



FCC 47 CFR PART 15 SUBPART C AND ANSI C63.4 : 2003

TEST REPORT

For

802.11b/g CPE (Access Point)

Model : ARG-CPE2615

Data Applies To : ARG-1705

Trade Name : ARGtek

Issued for

ARGtek Communication Inc.

**8F-9, No. 4, Lane 609, Sec. 5, Chung Hsin Rd., San Chung City, Taipei Hsien 241,
Taiwan, R.O.C**

Issued by

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	02/18/2009	Initial Issue	All Page 63	Jason Chang



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1. TEST REPORT CERTIFICATION

Applicant : ARGtek Corporation
Address : No. 8, Li-shing Road VII, Science-based Industrial Park, Hsinchu, Taiwan R.O.C.
Equipment Under Test : 802.11b/g CPE (Access Point)
Model : ARG-CPE2615
Data Applies To : ARG-1705
Trade Name : ARGtek
Tested Date : August 25, 2008 ~ February 18, 2009

APPLICABLE STANDARD	
STANDARD	TEST RESULT
FCC Part 15 Subpart C AND ANSI C63.4:2003	No non-compliance noted

Approved by:

Jason Chang

Jason Chang
Team Leader of Hsinchu Laboratory
Compliance Certification Services Inc.

Reviewed by:

Al

Alan Fan
Team Leader of Hsinchu Laboratory
Compliance Certification Services Inc.



WE HEREBY CERTIFY THAT: The measurements shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable. We assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.



2. EUT DESCRIPTION

2.1 DESCRIPTION OF EUT & POWER

Product Name	802.11b/g CPE (Access Point)
Model Number	ARG-CPE2615
Data Applies To	ARG-1705
Frequency Range	IEEE 802.11b/g : 2412MHz to 2462MHz
Transmit Power	IEEE 802.11b : 19.14dBm IEEE 802.11g : 16.17dBm
Channel Spacing	IEEE 802.11b/g : 5MHz
Channel Number	IEEE 802.11b/g : 11 Channels
Transmit Data Rate	IEEE 802.11b : 11, 5.5, 2, 1 Mbps IEEE 802.11g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps
Type of Modulation	IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g : OFDM (64QAM, 16QAM, QPSK, BPSK)
Frequency Selection	by software / firmware
Antenna Type	Patch Antenna, Antenna Gain : 14dBi.
Power Source	12DC From Adapter for PoE

Remark:

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: VYXARGTEK-1000 filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.
3. For more details, please refer to the User's manual of the EUT.

3. DESCRIPTION OF TEST MODES

The EUT had been tested under operating condition.

1. For fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power and power spectral density of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.
2. There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b : 11Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11g : 6 Mbps data rate (worst case) were chosen for full testing.



4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4:2003 and FCC CRF 47 15.207, 15.209 and 15.247.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Rm.258, Bldg.17, NO.195 , Sec. 4, Chung Hsing Rd., Chu-Tung Chen. Hsin-Chu, Taiwan 310 R.O.C.

NO. 989-1 Wen Shan Rd., Shang Shan Village, Qionglin Shiang Hsinchu County 30741, Taiwan, R.O.C

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4:2003 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 0240 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: 90585 and 90584).



5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	 90585, 90584
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	 R-1229/1189 C-1250/1294
Taiwan	TAF	FCC Method-47 CFR Part 15 Subpart C,D,E CISPR 11, FCC METHOD-47 CFR Part 18, EN 55011, CNS 13803, CISPR 13, CNS 13439, FCC Method-47 CFR Part 15 Subpart B, CISPR 14-1, EN 55014-1, CNS 13783-1, EN 55015, CNS 14115, CISPR 22, EN 55022, VCCI CNS 13438, EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 0240
Taiwan	BSMI	CNS 13803, CNS 13438, CNS 13439, CNS 13783-1, CNS 14115	 SL2-IS-E-0002 SL2-IN-E-0002 SL2-A1-E-0002 SL2-R1-E-0002 SL2-R2-E-0002 SL2-L1-E-0002

* No part of this report may be used to claim or imply product endorsement by TAF or any agency of the US Government.



6. CALIBRATION AND UNCERTAINTY

6.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

6.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 1000 MHz	+/- 3.2 dB
Radiated Emission, 1 to 26.5 GHz	+/- 3.2 dB
Power Line Conducted Emission	+/- 2.1 dB

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



7. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	PC	HP	Hp pavilion t222d	TWL33001TS	DoC
2	Notebook PC	Compaq	N800V	5Y33KSQZM0W41YR	DoC

SETUP DIAGRAM FOR TESTS

EUT & peripherals setup diagram is shown in appendix setup photos.

EUT OPERATING CONDITION

1. Setup all computers like the setup diagram.
2. Build up a connection between EUT and notebook(play music).
3. Run 8186_MP 1.4.7 software.
4. Run tftp_nfjrom.
5. Run MP_TEST.
6. Choice MODE, Channel, Date rate, power set.
7. Start test.



8. APPLICABLE LIMITS AND TEST RESULTS

8.1 6dB BANDWIDTH

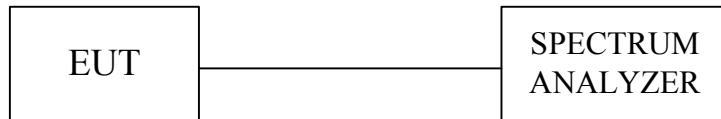
LIMIT

§ 15.207(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

TEST EQUIPMENT

Manufacturer or Type	Model No	Serial No	Date of Calibration	Calibration Period	Remark
ROHDE & SCHWARZ SPECTRUM ANALYZER	FSEK30	835253/002	October 25, 2008	1 Year	FINAL
AGILENT SPECTRUM ANALYZER	E4446A	MY433601.32	June 24, 2008	1 Year	FINAL

TEST SETUP



TEST PROCEDURE

The transmitter output was connected to a spectrum analyzer. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.



TEST RESULTS

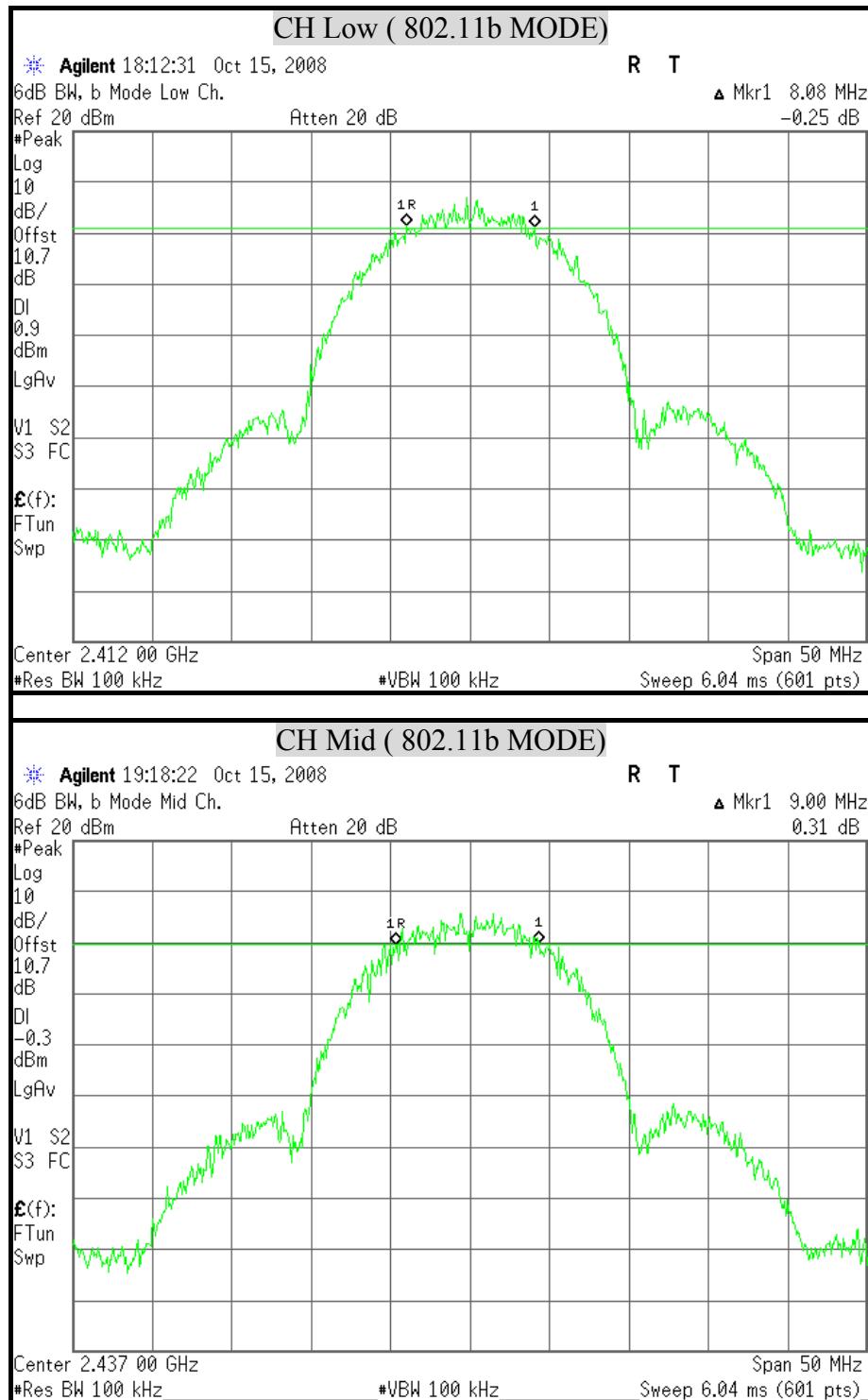
No non-compliance noted

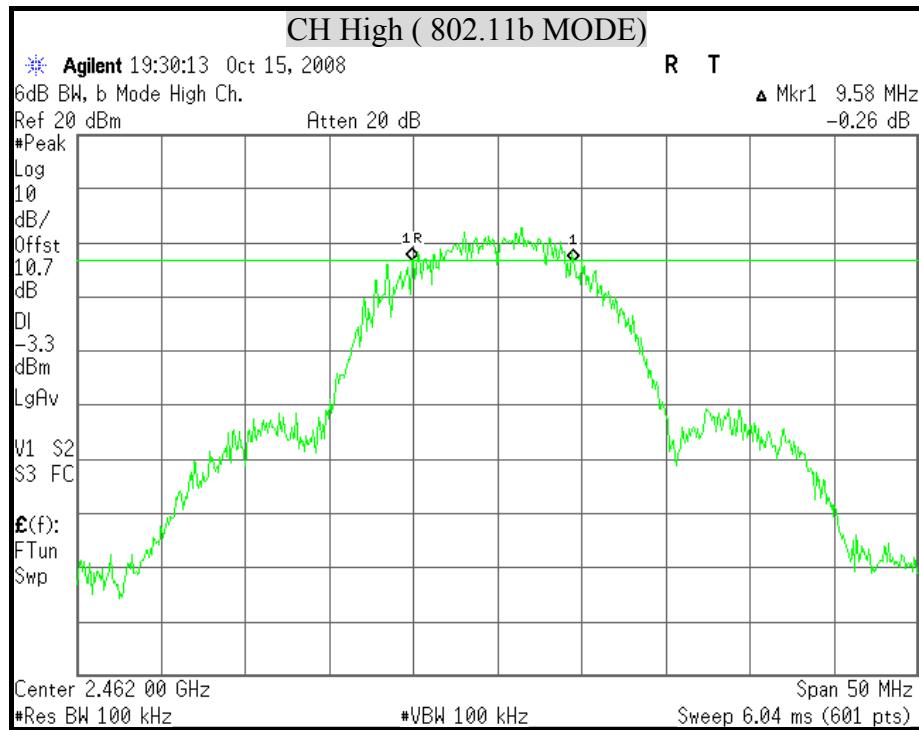
IEEE 802.11b MODE

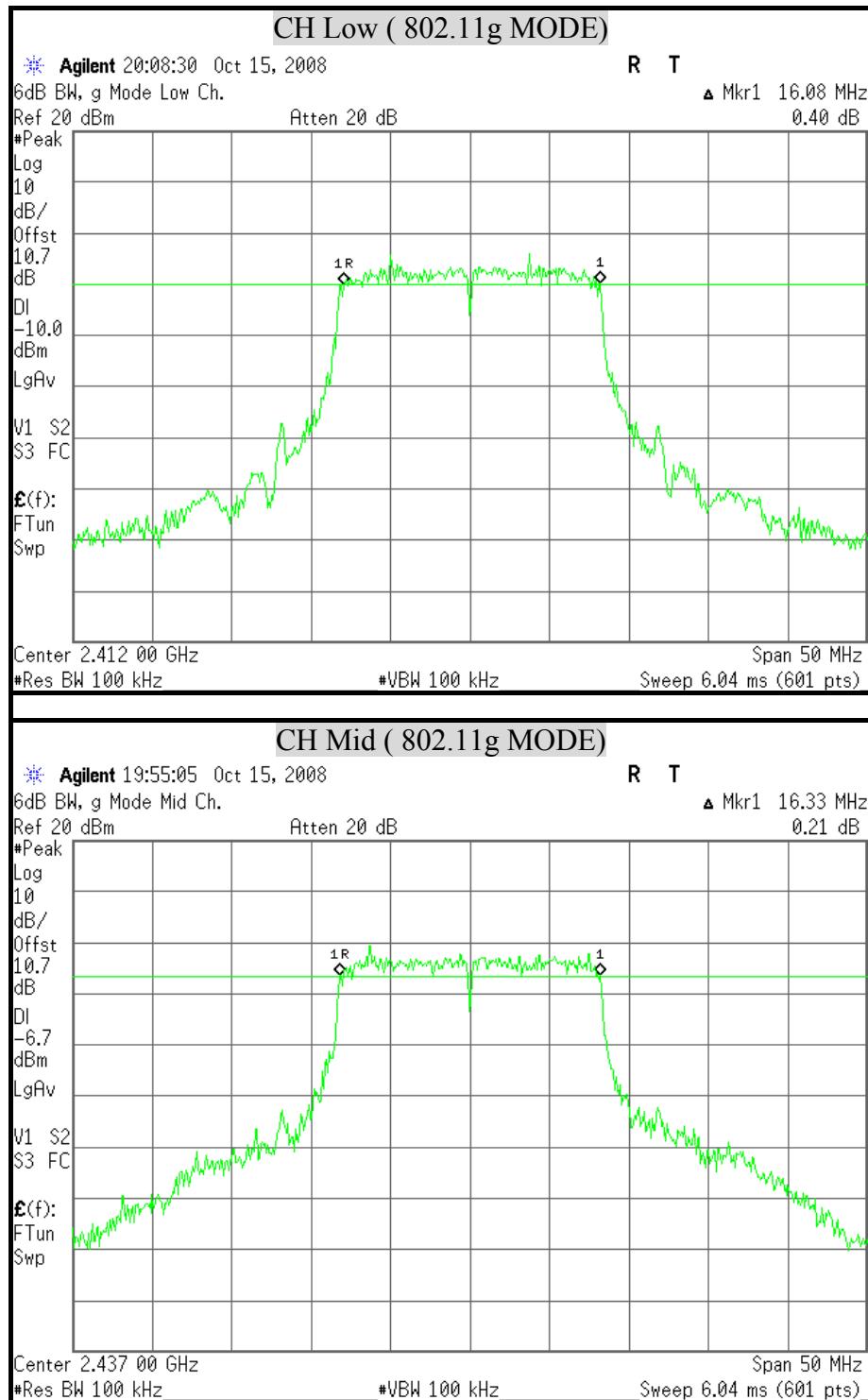
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	8.08	500	PASS
Middle	2437	9.00	500	PASS
High	2462	9.58	500	PASS

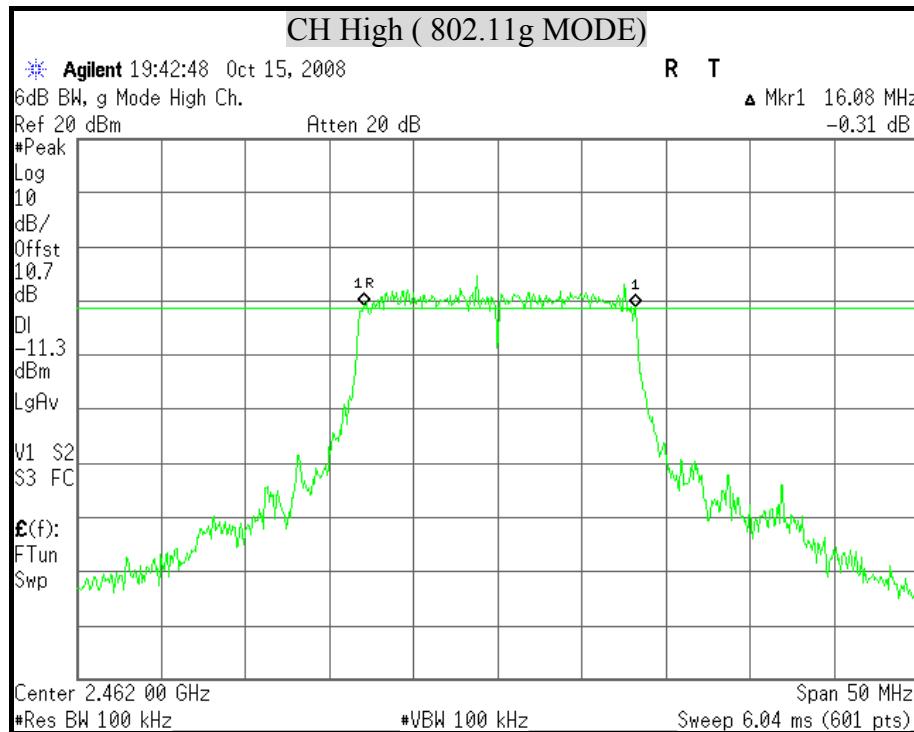
IEEE 802.11g MODE

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.08	500	PASS
Middle	2437	16.33	500	PASS
High	2462	16.08	500	PASS

6dB BANDWIDTH (802.11b MODE)



6dB BANDWIDTH (802.11g MODE)





8.2 MAXIMUM PEAK OUTPUT POWER

LIMIT

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following :

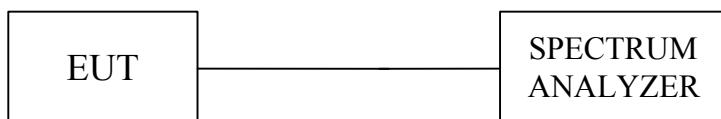
§ 15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands : 1 watt.

§ 15.247(b) (4) Except as shown in paragraphs (c) of this section , if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (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.

TEST EQUIPMENT

Manufacturer or Type	Model No	Serial No	Date of Calibration	Calibration Period	Remark
ROHDE & SCHWARZ SPECTRUM ANALYZER	FSEK30	835253/002	October 25, 2008	1 Year	FINAL
AGILENT SPECTRUM ANALYZER	E4446A	MY433601.32	June 24, 2008	1 Year	FINAL

TEST SETUP



TEST PROCEDURE

1. The spectrum shall be set as follows :
Span : 1.5 times channel integration bandwidth.
RBW : 1MHz
VBW : 3MHz
Detector : Peak
Sweep : Single trace
2. Compute the combined power of all signal responses contained in the trace by covering all the data points.
3. For 99% occupied BW, place the markers at the frequency at which 0.5% of the power lies to the right of the right marker and 0.5% of the power lies to the left of the left marker.
4. The peak output power is the channel power integrated over 99% bandwidth.



TEST RESULTS

No non-compliance noted

IEEE 802.11b MODE

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	18.81	27	PASS
Middle	2437	19.14	27	PASS
High	2462	16.49	27	PASS

Remark:

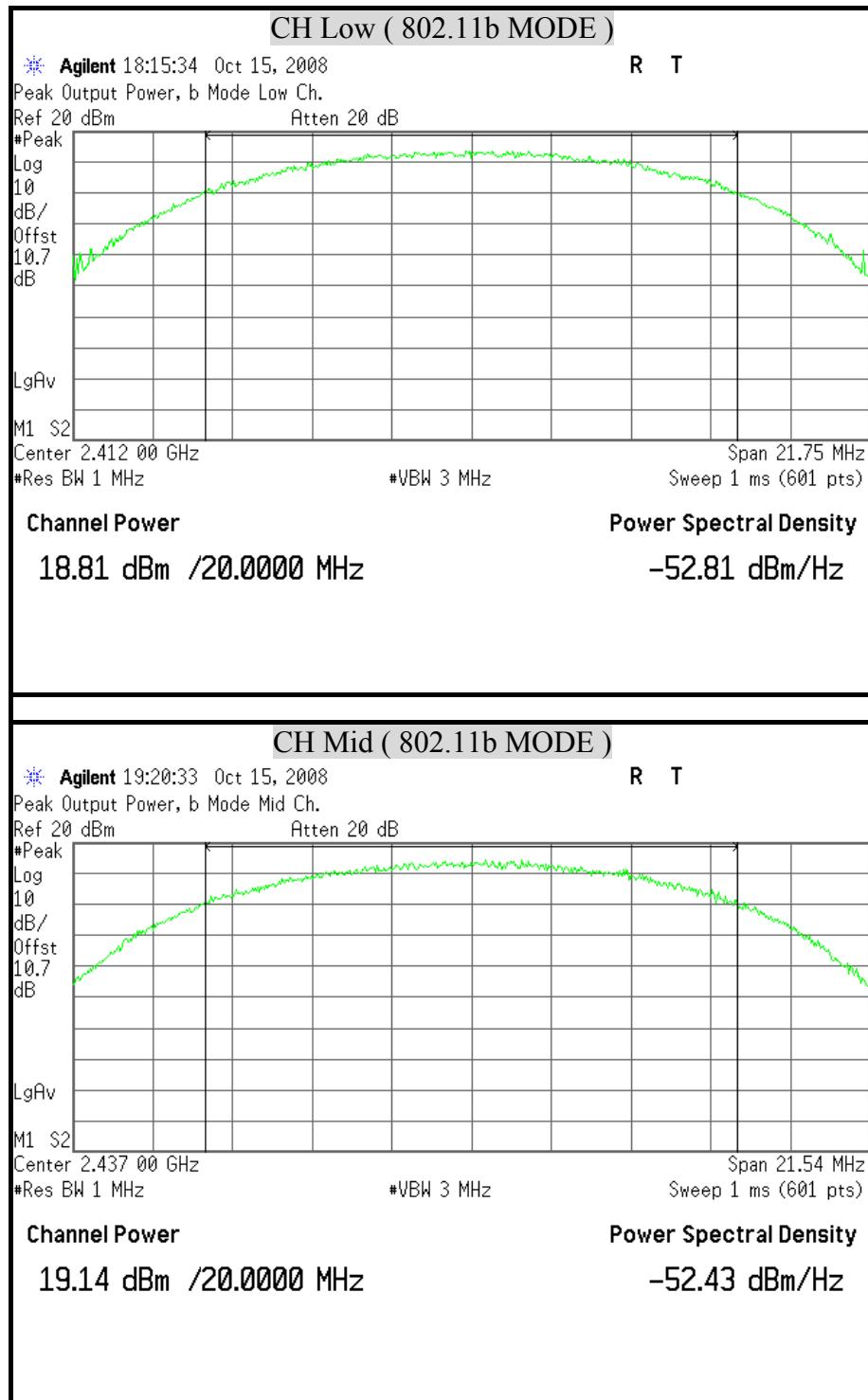
1. At final test to get the worst-case emission at 11Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 14 dBi; therefore the reduction due to antenna gain is 3 dB, so the limit is 27 dBm.

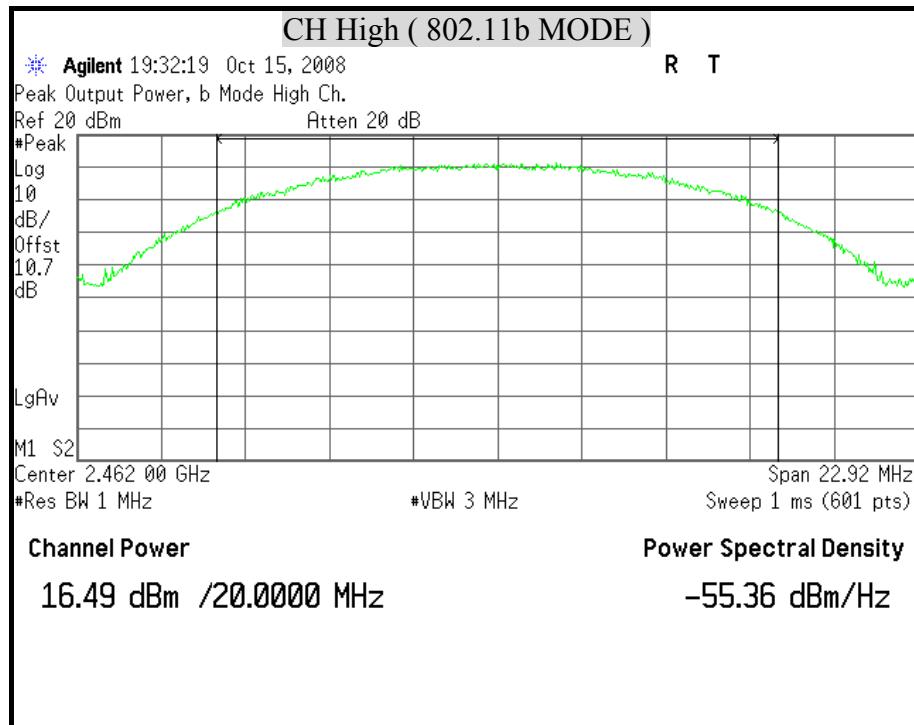
IEEE 802.11g MODE

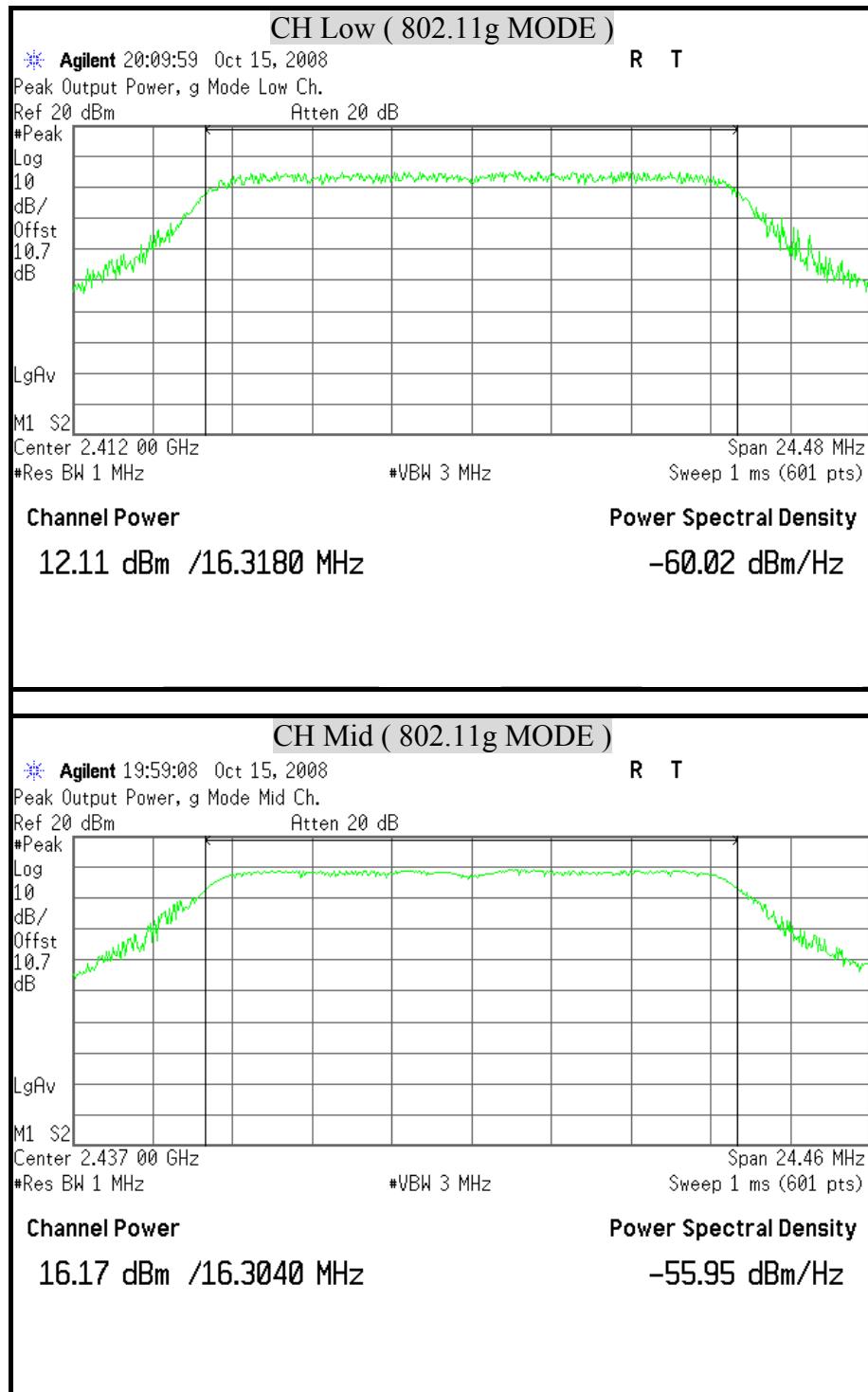
Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	12.11	27	PASS
Middle	2437	16.17	27	PASS
High	2462	10.50	27	PASS

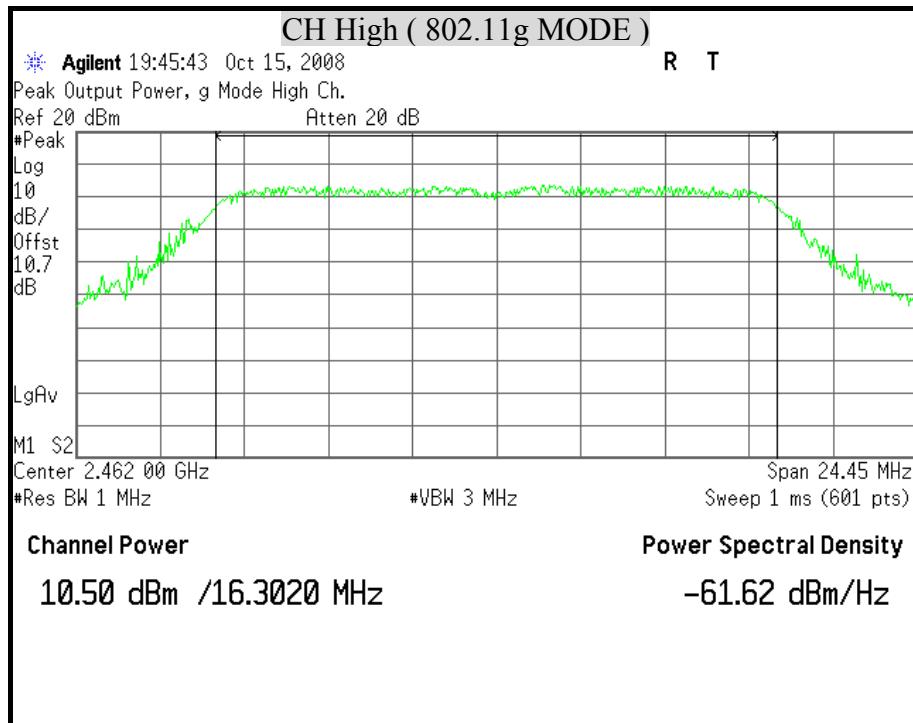
Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 14 dBi; therefore the reduction due to antenna gain is 3 dB, so the limit is 27 dBm.

**MAXIMUM PEAK OUTPUT POWER (802.11b MODE)**



**MAXIMUM PEAK OUTPUT POWER (802.11g MODE)**





8.3 MAXIMUM PERMISSIBLE EXPOSURE

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time
(A) Limits for Occupational / Control Exposures				
300-1,500	--	--	F/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300-1,500	--	--	F/1500	6
1,500-100,000	--	--	1	30

CALCULATIONS

Given
$$E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

**LIMIT**Power Density Limit, $S=1.0\text{mW/cm}^2$ **TEST RESULTS**

No non-compliance noted

Mode	Minimum separation distance (cm)	Output Power (dBm)	Numeri Gain (dBi)	Power Density Limit (mW/cm ²)	Power Density at 20cm (mW/cm ²)
IEEE 802.11b	20.0	19.14	25.12	1.00	0.409
IEEE 802.11g	20.0	16.17	25.12	1.00	0.206

Remark: For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.



8.4 AVERAGE POWER

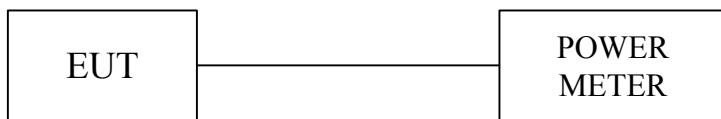
LIMIT

None; for reporting purposes only.

TEST EQUIPMENT

Manufacturer or Type	Model No	Serial No	Date of Calibration	Calibration Period	Remark
ANRITSU POWER METER	ML2487A MAL2491A	6K00001783 030982	March 06, 2008	1 Year	FINAL

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to a power meter.



TEST RESULTS

No non-compliance noted

IEEE 802.11b MODE

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	15.30
Middle	2437	15.47
High	2462	13.89

Remark:

1. At final test to get the worst-case emission at 11Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 14 dBi; therefore the reduction due to antenna gain is 3 dB, so the limit is 27 dBm.

IEEE 802.11g MODE

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	8.79
Middle	2437	12.86
High	2462	7.01

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 14 dBi; therefore the reduction due to antenna gain is 3 dB, so the limit is 27 dBm.



8.5 POWER SPECTRAL DENSITY

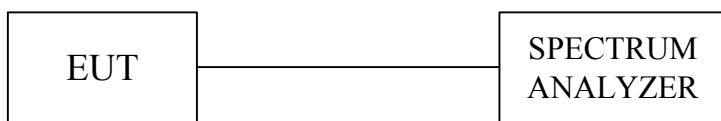
LIMIT

§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST EQUIPMENT

Manufacturer or Type	Model No	Serial No	Date of Calibration	Calibration Period	Remark
ROHDE & SCHWARZ SPECTRUM ANALYZER	FSEK30	835253/002	October 25, 2008	1 Year	FINAL
AGILENT SPECTRUM ANALYZER	E4446A	MY433601.32	June 24, 2008	1 Year	FINAL

TEST SETUP



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using $RBW = 3\text{KHz}$ and $VBW \geq RBW$, set sweep time = span / 3KHz.

The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span / 3KHz for a full response of the mixer in the spectrum analyzer.



TEST RESULTS

No non-compliance noted

IEEE 802.11b MODE

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2412	0.80	5	PASS
Middle	2437	-0.80	5	PASS
High	2462	3.12	5	PASS

Remark:

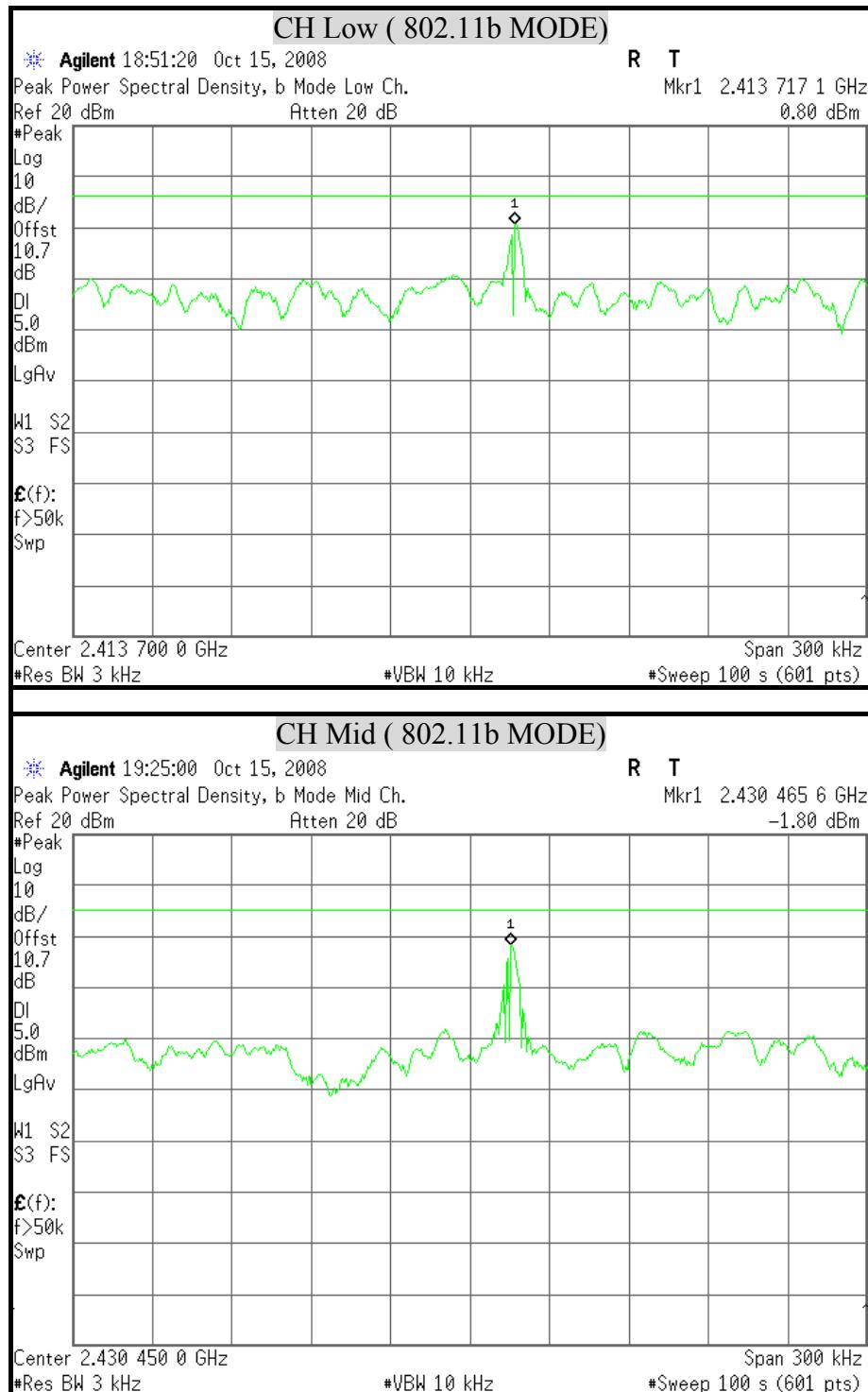
1. At final test to get the worst-case emission at 11Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 14 dBi; therefore the reduction due to antenna gain is 3 dB, so the limit is 5 dBm.

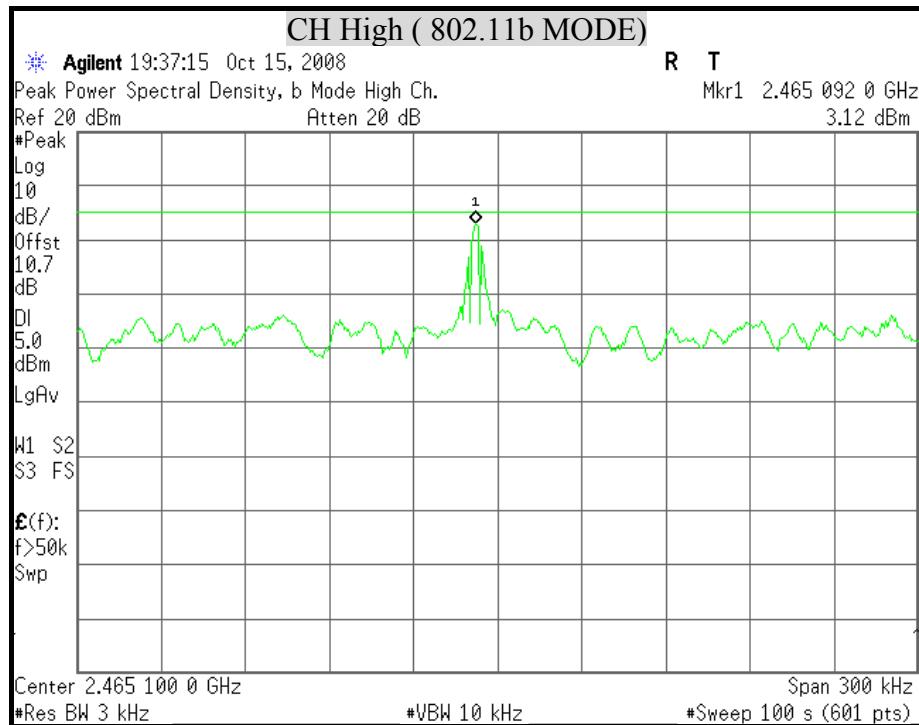
IEEE 802.11g MODE

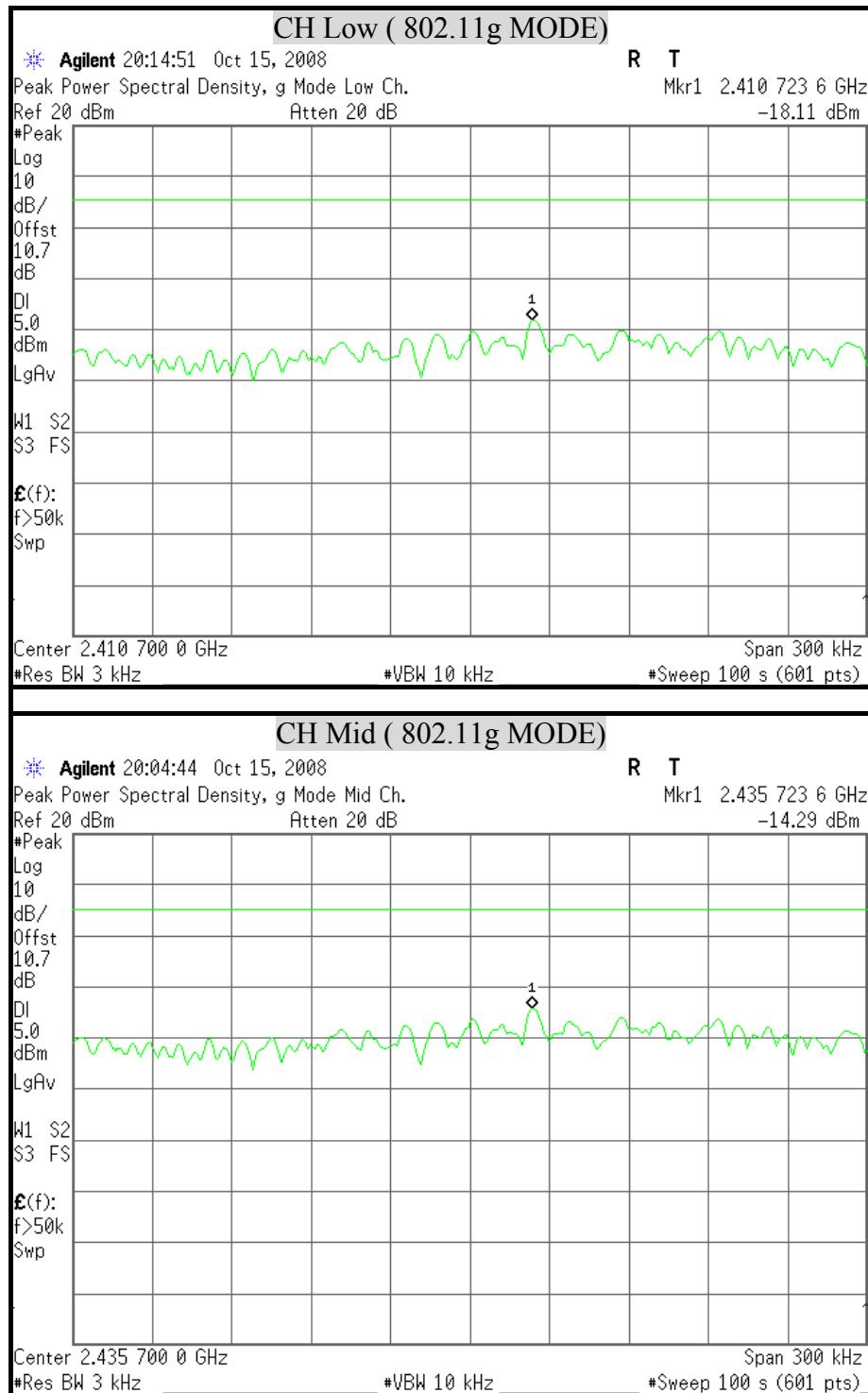
Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2412	-18.11	5	PASS
Middle	2437	-14.29	5	PASS
High	2462	-20.48	5	PASS

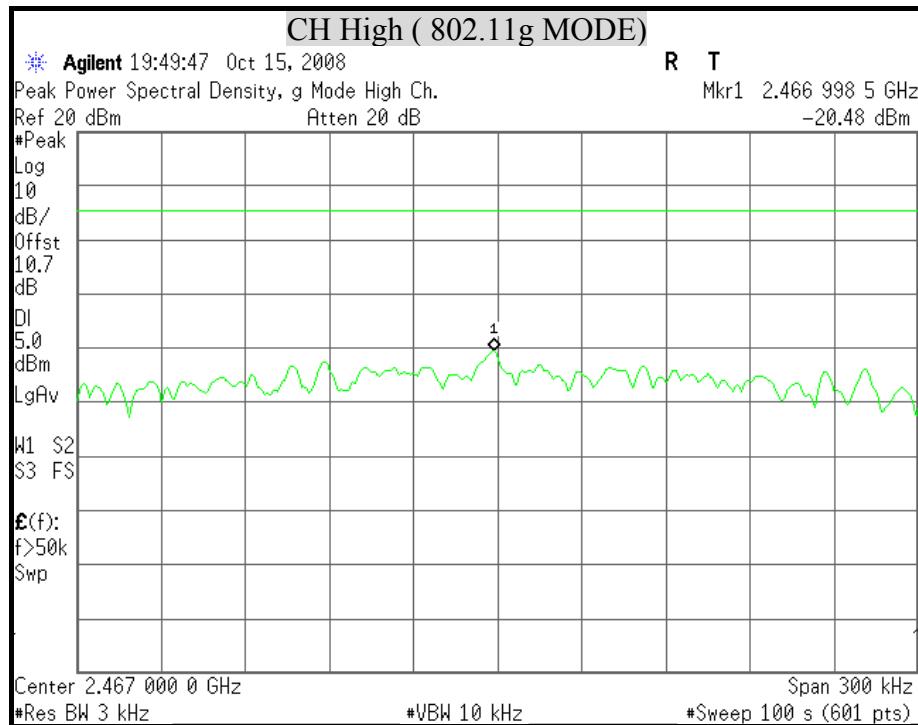
Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 14 dBi; therefore the reduction due to antenna gain is 3 dB, so the limit is 5 dBm

POWER SPECTRAL DENSITY (IEEE 802.11b MODE)



**POWER SPECTRAL DENSITY (IEEE 802.11g MODE)**





8.7 CONDUCTED SPURIOUS EMISSION

LIMITS

§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

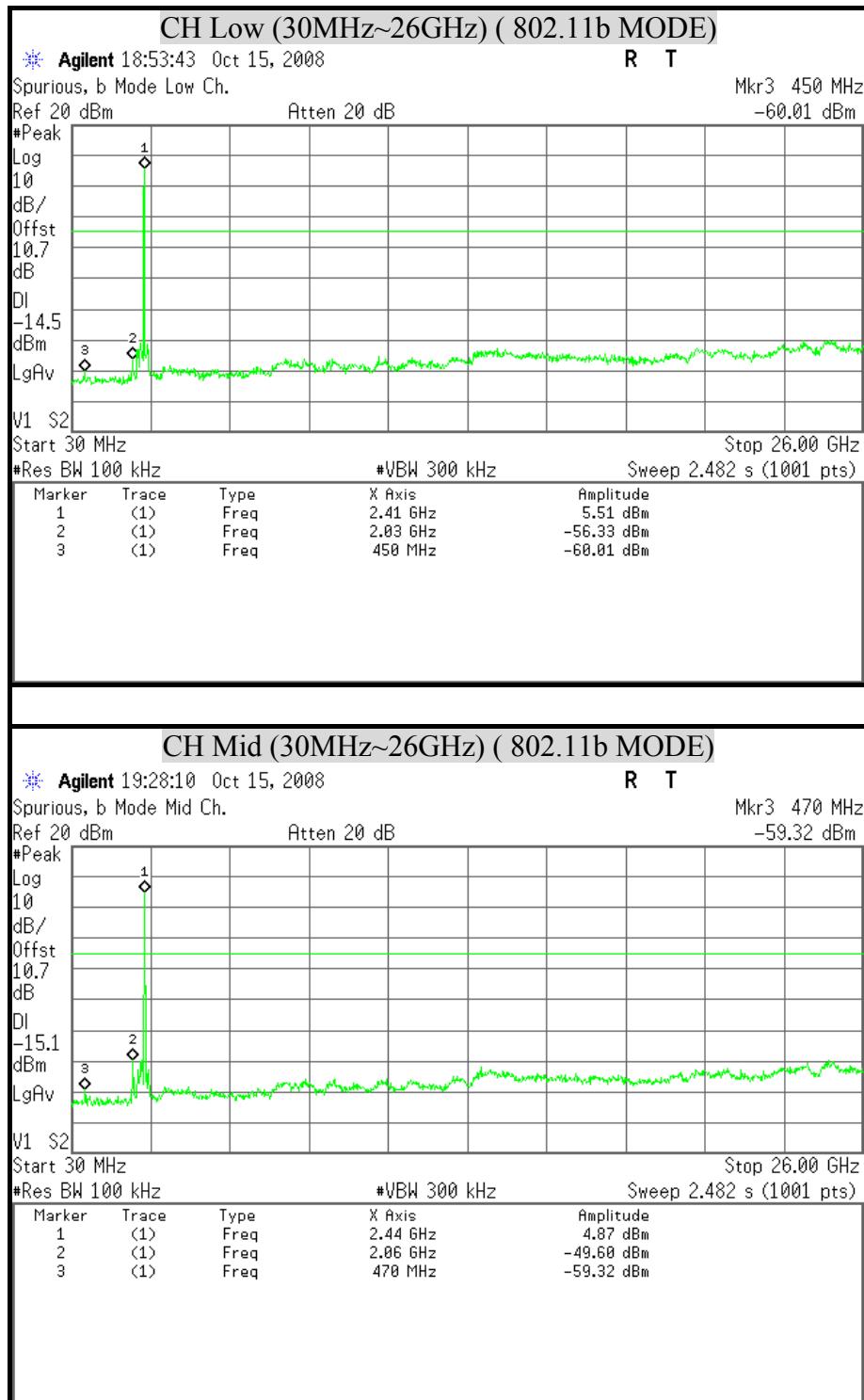
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

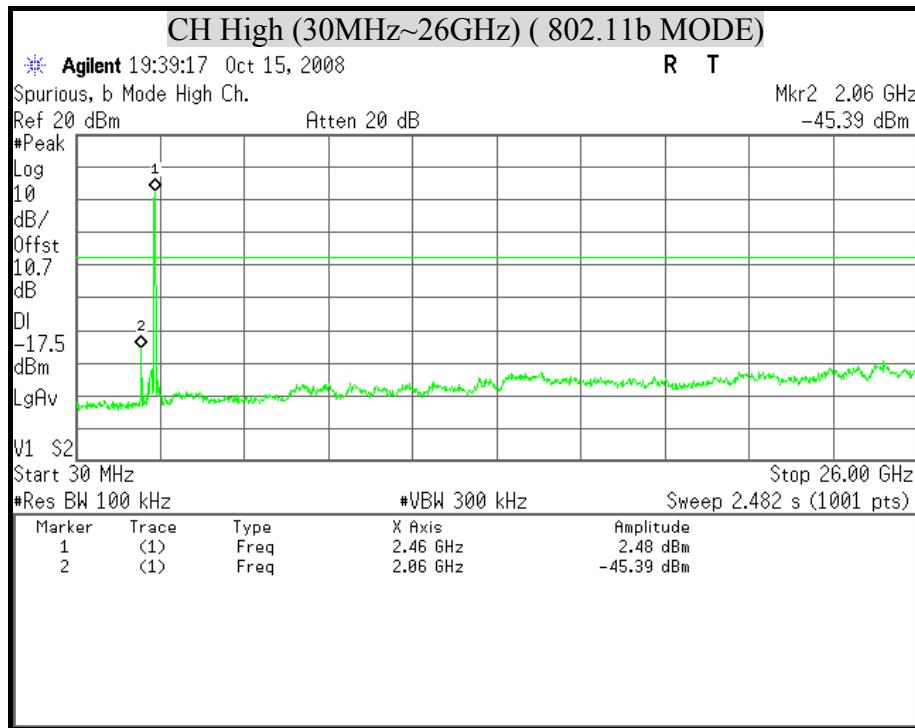
TEST RESULTS

No non-compliance noted



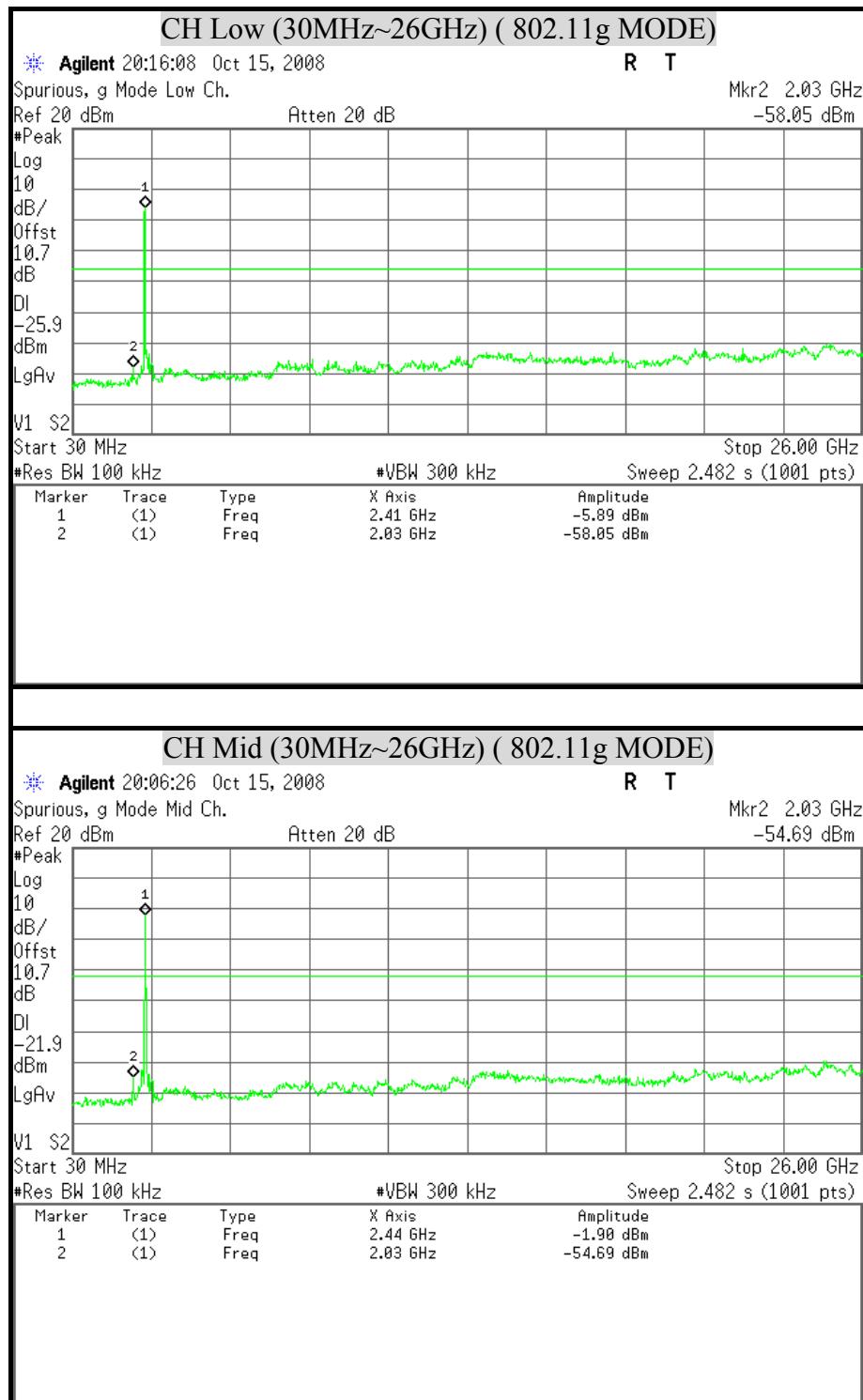
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT
(IEEE 802.11b MODE)

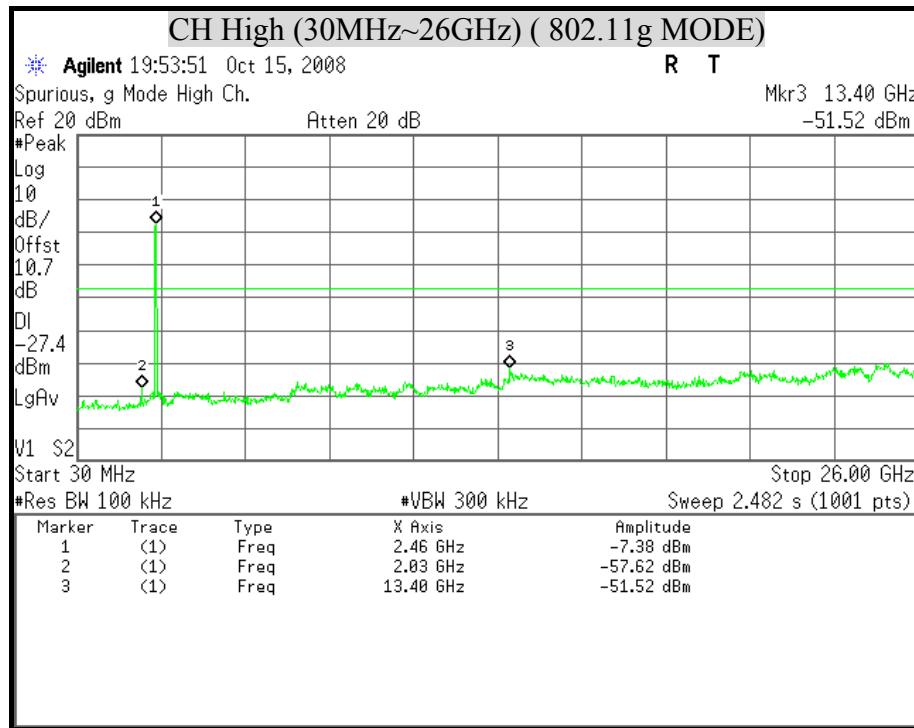






OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT
(802.11g MODE)







8.8 RADIATED EMISSIONS

8.8.1 TRANSMITTER RADIATED SUPURIOUS EMISSIONS

LIMITS

§ 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



§ 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 (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

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

§ 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

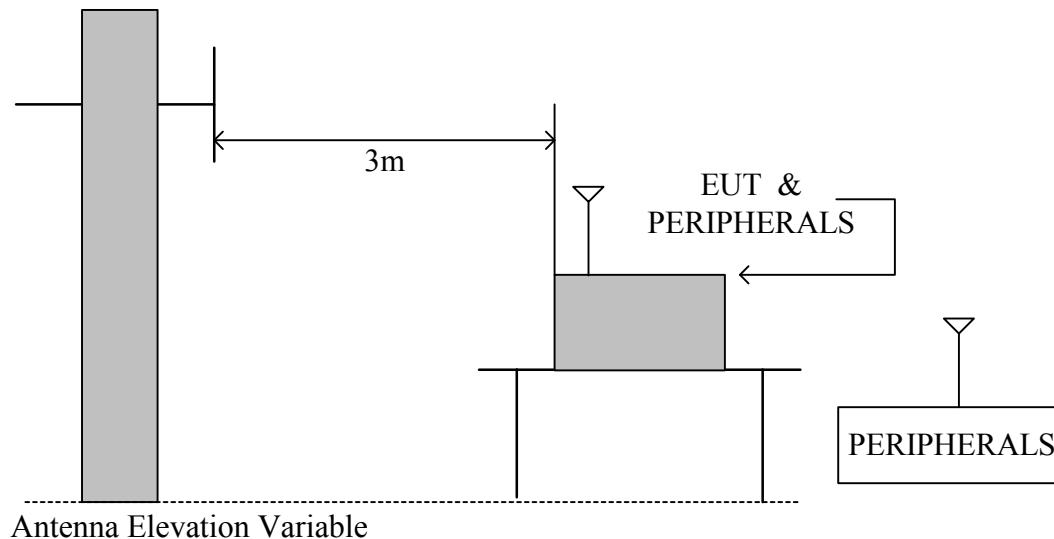
TEST EQUIPMENT

The following test equipment is utilized in making the measurements contained in this report.

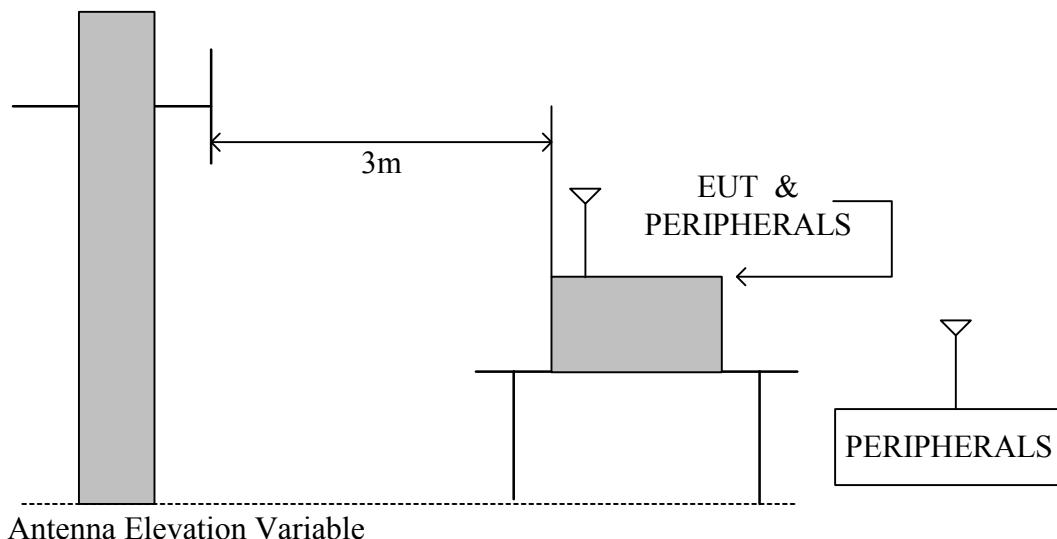
Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
CHASE BILOG ANTENNA	CBL6112B	2817	December 21, 2008	1 Year	FINAL
R/S SPECTRUM ANALYZER	FSEK30	835253/002	October 25, 2008	1 Year	FINAL
AGILENT SPECTRUM ANALYZER	E4446A	MY433601.32	June 24, 2008	1 Year	FINAL
R/S EMI TEST RECEIVER	ESCS30	835418/008	October 16, 2008	1 Year	FINAL
OPEN SITE	-----	No.2	May 07, 2008	1 Year	FINAL
MIYAZAKI N TYPE COAXIAL CABLE	8D-FB	02	May 16, 2008	1 Year	FINAL
Horn Antenna	AH-118	10089	October 18, 2008	1 Year	FINAL
Horn Antenna	AH-840	03077	December 25, 2008	1 Year	FINAL
Agilent Pre-amplifier	8449B	3008A01471	December 20, 2008	1 Year	FINAL
HP Amplifier	8447D	2944A10052	December 24, 2008	1 Year	FINAL
HP High pass filter	84300/80038	002	CAL. ON USE	1 Year	FINAL
HP High pass filter	84300/80039	003	CAL. ON USE	1 Year	FINAL

TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission from below 1GHz.



The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.





TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. While measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. While measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Note :

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

TEST RESULTS

No non-compliance noted



8.8.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz

Product Name	802.11b/g CPE (Access Point)	Test Date	2009/02/17
Model	ARG-CPE2615	Test By	Mimic Yang
Test Mode	Normal operating	TEMP & Humidity	23°C, 53%

Horizontal					
Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dB μ V/m)	Margin (dB)
81.73	51.99	-15.76	36.23	40.00	-3.77
89.82	55.08	-15.57	39.51	43.50	-3.99
93.05	54.68	-14.88	39.80	43.50	-3.70
440.63	45.94	-5.78	40.16	46.00	-5.84
539.25	44.42	-3.10	41.32	46.00	-4.68
755.88	41.07	-0.25	40.82	46.00	-5.18

Vertical					
Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dB μ V/m)	Margin (dB)
39.70	46.68	-7.67	39.01	40.00	-0.99
65.57	52.98	-14.82	38.16	40.00	-1.84
81.73	54.64	-15.76	38.88	40.00	-1.12
89.82	54.00	-15.57	38.43	43.50	-5.07
105.98	50.70	-12.00	38.70	43.50	-4.80
143.17	51.15	-9.28	41.87	43.50	-1.63

Remark:

1. Correction Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB).
2. Emission level (dB μ V/m) = Correction Factor (dB) + Meter Reading (dBuV).
3. Margin value = Emission level – Limit value.



8.8.3 TRANSMITTER RADIATED EMISSION ABOVE 1 GHz

Product Name	802.11b/g CPE (Access Point)	Test Date	2008/10/16
Model	ARG-CPE2615	Test By	Gundam Lin
Test Mode	IEEE 802.11b TX (CH Low)	TEMP & Humidity	25.5°C, 58%

Horizontal									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
2164.00	66.09	---	-9.23	56.86	---	85.64	---	-28.78	20dBc Peak Fundamental
2412.00	114.58	---	-8.95	105.64	---	---	---	---	Carrier
2518.00	66.52	---	-8.82	57.70	---	85.64	---	-27.94	20dBc Peak Fundamental
4827.00	56.31	43.19	-4.55	51.76	38.64	74.00	54.00	-2.24	Peak
Vertical									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
2194.00	69.70	---	-9.19	60.50	---	99.28	---	-38.78	20dBc Peak Fundamental
2306.00	77.19	---	-9.07	68.13	---	99.28	---	-31.15	20dBc Peak Fundamental
2412.00	128.22	---	-8.95	119.28	---	---	---	---	Carrier
2520.00	75.20	---	-8.82	66.38	---	99.28	---	-32.90	20dBc Peak Fundamental
4827.00	49.35	---	-4.55	44.81	---	74.00	54.00	-9.19	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
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. 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.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	802.11b/g CPE (Access Point)	Test Date	2008/10/16
Model	ARG-CPE2615	Test By	Gundam Lin
Test Mode	IEEE 802.11b TX (CH Middle)	TEMP & Humidity	25.5°C, 58%

Horizontal									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
2044.00	71.48	---	-9.36	62.12	---	87.76	---	-25.64	20dBc Peak Fundamental
2438.00	116.67	---	-8.92	107.76	---	---	---	---	Carrier
4876.00	73.27	53.42	-4.42	68.85	49.00	74.00	54.00	-5.00	AVG
7312.00	63.74	46.50	-0.83	62.91	45.67	74.00	54.00	-8.33	AVG
9748.00	65.33	48.78	2.66	67.99	51.44	74.00	54.00	-2.56	AVG

Vertical									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
2044.00	78.26	---	-9.36	68.90	---	99.52	---	-30.62	20dBc Peak Fundamental
2220.00	71.80	55.58	-9.16	62.64	46.42	74.00	54.00	-7.58	AVG
2304.00	76.22	---	-9.07	67.15	---	99.52	---	-32.37	20dBc Peak Fundamental
2328.00	81.86	58.72	-9.04	72.82	49.68	74.00	54.00	-4.32	AVG
2438.00	128.44	---	-8.92	119.52	---	---	---	---	Carrier
2546.00	75.02	---	-8.78	66.24	---	99.52	---	-33.28	20dBc Peak Fundamental
4876.00	68.17	51.05	-4.42	63.75	46.63	74.00	54.00	-7.37	AVG
7312.00	58.68	44.61	-0.83	57.84	43.78	74.00	54.00	-10.22	AVG
9748.00	62.98	47.13	2.66	65.64	49.79	74.00	54.00	-4.21	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
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. 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.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	802.11b/g CPE (Access Point)	Test Date	2008/10/16
Model	ARG-CPE2615	Test By	Gundam Lin
Test Mode	IEEE 802.11b TX (CH High)	TEMP & Humidity	25.5°C, 58%

Horizontal									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
2052.00	82.33	---	-9.35	72.98	---	85.25	---	-12.27	20dBc Peak Fundamental
2462.00	114.14	---	-8.89	105.25	---	---	---	---	Carrier
4925.00	51.40	---	-4.30	47.11	---	74.00	54.00	-6.89	Peak

Vertical									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
2052.00	99.23	66.60	-9.35	89.88	57.25	97.88	---	-8.00	20dBc Peak Fundamental
2278.00	71.07	47.12	-9.10	61.97	38.02	74.00	54.00	-15.98	AVG
2322.00	79.30	56.19	-9.05	70.25	47.14	74.00	54.00	-6.86	AVG
2354.00	80.00	59.95	-9.01	70.99	50.94	74.00	54.00	-3.06	AVG
2462.00	126.77	---	-8.89	117.88	---	---	---	---	Carrier
2572.00	76.24	---	-8.74	67.50	---	97.88	---	-30.38	20dBc Peak Fundamental
2872.00	72.68	55.82	-8.30	64.38	47.52	74.00	54.00	-6.48	AVG
4925.00	51.64	---	-4.30	47.35	---	74.00	54.00	-6.65	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
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. 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.

4. Result = Reading + Correction Factor

Margin = Result - Limit

Remark Peak = Result(PK) - Limit(AV)

Remark AVG = Result(AV) - Limit(AV)



Product Name	802.11b/g CPE (Access Point)			Test Date	2008/10/16		
Model	ARG-CPE2615			Test By	Gundam Lin		
Test Mode	IEEE 802.11g TX (CH Low)			TEMP & Humidity	25.5°C, 58%		

Horizontal									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
4827.00	49.46	---	-4.55	44.91	---	74.00	54.00	-9.09	Peak

Vertical									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
2298.00	71.12	51.23	-9.08	62.04	42.15	74.00	54.00	-11.85	AVG
2414.00	119.71	---	-8.94	110.77	---	---	---	---	Carier
4827.00	48.54	---	-4.55	44.00	---	74.00	54.00	-10.00	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
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. 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.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	802.11b/g CPE (Access Point)	Test Date	2008/10/16
Model	ARG-CPE2615	Test By	Gundam Lin
Test Mode	IEEE 802.11g TX (CH Middle)	TEMP & Humidity	25.5°C, 58%

Horizontal									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
4876.00	49.96	---	-4.42	45.53	---	74.00	54.00	-8.47	Peak
Vertical									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
2046.00	69.85	---	-9.36	60.49	---	94.09	---	-33.60	20dBc Peak Fundamental
2224.00	68.08	44.57	-9.16	58.92	35.41	74.00	54.00	-18.59	AVG
2432.00	123.02	---	-8.92	114.09	---	---	---	---	Carrier
4876.00	49.63	---	-4.42	45.21	---	74.00	54.00	-8.79	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
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. 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.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	802.11b/g CPE (Access Point)			Test Date	2008/10/16		
Model	ARG-CPE2615			Test By	Gundam Lin		
Test Mode	IEEE 802.11g TX (CH High)			TEMP & Humidity	25.5°C, 58%		

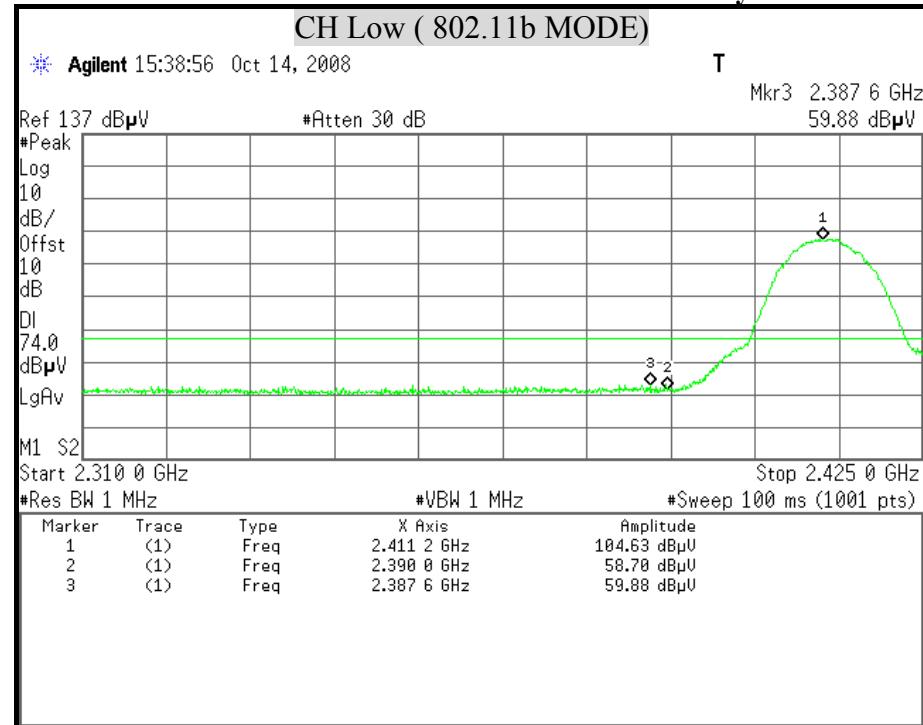
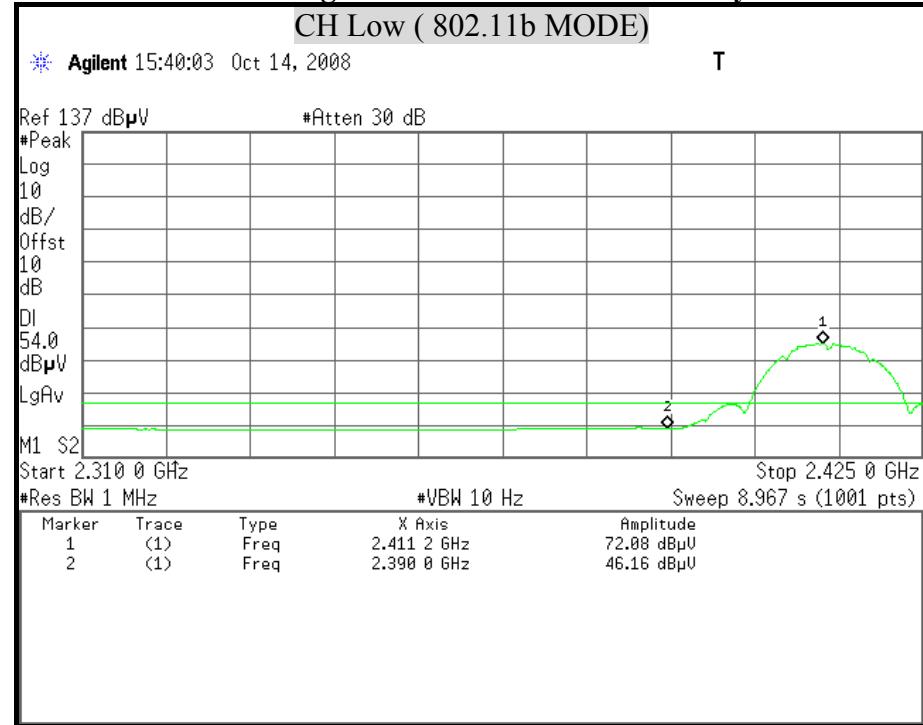
Horizontal									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
4918.00	50.74	---	-4.31	46.43	---	74.00	54.00	-7.57	Peak

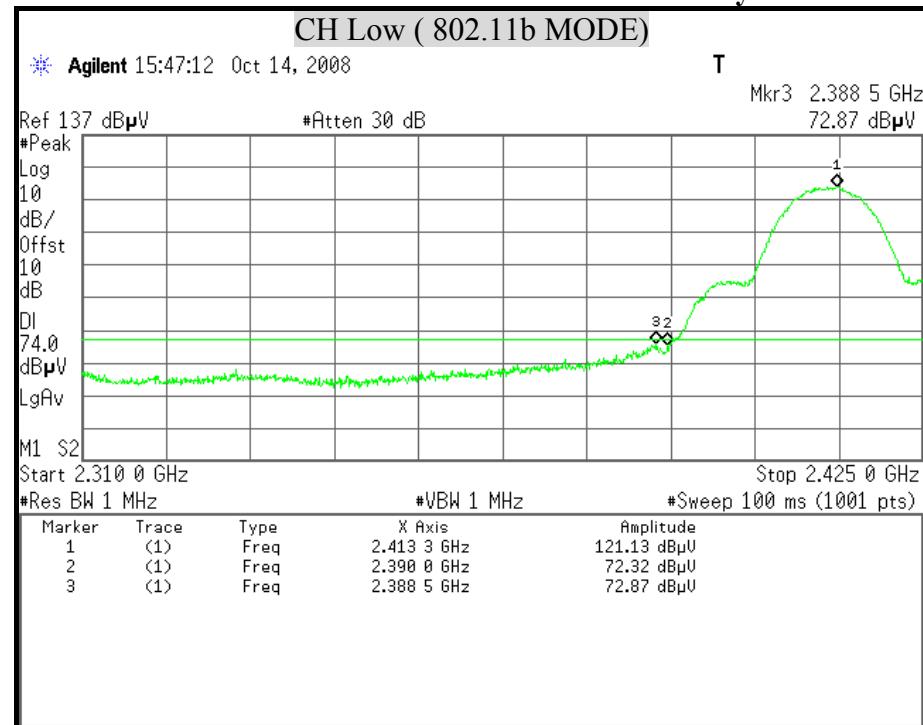
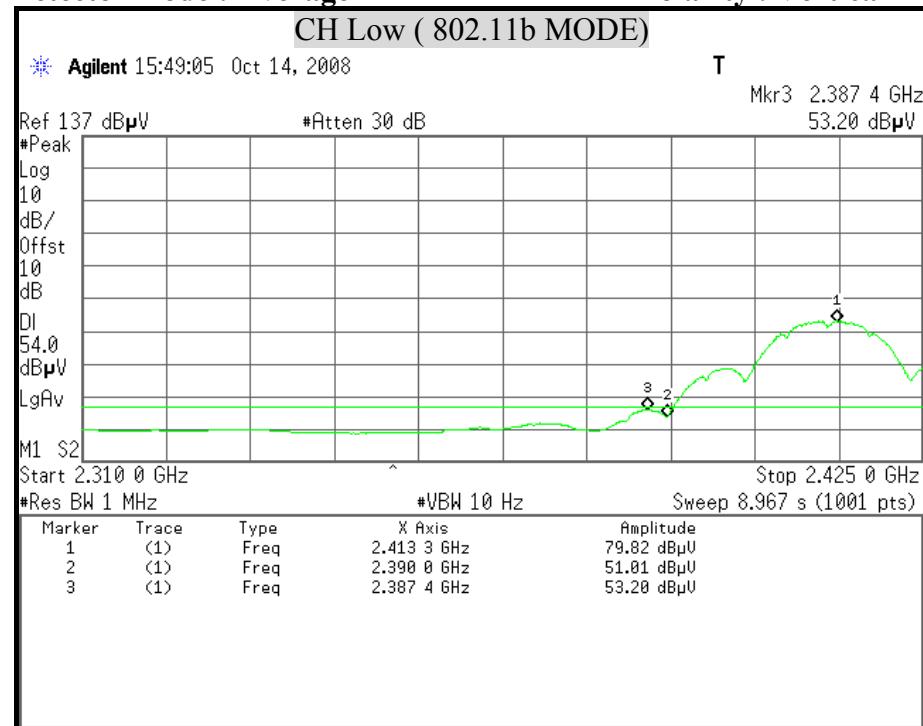
Vertical									
Frequency (MHz)	Reading-PK (dB μ V)	Reading-AV (dB μ V)	Correction Factor (dB/m)	Result-PK (dB μ V/m)	Result-AV (dB μ V/m)	Limit-PK (dB μ V/m)	Limit-AV (dB μ V/m)	Margin (dB)	Remark
4925.00	51.14	---	-4.30	46.85	---	74.00	54.00	-7.15	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
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. 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.
4. Result = Reading + Correction Factor
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(AV)
Remark AVG = Result(AV) – Limit(AV)

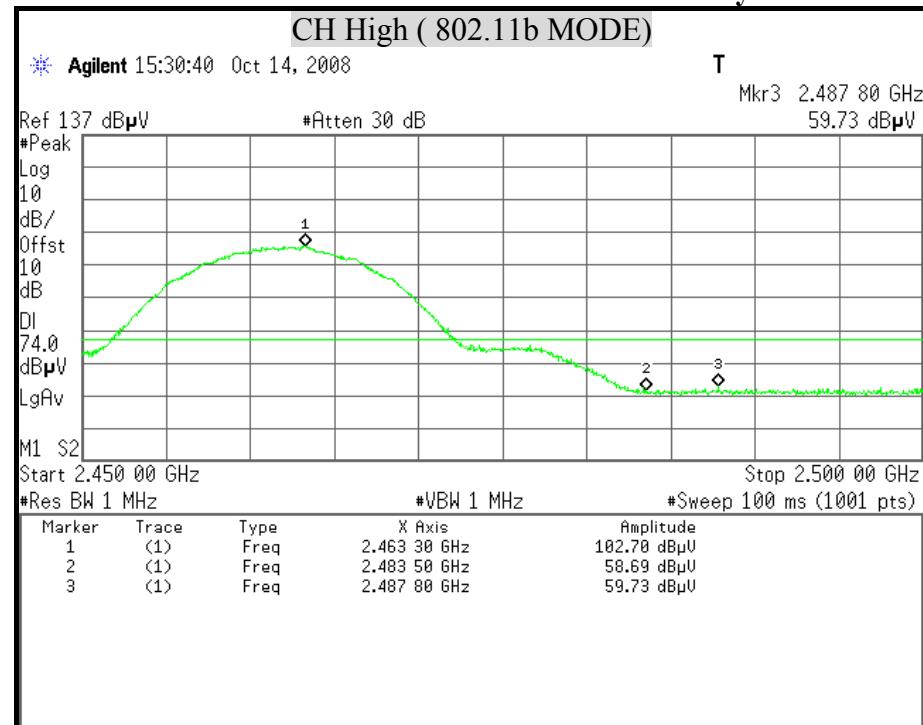
8.8.4 RESTRICTED BAND EDGES

Detector mode : Peak
Polarity : Horizontal

Detector mode : Average
Polarity : Horizontal


Detector mode : Peak**Polarity : Vertical****Detector mode : Average****Polarity : Vertical**

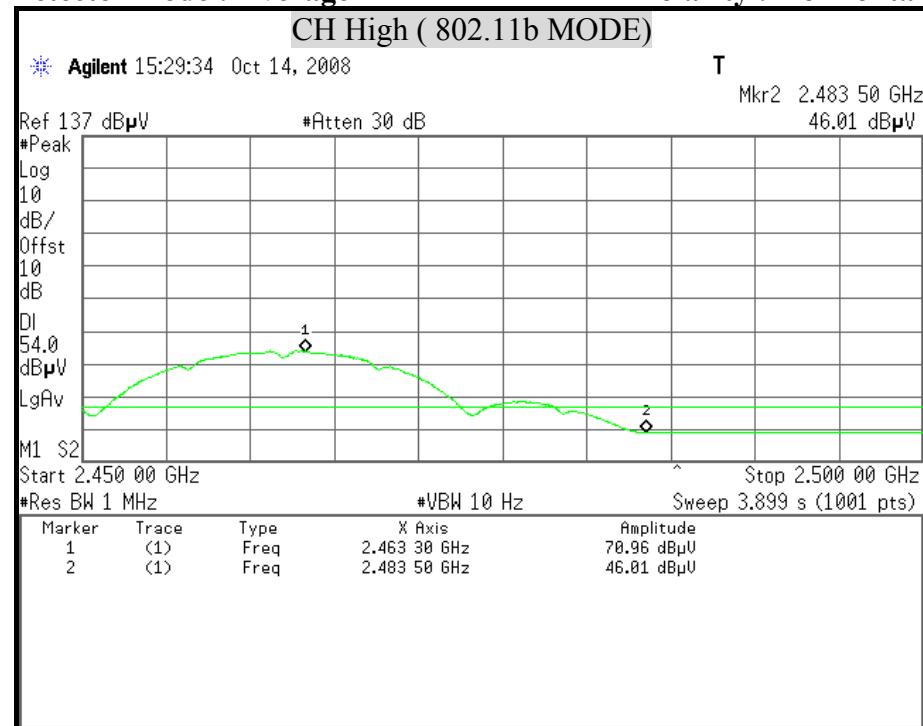
Detector mode : Peak

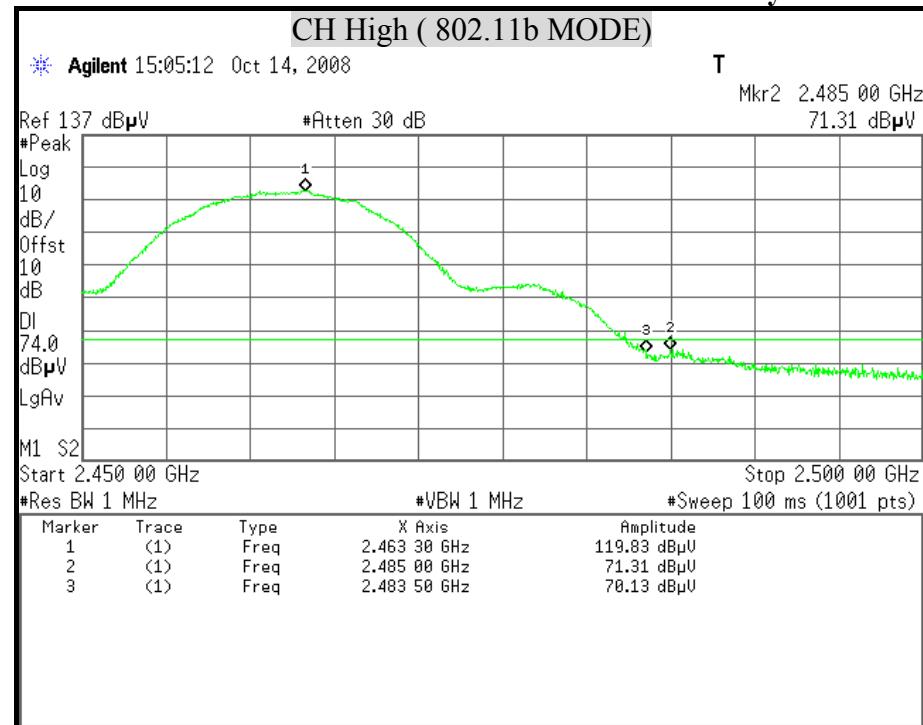
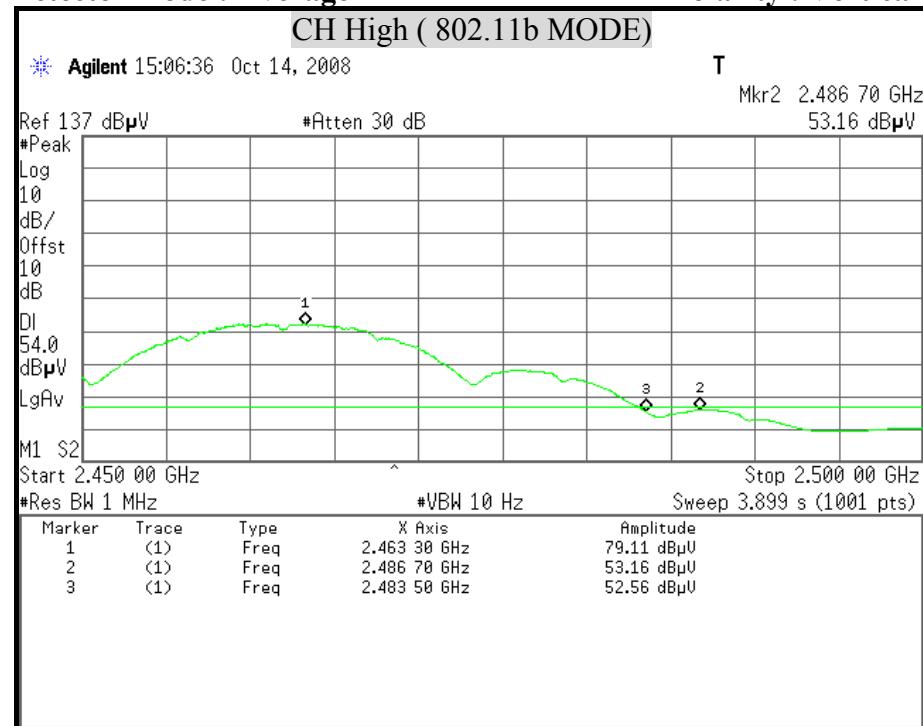
Polarity : Horizontal

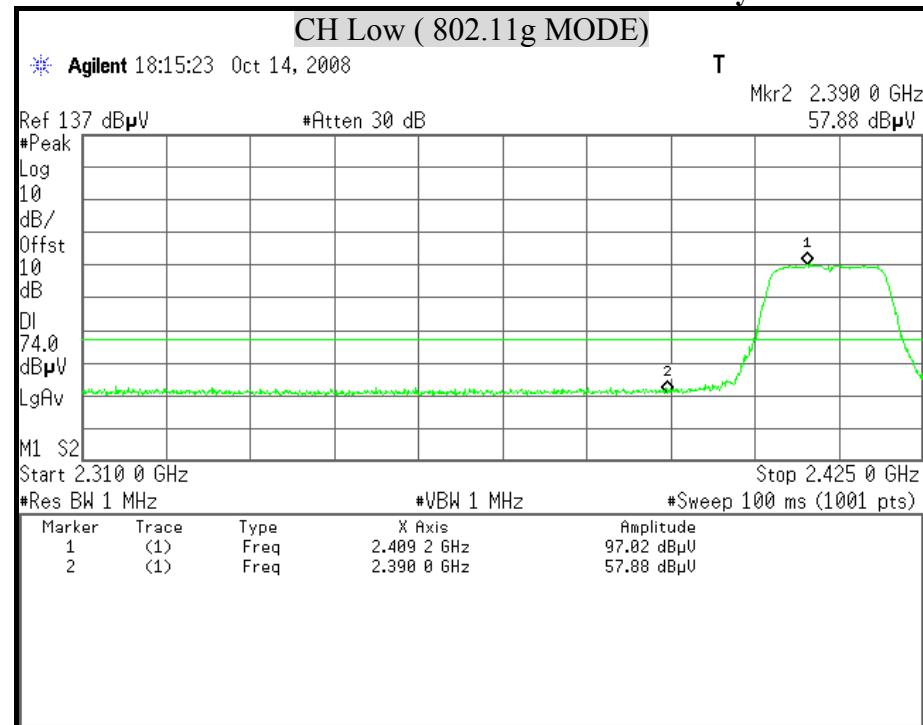
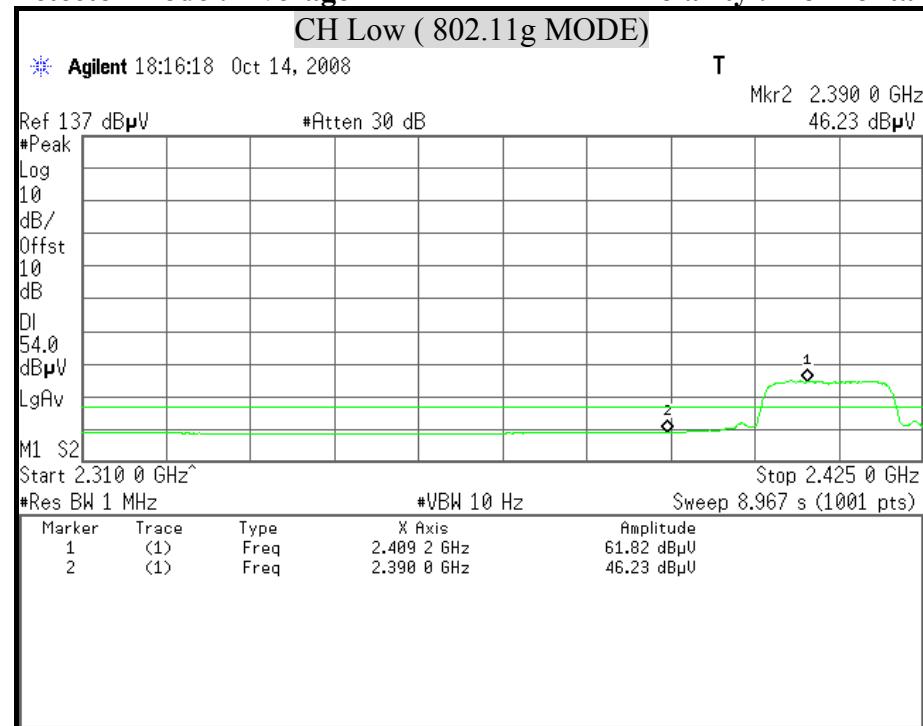


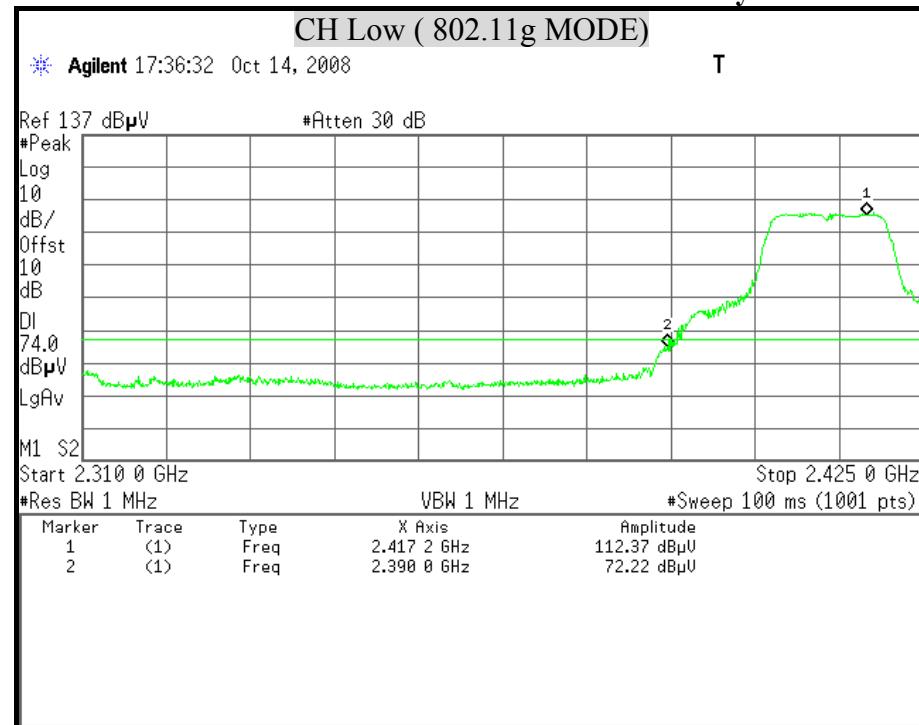
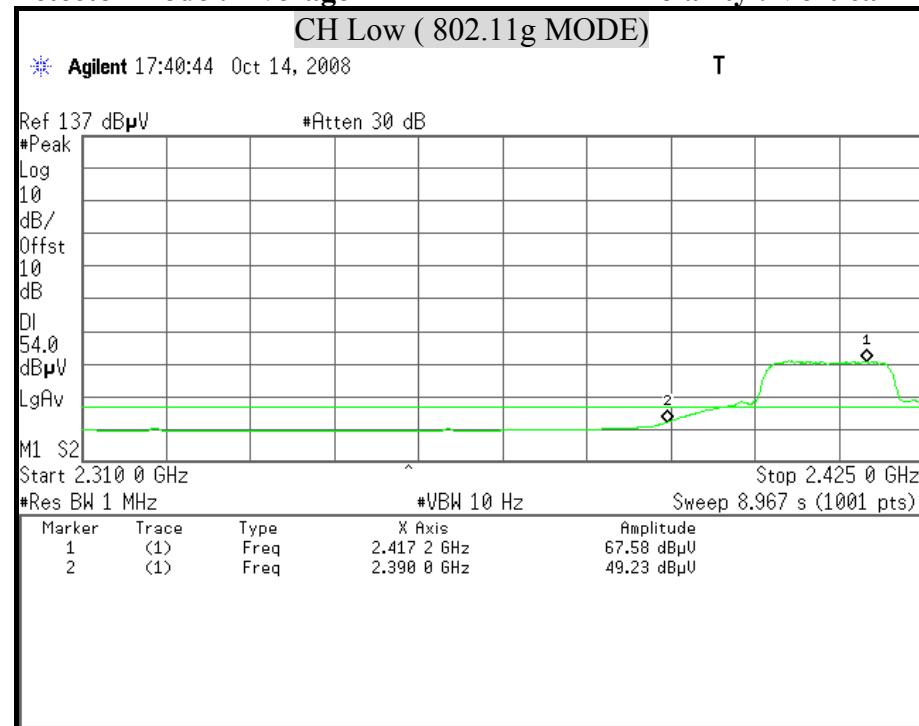
Detector mode : Average

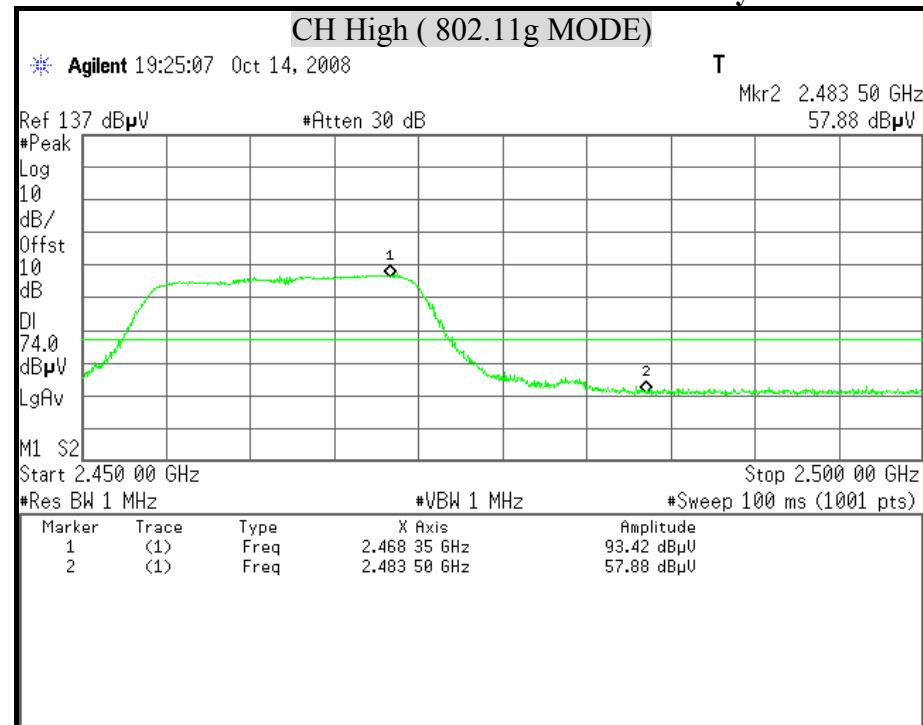
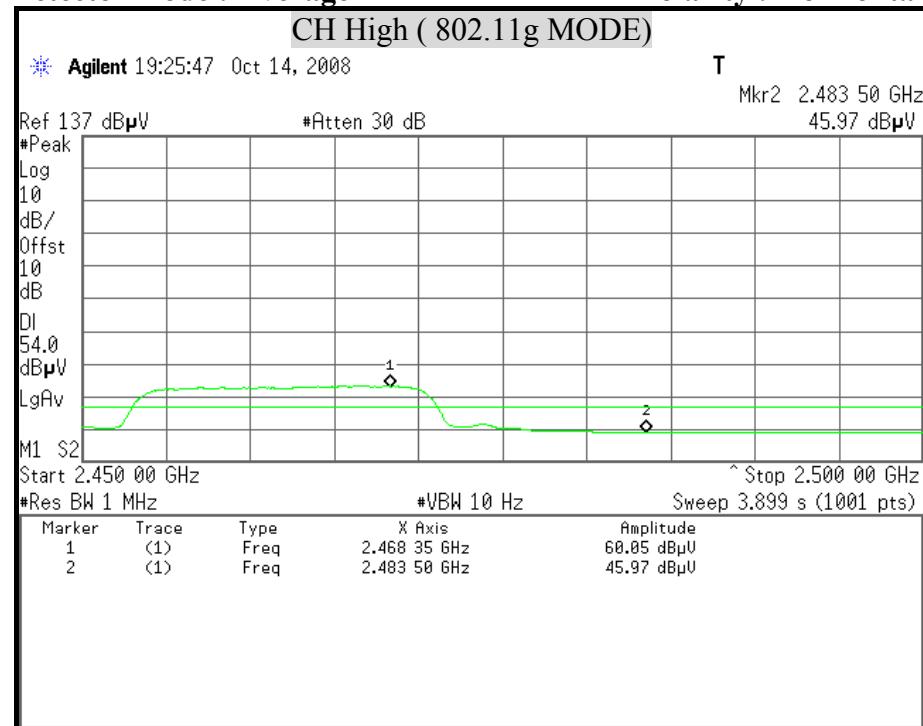
Polarity : Horizontal

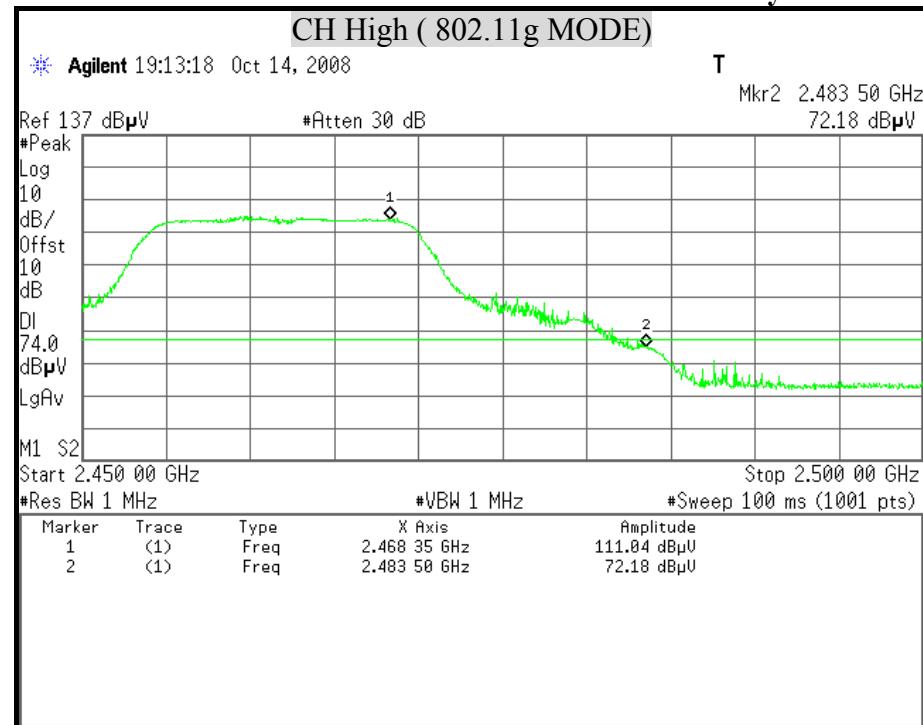
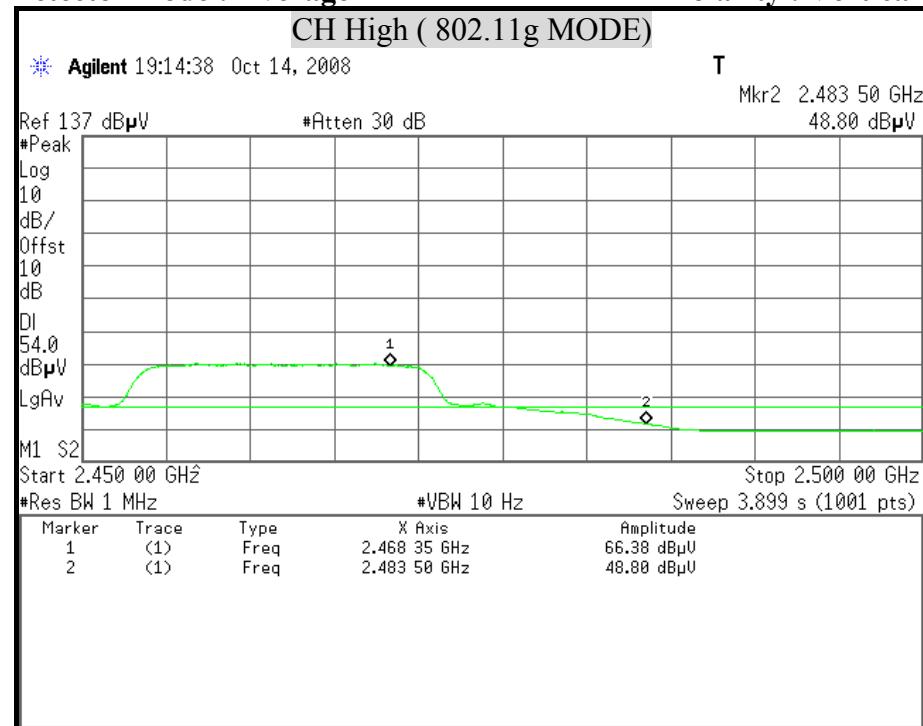


Detector mode : Peak
Polarity : Vertical

Detector mode : Average
Polarity : Vertical


Detector mode : Peak**Polarity : Horizontal****Detector mode : Average****Polarity : Horizontal**

Detector mode : Peak**Polarity : Vertical****Detector mode : Average****Polarity : Vertical**

Detector mode : Peak**Polarity : Horizontal****Detector mode : Average****Polarity : Horizontal**

Detector mode : Peak**Polarity : Vertical****Detector mode : Average****Polarity : Vertical**



8.9 POWERLINE CONDUCTED EMISSIONS

LIMITS

§ 15.207 (a) Except as shown in paragraph (b) and (c) 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 μ H/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.

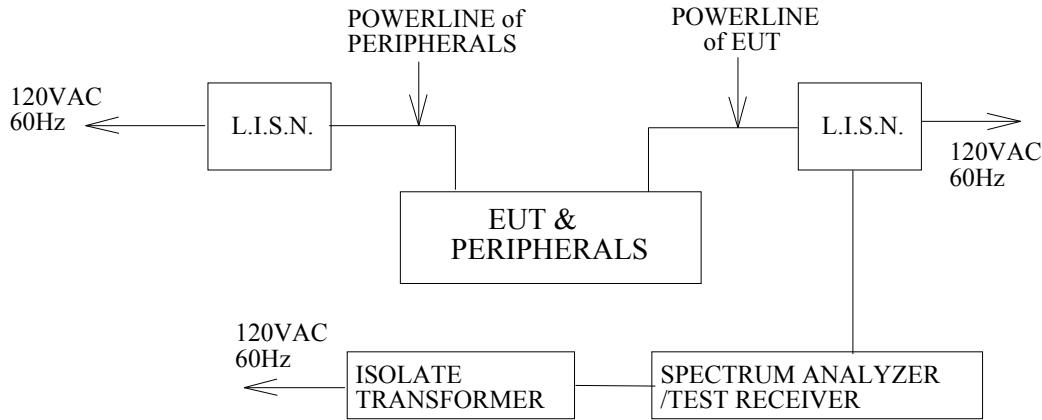
Frequency of Emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50

TEST EQUIPMENT

The following test equipment is used during the conducted powerline tests :

Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
SCHWARZBECK L.I.S.N	NSLK 8127	8127-465	July 09, 2008	1 Year	FINAL
SCHWARZBECK L.I.S.N	NSLK 8127	8127-473	October 04, 2008	1 Year	FINAL
R & S TEST RECEIVER	ESHS30	838550/003	January 23, 2009	1 Year	FINAL
KEENE SHIELDED ROOM	5983	No.1	N/A	N/A	FINAL
R & S PULSE LIMIT	ESH3-Z2	10117	September 26, 2008	1 Year	FINAL
BELDEN N TYPE COAXIAL CABLE	8268 M17/164	003	September 14, 2008	1 Year	FINAL

TEST SETUP



TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80cm above the horizontal ground plane. The EUT IS CONFIGURED IN ACCORDANCE WITH ANSI C63.4:2003.

The resolution bandwidth is set to 9 kHz for both quasi-peak detection and average detection measurements.

Line conducted data is recorded for both NEUTRAL and LINE.

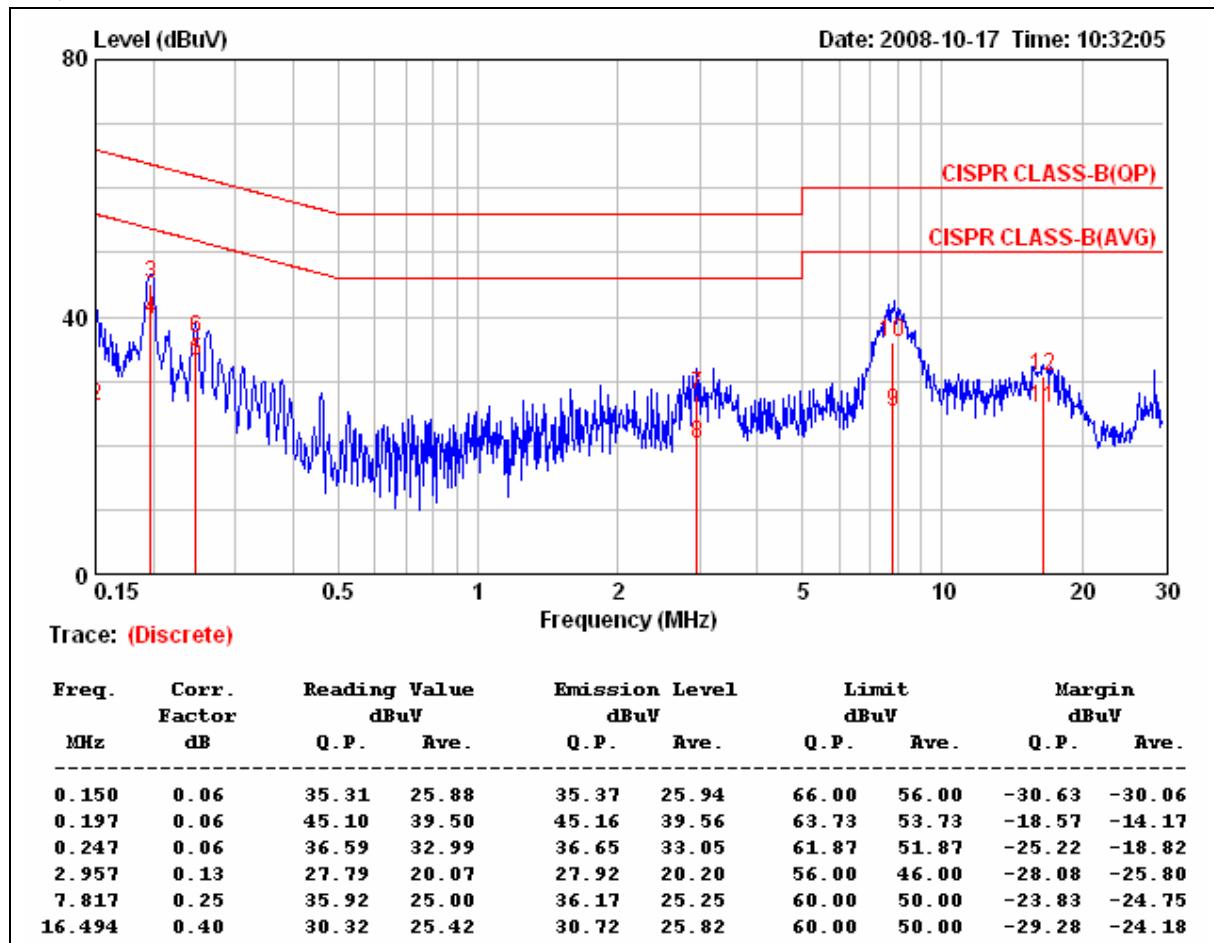
TEST RESULTS

No non-compliance noted

**CONDUCTED RF VOLTAGE MEASUREMENT**

Product Name	802.11b/g CPE (Access Point)	Test Date	2008/10/17
Model Name	ARG-CPE2615	Test By	Vic Lin
Test Mode	Normal operating	TEMP & Humidity	23.4°C, 62%

LINE

**Remark:**

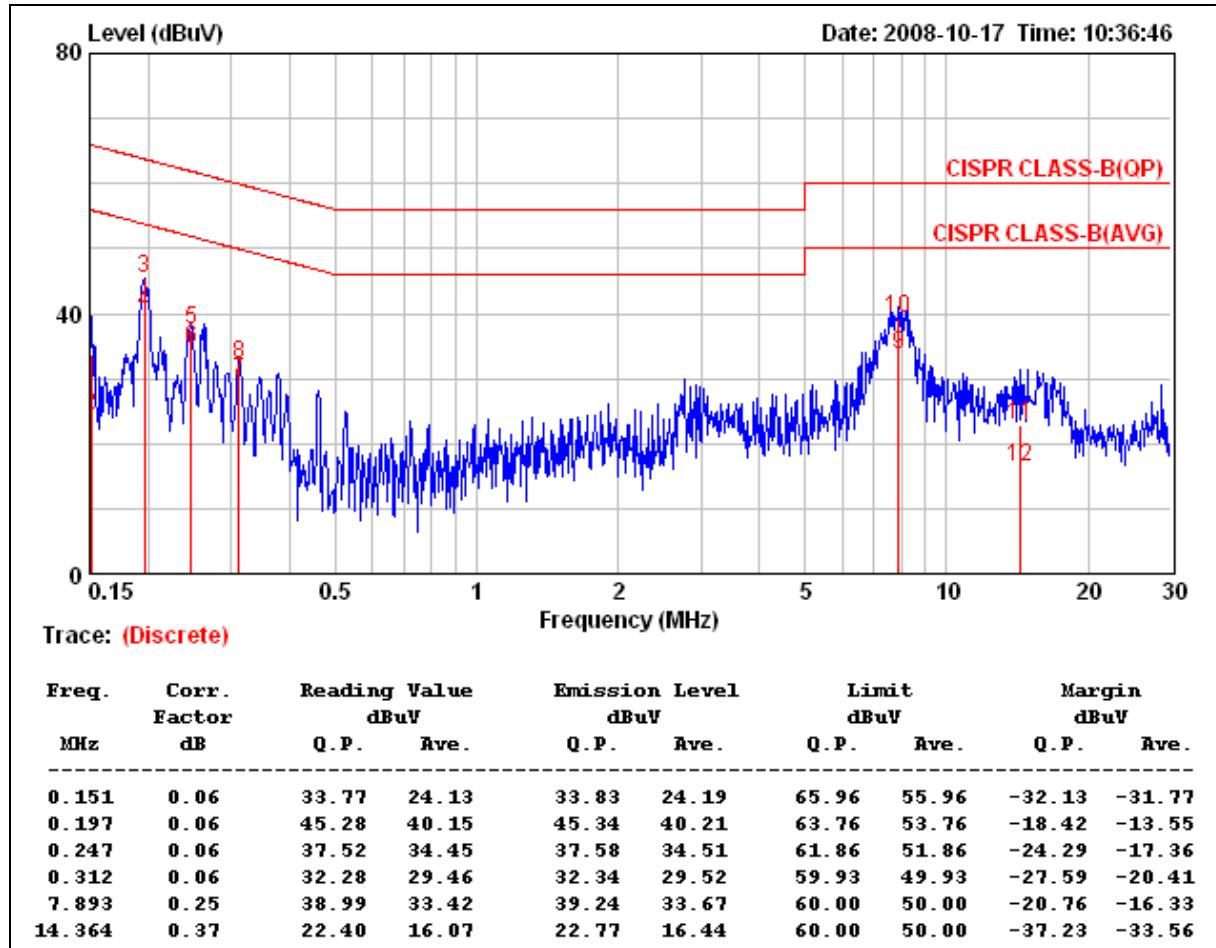
1. Correction Factor = Insertion loss + cable loss

2. Margin value = Emission level - Limit value



Product Name	802.11b/g CPE (Access Point)	Test Date	2008/10/17
Model Name	ARG-CPE2615	Test By	Vic Lin
Test Mode	Normal operating	TEMP & HUMIDITY	23.4°C, 62%

NEUTRAL

**Remark:**

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level - Limit value