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

TEST AND MEASUREMENT REPORT

For

Trimble Navigation Ltd.

935 Stewart Drive,

Sunnyvale, CA 94085, USA

FCC ID: JUP-95807WFBT
IC: 1756A-95807WFBT

Report Type:	**Product Type:**
Original Report	Wi-Fi and BT Combo Module

Prepared By:	Chen Ge
Report Number:	R1406117-247 DTS
Report Date:	2014-09-23
Reviewed By:	Ivan Cao RF Leader

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1406117-247DTS	Original Report	2014-08-18
A	R1406117-247DTS	Updated model names of host units	2014-09-23

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of *Trimble Navigation Ltd.* and their product, *FCC ID: JUP-95807WFBT, IC: 1756A-95807WFBT,* model: *LBEE1DARRC-519* or the "EUT" as referred to this report. The EUT is Bluetooth and 802.11b/g Wi-Fi combo module, and it will be integrated into Trimble three hosts (R10, Trimble P/N 9058X-XX and Trimble P/N 100070-XX).

1.2 Mechanical Description of EUT

The EUT measures approximately 8.0 mm (L) x 7.3 mm (W) x 1.1 mm (H) and weighs approximately 0.2 g.

1.3 Objective

This report is prepared on behalf of Trimble Navigation Ltd. in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commissions rules and IC RSS-210 Issue 8, Dec 2010.

The objective is to determine compliance with FCC Part 15.247 and IC RSS-210 rules.

1.4 Related Submittal(s)/Grant(s)

FCC part 15.247 DSS, RSS-210 submissions with FCC ID: JUP-95807WFBT, IC: 1756A-95807WFBT

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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

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

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

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

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

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

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2009.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

The test utility used was CommSet, version 1.26, was provided by Trimble Navigation Ldt. And was verified by Chen Ge to comply with the standard requirements being tested against.

2.3 Special Accessories

N/A

2.4 Equipment Modifications

No modifications were made to the EUT.

2.5 Local Support Equipment List

Manufacturer	Description	Model	Serial Number
Dell	Laptop	PP18L	KX355 A01

2.6 EUT Internal Configuration Details

Manufacturer	Description	Model	Serial Number
Murata	Wi-Fi/BT combo module	LBEE1DARRC-519	-
Trimble	Main board	93164-B	-

2.7 External I/O Cabling List and Details

Cable Description	Length (m)	To	From
RF Cable	<1.0	PSA	EUT
USB cable	<1.0	Laptop	EUT

3 Summary of Test Results

FCC & IC Rules	Description of Test	Result (s)
FCC §15.247(i), §2.1091 IC RSS-102	RF Exposure	Compliant
FCC §15.203 IC RSS-Gen §7.1.2	Antenna Requirement	Compliant
FCC §15.207(a) IC RSS-Gen §7.2.4	Conducted Emissions	Compliant
FCC §15.247 (d) IC RSS-210 §A8.5	Spurious Emissions at Antenna Port	Compliant
FCC §15.205 IC RSS-210 §2.2	Restricted Bands	Compliant
FCC §15.209, §15.247 (d) IC RSS-210 §A8.5	Radiated Spurious Emissions	Compliant
FCC §15.247(a)(2) IC RSS-210 §A8.2	6 dB Bandwidth	Compliant
FCC §15.247(b)(3) IC RSS-210 §A8.4	Maximum Peak Output Power	Compliant
FCC §15.247(d) IC RSS-210 §A8.5	100 kHz Bandwidth of Frequency Band Edge	Compliant
FCC §15.247(e) IC RSS-210 §A8.2(b)	Power Spectral Density	Compliant

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

4.1 Applicable Standard

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

Limits for General Population/Uncontrolled Exposure

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

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

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

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

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m2)	Time Averaging (min)
0.003 - 1	280	2.19	-	6
1 - 10	280 / f	2.19 / f	-	6
10 - 30	28	2.19 / f	-	6
30 – 300	28	0.073	2*	6
300 – 1 500	$1.585\ f^{0.5}$	$0.0042\ f^{0.5}$	f / 150	6
1 500 – 15 000	61.4	0.163	10	6
15 000 – 150 000	61.4	0.163	10	$616000/f^{1.2}$
150 000- 300 000	$0.158\ f^{0.5}$	$4.21 \times 10\ -4\ f^{0.5}$	$6.67 \times 10^{-5}\ f$	$616000/f^{1.2}$

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

4.2 MPE Prediction

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

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

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

4.3 MPE Results

Maximum peak output power at antenna input terminal (dBm):	14.85
Maximum peak output power at antenna input terminal (mW):	30.549
Prediction distance (cm):	20
Prediction frequency (MHz):	2412
Maximum Antenna Gain, typical (dBi):	4.0
Maximum Antenna Gain (numeric):	2.511
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.0152
Power density of prediction frequency at 20.0 cm (W/m^2):	0.152
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0
MPE limit for uncontrolled exposure at prediction frequency (W/m^2):	10

The device is compliant with the requirement MPE limit for uncontrolled exposure.

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

5.1 Applicable Standard

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

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

According to IC RSS-Gen §7.1.2: A transmitter can only be sold or operated with antennas with which it was approved. Transmitter may be approved with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest gain antenna of each combination of transmitter and antenna type for which approval is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type having equal or lesser gain as an antenna that had been successfully tested with the transmitter, will also be considered approved with the transmitter, and may be used and marketed with the transmitter. For Category I transmitters, the manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. For transmitters of RF output power of 10 milliwatts or less, only the portion of the antenna gain that is in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power to demonstrate compliance with the radiated power limits specified in the applicable standard. For transmitters of output power greater than 10 milliwatts, the total antenna gain shall be added to the measured RF output power to demonstrate compliance to the specified radiated power limits.

5.2 Antenna Connector Construction

This EUT has different internal antenna for the 3 hosts, that considered sufficient to comply with sections FCC Part 15.203 and IC RSS-Gen §7.1.2, Please refer to the EUT photos. The antenna gain for R10 is 2.0 dBi, for Trimble P/N 9058X-XX is 4.0 dBi, for Trimble P/N 100070-XX is 3.15 dBi.

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

6.1 Applicable Standards

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

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

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 Note 1	56 to 46 Note 1
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency.

6.2 Test Setup

The measurement was performed in a shielded room. The test setup and measurement procedure was per ANSI C63.4-2009. The specification limits were in accordance with FCC §15.207 and IC RSS-Gen §7.2.4.

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

R10 and Trimble P/N 9058X-XX:

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

Trimble P/N 100070-XX:

The EUT was powered by the laptop and connected with LISN-1 which provided 120 V / 60 Hz AC power.

6.3 Test Procedure

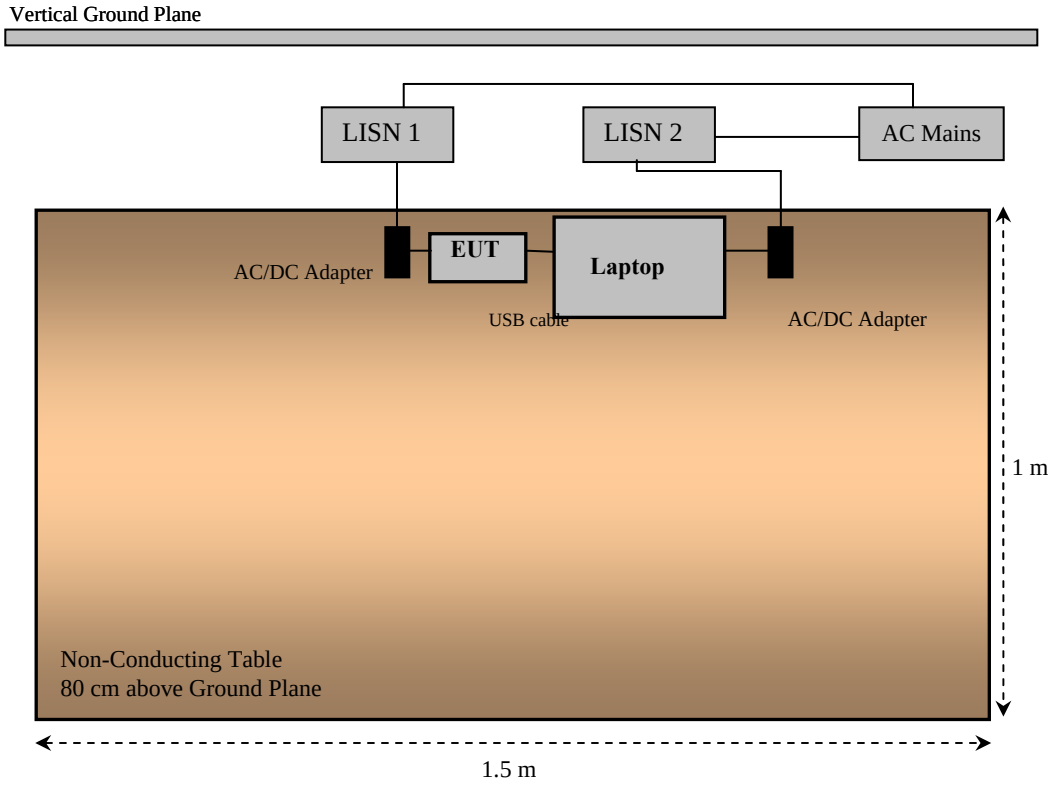
During the conducted emissions test, the support equipment was connected to the mains outlet of the LISN-2 and the LISN-2 was terminated.

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

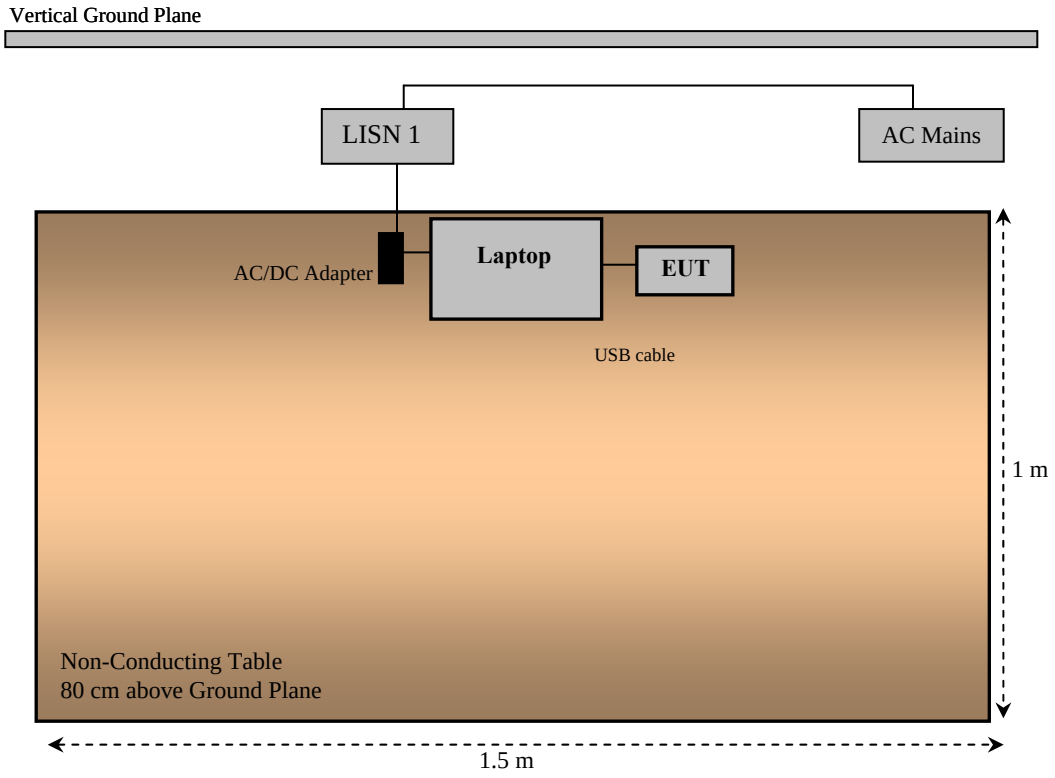
All data was recorded in the peak detection mode, quasi-peak and average. Quasi-Peak readings are distinguished with a “QP.” Average readings are distinguished with an “Ave”.

6.4 Test Setup Block Diagram

The set up for R10 and Trimble P/N 9058X-XX:



The set up for Trimble P/N 100070-XX:



6.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Cable Loss (CL) plus the High Pass Filter/Attenuator value (HA) and subtracting the Amplifier Gain (Ga) to the indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + CL + HA – Ga

For example, a corrected amplitude (CA) of 36 dBuV = Indicated Amplitude reading (Ai) of 50.0 dBuV + Cable Loss (CL) 1.0 dB + High Pass Filter/Attenuator (IA) 5 dB - Amplifier Gain (Ga) 20 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 (dB) = Corrected Amplitude (dBuV) - Limit (dBuV)

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	2014-04-18	1 year
Solar Electronics	LISN	9252-R-24-BNC	511205	2014-06-25	1 year
TTE	Filter, High Pass	H9962-150K-50-21378	K7133	2014-05-30	1 year

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

6.7 Test Environmental Conditions

Temperature:	23°C
Relative Humidity:	46%
ATM Pressure:	101.25kPa

The testing was performed by Chen Ge on 2014-07-24 in 5 meter chamber 3.

6.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC standard's conducted emissions limits, with a worst case margin of:

Transmitting Mode

R10:

Connection: AC/DC adapter of Laptop connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor (Line/Neutral)**	**Range (MHz)**
-12.75	0.150307	Neutral	0.15-30

Trimble P/N 9058X-XX:

Connection: AC/DC adapter of Laptop connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor (Line/Neutral)**	**Range (MHz)**
-6.3	0.150117	Live	0.15-30

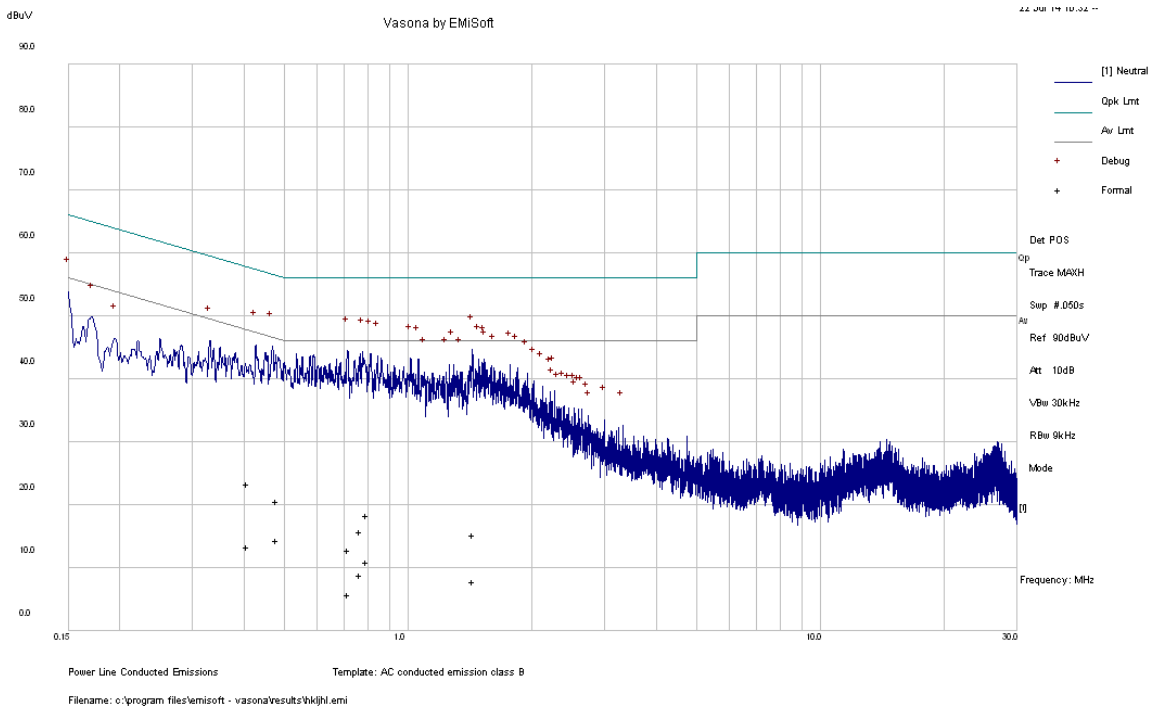
Trimble P/N 100070-XX:

Connection: AC/DC adapter of Laptop connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor (Line/Neutral)**	**Range (MHz)**
-11.96	0.64362	Neutral	0.15-30

6.9 Conducted Emissions Test Plots and Data

R10:

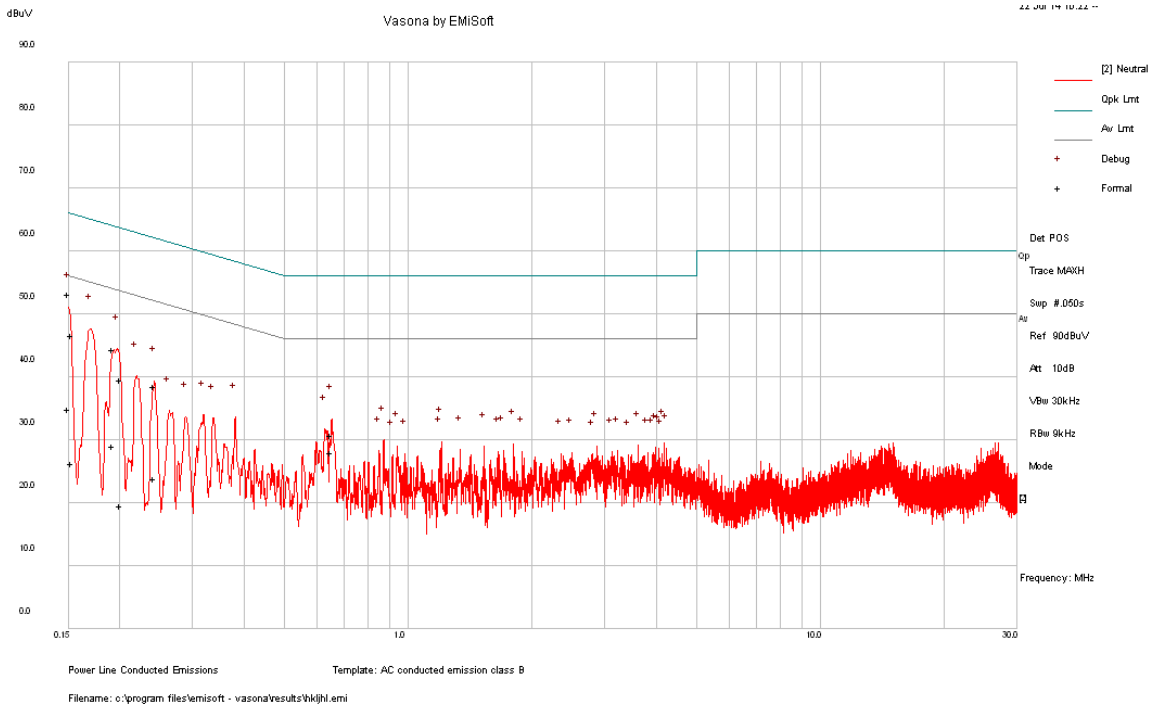
120 V, 60, Line



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
1.438728	15.26	L	56	-40.74	QP
0.480879	20.55	L	56.32	-35.78	QP
0.718812	12.8	L	56	-43.2	QP
0.769275	15.73	L	56	-40.27	QP
0.409515	23.3	L	57.66	-34.36	QP
0.794919	18.41	L	56	-37.59	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
1.438728	7.9	L	46	-38.1	Ave.
0.480879	14.4	L	46.32	-31.93	Ave.
0.718812	5.75	L	46	-40.25	Ave.
0.769275	8.85	L	46	-37.15	Ave.
0.409515	13.36	L	47.66	-34.3	Ave.
0.794919	10.98	L	46	-35.02	Ave.

120 V, 60, Neutral

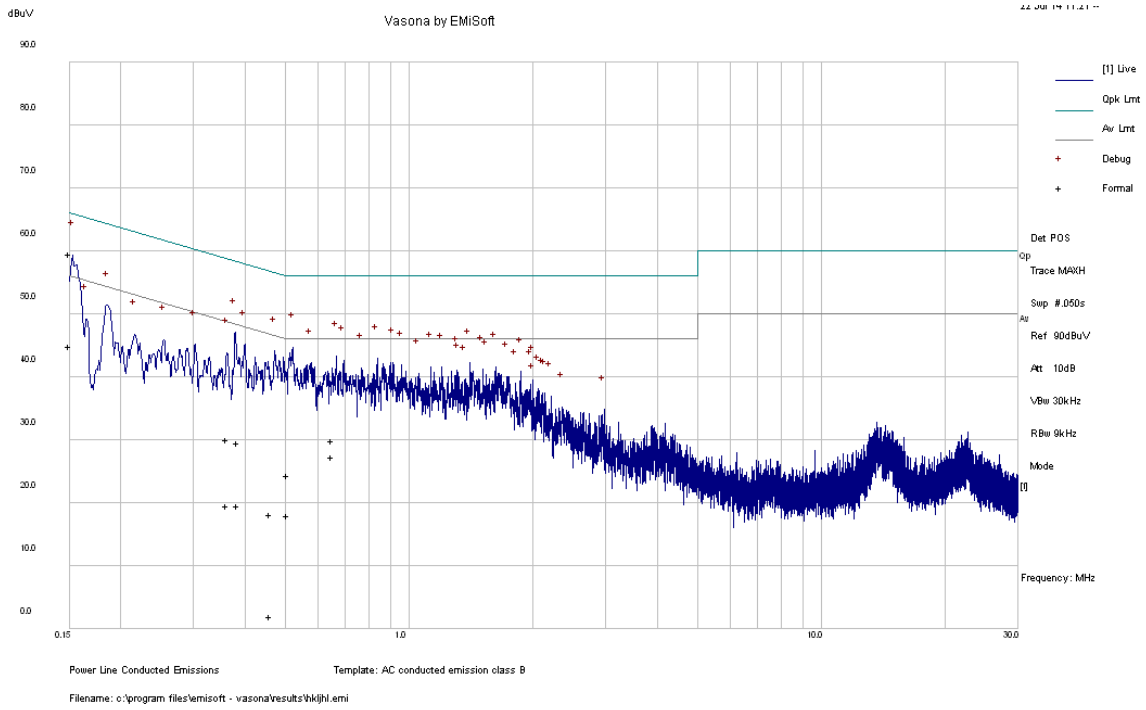


Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.150307	53.23	N	65.98	**-12.75**	QP
0.153375	46.71	N	65.82	-19.11	QP
0.193011	44.36	N	63.91	-19.54	QP
0.241917	38.51	N	62.03	-23.52	QP
0.649902	30.79	N	56	-25.21	QP
0.201078	39.64	N	63.57	-23.93	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.150307	35	N	55.98	-20.98	Ave.
0.153375	26.27	N	55.82	-29.55	Ave.
0.193011	29.05	N	53.91	-24.85	Ave.
0.241917	23.8	N	52.03	-28.23	Ave.
0.649902	28	N	46	-18	Ave.
0.201078	19.56	N	53.57	-34	Ave.

Trimble P/N 9058X-XX:

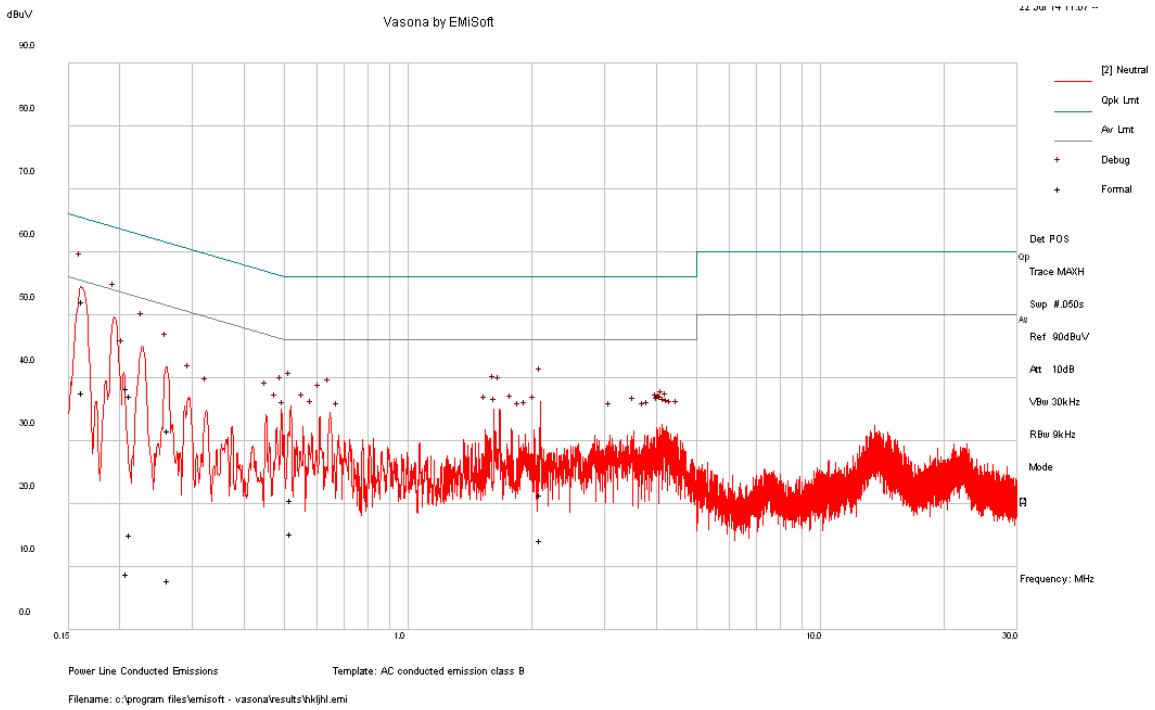
120 V, 60, Line



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.150117	59.66	L	65.99	**-6.33**	QP
0.362007	30.07	L	58.68	-28.62	QP
0.508029	24.42	L	56	-31.58	QP
0.462435	18.18	L	56.65	-38.47	QP
0.651981	30	L	56	-26	QP
0.385071	29.61	L	58.17	-28.55	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.150117	44.86	L	55.99	-11.13	Ave.
0.362007	19.57	L	48.68	-29.12	Ave.
0.508029	17.95	L	46	-28.05	Ave.
0.462435	1.9	L	46.65	-44.75	Ave.
0.651981	27.38	L	46	-18.62	Ave.
0.385071	19.51	L	48.17	-28.66	Ave.

120 V, 60, Neutral

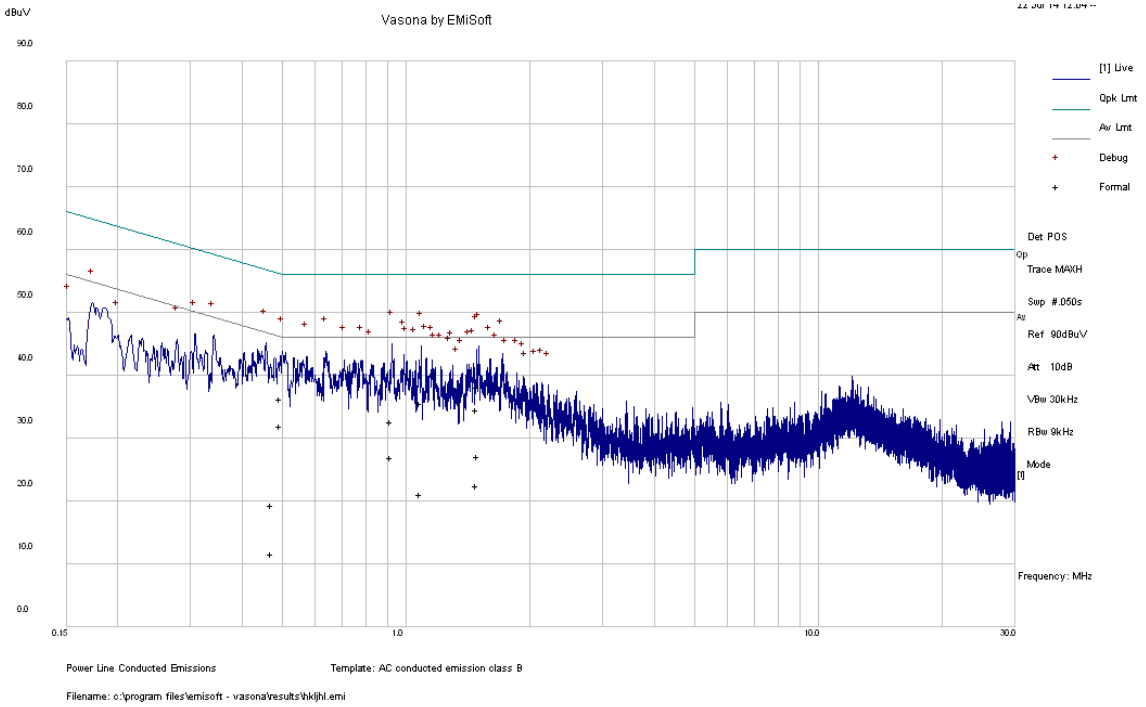


Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.162405	52.24	N	65.34	-13.1	QP
0.208125	38.3	N	63.28	-24.98	QP
0.2127	37.17	N	63.1	-25.93	QP
0.262131	31.68	N	61.36	-29.68	QP
2.092613	21.46	N	56	-34.54	QP
0.521649	20.56	N	56	-35.44	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.162405	37.66	N	55.34	-17.68	Ave.
0.208125	8.92	N	53.28	-44.36	Ave.
0.2127	15.08	N	53.1	-38.02	Ave.
0.262131	7.83	N	51.36	-43.53	Ave.
2.092613	14.17	N	46	-31.83	Ave.
0.521649	15.18	N	46	-30.82	Ave.

Trimble P/N 100070-XX:

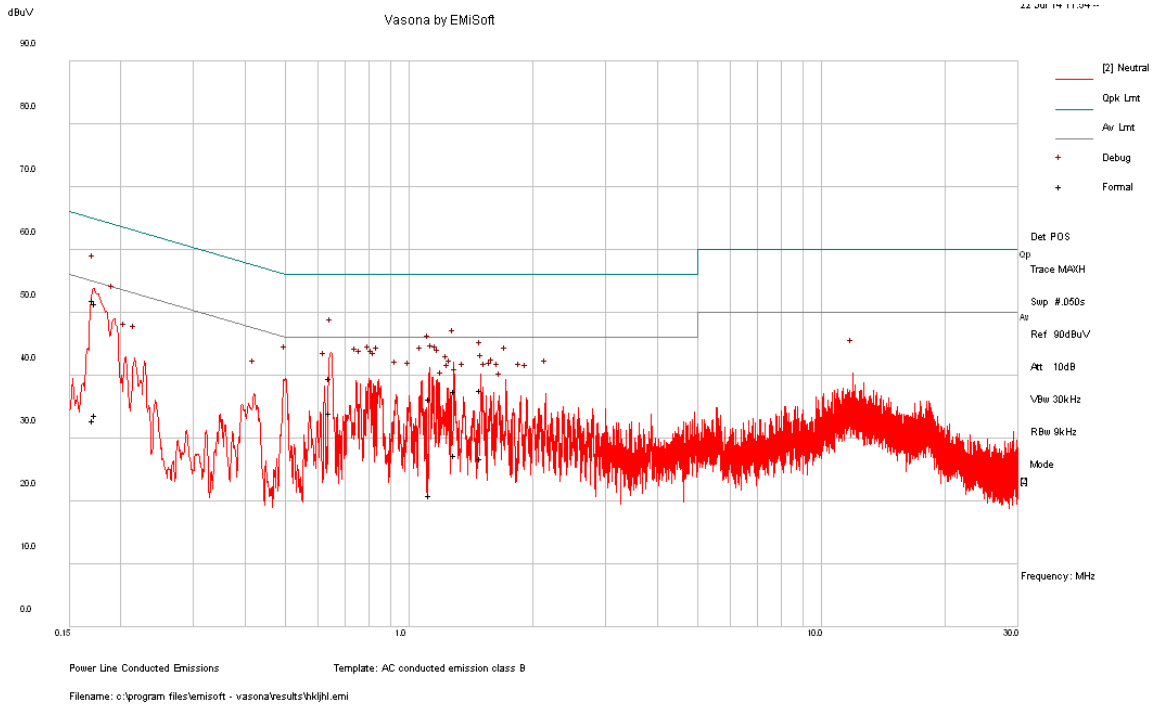
120 V, 60, Line



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.922428	32.61	L	56	-23.39	QP
1.086207	35.55	L	56	-20.45	QP
1.496208	38.13	L	56	-17.87	QP
0.471663	19.39	L	56.48	-37.1	QP
1.482237	34.57	L	56	-21.43	QP
0.494724	36.25	L	56.09	-19.84	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.922428	27	L	46	-19	Ave.
1.086207	21.13	L	46	-24.87	Ave.
1.496208	27.2	L	46	-18.8	Ave.
0.471663	11.7	L	46.48	-34.78	Ave.
1.482237	22.44	L	46	-23.56	Ave.
0.494724	32.06	L	46.09	-14.02	Ave.

120 V, 60, Neutral



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.171477	51.93	N	64.89	-12.96	QP
0.64362	39.59	N	56	-16.41	QP
1.29582	37.57	N	56	-18.43	QP
1.126173	36.37	N	56	-19.63	QP
0.174219	51.41	N	64.76	-13.35	QP
1.495926	37.75	N	56	-18.25	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (L/N)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.171477	32.89	N	54.89	-22	Ave.
0.64362	34.04	N	46	**-11.96**	Ave.
1.29582	27.31	N	46	-18.69	Ave.
1.126173	20.97	N	46	-25.03	Ave.
0.174219	33.67	N	54.76	-21.08	Ave.
1.495926	26.9	N	46	-19.1	Ave.

7 FCC §15.247(d) & IC RSS-210 §A8.5 - Spurious Emissions at Antenna Terminals

7.1 Applicable Standard

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

7.2 Measurement Procedure

The 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.

7.3 Test Equipment List and Details

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

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

7.4 Test Environmental Conditions

Temperature:	21° C
Relative Humidity:	29 %
ATM Pressure:	102.4 kPa

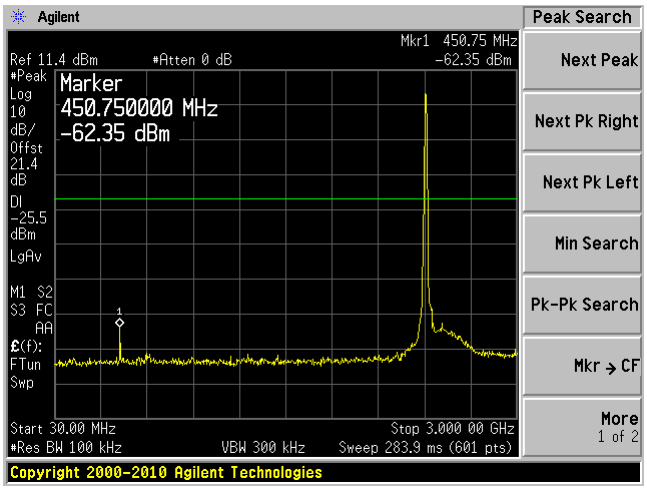
The testing was performed by Chen Ge on 2014-07-03 at RF test site.

7.5 Test Results

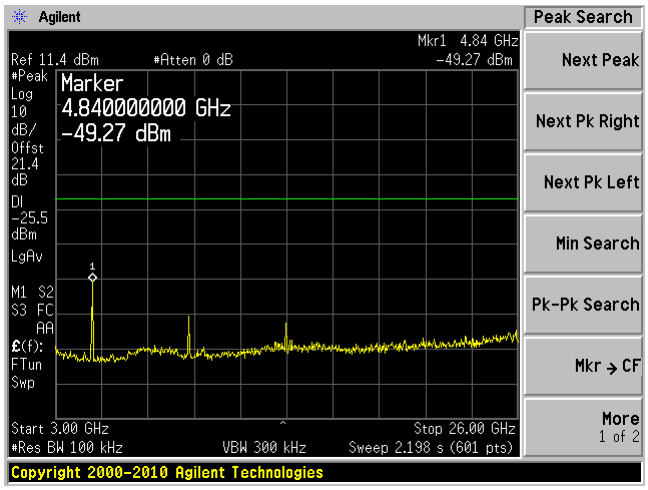
Please refer to following plots.

802.11b Low Channel 2412 MHz

30 MHz – 3 GHz

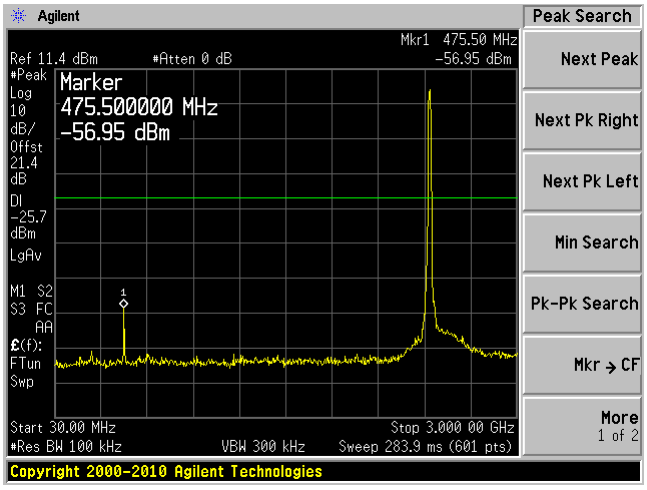


3 GHz – 26 GHz

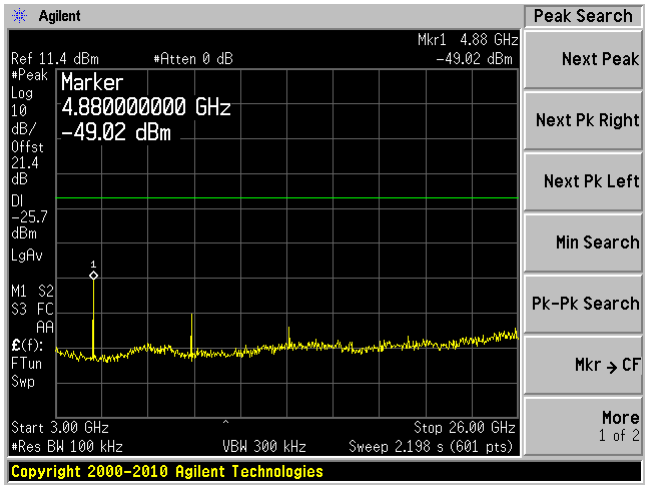


802.11b Middle Channel 2437 MHz

30 MHz – 3 GHz

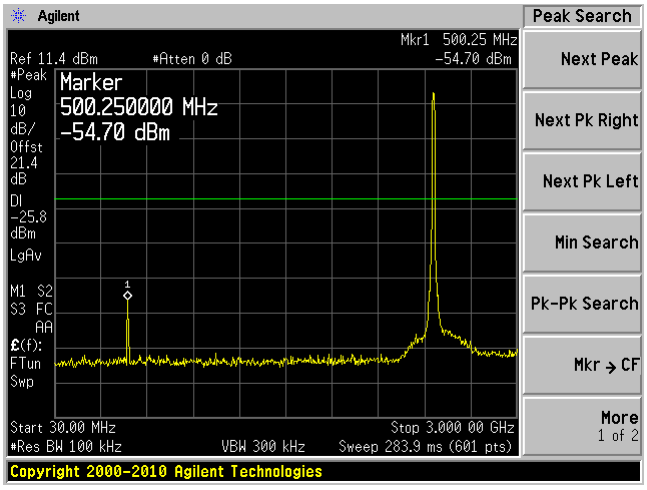


3 GHz – 26 GHz

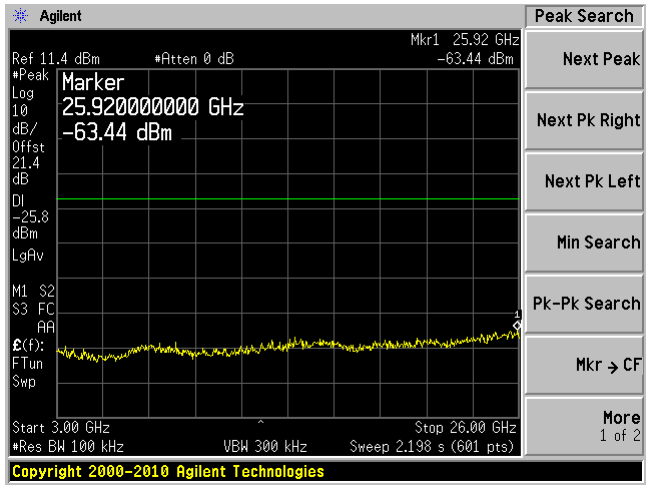


802.11b High Channel 2462 MHz

30 MHz – 3 GHz

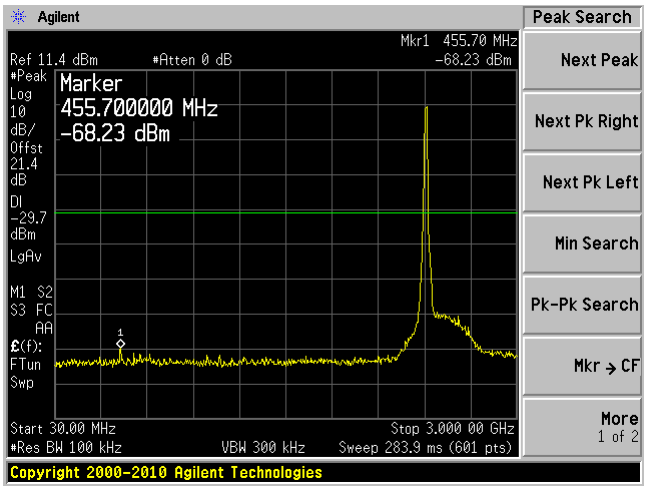


3 GHz – 26 GHz

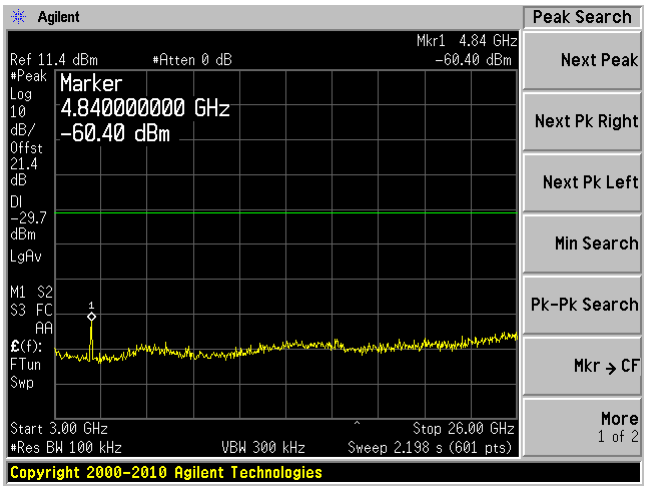


802.11g Low Channel 2412 MHz

30 MHz – 3 GHz

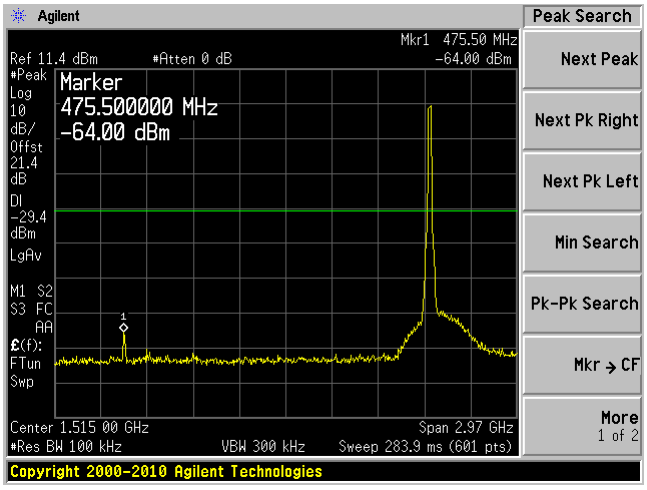


3 GHz – 26 GHz

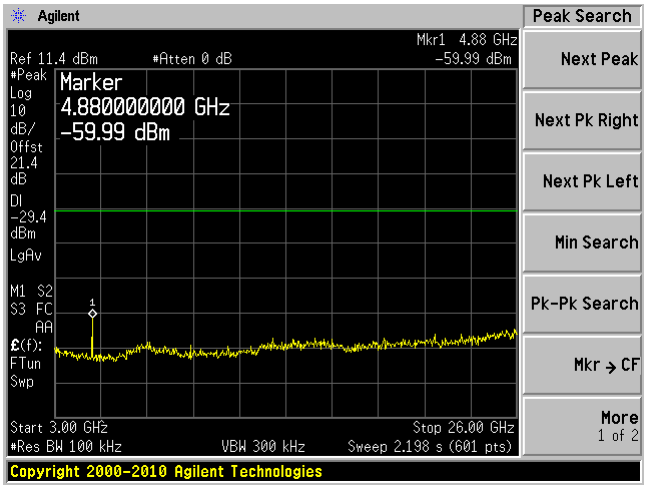


802.11g Middle Channel 2437 MHz

30 MHz – 3 GHz

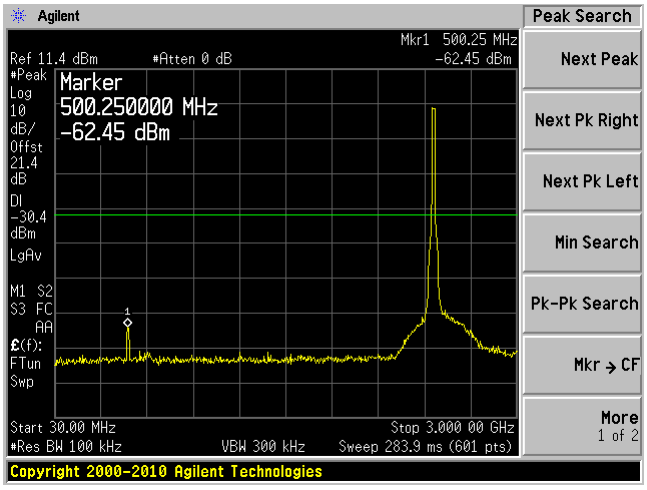


3 GHz – 26 GHz

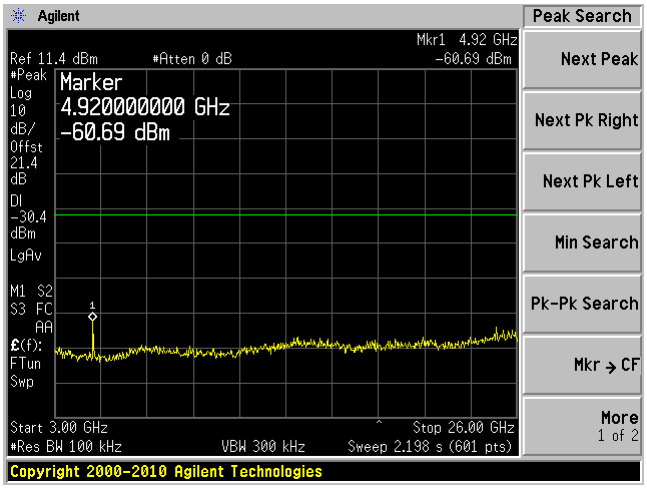


802.11g High Channel 2462 MHz

30 MHz – 3 GHz



3 GHz – 25 GHz



8 FCC §15.205, §15.209 & §15.247(d) & IC RSS-210 §A8.5 - Spurious Radiated Emissions

8.1 Applicable Standard

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

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

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 Note 2	3
88 - 216	150 Note 2	3
216 - 960	200 Note 2	3
Above 960	500	3

Note 2: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

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

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

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

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

8.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.4-2009. The specification used was the FCC 15C and IC RSS-210 limits.

The spacing between the peripherals was 10 centimeters.

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

8.3 Test Procedure

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

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

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

The spectrum analyzer or receiver is set as:

Below 1000 MHz:

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

Above 1000 MHz:

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

8.4 Corrected Amplitude & Margin Calculation

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

CA = Ai + AF + CL + Atten – Ga

For example, the Corrected Amplitude (CA) of 40.3 dBuV/m = indicated Amplitude reading (Ai) 32.5 dBuV + Antenna Factor (AF) 23.5dB + Cable Loss (CL) 3.7 dB + Attenuator (Atten) 10 dB - Amplifier Gain (Ga) 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 (dB) = Corrected Amplitude (dBuV/m) - Limit (dBuV/m)

8.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100338	2013-09-19	1 year
Agilent	Spectrum Analyzer	E4440A	MY44303352	2014-05-10	1 year
Sunol Science Corp	System Controller	SC99V	011003-1	N/R	N/R
Sunol Science Corp	Combination Antenna	JB3	A020106-3	2014-06-18	1 year
WiseWave	Horn Antenna	ARH-4223-02	10555-01	2012-08-09	3 Years
EMCO	Horn Antenna	3115	9511-4627	2013-10-17	1 year
Hewlett Packard	Pre-amplifier	8447D	2944A10187	2014-03-08	1 year
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2014-05-09	1 year

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

8.6 Test Environmental Conditions

Temperature:	22° C
Relative Humidity:	47 %
ATM Pressure:	101.68 kPa

The testing was performed by Chen Ge on 2014-07-16 in 5 meter chamber 3.

8.7 Summary of Test Results

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

R10:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Worst Channel, Range**
-7.975	2483.5	Vertical	802.11b High 30 MHz–25 GHz

Trimble P/N 9058X-XX:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Worst Channel, Range**
-8.755	2483.5	Horizontal	802.11b High 30 MHz–25 GHz

Trimble P/N 100070-XX:

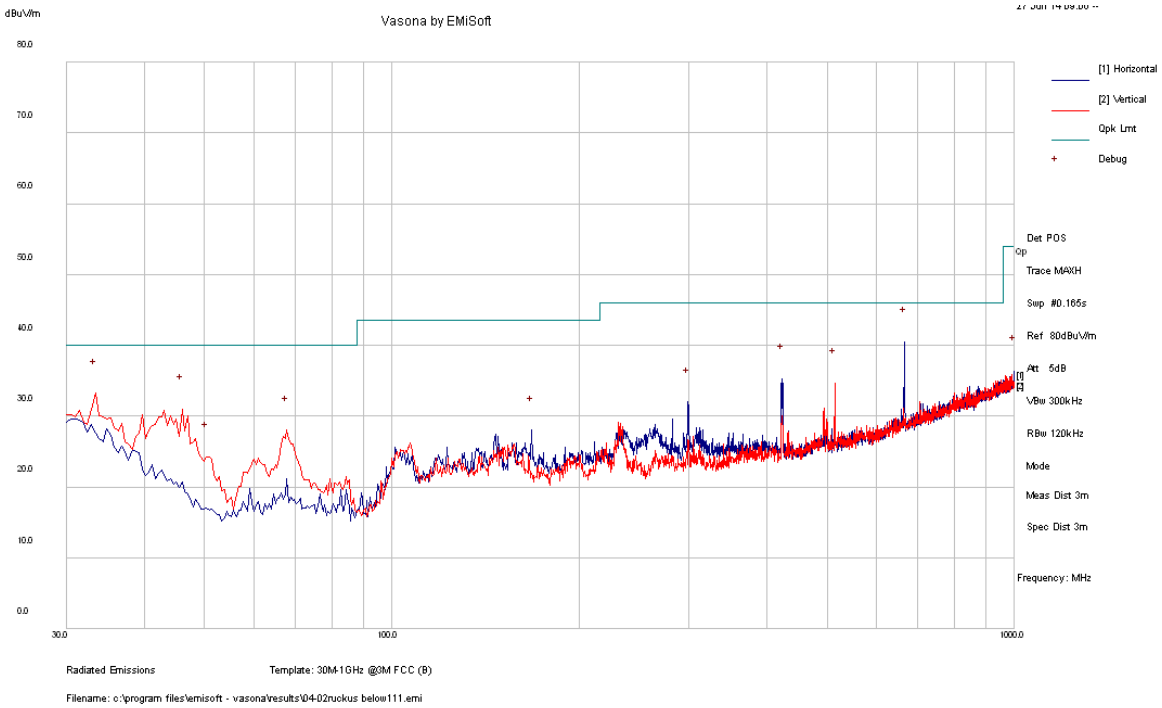
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Worst Channel, Range**
-8.645	2483.5	Vertical	802.11g High 30 MHz–25 GHz

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

8.8 Radiated Emissions Test Data and Plots

Host: R10

30 MHz – 1 GHz, Measured at 3 meters, EUT antenna port was terminated



2.4 GHz Band, Quasi-Peak Measurements, worst case

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
665.7435	24.14	253	H	114	46	-21.86
33.62475	20.65	100	V	266	40	-19.35
46.06125	28.22	152	V	17	40	-11.78
423.1008	29.03	191	H	98	46	-16.97
514.4545	34.06	100	V	262	46	-11.94
68.0765	23.15	113	V	327	40	-16.85

1–25 GHz, Measured at 3 meters

802.11b mode:

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	72.39	315	107	H	28.956	3.12	-	104.466	-	-	Peak
2412	68.99	324	120	V	28.956	3.12	-	101.066	-	-	Peak
2412	68.97	315	107	H	28.956	3.12	-	101.046	-	-	Ave
2412	64.55	324	120	V	28.956	3.12	-	96.626	-	-	Ave
2390	27.65	0	100	V	28.956	3.12	-	59.726	74	-14.274	Peak
2390	27.56	0	100	H	28.956	3.12	-	59.636	74	-14.364	Peak
2390	12.47	0	100	V	28.956	3.12	-	44.546	54	-9.454	Ave
2390	12.88	0	100	H	28.956	3.12	-	44.956	54	-9.044	Ave
4824	45.32	0	100	V	33.097	4.56	34.29	48.687	74	-25.313	Peak
4824	45.12	0	100	H	33.097	4.56	34.29	48.487	74	-25.513	Peak
4824	30.27	0	100	V	33.097	4.56	34.29	33.637	54	-20.363	Ave
4824	30.65	0	100	H	33.097	4.56	34.29	34.017	54	-19.983	Ave
7236	44.68	0	100	V	35.928	5.49	34.39	51.708	84.466	-32.758	Peak
7236	44.53	0	100	H	35.928	5.49	34.39	51.558	81.066	-29.508	Peak
7236	29.87	0	100	V	35.928	5.49	34.39	36.898	81.046	-44.148	Ave
7236	29.49	0	100	H	35.928	5.49	34.39	36.518	76.626	-40.108	Ave
9648	46	0	100	V	37.954	6.54	34.95	55.544	84.466	-28.922	Peak
9648	46.08	0	100	H	37.954	6.54	34.95	55.624	81.066	-25.442	Peak
9648	30.7	0	100	V	37.954	6.54	34.95	40.244	81.046	-40.802	Ave
9648	30.54	0	100	H	37.954	6.54	34.95	40.084	76.626	-36.542	Ave
Middle Channel 2437 MHz											
2437	70.74	46	120	V	28.956	3.12	-	102.816	-	-	Peak
2437	78.09	25	127	H	28.956	3.12	-	110.166	-	-	Peak
2437	66.42	46	120	V	28.956	3.12	-	98.496	-	-	Ave
2437	74.15	25	127	H	28.956	3.12	-	106.226	-	-	Ave
4874	44.68	0	100	V	33.327	4.54	34.29	48.257	74	-25.743	Peak
4874	44.8	0	100	H	33.327	4.54	34.29	48.377	74	-25.623	Peak
4874	30.09	0	100	V	33.327	4.54	34.29	33.667	54	-20.333	Ave
4874	30.52	0	100	H	33.327	4.54	34.29	34.097	54	-19.903	Ave
7311	44.68	0	100	V	36.369	5.57	34.39	52.229	74	-21.771	Peak
7311	44.69	0	100	H	36.369	5.57	34.39	52.239	74	-21.761	Peak
7311	29.49	0	100	V	36.369	5.57	34.39	37.039	54	-16.961	Ave
7311	29.32	0	100	H	36.369	5.57	34.39	36.869	54	-17.131	Ave
9748	44.76	0	100	V	38.087	6.62	34.95	54.517	82.816	-28.299	Peak
9748	44.85	0	100	H	38.087	6.62	34.95	54.607	90.166	-35.559	Peak
9748	30.75	0	100	V	38.087	6.62	34.95	40.507	78.496	-37.989	Ave
9748	30.69	0	100	H	38.087	6.62	34.95	40.447	86.226	-45.779	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	66.63	61	100	V	29.155	3.25	-	99.035	-	-	Peak
2462	78.47	356	126	H	29.155	3.25	-	110.875	-	-	Peak
2462	62.77	61	100	V	29.155	3.25	-	95.175	-	-	Ave
2462	75.09	356	126	H	29.155	3.25	-	107.495	-	-	Ave
2483.5	28.91	27	100	V	29.155	3.25	-	61.315	74	-12.685	Peak
2483.5	27.49	0	100	H	29.155	3.25	-	59.895	74	-14.105	Peak
2483.5	13.62	27	100	V	29.155	3.25	-	46.025	54	-7.975	Ave
2483.5	12.54	0	100	H	29.155	3.25	-	44.945	54	-9.055	Ave
4924	45.72	0	100	V	33.327	4.52	34.29	49.277	74	-24.723	Peak
4924	45.87	0	100	H	33.327	4.52	34.29	49.427	74	-24.573	Peak
4924	30.25	0	100	V	33.327	4.52	34.29	33.807	54	-20.193	Ave
4924	30.74	0	100	H	33.327	4.52	34.29	34.297	54	-19.703	Ave
7386	44.12	0	100	V	36.565	5.62	34.39	51.915	74	-22.085	Peak
7386	44.75	0	100	H	36.565	5.62	34.39	52.545	74	-21.455	Peak
7386	29.12	0	100	V	36.565	5.62	34.39	36.915	54	-17.085	Ave
7386	29.54	0	100	H	36.565	5.62	34.39	37.335	54	-16.665	Ave
9848	45.38	0	100	V	38.287	6.55	34.95	55.267	88.225	-32.958	Peak
9848	45.24	0	100	H	38.287	6.55	34.95	55.127	90.605	-35.478	Peak
9848	30.37	0	100	V	38.287	6.55	34.95	40.257	85.235	-44.978	Ave
9848	30.54	0	100	H	38.287	6.55	34.95	40.427	87.905	-47.478	Ave

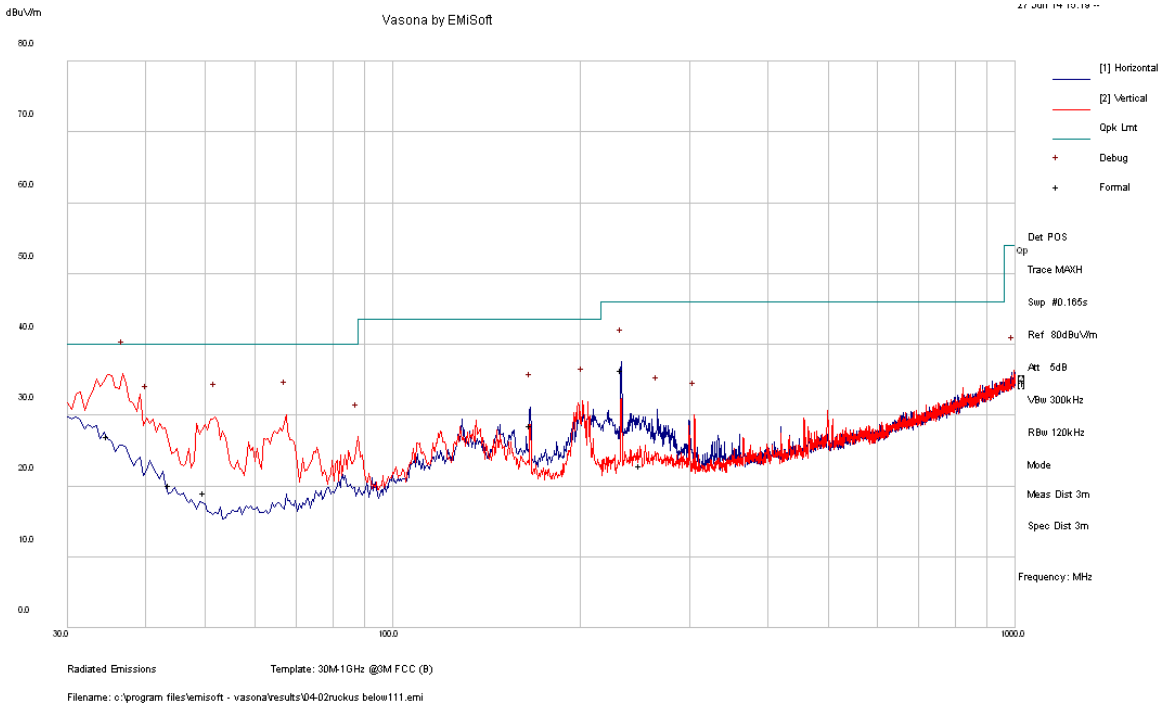
802.11g mode:

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	70.54	316	109	V	28.956	3.12	-	102.616	-	-	Peak
2412	77.68	3	129	H	28.956	3.12	-	109.756	-	-	Peak
2412	63.25	316	109	V	28.956	3.12	-	95.326	-	-	Ave
2412	70.21	3	129	H	28.956	3.12	-	102.286	-	-	Ave
2390	27.06	0	100	V	28.956	3.12	-	59.136	74	-14.864	Peak
2390	27.52	0	100	H	28.956	3.12	-	59.596	74	-14.404	Peak
2390	12.28	0	100	V	28.956	3.12	-	44.356	54	-9.644	Ave
2390	12.54	0	100	H	28.956	3.12	-	44.616	54	-9.384	Ave
4824	44.64	0	100	V	33.097	4.56	34.29	48.007	74	-25.993	Peak
4824	44.08	0	100	H	33.097	4.56	34.29	47.447	74	-26.553	Peak
4824	29.56	0	100	V	33.097	4.56	34.29	32.927	54	-21.073	Ave
4824	29.77	0	100	H	33.097	4.56	34.29	33.137	54	-20.863	Ave
7236	44.33	0	100	V	35.928	5.49	34.39	51.358	82.616	-31.258	Peak
7236	44.58	0	100	H	35.928	5.49	34.39	51.608	89.756	-38.148	Peak
7236	29.87	0	100	V	35.928	5.49	34.39	36.898	75.326	-38.428	Ave
7236	29.57	0	100	H	35.928	5.49	34.39	36.598	82.286	-45.688	Ave
9648	45.27	0	100	V	37.954	6.54	34.95	54.814	82.616	-27.802	Peak
9648	45.87	0	100	H	37.954	6.54	34.95	55.414	89.756	-34.342	Peak
9648	29.78	0	100	V	37.954	6.54	34.95	39.324	75.326	-36.002	Ave
9648	29.62	0	100	H	37.954	6.54	34.95	39.164	82.286	-43.122	Ave
Middle Channel 2437 MHz											
2437	72.56	323	105	V	28.956	3.12	-	104.636	-	-	Peak
2437	81.13	356	112	H	28.956	3.12	-	113.206	-	-	Peak
2437	65.25	323	105	V	28.956	3.12	-	97.326	-	-	Ave
2437	71.43	356	112	H	28.956	3.12	-	103.506	-	-	Ave
4874	45.24	0	100	V	33.327	4.54	34.29	48.817	74	-25.183	Peak
4874	45.42	0	100	H	33.327	4.54	34.29	48.997	74	-25.003	Peak
4874	30.5	0	100	V	33.327	4.54	34.29	34.077	54	-19.923	Ave
4874	30.21	0	100	H	33.327	4.54	34.29	33.787	54	-20.213	Ave
7311	44.36	0	100	V	36.369	5.57	34.39	51.909	74	-22.091	Peak
7311	45.02	0	100	H	36.369	5.57	34.39	52.569	74	-21.431	Peak
7311	29.58	0	100	V	36.369	5.57	34.39	37.129	54	-16.871	Ave
7311	30.11	0	100	H	36.369	5.57	34.39	37.659	54	-16.341	Ave
9748	45.42	0	100	V	38.087	6.62	34.95	55.177	84.636	-29.459	Peak
9748	45.36	0	100	H	38.087	6.62	34.95	55.117	93.206	-38.089	Peak
9748	29.88	0	100	V	38.087	6.62	34.95	39.637	77.326	-37.689	Ave
9748	29.47	0	100	H	38.087	6.62	34.95	39.227	83.506	-44.279	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	70.85	324	133	V	29.155	3.25	-	103.255	-	-	Peak
2462	82.13	353	124	H	29.155	3.25	-	114.535	-	-	Peak
2462	62.02	324	133	V	29.155	3.25	-	94.425	-	-	Ave
2462	72.3	353	124	H	29.155	3.25	-	104.705	-	-	Ave
2483.5	27.54	0	100	V	29.155	3.25	-	59.945	74	-14.055	Peak
2483.5	27.88	0	100	H	29.155	3.25	-	60.285	74	-13.715	Peak
2483.5	12.48	0	100	V	29.155	3.25	-	44.885	54	-9.115	Ave
2483.5	12.74	0	100	H	29.155	3.25	-	45.145	54	-8.855	Ave
4924	45.62	0	100	V	33.327	4.52	34.29	49.177	74	-24.823	Peak
4924	45.71	0	100	H	33.327	4.52	34.29	49.267	74	-24.733	Peak
4924	30.67	0	100	V	33.327	4.52	34.29	34.227	54	-19.773	Ave
4924	30.58	0	100	H	33.327	4.52	34.29	34.137	54	-19.863	Ave
7386	44.24	0	100	V	36.565	5.62	34.39	52.035	74	-21.965	Peak
7386	44.08	0	100	H	36.565	5.62	34.39	51.875	74	-22.125	Peak
7386	30.21	0	100	V	36.565	5.62	34.39	38.005	54	-15.995	Ave
7386	29.35	0	100	H	36.565	5.62	34.39	37.145	54	-16.855	Ave
9848	45.14	0	100	V	38.287	6.55	34.95	55.027	83.255	-28.228	Peak
9848	45.66	0	100	H	38.287	6.55	34.95	55.547	94.535	-38.988	Peak
9848	30.36	0	100	V	38.287	6.55	34.95	40.247	74.425	-34.178	Ave
9848	30.24	0	100	H	38.287	6.55	34.95	40.127	84.705	-44.578	Ave

Host: Trimble P/N 9058X-XX

30 MHz – 1 GHz, Measured at 3 meters,



2.4 GHz Band, Quasi-Peak Measurements @ 3m, worst case

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
36.8165	24.62	145	V	266	40	-15.38
233.168	35.31	102	H	92	46	-10.69
67.356	18.38	103	V	89	40	-21.62
51.65525	20.05	182	V	114	40	-19.95
40.296	21.61	154	V	106	40	-18.39
201.5088	26.64	102	V	275	43.5	-16.86

1–25 GHz, Measured at 3 meters

802.11b mode:

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
2412	58.49	225	100	V	28.956	3.12	-	90.566	-	-	Peak
2412	60.61	311	141	H	28.956	3.12	-	92.686	-	-	Peak
2412	53.73	225	100	V	28.956	3.12	-	85.806	-	-	Ave
2412	56.82	311	141	H	28.956	3.12	-	88.896	-	-	Ave
2390	26.92	0	100	V	28.956	3.12	-	58.996	74	-15.004	Peak
2390	26.57	0	100	H	28.956	3.12	-	58.646	74	-15.354	Peak
2390	12.54	0	100	V	28.956	3.12	-	44.616	54	-9.384	Ave
2390	12.74	0	100	H	28.956	3.12	-	44.816	54	-9.184	Ave
4824	44.09	0	100	V	33.097	4.56	34.29	47.457	74	-26.543	Peak
4824	44.35	0	100	H	33.097	4.56	34.29	47.717	74	-26.283	Peak
4824	30.21	0	100	V	33.097	4.56	34.29	33.577	54	-20.423	Ave
4824	30.55	0	100	H	33.097	4.56	34.29	33.917	54	-20.083	Ave
7236	44.44	0	100	V	35.928	5.49	34.39	51.468	70.566	-19.098	Peak
7236	44.58	0	100	H	35.928	5.49	34.39	51.608	72.686	-21.078	Peak
7236	29.91	0	100	V	35.928	5.49	34.39	36.938	65.806	-28.868	Ave
7236	30.52	0	100	H	35.928	5.49	34.39	37.548	68.896	-31.348	Ave
9648	44.65	0	100	V	37.954	6.54	34.95	54.194	70.566	-16.372	Peak
9648	44.87	0	100	H	37.954	6.54	34.95	54.414	72.686	-18.272	Peak
9648	30.47	0	100	V	37.954	6.54	34.95	40.014	65.806	-25.792	Ave
9648	30.58	0	100	H	37.954	6.54	34.95	40.124	68.896	-28.772	Ave
Middle Channel 2437 MHz											
2437	57.58	79	108	V	28.956	3.12	-	89.656	-	-	Peak
2437	60.69	321	105	H	28.956	3.12	-	92.766	-	-	Peak
2437	52.22	79	108	V	28.956	3.12	-	84.296	-	-	Ave
2437	56.87	321	105	H	28.956	3.12	-	88.946	-	-	Ave
4874	44.72	0	100	V	33.327	4.54	34.29	48.297	74	-25.703	Peak
4874	45.08	0	100	H	33.327	4.54	34.29	48.657	74	-25.343	Peak
4874	29.87	0	100	V	33.327	4.54	34.29	33.447	54	-20.553	Ave
4874	30.25	0	100	H	33.327	4.54	34.29	33.827	54	-20.173	Ave
7311	44.99	0	100	V	36.369	5.57	34.39	52.539	74	-21.461	Peak
7311	45.05	0	100	H	36.369	5.57	34.39	52.599	74	-21.401	Peak
7311	29.99	0	100	V	36.369	5.57	34.39	37.539	54	-16.461	Ave
7311	30.11	0	100	H	36.369	5.57	34.39	37.659	54	-16.341	Ave
9748	46.12	0	100	V	38.087	6.62	34.95	55.877	69.656	-13.779	Peak
9748	45.48	0	100	H	38.087	6.62	34.95	55.237	72.766	-17.529	Peak
9748	30.81	0	100	V	38.087	6.62	34.95	40.567	64.296	-23.729	Ave
9748	30.25	0	100	H	38.087	6.62	34.95	40.007	68.946	-28.939	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	57.96	151	120	V	29.155	3.25	-	90.365	-	-	Peak
2462	60.54	242	131	H	29.155	3.25	-	92.945	-	-	Peak
2462	51.88	151	120	V	29.155	3.25	-	84.285	-	-	Ave
2462	54.69	242	131	H	29.155	3.25	-	87.095	-	-	Ave
2483.5	26.25	0	100	V	29.155	3.25	-	58.655	74	-15.345	Peak
2483.5	26.41	0	100	H	29.155	3.25	-	58.815	74	-15.185	Peak
2483.5	11.94	0	100	V	29.155	3.25	-	44.345	54	-9.655	Ave
2483.5	12.25	0	100	H	29.155	3.25	-	44.655	54	-9.345	Ave
4924	45.15	0	100	V	33.327	4.52	34.29	48.707	74	-25.293	Peak
4924	45.35	0	100	H	33.327	4.52	34.29	48.907	74	-25.093	Peak
4924	30.39	0	100	V	33.327	4.52	34.29	33.947	54	-20.053	Ave
4924	30.25	0	100	H	33.327	4.52	34.29	33.807	54	-20.193	Ave
7386	44.49	0	100	V	36.565	5.62	34.39	52.285	74	-21.715	Peak
7386	44.25	0	100	H	36.565	5.62	34.39	52.045	74	-21.955	Peak
7386	29.81	0	100	V	36.565	5.62	34.39	37.605	54	-16.395	Ave
7386	30.02	0	100	H	36.565	5.62	34.39	37.815	54	-16.185	Ave
9848	44.35	0	100	V	38.287	6.55	34.95	54.237	88.225	-33.988	Peak
9848	44.23	0	100	H	38.287	6.55	34.95	54.117	90.605	-36.488	Peak
9848	30.68	0	100	V	38.287	6.55	34.95	40.567	85.235	-44.668	Ave
9848	30.71	0	100	H	38.287	6.55	34.95	40.597	87.905	-47.308	Ave

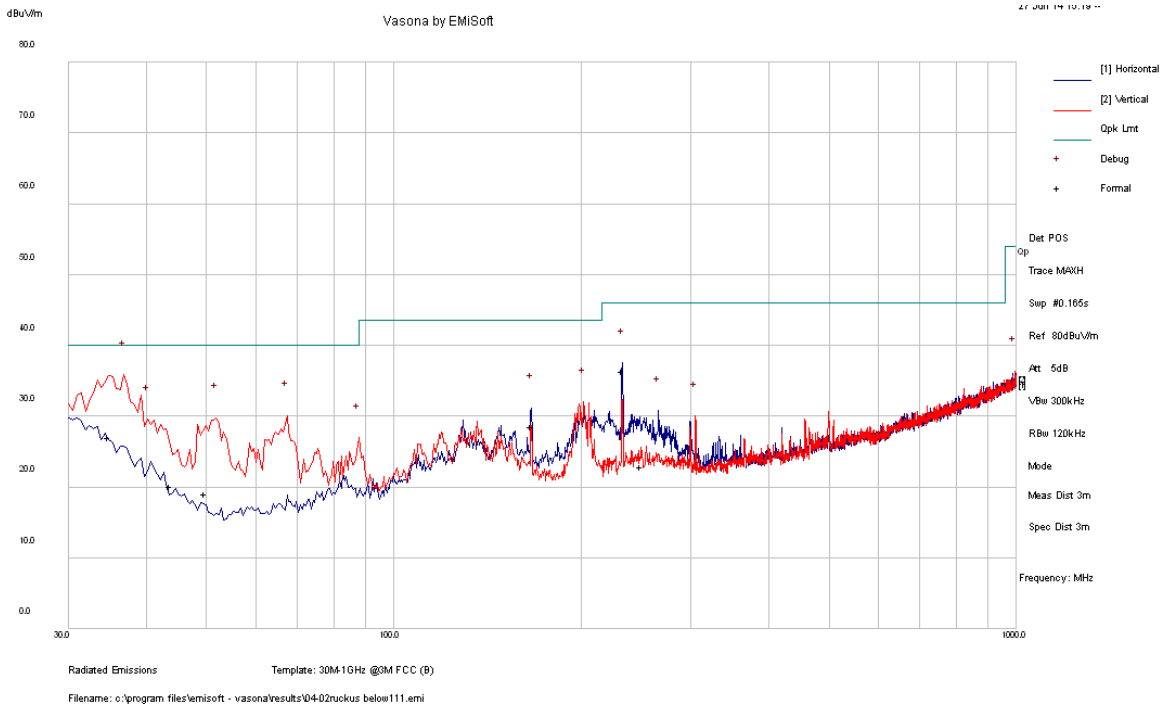
802.11g mode:

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	62.71	351	111	V	28.956	3.12	-	94.786	-	-	Peak
2412	63.13	315	124	H	28.956	3.12	-	95.206	-	-	Peak
2412	50.58	351	111	V	28.956	3.12	-	82.656	-	-	Ave
2412	51.96	315	124	H	28.956	3.12	-	84.036	-	-	Ave
2390	26.28	0	100	V	28.956	3.12	-	58.356	74	-15.644	Peak
2390	26.58	0	100	H	28.956	3.12	-	58.656	74	-15.344	Peak
2390	12.58	0	100	V	28.956	3.12	-	44.656	54	-9.344	Ave
2390	12.41	0	100	H	28.956	3.12	-	44.486	54	-9.514	Ave
4824	44.42	0	100	V	33.097	4.56	34.29	47.787	74	-26.213	Peak
4824	44.82	0	100	H	33.097	4.56	34.29	48.187	74	-25.813	Peak
4824	29.78	0	100	V	33.097	4.56	34.29	33.147	54	-20.853	Ave
4824	29.58	0	100	H	33.097	4.56	34.29	32.947	54	-21.053	Ave
7236	44.67	0	100	V	35.928	5.49	34.39	51.698	74.786	-23.088	Peak
7236	45.09	0	100	H	35.928	5.49	34.39	52.118	75.206	-23.088	Peak
7236	30.09	0	100	V	35.928	5.49	34.39	37.118	62.656	-25.538	Ave
7236	30.02	0	100	H	35.928	5.49	34.39	37.048	64.036	-26.988	Ave
9648	45.04	0	100	V	37.954	6.54	34.95	54.584	74.786	-20.202	Peak
9648	44.99	0	100	H	37.954	6.54	34.95	54.534	75.206	-20.672	Peak
9648	30.51	0	100	V	37.954	6.54	34.95	40.054	62.656	-22.602	Ave
9648	30.44	0	100	H	37.954	6.54	34.95	39.984	64.036	-24.052	Ave
Middle Channel 2437 MHz											
2437	56.41	198	100	V	28.956	3.12	-	88.486	-	-	Peak
2437	58.23	92	118	H	28.956	3.12	-	90.306	-	-	Peak
2437	44.15	198	100	V	28.956	3.12	-	76.226	-	-	Ave
2437	47.52	92	118	H	28.956	3.12	-	79.596	-	-	Ave
4874	45.52	0	100	V	33.327	4.54	34.29	49.097	74	-24.903	Peak
4874	45.24	0	100	H	33.327	4.54	34.29	48.817	74	-25.183	Peak
4874	30.04	0	100	V	33.327	4.54	34.29	33.617	54	-20.383	Ave
4874	30.21	0	100	H	33.327	4.54	34.29	33.787	54	-20.213	Ave
7311	44.21	0	100	V	36.369	5.57	34.39	51.759	74	-22.241	Peak
7311	44.51	0	100	H	36.369	5.57	34.39	52.059	74	-21.941	Peak
7311	30.1	0	100	V	36.369	5.57	34.39	37.649	54	-16.351	Ave
7311	30.21	0	100	H	36.369	5.57	34.39	37.759	54	-16.241	Ave
9748	45.65	0	100	V	38.087	6.62	34.95	55.407	68.486	-13.079	Peak
9748	45.29	0	100	H	38.087	6.62	34.95	55.047	70.306	-15.259	Peak
9748	30.87	0	100	V	38.087	6.62	34.95	40.627	56.226	-15.599	Ave
9748	30.55	0	100	H	38.087	6.62	34.95	40.307	59.596	-19.289	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	58.97	0	100	V	29.155	3.25	-	91.375	-	-	Peak
2462	60.22	42	100	H	29.155	3.25	-	92.625	-	-	Peak
2462	45.69	0	100	V	29.155	3.25	-	78.095	-	-	Ave
2462	48.01	42	100	H	29.155	3.25	-	80.415	-	-	Ave
2483.5	28.12	2	100	V	29.155	3.25	-	60.525	74	-13.475	Peak
2483.5	27.9	0	100	H	29.155	3.25	-	60.305	74	-13.695	Peak
2483.5	12.95	0	100	V	29.155	3.25	-	45.355	54	-8.645	Ave
2483.5	12.82	0	100	H	29.155	3.25	-	45.225	54	-8.775	Ave
4924	45.71	0	100	V	33.327	4.52	34.29	49.267	74	-24.733	Peak
4924	44.57	0	100	H	33.327	4.52	34.29	48.127	74	-25.873	Peak
4924	30.13	0	100	V	33.327	4.52	34.29	33.687	54	-20.313	Ave
4924	29.21	0	100	H	33.327	4.52	34.29	32.767	54	-21.233	Ave
7386	45.05	0	100	V	36.565	5.62	34.39	52.845	74	-21.155	Peak
7386	45.36	0	100	H	36.565	5.62	34.39	53.155	74	-20.845	Peak
7386	29.58	0	100	V	36.565	5.62	34.39	37.375	54	-16.625	Ave
7386	30.07	0	100	H	36.565	5.62	34.39	37.865	54	-16.135	Ave
9848	46.56	0	100	V	38.287	6.55	34.95	56.447	71.375	-14.928	Peak
9848	45.87	0	100	H	38.287	6.55	34.95	55.757	72.625	-16.868	Peak
9848	31.31	0	100	V	38.287	6.55	34.95	41.197	58.095	-16.898	Ave
9848	30.74	0	100	H	38.287	6.55	34.95	40.627	60.415	-19.788	Ave

Host: Trimble P/N 100070-XX

30 MHz – 1 GHz, Measured at 3 meters



2.4 GHz Band, Quasi-Peak Measurements @ 3m, worst case

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
236.9775	40.61	134	H	261	46	-5.39
33.6435	19.66	237	V	101	40	-20.34
215.864	33.91	122	H	360	43.5	-9.59
665.3388	21.56	288	H	119	46	-24.44
722.272	32.91	100	H	267	46	-13.09
248.673	33.71	100	H	340	46	-12.29

1–25 GHz, Measured at 3 meters

802.11b mode:

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	63.17	315	105	V	28.956	3.12	-	95.246	-	-	Peak
2412	70.69	132	139	H	28.956	3.12	-	102.766	-	-	Peak
2412	59.87	315	105	V	28.956	3.12	-	91.946	-	-	Ave
2412	67.11	132	139	H	28.956	3.12	-	99.186	-	-	Ave
2390	27.1	0	100	V	28.956	3.12	-	59.176	74	-14.824	Peak
2390	27.21	0	100	H	28.956	3.12	-	59.286	74	-14.714	Peak
2390	12.39	0	100	V	28.956	3.12	-	44.466	54	-9.534	Ave
2390	12.62	0	100	H	28.956	3.12	-	44.696	54	-9.304	Ave
4824	47.09	57	105	V	33.097	4.56	34.29	50.457	74	-23.543	Peak
4824	47.08	26	100	H	33.097	4.56	34.29	50.447	74	-23.553	Peak
4824	32.52	57	105	V	33.097	4.56	34.29	35.887	54	-18.113	Ave
4824	32.71	26	100	H	33.097	4.56	34.29	36.077	54	-17.923	Ave
7236	45.59	0	100	V	35.928	5.49	34.39	52.618	75.246	-22.628	Peak
7236	45.78	0	100	H	35.928	5.49	34.39	52.808	82.766	-29.958	Peak
7236	30.54	0	100	V	35.928	5.49	34.39	37.568	71.946	-34.378	Ave
7236	30.84	0	100	H	35.928	5.49	34.39	37.868	79.186	-41.318	Ave
9648	45.18	0	100	V	37.954	6.54	34.95	54.724	75.246	-20.522	Peak
9648	45.36	0	100	H	37.954	6.54	34.95	54.904	82.766	-27.862	Peak
9648	30.25	0	100	V	37.954	6.54	34.95	39.794	71.946	-32.152	Ave
9648	30.54	0	100	H	37.954	6.54	34.95	40.084	79.186	-39.102	Ave
Middle Channel 2437 MHz											
2437	65.15	95	119	V	28.956	3.12	-	97.226	-	-	Peak
2437	72.45	125	127	H	28.956	3.12	-	104.526	-	-	Peak
2437	61.85	95	119	V	28.956	3.12	-	93.926	-	-	Ave
2437	69.29	125	127	H	28.956	3.12	-	101.366	-	-	Ave
4874	46.91	0	100	V	33.327	4.54	34.29	50.487	74	-23.513	Peak
4874	47.47	0	100	H	33.327	4.54	34.29	51.047	74	-22.953	Peak
4874	32.21	0	100	V	33.327	4.54	34.29	35.787	54	-18.213	Ave
4874	31.54	0	100	H	33.327	4.54	34.29	35.117	54	-18.883	Ave
7311	44.96	0	100	V	36.369	5.57	34.39	52.509	74	-21.491	Peak
7311	45.96	0	100	H	36.369	5.57	34.39	53.509	74	-20.491	Peak
7311	30.47	0	100	V	36.369	5.57	34.39	38.019	54	-15.981	Ave
7311	30.58	0	100	H	36.369	5.57	34.39	38.129	54	-15.871	Ave
9748	46.73	0	100	V	38.087	6.62	34.95	56.487	77.226	-20.739	Peak
9748	45.87	0	100	H	38.087	6.62	34.95	55.627	84.526	-28.899	Peak
9748	31.22	0	100	V	38.087	6.62	34.95	40.977	73.926	-32.949	Ave
9748	30.48	0	100	H	38.087	6.62	34.95	40.237	81.366	-41.129	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	64.13	94	113	V	29.155	3.25	-	96.535	-	-	Peak
2462	71.05	125	121	H	29.155	3.25	-	103.455	-	-	Peak
2462	60.84	94	113	V	29.155	3.25	-	93.245	-	-	Ave
2462	67.66	125	121	H	29.155	3.25	-	100.065	-	-	Ave
2483.5	27.24	0	100	V	29.155	3.25	-	59.645	74	-14.355	Peak
2483.5	27.66	0	100	H	29.155	3.25	-	60.065	74	-13.935	Peak
2483.5	12.36	0	100	V	29.155	3.25	-	44.765	54	-9.235	Ave
2483.5	12.84	0	100	H	29.155	3.25	-	45.245	54	-8.755	Ave
4924	45.98	0	100	V	33.327	4.52	34.29	49.537	74	-24.463	Peak
4924	47.21	35	100	H	33.327	4.52	34.29	50.767	74	-23.233	Peak
4924	30.25	0	100	V	33.327	4.52	34.29	33.807	54	-20.193	Ave
4924	32.54	35	100	H	33.327	4.52	34.29	36.097	54	-17.903	Ave
7386	45.08	0	100	V	36.565	5.62	34.39	52.875	74	-21.125	Peak
7386	45.36	0	100	H	36.565	5.62	34.39	53.155	74	-20.845	Peak
7386	30.11	0	100	V	36.565	5.62	34.39	37.905	54	-16.095	Ave
7386	30.26	0	100	H	36.565	5.62	34.39	38.055	54	-15.945	Ave
9848	45.48	0	100	V	38.287	6.55	34.95	55.367	88.225	-32.858	Peak
9848	44.68	0	100	H	38.287	6.55	34.95	54.567	90.605	-36.038	Peak
9848	30.25	0	100	V	38.287	6.55	34.95	40.137	85.235	-45.098	Ave
9848	30.95	0	100	H	38.287	6.55	34.95	40.837	87.905	-47.068	Ave

802.11g mode:

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	70.83	153	115	V	28.956	3.12	-	102.906	-	-	Peak
2412	76.17	120	134	H	28.956	3.12	-	108.246	-	-	Peak
2412	66.54	153	115	V	28.956	3.12	-	98.616	-	-	Ave
2412	65.24	120	134	H	28.956	3.12	-	97.316	-	-	Ave
2390	27.32	0	100	V	28.956	3.12	-	59.396	74	-14.604	Peak
2390	27.14	0	100	H	28.956	3.12	-	59.216	74	-14.784	Peak
2390	12.65	0	100	V	28.956	3.12	-	44.726	54	-9.274	Ave
2390	12.88	0	100	H	28.956	3.12	-	44.956	54	-9.044	Ave
4824	46.41	0	100	V	33.097	4.56	34.29	49.777	74	-24.223	Peak
4824	46.52	0	100	H	33.097	4.56	34.29	49.887	74	-24.113	Peak
4824	31.25	0	100	V	33.097	4.56	34.29	34.617	54	-19.383	Ave
4824	31.62	0	100	H	33.097	4.56	34.29	34.987	54	-19.013	Ave
7236	45.28	0	100	V	35.928	5.49	34.39	52.308	82.906	-30.598	Peak
7236	45.36	0	100	H	35.928	5.49	34.39	52.388	88.246	-35.858	Peak
7236	30.25	0	100	V	35.928	5.49	34.39	37.278	78.616	-41.338	Ave
7236	30.24	0	100	H	35.928	5.49	34.39	37.268	77.316	-40.048	Ave
9648	45.81	0	100	V	37.954	6.54	34.95	55.354	82.906	-27.552	Peak
9648	45.06	0	100	H	37.954	6.54	34.95	54.604	88.246	-33.642	Peak
9648	30.25	0	100	V	37.954	6.54	34.95	39.794	78.616	-38.822	Ave
9648	30.27	0	100	H	37.954	6.54	34.95	39.814	77.316	-37.502	Ave
Middle Channel 2437 MHz											
2437	74.62	147	103	V	28.956	3.12	-	106.696	-	-	Peak
2437	75.46	126	124	H	28.956	3.12	-	107.536	-	-	Peak
2437	62.48	147	103	V	28.956	3.12	-	94.556	-	-	Ave
2437	65.39	126	124	H	28.956	3.12	-	97.466	-	-	Ave
4874	45.77	0	100	V	33.327	4.54	34.29	49.347	74	-24.653	Peak
4874	45.68	0	100	H	33.327	4.54	34.29	49.257	74	-24.743	Peak
4874	30.54	0	100	V	33.327	4.54	34.29	34.117	54	-19.883	Ave
4874	30.64	0	100	H	33.327	4.54	34.29	34.217	54	-19.783	Ave
7311	46.12	0	100	V	36.369	5.57	34.39	53.669	74	-20.331	Peak
7311	46.33	0	100	H	36.369	5.57	34.39	53.879	74	-20.121	Peak
7311	31.52	0	100	V	36.369	5.57	34.39	39.069	54	-14.931	Ave
7311	31.59	0	100	H	36.369	5.57	34.39	39.139	54	-14.861	Ave
9748	45.87	0	100	V	38.087	6.62	34.95	55.627	86.696	-31.069	Peak
9748	45.68	0	100	H	38.087	6.62	34.95	55.437	87.536	-32.099	Peak
9748	31.55	0	100	V	38.087	6.62	34.95	41.307	74.556	-33.249	Ave
9748	31.68	0	100	H	38.087	6.62	34.95	41.437	77.466	-36.029	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	64.73	88	114	V	29.155	3.25	-	97.135	-	-	Peak
2462	73.74	121	124	H	29.155	3.25	-	106.145	-	-	Peak
2462	54.61	88	114	V	29.155	3.25	-	87.015	-	-	Ave
2462	63.35	121	124	H	29.155	3.25	-	95.755	-	-	Ave
2483.5	27.42		100	V	29.155	3.25	-	59.825	74	-14.175	Peak
2483.5	27.63	0	100	H	29.155	3.25	-	60.035	74	-13.965	Peak
2483.5	12.03	0	100	V	29.155	3.25	-	44.435	54	-9.565	Ave
2483.5	12.54	0	100	H	29.155	3.25	-	44.945	54	-9.055	Ave
4924	46.07	0	100	V	33.327	4.52	34.29	49.627	74	-24.373	Peak
4924	46.32	0	100	H	33.327	4.52	34.29	49.877	74	-24.123	Peak
4924	31.03	0	100	V	33.327	4.52	34.29	34.587	54	-19.413	Ave
4924	31.2	0	100	H	33.327	4.52	34.29	34.757	54	-19.243	Ave
7386	44.49	0	100	V	36.565	5.62	34.39	52.285	74	-21.715	Peak
7386	44.63	0	100	H	36.565	5.62	34.39	52.425	74	-21.575	Peak
7386	30.32	0	100	V	36.565	5.62	34.39	38.115	54	-15.885	Ave
7386	30.25	0	100	H	36.565	5.62	34.39	38.045	54	-15.955	Ave
9848	45.96	0	100	V	38.287	6.55	34.95	55.847	77.135	-21.288	Peak
9848	45.48	0	100	H	38.287	6.55	34.95	55.367	86.145	-30.778	Peak
9848	30.25	0	100	V	38.287	6.55	34.95	40.137	67.015	-26.878	Ave
9848	30.33	0	100	H	38.287	6.55	34.95	40.217	75.755	-35.538	Ave

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

9.1 Applicable Standard

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

9.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emissions bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

9.3 Test Equipment List and Details

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

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

9.4 Test Environmental Conditions

Temperature:	21° C
Relative Humidity:	29 %
ATM Pressure:	102.4 kPa

The testing was performed by Chen Ge on 2014-07-03 at RF test site.

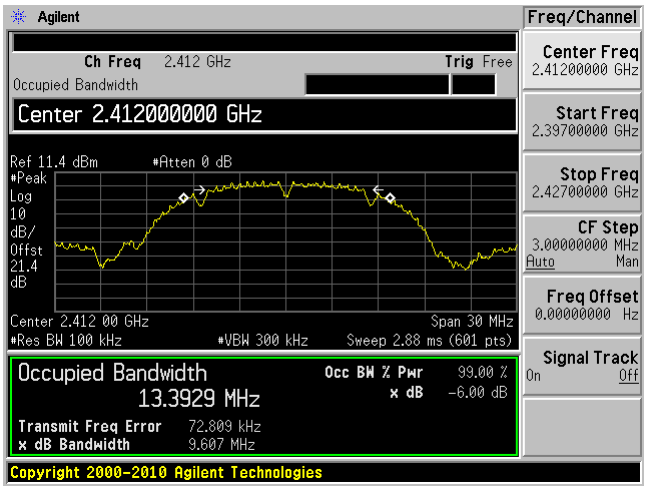
9.5 Test Results

Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	6 dB Emission Bandwidth (MHz)	Limit (kHz)	Results
802.11b mode					
Low	2412	13.3929	9.607	> 500	Compliant
Middle	2437	13.4264	10.076	> 500	Compliant
High	2462	13.4563	9.608	> 500	Compliant
802.11g mode					
Low	2412	16.4777	16.616	> 500	Compliant
Middle	2437	16.4613	16.588	> 500	Compliant
High	2462	16.4661	16.597	> 500	Compliant

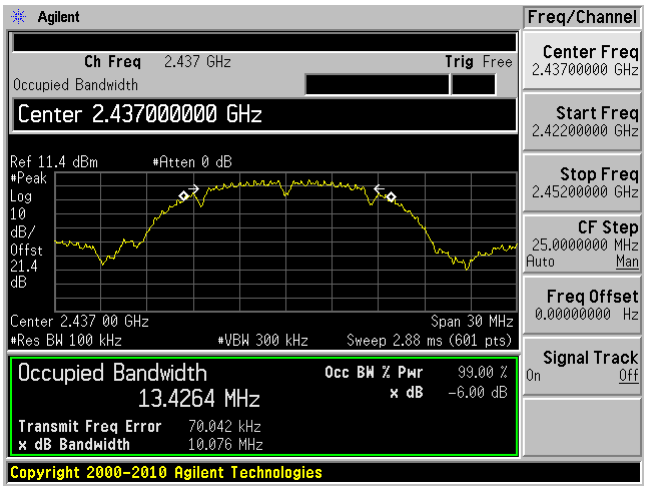
Please refer to the following plots for detailed test results

802.11 b

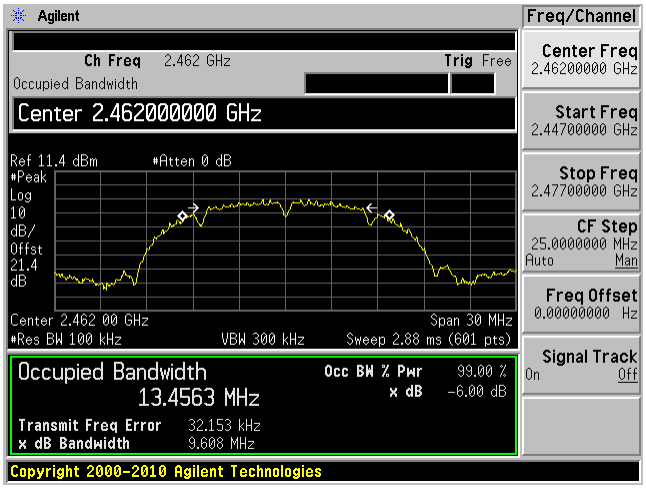
Low channel: 2412 MHz



Middle Channel: 2437 MHz

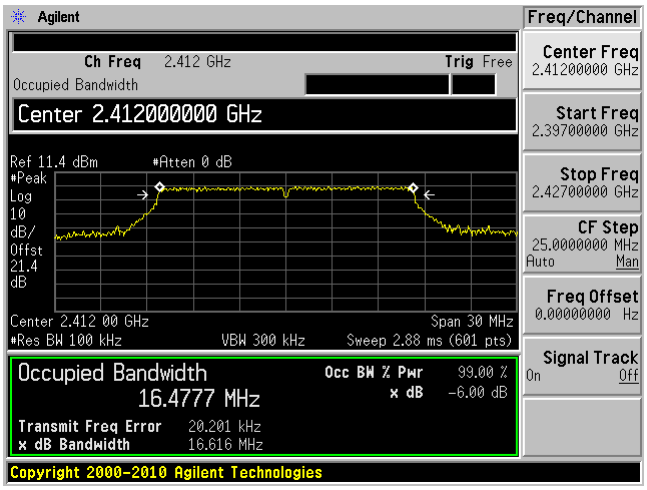


High Channel: 2462 MHz

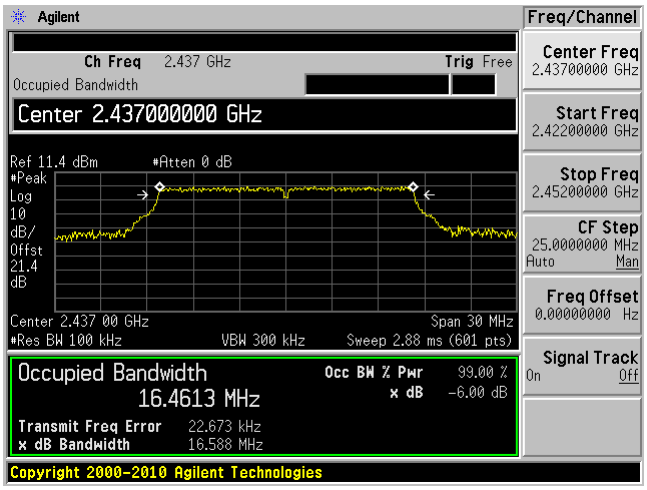


802.11 g

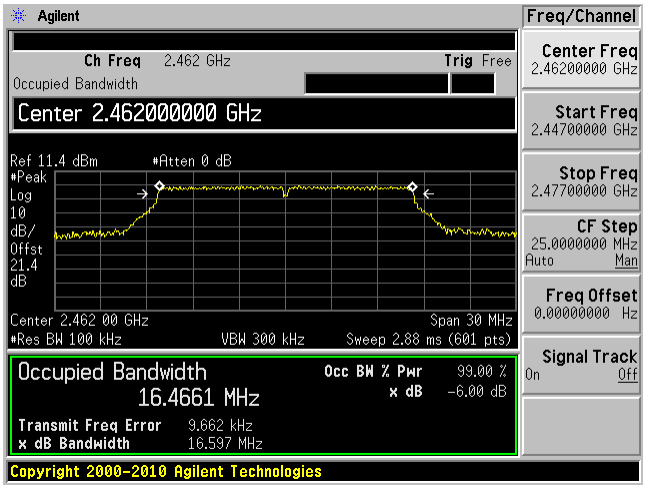
Low channel: 2412 MHz



Middle Channel: 2437 MHz



High Channel: 2462 MHz



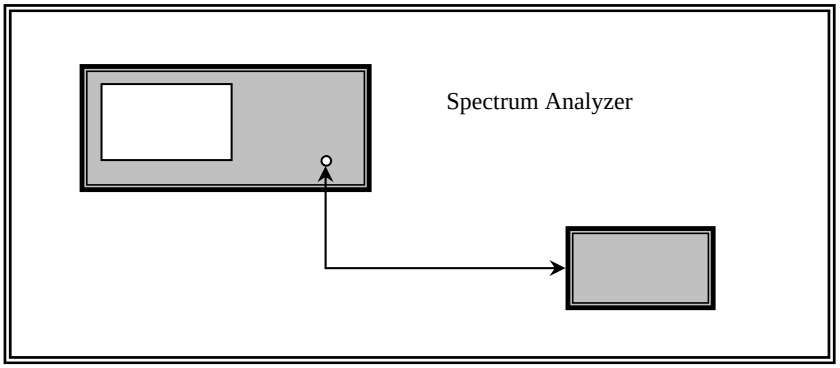
10 FCC §15.247(b) & IC RSS-210 §A8.4 - Peak Output Power Measurement

10.1 Applicable Standard

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

10.2 Measurement Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a spectrum analyzer.
3. Add a correction factor to the display.



10.3 Test Equipment List and Details

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

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

10.4 Test Environmental Conditions

Temperature:	21° C
Relative Humidity:	29 %
ATM Pressure:	102.4 kPa

The testing was performed by Chen Ge on 2014-07-03 at RF test site.

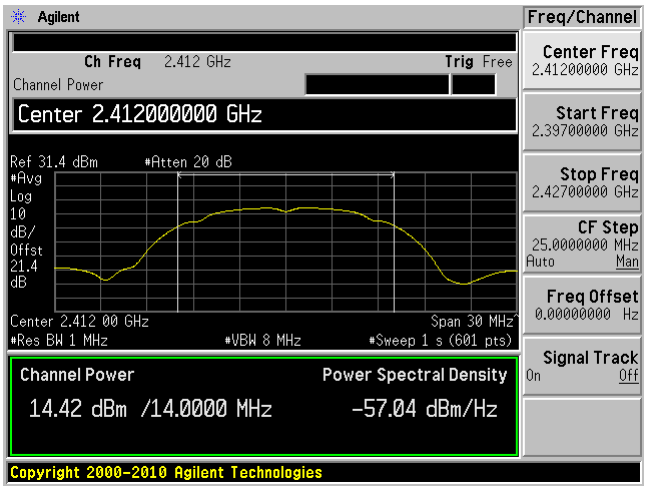
10.5 Test Results

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11b mode				
Low	2412	14.42	30	-15.58
Middle	2437	14.67	30	-15.33
High	2462	14.73	30	-15.27
802.11g mode				
Low	2412	14.85	30	-15.15
Middle	2437	14.65	30	-15.35
High	2462	14.74	30	-15.26

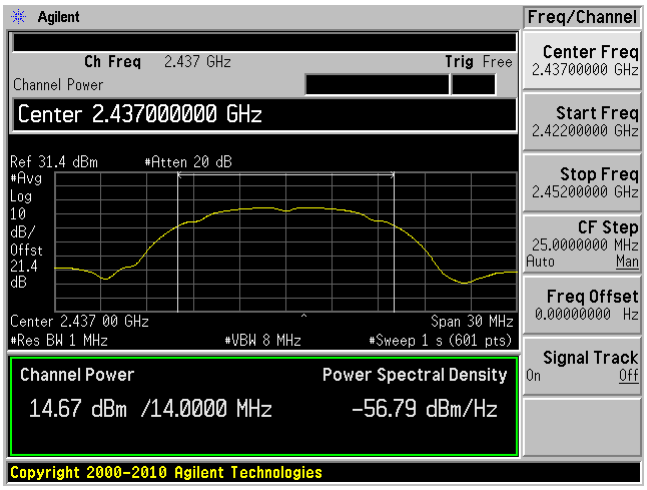
Please refer to the following plots.

802.11 b

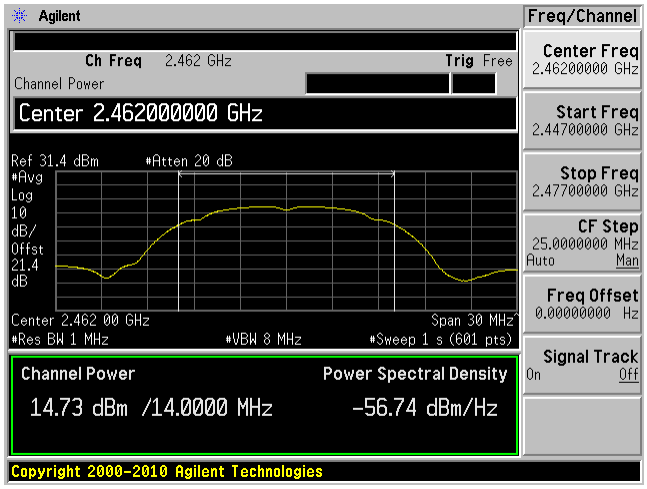
Low channel: 2412 MHz



Middle Channel: 2437 MHz

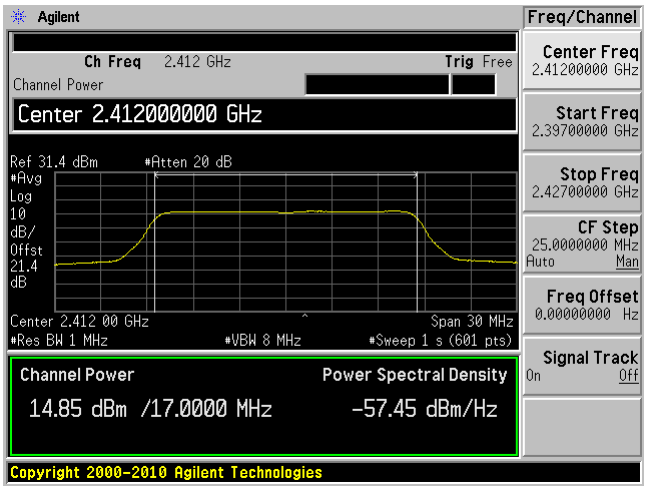


High Channel: 2462 MHz

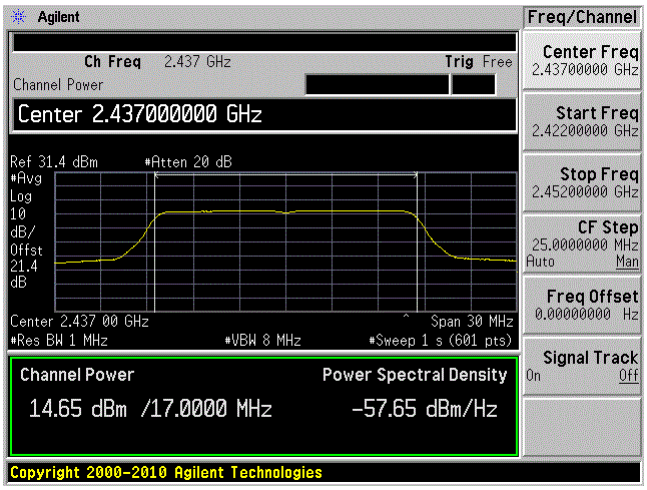


802.11 g

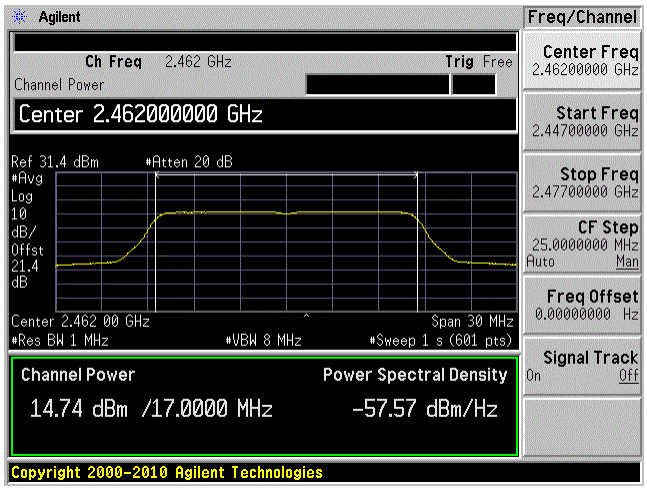
Low channel: 2412 MHz



Middle Channel: 2437 MHz



High Channel: 2462 MHz



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

11.1 Applicable Standard

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

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

11.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

11.3 Test Equipment List and Details

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

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

11.4 Test Environmental Conditions

Temperature:	21° C
Relative Humidity:	29 %
ATM Pressure:	102.4 kPa

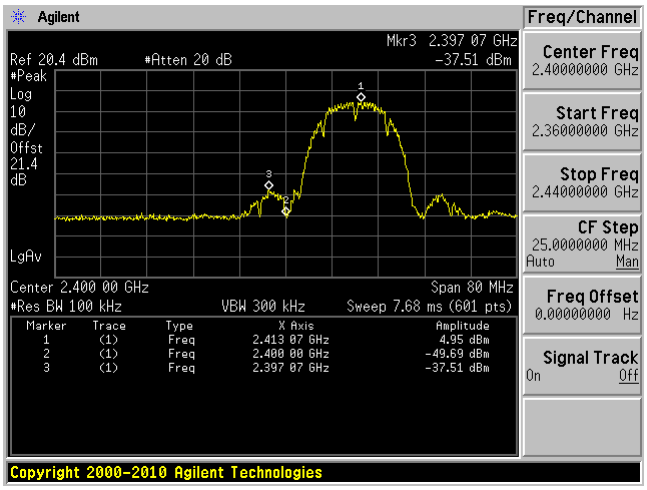
The testing was performed by Chen Ge on 2014-07-03 at RF test site.

11.5 Test Results

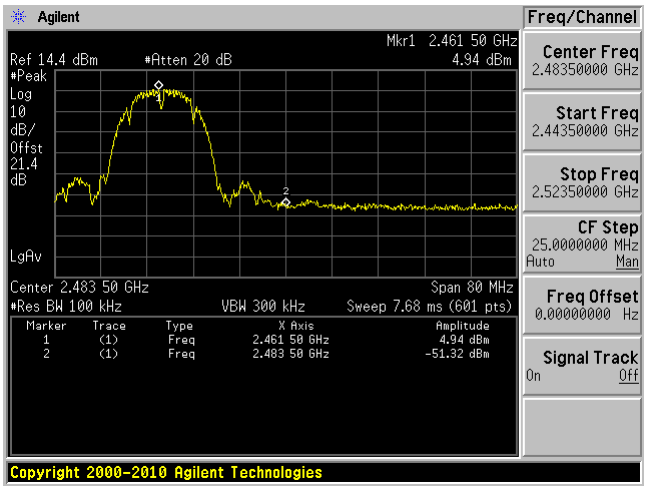
Please refer to following pages for plots of band edge.

802.11b

Low Band Edge

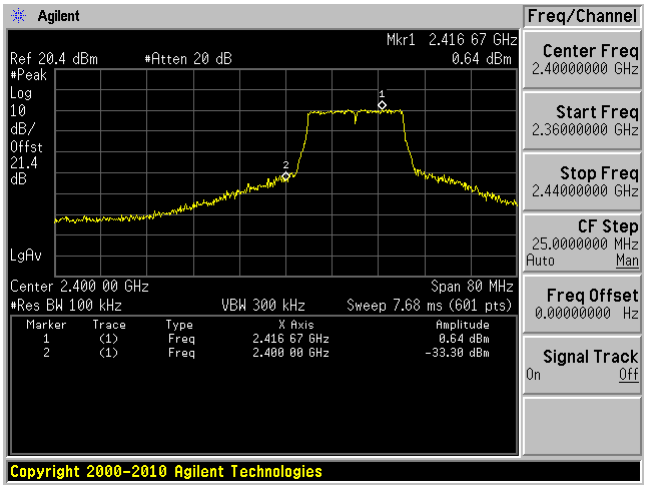


High Band Edge

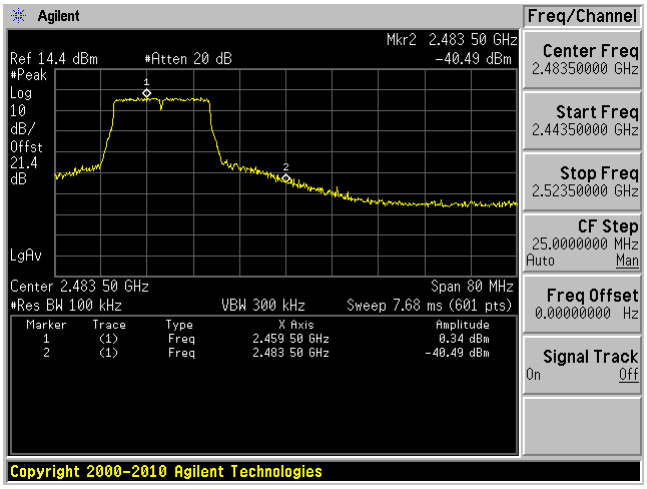


802.11g

Low Band Edge



High Band Edge



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

12.1 Applicable Standard

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

12.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position and set the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to 1.5MHz span mode. Additionally set RBW and VBW of spectrum analyzer to proper value.
4. Repeat above procedures until all frequencies measured were complete.

12.3 Test Equipment List and Details

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

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

12.4 Test Environmental Conditions

Temperature:	21° C
Relative Humidity:	29 %
ATM Pressure:	102.4 kPa

The testing was performed by Chen Ge on 2014-07-03 at RF test site.

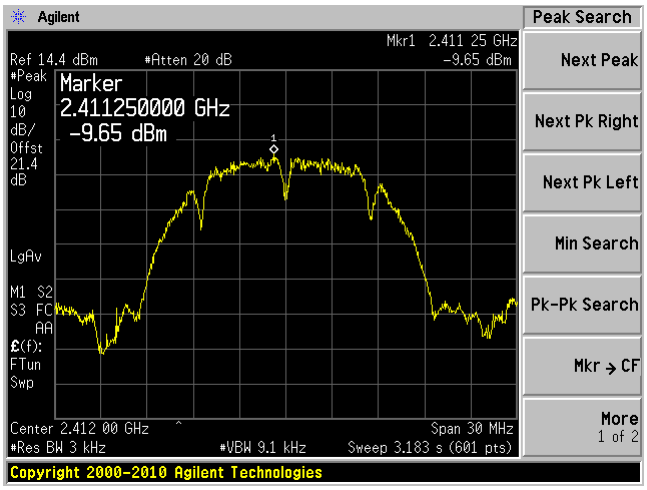
12.5 Test Results

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)
802.11 b				
Low	2412	-9.65	8	-17.65
Middle	2437	-9.70	8	-17.7
High	2462	-9.65	8	-17.65
802.11 g				
Low	2412	-11.63	8	-19.63
Middle	2437	-11.89	8	-19.89
High	2462	-12.00	8	-20

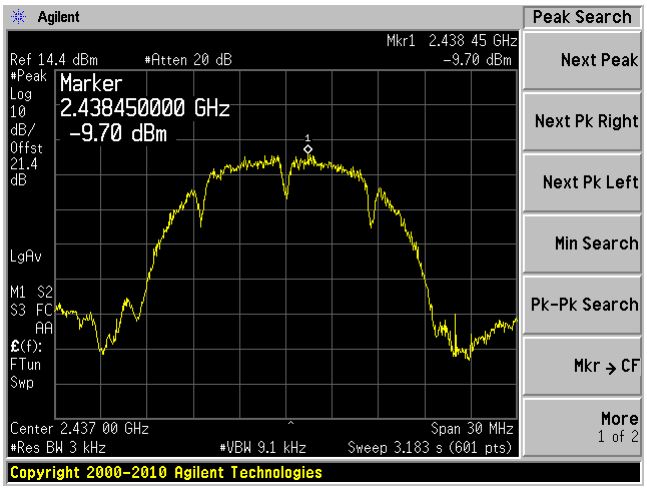
Please refer to the following plots.

802.11 b

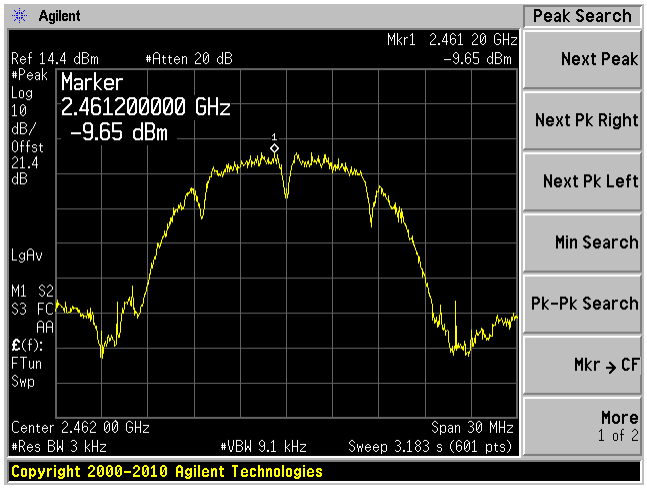
Low channel: 2412 MHz



Middle Channel: 2437 MHz

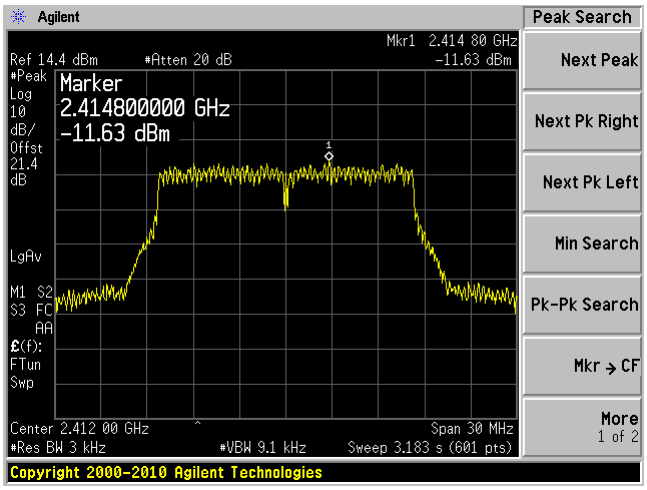


High Channel: 2462 MHz

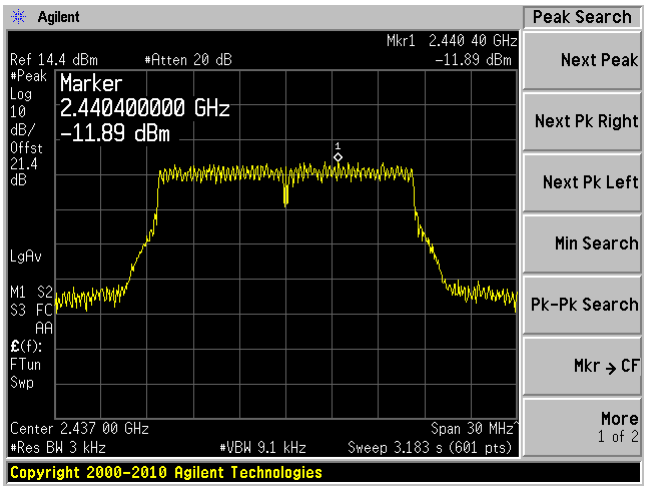


802.11 g

Low channel: 2412 MHz



Middle Channel: 2437 MHz



High Channel: 2462 MHz