FCC PART 15, SUBPART C
IC RSS-210, ISSUE 8, DECEMBER 2010

TEST AND MEASUREMENT REPORT

For

Tropos Networks, Inc.

555 Del Rey Avenue, Sunnyvale, CA 94085, USA

FCC ID: P9J-642401
IC: 4751A-642401

Report Type:	**Product Type:**
Original Report	802.11b/g/n Wi-Fi Module

Prepared By:	Isaac Aguilar Test Engineer
Report Number:	R1409232-247
Report Date:	2014-12-22
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1409232-247	Original	2014-12-22

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of *Tropos Networks, Inc.,* and their product model: Bluefin 2G, *FCC ID: P9J-642401 and IC ID: 4751A-642401* or the "EUT" (Equipment under Test) as referred to in this report. The EUT is a Wi-Fi 802.11b/g/n RF module operates in 2.4 GHz ISM band.

1.2 Mechanical Description of EUT

The EUT measures approximately 21 cm (L) x 16.5cm (W) x 35 cm (H) and weighs 1.65 kg.

The test data gathered are from typical production sample, serial number: 301367 assigned by client.

1.3 Objective

This report is prepared on behalf of *Tropos Networks, Inc.* in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commissions rules and IC RSS-210.

The objective is to determine compliance with FCC Part 15.247 and RSS-210 rules for Output Power, Antenna Requirements, 6 dB & 99% Bandwidth, power spectral density, 100 kHz Bandwidth of Band Edges Measurement, Spurious Emissions, Conducted and Radiated Spurious Emissions.

1.4 Related Submittal(s)/Grant(s)

N/A

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz and FCC KDB 558074 D01 DTS Meas Guidance v03r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

The following calculation follows the procedures as set forth in clause 7.2.3, ETSI TR 100 028-1 V1.4.1 (2001-12), the expression of Uncertainty in Radiated RF Testing is in accordance to ISO/IEC 17025 and TR 100 028-1 V1.4.1 (2001-12).

The expanded Measurement Uncertainty value having a confidence factor of 95%, is within a range of 5.48 dB.

This means that the value of conducted RF carrier power test will be within +/- 2.74 dB of the measuring radiated emissions power versus the expected value.

The expected value is defined as the power at the antenna of the Transmitter under Test.

1.7 Test Facility

Bay area compliance Laboratories Corp. (BACL) is:

1-An independent Commercial Test Laboratory accredited to **ISO 17025:2005** by **A2LA**, in the fields of: Electromagnetic Compatibility & Telecommunications covering Emissions, Immunity, Radio, RF Exposure, Safety and Telecom. This includes NEBS (Network Equipment Building System), Wireless RF, Telecommunications Terminal Equipment (TTE); Network Equipment; Information Technology Equipment (ITE); Medical Electrical Equipment; Industrial, Commercial, and Medical Test Equipment; Professional Audio and Video Equipment; Electronic (Digital) Products; Industrial and Scientific Instruments; Cabled Distribution Systems and Energy Efficiency Lighting.

2- An ENERGY STAR Recognized Laboratory, for the LM80 Testing, a wide variety of Luminares and Computers.

3- A NIST Designated Phase-I and Phase-II CAB including: ACMA (Australian Communication and Media Authority), BSMI (Bureau of Standards, Metrology and Inspection of Taiwan), IDA (Infocomm Development Authority of Singapore), IC(Industry Canada), Korea (Ministry of Communications Radio Research Laboratory), NCC (Formerly DGT; Directorate General of Telecommunication of Chinese Taipei) OFTA (Office of the Telecommunications Authority of Hong Kong), Vietnam, VCCI – Voluntary Control Council for Interference of Japan and a designated EU CAB (Conformity Assessment Body) (Notified Body) for the EMC and R&TTE Directives.

4- A Product Certification Body accredited to **ISO Guide 65:1996** by **A2LA** to certify:
1- Unlicensed, Licensed radio frequency devices and Telephone Terminal Equipment for the FCC. Scope A1, A2, A3, A4, B1, B2, B3, B4 & C.
2. Radio Standards Specifications (RSS) in the Category I Equipment Standards List and All Broadcasting Technical Standards (BETS) in Category I Equipment Standards List for Industry Canada.
3. Radio Communication Equipment for Singapore.
4. Radio Equipment Specifications, GMDSS Marine Radio Equipment Specifications, and Fixed Network Equipment Specifications for Hong Kong.
5. Japan MIC Telecommunication Business Law (A1, A2) and Radio Law (B1, B2 and B3).
6. Audio/Video, Battery Charging Systems, Computers, Displays, Enterprise Servers, Imaging Equipment, Set-Top Boxes, Telephony, Televisions, Ceiling Fans, CFLs (Including GU24s),Decorative Light Strings, Integral LED Lamps, Luminaires, Residential Ventilating Fans.

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2009, ANSI C63.4-2009, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: A-0027. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is an American Association for Laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2009 and FCC KDB 558074 D01 DTS Meas Guidance v03r02.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test. The worst-case data rates are determined to be as follows for each mode based upon investigation by measuring the average power, peak power and PPSD across all data rates bandwidths, and modulations.

2.2 EUT Exercise Software

The test utility used was *Atheros Radio Test 2* and was provided by *Tropos Networks, Inc.*, and was verified by Isaac Aguilar to comply with the standard requirements being tested against.

2.3 Special Equipment

No special equipment was used.

2.4 Equipment Modifications

No modifications were made to the equipment.

2.5 Local Support Equipment

Manufacturer	Description	Model	Serial Number
DELL	laptop	E5430	7x4v3x1
DELL	laptop	E5430	8w4v3x1

2.6 EUT Internal Configuration Details

N/A

2.7 Interface Ports and Cables

Cable Description	Length (m)	To	From
RF Cable	< 1	Module Antenna Port	Spectrum Analyzer
CAT5e	< 1	Moldue RJ-45	Laptop

2.8 Power Supply List and Details

Manufacturer	Description	Model	Serial Number
CINCON ELECTRONICS	POE 48V 1.2A	TR60A-POE-L	007653

3 Summary of Test Results

Results reported relate only to the product tested.

FCC & IC Rules	Description of Test	Results
FCC §2.1091, § 15.247(i) IC RSS-102	RF Exposure	Compliant
FCC §15.207(a) IC RSS-Gen §7.2.4	AC Line Conducted Emissions	Compliant
FCC §15.203 IC RSS-Gen §7.1.2	Antenna Requirements	Compliant
FCC §15.247(d) IC RSS-210 §A8.5	Spurious Emissions at Antenna Port	Compliant
FCC §15.209, §15.247(d) IC RSS-210 §A8.2, §A8.5	Spurious Radiated Emissions	Compliant
FCC §15.247(a)(2) IC RSS-210 §A8.5	6 dB & 99% EMision Bandwidth	Compliant
FCC §15.247(b)(3) IC RSS-210 §A8.4	Output Power	Compliant
FCC §15.247(d) IC RSS-210 §A8.5	Band Edge	Compliant
FCC §15.247(e) IC RSS-210 §A8.2(b)	Power Spectral Density	Compliant

4 FCC §2.1091, §15.247(i) & IC RSS-102 – RF Exposure

4.1 Applicable Standard

According to FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* (100)	30
1.34-30	824/f	2.19/f	* ($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Before equipment certification is granted, the procedure of IC RSS-102 must be followed concerning the exposure of humans to RF fields.

According to IC RSS-102 Issue 2 section 4.1, RF limits used for general public will be applied to the EUT.

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Time Averaging (min)
0.003 - 1	280	2.19	-	6
1 - 10	280 / f	2.19 / f	-	6
10 - 30	28	2.19 / f	-	6
30 – 300	28	0.073	2*	6
300 – 1 500	$1.585\ f^{0.5}$	$0.0042\ f^{0.5}$	f / 150	6
1 500 – 15 000	61.4	0.163	10	6
15 000 – 150 000	61.4	0.163	10	$616000 / f^{1.2}$
150 000- 300 000	$0.158\ f^{0.5}$	$4.21 \times 10^{-4}\ f^{0.5}$	$6.67 \times 10^{-5}\ f$	$616000 / f^{1.2}$

Note: *f* is frequency in MHz
* = Power density limit is applicable at frequencies greater than 100 MHz

4.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

4.3 MPE Results

Maximum peak output power at antenna input terminal (dBm):	28.27
Maximum peak output power at antenna input terminal (mW):	671.43
Prediction distance (cm):	20
Prediction frequency (MHz):	2412
Maximum Antenna Gain, typical (dBi):	7.5
Maximum Antenna Gain (numeric):	5.62
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.75
Power density of prediction frequency at 20.0 cm (W/m^2):	7.51
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0
MPE limit for uncontrolled exposure at prediction frequency (W/m^2):	10

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.75 mW/cm^2 (7.51 W/m^2). Limit is 1.0 mW/cm^2 (10 W/m^2).

5 FCC §15.203 & IC RSS-Gen §7.1.2 – Antenna Requirements

5.1 Applicable Standard

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

And according to FCC §15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to IC RSS-Gen §7.1.2: Transmitter Antenna

A transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 mW or less. For devices of output powers greater than 10 mW, except devices subject to RSS-210 Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands) or RSS-210 Annex 9 (Local Area Network Devices), the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

5.2 Antenna List

Manufacturers	Antenna Type/Pattern	Antenna Gain (dBi) @ 2.4 GHz
SmartAnt	Omni-Type	7.5

Note: The power setting was controlled by manufacture with different antenna configuration. The power setting of the different antenna will be set with the corresponded value and no more then the level reported.

The 7.5 dBi patch antenna consist of MMCX connectors with greater than 6 dBi gain; therefore, the output power and power spectral density limit shall be reduced by 1.5 dB to comply with the antenna requirement.

6 FCC §15.207 & IC RSS-Gen §7.2.4 – AC Line Conducted Emissions

6.1 Applicable Standards

As per FCC §15.207 and IC RSS-Gen §7.2.4 Conducted limits:

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

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 Note	56 to 46 Note
0.5-5	56	46
5-30	60	50

Note: Decreases with the logarithm of the frequency.

6.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.4-2009 measurement procedure. The specification used was FCC §15.207 and IC RSS-Gen §7.2.4 limits.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The AC/DC power adapter of the EUT was connected with LISN-1 which provided 120 V / 60 Hz AC power.

6.3 Test Procedure

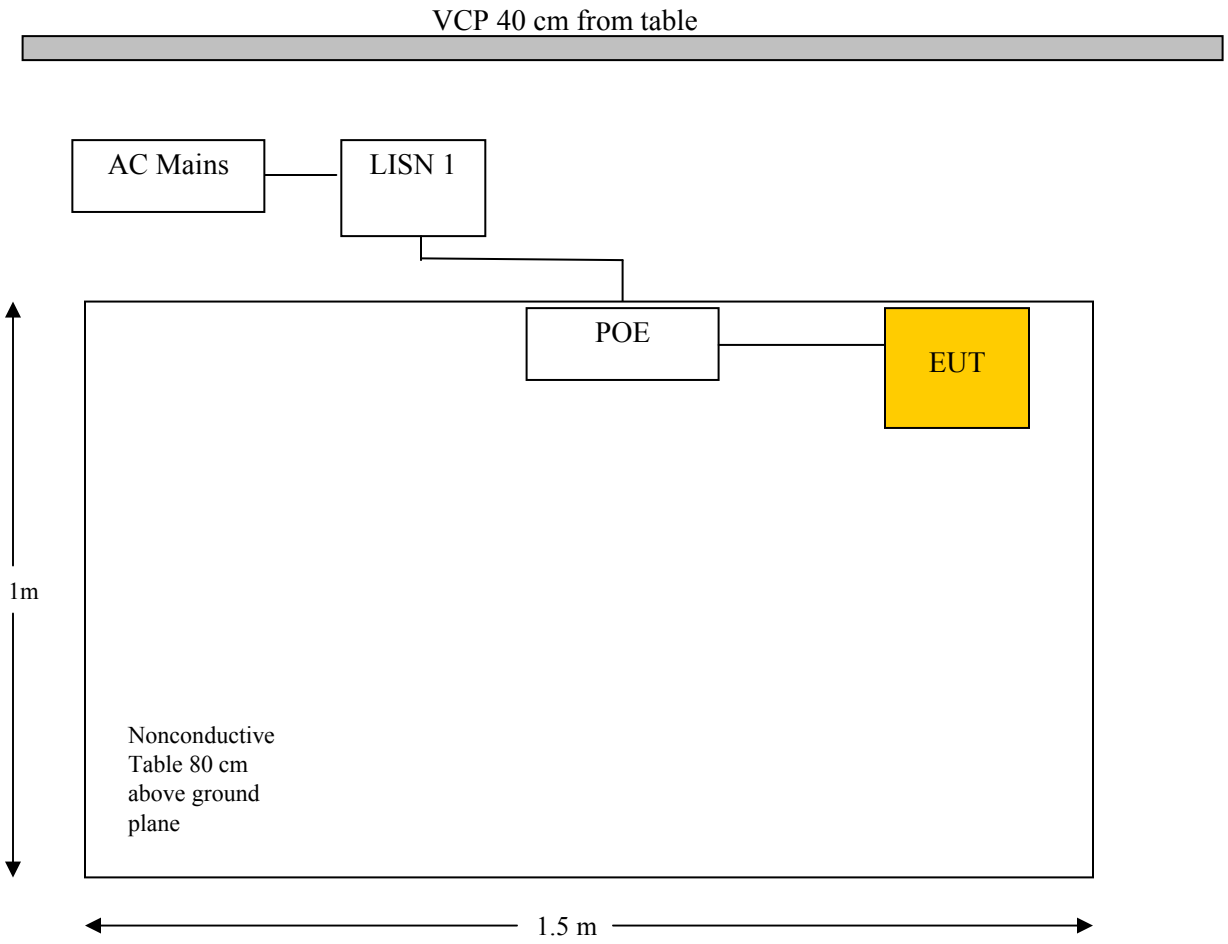
During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-1 and the power cord of the support equipment was connected to LISN-2.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the peak detection mode, quasi-peak and average. Quasi-Peak readings are distinguished with a “QP.” Average readings are distinguished with an “Ave.”

6.4 Test Setup Block Diagram

AC/DC Adaptor:



6.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Cable Loss (CL), the Attenuator Factor (Atten) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + CL + Atten

For example, a corrected amplitude of 46.2 dBuV = Indicated Reading (32.5 dBuV) + Cable Loss (3.7 dB) + Attenuator (10 dB)

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Limit

6.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2013-10-28	1 year
Solar Electronics	LISN	9252-50-R-24-N	511205	2013-10-25	1 year
TTE	Filter, High Pass	H962-150k-50-21378	K7133	2014-01-30	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

6.7 Test Environmental Conditions

Temperature:	22-24º C
Relative Humidity:	40-41 %
ATM Pressure:	103.1-104.1 KPa

The testing was performed by Cipher Chu on 2014-10-05 in 5m chamber3.

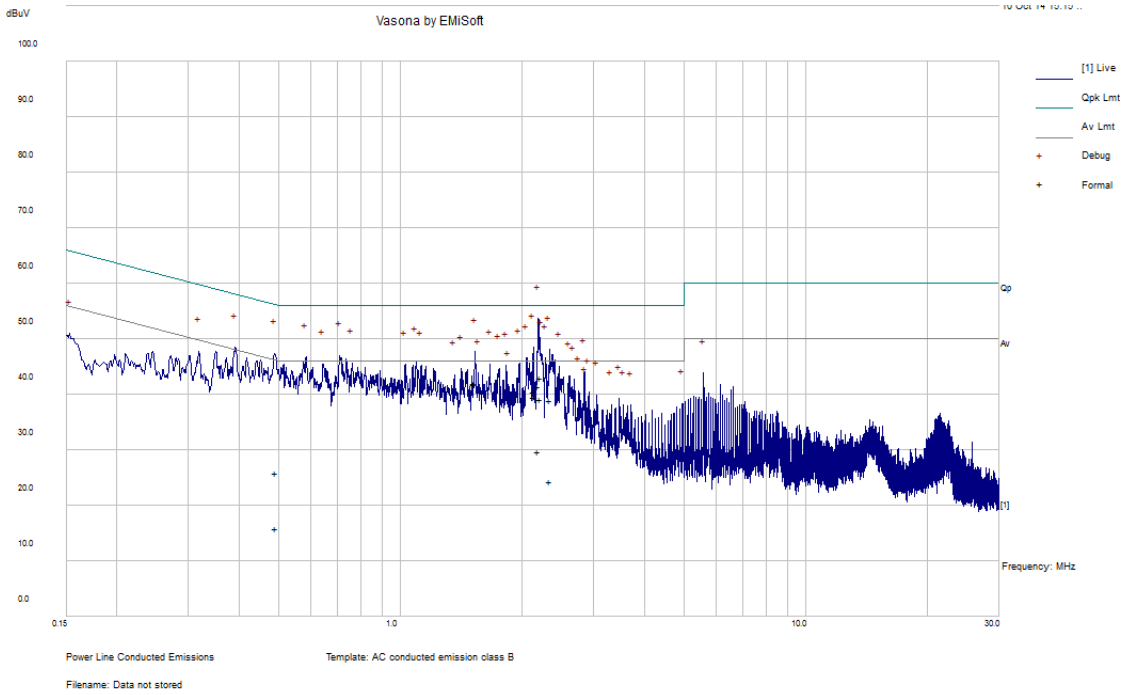
6.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC 15C and IC RSS-Gen standard's conducted emissions limits, with the margin reading of:

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-3.0	2.184642	Neutral	0.15-30

6.9 Conducted Emissions Test Plots and Data

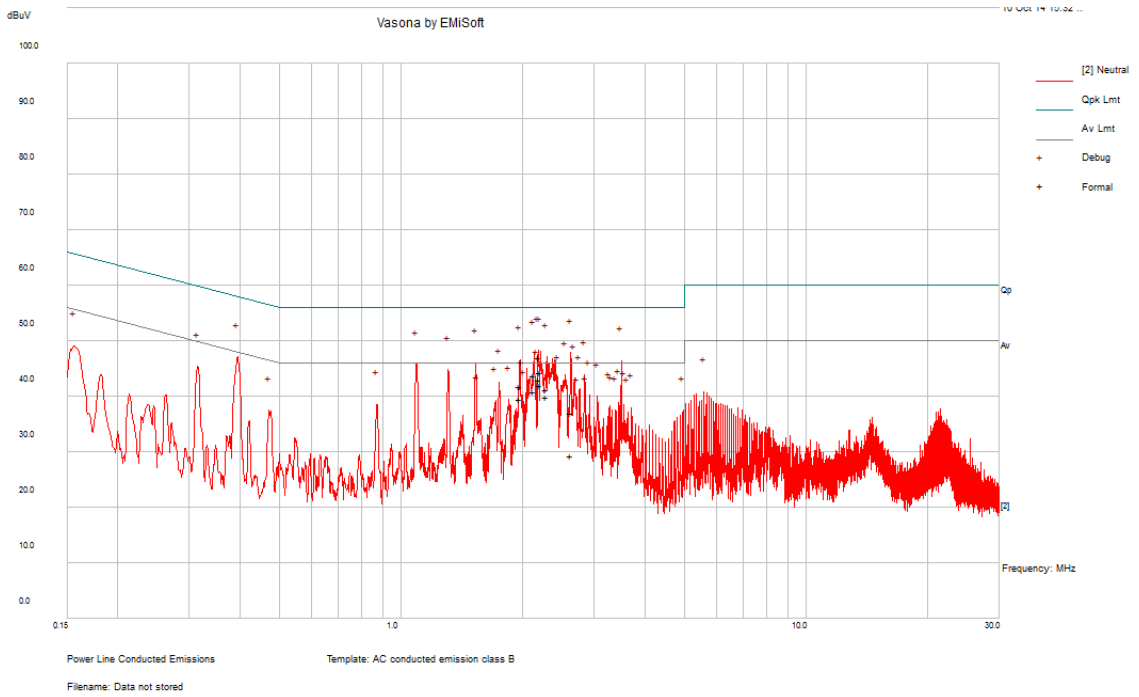
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
2.193618	31.67	Line	56	-14.55	QP
2.131749	30.79	Line	56	-15.43	QP
2.33642	29.11	Line	56	-17.11	QP
1.5255	32.41	Line	56	-13.86	QP
2.211672	33.16	Line	56	-13.06	QP
0.492153	16.25	Line	56.13	-30.16	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
2.193618	20.06	Line	46	-16.16	Ave.
2.131749	29.7	Line	46	-6.52	Ave.
2.33642	14.54	Line	46	-21.67	Ave.
1.5255	32.05	Line	46	-4.22	Ave.
2.211672	29.45	Line	46	-6.78	Ave.
0.492153	6.21	Line	46.13	-30.2	Ave.

120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
2.184642	37.22	Neutral	56	-9.01	QP
2.207249	34.48	Neutral	56	-11.74	QP
2.624332	27.33	Neutral	56	-18.88	QP
2.127753	34	Neutral	56	-12.23	QP
2.288888	31.44	Neutral	56	-14.78	QP
1.959933	32.02	Neutral	56	-14.21	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
2.184642	33.23	Neutral	46	-3	Ave.
2.207249	32.21	Neutral	46	-4.01	Ave.
2.624332	19.62	Neutral	46	-16.59	Ave.
2.127753	31.11	Neutral	46	-5.12	Ave.
2.288888	30.25	Neutral	46	-5.97	Ave.
1.959933	29.87	Neutral	46	-6.36	Ave.

7 FCC §15.247(d) & IC RSS-Gen §A8.5 – Spurious Emissions at Antenna Terminals

7.1 Applicable Standard

For FCC §15.247(d) and IC RSS-210 §A8.5 in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

7.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 11: Emissions in non-restricted frequency bands.

7.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Cycle
Agilent	Spectrum Analyzer	E4440A	MY44303352	2013-10-16	1 Year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

7.4 Test Environmental Conditions

Temperature:	24 °C
Relative Humidity:	42 %
ATM Pressure:	101.28 kPa

The testing was performed by Isaac Aguilar from 2014-09-25 at RF site.

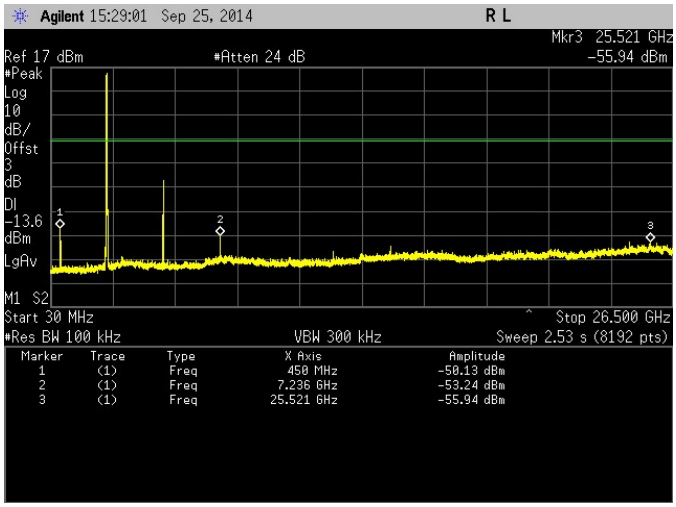
7.5 Test Results

The maximum PSD level was deteremined by the method described in FCC KDB 558074 D01 DTS Meas Guidance v03r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 11.2: Reference level measurement. This PSD measurement is the reference level for the spurious emissions outside the non-restriced band.

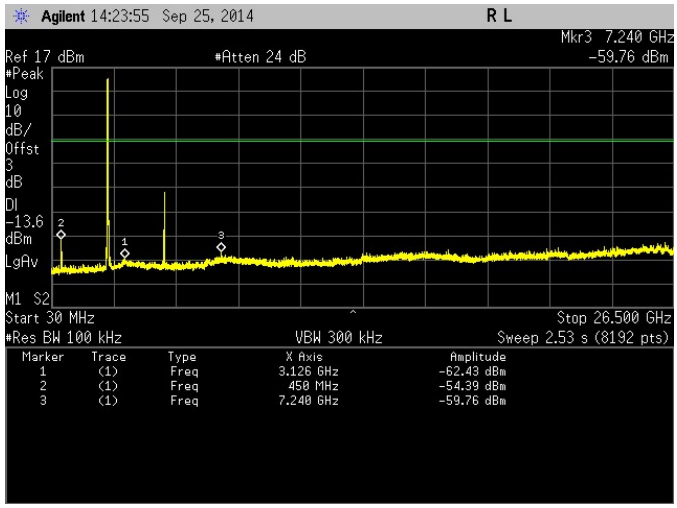
Please refer to the following test plots:

802.11b mode

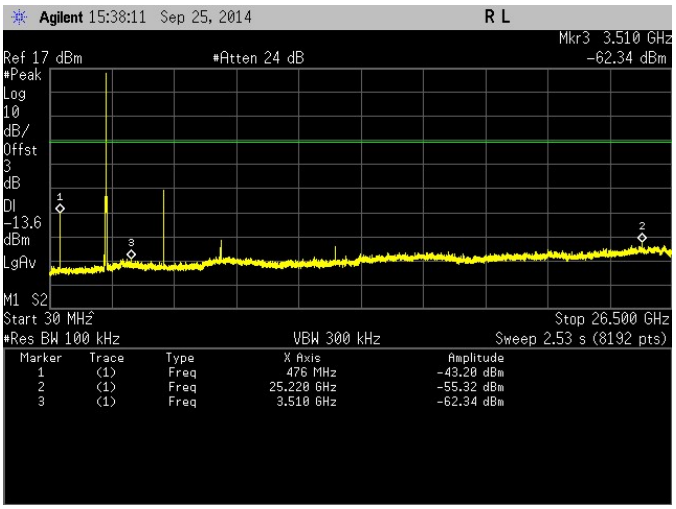
Low Channl, Chain 0



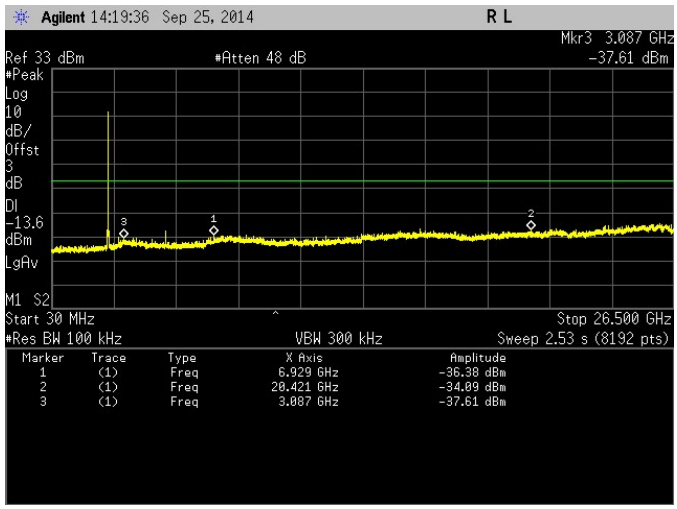
Low Channel, Chain 1



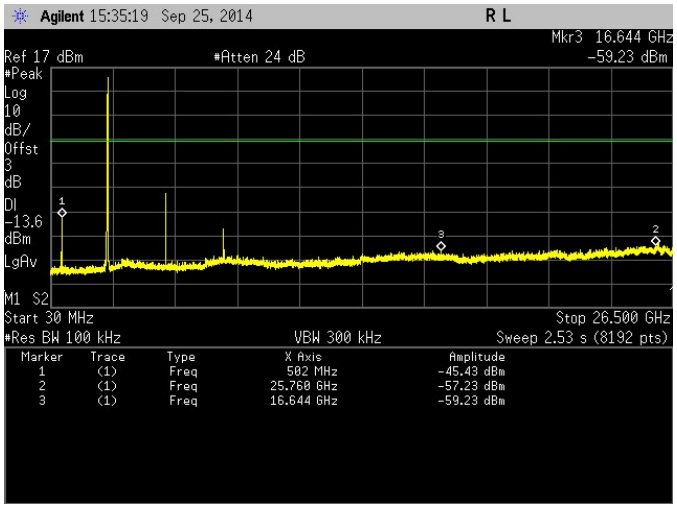
Middle Channl, Chain 0



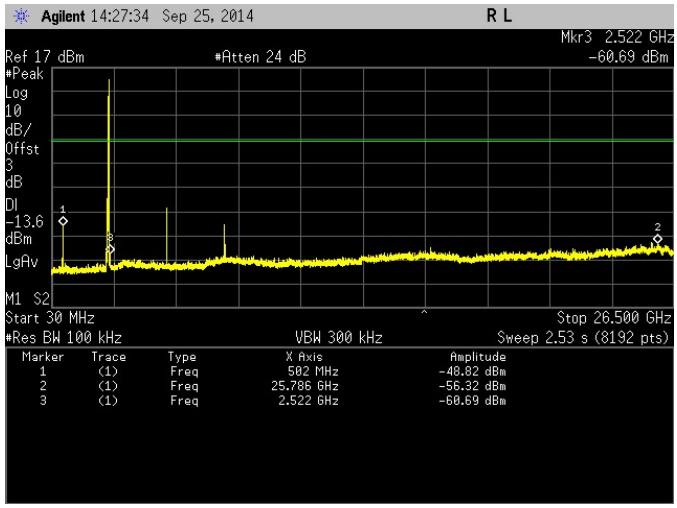
Middle Channel, Chain 1



High Channel, Chain 0

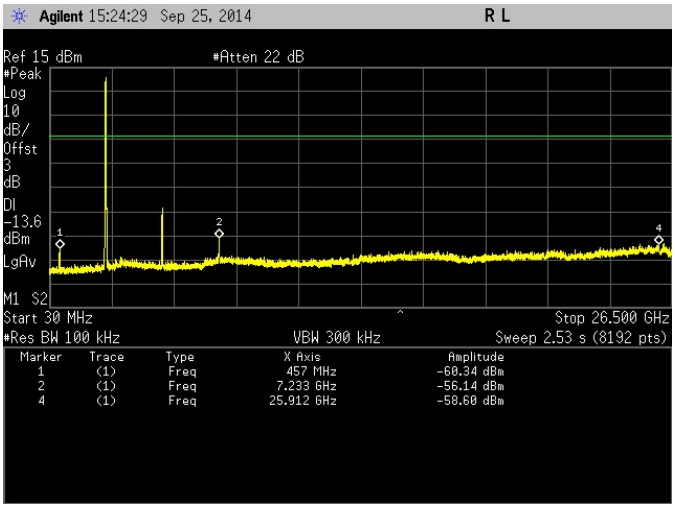


High Channel, Chain 1

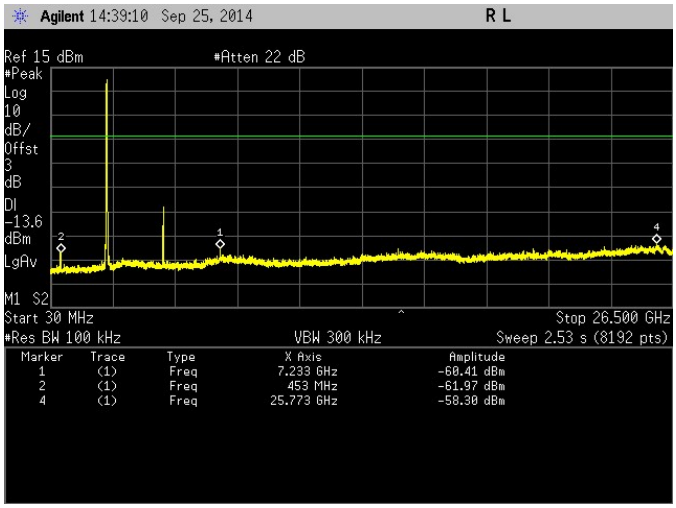


802.11g mode

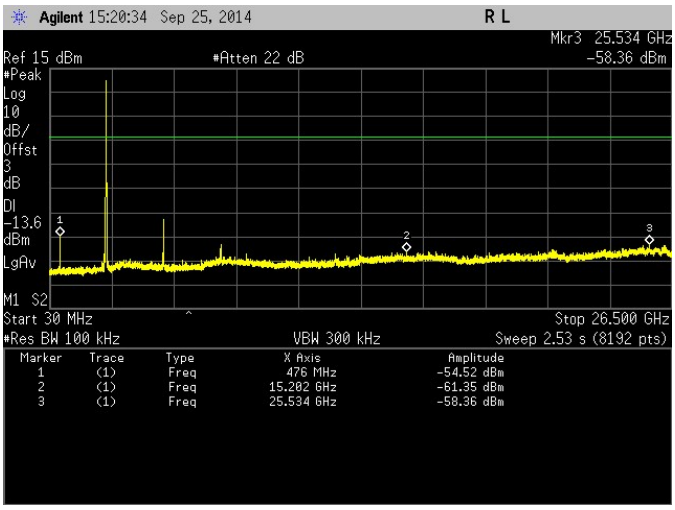
Low Channel, Chain 0



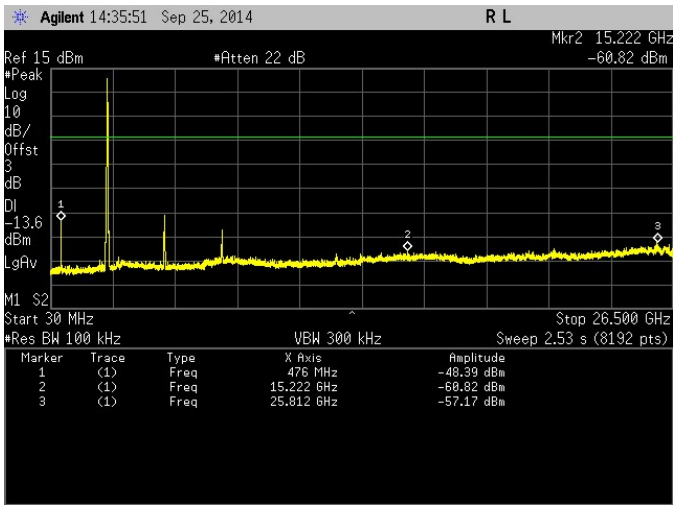
Low Channel, Chain 1



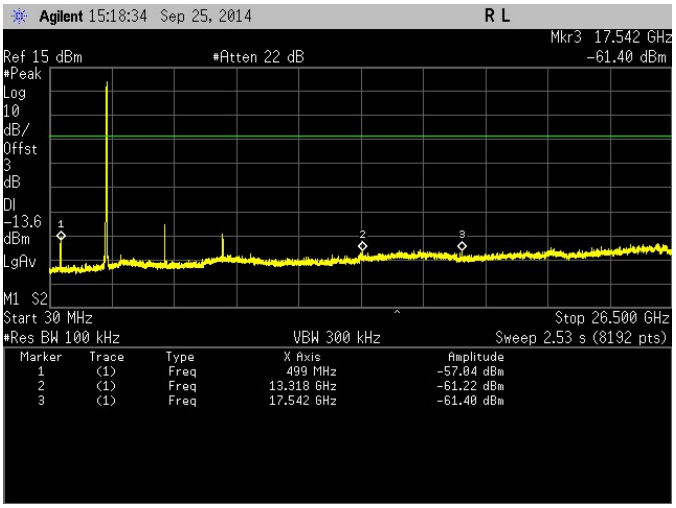
Middle Channel, Chain 0



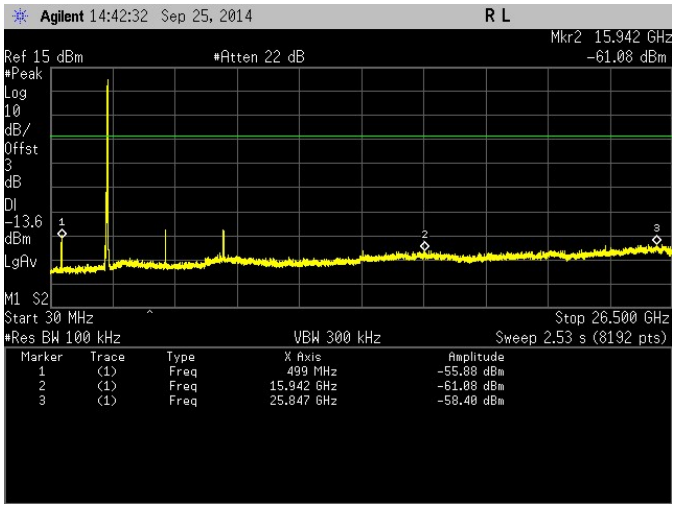
Middle Channel, Chain 1



High Channel, Chain 0

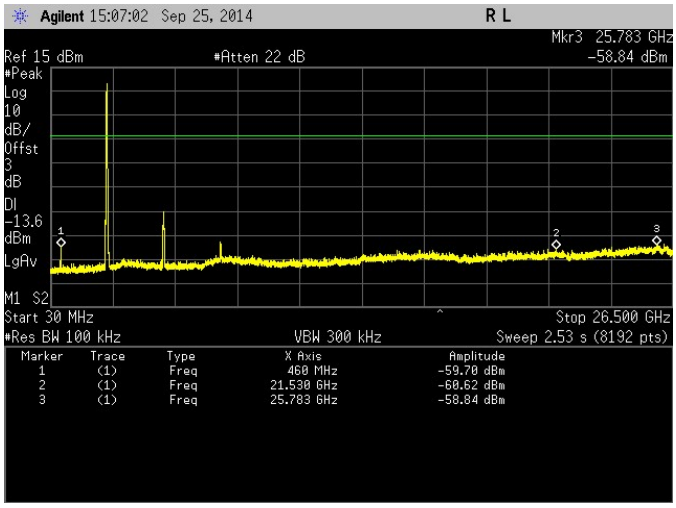


High Channel, Chain 1

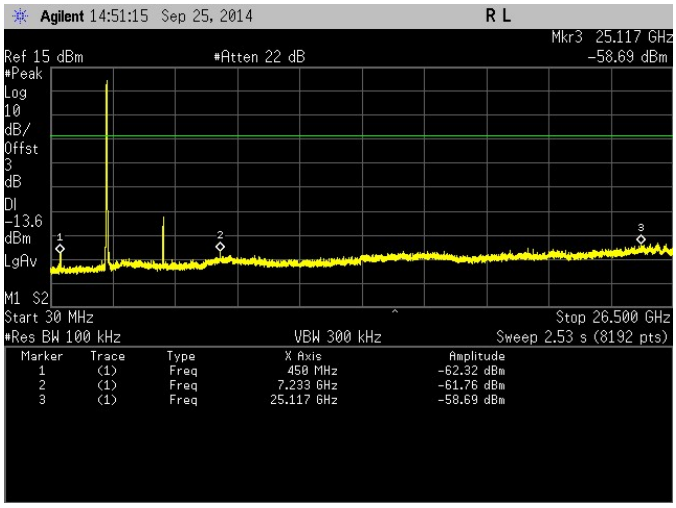


802.11n20 mode

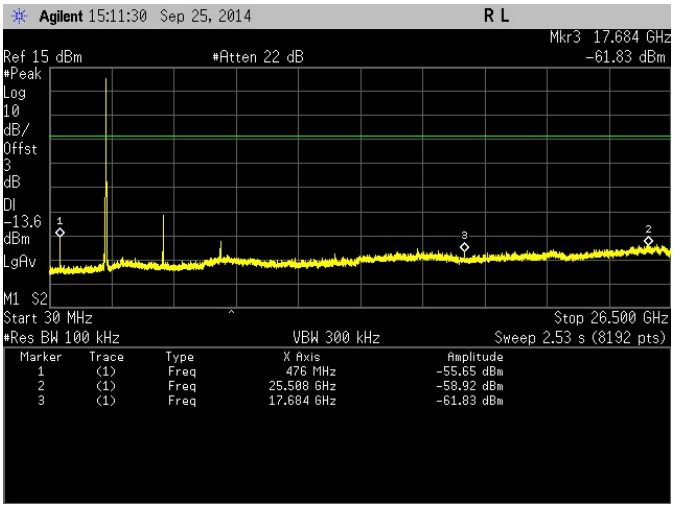
Low Channel, Chain 0



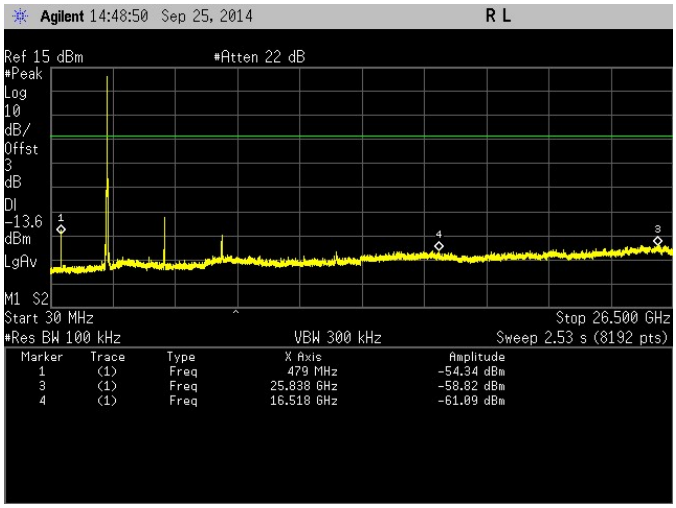
Low Channel, Chain 1



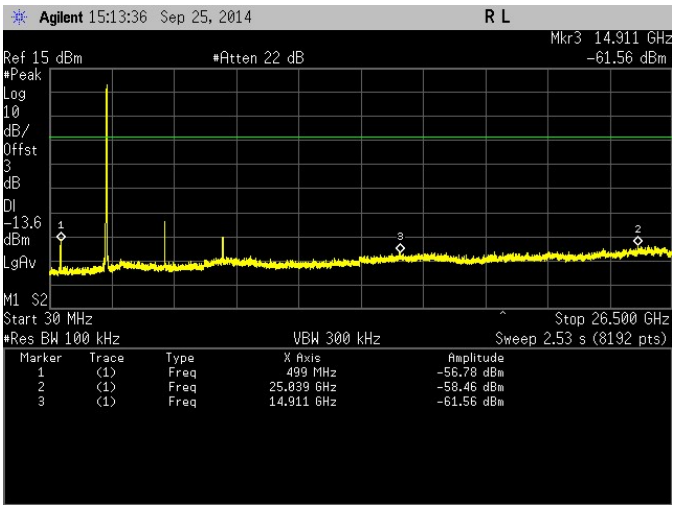
Middle Channel, Chain 0



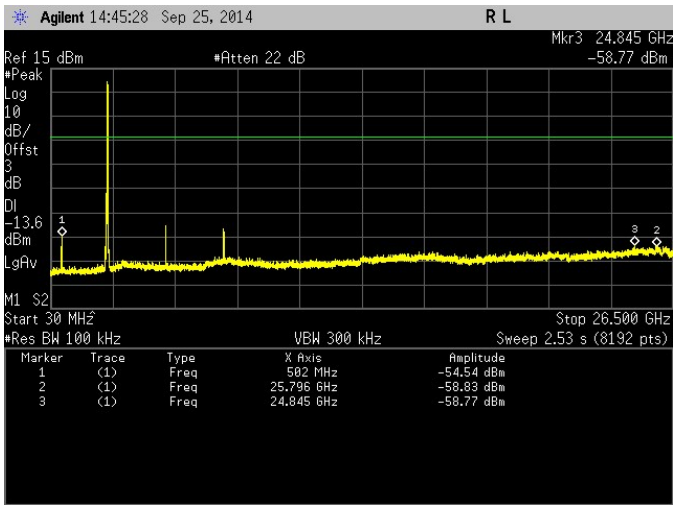
Middle Channel, Chain 1



High Channel, Chain 0

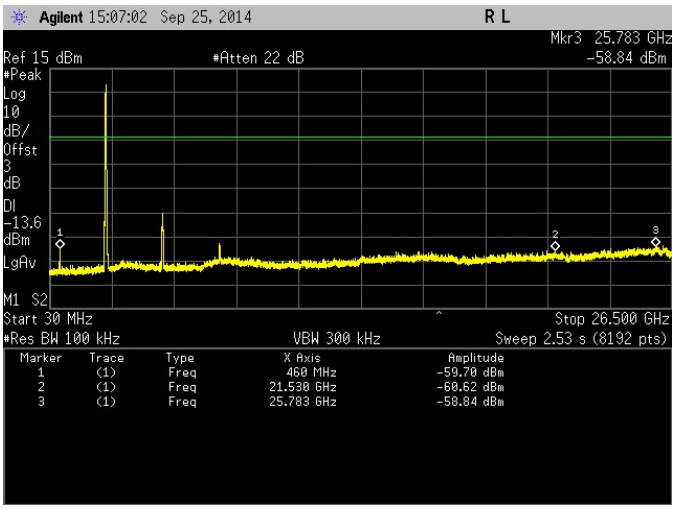


High Channel, Chain 1

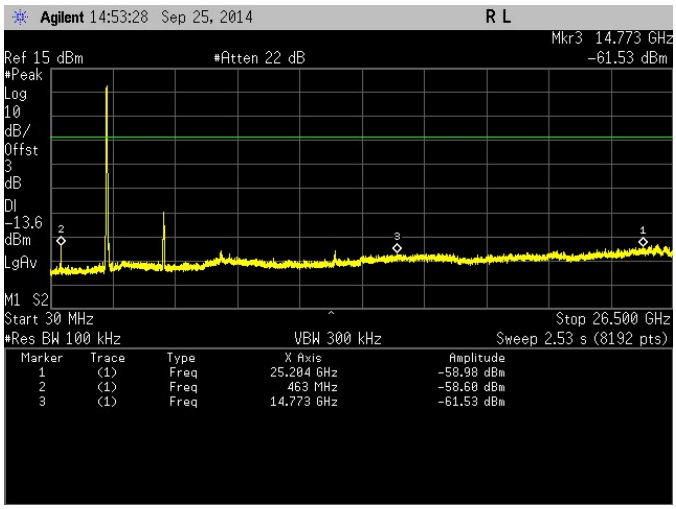


802.11n40 mode

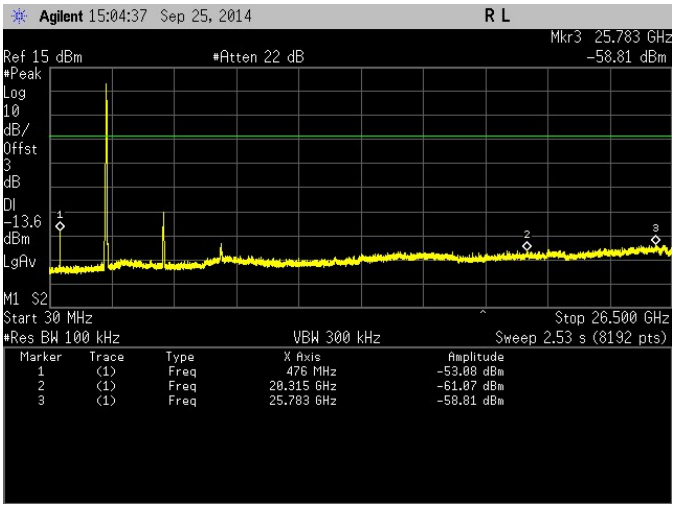
Low Channel, Chain 0



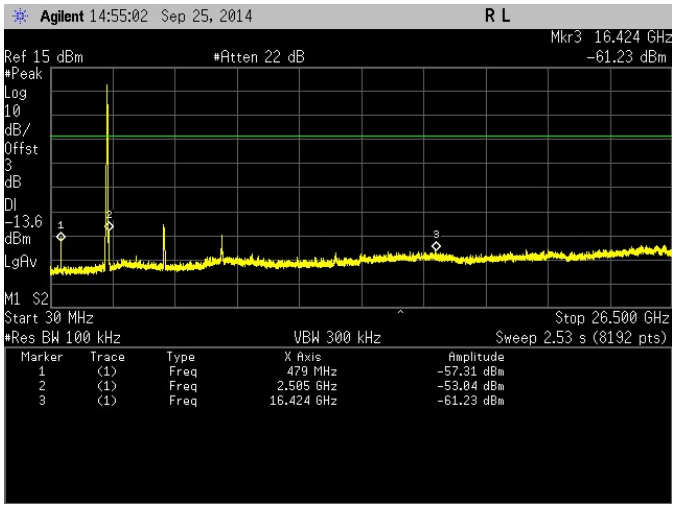
Middle Channel, Chain 1



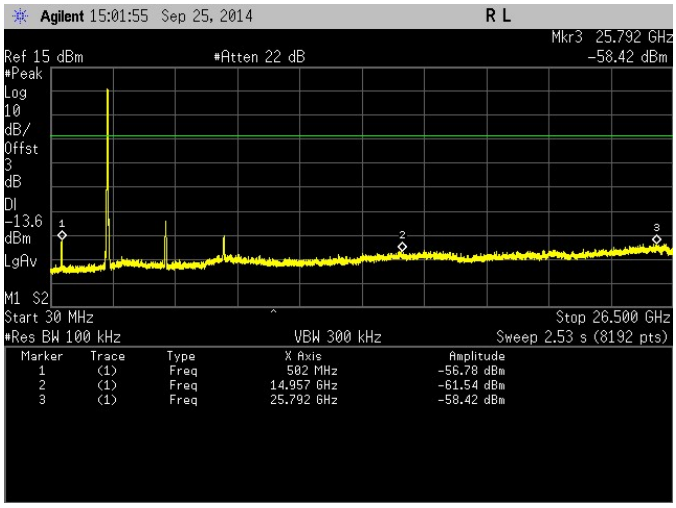
Middle Channel, Chain 0



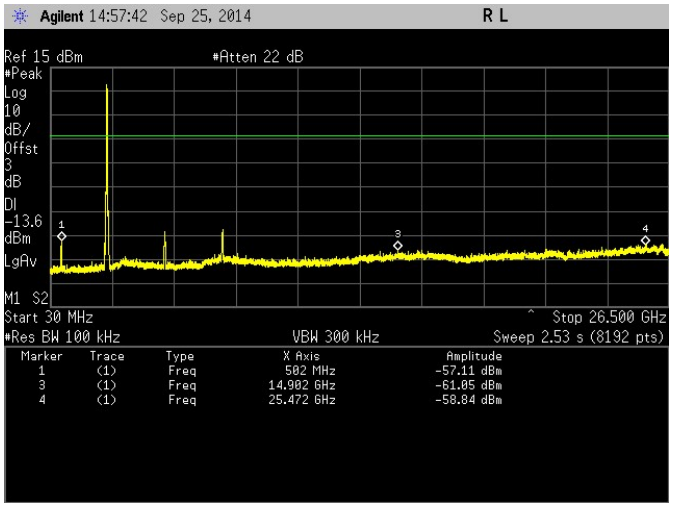
Middle Channel, Chain 1



High Channel, Chain 0



High Channel, Chain 1



8 FCC §15.209, §15.247(d) & IC RSS-210 §A8.5 – Spurious Radiated Emissions

8.1 Applicable Standards

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As per FCC §15.209(a) and RSS-210: Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	960 – 1240	4. 5 – 5. 15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5. 35 – 5. 46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 –167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3 3458 – 3 358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

As per FCC §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c).

As per IC RSS-210 A8.5 Out-of-band Emissions, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section A8.4 (4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

8.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.4-2009. The specification used was the FCC 15 Subpart C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

8.3 Test Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 11: Emissions in non-restricted frequency bands and section 12: Emissions in restricted frequency bands. As well as ANSI C63.4: 2009 as described below:

For the radiated emissions test, the EUT host, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

The spectrum analyzer or receiver is set as:

Below 1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
(2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

8.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Limit

8.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2013-10-28	1 year
Agilent	Spectrum Analyzer	E4440A	MY44303352	2013-10-16	1 year
Sunol Science Corp	System Controller	SC99V	011003-1	N/R	N/R
Sunol Science Corp	Combination Antenna	JB3	A020106-3	2013-10-18	1 year
EMCO	Horn Antenna	3115	9511-4627	2013-10-17	1 year
Hewlett Packard	Pre-amplifier	8447D	2944A10187	2013-10-08	1 year
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2013-10-09	1 year

***Statement of Traceability: BACL** attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.*

8.6 Test Environmental Conditions

Temperature:	23-24 °C
Relative Humidity:	43-47 %
ATM Pressure:	101.28-101.56 kPa

The testing was performed by Isaac Aguilar on 2014-09-29 thru 2014-10-01 in 5 m chamber 3.

8.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Title 47, Part 15C and RSS-210 standard's radiated emissions limits, and had the worst margin of:

30-1000 MHz:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode**
-10	375	Vertical	802.11g

1 – 25 GHz:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode**
-0.024	2390	Horizontal	802.11b

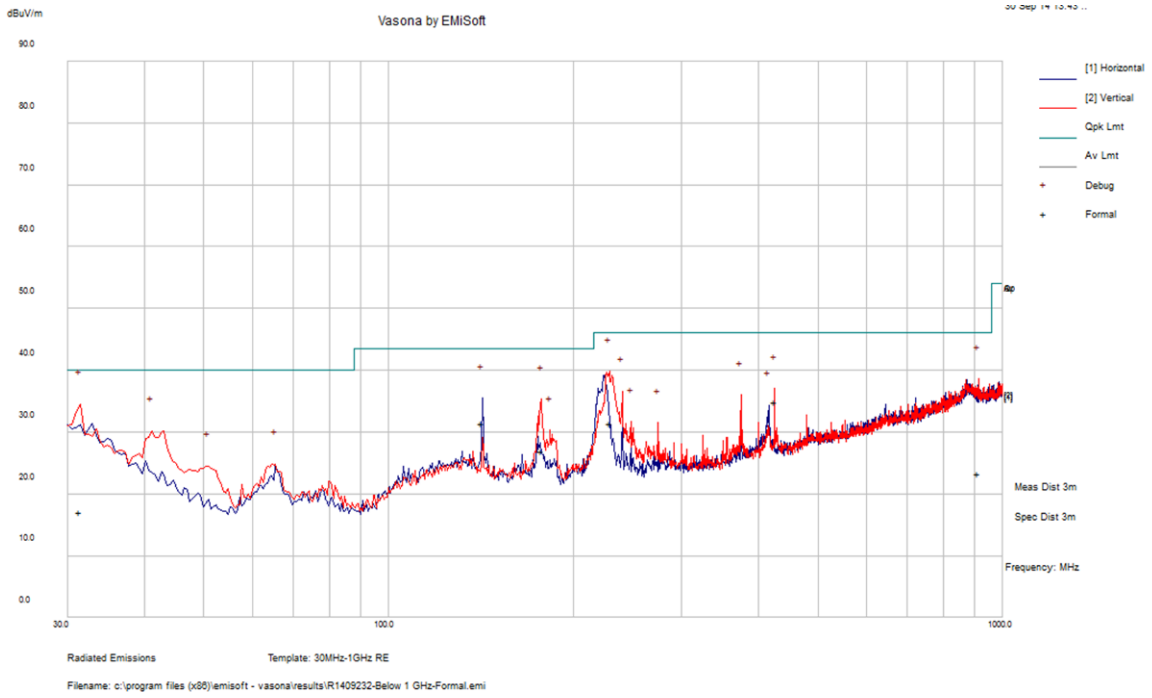
8.8 Radiated Emissions Test Data and Plots

1) 30 MHz – 1 GHz, Measured at 3 meters

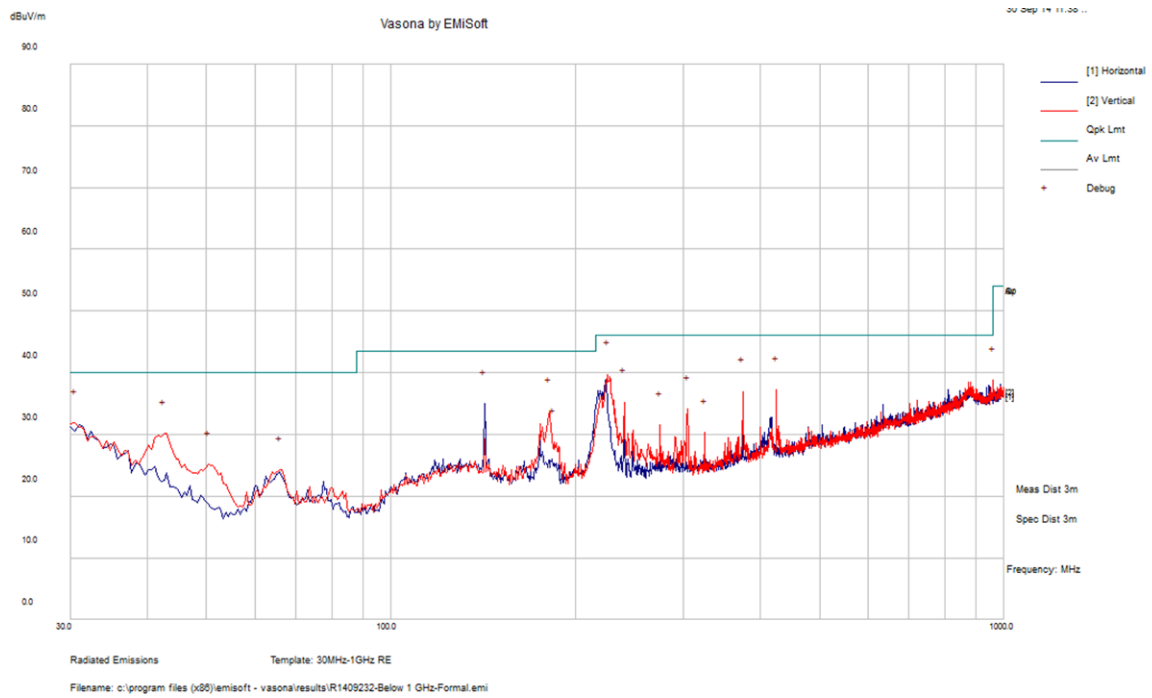
Frequency (MHz)	Raw (dBµV)	Cable Loss (dB)	Antenna Gain (dB)	Corrected Reading Level (dBuV/m)	Measurement Type (PK/QP/Ave)	Antenna		Table Azmuthal (Degrees)	Limit (dBµV/m)	Margin (dB)	Pass /Fail
						Pol (V/H)	Height (cm)				
Low Channel (2412 MHz)											
31	10.39	10.27	-3.56	17.1	QP	V	180	289	40	-22.9	Pass
229	33.15	10.8	-12.5	31.45	QP	V	152	336	46	-14.55	Pass
913	12.92	11.78	-1.32	23.39	QP	V	287	41	46	-22.61	Pass
142	31.75	10.6	-10.88	31.47	QP	H	196	279	43.5	-12.03	Pass
178	29.19	10.67	-12.88	26.97	QP	V	181	87	43.5	-16.53	Pass
425	31.59	11.11	-7.77	34.93	QP	V	101	317	46	-11.07	Pass
Middle Channel (2437 MHz)											
225	27.51	10.79	-12.58	25.72	QP	V	182	360	46	-20.28	Pass
30	8.89	10.27	-2.76	16.4	QP	V	401	251	40	-23.6	Pass
142	29.46	10.6	-10.88	29.18	QP	H	349	94	43.5	-14.32	Pass
425	30.4	11.11	-7.77	33.75	QP	V	109	7	46	-12.25	Pass
375	33.54	11.05	-8.59	36	QP	V	101	4	46	-10	Pass
181	27.03	10.67	-12.96	24.75	QP	V	121	357	43.5	-18.75	Pass
High Channel (2462 MHz)											
711	9.58	11.55	-3.82	17.32	QP	H	366	109	46	-28.68	Pass
230	30.99	10.8	-12.48	29.32	QP	V	121	187	46	-16.68	Pass
866	20.29	11.72	-1.89	30.12	QP	H	274	95	46	-15.88	Pass
31	9.64	10.27	-3.48	16.43	QP	V	254	203	40	-23.57	Pass
375	32.23	11.05	-8.59	34.69	QP	V	110	161	46	-11.31	Pass
425	29.48	11.11	-7.77	32.82	QP	V	118	146	46	-13.18	Pass

Note: 802.11g was determined as in ANSI 63.10-2013 was tested and reported.

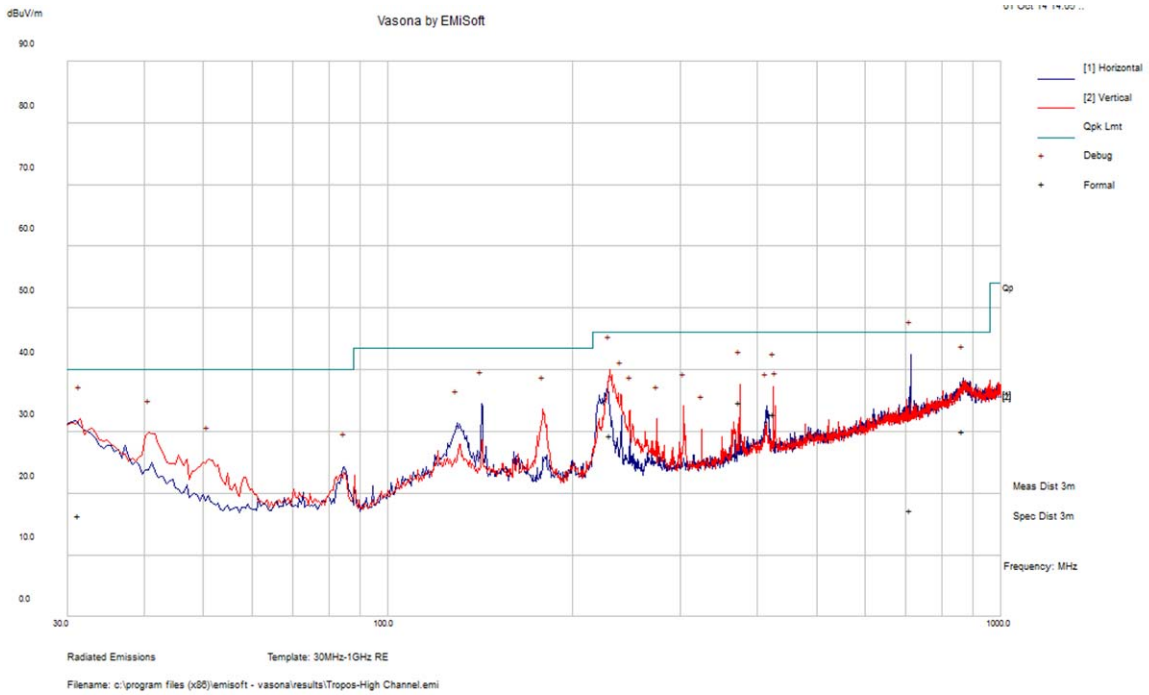
Low Channel 2412 MHz



Middle Channel 2437 MHz



High Channel 2462 MHz



2) Above 1 GHz, Measrued at 3 meters

802.11b mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2412	83.69	150	100	V	28.956	3.12	0	115.766	-	-	Peak/Fund
2412	83.82	150	100	H	28.956	3.12	0	115.896	-	-	Peak/Fund
2412	78.51	308	100	V	28.956	3.12	0	110.586	-	-	Ave/Fund
2412	78.73	308	100	H	28.956	3.12	0	110.806	-	-	Ave/Fund
4824	49.61	292	130	V	33.097	4.56	36.4	50.867	74	-23.133	Peak
4824	48.08	292	130	H	33.097	4.56	36.4	49.337	74	-24.663	Peak
4824	42.88	244	100	V	33.097	4.56	36.4	44.137	54	-9.863	Ave
4824	37.13	244	100	H	33.097	4.56	36.4	38.387	54	-15.613	Ave
7236	48.66	111	122	V	35.928	5.49	36.58	53.498	74	-20.502	Peak
7236	49.14	111	122	H	35.928	5.49	36.58	53.978	74	-20.022	Peak
7236	36.75	325	100	V	35.928	5.49	36.58	41.588	54	-12.412	Ave
7236	36.77	325	100	H	35.928	5.49	36.58	41.608	54	-12.392	Ave
9648	47.67	0	100	V	37.954	6.54	37.21	54.954	74	-19.046	Peak
9648	47.49	0	100	H	37.954	6.54	37.21	54.774	74	-19.226	Peak
9648	34.94	0	100	V	37.954	6.54	37.21	42.224	54	-11.776	Ave
9648	34.92	0	100	H	37.954	6.54	37.21	42.204	54	-11.796	Ave
Middle Channel 2437 MHz, measured at 3 meters											
2437	84.41	139	100	V	28.956	3.12	0	116.486	-	-	Peak/Fund
2437	86.3	139	100	H	28.956	3.12	0	118.376	-	-	Peak/Fund
2437	79.44	0	100	V	28.956	3.12	0	111.516	-	-	Ave/Fund
2437	80.74	0	100	H	28.956	3.12	0	112.816	-	-	Ave/Fund
4874	53.47	165	100	V	33.327	4.54	36.4	54.937	74	-19.063	Peak
4874	49.99	165	100	H	33.327	4.54	36.4	51.457	74	-22.543	Peak
4874	49.3	101	100	V	33.327	4.54	36.4	50.767	54	-3.233	Ave
4874	43.59	101	100	H	33.327	4.54	36.4	45.057	54	-8.943	Ave
7311	50.92	143	100	V	36.369	5.57	36.58	56.279	74	-17.721	Peak
7311	49.81	143	100	H	36.369	5.57	36.58	55.169	74	-18.831	Peak
7311	41.7	348	100	V	36.369	5.57	36.58	47.059	54	-6.941	Ave
7311	37.54	348	100	H	36.369	5.57	36.58	42.899	54	-11.101	Ave
9748	47.08	0	100	V	38.087	6.62	37.21	54.577	74	-19.423	Peak
9748	47.71	0	100	H	38.087	6.62	37.21	55.207	74	-18.793	Peak
9748	34.99	0	100	V	38.087	6.62	37.21	42.487	54	-11.513	Ave
9748	35.02	0	100	H	38.087	6.62	37.21	42.517	54	-11.483	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 2462 MHz, measured at 3 meters											
2462	82.79	143	100	V	29.155	3.25	0	115.195	-	-	Peak/Fund
2462	84.53	143	100	H	29.155	3.25	0	116.935	-	-	Peak/Fund
2462	77.61	341	100	V	29.155	3.25	0	110.015	-	-	Ave/Fund
2462	79.75	341	100	H	29.155	3.25	0	112.155	-	-	Ave/Fund
4924	48.15	89	100	V	33.327	4.52	36.4	49.597	74	-24.403	Peak
4924	45.43	89	100	H	33.327	4.52	36.4	46.877	74	-27.123	Peak
4924	42.55	61	100	V	33.327	4.52	36.4	43.997	54	-10.003	Ave
4924	37.98	61	100	H	33.327	4.52	36.4	39.427	54	-14.573	Ave
7386	49.35	56	100	V	36.565	5.62	36.58	54.955	74	-19.045	Peak
7386	48.63	56	100	H	36.565	5.62	36.58	54.235	74	-19.765	Peak
7386	36.64	357	100	V	36.565	5.62	36.58	42.245	54	-11.755	Ave
7386	36.73	357	100	H	36.565	5.62	36.58	42.335	54	-11.665	Ave
9848	47.77	0	100	V	38.287	6.55	37.21	55.397	74	-18.603	Peak
9848	47.55	0	100	H	38.287	6.55	37.21	55.177	74	-18.823	Peak
9848	35.16	0	100	V	38.287	6.55	37.21	42.787	54	-11.213	Ave
9848	35.11	0	100	H	38.287	6.55	37.21	42.737	54	-11.263	Ave

802.11g mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2412	80.94	150	100	V	28.956	3.12	0	113.016	-	-	Peak/ Fund
2412	81.45	150	100	H	28.956	3.12	0	113.526	-	-	Peak/ Fund
2412	68.32	308	100	V	28.956	3.12	0	100.396	-	-	Ave/ Fund
2412	69.21	308	100	H	28.956	3.12	0	101.286	-	-	Ave/ Fund
4824	50.05	292	130	V	33.097	4.56	36.4	51.307	74	-22.693	Peak
4824	47.74	292	130	H	33.097	4.56	36.4	48.997	74	-25.003	Peak
4824	43.43	244	100	V	33.097	4.56	36.4	44.687	54	-9.313	Ave
4824	36.21	244	100	H	33.097	4.56	36.4	37.467	54	-16.533	Ave
7236	49.04	111	122	V	35.928	5.49	36.58	53.878	74	-20.122	Peak
7236	48.63	111	122	H	35.928	5.49	36.58	53.468	74	-20.532	Peak
7236	36.79	325	100	V	35.928	5.49	36.58	41.628	54	-12.372	Ave
7236	36.82	325	100	H	35.928	5.49	36.58	41.658	54	-12.342	Ave
9648	47.14	0	100	V	37.954	6.54	37.21	54.424	74	-19.576	Peak
9648	46.66	0	100	H	37.954	6.54	37.21	53.944	74	-20.056	Peak
9648	34.97	0	100	V	37.954	6.54	37.21	42.254	54	-11.746	Ave
9648	34.95	0	100	H	37.954	6.54	37.21	42.234	54	-11.766	Ave
Middle Channel 2437 MHz, measured at 3 meters											
2437	85.47	139	100	V	28.956	3.12	0	117.546	-	-	Peak/ Fund
2437	86.69	139	100	H	28.956	3.12	0	118.766	-	-	Peak/ Fund
2437	72.88	0	100	V	28.956	3.12	0	104.956	-	-	Ave/ Fund
2437	74.44	0	100	H	28.956	3.12	0	106.516	-	-	Ave/ Fund
4874	52.31	165	100	V	33.327	4.54	36.4	53.777	74	-20.223	Peak
4874	48.12	165	100	H	33.327	4.54	36.4	49.587	74	-24.413	Peak
4874	40.94	101	100	V	33.327	4.54	36.4	42.407	54	-11.593	Ave
4874	35.11	101	100	H	33.327	4.54	36.4	36.577	54	-17.423	Ave
7311	49.98	143	100	V	36.369	5.57	36.58	55.339	74	-18.661	Peak
7311	49.07	143	100	H	36.369	5.57	36.58	54.429	74	-19.571	Peak
7311	37.06	348	100	V	36.369	5.57	36.58	42.419	54	-11.581	Ave
7311	36.98	348	100	H	36.369	5.57	36.58	42.339	54	-11.661	Ave
9748	47.33	0	100	V	38.087	6.62	37.21	54.827	74	-19.173	Peak
9748	47.49	0	100	H	38.087	6.62	37.21	54.987	74	-19.013	Peak
9748	34.98	0	100	V	38.087	6.62	37.21	42.477	54	-11.523	Ave
9748	34.94	0	100	H	38.087	6.62	37.21	42.437	54	-11.563	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 2462 MHz, measured at 3 meters											
2462	81.85	143	100	V	29.155	3.25	0	114.255	-	-	Peak/ Fund
2462	84.68	143	100	H	29.155	3.25	0	117.085	-	-	Peak/ Fund
2462	69.35	341	100	V	29.155	3.25	0	101.755	-	-	Ave/ Fund
2462	71.43	341	100	H	29.155	3.25	0	103.835	-	-	Ave/ Fund
4924	47.22	89	100	V	33.327	4.52	36.4	48.667	74	-25.333	Peak
4924	47.8	89	100	H	33.327	4.52	36.4	49.247	74	-24.753	Peak
4924	34.78	61	100	V	33.327	4.52	36.4	36.227	54	-17.773	Ave
4924	34.77	61	100	H	33.327	4.52	36.4	36.217	54	-17.783	Ave
7386	48.45	56	100	V	36.565	5.62	36.58	54.055	74	-19.945	Peak
7386	48.25	56	100	H	36.565	5.62	36.58	53.855	74	-20.145	Peak
7386	36.74	357	100	V	36.565	5.62	36.58	42.345	54	-11.655	Ave
7386	36.75	357	100	H	36.565	5.62	36.58	42.355	54	-11.645	Ave
9848	47.65	0	100	V	38.287	6.55	37.21	55.277	74	-18.723	Peak
9848	47.03	0	100	H	38.287	6.55	37.21	54.657	74	-19.343	Peak
9848	35.06	0	100	V	38.287	6.55	37.21	42.687	54	-11.313	Ave
9848	35.11	0	100	H	38.287	6.55	37.21	42.737	54	-11.263	Ave

802.11n-HT20 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2412	82.61	153	100	V	28.956	3.12	0	114.686	-	-	Peak/ Fund
2412	81.97	153	100	H	28.956	3.12	0	114.046	-	-	Peak/ Fund
2412	70.09	310	100	V	28.956	3.12	0	102.166	-	-	Ave/ Fund
2412	70.07	310	100	H	28.956	3.12	0	102.146	-	-	Ave/ Fund
4824	47.81	295	130	V	33.097	4.56	36.4	49.067	74	-24.933	Peak
4824	47.86	295	130	H	33.097	4.56	36.4	49.117	74	-24.883	Peak
4824	34.78	247	100	V	33.097	4.56	36.4	36.037	54	-17.963	Ave
4824	34.73	247	100	H	33.097	4.56	36.4	35.987	54	-18.013	Ave
7236	48.61	113	122	V	35.928	5.49	36.58	53.448	74	-20.552	Peak
7236	49.43	113	122	H	35.928	5.49	36.58	54.268	74	-19.732	Peak
7236	36.51	325	100	V	35.928	5.49	36.58	41.348	54	-12.652	Ave
7236	36.47	325	100	H	35.928	5.49	36.58	41.308	54	-12.692	Ave
9648	46.9	0	100	V	37.954	6.54	37.21	54.184	74	-19.816	Peak
9648	46.85	0	100	H	37.954	6.54	37.21	54.134	74	-19.866	Peak
9648	34.67	0	100	V	37.954	6.54	37.21	41.954	54	-12.046	Ave
9648	34.71	0	100	H	37.954	6.54	37.21	41.994	54	-12.006	Ave
Middle Channel 2437 MHz, measured at 3 meters											
2437	87.78	137	100	V	28.956	3.12	0	119.856	-	-	Peak/ Fund
2437	87.8	137	100	H	28.956	3.12	0	119.876	-	-	Peak/ Fund
2437	74.39	26	100	V	28.956	3.12	0	106.466	-	-	Ave/ Fund
2437	75.65	26	100	H	28.956	3.12	0	107.726	-	-	Ave/ Fund
4874	54.21	163	100	V	33.327	4.54	36.4	55.677	74	-18.323	Peak
4874	50.17	163	100	H	33.327	4.54	36.4	51.637	74	-22.363	Peak
4874	40.24	105	100	V	33.327	4.54	36.4	41.707	54	-12.293	Ave
4874	35.58	105	100	H	33.327	4.54	36.4	37.047	54	-16.953	Ave
7311	51.43	146	100	V	36.369	5.57	36.58	56.789	74	-17.211	Peak
7311	48.82	146	100	H	36.369	5.57	36.58	54.179	74	-19.821	Peak
7311	38.77	340	100	V	36.369	5.57	36.58	44.129	54	-9.871	Ave
7311	36.95	340	100	H	36.369	5.57	36.58	42.309	54	-11.691	Ave
9748	46.63	0	100	V	38.087	6.62	37.21	54.127	74	-19.873	Peak
9748	46.69	0	100	H	38.087	6.62	37.21	54.187	74	-19.813	Peak
9748	34.74	0	100	V	38.087	6.62	37.21	42.237	54	-11.763	Ave
9748	34.73	0	100	H	38.087	6.62	37.21	42.227	54	-11.773	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 2462 MHz, measured at 3 meters											
2462	82.05	142	100	V	29.155	3.25	0	114.455	-	-	Peak/ Fund
2462	81.72	142	100	H	29.155	3.25	0	114.125	-	-	Peak/ Fund
2462	69.56	346	100	V	29.155	3.25	0	101.965	-	-	Ave/ Fund
2462	69.25	346	100	H	29.155	3.25	0	101.655	-	-	Ave/ Fund
4924	47.68	81	100	V	33.327	4.52	36.4	49.127	74	-24.873	Peak
4924	47.44	81	100	H	33.327	4.52	36.4	48.887	74	-25.113	Peak
4924	34.53	66	100	V	33.327	4.52	36.4	35.977	54	-18.023	Ave
4924	34.52	66	100	H	33.327	4.52	36.4	35.967	54	-18.033	Ave
7386	48.21	53	100	V	36.565	5.62	36.58	53.815	74	-20.185	Peak
7386	48.4	53	100	H	36.565	5.62	36.58	54.005	74	-19.995	Peak
7386	36.47	351	100	V	36.565	5.62	36.58	42.075	54	-11.925	Ave
7386	36.48	351	100	H	36.565	5.62	36.58	42.085	54	-11.915	Ave
9848	46.86	0	100	V	38.287	6.55	37.21	54.487	74	-19.513	Peak
9848	47.66	0	100	H	38.287	6.55	37.21	55.287	74	-18.713	Peak
9848	34.84	0	100	V	38.287	6.55	37.21	42.467	54	-11.533	Ave
9848	34.87	0	100	H	38.287	6.55	37.21	42.497	54	-11.503	Ave

802.11n-HT40 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2422 MHz, measured at 3 meters											
2422	76.7	350	100	V	28.956	3.12	0	108.776	-	-	Peak/ Fund
2422	77.28	140	140	H	28.956	3.12	0	109.356	-	-	Peak/ Fund
2422	64.37	350	100	V	28.956	3.12	0	96.446	-	-	Ave/ Fund
2422	65.35	140	140	H	28.956	3.12	0	97.426	-	-	Ave/ Fund
4844	47.33	0	100	V	33.097	4.56	36.4	48.587	74	-25.413	Peak
4844	46.16	0	100	H	33.097	4.56	36.4	47.417	74	-26.583	Peak
4844	34.65	0	100	V	33.097	4.56	36.4	35.907	54	-18.093	Ave
4844	34.68	0	100	H	33.097	4.56	36.4	35.937	54	-18.063	Ave
7266	49.16	0	100	V	35.928	5.49	36.58	53.998	74	-20.002	Peak
7266	48.43	0	100	H	35.928	5.49	36.58	53.268	74	-20.732	Peak
7266	36.6	0	100	V	35.928	5.49	36.58	41.438	54	-12.562	Ave
7266	36.61	0	100	H	35.928	5.49	36.58	41.448	54	-12.552	Ave
9688	46.95	0	100	V	37.954	6.54	37.21	54.234	74	-19.766	Peak
9688	46.71	0	100	H	37.954	6.54	37.21	53.994	74	-20.006	Peak
9688	34.67	0	100	V	37.954	6.54	37.21	41.954	54	-12.046	Ave
9688	34.68	0	100	H	37.954	6.54	37.21	41.964	54	-12.036	Ave
Middle Channel 2437 MHz, measured at 3 meters											
2437	83.87	349	100	V	28.956	3.12	0	115.946	-	-	Peak/ Fund
2437	85.31	142	133	H	28.956	3.12	0	117.386	-	-	Peak/ Fund
2437	71	349	100	V	28.956	3.12	0	103.076	-	-	Ave/ Fund
2437	73.1	142	133	H	28.956	3.12	0	105.176	-	-	Ave/ Fund
4874	49.25	33	100	V	33.327	4.54	36.4	50.717	74	-23.283	Peak
4874	44.87	283	103	H	33.327	4.54	36.4	46.337	74	-27.663	Peak
4874	36.54	33	100	V	33.327	4.54	36.4	38.007	54	-15.993	Ave
4874	31.76	283	103	H	33.327	4.54	36.4	33.227	54	-20.773	Ave
7311	49.68	0	100	V	36.369	5.57	36.58	55.039	74	-18.961	Peak
7311	49.07	0	100	H	36.369	5.57	36.58	54.429	74	-19.571	Peak
7311	37.08	0	100	V	36.369	5.57	36.58	42.439	54	-11.561	Ave
7311	36.89	0	100	H	36.369	5.57	36.58	42.249	54	-11.751	Ave
9748	46.8	0	100	V	38.087	6.62	37.21	54.297	74	-19.703	Peak
9748	46.68	0	100	H	38.087	6.62	37.21	54.177	74	-19.823	Peak
9748	34.7	0	100	V	38.087	6.62	37.21	42.197	54	-11.803	Ave
9748	34.73	0	100	H	38.087	6.62	37.21	42.227	54	-11.773	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 2452 MHz, measured at 3 meters											
2452	79.37	347	100	V	29.155	3.25	0	111.775	-	-	Peak/ Fund
2452	78.27	140	144	H	29.155	3.25	0	110.675	-	-	Peak/ Fund
2452	66.52	347	100	V	29.155	3.25	0	98.925	-	-	Ave/ Fund
2452	66.47	140	144	H	29.155	3.25	0	98.875	-	-	Ave/ Fund
4904	41.78	0	100	V	33.327	4.52	36.4	43.227	74	-30.773	Peak
4904	41.04	0	100	H	33.327	4.52	36.4	42.487	74	-31.513	Peak
4904	29.08	0	100	V	33.327	4.52	36.4	30.527	54	-23.473	Ave
4904	28.94	0	100	H	33.327	4.52	36.4	30.387	54	-23.613	Ave
7356	41.44	0	100	V	36.565	5.62	36.58	47.045	74	-26.955	Peak
7356	41.14	0	100	H	36.565	5.62	36.58	46.745	74	-27.255	Peak
7356	29.22	0	100	V	36.565	5.62	36.58	34.825	54	-19.175	Ave
7356	29.08	0	100	H	36.565	5.62	36.58	34.685	54	-19.315	Ave
9808	39.85	0	100	V	38.287	6.55	37.21	47.477	74	-26.523	Peak
9808	40.02	0	100	H	38.287	6.55	37.21	47.647	74	-26.353	Peak
9808	27.64	0	100	V	38.287	6.55	37.21	35.267	54	-18.733	Ave
9808	27.6	0	100	H	38.287	6.55	37.21	35.227	54	-18.773	Ave

3) Restricted Band Edge, Measured at 3 meters

802.11b mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2390	35.86	41	100	V	28.956	3.12	0	67.936	74	-6.064	Peak
2390	41.5	156	100	H	28.956	3.12	0	73.576	74	-0.424	Peak
2390	19	41	100	V	28.956	3.12	0	51.076	54	-2.924	Ave
2390	21.9	156	100	H	28.956	3.12	0	53.976	54	-0.024	Ave
High Channel 2462 MHz, measured at 3 meters											
2483.5	36.36	120	100	V	29.155	3.25	0	68.765	74	-5.235	Peak
2483.5	39.07	152	153	H	29.155	3.25	0	71.475	74	-2.525	Peak
2483.5	18.39	120	100	V	29.155	3.25	0	50.795	54	-3.205	Ave
2483.5	20.31	152	153	H	29.155	3.25	0	52.715	54	-1.285	Ave

802.11g mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2390	40.31	360	100	V	28.956	3.12	0	72.386	74	-1.614	Peak
2390	40	132	100	H	28.956	3.12	0	72.076	74	-1.924	Peak
2390	18.96	360	100	V	28.956	3.12	0	51.036	54	-2.964	Ave
2390	18.41	132	100	H	28.956	3.12	0	50.486	54	-3.514	Ave
High Channel 2462 MHz, measured at 3 meters											
2483.5	40.9	120	100	V	29.155	3.25	0	73.305	74	-0.695	Peak
2483.5	41.5	151	152	H	29.155	3.25	0	73.905	74	-0.095	Peak
2483.5	17.13	120	100	V	29.155	3.25	0	49.535	54	-4.465	Ave
2483.5	18.45	151	152	H	29.155	3.25	0	50.855	54	-3.145	Ave

802.11n-HT20 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2390	38.35	360	100	V	28.956	3.12	0	70.426	74	-3.574	Peak
2390	40.26	148	135	H	28.956	3.12	0	72.336	74	-1.664	Peak
2390	19.87	360	100	V	28.956	3.12	0	51.946	54	-2.054	Ave
2390	20.76	148	135	H	28.956	3.12	0	52.836	54	-1.164	Ave
High Channel 2462 MHz, measured at 3 meters											
2483.5	39.71	116	100	V	29.155	3.25	0	72.115	74	-1.885	Peak
2483.5	38.03	214	115	H	29.155	3.25	0	70.435	74	-3.565	Peak
2483.5	18.1	116	100	V	29.155	3.25	0	50.505	54	-3.495	Ave
2483.5	18.09	214	115	H	29.155	3.25	0	50.495	54	-3.505	Ave

802.11n-HT40 mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2422 MHz, measured at 3 meters											
2390	36.6	360	100	V	28.956	3.12	0	68.676	74	-5.324	Peak
2390	36.36	148	135	H	28.956	3.12	0	68.436	74	-5.564	Peak
2390	21.32	360	100	V	28.956	3.12	0	53.396	54	-0.604	Ave
2390	20.07	148	135	H	28.956	3.12	0	52.146	54	-1.854	Ave
High Channel 2452 MHz, measured at 3 meters											
2483.5	36.12	351	129	V	29.155	3.25	0	68.525	74	-5.475	Peak
2483.5	39.02	148	153	H	29.155	3.25	0	71.425	74	-2.575	Peak
2483.5	17.17	351	129	V	29.155	3.25	0	49.575	54	-4.425	Ave
2483.5	20.22	148	153	H	29.155	3.25	0	52.625	54	-1.375	Ave

9 FCC§15.247(a)(2) & IC RSS-210 §A8.2 – 6 dB & 99% Occuipied Bandwidth

9.1 Applicable Standard

According to FCC §15.247(a)(2) and IC RSS-210 A8.2 (a), systems using digital modulation techniques may operate in the 902~928 MHz, 2400~2483.5 MHz, and 5725~5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz

9.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 8.1: DTS bandwidth ANSI 63.10-2013 states that only the middle channel needs to be tested if it is at least150% greater than the limit (500 kHz).

9.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Cycle
Agilent	Spectrum Analyzer	E4440A	MY44303352	2013-10-16	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

9.4 Test Environmental Conditions

Temperature:	24 °C
Relative Humidity:	42 %
ATM Pressure:	101.28 kPa

The testing was performed by Isaac Aguilar from 2014-09-25 at RF site.

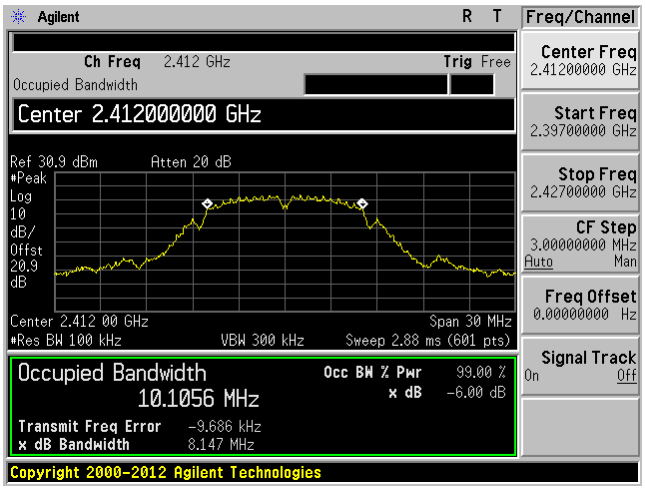
9.5 Test Results

Antenna Port	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	6 dB Emission Bandwidth (MHz)	Limit (kHz)	Results
802.11b mode						
C0	Low	2412	10.1056	8.147	> 500	Compliant
	Middle	2437	10.0928	8.097	> 500	Compliant
	High	2462	10.0590	8.086	> 500	Compliant
C1	Low	2412	10.7166	8.099	> 500	Compliant
	Middle	2437	10.0554	8.106	> 500	Compliant
	High	2462	10.0959	8.080	> 500	Compliant
802.11g mode						
C0	Low	2412	16.4372	16.368	> 500	Compliant
	Middle	2437	16.4965	16.381	> 500	Compliant
	High	2462	16.3931	15.504	> 500	Compliant
C1	Low	2412	16.5058	16.499	> 500	Compliant
	Middle	2437	16.4884	16.343	> 500	Compliant
	High	2462	16.4037	15.711	> 500	Compliant
802.11n-HT20 mode						
C0	Low	2412	17.6200	17.563	> 500	Compliant
	Middle	2437	17.6043	17.563	> 500	Compliant
	High	2462	17.5761	16.002	> 500	Compliant
C1	Low	2412	17.5701	17.608	> 500	Compliant
	Middle	2437	17.6374	17.629	> 500	Compliant
	High	2462	17.5908	17.582	> 500	Compliant
802.11n-HT40 mode						
C0	Low	2422	35.6941	33.861	> 500	Compliant
	Middle	2437	35.6458	25.843	> 500	Compliant
	High	2452	35.6908	26.253	> 500	Compliant
C1	Low	2422	35.7042	28.862	> 500	Compliant
	Middle	2437	35.6458	18.560	> 500	Compliant
	High	2452	35.5808	19.020	> 500	Compliant

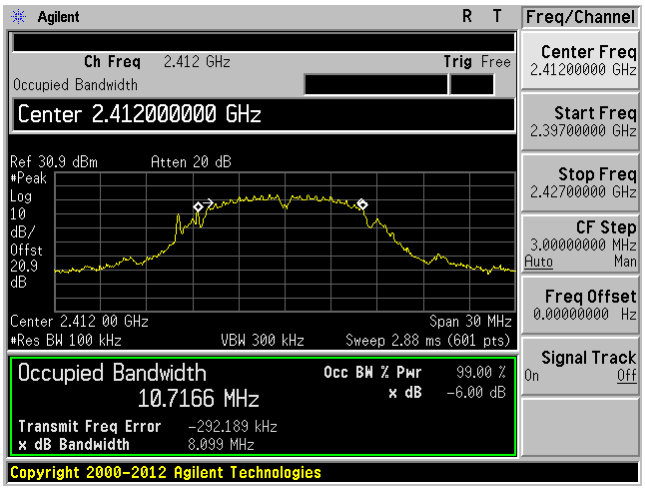
Please refer to the following plots for detailed test results.

802.11b, Low Channel, 2412 MHz

C0

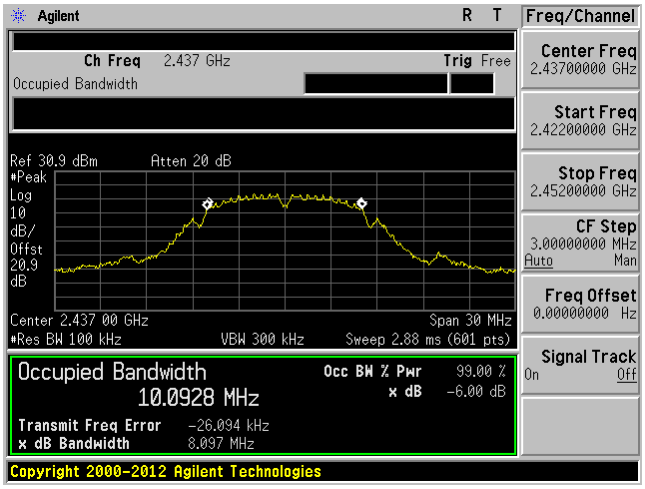


C1

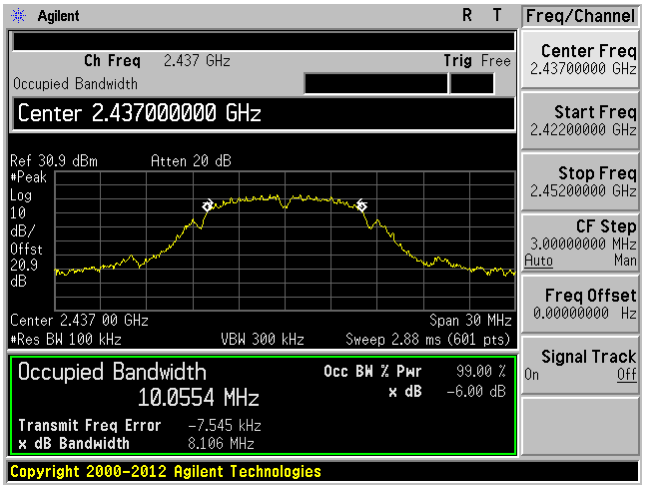


802.11b, Middle Channel, 2437 MHz

C0

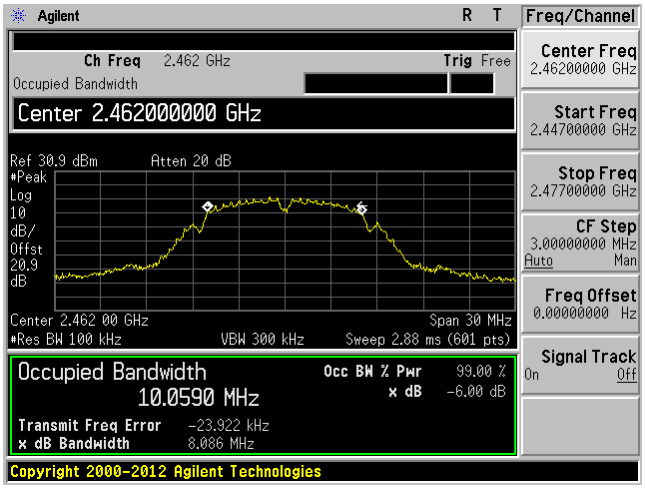


C1

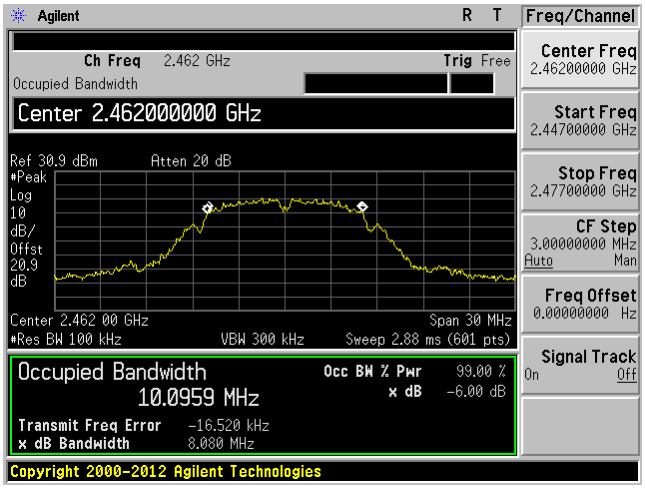


802.11b, High Channel, 2462 MHz

C0

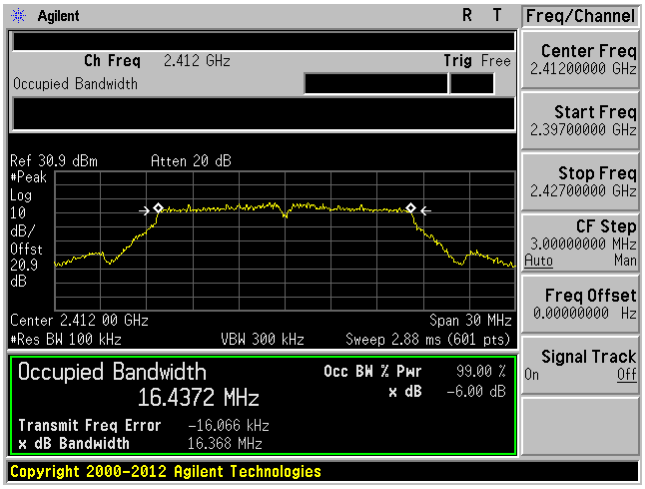


C1

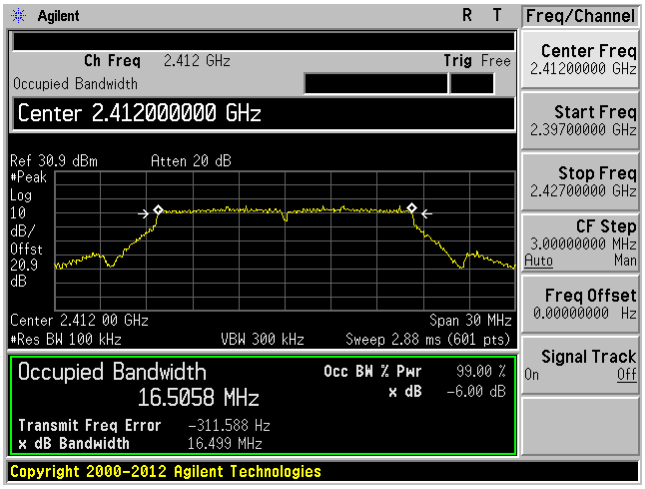


802.11g, Low Channel, 2412 MHz

C0

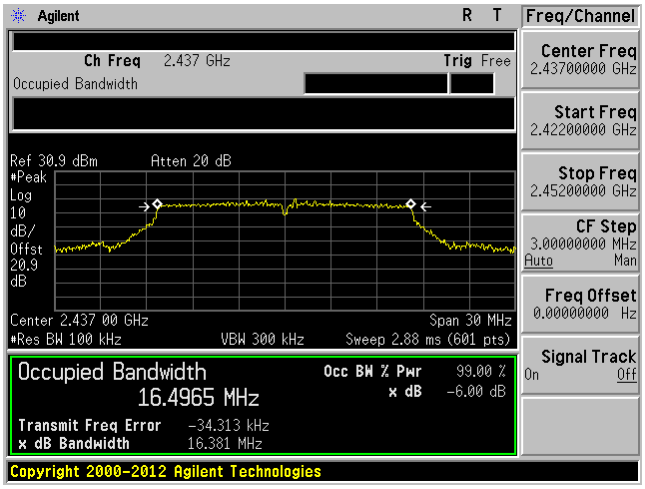


C1

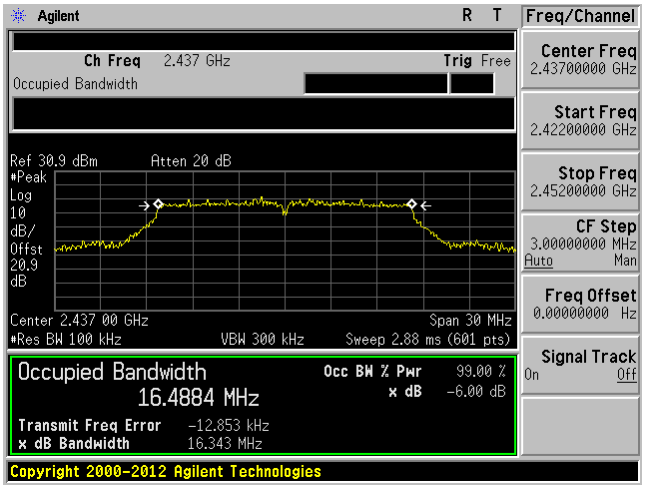


802.11g, Middle Channel, 2437 MHz

C0

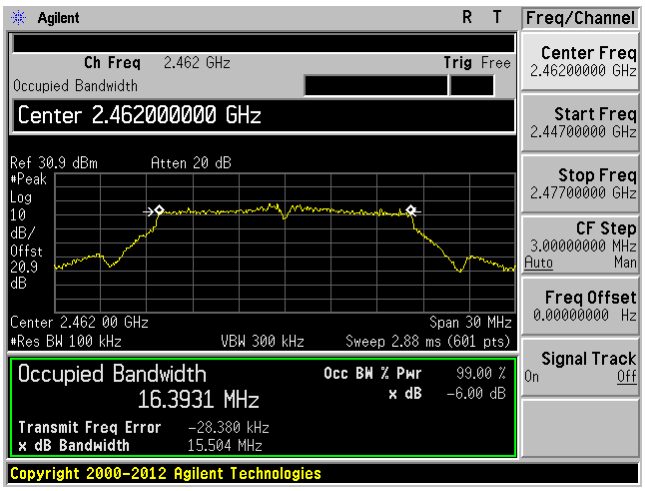


C1

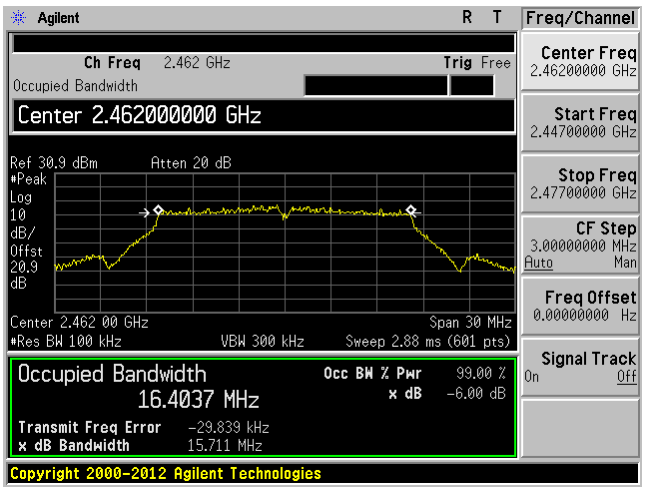


802.11g, High Channel, 2462 MHz

C0

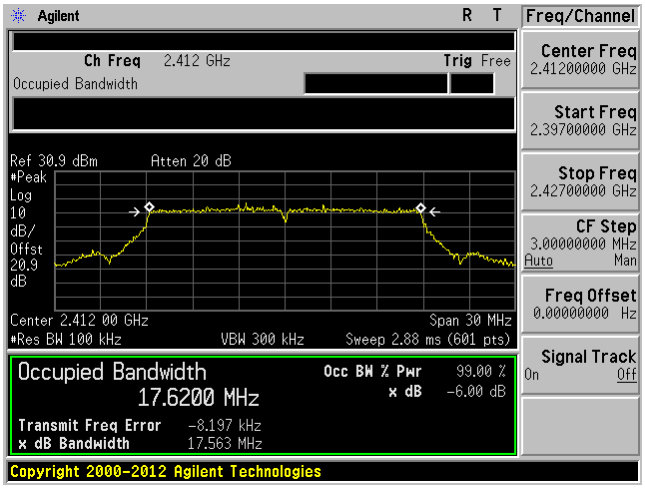


C1

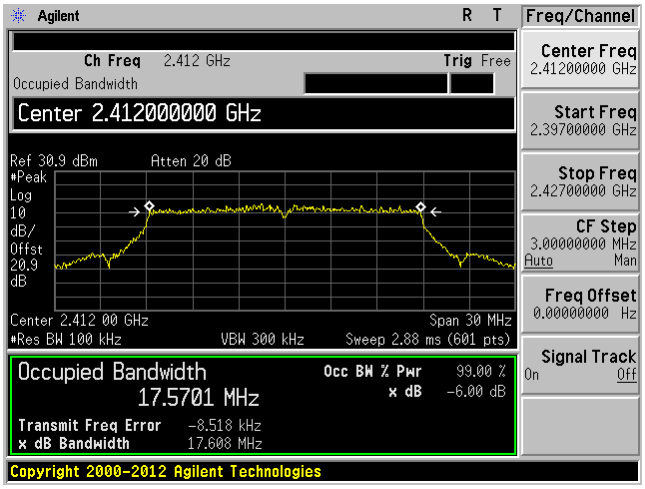


802.11n-HT20, Low Channel, 2412 MHz

C0

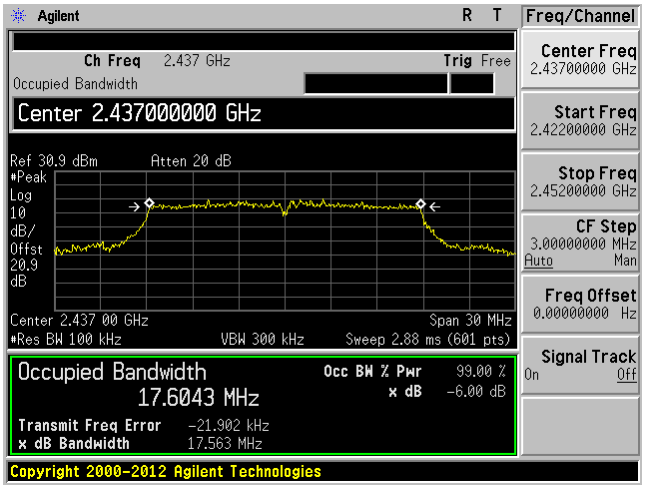


C1

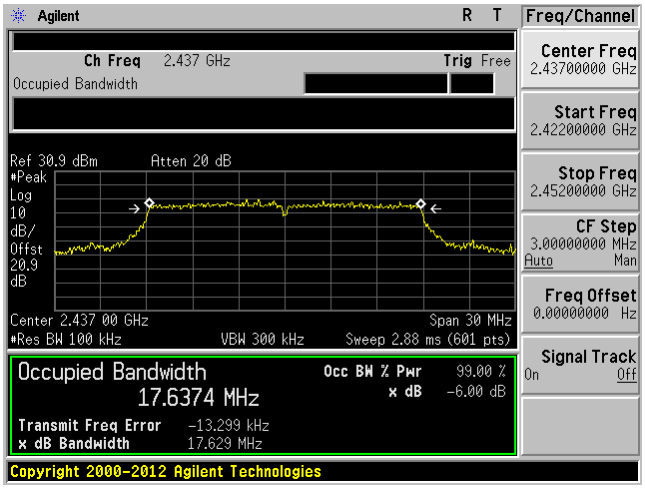


802.11n-HT20, Middle Channel, 2437 MHz

C0

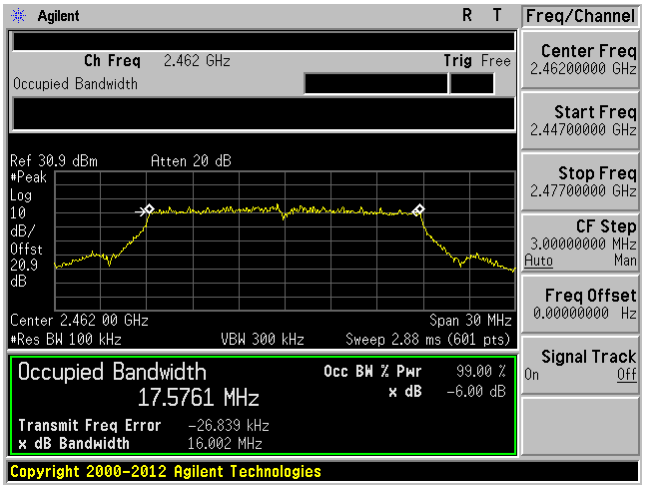


C1

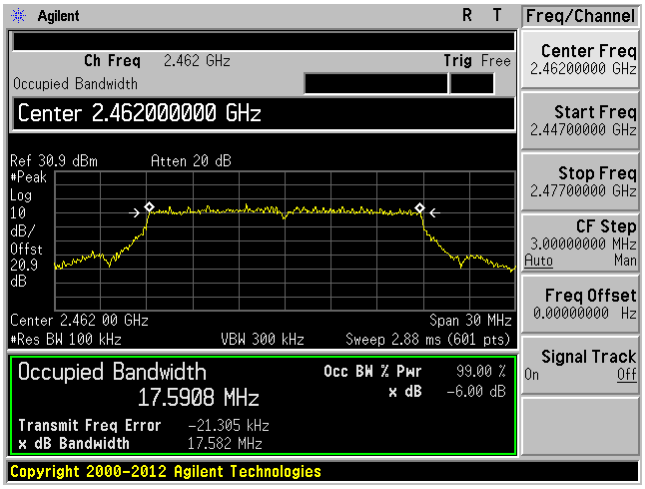


802.11n-HT20, High Channel, 2462 MHz

C0

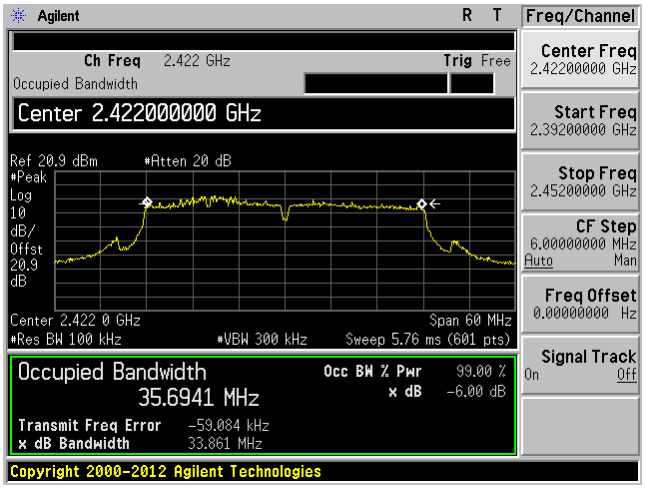


C1

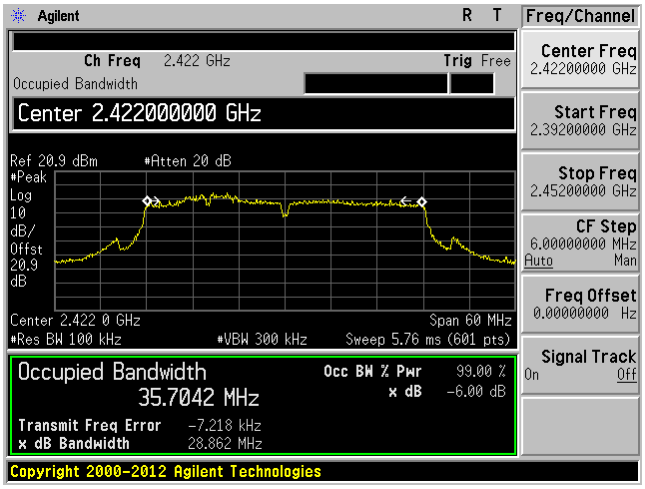


802.11n-HT40, Low Channel, 2422 MHz

C0

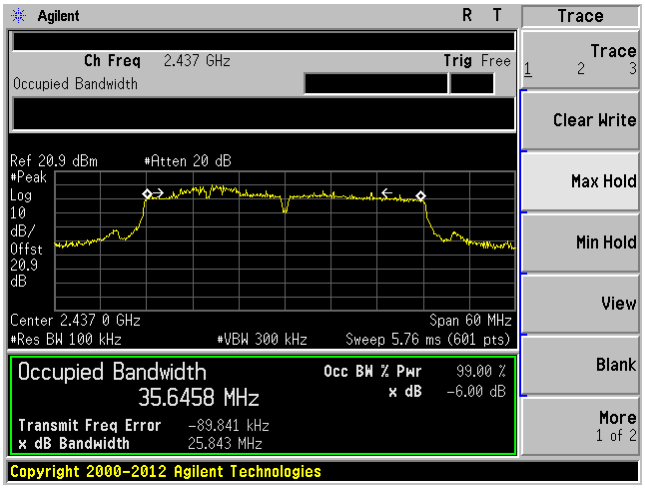


C1

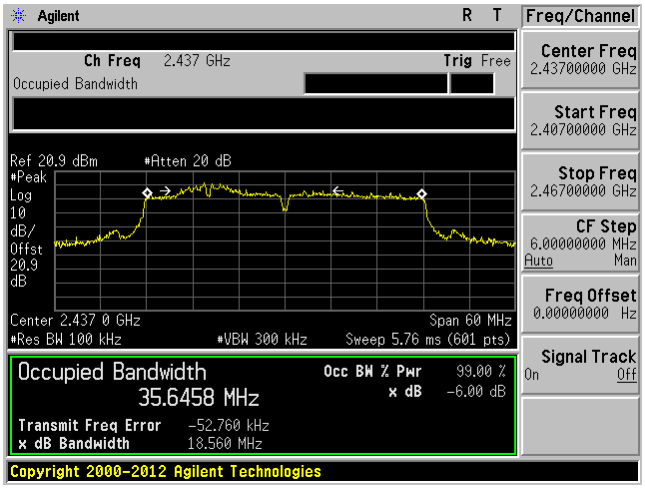


802.11n-HT40, Middle Channel, 2437 MHz

C0

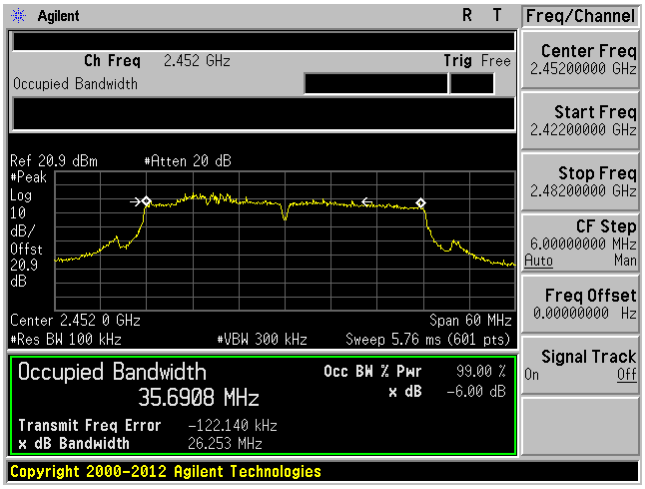


C1

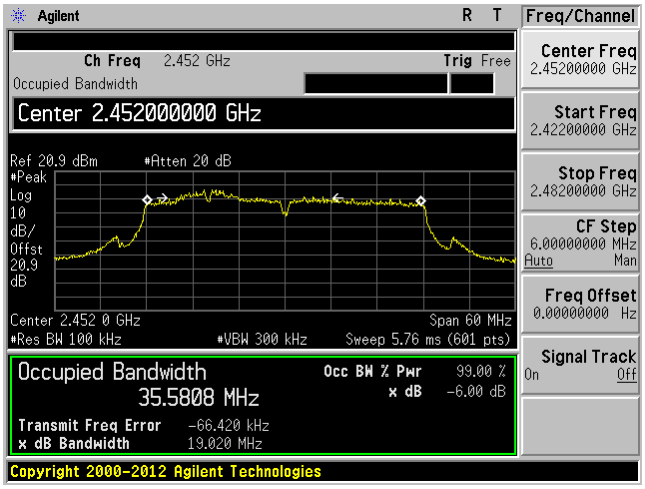


802.11n-HT40, High Channel, 2452 MHz

C0



C1



10 FCC §15.247(b) & IC RSS-210 §A8.4 – Peak Output Power Measurement

10.1 Applicable Standard

According to FCC §15.247(b) and IC RSS-210 §A8.4(4) for systems using digital modulation in the 902~928 MHz, 2400~2483.5 MHz, and 5725~5850 MHz bands: 1 Watt.

10.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 9.1.1: RBW ≥ DTS bandwidth.

10.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Cycle
Agilent	Spectrum Analyzer	E4440A	MY44303352	2013-10-16	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

10.4 Test Environmental Conditions

Temperature:	24 °C
Relative Humidity:	42 %
ATM Pressure:	101.28 kPa

The testing was performed by Isaac Aguilar on 2014-09-25 at RF site.

10.5 Test Results

Frequency (MHz)	Conducted Output Power (dBm)		Conducted Output Power (mW)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Margin (dB)
	Chain 0	Chain 1	Chain 0	Chain 1				
Mode: 802.11b								
2412	25.16	25.36	328.10	343.56	671.65	28.27	28.5	-0.23
2437	25.33	25.09	341.19	322.85	664.04	28.22	28.5	-0.28
2462	25.23	25.27	333.43	336.51	669.94	28.26	28.5	-0.24
Mode: 802.11g								
2412	25.11	24.67	324.34	293.09	617.43	27.91	28.5	-0.59
2437	25.09	24.97	322.85	314.05	636.90	28.04	28.5	-0.46
2462	25.03	25.07	318.42	321.37	639.79	28.06	28.5	-0.44
Mode: 802.11n20								
2412	24.62	25.08	289.73	322.11	611.84	27.87	28.5	-0.63
2437	25.08	25.11	322.11	324.34	646.45	28.11	28.5	-0.39
2462	24.63	25.03	290.40	318.42	608.82	27.84	28.5	-0.66
Mode: 802.11n40								
2422	24.81	24.92	302.69	310.46	613.15	27.88	28.5	-0.62
2437	24.7	24.99	295.12	315.50	610.62	27.86	28.5	-0.64
2452	25.09	25.04	322.85	319.15	642.00	28.08	28.5	-0.42

Note: The 7.5 dBi patch antenna consist of MMCX connectors with greater than 6 dBi gain; therefore, the output power and power spectral density limit shall be reduced by 1.5 dB to comply with the antenna requirement.

11 FCC §15.247(d) & IC RSS-210 §A8.5 – 100 kHz Bandwidth of Band Edges

11.1 Applicable Standard

According to FCC §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emissions limits specified in §15.209(a) see §15.205(c).

According to IC RSS-210 §A8.5, in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

11.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 13: Band-edge measurements

11.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Cycle
Agilent	Spectrum Analyzer	E4440A	MY44303352	2013-10-16	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

11.4 Test Environmental Conditions

Temperature:	23 °C
Relative Humidity:	46 %
ATM Pressure:	101.48 kPa

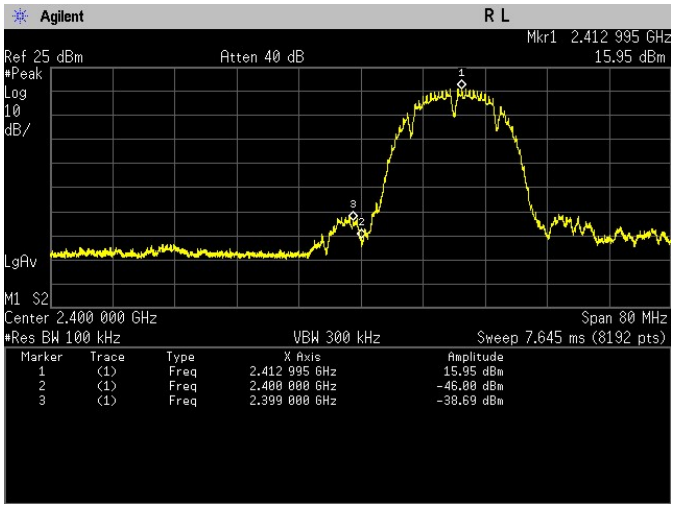
The testing was performed by Isaac Aguilar on 2014-09-29 at RF site.

11.5 Test Results

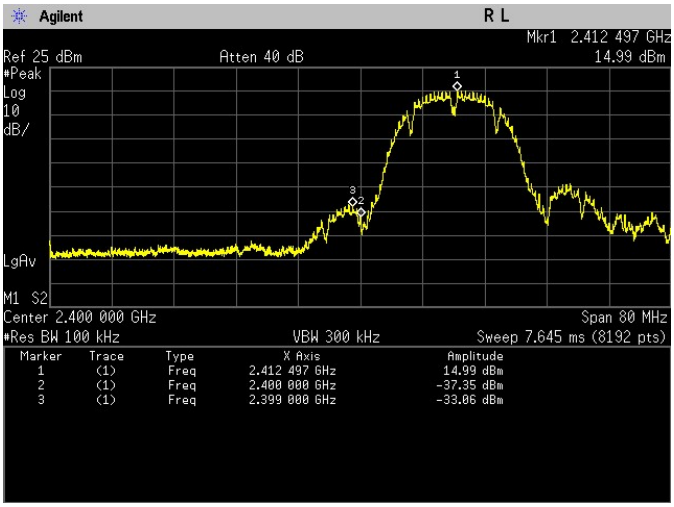
The plots below show that the EUT is compliant with the limits set forth by FCC §15.247(d) and IC RSS-210 §A8.5.

802.11b mode

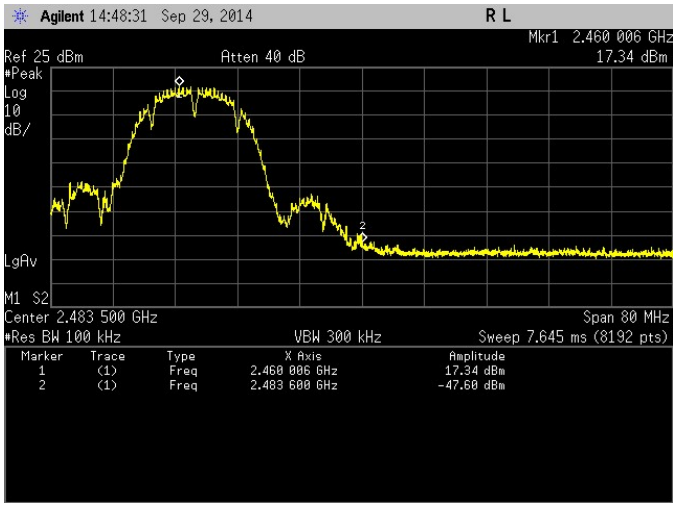
Low Channel, Chain 0



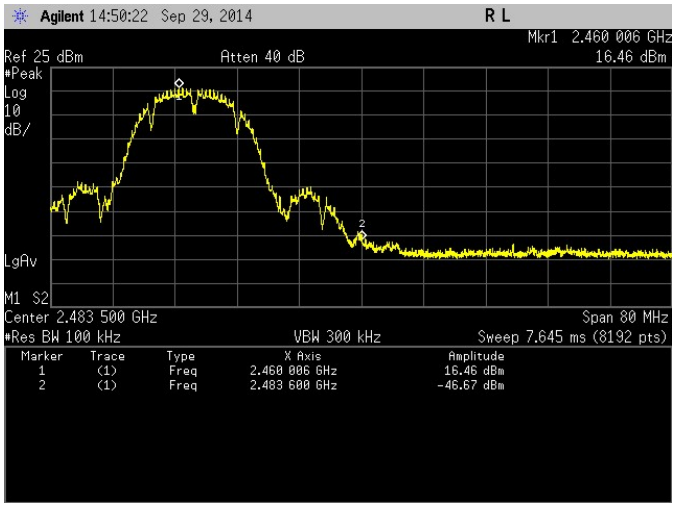
Low Channel, Chain 1



High Channel, Chain 0

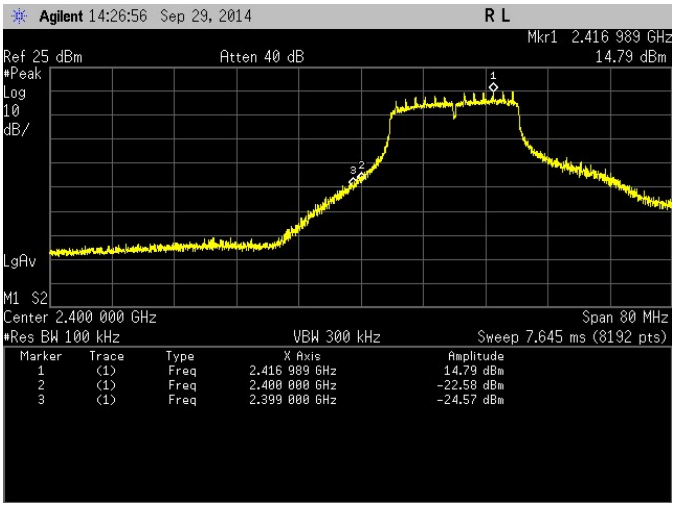


High Channel, Chain 1

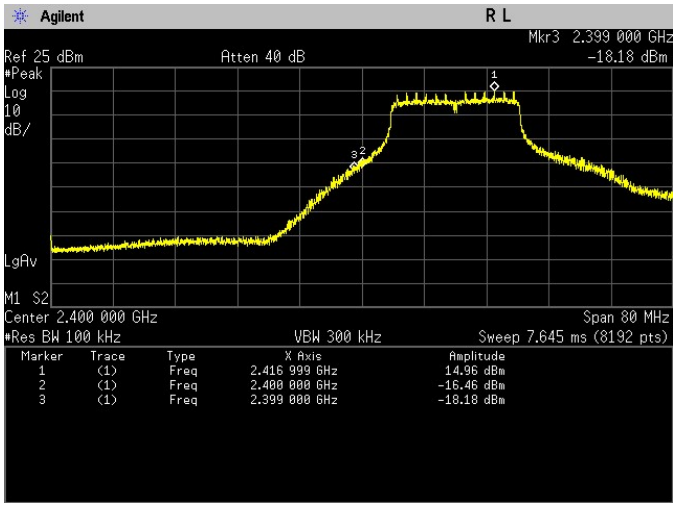


802.11g mode

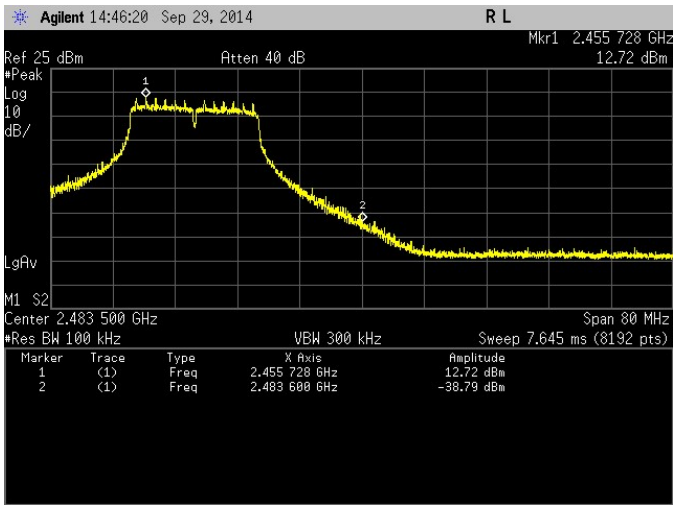
Low Channel, Chain 0



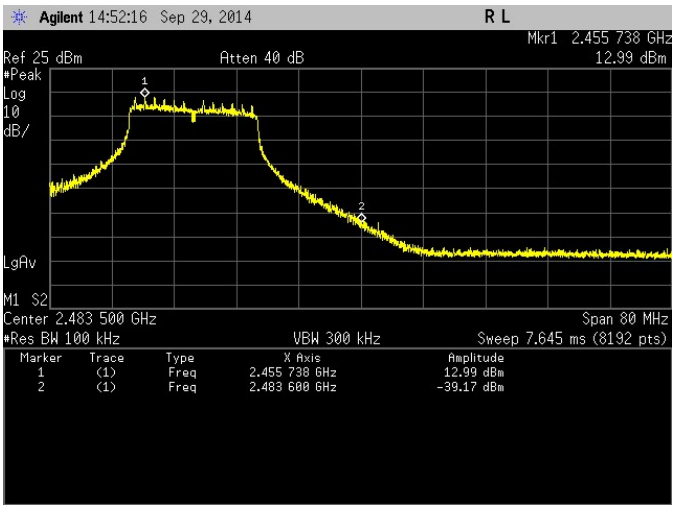
Low Channel, Chain 1



High Channel, Chain 0

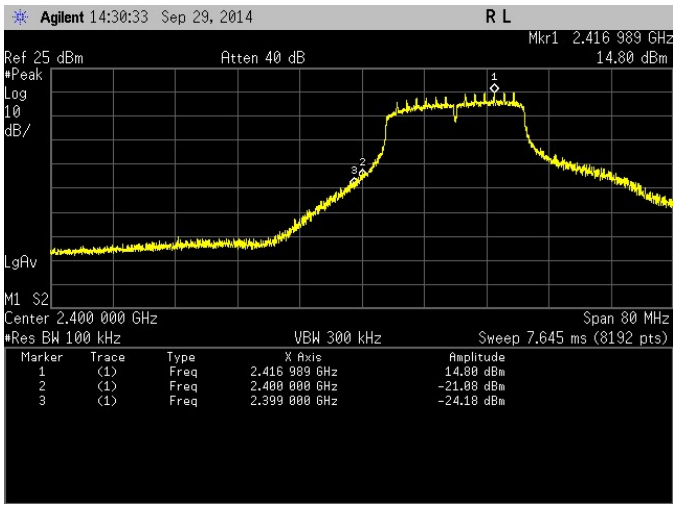


High Channel, Chain 1

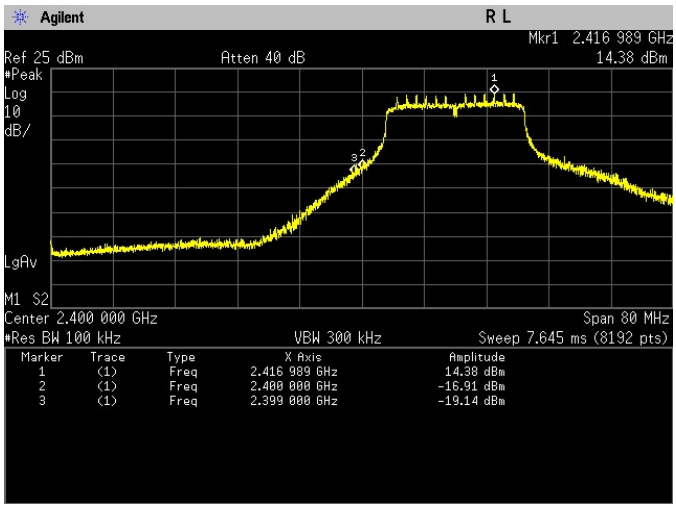


802.11n20 mode

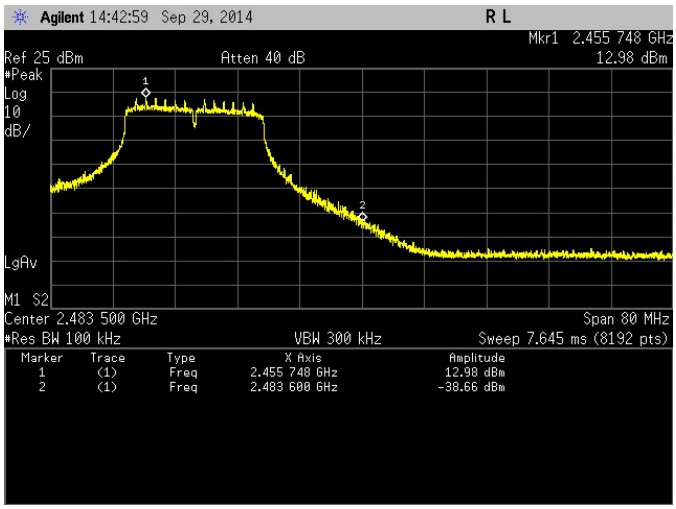
Low Channel, Chain 0



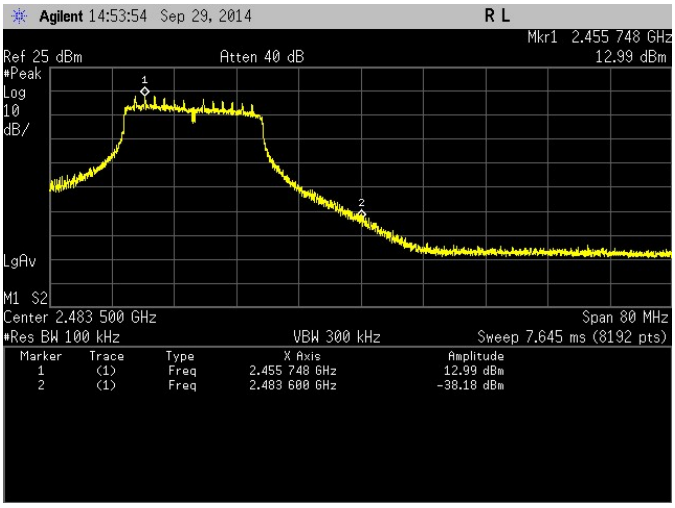
Low Channel, Chain 1



High Channel, Chain 0

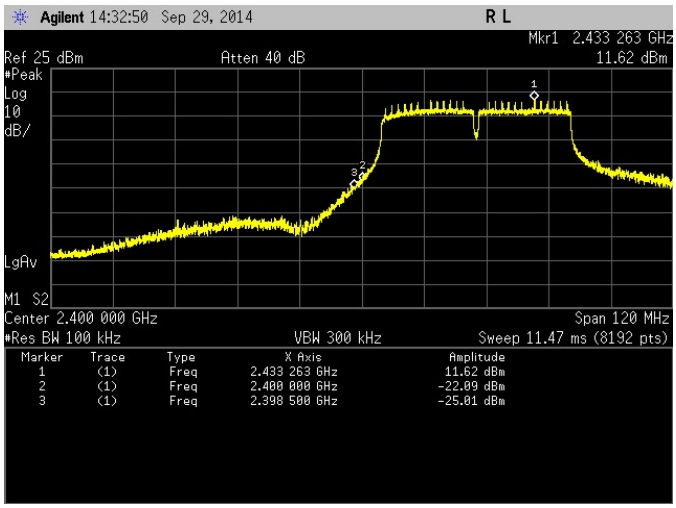


High Channel, Chain 1

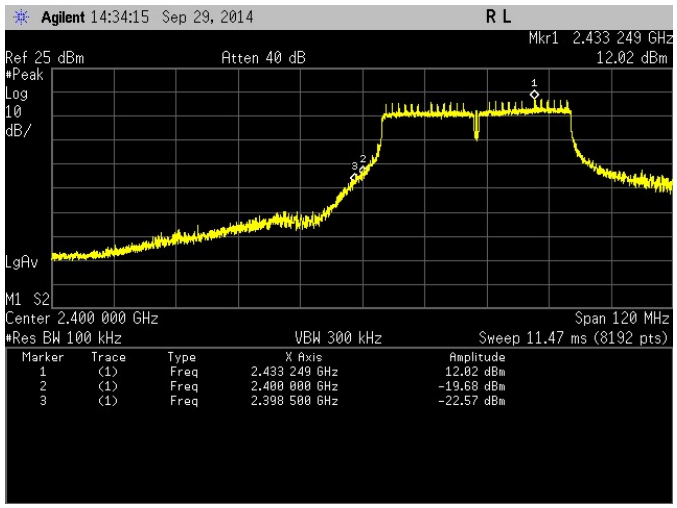


802.11n40 mode

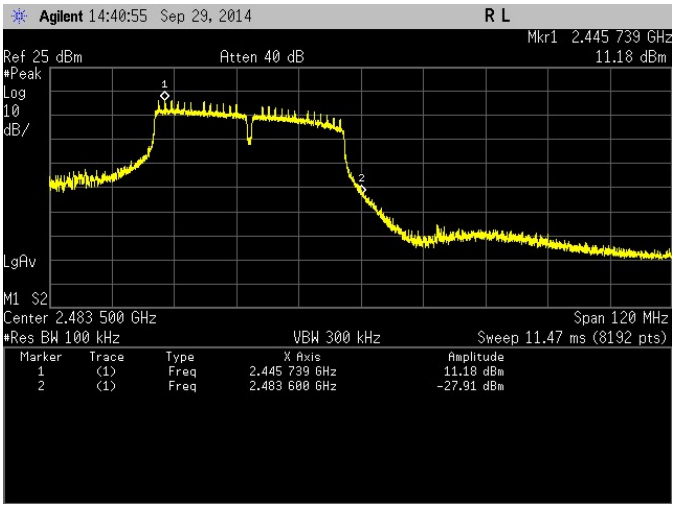
Low Channel, Chain 0



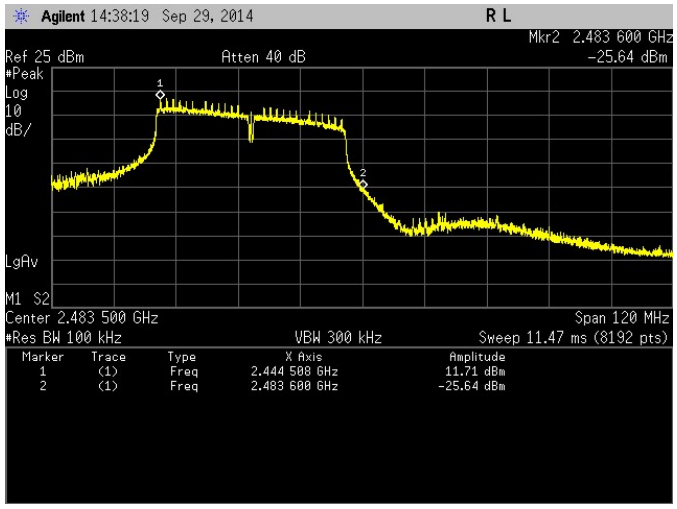
Low Channel, Chain 1



High Channel, Chain 0



High Channel, Chain 1



12 FCC §15.247(e) & IC RSS-210 §A8.2 (b) – Power Spectral Density

12.1 Applicable Standard

According to FCC §15.247(e) and RSS-210 §A8.2 (b) , for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

12.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10.2: Method PKPSD (Peak PSD).

12.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Cycle
Agilent	Spectrum Analyzer	E4440A	MY44303352	2013-10-16	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

12.4 Test Environmental Conditions

Temperature:	24 °C
Relative Humidity:	42 %
ATM Pressure:	101.28 kPa

The testing was performed by Isaac Aguilar from 2014-09-25 at RF site.

12.5 Test Results

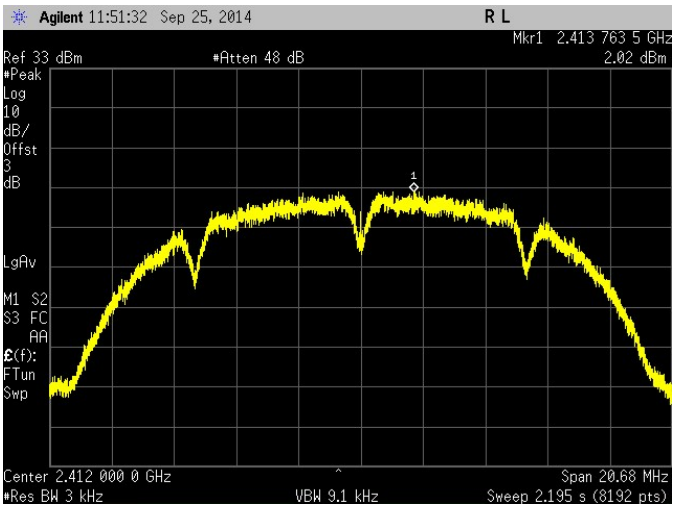
Refer to the table and plots below for the test results. For 802.11 b the worst case chain was chosen for Max PSD.

Frequency (MHz)	TX Power Spectral Density (dBm)		TX Power Spectral Density (mW)		Total PSD (mW)	Total PSD (dBm)	FCC/IC Limit (dBm)
	Chain 0	Chain 1	Chain 0	Chain 1			
802.11b mode							
2412	2.02	2.64	1.59	1.84	1.84	2.64	6.5
2437	2.27	3.86	1.69	2.43	2.43	3.86	6.5
2462	2.59	-0.02	1.82	1.00	1.82	2.59	6.5
802.11g mode							
2412	2.60	2.02	1.82	1.59	3.41	5.33	6.5
2437	0.99	3.82	1.26	2.41	3.67	5.64	6.5
2462	-0.36	0.51	0.92	1.12	2.05	3.11	6.5
802.11n20 mode							
2412	1.76	2.92	1.50	1.96	3.46	5.39	6.5
2437	1.95	3.87	1.57	2.44	4.00	6.03	6.5
2462	-0.26	0.35	0.94	1.08	2.03	3.07	6.5
802.11n40 mode							
2422	-0.72	2.88	0.85	1.94	2.79	4.45	6.5
2437	0.38	3.17	1.09	2.07	3.17	5.01	6.5
2452	-1.54	4.69	0.70	2.94	3.65	5.62	6.5

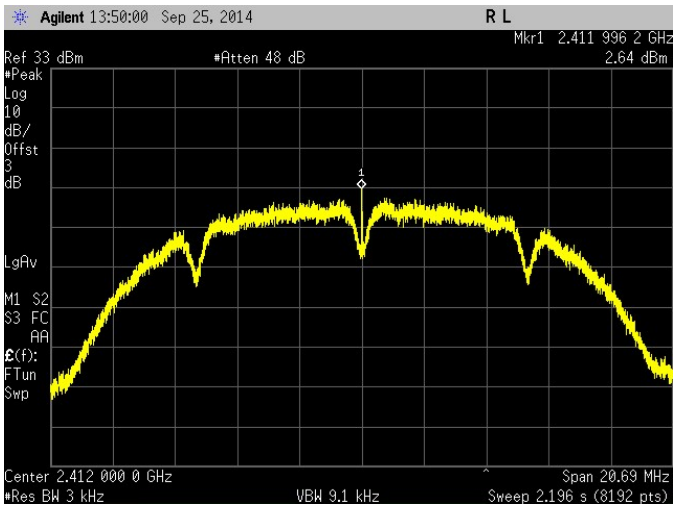
Note: The 7.5 dBi patch antenna consist of MMCX connectors with greater than 6 dBi gain; therefore, the output power and power spectral density limit shall be reduced by 1.5 dB to comply with the antenna requirement.

802.11b mode

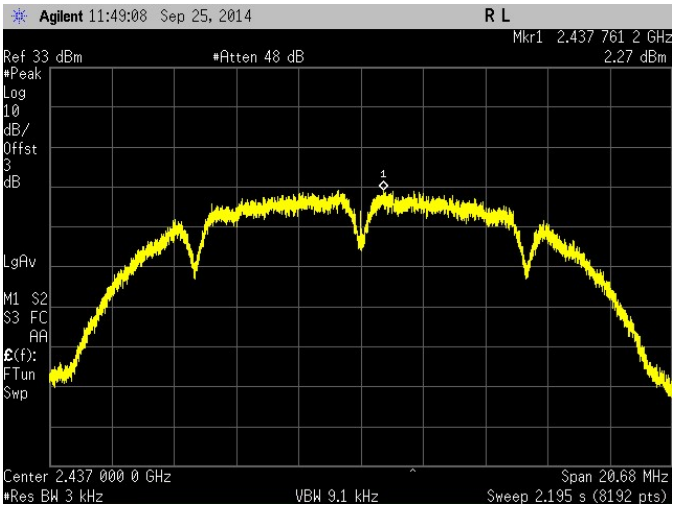
Low Channel, Chain 0



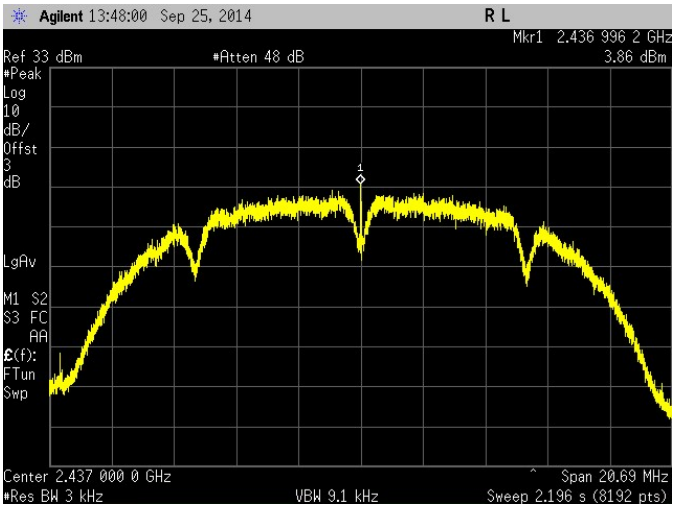
Low Channel, Chain 1



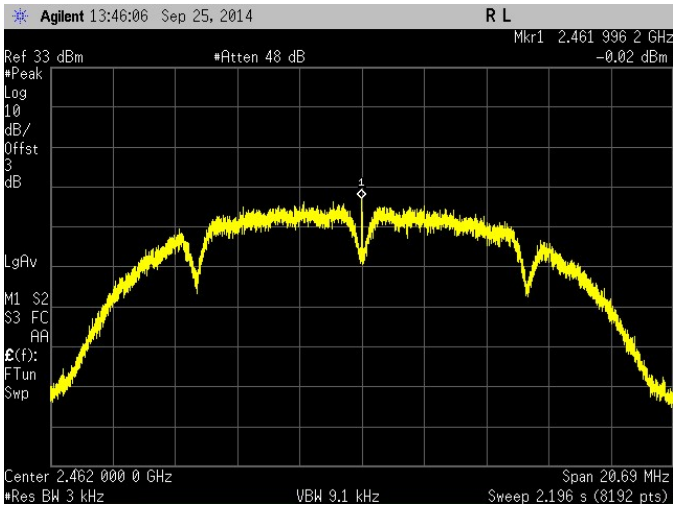
Middle Channel, Chain 0



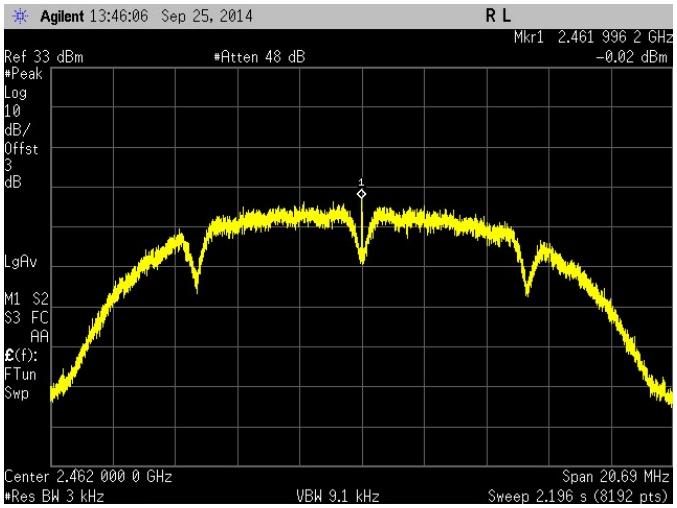
Middle Channel, Chain 1



High Channel, Chain 0

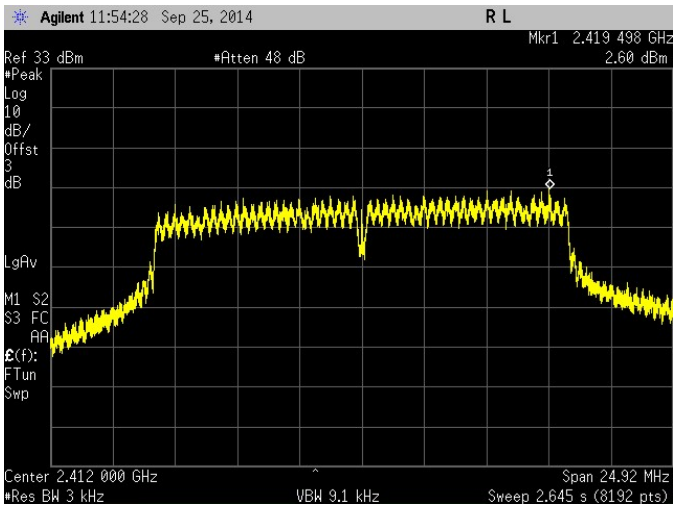


High Channel, Chain 1

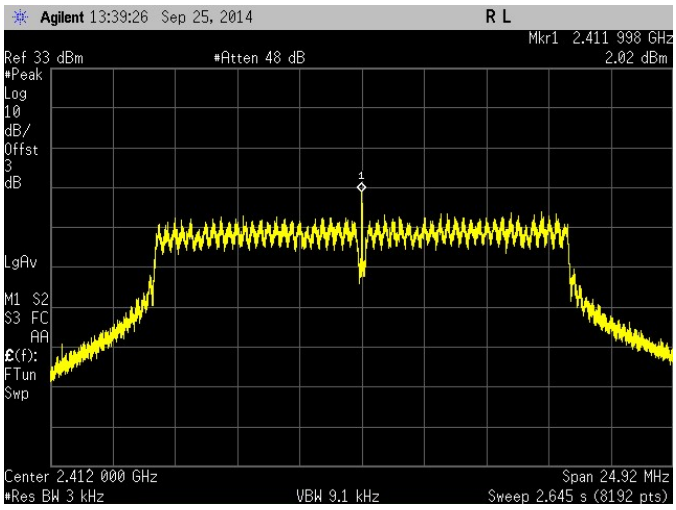


802.11g mode

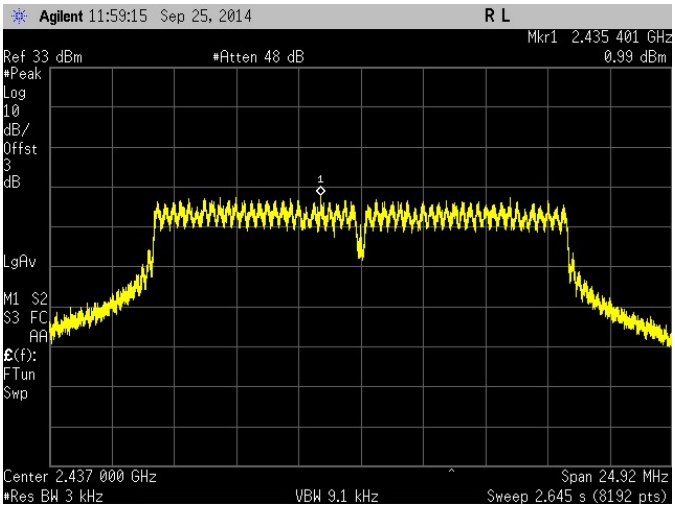
Low Channel Chian 0



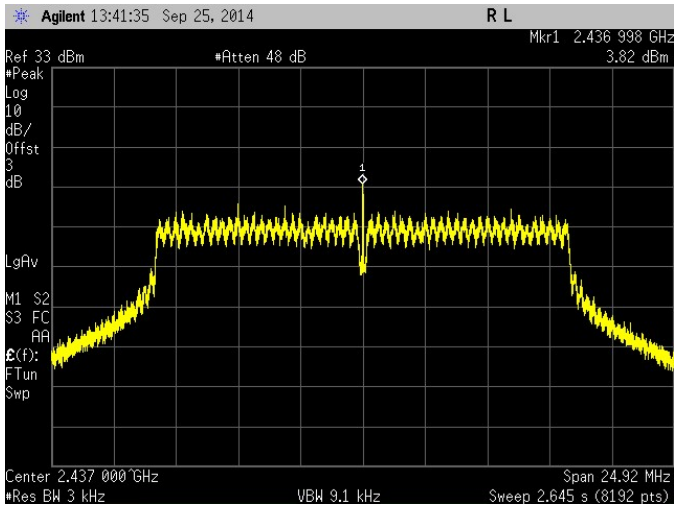
Low Channel Chain 1



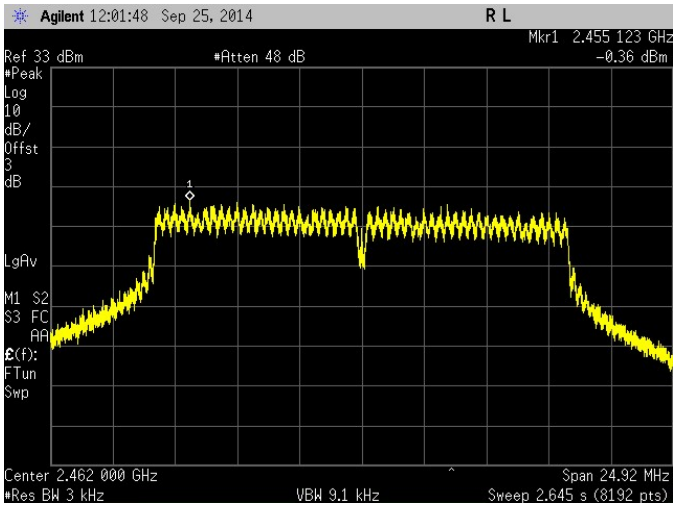
Middle Channel, Chain 0



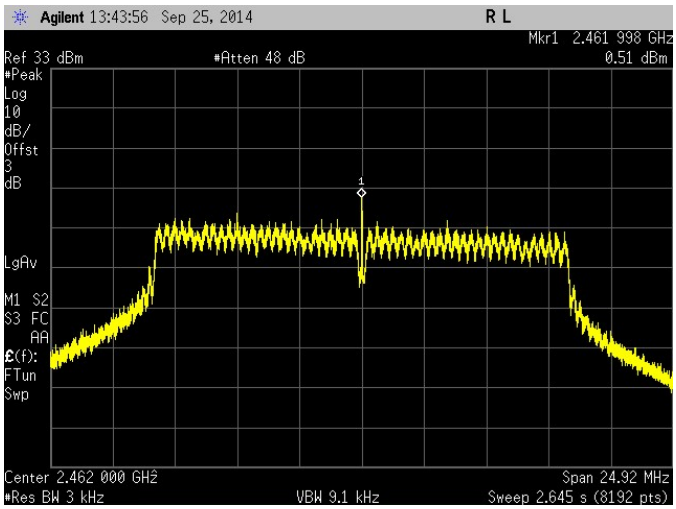
Middle Channal, Chain 1



High Channel, Chain 0

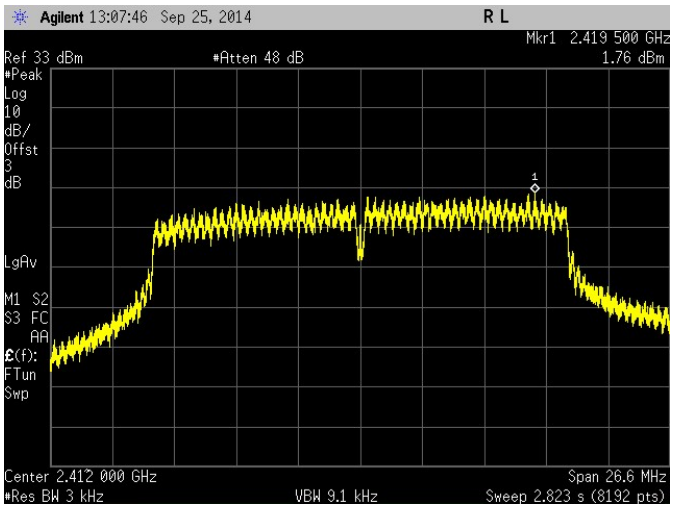


High Channel, Chain 1

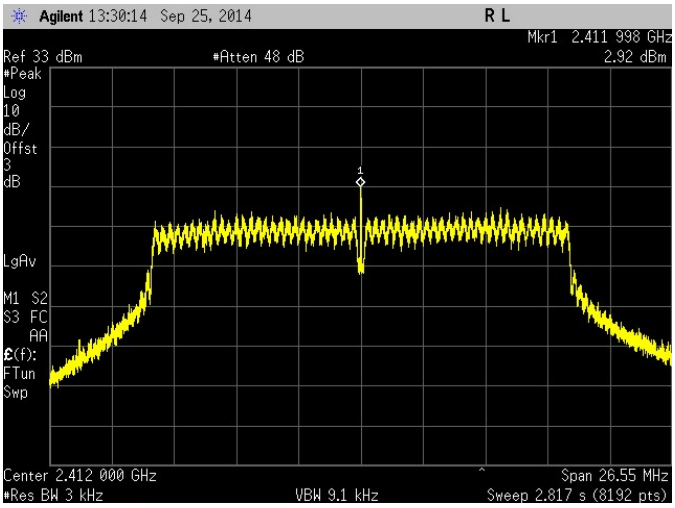


802.11n20 mode

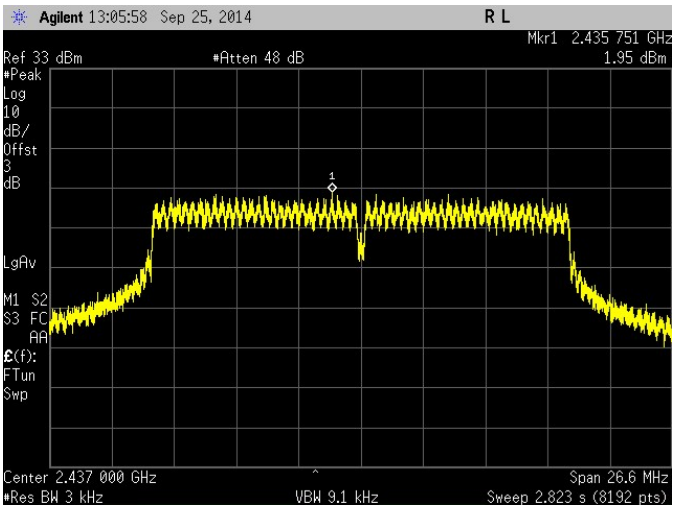
Low Channel, Chain 0



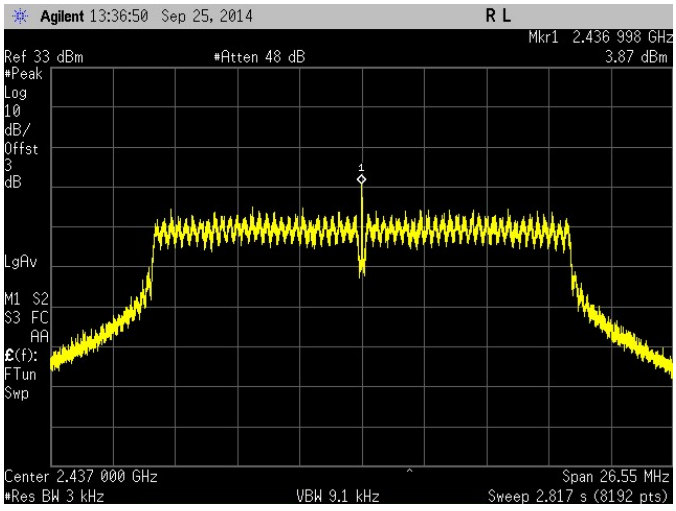
Low Channel, Chain 1



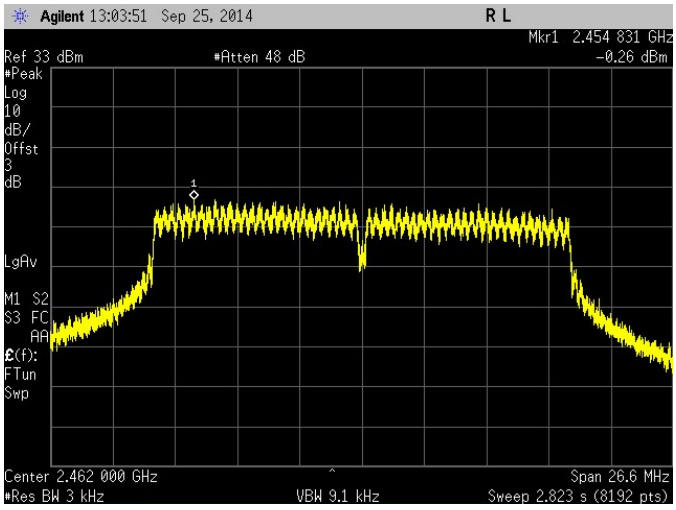
Middle Channel, Chain 0



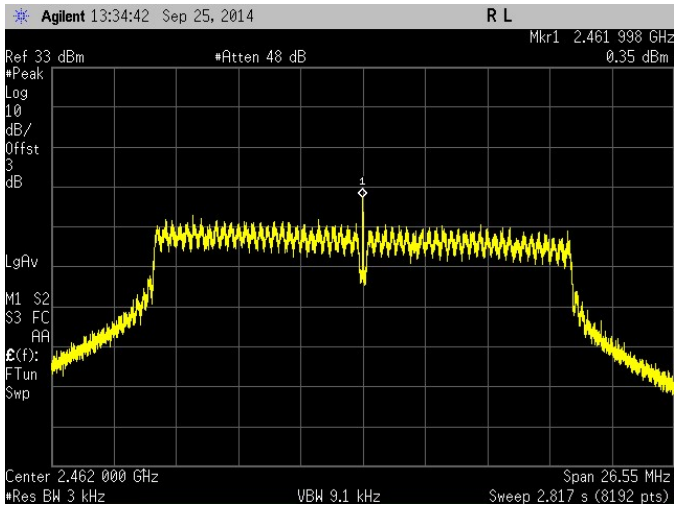
Middle Channel, Chain 1



High Channel, Chain 0

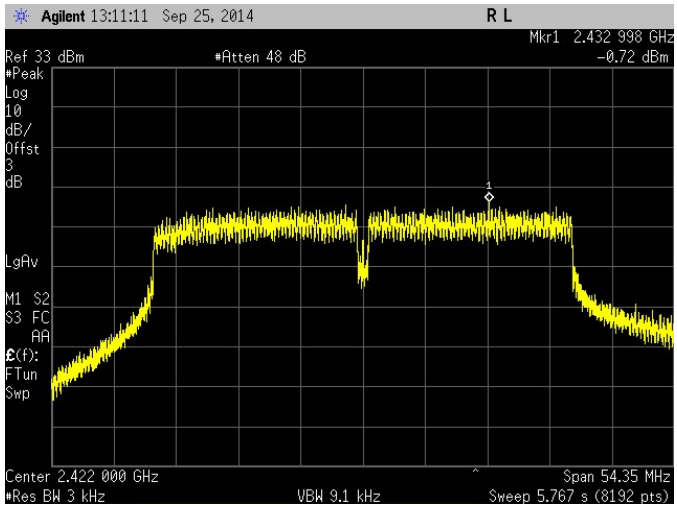


High Channel, Chain 1

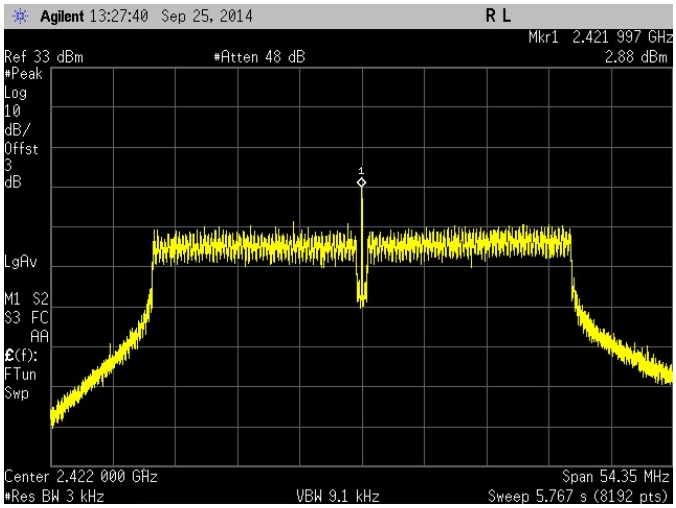


802.11n40 mode

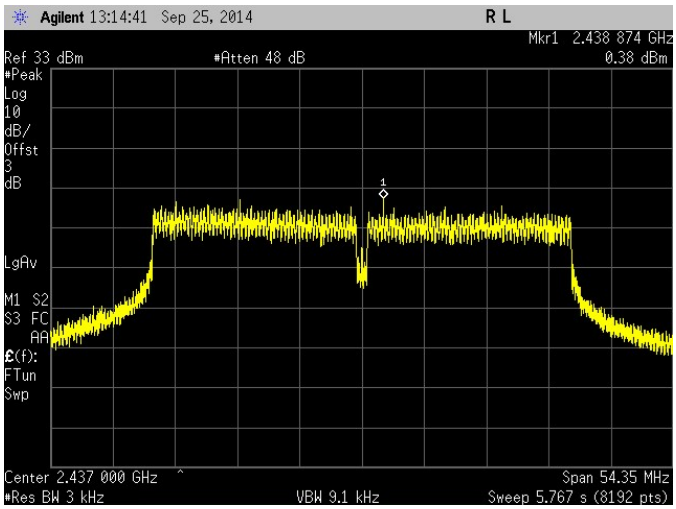
Low Channel, Chain 0



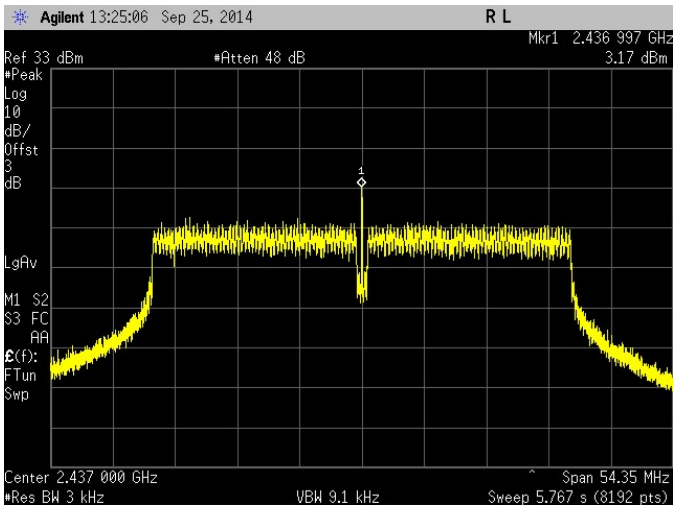
Low Channel, Chain 1



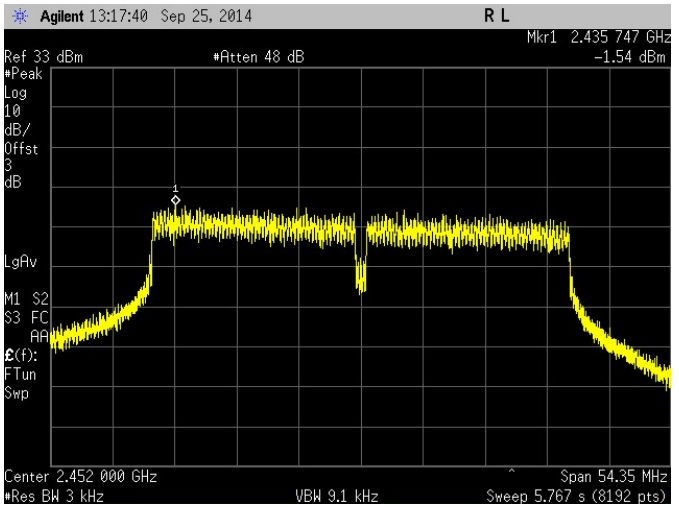
Middle Channel, Chain 0



Middle Channel, Chain 1



High Channel, Chain 0



High Channel, Chian 1