FCC 47 CFR PART 15 SUBPART C

for

Powerline Wireless Network Extender

Model: WPB3000

Brand: Actiontec

Test Report Number:
C130722Z01-RP1
Issued Date: August 1, 2013

Issued for

Actiontec Electronics, Inc.
760 North Mary Ave., Sunnyvale, CA 94085 USA

Issued by:

Compliance Certification Services (Shenzhen) Inc.
No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd.,
Guan Lan Town, Baoan District, Shenzhen, China
TEL: 86-755-28055000
FAX: 86-755-28055221

A2LA ACCREDITED
TESTING CERT #2861.01

Revision History

Rev.	Issue No.	Revisions	Effect Page	Revised By
00	C130722Z01-RP1	Initial Issue	ALL	Sabrina Wang

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1 TEST CERTIFICATION

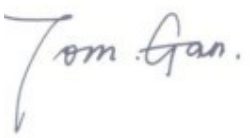
Product	Powerline Wireless Network Extender
Model	WPB3000
Brand	Actiontec
Tested	July 22~August 1, 2013
Applicant	**Actiontec Electronics, Inc.** 760 North Mary Ave., Sunnyvale, CA 94085 USA
Manufacturer	**Shenzhen Gongjin Electronics Co., Ltd.** B116, B118, A211-A213, B201-B213, A311-A313, B411-413, BF08-09 Nanshan Medical Instrument Industry Park, 1019# Nanhai Road, Nanshan District, Shenzhen, Guangdong, 518067, P.R.China

APPLICABLE STANDARDS			
Standard	**Test Type**	**Standard**	**Test Type**
15.207(a)	Power Line Conducted Emissions	15.247(d) 15.209(a)	● Spurious Emissions ● Conducted Measurement ● Radiated Emissions
15.247(a)(2)	6dB Bandwidth Measurement	15.247(b)(3) 15.247(b)(4)	Peak Power Measurement
15.247(d)	Band Edges Measurement	15.247(e)	Peak Power Spectral Density

We hereby certify that:

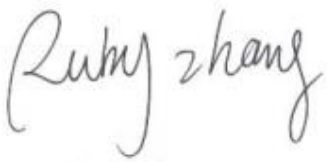
The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in **ANSI C63.4: 2009** and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.
The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:



Tom Gan
Supervisor of EMC Dept.
Compliance Certification Service Inc.

Reviewed by:



Ruby Zhang
Supervisor of Report Dept.
Compliance Certification Service Inc.

2 TEST RESULT SUMMARY

APPLICABLE STANDARDS			
Standard	**Test Type**	**Result**	**Remark**
15.247(a)(2)	6dB Bandwidth Measurement	Pass	Meet the requirement of limit.
15.247(b)(3) 15.247(b)(4)	Peak Power Measurement	Pass	Meet the requirement of limit.
15.247(d)	Band Edges Measurement	Pass	Meet the requirement of limit.
15.247(e)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.247(d) 15.209(a)	● Spurious Emissions ● Conducted Measurement ● Radiated Emissions	Pass	Meet the requirement of limit.
15.207(a)	Power line Conducted Emissions	Pass	Meet the requirement of limit.

Note: 1. The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.
2. The information of measurement uncertainty is available upon the customer's request.

3 EUT DESCRIPTION

Product	Powerline Wireless Network Extender
Model Number	WPB3000
Brand	Actiontec
Model Discrepancy	N/A
Serial Number	C130722Z01-RP1
Received Date	July 22, 2013
Power Supply	Input: AC100-240V~50/60Hz, 0.15A
Transmit Power	IEEE 802.11b mode: 12.60dBm (Antenna 0) IEEE 802.11b mode: 14.10dBm (Antenna 1) IEEE 802.11g mode: 21.20dBm (Antenna 0) IEEE 802.11g mode: 21.50dBm (Antenna 1) IEEE 802.11n HT20 MHz mode: 24.11dBm(Combine with Antenna 0 and Antenna 1) IEEE 802.11n HT40 MHz mode: 20.51dBm(Combine with Antenna 0 and Antenna 1)
Modulation Technique	IEEE 802.11b mode: DSSS(CCK,QPSK, BPSK) IEEE 802.11g mode: OFDM (BPSK/QPSK/16QAM/64QAM) IEEE 802.11n HT20 MHz mode: OFDM (BPSK/QPSK/16QAM/64QAM) IEEE 802.11n HT40 MHz mode: OFDM (BPSK/QPSK/16QAM/64QAM)
Transmit Data Rate	IEEE 802.11b: 11Mbps(CCK) with fall back rates of 5.5/2/1Mbps IEEE 802.11g: 54Mbps with fall back rates of 48/36/24/18/12/9 /6Mbps IEEE 802.11n HT20: 65.0Mbps with fall back rates of 65.0/58.5/52.0/ 39.0/26.0/19.5/13.0/6.5 Mbps IEEE 802.11n HT40: 135.0Mbps with fall back rates of 121.5/ 108.0/ 81.0/54.0/40.5/27.0/13.5 Mbps
Number of Channels	IEEE 802.11b mode: 11 Channels IEEE 802.11g mode: 11 Channels IEEE 802.11n HT20 MHz mode: 11 Channels IEEE 802.11n HT40 MHz mode: 7 Channels
Antenna Specification	Dipole Antenna with 2.0dBi gain (Max)
Channels Spacing	IEEE 802.11b/g ,802.11n HT20/HT40 : 5MHz
Temperature Range	-10°C ~ +70°C

Note: *1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*

*2. This submittal(s) (test report) is intended for FCC ID: **LNQWPB3000** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.*

4 TEST METHODOLOGY

4.1. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Test Item	Test mode	Worse mode
Conducted Emission	**Mode 1:** Normal Link	**Mode 1**
Radiated Emission	**Mode 1:** TX	**Mode 1**

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only, and power line conducted emission below 30MHz, which worst case was in normal link mode.

IEEE802.11b mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High(2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE802.11g mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT20 MHz mode: Channel Low (2412MHz), Channel Mid(2437MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT40 MHz mode: Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with 13.5Mbps data rate were chosen for full testing.

5 SETUP OF EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1	NOTEBOOK	E335	R9-WN1EF	N/A	Thinkpad	Unshielded 1.20m	N/A

Note:

Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5.2. CONFIGURATION OF SYSTEM UNDER TEST

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

6 FACILITIES AND ACCREDITATIONS

6.1. FACILITIES

All measurement facilities used to collect the measurement data are located at **No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China**

The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	**A2LA**
China	**CNAS**

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA	**FCC**
Japan	**VCCI(C-3478, R-3135, T-652, G-624)**
Canada	**INDUSTRY CANADA**
Taiwan	**BSMI**
Norway	**Nemko**

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsrf.com

6.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Parameter	Uncertainty
Radiated Emission, 30 to 200 MHz Test Site : 966(2)	+/-3.6880dB
Radiated Emission, 200 to 1000 MHz Test Site : 966(2)	+/-3.6695dB
Radiated Emission, 1 to 8 GHz	+/-5.1782dB
Radiated Emission, 8 to 18 GHz	+/-5.2173dB
Conducted Emissions	+/-3.6836dB
Band Width	178kHz
Peak Output Power MU	+/-1.906dB
Band Edge MU	+/-0.182dB
Channel Separation MU	416.178Hz
Duty Cycle MU	0.054ms
Frequency Stability MU	226Hz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.

7 FCC PART 15.247 REQUIREMENTS

7.1. POWER LINE CONDUCTED EMISSIONS MEASUREMENT

7.1.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, 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 frequency ranges.

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

NOTE:

(1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

7.1.2. TEST INSTRUMENTS

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2013	03/08/2014
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	04/20/2013	04/19/2014
LISN	EMCO	3825/2	8901-1459	03/09/2013	03/08/2014
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	03/04/2013	03/03/2014
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R = No Calibration Request.

7.1.3. TEST PROCEDURES (please refer to measurement standard)

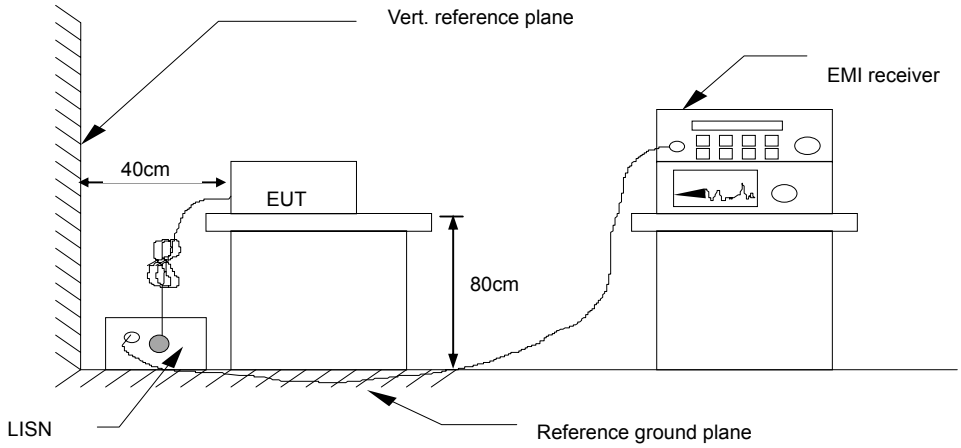
- The EUT and Support equipment, if needed, was placed on a non-conducted table, which is 0.8m above the ground plane and 0.4m away from the conducted wall.

- The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane. All support equipment power received from a second LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

- The frequency range from 150 kHz to 30 MHz was searched. The test data of the worst-case condition(s) was recorded. Emission levels under limit 20dB were not recorded.

7.1.4. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.1.5. DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit = Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

7.1.6. TEST RESULTS

Model No.	WPB3000	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 1
Tested by	Eve Wang	**Line**	L1

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)	**Line (L1/L2)**
0.5830	34.34	7.22	9.72	44.06	16.94	56.00	46.00	-11.94	-29.06	Pass	L1
0.7630	32.79	4.41	9.77	42.56	14.18	56.00	46.00	-13.44	-31.82	Pass	L1
0.9630	36.26	2.92	9.72	45.98	12.64	56.00	46.00	-10.02	-33.36	Pass	L1
1.2190	35.13	6.58	9.71	44.84	16.29	56.00	46.00	-11.16	-29.71	Pass	L1
1.3670	36.38	2.63	9.72	46.10	12.35	56.00	46.00	-9.90	-33.65	Pass	L1
1.6590	38.63	3.78	9.72	48.35	13.50	56.00	46.00	-7.65	-32.50	Pass	L1
0.6390	36.29	4.26	9.69	45.98	13.95	56.00	46.00	-10.02	-32.05	Pass	L2
0.9350	36.54	3.77	9.79	46.33	13.56	56.00	46.00	-9.67	-32.44	Pass	L2
0.9790	35.80	2.52	9.80	45.60	12.32	56.00	46.00	-10.40	-33.68	Pass	L2
1.3150	36.07	4.15	9.79	45.86	13.94	56.00	46.00	-10.14	-32.06	Pass	L2
1.4390	38.00	3.06	9.78	47.78	12.84	56.00	46.00	-8.22	-33.16	Pass	L2
1.6390	38.14	5.66	9.76	47.90	15.42	56.00	46.00	-8.10	-30.58	Pass	L2

REMARKS: *L1 = Line One (Live Line)*

L2 = Line Two (Neutral Line)

7.2. SPURIOUS EMISSIONS MEASUREMENT

7.2.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

§15.247(d)specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:
If the peakoutput power procedure is used to measure the fundamental emission powerto demonstrate compliance to 15.247(b)(3)requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency bandshall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
If the averageoutput power procedure is used to measure the fundamental emission powerto demonstrate compliance to 15.247(b)(3)requirements,then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measuredin-band average PSD level.
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 Section 15.205(c)).

7.2.2. TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/09/2013	03/08/2014

7.2.3. TEST PROCEDURE (please refer to measurement standard)

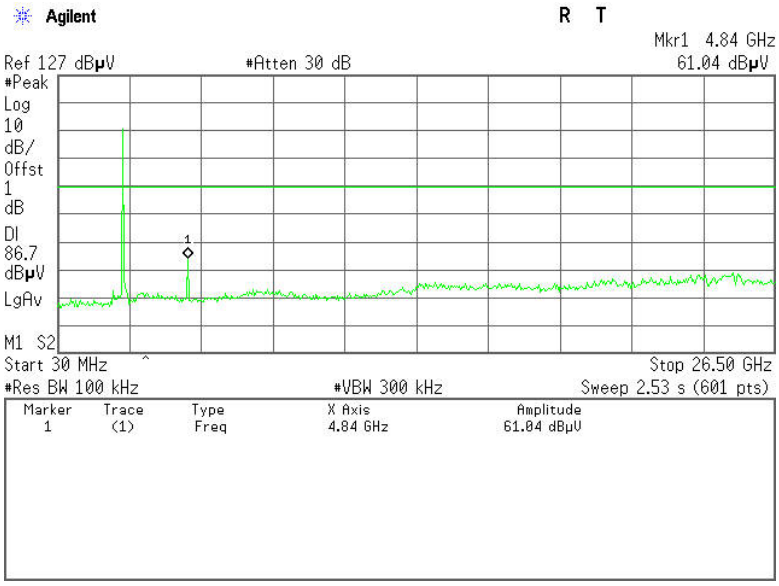
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.
Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

7.2.4. TEST RESULTS

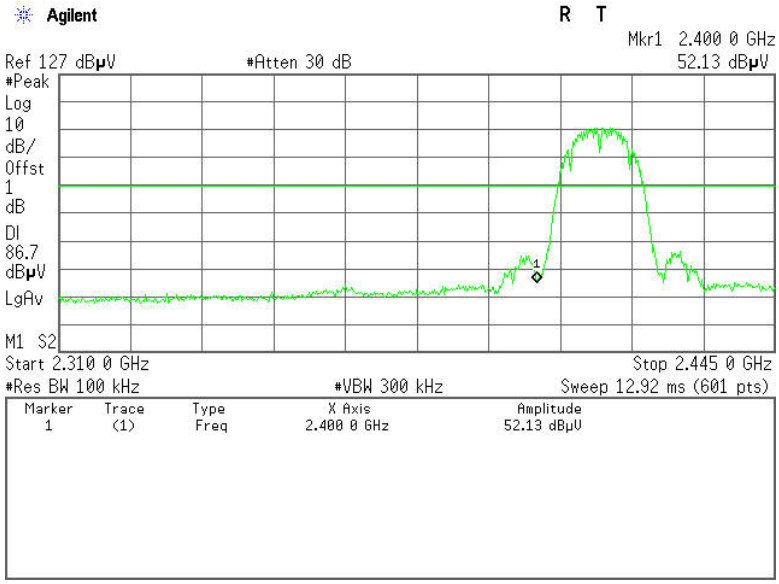
Test Plot

IEEE 802.11b(Antenna 0) mode

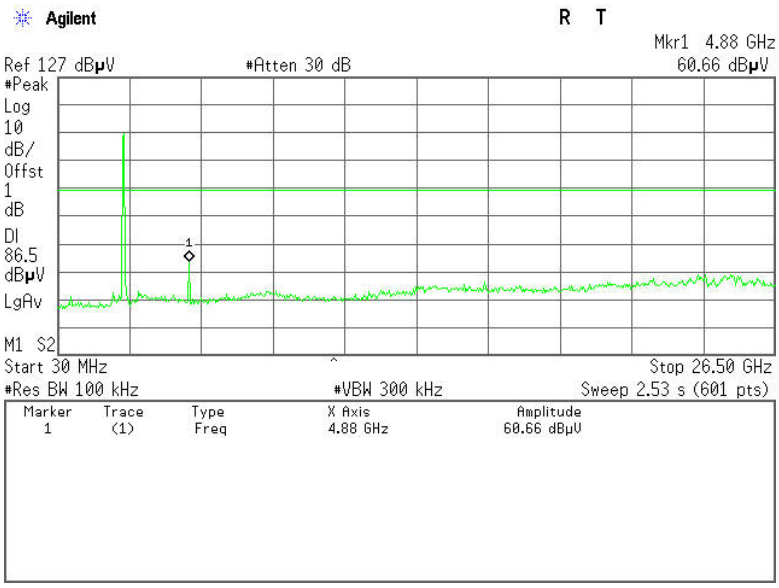
CH Low (30MHz ~26.5GHz)



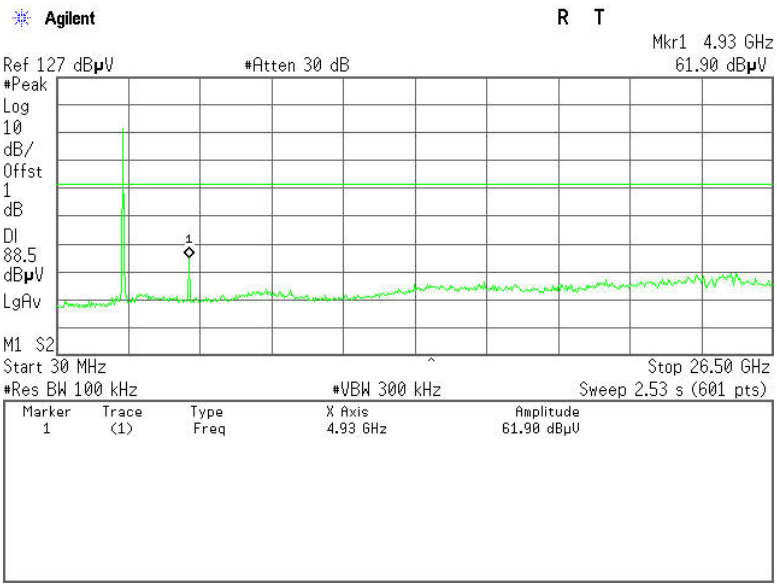
CH Low (2.31GHz ~2.445GHz)



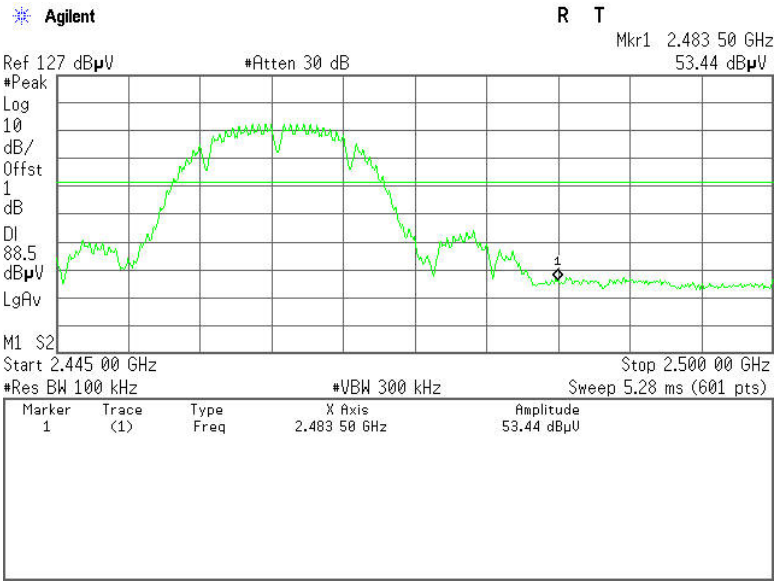
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)

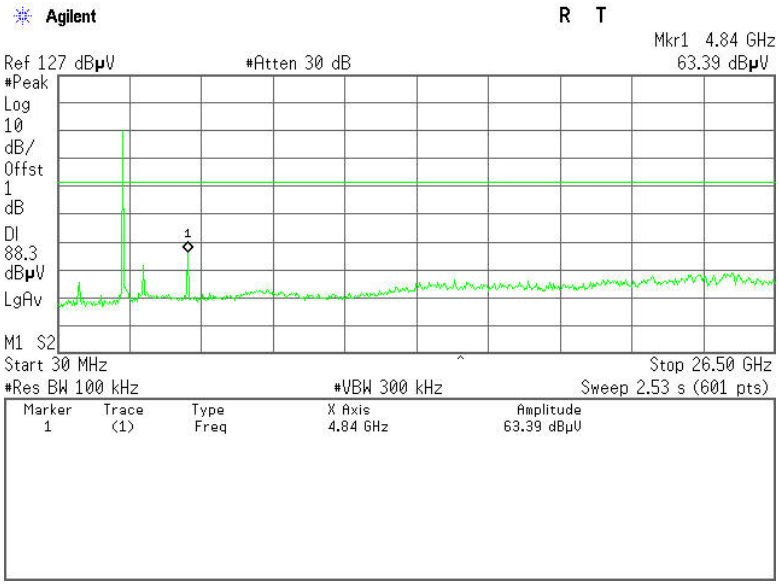


CH High (2.445GHz ~2.5GHz)

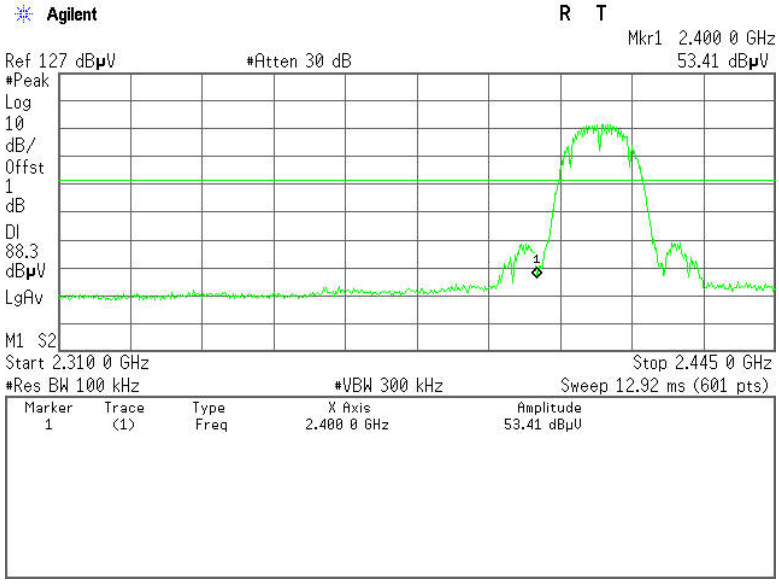


IEEE 802.11b(Antenna 1) mode

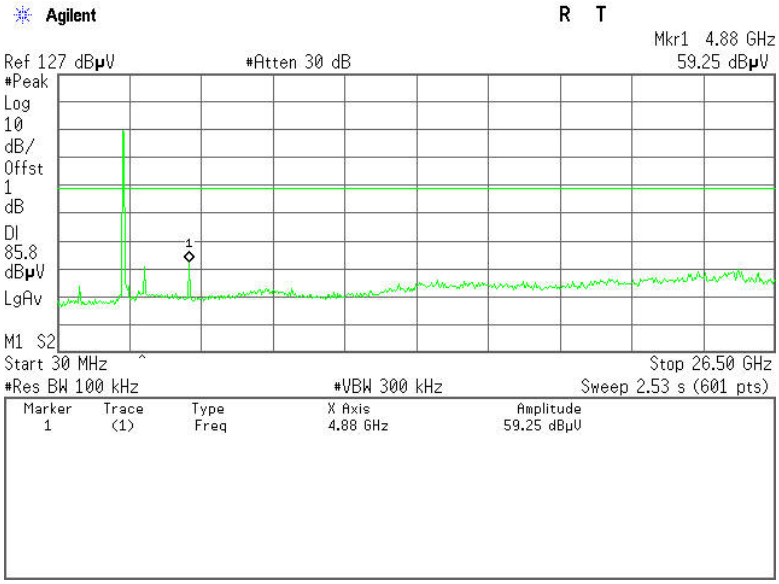
CH Low (30MHz ~26.5GHz)



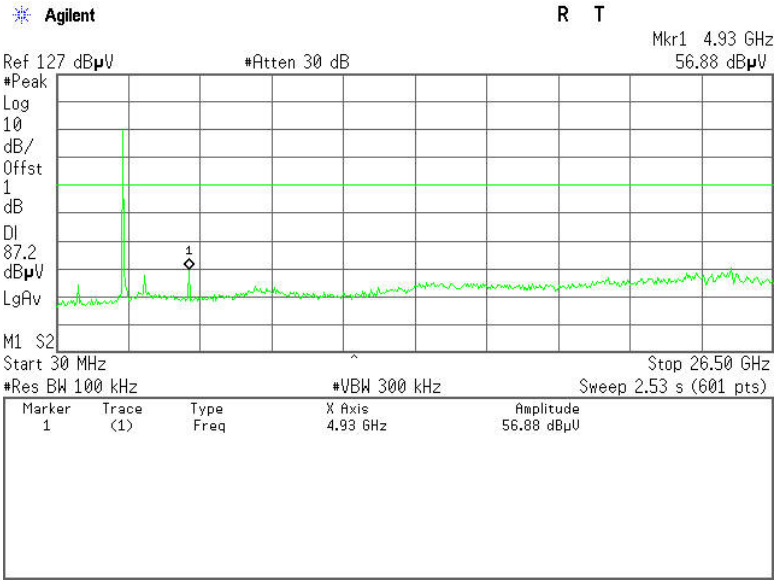
CH Low (2.31GHz ~2.445GHz)



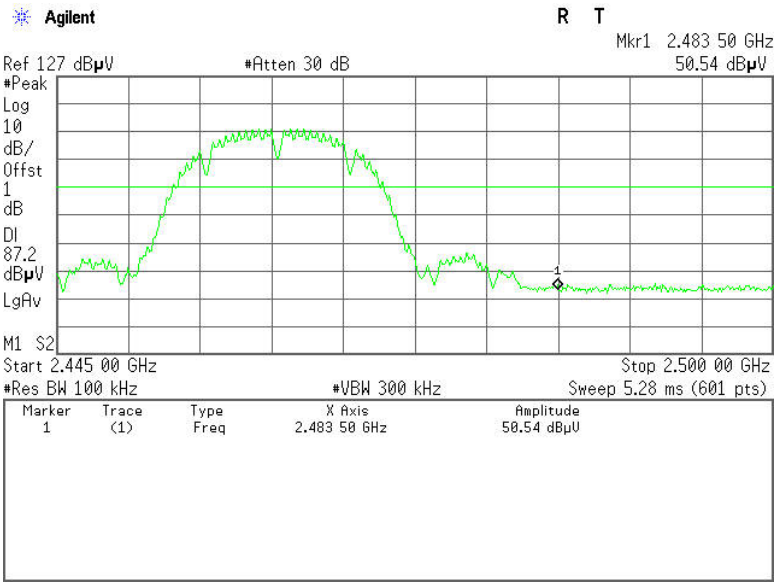
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)

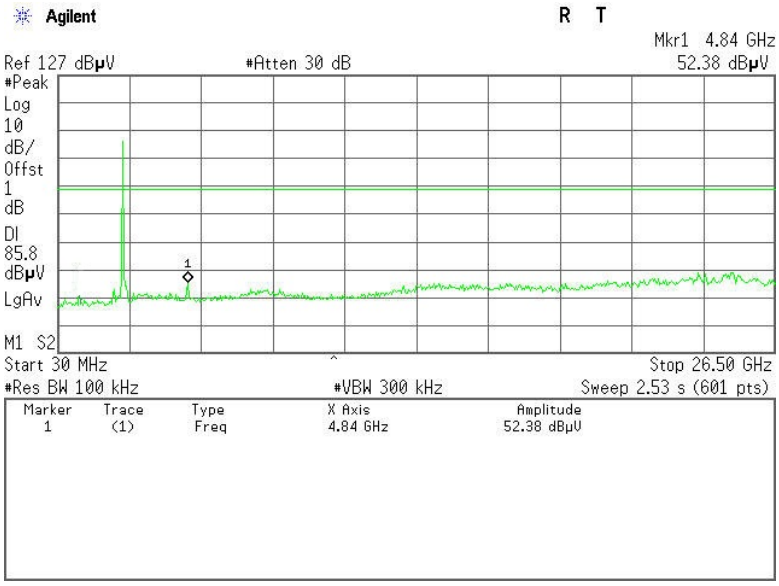


CH High (2.445GHz ~2.5GHz)

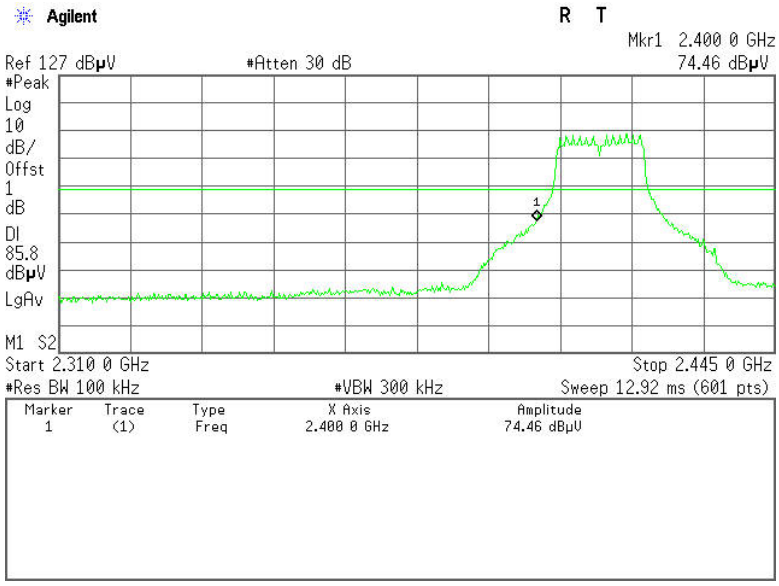


IEEE 802.11g(Antenna 0) mode

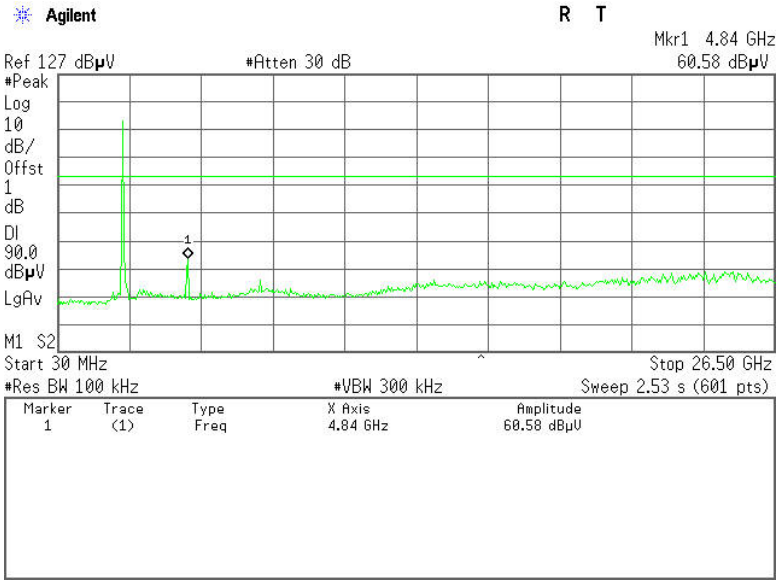
CH Low (30MHz ~26.5GHz)



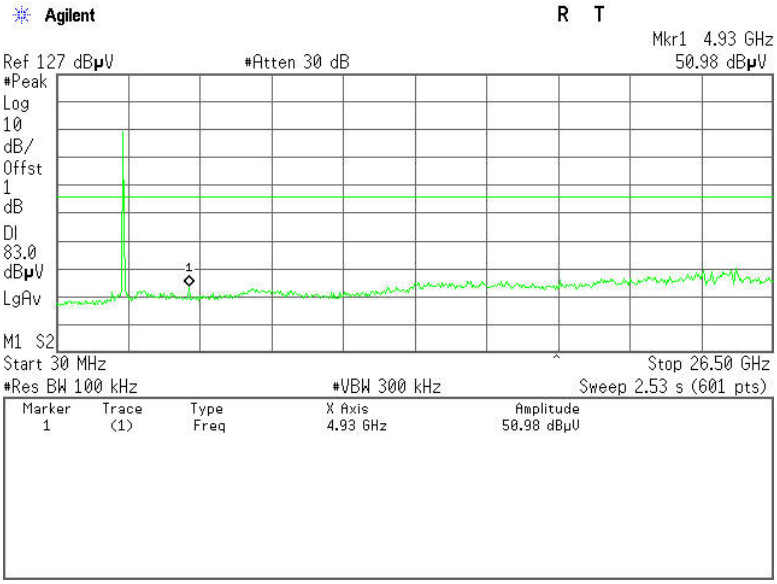
CH Low (2.31GHz ~2.445GHz)



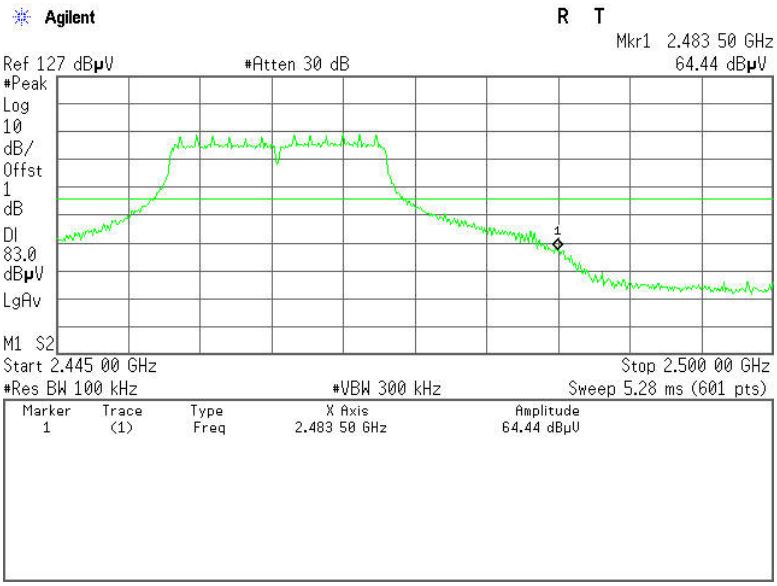
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)

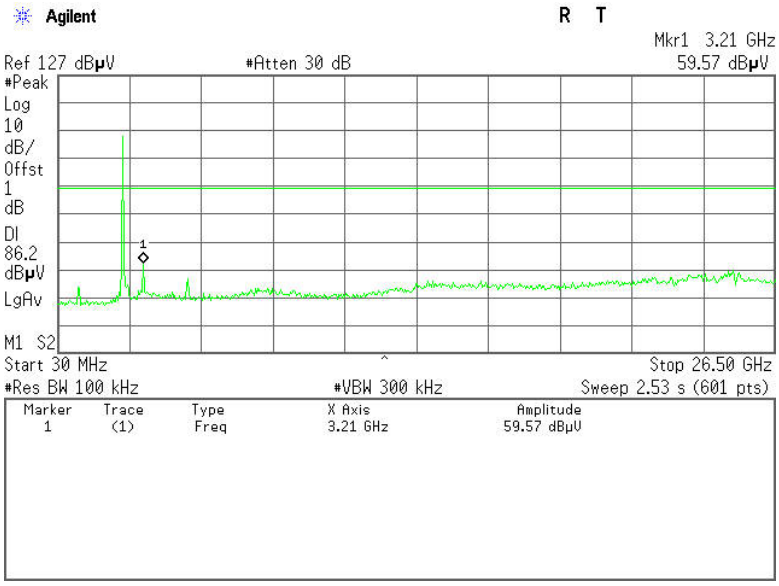


CH High (2.445GHz ~2.5GHz)

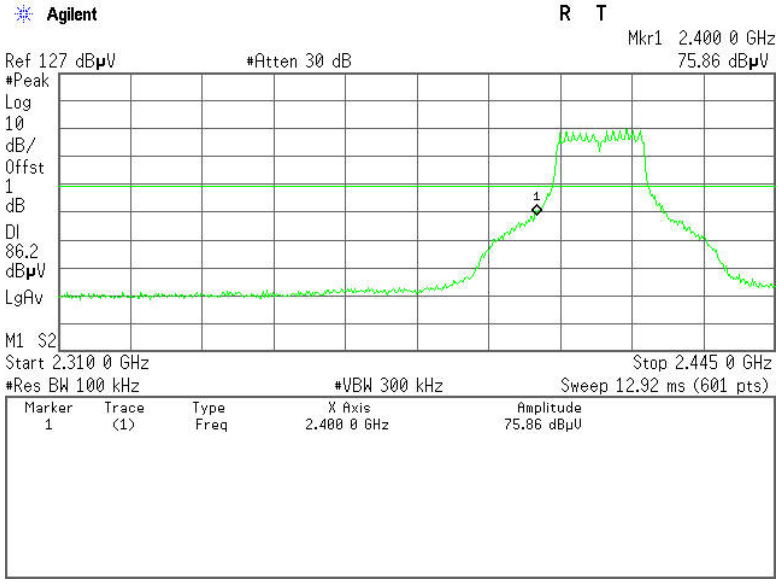


IEEE 802.11g(Antenna 1) mode

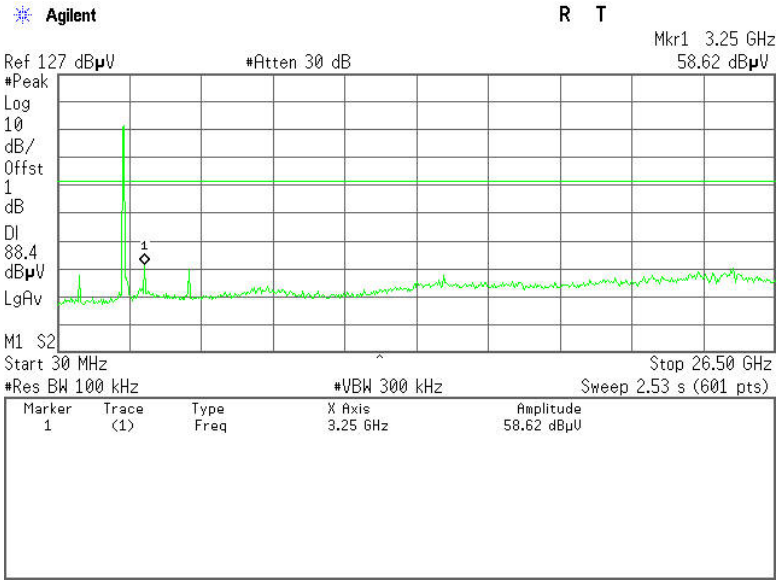
CH Low (30MHz ~26.5GHz)



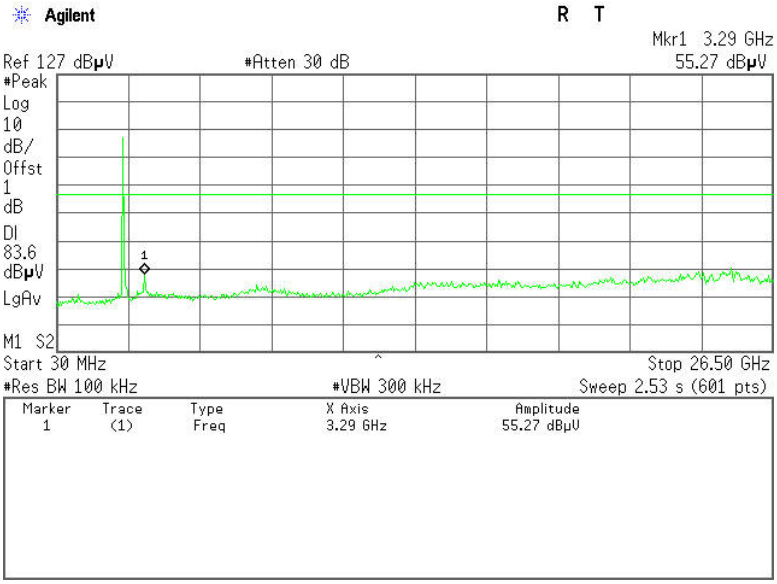
CH Low (2.31GHz ~2.445GHz)



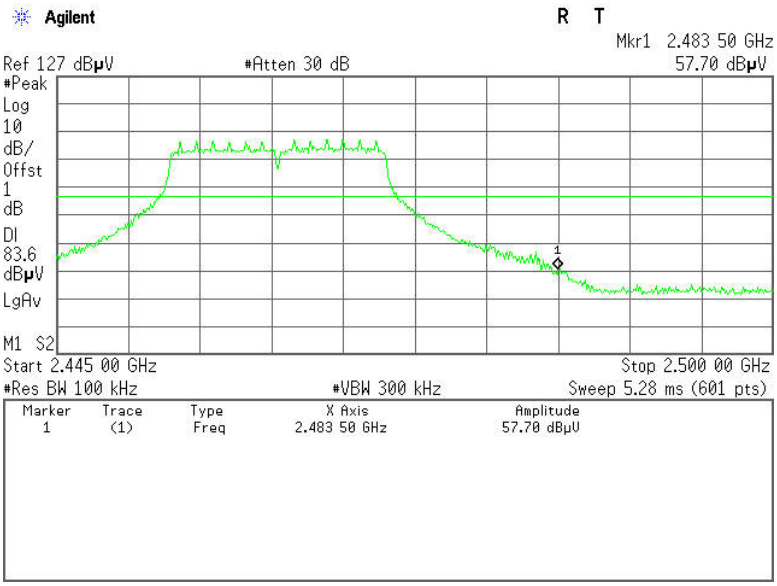
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)

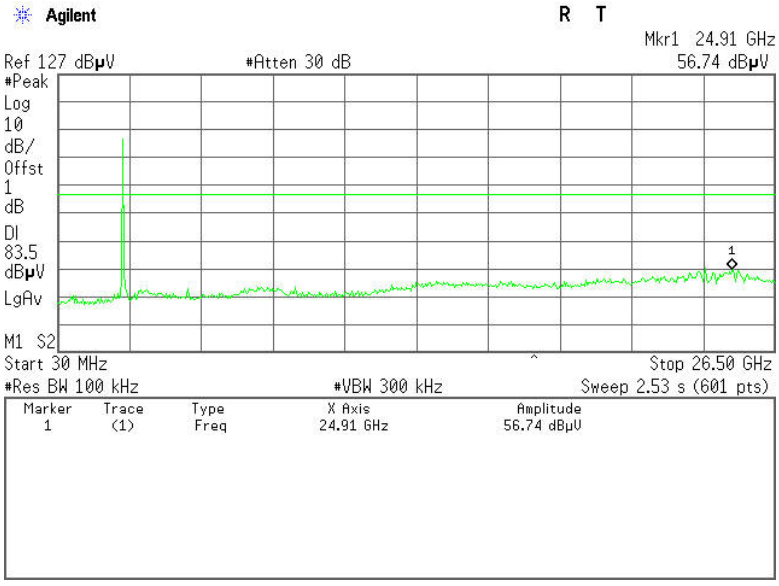


CH High (2.445GHz ~2.5GHz)

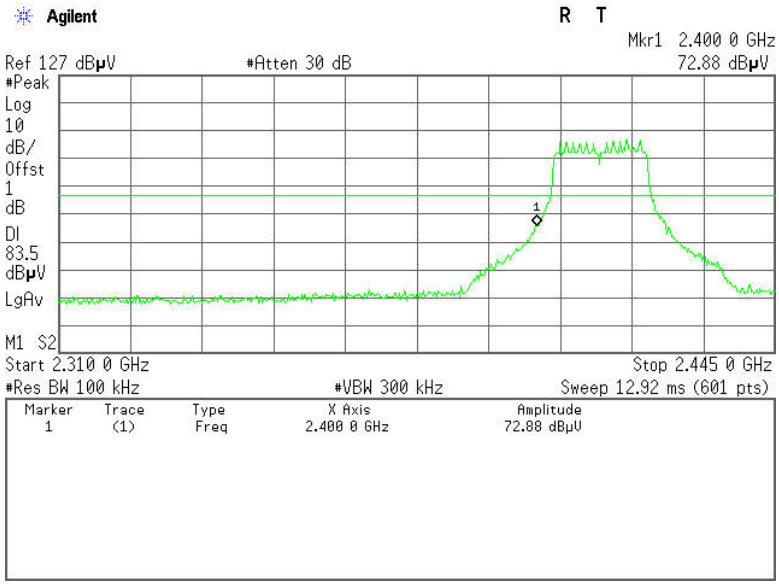


IEEE 802.11n HT20 MHz(Antenna 0) mode

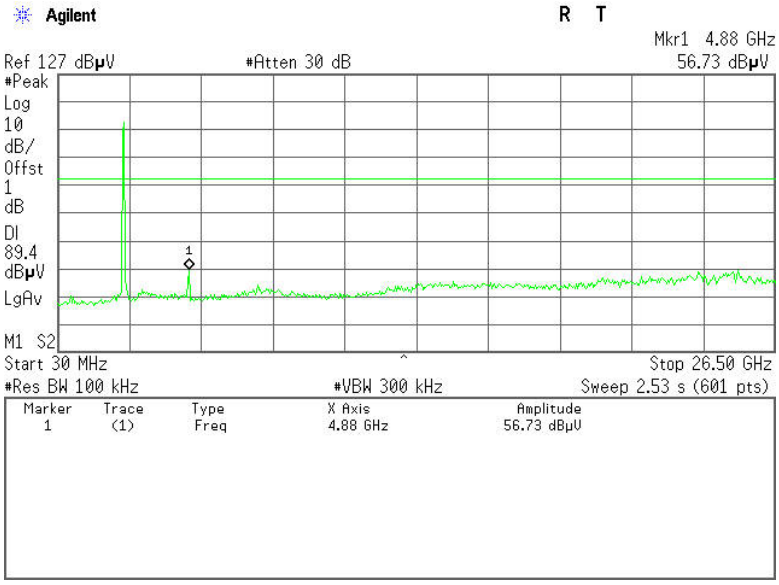
CH Low (30MHz ~26.5GHz)



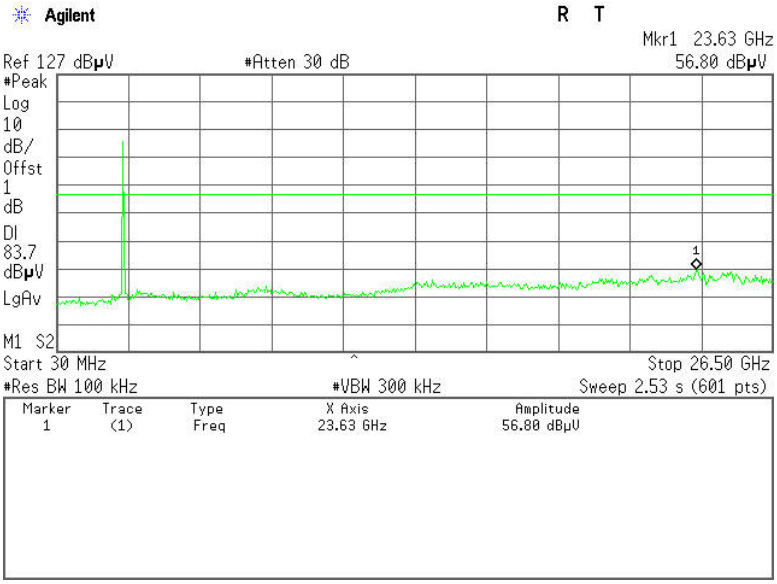
CH Low (2.31GHz ~2.445GHz)



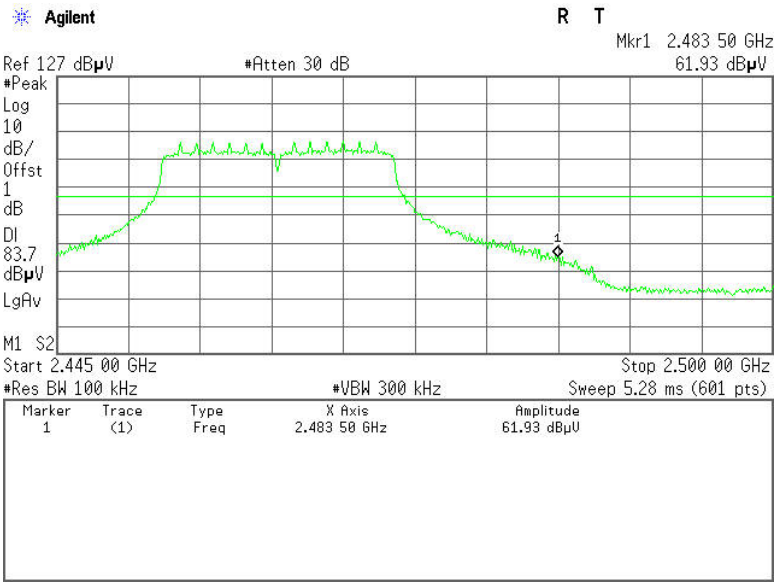
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)

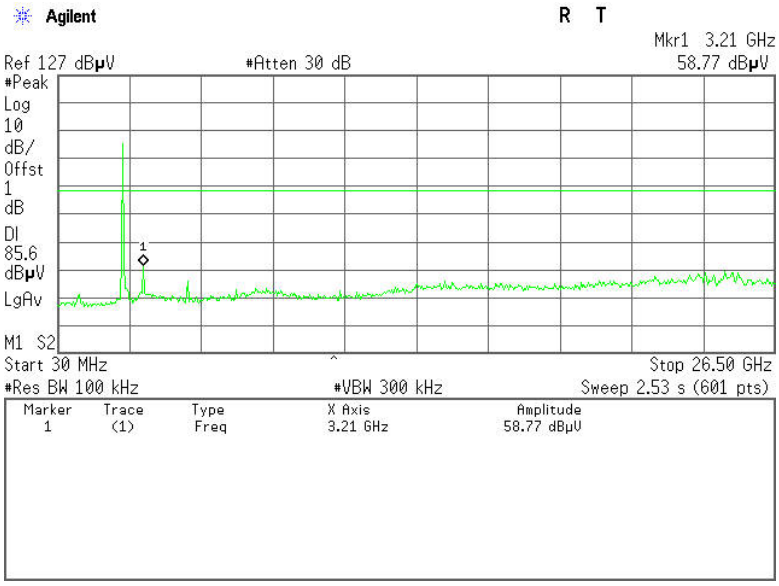


CH High (2.445GHz ~2.5GHz)

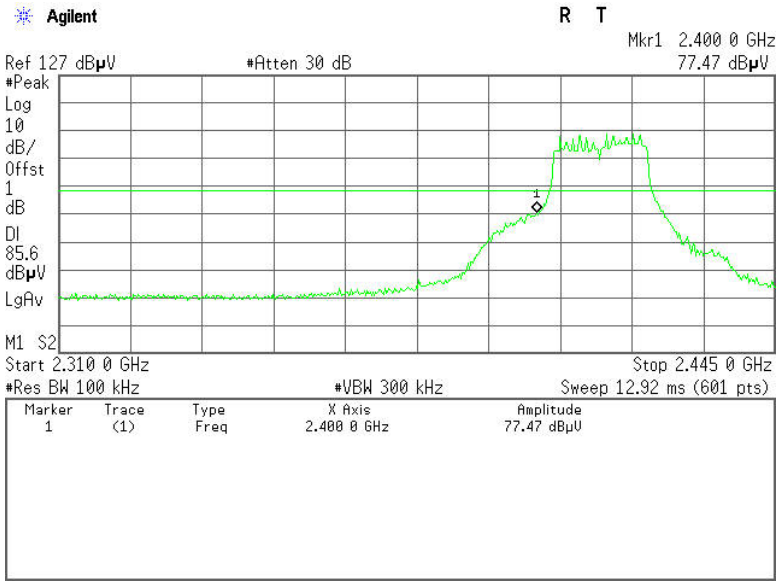


IEEE 802.11n HT20 MHz(Antenna 1) mode

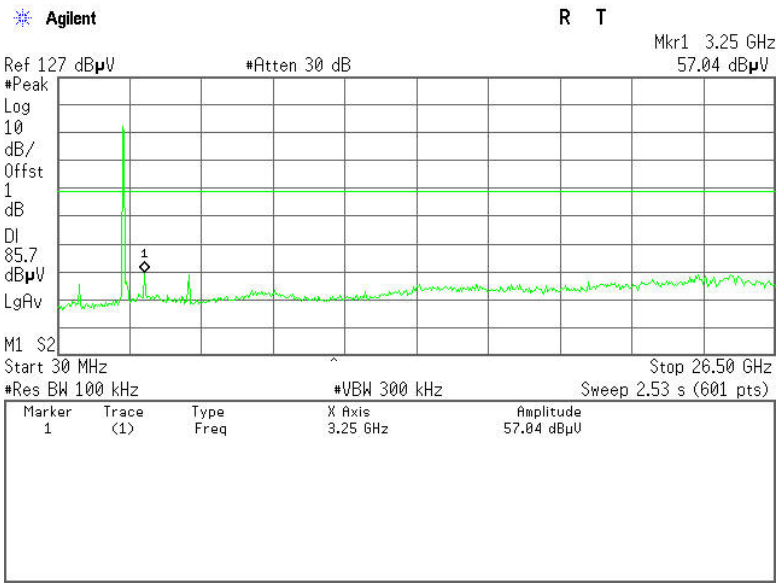
CH Low (30MHz ~26.5GHz)



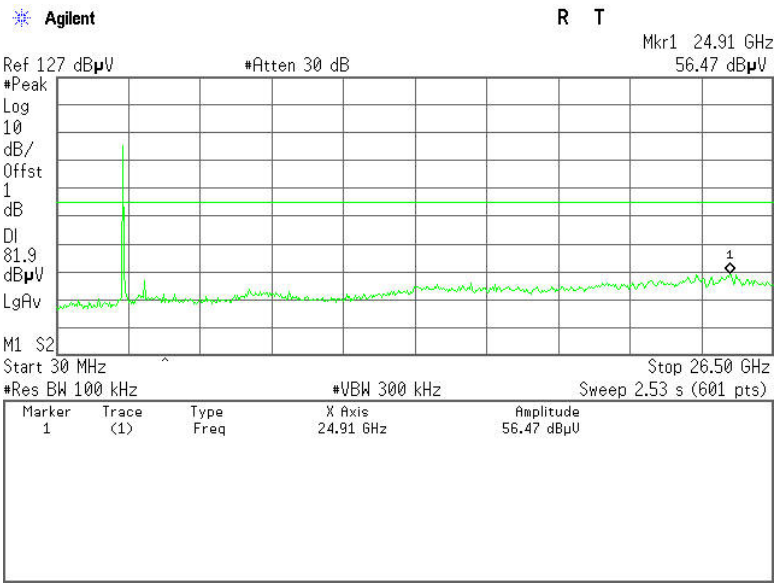
CH Low (2.31GHz ~2.445GHz)



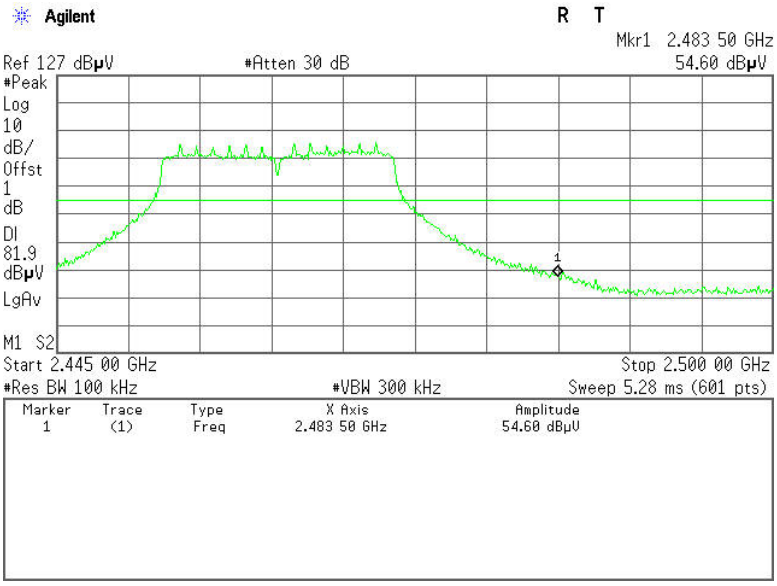
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)

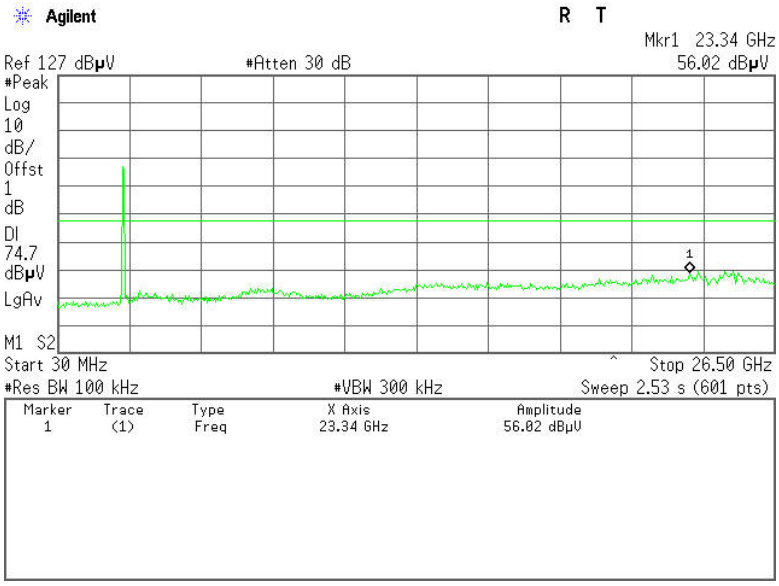


CH High (2.445GHz ~2.5GHz)

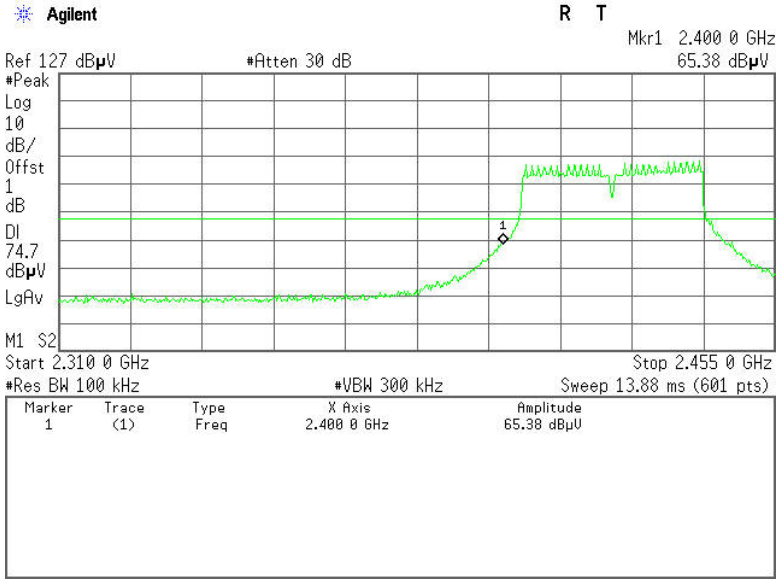


IEEE 802.11n HT40 MHz(Antenna 0) mode

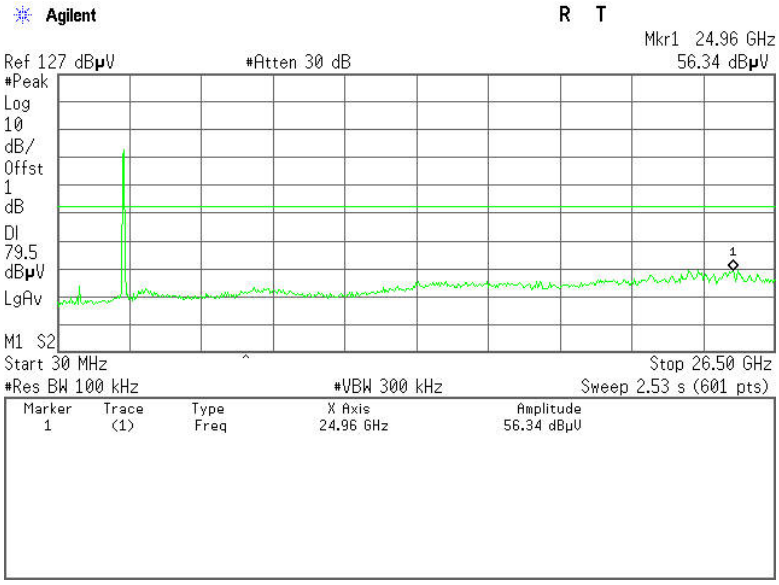
CH Low (30MHz ~26.5GHz)



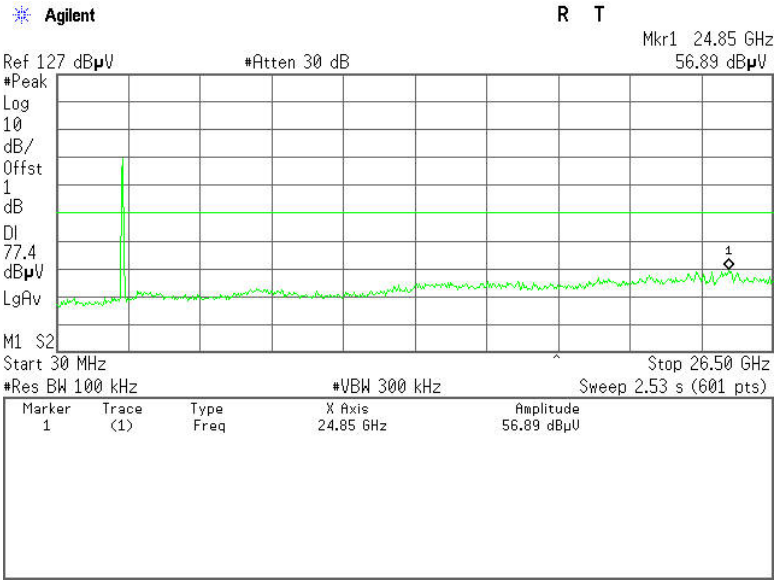
CH Low (2.31GHz ~2.445GHz)



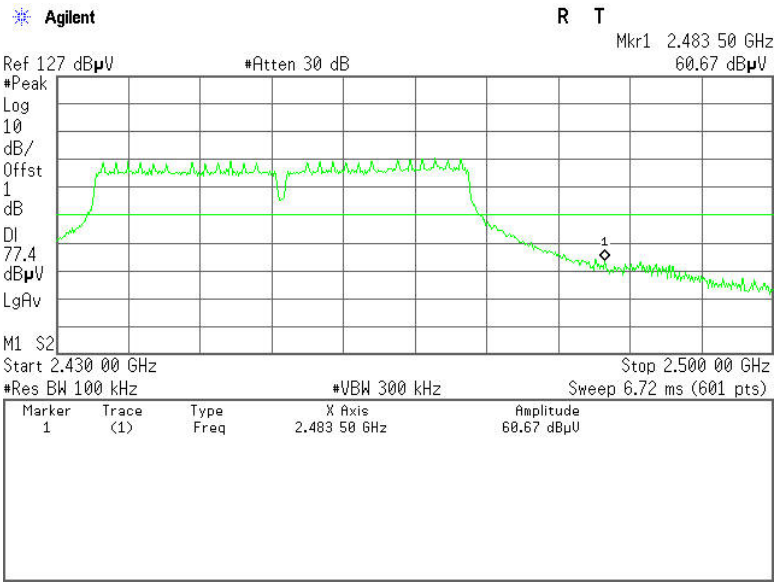
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)

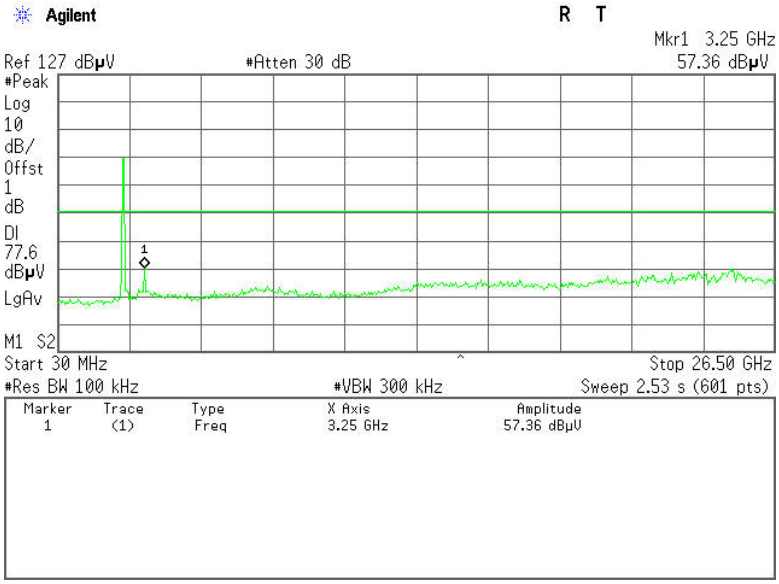


CH High (2.43GHz ~2.5GHz)

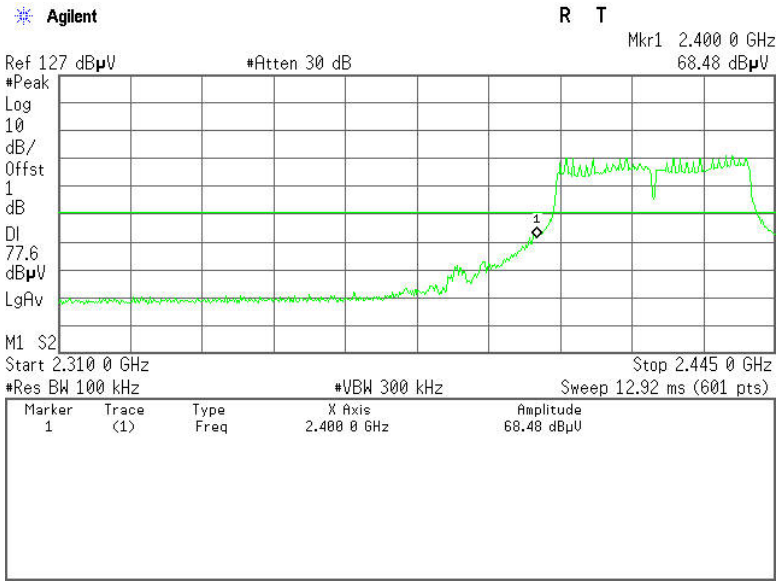


IEEE 802.11n HT40 MHz(Antenna 1) mode

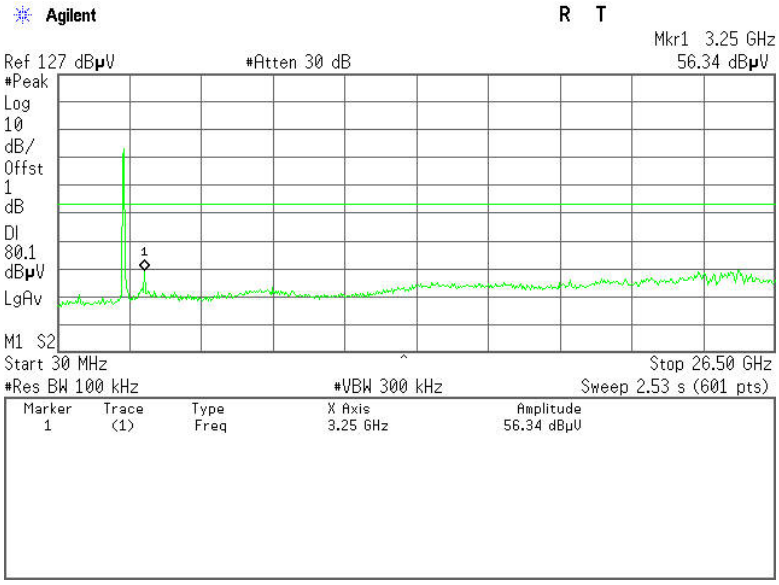
CH Low (30MHz ~26.5GHz)



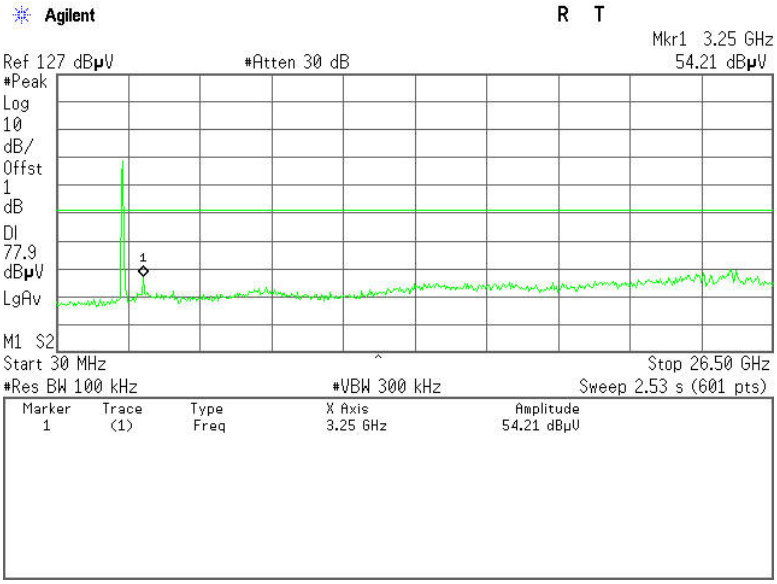
CH Low (2.31GHz ~2.445GHz)



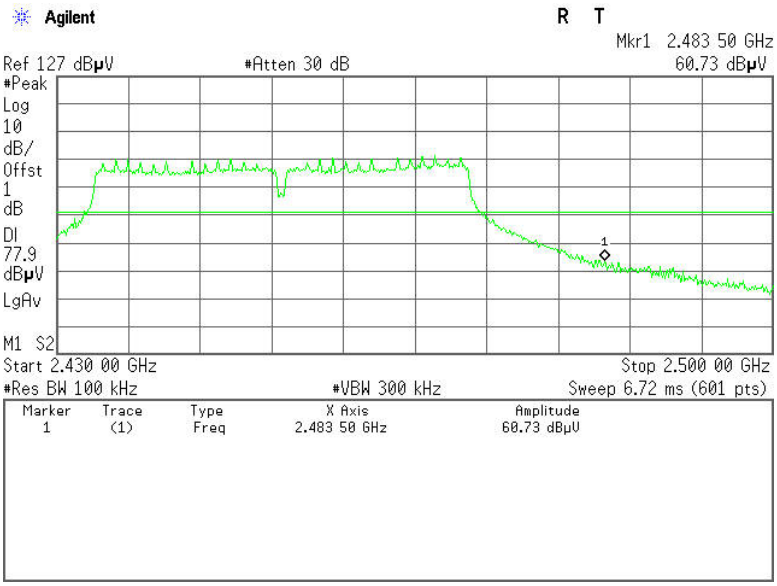
CH Mid (30MHz ~26.5GHz)



CH High (30MHz ~26.5GHz)



CH High (2.43GHz ~2.5GHz)



7.2.4.1. LIMITS OF RADIATED EMISSIONS MEASUREMENT

According to §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 (mV/m)	Measurement Distance (m)
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

Remark: 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.

1. In the emission table above, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

NOTE:(1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

7.2.4.2. TEST INSTRUMENTS

Radiated Emission Test Site 966（2）					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/09/2013	03/08/2014
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2013	03/08/2014
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2013	03/18/2014
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2013	03/18/2014
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	06/21/2013	06/21/2014
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/02/2013	03/01/2014
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/02/2013	03/01/2014
Loop Antenna	A、R、A	PLA-1030/B	1029	03/19/2013	03/18/2014
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	03/04/2013	03/03/2014
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The FCC Site Registration number is 101879.

3. N.C.R = No Calibration Required.

7.2.4.3. TEST PROCEDURE (please refer to measurement standard)

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

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

   Above 1GHz:

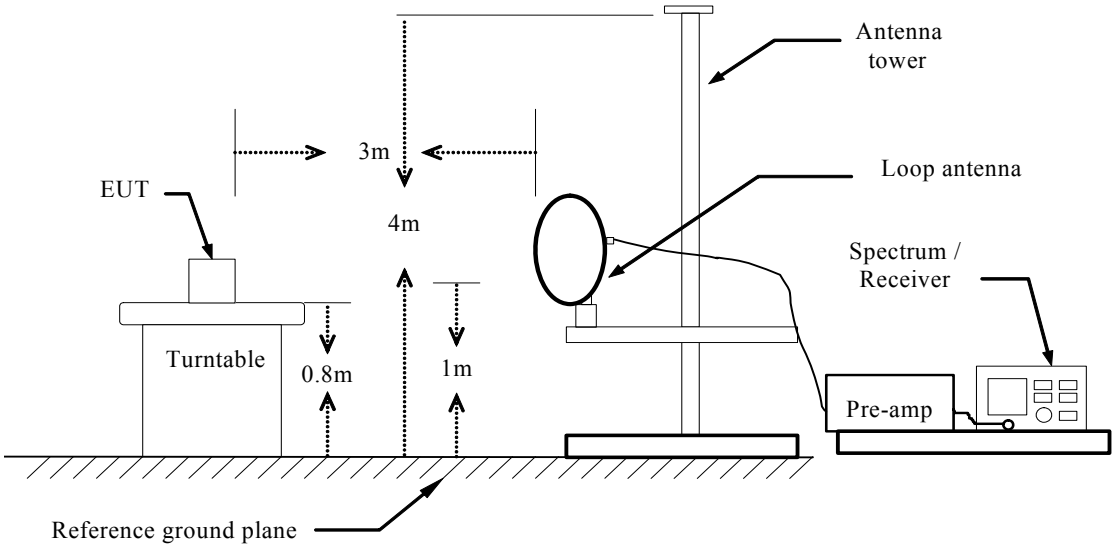
   (a) PEAK: RBW=1MHz,VBW=3MHz / Sweep=AUTO

   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

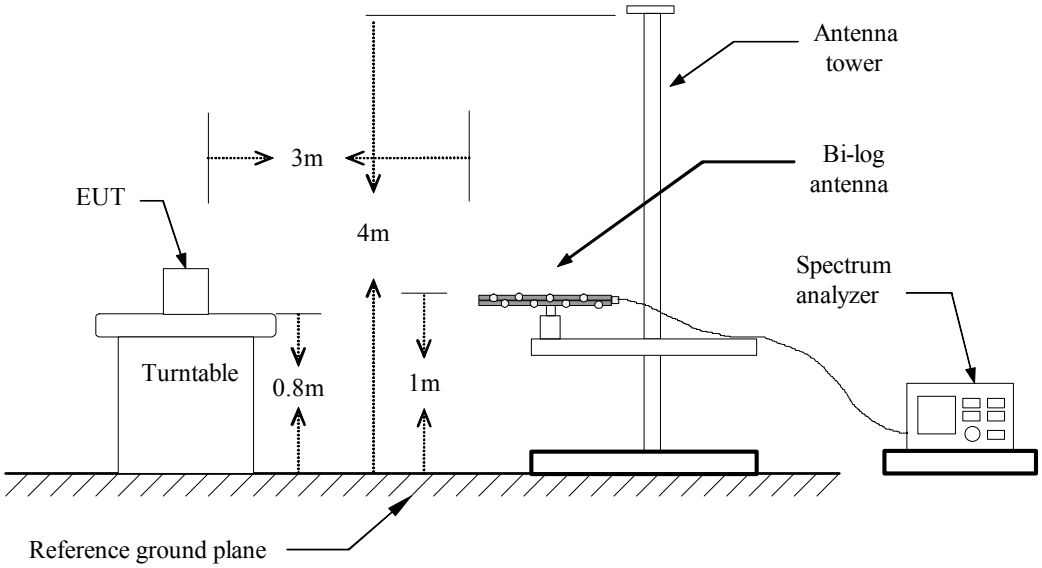
7. Repeat above procedures until the measurements for all frequencies are complete.

7.2.4.4. TEST SETUP

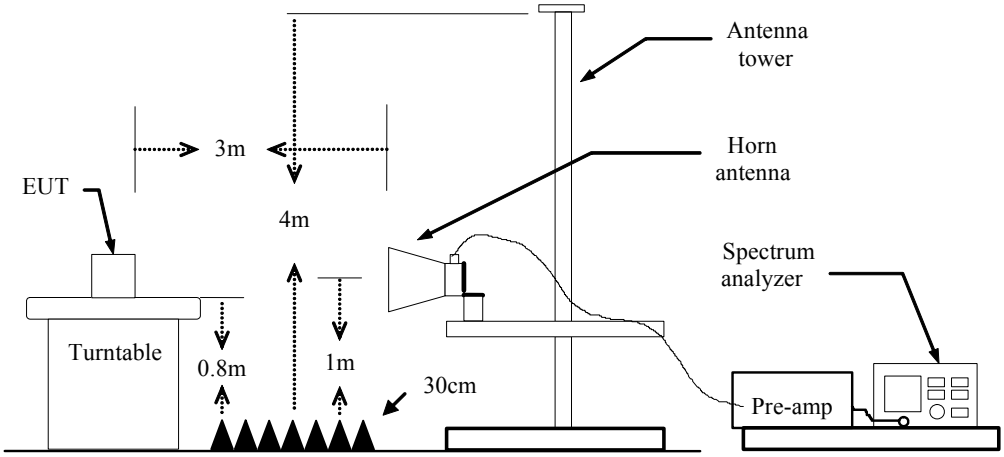
Below 30MHz



Below 1 GHz



Above 1 GHz



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.2.4.5. DATA SAPLE

Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXX.XXXX	36.37	-12.20	24.17	40.00	-15.83	V	QP

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Q.P. = Quasi-peak Reading

Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXXX.XXXX	62.09	-11.42	50.67	74.00	-23.33	V	Peak
XXXX.XXXX	49.78	-11.42	38.36	54.00	-15.64	V	AVG

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Peak = Peak Reading
AVG = Average Reading

Calculation Formula

Margin (dB) = Result (dBuV/m) – Limits (dBuV/m)
Result (dBuV/m) = Reading (dBuV) + Correction Factor

7.2.4.6. TEST RESULTS

Below 1 GHz

Test Mode: TX **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
89.8167	60.79	-23.32	37.47	43.50	-6.03	V	QP
374.3500	49.57	-16.77	32.80	46.00	-13.20	V	QP
500.4500	50.75	-14.06	36.69	46.00	-9.31	V	QP
600.6833	45.33	-12.92	32.41	46.00	-13.59	V	QP
749.4167	47.80	-11.36	36.44	46.00	-9.56	V	QP
875.5167	47.65	-9.81	37.84	46.00	-8.16	V	QP
299.9833	50.82	-18.35	32.47	46.00	-13.53	H	QP
374.3500	52.88	-16.77	36.11	46.00	-9.89	H	QP
500.4500	49.34	-14.06	35.28	46.00	-10.72	H	QP
624.9333	44.98	-12.63	32.35	46.00	-13.65	H	QP
749.4167	50.52	-11.36	39.16	46.00	-6.84	H	QP
875.5167	50.24	-9.81	40.43	46.00	-5.57	H	QP

***Remark:** No emission found between lowest internal used/generated frequency to 30MHz.*

Notes:

1. *Radiated emissions measured in frequency range from 9kHz to 1GHz were made with an instrument using Quasi-peak detector mode.*
2. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
3. *The IF bandwidth of Receiver between 30MHz to 1GHz was 120kHz.*
4. *Frequency (MHz). = Emission frequency in MHz*
   Reading (dBμV/m) = Receiver reading
   Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain
   Limit (dBμV/m) = Limit stated in standard
   Margin (dB) = Measured (dBμV/m) – Limits (dBμV/m)
   Antenna Pol e(H/V) = Current carrying line of reading

Above 1 GHz

Test Mode: TX / IEEE 802.11b(Antenna 0) (CH Low) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3190.0000	47.21	-4.10	43.11	74.00	-30.89	V	peak
3685.0000	46.09	-2.79	43.30	74.00	-30.70	V	peak
4135.0000	45.83	-1.89	43.94	74.00	-30.06	V	peak
4825.0000	46.19	0.52	46.71	74.00	-27.29	V	peak
5245.0000	45.30	1.54	46.84	74.00	-27.16	V	peak
6145.0000	45.71	3.52	49.23	74.00	-24.77	V	peak
3220.0000	51.37	-4.08	47.29	74.00	-26.71	H	Peak
3760.0000	45.83	-2.59	43.24	74.00	-30.76	H	Peak
4375.0000	44.87	-0.91	43.96	74.00	-30.04	H	Peak
4825.0000	48.50	0.52	49.02	74.00	-24.98	H	Peak
5725.0000	45.04	2.46	47.50	74.00	-26.50	H	Peak
6250.0000	44.11	3.83	47.94	74.00	-26.06	H	Peak

***REMARKS**:*

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11b(Antenna 0) (CH Mid) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3250.0000	47.19	-4.07	43.12	74.00	-30.88	V	Peak
3745.0000	45.77	-2.63	43.14	74.00	-30.86	V	Peak
4420.0000	45.43	-0.78	44.65	74.00	-29.35	V	Peak
4870.0000	46.57	0.73	47.30	74.00	-26.70	V	Peak
5665.0000	44.12	2.21	46.33	74.00	-27.67	V	Peak
6400.0000	44.29	4.26	48.55	74.00	-25.45	V	Peak
3250.0000	50.26	-4.07	46.19	74.00	-27.81	H	Peak
4165.0000	45.89	-1.75	44.14	74.00	-29.86	H	Peak
4360.0000	45.42	-0.97	44.45	74.00	-29.55	H	Peak
5050.0000	44.59	1.38	45.97	74.00	-28.03	H	Peak
5620.0000	44.73	2.02	46.75	74.00	-27.25	H	Peak
6370.0000	44.90	4.18	49.08	74.00	-24.92	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11b(Antenna 0) (CH High) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3430.0000	46.65	-3.85	42.80	74.00	-31.20	V	Peak
4420.0000	45.25	-0.78	44.47	74.00	-29.53	V	Peak
4930.0000	47.47	1.00	48.47	74.00	-25.53	V	Peak
5245.0000	45.21	1.54	46.75	74.00	-27.25	V	Peak
5875.0000	44.41	2.90	47.31	74.00	-26.69	V	Peak
6385.0000	44.19	4.22	48.41	74.00	-25.59	V	Peak
3280.0000	48.32	-4.05	44.27	74.00	-29.73	H	Peak
3775.0000	46.71	-2.55	44.16	74.00	-29.84	H	Peak
4270.0000	45.42	-1.31	44.11	74.00	-29.89	H	Peak
4930.0000	46.30	1.00	47.30	74.00	-26.70	H	Peak
5530.0000	44.84	1.79	46.63	74.00	-27.37	H	Peak
5995.0000	44.56	3.08	47.64	74.00	-26.36	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11b(Antenna 1) (CH Low) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3475.0000	45.81	-3.63	42.18	74.00	-31.82	V	peak
4135.0000	45.61	-1.89	43.72	74.00	-30.28	V	peak
4825.0000	54.24	0.52	54.76	74.00	-19.24	V	peak
4825.0000	50.94	0.52	51.46	54.00	-2.54	V	AVG
5320.0000	44.73	1.53	46.26	74.00	-27.74	V	peak
5740.0000	44.43	2.52	46.95	74.00	-27.05	V	peak
6160.0000	45.47	3.56	49.03	74.00	-24.97	V	peak
3535.0000	45.94	-3.33	42.61	74.00	-31.39	H	Peak
4255.0000	45.36	-1.37	43.99	74.00	-30.01	H	Peak
4825.0000	54.33	0.52	54.85	74.00	-19.15	H	Peak
4825.0000	50.83	0.52	51.35	54.00	-2.65	H	AVG
5125.0000	44.86	1.46	46.32	74.00	-27.68	H	Peak
5680.0000	44.96	2.27	47.23	74.00	-26.77	H	Peak
6145.0000	45.07	3.52	48.59	74.00	-25.41	H	Peak

***REMARKS**:*

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11b(Antenna 1) (CH Mid) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3430.0000	46.83	-3.85	42.98	74.00	-31.02	V	Peak
3760.0000	46.17	-2.59	43.58	74.00	-30.42	V	Peak
4450.0000	45.18	-0.73	44.45	74.00	-29.55	V	Peak
4870.0000	47.73	0.73	48.46	74.00	-25.54	V	Peak
5575.0000	45.59	1.88	47.47	74.00	-26.53	V	Peak
6535.0000	44.65	4.64	49.29	74.00	-24.71	V	Peak
3760.0000	45.67	-2.59	43.08	74.00	-30.92	H	Peak
4435.0000	45.14	-0.76	44.38	74.00	-29.62	H	Peak
4870.0000	47.44	0.73	48.17	74.00	-25.83	H	Peak
5680.0000	45.30	2.27	47.57	74.00	-26.43	H	Peak
6250.0000	45.30	3.83	49.13	74.00	-24.87	H	Peak
6760.0000	44.72	5.36	50.08	74.00	-23.92	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11b(Antenna 1) (CH High) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3760.0000	46.32	-2.59	43.73	74.00	-30.27	V	Peak
4210.0000	45.92	-1.54	44.38	74.00	-29.62	V	Peak
4930.0000	47.52	1.00	48.52	74.00	-25.48	V	Peak
5575.0000	44.88	1.88	46.76	74.00	-27.24	V	Peak
6160.0000	44.88	3.56	48.44	74.00	-25.56	V	Peak
6640.0000	44.46	4.96	49.42	74.00	-24.58	V	Peak
3235.0000	47.31	-4.07	43.24	74.00	-30.76	H	Peak
4060.0000	45.37	-2.24	43.13	74.00	-30.87	H	Peak
4375.0000	46.25	-0.91	45.34	74.00	-28.66	H	Peak
4930.0000	47.39	1.00	48.39	74.00	-25.61	H	Peak
5635.0000	45.18	2.08	47.26	74.00	-26.74	H	Peak
6265.0000	44.97	3.88	48.85	74.00	-25.15	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11g(Antenna 0) (CH Low) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1600.0000	52.30	-8.68	43.62	74.00	-30.38	V	Peak
3220.0000	49.37	-4.08	45.29	74.00	-28.71	V	Peak
4240.0000	45.45	-1.43	44.02	74.00	-29.98	V	Peak
5215.0000	45.32	1.55	46.87	74.00	-27.13	V	Peak
5755.0000	44.74	2.59	47.33	74.00	-26.67	V	Peak
6295.0000	44.39	3.97	48.36	74.00	-25.64	V	Peak
3220.0000	54.23	-4.08	50.15	74.00	-23.85	H	Peak
3805.0000	46.23	-2.49	43.74	74.00	-30.26	H	Peak
4360.0000	45.77	-0.97	44.80	74.00	-29.20	H	Peak
4825.0000	48.17	0.52	48.69	74.00	-25.31	H	Peak
5095.0000	45.91	1.43	47.34	74.00	-26.66	H	Peak
5995.0000	44.87	3.08	47.95	74.00	-26.05	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11g(Antenna 0) (CH Mid) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3250.0000	47.46	-4.07	43.39	74.00	-30.61	V	Peak
3970.0000	46.46	-2.52	43.94	74.00	-30.06	V	Peak
4885.0000	49.16	0.80	49.96	74.00	-24.04	V	Peak
6010.0000	45.93	3.12	49.05	74.00	-24.95	V	Peak
6535.0000	45.20	4.64	49.84	74.00	-24.16	V	Peak
6820.0000	45.52	5.57	51.09	74.00	-22.91	V	Peak
3250.0000	52.49	-4.07	48.42	74.00	-25.58	H	Peak
4195.0000	46.53	-1.60	44.93	74.00	-29.07	H	Peak
4885.0000	49.98	0.80	50.78	74.00	-23.22	H	Peak
5860.0000	44.90	2.87	47.77	74.00	-26.23	H	Peak
6295.0000	45.26	3.97	49.23	74.00	-24.77	H	Peak
6745.0000	45.14	5.31	50.45	74.00	-23.55	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11g(Antenna 0) (CH High) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3685.0000	45.84	-2.79	43.05	74.00	-30.95	V	Peak
4375.0000	45.50	-0.91	44.59	74.00	-29.41	V	Peak
4990.0000	45.85	1.27	47.12	74.00	-26.88	V	Peak
5665.0000	44.85	2.21	47.06	74.00	-26.94	V	Peak
6115.0000	44.32	3.43	47.75	74.00	-26.25	V	Peak
6700.0000	43.93	5.16	49.09	74.00	-24.91	V	Peak
3280.0000	49.09	-4.05	45.04	74.00	-28.96	H	Peak
4420.0000	45.33	-0.78	44.55	74.00	-29.45	H	Peak
4750.0000	45.55	0.19	45.74	74.00	-28.26	H	Peak
5245.0000	45.70	1.54	47.24	74.00	-26.76	H	Peak
5860.0000	44.61	2.87	47.48	74.00	-26.52	H	Peak
6535.0000	45.78	4.64	50.42	74.00	-23.58	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11g(Antenna 1) (CH Low) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3265.0000	47.15	-4.06	43.09	74.00	-30.91	V	Peak
3805.0000	46.73	-2.49	44.24	74.00	-29.76	V	Peak
4825.0000	49.11	0.52	49.63	74.00	-24.37	V	Peak
5560.0000	44.46	1.85	46.31	74.00	-27.69	V	Peak
6220.0000	45.73	3.74	49.47	74.00	-24.53	V	Peak
6475.0000	45.05	4.47	49.52	74.00	-24.48	V	Peak
2980.0000	47.88	-4.32	43.56	74.00	-30.44	H	Peak
3865.0000	45.91	-2.50	43.41	74.00	-30.59	H	Peak
4825.0000	49.34	0.52	49.86	74.00	-24.14	H	Peak
5080.0000	46.00	1.41	47.41	74.00	-26.59	H	Peak
5740.0000	45.17	2.52	47.69	74.00	-26.31	H	Peak
6310.0000	45.37	4.01	49.38	74.00	-24.62	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11g(Antenna 1) (CH Mid) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3865.0000	46.13	-2.50	43.63	74.00	-30.37	V	Peak
4270.0000	45.40	-1.31	44.09	74.00	-29.91	V	Peak
4885.0000	54.84	0.80	55.64	74.00	-18.36	V	Peak
4885.0000	41.37	0.80	42.17	54.00	-11.83	V	AVG
5515.0000	45.03	1.76	46.79	74.00	-27.21	V	Peak
5995.0000	45.56	3.08	48.64	74.00	-25.36	V	Peak
6325.0000	44.94	4.05	48.99	74.00	-25.01	V	Peak
3130.0000	47.28	-4.14	43.14	74.00	-30.86	H	Peak
3790.0000	46.68	-2.52	44.16	74.00	-29.84	H	Peak
4390.0000	44.84	-0.86	43.98	74.00	-30.02	H	Peak
4885.0000	50.99	0.80	51.79	74.00	-22.21	H	Peak
5530.0000	44.95	1.79	46.74	74.00	-27.26	H	Peak
6355.0000	44.72	4.13	48.85	74.00	-25.15	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11g(Antenna 1) (CH High) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3265.0000	47.10	-4.06	43.04	74.00	-30.96	V	Peak
4255.0000	46.21	-1.37	44.84	74.00	-29.16	V	Peak
4930.0000	46.15	1.00	47.15	74.00	-26.85	V	Peak
5275.0000	44.98	1.54	46.52	74.00	-27.48	V	Peak
5875.0000	45.09	2.90	47.99	74.00	-26.01	V	Peak
6505.0000	44.34	4.55	48.89	74.00	-25.11	V	Peak
3835.0000	46.48	-2.50	43.98	74.00	-30.02	H	Peak
4375.0000	45.38	-0.91	44.47	74.00	-29.53	H	Peak
4930.0000	45.22	1.00	46.22	74.00	-27.78	H	Peak
5230.0000	45.18	1.55	46.73	74.00	-27.27	H	Peak
5665.0000	45.45	2.21	47.66	74.00	-26.34	H	Peak
5980.0000	45.09	3.06	48.15	74.00	-25.85	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11n HT20 MHz **Tested by:** Mack Li

(Combine with Antenna 0 and Antenna 1) (CH Low)

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3220.0000	47.55	-4.08	43.47	74.00	-30.53	V	Peak
3865.0000	46.15	-2.50	43.65	74.00	-30.35	V	Peak
4375.0000	45.66	-0.91	44.75	74.00	-29.25	V	Peak
4825.0000	48.72	0.52	49.24	74.00	-24.76	V	Peak
5830.0000	45.64	2.83	48.47	74.00	-25.53	V	Peak
6580.0000	44.35	4.76	49.11	74.00	-24.89	V	Peak
3220.0000	51.84	-4.08	47.76	74.00	-26.24	H	Peak
4135.0000	45.27	-1.89	43.38	74.00	-30.62	H	Peak
4825.0000	47.92	0.52	48.44	74.00	-25.56	H	Peak
5350.0000	44.66	1.53	46.19	74.00	-27.81	H	Peak
5770.0000	44.50	2.65	47.15	74.00	-26.85	H	Peak
6550.0000	45.76	4.68	50.44	74.00	-23.56	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11n HT20 MHz **Tested by:** Mack Li

(Combine with Antenna 0 and Antenna 1) (CH Mid)

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3250.0000	50.37	-4.07	46.30	74.00	-27.70	V	Peak
3925.0000	45.84	-2.51	43.33	74.00	-30.67	V	Peak
4330.0000	45.26	-1.09	44.17	74.00	-29.83	V	Peak
4870.0000	55.14	0.73	55.87	74.00	-18.13	V	Peak
4870.0000	41.37	0.73	42.10	54.00	-11.90	V	AVG
5500.0000	44.84	1.73	46.57	74.00	-27.43	V	Peak
6265.0000	45.03	3.88	48.91	74.00	-25.09	V	Peak
3250.0000	51.71	-4.07	47.64	74.00	-26.36	H	Peak
3820.0000	45.43	-2.49	42.94	74.00	-31.06	H	Peak
4870.0000	57.90	0.73	58.63	74.00	-15.37	H	Peak
4870.0000	44.02	0.73	44.75	54.00	-9.25	H	AVG
5515.0000	45.00	1.76	46.76	74.00	-27.24	H	Peak
6340.0000	45.50	4.09	49.59	74.00	-24.41	H	Peak
6940.0000	44.95	6.04	50.99	74.00	-23.01	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / EEE 802.11n HT20 MHz **Tested by:** Mack Li

(Combine with Antenna 0 and Antenna 1) (CH High)

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3235.0000	46.66	-4.07	42.59	74.00	-31.41	V	Peak
3835.0000	46.35	-2.50	43.85	74.00	-30.15	V	Peak
4255.0000	45.60	-1.37	44.23	74.00	-29.77	V	Peak
4810.0000	45.95	0.46	46.41	74.00	-27.59	V	Peak
5605.0000	45.28	1.95	47.23	74.00	-26.77	V	Peak
6325.0000	46.00	4.05	50.05	74.00	-23.95	V	Peak
3280.0000	47.28	-4.05	43.23	74.00	-30.77	H	Peak
4030.0000	45.80	-2.39	43.41	74.00	-30.59	H	Peak
4330.0000	45.30	-1.09	44.21	74.00	-29.79	H	Peak
4960.0000	45.07	1.14	46.21	74.00	-27.79	H	Peak
5875.0000	44.79	2.90	47.69	74.00	-26.31	H	Peak
6145.0000	45.10	3.52	48.62	74.00	-25.38	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX/ IEEE 802.11n HT40 MHz **Tested by:** Mack Li

(Combine with Antenna 0 and Antenna 1) (CH Low)

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3760.0000	45.42	-2.59	42.83	74.00	-31.17	V	Peak
4585.0000	45.07	-0.49	44.58	74.00	-29.42	V	Peak
4930.0000	45.60	1.00	46.60	74.00	-27.40	V	Peak
5350.0000	44.86	1.53	46.39	74.00	-27.61	V	Peak
5755.0000	44.79	2.59	47.38	74.00	-26.62	V	Peak
6175.0000	44.80	3.61	48.41	74.00	-25.59	V	Peak
3250.0000	49.47	-4.07	45.40	74.00	-28.60	H	Peak
4315.0000	45.95	-1.14	44.81	74.00	-29.19	H	Peak
5020.0000	44.81	1.34	46.15	74.00	-27.85	H	Peak
5575.0000	45.67	1.88	47.55	74.00	-26.45	H	Peak
6250.0000	45.40	3.83	49.23	74.00	-24.77	H	Peak
6895.0000	44.39	5.82	50.21	74.00	-23.79	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11n HT40 MHz **Tested by:** Mack Li

(Combine with Antenna 0 and Antenna 1) (CH Mid)

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3310.0000	46.40	-4.04	42.36	74.00	-31.64	V	Peak
3940.0000	46.09	-2.52	43.57	74.00	-30.43	V	Peak
4420.0000	45.41	-0.78	44.63	74.00	-29.37	V	Peak
4945.0000	45.23	1.07	46.30	74.00	-27.70	V	Peak
5605.0000	44.58	1.95	46.53	74.00	-27.47	V	Peak
6010.0000	44.23	3.12	47.35	74.00	-26.65	V	Peak
3265.0000	48.71	-4.06	44.65	74.00	-29.35	H	Peak
4180.0000	45.42	-1.67	43.75	74.00	-30.25	H	Peak
4780.0000	45.95	0.32	46.27	74.00	-27.73	H	Peak
5095.0000	44.99	1.43	46.42	74.00	-27.58	H	Peak
5755.0000	44.42	2.59	47.01	74.00	-26.99	H	Peak
6190.0000	45.04	3.65	48.69	74.00	-25.31	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX/ IEEE 802.11n HT40 MHz **Tested by:** Mack Li

(Combine with Antenna 0 and Antenna 1) (CH High)

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** July 24, 2013

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
4165.0000	45.55	-1.75	43.80	74.00	-30.20	V	Peak
5050.0000	44.69	1.38	46.07	74.00	-27.93	V	Peak
5455.0000	45.38	1.63	47.01	74.00	-26.99	V	Peak
5860.0000	45.02	2.87	47.89	74.00	-26.11	V	Peak
6145.0000	44.64	3.52	48.16	74.00	-25.84	V	Peak
6445.0000	45.07	4.39	49.46	74.00	-24.54	V	Peak
3265.0000	47.21	-4.06	43.15	74.00	-30.85	H	Peak
3610.0000	45.98	-2.98	43.00	74.00	-31.00	H	Peak
4255.0000	45.67	-1.37	44.30	74.00	-29.70	H	Peak
5065.0000	45.36	1.39	46.75	74.00	-27.25	H	Peak
5755.0000	43.88	2.59	46.47	74.00	-27.53	H	Peak
6280.0000	44.98	3.92	48.90	74.00	-25.10	H	Peak

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

7.3. 6dB BANDWIDTH MEASUREMENT

7.3.1. LIMITS

According to §15.247(a)(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.

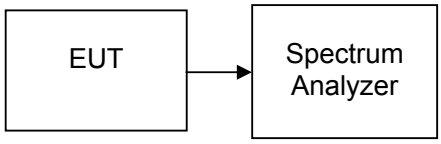
7.3.2. TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	03/09/2013	03/08/2014

7.3.3. TEST PROCEDURES (please refer to measurement standard)

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 1-5 % of the emission bandwidth (EBW), VBW = ≥ 3 x RBW, Sweep = auto.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

7.3.4. TEST SETUP



7.3.5. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b(Antenna 0)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	10143	>500	PASS
Mid	2437	10137		PASS
High	2462	10131		PASS

Test mode: IEEE 802.11b(Antenna 1)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	10141	>500	PASS
Mid	2437	10143		PASS
High	2462	10139		PASS

Test mode: IEEE 802.11g(Antenna 0)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	16358	>500	PASS
Mid	2437	16364		PASS
High	2462	16390		PASS

Test mode: IEEE 802.11g(Antenna 1)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	16385	>500	PASS
Mid	2437	16362		PASS
High	2462	16368		PASS

Test mode: IEEE 802.11n HT20 MHz(Antenna 0)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	17614	>500	PASS
Mid	2437	17298		PASS
High	2462	17286		PASS

Test mode: IEEE 802.11n HT20 MHz(Antenna 1)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	15347	>500	PASS
Mid	2437	17626		PASS
High	2462	16428		PASS

Test mode: IEEE 802.11n HT40 MHz(Antenna 0)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2422	36131	>500	PASS
Mid	2437	36399		PASS
High	2452	36413		PASS

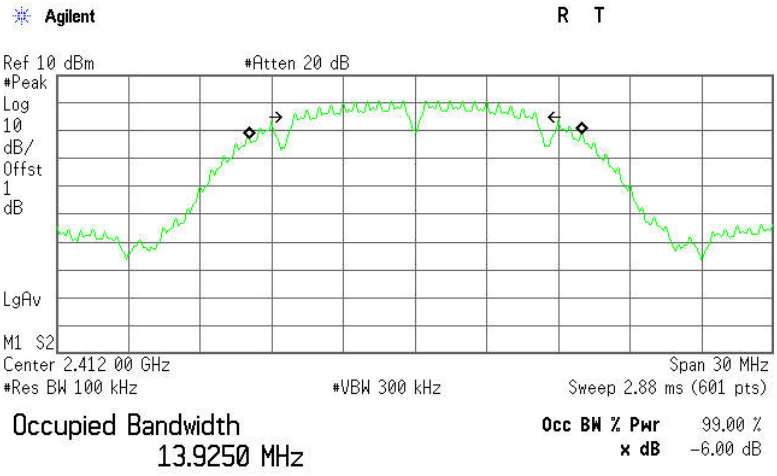
Test mode: IEEE 802.11n HT40 MHz(Antenna 1)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2422	36105	>500	PASS
Mid	2437	36045		PASS
High	2452	36411		PASS

Test Plot

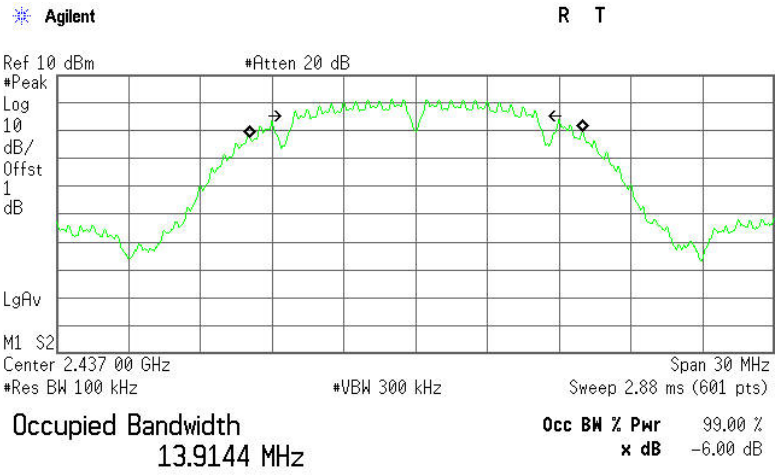
IEEE 802.11b (Antenna 0) mode

6dB Bandwidth (CH Low)



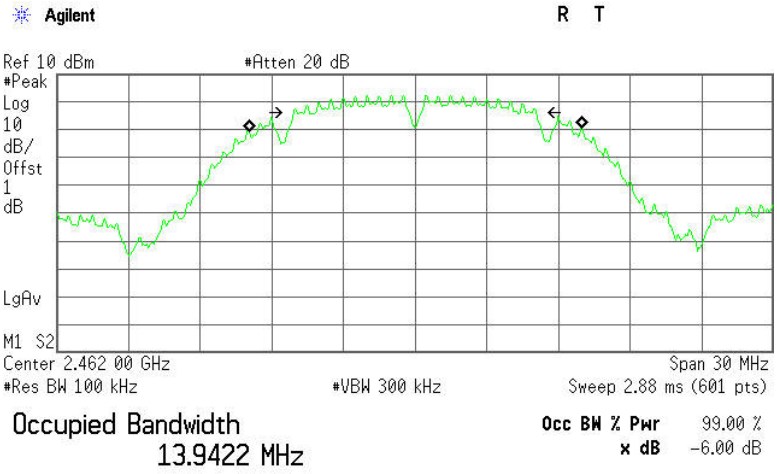
Transmit Freq Error 25.878 kHz
x dB Bandwidth 10.143 MHz

6dB Bandwidth (CH Mid)



Transmit Freq Error 31.562 kHz
x dB Bandwidth 10.137 MHz

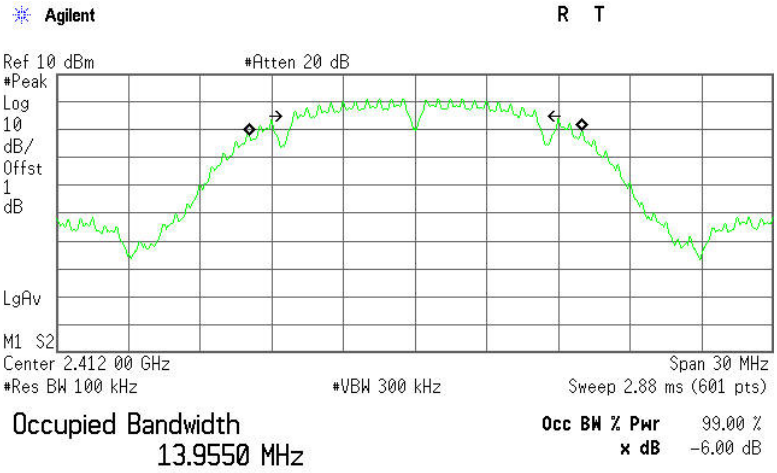
6dB Bandwidth (CH High)



Transmit Freq Error 22.223 kHz
x dB Bandwidth 10.131 MHz

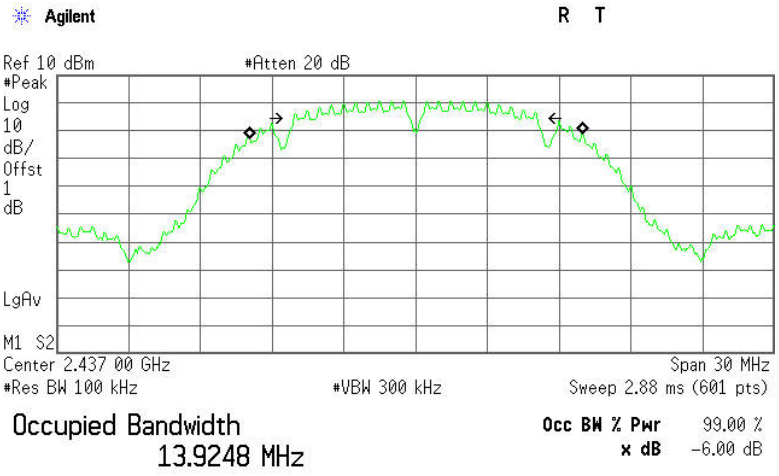
IEEE 802.11b (Antenna 1) mode

6dB Bandwidth (CH Low)



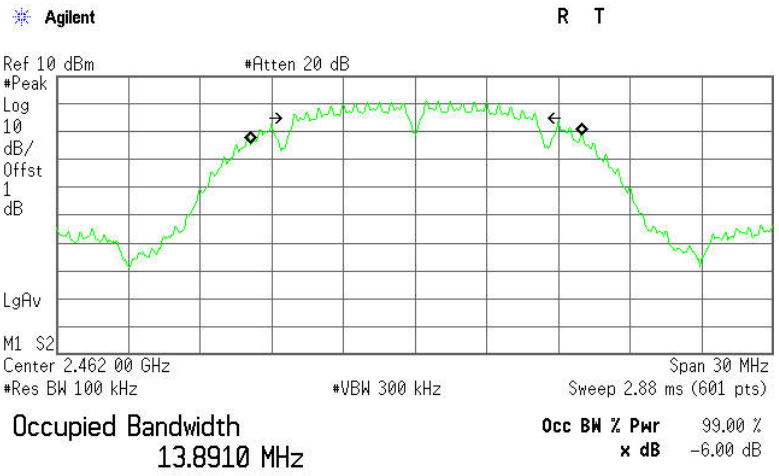
Transmit Freq Error 21.771 kHz
x dB Bandwidth 10.141 MHz

6dB Bandwidth (CH Mid)



Transmit Freq Error 23.044 kHz
x dB Bandwidth 10.143 MHz

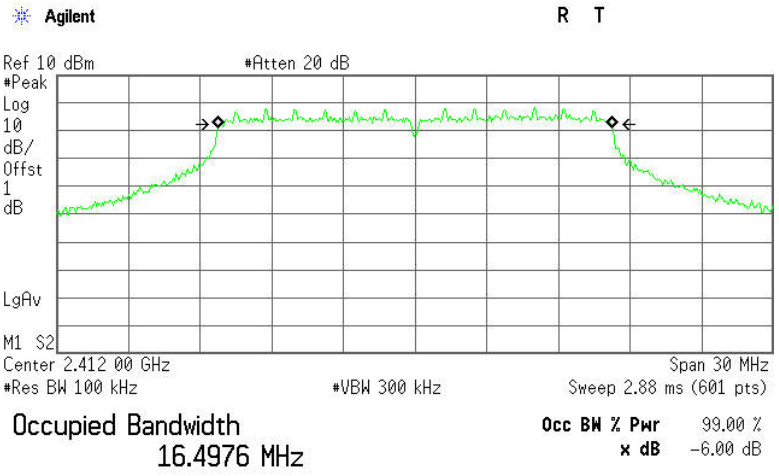
6dB Bandwidth (CH High)



Transmit Freq Error 35.302 kHz
x dB Bandwidth 10.139 MHz

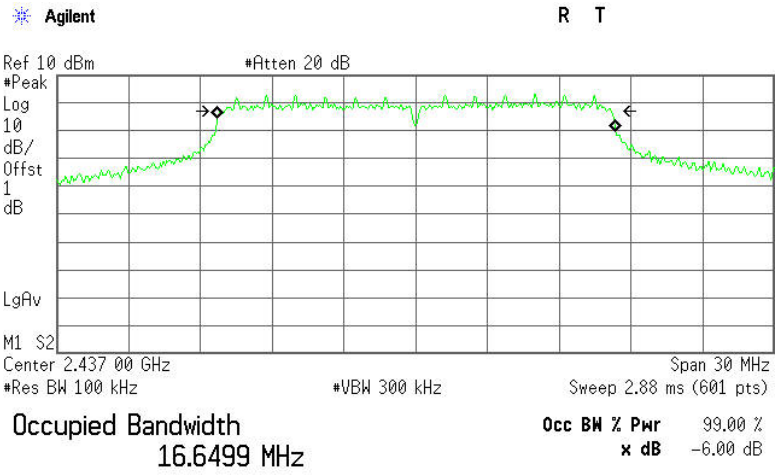
IEEE 802.11g (Antenna 0) mode

6dB Bandwidth (CH Low)



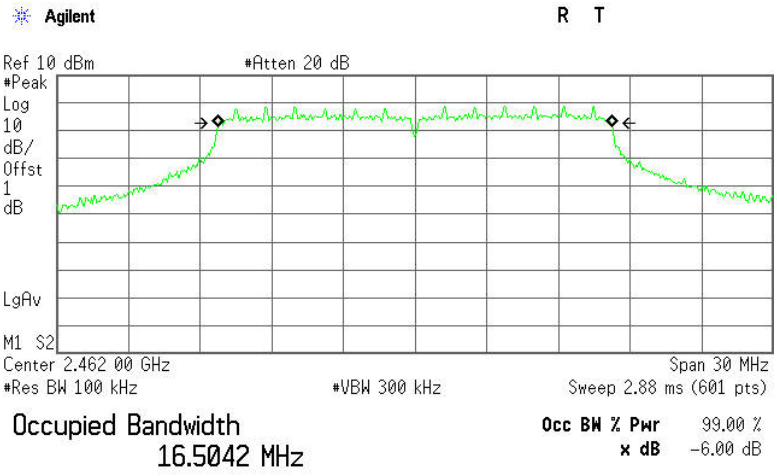
Transmit Freq Error 10.236 kHz
x dB Bandwidth 16.358 MHz

6dB Bandwidth (CH Mid)



Transmit Freq Error 42.456 kHz
x dB Bandwidth 16.364 MHz

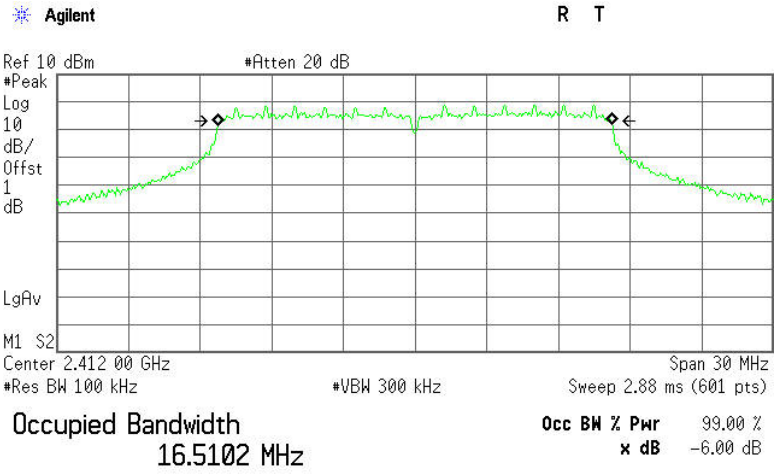
6dB Bandwidth (CH High)



Transmit Freq Error 3.854 kHz
x dB Bandwidth 16.390 MHz

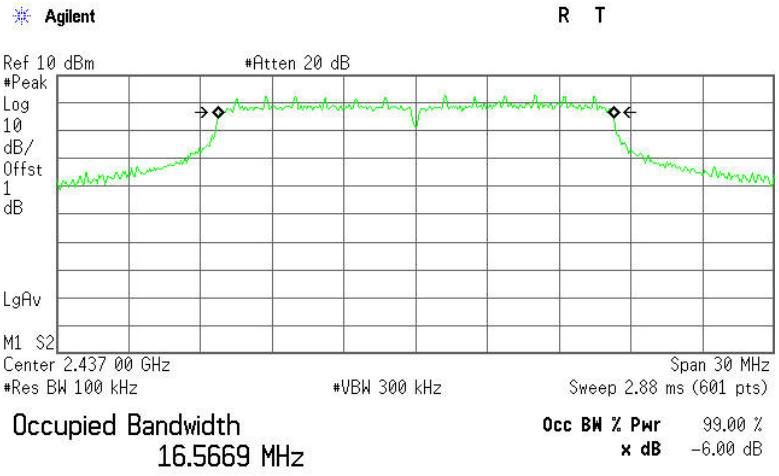
IEEE 802.11g (Antenna 1) mode

6dB Bandwidth (CH Low)



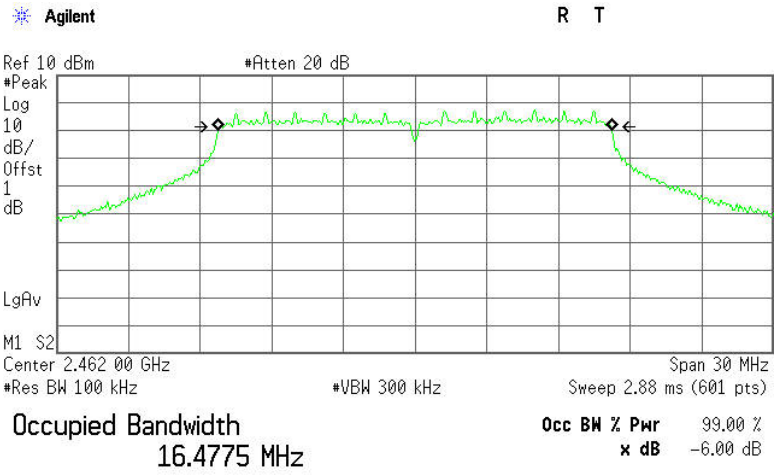
Transmit Freq Error 2.952 kHz
x dB Bandwidth 16.385 MHz

6dB Bandwidth (CH Mid)



Transmit Freq Error 13.472 kHz
x dB Bandwidth 16.362 MHz

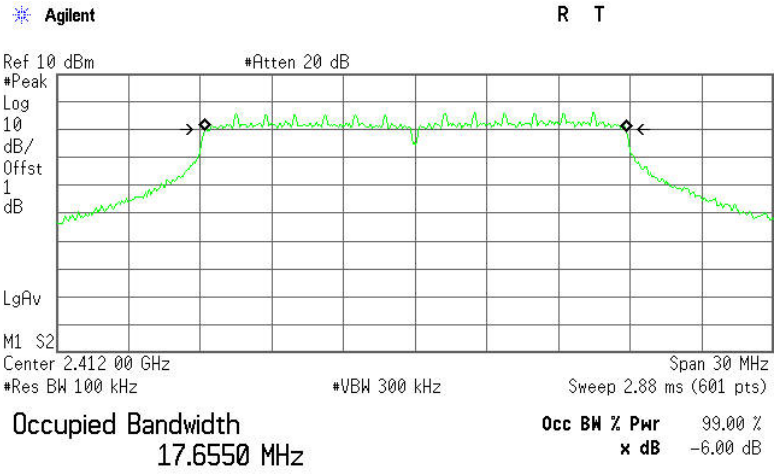
6dB Bandwidth (CH High)



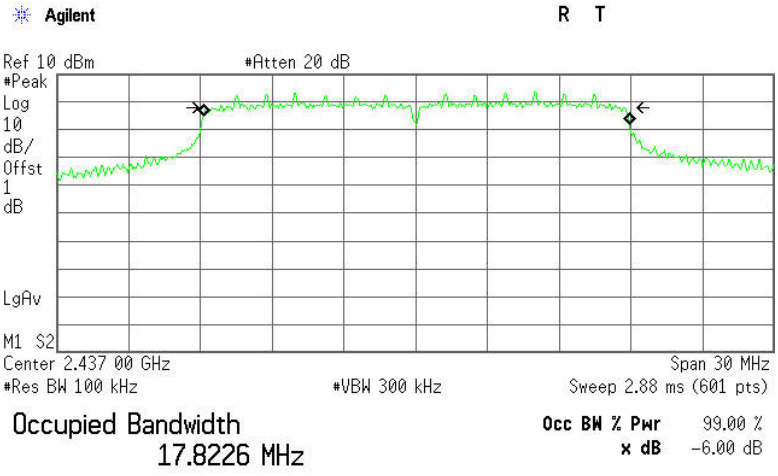
Transmit Freq Error 6.342 kHz
x dB Bandwidth 16.368 MHz

IEEE 802.11n HT20 MHz (Antenna 0) mode

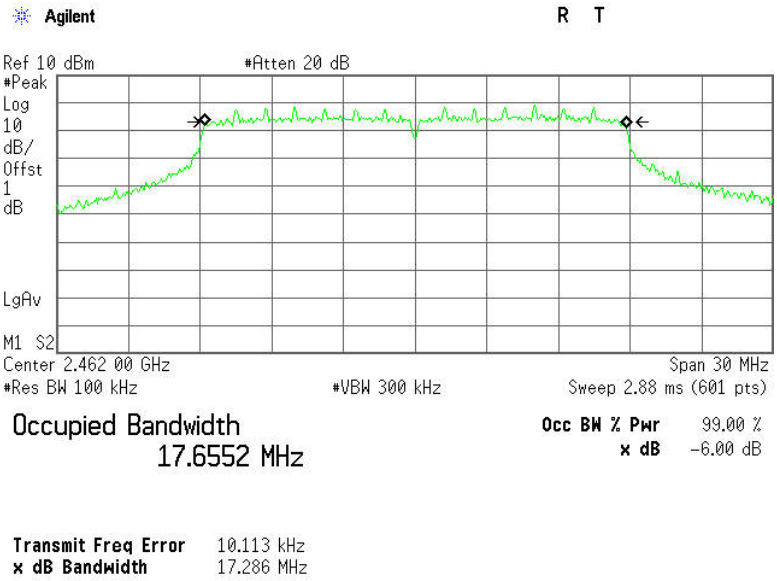
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

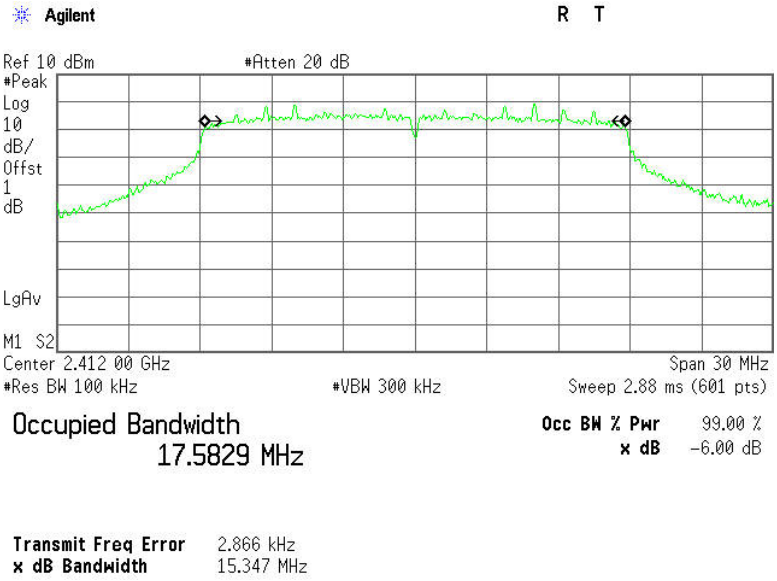


6dB Bandwidth (CH High)

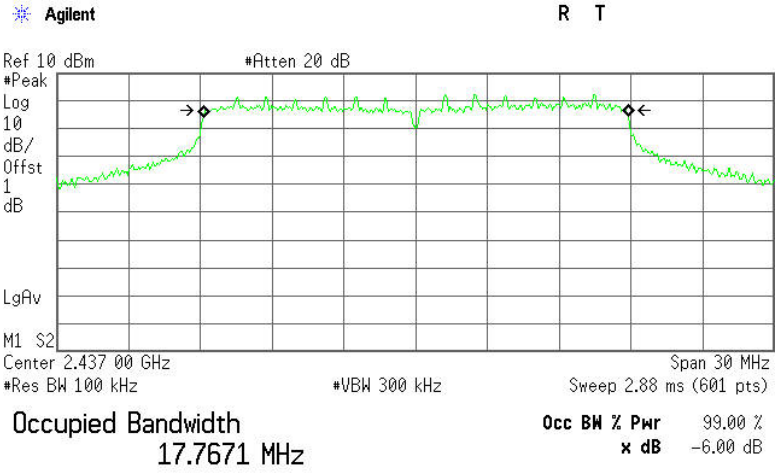


IEEE 802.11n HT20 MHz (Antenna 1) mode

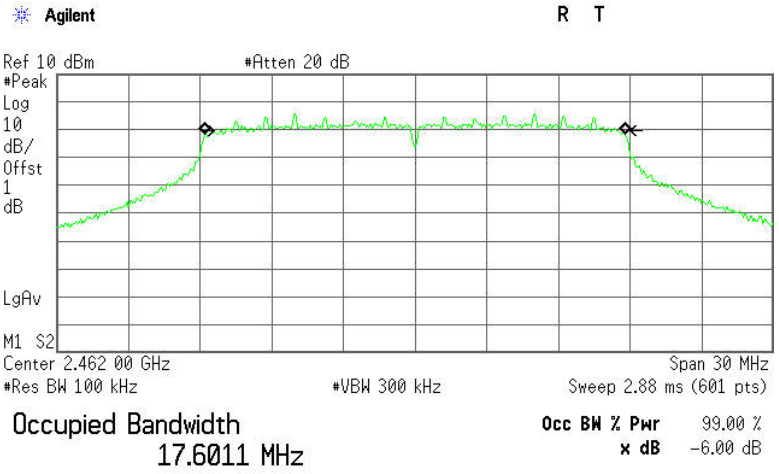
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

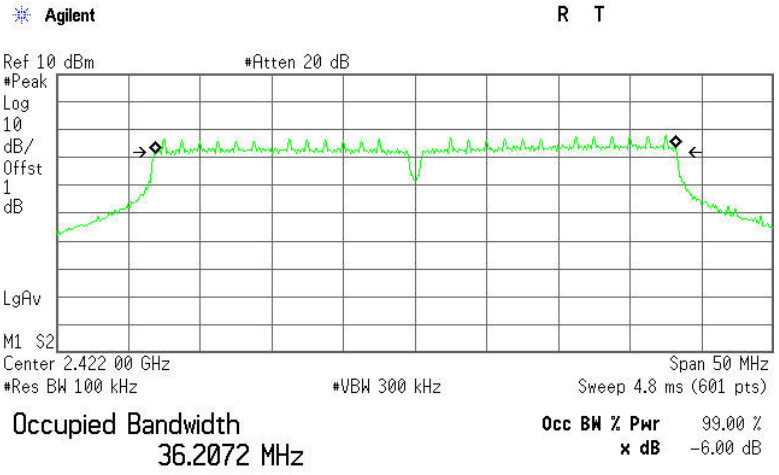


6dB Bandwidth (CH High)

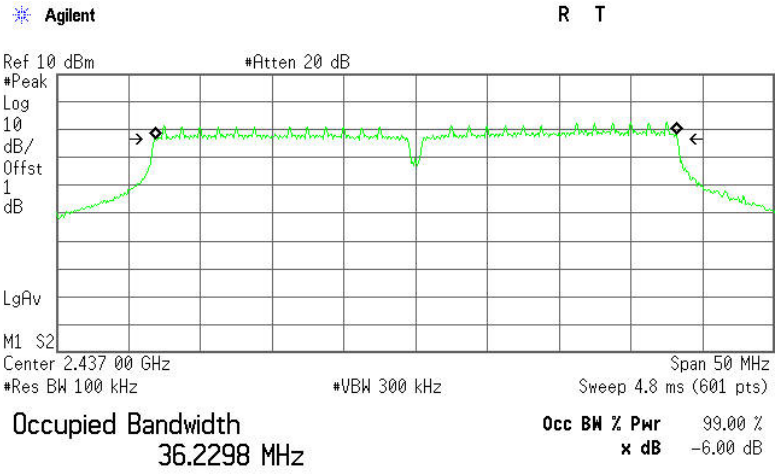


IEEE 802.11n HT40 MHz (Antenna 0) mode

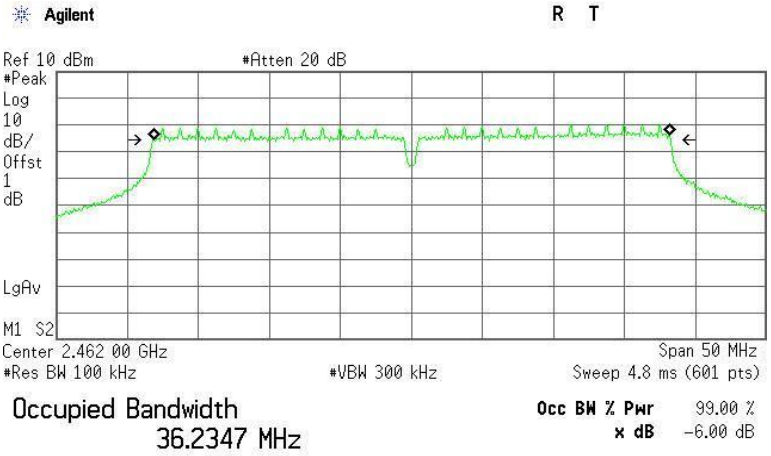
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



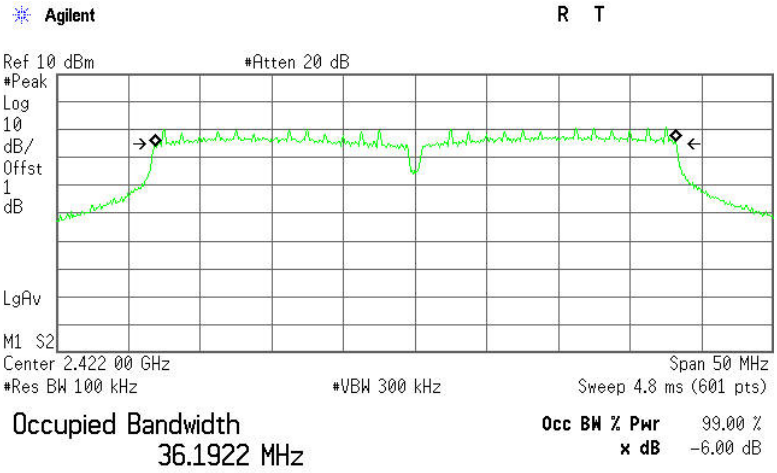
6dB Bandwidth (CH High)



Transmit Freq Error 31.746 kHz
x dB Bandwidth 36.413 MHz

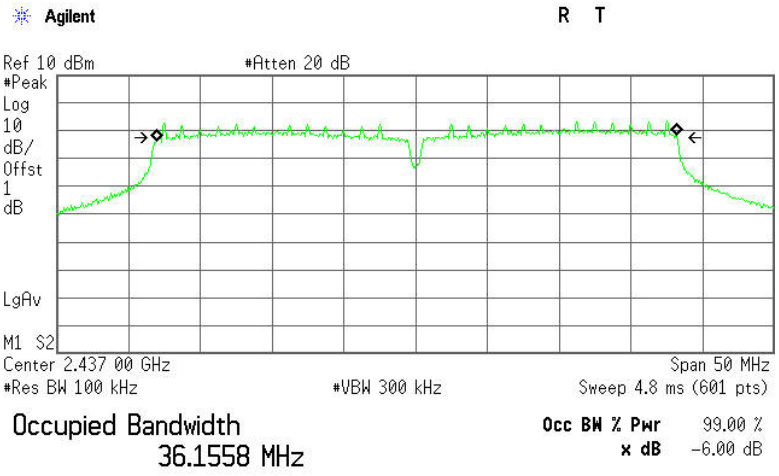
IEEE 802.11n HT40 MHz (Antenna 1) mode

6dB Bandwidth (CH Low)



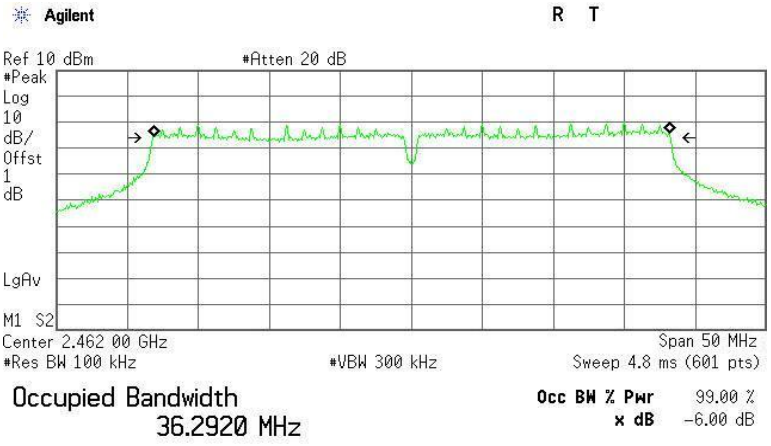
Transmit Freq Error 38.130 kHz
x dB Bandwidth 36.105 MHz

6dB Bandwidth (CH Mid)



Transmit Freq Error 63.854 kHz
x dB Bandwidth 36.045 MHz

6dB Bandwidth (CH High)



Transmit Freq Error 21.908 kHz
x dB Bandwidth 36.411 MHz

7.4. PEAK OUTPUT POWER

7.4.1. LIMITS

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.

2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

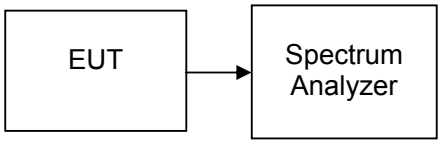
7.4.2. TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	03/09/2013	03/08/2014

7.4.3. TEST PROCEDURES (please refer to measurement standard)

1. This procedure provides an integrated measurement alternative when the maximum available RBW < EBW.
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Set the span to a value that is 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges(for some analyzers, this may require a manual overrideto ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at 1 MHz intervals extending across the EBW of the spectrum.

7.4.4. TEST SETUP



7.4.5. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b (Antenna 0)

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	12.60	0.01820	1	PASS
Mid	2437	11.70	0.01479		PASS
High	2462	12.40	0.01738		PASS

Test mode: IEEE 802.11b (Antenna 1)

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	11.80	0.01514	1	PASS
Mid	2437	12.90	0.01950		PASS
High	2462	14.10	0.02570		PASS

Test mode: IEEE 802.11g (Antenna 0)

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	18.60	0.07244	1	PASS
Mid	2437	21.20	0.13183		PASS
High	2462	17.40	0.05495		PASS

Test mode: IEEE 802.11g (Antenna 1)

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	16.10	0.04074	1	PASS
Mid	2437	21.50	0.14125		PASS
High	2462	18.60	0.07244		PASS