FCC 47 CFR PART 15 SUBPART C

for

XDSL Bonded 4 Port
Model: 6759-W1-XXYYYY,6729-W1-XXYYYY
("XX"= NA, EU, UK, etc. Which indicates the used adapter with different plug, the first "Y"= "-" or blank, the second to fourth "Y"=0~9, or A~Z, or blank which identifies different marketing areas.)

Brand: ZHONE

Test Report Number:
C140703Z02-RP1
Issued Date: August 18, 2014

Issued for

Zhone Technologies, Inc.
7195 Oakport Street Oakland, CA 94621 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

TESTING CERT #2861.01

检 测
CNAS L4818

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 18, 2014	Initial Issue	ALL	Nancy Fu

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1 TEST CERTIFICATION

Product	XDSL Bonded 4 Port
Model	6759-W1-XXYYYY,6729-W1-XXYYYY("XX"= NA, EU, UK, etc. Which indicates the used adapter with different plug, the first "Y"= "-" or blank, the second to fourth "Y"=0~9, or A~Z, or blank which identifies different marketing areas.)
Brand	ZHONE
Tested	July 3~ August 18, 2014
Applicant	**Zhone Technologies, Inc.** 7195 Oakport Street Oakland, CA 94621 USA
Manufacturer	**Zhone Technologies, Inc.** 7195 Oakport Street Oakland, CA 94621 USA

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

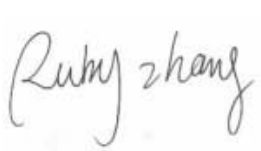
We hereby certify that:

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:

Sunday Hu
Supervisor of EMC Dept.
Compliance Certification Service Inc.

Reviewed by:



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

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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.

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3 EUT DESCRIPTION

Product	XDSL Bonded 4 Port
Model Number	6759-W1-XXYYYY,6729-W1-XXYYYY("XX"= NA, EU, UK, etc. Which indicates the used adapter with different plug, the first "Y"= "-" or blank, the second to fourth "Y"=0~9, or A~Z, or blank which identifies different marketing areas.)
Brand	ZHONE
Model Discrepancy	1. The model's electrical connections and PCB are the same except for the model 6759-W1-XXYYYY than the model 6729-W1-XXYYYY multiple HPNA ports. 2. "XX"= NA, EU, UK, etc. Which indicates the used adapter with different plug, the first "Y"= "-" or blank, the second to fourth " Y"=0~9, or A~Z, or blank which identifies different marketing areas.
Serial Number	C140703Z02-RP1
Received Date	July 3, 2014
Power Supply	DC12V powered by the adapter
Adapter Manufacturer / Model No.	DVE/DSA-30PFB-12 FUS 120250 I/P:100-240,50/60Hz,0.8A O/P:12V,2.5A DC Output Cable: Unshielded,1.45m
Transmit Power	IEEE 802.11b mode: 17.45dBm (Antenna 0) IEEE 802.11b mode: 16.77dBm (Antenna 1) IEEE 802.11g mode: 23.81dBm (Antenna 0) IEEE 802.11g mode: 22.97dBm (Antenna 1) IEEE 802.11n HT20 MHz mode: 24.12dBm (Combine with Antenna 0 and Antenna 1) IEEE 802.11n HT40 MHz mode: 23.39dBm (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: 130Mbps with fall back rates of 130/117/104/ 78/52/39/26/13Mbps IEEE 802.11n HT40: 270Mbps with fall back rates of 270/243/216/ 162/108/81/54/27Mbps
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 5.0dBi gain (Max)
Channels Spacing	IEEE 802.11b/g ,802.11n HT20/HT40 : 5MHz
Temperature Range	0°C ~ +40°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: **PJZ67X9** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.*

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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 1Gbps(6759-W1-NA) **Mode 2:** Normal Link 100Mbps(6759-W1-NA) **Mode 3:** Normal Link 10Mbps(6759-W1-NA) **Mode 4:** Normal Link 1Gbps(6729-W1-NA) **Mode 5:** Normal Link 100Mbps(6729-W1-NA) **Mode 6:** Normal Link 10Mbps(6729-W1-NA)	**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 13Mbps data rate were chosen for full testing.

IEEE 802.11n HT40 MHz mode: Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with 27Mbps data rate were chosen for full testing.

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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 #1	E336	R9-WN1EF	N/A	Thinkpad	Unshielded 0.50m	Unshielded 1.50m
2	Notebook #2	E335	R9-WN0EF	N/A	Thinkpad	Unshielded 0.50m	Unshielded 1.50m
3	WD#1	WXB1AAO V4476	WDBACY320 1ABK-PESN	N/A	N/A	Unshielded 0.50m	N/A
4	WD#2	WXF1A902 7339	WDBACY320 2ABK-PESN	N/A	N/A	Unshielded 0.50m	N/A
5	Broadband integrated access device	ZXDSL 9806H	N/A	N/A	N/A	Unshielded 2.00m	Unshielded 1.50m

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.

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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.

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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	03/09/2014	03/08/2015
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	04/20/2014	04/19/2015
LISN	EMCO	3825/2	8901-1459	03/09/2014	03/08/2015
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	03/04/2014	03/03/2015
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.

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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.

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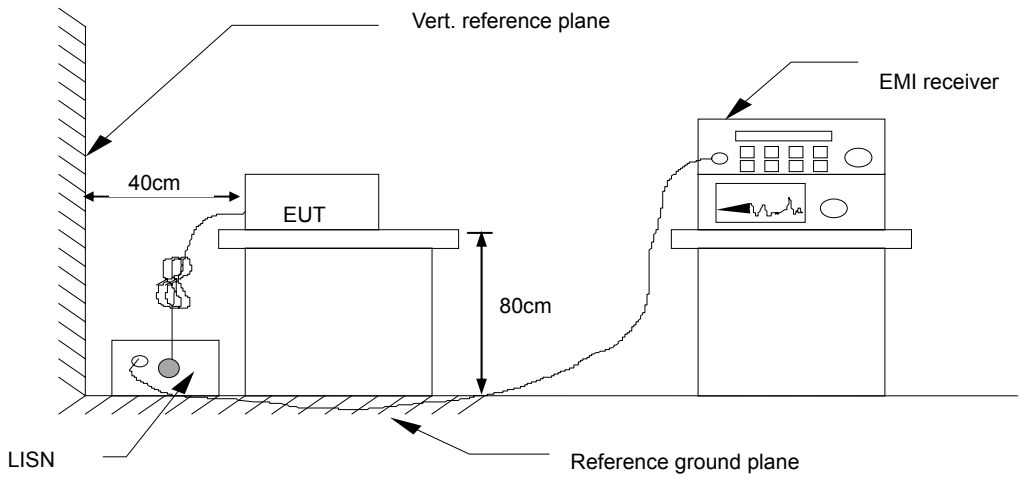
7.1.4. TEST SETUP



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)

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7.1.6. TEST RESULTS

Model No.	6759-W1-NA	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 1
Tested by	Mack Li	**Line**	L1
Test Date	July 11, 2014		

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)
0.1500	40.78	29.09	9.58	50.36	38.67	65.99	56.00	-15.63	-17.33	Pass
0.1900	34.53	22.84	9.67	44.20	32.51	64.03	54.04	-19.83	-21.53	Pass
0.2260	31.71	20.58	9.69	41.40	30.27	62.59	52.60	-21.19	-22.33	Pass
0.2980	26.76	15.03	9.69	36.45	24.72	60.30	50.30	-23.85	-25.58	Pass
11.4220	25.22	16.61	9.88	35.10	26.49	60.00	50.00	-24.90	-23.51	Pass
12.8340	31.48	23.12	9.89	41.37	33.01	60.00	50.00	-18.63	-16.99	Pass

Model No.	6759-W1-NA	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 1
Tested by	Mack Li	**Line**	L2
Test Date	July 11, 2014		

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)
0.1500	40.74	27.61	9.78	50.52	37.39	65.99	56.00	-15.47	-18.61	Pass
0.1940	34.58	19.88	9.79	44.37	29.67	63.86	53.86	-19.49	-24.19	Pass
0.2380	34.12	13.73	9.78	43.90	23.51	62.16	52.17	-18.26	-28.66	Pass
0.3060	29.44	19.37	9.75	39.19	29.12	60.08	50.08	-20.89	-20.96	Pass
1.8820	17.93	2.94	9.74	27.67	12.68	56.00	46.00	-28.33	-33.32	Pass
12.7140	28.66	20.10	9.78	38.44	29.88	60.00	50.00	-21.56	-20.12	Pass

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

L2 = Line Two (Neutral Line)

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7.2. SPURIOUS EMISSIONS MEASUREMENT

7.2.1. CONDUCTED EMISSIONS MEASUREMENT

7.2.1.1. 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)).

7.2.1.2. TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015

7.2.1.3. 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.

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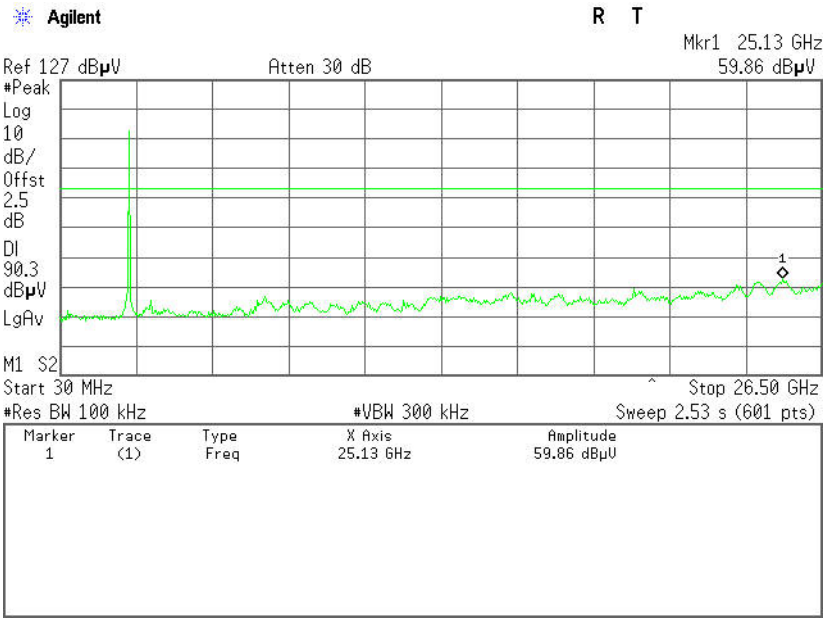
7.2.1.4. TEST RESULTS

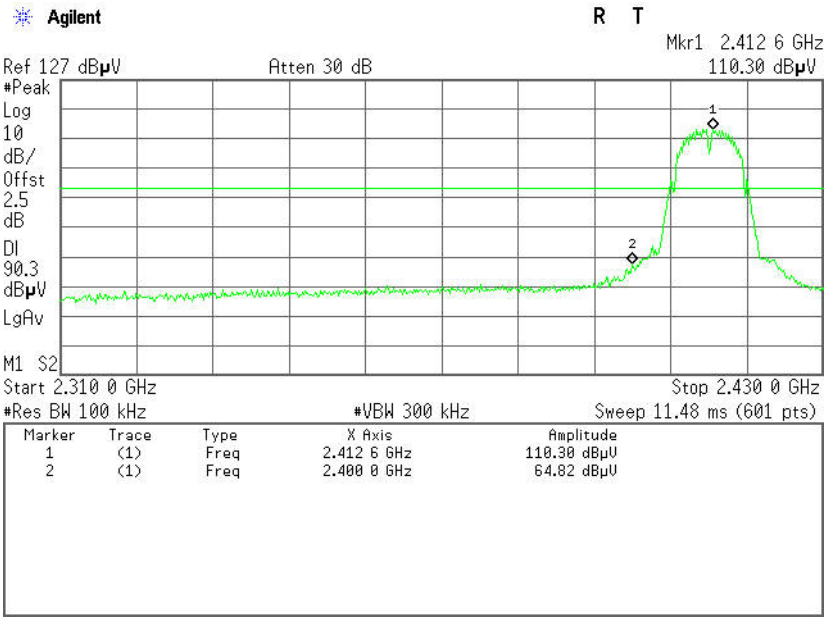
Test Plot

IEEE 802.11b mode(Antenna 0)

CH Low (30MHz ~26.5GHz)



CH Low (2.31GHz ~2.43GHz)



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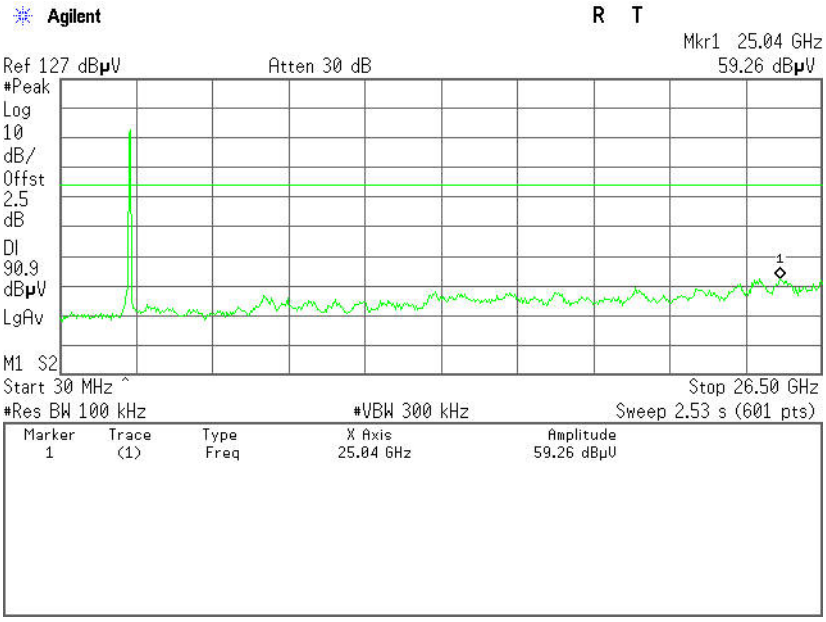
CH Mid (30MHz ~26.5GHz)



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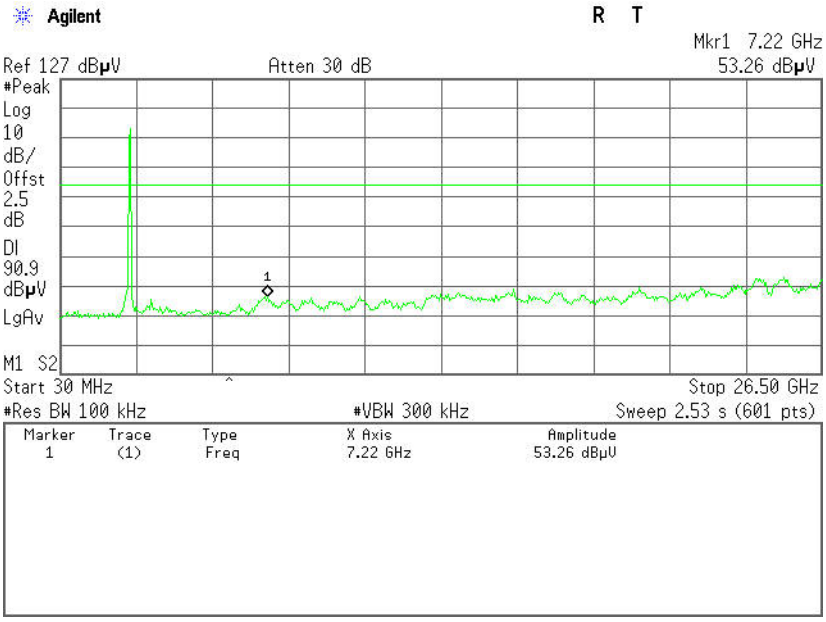
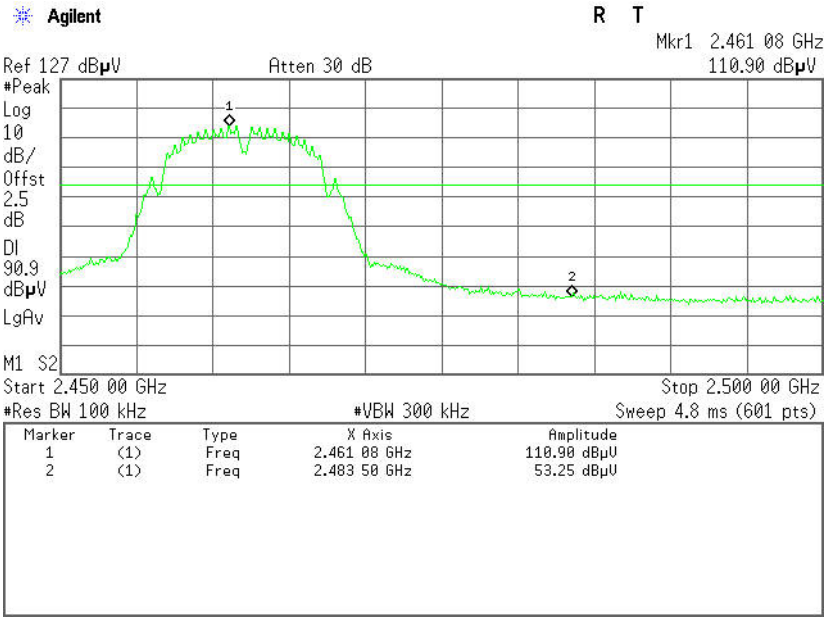
CH High (30MHz ~26.5GHz)



CH High (2.45GHz ~2.5GHz)



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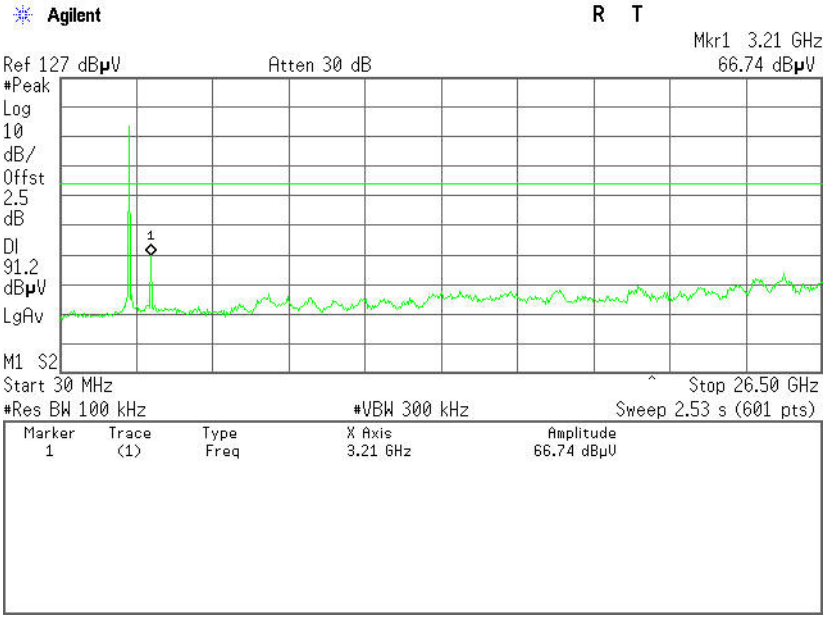
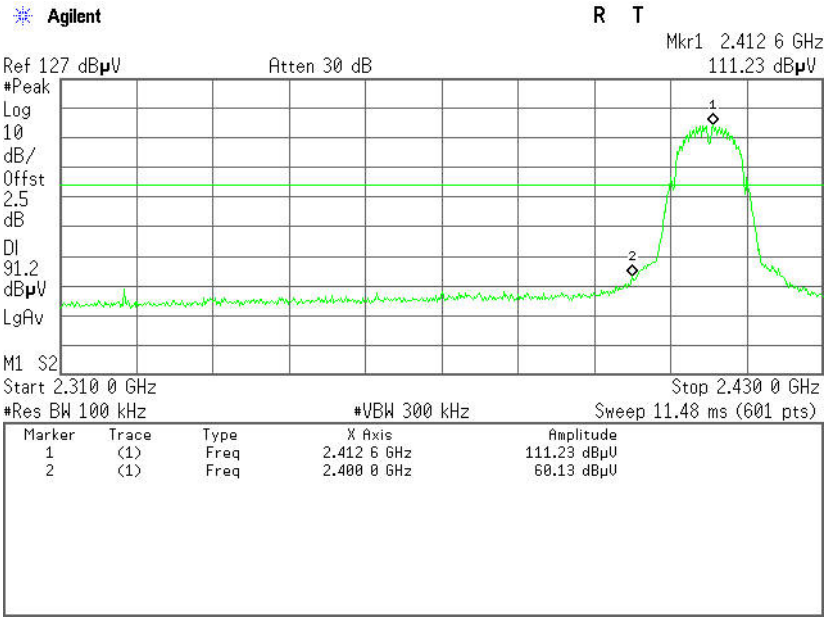
IEEE 802.11b mode(Antenna 1)

CH Low (30MHz ~26.5GHz)



CH Low (2.31GHz ~2.43GHz)



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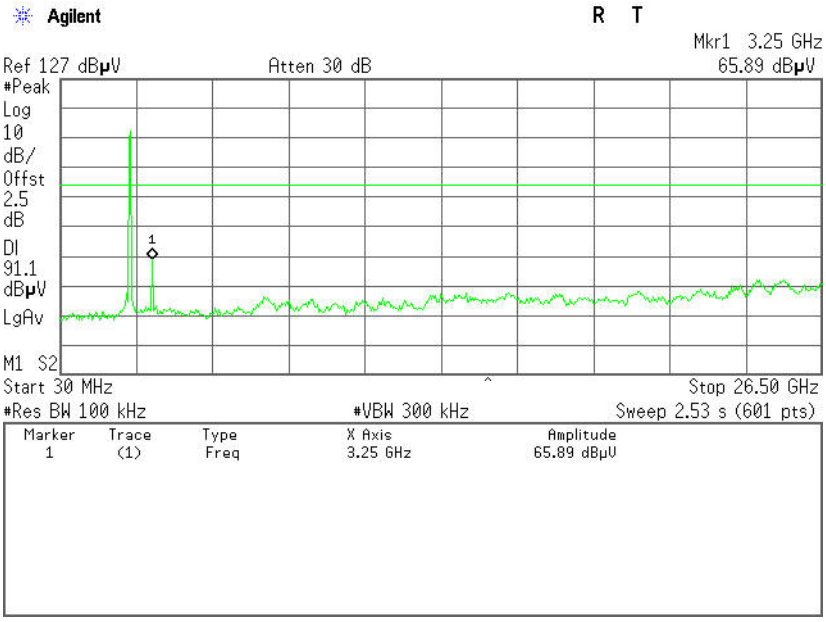
CH Mid (30MHz ~26.5GHz)



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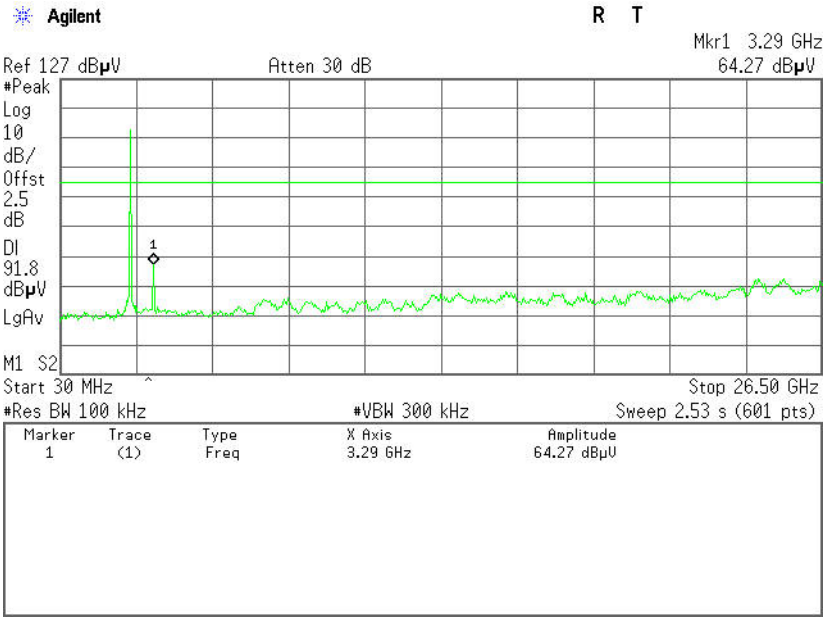
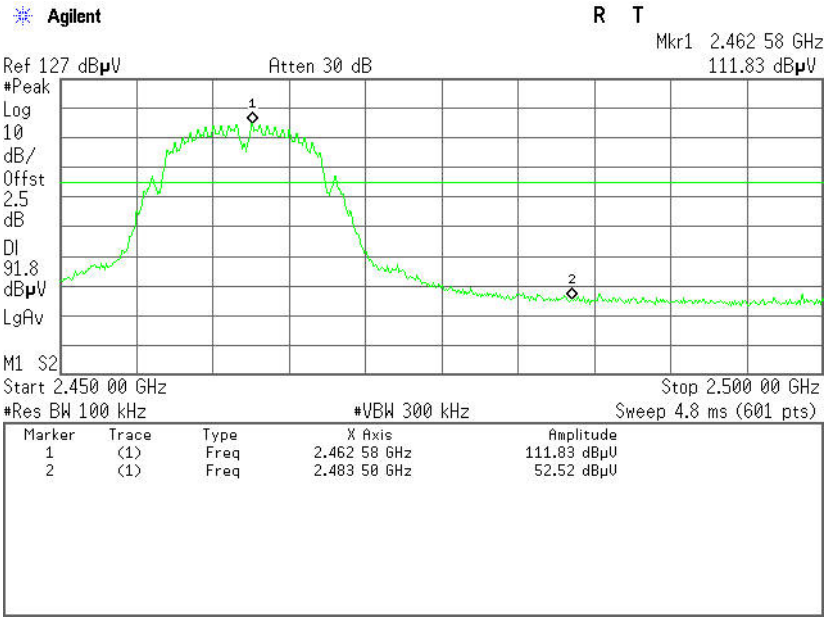
CH High (30MHz ~26.5GHz)



CH High (2.45GHz ~2.5GHz)



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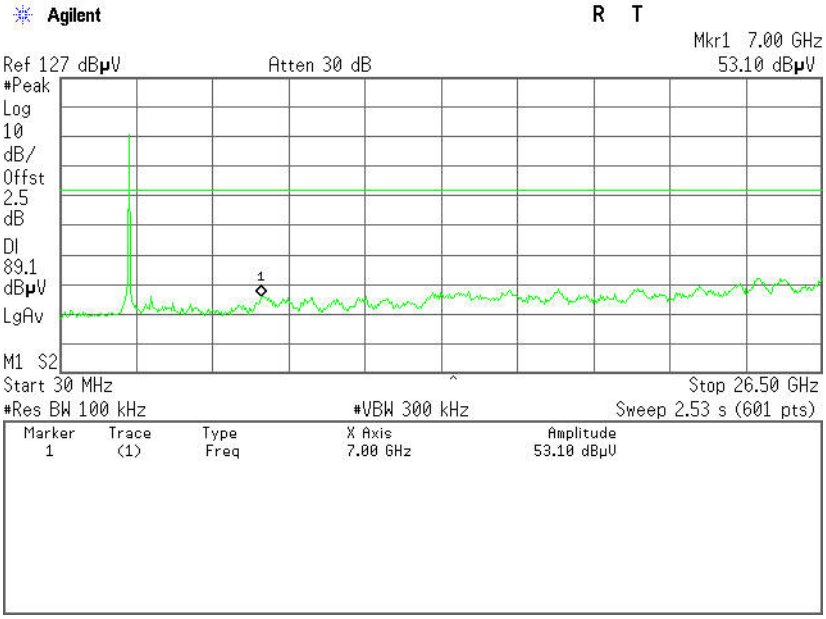
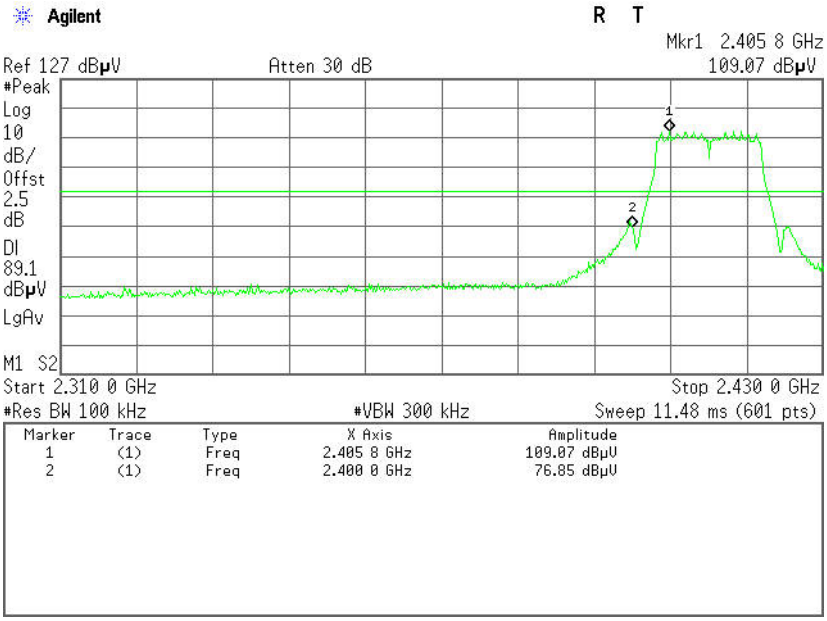
IEEE 802.11g mode(Antenna 0)

CH Low (30MHz ~26.5GHz)



CH Low (2.31GHz ~2.43GHz)



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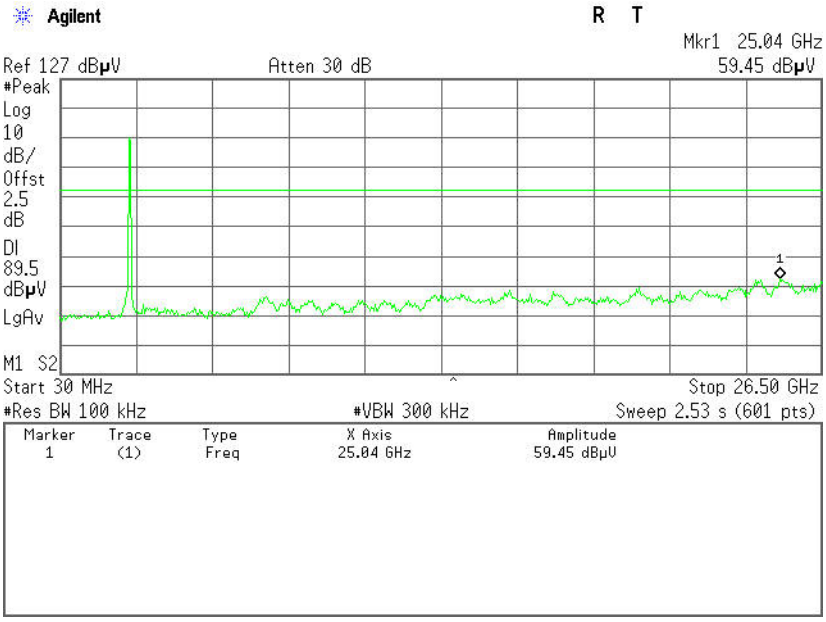
CH Mid (30MHz ~26.5GHz)



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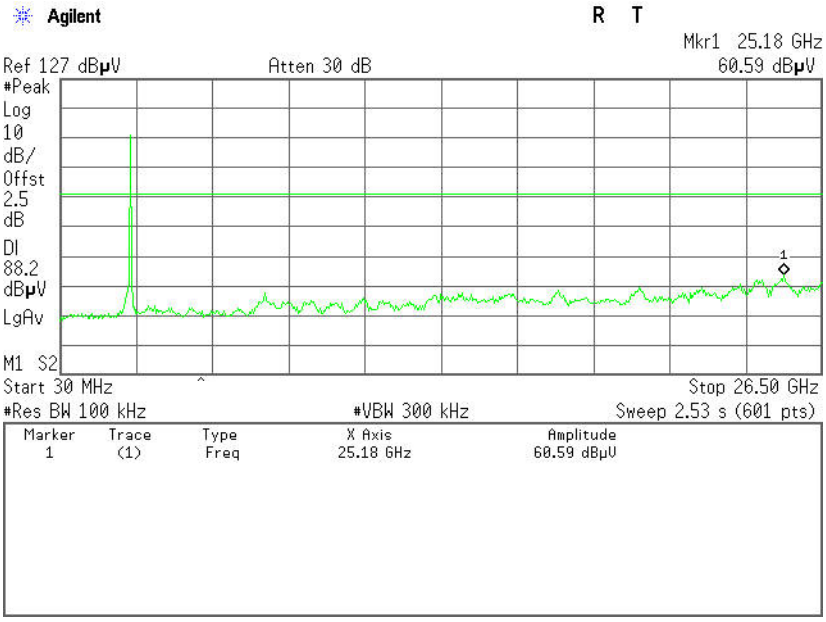
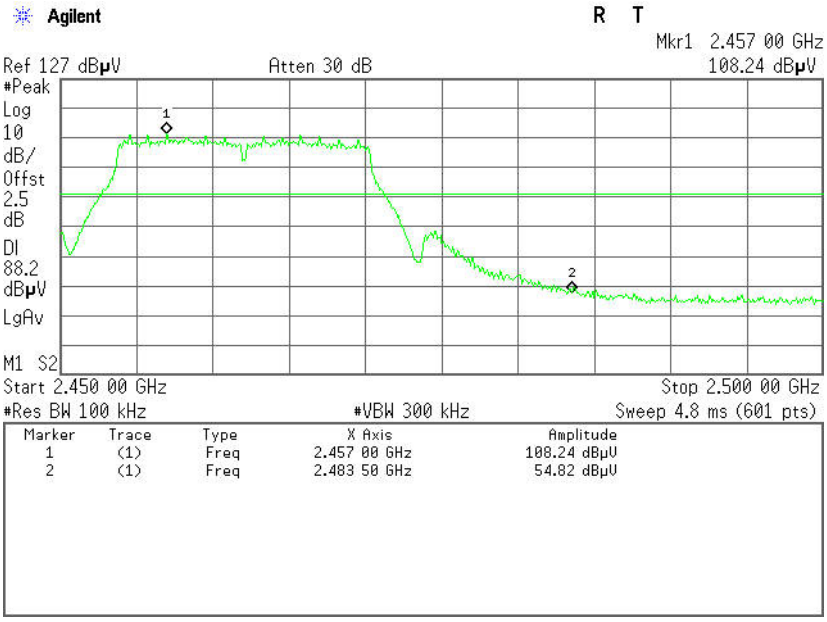
CH High (30MHz ~26.5GHz)



CH High (2.45GHz ~2.5GHz)



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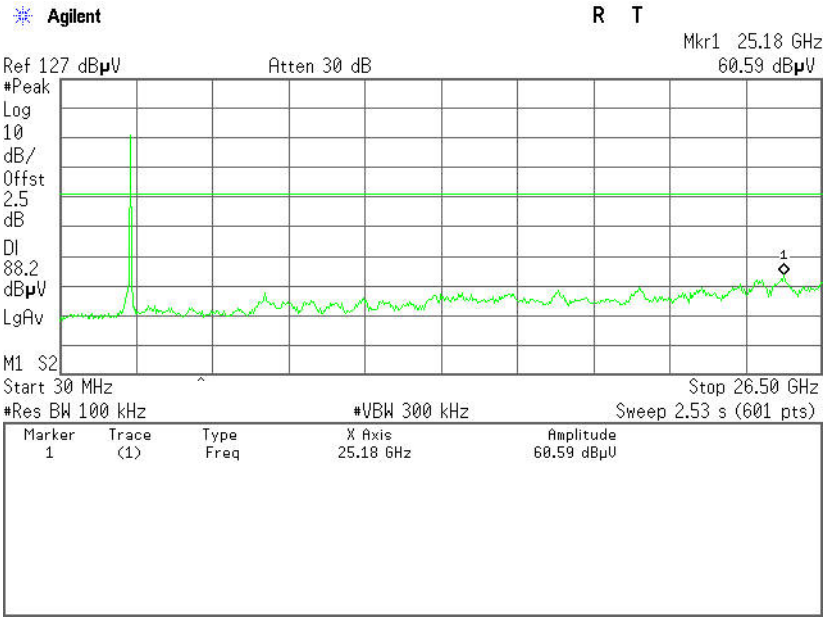
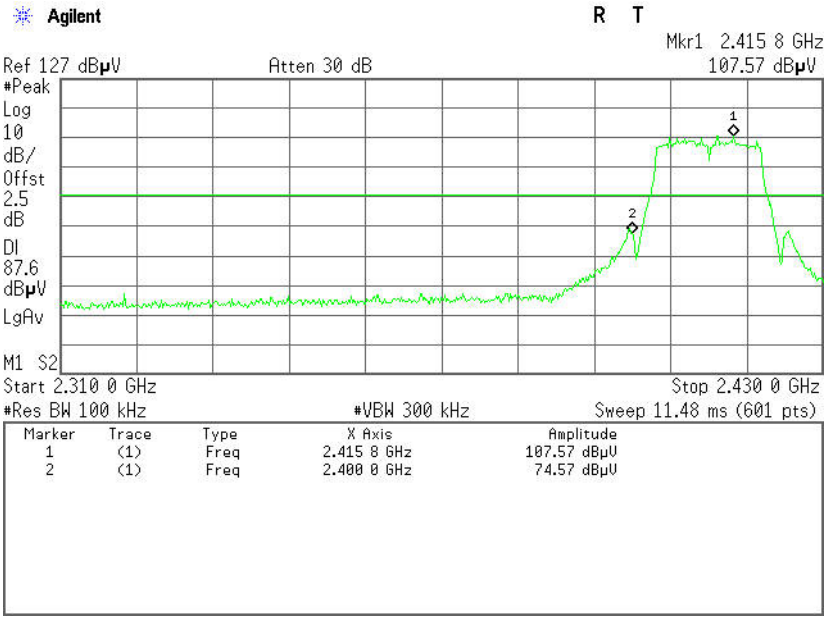
IEEE 802.11g mode(Antenna 1)

CH Low (30MHz ~26.5GHz)



CH Low (2.31GHz ~2.43GHz)



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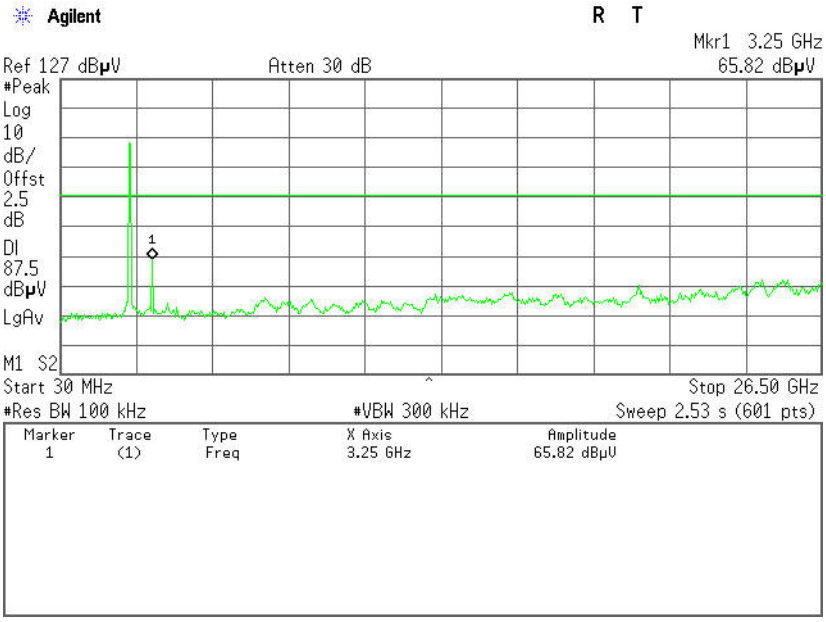
CH Mid (30MHz ~26.5GHz)



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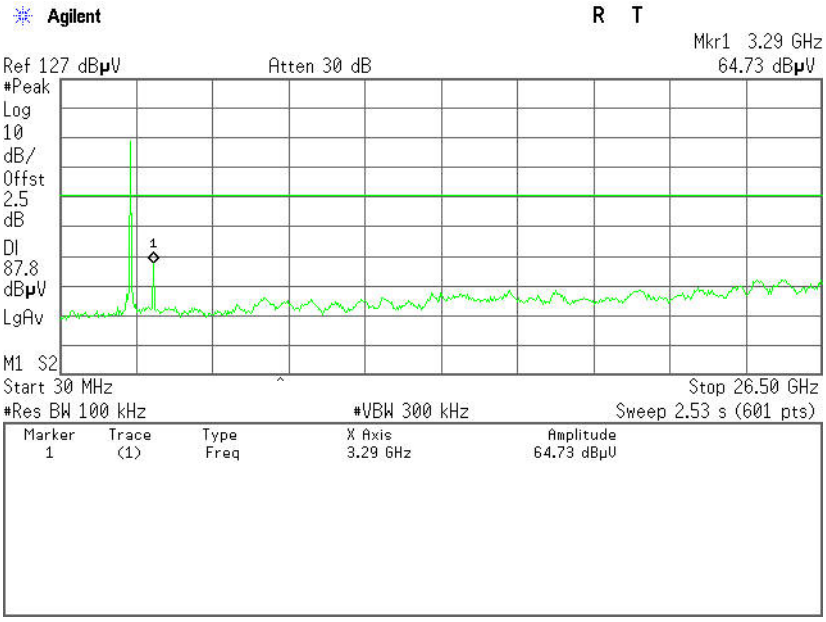
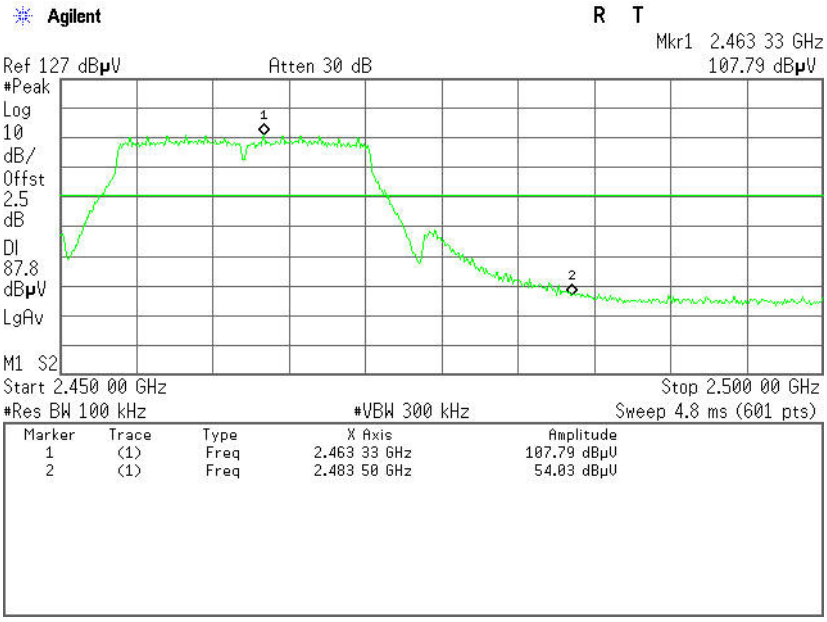
CH High (30MHz ~26.5GHz)



CH High (2.45GHz ~2.5GHz)



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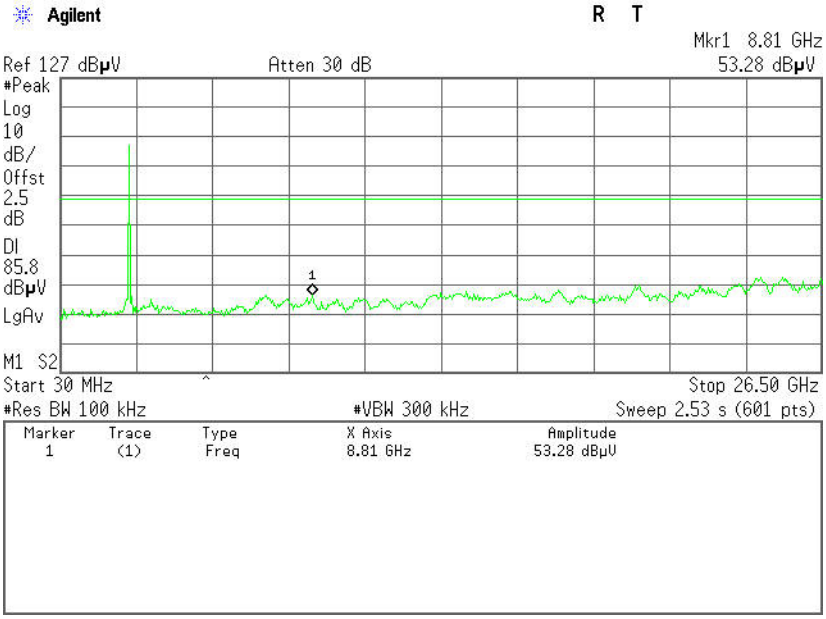
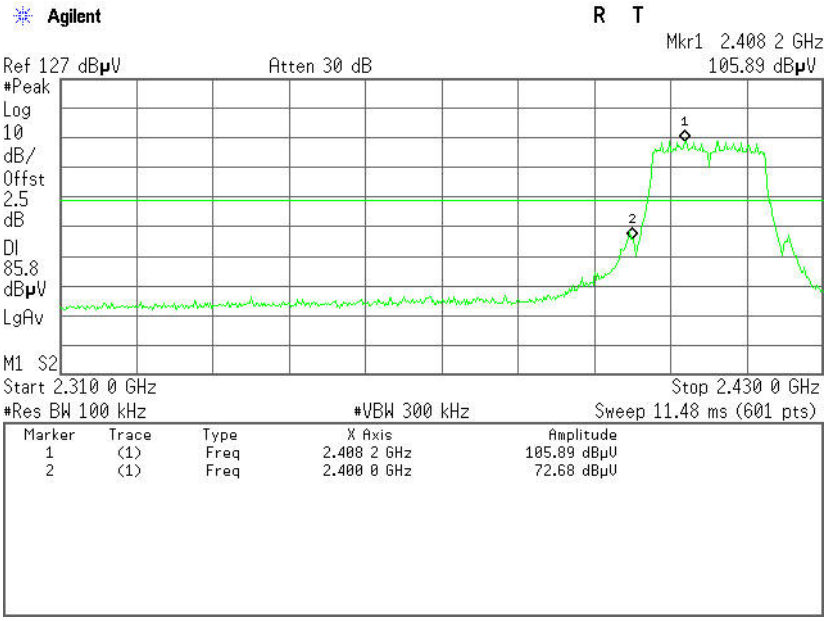
IEEE 802.11n HT20 MHz mode(Antenna 0)

CH Low (30MHz ~26.5GHz)



CH Low (2.31GHz ~2.43GHz)



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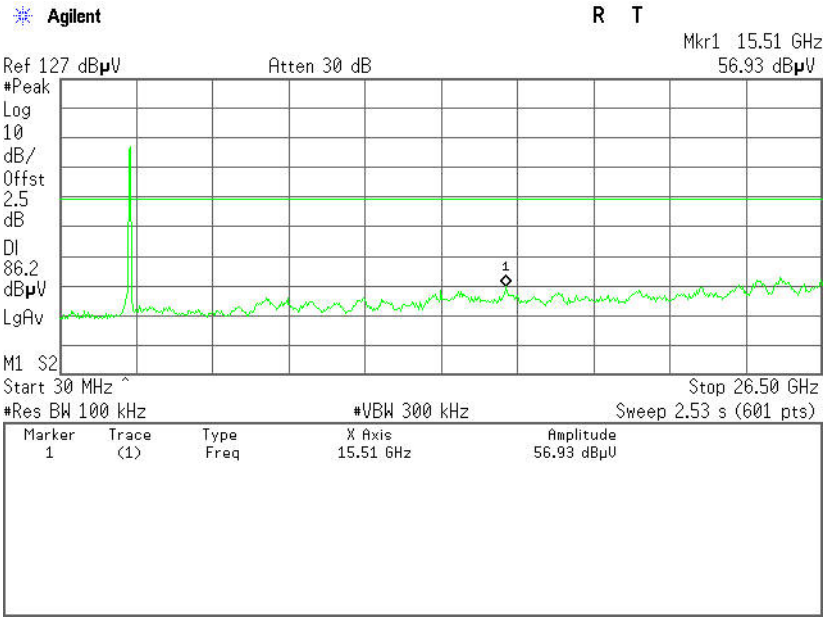
CH Mid (30MHz ~26.5GHz)



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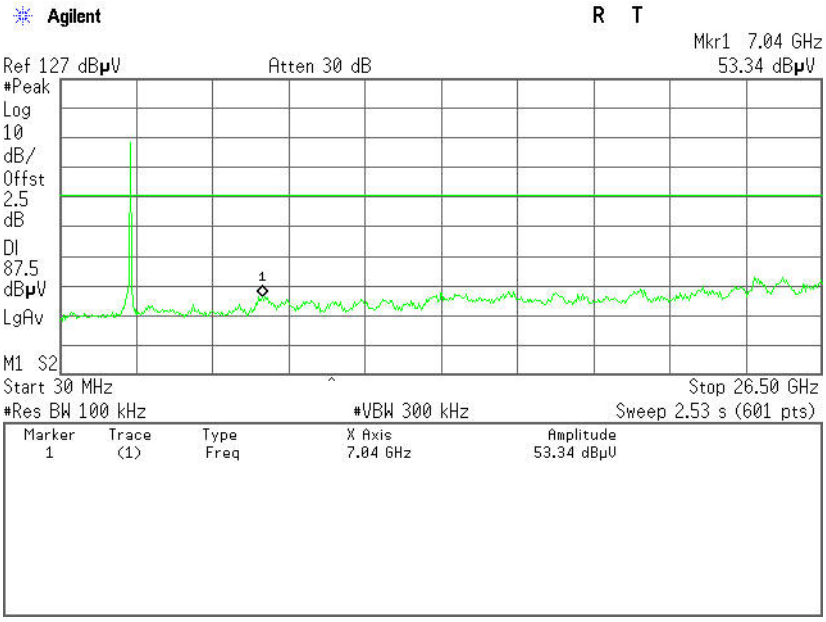
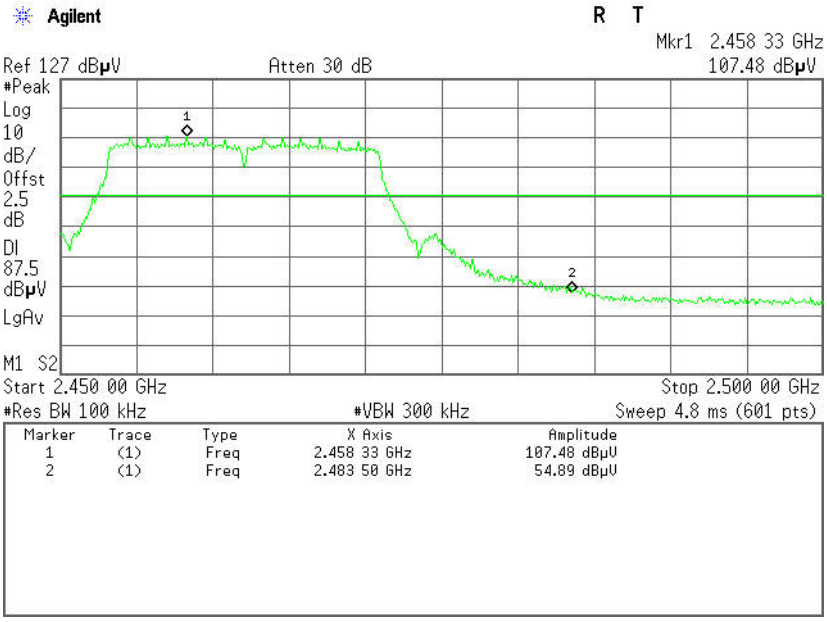
CH High (30MHz ~26.5GHz)



CH High (2.45GHz ~2.5GHz)



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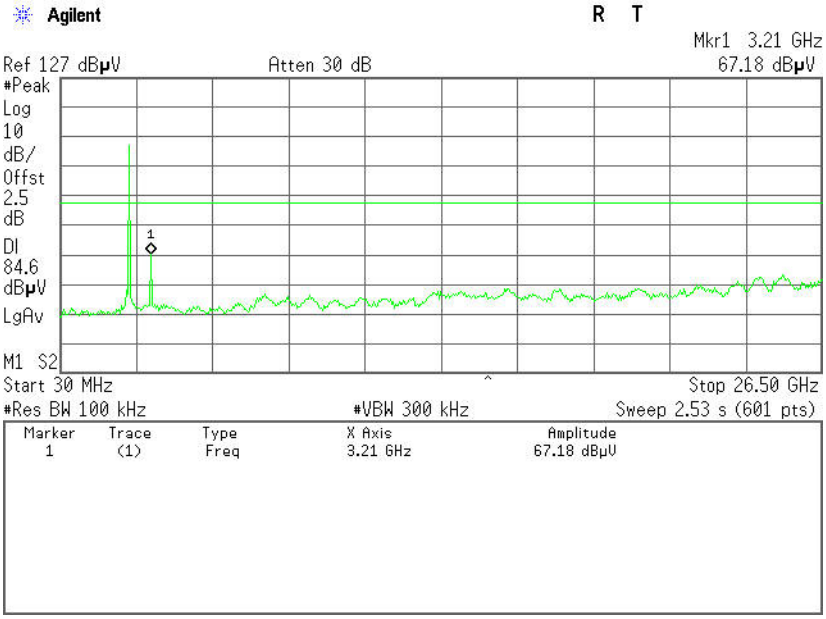
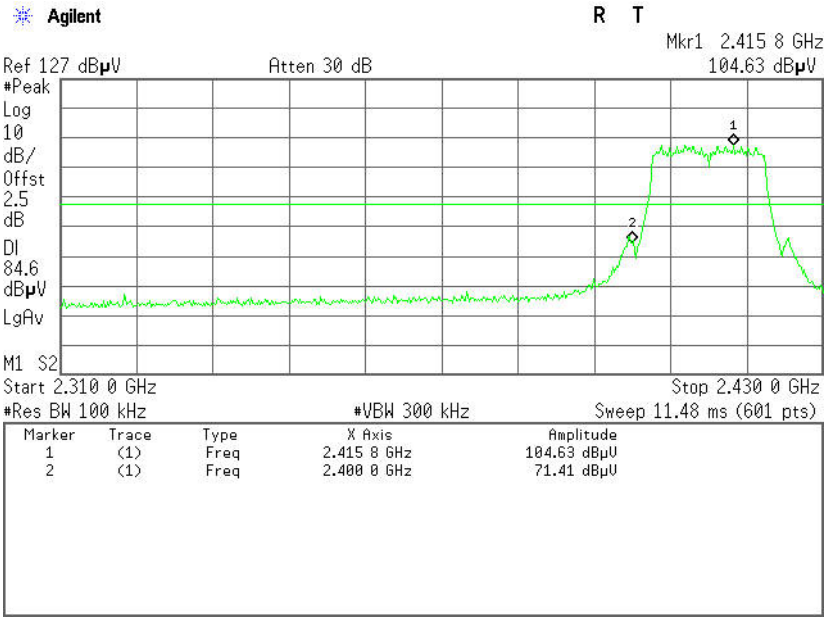
IEEE 802.11n HT20 MHz mode(Antenna 1)

CH Low (30MHz ~26.5GHz)



CH Low (2.31GHz ~2.43GHz)



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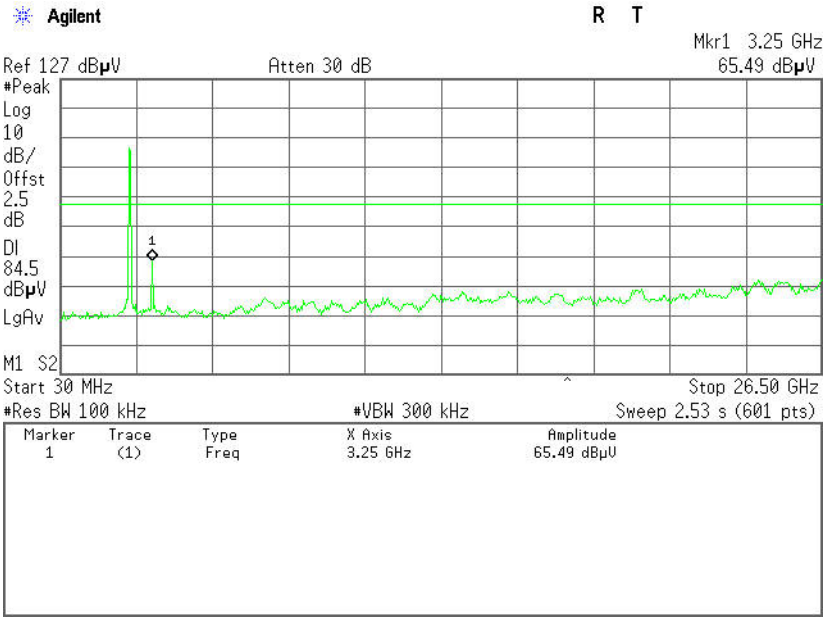
CH Mid (30MHz ~26.5GHz)



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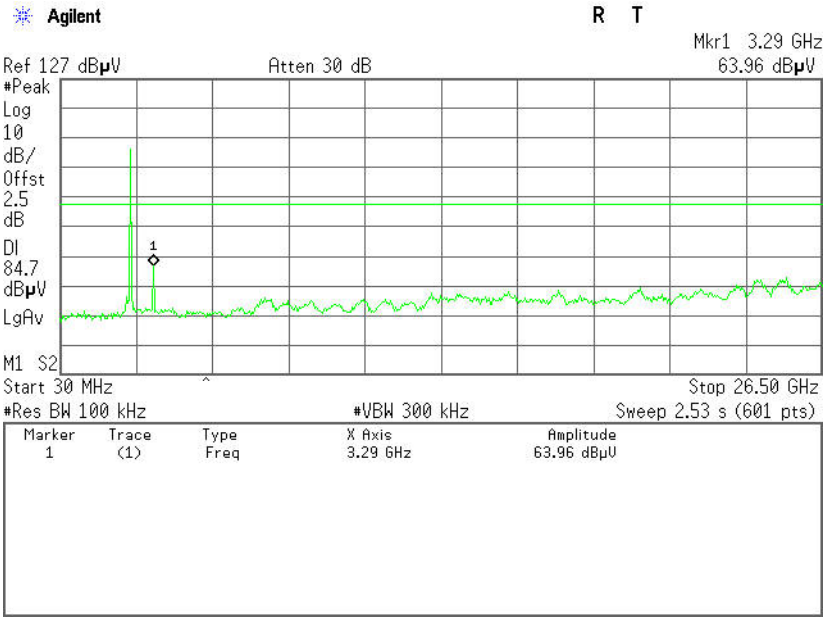
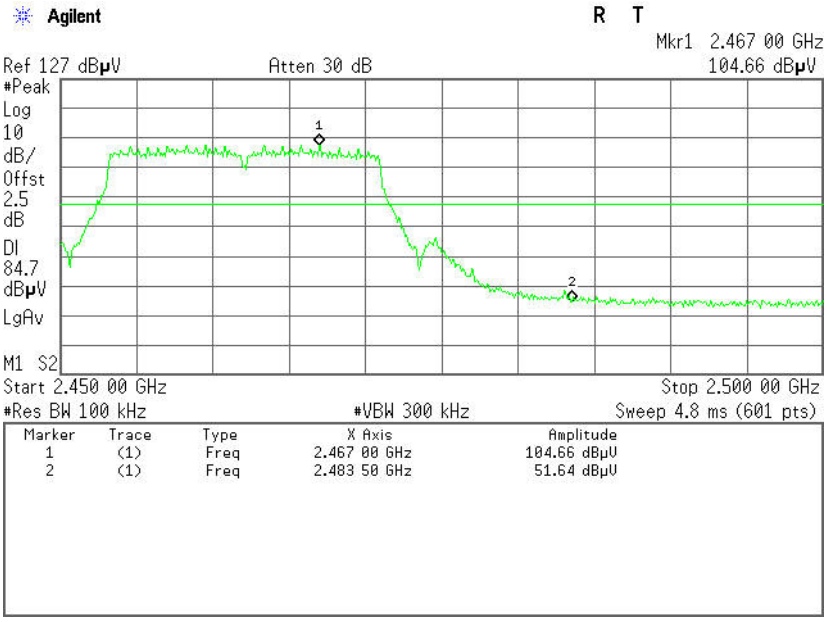
CH High (30MHz ~26.5GHz)



CH High (2.45GHz ~2.5GHz)



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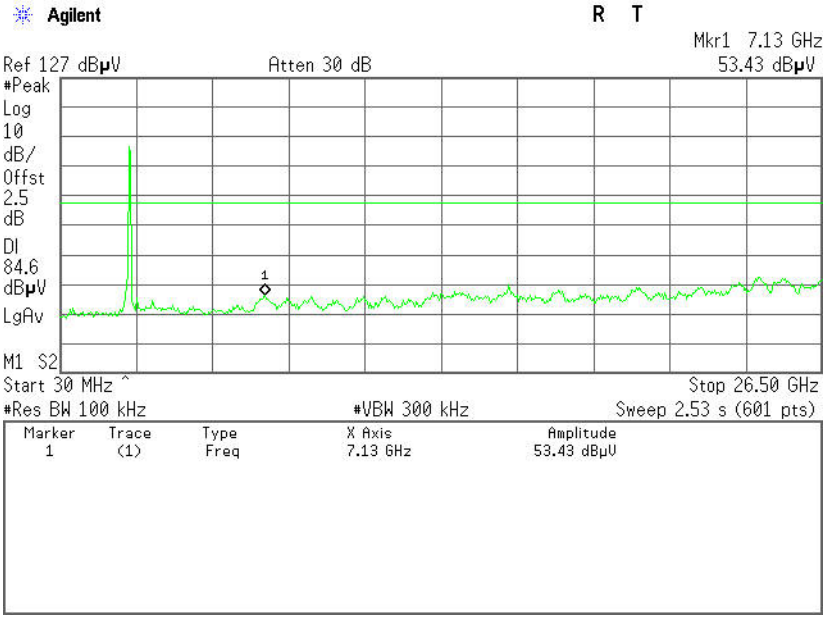
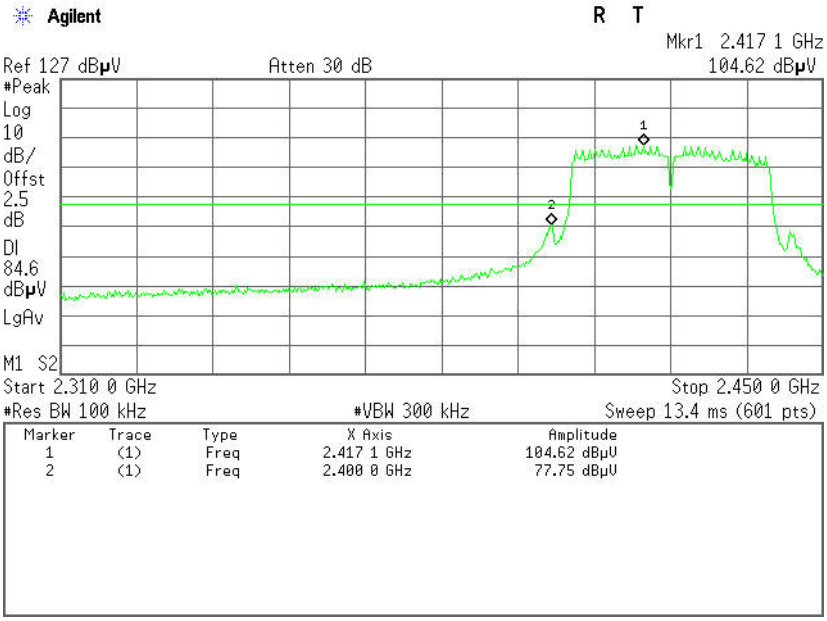
IEEE 802.11n HT40 MHz mode(Antenna 0)

CH Low (30MHz ~26.5GHz)



CH Low (2.31GHz ~2.45GHz)



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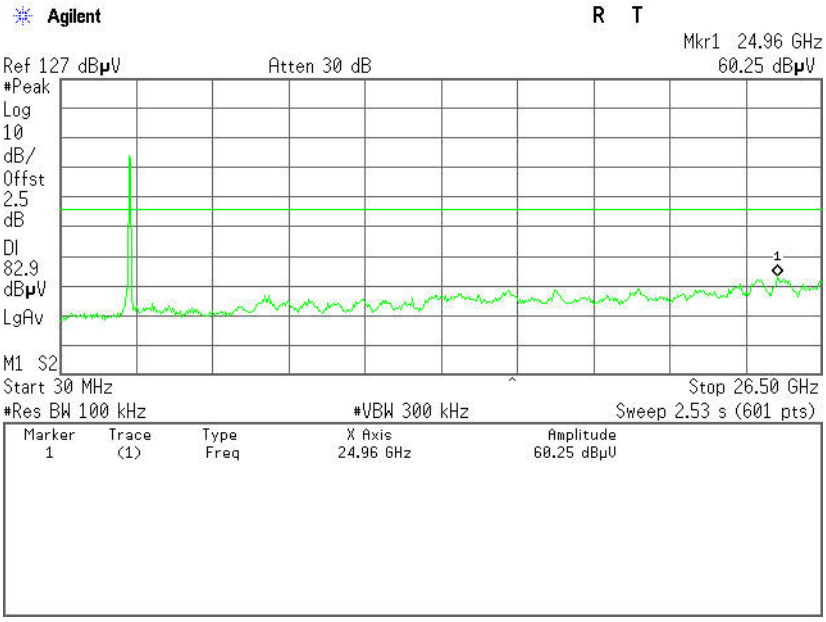
CH Mid (30MHz ~26.5GHz)



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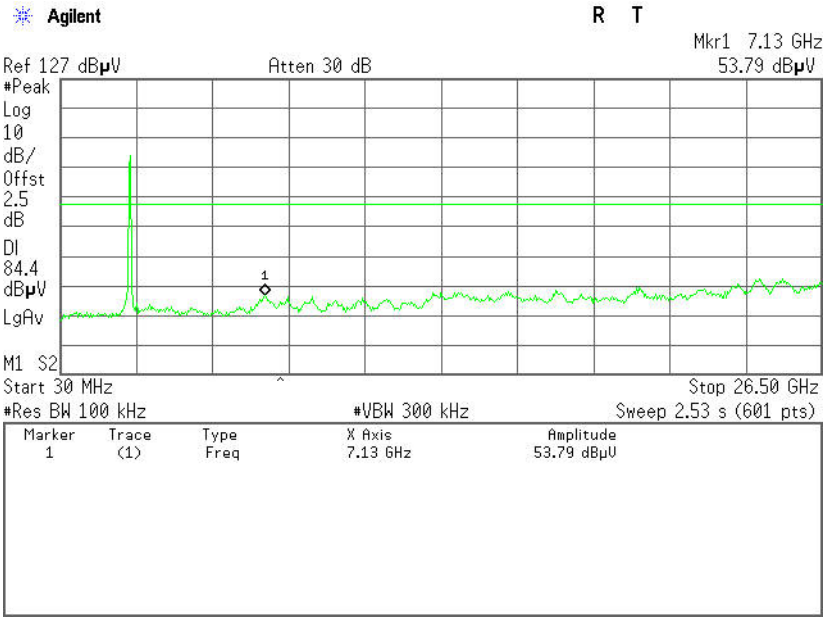
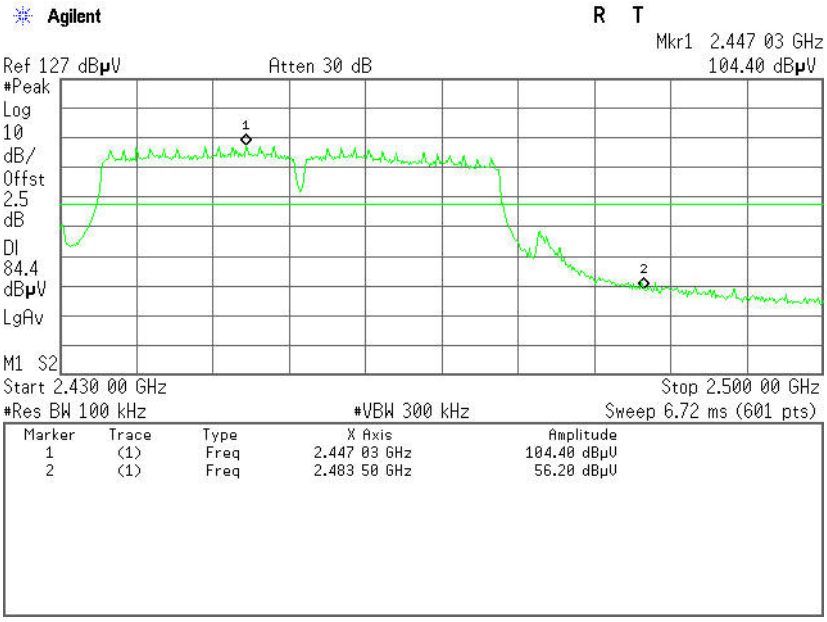
CH High (30MHz ~26.5GHz)



CH High (2.43GHz ~2.5GHz)



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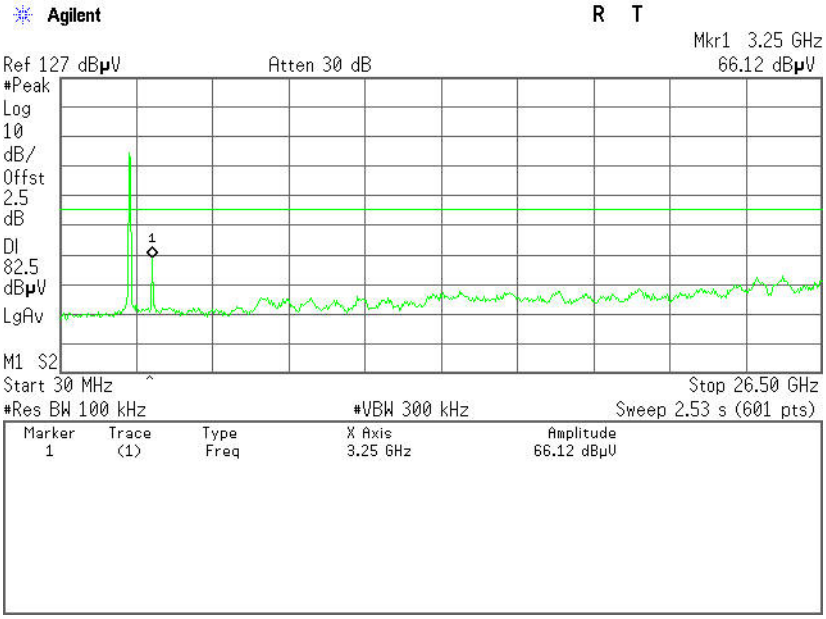
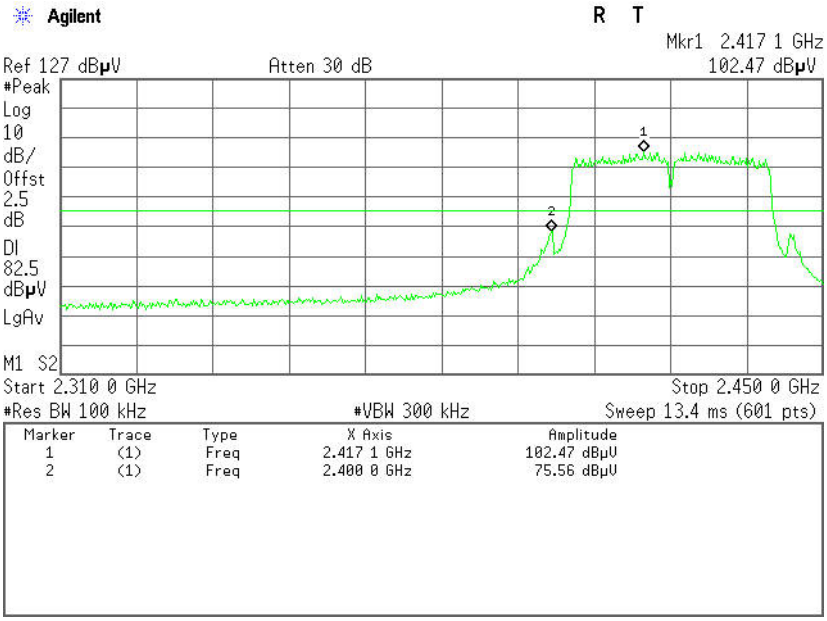
IEEE 802.11n HT40 MHz mode(Antenna 1)

CH Low (30MHz ~26.5GHz)



CH Low (2.31GHz ~2.45GHz)



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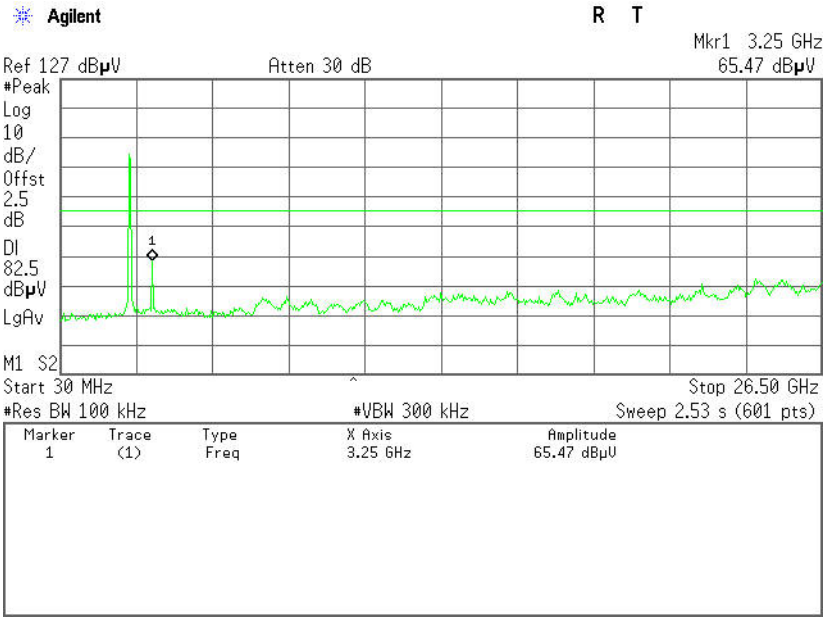
CH Mid (30MHz ~26.5GHz)



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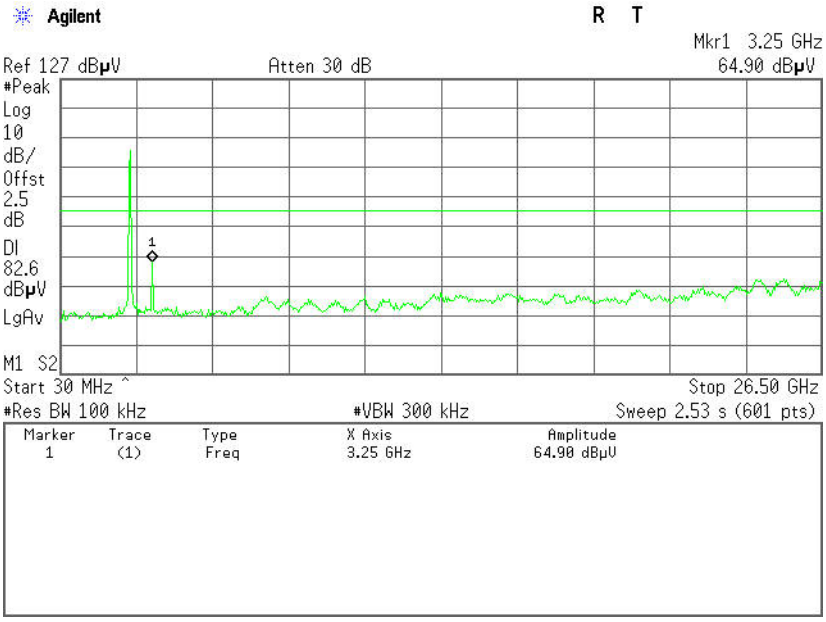
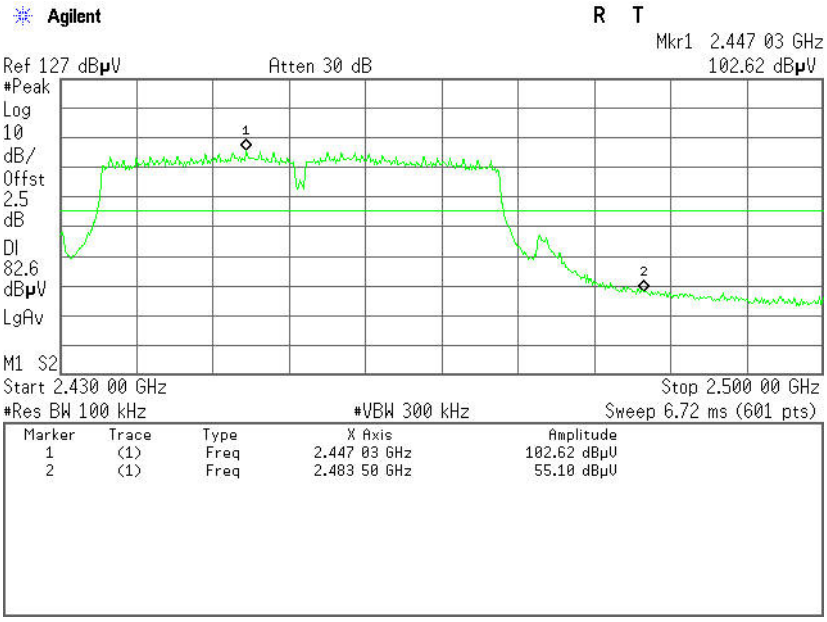
CH High (30MHz ~26.5GHz)



CH High (2.43GHz ~2.5GHz)



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7.2.2. RADIATED EMISSIONS MEASUREMENT

7.2.2.1. 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).

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7.2.2.2. 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	03/01/2014	03/01/2015
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2014	03/08/2015
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2014	03/18/2015
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2014	03/18/2015
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	07/10/2014	07/09/2015
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/01/2014	03/01/2015
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/01/2014	03/01/2015
Loop Antenna	A、R、A	PLA-1030/B	1029	09/27/2013	09/26/2014
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	02/28/2014	02/28/2015
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.

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7.2.2.3. 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.

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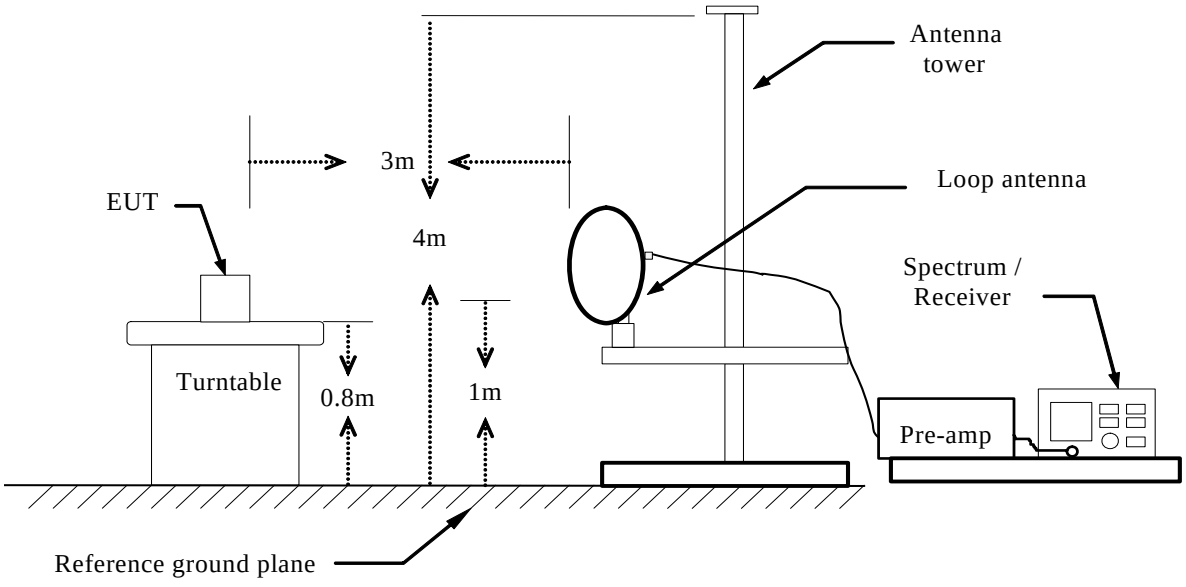
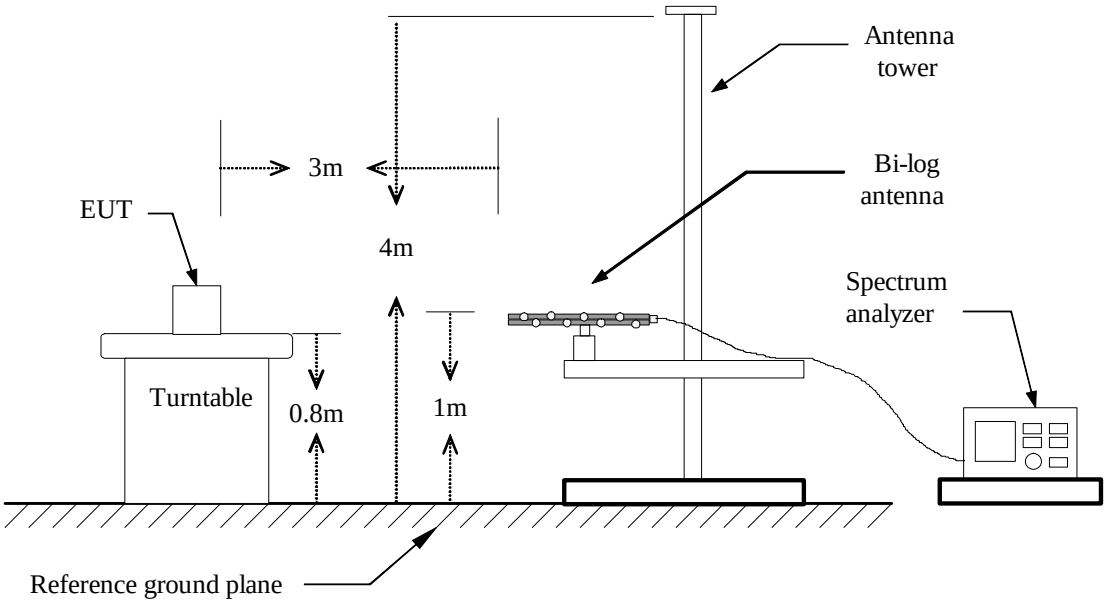
7.2.2.4. TEST SETUP

Below 30MHz



Below 1 GHz



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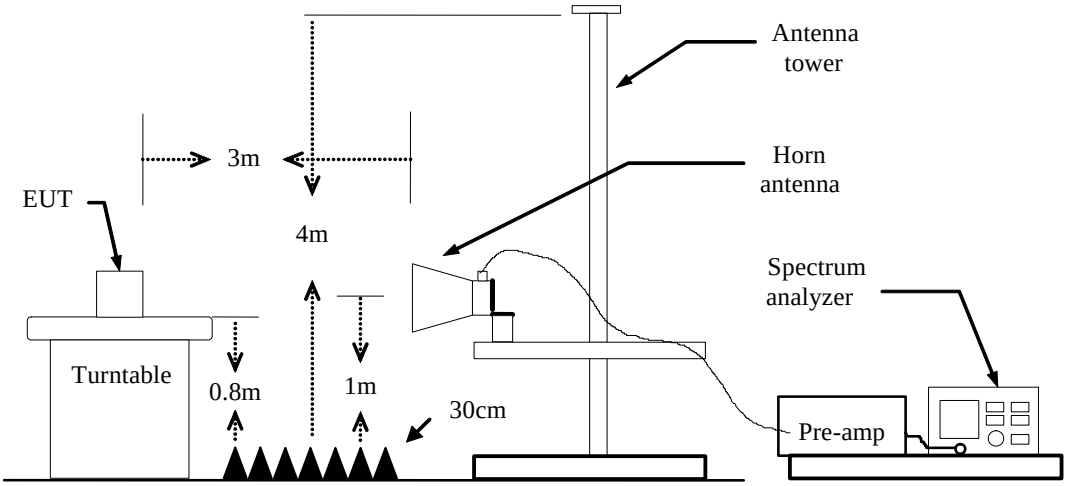
Above 1 GHz



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

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7.2.2.5. 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

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7.2.2.6. TEST RESULTS

Below 1 GHz

Operation Mode: TX **Test Date:** July 28, 2014

Temperature: 24°C **Tested by:** Mack Li

Humidity: 52% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
38.7300	52.83	-15.79	37.04	40.00	-2.96	V	QP
90.1400	61.05	-24.72	36.33	43.50	-7.17	V	QP
320.0300	53.83	-18.93	34.90	46.00	-11.10	V	QP
389.8700	54.91	-16.43	38.48	46.00	-7.52	V	QP
640.1300	49.98	-12.47	37.51	46.00	-8.49	V	QP
800.1800	48.04	-11.11	36.93	46.00	-9.07	V	QP
38.7300	52.30	-15.79	36.51	40.00	-3.49	H	QP
70.7400	61.01	-25.77	35.24	40.00	-4.76	H	QP
320.0300	58.23	-18.93	39.30	46.00	-6.70	H	QP
400.5400	55.55	-16.06	39.49	46.00	-6.51	H	QP
640.1300	50.84	-12.47	38.37	46.00	-7.63	H	QP
800.1800	48.62	-11.11	37.51	46.00	-8.49	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

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Above 1 GHz

Antenna 0

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3214.000	46.97	-3.41	43.56	74.00	-26.78	V	Peak
3970.000	42.53	-1.15	41.38	74.00	-29.91	V	Peak
4825.000	45.23	1.78	47.01	74.00	-27.52	V	Peak
5887.000	40.37	3.20	43.57	74.00	-26.87	V	Peak
6904.000	40.45	7.29	47.74	74.00	-25.39	V	Peak
7714.000	41.01	9.09	50.10	74.00	-16.45	V	Peak
3214.000	45.65	-3.41	42.24	74.00	-31.76	H	Peak
4168.000	41.96	-0.55	41.41	74.00	-32.59	H	Peak
4825.000	44.57	1.78	46.35	74.00	-27.65	H	Peak
5905.000	39.89	3.23	43.12	74.00	-30.88	H	Peak
6931.000	40.32	7.40	47.72	74.00	-26.28	H	Peak
7759.000	40.91	9.18	50.09	74.00	-23.91	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).*

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3250.000	45.75	-3.34	42.41	74.00	-31.59	V	peak
4276.000	41.90	-0.23	41.67	74.00	-32.33	V	peak
4870.000	46.33	1.97	48.30	74.00	-25.70	V	peak
5608.000	40.40	2.73	43.13	74.00	-30.87	V	peak
6490.000	39.59	5.50	45.09	74.00	-28.91	V	peak
7138.000	41.01	7.97	48.98	74.00	-25.02	V	peak
3250.000	45.28	-3.34	41.94	74.00	-32.06	H	Peak
3907.000	42.59	-1.38	41.21	74.00	-32.79	H	Peak
4870.000	44.66	1.97	46.63	74.00	-27.37	H	Peak
5572.000	41.28	2.67	43.95	74.00	-30.05	H	Peak
6751.000	39.65	6.63	46.28	74.00	-27.72	H	Peak
7768.000	40.17	9.20	49.37	74.00	-24.63	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).*

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3286.000	47.16	-3.28	43.88	74.00	-30.12	V	peak
3970.000	42.24	-1.15	41.09	74.00	-32.91	V	peak
4924.000	46.35	2.19	48.54	74.00	-25.46	V	peak
5770.000	40.74	3.00	43.74	74.00	-30.26	V	peak
6913.000	40.35	7.33	47.68	74.00	-26.32	V	peak
7732.000	40.42	9.13	49.55	74.00	-24.45	V	peak
3286.000	45.53	-3.28	42.25	74.00	-31.75	H	Peak
3934.000	42.54	-1.28	41.26	74.00	-32.74	H	Peak
4924.000	41.87	2.19	44.06	74.00	-29.94	H	Peak
5824.000	40.73	3.09	43.82	74.00	-30.18	H	Peak
6967.000	40.22	7.56	47.78	74.00	-26.22	H	Peak
7750.000	40.78	9.16	49.94	74.00	-24.06	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).*

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Antenna 1

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3214.000	57.38	-3.41	53.97	74.00	-20.03	V	Peak
3214.000	56.09	-3.41	52.68	54.00	-1.32	V	AVG
3907.000	42.38	-1.38	41.00	74.00	-33.00	V	Peak
4825.000	42.42	1.78	44.20	74.00	-29.80	V	Peak
5473.000	40.37	2.55	42.92	74.00	-31.08	V	Peak
6139.000	40.29	3.99	44.28	74.00	-29.72	V	Peak
7480.000	39.71	8.64	48.35	74.00	-25.65	V	Peak
3214.000	49.97	-3.41	46.56	74.00	-27.44	H	Peak
4465.000	42.30	0.33	42.63	74.00	-31.37	H	Peak
5320.000	41.05	2.54	43.59	74.00	-30.41	H	Peak
6211.000	40.30	4.30	44.60	74.00	-29.40	H	Peak
6769.000	39.88	6.70	46.58	74.00	-27.42	H	Peak
7597.000	39.59	8.86	48.45	74.00	-25.55	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).*

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3250.000	54.94	-3.34	51.60	74.00	-22.40	V	peak
4168.000	41.59	-0.55	41.04	74.00	-32.96	V	peak
4870.000	44.37	1.97	46.34	74.00	-27.66	V	peak
5716.000	40.24	2.91	43.15	74.00	-30.85	V	peak
6418.000	40.32	5.19	45.51	74.00	-28.49	V	peak
6958.000	41.14	7.52	48.66	74.00	-25.34	V	peak
3250.000	50.18	-3.34	46.84	74.00	-27.16	H	Peak
4240.000	41.76	-0.33	41.43	74.00	-32.57	H	Peak
4870.000	41.30	1.97	43.27	74.00	-30.73	H	Peak
5572.000	41.26	2.67	43.93	74.00	-30.07	H	Peak
6256.000	40.19	4.49	44.68	74.00	-29.32	H	Peak
6922.000	41.08	7.36	48.44	74.00	-25.56	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).*

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3286.000	53.57	-3.28	50.29	74.00	-23.71	V	peak
3970.000	42.78	-1.15	41.63	74.00	-32.37	V	peak
4924.000	44.80	2.19	46.99	74.00	-27.01	V	peak
5581.000	40.34	2.69	43.03	74.00	-30.97	V	peak
6778.000	41.03	6.74	47.77	74.00	-26.23	V	peak
7660.000	39.63	8.99	48.62	74.00	-25.38	V	peak
3286.000	48.66	-3.28	45.38	74.00	-28.62	H	Peak
4258.000	42.57	-0.28	42.29	74.00	-31.71	H	Peak
5338.000	41.53	2.54	44.07	74.00	-29.93	H	Peak
6202.000	40.07	4.26	44.33	74.00	-29.67	H	Peak
6931.000	41.02	7.40	48.42	74.00	-25.58	H	Peak
7687.000	40.31	9.04	49.35	74.00	-24.65	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).*

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Antenna 0

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1063.000	46.94	-10.28	36.66	74.00	-37.34	V	Peak
2530.000	45.45	-6.06	39.39	74.00	-34.61	V	Peak
3214.000	55.15	-3.41	51.74	74.00	-22.26	V	Peak
4033.000	42.18	-0.94	41.24	74.00	-32.76	V	Peak
4969.000	40.88	2.38	43.26	74.00	-30.74	V	Peak
5995.000	40.75	3.38	44.13	74.00	-29.87	V	Peak
2521.000	48.02	-6.10	41.92	74.00	-32.08	H	Peak
3214.000	50.54	-3.41	47.13	74.00	-26.87	H	Peak
4240.000	42.19	-0.33	41.86	74.00	-32.14	H	Peak
4816.000	42.30	1.74	44.04	74.00	-29.96	H	Peak
6229.000	40.52	4.38	44.90	74.00	-29.10	H	Peak
6778.000	40.21	6.74	46.95	74.00	-27.05	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).*

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1000.0000	48.32	-8.82	39.50	74.00	-34.50	V	Peak
1342.000	49.66	-12.30	37.36	74.00	-36.64	V	Peak
3250.000	51.21	-3.34	47.87	74.00	-26.13	V	Peak
3862.000	40.73	-1.55	39.18	74.00	-34.82	V	Peak
4879.000	40.88	2.01	42.89	74.00	-31.11	V	Peak
5140.000	41.33	2.52	43.85	74.00	-30.15	V	Peak
2800.000	46.02	-4.76	41.26	74.00	-32.74	H	Peak
3250.000	50.57	-3.34	47.23	74.00	-26.77	H	Peak
3880.000	42.85	-1.48	41.37	74.00	-32.63	H	Peak
4348.000	41.92	-0.02	41.90	74.00	-32.10	H	Peak
4807.000	40.79	1.71	42.50	74.00	-31.50	H	Peak
5320.000	40.83	2.54	43.37	74.00	-30.63	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).*

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1999.000	48.24	-8.31	39.93	74.00	-34.07	V	Peak
2800.000	45.78	-4.76	41.02	74.00	-32.98	V	Peak
3286.000	53.20	-3.28	49.92	74.00	-24.08	V	Peak
3520.000	43.12	-2.82	40.30	74.00	-33.70	V	Peak
4024.000	43.11	-0.97	42.14	74.00	-31.86	V	Peak
4924.000	43.45	2.19	45.64	74.00	-28.36	V	Peak
1117.000	50.32	-11.52	38.80	74.00	-35.20	H	Peak
1342.000	50.75	-12.30	38.45	74.00	-35.55	H	Peak
2494.000	45.01	-6.23	38.78	74.00	-35.22	H	Peak
3286.000	49.74	-3.28	46.46	74.00	-27.54	H	Peak
4285.000	41.32	-0.20	41.12	74.00	-32.88	H	Peak
5212.000	40.02	2.53	42.55	74.00	-31.45	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).*

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Antenna 1

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3214.000	56.65	-3.41	53.24	74.00	-20.76	V	Peak
3214.000	55.83	-3.41	52.42	54.00	-1.58	V	AVG
4366.000	41.87	0.04	41.91	74.00	-32.09	V	Peak
4816.000	42.16	1.74	43.90	74.00	-30.10	V	Peak
5995.000	40.75	3.38	44.13	74.00	-29.87	V	Peak
6742.000	40.44	6.59	47.03	74.00	-26.97	V	Peak
7408.000	40.84	8.50	49.34	74.00	-24.66	V	Peak
3214.000	49.04	-3.41	45.63	74.00	-28.37	H	Peak
3907.000	42.09	-1.38	40.71	74.00	-33.29	H	Peak
4816.000	42.30	1.74	44.04	74.00	-29.96	H	Peak
5662.000	40.15	2.82	42.97	74.00	-31.03	H	Peak
6229.000	41.02	4.38	45.40	74.00	-28.60	H	Peak
6751.000	40.13	6.63	46.76	74.00	-27.24	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).*

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3250.000	55.21	-3.34	51.87	74.00	-22.13	V	Peak
4366.000	41.70	0.04	41.74	74.00	-32.26	V	Peak
4879.000	42.38	2.01	44.39	74.00	-29.61	V	Peak
6328.000	40.14	4.80	44.94	74.00	-29.06	V	Peak
6958.000	40.60	7.52	48.12	74.00	-25.88	V	Peak
7705.000	40.32	9.07	49.39	74.00	-24.61	V	Peak
3250.000	49.57	-3.34	46.23	74.00	-27.77	H	Peak
4348.000	42.42	-0.02	42.40	74.00	-31.60	H	Peak
5032.000	40.99	2.51	43.50	74.00	-30.50	H	Peak
6274.000	40.29	4.57	44.86	74.00	-29.14	H	Peak
6742.000	41.27	6.59	47.86	74.00	-26.14	H	Peak
7750.000	40.92	9.16	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).*

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

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3286.000	53.20	-3.28	49.92	74.00	-24.08	V	Peak
4024.000	43.11	-0.97	42.14	74.00	-31.86	V	Peak
4924.000	43.45	2.19	45.64	74.00	-28.36	V	Peak
5878.000	40.57	3.19	43.76	74.00	-30.24	V	Peak
6949.000	39.86	7.48	47.34	74.00	-26.66	V	Peak
7723.000	41.16	9.11	50.27	74.00	-23.73	V	Peak
3286.000	48.74	-3.28	45.46	74.00	-28.54	H	Peak
4285.000	42.32	-0.20	42.12	74.00	-31.88	H	Peak
4978.000	41.11	2.42	43.53	74.00	-30.47	H	Peak
5680.000	41.20	2.85	44.05	74.00	-29.95	H	Peak
6580.000	40.28	5.89	46.17	74.00	-27.83	H	Peak
7255.000	39.75	8.20	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).*

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Combine with Antenna 0 and Antenna 1

Test Mode: TX / IEEE 802.11n HT20 MHz(CH Low) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3214.000	56.60	-3.41	53.19	74.00	-20.81	V	Peak
3214.000	55.86	-3.41	52.45	54.00	-1.55	V	AVG
3772.000	43.60	-1.88	41.72	74.00	-32.28	V	Peak
4411.000	41.13	0.17	41.30	74.00	-32.70	V	Peak
5032.000	40.63	2.51	43.14	74.00	-30.86	V	Peak
5815.000	40.17	3.08	43.25	74.00	-30.75	V	Peak
6589.000	39.65	5.93	45.58	74.00	-28.42	V	Peak
3214.000	49.42	-3.41	46.01	74.00	-27.99	H	Peak
4276.000	42.95	-0.23	42.72	74.00	-31.28	H	Peak
5041.000	40.91	2.51	43.42	74.00	-30.58	H	Peak
5725.000	41.06	2.93	43.99	74.00	-30.01	H	Peak
6274.000	40.41	4.57	44.98	74.00	-29.02	H	Peak
6958.000	41.10	7.52	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).*

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Test Mode: TX / IEEE 802.11n HT20 MHz(CH Mid) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3250.000	54.24	-3.34	50.90	74.00	-23.10	V	Peak
4384.000	42.12	0.09	42.21	74.00	-31.79	V	Peak
4807.000	41.89	1.71	43.60	74.00	-30.40	V	Peak
5599.000	41.30	2.72	44.02	74.00	-29.98	V	Peak
6211.000	40.44	4.30	44.74	74.00	-29.26	V	Peak
7111.000	40.03	7.92	47.95	74.00	-26.05	V	Peak
3250.000	50.11	-3.34	46.77	74.00	-27.23	H	Peak
3745.000	43.27	-1.98	41.29	74.00	-32.71	H	Peak
4798.000	41.74	1.67	43.41	74.00	-30.59	H	Peak
5410.000	41.05	2.54	43.59	74.00	-30.41	H	Peak
6481.000	40.28	5.46	45.74	74.00	-28.26	H	Peak
7021.000	40.69	7.74	48.43	74.00	-25.57	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).*

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Test Mode: TX / IEEE 802.11n HT20 MHz(CH High) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3286.000	52.95	-3.28	49.67	74.00	-24.33	V	Peak
4465.000	40.83	0.33	41.16	74.00	-32.84	V	Peak
5311.000	40.74	2.53	43.27	74.00	-30.73	V	Peak
6589.000	39.54	5.93	45.47	74.00	-28.53	V	Peak
7291.000	39.67	8.27	47.94	74.00	-26.06	V	Peak
7795.000	39.33	9.25	48.58	74.00	-25.42	V	Peak
3286.000	47.87	-3.28	44.59	74.00	-29.41	H	Peak
4600.000	41.58	0.85	42.43	74.00	-31.57	H	Peak
5383.000	40.97	2.54	43.51	74.00	-30.49	H	Peak
6499.000	40.15	5.54	45.69	74.00	-28.31	H	Peak
6958.000	41.02	7.52	48.54	74.00	-25.46	H	Peak
7786.000	41.15	9.23	50.38	74.00	-23.62	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).*

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Combine with Antenna 0 and Antenna 1

Test Mode: TX / IEEE 802.11n HT40 MHz(CH Low) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3232.000	54.26	-3.38	50.88	74.00	-23.12	V	Peak
4591.000	41.10	0.81	41.91	74.00	-32.09	V	Peak
4978.000	41.36	2.42	43.78	74.00	-30.22	V	Peak
5806.000	40.83	3.06	43.89	74.00	-30.11	V	Peak
6949.000	40.57	7.48	48.05	74.00	-25.95	V	Peak
7759.000	40.70	9.18	49.88	74.00	-24.12	V	Peak
3232.000	47.21	-3.38	43.83	74.00	-30.17	H	Peak
3997.000	42.95	-1.05	41.90	74.00	-32.10	H	Peak
4771.000	41.70	1.56	43.26	74.00	-30.74	H	Peak
5239.000	41.71	2.53	44.24	74.00	-29.76	H	Peak
6301.000	39.85	4.69	44.54	74.00	-29.46	H	Peak
7471.000	39.53	8.62	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).*

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Test Mode: TX / IEEE 802.11n HT40 MHz(CH Mid) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3250.000	53.79	-3.34	50.45	74.00	-23.55	V	Peak
4411.000	41.27	0.17	41.44	74.00	-32.56	V	Peak
5176.000	40.62	2.52	43.14	74.00	-30.86	V	Peak
5878.000	40.47	3.19	43.66	74.00	-30.34	V	Peak
6805.000	40.88	6.86	47.74	74.00	-26.26	V	Peak
8362.000	39.76	9.45	49.21	74.00	-24.79	V	Peak
3250.000	49.38	-3.34	46.04	74.00	-27.96	H	Peak
4330.000	41.82	-0.07	41.75	74.00	-32.25	H	Peak
5194.000	40.95	2.53	43.48	74.00	-30.52	H	Peak
6310.000	40.03	4.73	44.76	74.00	-29.24	H	Peak
7228.000	40.43	8.14	48.57	74.00	-25.43	H	Peak
7741.000	40.81	9.14	49.95	74.00	-24.05	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).*

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Test Mode: TX / IEEE 802.11n HT40 MHz(CH High) **Tested by:** Mack Li

Ambient temperature: 24°C **Relative humidity:** 52 % RH **Date:** July 28, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3286.000	53.60	-3.28	50.32	74.00	-23.68	V	Peak
4366.000	41.80	0.04	41.84	74.00	-32.16	V	Peak
5275.000	41.33	2.53	43.86	74.00	-30.14	V	Peak
6229.000	40.36	4.38	44.74	74.00	-29.26	V	Peak
6967.000	40.01	7.56	47.57	74.00	-26.43	V	Peak
7768.000	40.08	9.20	49.28	74.00	-24.72	V	Peak
3286.000	48.26	-3.28	44.98	74.00	-29.02	H	Peak
4042.000	42.61	-0.92	41.69	74.00	-32.31	H	Peak
4870.000	40.57	1.97	42.54	74.00	-31.46	H	Peak
5869.000	41.24	3.17	44.41	74.00	-29.59	H	Peak
6841.000	40.85	7.01	47.86	74.00	-26.14	H	Peak
7660.000	40.20	8.99	49.19	74.00	-24.81	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).*

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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

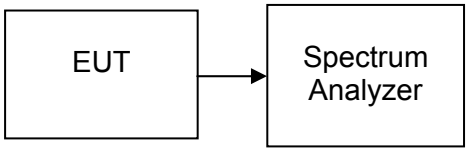
Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015

7.3.3. TEST PROCEDURES (please refer to measurement standard)

8.1 Option 1:

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ⩾ 3 x RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.3.4. TEST SETUP



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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	8112	>500	PASS
Mid	2437	8113		PASS
High	2462	8138		PASS

Test mode: IEEE 802.11b (Antenna 1)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	8135	>500	PASS
Mid	2437	8135		PASS
High	2462	8098		PASS

Test mode: IEEE 802.11g (Antenna 0)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	16465	>500	PASS
Mid	2437	16533		PASS
High	2462	16463		PASS

Test mode: IEEE 802.11g (Antenna 1)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	16465	>500	PASS
Mid	2437	16468		PASS
High	2462	16470		PASS

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

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	17662	>500	PASS
Mid	2437	17657		PASS
High	2462	17643		PASS

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

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	17711	>500	PASS
Mid	2437	17682		PASS
High	2462	17701		PASS

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

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2422	35770	>500	PASS
Mid	2437	35591		PASS
High	2452	35783		PASS

Test mode: IEEE 802.11n HT40 MHz (Antenna1)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2422	35669	>500	PASS
Mid	2437	35954		PASS
High	2452	35861		PASS

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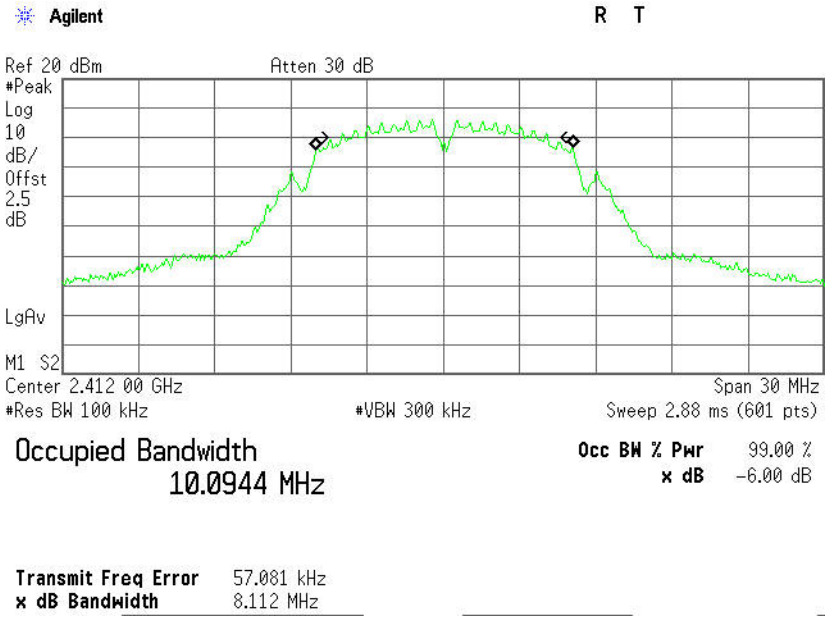
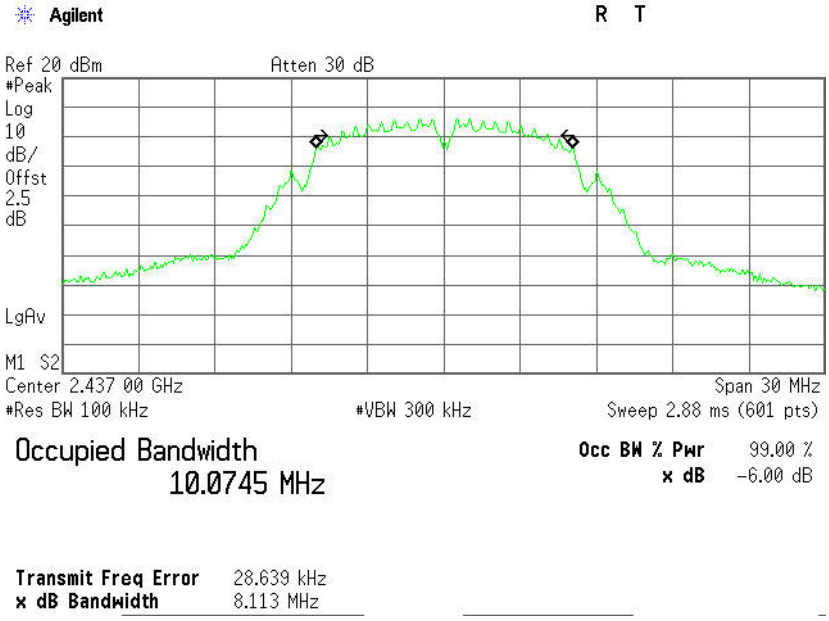
Test Plot

IEEE 802.11b mode (Antenna 0)

6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



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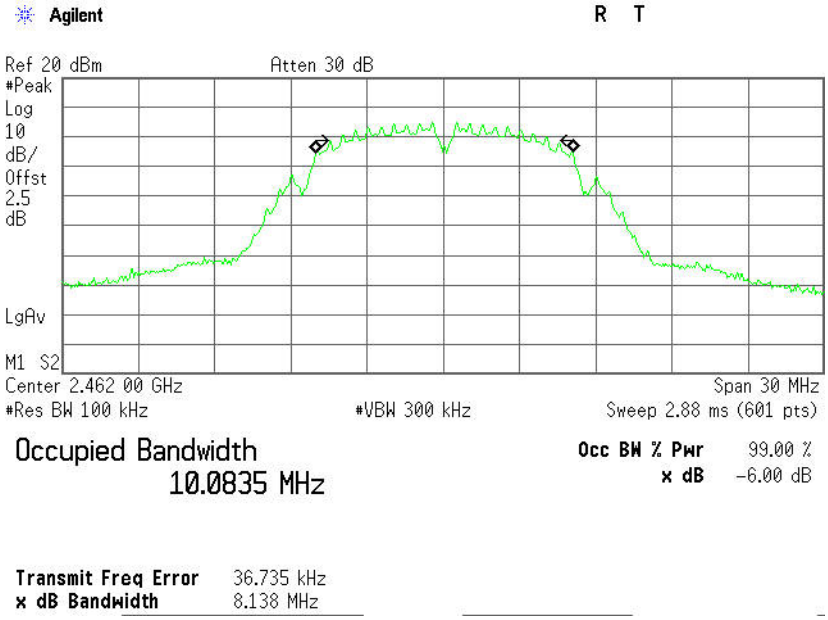
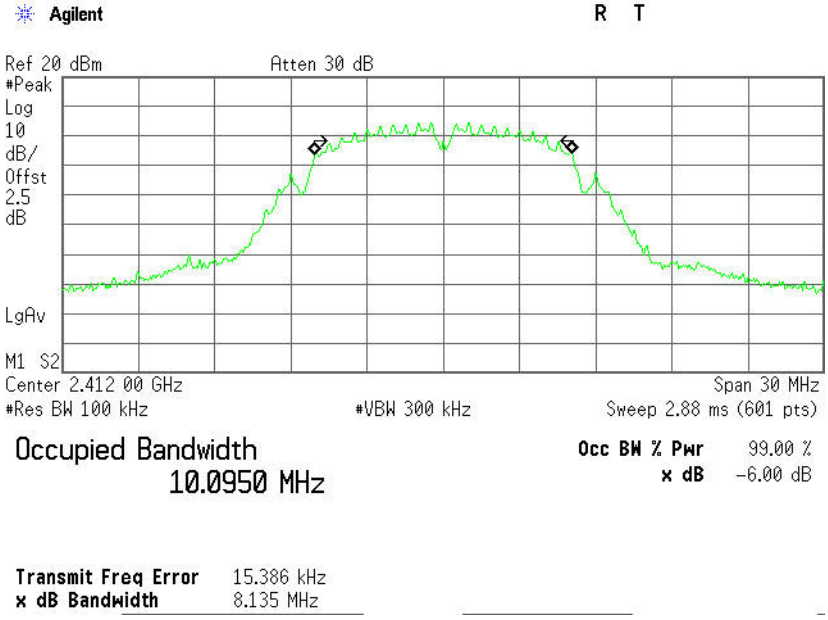
6dB Bandwidth (CH High)



IEEE 802.11b mode (Antenna 1)

6dB Bandwidth (CH Low)



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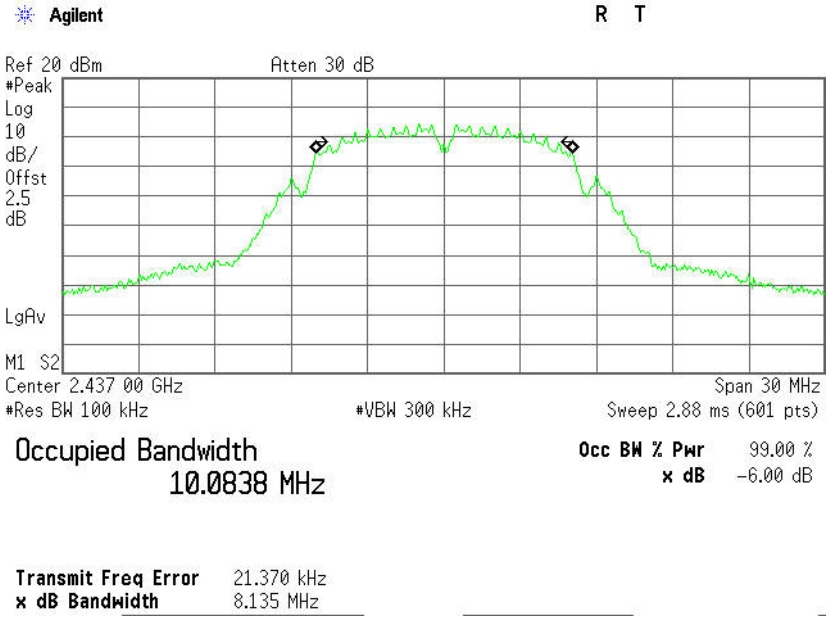
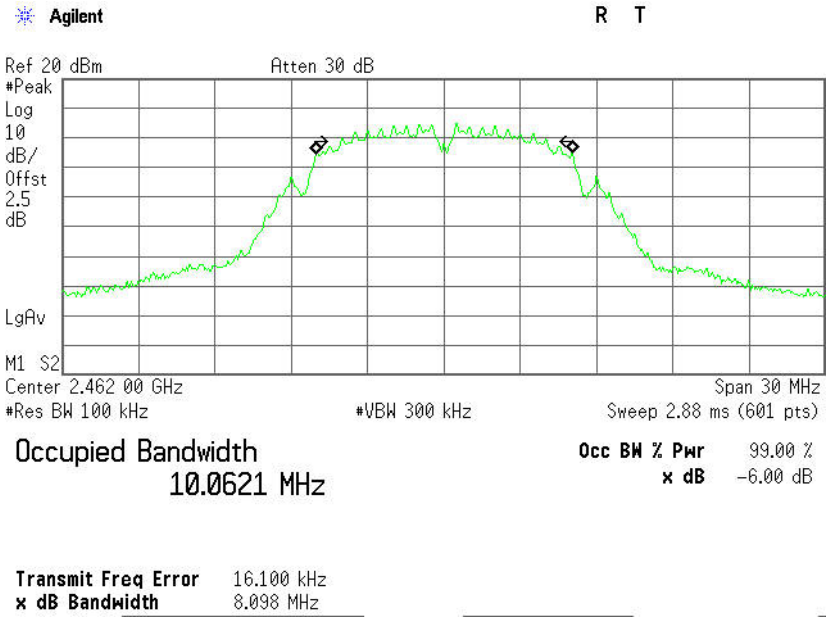
6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)



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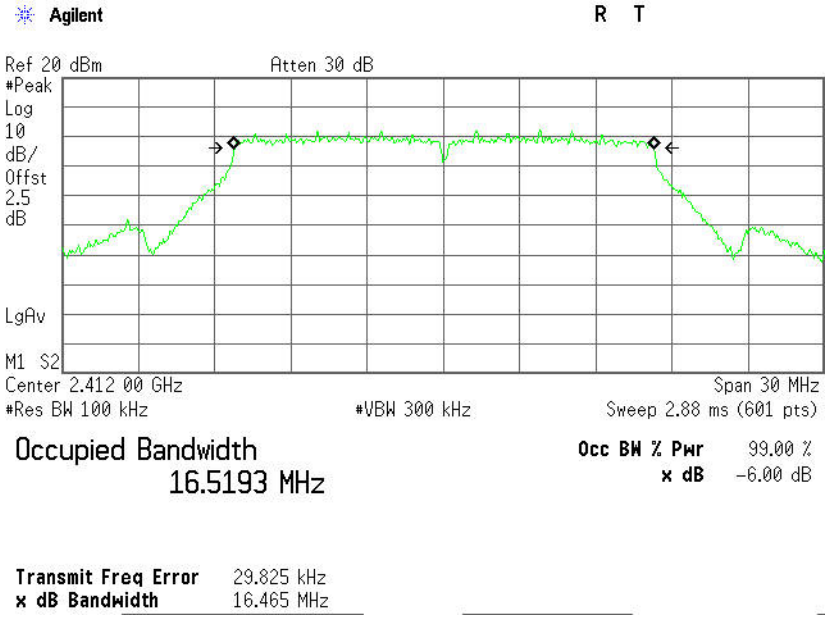
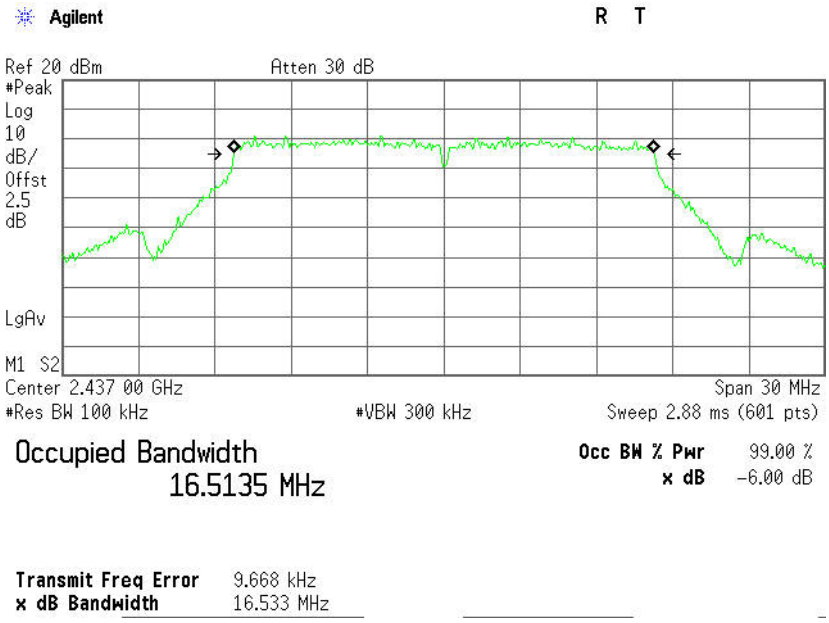
IEEE 802.11g mode (Antenna 0)

6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



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