FCC PART 15, SUBPART C
IC RSS-247, ISSUE 1, MAY 2015

TEST AND MEASUREMENT REPORT

For

NVIDIA CORPORATION

2701 San Tomas Expressway,

Santa Clara, CA 95050, USA

FCC ID: VOB-P2290W
IC: 7361A-P2290W

Report Type:	**Product Type:**
Original Report	Tablet

Prepared By:	Todd Moy Test Engineer
Report Number:	R1511101-247
Report Date:	2016-04-01
Reviewed By:	Simon Ma RF Lead

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1511101-247	Original Report	2016-04-01

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of *NVIDIA CORPORATION*, and their product model: *P2290W*, FCC ID: VOB-P2290W; IC: 7361A-P2290W or the "EUT" as referred to in this report. It is a tablet with Wi-Fi, Bluetooth and BLE functions. It operates in the 2.4 GHz and 5 GHz bands.

1.2 Mechanical Description of EUT

The EUT measures approximately 218 mm (L) x 123 mm (W) x 8 mm (H) and weight 350 g.

The test data gathered are from typical production sample, serial number: 0424515000300 assigned by NVIDIA CORPORATION.

1.3 Objective

This report is prepared on behalf of *NVIDIA CORPORATION*, in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commission's rules and IC RSS-247 Issue 1, MAY 2015.

The objective is to determine compliance with FCC Part 15.247 and IC RSS-247 rules for Output Power, Antenna Requirements, 6 dB Bandwidth, Power Spectral Density, 100 kHz Bandwidth of Band Edges Measurement, Conducted and Radiated Spurious Emissions.

1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment DSS with FCC ID: VOB-P2290W
FCC Part 15, Subpart E, Equipment NII with FCC ID: VOB-P2290W

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and FCC KDB 558074 D01 DTS Meas Guidance v03r03: 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.

Based on CISPR16-4-2:2011, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\pm$2.0 dB for Conducted Emissions tests and $\pm$4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

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:
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 C63.10-2013, ANSI C63.4-2014, 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 C63.10-2013 and FCC KDB 558074 D01 DTS Meas Guidance v03r04.

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 Android Debug Bridge provided by *NVIDIA CORPORATION.*, the software was verified by *Todd Moy* to comply with the standard requirements being tested against.

2.3 Duty Cycle Correction Factor

According to KDB 558074 D01 DTS Meas Guidance v03r04 section 6.0:

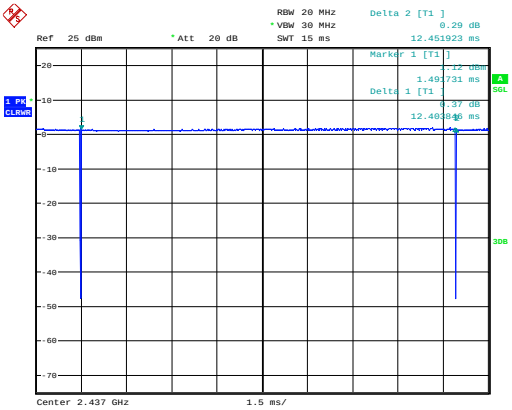
Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%). When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be utilized to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data is being acquired (i.e., no transmitter off-time is to be considered).

Radio Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11b	12.40	12.45	99.60	0.02
802.11g	2.06	2.13	96.71	0.15
802.11n20	0.98	1.02	96.08	0.17
802.11n40	0.49	0.53	92.45	0.34
BLE	0.39	0.63	61.90	2.08

Duty Cycle = On Time (ms)/ Period (ms)
Duty Cycle Correction Factor (dB) = 10*log(1/Duty Cycle)

Please refer to the following plots.

802.11b mode



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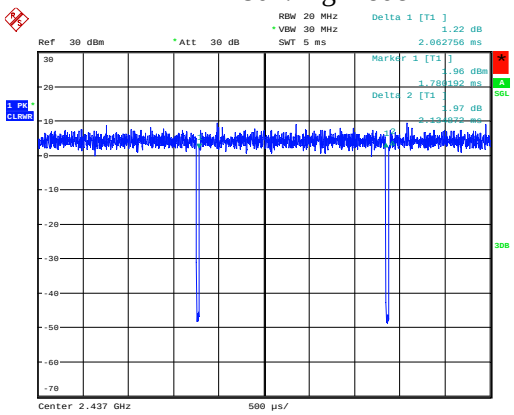
802.11g mode



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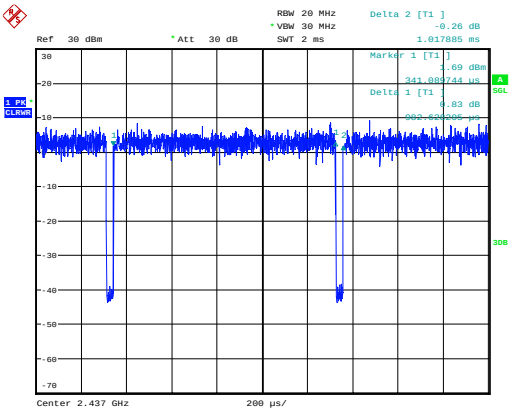

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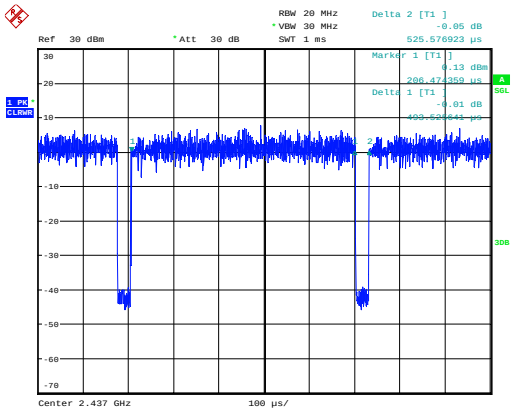

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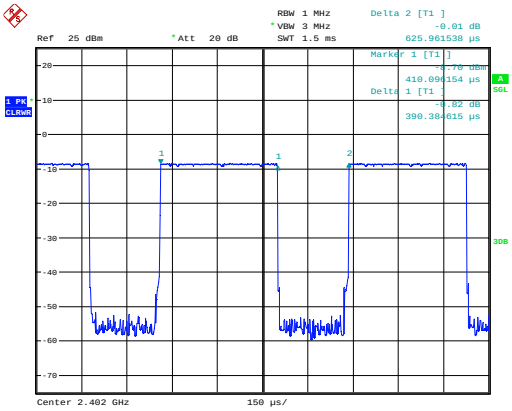
BLE



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2.4 Equipment Modifications

A hole was cut in the back of the EUT to access the antenna ports.

2.5 Local Support Equipment

Manufacturer	Description	Model
Dell	Laptop	Latitude D630

2.6 EUT Internal Configuration Details

Manufacturer	Description	Model
NVIDIA	Main Board	P2290
BYD	battery	11416519-00

2.7 Support Equipment

Manufacturer	Description	Model
NVIDIA	USB Power Adapter	SPA011AU5W2

2.8 Interface Ports and Cabling

Cable Description	Length (m)	To	From
USB Cable	< 1 m	Laptop	EUT
U.FL-RSMA pigtail	< 1 m	EUT	PSA

3 Summary of Test Results

Results reported relate only to the product tested.

FCC & IC Rules	Description of Test	Results
FCC §15.203 IC RSS-Gen §8.3	Antenna Requirement	Compliant
FCC §15.207 IC RSS-Gen §8.8	AC Line Conducted Emissions	Compliant
FCC §2.1093, §15.247(i) IC RSS-102	RF Exposure	Compliant[1]
FCC §2.1051, §15.247 (d) IC RSS-247 §5.5	Spurious Emissions at Antenna Port	Compliant
FCC §2.1053, §15.205, §15.209, §15.247 (d) IC RSS-247 §5.5 IC RSS-Gen §8.9 & §8.10	Radiated Spurious Emissions	Compliant
FCC §15.247(a)(2) IC RSS-247 §5.2 (1)	6 dB & 99% Emission Bandwidth	Compliant
FCC §15.247(b)(3) IC RSS-247 §5.4 (4)	Maximum Peak Output Power	Compliant
FCC §15.247(d) IC RSS-247 §5.5	100 kHz Bandwidth of Frequency Band Edge	Compliant
FCC §15.247(e) IC RSS-247 §5.2 (2)	Power Spectral Density	Compliant

Note[1]: RF exposure analysis is covered in a separate report.

4 FCC §15.203 & IC RSS-Gen §8.3 - Antenna Requirements

4.1 Applicable Standards

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 §8.3: Transmitter Antenna

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the license-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

License-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the license-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of license-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. [9] 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 a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

4.2 Antenna Description

The antennas used by the EUT are permanent attached antennas.

Antenna Port	Maximum Antenna Gain (dBi) @ 2.4GHz
Wi-Fi 0/Bluetooth	1.7
Wi-Fi 1	2.3

5 FCC §2.1093, §15.247(i) & IC RSS-102 – RF Exposure

5.1 Applicable Standards

FCC §2.1093, §15.247(i), & IC RSS-102

5.2 Test Results

Please refer to the SAR Report: R1511101- SAR.

6 FCC §15.207 & IC RSS-Gen §8.8 - AC Line Conducted Emissions

6.1 Applicable Standards

As per FCC §15.207 and IC RSS-Gen §8.8 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 Note1	56 to 46 Note2
0.5-5	56	46
5-30	60	50

Note1: Decreases with the logarithm of the frequency.
Note2: A linear average detector is required

6.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.10-2013 measurement procedure. The specification used were FCC §15.207 and IC RSS-Gen §8.8 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 cords of support equipment were connected to LISN-2.

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

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

6.4 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:

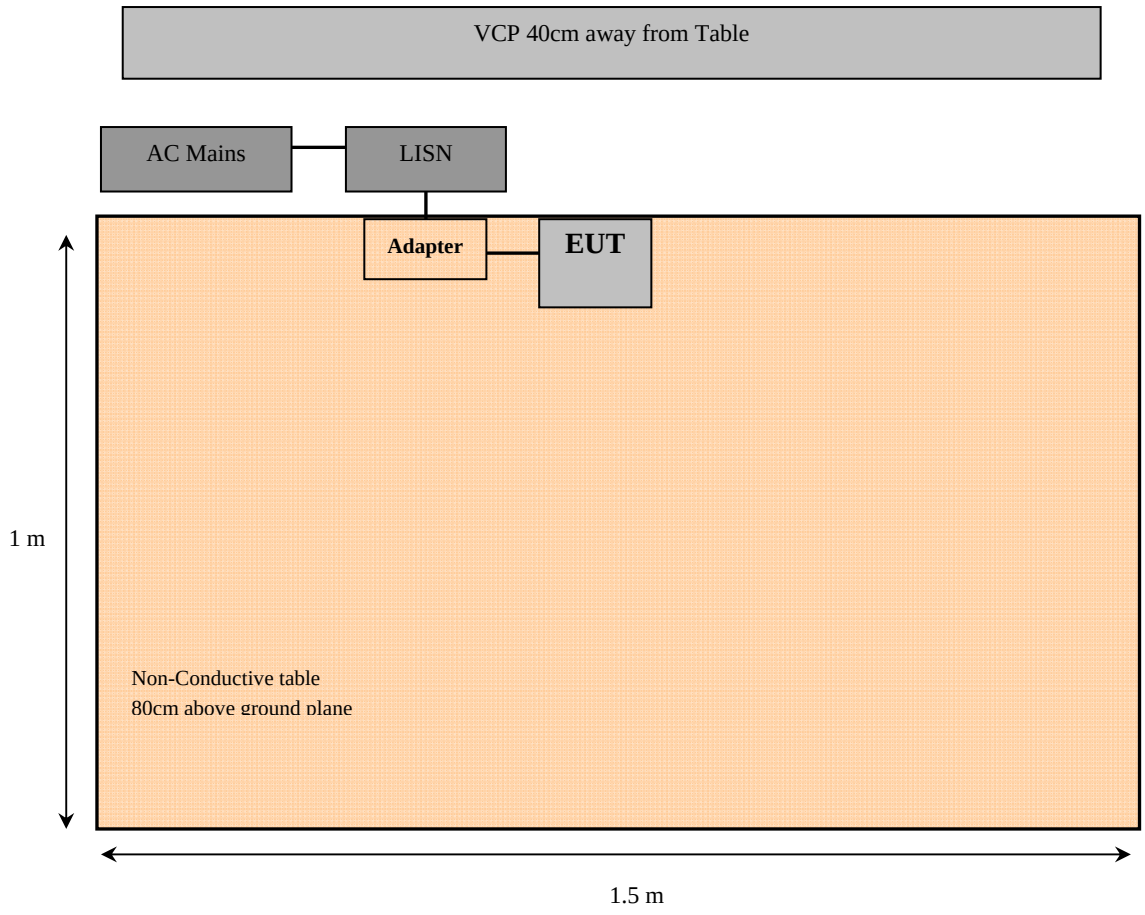
CA = Ai + CL + Atten

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

6.5 Test Setup Block Diagram



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	100044	2015-07-23	1 year
Rohde & Schwarz	Impulse Limiter	ESH3-Z2	101963	2015-07-15	1year
Keysight Technologies	RF Limiter	11867A	MY42242931	2015-12-15	1year
Solar Electronics Company	High Pass Filter	Type 7930-100	7930150204	2015-03-06	1 year
Suirong	30 ft conductive emission cable	LMR 400	-	2015-03-05	1 year
FCC	LISN	FCC-LISN-50-25-2-10-CISPR16	160129	2015-04-07	1year

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:	15º C
Relative Humidity:	42 %
ATM Pressure:	101.31 kPa

The testing was performed by Todd Moy on 2016-01-08 in 5 chamber 3.

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:

2.4 GHz Wi-Fi

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Live/Neutral)**	**Range (MHz)**
-7.23	27.36103	Line	0.15-30

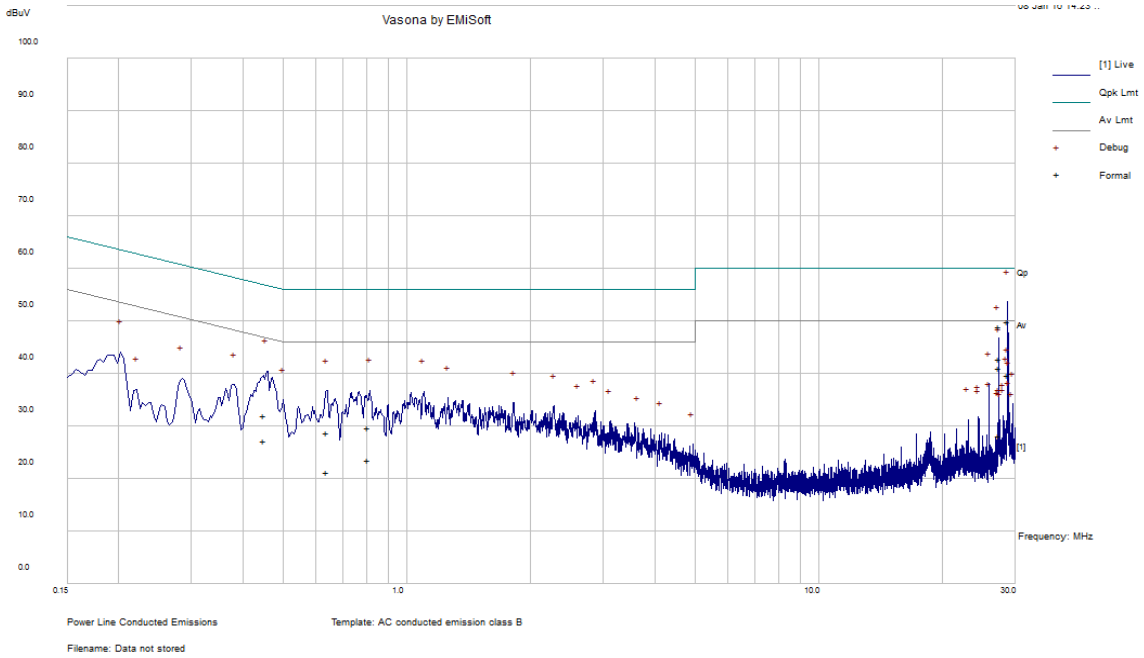
BLE

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Live/Neutral)**	**Range (MHz)**
-17.96	0.49017	Neutral	0.15-30

6.9 Conducted Emissions Test Plots and Data

2.4 GHz Wi-Fi

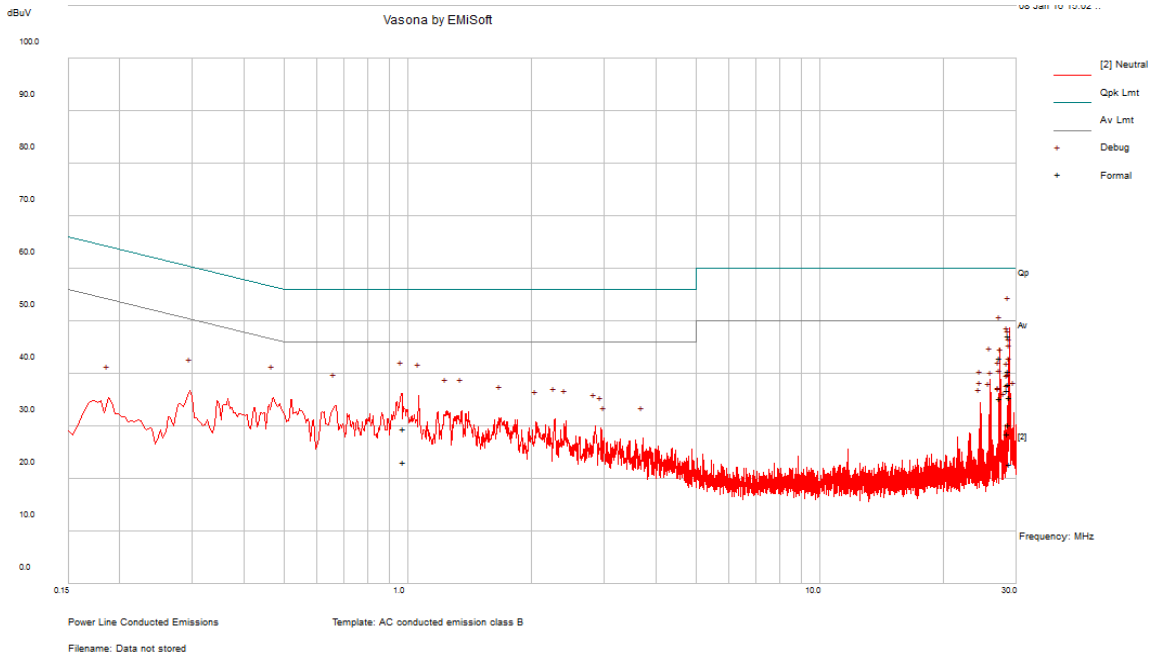
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
28.75227	49.84	Line	60	-10.16	QP
27.30912	41.11	Line	60	-18.89	QP
0.450133	32.07	Line	56.87	-24.81	QP
27.36103	48.9	Line	60	-11.1	QP
0.806035	29.74	Line	56	-26.26	QP
0.638701	28.87	Line	56	-27.13	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
28.75227	39.65	Line	50	-10.35	Ave.
27.30912	28.15	Line	50	-21.85	Ave.
0.450133	27.2	Line	46.87	-19.67	Ave.
27.36103	42.77	Line	50	**-7.23**	Ave.
0.806035	23.68	Line	46	-22.32	Ave.
0.638701	21.2	Line	46	-24.8	Ave.

120 V, 60 Hz – Neutral

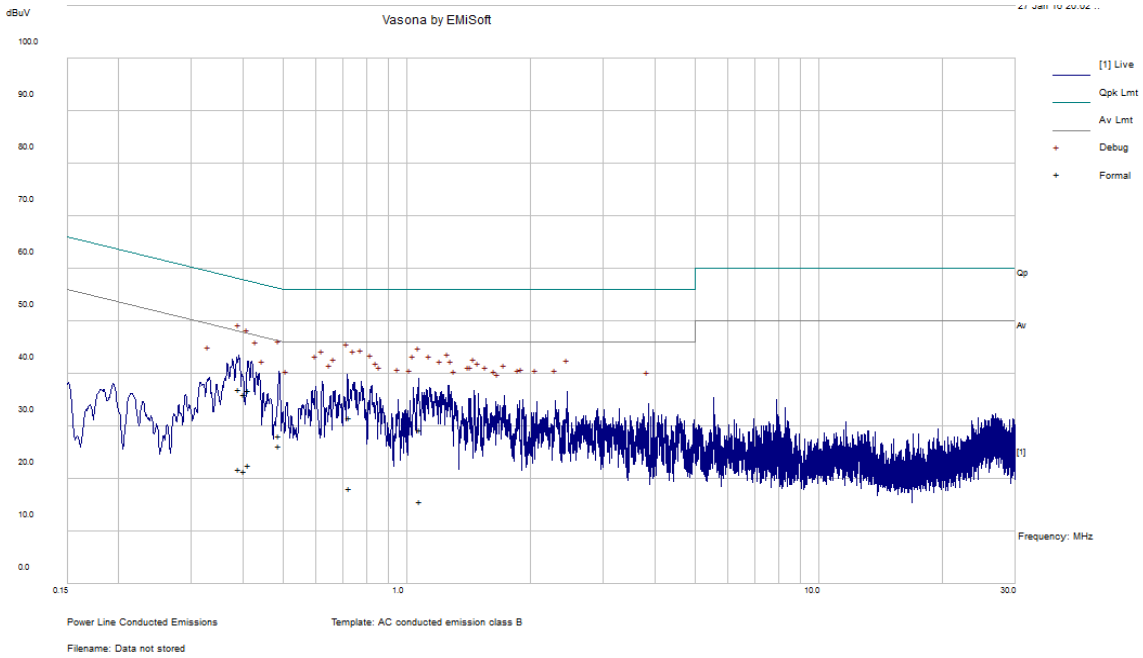


Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
28.78138	47.32	Neutral	60	-12.68	QP
27.346	43.08	Neutral	60	-16.92	QP
28.64647	36.94	Neutral	60	-23.06	QP
28.82417	40.6	Neutral	60	-19.4	QP
28.92293	35.5	Neutral	60	-24.5	QP
0.979907	29.57	Neutral	56	-26.43	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
28.78138	38.06	Neutral	50	-11.94	Ave.
27.346	35.23	Neutral	50	-14.77	Ave.
28.64647	28.62	Neutral	50	-21.38	Ave.
28.82417	30.41	Neutral	50	-19.59	Ave.
28.92293	22.73	Neutral	50	-27.27	Ave.
0.979907	23.21	Neutral	46	-22.79	Ave.

BLE

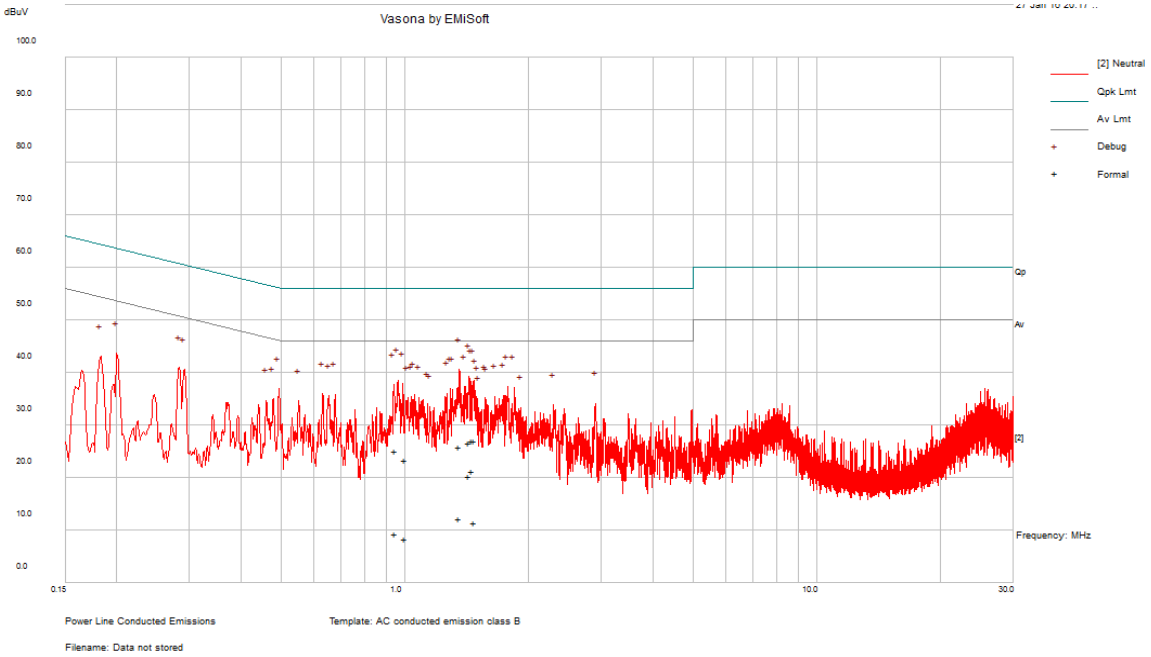
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.392352	37.09	Line	58.01	-20.92	QP
0.403716	36.14	Line	57.78	-21.64	QP
0.49017	26.23	Line	56.16	-29.93	QP
0.726156	31.58	Line	56	-24.42	QP
1.078062	29.43	Line	56	-26.57	QP
0.413481	36.93	Line	57.58	-20.65	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.392352	21.78	Line	48.01	-26.23	Ave.
0.403716	21.51	Line	47.78	-26.27	Ave.
0.49017	28.21	Line	46.16	**-17.96**	Ave.
0.726156	18.19	Line	46	-27.81	Ave.
1.078062	15.75	Line	46	-30.25	Ave.
0.413481	22.7	Line	47.58	-24.88	Ave.

120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
1.353309	25.91	Neutral	56	-30.09	QP
1.430283	26.77	Neutral	56	-29.23	QP
0.947451	25.14	Neutral	56	-30.86	QP
1.479432	27.1	Neutral	56	-28.9	QP
1.455951	27.03	Neutral	56	-28.97	QP
1.001136	23.41	Neutral	56	-32.59	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
1.353309	12.21	Neutral	46	-33.79	Ave.
1.430283	20.33	Neutral	46	-25.67	Ave.
0.947451	9.34	Neutral	46	-36.66	Ave.
1.479432	11.56	Neutral	46	-34.44	Ave.
1.455951	21.21	Neutral	46	-24.79	Ave.
1.001136	8.43	Neutral	46	-37.57	Ave.

7 FCC §15.209, §15.247(d) & IC RSS-247 §5.5, RSS-Gen §8.9, §8.10 - Spurious Radiated Emissions

7.1 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 §15.205(a) and RSS-Gen 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 §15.209(a): 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 §15.247 (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-Gen 8.9,

> Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table 4 or Table 5 below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

Table 4 – General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Above 30 MHz

Frequency (MHz)	Field Strength (µv/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

* Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for license-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

Note: Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specific RSS.

As per IC RSS-247 §5.5, 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 5.4(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.

7.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2013. The specification used was the FCC 15 Subpart C and IC RSS-247 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.

7.3 Test Procedure

For the radiated emissions test, the EUT host, and all support equipment power cords were 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 was set 3 meter away from the testing antenna, which was varied from 1-4 meter, and the EUT was placed on a turntable, which was 0.8 meter and 1.5 meter above the ground plane for below and above 1000 MHz measurements, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna's polarity should be changed between horizontal and vertical.

The spectrum analyzer or receiver was 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

7.4 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

7.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100044	2015-07-23	1 year
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2015-06-22	1 year
Sunol Science Corp	System Controller	SC99V	011003-1	N/R	N/R
Sunol Sciences	Antenna, Biconi-Log	JB3	A020106-2	2015-07-11	2 years
EMCO	Antenna, Horn	3115	9511-4627	2015-01-15	1 year
Agilent	Amplifier, Pre	8447D	2944A10187	2015-03-20	1 year
Suirong	30 ft conductive emission cable	LMR 400	-	2015-03-05	1 year
-	SMA cable	-	C0002	Each time[1]	N/A
IW Microwave	High Frequency Cable	DC-1438	SPS-2303-3840-SPS	2015-01-18	1 year
Hewlett-Packard	5 ft N-type RF cable	-	1268	2015-05-15	1 year
Hewlett	Pre-Amplifier	8449B	3008A01978	2015-03-11	1year
Wisewave	Amplifier, Low Noise	ALN-22093530-01	12263-01	2015-04-28	1 year
Wisewave	Antenna, Horn	ARH-4223-02	10555-02	2013-09-20	3 year

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.

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

7.6 Test Environmental Conditions

Temperature:	20-22 ºC
Relative Humidity:	42-50 %
ATM Pressure:	102.7 kPa

The testing was performed by Leonard Grey and Todd Moy from 2015-12-08 to 2016-01-08 in 5m chamber 3.

7.7 Summary of Test Results

According to the data hereinafter, the EUT complied with FCC Title 47, Part 15C and IC RSS-247 standard's radiated emissions limits, and had the worst margin of:

2.4 GHz Wi-Fi

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode, channel**
-0.51	2483.5	Horizontal	g mode, high channel

BLE

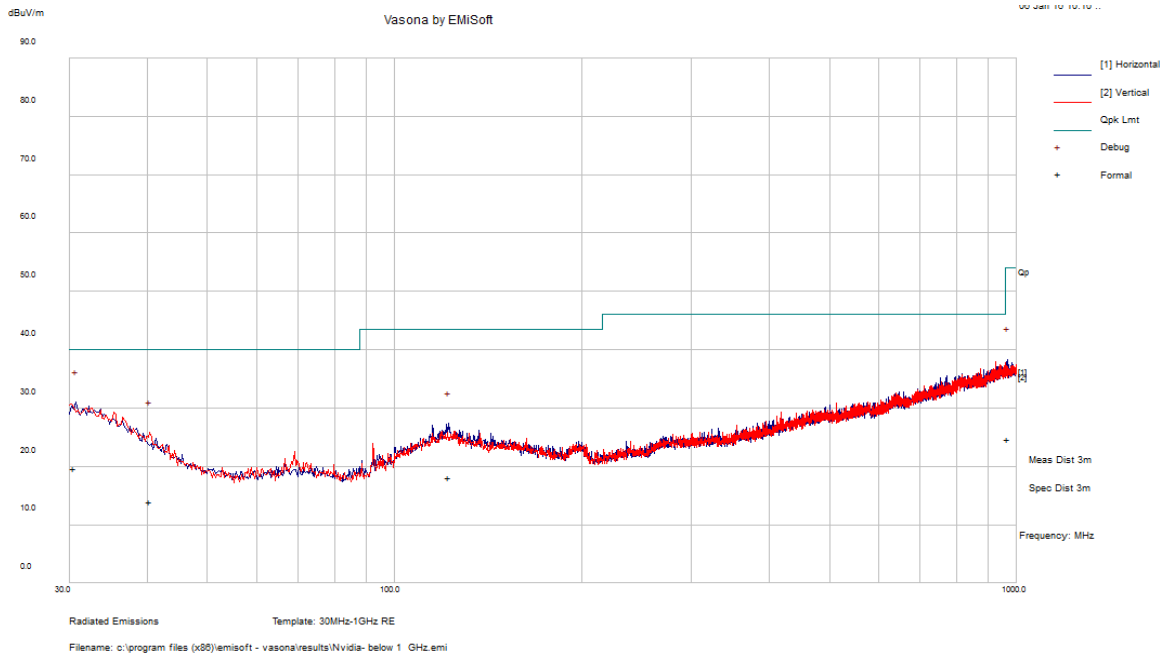
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**channel**
-5.36	2483.5	Horizontal	High channel

Please refer to the following table and plots for specific test result details

7.8 Radiated Emissions Test Results

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

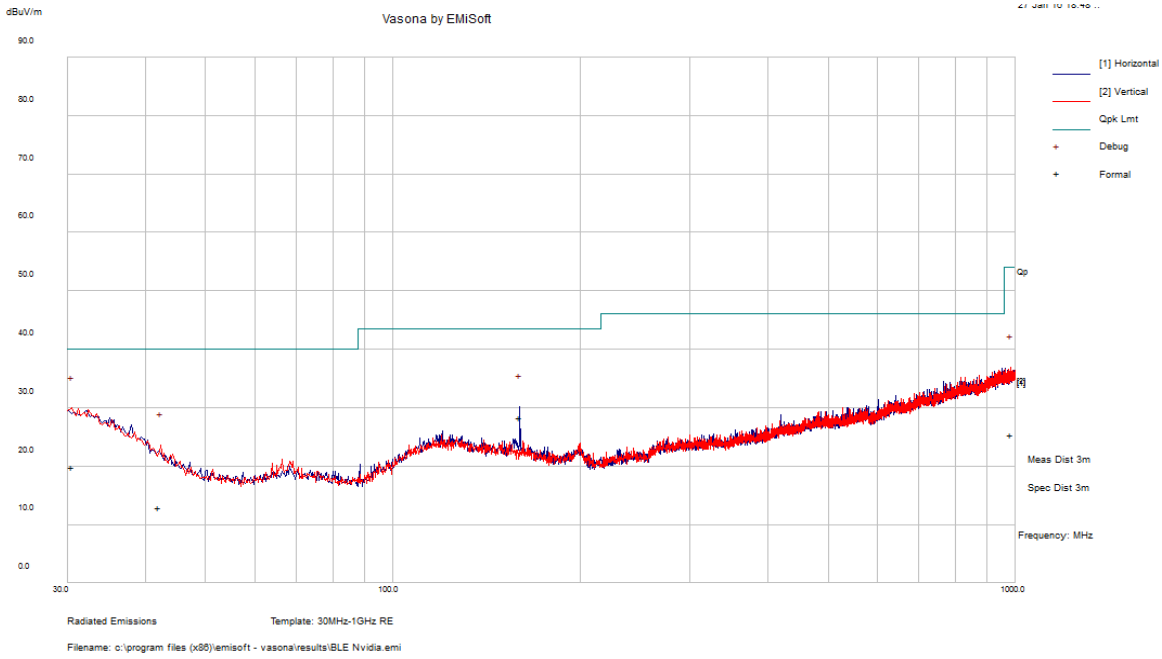
2.4 GHz Wi-Fi



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
30.49825	19.66	237	H	56	40	-20.34	QP
40.35825	14.01	262	V	129	40	-25.99	QP
966.7635	24.74	182	H	321	54	-29.26	QP
122.0458	18.05	156	H	125	43.5	-25.45	QP

Note: Only the top 4 points are present because the other 2 points are 20 dB below the limit.

BLE



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
30.485	29.94	300	V	0	40	-10.06	QP
159.98	30.17	100	H	0	43.5	-13.33	QP
42.3675	23.65	100	V	0	40	-16.35	QP
983.995	36.96	100	V	0	54	-17.04	QP

Note: Only the top 4 points are present because the other 2 points are 20 dB below the limit.

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2) 1–25 GHz Measured at 3 meters

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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											
2412	69.85	129	300	V	29.04	3.43	0.00	102.32	-	-	Peak
2412	72.83	18	300	H	29.04	3.43	0.00	105.30	-	-	Peak
2412	66.98	279	283	V	29.04	3.43	0.00	99.45	-	-	Ave
2412	69.21	25	104	H	29.04	3.43	0.00	101.68	-	-	Ave
2390	27.48	0	100	V	29.04	3.43	0.00	59.95	74	-14.05	Peak
2390	27.75	0	100	H	29.04	3.43	0.00	60.22	74	-13.78	Peak
2390	14.05	119	138	V	29.04	3.43	0.00	46.52	54	-7.48	Ave
2390	13.35	330	281	H	29.04	3.43	0.00	45.82	54	-8.18	Ave
4824	48.62	333	208	V	32.47	6.06	33.72	53.43	74	-20.57	Peak
4824	48.70	22	177	H	32.47	6.06	33.72	53.51	74	-20.49	Peak
4824	41.18	334	244	V	32.47	6.06	33.72	45.99	54	-8.01	Ave
4824	42.82	163	220	H	32.47	6.06	33.72	47.63	54	-6.37	Ave
7236	44.03	0	100	V	36.69	6.92	33.93	53.71	74	-20.29	Peak
7236	44.24	0	100	H	36.69	6.92	33.93	53.92	74	-20.08	Peak
7236	30.76	0	100	V	36.69	6.92	33.93	40.44	54	-13.56	Ave
7236	30.90	0	100	H	36.69	6.92	33.93	40.58	54	-13.42	Ave
9648	44.77	0	100	V	37.84	9.84	34.31	58.13	74	-15.87	Peak
9648	44.29	0	100	H	37.84	9.84	34.31	57.65	74	-16.35	Peak
9648	31.06	0	100	V	37.84	9.84	34.31	44.42	54	-9.58	Ave
9648	31.11	0	100	H	37.84	9.84	34.31	44.47	54	-9.53	Ave
Middle Channel 2442 MHz											
2442	71.02	114	266	V	29.41	3.43	0.00	103.86	-	-	Peak
2442	71.16	25	290	H	29.41	3.43	0.00	104.00	-	-	Peak
2442	65.83	106	271	V	29.41	3.43	0.00	98.67	-	-	Ave
2442	67.21	26	100	H	29.41	3.43	0.00	100.05	-	-	Ave
4884	49.64	317	300	V	32.64	6.06	33.75	54.58	74	-19.42	Peak
4884	50.37	195	300	H	32.64	6.06	33.75	55.31	74	-18.69	Peak
4884	43.22	332	136	V	32.64	6.06	33.75	48.16	54	-5.84	Ave
4884	44.19	193	300	H	32.64	6.06	33.75	49.13	54	-4.87	Ave
7326	43.94	0	100	V	37.15	7.39	33.99	54.49	74	-19.51	Peak
7326	43.97	0	100	H	37.15	7.39	33.99	54.52	74	-19.48	Peak
7326	30.47	0	100	V	37.15	7.39	33.99	41.02	54	-12.98	Ave
7326	30.47	0	100	H	37.15	7.39	33.99	41.02	54	-12.98	Ave
9768	43.70	0	100	V	37.92	8.72	34.31	56.03	74	-17.97	Peak
9768	44.23	0	100	H	37.92	8.72	34.31	56.56	74	-17.44	Peak
9768	30.33	0	100	V	37.92	8.72	34.31	42.66	54	-11.34	Ave
9768	30.29	0	100	H	37.92	8.72	34.31	42.62	54	-11.38	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 2472 MHz											
2472	69.76	113	235	V	29.41	3.43	0.00	102.60	-	-	Peak
2472	70.77	29	162	H	29.41	3.43	0.00	103.61	-	-	Peak
2472	66	113	236	V	29.41	3.43	0.00	98.84	-	-	Ave
2472	66.74	27	160	H	29.41	3.43	0.00	99.58	-	-	Ave
2483.5	29.93	176	100	V	29.41	3.43	0.00	62.77	74	-11.23	Peak
2483.5	29.57	170	300	H	29.41	3.43	0.00	62.41	74	-11.59	Peak
2483.5	17.86	112	254	V	29.41	3.43	0.00	50.70	54	-3.30	Ave
2483.5	18.78	29	160	H	29.41	3.43	0.00	51.62	54	-2.38	Ave
4944	52.39	186	131	V	32.64	6.35	33.72	57.65	74	-16.35	Peak
4944	51.77	351	277	H	32.64	6.35	33.72	57.03	74	-16.97	Peak
4944	46.80	196	208	V	32.64	6.35	33.72	52.06	54	-1.94	Ave
4944	46.76	199	279	H	32.64	6.35	33.72	52.02	54	-1.98	Ave
7416	45.30	0	100	V	37.14	7.46	33.99	55.92	74	-18.08	Peak
7416	44.86	0	100	H	37.14	7.46	33.99	55.48	74	-18.52	Peak
7416	30.36	0	100	V	37.14	7.46	33.99	40.98	54	-13.02	Ave
7416	30.28	0	100	H	37.14	7.46	33.99	40.90	54	-13.10	Ave
9888	44.03	0	100	V	37.99	9.11	34.39	56.73	74	-17.27	Peak
9888	43.99	0	100	H	37.99	9.11	34.39	56.69	74	-17.31	Peak
9888	30.38	0	100	V	37.99	9.11	34.39	43.08	54	-10.92	Ave
9888	30.29	0	100	H	37.99	9.11	34.39	42.99	54	-11.01	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)	
CH10: 2457 MHz											
4914	48.17	-	-	H	32.638	6.35	33.72	53.438	54	-0.562	Ave
CH11: 2462 MHz											
2483.5	31.22	-	-	H	29.413	3.43	0.00	64.063	74	-9.937	Peak
2483.5	20.2	-	-	H	29.413	3.43	0.00	53.043	54	-0.957	Ave
4924	48.41	-	-	H	32.638	6.35	33.72	53.678	54	-0.322	Ave
CH12: 2467 MHz											
4934	51.05	-	-	H	32.638	6.35	33.72	56.318	74	-17.682	Peak
4934	46.77	-	-	H	32.638	6.35	33.72	52.038	54	-1.962	Ave

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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											
2412	69.44	276	276	V	29.04	3.43	0.00	101.91	-	-	Peak
2412	72.97	0	152	H	29.04	3.43	0.00	105.44	-	-	Peak
2412	27.68	276	276	V	29.04	3.43	0.00	60.15	-	-	Ave
2412	69.62	0	184	H	29.04	3.43	0.00	102.09	-	-	Ave
2390	27.9	82	269	V	29.042	3.43	0.00	60.37	74	-13.63	Peak
2390	27.23	0	152	H	29.04	3.43	0.00	59.70	74	-14.30	Peak
2390	14.05	133	186	V	29.04	3.43	0.00	46.52	54	-7.48	Ave
2390	14.61	6	300	H	29.04	3.43	0.00	47.08	54	-6.92	Ave
4824	47.61	260	287	V	32.47	6.06	33.72	52.42	74	-21.58	Peak
4824	48.72	163	298	H	32.47	6.06	33.72	53.53	74	-20.47	Peak
4824	41.09	278	226	V	32.47	6.06	33.72	45.90	54	-8.10	Ave
4824	43.18	166	223	H	32.47	6.06	33.72	47.99	54	-6.01	Ave
7236	44.55	0	100	V	36.69	6.92	33.93	54.23	74	-19.77	Peak
7236	43.81	0	100	H	36.69	6.92	33.93	53.49	74	-20.51	Peak
7236	30.19	0	100	V	36.69	6.92	33.93	39.87	54	-14.13	Ave
7236	30.23	0	100	H	36.69	6.92	33.93	39.91	54	-14.09	Ave
9648	45.50	0	100	V	37.84	9.84	34.31	58.86	74	-15.14	Peak
9648	45.11	0	100	H	37.84	9.84	34.31	58.47	74	-15.53	Peak
9648	31.46	0	100	V	37.84	9.84	34.31	44.82	54	-9.18	Ave
9648	31.48	0	100	H	37.84	9.84	34.31	44.84	54	-9.16	Ave
Middle Channel 2442 MHz											
2442	68.97	98	266	V	29.41	3.43	0.00	101.81	-	-	Peak
2442	72.48	0	289	H	29.41	3.43	0.00	105.32	-	-	Peak
2442	65.29	308	267	V	29.41	3.43	0.00	98.13	-	-	Ave
2442	68.77	0	105	H	29.41	3.43	0.00	101.61	-	-	Ave
4884	47.04	84	205	V	32.64	6.06	33.75	51.98	74	-22.02	Peak
4884	47.96	166	187	H	32.64	6.06	33.75	52.90	74	-21.10	Peak
4884	36.88	310	224	V	32.64	6.06	33.75	41.82	54	-12.18	Ave
4884	39.87	37	191	H	32.64	6.06	33.75	44.81	54	-9.19	Ave
7326	43.61	0	100	V	37.15	7.39	33.99	54.16	74	-19.84	Peak
7326	44.47	0	100	H	37.15	7.39	33.99	55.02	74	-18.98	Peak
7326	30.26	0	100	V	37.15	7.39	33.99	40.81	54	-13.19	Ave
7326	30.27	0	100	H	37.15	7.39	33.99	40.82	54	-13.18	Ave
9768	43.30	0	100	V	37.92	8.72	34.31	55.63	74	-18.37	Peak
9768	44.45	0	100	H	37.92	8.72	34.31	56.78	74	-17.22	Peak
9768	30.23	0	100	V	37.92	8.72	34.31	42.56	54	-11.44	Ave
9768	31.08	0	100	H	37.92	8.72	34.31	43.41	54	-10.59	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 2472 MHz											
2472	68.56	290	272	V	29.41	3.43	0.00	101.40	-	-	Peak
2472	70.18	6	100	H	29.41	3.43	0.00	103.02	-	-	Peak
2472	62.99	197	272	V	29.41	3.43	0.00	95.83	-	-	Ave
2472	66.43	0	213	H	29.41	3.43	0.00	99.27	-	-	Ave
2483.5	28.9	290	272	V	29.41	3.43	0.00	61.74	74	-12.26	Peak
2483.5	29.53	6	100	H	29.41	3.43	0.00	62.37	74	-11.63	Peak
2483.5	18.43	212	274	V	29.41	3.43	0.00	51.27	54	-2.73	Ave
2483.5	18.53	192	213	H	29.41	3.43	0.00	51.37	54	-2.63	Ave
4944	46.17	0	100	V	32.64	6.35	33.75	51.40	74	-22.60	Peak
4944	47.24	13	197	H	32.64	6.35	33.75	52.47	74	-21.53	Peak
4944	32.88	75	278	V	32.64	6.35	33.75	38.11	54	-15.89	Ave
4944	37.84	170	219	H	32.64	6.35	33.75	43.07	54	-10.93	Ave
7416	43.99	0	100	V	37.14	7.46	33.99	54.61	74	-19.39	Peak
7416	43.25	0	100	H	37.14	7.46	33.99	53.87	74	-20.13	Peak
7416	30.08	0	100	V	37.14	7.46	33.99	40.70	54	-13.30	Ave
7416	30.16	0	100	H	37.14	7.46	33.99	40.78	54	-13.22	Ave
9888	43.44	0	100	V	37.99	9.11	34.39	56.14	74	-17.86	Peak
9888	43.55	0	100	H	37.99	9.11	34.39	56.25	74	-17.75	Peak
9888	29.99	0	100	V	37.99	9.11	34.39	42.69	54	-11.31	Ave
9888	29.95	0	100	H	37.99	9.11	34.39	42.65	54	-11.35	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)	
CH10: 2457 MHz											
2483.5	19.79	-	-	H	29.413	3.43	0	52.633	54	-1.367	Ave
CH11: 2462 MHz											
2483.5	18.79	-	-	H	29.413	3.43	0.00	51.633	54	-2.367	Ave
CH12: 2467 MHz											
2483.5	18.41	-	-	H	29.413	3.43	0.00	51.253	54	-2.747	Ave

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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											
2412	71.18	132	300	V	29.04	3.43	0.00	103.65	-	-	Peak
2412	71.42	240	281	H	29.04	3.43	0.00	103.89	-	-	Peak
2412	62.09	90	300	V	29.04	3.43	0.00	94.56	-	-	Ave
2412	61.79	156	229	H	29.04	3.43	0.00	94.26	-	-	Ave
2390	31.85	132	300	V	29.04	3.43	0.00	64.32	74	-9.68	Peak
2390	33.72	240	281	H	29.04	3.43	0.00	66.19	74	-7.81	Peak
2390	16.91	90	300	V	29.04	3.43	0.00	49.38	54	-4.62	Ave
2390	16.45	156	229	H	29.04	3.43	0.00	48.92	54	-5.08	Ave
4824	48.19	0	100	V	32.47	6.06	33.72	53.00	74	-21.00	Peak
4824	49.29	196	186	H	32.47	6.06	33.72	54.10	74	-19.90	Peak
4824	32.79	338	100	V	32.47	6.06	33.72	37.60	54	-16.40	Ave
4824	32.88	0	100	H	32.47	6.06	33.72	37.69	54	-16.31	Ave
7236	44.35	0	100	V	36.69	6.92	33.93	54.03	74	-19.97	Peak
7236	44.85	0	100	H	36.69	6.92	33.93	54.53	74	-19.47	Peak
7236	30.71	0	100	V	36.69	6.92	33.93	40.39	54	-13.61	Ave
7236	30.67	0	100	H	36.69	6.92	33.93	40.35	54	-13.65	Ave
9648	44.75	0	100	V	37.84	9.84	34.31	58.11	74	-15.89	Peak
9648	44.24	0	100	H	37.84	9.84	34.31	57.60	74	-16.40	Peak
9648	31.19	0	100	V	37.84	9.84	34.31	44.55	54	-9.45	Ave
9648	31.16	0	100	H	37.84	9.84	34.31	44.52	54	-9.48	Ave
Middle Channel 2442 MHz											
2442	74.97	102	167	V	29.41	3.43	0.00	107.81	-	-	Peak
2442	76.08	28	102	H	29.41	3.43	0.00	108.92	-	-	Peak
2442	63.57	102	300	V	29.41	3.43	0.00	96.41	-	-	Ave
2442	64.31	27	288	H	29.41	3.43	0.00	97.15	-	-	Ave
4884	46.70	0	100	V	32.64	6.06	33.75	51.64	74	-22.36	Peak
4884	47.36	0	100	H	32.64	6.06	33.75	52.30	74	-21.70	Peak
4884	33.03	0	100	V	32.64	6.06	33.75	37.97	54	-16.03	Ave
4884	33.54	203	300	H	32.64	6.06	33.75	38.48	54	-15.52	Ave
7326	44.72	0	100	V	37.15	7.39	33.99	55.27	74	-18.73	Peak
7326	44.67	0	100	H	37.15	7.39	33.99	55.22	74	-18.78	Peak
7326	30.69	0	100	V	37.15	7.39	33.99	41.24	54	-12.76	Ave
7326	30.71	0	100	H	37.15	7.39	33.99	41.26	54	-12.74	Ave
9768	43.90	0	100	V	37.92	8.72	34.31	56.23	74	-17.77	Peak
9768	44.89	0	100	H	37.92	8.72	34.31	57.22	74	-16.78	Peak
9768	30.76	0	100	V	37.92	8.72	34.31	43.09	54	-10.91	Ave
9768	30.71	0	100	H	37.92	8.72	34.31	43.04	54	-10.96	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 2472 MHz											
2472	68.61	138	300	V	29.41	3.43	0.00	101.45	-	-	Peak
2472	70.83	39	256	H	29.41	3.43	0.00	103.67	-	-	Peak
2472	57.61	139	238	V	29.41	3.43	0.00	90.45	-	-	Ave
2472	59.33	16	289	H	29.41	3.43	0.00	92.17	-	-	Ave
2483.5	38.79	138	300	V	29.41	3.43	0.00	71.63	74	-2.37	Peak
2483.5	40.65	39	256	H	29.41	3.43	0.00	73.49	74	-0.51	Peak
2483.5	17.1	139	238	V	29.41	3.43	0.00	49.94	54	-4.06	Ave
2483.5	18.82	41	157	H	29.41	3.43	0.00	51.66	54	-2.34	Ave
4944	54.34	188	100	V	32.64	6.35	33.72	59.60	74	-14.40	Peak
4944	53.53	351	299	H	32.64	6.35	33.72	58.79	74	-15.21	Peak
4944	37.43	0	100	V	32.64	6.35	33.72	42.69	54	-11.31	Ave
4944	37.72	163	300	H	32.64	6.35	33.72	42.98	54	-11.02	Ave
7416	43.99	0	100	V	37.14	7.46	33.99	54.61	74	-19.39	Peak
7416	44.33	0	100	H	37.14	7.46	33.99	54.95	74	-19.05	Peak
7416	30.53	0	100	V	37.14	7.46	33.99	41.15	54	-12.85	Ave
7416	30.60	0	100	H	37.14	7.46	33.99	41.22	54	-12.78	Ave
9888	44.31	0	100	V	37.99	9.11	34.39	57.01	74	-16.99	Peak
9888	44.44	0	100	H	37.99	9.11	34.39	57.14	74	-16.86	Peak
9888	30.47	0	100	V	37.99	9.11	34.39	43.17	54	-10.83	Ave
9888	30.48	0	100	H	37.99	9.11	34.39	43.18	54	-10.82	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)	
CH 12: 2467 MHz											
2483.5	19.41	40	250	H	29.413	3.43	0.00	52.253	54	-1.747	Ave
CH 11: 2462 MHz											
2483.5	19.1	40	250	H	29.413	3.43	0.00	51.943	54	-2.057	Ave

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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											
2412	70.67	103	208	V	29.04	3.43	0.00	103.14	-	-	Peak
2412	73.59	190	153	H	29.04	3.43	0.00	106.06	-	-	Peak
2412	59.42	107	209	V	29.04	3.43	0.00	91.89	-	-	Ave
2412	63.26	0	300	H	29.04	3.43	0.00	95.73	-	-	Ave
2390	32.34	103	208	V	29.04	3.43	0.00	64.81	74	-9.19	Peak
2390	33.08	190	153	H	29.04	3.43	0.00	65.55	74	-8.45	Peak
2390	16.39	107	209	V	29.04	3.43	0.00	48.86	54	-5.14	Ave
2390	17.42	0	300	H	29.04	3.43	0.00	49.89	54	-4.11	Ave
4824	44.80	0	100	V	32.47	6.06	33.72	49.61	74	-24.39	Peak
4824	44.81	0	100	H	32.47	6.06	33.72	49.62	74	-24.38	Peak
4824	31.61	0	100	V	32.47	6.06	33.72	36.42	54	-17.58	Ave
4824	32.04	0	100	H	32.47	6.06	33.72	36.85	54	-17.15	Ave
7236	44.72	0	100	V	36.69	6.92	33.93	54.40	74	-19.60	Peak
7236	44.84	0	100	H	36.69	6.92	33.93	54.52	74	-19.48	Peak
7236	30.70	0	100	V	36.69	6.92	33.93	40.38	54	-13.62	Ave
7236	30.81	0	100	H	36.69	6.92	33.93	40.49	54	-13.51	Ave
9648	44.93	0	100	V	37.84	9.84	34.31	58.29	74	-15.71	Peak
9648	45.02	0	100	H	37.84	9.84	34.31	58.38	74	-15.62	Peak
9648	31.16	0	100	V	37.84	9.84	34.31	44.52	54	-9.48	Ave
9648	31.20	0	100	H	37.84	9.84	34.31	44.56	54	-9.44	Ave
Middle Channel 2442 MHz											
2442	72.86	73	207	V	29.41	3.43	0.00	105.70	-	-	Peak
2442	74.76	167	151	H	29.41	3.43	0.00	107.60	-	-	Peak
2442	60.49	286	247	V	29.41	3.43	0.00	93.33	-	-	Ave
2442	65.05	184	153	H	29.41	3.43	0.00	97.89	-	-	Ave
4884	46.00	0	100	V	32.64	6.06	33.75	50.94	74	-23.06	Peak
4884	45.82	0	100	H	32.64	6.06	33.75	50.76	74	-23.24	Peak
4884	31.66	295	133	V	32.64	6.06	33.75	36.60	54	-17.40	Ave
4884	32.52	14	287	H	32.64	6.06	33.75	37.46	54	-16.54	Ave
7326	44.80	0	100	V	37.15	7.39	33.99	55.35	74	-18.65	Peak
7326	44.01	0	100	H	37.15	7.39	33.99	54.56	74	-19.44	Peak
7326	30.58	0	100	V	37.15	7.39	33.99	41.13	54	-12.87	Ave
7326	30.54	0	100	H	37.15	7.39	33.99	41.09	54	-12.91	Ave
9768	44.96	0	100	V	37.92	8.72	34.31	57.29	74	-16.71	Peak
9768	43.76	0	100	H	37.92	8.72	34.31	56.09	74	-17.91	Peak
9768	30.56	0	100	V	37.92	8.72	34.31	42.89	54	-11.11	Ave
9768	30.53	0	100	H	37.92	8.72	34.31	42.86	54	-11.14	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 2472 MHz											
2472	67.33	268	289	V	29.41	3.43	0.00	100.17	-	-	Peak
2472	68.13	349	289	H	29.41	3.43	0.00	100.97	-	-	Peak
2472	56.82	271	266	V	29.41	3.43	0.00	89.66	-	-	Ave
2472	57.49	0	201	H	29.41	3.43	0.00	90.33	-	-	Ave
2483.5	38.23	268	289	V	29.41	3.43	0.00	71.07	74	-2.93	Peak
2483.5	38.53	349	289	H	29.41	3.43	0.00	71.37	74	-2.63	Peak
2483.5	17.09	271	266	V	29.41	3.43	0.00	49.93	54	-4.07	Ave
2483.5	18.3	0	201	H	29.41	3.43	0.00	51.14	54	-2.86	Ave
4944	45.17	0	100	V	32.64	6.35	33.72	50.43	74	-23.57	Peak
4944	44.96	0	100	H	32.64	6.35	33.72	50.22	74	-23.78	Peak
4944	31.62	0	100	V	32.64	6.35	33.72	36.88	54	-17.12	Ave
4944	31.72	0	100	H	32.64	6.35	33.72	36.98	54	-17.02	Ave
7416	44.11	0	100	V	37.14	7.46	33.99	54.73	74	-19.27	Peak
7416	44.12	0	100	H	37.14	7.46	33.99	54.74	74	-19.26	Peak
7416	30.55	0	100	V	37.14	7.46	33.99	41.17	54	-12.83	Ave
7416	30.61	0	100	H	37.14	7.46	33.99	41.23	54	-12.77	Ave
9888	44.04	0	100	V	37.99	9.11	34.39	56.74	74	-17.26	Peak
9888	43.56	0	100	H	37.99	9.11	34.39	56.26	74	-17.74	Peak
9888	30.45	0	100	V	37.99	9.11	34.39	43.15	54	-10.85	Ave
9888	30.46	0	100	H	37.99	9.11	34.39	43.16	54	-10.84	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)	
CH 12: 2467 MHz											
2483.5	32.53	0	289	H	29.413	3.43	0.00	65.373	74	-8.627	Peak
2483.5	18.33	0	283	H	29.413	3.43	0.00	51.173	54	-2.827	Ave
CH 11: 2462 MHz											
2483.5	20.95	0	280	H	29.413	3.43	0.00	53.793	54	-0.207	Ave

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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											
2412	74.11	100	275	V	29.04	3.43	0.00	106.58	-	-	Peak
2412	77	21	249	H	29.04	3.43	0.00	109.47	-	-	Peak
2412	63.3	106	255	V	29.04	3.43	0.00	95.77	-	-	Ave
2412	64.73	25	251	H	29.04	3.43	0.00	97.20	-	-	Ave
2390	38.74	93	284	V	29.04	3.43	0.00	71.21	74	-2.79	Peak
2390	36.97	42	154	H	29.04	3.43	0.00	69.44	74	-4.56	Peak
2390	18	271	231	V	29.04	3.43	0.00	50.47	54	-3.53	Ave
2390	18.49	25	191	H	29.04	3.43	0.00	50.96	54	-3.04	Ave
4824	46.34	0	100	V	32.47	6.06	33.72	51.15	74	-22.85	Peak
4824	48.08	0	100	H	32.47	6.06	33.72	52.89	74	-21.11	Peak
4824	33.11	0	221	V	32.47	6.06	33.72	37.92	54	-16.08	Ave
4824	34.73	163	221	H	32.47	6.06	33.72	39.54	54	-14.46	Ave
7236	45.57	0	100	V	36.69	6.92	33.93	55.25	74	-18.75	Peak
7236	45.31			H	36.692	6.92	33.93	54.99	74.00	-19.01	Peak
7236	31.21	0	100	V	36.69	6.92	33.93	40.89	54	-13.11	Ave
7236	31.16	0	100	H	36.69	6.92	33.93	40.84	54	-13.16	Ave
9648	44.51	0	100	V	37.84	9.84	34.31	57.87	74	-16.13	Peak
9648	44.90	0	100	H	37.84	9.84	34.31	58.26	74	-15.74	Peak
9648	31.34	0	100	V	37.84	9.84	34.31	44.70	54	-9.30	Ave
9648	31.40	0	100	H	37.84	9.84	34.31	44.76	54	-9.24	Ave
Middle Channel 2442 MHz											
2442	75.4	270	272	V	29.41	3.43	0.00	108.24	-	-	Peak
2442	77.15	14	300	H	29.41	3.43	0.00	109.99	-	-	Peak
2442	64.73	74	272	V	29.41	3.43	0.00	97.57	-	-	Ave
2442	65.65	21	226	H	29.41	3.43	0.00	98.49	-	-	Ave
4884	46.93	0	100	V	32.64	6.06	33.75	51.87	74	-22.13	Peak
4884	46.47	0	100	H	32.64	6.06	33.75	51.41	74	-22.59	Peak
4884	33.51	114	281	V	32.64	6.06	33.75	38.45	54	-15.55	Ave
4884	33.92	196	300	H	32.64	6.06	33.75	38.86	54	-15.14	Ave
7326	45.10	0	100	V	37.15	7.39	33.99	55.65	74	-18.35	Peak
7326	45.42	0	100	H	37.15	7.39	33.99	55.97	74	-18.03	Peak
7326	30.71	0	100	V	37.15	7.39	33.99	41.26	54	-12.74	Ave
7326	30.73	0	100	H	37.15	7.39	33.99	41.28	54	-12.72	Ave
9768	44.47	0	100	V	37.92	8.72	34.31	56.80	74	-17.20	Peak
9768	43.98	0	100	H	37.92	8.72	34.31	56.31	74	-17.69	Peak
9768	30.61	0	100	V	37.92	8.72	34.31	42.94	54	-11.06	Ave
9768	30.60	0	100	H	37.92	8.72	34.31	42.93	54	-11.07	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 2472 MHz											
2472	68.3	271	265	V	29.41	3.43	0.00	101.14	-	-	Peak
2472	69	28	221	H	29.41	3.43	0.00	101.84	-	-	Peak
2472	57.02	110	269	V	29.41	3.43	0.00	89.86	-	-	Ave
2472	57.19	164	150	H	29.41	3.43	0.00	90.03	-	-	Ave
2483.5	40.21	74	295	V	29.41	3.43	0.00	73.05	74	-0.95	Peak
2483.5	40.6	14	290	H	29.41	3.43	0.00	73.44	74	-0.56	Peak
2483.5	16.44	110	269	V	29.41	3.43	0.00	49.28	54	-4.72	Ave
2483.5	16.32	164	150	H	29.41	3.43	0.00	49.16	54	-4.84	Ave
4944	51.91	194	149	V	32.64	6.35	33.72	57.17	74	-16.83	Peak
4944	50.97	190	252	H	32.64	6.35	33.72	56.23	74	-17.77	Peak
4944	34.86	199	130	V	32.64	6.35	33.72	40.12	54	-13.88	Ave
4944	34.69	203	280	H	32.64	6.35	33.72	39.95	54	-14.05	Ave
7416	44.74	0	100	V	37.14	7.46	33.99	55.36	74	-18.64	Peak
7416	44.48	0	100	H	37.14	7.46	33.99	55.10	74	-18.90	Peak
7416	30.56	0	100	V	37.14	7.46	33.99	41.18	54	-12.82	Ave
7416	30.65	0	100	H	37.14	7.46	33.99	41.27	54	-12.73	Ave
9888	44.03	0	100	V	37.99	9.11	34.39	56.73	74	-17.27	Peak
9888	44.25	0	100	H	37.99	9.11	34.39	56.95	74	-17.05	Peak
9888	30.49	0	100	V	37.99	9.11	34.39	43.19	54	-10.81	Ave
9888	30.48	0	100	H	37.99	9.11	34.39	43.18	54	-10.82	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)	
CH 12: 2462 MHz											
2483.5	38.82	164	150	H	29.413	3.43	0.00	71.663	74	-2.337	Peak
2483.5	18.33	164	150	H	29.413	3.43	0.00	51.173	54	-2.827	Ave
CH 11: 2457 MHz											
2483.5	39.43	164	150	H	29.413	3.43	0.00	72.273	74	-1.727	Peak
2483.5	18.1	164	150	H	29.413	3.43	0.00	50.943	54	-3.057	Ave

802.11n40 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											
2422	70.8	95	275	V	29.04	3.43	0.00	103.27	-	-	Peak
2422	70.78	157	186	H	29.04	3.43	0.00	103.25	-	-	Peak
2422	58.57	110	278	V	29.04	3.43	0.00	91.04	-	-	Ave
2422	59.32	16	140	H	29.04	3.43	0.00	91.79	-	-	Ave
2390	31.71	95	275	V	29.04	3.43	0.00	64.18	74	-9.82	Peak
2390	35.86	157	186	H	29.04	3.43	0.00	68.33	74	-5.67	Peak
2390	17.27	110	278	V	29.04	3.43	0.00	49.74	54	-4.26	Ave
2390	18.52	16	140	H	29.04	3.43	0.00	50.99	54	-3.01	Ave
4844	45.67	0	100	V	32.47	6.06	33.72	50.48	74	-23.52	Peak
4844	45.26	0	100	H	32.47	6.06	33.72	50.07	74	-23.93	Peak
4844	31.90	0	100	V	32.47	6.06	33.72	36.71	54	-17.29	Ave
4844	33.06	160	139	H	32.47	6.06	33.72	37.87	54	-16.13	Ave
7266	44.69	0	100	V	37.15	6.92	33.93	54.82	74	-19.18	Peak
7266	44.69	0	100	H	37.15	6.92	33.93	54.82	74	-19.18	Peak
7266	30.73	0	100	V	37.15	6.92	33.93	40.86	54	-13.14	Ave
7266	30.74	0	100	H	37.15	6.92	33.93	40.87	54	-13.13	Ave
9688	45.41	0	100	V	37.84	9.31	34.31	58.24	74	-15.76	Peak
9688	45.97	0	100	H	37.84	9.31	34.31	58.80	74	-15.20	Peak
9688	31.03	0	100	V	37.84	9.31	34.31	43.86	54	-10.14	Ave
9688	30.72	0	100	H	37.84	9.31	34.31	43.55	54	-10.45	Ave
Middle Channel 2442 MHz											
2442	71.1	96	247	V	29.41	3.43	0.00	103.94	-	-	Peak
2442	71.57	163	245	H	29.41	3.43	0.00	104.41	-	-	Peak
2442	58.78	124	300	V	29.41	3.43	0.00	91.62	-	-	Ave
2442	60.08	25	251	H	29.41	3.43	0.00	92.92	-	-	Ave
4884	46.29	0	100	V	32.64	6.06	33.75	51.23	74	-22.77	Peak
4884	45.92	0	100	H	32.64	6.06	33.75	50.86	74	-23.14	Peak
4884	31.83	0	100	V	32.64	6.06	33.75	36.77	54	-17.23	Ave
4884	32.18	0	100	H	32.64	6.06	33.75	37.12	54	-16.88	Ave
7326	44.27	0	100	V	37.15	7.39	33.99	54.82	74	-19.18	Peak
7326	44.63	0	100	H	37.15	7.39	33.99	55.18	74	-18.82	Peak
7326	30.91	0	100	V	37.15	7.39	33.99	41.46	54	-12.54	Ave
7326	30.91	0	100	H	37.15	7.39	33.99	41.46	54	-12.54	Ave
9768	44.24	0	100	V	37.92	8.72	34.31	56.57	74	-17.43	Peak
9768	45.11	0	100	H	37.92	8.72	34.31	57.44	74	-16.56	Peak
9768	31.00	0	100	V	37.92	8.72	34.31	43.33	54	-10.67	Ave
9768	30.97	0	100	H	37.92	8.72	34.31	43.30	54	-10.70	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											
2462	68.37	270	294	V	29.41	3.43	0.00	101.21	-	-	Peak
2462	70.27	27	123	H	29.41	3.43	0.00	103.11	-	-	Peak
2462	57	95	246	V	29.41	3.43	0.00	89.84	-	-	Ave
2462	58.01	24	252	H	29.41	3.43	0.00	90.85	-	-	Ave
2483.5	35.32	270	294	V	29.41	3.43	0.00	68.16	74	-5.84	Peak
2483.5	35.41	10	199	H	29.41	3.43	0.00	68.25	74	-5.75	Peak
2483.5	16.98	95	246	V	29.41	3.43	0.00	49.82	54	-4.18	Ave
2483.5	18.78	181	288	H	29.41	3.43	0.00	51.62	54	-2.38	Ave
4924	48.13	0	215	V	32.64	6.35	33.72	53.39	74	-20.61	Peak
4924	47.50	0	100	H	32.64	6.35	33.72	52.76	74	-21.24	Peak
4924	33.28	328	100	V	32.64	6.35	33.72	38.54	54	-15.46	Ave
4924	33.03	0	300	H	32.64	6.35	33.72	38.29	54	-15.71	Ave
7386	45.83	0	100	V	37.14	7.46	33.99	56.45	74	-17.55	Peak
7386	44.55	0	100	H	37.14	7.46	33.99	55.17	74	-18.83	Peak
7386	30.50	0	100	V	37.14	7.46	33.99	41.11	54	-12.89	Ave
7386	30.65	0	100	H	37.14	7.46	33.99	41.27	54	-12.73	Ave
9848	44.92	0	100	V	37.92	8.72	34.39	57.17	74	-16.83	Peak
9848	44.28	0	100	H	37.92	8.72	34.39	56.53	74	-17.47	Peak
9848	30.94	0	100	V	37.92	8.72	34.39	43.19	54	-10.81	Ave
9848	30.92	0	100	H	37.92	8.72	34.39	43.17	54	-10.83	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)	
CH 4: 2427 MHz											
2390	38.1	16	140	H	29.042	3.43	0.00	70.572	74	-3.428	Peak
2390	20.26	16	140	H	29.042	3.43	0.00	52.732	54	-1.268	Ave
CH 5: 2432 MHz											
2390	38.16	16	140	H	29.042	3.43	0.00	70.632	74	-3.368	Peak
2390	20.44	16	140	H	29.042	3.43	0.00	52.912	54	-1.088	Ave
2483.5	34.08	10	199	H	29.413	3.43	0.00	66.923	74	-7.077	Peak
2483.5	17.17	10	199	H	29.413	3.43	0.00	50.013	54	-3.987	Ave
CH 6: 2437 MHz											
2390	33.65	16	140	H	29.042	3.43	0.00	66.122	74	-7.878	Peak
2390	15.77	16	140	H	29.042	3.43	0.00	48.242	54	-5.758	Ave
2483.5	38.44	10	199	H	29.413	3.43	0.00	71.283	74	-2.717	Peak
2483.5	19.04	10	199	H	29.413	3.43	0.00	51.883	54	-2.117	Ave
CH 8: 2447 MHz											
2483.5	38.67	10	199	H	29.413	3.43	0.00	71.513	74	-2.487	Peak
2483.5	17.8	10	199	H	29.413	3.43	0.00	50.643	54	-3.357	Ave
CH 9: 2452 MHz,											
2483.5	34.76	10	199	H	29.413	3.43	0.00	67.603	74	-6.397	Peak
2483.5	18.78	10	199	H	29.413	3.43	0.00	51.623	54	-2.377	Ave
CH 10: 2457 MHz											
2483.5	35.01	10	199	H	29.413	3.43	0.00	67.853	74	-6.147	Peak
2483.5	18.67	10	199	H	29.413	3.43	0.00	51.513	54	-2.487	Ave

BLE (Max Power)

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 2402 MHz											
2402	61.64	114	278	V	29.04	3.43	0.00	94.11	-	-	Peak
2402	62.82	33	275	H	29.04	3.43	0.00	95.29	-	-	Peak
2402	45.86	114	278	V	29.04	3.43	0.00	78.33	-	-	Ave
2402	46.44	33	275	H	29.04	3.43	0.00	78.91	-	-	Ave
2390	27.11	114	278	V	29.04	3.43	0.00	59.58	74	-14.42	Peak
2390	26.92	33	275	H	29.04	3.43	0.00	59.39	74	-14.61	Peak
2390	16.14	114	278	V	29.04	3.43	0.00	48.61	54	-5.39	Ave
2390	16.16	33	275	H	29.04	3.43	0.00	48.63	54	-5.37	Ave
4804	44.95	339	262	V	32.47	6.06	33.72	49.76	74	-24.24	Peak
4804	45.25	164	264	H	32.47	6.06	33.72	50.06	74	-23.94	Peak
4804	33.08	339	262	V	32.47	6.06	33.72	37.89	54	-16.11	Ave
4804	33.56	164	264	H	32.47	6.06	33.72	38.37	54	-15.63	Ave
7206	43.72	0	100	V	36.69	6.92	33.93	53.40	74	-20.60	Peak
7206	43.21	0	100	H	36.69	6.92	33.93	52.89	74	-21.11	Peak
7206	30.43	0	100	V	36.69	6.92	33.93	40.11	54	-13.89	Ave
7206	30.54	0	100	H	36.69	6.92	33.93	40.22	54	-13.78	Ave
9608	43.93	0	100	V	37.84	9.84	34.31	57.29	74	-16.71	Peak
9608	44.67	0	100	H	37.84	9.84	34.31	58.03	74	-15.97	Peak
9608	31.84	0	100	V	37.84	9.84	34.31	45.20	54	-8.80	Ave
9608	31.8	0	100	H	37.84	9.84	34.31	45.16	54	-8.84	Ave
Middle Channel 2440 MHz											
2440	64.72	87	294	V	29.41	3.43	0.00	97.56	-	-	Peak
2440	66.6	24	100	H	29.41	3.43	0.00	99.44	-	-	Peak
2440	48.13	104	152	V	29.41	3.43	0.00	80.97	-	-	Ave
2440	48.32	230	261	H	29.41	3.43	0.00	81.16	-	-	Ave
4880	46.36	338	212	V	32.64	6.06	33.75	51.31	74	-22.69	Peak
4880	46.69	15	231	H	32.64	6.06	33.75	51.64	74	-22.36	Peak
4880	36.47	186	131	V	32.64	6.06	33.75	41.42	54	-12.58	Ave
4880	37.07	164	231	H	32.64	6.06	33.75	42.02	54	-11.98	Ave
7320	41.68	0	100	V	37.15	7.39	33.99	52.24	74	-21.76	Peak
7320	41.21	0	100	H	37.15	7.39	33.99	51.77	74	-22.23	Peak
7320	30.51	0	100	V	37.15	7.39	33.99	41.07	54	-12.93	Ave
7320	30.39	0	100	H	37.15	7.39	33.99	40.95	54	-13.05	Ave
9760	42.68	0	100	V	37.92	8.72	34.31	55.01	74	-18.99	Peak
9760	43.04	0	100	H	37.92	8.72	34.31	55.37	74	-18.63	Peak
9760	32.4	0	100	V	37.92	8.72	34.31	44.73	54	-9.27	Ave
9760	32.41	0	100	H	37.92	8.72	34.31	44.74	54	-9.26	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 2480 MHz											
2480	65.85	129	284	V	29.41	3.43	0.00	98.69	-	-	Peak
2480	66.67	18	100	H	29.41	3.43	0.00	99.51	-	-	Peak
2480	48.96	88	287	V	29.41	3.43	0.00	81.80	-	-	Ave
2480	48.78	163	100	H	29.41	3.43	0.00	81.62	-	-	Ave
2483.5	28.82	129	285	V	29.41	3.43	0.00	61.66	74	-12.34	Peak
2483.5	28.54	18	100	H	29.41	3.43	0.00	61.38	74	-12.62	Peak
2483.5	15.78	88	287	V	29.41	3.43	0.00	48.62	54	-5.38	Ave
2483.5	15.8	163	100	H	29.41	3.43	0.00	48.64	54	-5.36	Ave
4960	47.17	332	132	V	32.91	5.31	34.62	50.77	74	-23.23	Peak
4960	48.86	165	237	H	32.99	5.31	34.62	52.54	74	-21.47	Peak
4960	37.24	192	118	V	32.91	5.31	34.62	40.84	54	-13.16	Ave
4960	38.52	352	237	H	32.99	5.31	34.62	42.20	54	-11.81	Ave
7440	42.36	0	100	V	37.14	7.46	33.99	52.97	74	-21.03	Peak
7440	41.86	0	100	H	37.14	7.46	33.99	52.47	74	-21.53	Peak
7440	31.84	0	100	V	37.14	7.46	33.99	42.45	54	-11.55	Ave
7440	31.7	0	100	H	37.14	7.46	33.99	42.31	54	-11.69	Ave
9920	41.69	0	100	V	37.99	9.11	34.39	54.39	74	-19.61	Peak
9920	40.82	0	100	H	37.99	9.11	34.39	53.52	74	-20.48	Peak
9920	30.86	0	100	V	37.99	9.11	34.39	43.56	54	-10.44	Ave
9920	30.89	0	100	H	37.99	9.11	34.39	43.59	54	-10.41	Ave

Note: Duty Cycle Correction Factor has been added to the measurements.

8 FCC §15.247(a) (2) & IC RSS-247 §5.2 -Emission Bandwidth

8.1 Applicable Standards

According to FCC §15.247(a) (2) and IC RSS-247 §5.2, 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

8.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r04: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 8: DTS bandwidth

8.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2015-06-22	1 year
-	U. FL to SMA pigtail	-	-	Each time[1]	N/A
-	10dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.

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

8.4 Test Environmental Conditions

Temperature:	22º C
Relative Humidity:	42 %
ATM Pressure:	102.7 KPa

The testing was performed by Todd Moy on 2015-12-08 in RF site.

8.5 Test Results

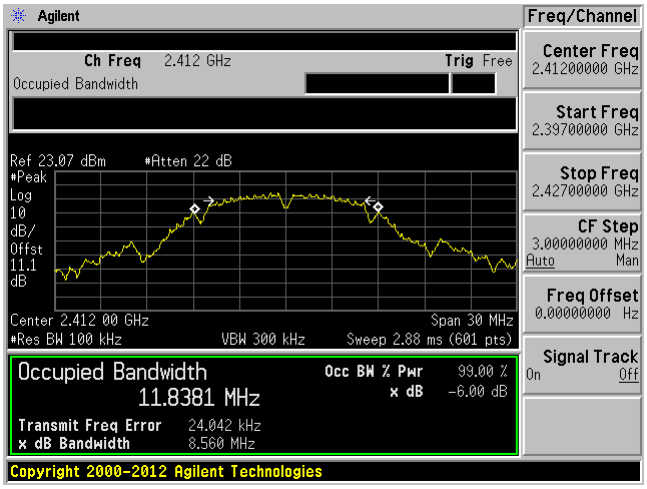
Channel	Frequency (MHz)	99% OBW Chain 0 (kHz)	99% OBW Chain 1 (kHz)	6 dB BW Chain 0 (kHz)	6 dB BW Chain 1 (kHz)	6 dB OBW limit (kHz)
802.11 b mode						
Low	2412	11838.1	11394.9	8560	8601	500
Middle	2442	11785.4	11754	8530	7655	500
High	2472	10542.6	10409.9	8056	7623	500
802.11 g mode						
Low	2412	16539.2	16468.1	16407	16487	500
Middle	2442	16550.6	16464.4	16460	15968	500
High	2472	16396.6	16340.8	15477	15067	500
802.11n-HT20 mode						
Low	2412	17672.9	17617.6	17640	17657	500
Middle	2442	17777	176629	17405	15865	500
High	2472	17645.9	17546.5	16375	16354	500
802.11n-HT40 mode						
Low	2422	36119.5	36170.3	36174	34758	500
Middle	2442	36185.8	35931.9	36436	28878	500
High	2462	35991.2	360963	35135	34852	500

Channel	Frequency (MHz)	99% OBW (kHz)	6 dB OBW (kHz)	6 dB OBW limit (kHz)
BLE				
Low	2402	1089.4	708.472	500
Middle	2440	1089	713.650	500
High	2480	1091.1	707.869	500

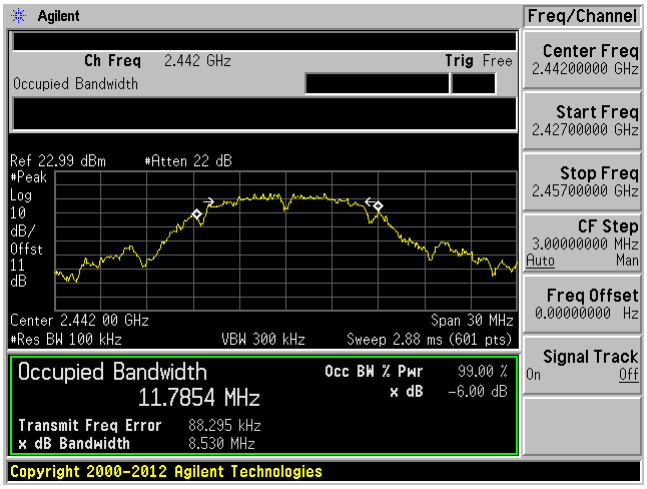
Please refer to the following plots for detailed test results.

802.11b mode Chain 0

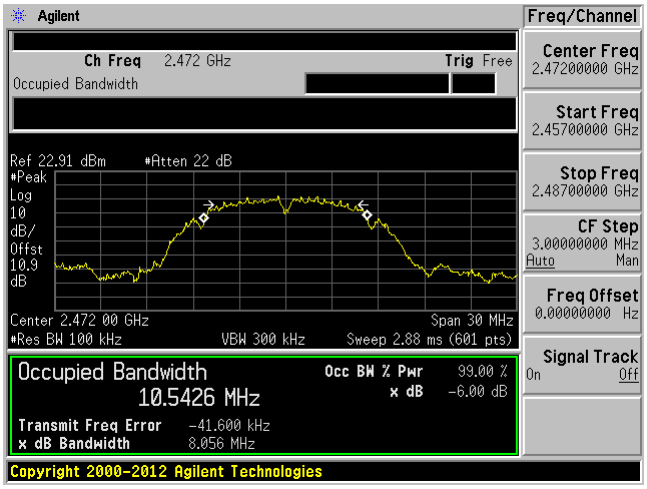
Low Channel 2412 MHz



Middle Channel 2442 MHz

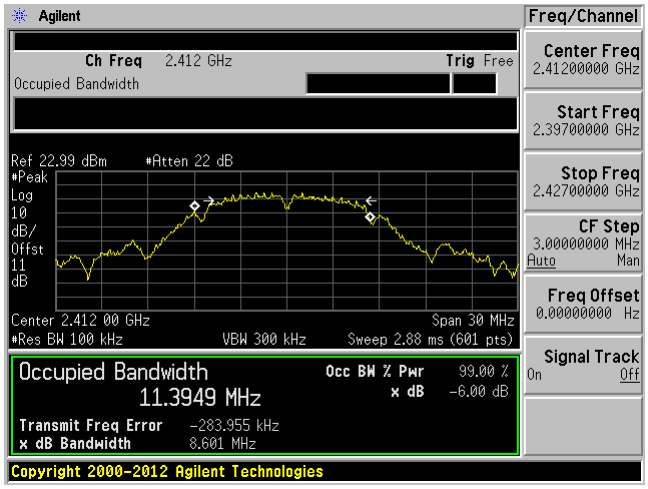


High Channel 2472 MHz

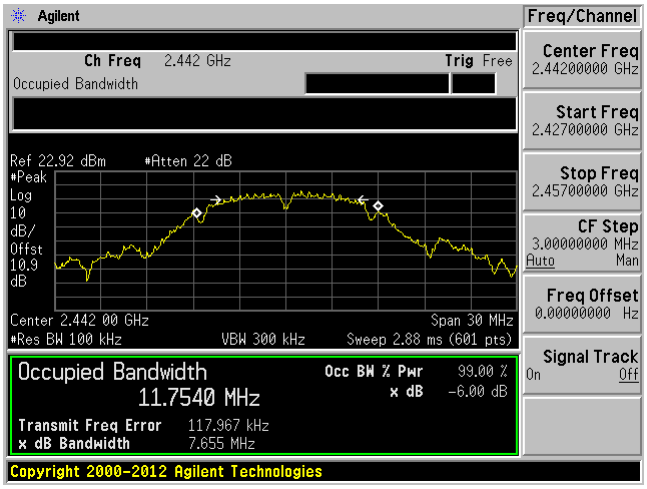


802.11b mode Chain 1

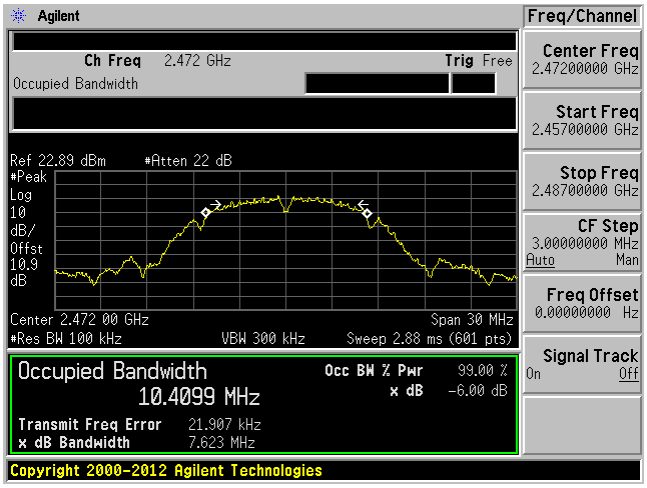
Low Channel 2412 MHz



Middle Channel 2442 MHz

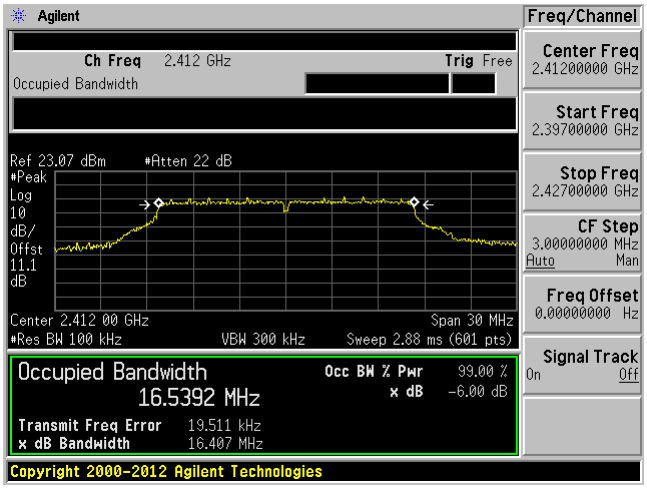


High Channel 2472 MHz

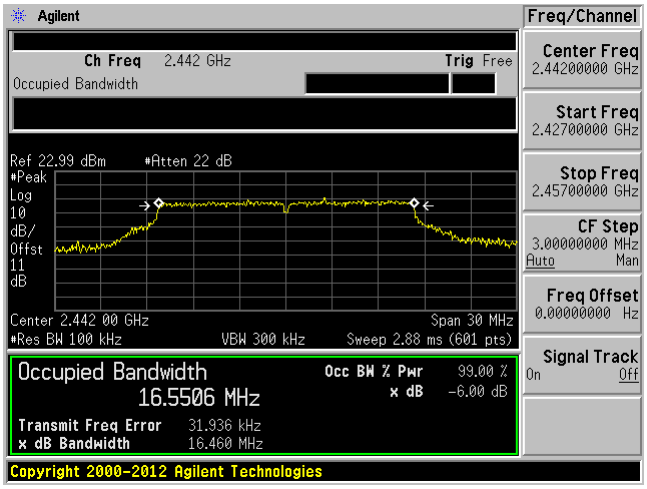


802.11g mode Chain 0

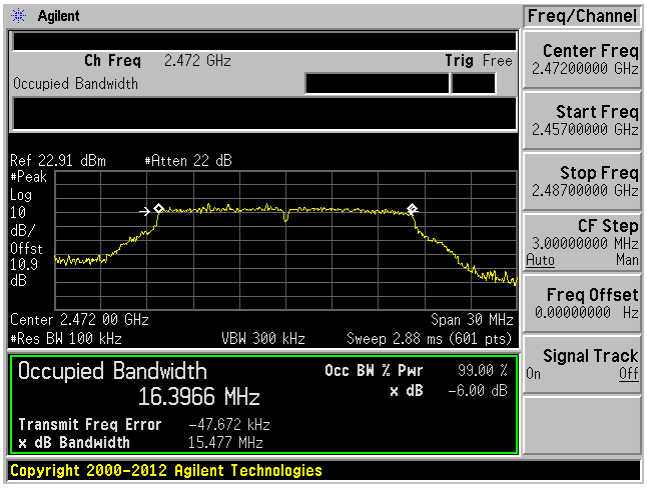
Low Channel 2412 MHz



Middle Channel 2442 MHz

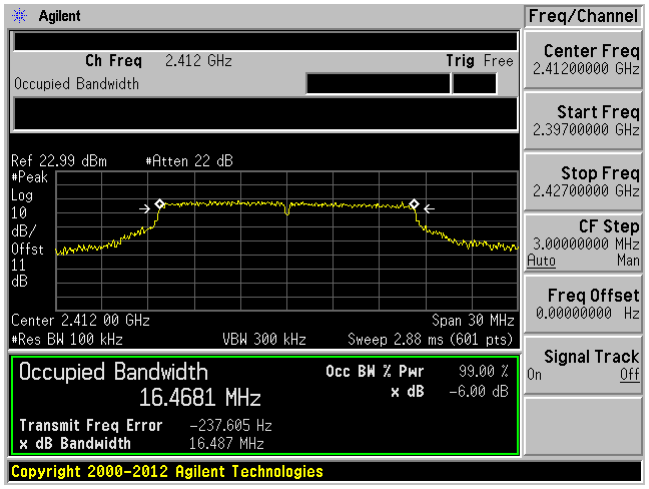


High Channel 2472 MHz

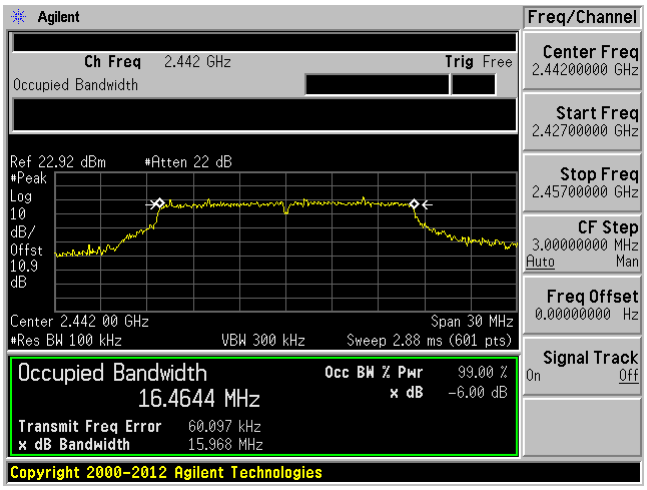


802.11g mode Chain 1

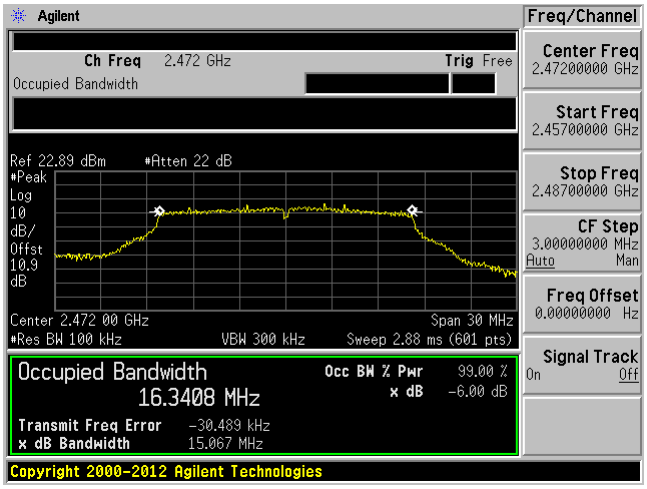
Low Channel 2412 MHz



Middle Channel 2442 MHz

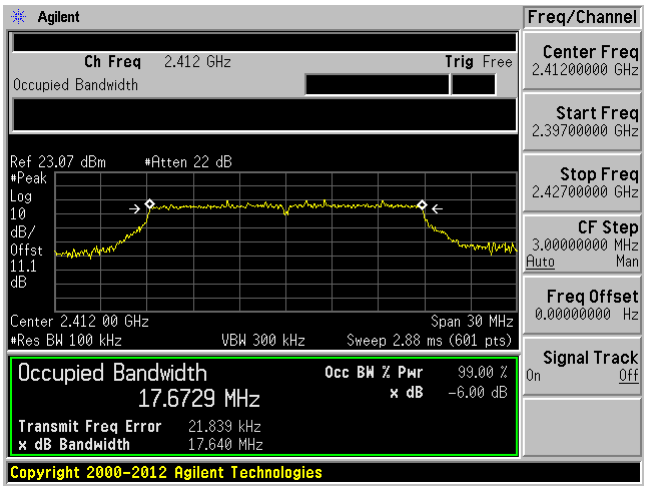


High Channel 2472 MHz

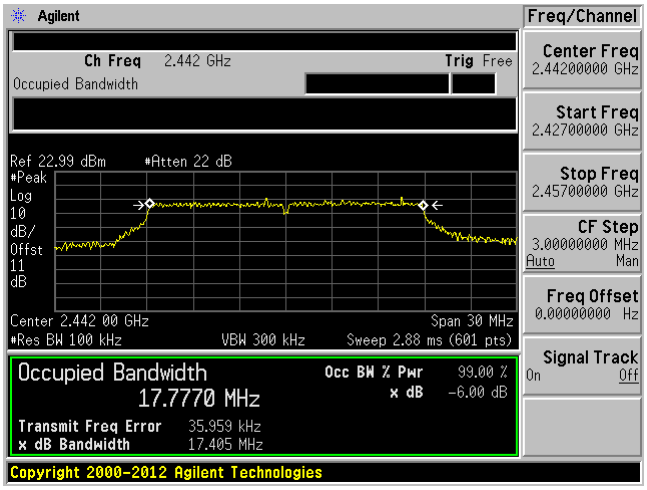


802.11n20 mode Chain 0

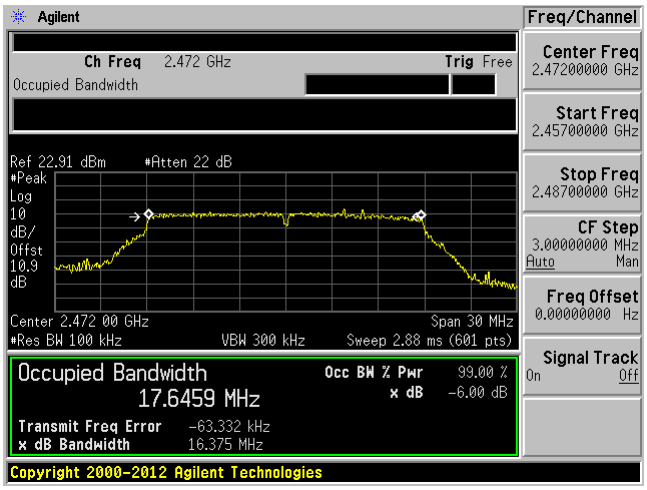
Low Channel 2412 MHz



Middle Channel 2442 MHz

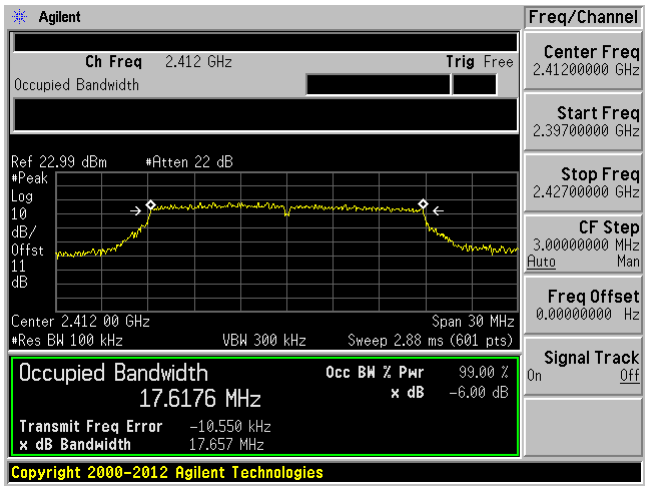


High Channel 2472 MHz

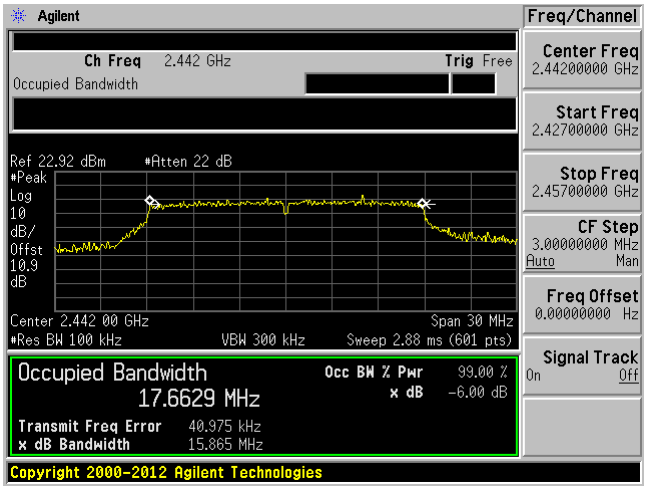


802.11n20 mode Chain 1

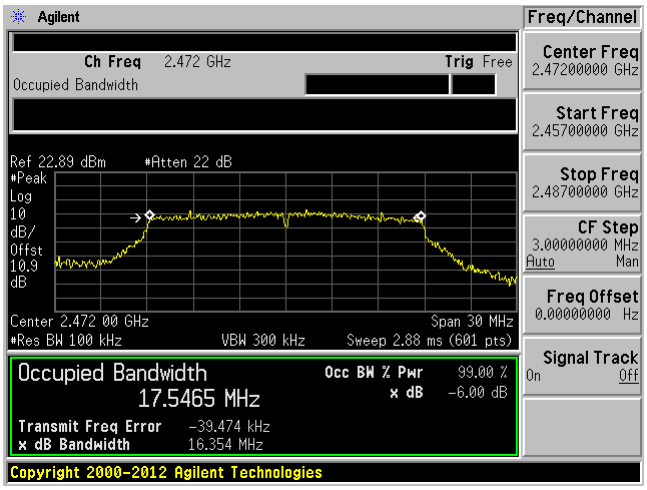
Low Channel 2412 MHz



Middle Channel 2442 MHz

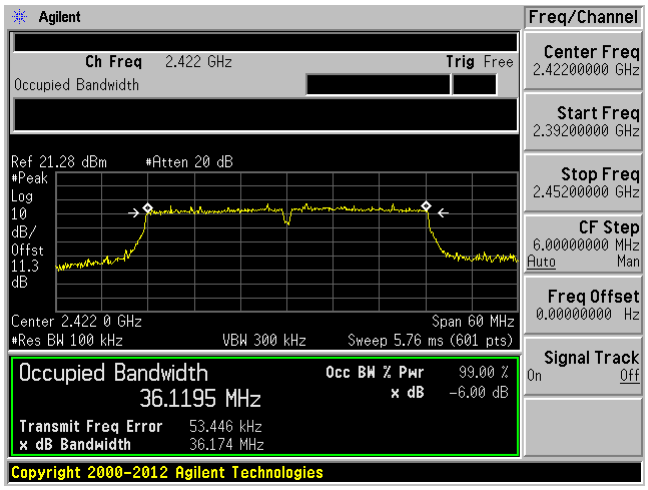


High Channel 2472 MHz

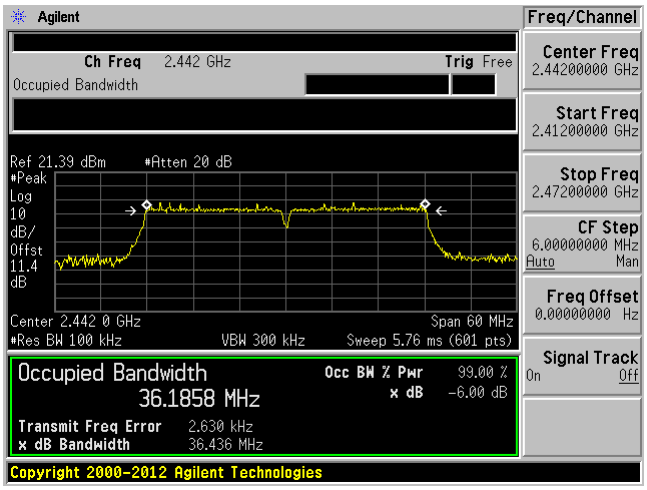


802.11n40 mode Chain 0

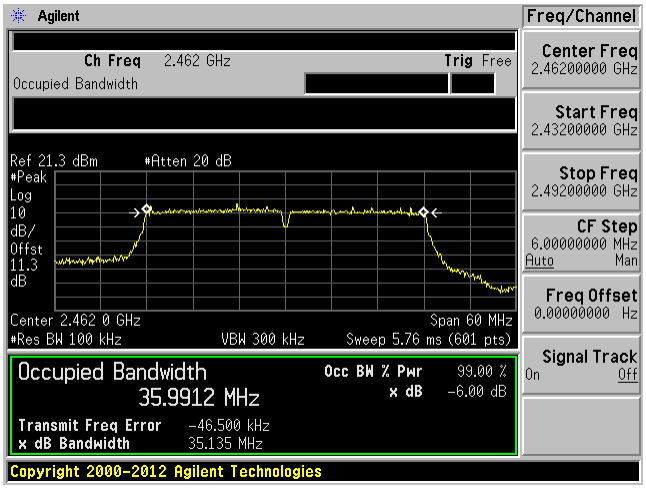
Low Channel 2422 MHz



Middle Channel 2442 MHz

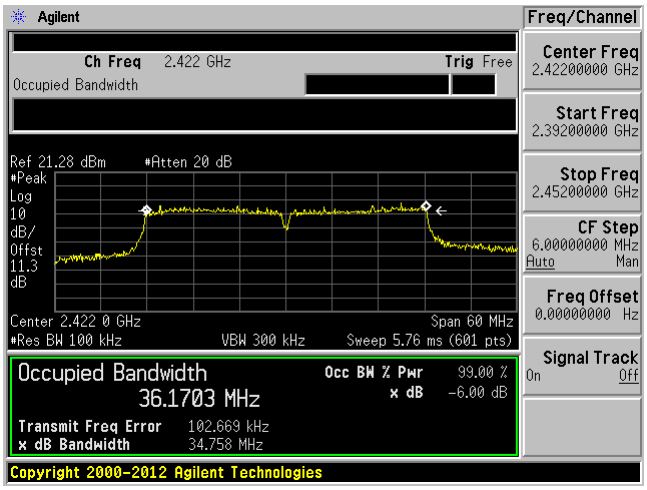


High Channel 2462 MHz

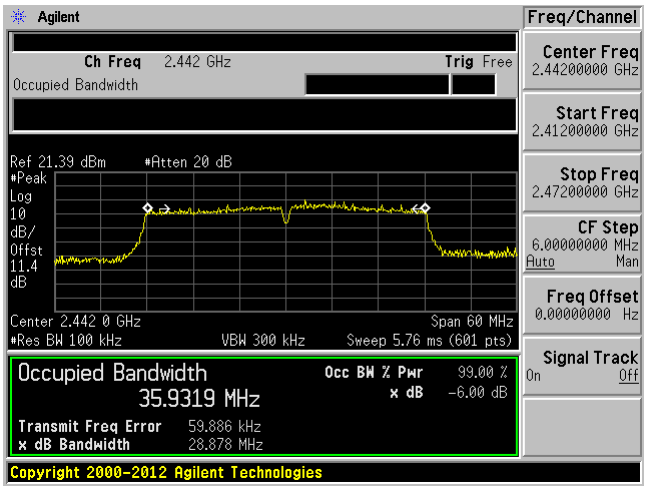


802.11n40 mode Chain 1

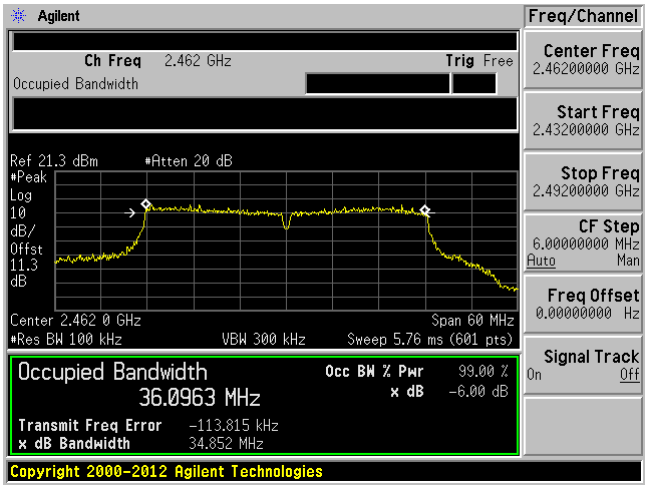
Low Channel 2422 MHz



Middle Channel 2442 MHz

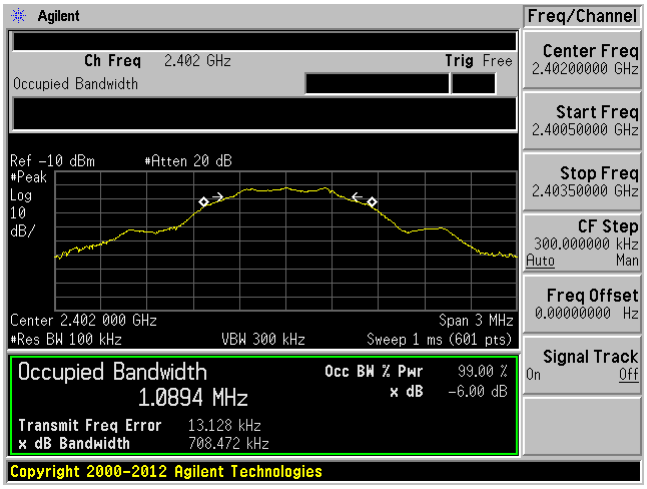


High Channel 2462 MHz

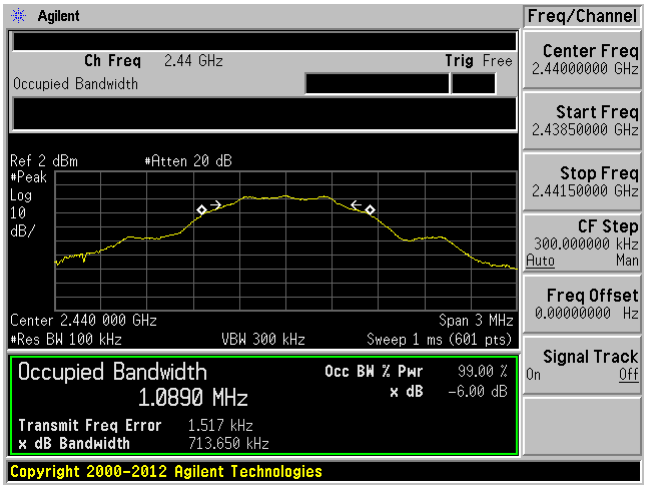


BLE

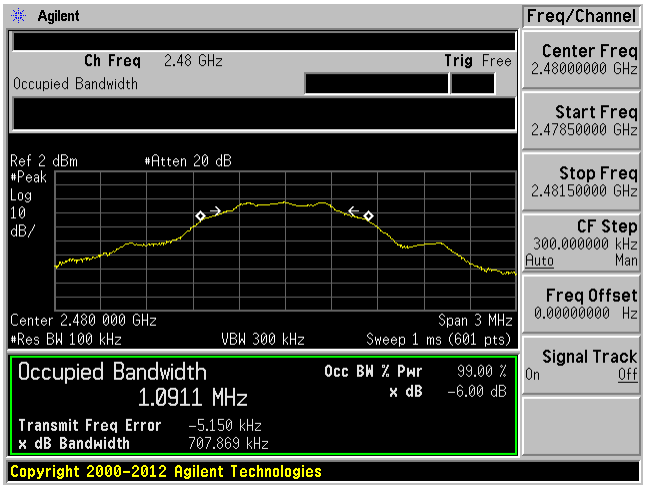
Low Channel 2402 MHz



Middle Channel 2440 MHz



High Channel 2480 MHz



9 FCC §15.247(b) (3) & IC RSS-247 §5.4 (4) - Output Power Measurement

9.1 Applicable Standards

According to FCC §15.247(b) (3) and IC RSS-247 §5.4 (4) for systems using digital modulation in the 902~928 MHz, 2400~2483.5 MHz, and 5725~5850 MHz bands: 1 Watt.

9.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r04: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 9: Fundamental emission output power

9.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2015-06-22	1 year
ETS- Lingerin	Power Sensor	7002-006	160097	2014-10-21	2 years
-	U. FL to SMA pigtail	-	-	Each time[1]	N/A
-	10dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.

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:	22º C
Relative Humidity:	42 %
ATM Pressure:	102.7 KPa

The testing was performed by Todd Moy on 2015-12-08 in RF site.

9.5 Test Results

Average Output Power

Channel	Frequency (MHz)	Ave Power Chain 0 (dBm)	Ave Power Chain 1 (dBm)	Limit (dBm)
802.11b mode				
1	2412	16.84	16.84	30
7	2442	16.61	17.17	30
10	2457	15.19	16.5	30
11	2462	13.64	15.62	30
12	2467	12.89	16.04	30
13	2472	13.84	13.67	30
802.11g mode				
1	2412	16.28	15.55	30
7	2442	16.2	16.24	30
11	2462	15.92	14.31	30
12	2467	13.66	10.86	30
13	2472	11.14	10.87	30

Channel	Frequency (MHz)	Ave Power Chain 0 (dBm)	Ave Power Chain 1 (dBm)	Total Power (dBm)	Limit (dBm)
802.11n-HT20 mode					
1	2412	14.83	14.27	17.57	30
7	2442	15.95	16.34	19.16	30
11	2462	13.68	12.05	15.95	30
12	2467	11.51	10.63	14.10	30
13	2472	8.78	8.31	11.56	30
802.11n-HT40 mode					
3	2422	13.62	12.33	16.03	30
4	2427	14.65	13.73	17.22	30
5	2432	15.53	14.77	18.18	30
6	2437	14.89	14.25	17.59	30
7	2442	13.73	13.32	16.54	30
8	2447	13.86	13.1	16.51	30
9	2452	12.62	11.63	15.16	30
10	2457	11.75	10.92	14.37	30
11	2462	12.19	10.4	14.40	30

Note: Duty Cycle correction factor has already been added to the measurement.

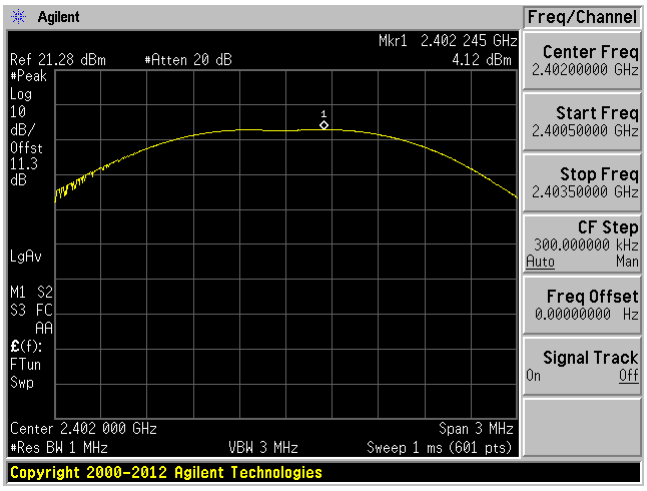
Peak Output Power

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)
BLE			
Low	2402	4.12	30
Middle	2440	6.57	30
High	2480	5.99	30

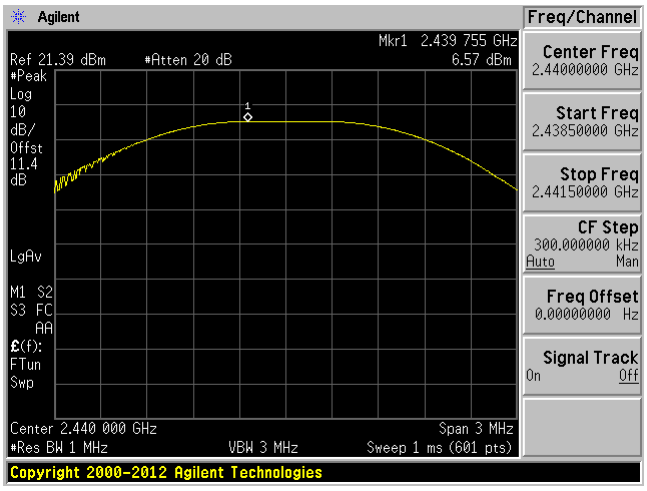
Please refer to the following plots for detailed test results.

BLE

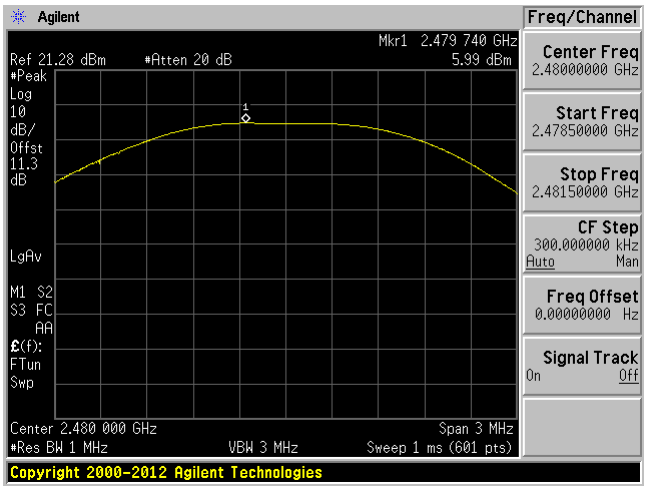
Low Channel 2402 MHz



Middle Channel 2440 MHz



High Channel 2480 MHz



10 FCC §15.247(d) & IC RSS-247 §5.5 – 100 kHz Bandwidth of Band Edges

10.1 Applicable Standards

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-247 §5.5.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 5.4(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.

10.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r04: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 13: Band-edge measurements

10.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2015-06-22	1 year
-	U. FL to SMA pigtail	-	-	Each time[1]	N/A
-	10dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
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

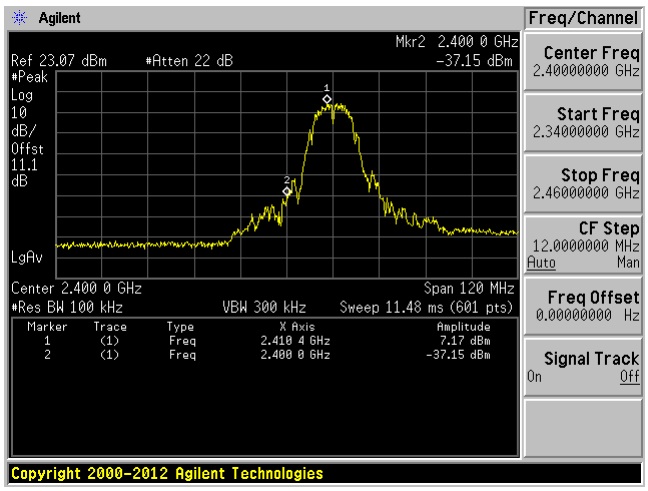
Temperature:	22º C
Relative Humidity:	42 %
ATM Pressure:	102.7 KPa

The testing was performed by Todd Moy on 2015-12-08 in RF site.

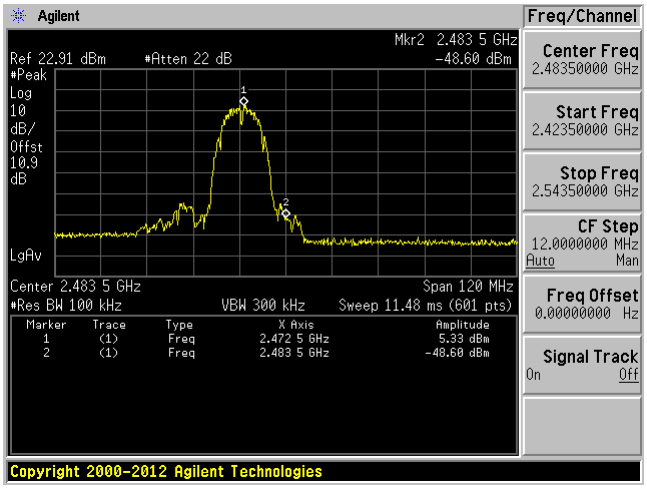
10.5 Test Results

802.11b mode Chain 0

Low Channel 2412 MHz

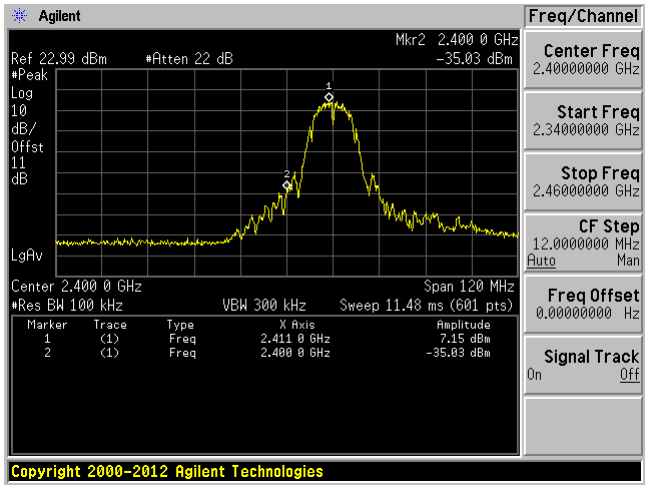


High Channel 2472 MHz

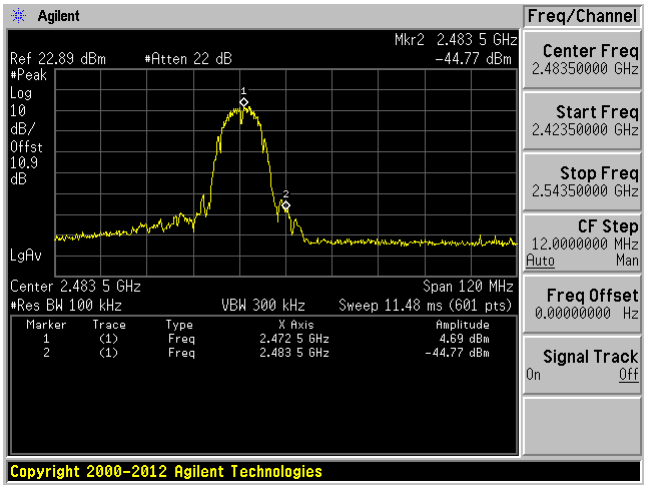


802.11b mode Chain 1

Low Channel 2412 MHz

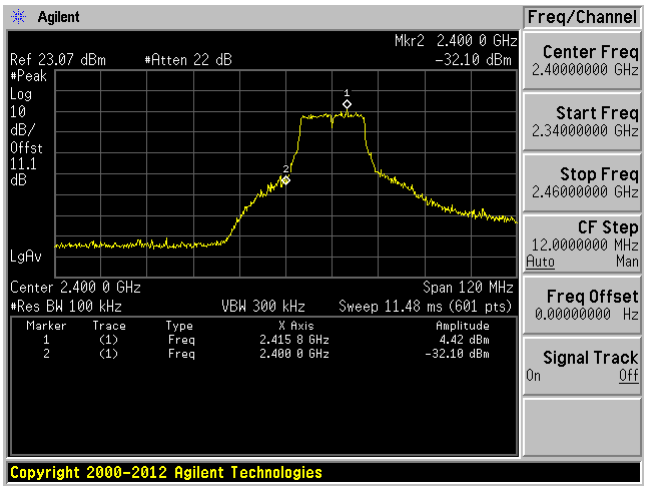


High Channel 2472 MHz

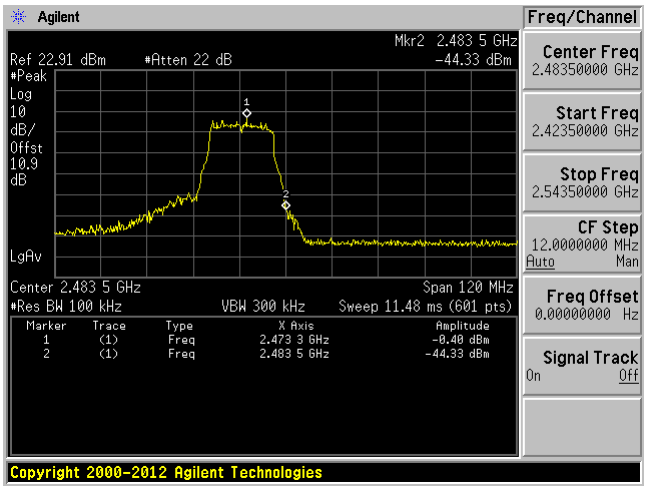


802.11g mode Chain 0

Low Channel 2412 MHz

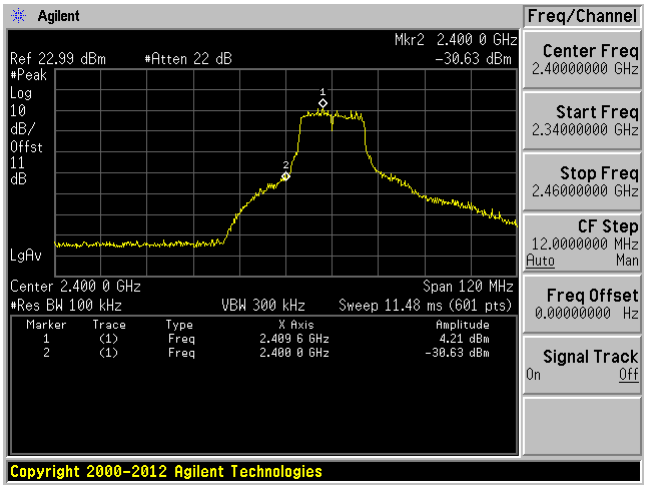


High Channel 2472 MHz

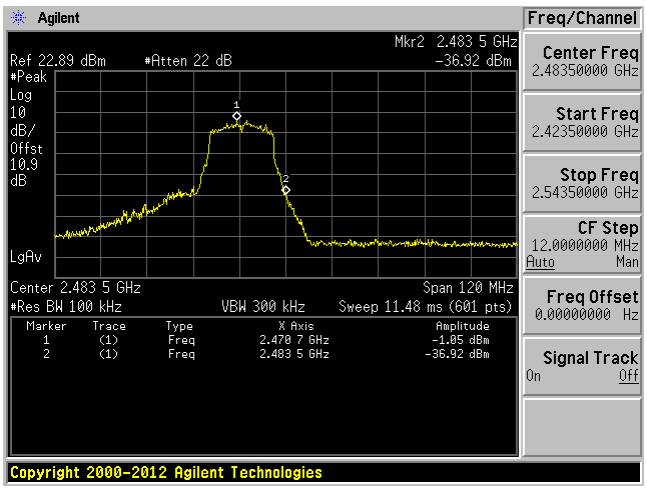


802.11g mode Chain 1

Low Channel 2412 MHz

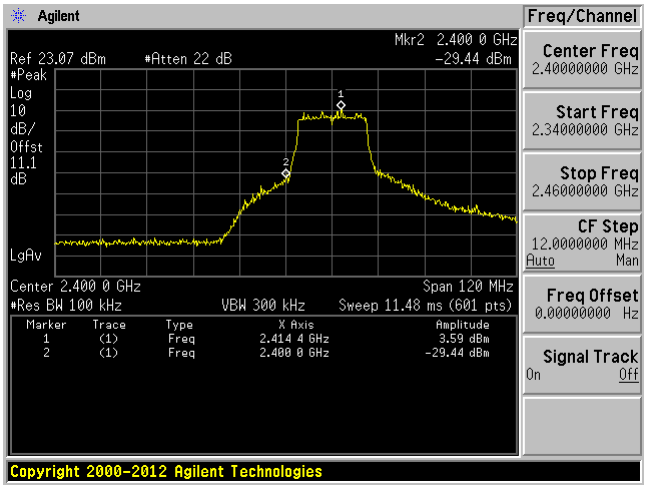


High Channel 2472 MHz

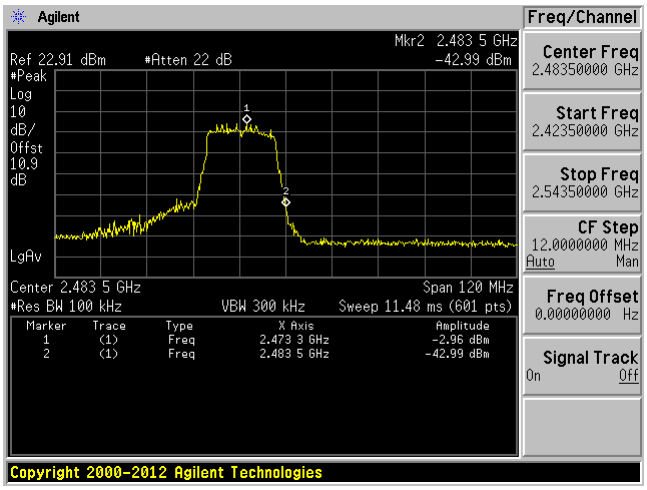


802.11n20 mode Chain 0

Low Channel 2412 MHz

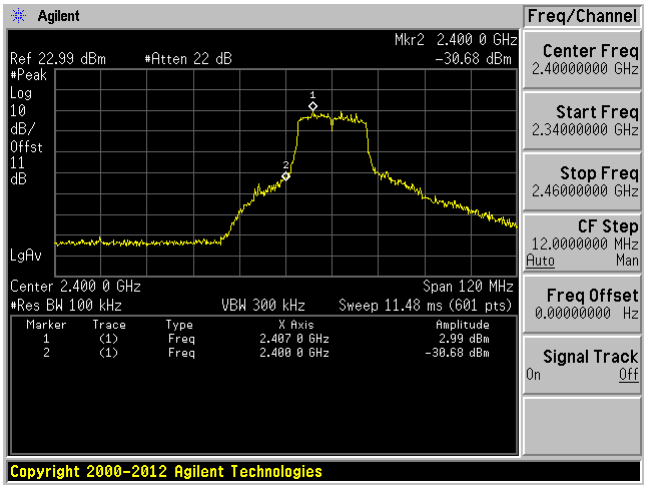


High Channel 2472 MHz

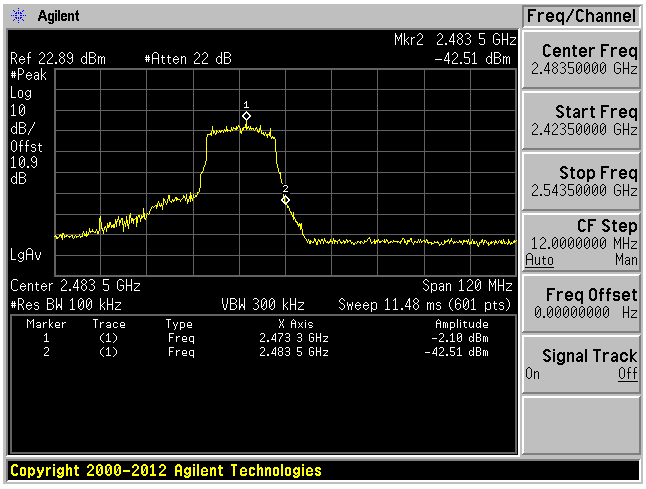


802.11n20 mode Chain 1

Low Channel 2412 MHz

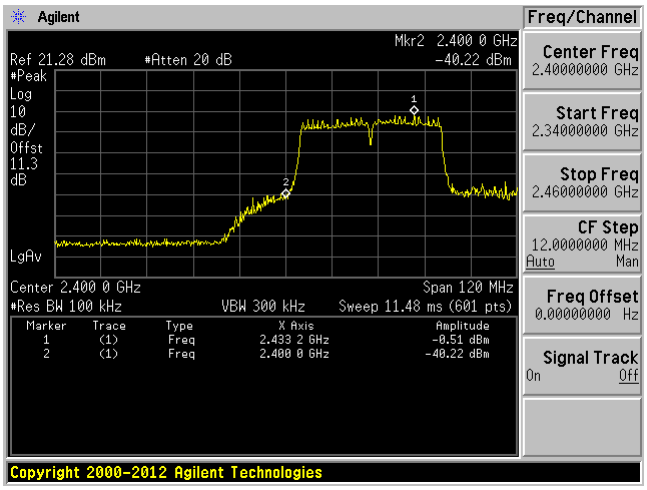


High Channel 2472 MHz

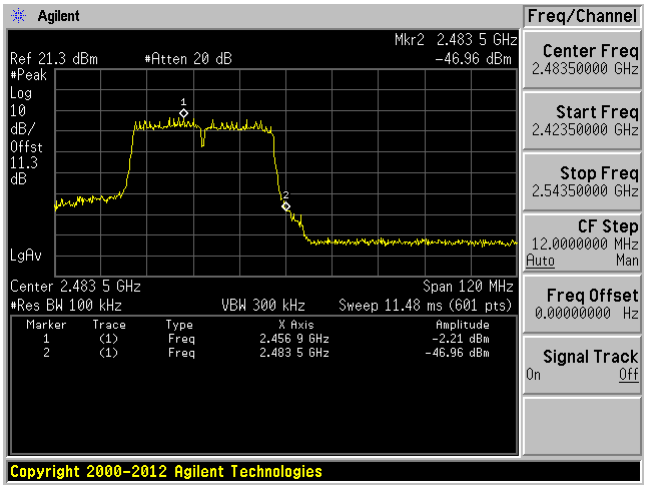


802.11n40 mode Chain 0

Low Channel 2422 MHz

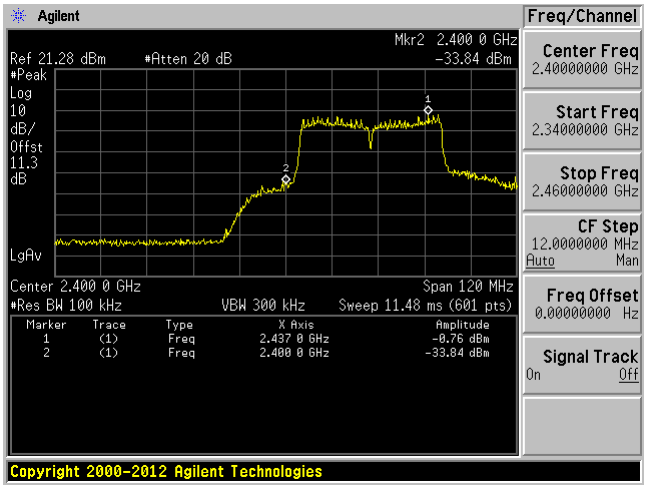


High Channel 2462 MHz

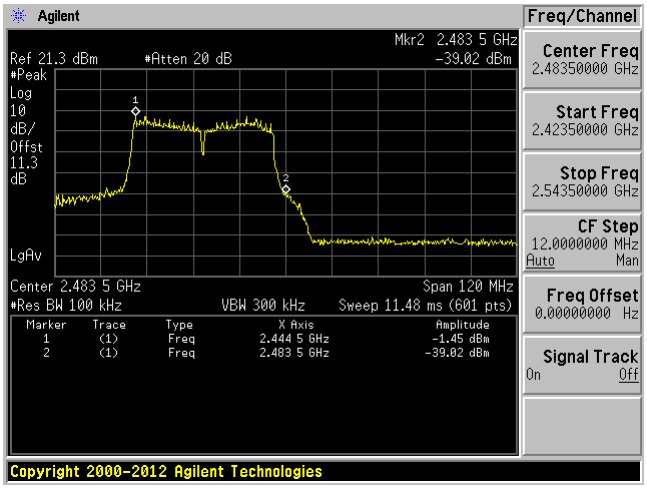


802.11n40 mode Chain 1

Low Channel 2422 MHz

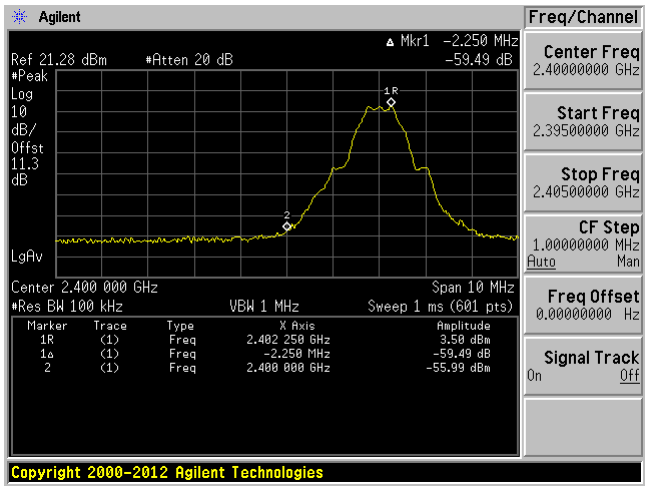


High Channel 2462 MHz

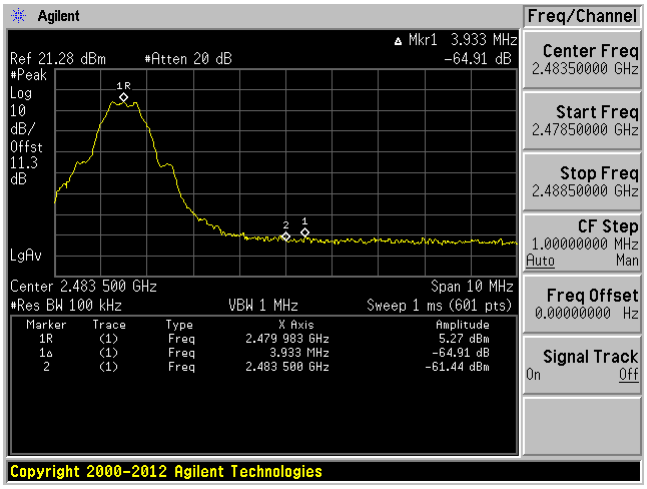


BLE

Low Channel 2402 MHz



High Channel 2480 MHz



11 FCC §15.247(e) & IC RSS-247 §5.2(2) – Power Spectral Density

11.1 Applicable Standards

According to FCC §15.247(e) and RSS-247 §5.2 (2) , 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.

11.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v03r04: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10: Maximum power spectral density level in the fundamental emission.

11.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2015-06-22	1 year
-	U. FL to SMA pigtail	-	-	Each time[1]	N/A
-	10dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
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:	22º C
Relative Humidity:	42 %
ATM Pressure:	102.7 KPa

The testing was performed by Todd Moy on 2015-12-08 in RF site.

11.5 Test Results

Channel	Frequency (MHz)	PSD Chain 0 (dBm/3kHz)	PSD Chain 1 (dBm/3kHz)	Limit (dBm/3kHz)
802.11b mode				
Low	2412	-5.37	-6.37	8
Middle	2442	-4.15	-5.88	8
High	2472	-9.98	-8.97	8
802.11g mode				
Low	2412	-9.53	-9.4	8
Middle	2442	-9.93	-8.06	8
High	2472	-14.55	-12.57	8

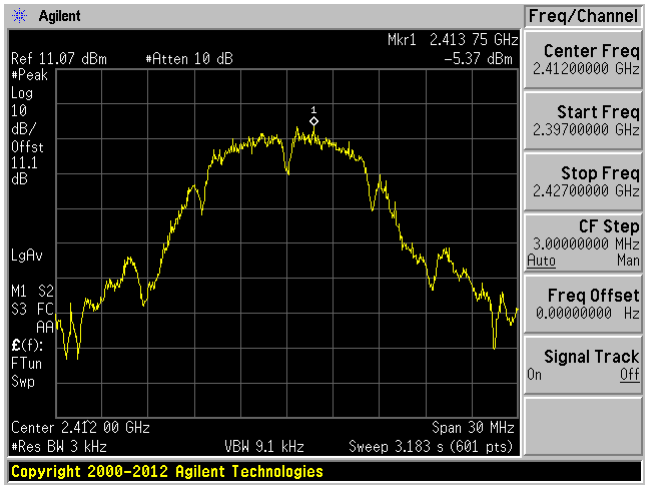
Channel	Frequency (MHz)	PSD Chain 0 (dBm/3kHz)	PSD Chain 1 (dBm/3kHz)	Total PSD (dBm/3 kHz)	limit (dBm/3kHz)
802.11n-HT20 mode					
Low	2412	-10.62	-11.6	-8.07	8
Middle	2442	-10.28	-8.95	-6.55	8
High	2472	-16.98	-16.84	-13.90	8
802.11n-HT40 mode					
Low	2422	-15.85	-15.56	-12.69	8
Middle	2437	-14.67	-14.61	-11.63	8
High	2462	-16.22	-16.57	-13.38	8

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
BLE			
Low	2402	-9.81	8
Middle	2440	-7.46	8
High	2480	-8.09	8

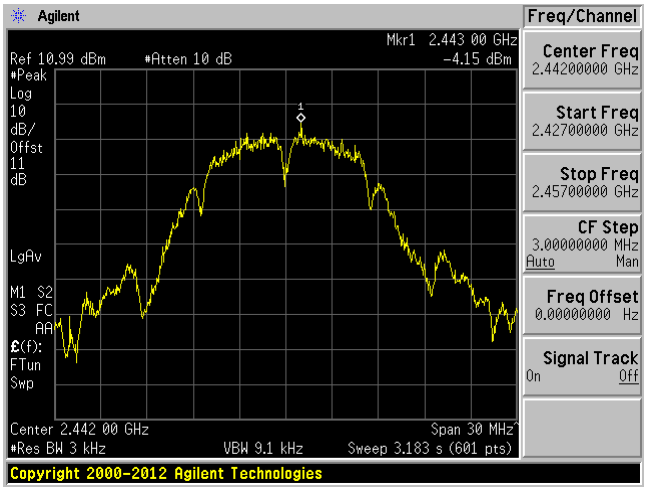
Please refer to the following plots for detailed test results

802.11b mode Chain 0

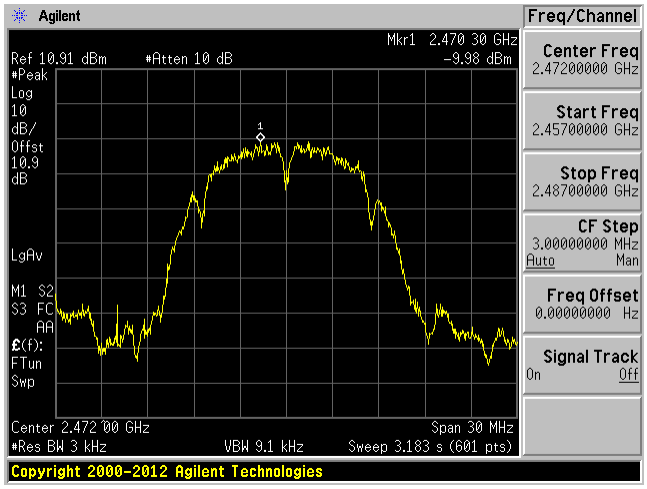
Low Channel 2412 MHz



Middle Channel 2442 MHz

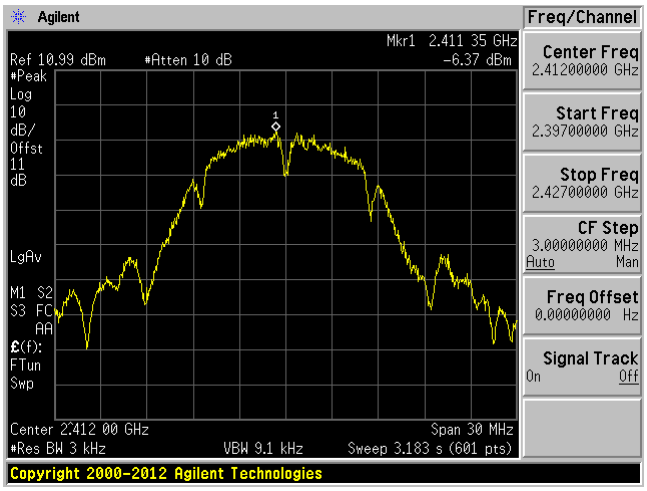


High Channel 2472 MHz

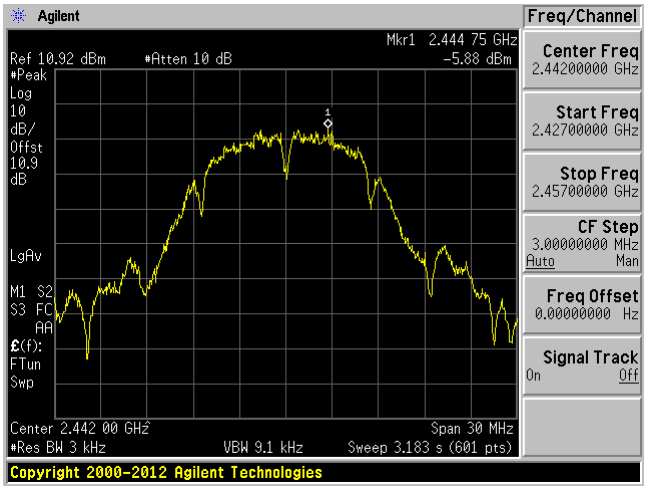


802.11b mode Chain 1

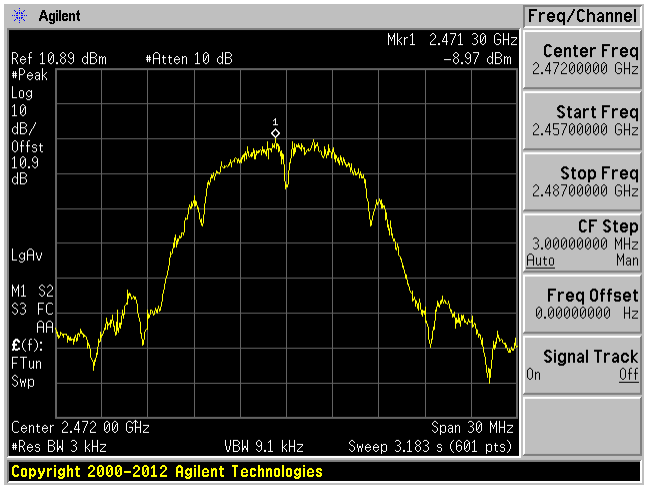
Low Channel 2412 MHz



Middle Channel 2442 MHz

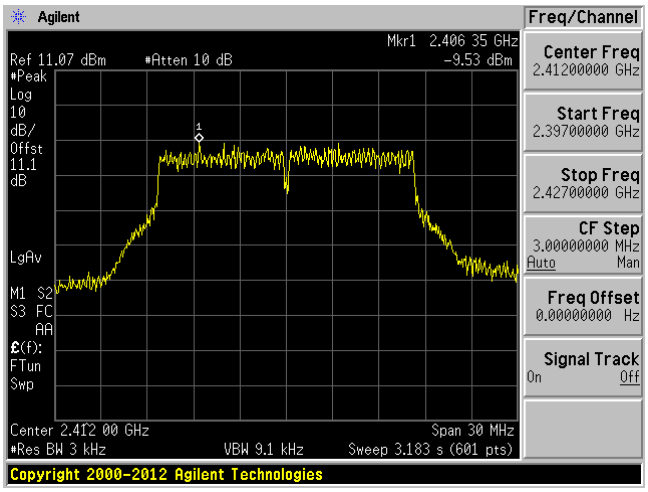


High Channel 2472 MHz

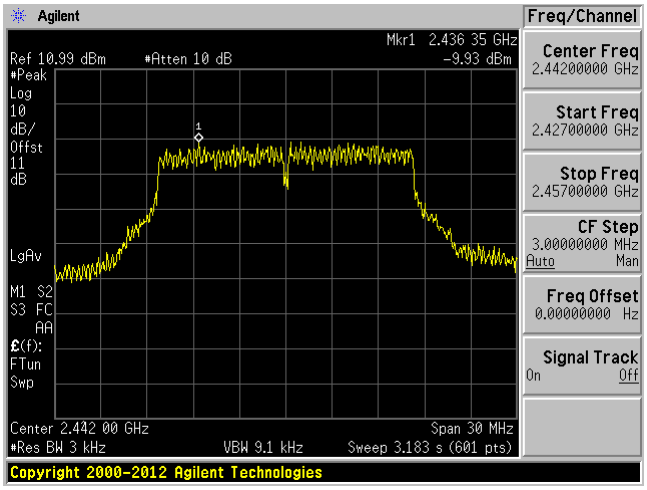


802.11g mode Chain 0

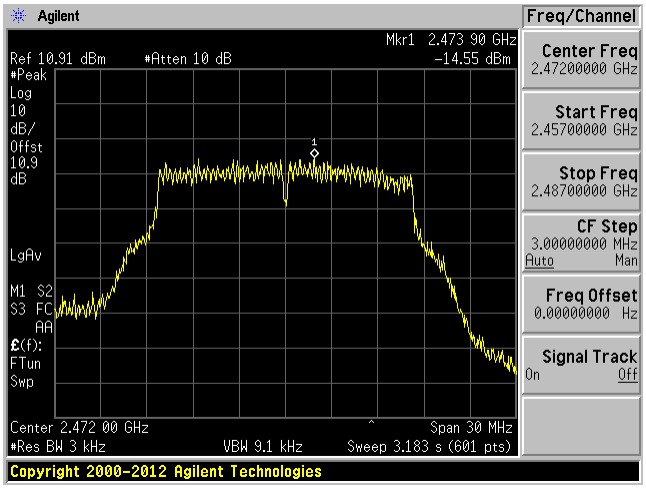
Low Channel 2412 MHz



Middle Channel 2442 MHz

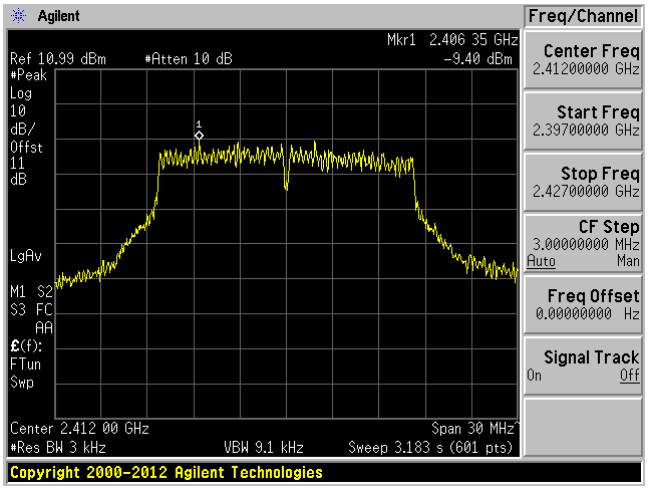


High Channel 2472 MHz

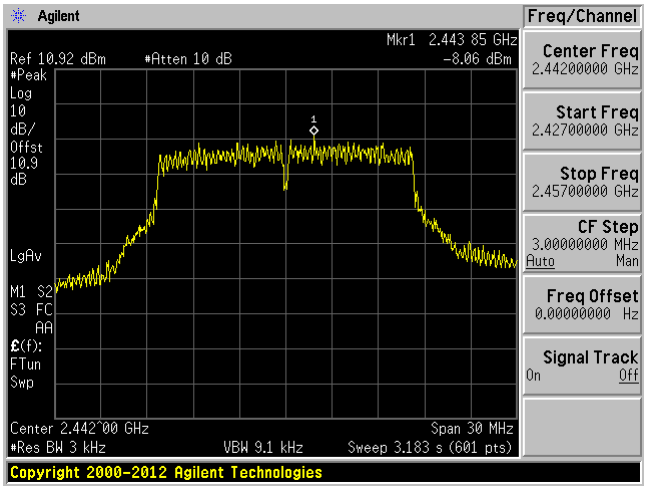


802.11g mode Chain 1

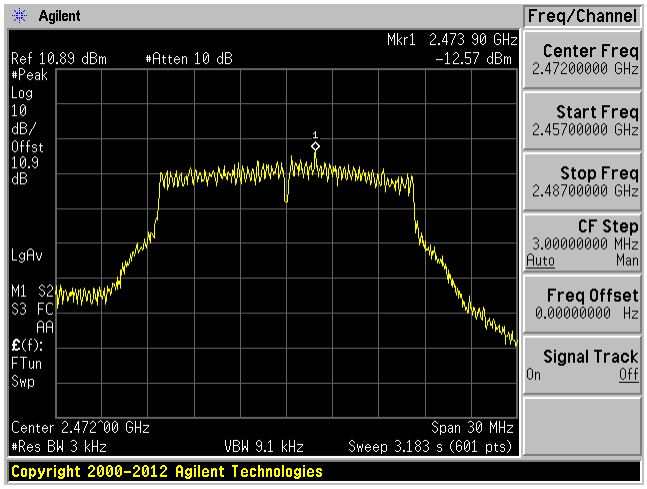
Low Channel 2412 MHz



Middle Channel 2442 MHz

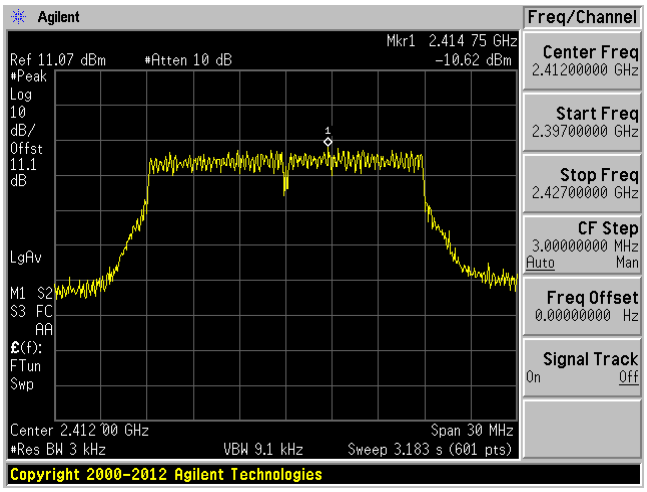


High Channel 2472 MHz

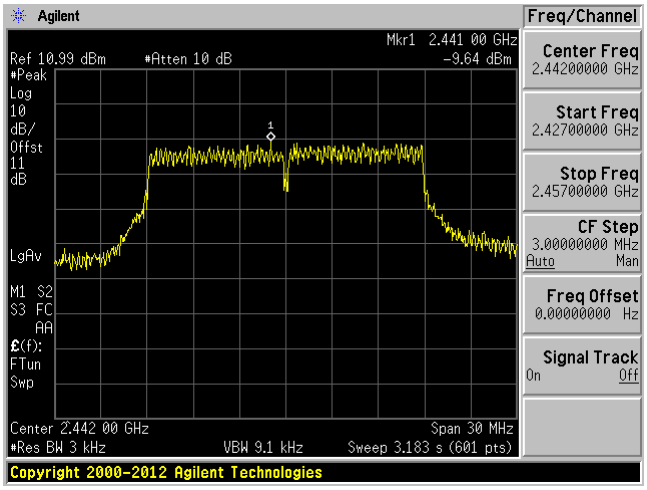


802.11n20 mode Chain 0

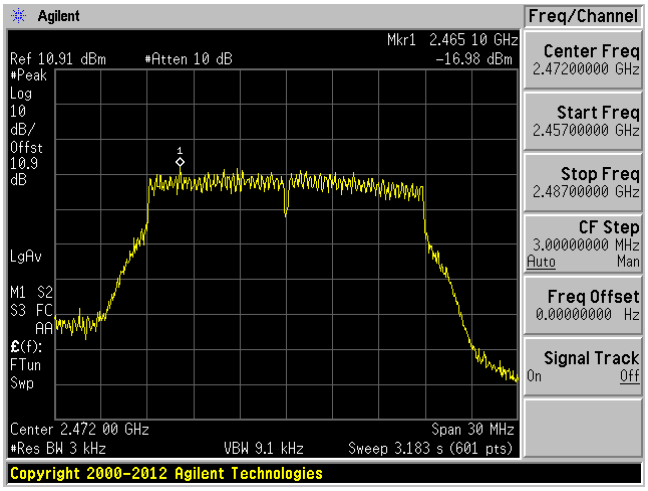
Low Channel 2412 MHz



Middle Channel 2442 MHz

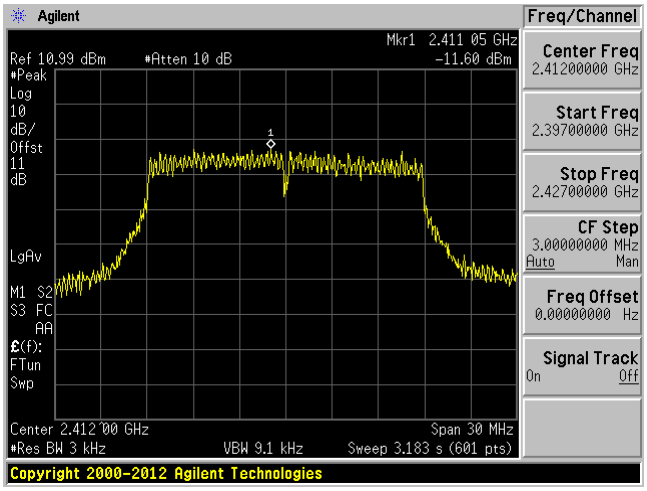


High Channel 2472 MHz

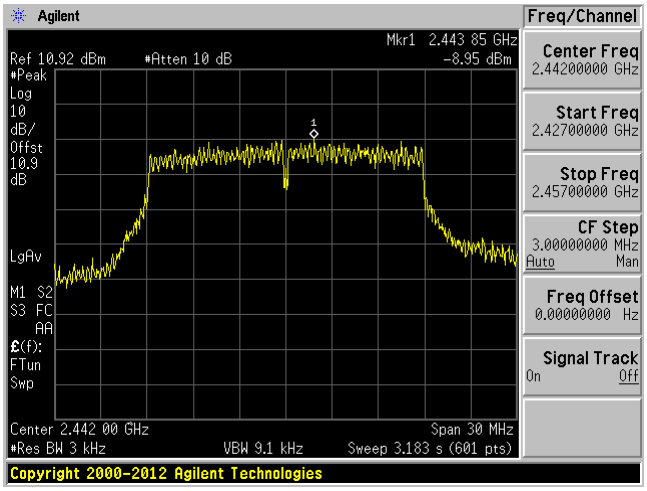


802.11n20 mode Chain 1

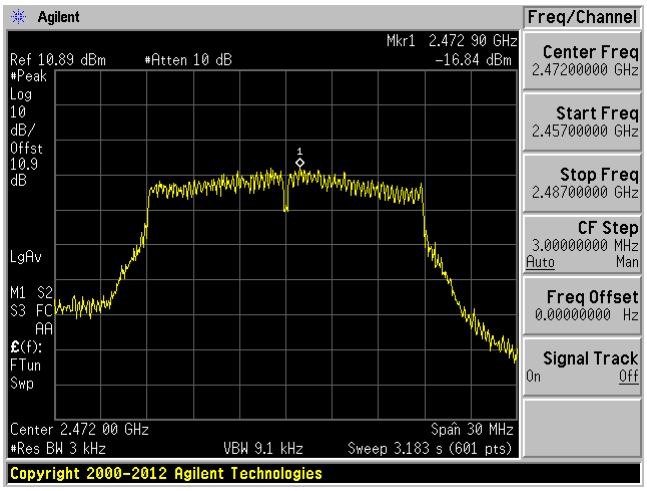
Low Channel 2412 MHz



Middle Channel 2442 MHz

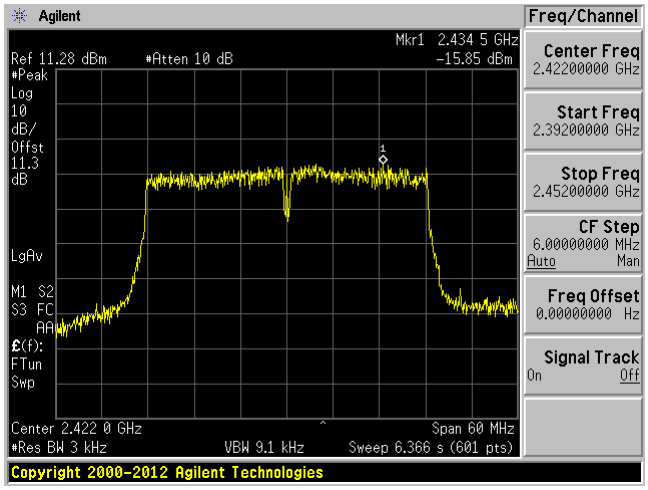


High Channel 2472 MHz

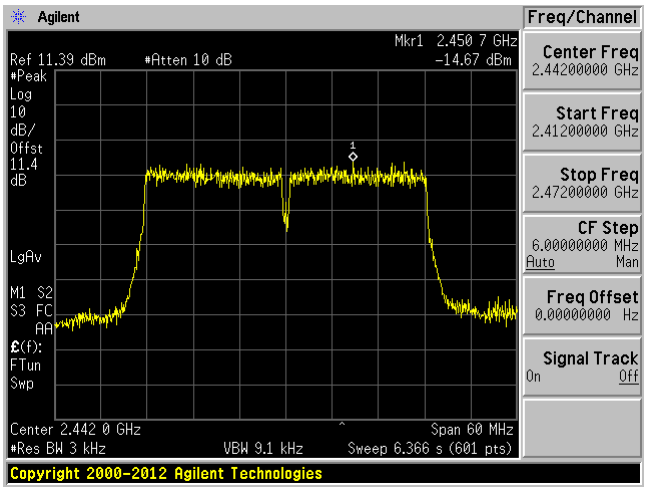


802.11n40 mode Chain 0

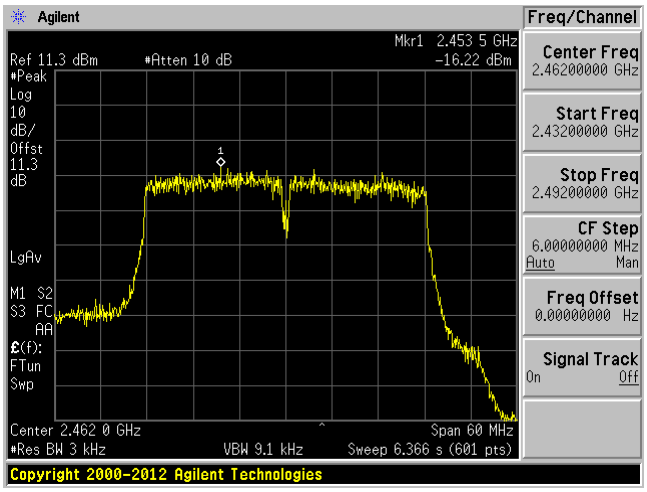
Low Channel 2422 MHz



Middle Channel 2442 MHz

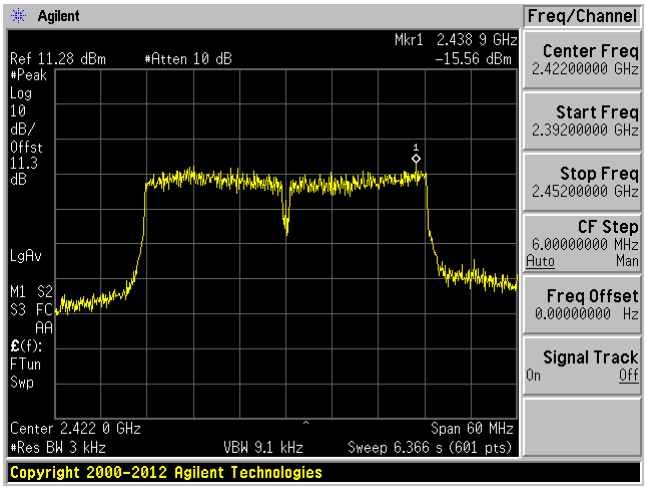


High Channel 2462 MHz

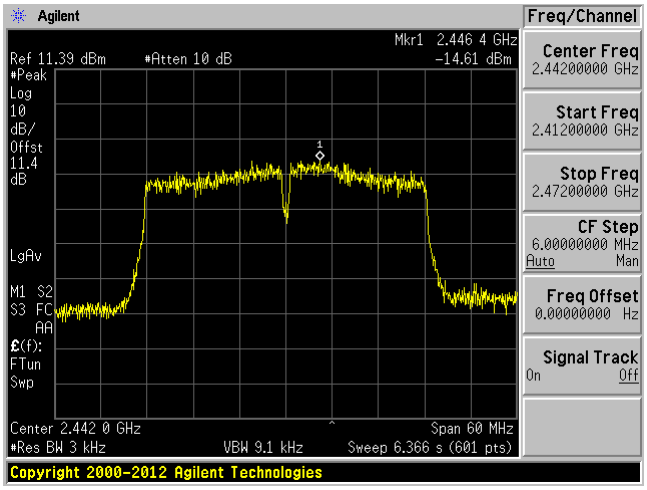


802.11n40 mode Chain 1

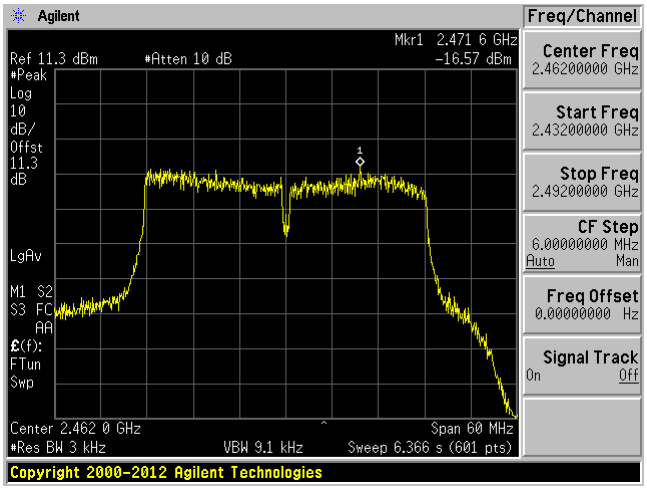
Low Channel 2422 MHz



Middle Channel 2442 MHz

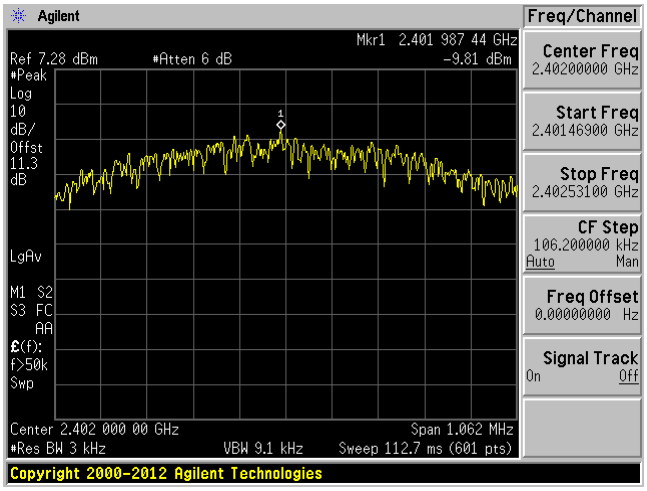


High Channel 2462 MHz

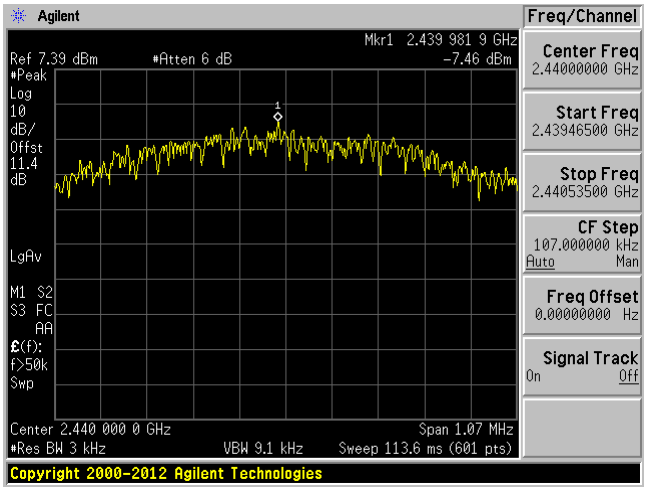


BLE

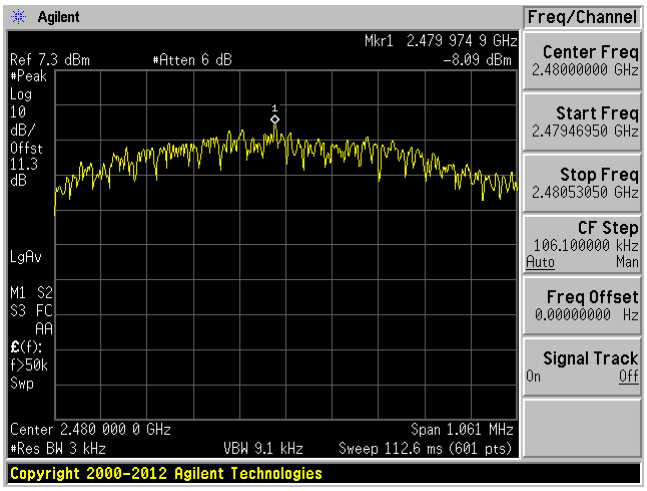
Low Channel 2402 MHz



Middle Channel 2440 MHz



High Channel 2480 MHz



12 FCC §15.247(d) & IC RSS-247 §5.5 & IC RSS-GEN §8.9 – Spurious Emissions at Antenna Terminals

12.1 Applicable Standards

For 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-247 §5.5, 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 5.4(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.

12.2 Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

12.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2015-06-22	1 year
-	U. FL to SMA pigtail	-	-	Each time[1]	N/A
-	10dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
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:	22º C
Relative Humidity:	42 %
ATM Pressure:	102.7 KPa

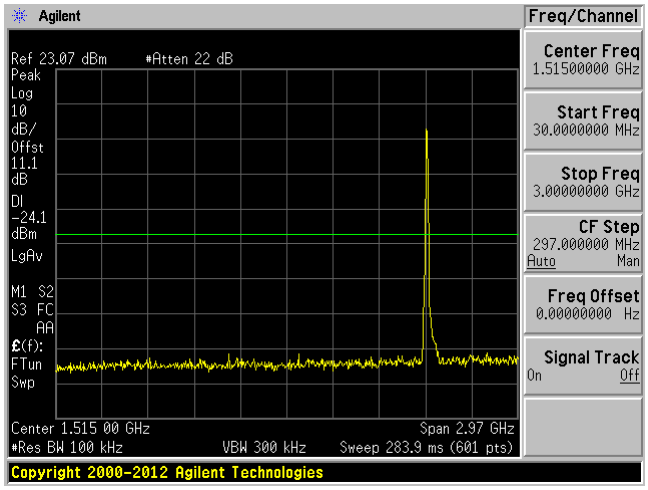
The testing was performed by Todd Moy on 2015-12-08 in RF site.

12.5 Test Results

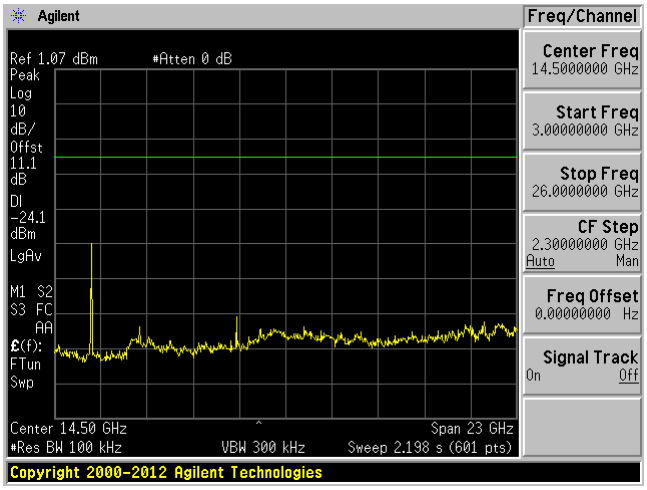
Please refer to following plots.

802.11b mode Chain 0

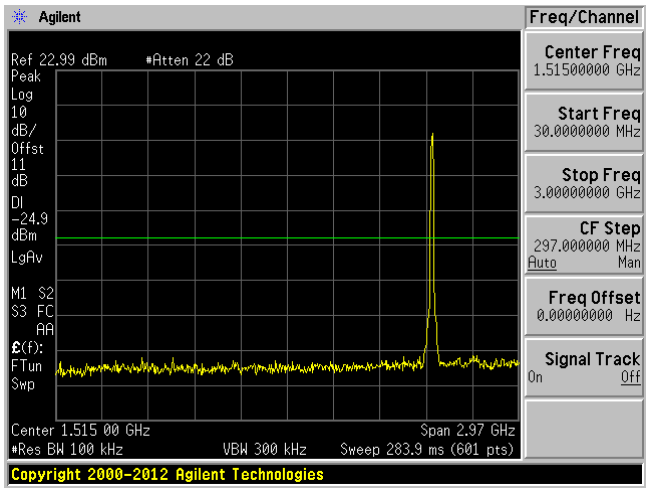
Low Channel 30MHz – 3 GHz



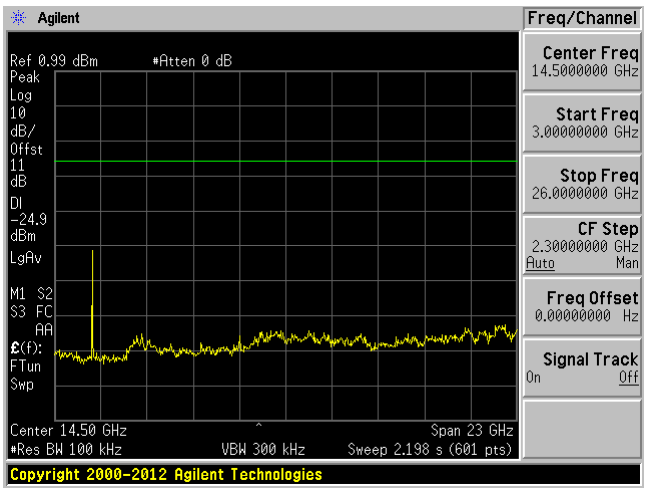
Low Channel 3 GHz – 25 GHz



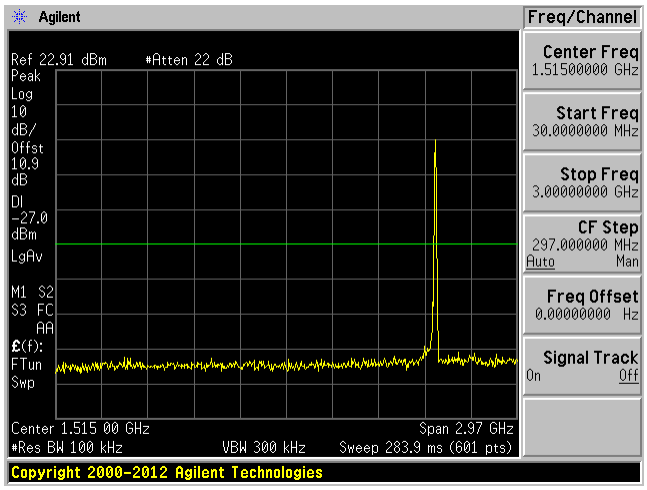
Middle Channel 30 MHz – 3 GHz



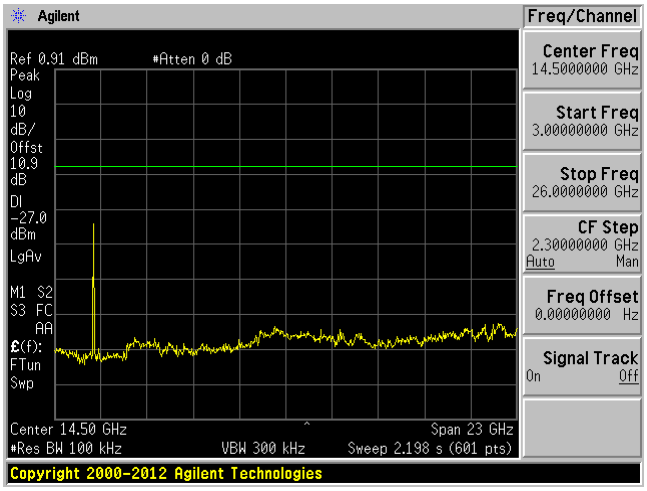
Middle Channel 3 GHz – 25 GHz



High Channel 30 MHz – 3 GHz

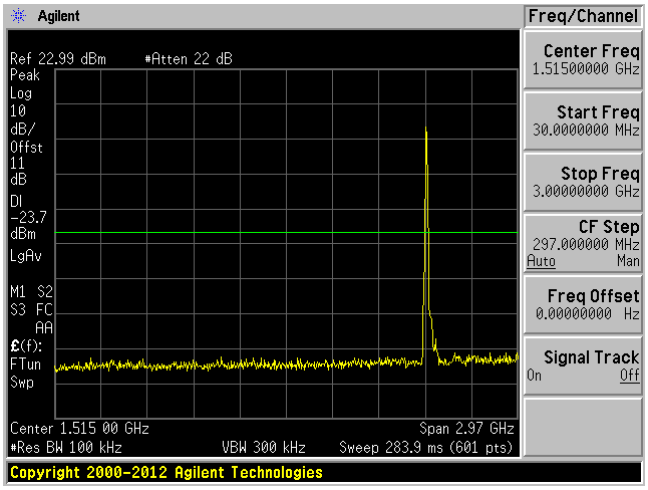


High Channel 3 GHz – 25 GHz

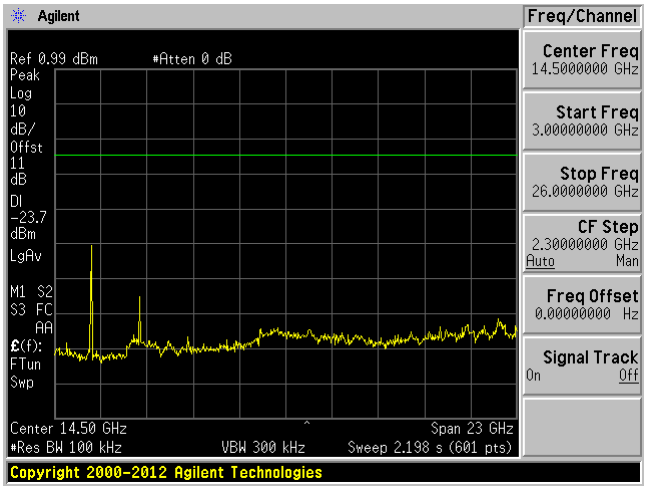


802.11b mode Chain 1

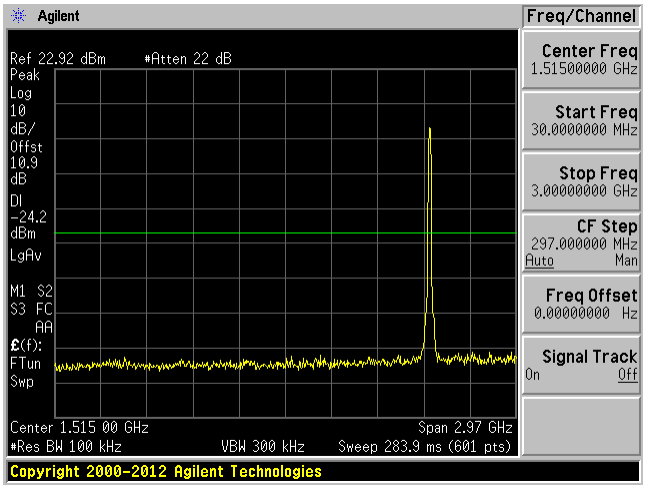
Low Channel 30 MHz – 3 GHz



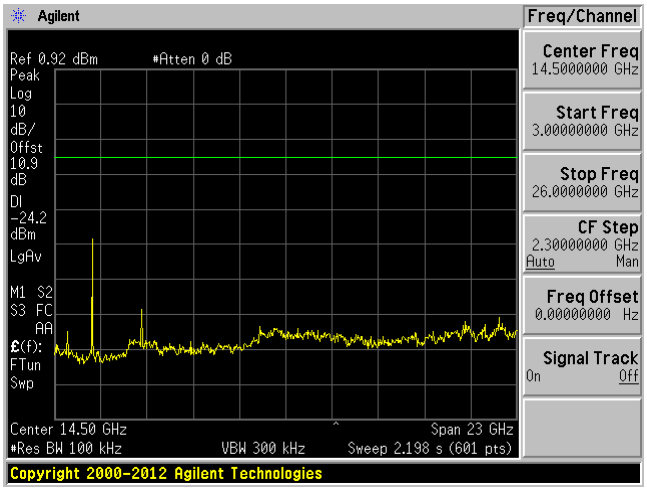
Low Channel 3 GHz – 25 GHz



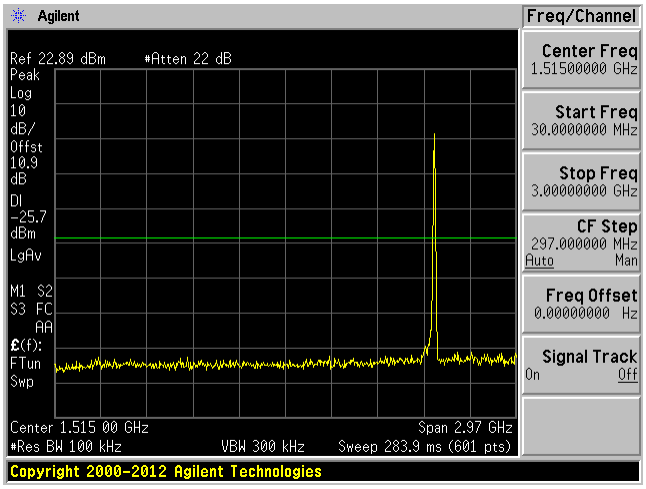
Middle Channel 30 MHz – 3 GHz



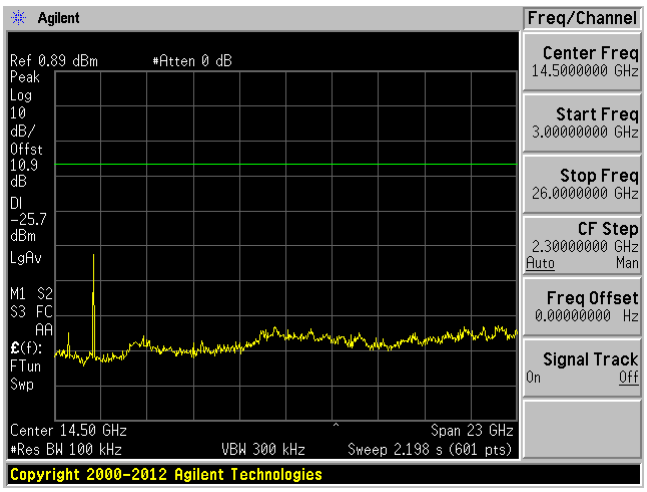
Middle Channel 3 GHz – 25 GHz



High Channel 30 MHz – 3 GHz

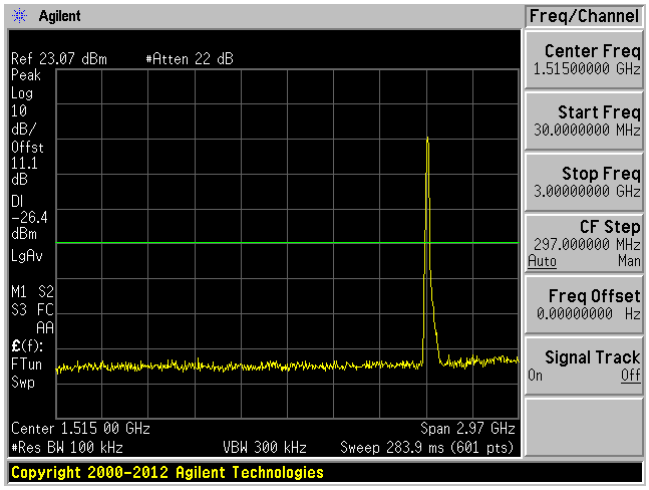


High Channel 3 GHz – 25 GHz

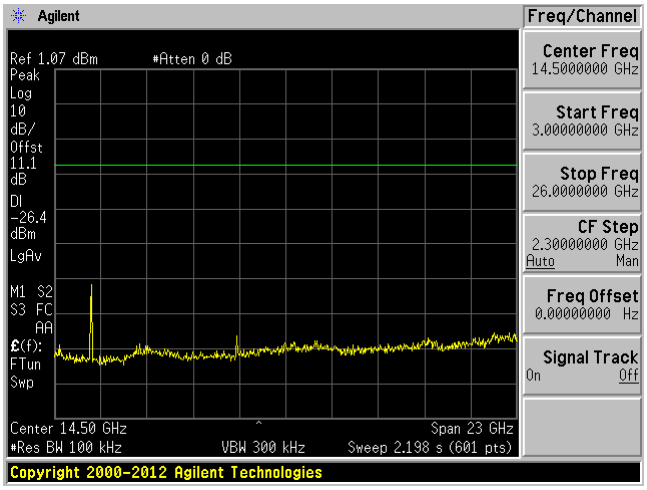


802.11g mode Chain 0

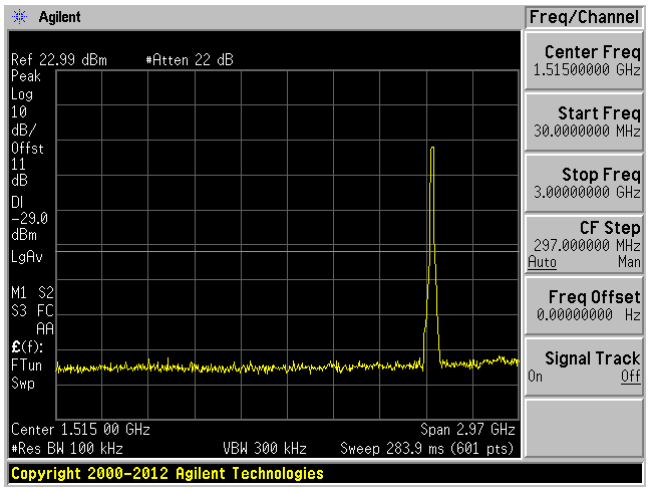
Low Channel 30 MHz – 3 GHz



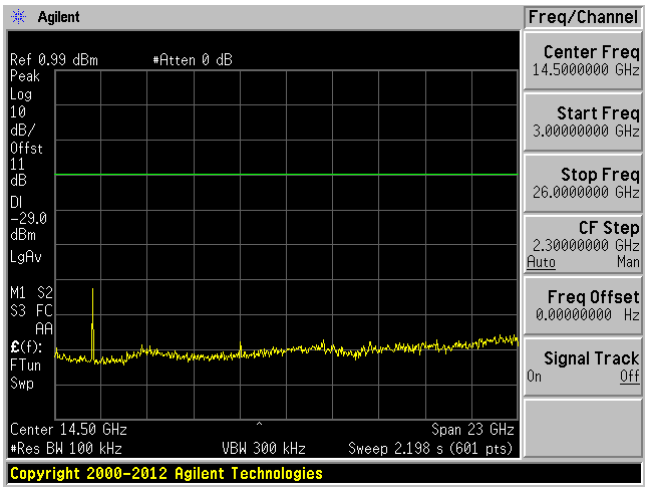
Low Channel 3 GHz – 25 GHz



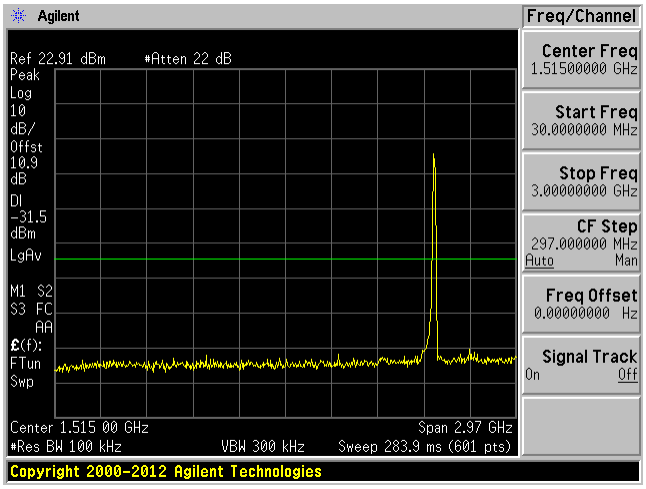
Middle Channel 30 MHz – 3 GHz



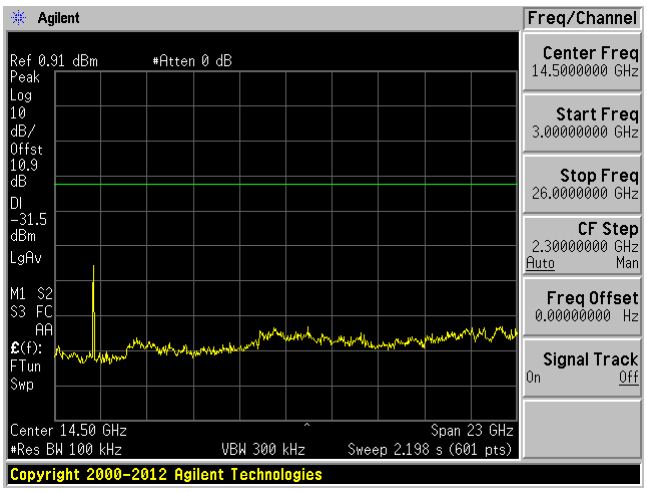
Middle Channel 3 GHz – 25 GHz



High Channel 30 MHz – 3 GHz

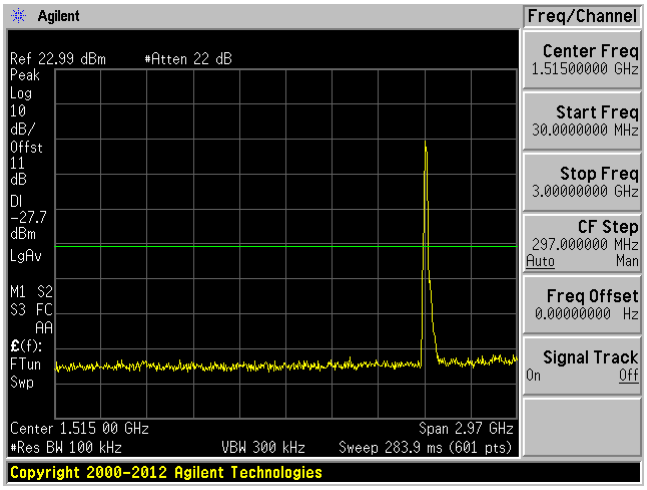


High Channel 3 GHz – 25 GHz

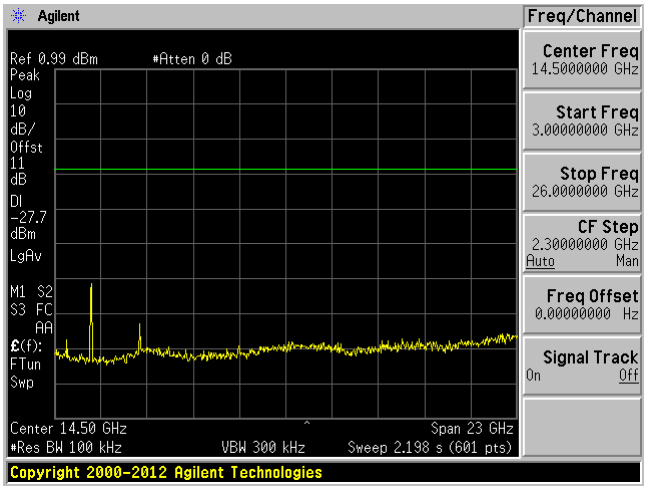


802.11g mode Chain 1

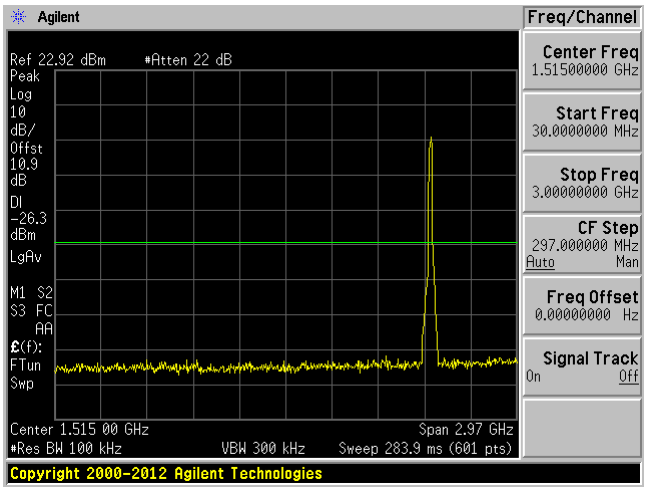
Low Channel 30MHz – 3 GHz



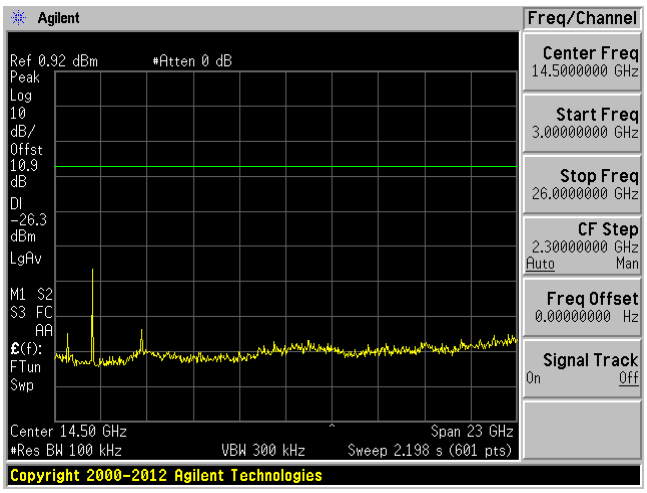
Low Channel 3 GHz – 25 GHz



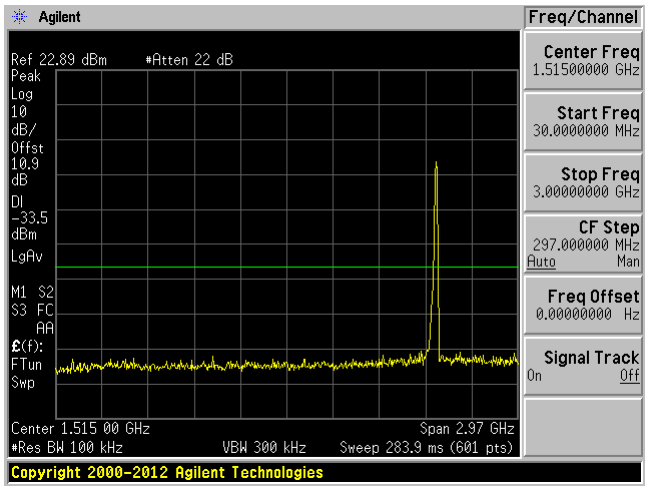
Middle Channel 30 MHz – 3 GHz



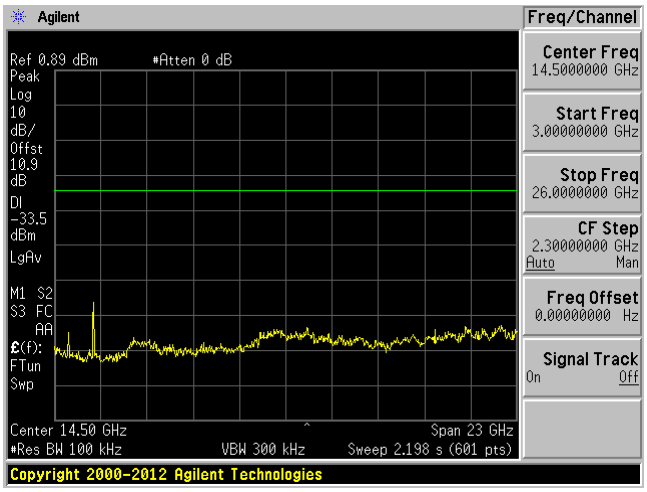
Middle Channel 3 GHz – 25 GHz



High Channel 30 MHz – 3 GHz

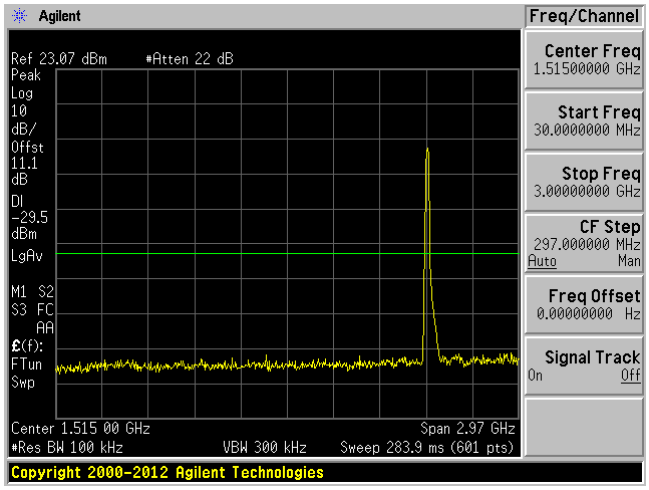


High Channel 3 GHz – 25 GHz

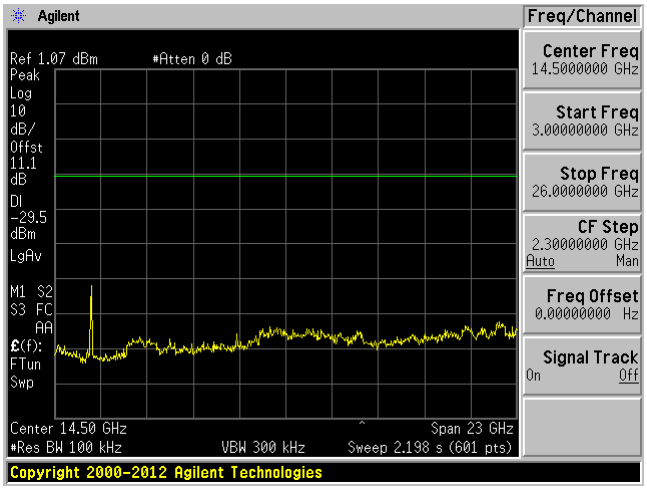


802.11n20 mode Chain 0

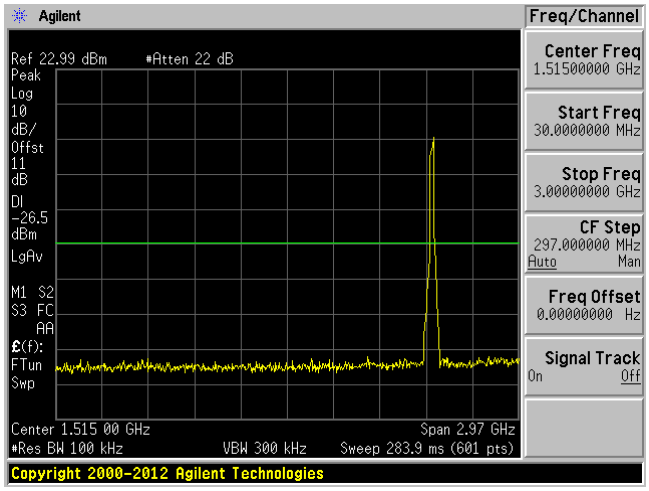
Low Channel 30 MHz – 3 GHz



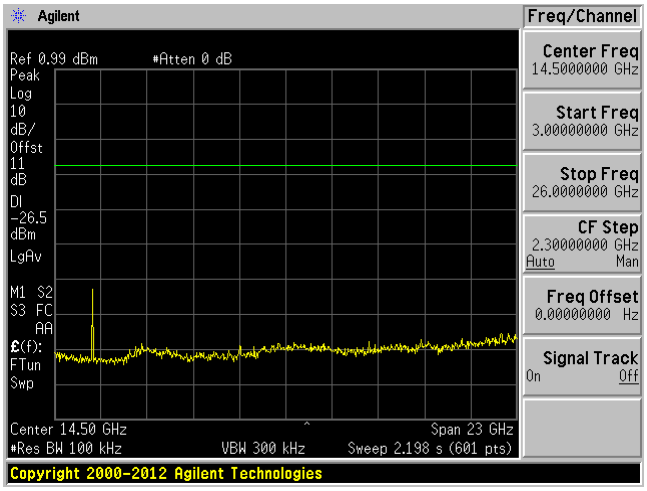
Low Channel 3 GHz – 25 GHz



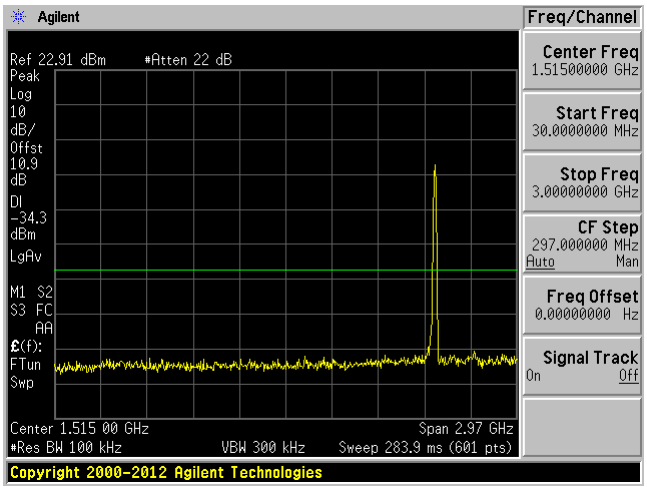
Middle Channel 30 MHz – 3 GHz



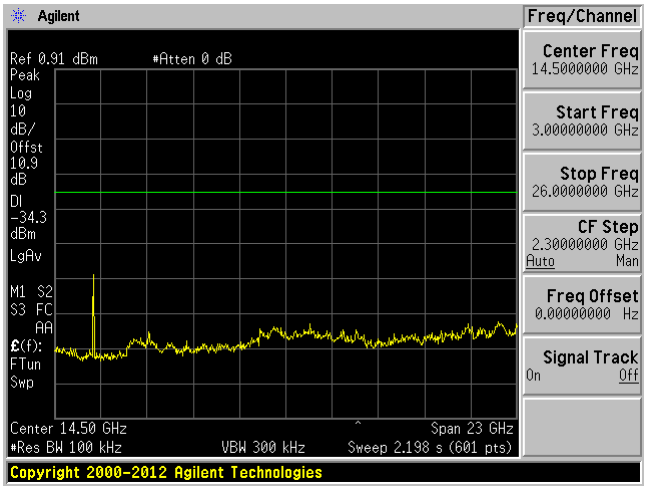
Middle Channel 3 GHz – 25 GHz



High Channel 30 MHz – 3 GHz

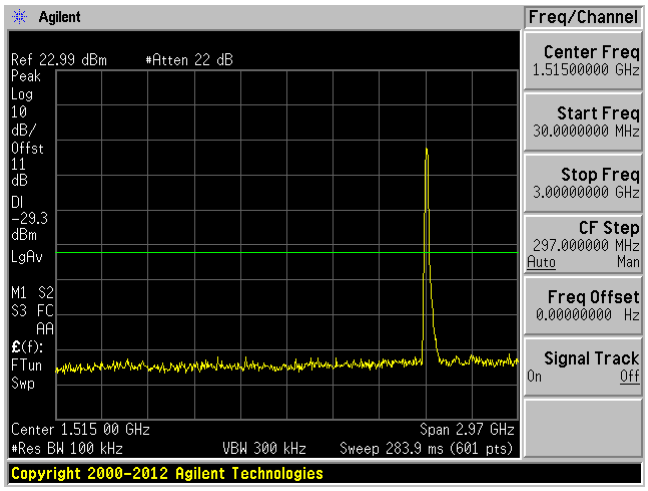


High Channel 3 GHz – 25 GHz

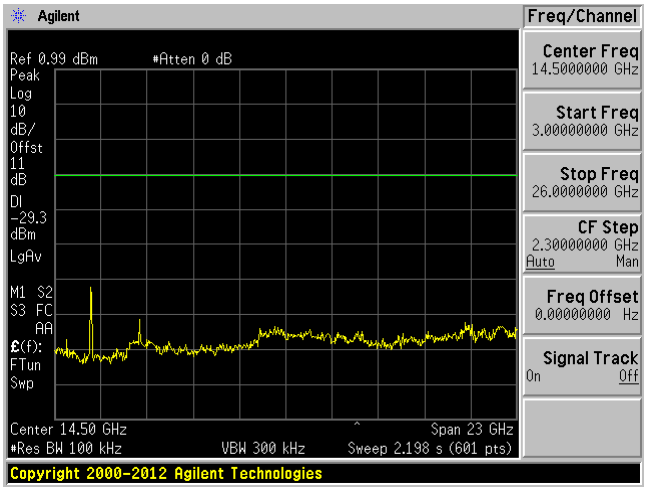


802.11n20 mode Chain 1

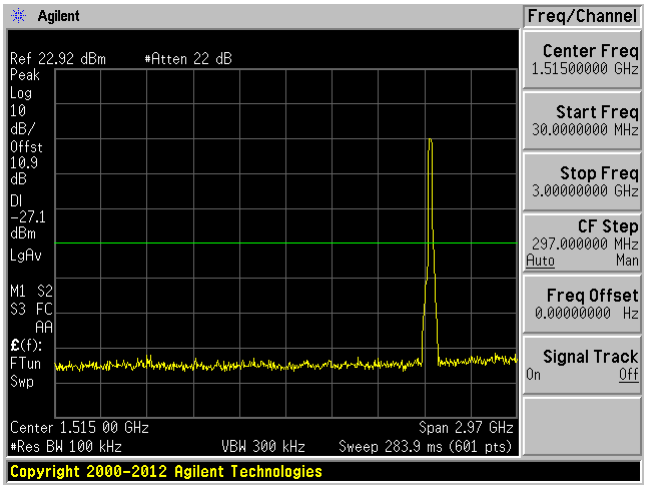
Low Channel 30 MHz – 3 GHz



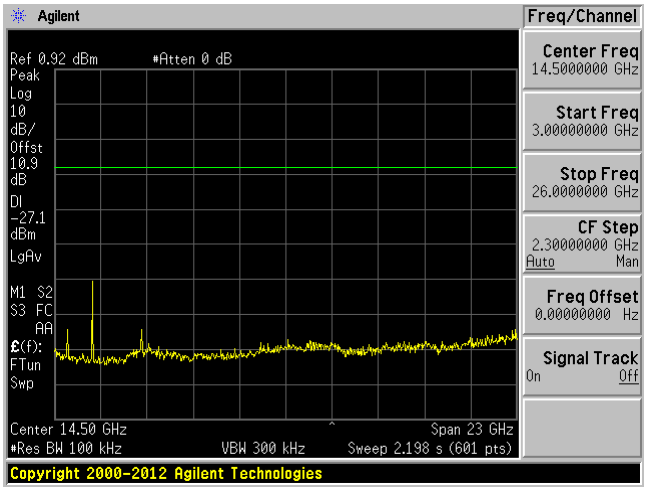
Low Channel 3 GHz – 25 GHz



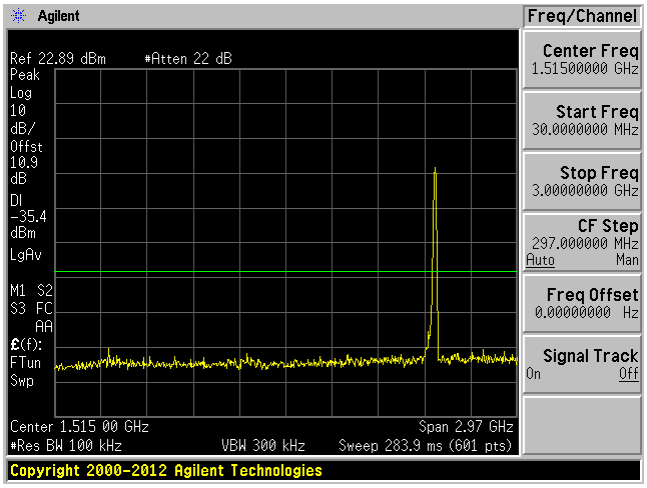
Middle Channel 30 MHz – 3 GHz



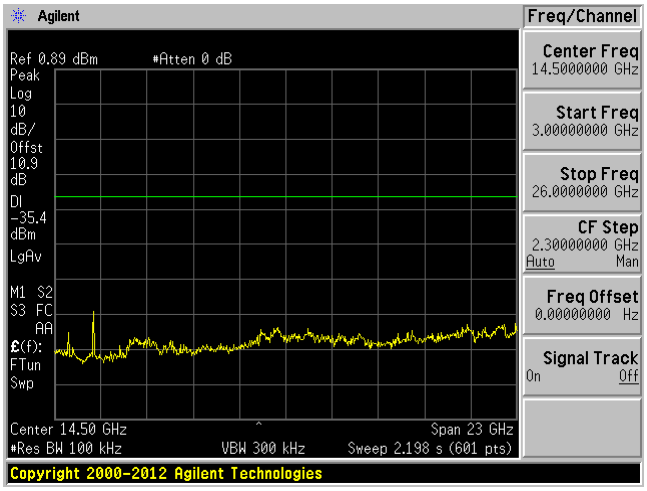
Middle Channel 3 GHz – 25 GHz



High Channel 30 MHz – 3 GHz

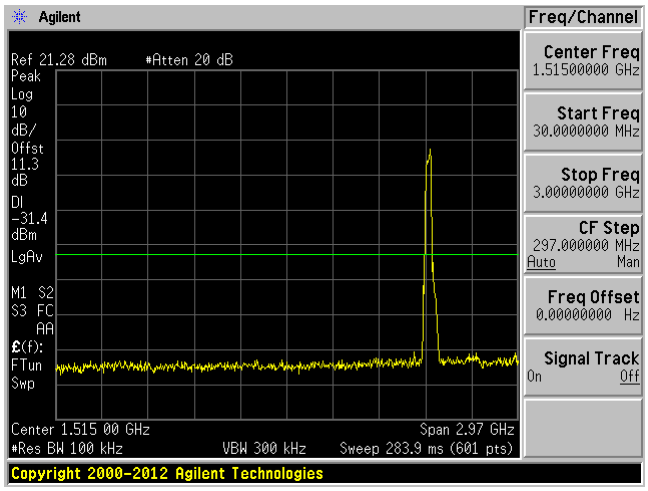


High Channel 3 GHz – 25 GHz

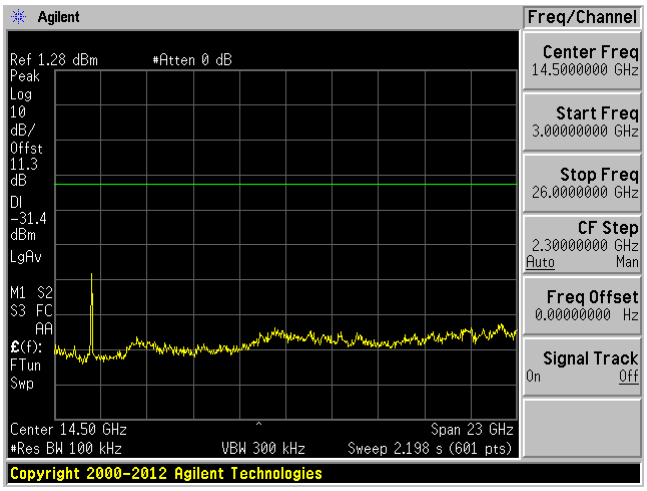


802.11n40 mode Chain 0

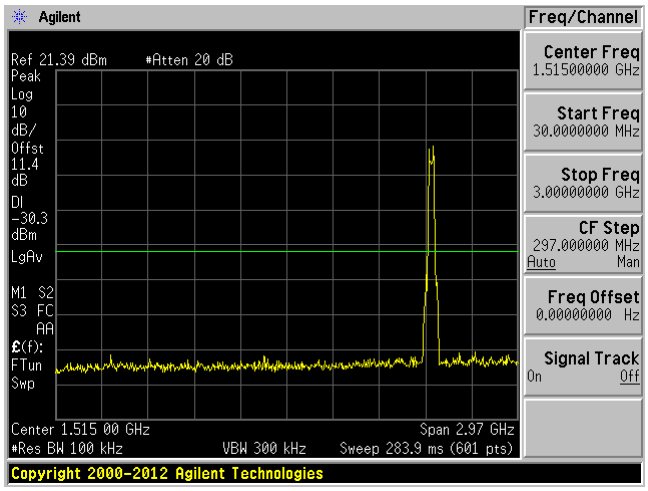
Low Channel 30 MHz – 3 GHz



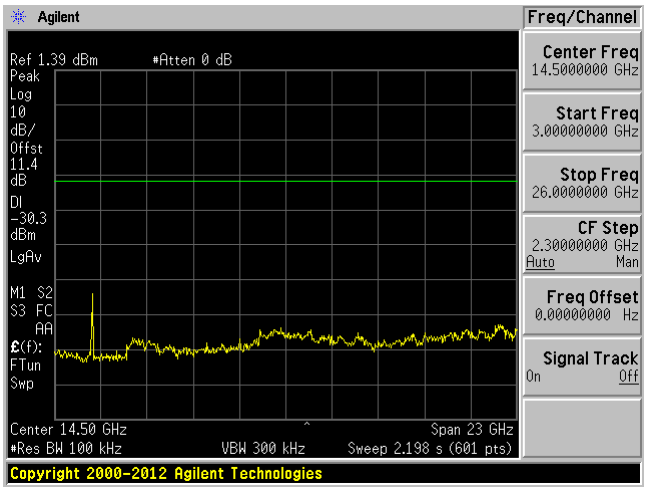
Low Channel 3 GHz – 25 GHz



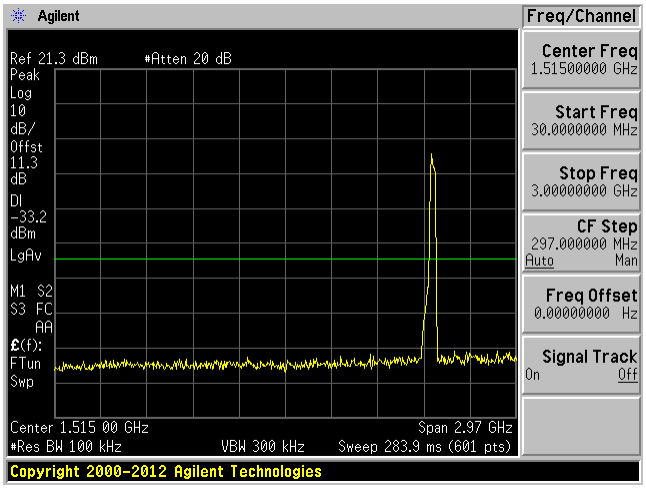
Middle Channel 30 MHz – 3 GHz



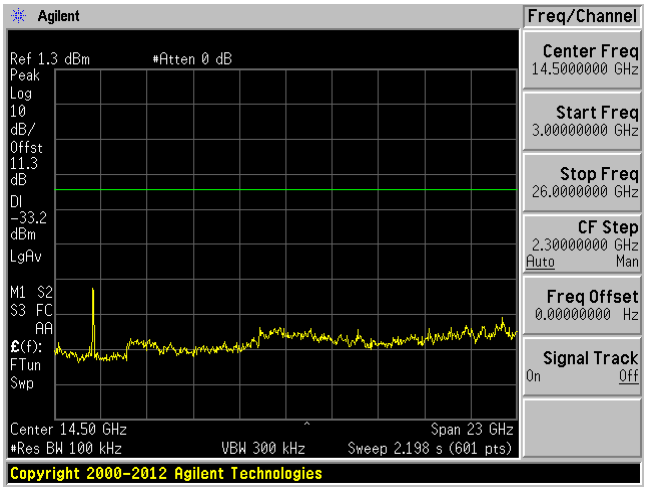
Middle Channel 3 GHz – 25 GHz



High Channel 30 MHz – 3 GHz

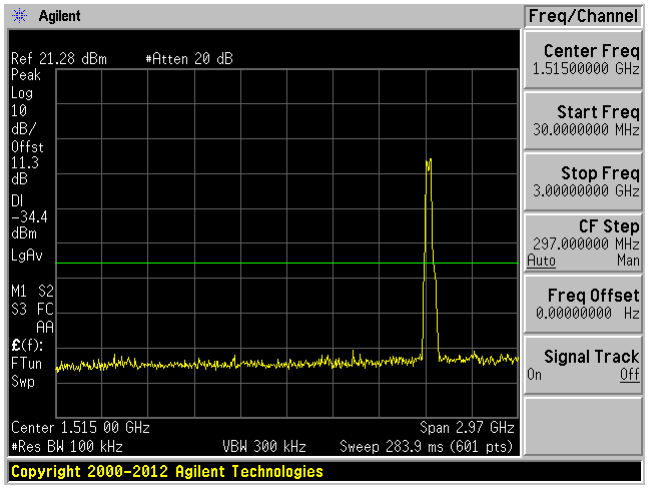


High Channel 3 GHz – 25 GHz

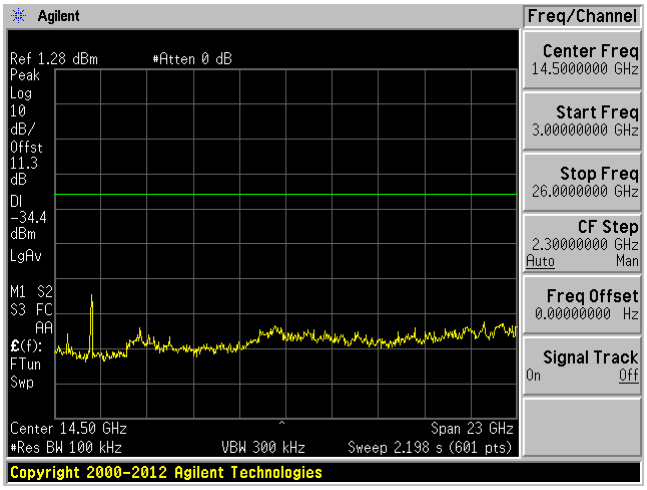


802.11n40 mode Chain 1

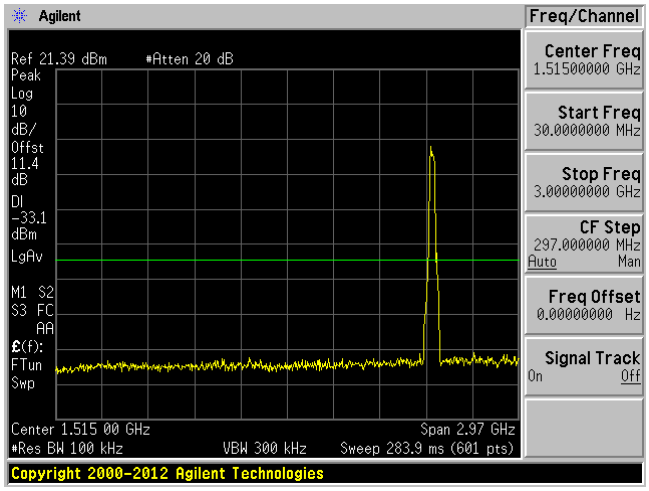
Low Channel 30 MHz – 3 GHz



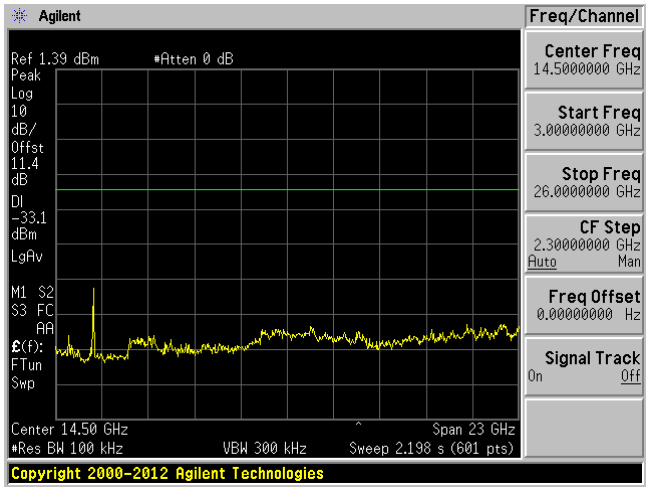
Low Channel 3 GHz – 25 GHz



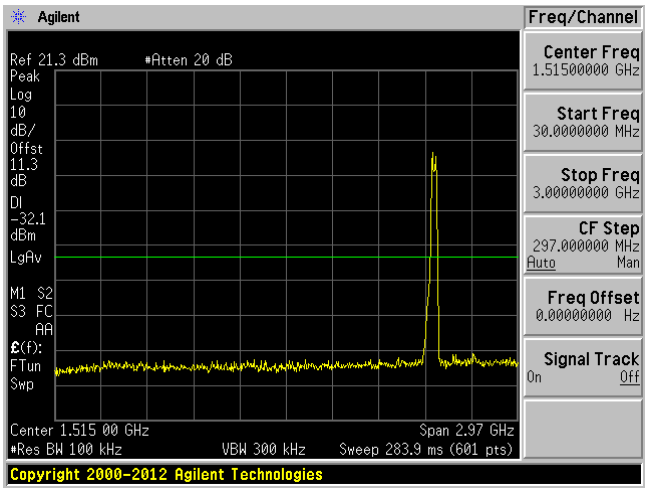
Middle Channel 30 MHz – 3 GHz



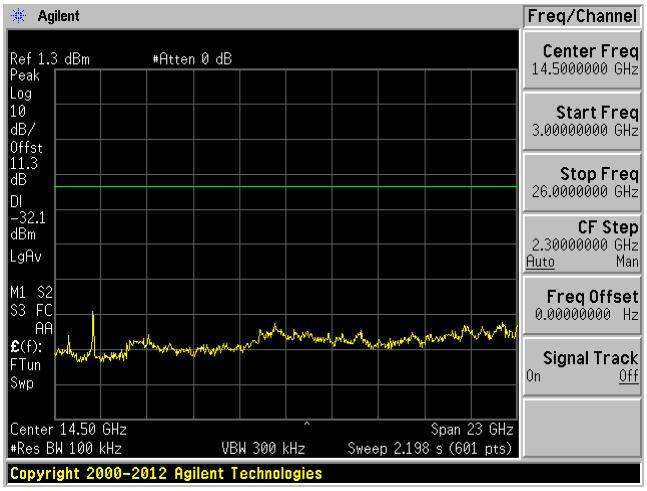
Middle Channel 3 GHz – 25 GHz



High Channel 30 MHz – 3 GHz

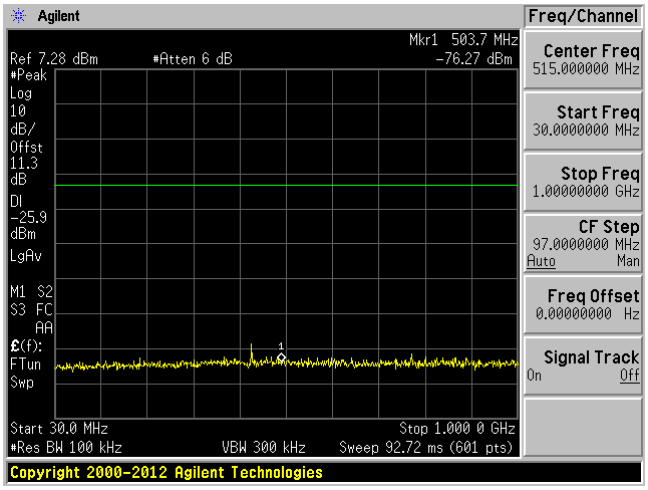


High Channel 3 GHz – 25 GHz

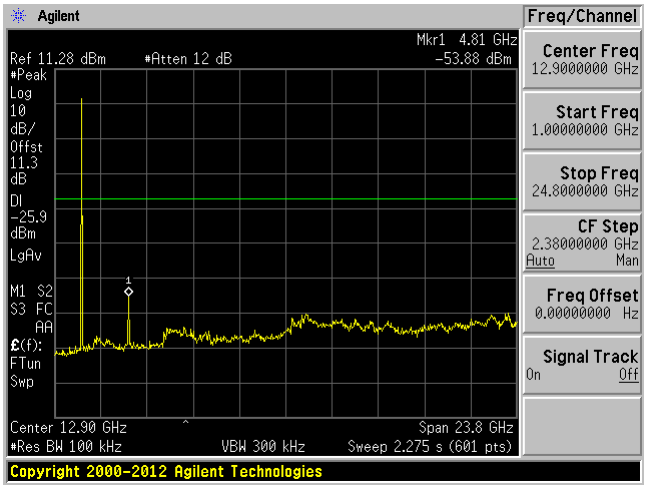


BLE

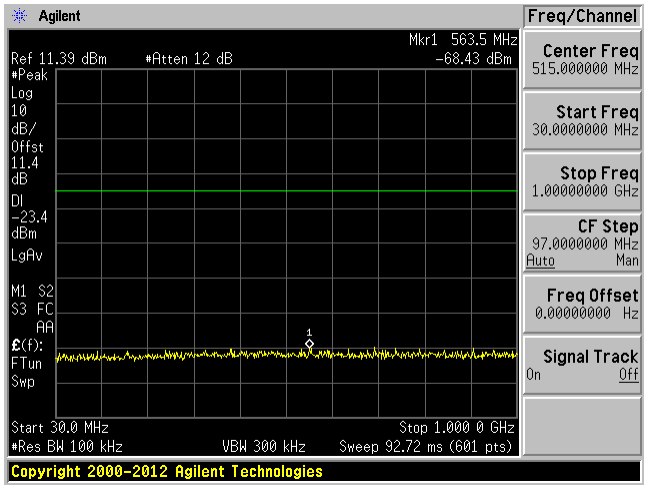
Low Channel 30 MHz – 1 GHz



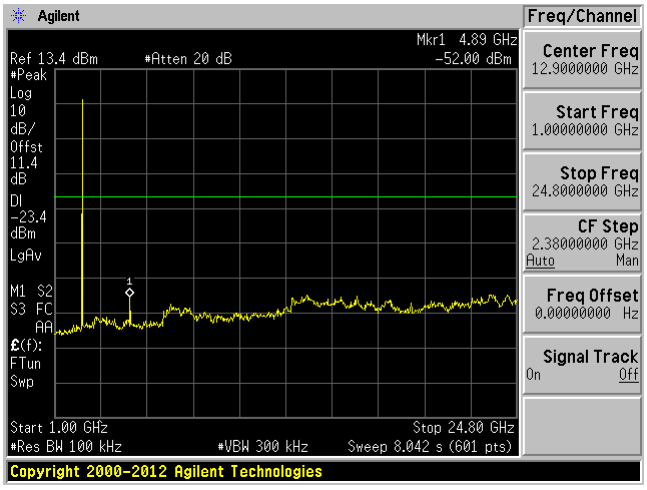
Low Channel 1 GHz – 25 GHz



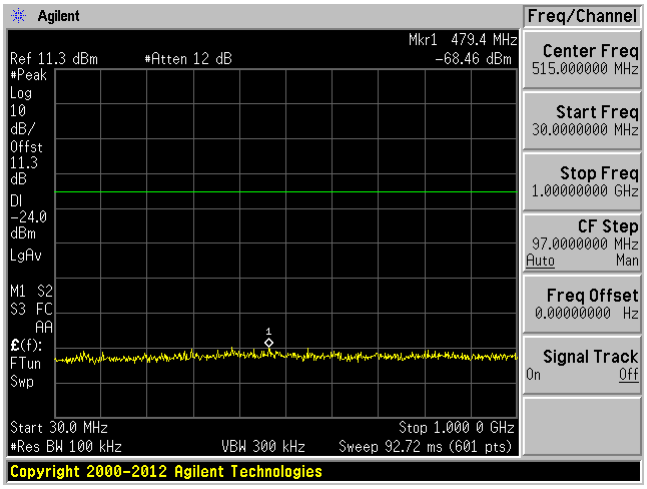
Middle Channel 30 MHz – 1 GHz



Middle Channel 1 GHz – 25 GHz



High Channel 30 MHz – 1 GHz



High Channel 1 GHz – 25 GHz