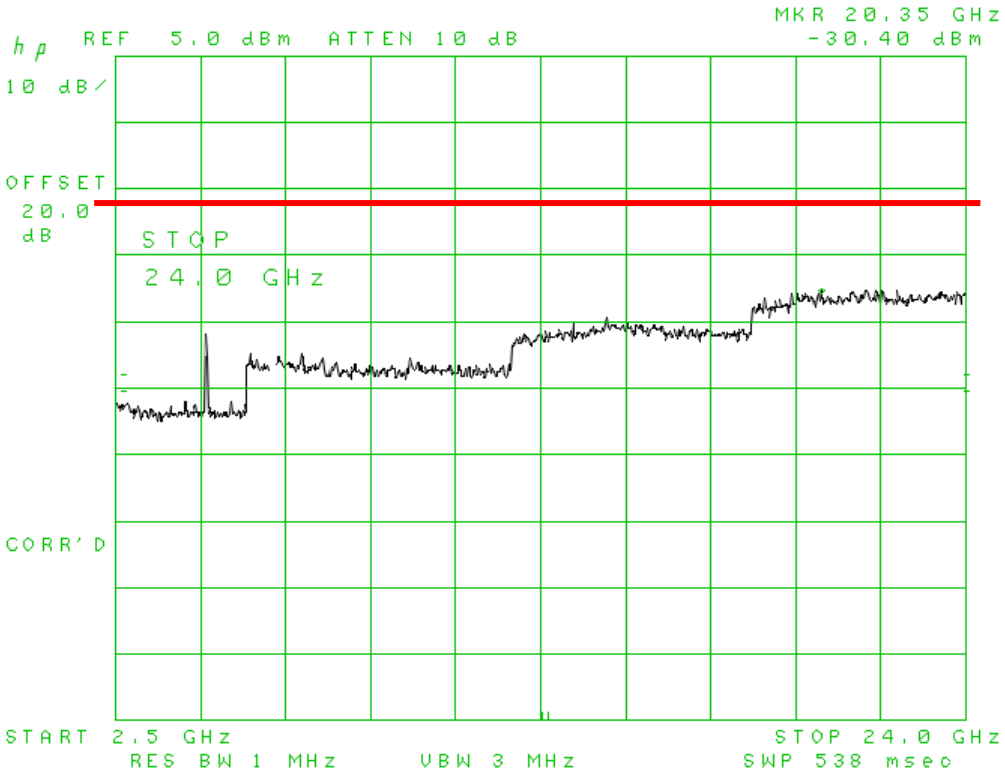


Figure 13. Antenna Conducted Emissions 802.11g Low, Part 3

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

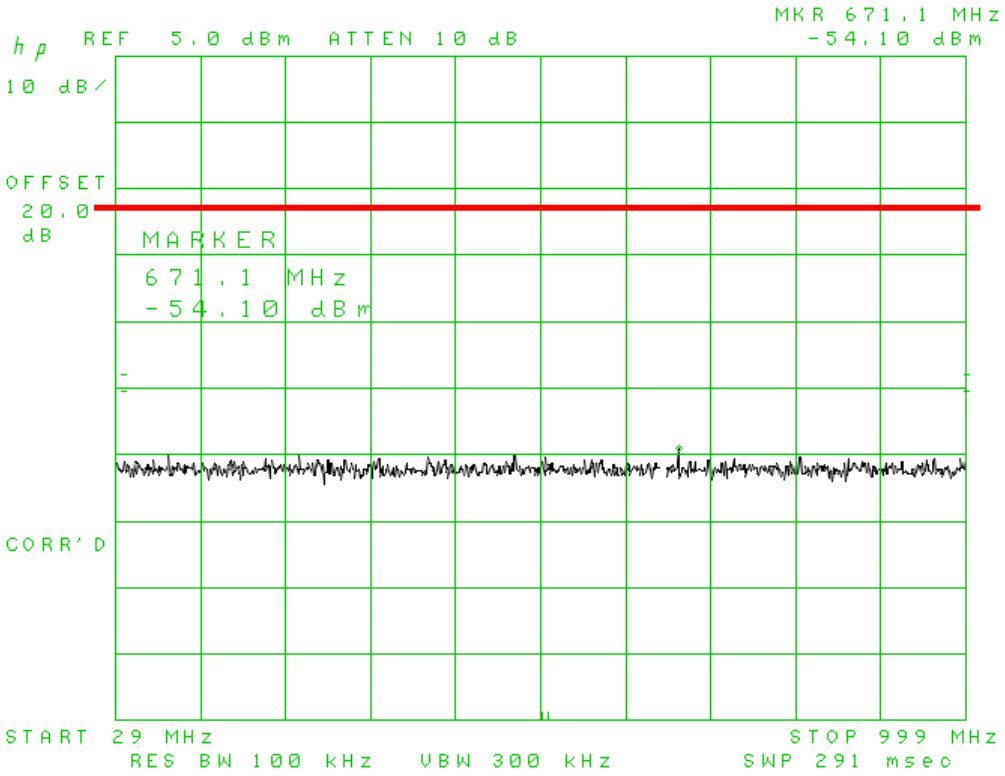


Figure 14. Antenna Conducted Emissions 802.11g Mid, Part 1

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

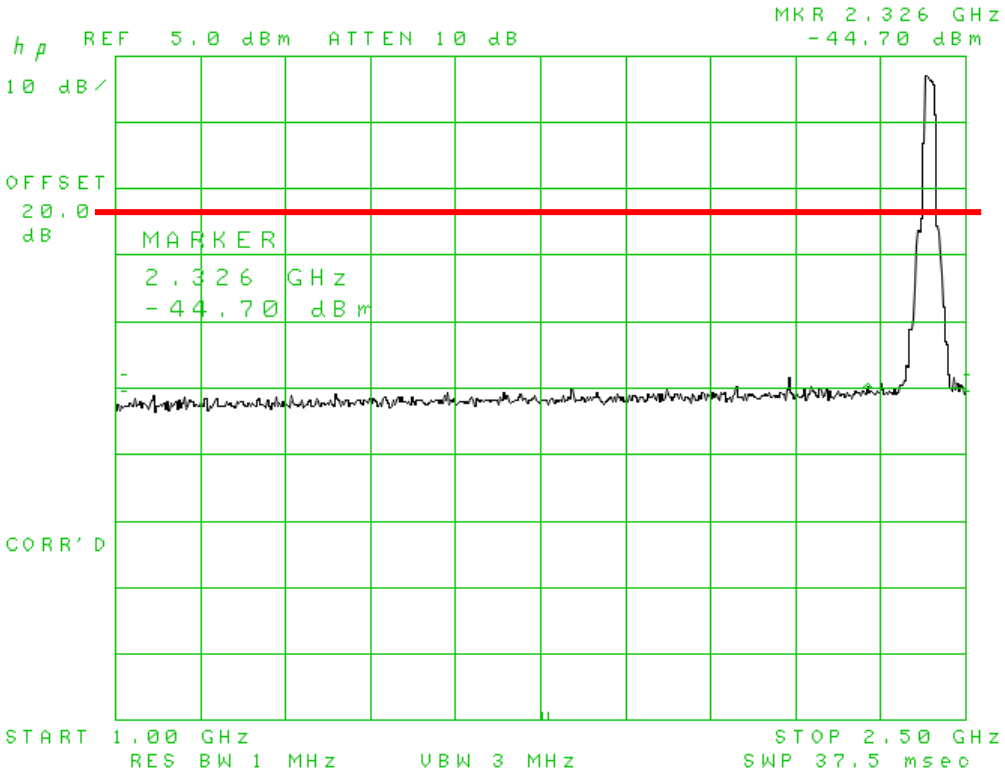


Figure 15. Antenna Conducted Emissions 802.11g Mid, Part 2

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental. The larger peak to the right is the fund mental emission.

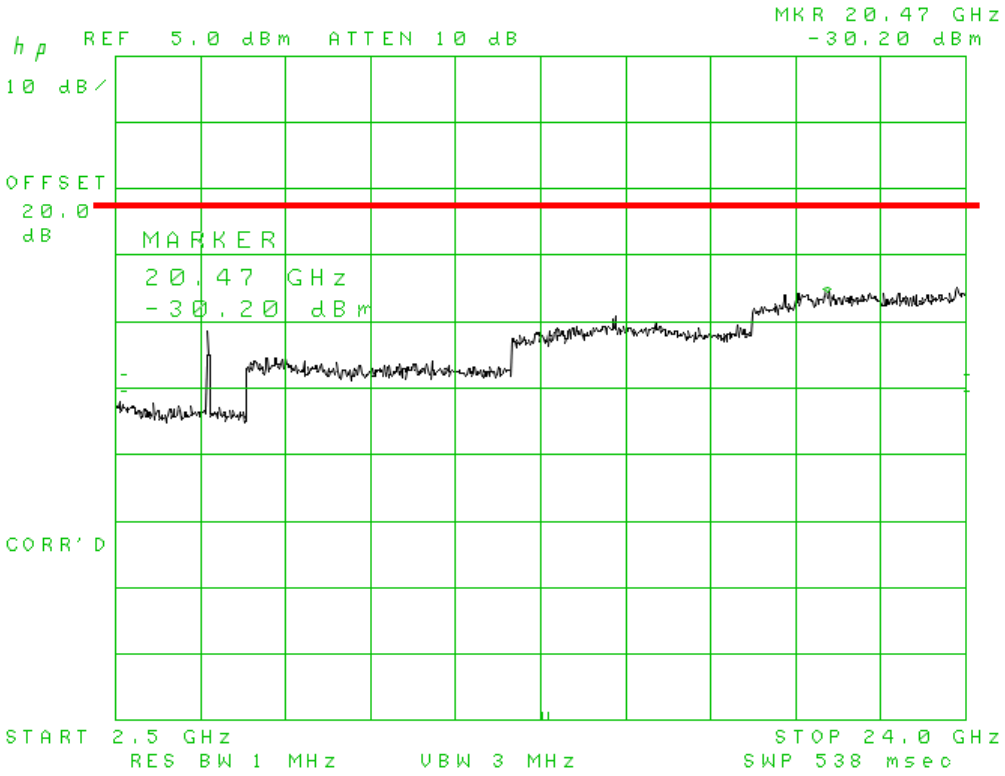


Figure 16. Antenna Conducted Emissions 802.11g Mid, Part 3

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

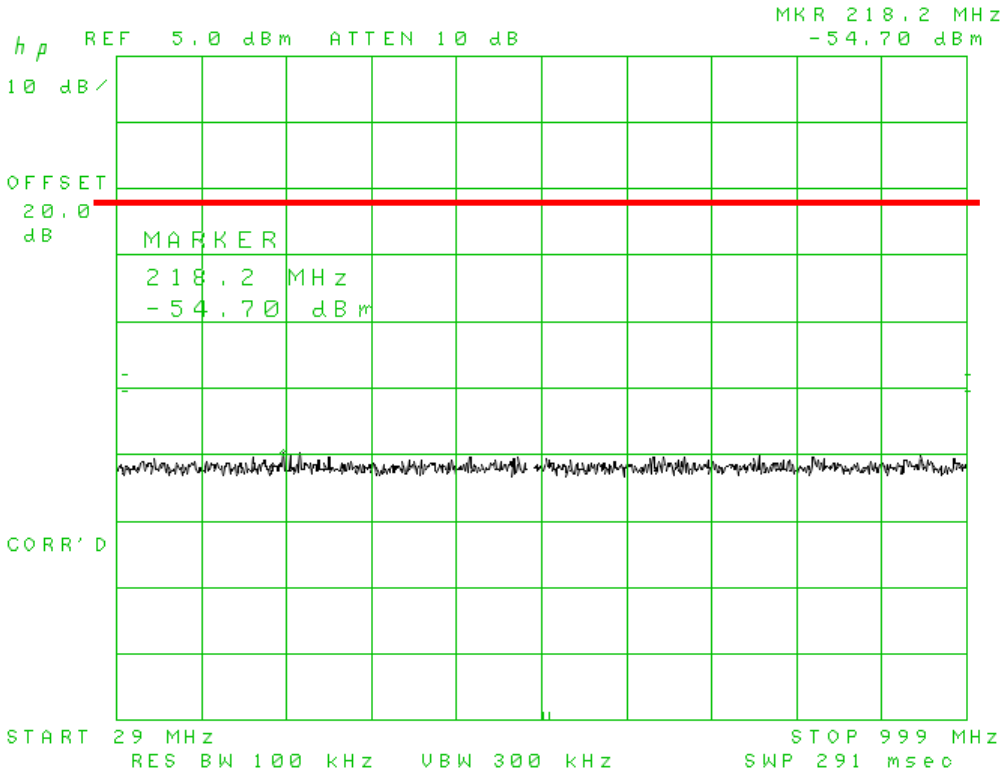


Figure 17. Antenna Conducted Emissions 802.11g High, Part 1

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

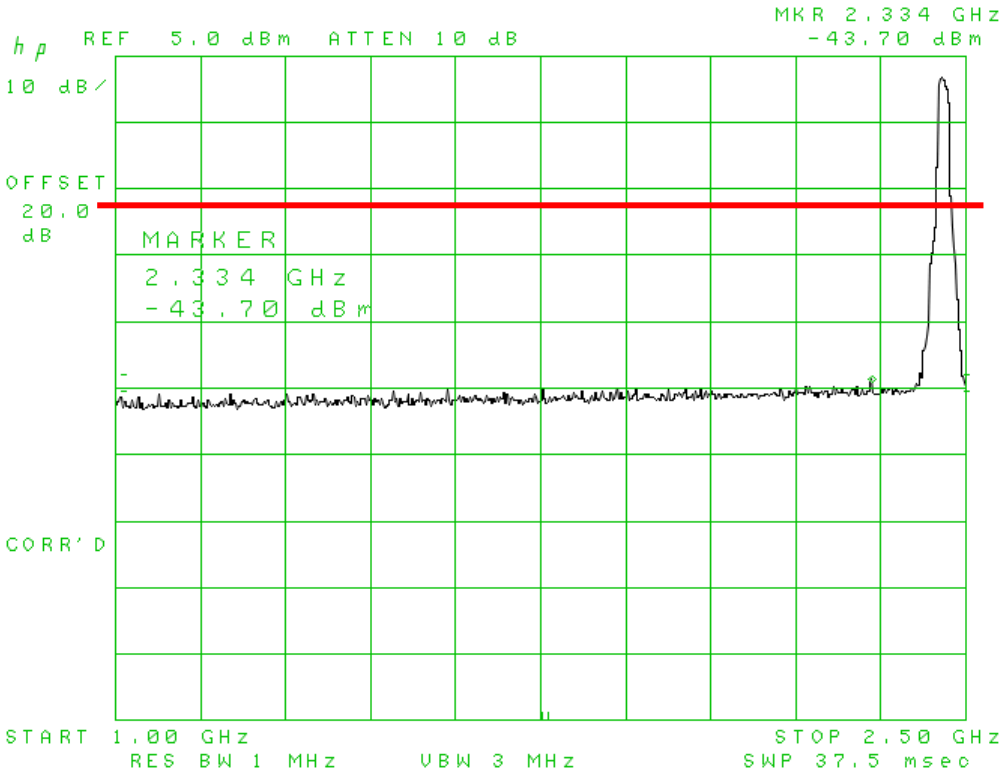


Figure 18. Antenna Conducted Emissions 802.11g High, Part 2

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental. The larger peak to the right is the fund mental emission.

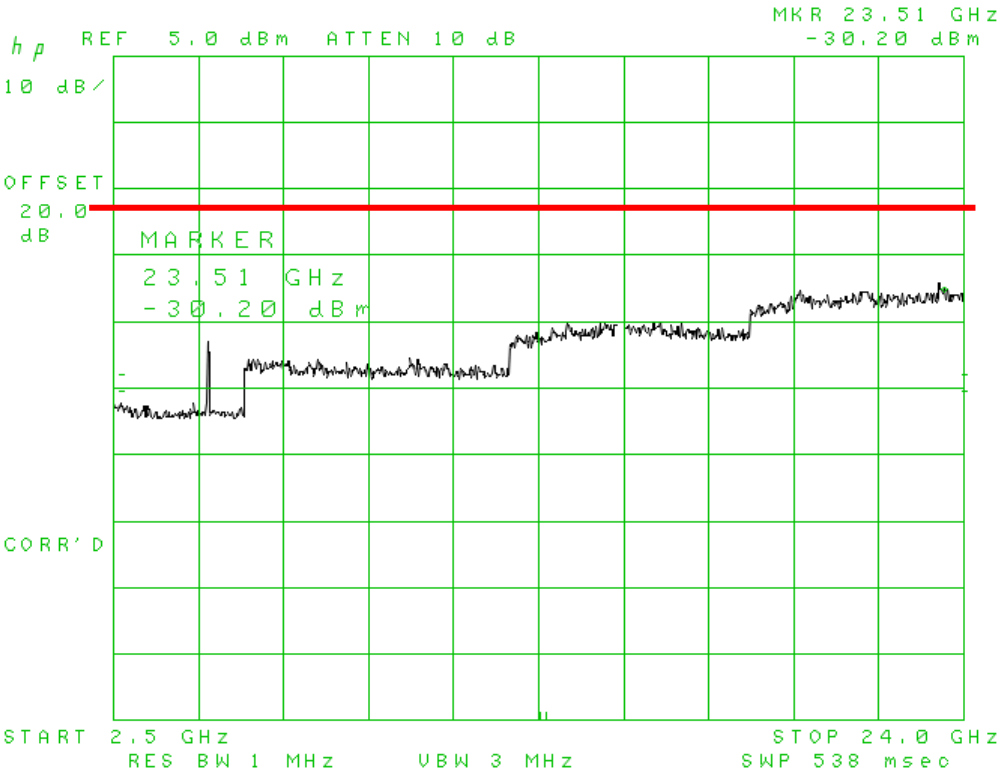


Figure 19. Antenna Conducted Emissions 802.11g High, Part 3

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

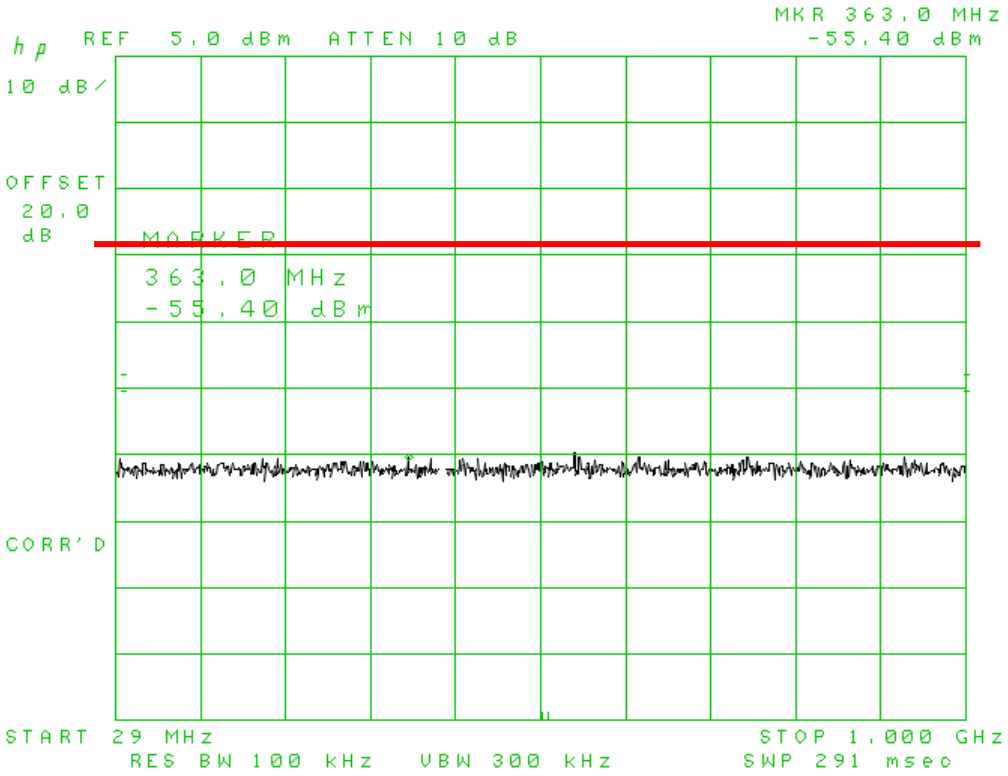


Figure 20. Antenna Conducted Emissions 802.11n Low, Part 1

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

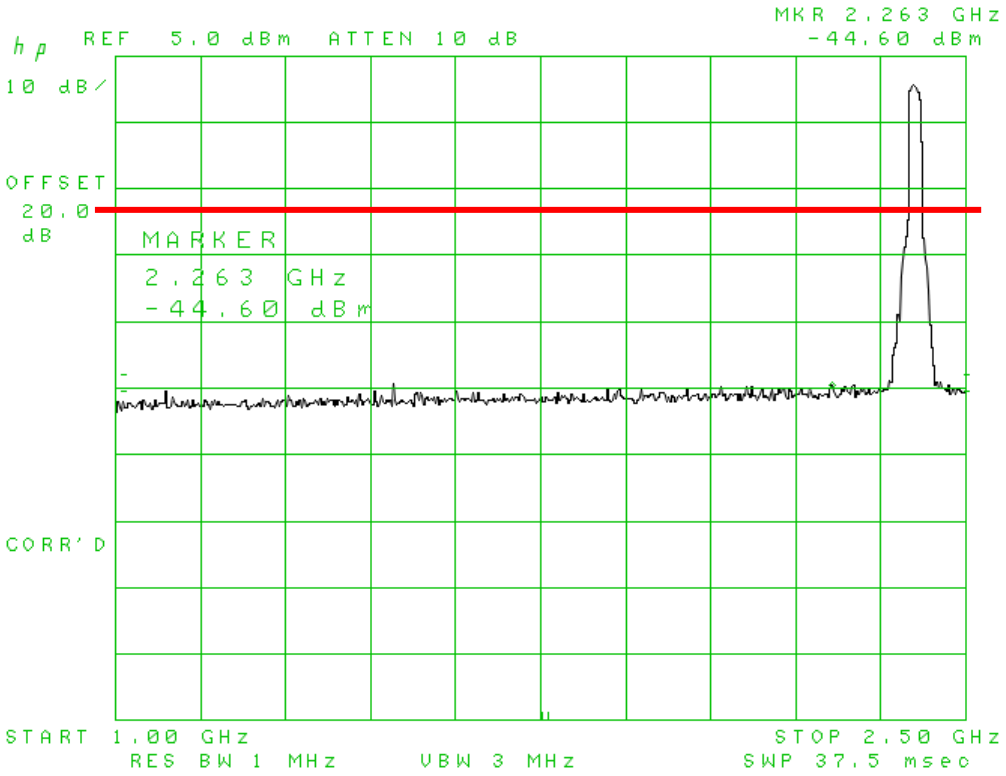


Figure 21. Antenna Conducted Emissions 802.11n Low, Part 2

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental. The larger peak to the right is the fund mental emission.

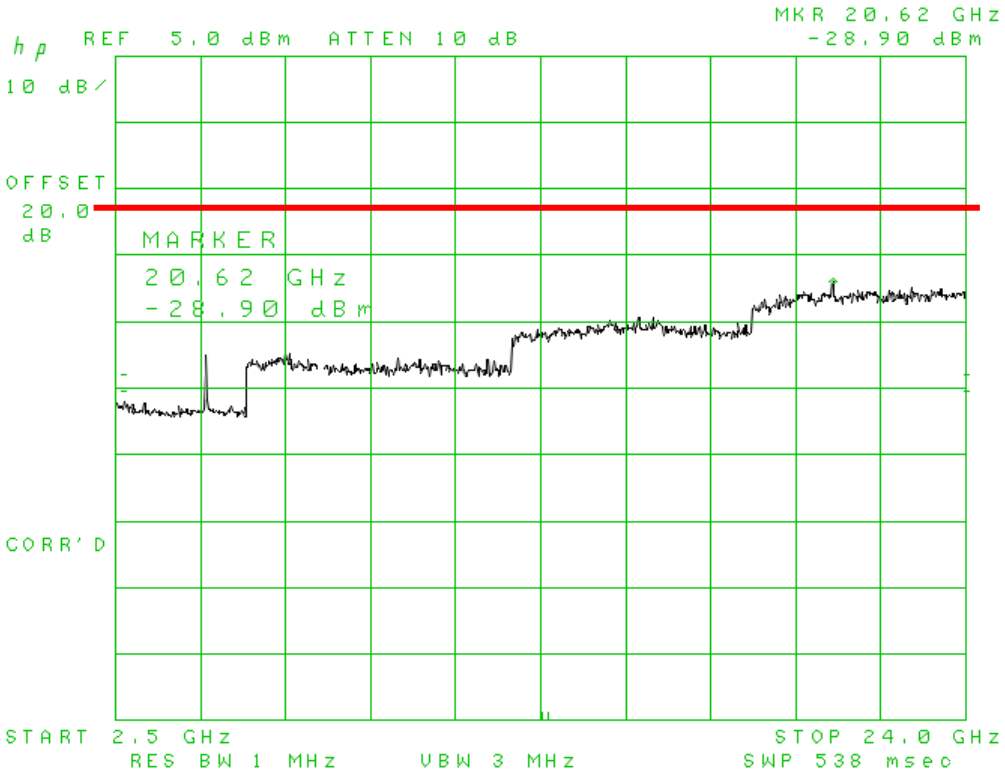


Figure 22. Antenna Conducted Emissions 802.11n Low, Part 3

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

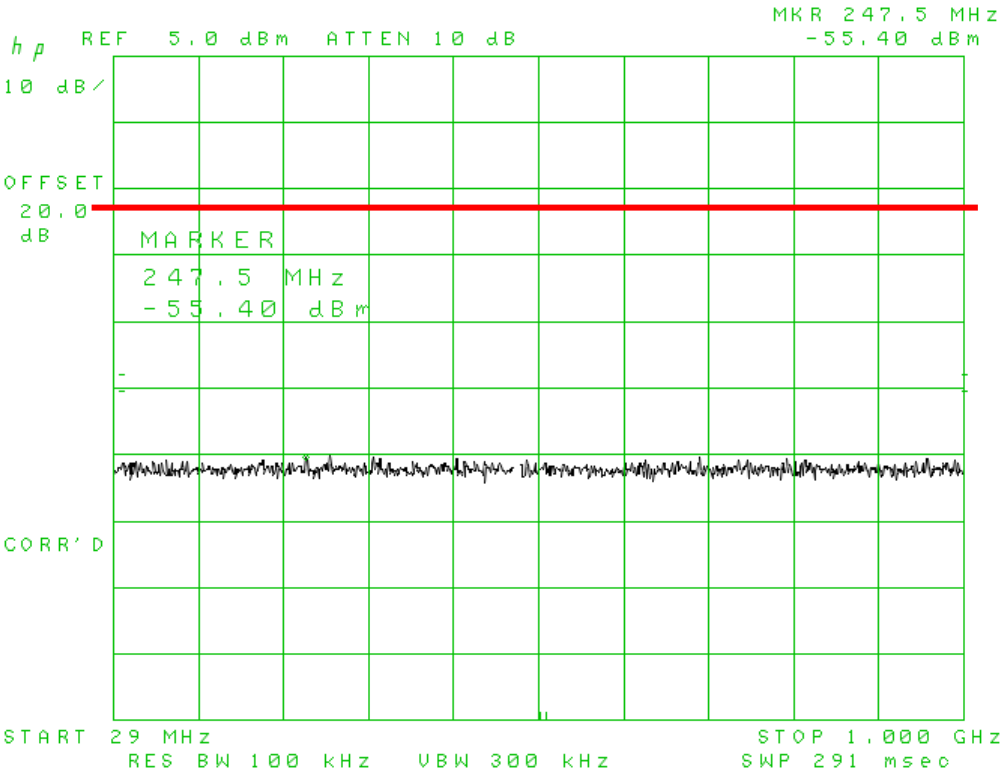


Figure 23. Antenna Conducted Emissions 802.11n Mid, Part 1

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

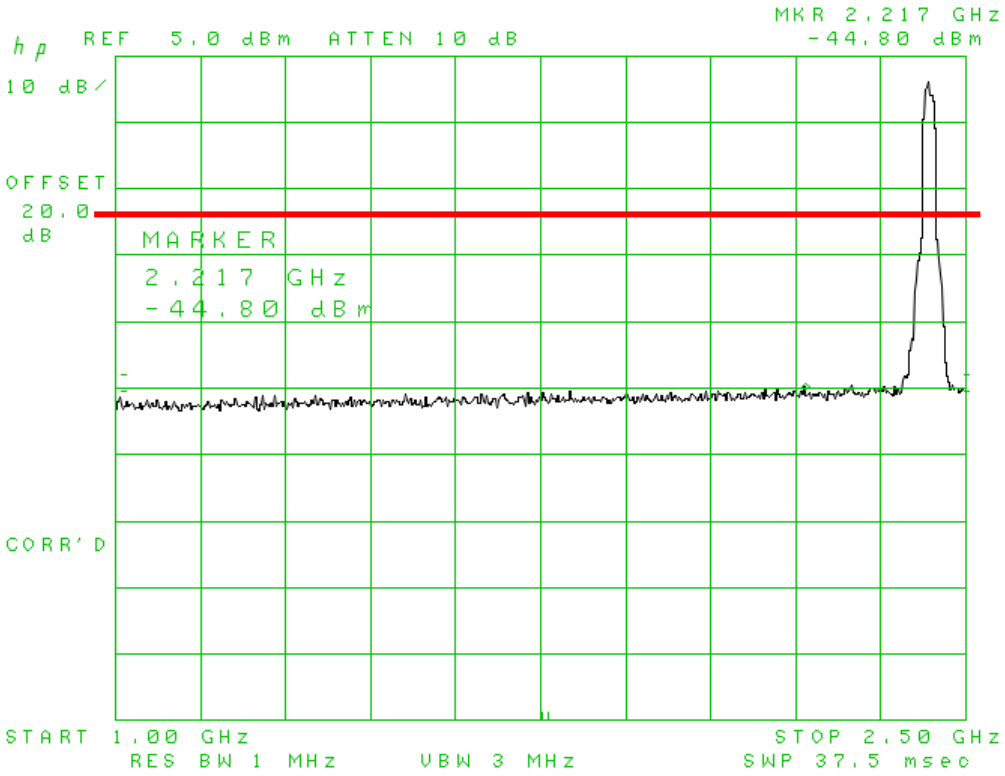


Figure 24. Antenna Conducted Emissions 802.11n Mid, Part 2

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental. The larger peak to the right is the fund mental emission.

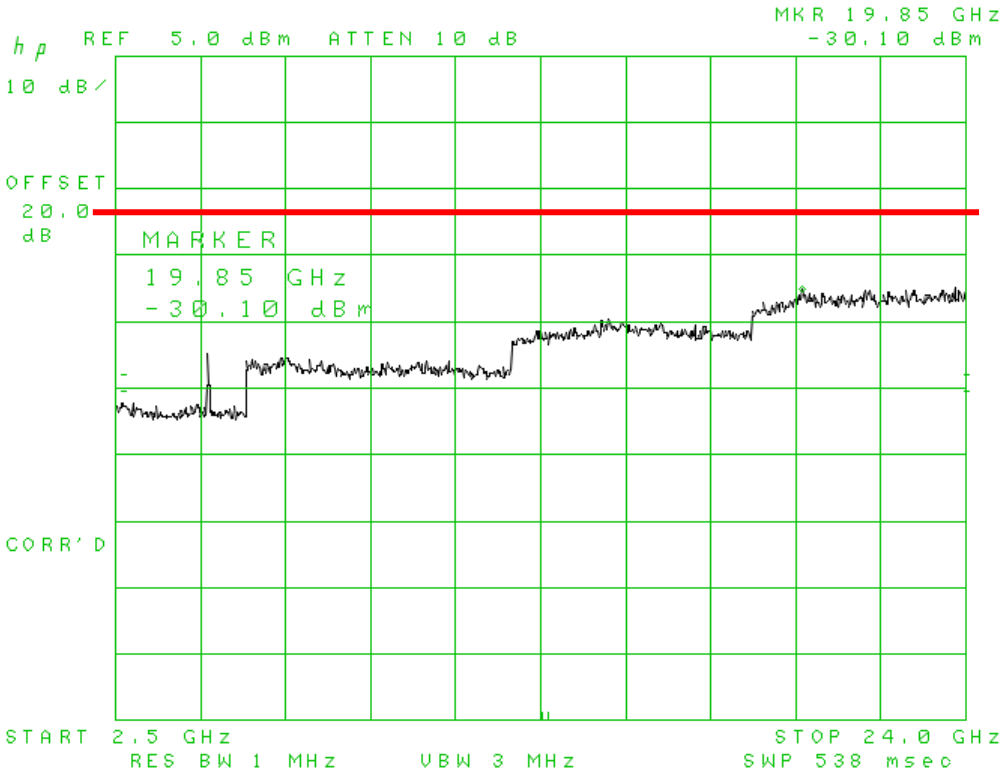


Figure 25. Antenna Conducted Emissions 802.11n Mid, Part 3

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

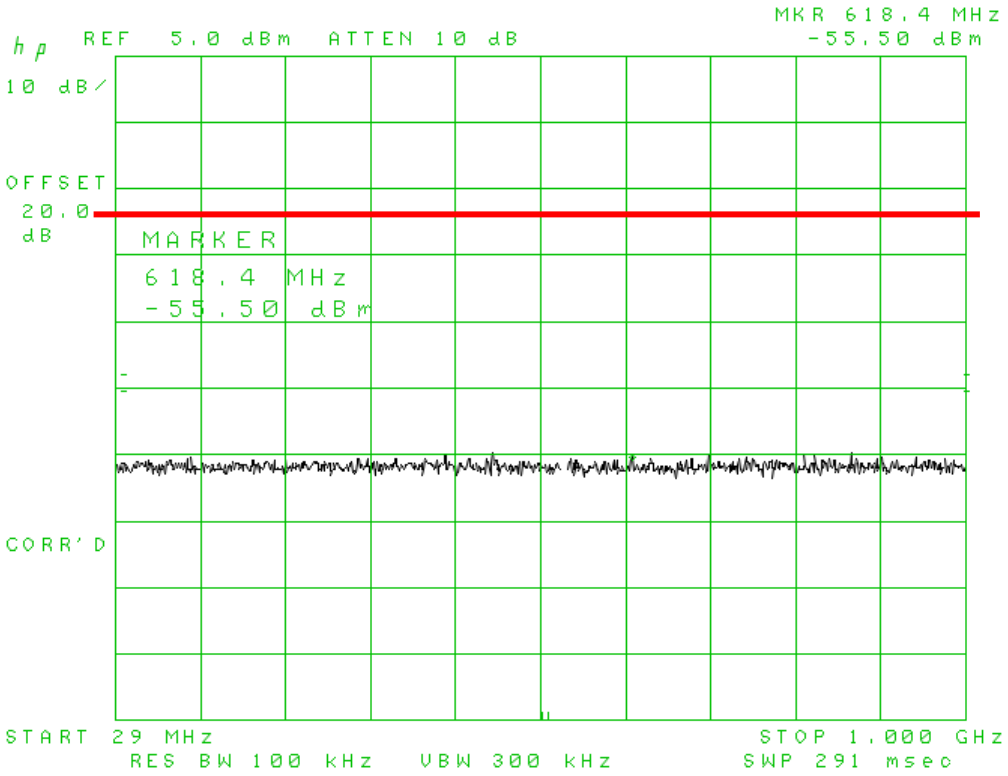


Figure 26. Antenna Conducted Emissions 802.11n High, Part 1

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

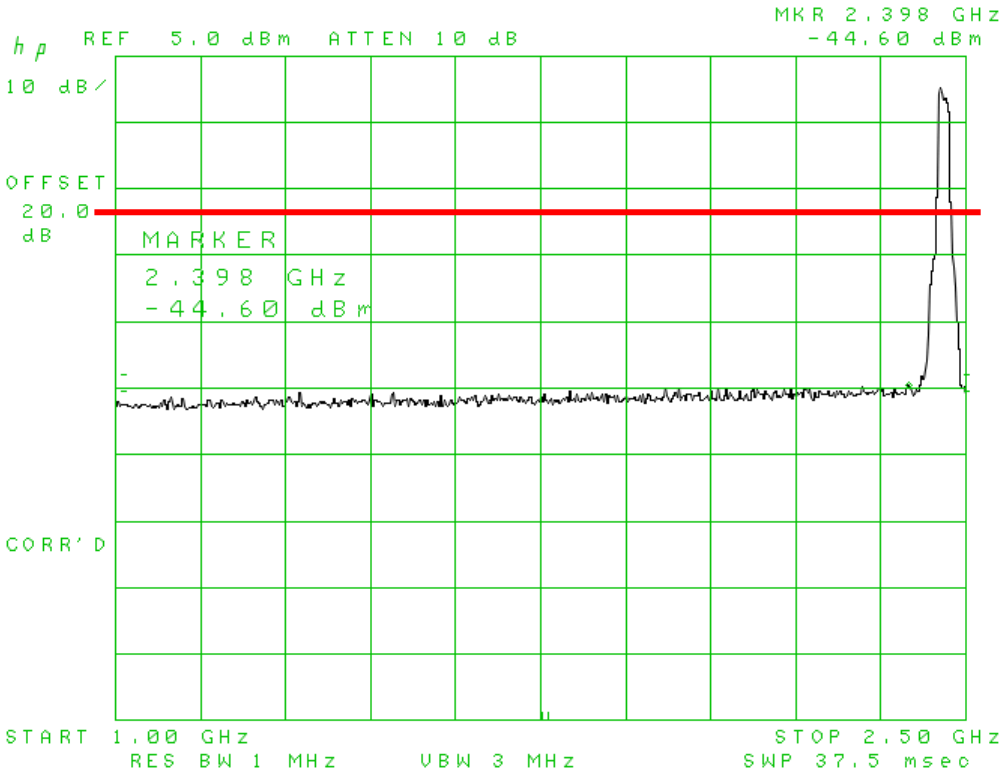


Figure 27. Antenna Conducted Emissions 802.11n High, Part 2

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental. The larger peak to the right is the fund mental emission.

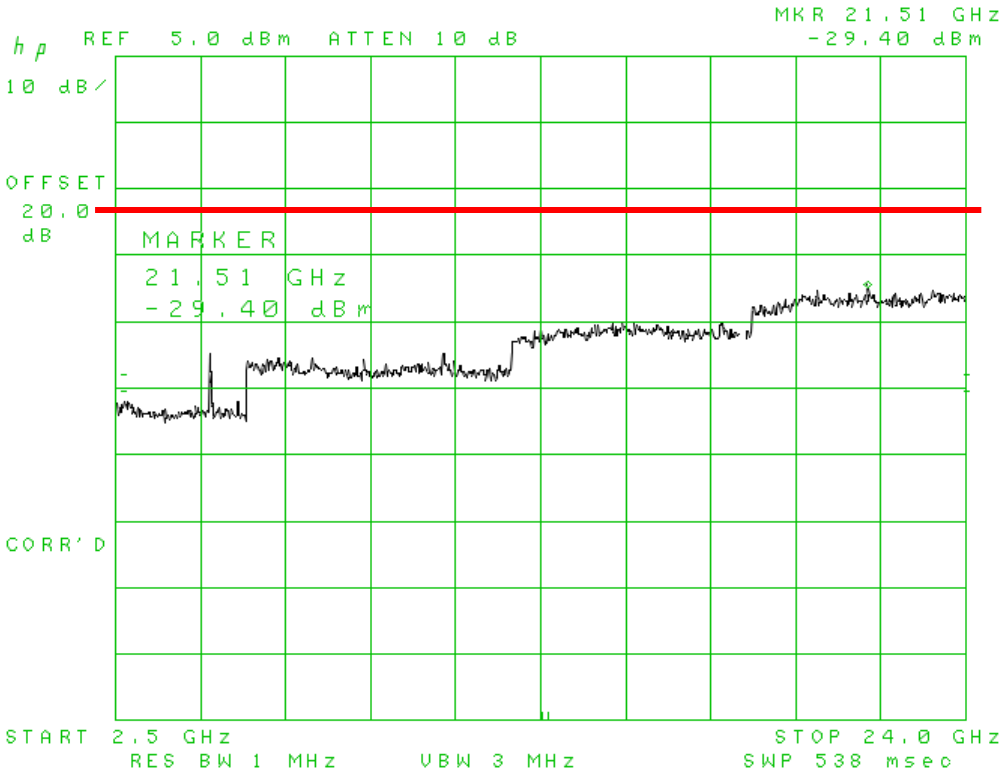


Figure 28. Antenna Conducted Emissions 802.11n High, Part 3

Note: Offset is used to correct for cable loss and attenuator used. The red line is at least 20 dB down from the measured fundamental.

Table 6. 802.11b Peak Radiated Fundamental & Harmonic Emissions

Test: FCC Part 15, Para 15.209, 15.247(d)					**Client:** Aglogica Holdings, Inc.			
Project: 16-0105					**Model:** AGL2			
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**
Low Channel								
2412.00	81.00		32.09	113.09		3.0m./HORZ		**PK**
4824.00	49.14	2.10	7.05	58.29	74.0*	3.0m./HORZ	15.7	**PK**
7236.00	48.50	2.10	12.54	63.14	74.0*	3.0m./HORZ	10.9	**PK**
Mid Channel								
2437.00	80.26		31.53	111.79		3.0m./HORZ		**PK**
4874.00	46.67	2.10	8.14	56.91	74.0*	3.0m./HORZ	17.1	**PK**
High Channel								
2462.00	80.71		31.53	112.24		3.0m./HORZ		**PK**
4924.00	48.20	2.10	8.26	58.56	74.0*	3.0m./HORZ	15.4	**PK**
7383.00	46.64	2.10	14.21	62.95	74.0*	3.0m./HORZ	11.0	**PK**

1. (*) Falls within the restricted bands of CFR 15.205. Limits based on CFR15.209 & 20 dB relaxation for peak measurements of CFR 15.35.
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, tested while broadcasting from each antenna, 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 4824.00 MHz:

Magnitude of Measured Frequency	49.14	dBuV
+Additional Factor (2.4 GHz filter)	2.10	dB
+Antenna Factor + Cable Loss+ Amplifier Gain	7.05	dB/m
Corrected Result	58.29	dBuV/m

Test Date: June 27 & 28, 2016
Tested By
Signature: _____ Name: George Yang

Table 7. 802.11b Average Radiated Fundamental & Harmonic Emissions

Test: FCC Part 15, Para 15.209, 15.247(d)					**Client:** Aglogica Holdings, Inc.			
Project: 16-0105					**Model:** AGL2			
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**
Low Channel								
2412.00	71.39		32.09	103.48		3.0m./HORZ		**AVG**
4824.00	33.75	2.10	7.05	42.90	54.0*	3.0m./HORZ	11.1	**AVG**
7236.00	37.15	2.10	12.54	51.79	54.0*	3.0m./HORZ	2.2	**AVG**
Mid Channel								
2437.00	70.85		31.53	102.38		3.0m./HORZ		**AVG**
4874.00	32.90	2.10	8.14	43.14	54.0*	3.0m./HORZ	10.9	**AVG**
High Channel								
2462.00	70.96		31.53	102.49		3.0m./HORZ		**AVG**
4924.00	34.45	2.10	8.26	44.81	54.0*	3.0m./HORZ	9.2	**AVG**
7383.00	34.09	2.10	14.21	50.40	54.0*	3.0m./HORZ	3.6	**AVG**

1. (*) Falls within the restricted bands of CFR 15.205. Limits based on CFR15.209 & 20 dB relaxation for peak measurements of CFR 15.35.
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, tested while broadcasting from each antenna, 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 4824.00 MHz:

Magnitude of Measured Frequency	33.75	dBuV
Additional Factor (2.4 GHz filter)	2.10	dB
+Antenna Factor + Cable Loss+ Amplifier Gain – Duty Cycle	7.05	dB/m
Corrected Result	42.90	dBuV/m

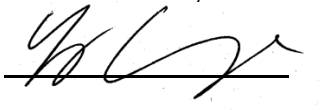
Test Date: June 27 & 28, 2016
Tested By
Signature:  Name: George Yang

Table 8. 802.11g Peak Radiated Fundamental & Harmonic Emissions

Test: FCC Part 15, Para 15.209, 15.247(d)					**Client:** Aglogica Holdings, Inc.			
Project: 16-0105					**Model:** AGL2			
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**
Low Channel								
2412.00	82.82		30.08	112.90		3.0m./HORZ		**PK**
4824.00	53.76	2.10	3.82	59.68	74.0*	3.0m./HORZ	17.3	**PK**
Mid Channel								
2437.00	83.91		30.16	114.07		3.0m./HORZ		**PK**
4874.00	54.36	2.10	4.28	60.74	74.0*	3.0m./HORZ	13.3	**PK**
High Channel								
2462.00	81.56		30.16	111.72		3.0m./HORZ		**PK**
4924.00	54.69	2.10	4.48	61.27	74.0*	3.0m./HORZ	12.7	**PK**

1. (*) Falls within the restricted bands of CFR 15.205. Limits based on CFR15.209 & 20 dB relaxation for peak measurements of CFR 15.35.
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, tested while broadcasting from each antenna, 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 4824.00 MHz:

Magnitude of Measured Frequency	53.76	dBuV
Additional Factor (2.4 GHz filter)	2.10	dB
+Antenna Factor + Cable Loss+ Amplifier Gain – Duty Cycle	3.82	dB/m
Corrected Result	59.68	dBuV/m

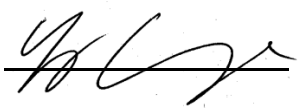
Test Date: June 27 & 28, 2016
Tested By
Signature:  Name: George Yang

Table 9. 802.11g Average Radiated Fundamental & Harmonic Emissions

Test: FCC Part 15, Para 15.209, 15.247(d)					**Client:** Aglogica Holdings, Inc.			
Project: 16-0105					**Model:** AGL2			
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**
Low Channel								
2412.00	63.50		30.08	93.58		3.0m./HORZ		**AVG**
4824.00	36.63	2.10	3.82	42.55	54.0*	3.0m./HORZ	11.4	**AVG**
Mid Channel								
2437.00	64.46		30.16	94.62		3.0m./HORZ		**AVG**
4874.00	35.64	2.10	4.28	42.02	54.0*	3.0m./HORZ	12.0	**AVG**
High Channel								
2462.00	62.67		30.16	92.83		3.0m./HORZ		**AVG**
4924.00	36.51	2.10	4.48	43.09	54.0*	3.0m./HORZ	10.9	**AVG**

1. (*) Falls within the restricted bands of CFR 15.205. Limits based on CFR15.209 & 20 dB relaxation for peak measurements of CFR 15.35.
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, tested while broadcasting from each antenna, 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 4824.00 MHz:

Magnitude of Measured Frequency	36.63	dBuV
Additional Factor (2.4 GHz filter)	2.10	dB
+Antenna Factor + Cable Loss+ Amplifier Gain – Duty Cycle	3.82	dB/m
Corrected Result	42.55	dBuV/m

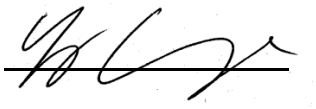
Test Date: June 27 & 28, 2016
Tested By
Signature:  Name: George Yang

Table 10. 802.11n Peak Radiated Fundamental & Harmonic Emissions

Test: FCC Part 15, Para 15.209, 15.247(d)					**Client:** Aglogica Holdings, Inc.			
Project: 16-0105					**Model:** AGL2			
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**
Low Channel								
2412	77.19		32.09	109.28		3.0m./HORZ		**PK**
4824	44.42	2.10	7.05	53.57	74.0*	3.0m./HORZ	20.4	**PK**
Mid Channel								
2437	76.56		31.53	108.09		3.0m./HORZ		**PK**
4874	41.74	2.10	8.05	51.89	74.0*	3.0m./HORZ	22.1	**PK**
High Channel								
2462	76.62		31.53	108.15		3.0m./HORZ		**PK**
4924	43.42	2.10	8.26	53.78	74.0*	3.0m./HORZ	20.2	**PK**

1. (*) Falls within the restricted bands of CFR 15.205. Limits based on CFR15.209 & 20 dB relaxation for peak measurements of CFR 15.35.
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, tested while broadcasting from each antenna, 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 4824.00 MHz:

Magnitude of Measured Frequency	44.42	dBuV
Additional Factor (2.4 GHz filter)	2.10	dB
+Antenna Factor + Cable Loss+ Amplifier Gain – Duty Cycle	7.05	dB/m
Corrected Result	53.57	dBuV/m

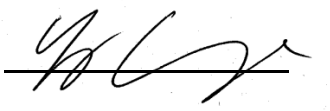
Test Date: June 27 & 28, 2016
Tested By
Signature:  Name: George Yang

Table 11. 802.11n Average Radiated Fundamental & Harmonic Emissions

Test: FCC Part 15, Para 15.209, 15.247(d)					**Client:** Aglogica Holdings, Inc.			
Project: 16-0105					**Model:** AGL2			
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**
Low Channel								
2412	59.17		32.09	91.26		3.0m./HORZ		**AVG**
4824	31.24	2.10	7.05	40.39	54.0*	3.0m./HORZ	13.6	**AVG**
Mid Channel								
2437	58.73		31.53	90.26		3.0m./HORZ		**AVG**
4874	30.68	2.10	8.05	40.83	54.0*	3.0m./HORZ	13.2	**AVG**
High Channel								
2462	58.62		31.53	90.15		3.0m./HORZ		**AVG**
4924	31.52	2.10	8.26	41.88	54.0*	3.0m./HORZ	12.1	**AVG**

1. (*) Falls within the restricted bands of CFR 15.205. Limits based on CFR15.209 & 20 dB relaxation for peak measurements of CFR 15.35.
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, tested while broadcasting from each antenna, 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 4824.00 MHz:

Magnitude of Measured Frequency	31.24	dBuV
Additional Factor (2.4 GHz filter)	2.10	dB
+Antenna Factor + Cable Loss+ Amplifier Gain – Duty Cycle	7.05	dB/m
Corrected Result	40.39	dBuV/m

Test Date: June 27 & 28, 2016
Tested By
Signature: _____ Name: George Yang

2.11 Band Edge Measurements – (CFR 15.247 (d))

Band Edge measurements are made following the guidelines in ANSI C63.10-2013 with the EUT initially operating on the Lowest Channel and then operating on the Highest Channel within its band of operation. Measurements are performed to demonstrate compliance with the requirement of 15.247(d) that all emissions outside of the band edges be attenuated by at least 20 dB when compared to its highest in-band value (contained in a 100 kHz band).

To capture the band edge the Spectrum Analyzer frequency span was set to 2 MHz or a span wide enough to capture the peak level of the emission operating on the channel closest to the band edge as well as any modulation products falling outside of the authorized band of operation. Measurements are performed with RBW approximately 1.5* Span. In all cases, the VBW is set ≥ RBW. See figure and calculations below for more detail.

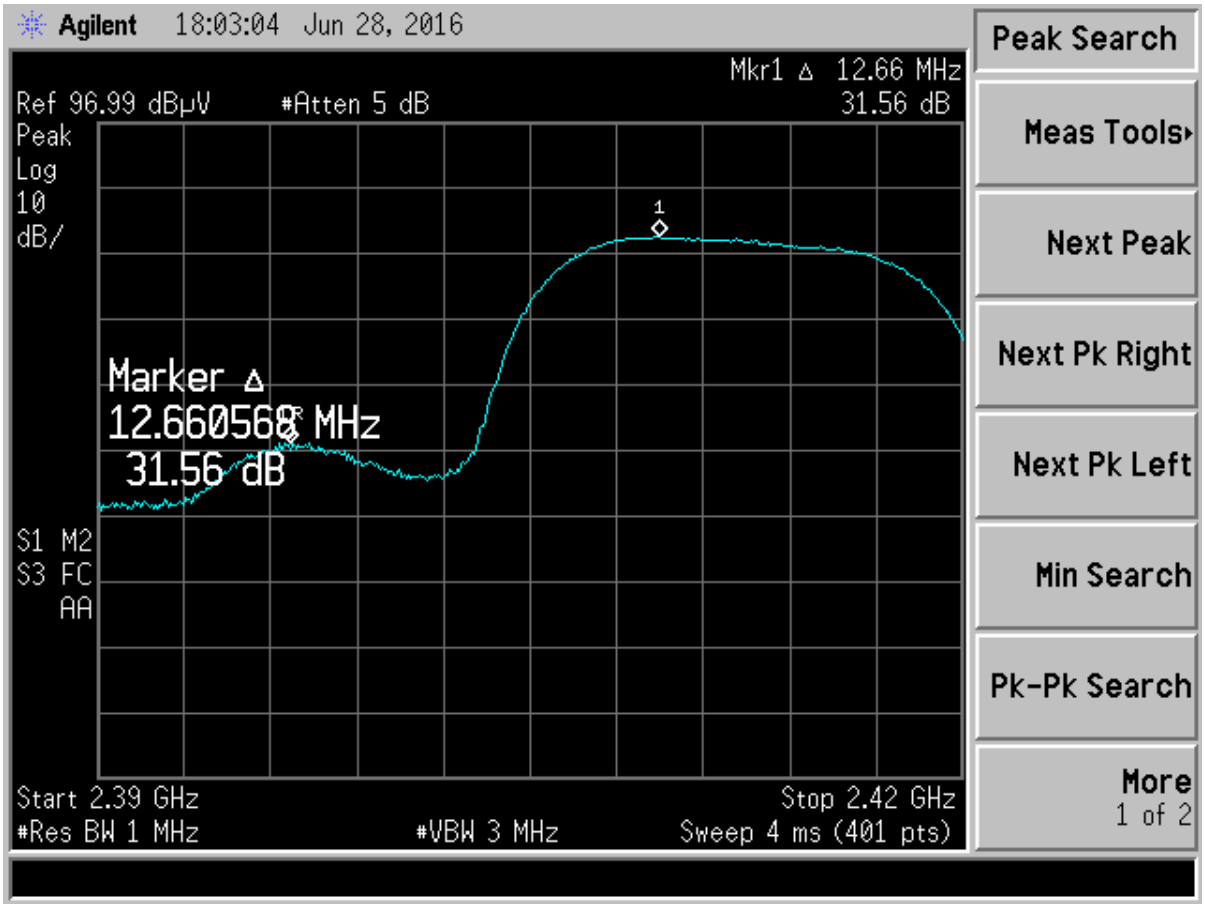


Figure 29. Band Edge Compliance, 802.11b Low Channel - Peak

Note: Plot shows 20 dB in-band limit. Restricted band emissions evaluated below.

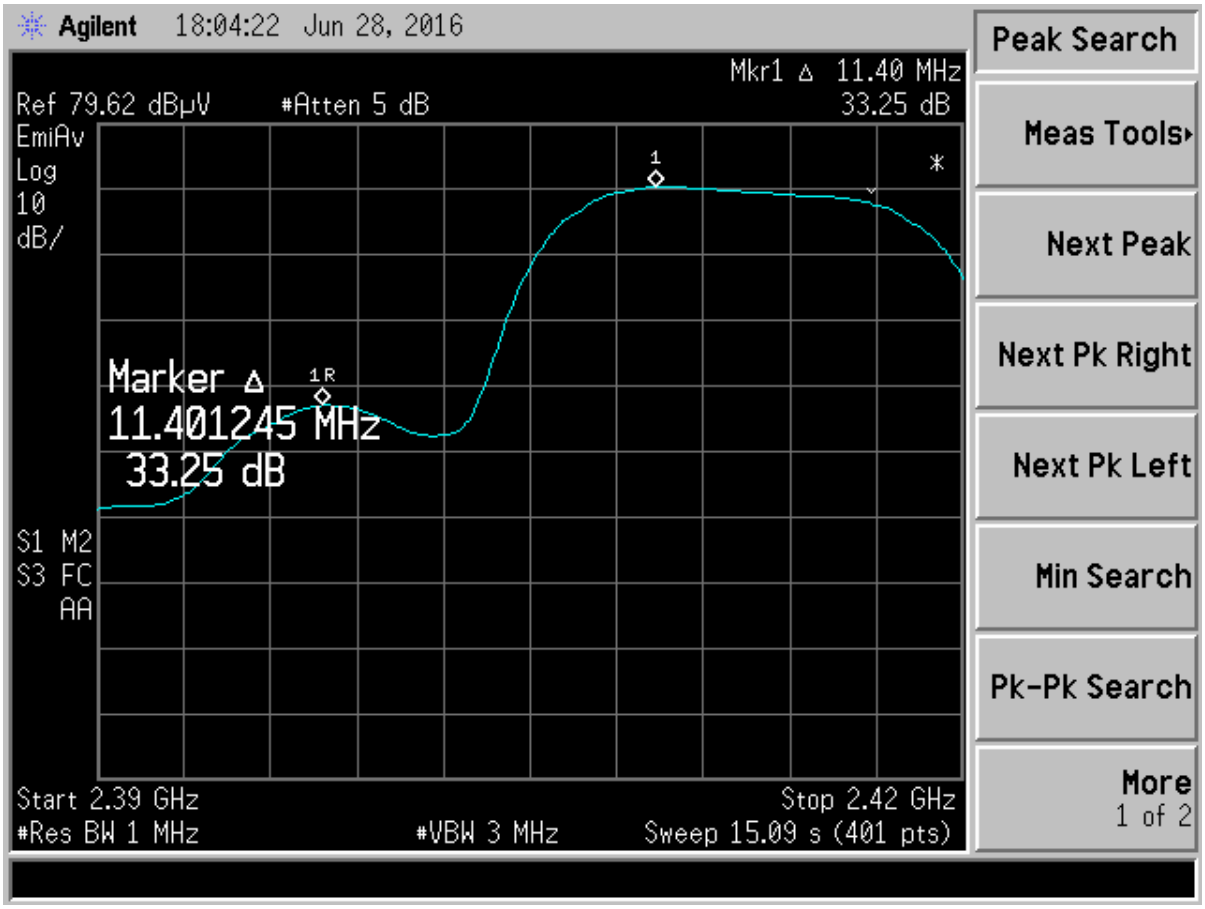


Figure 30. Band Edge Compliance, 802.11b Low Channel - Average

Note: Plot shows 20 dB in-band limit. Restricted band emissions evaluated below.

Calculation of lower band edge measurement:

Band Edge Calculated Result	33.25	dB
Band Edge Limit (20 dB from Fundamental)	20.00	dB
Band Edge Margin	13.25	dB

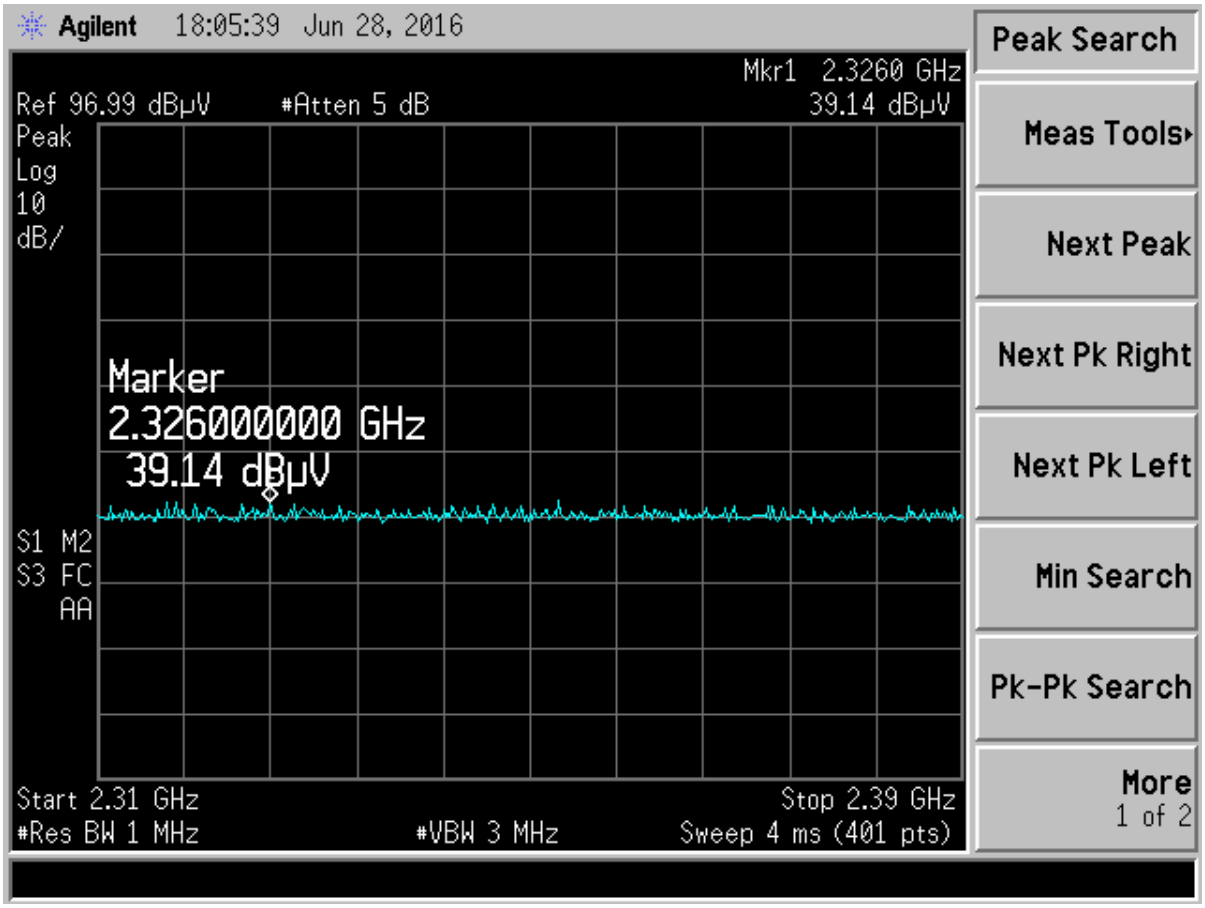


Figure 31. Radiated Restricted band 2310 MHz to 2390 MHz, 802.11b - Peak

Table 12. Radiated Restricted Band 2310 MHz to 2390 MHz, 802.11b – Peak

2310 MHz to 2390 MHz Restricted Band Peak Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**AVG Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2326.00	39.14	-4.52	34.62	54	3.0m/HORZ	19.4	**PK**

NOTE: Peak value meets AVG limit for restricted band.

Test Date: June 28 & 29, 2016
Tested By
Signature: Name: George Yang

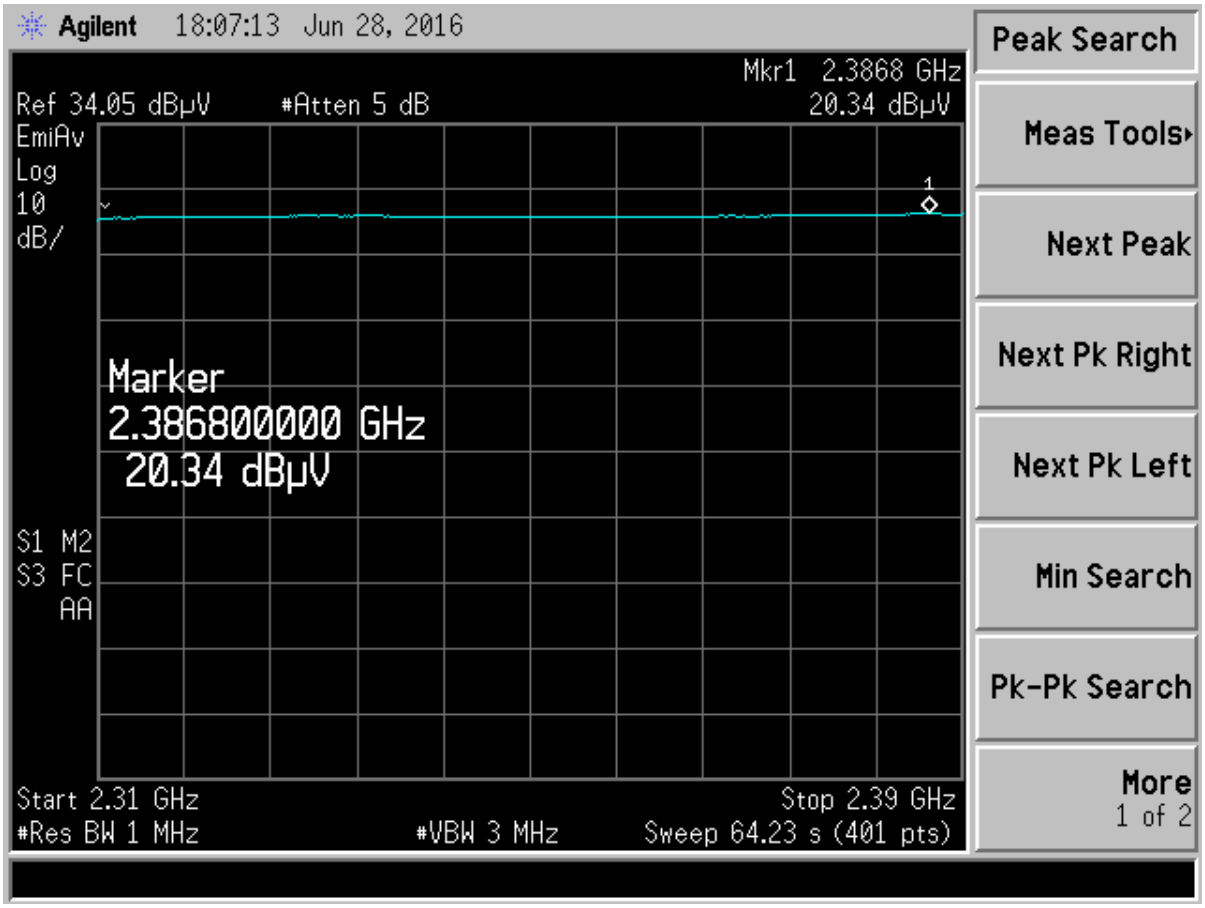


Figure 32. Radiated Restricted band 2310 MHz to 2390 MHz, 802.11b - Average

Table 12. Radiated Restricted Band 2310 MHz to 2390 MHz, 802.11b – Average

2483.5 MHz to 2500 MHz Restricted Band Average Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**PK Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2386.80	20.34	30.58	50.92	54.0	3.0m./HORZ	3.1	**AVG**

Test Date: June 28 & 29, 2016
Tested By
Signature: _____ Name: George Yang

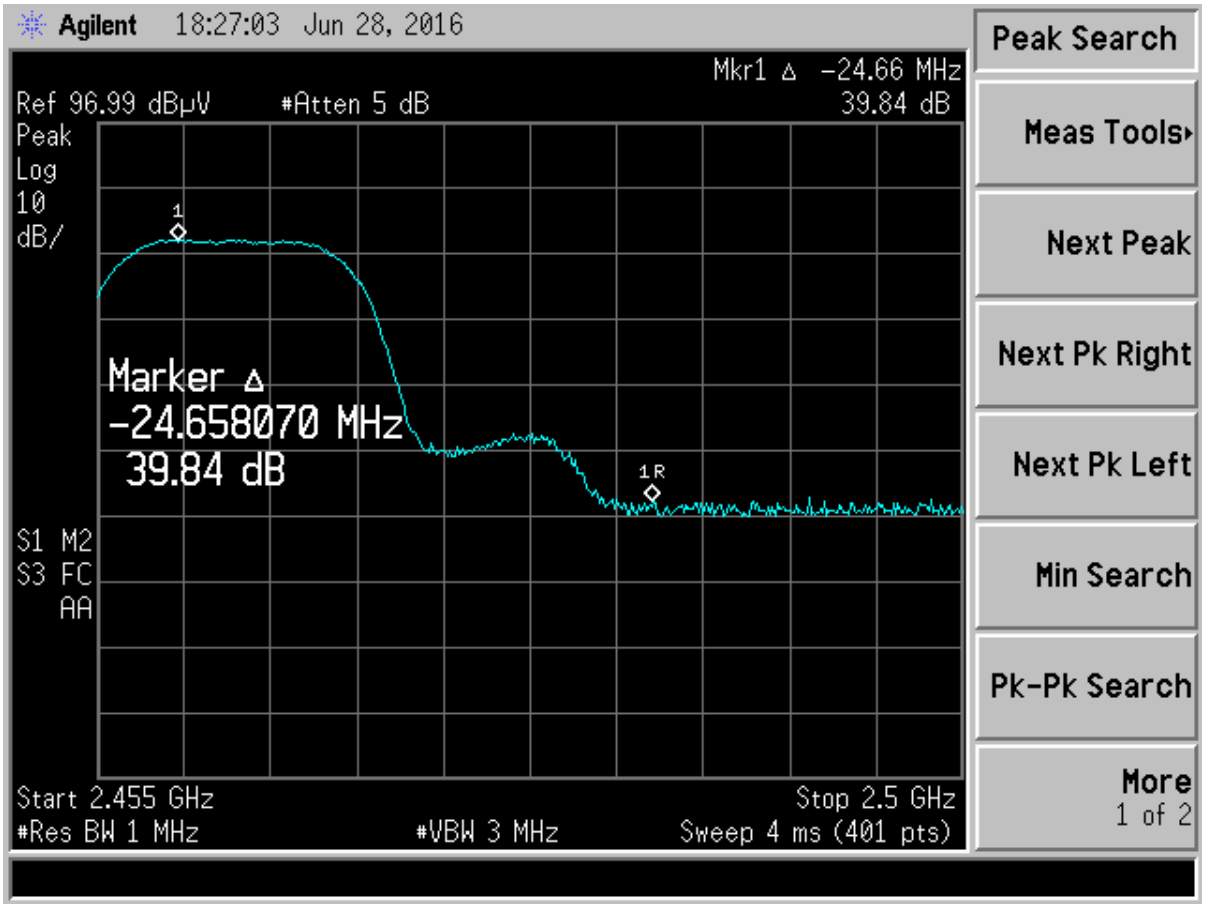


Figure 33. Band Edge Compliance, 802.11b High Channel – Peak

Note: Plot shows 20 dB in-band limit. Restricted band emissions evaluated below.

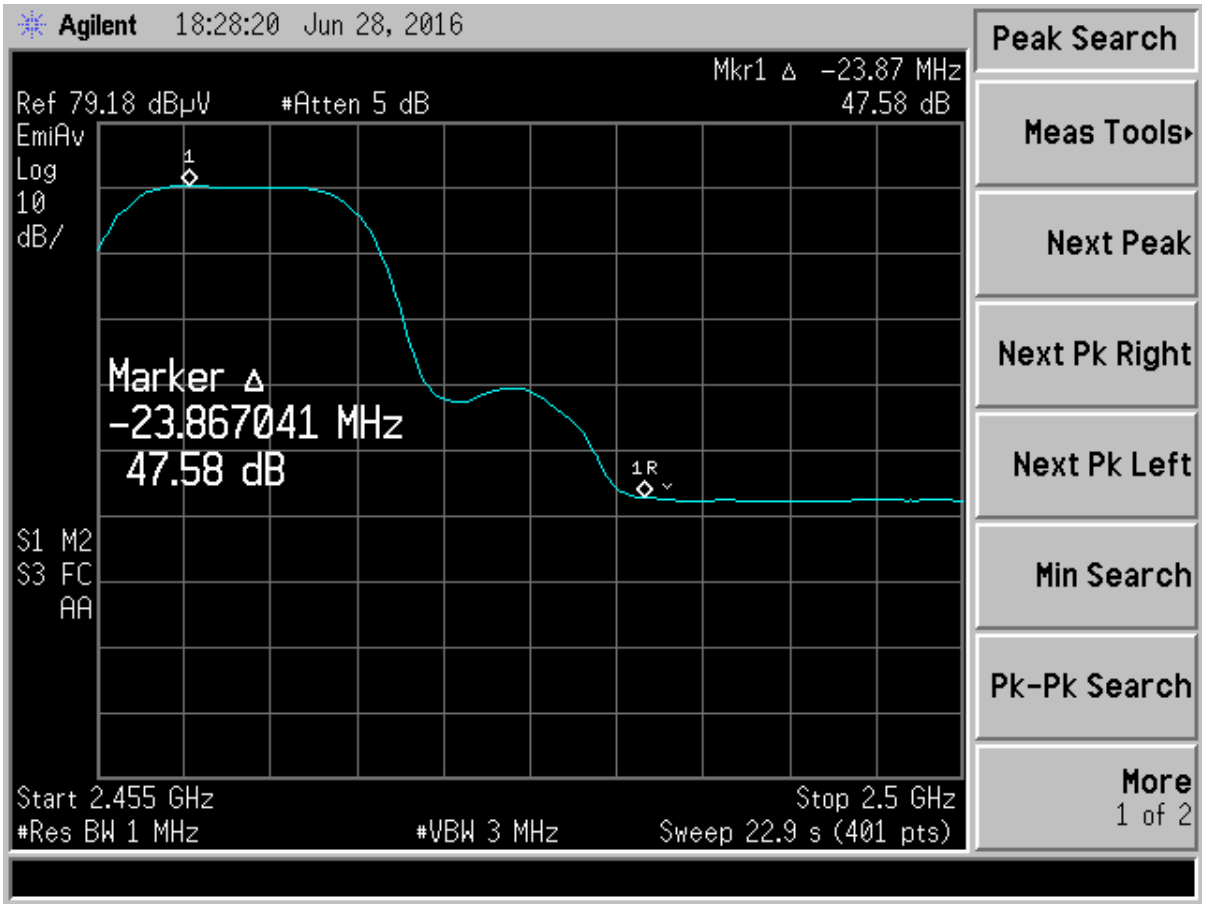


Figure 34. Band Edge Compliance, 802.11b High Channel – Average

Note: Plot shows 20 dB in-band limit. Restricted band emissions evaluated below.

Calculation of lower band edge measurement:

Band Edge Calculated Result	47.58	dB
Band Edge Limit (20 dB from Fundamental)	20.00	dB
Band Edge Margin	27.58	dB

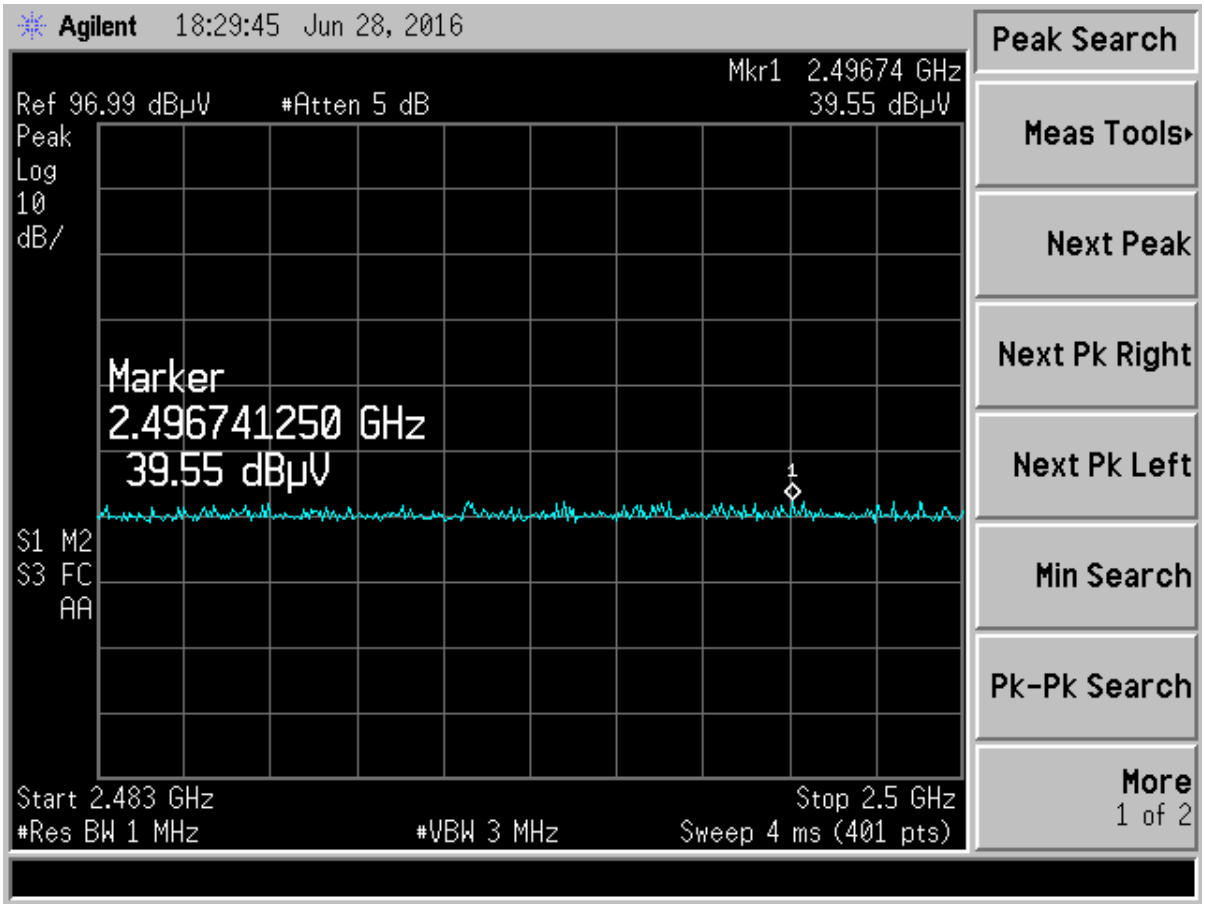


Figure 35. Radiated Restricted Band 2483.5 MHz to 2500 MHz, 802.11b - Peak

Table 13. Radiated Restricted Band 2483.5 MHz to 2500 MHz, 802.11b – Peak

2483.5 MHz to 2500 MHz Restricted Band Peak Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**PK Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2496.74	39.55	30.98	70.53	74.0	3.0m./HORZ	3.5	**PK**

Test Date: June 28 & 29, 2016
Tested By
Signature: Name: George Yang

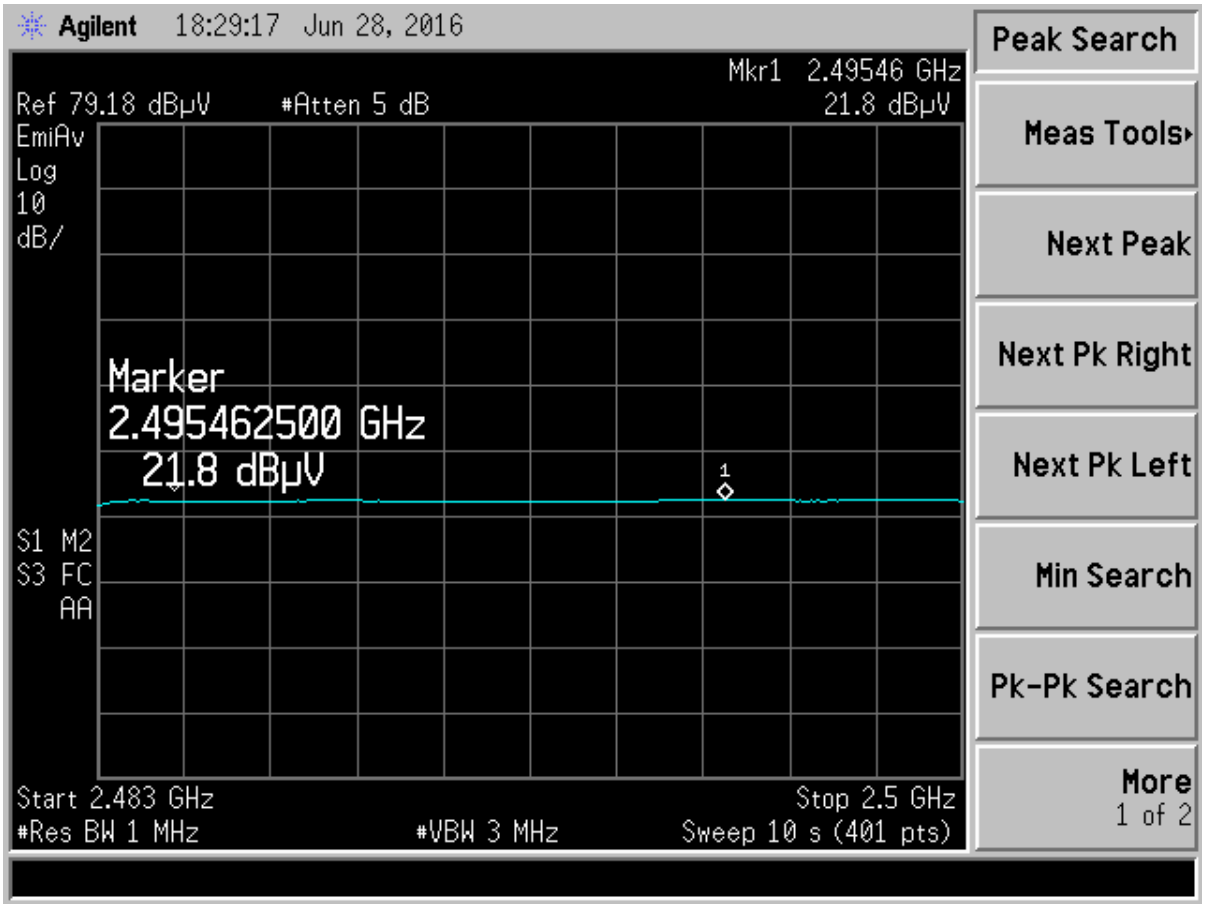


Figure 36. Radiated Restricted Band 2483.5 MHz to 2500 MHz, 802.11b - Average

Table 14. Radiated Restricted Band 2483.5 MHz to 2500 MHz, 802.11b – Average

2483.5 MHz to 2500 MHz Restricted Band Average Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**PK Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2495.46	21.8	30.98	52.78	54.0	3.0m./HORZ	1.2	**AVG**

Test Date: June 28 & 29, 2016
Tested By
Signature: Name: George Yang

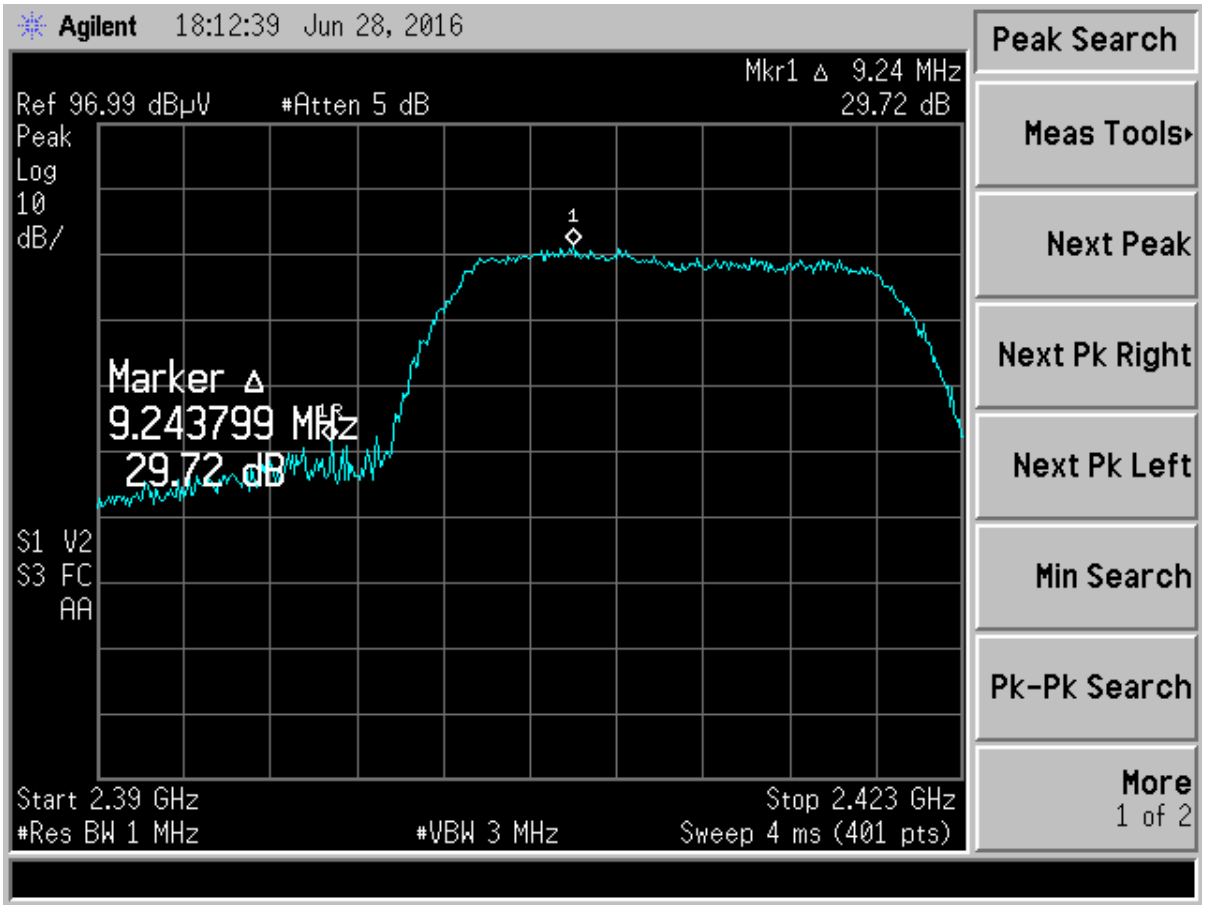


Figure 37. Band Edge Compliance, 802.11g Low Channel Delta - Peak

Note: Plot shows 20 dB in-band limit. Restricted band emissions evaluated below.

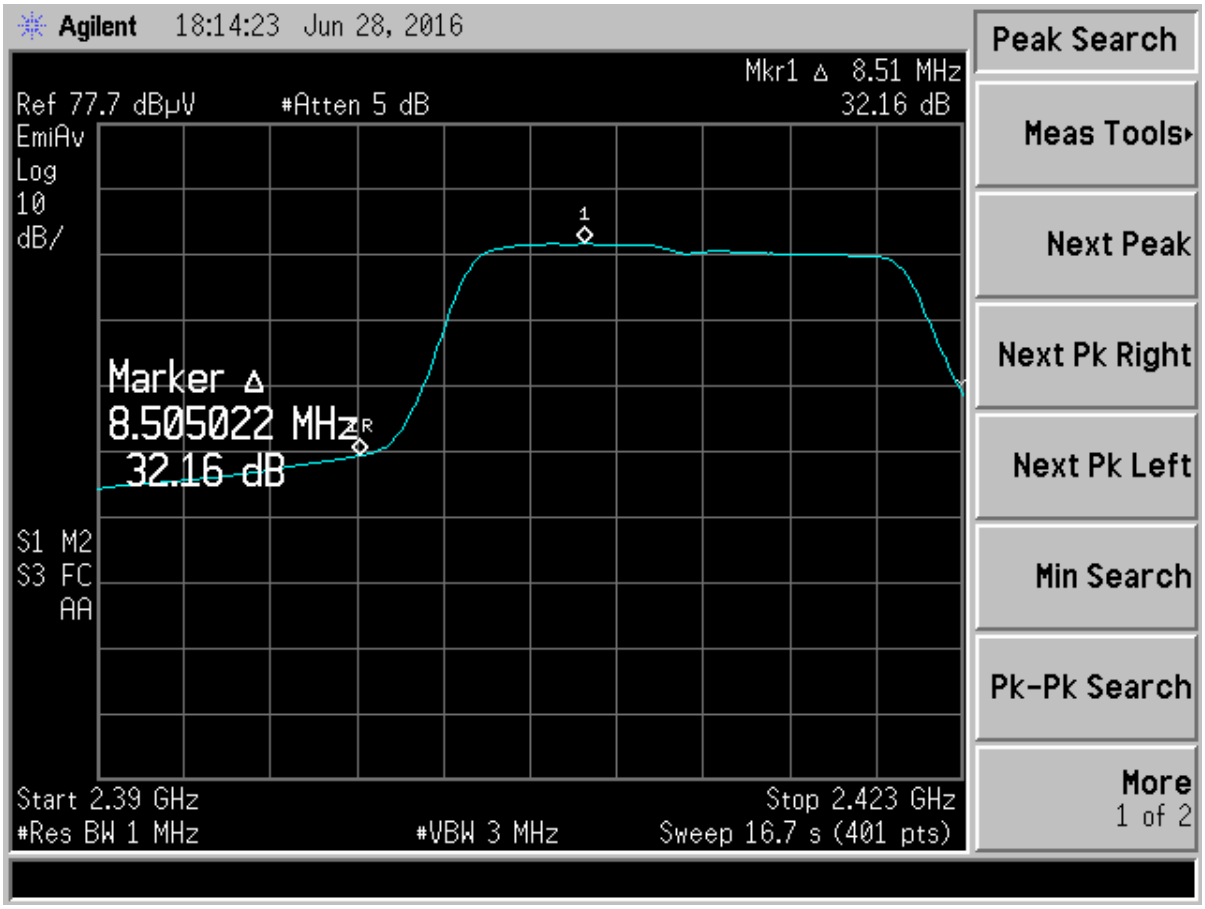


Figure 38. Band Edge Compliance, 802.11g Low Channel Delta - Average

Note: Plot shows 20 dB in-band limit. Restricted band emissions evaluated below.

Calculation of lower band edge measurement:

Band Edge Calculated Result	32.16	dB
Band Edge Limit (20 dB from Fundamental)	20.00	dB
Band Edge Margin	12.16	dB

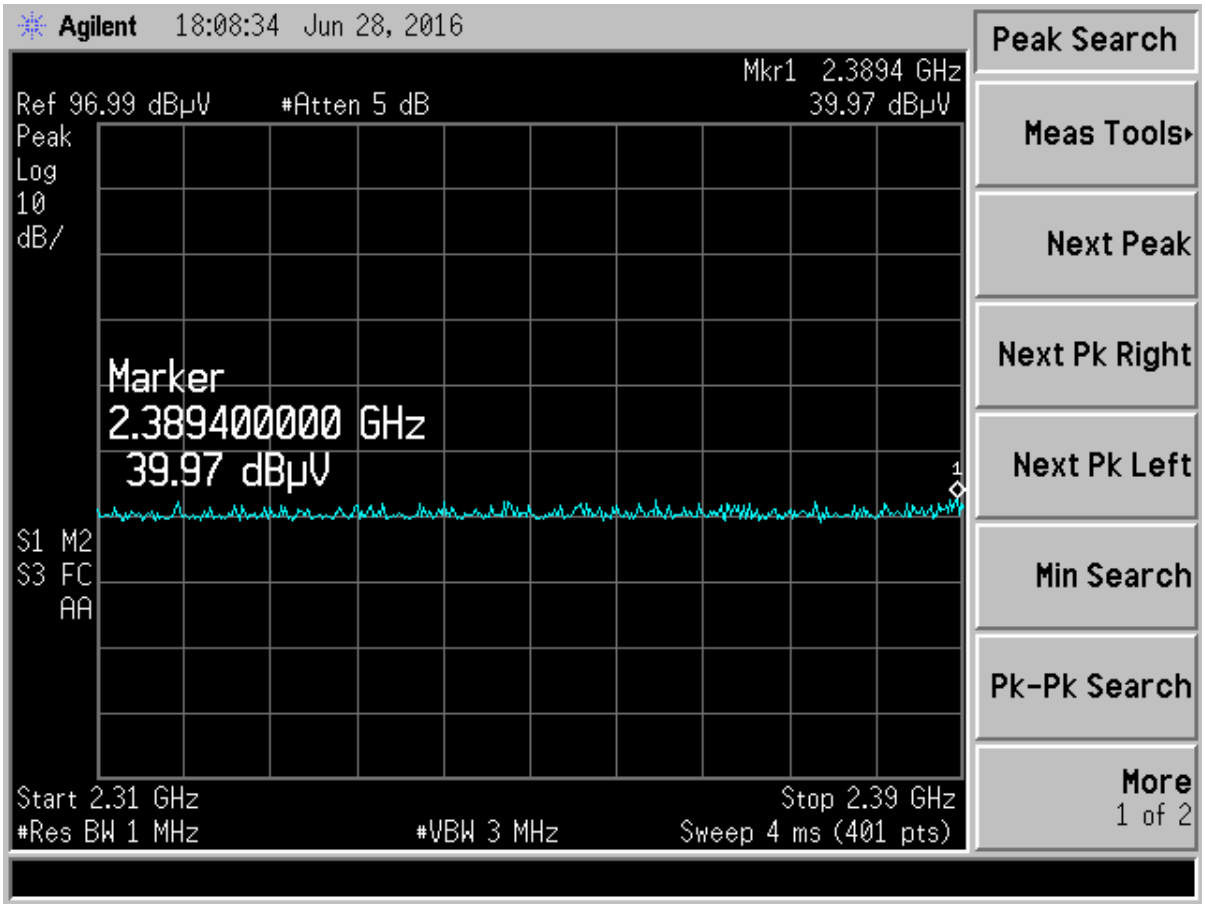


Figure 39. Radiated Restricted band 2310 MHz to 2390 MHz, 802.11g - Peak

Table 15. Radiated Restricted Band 2310 MHz to 2390 MHz, 802.11g – Peak

2310 MHz to 2390 MHz Restricted Band Peak Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**PK Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2389.40	39.97	30.58	70.55	74.0	3.0m./HORZ	3.5	**PK**

Test Date: June 28 & 29, 2016
Tested By
Signature: Name: George Yang

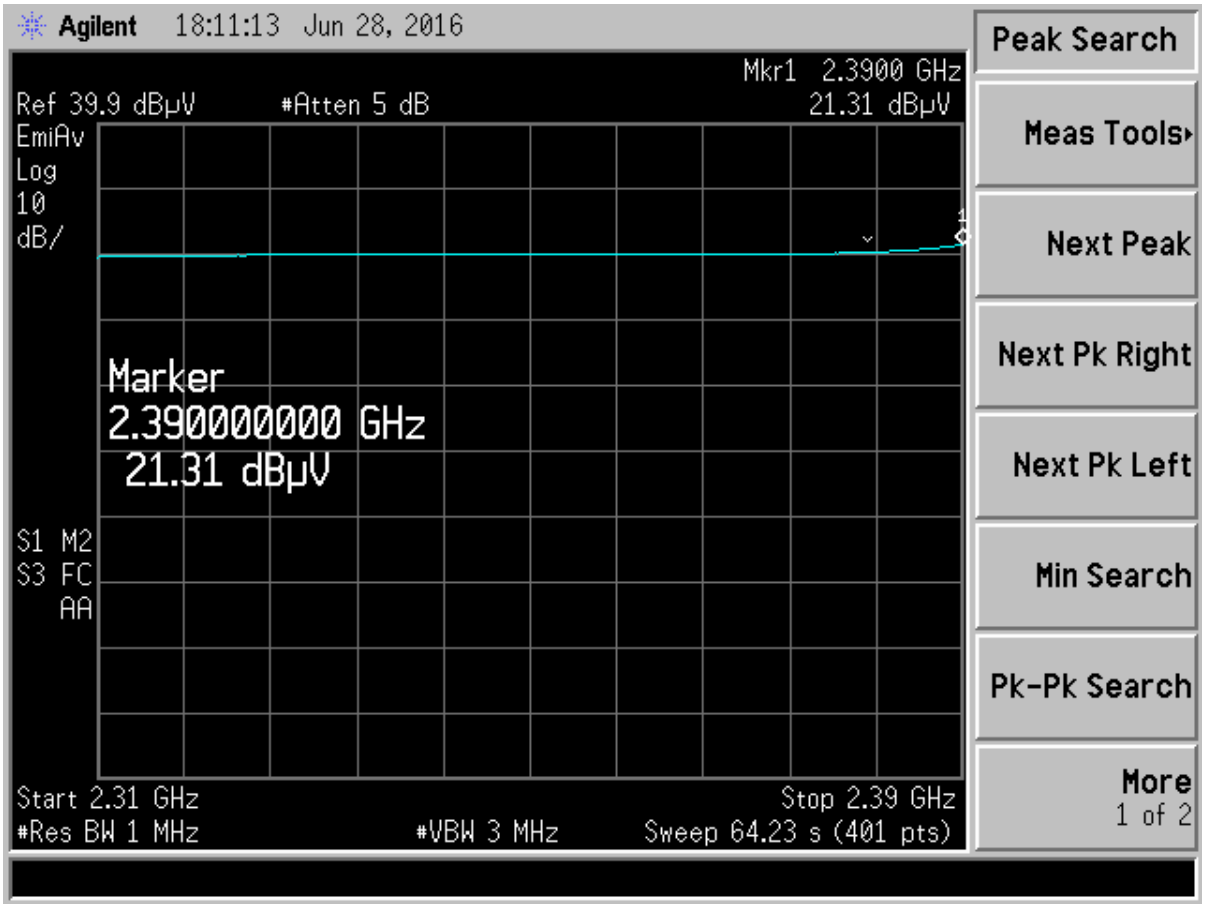


Figure 40. Radiated Restricted Band 2310 MHz to 2390 MHz, 802.11g -Average

Radiated Restricted Band 2310 MHz to 2390 MHz, 802.11g – Average

2310 MHz to 2390 MHz Restricted Band Average Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**AVG Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2390.00	21.31	30.58	51.89	54.0	3.0m./HORZ	2.1	**AVG**

Test Date: June 28 & 29, 2016
Tested By
Signature: Name: George Yang

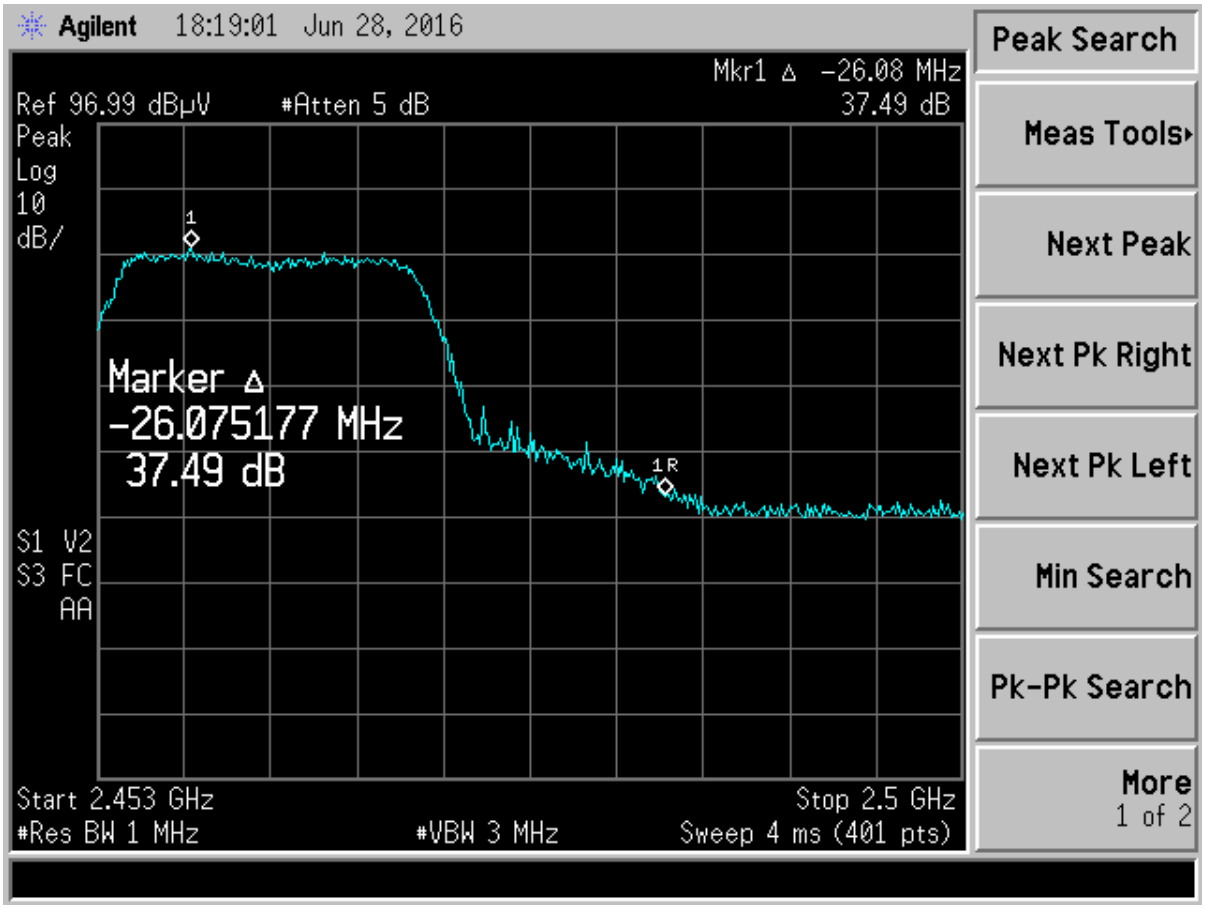


Figure 41. Band Edge Compliance, 802.11g High Channel Delta – Peak

Note: Plot shows 20 dB in-band limit. Restricted band emissions evaluated below.

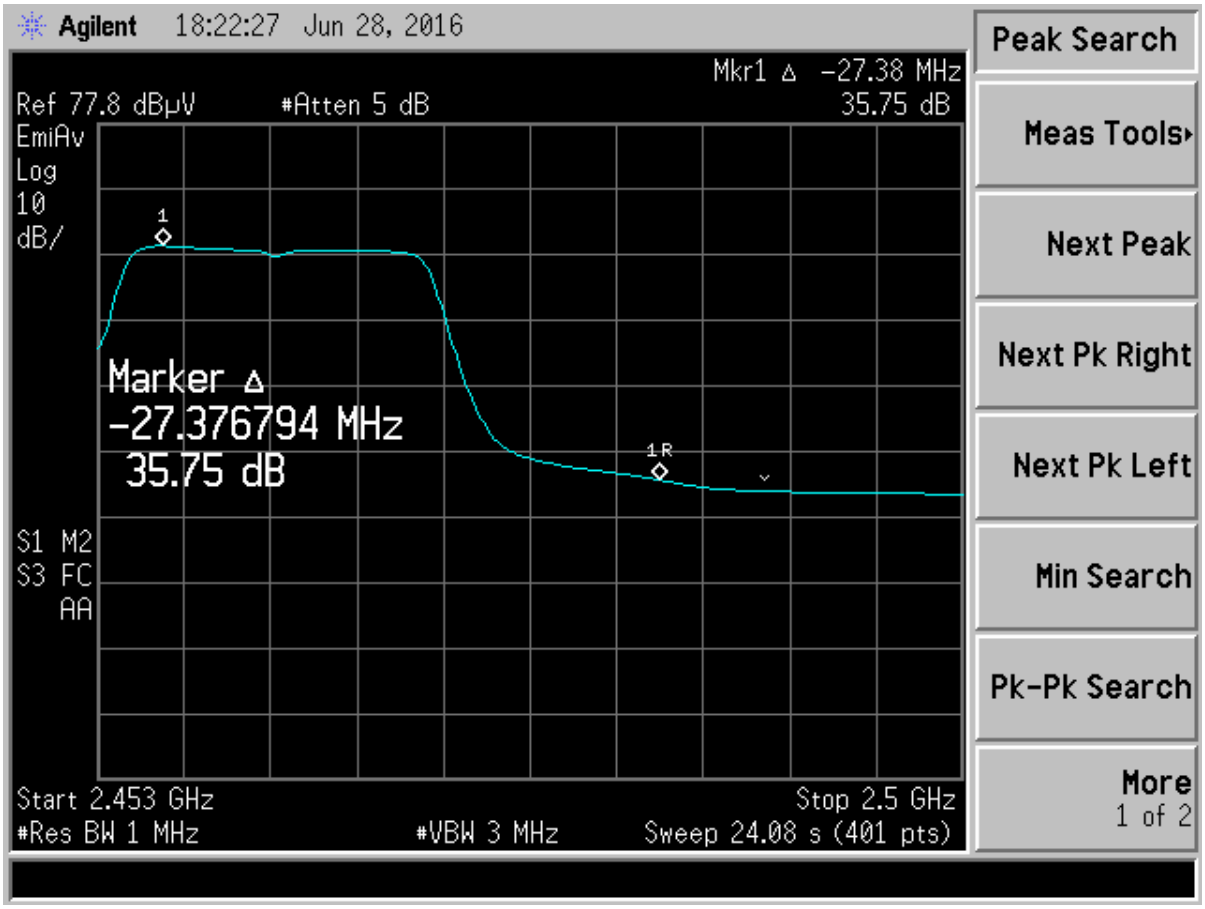


Figure 42. Band Edge Compliance, 802.11g High Channel Delta – Average

Note: Plots shows 20 dB in-band limit. Restricted band emissions evaluated below.

Calculation of upper band edge measurement:

Band Edge Calculated Result	35.75	dB
Band Edge Limit (20 dB from Fundamental)	20.00	dB
Band Edge Margin	15.75	dB

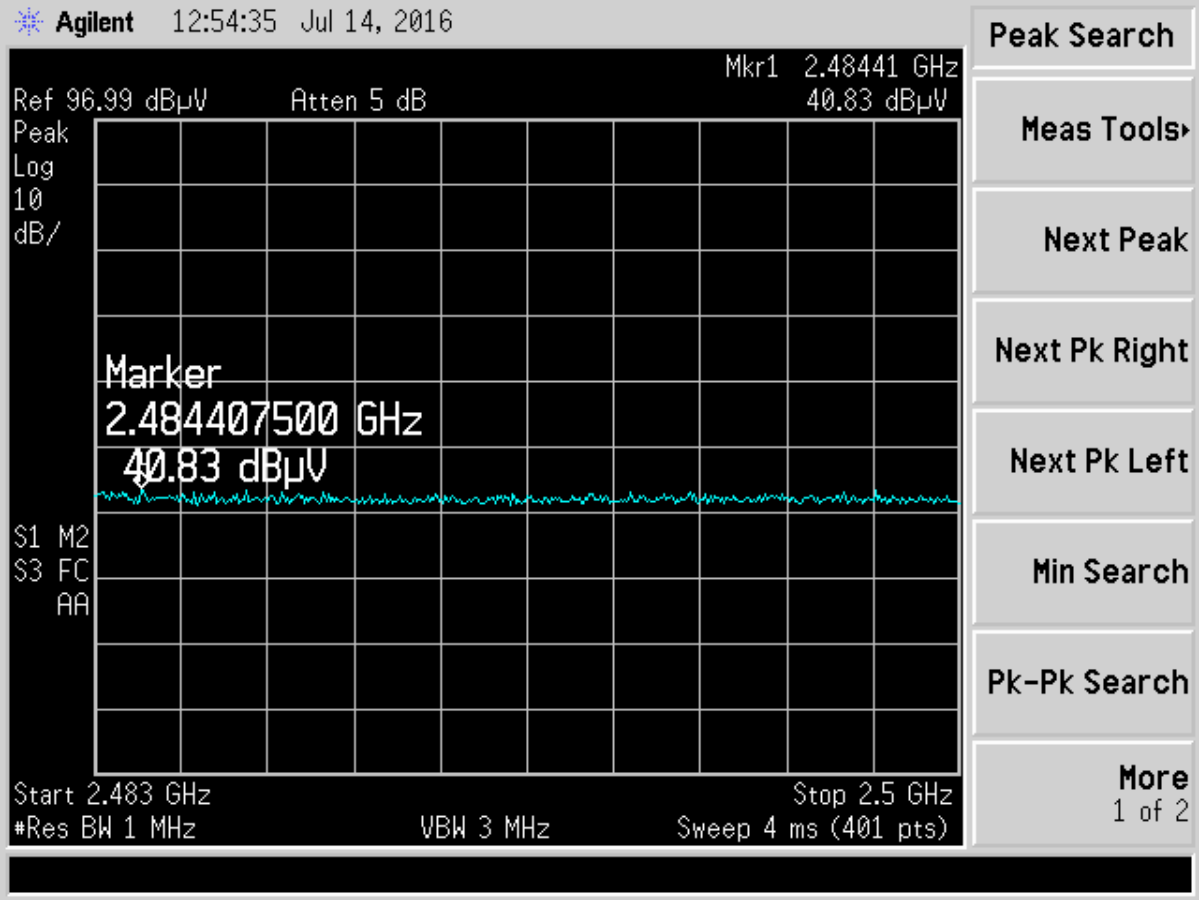


Figure 43. Radiated Restricted Band 2483.5 MHz to 2500 MHz, 802.11g - Peak

Table 15. Radiated Restricted Band 2483.5 MHz to 2500 MHz, 802.11g – Peak

2483.5 MHz to 2500 MHz Restricted Band Peak Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**PK Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2484.40	40.83	32.88	73.70	74.0	3.0m./HORZ	0.3	**PK**

Test Date: July 14, 2016
Tested By
Signature: Name: George Yang

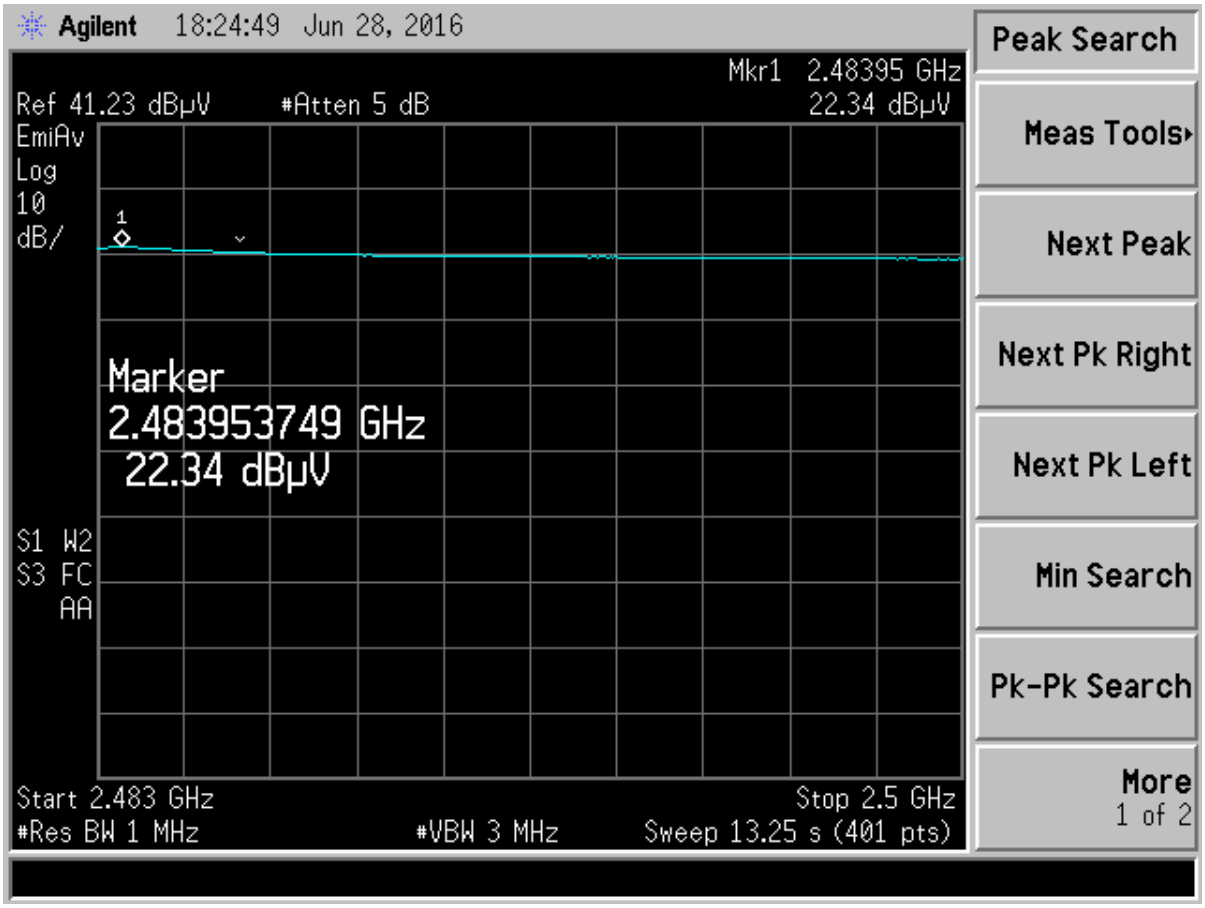


Figure 44. Radiated Restricted Band 2483.5 MHz to 2500 MHz, 802.11g - Average

Table 16. Radiated Restricted Band 2483.5 MHz to 2500 MHz, 802.11g – Average

2483.5 MHz to 2500 MHz Restricted Band Average Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**AVG Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2483.95	22.34	30.98	53.32	54.0	3.0m./HORZ	0.7	**AVG**

Test Date: June 28 & 29, 2016
Tested By
Signature: Name: George Yang

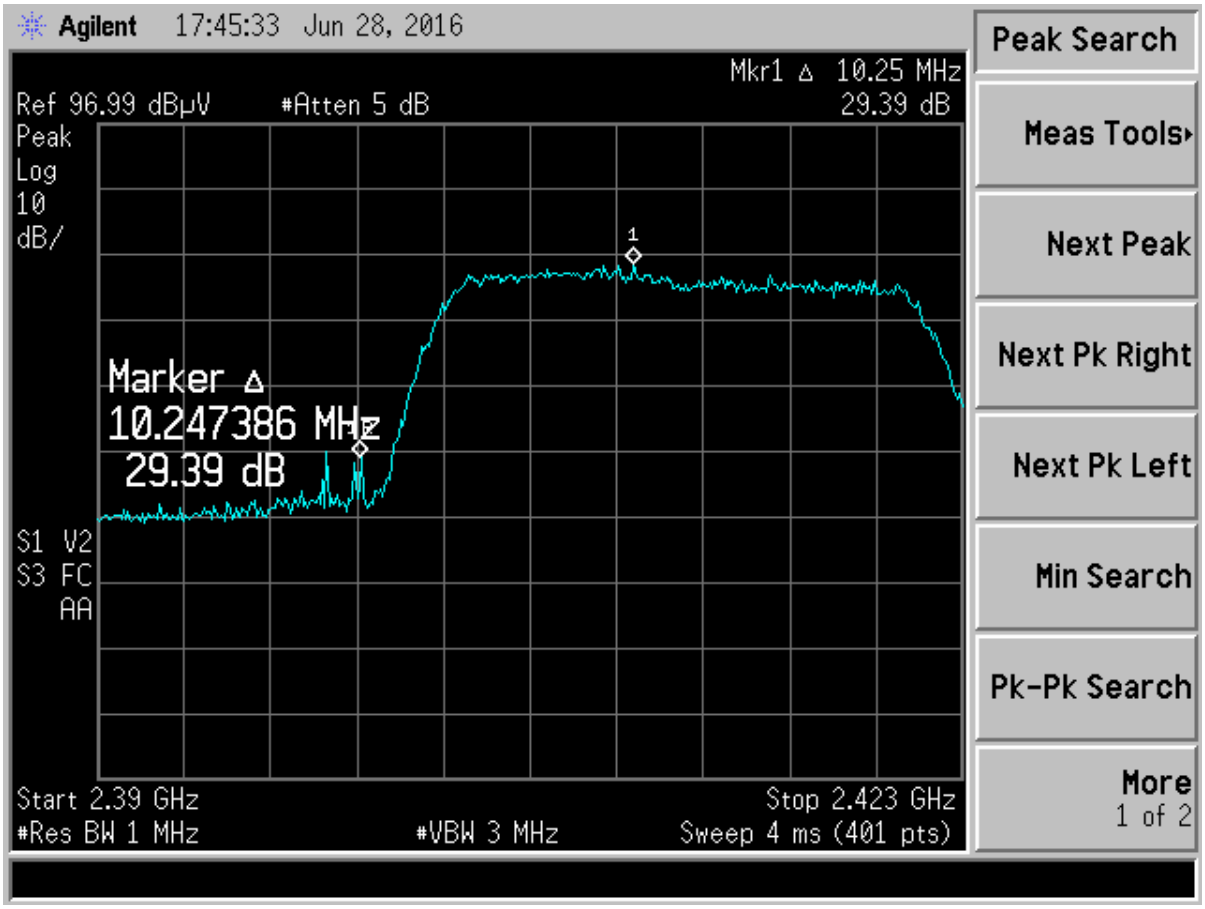


Figure 45. Band Edge Compliance, 802.11n Low Channel Delta – Peak

Note: Plot shows 20 dB in-band limit. Restricted band emissions evaluated below.

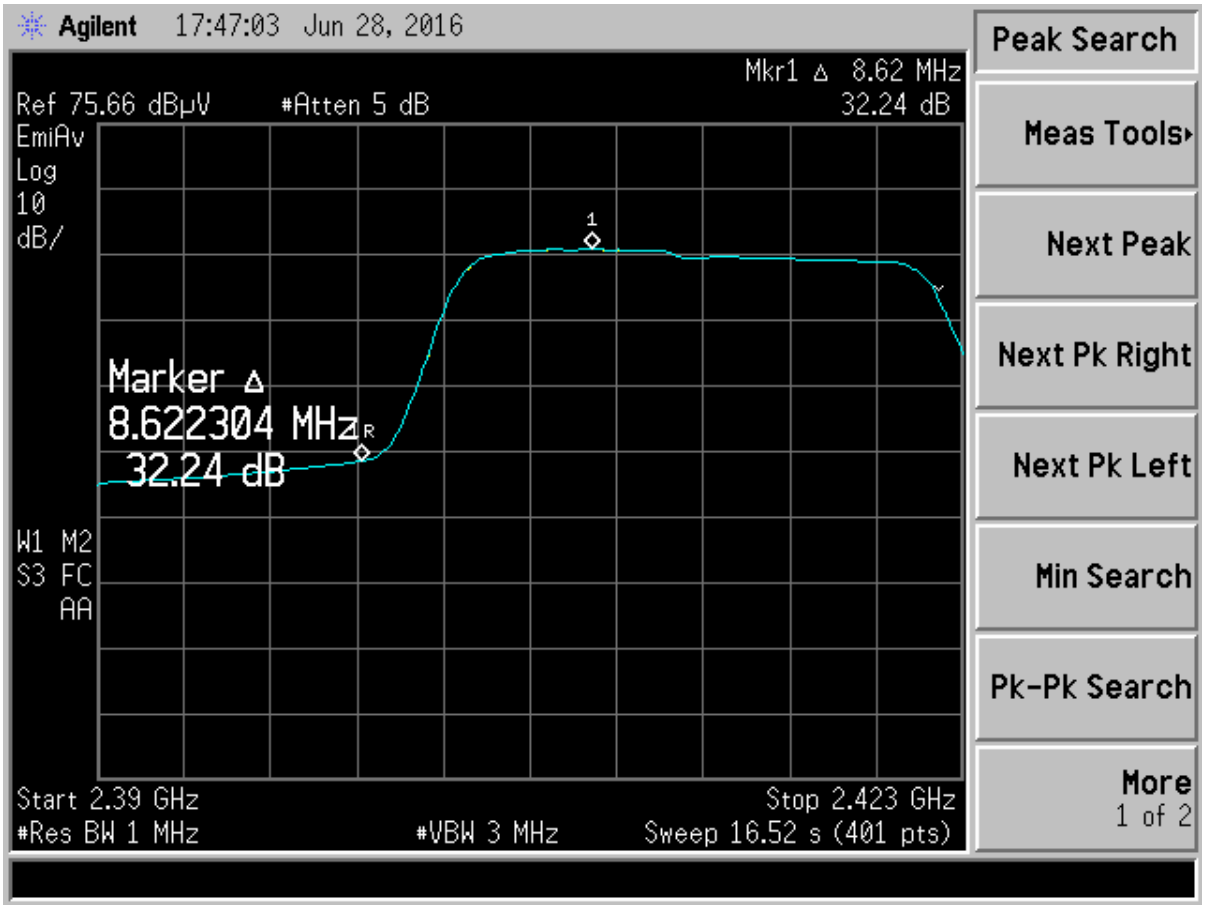


Figure 46. Band Edge Compliance, 802.11n Low Channel Delta - Average

Note: Plot shows 20 dB in-band limit. Restricted band emissions evaluated below.

Calculation of lower band edge measurement:

Band Edge Calculated Result	32.24	dB
Band Edge Limit (20 dB from Fundamental)	20.00	dB
Band Edge Margin	12.24	dB

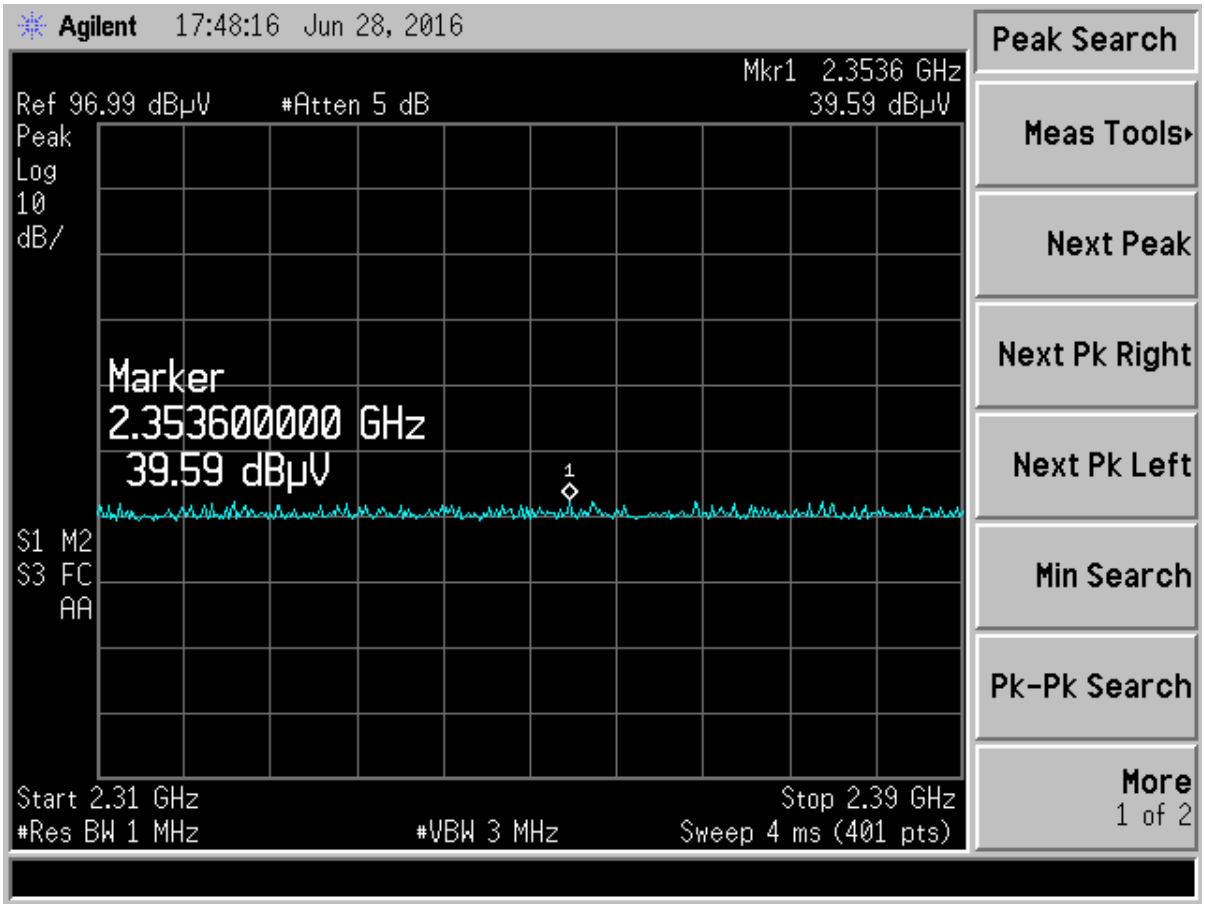


Figure 47. Radiated Restricted Band 2310 MHz to 2390 MHz, 802.11n - Peak

Table 17. Radiated Restricted Band 2310 MHz to 2390 MHz, 802.11n – Peak

2310 MHz to 2390 MHz Restricted Band Peak Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**PK Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2353.60	39.59	31.68	71.27	74.0	3.0m./HORZ	2.7	**PK**

Test Date: June 28 & 29, 2016
Tested By
Signature: Name: George Yang

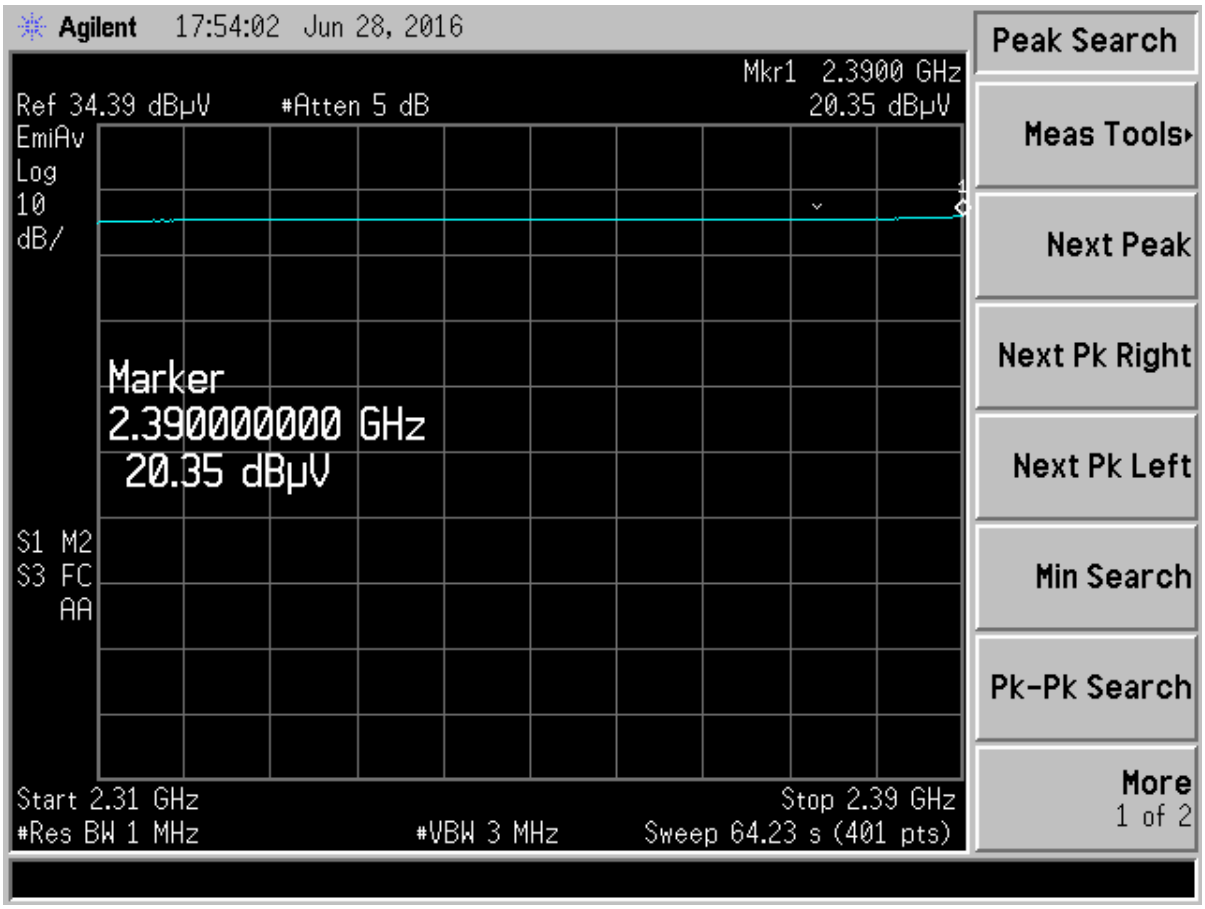


Figure 48. Radiated Restricted Band 2310 MHz to 2390 MHz, 802.11n - Average

Table 18. Radiated Restricted Band 2310 MHz to 2390 MHz, 802.11n – Peak

2310 MHz to 2390 MHz Restricted Band Average Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**AVG Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2390.00	20.35	31.68	52.03	54.0	3.0m./HORZ	2.0	**AVG**

Test Date: June 28 & 29, 2016
Tested By
Signature: Name: George Yang

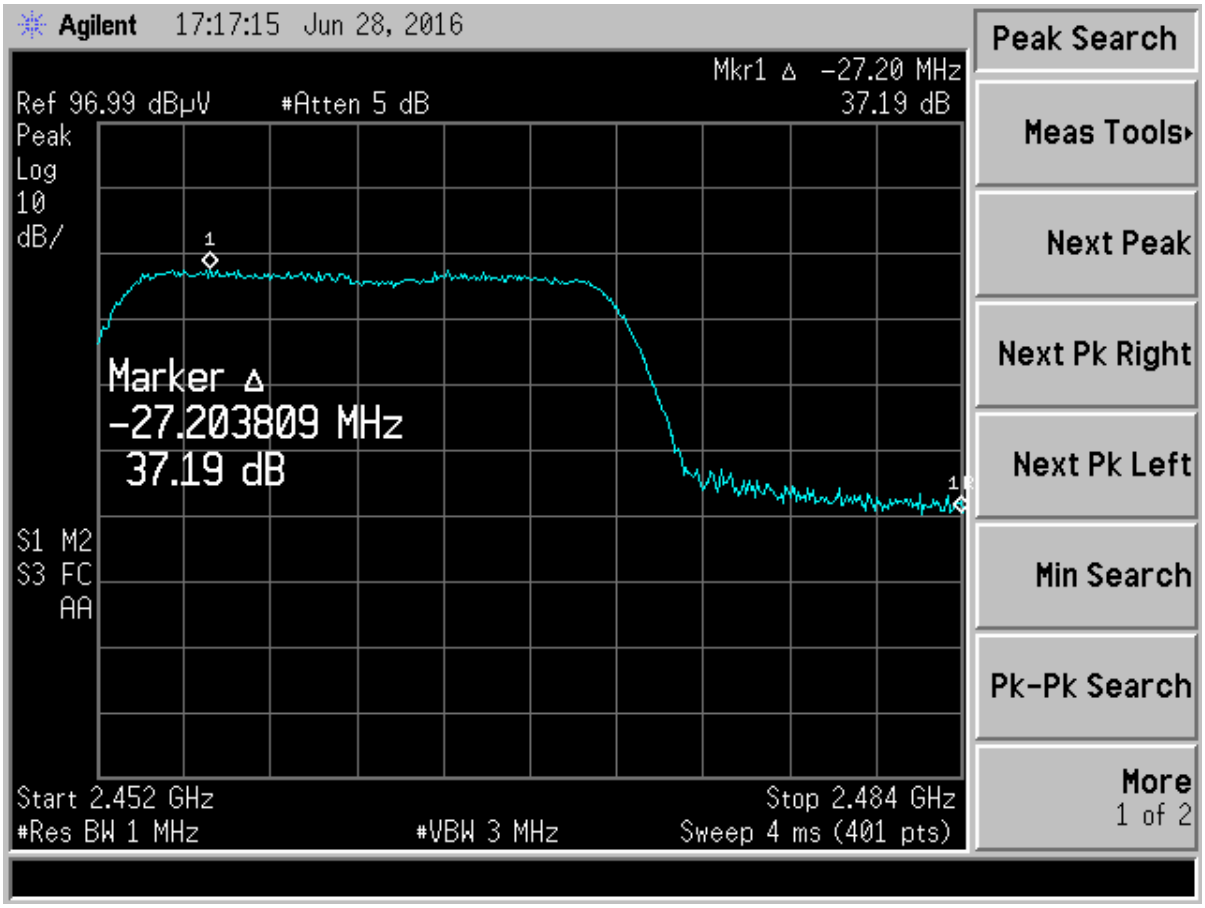


Figure 49. Band Edge Compliance, 802.11n High Channel Delta – Peak

Note: Plot shows 20 dB in-band limits. Restricted band emissions evaluated below.

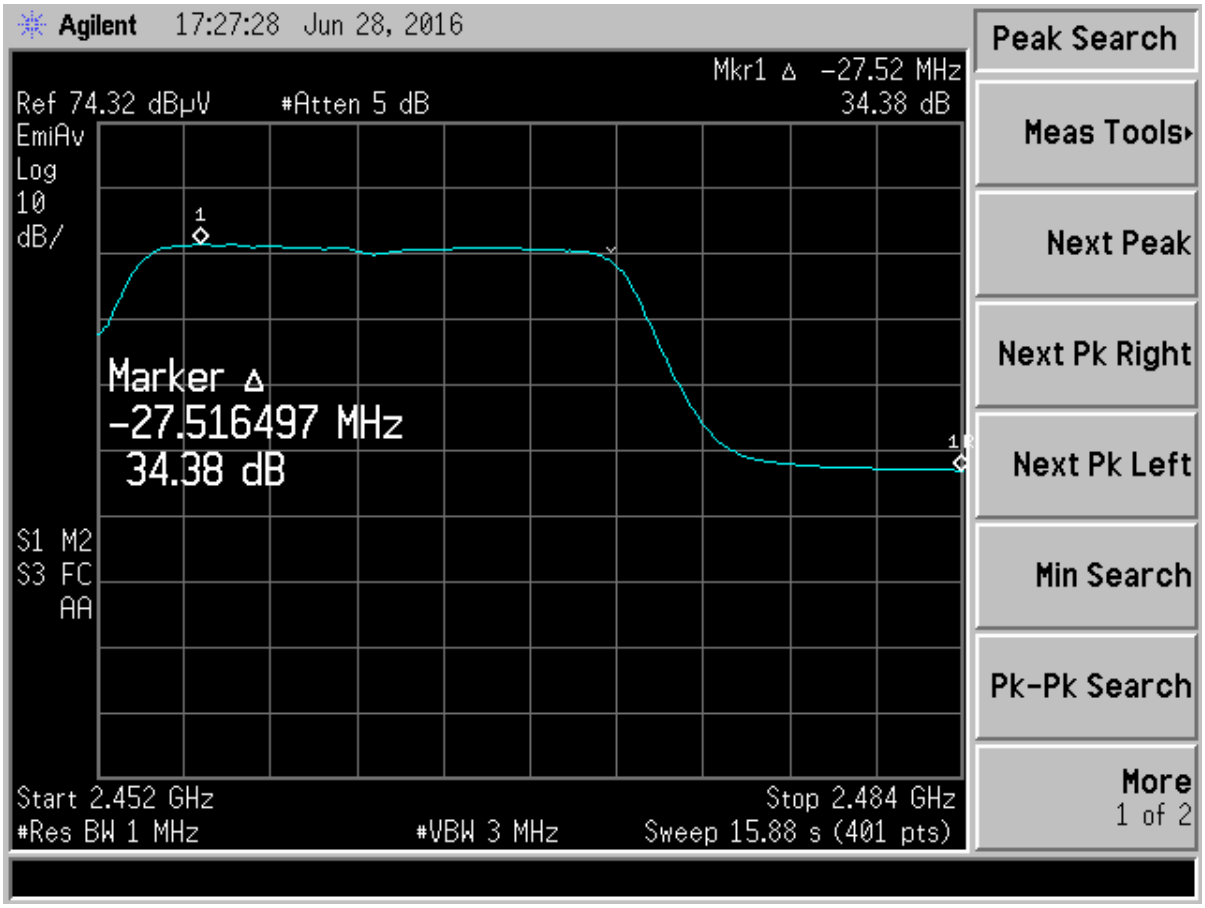


Figure 50. Band Edge Compliance, 802.11n High Channel Delta – Average

Note: Plot shows 20 dB in-band limits. Restricted band emissions evaluated below.

Calculation of upper band edge measurement:

Band Edge Calculated Result	34.38	dB
Band Edge Limit (20 dB from Fundamental)	20.00	dB
Band Edge Margin	14.38	dB

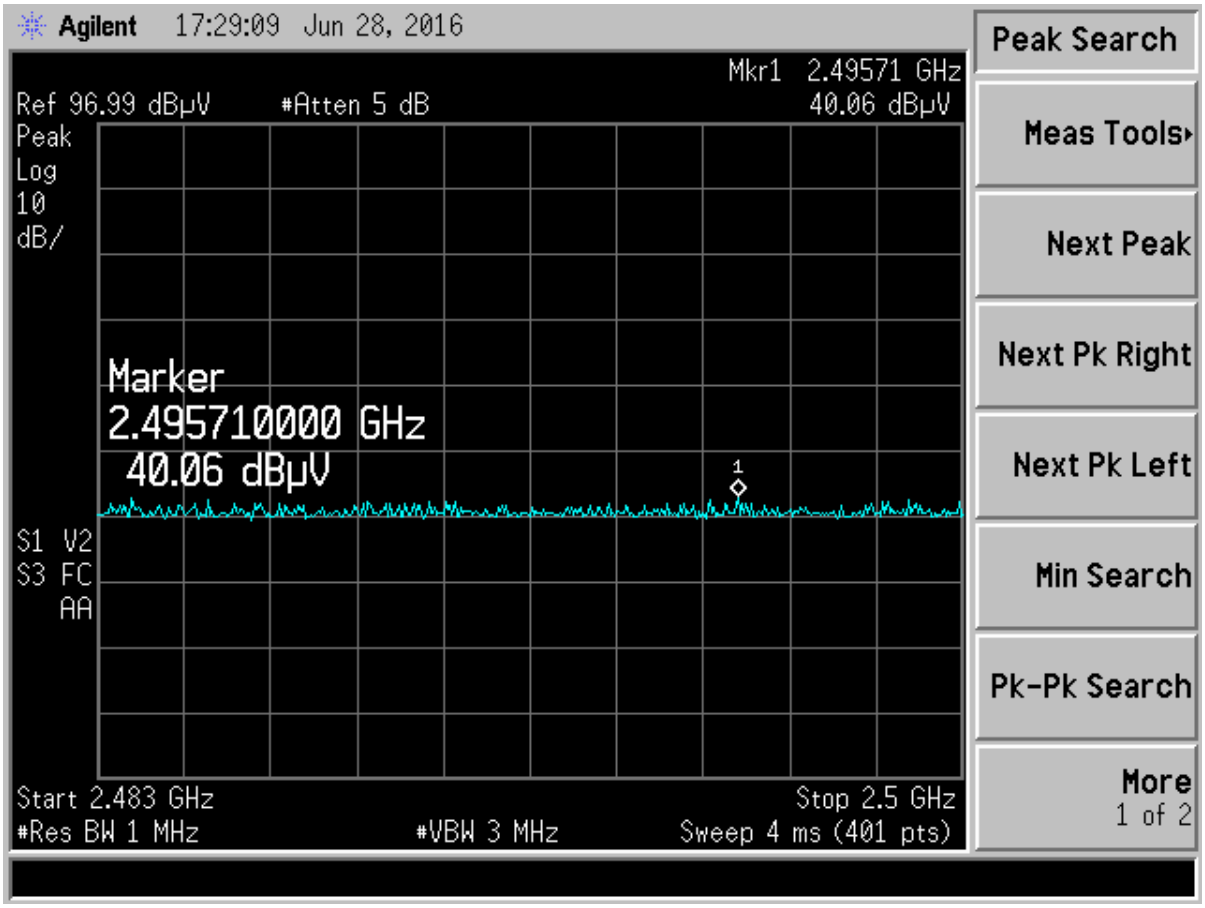


Figure 51. Radiated Restricted band 2483.5 MHz to 2500 MHz, 802.11n - Peak

Table 19. Radiated Restricted Band 2483.5 MHz to 2500 MHz, 802.11n – Peak

2483.5 MHz to 2500 MHz Restricted Band Peak Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**PK Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2495.71	40.06	31.53	71.59	74.0	3.0m./HORZ	2.4	**PK**

Test Date: June 28 & 29, 2016
Tested By
Signature: Name: George Yang

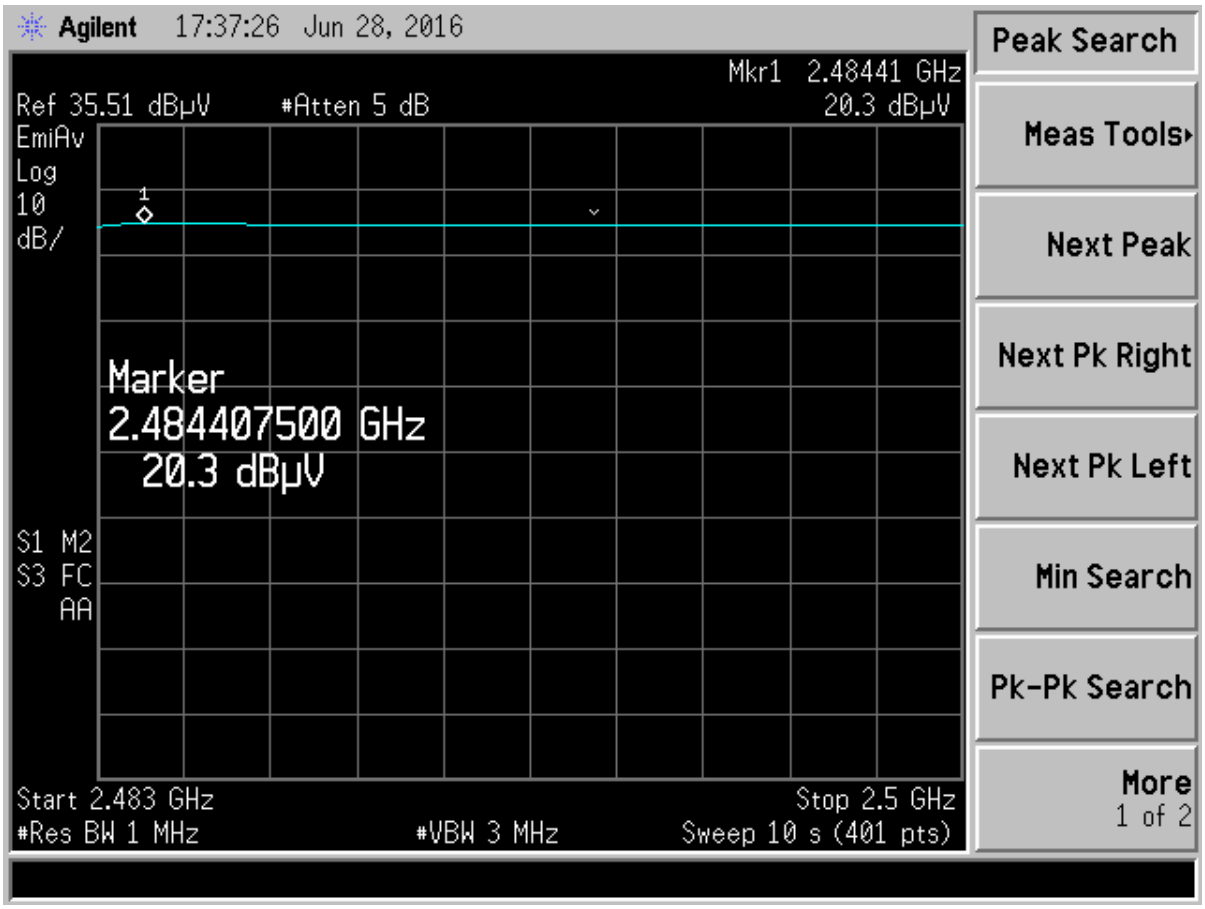


Figure 52. Radiated Restricted Band 2310 MHz to 2390 MHz, 802.11n - Average

Table 20. Radiated Restricted Band 2483.5 MHz to 2500 MHz, 802.11n – Average

2483.5 MHz to 2500 MHz Restricted Band Average Measurements							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**AVG Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2484.40	20.30	31.53	51.83	54.0	3.0m./HORZ	2.2	**AVG**

Test Date: June 28 & 29, 2016
Tested By
Signature: Name: George Yang

2.12 Six (6) dB Bandwidth per CFR 15.247(a)(2),

The EUT antenna port was connected to a spectrum analyzer with a 50 Ω input impedance. Measurements were performed similar to the method of FCC, KDB Publication No. 558074 for a bandwidth of 6 dB. The RBW was set to 100 kHz and with the VBW ≥ RBW. The results of this test are given in the table below and Figures below.

Table 21. 802.11b Six (6) dB Bandwidth

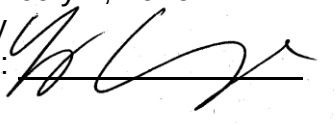
Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum FCC Bandwidth (MHz)
2412	12.102	0.500
2437	12.340	0.500
2462	12.165	0.500

Table 22. 802.11g Six (6) dB Bandwidth

Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum FCC Bandwidth (MHz)
2412	16.227	0.500
2437	16.276	0.500
2462	16.081	0.500

Table 23. 802.11n Six (6) dB Bandwidth

Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum FCC Bandwidth (MHz)
2412	17.286	0.500
2437	17.116	0.500
2462	16.565	0.500

Test Date: July 7, 2016
Tested By
Signature:  Name: George Yang

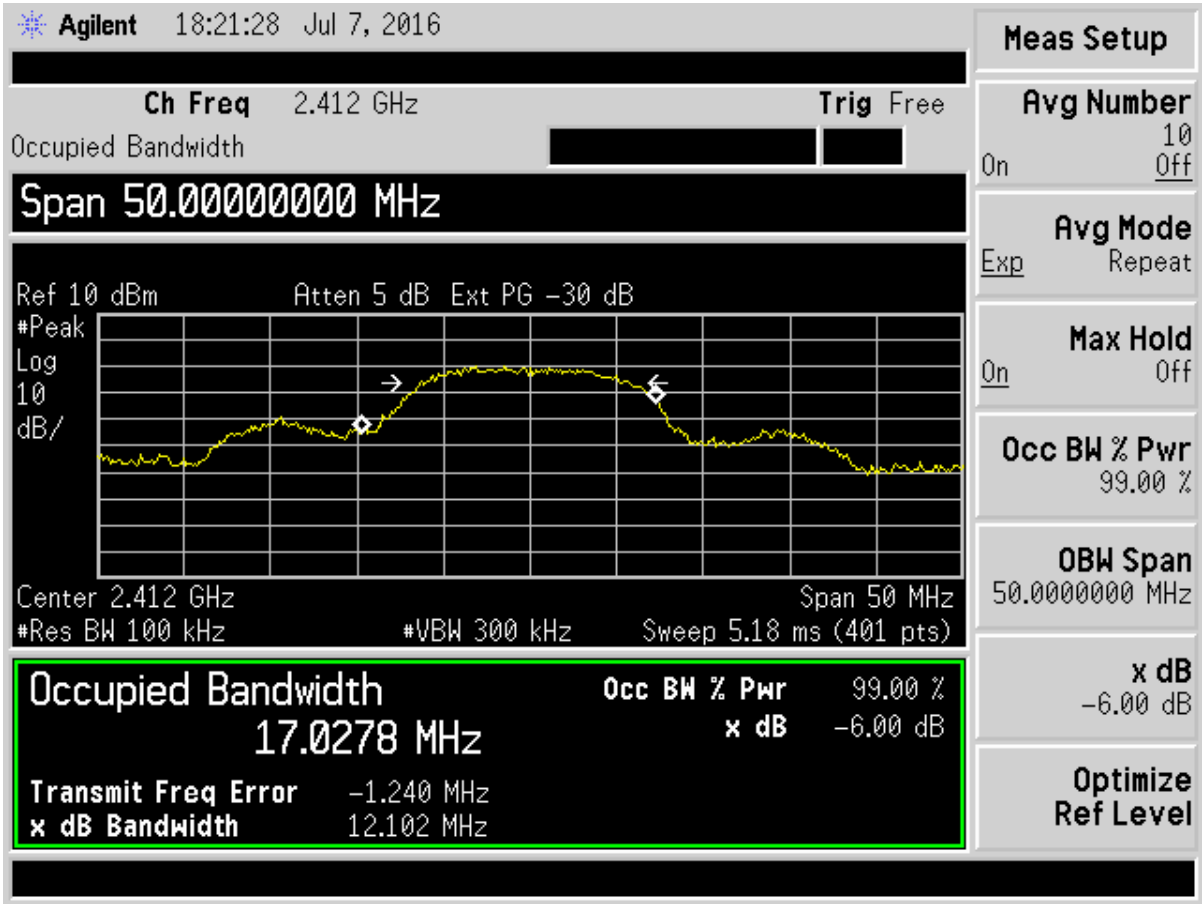


Figure 53. Six dB Bandwidth - 15.247 – 802.11b Low Channel

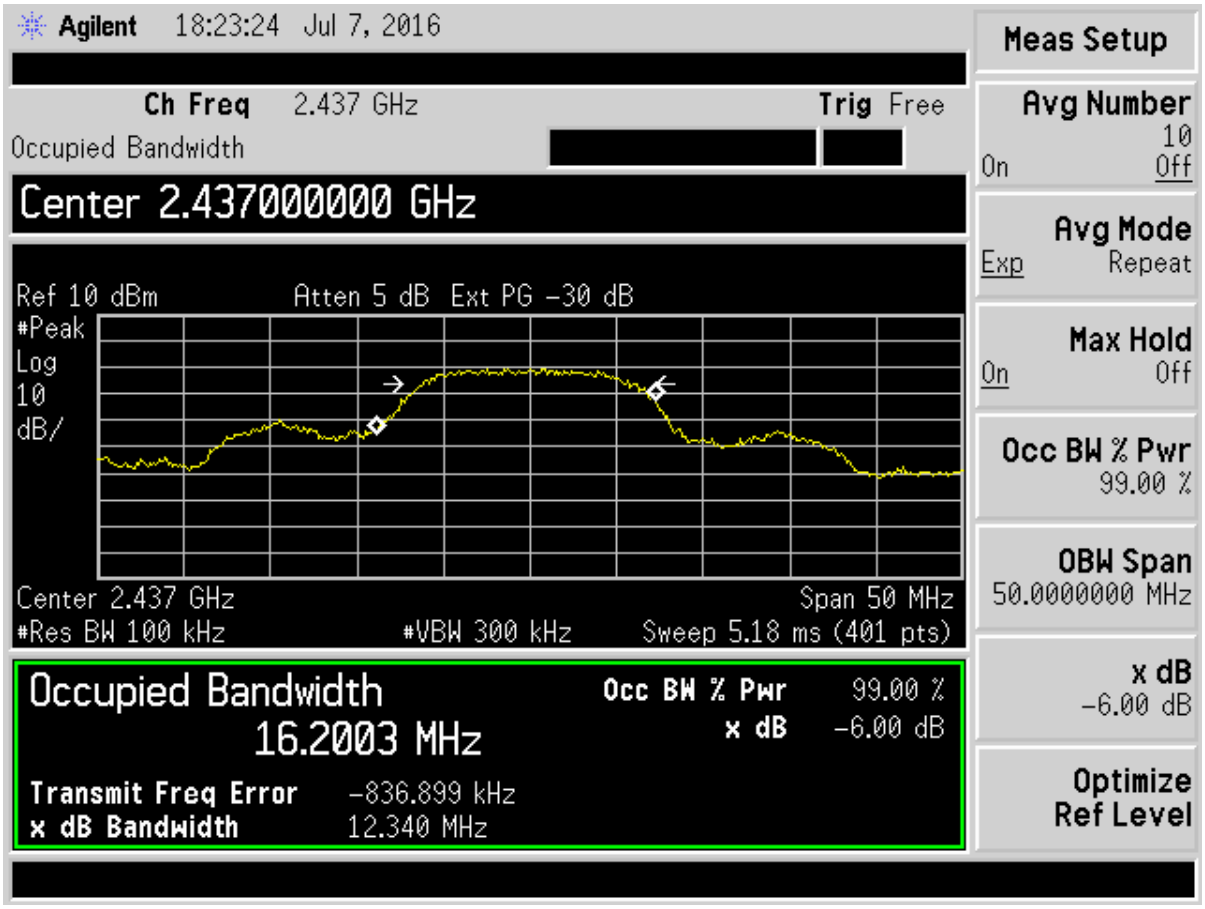


Figure 54. Six dB Bandwidth - 15.247 – 802.11b Mid Channel

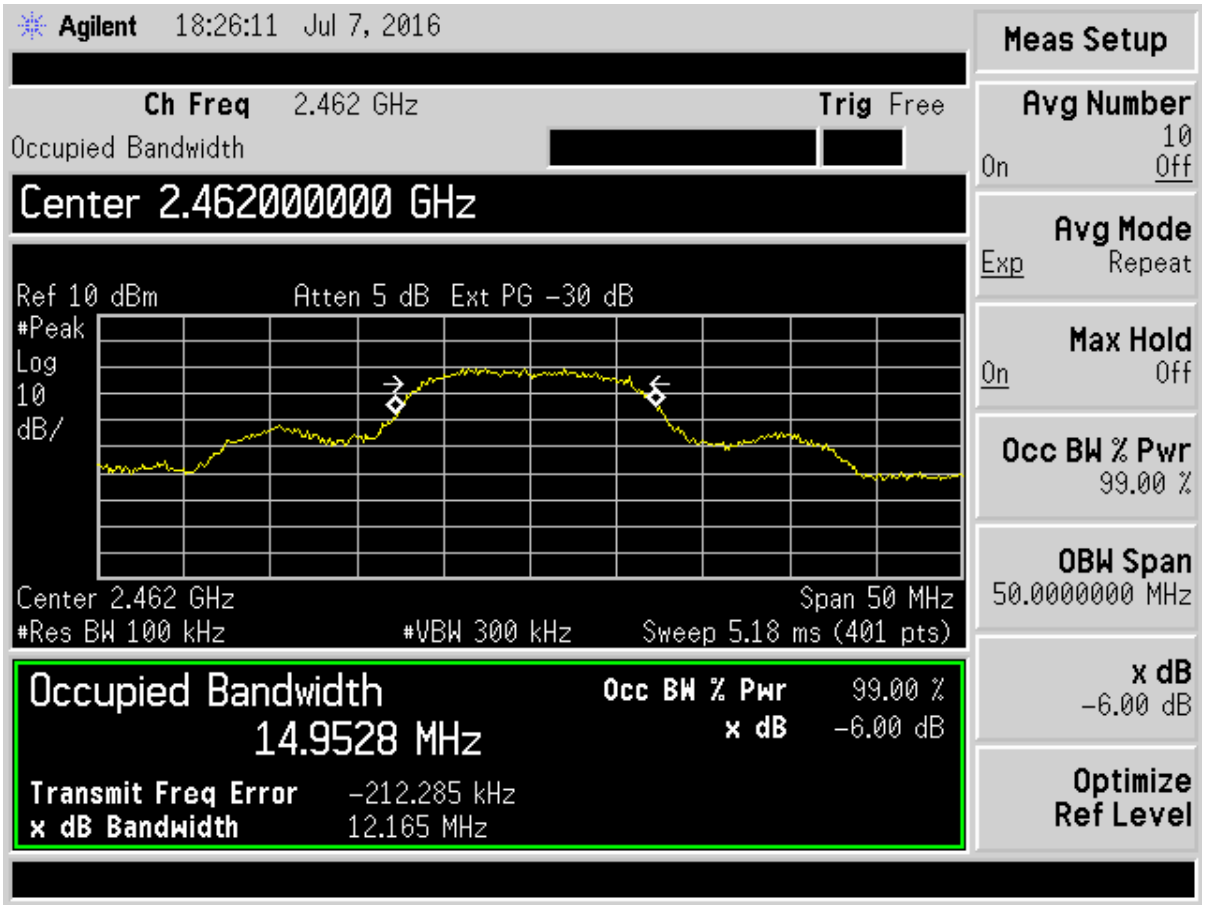


Figure 55. Six dB Bandwidth - 15.247 – 802.11b High Channel

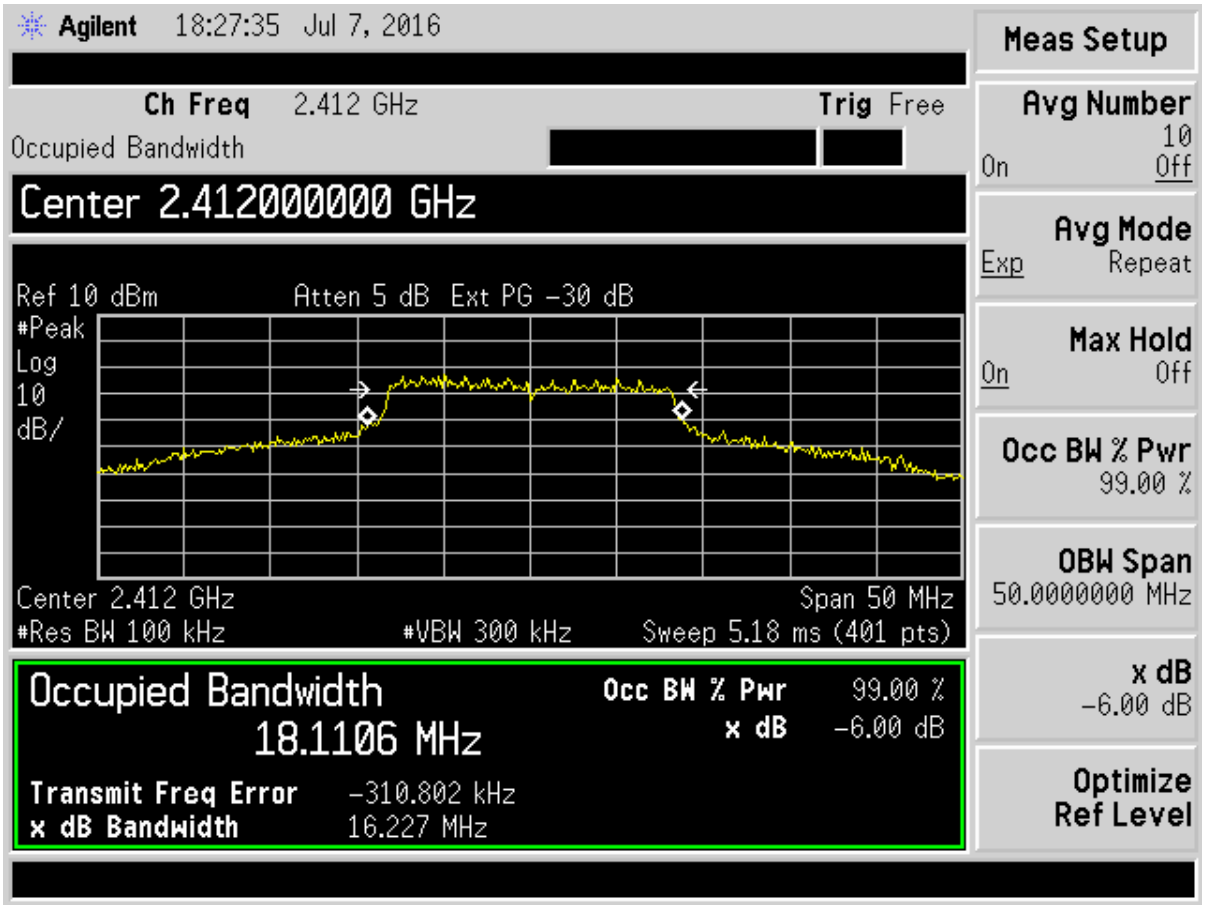


Figure 56. Six dB Bandwidth - 15.247 – 802.11g Low Channel

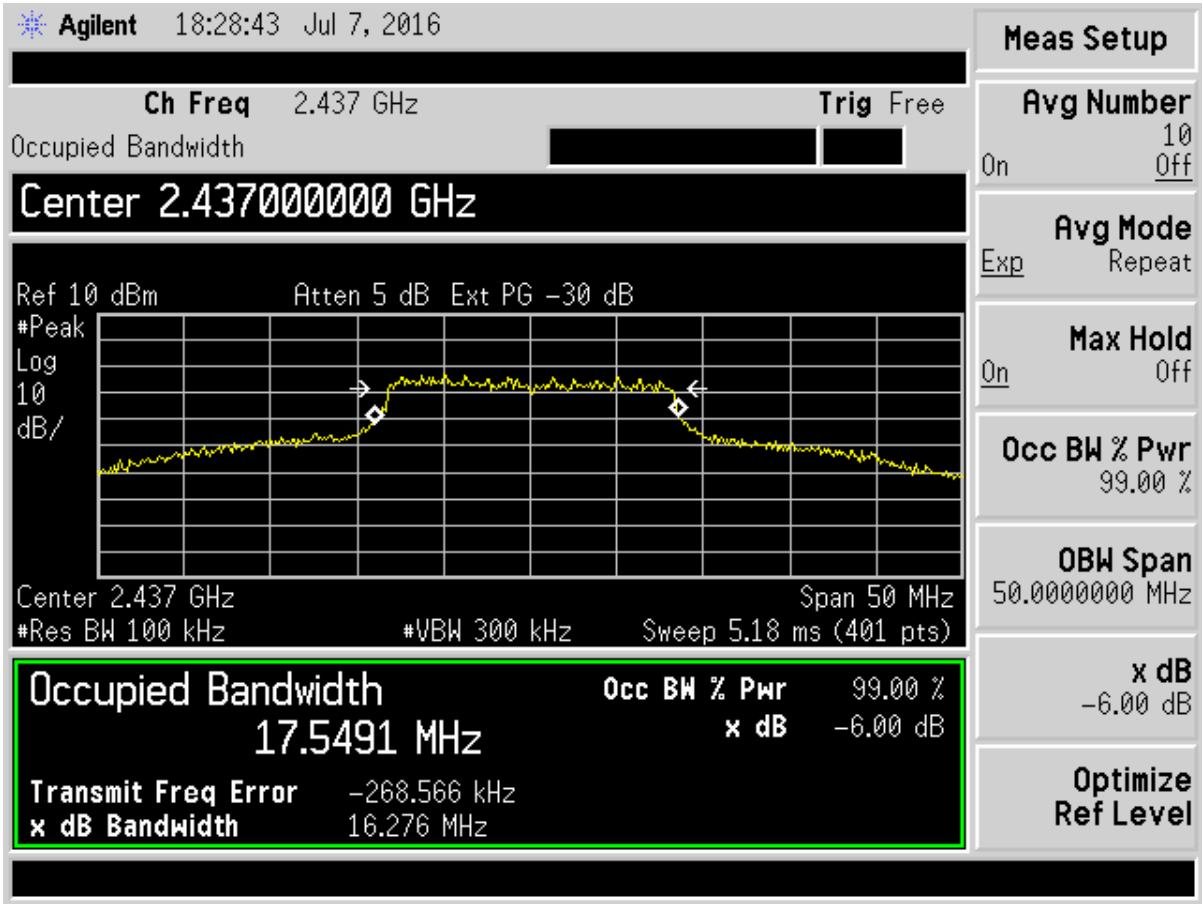


Figure 57. Six dB Bandwidth - 15.247 – 802.11g Mid Channel

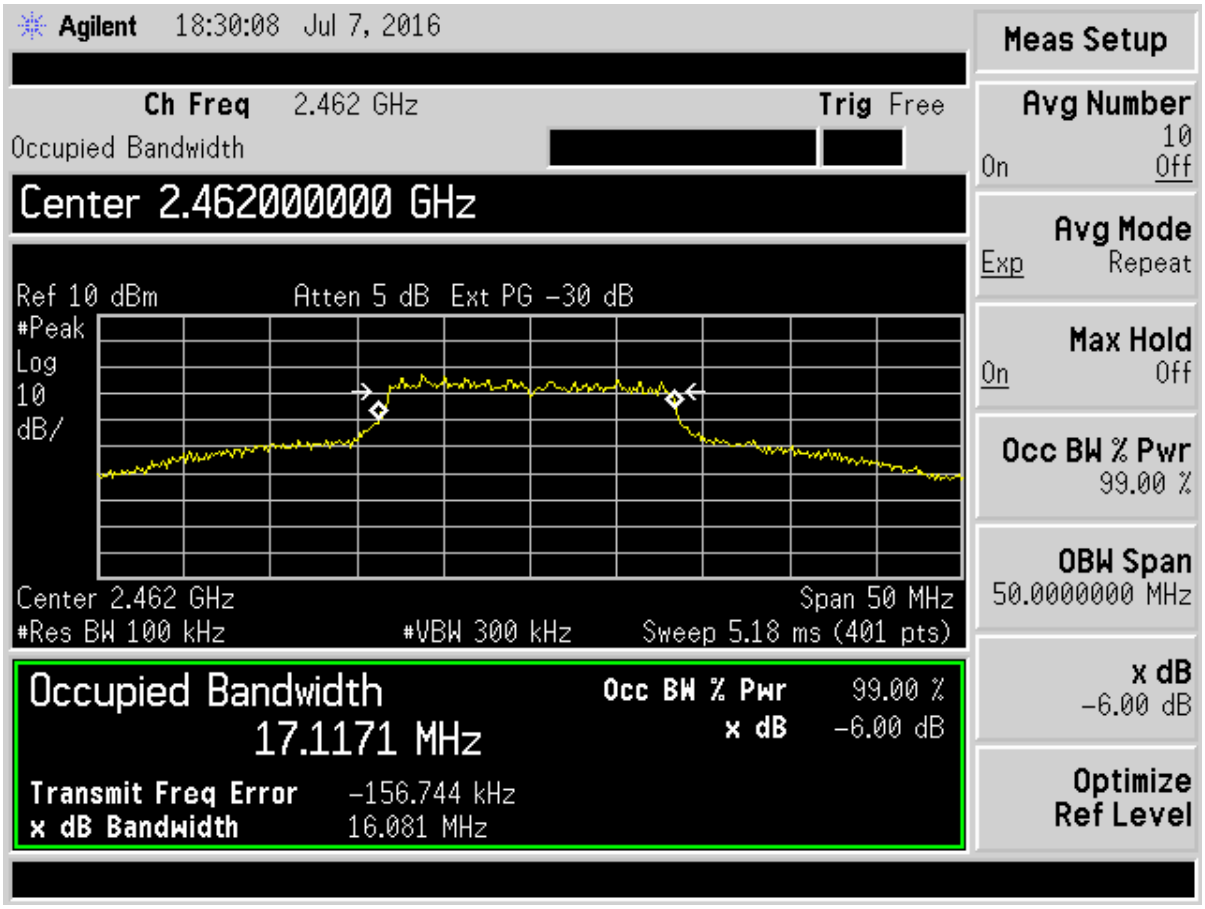


Figure 58. Six dB Bandwidth - 15.247 – 802.11g High Channel

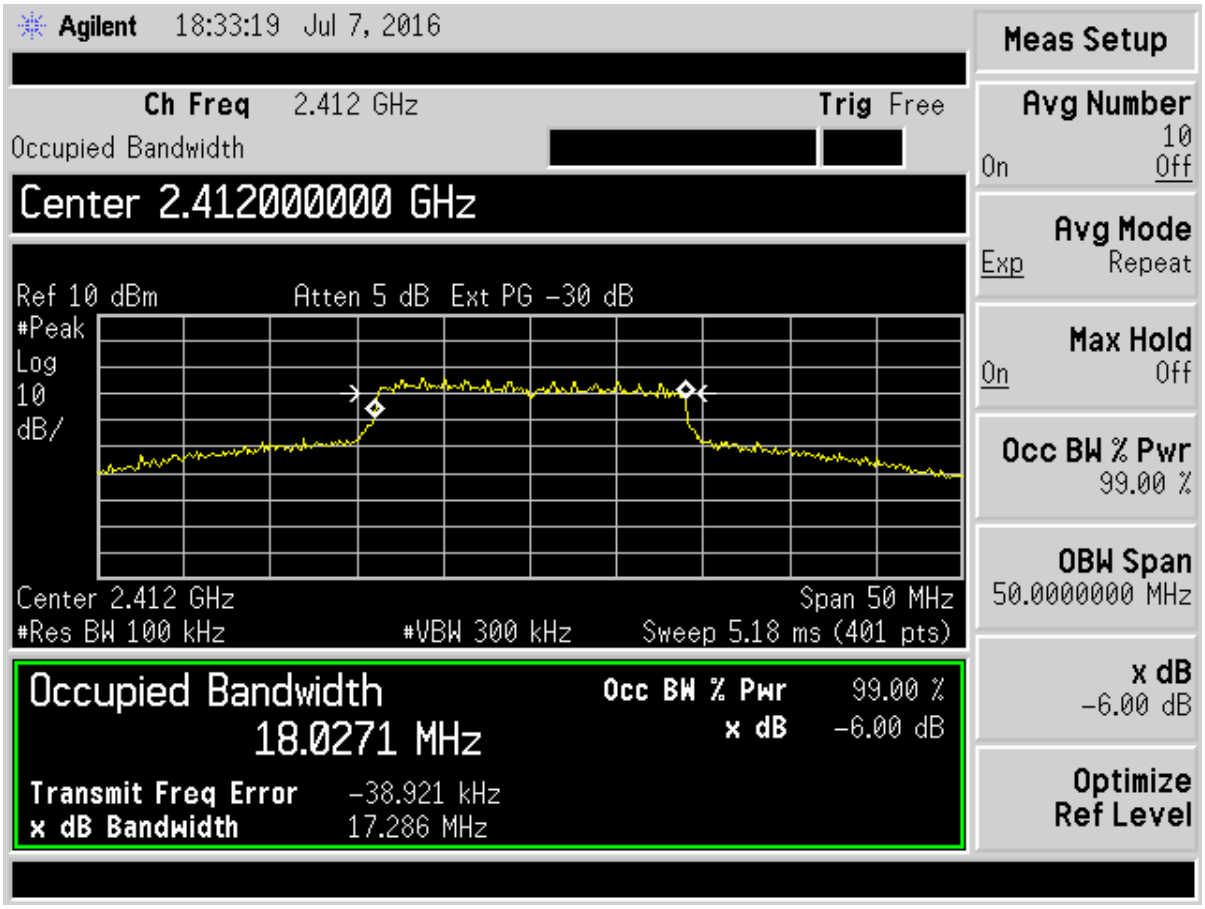


Figure 59. Six dB Bandwidth - 15.247 – 802.11n Low Channel

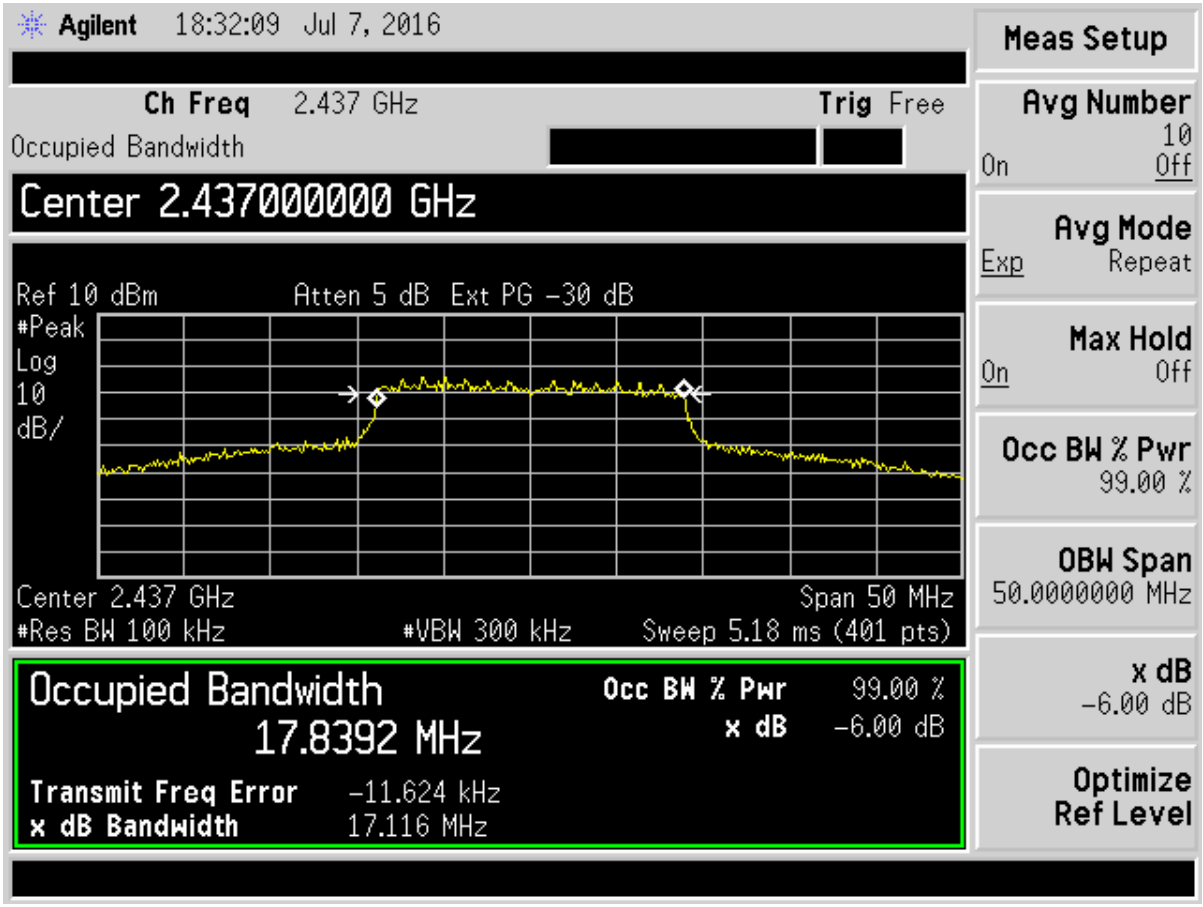


Figure 60. Six dB Bandwidth - 15.247 – 802.11n Mid Channel

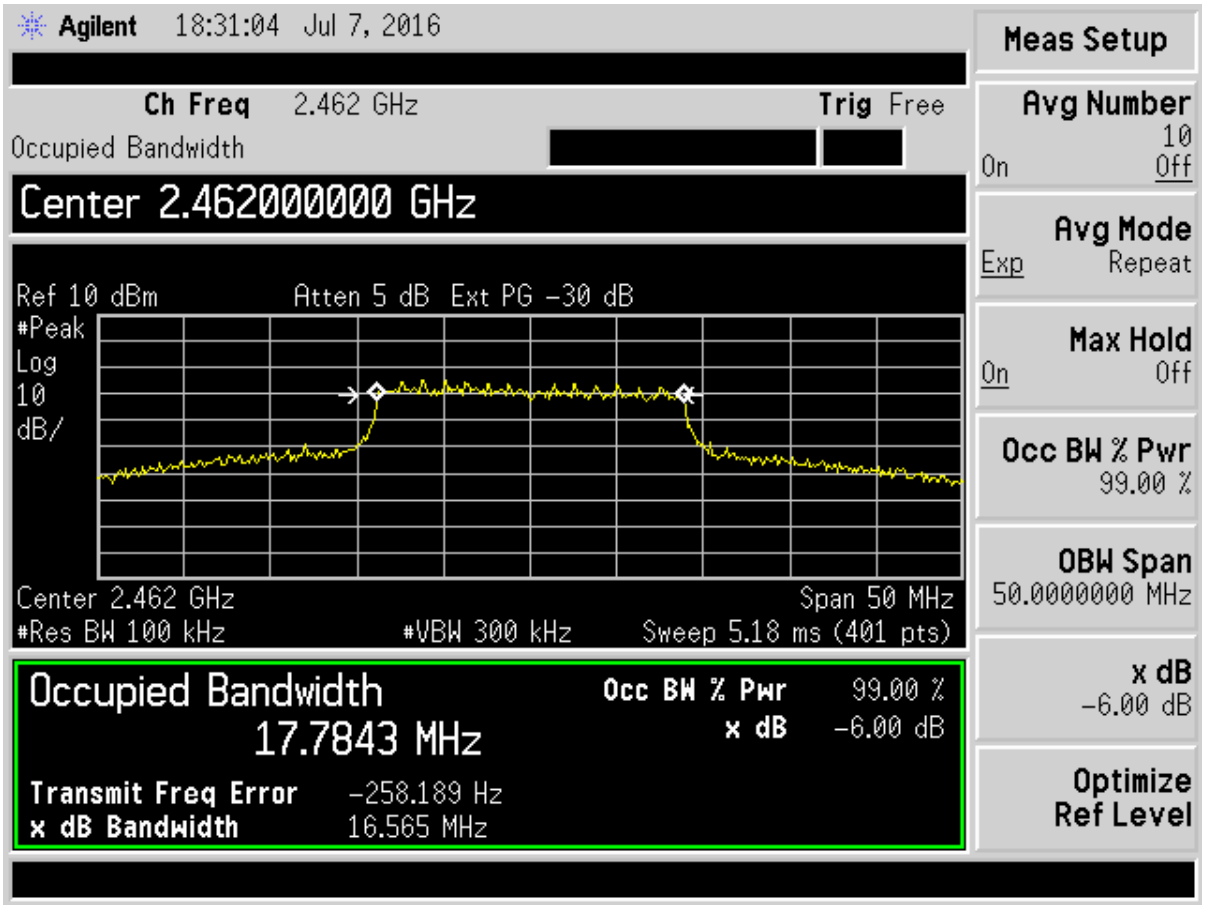


Figure 61. Six dB Bandwidth - 15.247 – 802.11n High Channel

2.13 99% Occupied Bandwidth (IC RSS Gen, 6.6)

These measurements were performed while the EUT was in a constant transmit mode. A method similar to the marker delta method was used to capture the points. The RBW was set to approximately 1/100 of the manufacturers claimed RBW and with the VBW ≥ RBW. The results of this test are given in the tables above.

Table 24. 802.11b 20 dB Bandwidth and 99% Occupied Bandwidth

Frequency (MHz)	99% Occupied Bandwidth (MHz)
2412	17.0278
2437	16.2003
2462	14.9528

Table 25. 802.11g 20 dB Bandwidth and 99% Occupied Bandwidth

Frequency (MHz)	99% Occupied Bandwidth (MHz)
2412	18.1106
2437	17.5491
2462	17.1171

Table 26. 802.11n 20 dB Bandwidth and 99% Occupied Bandwidth

Frequency (MHz)	99% Occupied Bandwidth (MHz)
2412	18.0271
2437	17.8392
2462	17.7843

2.14 Maximum Peak Conducted Output Power (CFR 15.247 (b) (3))

For this test, the transmitter was programmed to operate at a maximum output power across the bandwidth.

Peak power within the band 2.4 GHz to 2.5 GHz was measured per FCC KDB Publication 558074 and ANSI C63.10-2013 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 Ω with the RBW set greater than the 6 dB bandwidth of the EUT, and the VBW ≥ RBW. Peak antenna conducted output power is tabulated in the table below.

The EUT is designed to only transmit from one of the two ports, during investigational testing the port that yields the highest emissions was port J8. Therefore the EUT was programmed to transmit from J8, that value was recorded. Additional while the EUT was transmitting from port J8, port J3 was measured and those emissions levels were summed together with the recorded values from J8. The results are presented below.

Table 27. 802.11b Peak Antenna Conducted Output Power per Part 15.247 (b) (3)

Frequency of Fundamental (MHz)	Raw Test Data (dBm)	Converted Data (mW)	Total output Power (mW)	FCC Limit (mW)
2412	16.9	48.9	48.9	1000
2437	17.4	54.9	54.9	1000
2462	16.7	46.7	46.7	1000

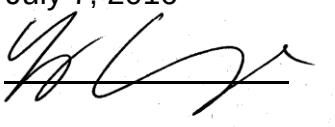
Test Date: July 7, 2016
Tested By
Signature:  Name: George Yang

Table 28. 802.11g Peak Antenna Conducted Output Power per Part 15.247 (b) (3)

Frequency of Fundamental (MHz)	Raw Test Data (dBm)	Converted Data (mW)	Total output Power (mW)	FCC Limit (mW)
2412	15.5	35.5	35.5	1000
2437	15.6	36.3	36.3	1000
2462	15.5	35.5	35.5	1000

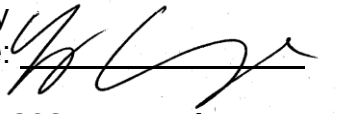
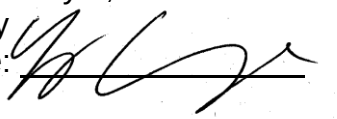
Test Date: July 7, 2016
Tested By
Signature:  Name: George Yang

Table 29. 802.11n Peak Antenna Conducted Output Power per Part 15.247 (b) (3)

Frequency of Fundamental (MHz)	Raw Test Data (dBm)	Converted Data (mW)	Total output Power (mW)	FCC Limit (mW)
2412	13.2	20.9	20.9	1000
2437	13.5	22.4	22.4	1000
2462	12.9	19.5	19.5	1000

Test Date: July 7, 2016
Tested By
Signature:  Name: George Yang

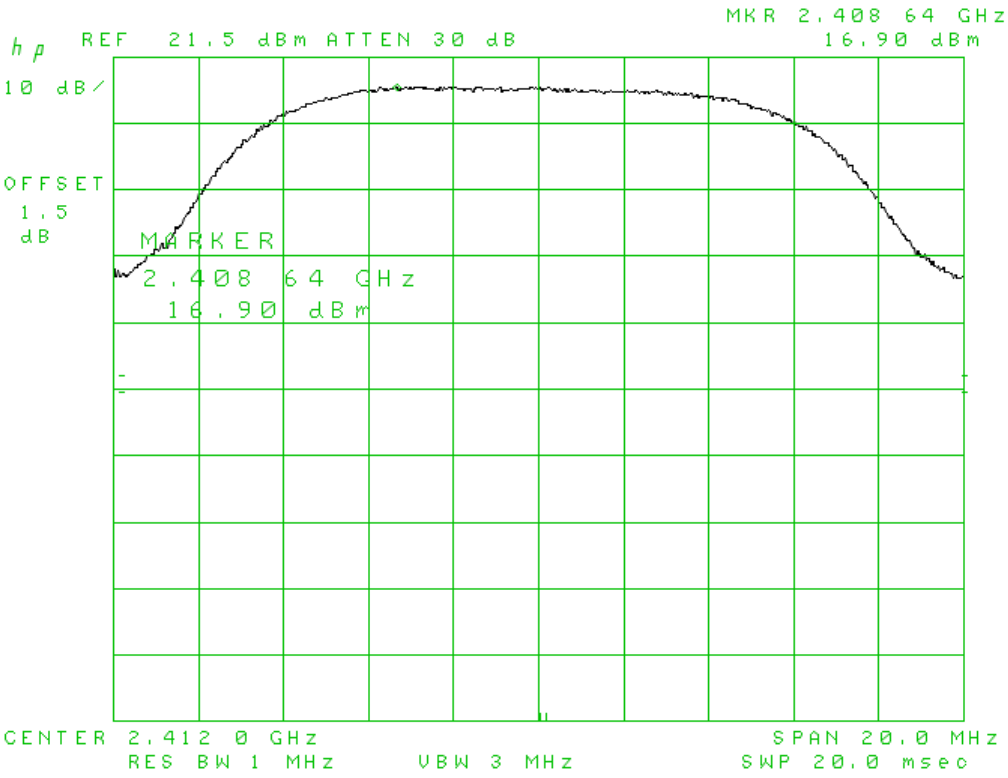


Figure 62. Peak Antenna Conducted Output Power 802.11b Low Channel

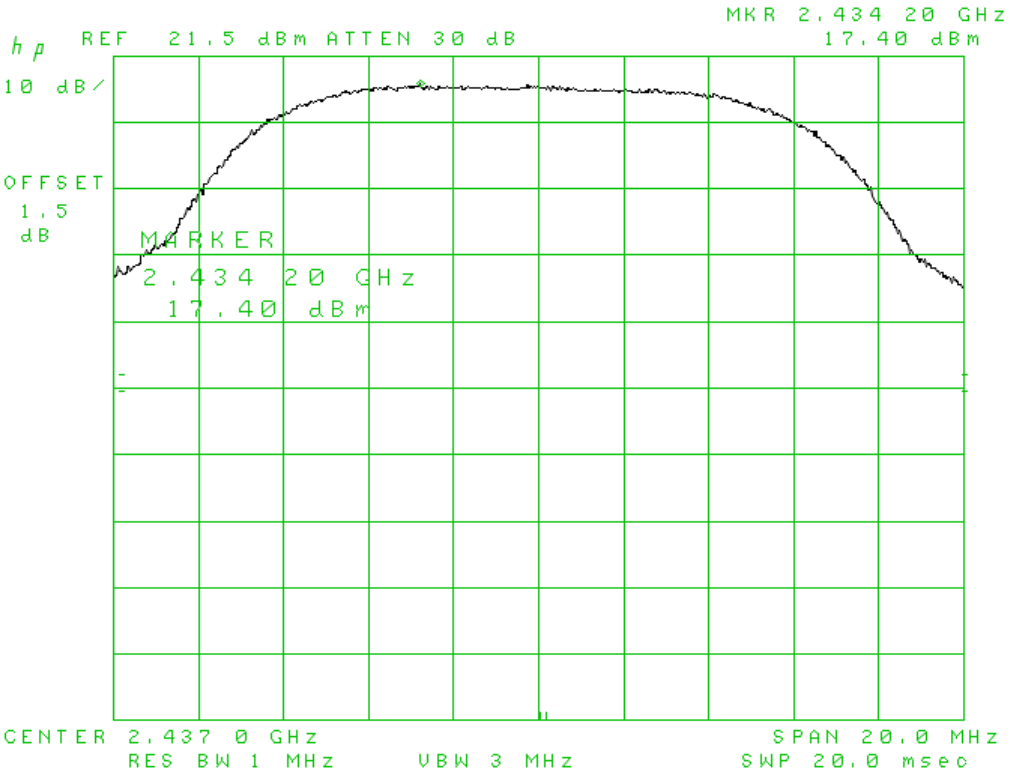


Figure 63. Peak Antenna Conducted Output Power 802.11b Mid Channel

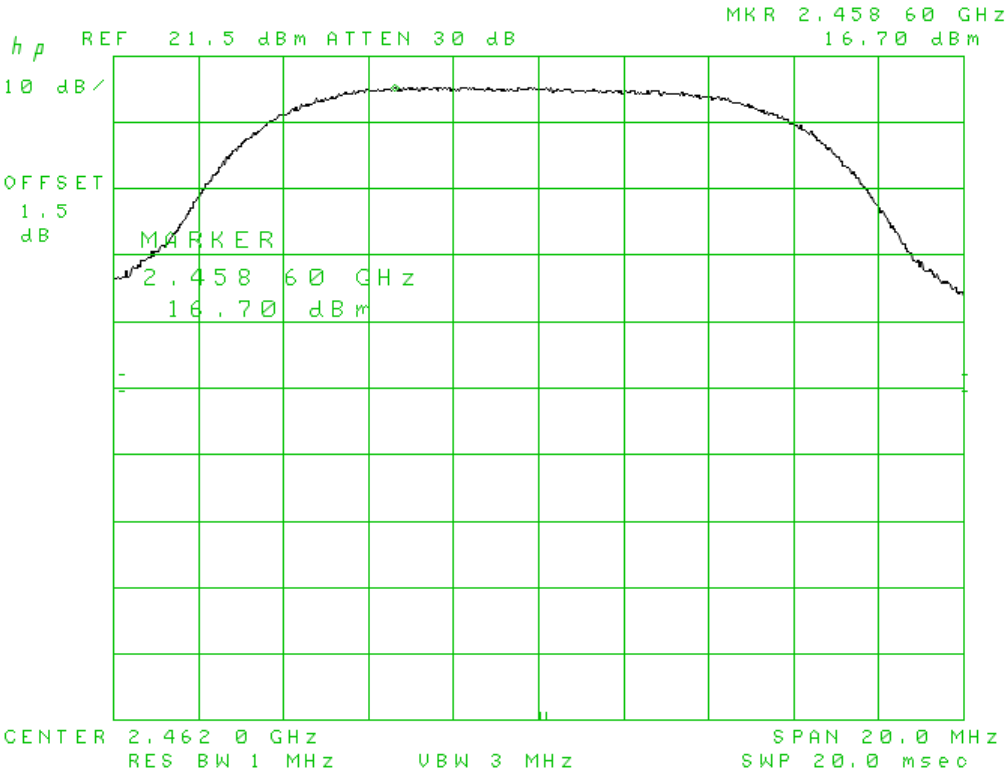


Figure 64. Peak Antenna Conducted Output Power 802.11b High Channel

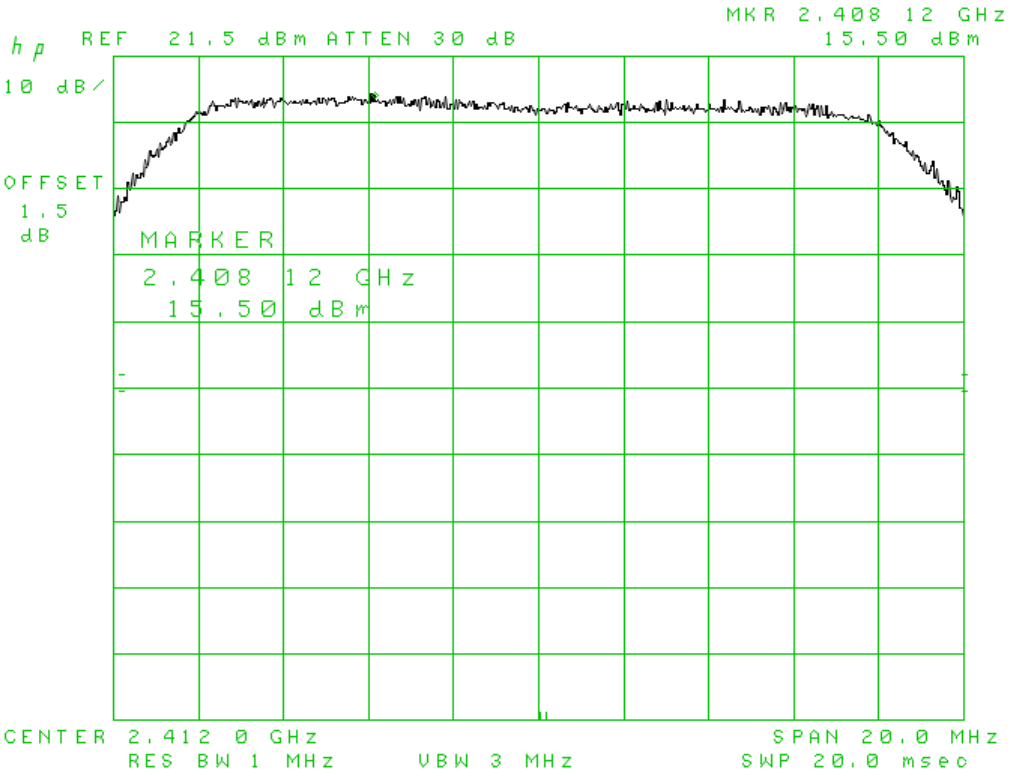


Figure 65. Peak Antenna Conducted Output Power 802.11g Low Channel

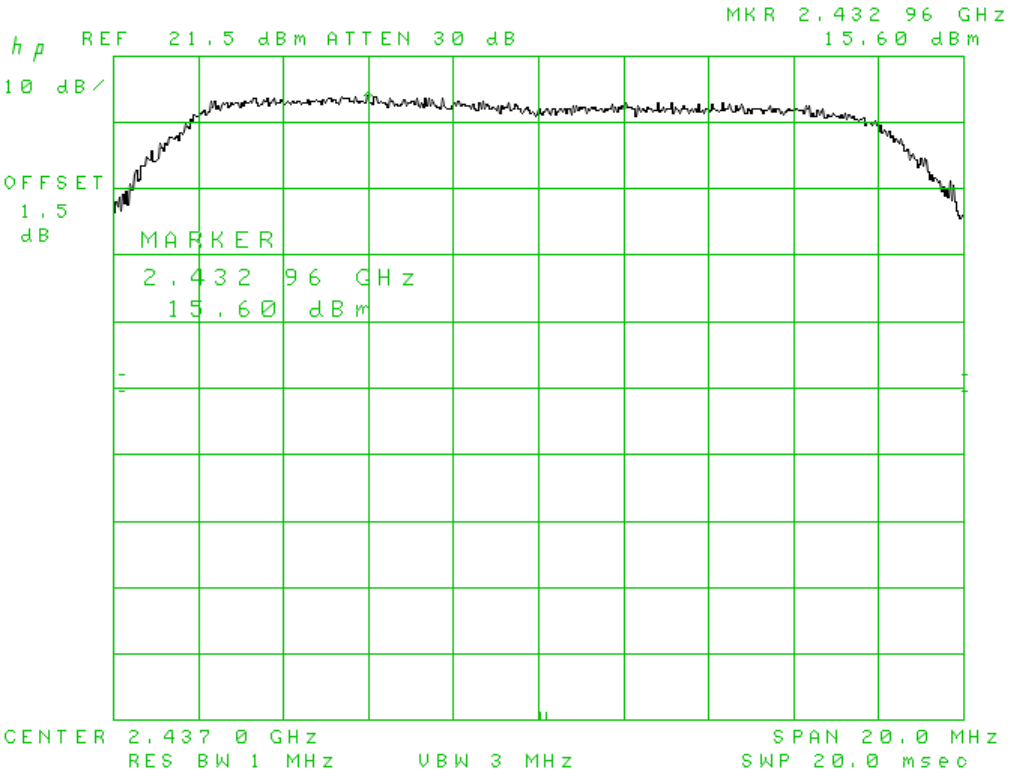


Figure 66. Peak Antenna Conducted Output Power 802.11g Mid Channel

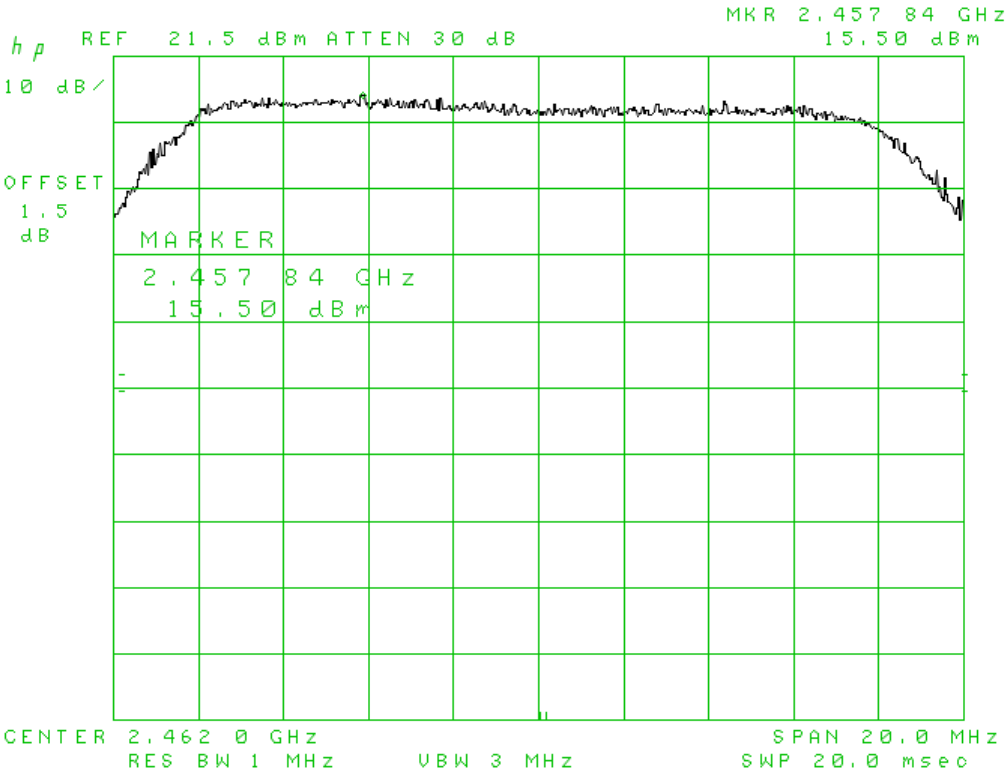


Figure 67. Peak Antenna Conducted Output Power 802.11g High Channel

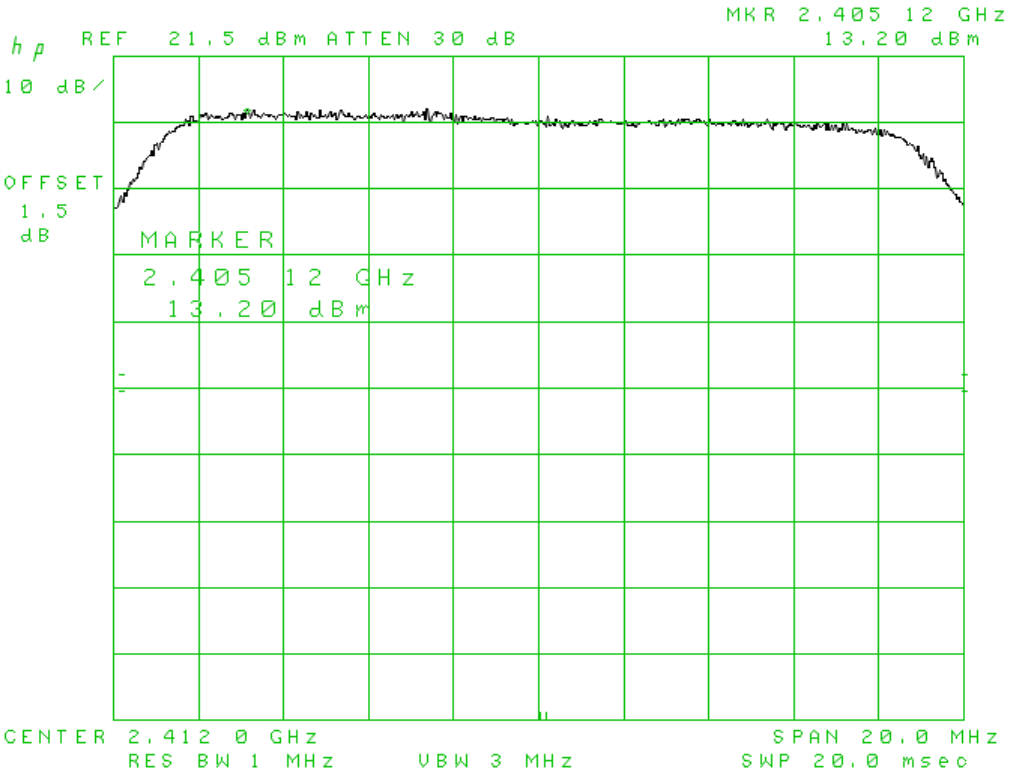


Figure 68. Peak Antenna Conducted Output Power 802.11n Low Channel

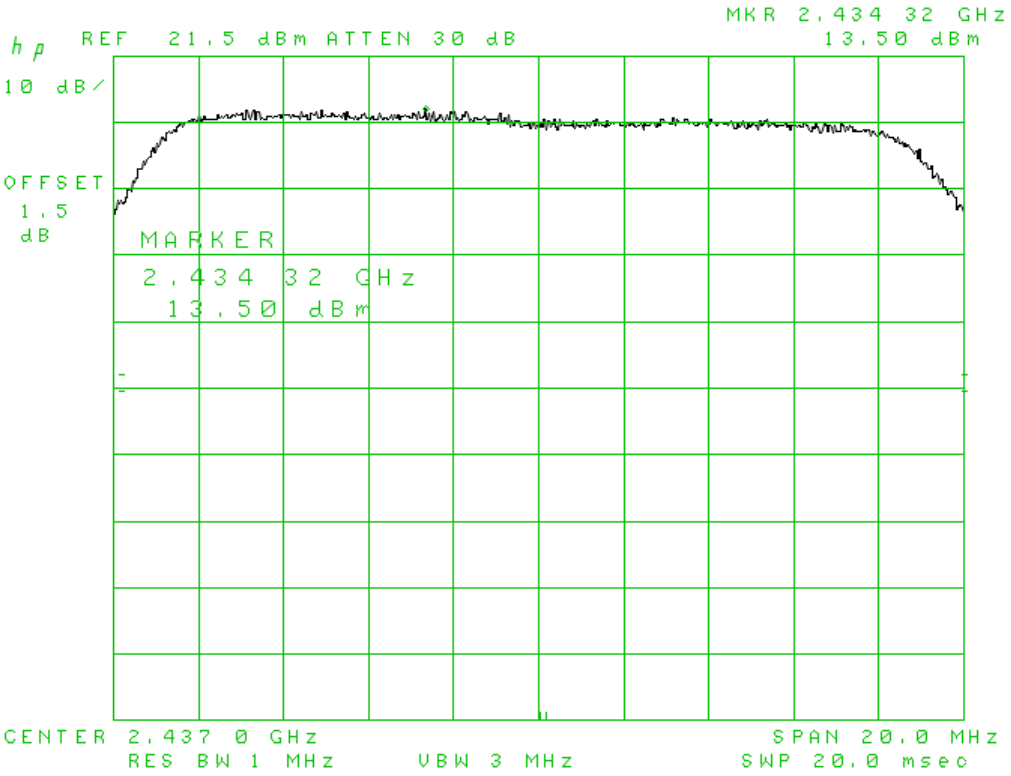


Figure 69. Peak Antenna Conducted Output Power 802.11n Mid Channel

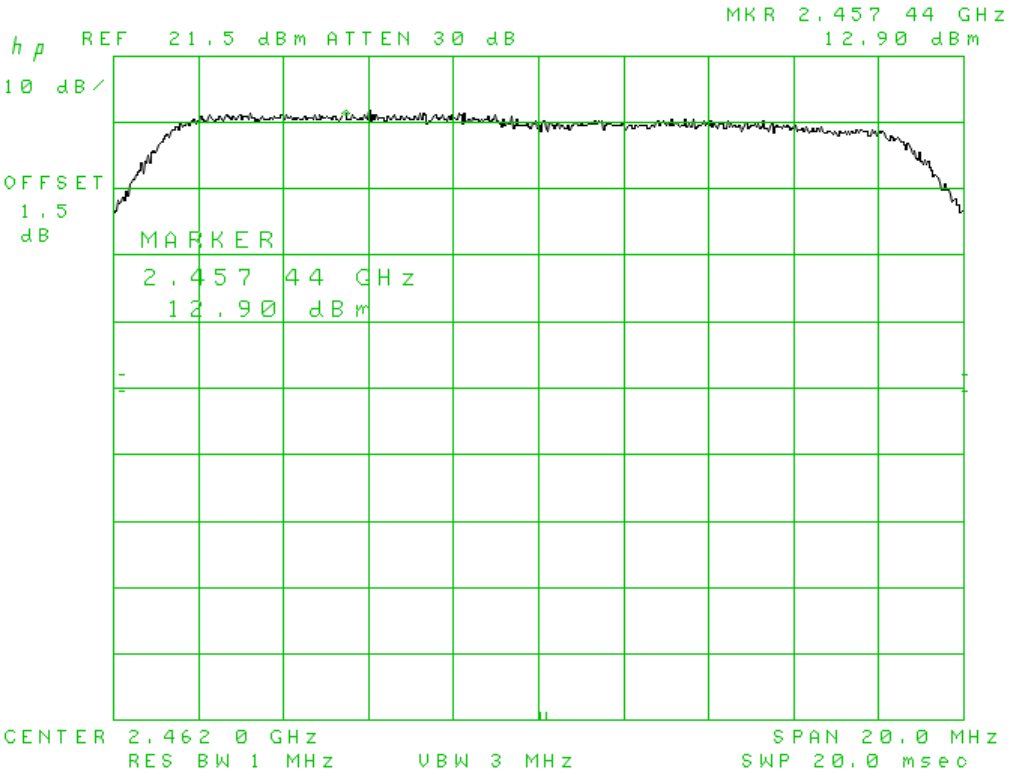


Figure 70. Peak Antenna Conducted Output Power 802.11n High Channel

2.15 Power Spectral Density (CFR 15.247(e)) (IC RSS 247 5.2(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 558074. The RBW was set to 3 kHz and the Video Bandwidth was set to ≥ RBW. The span was set to 1.5 times the OBW.

In accordance with 15.247 (e), the power spectral density shall be no greater than +8 dBm per any 3 kHz band.

The following results show that all are less than +8 dBm per 3 kHz band.

The EUT is designed to only transmit from one of the two ports, during investigational testing the port that yields the highest emissions was port J8. Therefore the EUT was programmed to transmit from J8, that value was recorded. Additional while the EUT was transmitting from port J8, port J3 was measured and those emissions levels were summed together with the recorded values from J8. The results are presented below.

Table 30. 802.11b Power Spectral Density for Low, Mid and High Bands

Frequency (MHz)	Raw Test Data (dBm/3 kHz)	FCC Limit (dBm/3 kHz)
2412	0.8	+8.0
2437	0.6	+8.0
2462	0.4	+8.0

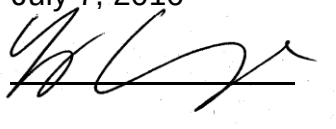
Test Date: July 7, 2016
Tested By
Signature:  Name: George Yang

Table 31. 802.11g Power Spectral Density for Low, Mid and High Bands

Frequency (MHz)	Raw Test Data (dBm/3 kHz)	FCC Limit (dBm/3 kHz)
2412	-4.0	+8.0
2437	-3.3	+8.0
2462	-4.0	+8.0

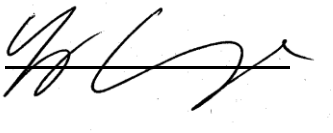
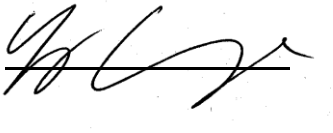
Test Date: July 7, 2016
Tested By
Signature:  Name: George Yang

Table 32. 802.11n Power Spectral Density for Low, Mid and High Bands

Frequency (MHz)	Raw Test Data (dBm/3 kHz)	FCC Limit (dBm/3 kHz)
2412	-5.2	+8.0
2437	-5.4	+8.0
2462	-6.2	+8.0

Test Date: July 7, 2016
Tested By
Signature:  Name: George Yang

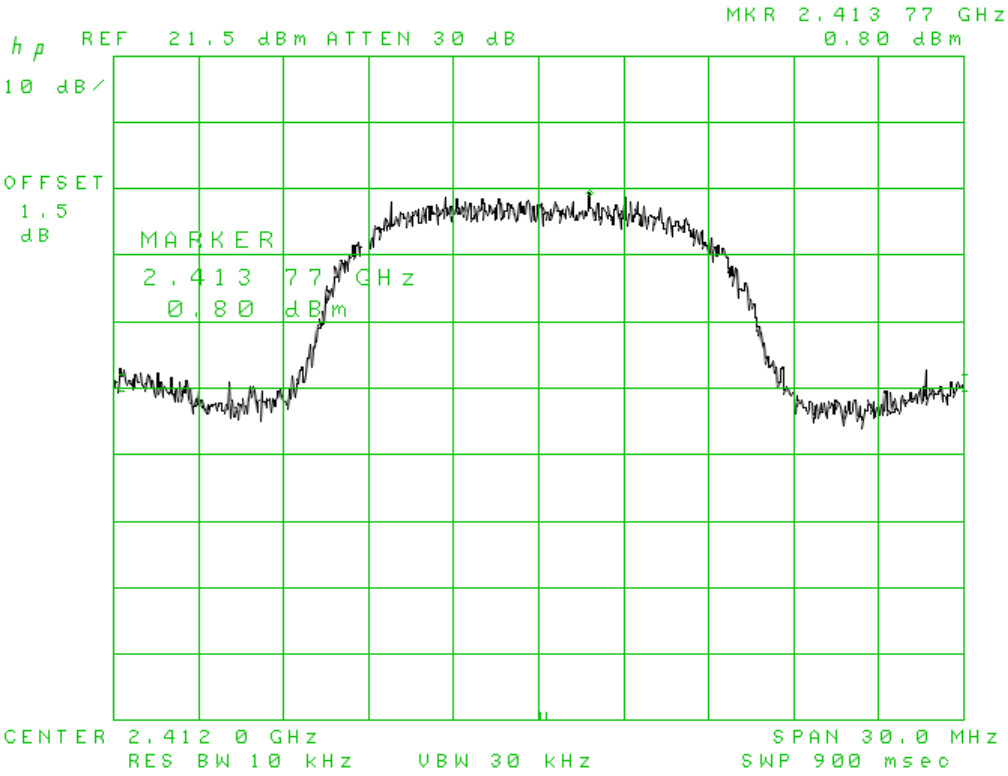


Figure 71. Peak Power Spectral Density 802.11b Low Channel

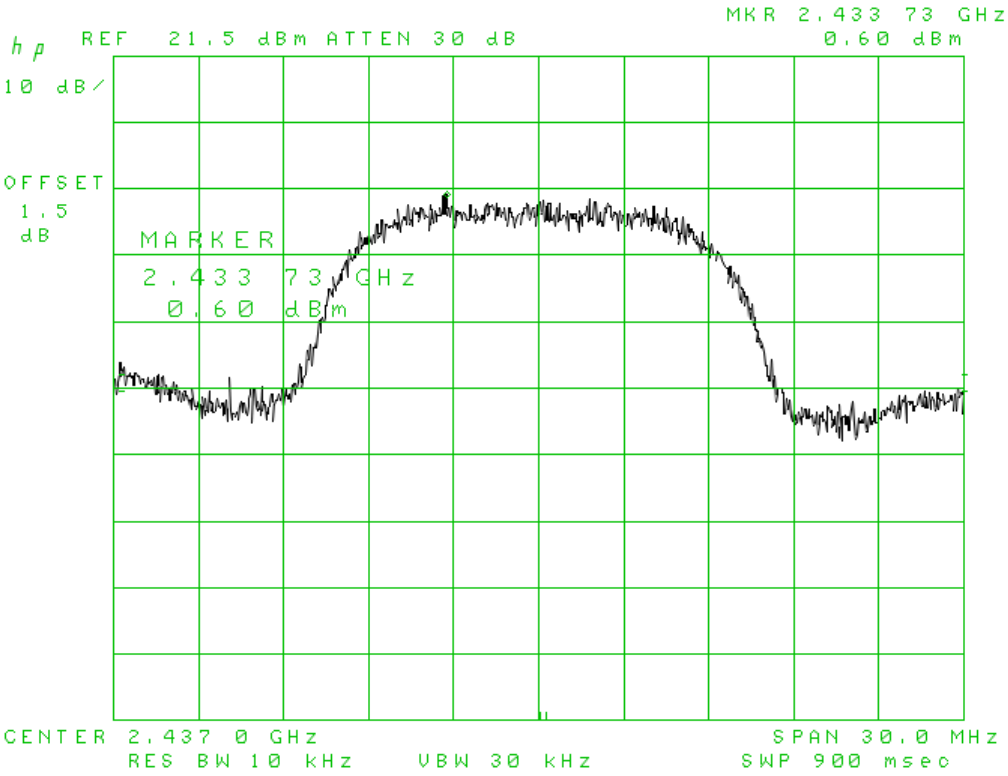


Figure 72. Peak Power Spectral Density 802.11b Mid Channel

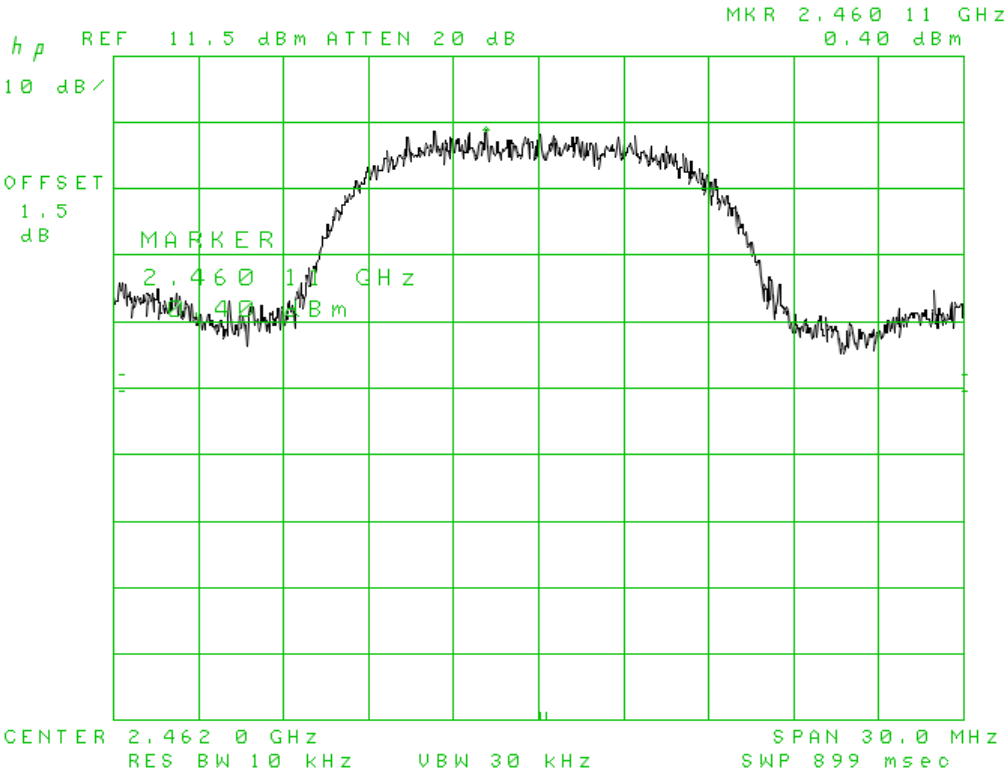


Figure 73. Peak Power Spectral Density 802.11b High Channel

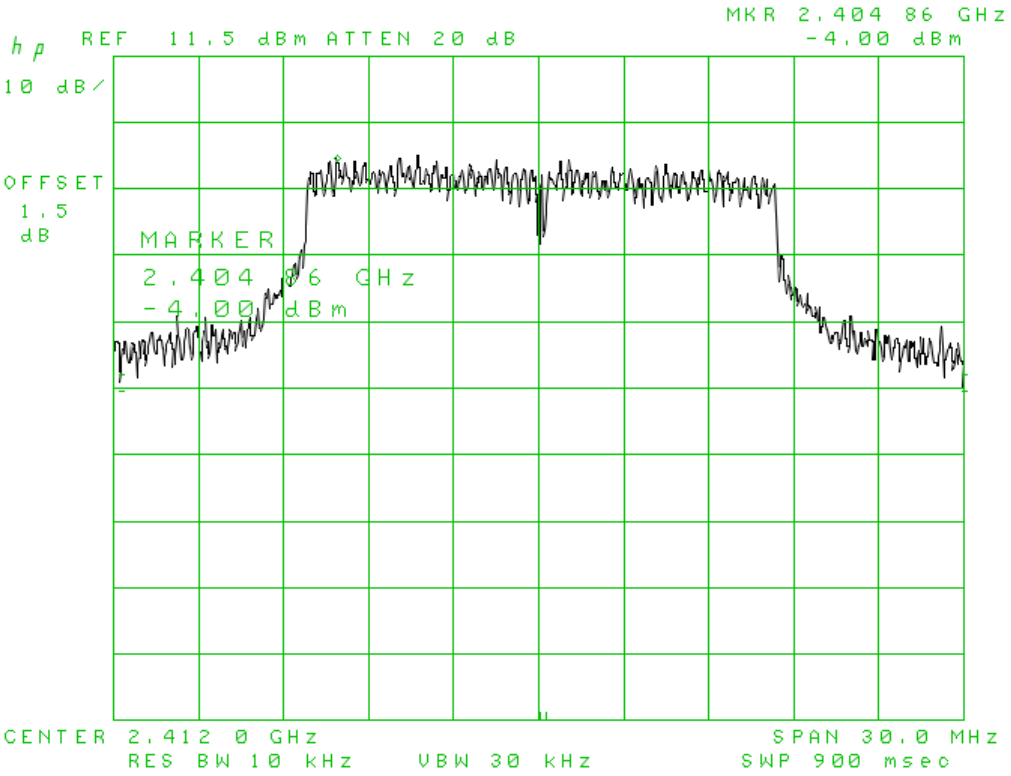


Figure 74. Peak Power Spectral Density 802.11g Low Channel

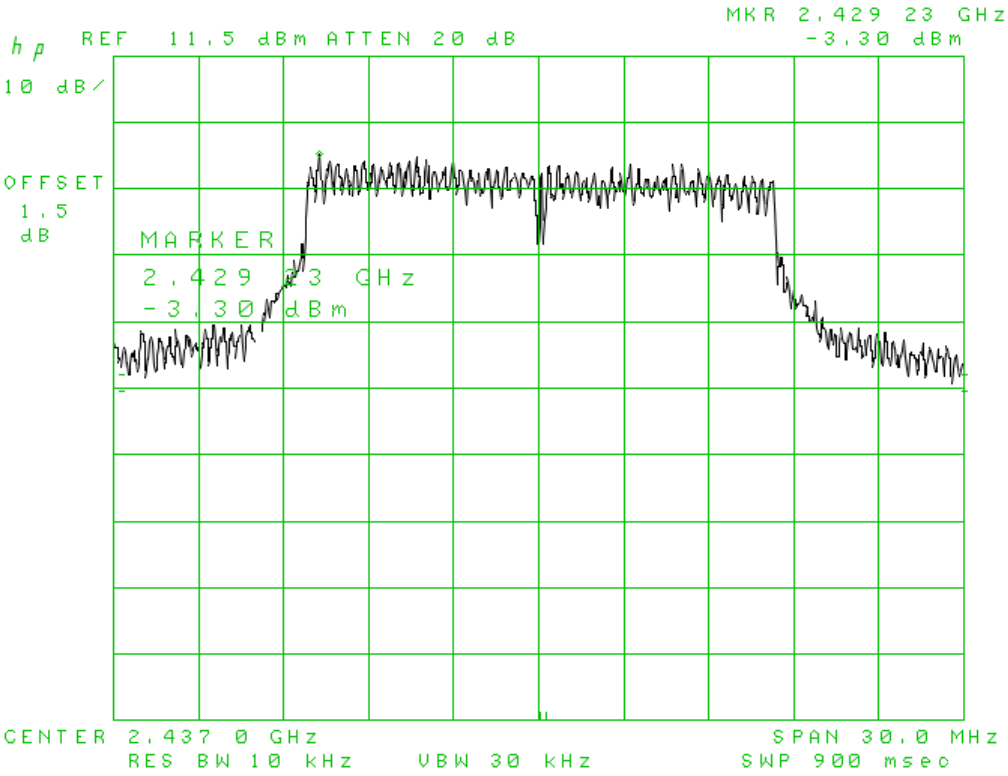


Figure 75. Peak Power Spectral Density 802.11g Mid Channel

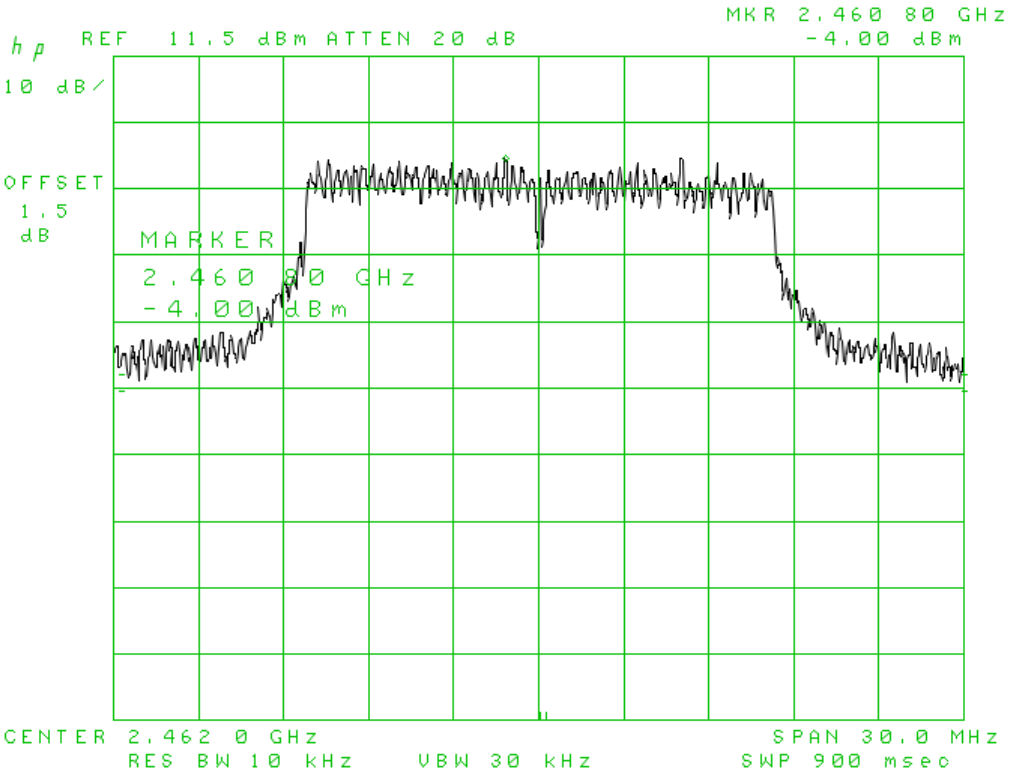


Figure 76. Peak Power Spectral Density 802.11g High Channel

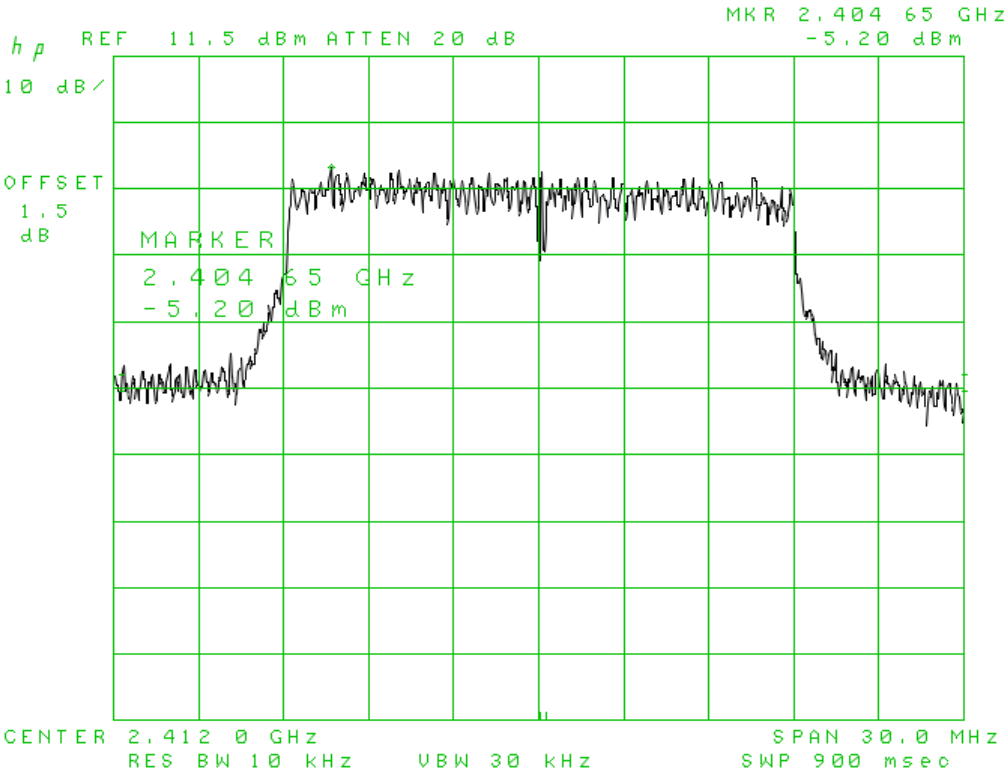


Figure 77. Peak Power Spectral Density 802.11n Low Channel

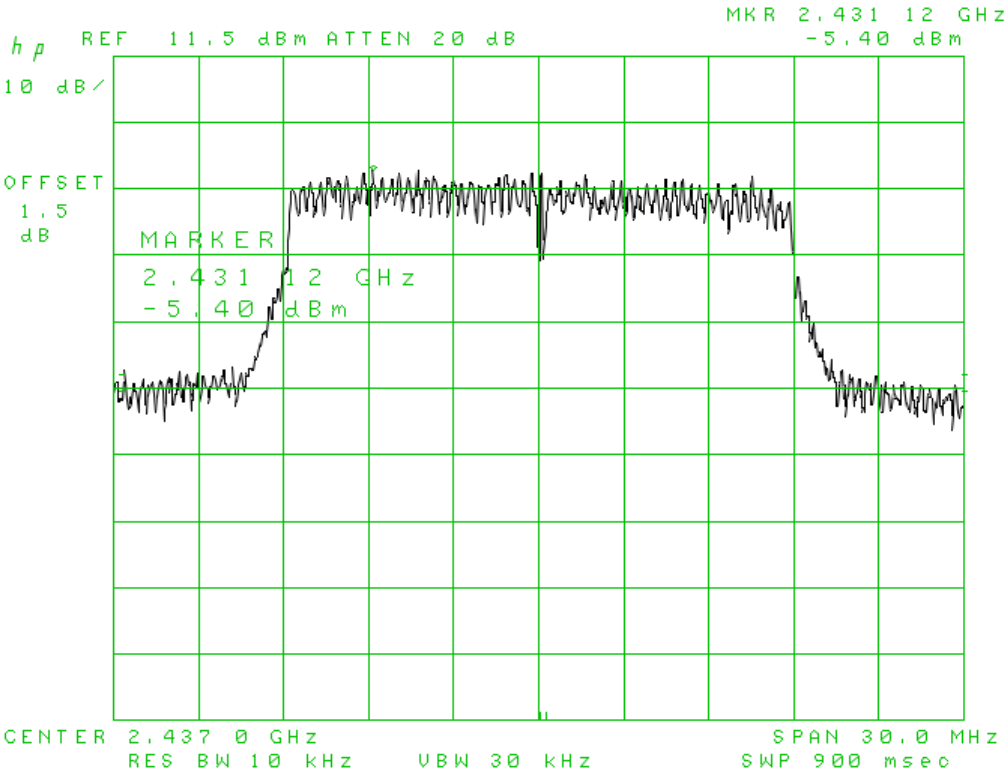


Figure 78. Peak Power Spectral Density 802.11n Mid Channel

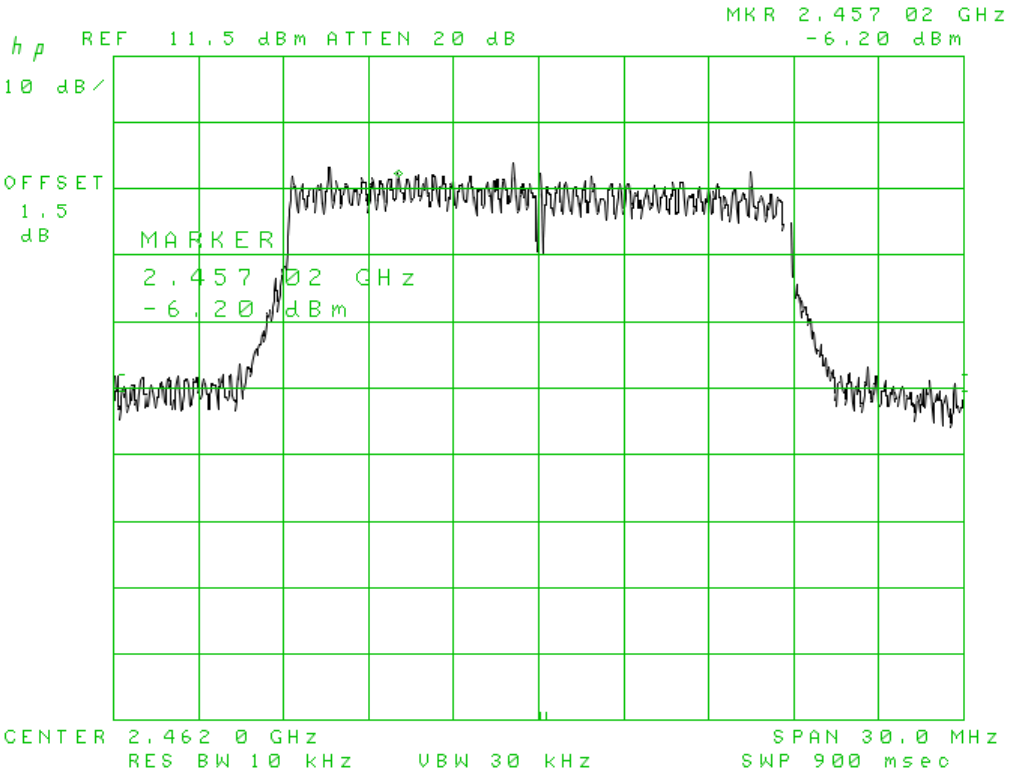


Figure 79. Peak Power Spectral Density 802.11n High Channel

2.16 Unintentional Radiator, Powerline Emissions (CFR 15.107)

The power line conducted voltage emissions measurements have been carried out in accordance with CFR 15.107, per ANSI C63.4:2009, Paragraph 7, with a spectrum analyzer connected to a LISN and the EUT placed into a continuous mode of transmission.

The worst-case results for conducted emissions were determined to be produced when the EUT was operating under continuous transmission. The worst case measurement occurred on the Phase line at 0.51 MHz. The emission level was 2.7 dB from the applicable limit. All other emissions were at least 2.8 dB from the limit. Those results are given in the table following.

NOTE: The test data provided in this section is to support the Verification and co-location requirement for the digital apparatus and the radios within.

Table 33. Transmitter Power Line Conducted Emissions Test Data, Part 15.107

150 KHz to 30 MHz with Class B Limits						
Test: Power Line Conducted Emissions				**Client:** Aglogica Holdings, Inc.		
Project: 16-0105				**Model:** AGL2		
Frequency (MHz)	**Test Data (dBuv)**	**LISN+CL-PA (dB)**	**Results (dBuV)**	**AVG Limits (dBuV)**	**Margin (dB)**	**Detector PK, QP, or AVG**
120 VAC, 60 Hz Phase						
0.15	51.10	1.36	52.46	55.8	3.3	**PK**
0.51	42.90	0.43	43.33	46.0	2.7	**PK**
4.85	41.50	0.44	41.94	46.0	4.1	**PK**
6.14	46.70	0.47	47.17	50.0	2.8	**PK**
19.60	41.00	0.62	41.62	50.0	8.4	**PK**
24.45	42.80	0.69	43.49	50.0	6.5	**PK**
120VAC, 60 Hz Neutral						
0.46	44.70	0.44	45.14	56.6*	11.5	**QP**
0.46	41.00	0.44	41.44	46.6	5.2	**AVG**
0.54	45.40	0.41	45.81	56.0*	10.2	**QP**
0.54	41.70	0.41	42.11	46.0	3.9	**AVG**
4.61	42.00	0.42	42.42	46.0	3.6	**PK**
6.14	46.60	0.46	47.06	50.0	2.9	**PK**
11.16	41.10	0.59	41.69	50.0	8.3	**PK**
21.23	41.20	0.64	41.84	50.0	8.2	**PK**

Note: * denotes QP Limits

SAMPLE CALCULATION at 0.15 MHz:

Magnitude of Measured Frequency	51.10	dBuV
+ Cable Loss+ LISN Loss	1.36	dB
=Corrected Result	52.46	dBuV
Limit	55.80	dBuV
-Corrected Result	52.46	dBuV
Margin	3.34	dB

Test Date: June 15, 2016
Tested By
Signature: Hossein Rahnama Name: Hossein Rahnama

2.17 Unintentional Radiator, Radiated Emissions (CFR 15.109)

Radiated emissions disturbance Measurements were performed with an instrument having both peak and quasi-peak detectors over the frequency range of 30 MHz to 5 times the highest frequency used or generated by the test unit. Measurements of the radiated emissions were made with the receiver antenna at a distance of 3 m from the boundary of the test unit.

The test antenna was varied from 1 m to 4 m in height while watching the analyzers' display for the maximum magnitude of the signal at the test frequency. The antenna polarization (horizontal or vertical) and test sample azimuth were varied during the measurements to find the maximum field strength readings to record.

The worst-case radiated emission in the range of 30 MHz to 1 GHz was 13.3 dB below the limit at 529.80 MHz. This signal is found in Table 46. All other radiated emissions in this range were 13.8 dB or more below the limit.

The worst-case radiated emissions in the range of 1 GHz to 13 GHz was greater than 20 dB below the limit at all frequencies.

NOTE: The test data provided in this section is to support the Verification and co-location requirement for the digital apparatus and the radios within. During this testing the radio were placed into normal operation mode.

Table 34. Unintentional Radiator, Peak Radiated Emissions (CFR 15.109),

30 MHz to 1000 MHz

30 MHz to 1000 MHz with Class B Limits							
Test: Radiated Emissions				**Client:** Aglogica Holdings, Inc.			
Project: 16-0105				**Model:** AGL2			
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**
167.63	34.50	-4.80	29.70	43.5	3m./VERT	13.8	**PK**
110.95	32.60	-8.46	24.14	43.5	3m./HORZ	19.4	**PK**
147.97	32.30	-6.52	25.78	43.5	3m./HORZ	17.7	**PK**
437.96	31.80	-1.37	30.43	46.0	3m./HORZ	15.6	**PK**
380.41	33.40	-3.21	30.19	46.0	3m./VERT	15.8	**PK**
529.80	32.40	0.34	32.74	46.0	3m./VERT	13.3	**PK**

SAMPLE CALCULATION at 167.63 MHz:

Magnitude of Measured Frequency	34.50	dBuV
+ Cable Loss+ LISN Loss	-4.80	dB
=Corrected Result	29.70	dBuV
Limit	43.50	dBuV
-Corrected Result	29.70	dBuV
Margin	13.80	dB

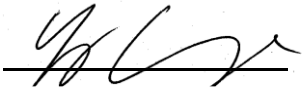
Test Date: June 1, 2016
Tested By
Signature: _____ Name: George Yang

Table 35. Unintentional Radiator, Peak Radiated Emissions (CFR 15.109), Above 1 GHz

1 GHz to 13 GHz with Class B Limits							
Test: Radiated Emissions				**Client:** Aglogica Holdings Inc.			
Project: 16-0105				**Model:** AGL2			
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**AVG Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
All emissions found are more than 20 dB below the applicable limit.							

SAMPLE CALCULATION: N/A

Test Date: June 1, 2016

Signature:  Name: George Yang

2.18 Measurement Uncertainty

The measurement uncertainties given were calculated using the method detailed in CISPR 16-4. A coverage factor of k=2 was used to give a level of confidence of approximately 95%.

2.18.1 Conducted Emissions Measurement Uncertainty

Measurement Uncertainty (within a 95% confidence level) for this test is ± 2.78 dB.

The data listed in this test report does not have sufficient margin to negate the effects of uncertainty. Therefore, the EUT conditionally meets this requirement.

2.18.2 Radiated Emissions Measurement Uncertainty

For a measurement distance of 3 m the measurement uncertainty (with a 95% confidence level) for this test using a Biconical Antenna (30 MHz to 200 MHz) is ± 5.39 dB. This value includes all elements of measurement.

The measurement uncertainty (with a 95% confidence level) for this test using a Log Periodic Antenna (200 MHz to 1000 MHz) is ± 5.18 dB.

The measurement uncertainty (with a 95% confidence level) for this test using a Horn Antenna is ± 5.21dB.

The data listed in this test report does have sufficient margin to negate the effects of uncertainty. Therefore, the EUT unconditionally meets this requirement.

3 Test Outcome

In our opinion, when tested as described in this test report, the EUT meets the requirements for FCC Part 2, Subpart J, Paragraph 2.907 and FCC Part 15, Subpart C, Paragraphs 15.207, 15.209, and 15.247. Additionally, the EUT meets the requirements for IC RSS-247, Issue 1.