FCC 47 CFR PART 15 SUBPART C AND ANSI C63.4:2003 TEST REPORT (Class II Permissive Change Report)

For

802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD

Model : BCM94313HMG2L

Trade Name : Broadcom

Issued for

BROADCOM CORPORATION

190 MATHILDA PLACE SUNNYVALE, CA 94086, U.S.A.

Issued by

Compliance Certification Services Inc.
Hsinchu Lab.
NO. 989-1 Wen Shan Rd., Shang Shan Village,
Qionglin Shiang Hsinchu County 30741, Taiwan, R.O.C
TEL: +886-3-5921698
FAX: +886-3-5921108

http://www.ccsrf.com
E-Mail : service@ccsrf.com

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	01/31/2011	Initial Issue	All Page 35	Cindy Pon
01	03/08/2012	Revised the Description of Class II Changes and the Maximum Peak Output Power.	Page 1, 5, 6, 11, 14	Cindy Pon

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TITLE PAGE NO.

1. TEST REPORT CERTIFICATION

Applicant	：	BROADCOM CORPORATION
Address	：	190 MATHILDA PLACE SUNNYVALE, CA 94086, U.S.A.
Equipment Under Test	：	802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD
Model	：	BCM94313HMG2L
Trade Name	：	Broadcom
Tested Date	：	December 21, 2011 ~ January 31, 2012

APPLICABLE STANDARD	
Standard	**Test Result**
FCC Part 15 Subpart C AND ANSI C63.4:2003	PASS

WE HEREBY CERTIFY THAT: The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Rex Liao
Deputy Section Manager

Reviewed by:

Jacky Chen
Deputy Section Manager

2. EUT DESCRIPTION

Product Name	802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD
Model Number	BCM94313HMG2L
Identify Number	T111208123
Received Date	December 21, 2011
Frequency Range	IEEE 802.11b/g : 2412MHz～2462MHz
Transmit Power	IEEE 802.11b : 21.10dBm (0.1288 W) IEEE 802.11g : 25.22dBm (0.3327 W)
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	PIFA Antenna, Antenna Gain :0.42dBi
Power Rating	20Vdc,3.25A (From Power Adapter)
Test Voltage	120Vac/60Hz
DC Power Cable Type	Non-shielded cable 1.8m (Non-detachable)
I/O Port	USB 2.0 Port × 2, RJ-45 Port × 1, HDMI Port × 1, USB 3.0 Port × 2, Audio Port × 1, SD Card Port × 1, Power Port × 1

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	lenovo	ADP-65KH B	100-240Vac, 50/60Hz, 1.5A	20Vdc, 3.25A
2	lenovo	PA-1650-56LC	100-240Vac, 50/60Hz, 1.7A	20Vdc, 3.25A

Remark :

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *For more details, please refer to the User's manual of the EUT.*
3. *This submittal(s) (test report) is intended for FCC ID: QDS-BRCM1050I filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.*

3. DESCRIPTION OF CLASS II CHANGE

The major change filed under this application is:

1. The operation frequency is 2412MHz~2462MHz.
2. Add portable condition compliance to the grant so that the module may be used in qualified host PC(s) and implementation of module-notebook authentication.
   Product name: Notebook Computer
   Brand name: lenovo
   Model: 20170, 3726, Lenovo IdeaPad U410
   The above model numbers have the same specifications.

4. DESCRIPTION OF TEST MODES

The EUT is an 802.11b/g transceiver in 802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD form factor. The EUT is 1 × 1 spatial device. The antenna configuration is one TX antenna (Chain 1) and two RX antennas (Diversity), as there are two PIFA antennas.

Radiated Emission Test (Below 1 GHz)

TX Mode

Conducted / Radiated Emission Test (Above 1 GHz)

IEEE 802.11b, 802.11g, 802.11n HT20 mode

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b mode : 1Mbps data rate (worst case) were chosen for full testing.

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

IEEE 802.11n HT20 mode : Covered by the worst case 802.11g Mode Legacy testing.

5. TEST METHODOLOGY

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

6. FACILITIES AND ACCREDITATION

6.1 FACILITIES

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

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 C63.4:2003 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4, CISPR 16-1-5.

6.2 ACCREDITATIONS

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

Taiwan	TAF

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

Canada	INDUSTRY CANADA
Japan	VCCI
Taiwan	BSMI
USA	FCC MRA

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

6.3 MEASUREMENT UNCERTAINTY

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2.

PARAMETER	UNCERTAINTY
Semi Anechoic Chamber (966 Chamber_A) / Radiated Emission, 30 to 1000 MHz	+/- 3.0371
Semi Anechoic Chamber (966 Chamber_A) / Radiated Emission, 1 to 18GHz	+/- 2.5258
Semi Anechoic Chamber (966 Chamber_A) / Radiated Emission, 18 to 26 GHz	+/- 2.5012
Semi Anechoic Chamber (966 Chamber_A) / Radiated Emission, 26 to 40 GHz	+/- 2.7846

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Consistent with industry standard (e.g. CISPR 22: 2006, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than U_{CISPR} which is 3.6dB and 5.2dB respectively. CCS values (called U_{Lab} in CISPR 16-4-2) is less than U_{CISPR} as shown in the table above. Therefore, MU need not be considered for compliance.

7. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

N/A

SETUP DIAGRAM FOR TESTS

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

EUT OPERATING CONDITION

Tx Mode

1. Setup all computers like the setup diagram.
2. Select the following settings.
3. net stop wlansvc.
   timeout 1
   net start wlansvc
   timeout 4
   wl out
   wl up
   wl antdiv 0
   wl txant 0
   wl mpc 0
   wl frameburst 1
   wl down
   wl ampdu 1
   wl country ALL
   wl band b
   wl up
   wl chanspec -c 1 -b 2 -w 20 -s 0
   timeout 4
   wl wsec 0
   timeout 4
   wl join testb imode adhoc
   timeout 4
   wl legacylink
   timeout 6
   wl nrate -r 1
   wl cck_txbw 2
   wl txpwr1 -o -q 75
   timeout 4
   epi_ttcp -tsuHfm -l 8760 -n 10000000 192.168.66.255
4. Run Tx Test software.
5. All of the functions are under run.
6. Start test.

8. FCC PART 15.247 REQUIREMENTS

8.1 MAXIMUM PEAK OUTPUT POWER

LIMITS

§ 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.

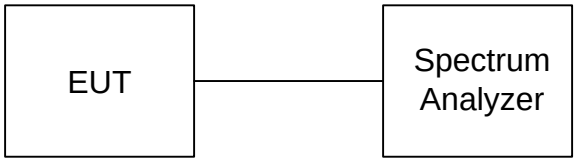
§ 15.247(b) (4) Except as shown in paragraphs (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4407B	US41443108	08/09/2012

Remark: *Each piece of equipment is scheduled for calibration once a year.*

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. The peak output power is the channel power integrated over 26dB bandwidth.

TEST RESULTS

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2412	19.47	0.0885	30	1	PASS
Middle	2437	21.10	0.1288	30	1	PASS
High	2462	15.80	0.0380	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 1Mbps.*
2. *The cable assembly insertion loss of 11.5dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*

IEEE 802.11g Mode

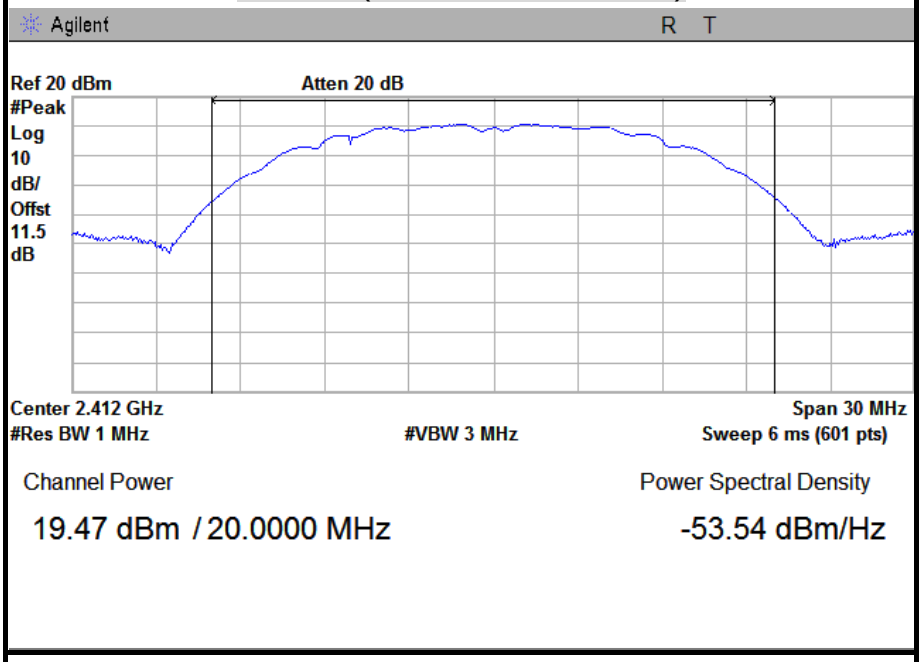
Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2412	23.40	0.2188	30	1	PASS
Middle	2437	25.22	0.3327	30	1	PASS
High	2462	17.05	0.0507	30	1	PASS

Remark:

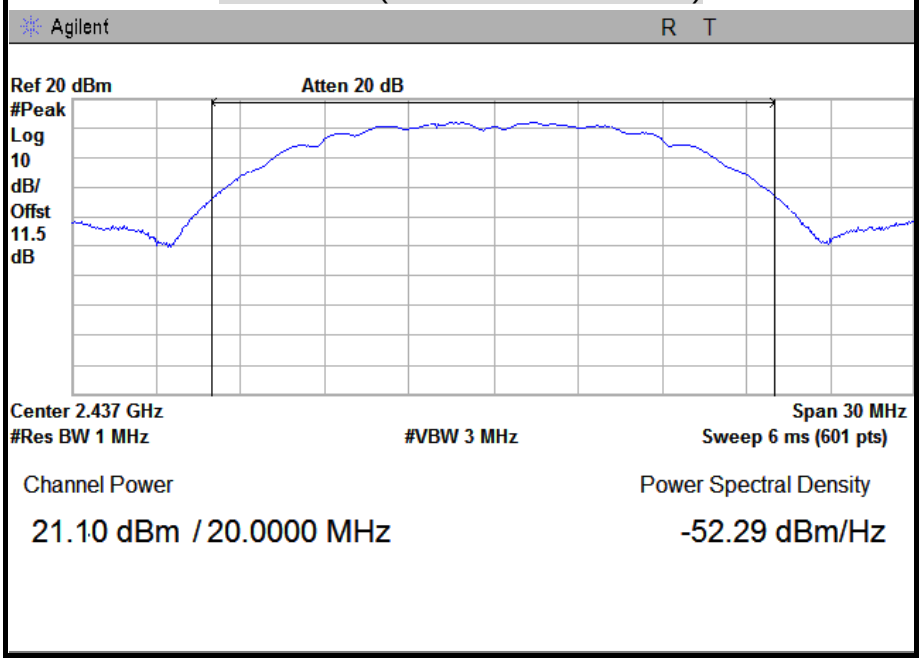
1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 11.5dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*

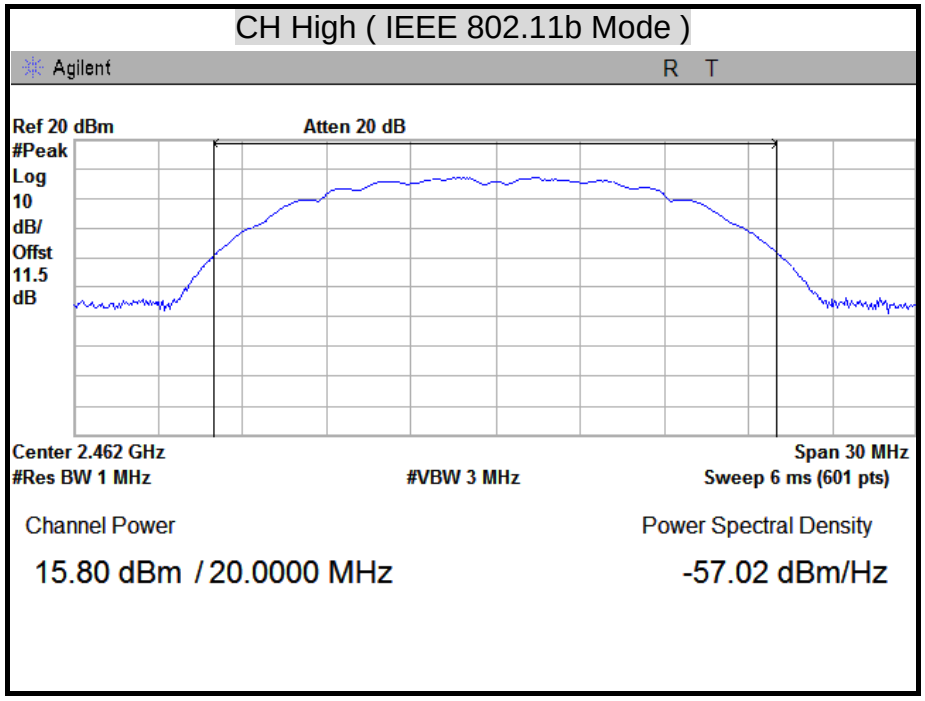
MAXIMUM PEAK OUTPUT POWER

CH Low (IEEE 802.11b Mode)

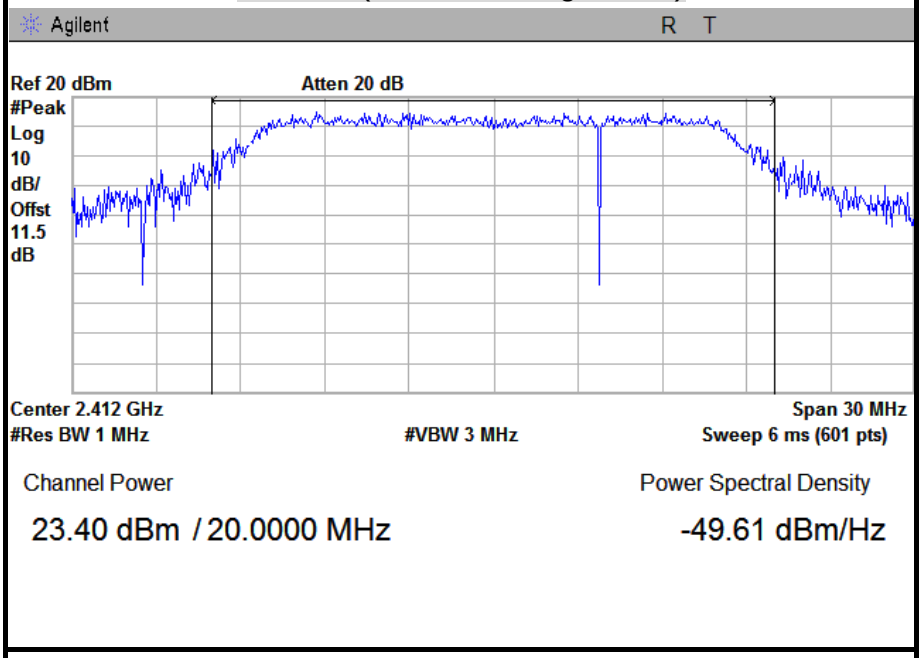


CH Middle (IEEE 802.11b Mode)

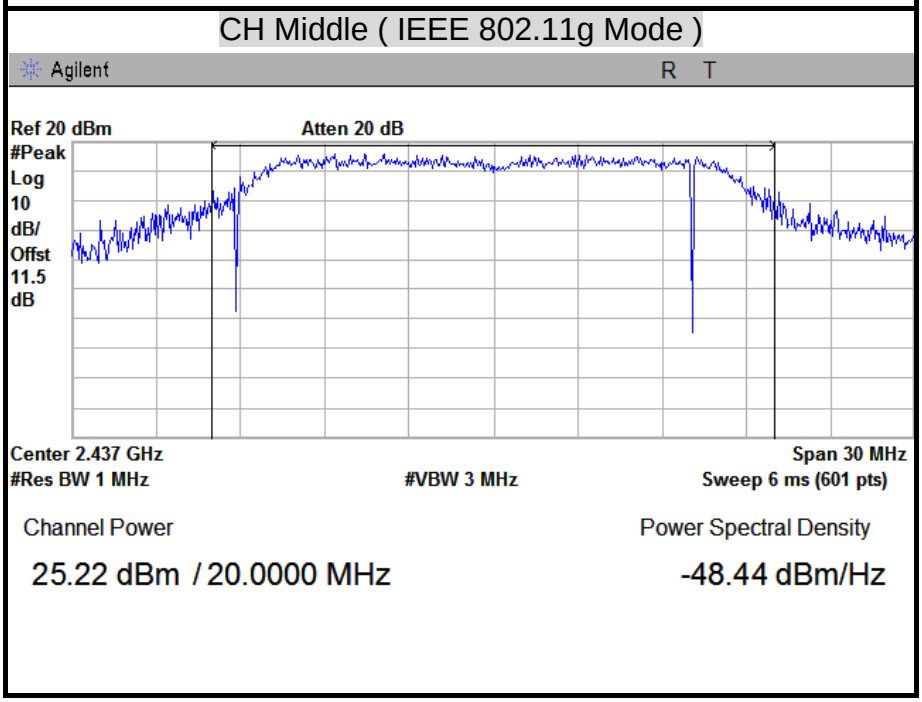


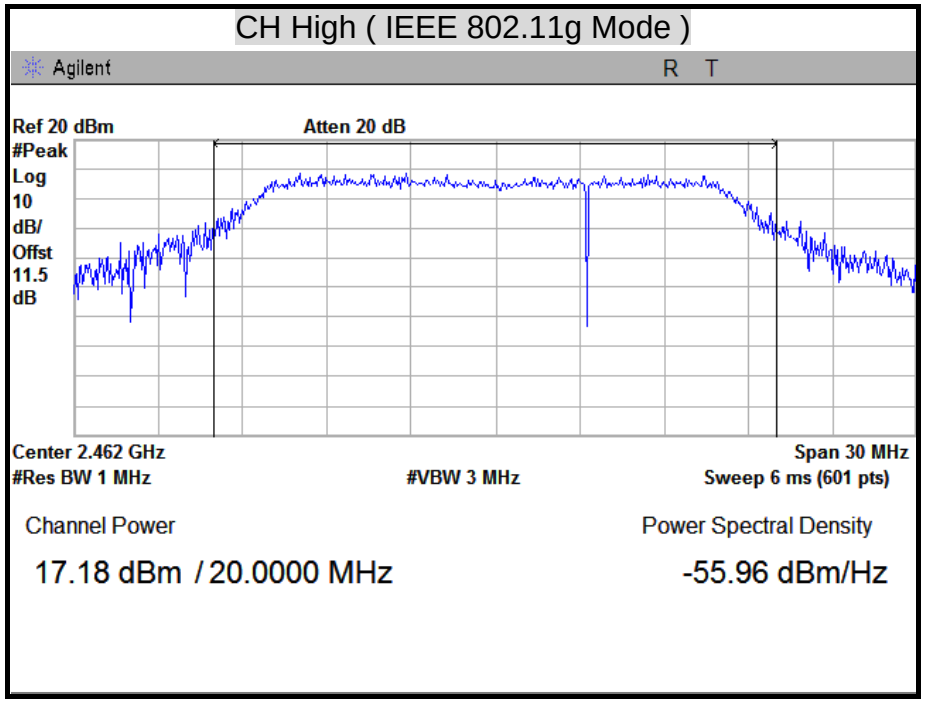


CH Low (IEEE 802.11g Mode)



CH Middle (IEEE 802.11g Mode)





8.2 RADIATED EMISSION

LIMITS

(1) According to § 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			

Remark:
1. [1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
2. [2] Above 38.6

(2) According to § 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 is 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.

(3) 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 (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

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.*

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

TEST EQUIPMENT

Radiated Emission / 966Chamber_A

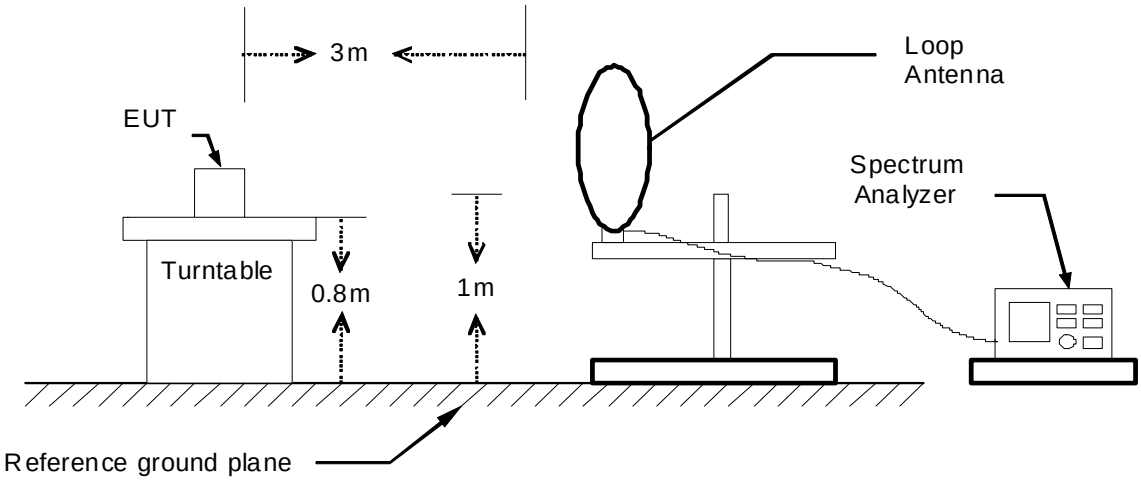
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY46180323	04/24/2012
EMI Receiver	ROHDE & SCHWARZ	ESCI	100221	04/24/2012
Bi-log Antenna	SCHWARZBECK	VULB 9168	9168-249	10/03/2012
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-778	09/05/2012
Horn Antenna	COM-POWER	AH-840	03077	12/06/2012
Pre-Amplifier	Agilent	8449B	3008A01471	07/24/2012
Pre-Amplifier	HP	8447F	2944A03748	09/18/2012
LOOP Antenna	EMCO	6502	8905-2356	06/10/2012
Band Reject Notch Filter	Micro-Tronics	BRM05702-01	009	N.C.R

Remark: *1. Each piece of equipment is scheduled for calibration once a year.*
2. N.C.R = No Calibration Request.

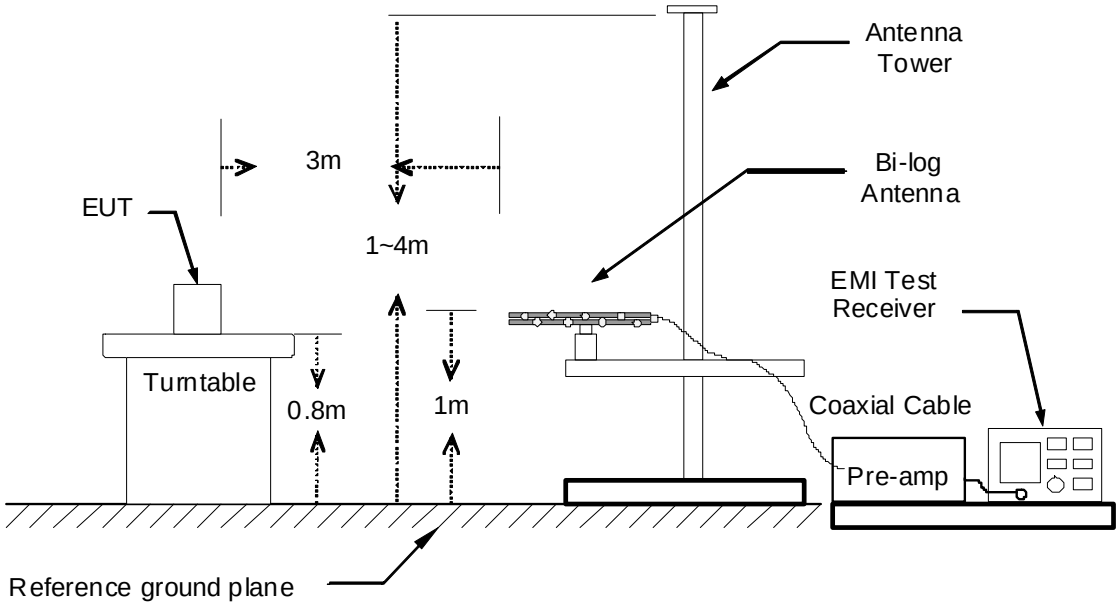
TEST SETUP

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

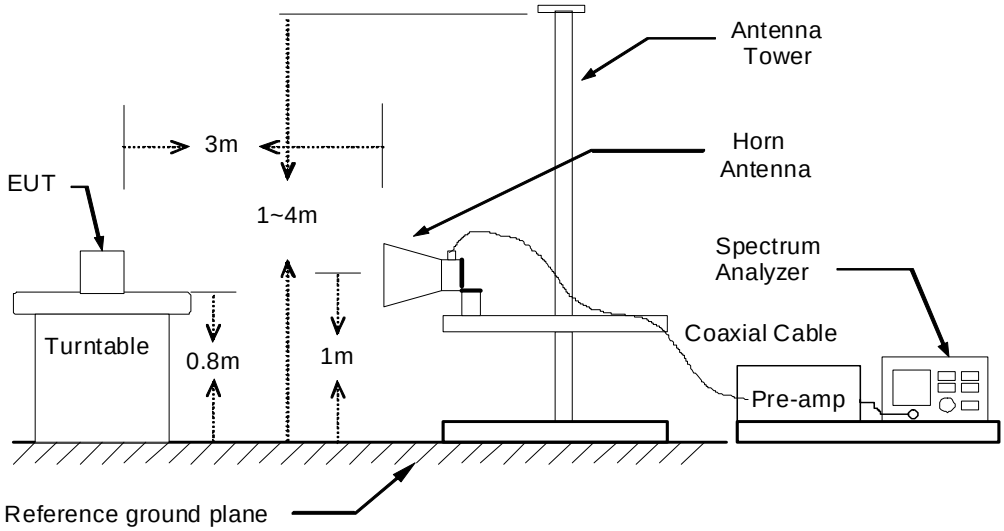
9kHz ~ 30MHz



30MHz ~ 1GHz



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



TEST PROCEDURE

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
2. 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.
3. 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.
4. 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.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. 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.

Remark：

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

Below 1 GHz (9kHz ~ 30MHz)

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

Below 1 GHz (30MHz ~ 1GHz)

Product Name	802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD	Test By	Rueyyan Lin
Test Model	BCM94313HMG2L	Test Date	2012/01/11
Test Mode	IEEE 802.11b TX / CH Middle (worst case)	Temp. & Humidity	21°C, 62%

966 Chamber_A at 3Meter / Horizontal						
Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
90.14	39.96	-15.85	24.11	43.50	-19.39	Peak
139.61	40.39	-10.11	30.28	43.50	-13.22	Peak
232.73	44.55	-11.34	33.21	46.00	-12.79	Peak
345.25	46.19	-7.55	38.65	46.00	-7.35	Peak
512.09	36.34	-3.61	32.73	46.00	-13.27	Peak
664.38	33.46	-0.64	32.82	46.00	-13.18	Peak
803.09	33.33	2.06	35.39	46.00	-10.61	Peak

966 Chamber_A at 3Meter / Vertical						
Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
36.79	45.27	-10.58	34.69	40.00	-5.31	Peak
139.61	46.04	-10.11	35.93	43.50	-7.57	Peak
345.25	42.74	-7.55	35.19	46.00	-10.81	Peak
494.63	40.91	-3.96	36.95	46.00	-9.05	Peak
665.35	34.92	-0.62	34.30	46.00	-11.70	Peak
836.07	31.28	2.69	33.98	46.00	-12.02	Peak
990.30	31.62	4.49	36.12	54.00	-17.88	Peak

Remark:

1. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.*
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. *Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – PreAmp.Gain (dB)*
4. *Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)*
5. *Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).*

TX Above 1 GHz

Product Name	802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD	Test By	Rueyyan Lin
Test Model	BCM94313HMG2L	Test Date	2012/01/10
Test Mode	IEEE 802.11b TX / CH Low	Temp. & Humidity	20.5°C, 63%

966 Chamber_A at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1206.00	55.04	---	-6.77	48.27	---	74.00	54.00	-5.73	Peak
1674.00	52.91	---	-4.36	48.54	---	74.00	54.00	-5.46	Peak
3585.00	42.69	---	1.47	44.16	---	74.00	54.00	-9.84	Peak
4890.00	42.44	---	5.76	48.20	---	74.00	54.00	-5.80	Peak

966 Chamber_A at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1208.00	54.75	---	-6.76	47.99	---	74.00	54.00	-6.01	Peak
1498.00	54.20	---	-5.05	49.15	---	74.00	54.00	-4.85	Peak
3045.00	44.07	---	0.62	44.69	---	74.00	54.00	-9.31	Peak
4830.00	50.54	47.24	5.56	56.10	52.80	74.00	54.00	-1.20	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *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.*
4. *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.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD	Test By	Rueyyan Lin
Test Model	BCM94313HMG2L	Test Date	2012/01/10
Test Mode	IEEE 802.11b TX / CH Middle	Temp. & Humidity	20.5°C, 63%

966 Chamber_A at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1320.00	54.07	---	-6.10	47.97	---	74.00	54.00	-6.03	Peak
1728.00	54.72	---	-4.16	50.57	---	74.00	54.00	-3.43	Peak
4380.00	42.20	---	4.11	46.31	---	74.00	54.00	-7.69	Peak
4875.00	44.87	---	5.71	50.58	---	74.00	54.00	-3.42	Peak

966 Chamber_A at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1216.00	55.21	---	-6.71	48.50	---	74.00	54.00	-5.50	Peak
1576.00	53.74	---	-4.75	48.99	---	74.00	54.00	-5.01	Peak
3375.00	43.54	---	1.03	44.57	---	74.00	54.00	-9.43	Peak
4875.00	53.28	47.22	5.71	58.99	52.93	74.00	54.00	-1.07	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *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.*
4. *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.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD	Test By	Rueyyan Lin
Test Model	BCM94313HMG2L	Test Date	2012/01/10
Test Mode	IEEE 802.11b TX / CH High	Temp. & Humidity	20.5°C, 63%

966 Chamber_A at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1128.00	54.51	---	-7.23	47.29	---	74.00	54.00	-6.71	Peak
1652.00	54.47	---	-4.45	50.02	---	74.00	54.00	-3.98	Peak
3270.00	43.45	---	0.90	44.35	---	74.00	54.00	-9.65	Peak
4920.00	42.92	---	5.85	48.78	---	74.00	54.00	-5.22	Peak

966 Chamber_A at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1080.00	56.81	---	-7.51	49.30	---	74.00	54.00	-4.70	Peak
1784.00	53.41	---	-3.94	49.47	---	74.00	54.00	-4.53	Peak
3375.00	42.75	---	1.03	43.78	---	74.00	54.00	-10.22	Peak
4920.00	53.56	47.54	5.85	59.41	53.39	74.00	54.00	-0.61	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *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.*
4. *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.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD	Test By	Rueyyan Lin
Test Model	BCM94313HMG2L	Test Date	2012/01/10
Test Mode	IEEE 802.11g TX / CH Low	Temp. & Humidity	20.5°C, 63%

966 Chamber_A at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1306.00	54.42	---	-6.18	48.24	---	74.00	54.00	-5.76	Peak
1656.00	54.32	---	-4.43	49.89	---	74.00	54.00	-4.11	Peak
3915.00	42.47	---	2.58	45.05	---	74.00	54.00	-8.95	Peak
4845.00	41.44	---	5.61	47.05	---	74.00	54.00	-6.95	Peak

966 Chamber_A at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1828.00	60.66	44.39	-3.77	56.89	40.62	74.00	54.00	-13.38	AVG
2034.00	57.28	45.66	-2.96	54.32	42.70	74.00	54.00	-11.30	AVG
4395.00	43.18	---	4.16	47.34	---	74.00	54.00	-6.66	Peak
4830.00	42.94	---	5.56	48.50	---	74.00	54.00	-5.50	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *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.*
4. *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.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD	Test By	Rueyyan Lin
Test Model	BCM94313HMG2L	Test Date	2012/01/10
Test Mode	IEEE 802.11g TX / CH Middle	Temp. & Humidity	20.5°C, 63%

966 Chamber_A at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1218.00	57.46	---	-6.70	50.76	---	74.00	54.00	-3.24	Peak
1674.00	54.10	---	-4.36	49.74	---	74.00	54.00	-4.26	Peak
3975.00	42.64	---	2.79	45.42	---	74.00	54.00	-8.58	Peak
4875.00	42.63	---	5.71	48.33	---	74.00	54.00	-5.67	Peak

966 Chamber_A at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1218.00	62.88	54.22	-6.70	56.18	47.52	74.00	54.00	-6.48	AVG
1974.00	59.88	45.72	-3.20	56.68	42.52	74.00	54.00	-11.48	AVG
3375.00	42.75	---	1.03	43.78	---	74.00	54.00	-10.22	Peak
4875.00	55.82	43.33	5.71	61.53	49.04	74.00	54.00	-4.96	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *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.*
4. *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.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	802.11g/DRAFT 802.11n WIRELESS LAN PCI-E MIMICARD	Test By	Rueyyan Lin
Test Model	BCM94313HMG2L	Test Date	2012/01/10
Test Mode	IEEE 802.11g TX / CH High	Temp. & Humidity	20.5°C, 63%

966 Chamber_A at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1536.00	54.05	---	-4.90	49.15	---	74.00	54.00	-4.85	Peak
3705.00	42.45	---	1.87	44.33	---	74.00	54.00	-9.67	Peak
4920.00	41.20	---	5.85	47.05	---	74.00	54.00	-6.95	Peak

966 Chamber_A at 3Meter / Vertical

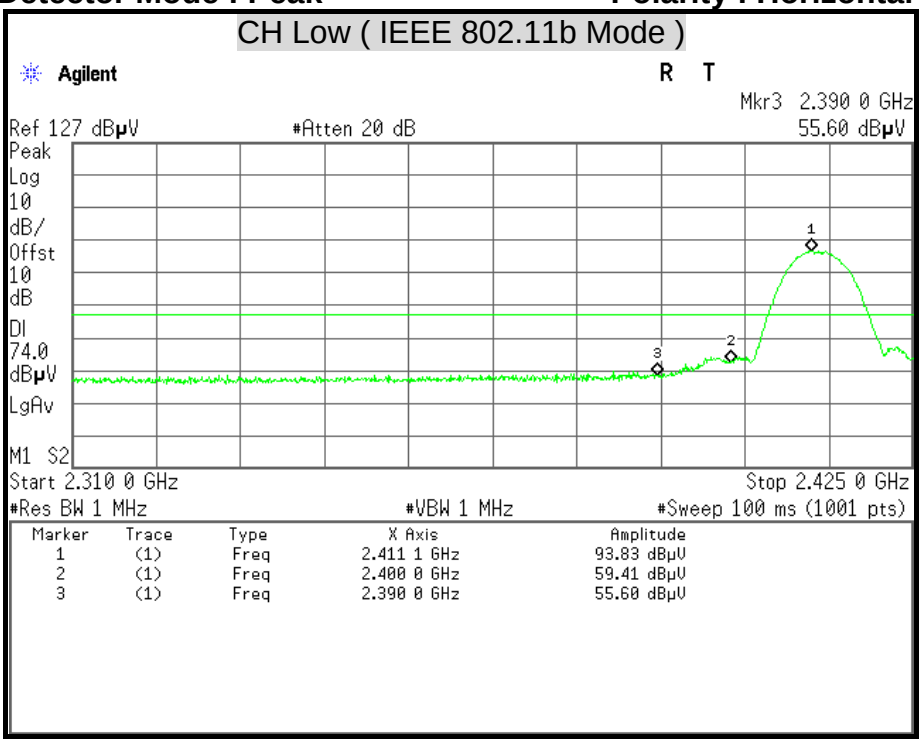
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1660.00	55.43	---	-4.42	51.01	---	74.00	54.00	-2.99	Peak
1744.00	55.80	---	-4.09	51.71	---	74.00	54.00	-2.29	Peak
3120.00	43.57	---	0.72	44.28	---	74.00	54.00	-9.72	Peak
4875.00	41.78	---	5.71	47.48	---	74.00	54.00	-6.52	Peak

Remark:

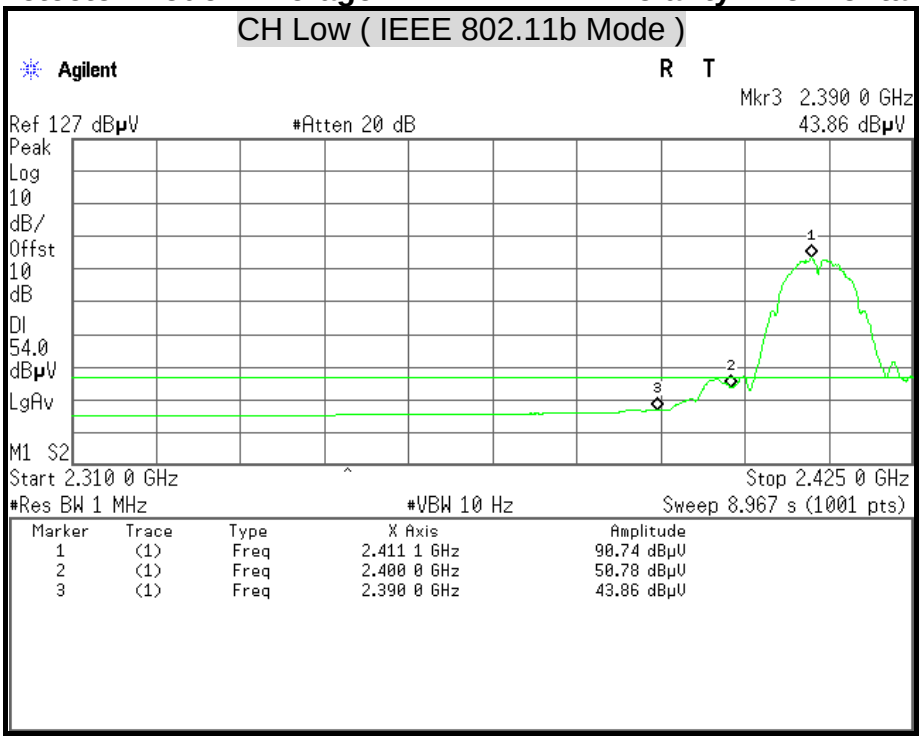
1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *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.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV))

Restricted Band Edges

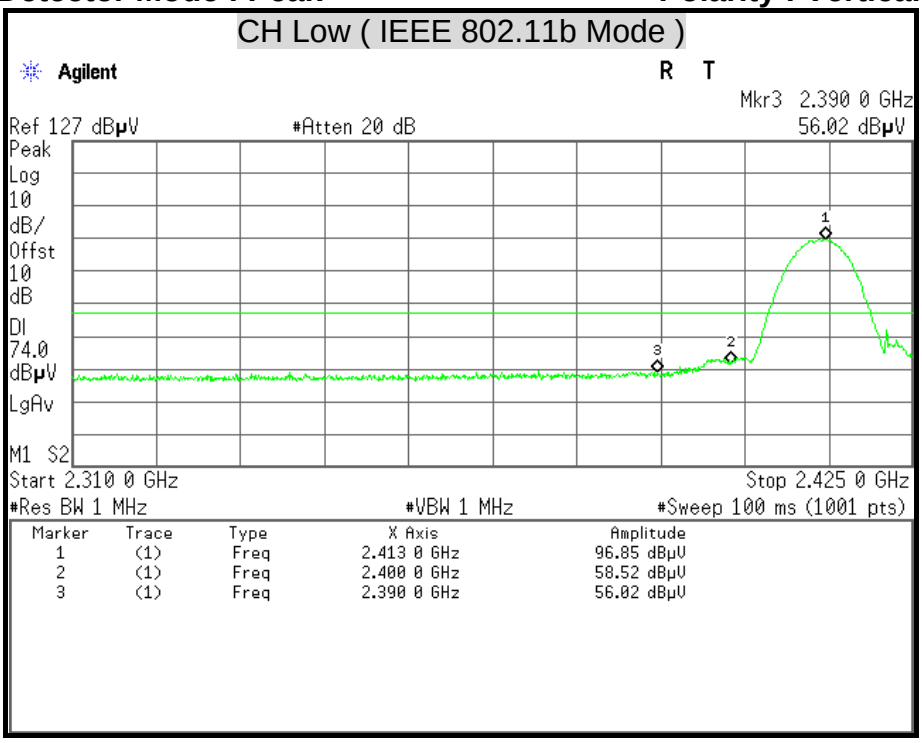
Detector Mode : Peak **Polarity : Horizontal**



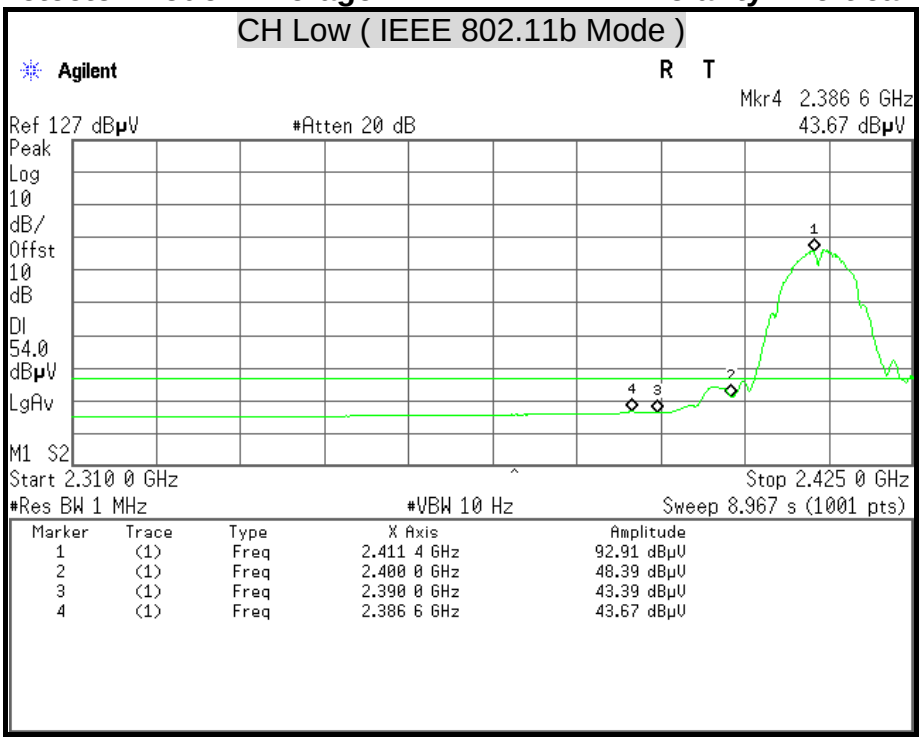
Detector Mode : Average **Polarity : Horizontal**



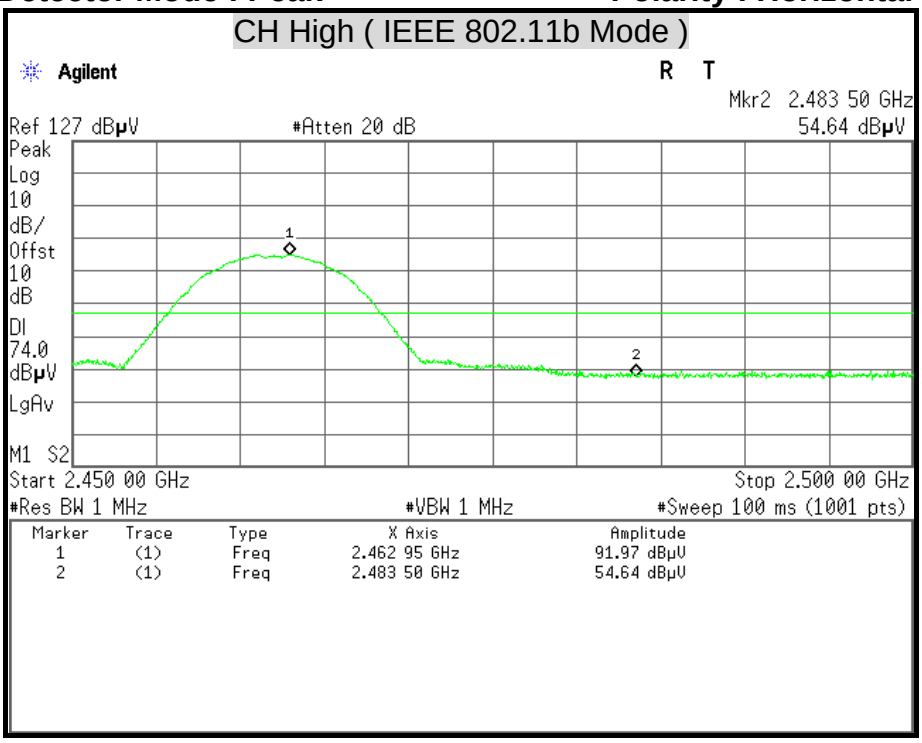
Detector Mode : Peak **Polarity : Vertical**



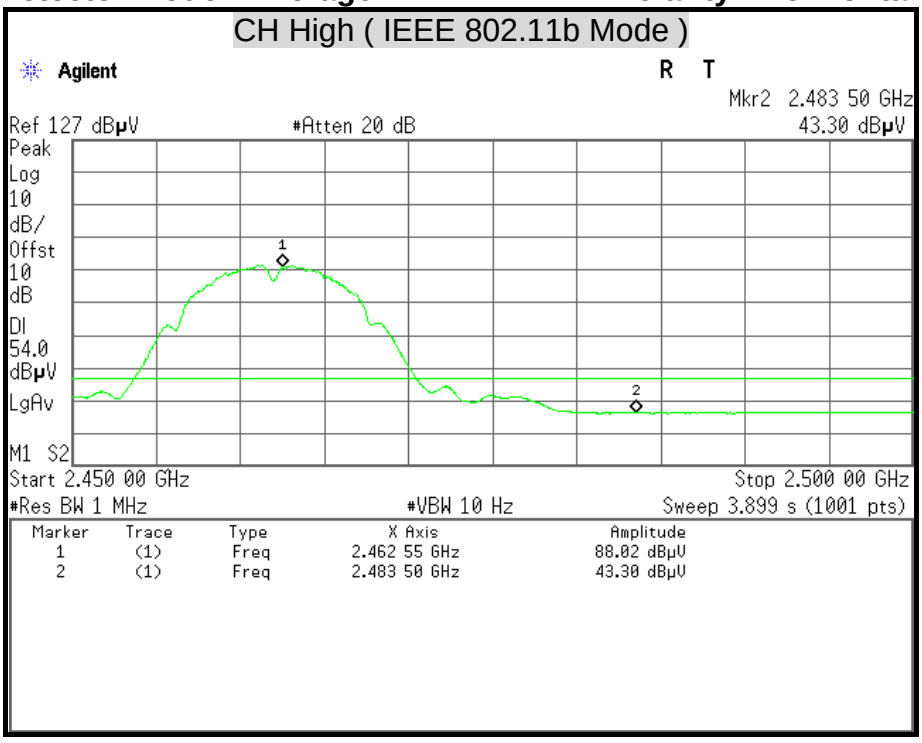
Detector Mode : Average **Polarity : Vertical**



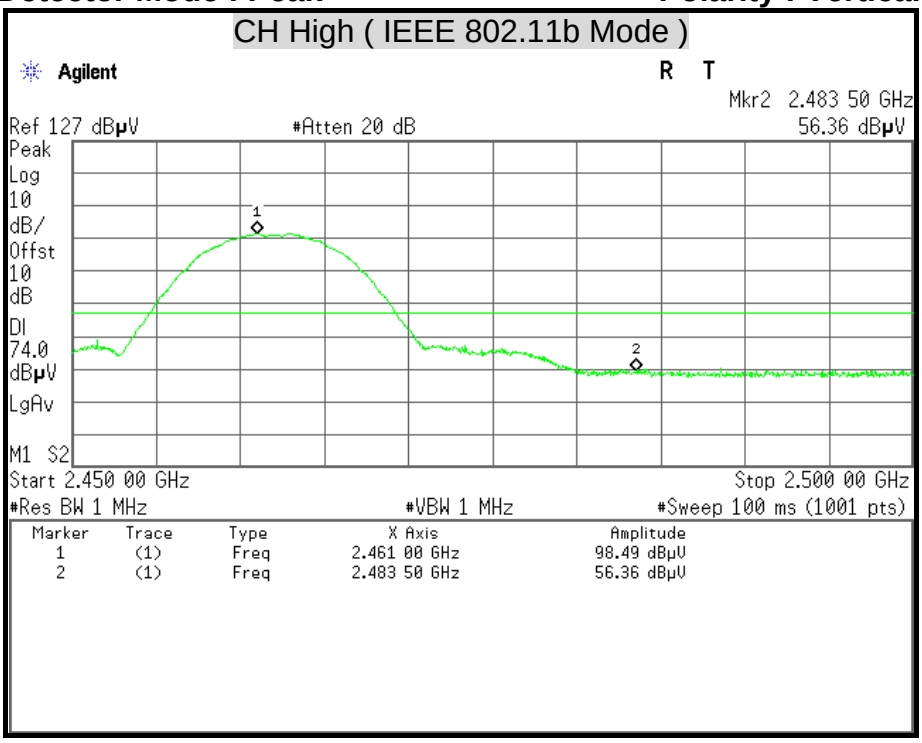
Detector Mode : Peak **Polarity : Horizontal**



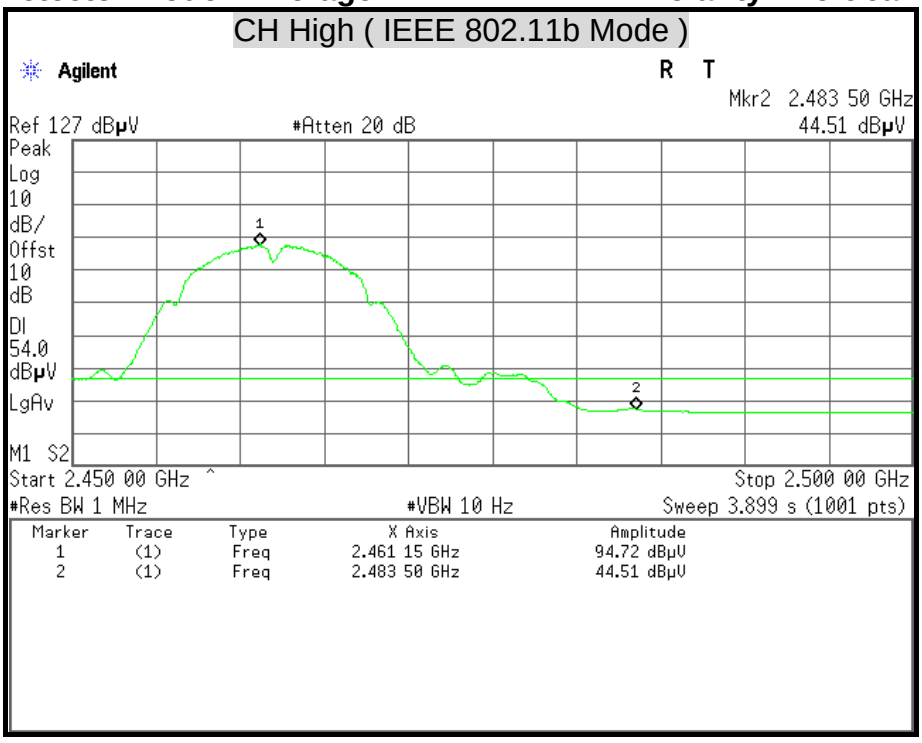
Detector Mode : Average **Polarity : Horizontal**



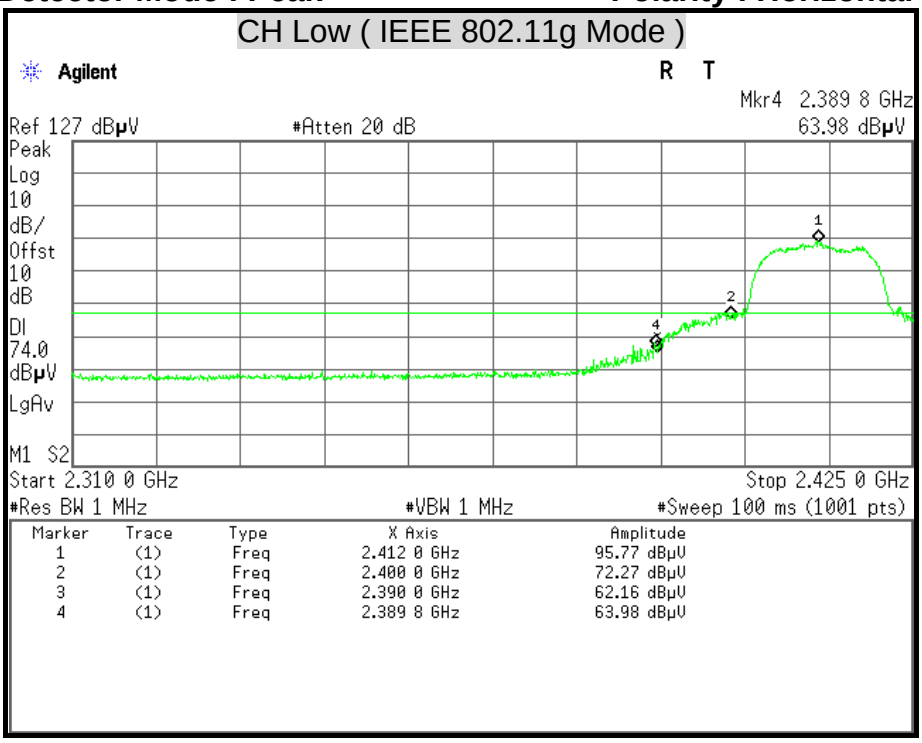
Detector Mode : Peak **Polarity : Vertical**



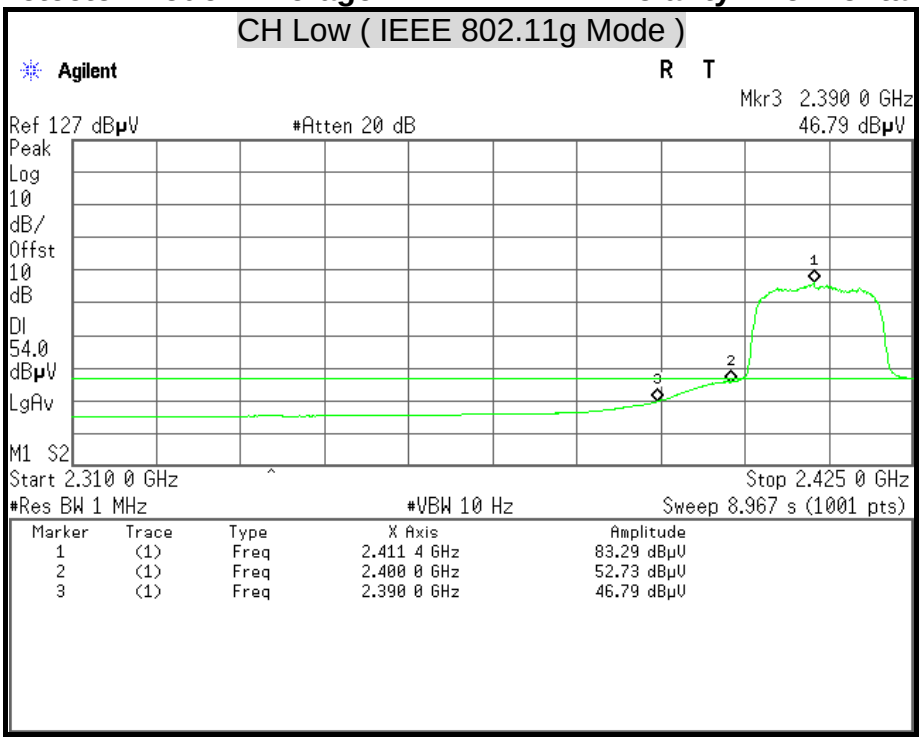
Detector Mode : Average **Polarity : Vertical**



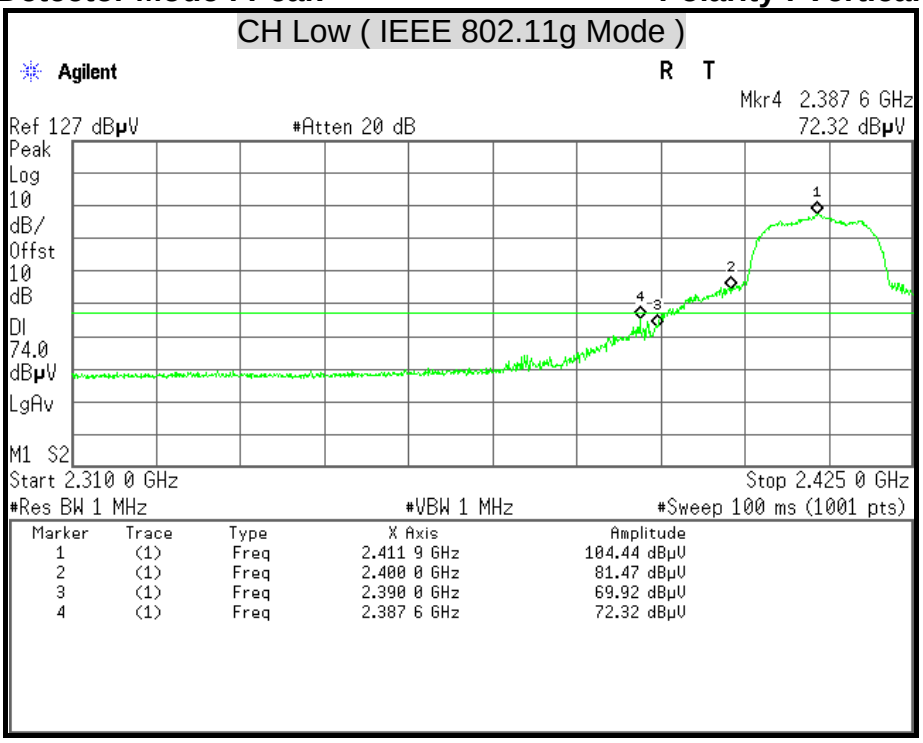
Detector Mode : Peak **Polarity : Horizontal**



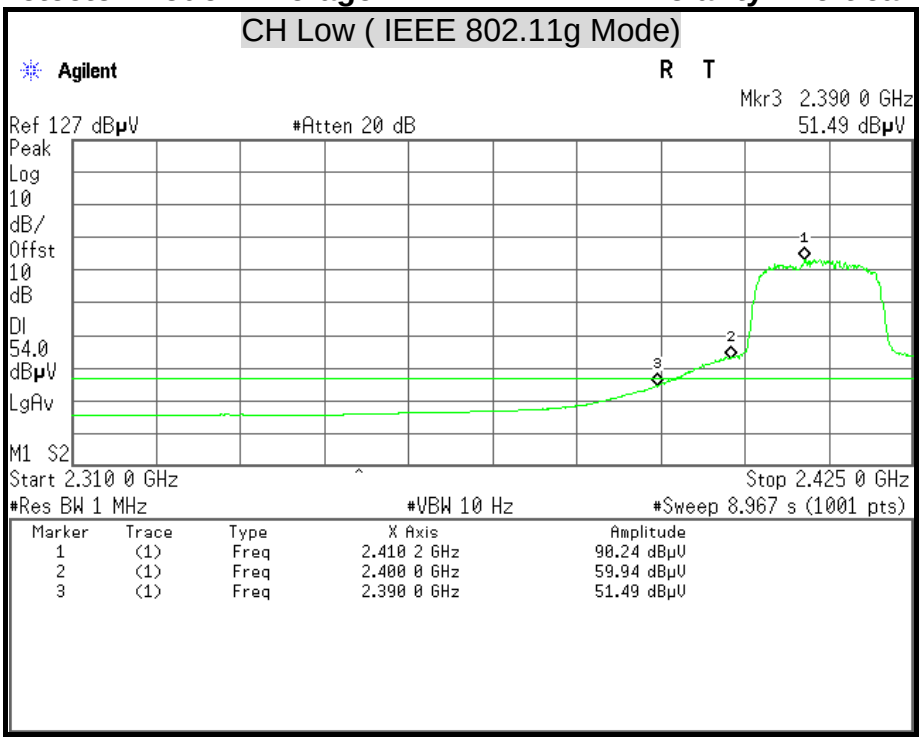
Detector Mode : Average **Polarity : Horizontal**



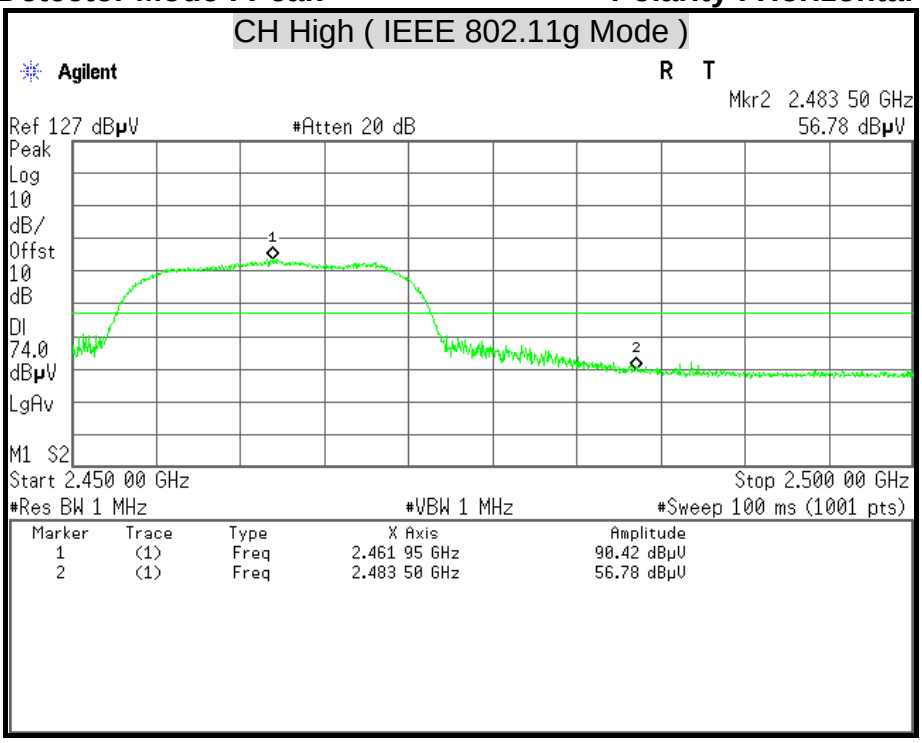
Detector Mode : Peak **Polarity : Vertical**



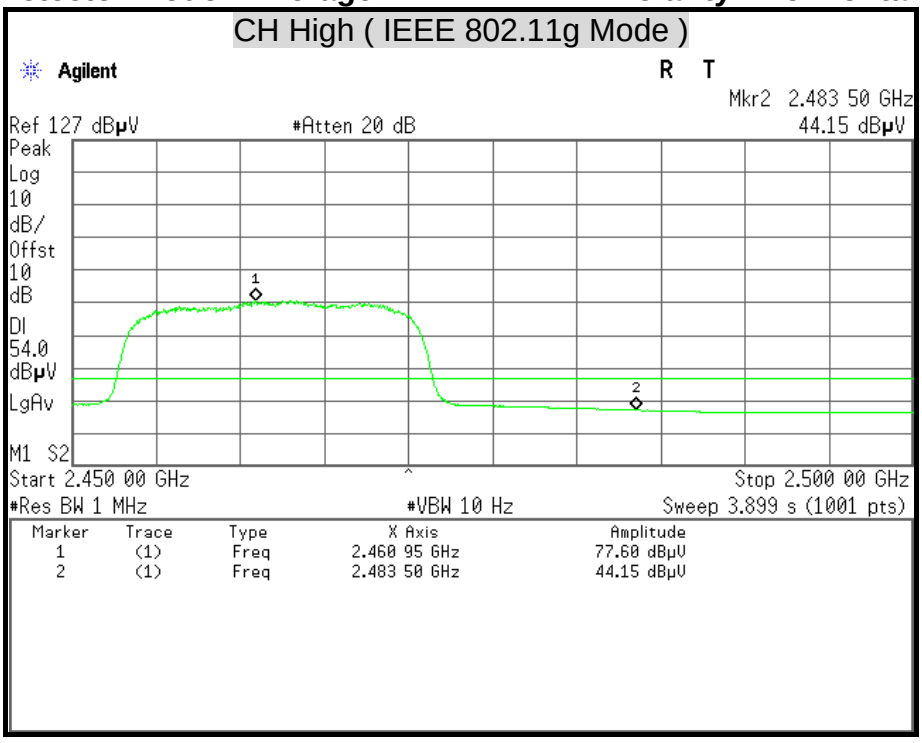
Detector Mode : Average **Polarity : Vertical**



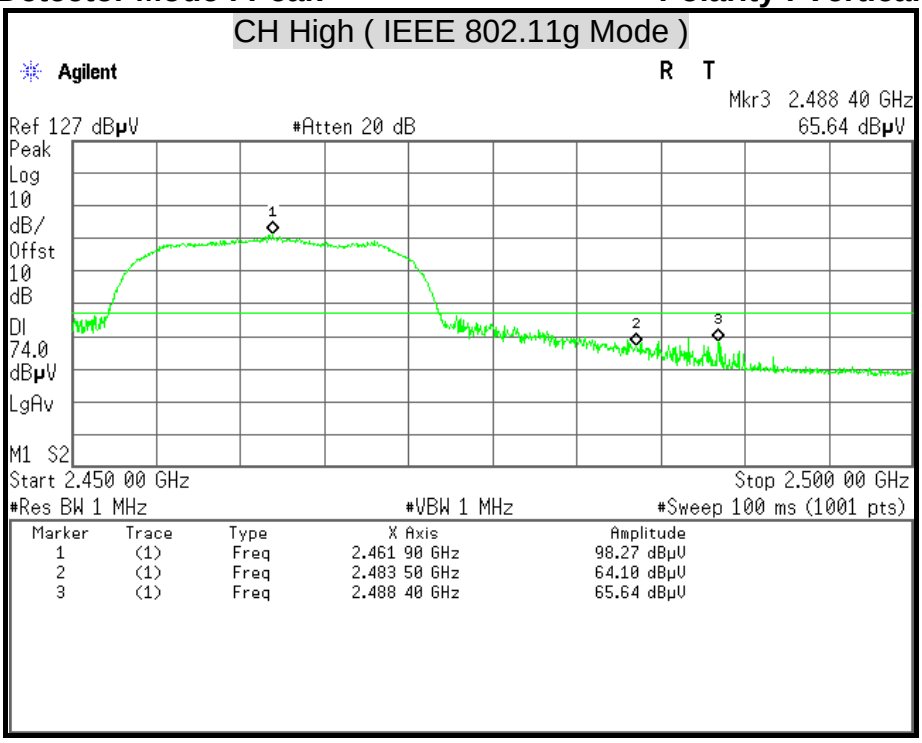
Detector Mode : Peak **Polarity : Horizontal**



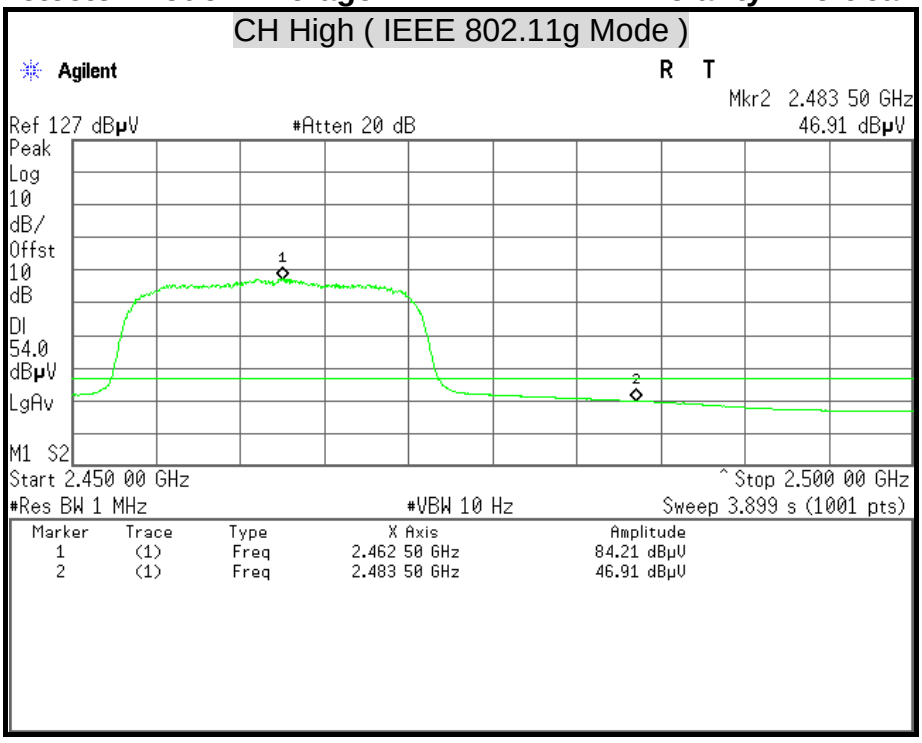
Detector Mode : Average **Polarity : Horizontal**



Detector Mode : Peak **Polarity : Vertical**



Detector Mode : Average **Polarity : Vertical**



APPENDIX SETUP PHOTOS

RADIATED EMISSION SETUP