



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

For

VOIP GATEWAY

Model : GW5051

Trade Name : Alvarion

Issued for

TECOM CO.,LTD.

**23, R&D Road 2 Science-Based Industrial Park Hsin-Chu
Taiwan R.O.C.**

Issued by

**Compliance Certification Services Inc.
Hsinchu Lab.**

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	07/27/2010	Initial Issue	All Page 64	Joanna Wen



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1. TEST REPORT CERTIFICATION

Applicant : TECOM CO.,LTD.
Address : 23, R&D Road 2 Science-Based Industrial Park Hsin-Chu
 Taiwan R.O.C.
Equipment Under Test : VOIP GATEWAY
Model : GW5051
Trade Name : Alvarion
Tested Date : July 16, 2010 ~ July 27, 2010

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:

Reviewed by:

Alex Chiu
Director

Gundam Lin
Team Leader



2. EUT DESCRIPTION

2.1 DESCRIPTION OF EUT & POWER

Product Name	VOIP GATEWAY
Model Number	GW5051
Received Date	July 16, 2010
Frequency Range	IEEE 802.11b/g : 2412MHz ~ 2462MHz
Transmit Power	IEEE 802.11b : 20.38dBm (0.1091W) IEEE 802.11g : 21.20dBm (0.1318W)
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)
Antenna Type	Monopole Antenna , Antenna Gain 4dBi
AC Power Cord Type	Unshielded cable,1.5m (detachable) to power adapter
DC Power Cord Type	Unshielded cable,1.5m (no detachable) with a core
Power Source	48V,0.9A /12V,1.25A (From Power Adapter)
I/O Port	VOIP port x 2, LAN port x 4, WAN x 1, Power port x 1

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	LS	0438B0258	100-240VAC,1.5A,50/60Hz	48V,0.9A /12V,1.25A

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: D6XGW5051 filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



3. DESCRIPTION OF TEST MODES

The EUT (GW5051) 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.

4. 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.

5. FACILITIES AND ACCREDITATION

5.1 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.



5.2 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.

Taiwan BSMI
USA FCC MRA

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

5.3 MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Open Area Test Site (OATS No.3) / Radiated Emission, 30 to 200 MHz	+/- 3.9267
Open Area Test Site (OATS No.3) / Radiated Emission, 200 to 1000 MHz	+/- 3.6899
Semi Anechoic Chamber (966 Chamber) / Radiated Emission, 30 to 200 MHz	+/- 3.6878
Semi Anechoic Chamber (966 Chamber) / Radiated Emission, 200 to 1000 MHz	+/- 3.0885
Semi Anechoic Chamber (966 Chamber) / Radiated Emission, 1 to 26.5GHz	+/- 3.2000
Conducted Emission, 9kHz to 30MHz	+/- 1.7468

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.



6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook PC	DELL	Latitude D610	CN-0C4708-48643-625-5565	E2K24BNHM
2	Notebook PC	Lenovo ideaPad	S10e_4068-RZ1	L3CEV2D	HFS-FL
3	Notebook PC	IBM	ThinkPad T61 7663-AS6	L3F3864	---
4	PC	HP	DC57550	SGH6510CDQ	---
5	Telephone	ROMEO	TC-215	20081049	---
6	Telephone	ROMEO	TC-215	20080768	---
7	Ethernet Switch	ASUS	GX1008B	90-Q872AN1N0NAM A0-88QSA1003522	---

No.	Signal Cable Description
1	Unshielded RJ-45 cable, 12m x 2
2	Unshielded RJ-45 cable, 1.2m x 3
3	Unshielded RJ-11 cable, 1.5 m x 2

SETUP DIAGRAM FOR TESTS

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



EUT OPERATING CONDITION

RF Mode

1. Set up whole system for test as shown on diagram.
2. Telnet 192.168.1.1 Password:admin
3. Account / Passsword:admin / admin→sh
4. wlctl down
wlctl txpwr1 -o -q xx
wlctl rate xx
wlctl channel xx
wlctl rateset xxb
wlctl up
wlctl txant 0
wlctl antdiv 0
wlctl join ace
wlctl join ace
wlctl join ace
wlctl join ace
⇒ Tx Data Rate:1Mbps (IEEE 802.11b mode)
6Mbps (IEEE 802.11g mode)
5. All of the function are under run.
6. Start: Test.

Normal Mode

1. Setup whole system for test as shown on diagram.
2. Power on all equipments.
3. Notebook PC_ping EUT IP 192.168.2.1 through WAN connected by RJ45 cable.
4. Notebook PC_ping EUT IP 192.168.1.1 through LAN connected by RJ45 cable.
5. Notebook PC_ping EUT IP 192.168.1.1 through wireless LAN.
6. LAN 2~3 port link ethernet switch load.
7. Set telephones(VOIP) on the talking mode.
8. Start test.



7. FCC PART 15.247 REQUIREMENTS

7.1 6dB BANDWIDTH

LIMITS

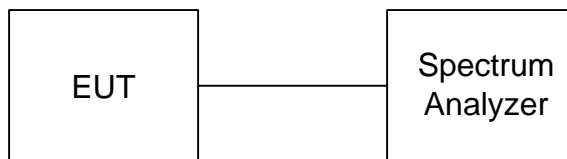
§ 15.247(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/20/2011
Spectrum Analyzer	Agilent	E4446A	MY46180323	05/02/2011

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

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

IEEE 802.11b Mode

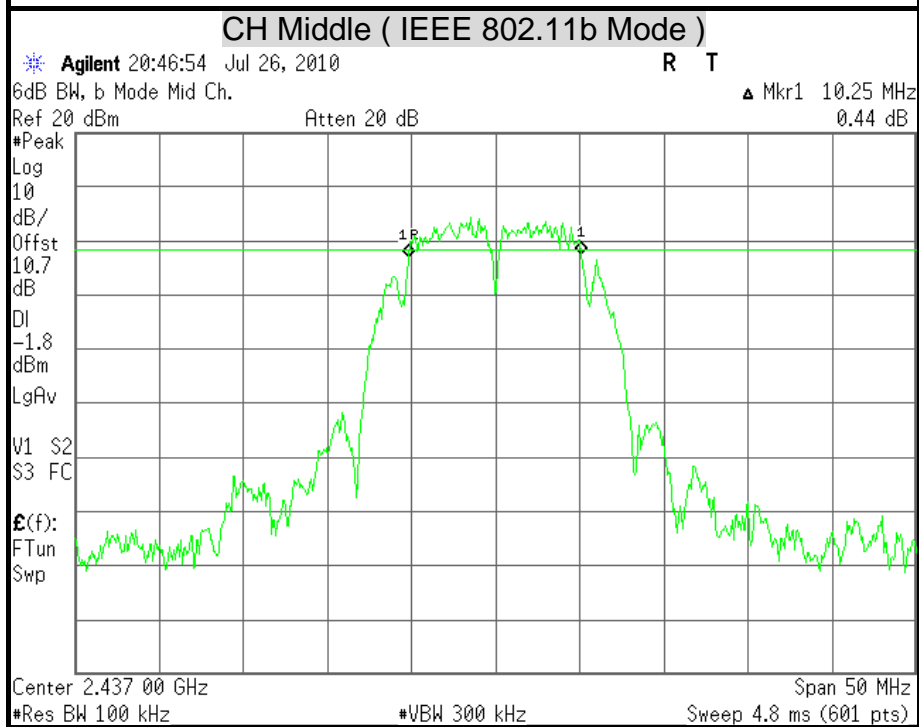
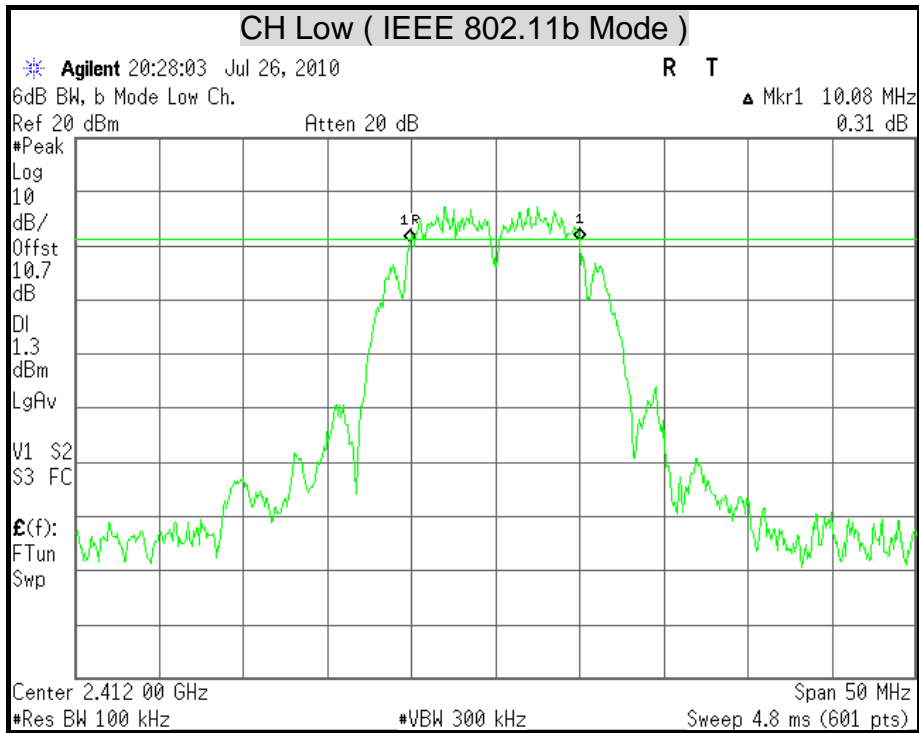
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	10.08	500	PASS
Middle	2437	10.25	500	PASS
High	2462	10.17	500	PASS

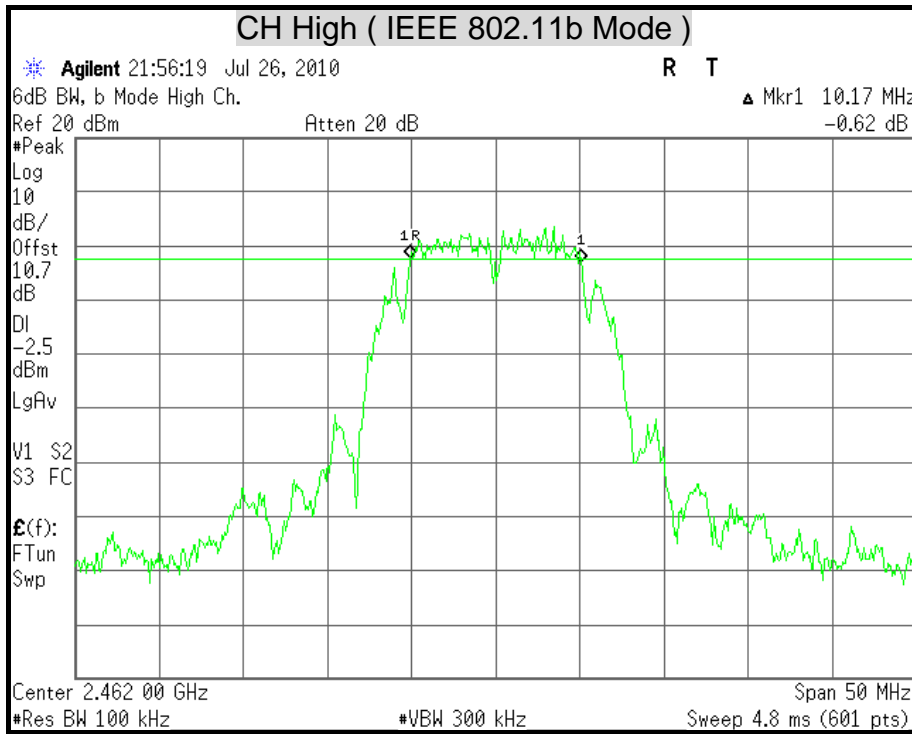
IEEE 802.11g Mode

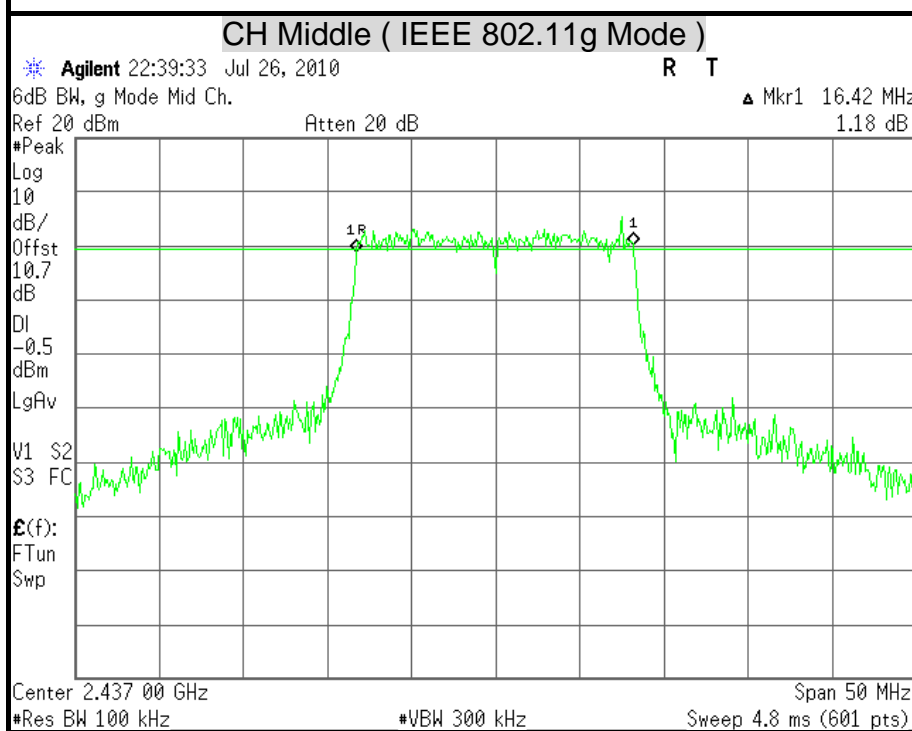
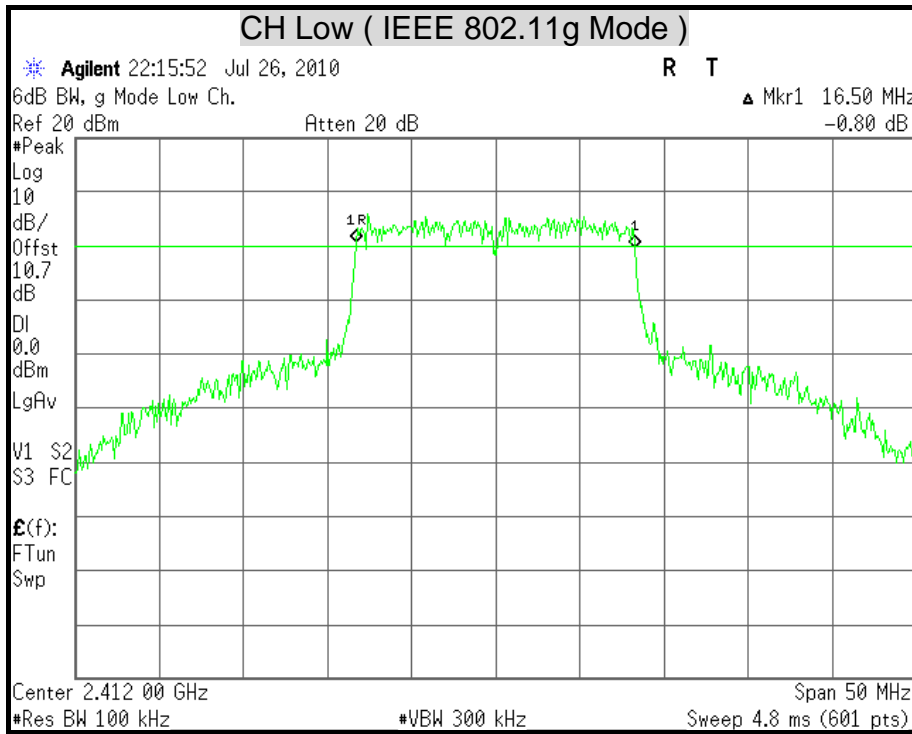
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.50	500	PASS
Middle	2437	16.42	500	PASS
High	2462	16.50	500	PASS

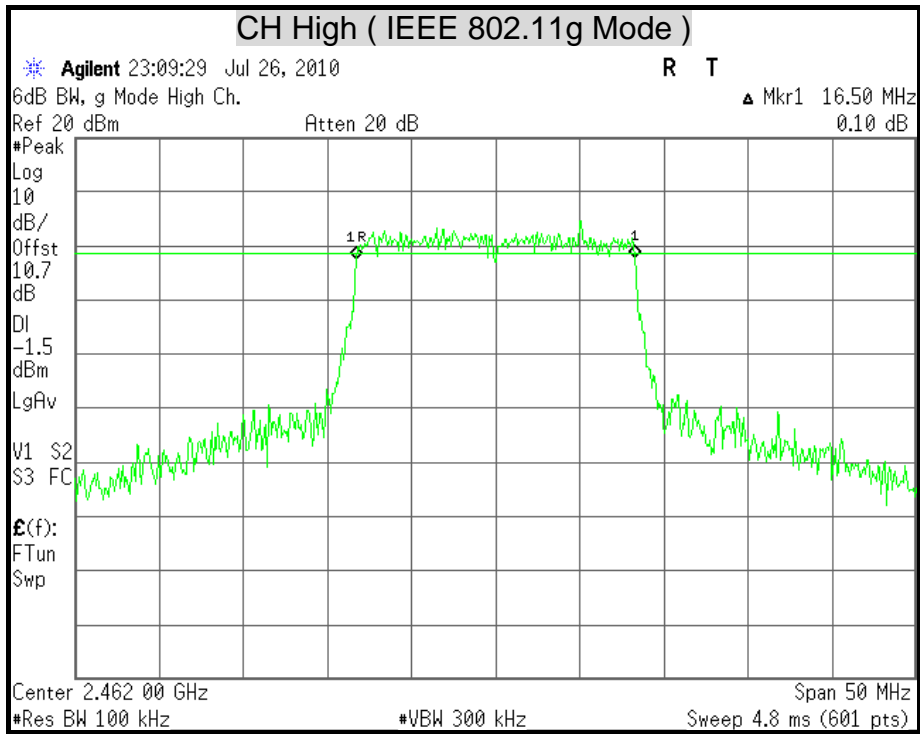


6dB BANDWIDTH











7.2 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.

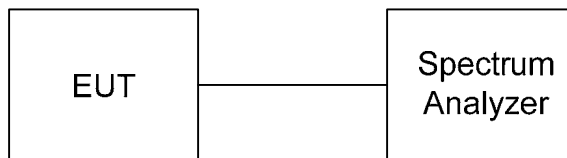
§ 15.247(b) (4) Except as shown in paragraphs (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section, as appropriate, 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	E4446A	MY43360132	06/20/2011
Spectrum Analyzer	Agilent	E4446A	MY46180323	05/02/2011

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

TEST SETUP



TEST PROCEDURE

- The spectrum shall be set as follows :
 - Span : 1.5 times channel integration bandwidth.
 - RBW : 1MHz
 - VBW : 3MHz
 - Detector : Peak
 - Sweep : Single trace
- Compute the combined power of all signal responses contained in the trace by covering all the data points.
- 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	20.38	0.1091	30	1	PASS
Middle	2437	18.17	0.0656	30	1	PASS
High	2462	16.84	0.0483	30	1	PASS

Remark:

1. At final test to get the worst-case emission at 1Mbps.
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.

IEEE 802.11g Mode

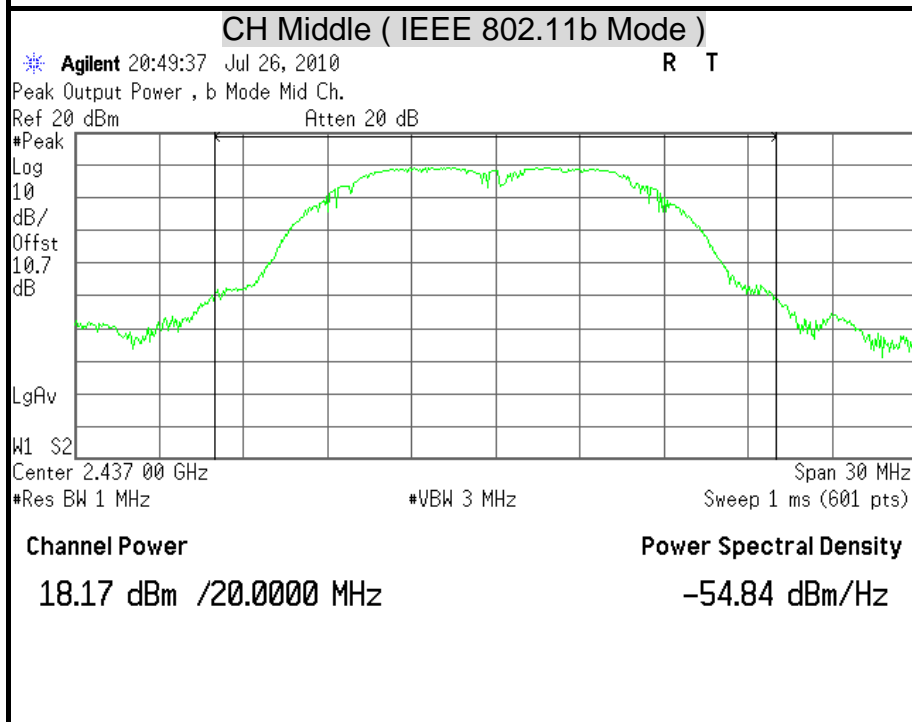
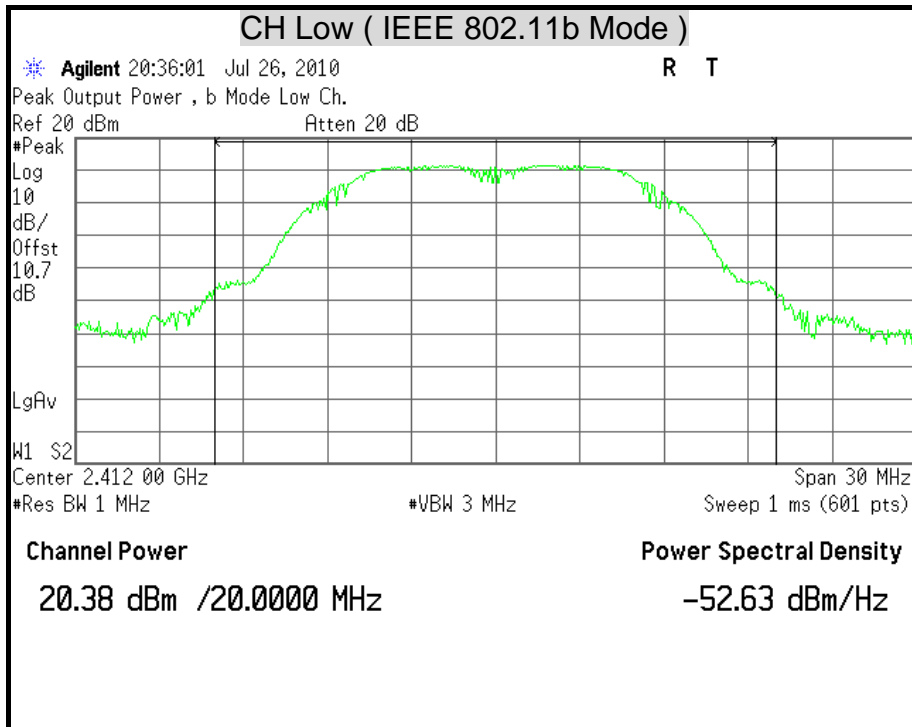
Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2412	21.20	0.1318	30	1	PASS
Middle	2437	20.89	0.1227	30	1	PASS
High	2462	20.91	0.1233	30	1	PASS

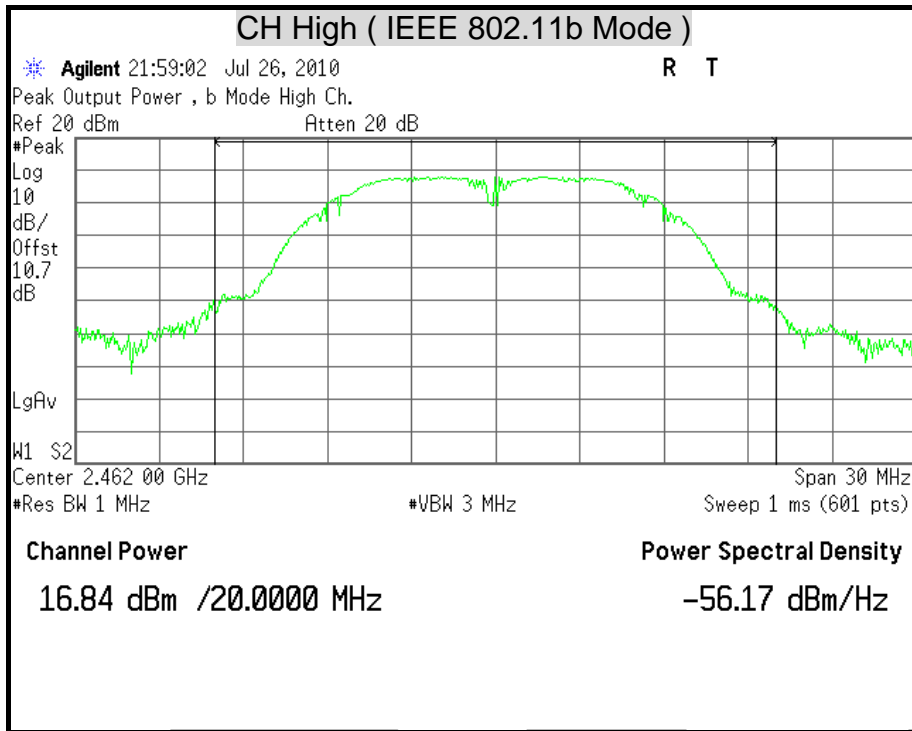
Remark:

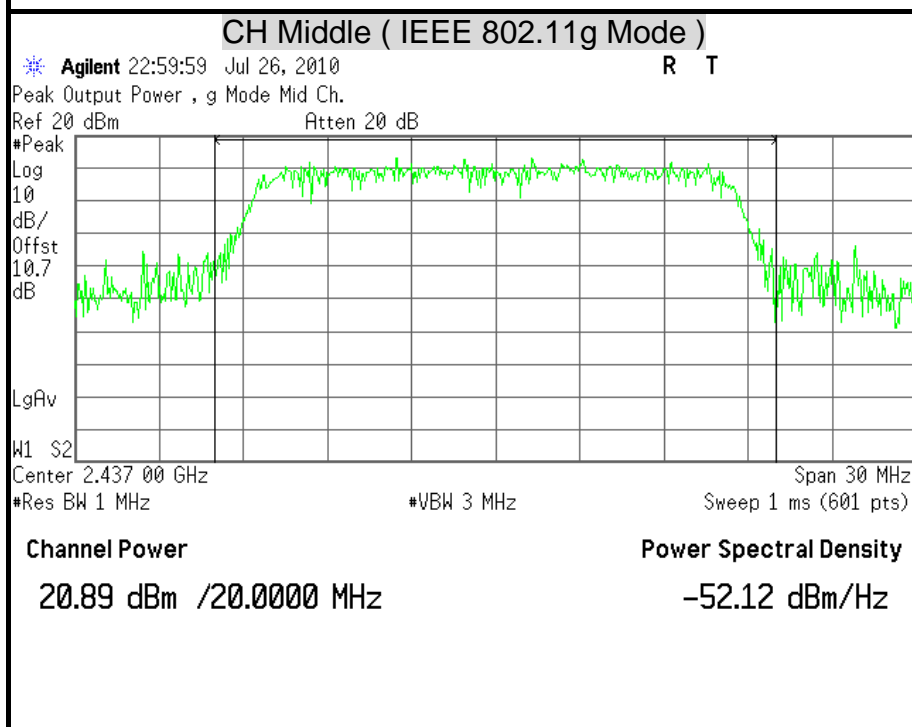
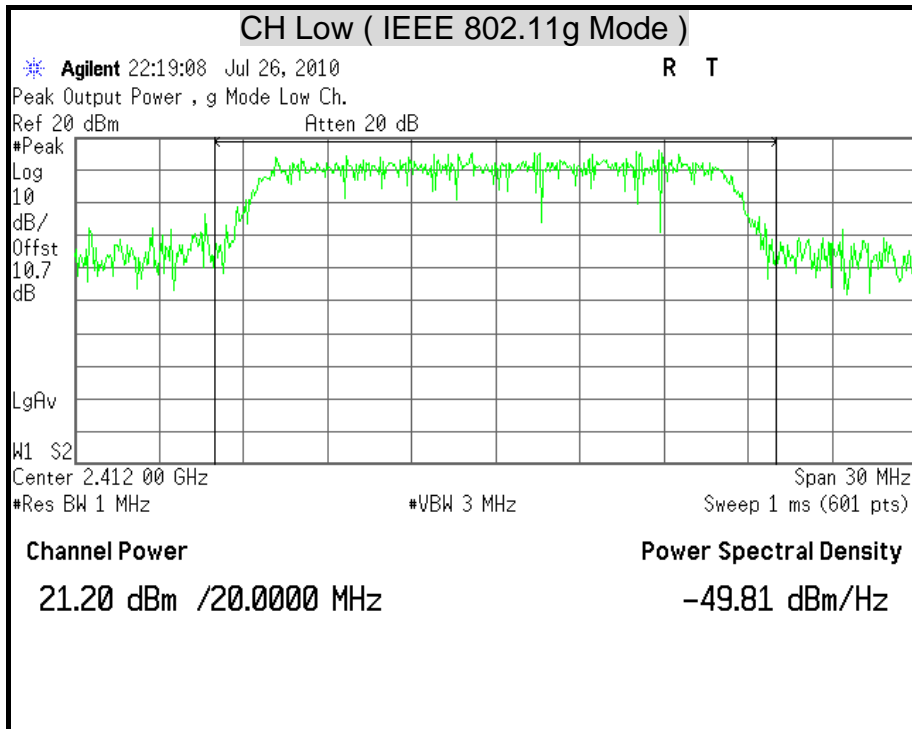
1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

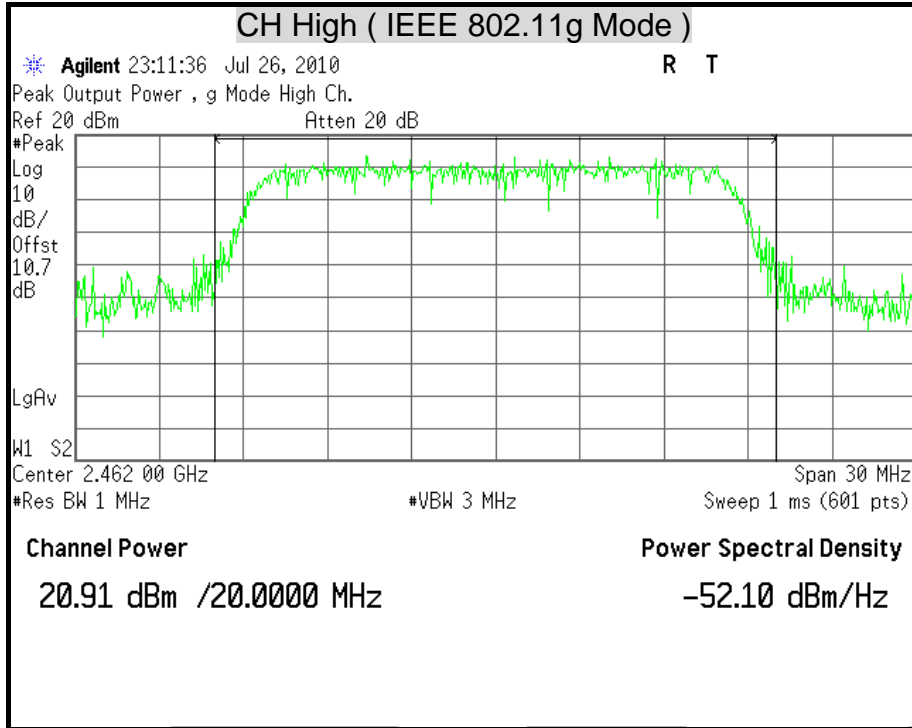


MAXIMUM PEAK OUTPUT POWER











7.3 AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/20/2011
Spectrum Analyzer	Agilent	E4446A	MY46180323	05/02/2011

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

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer.



TEST RESULTS

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	17.73
Middle	2437	15.58
High	2462	14.17

Remark:

1. At final test to get the worst-case emission at 1Mbps.
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.

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	18.29
Middle	2437	17.49
High	2462	17.63

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.



7.4 POWER SPECTRAL DENSITY

LIMITS

§ 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

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/20/2011
Spectrum Analyzer	Agilent	E4446A	MY46180323	05/02/2011

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

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 = 3KHz and VBW = 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

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-5.45	8	PASS
Middle	2437	-6.53	8	PASS
High	2462	-7.58	8	PASS

Remark:

1. At final test to get the worst-case emission at 1Mbps.
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.

IEEE 802.11g Mode

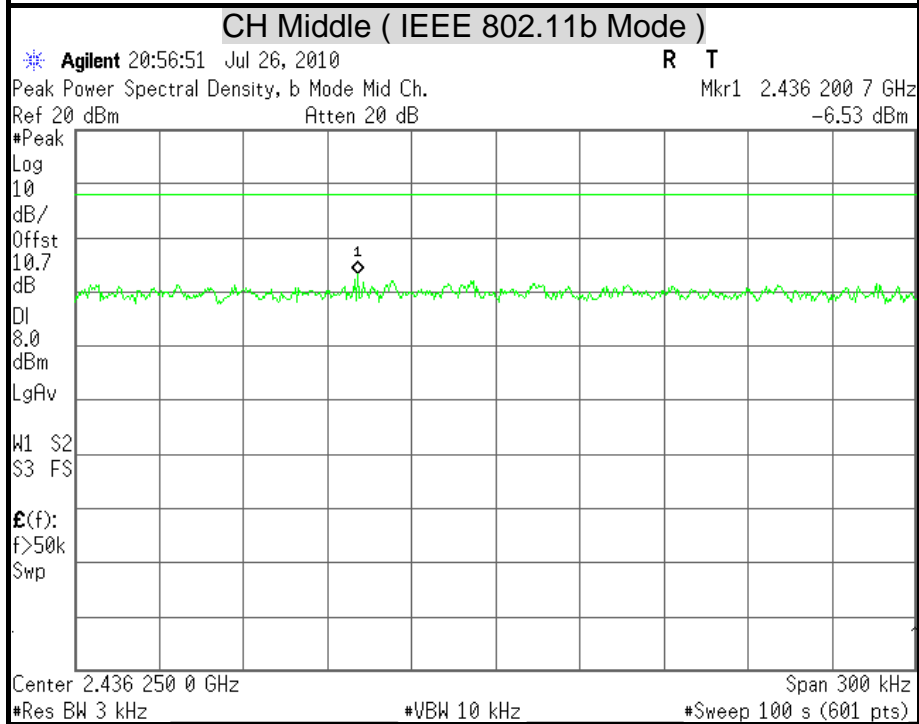
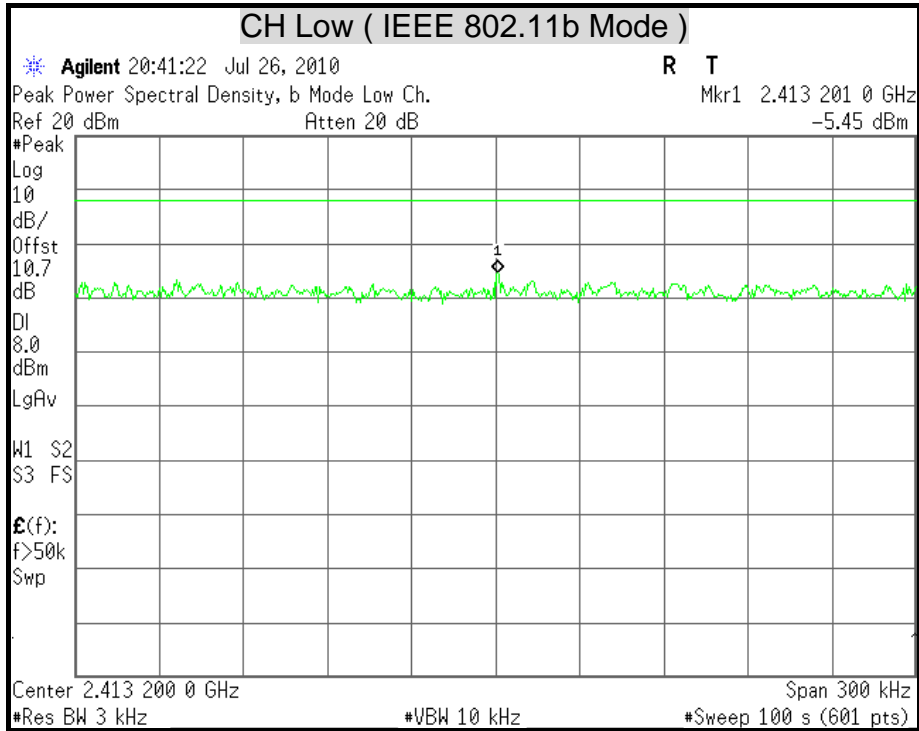
Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-5.41	8	PASS
Middle	2437	-7.22	8	PASS
High	2462	-4.39	8	PASS

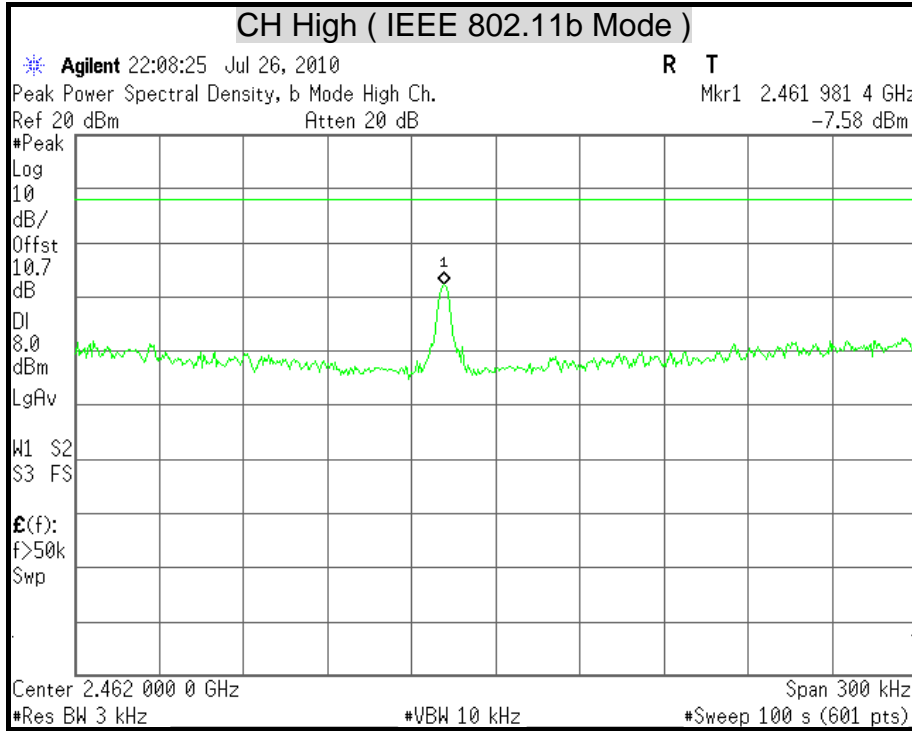
Remark:

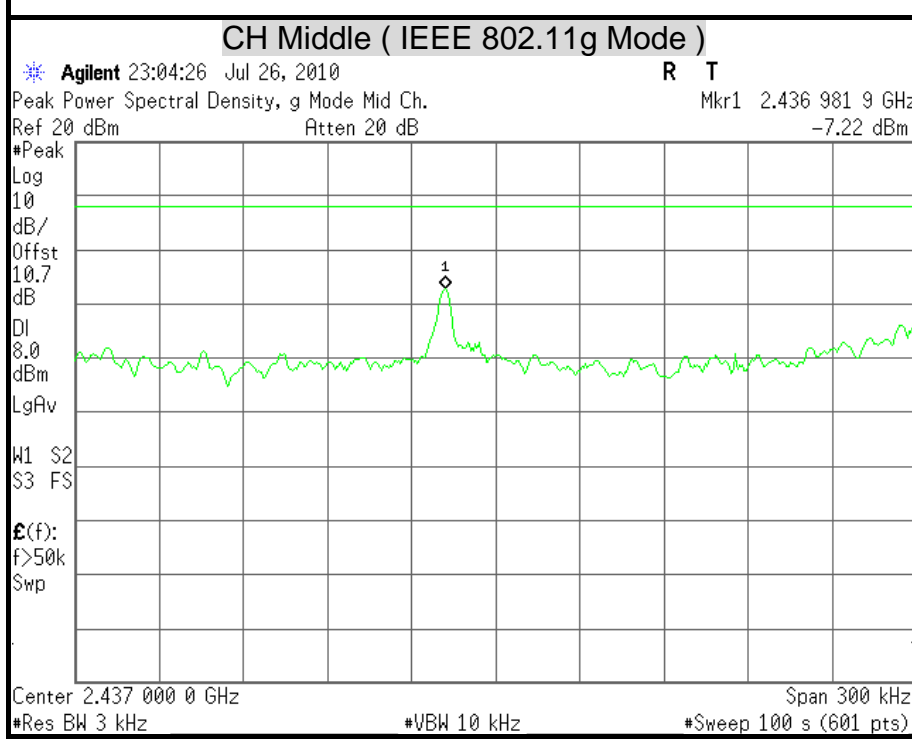
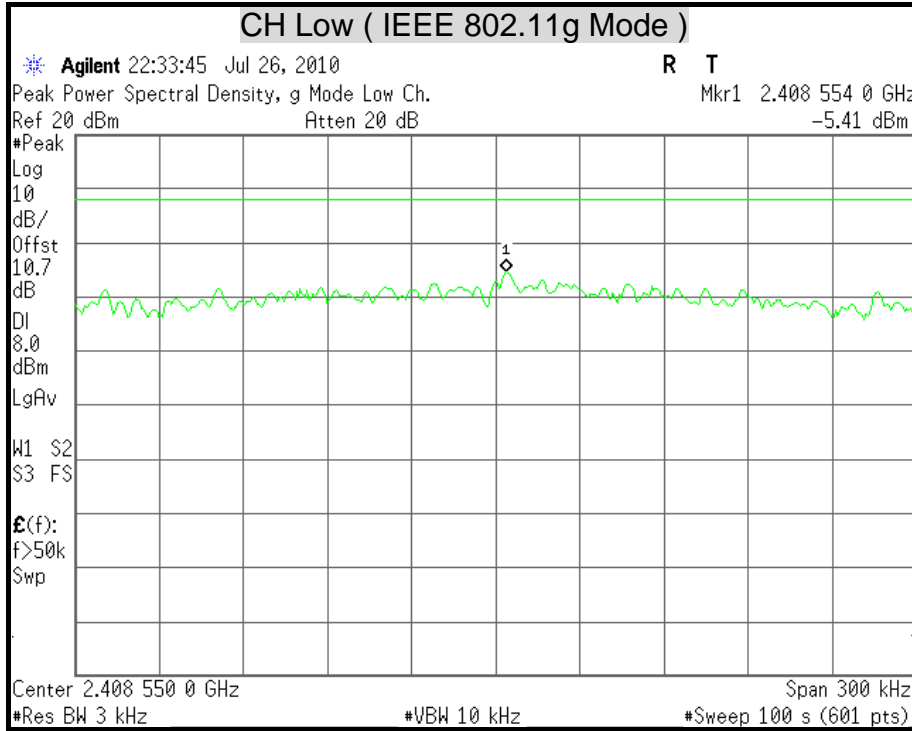
1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

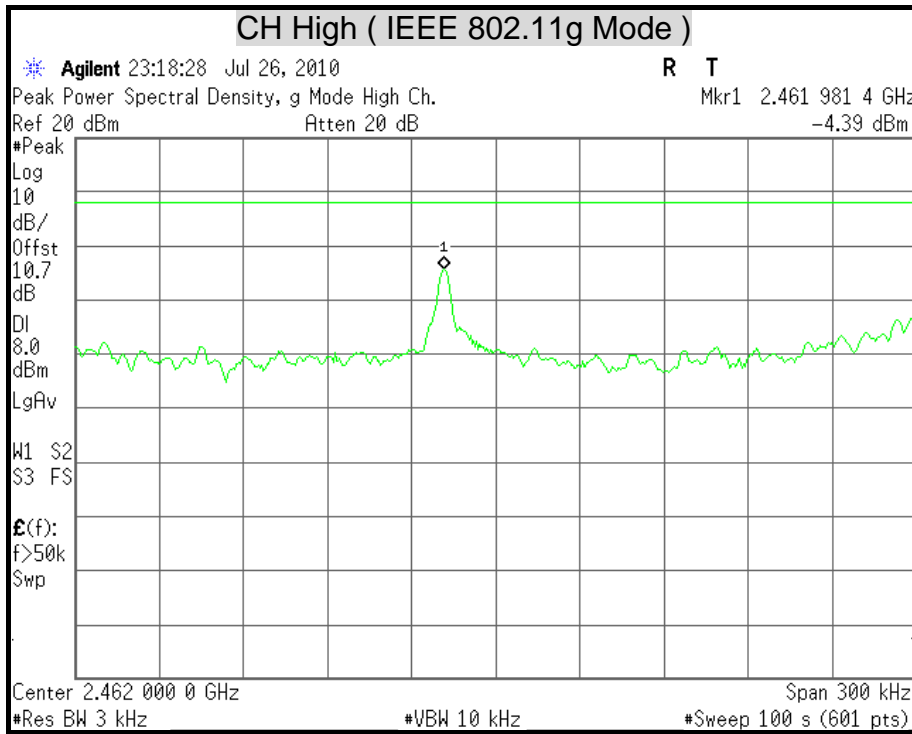


POWER SPECTRAL DENSITY











7.5 CONDUCTED SPURIOUS EMISSION

LIMITS

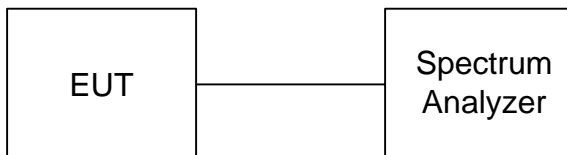
§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the and that contains the highest level 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 EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/20/2011
Spectrum Analyzer	Agilent	E4446A	MY46180323	05/02/2011

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

TEST SETUP



TEST PROCEDURE

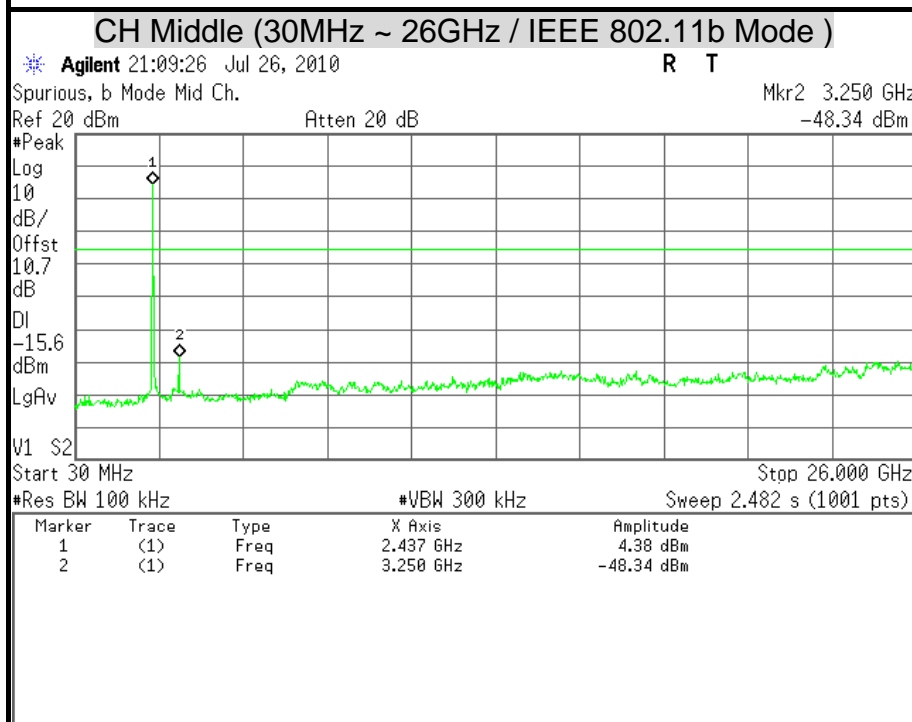
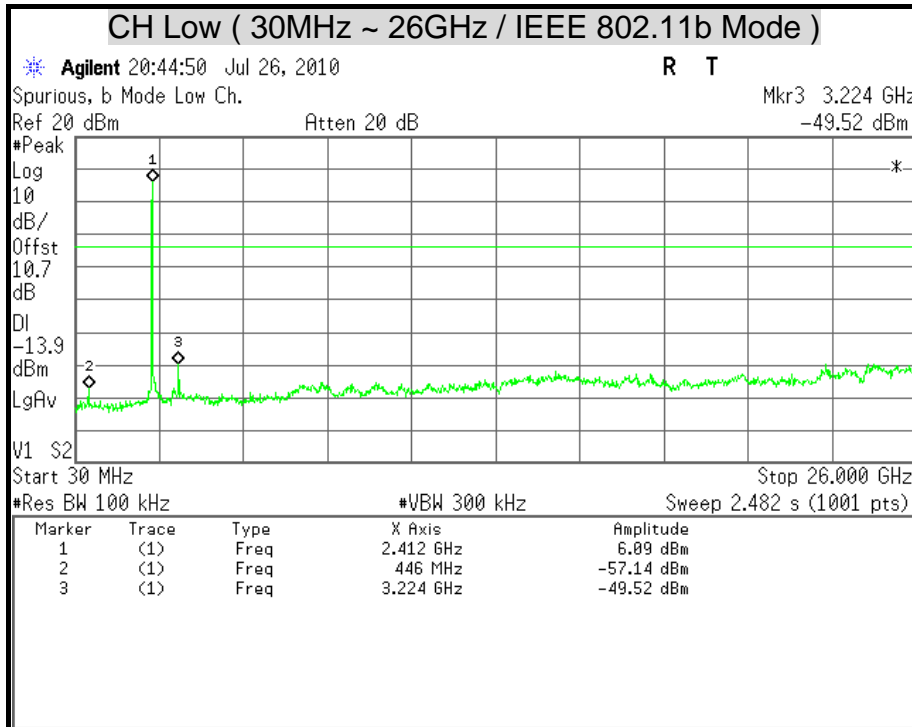
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

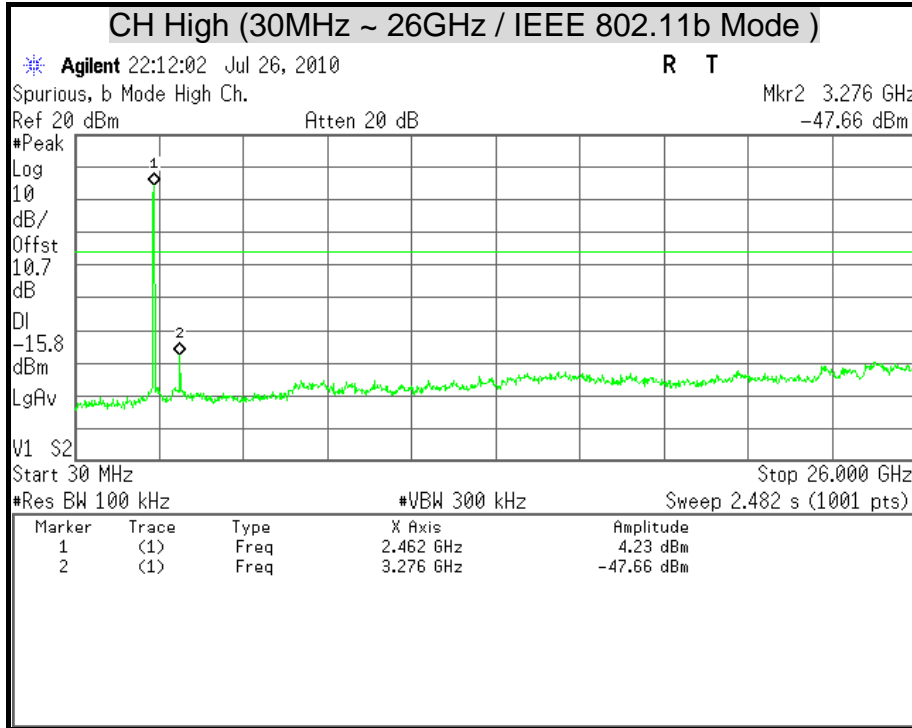
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

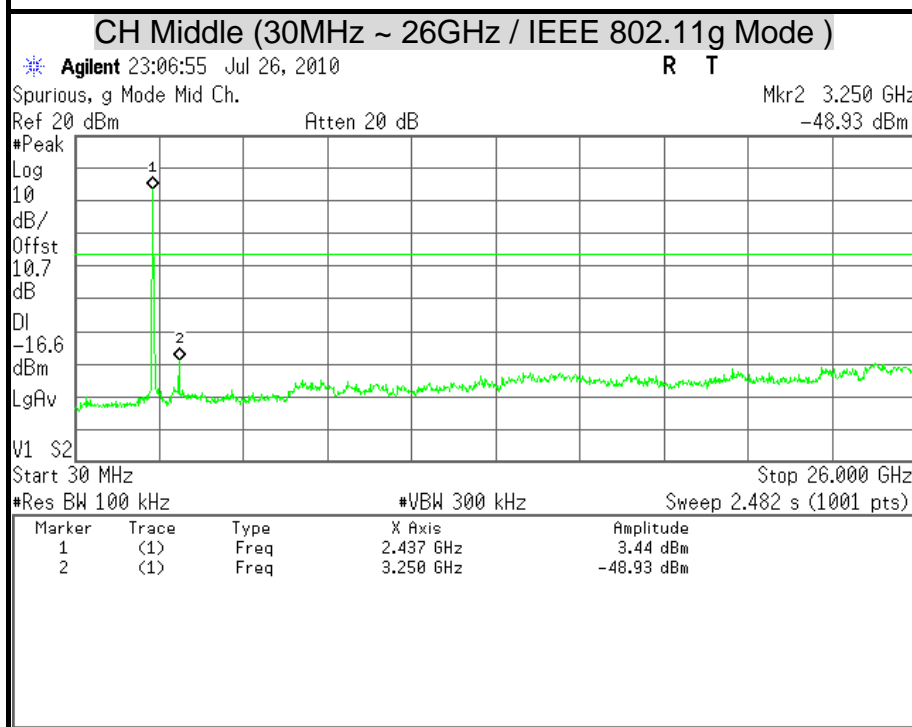
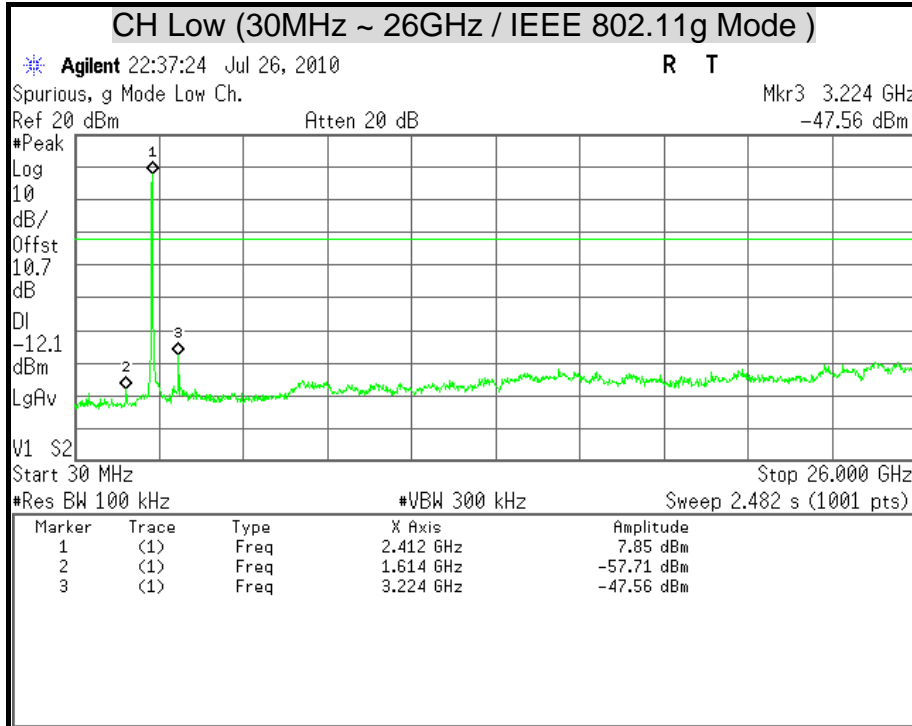


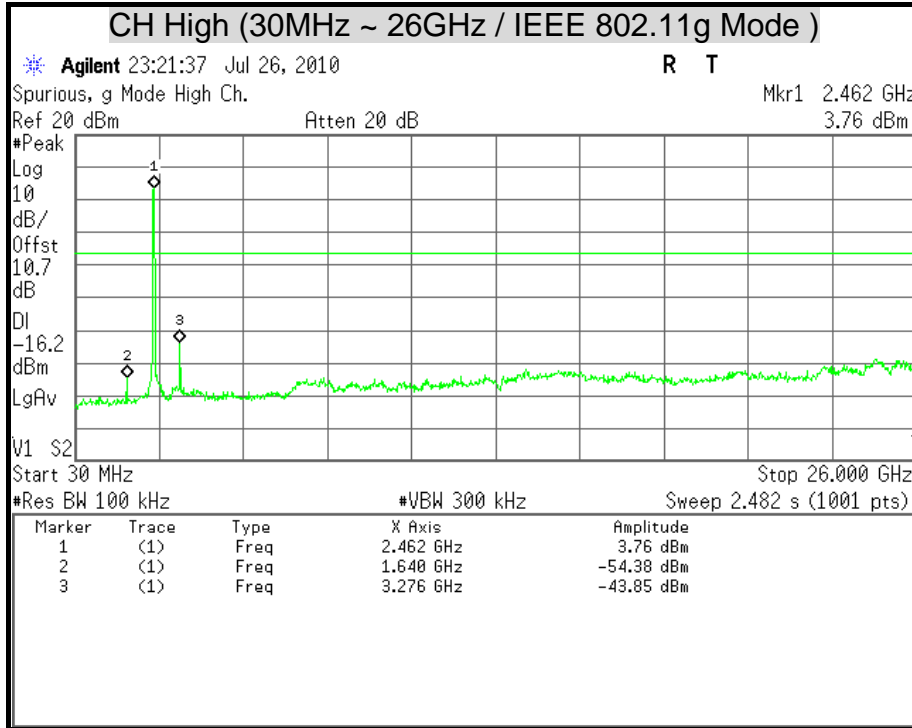
TEST RESULTS

OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT











7.6 RADIATED EMISSION

LIMITS

(1) § 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:

Table with 4 columns: MHz, MHz, MHz, GHz. It lists various frequency ranges and their corresponding GHz values.

Remark:

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

(2) § 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.



(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

966Chamber_A

Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/20/2011
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100221	05/03/2011
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-249	11/12/2010
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00078732	07/05/2011
Pre-Amplifier	Agilent	8449B	3008A01471	08/02/2010
Pre-Amplifier	HP	8447F	2944A03748	09/24/2010
RF Coaxial Cable	HUBER-SUHNER	SUCOFLEX 104PEA	SN31347	07/21/2011
RF Coaxial Cable	HUBER-SUHNER	SUCOFLEX 104PEA	SN31350	07/21/2011
RF Coaxial Cable	HUBER-SUHNER	SUCOFLEX 104PEA	SN31355	07/21/2011
LOOP Antenna	EMCO	6502	8905-2356	06/09/2011
Notch Filters Band Reject	Micro-Tronics	BRM05702-01	009	N.C.R

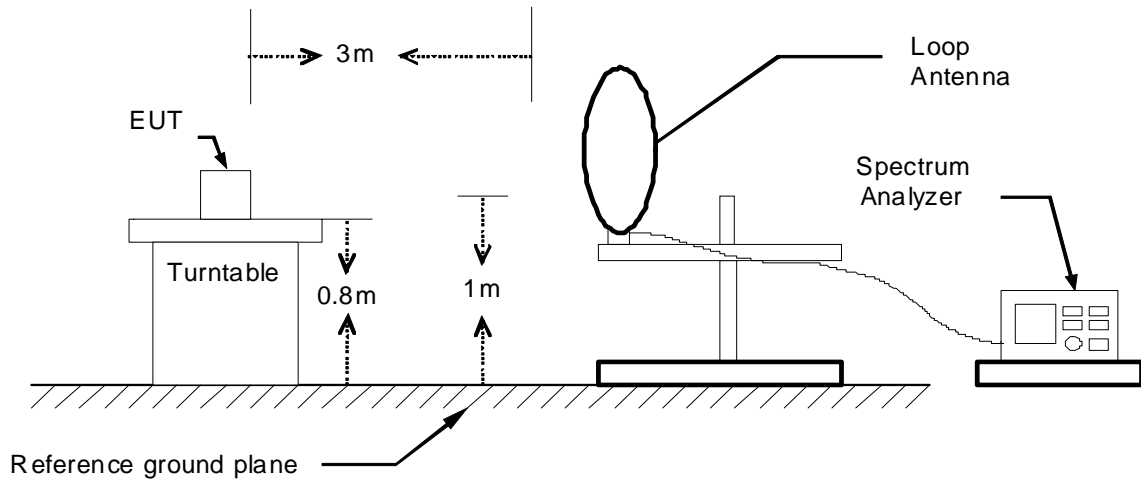
Remark: 1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R = No Calibration Request.



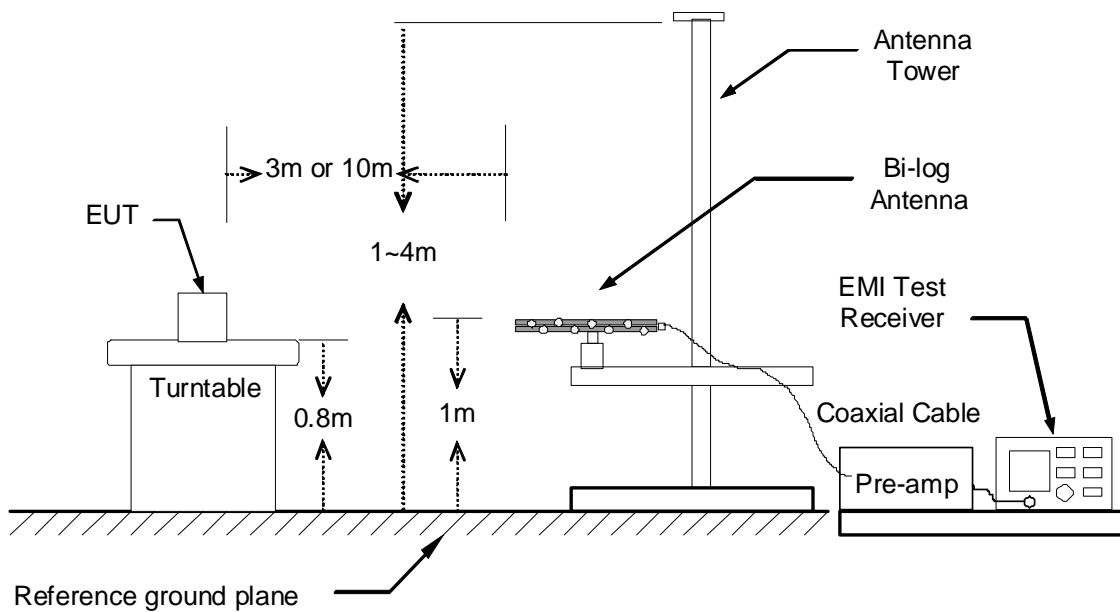
TEST SETUP

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

9kHz ~ 30MHz

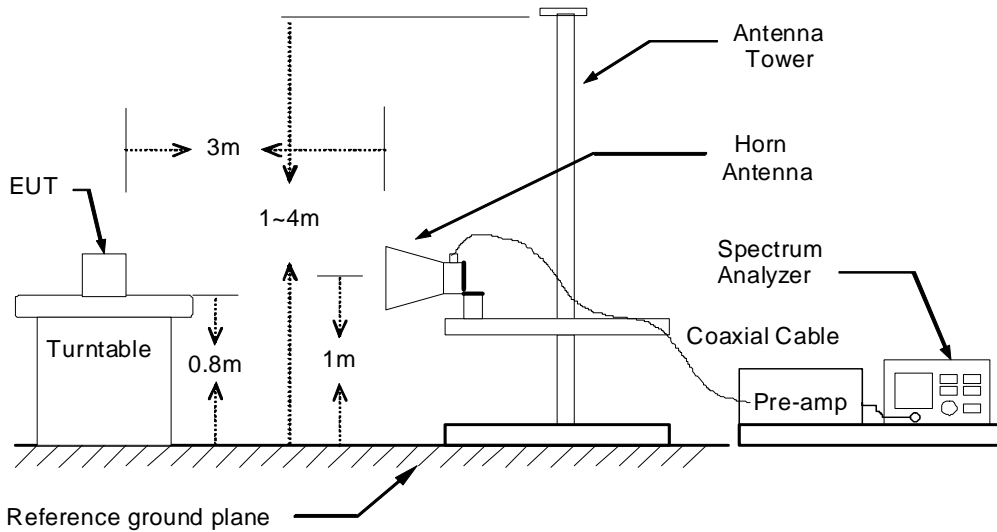


30MHz ~ 1GHz





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 at a 10 meter open area test site. 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	VOIP GATEWAY	Test By	Rueyyan Lin
Model	GW5051	Test Date	2010/07/22
Test Mode	Normal operating (worst-case)	TEMP & Humidity	24.8°C, 49%

966 Chamber_A at 3Meter / Horizontal						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
133.79	45.65	-11.12	34.53	43.50	-8.97	Peak
183.26	50.30	-11.55	38.75	43.50	-4.75	QP
250.19	48.81	-10.67	38.14	46.00	-7.86	Peak
299.66	52.10	-8.88	43.22	46.00	-2.78	QP
399.57	42.86	-5.85	37.02	46.00	-8.98	Peak
500.45	41.63	-3.69	37.93	46.00	-8.07	Peak
600.36	42.54	-1.30	41.24	46.00	-4.76	Peak
749.74	37.60	1.13	38.72	46.00	-7.28	Peak

966 Chamber_A at 3Meter / Vertical						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
37.76	46.40	-10.44	35.96	40.00	-4.04	QP
45.52	45.80	-9.65	36.15	40.00	-3.85	QP
150.28	48.07	-10.24	37.83	43.50	-5.67	Peak
186.17	51.20	-11.70	39.50	43.50	-4.00	QP
250.19	49.83	-10.67	39.16	46.00	-6.84	Peak
399.57	44.60	-5.85	38.76	46.00	-7.24	Peak
600.36	42.75	-1.30	41.45	46.00	-4.55	Peak
800.18	39.20	2.04	41.24	46.00	-4.76	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 (dBµV/m) = Reading (dBµV) + Correction Factor (dB/m)
5. Margin (dB) = Remark result (dBµV/m) - Quasi-peak limit (dBµV/m).



Above 1 GHz

Product Name	VOIP GATEWAY	Test By	Rueyyan Lin
Model	GW5051	Test Date	2010/07/22
Test Mode	IEEE 802.11b TX / CH Low	TEMP & Humidity	24.8°C, 49%

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
1032.00	55.88	---	-4.58	51.30	---	74.00	54.00	-2.70	Peak
1238.00	55.12	---	-3.96	51.16	---	74.00	54.00	-2.84	Peak
1496.00	54.45	---	-3.19	51.26	---	74.00	54.00	-2.74	Peak
2412.00	96.87	---	2.27	99.13	---	---	---	---	Carrier
3517.50	42.37	---	3.93	46.30	---	74.00	54.00	-7.70	Peak
5077.50	41.02	---	7.64	48.66	---	74.00	54.00	-5.34	Peak
7237.50	47.10	41.47	9.49	56.59	50.96	74.00	54.00	-3.04	AVG

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
1088.00	55.67	---	-4.41	51.26	---	74.00	54.00	-2.74	Peak
1252.00	54.65	---	-3.92	50.73	---	74.00	54.00	-3.27	Peak
1522.00	53.75	---	-2.97	50.78	---	74.00	54.00	-3.22	Peak
2412.00	107.41	---	2.28	109.69	---	---	---	---	Carrier
3705.00	41.83	---	4.43	46.26	---	74.00	54.00	-7.74	Peak
4972.50	41.68	---	7.53	49.21	---	74.00	54.00	-4.79	Peak
7230.00	46.12	42.67	9.50	55.62	52.17	74.00	54.00	-1.83	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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	VOIP GATEWAY	Test By	Rueyyan Lin
Model	GW5051	Test Date	2010/07/22
Test Mode	IEEE 802.11b TX / CH Middle	TEMP & Humidity	24.8°C, 49%

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
1052.00	56.29	---	-4.52	51.78	---	74.00	54.00	-2.22	Peak
1272.00	55.12	---	-3.86	51.26	---	74.00	54.00	-2.74	Peak
1600.00	54.27	---	-2.24	52.03	---	74.00	54.00	-1.97	Peak
2437.00	94.43	---	2.31	96.74	---	---	---	---	Carrier
4852.50	41.60	---	7.29	48.90	---	74.00	54.00	-5.10	Peak
5842.50	40.95	---	8.58	49.53	---	74.00	54.00	-4.47	Peak
7312.50	45.06	37.86	9.31	54.37	47.17	74.00	54.00	-6.83	AVG

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
1066.00	55.20	---	-4.47	50.73	---	74.00	54.00	-3.27	Peak
1270.00	54.85	---	-3.86	50.99	---	74.00	54.00	-3.01	Peak
1564.00	54.19	---	-2.58	51.61	---	74.00	54.00	-2.39	Peak
2437.00	103.93	---	2.31	106.24	---	---	---	---	Carrier
3270.00	42.60	---	3.65	46.24	---	74.00	54.00	-7.76	Peak
6270.00	41.34	---	9.25	50.60	---	74.00	54.00	-3.40	Peak
7312.50	47.68	43.34	9.31	56.99	52.65	74.00	54.00	-1.35	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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



Product Name	VOIP GATEWAY	Test By	Rueyyan Lin
Model	GW5051	Test Date	2010/07/22
Test Mode	IEEE 802.11b TX / CH High	TEMP & Humidity	24.8°C, 49%

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
1032.00	55.67	---	-4.58	51.09	---	74.00	54.00	-2.91	Peak
1160.00	55.86	---	-4.19	51.67	---	74.00	54.00	-2.33	Peak
1398.00	53.43	---	-3.48	49.95	---	74.00	54.00	-4.05	Peak
2462.00	92.36	---	2.37	94.72	---	---	---	---	Carrier
3210.00	42.82	---	3.58	46.40	---	74.00	54.00	-7.60	Peak
5700.00	40.91	---	8.32	49.24	---	74.00	54.00	-4.76	Peak
7387.50	46.12	39.69	9.14	55.26	48.83	74.00	54.00	-5.17	AVG

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
1046.00	54.97	---	-4.53	50.44	---	74.00	54.00	-3.56	Peak
1180.00	55.51	---	-4.13	51.37	---	74.00	54.00	-2.63	Peak
1398.00	54.30	---	-3.48	50.83	---	74.00	54.00	-3.17	Peak
2462.00	106.13	---	2.36	108.49	---	---	---	---	Carrier
3285.00	43.80	---	3.66	47.46	---	74.00	54.00	-6.54	Peak
6727.50	41.57	---	9.80	51.37	---	74.00	54.00	-2.63	Peak
7380.00	48.02	42.14	9.16	57.18	51.30	74.00	54.00	-2.70	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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



Product Name	VOIP GATEWAY	Test By	Rueyyan Lin
Model	GW5051	Test Date	2010/07/22
Test Mode	IEEE 802.11g TX / CH Low	TEMP & Humidity	24.8°C, 49%

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
1012.00	55.77	---	-4.64	51.13	---	74.00	54.00	-2.87	Peak
1254.00	55.42	---	-3.91	51.51	---	74.00	54.00	-2.49	Peak
1456.00	55.24	---	-3.31	51.93	---	74.00	54.00	-2.07	Peak
2412.00	104.12	---	2.27	106.39	---	---	---	---	Carrier
4815.00	41.72	---	7.22	48.94	---	74.00	54.00	-5.06	Peak
5767.50	40.80	---	8.44	49.24	---	74.00	54.00	-4.76	Peak
7230.00	53.73	39.35	9.50	63.23	48.85	74.00	54.00	-5.15	AVG

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
1058.00	55.80	---	-4.50	51.30	---	74.00	54.00	-2.70	Peak
1356.00	54.53	---	-3.61	50.93	---	74.00	54.00	-3.07	Peak
1564.00	53.57	---	-2.58	50.99	---	74.00	54.00	-3.01	Peak
2412.00	113.69	---	2.28	115.97	---	---	---	---	Carrier
3502.50	42.48	---	3.89	46.37	---	74.00	54.00	-7.63	Peak
5775.00	41.33	---	8.46	49.79	---	74.00	54.00	-4.21	Peak
7237.50	57.10	42.11	9.49	66.59	51.60	74.00	54.00	-2.40	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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



Product Name	VOIP GATEWAY	Test By	Rueyyan Lin
Model	GW5051	Test Date	2010/07/22
Test Mode	IEEE 802.11g TX / CH Middle	TEMP & Humidity	24.8°C, 49%

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
1018.00	55.77	---	-4.62	51.15	---	74.00	54.00	-2.85	Peak
1286.00	54.73	---	-3.82	50.92	---	74.00	54.00	-3.08	Peak
1442.00	54.31	---	-3.35	50.96	---	74.00	54.00	-3.04	Peak
2437.00	101.11	---	2.31	103.42	---	---	---	---	Carrier
4627.50	41.42	---	6.86	48.28	---	74.00	54.00	-5.72	Peak
5722.50	41.60	---	8.36	49.97	---	74.00	54.00	-4.03	Peak
7312.50	54.28	37.62	9.31	63.59	46.93	74.00	54.00	-7.07	AVG

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
1032.00	55.40	---	-4.58	50.83	---	74.00	54.00	-3.17	Peak
1290.00	55.05	---	-3.80	51.25	---	74.00	54.00	-2.75	Peak
1514.00	53.84	---	-3.04	50.79	---	74.00	54.00	-3.21	Peak
2437.00	112.30	---	2.31	114.61	---	---	---	---	Carrier
3240.00	43.10	---	3.61	46.71	---	74.00	54.00	-7.29	Peak
4852.50	41.27	---	7.29	48.56	---	74.00	54.00	-5.44	Peak
7312.50	55.63	42.10	9.31	64.94	51.41	74.00	54.00	-2.59	AVG

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- Average test would be performed if the peak result were greater than the average limit.
- 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.
- 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.
- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
- Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	VOIP GATEWAY	Test By	Rueyyan Lin
Model	GW5051	Test Date	2010/07/22
Test Mode	IEEE 802.11g TX / CH High	TEMP & Humidity	24.8°C, 49%

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
1028.00	55.15	---	-4.59	50.56	---	74.00	54.00	-3.44	Peak
1220.00	55.32	---	-4.01	51.31	---	74.00	54.00	-2.69	Peak
1550.00	53.98	---	-2.71	51.28	---	74.00	54.00	-2.72	Peak
2462.00	97.78	---	2.37	100.14	---	---	---	---	Carrier
4965.00	41.48	---	7.51	49.00	---	74.00	54.00	-5.00	Peak
6277.50	40.22	---	9.27	49.49	---	74.00	54.00	-4.51	Peak
7380.00	54.86	40.72	9.16	64.02	49.88	74.00	54.00	-4.12	AVG

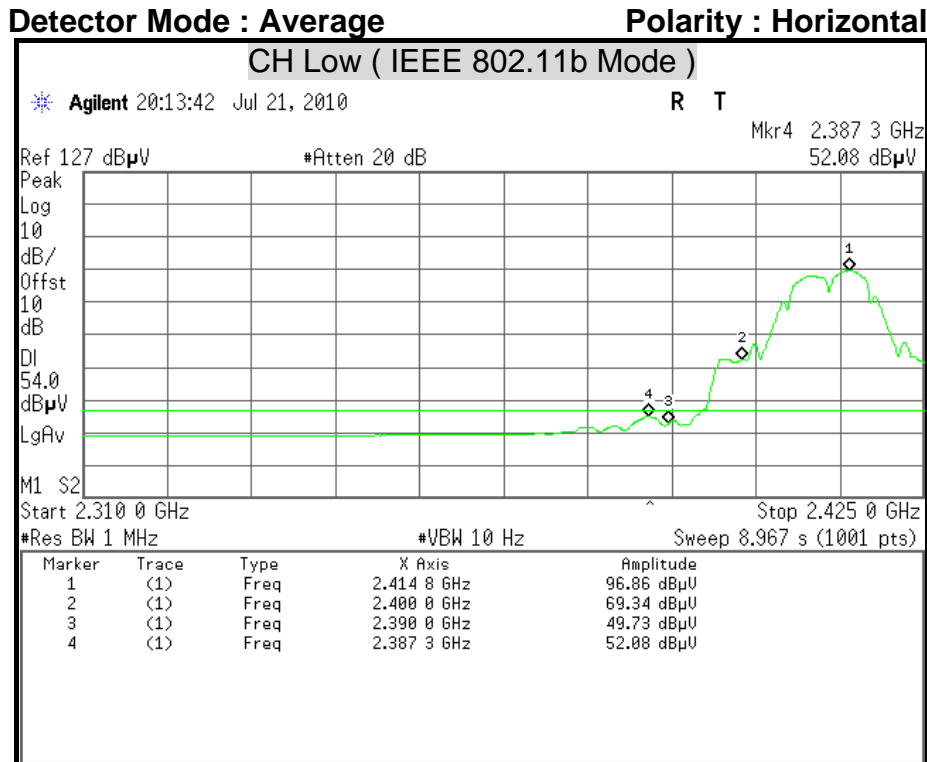
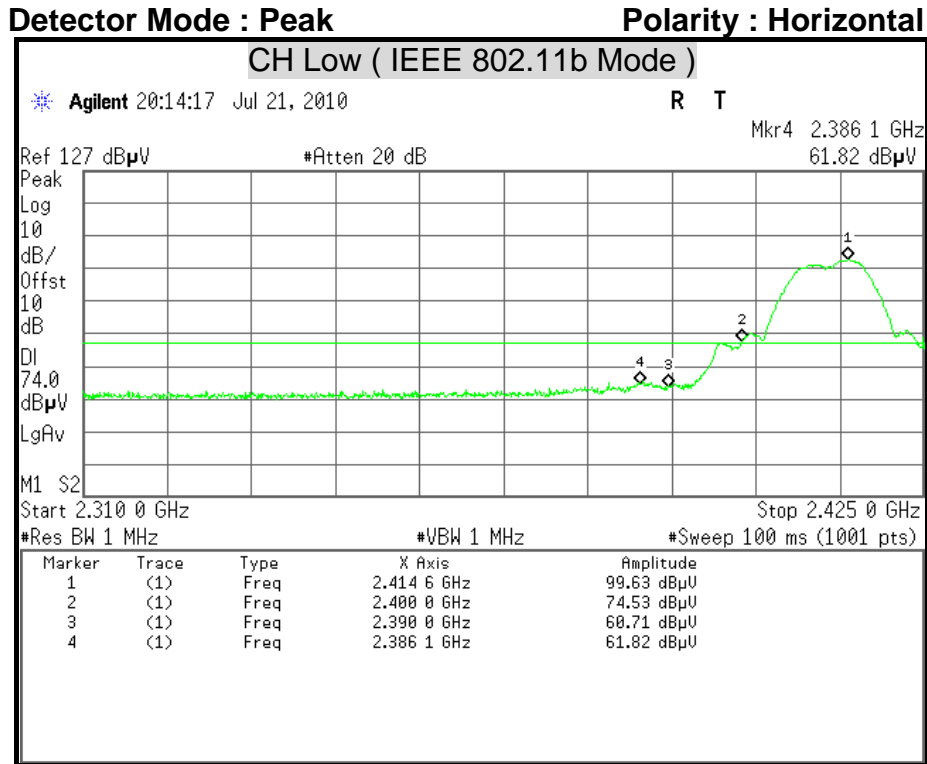
966 Chamber_A at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1146.00	55.54	---	-4.23	51.30	---	74.00	54.00	-2.70	Peak
1478.00	54.88	---	-3.24	51.64	---	74.00	54.00	-2.36	Peak
2462.00	112.32	---	2.36	114.68	---	---	---	---	Carrier
2568.00	56.86	43.43	2.56	59.42	45.99	74.00	54.00	-8.01	AVG
4927.50	41.37	---	7.44	48.81	---	74.00	54.00	-5.19	Peak
6075.00	40.23	---	8.96	49.20	---	74.00	54.00	-4.80	Peak
7380.00	58.92	43.67	9.16	68.08	52.83	74.00	54.00	-1.17	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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



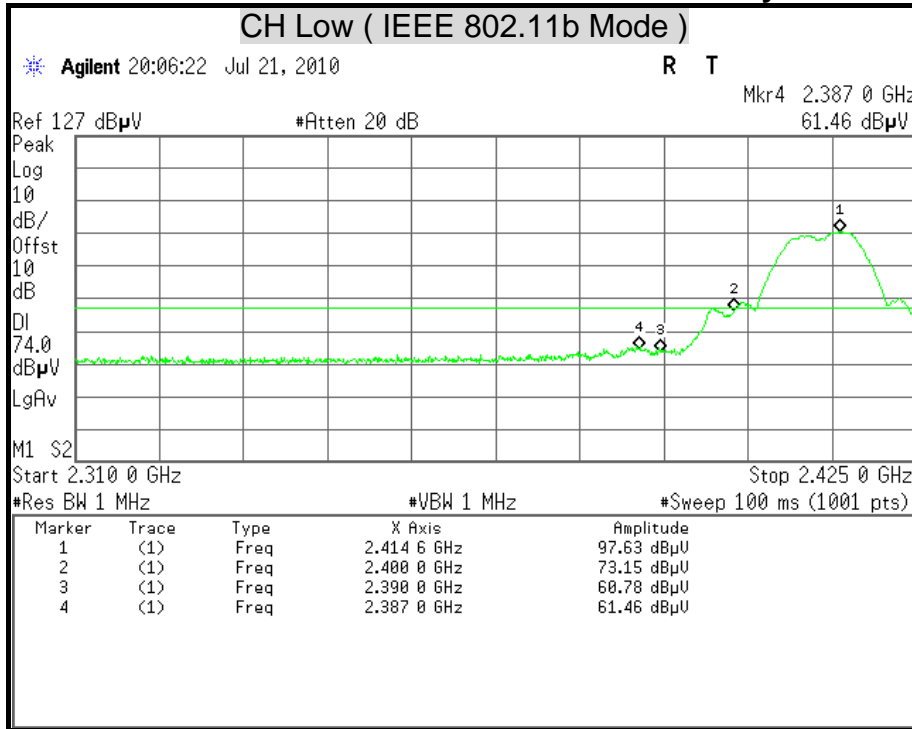
Restricted Band Edges





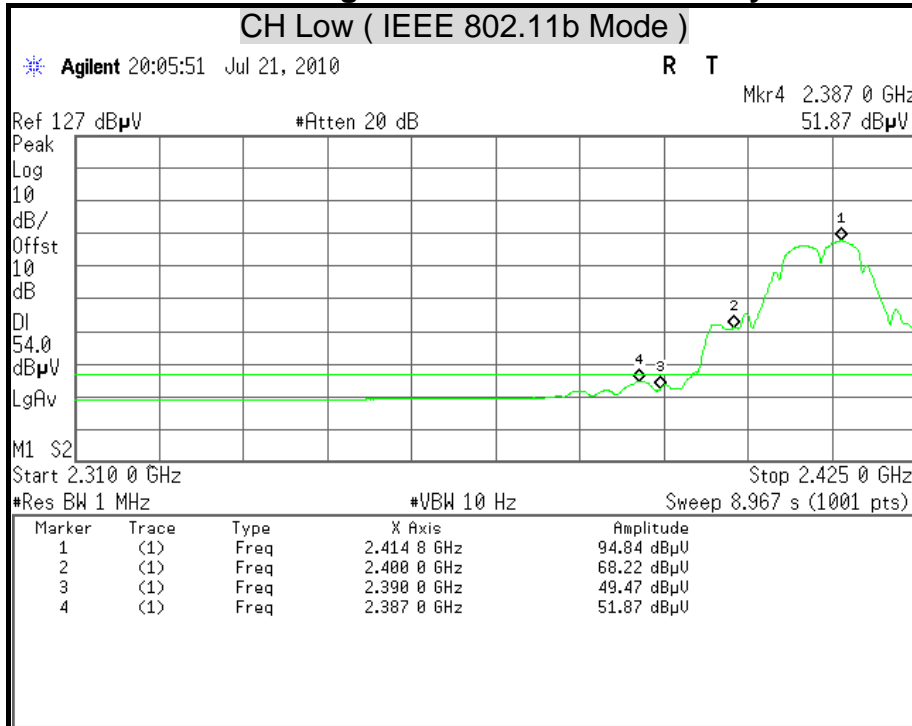
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

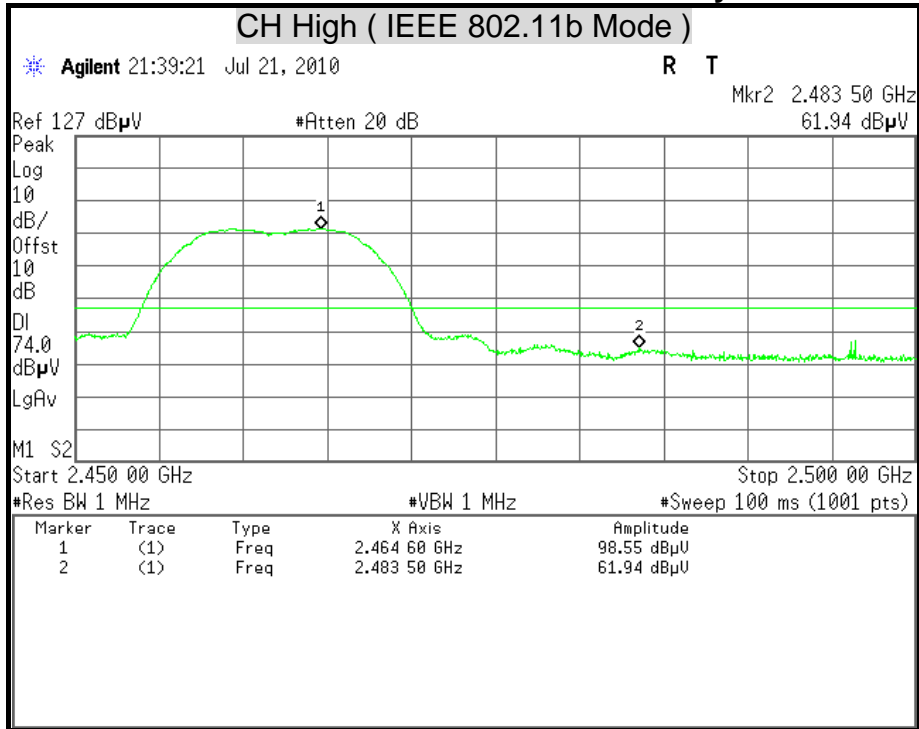
Polarity : Vertical





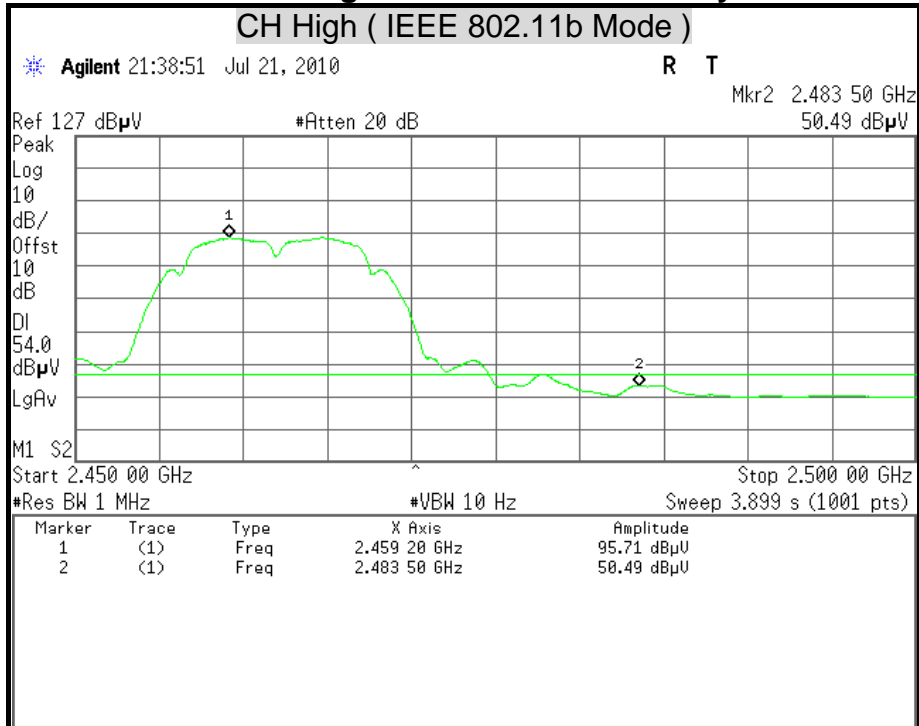
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

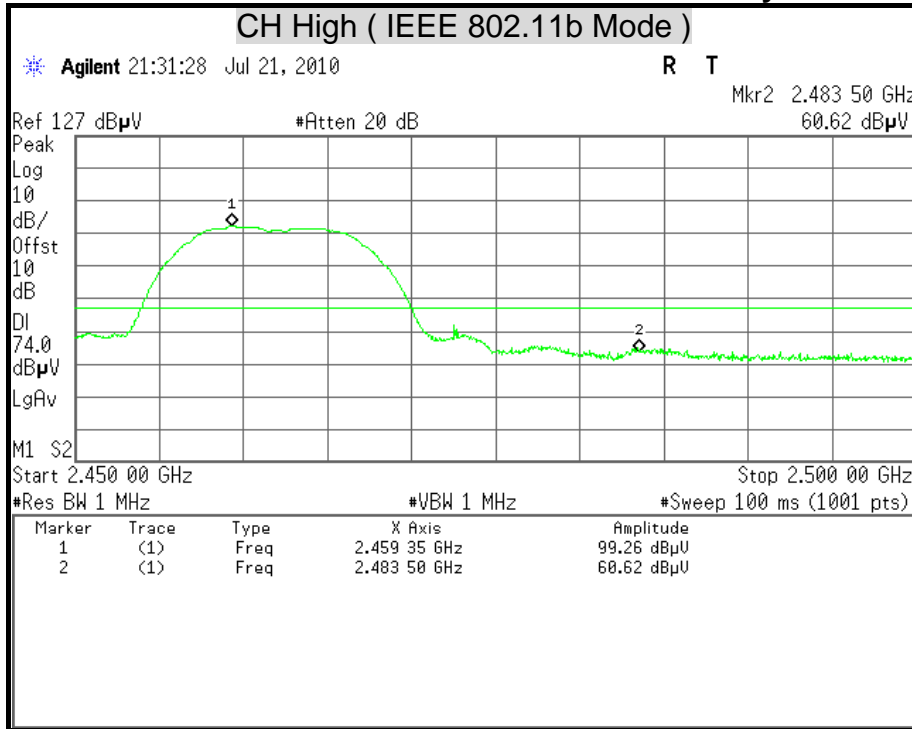
Polarity : Horizontal





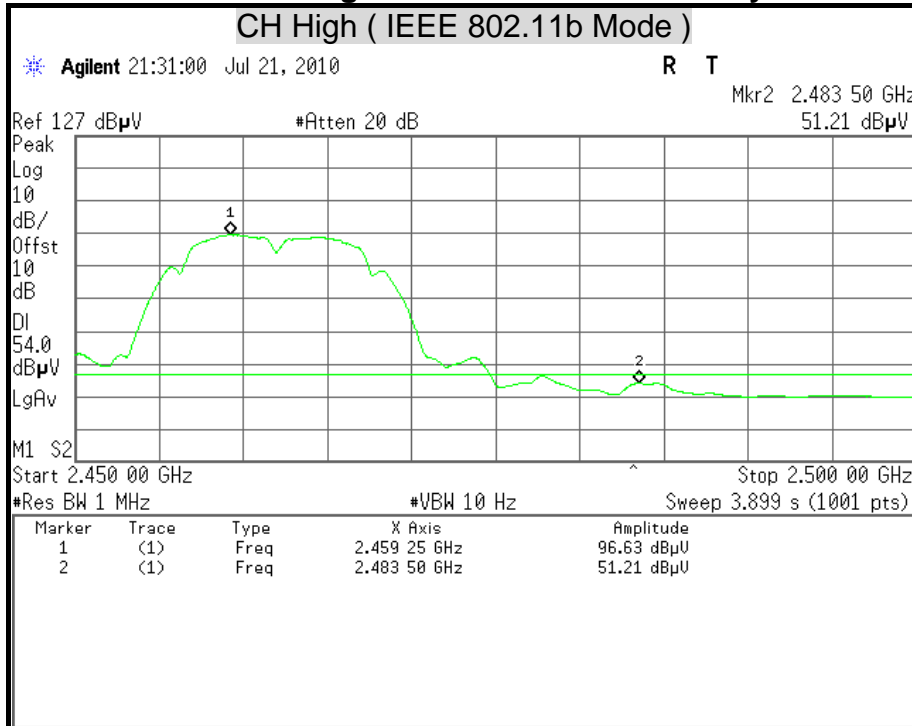
Detector Mode : Peak

Polarity : Vertical



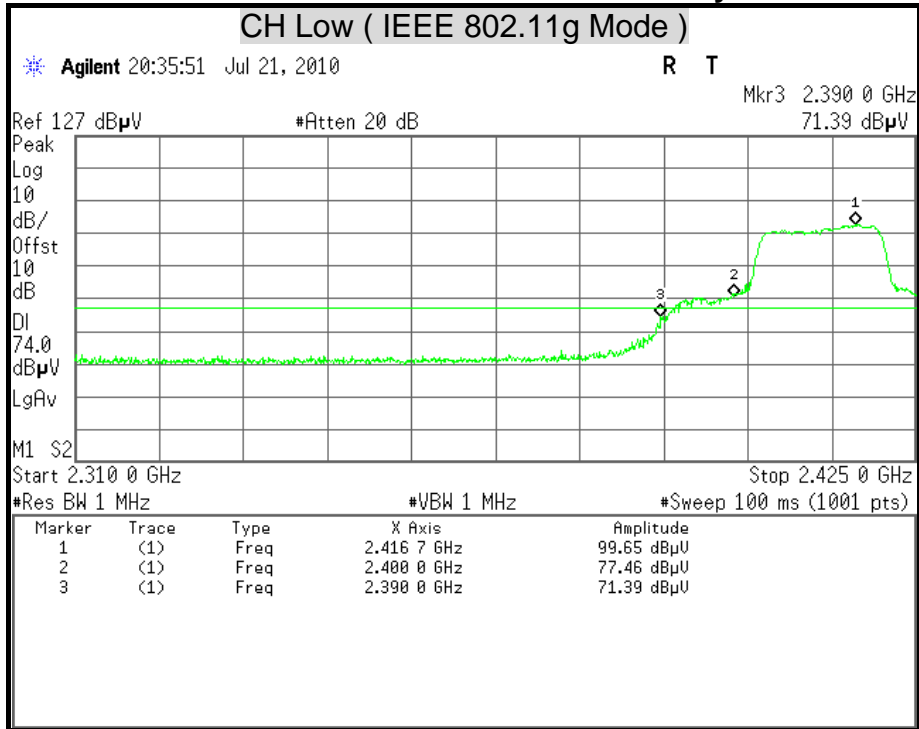
Detector Mode : Average

Polarity : Vertical

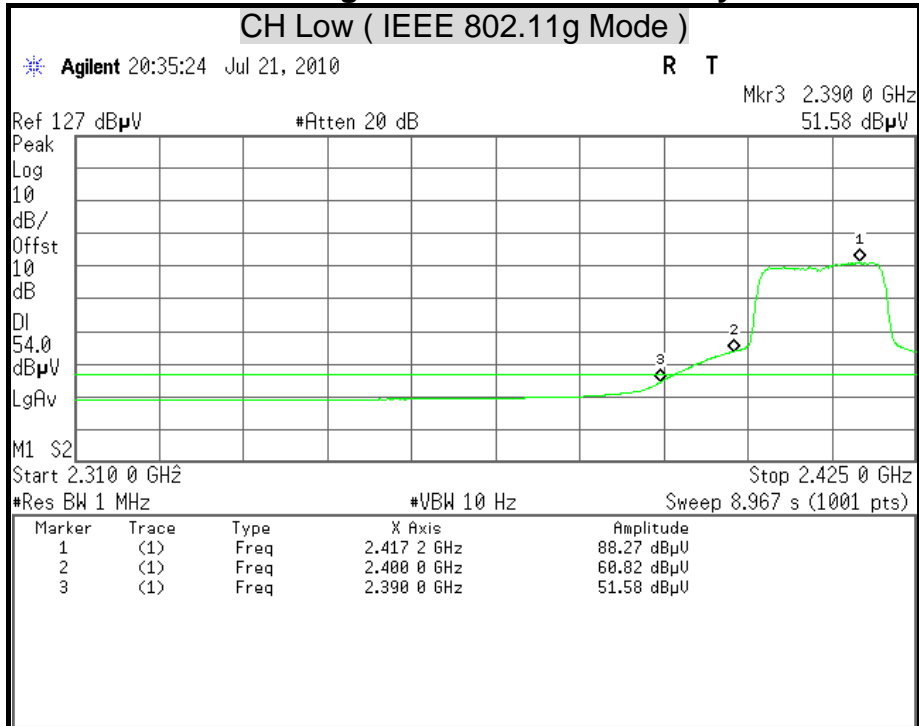




Detector Mode : Peak Polarity : Horizontal



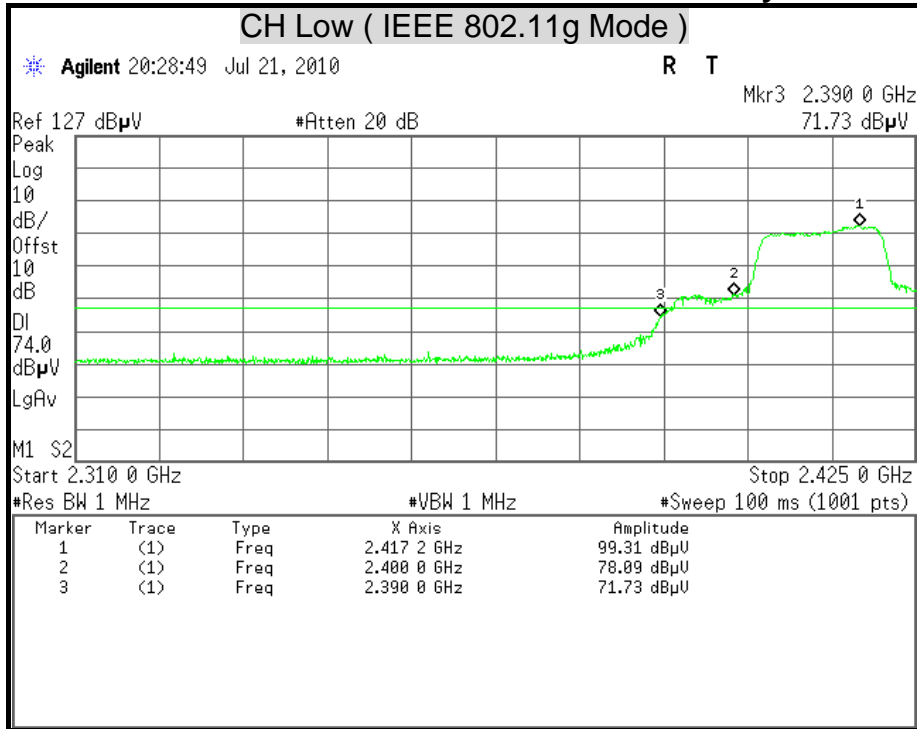
Detector Mode : Average Polarity : Horizontal





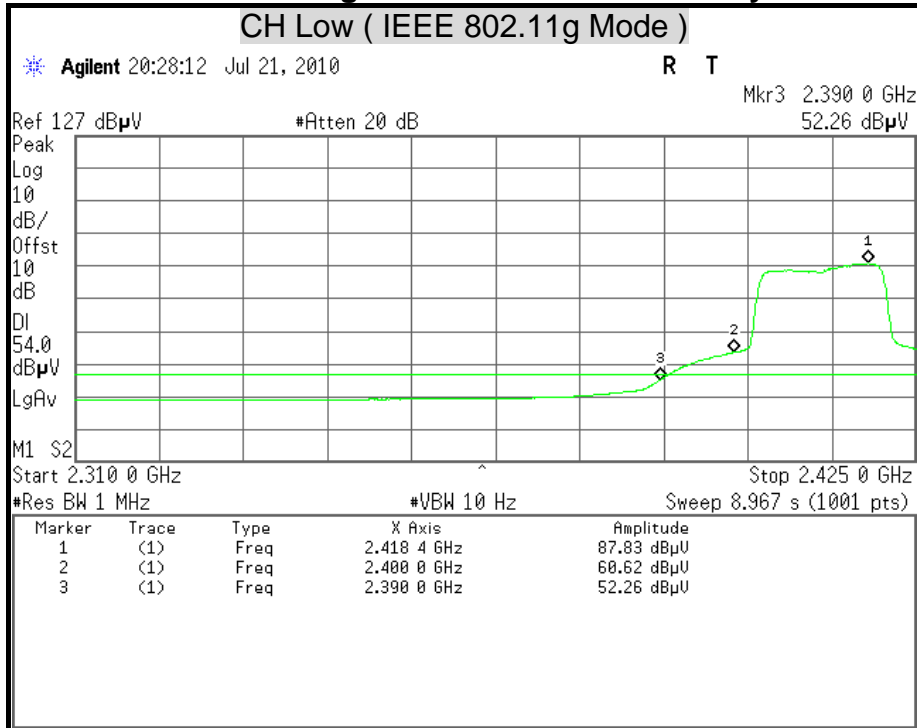
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

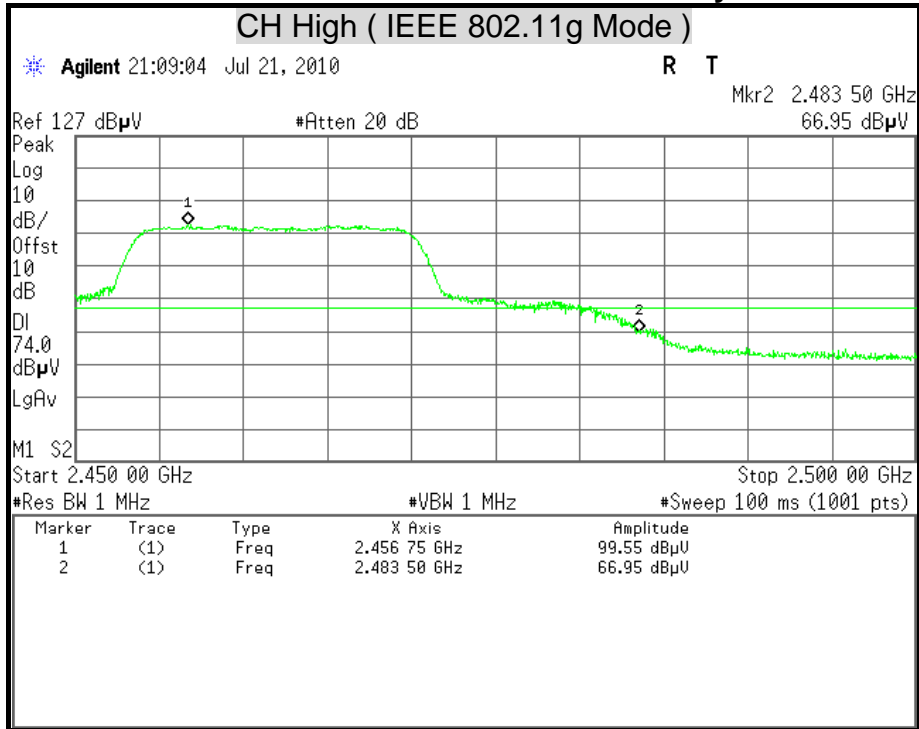
Polarity : Vertical





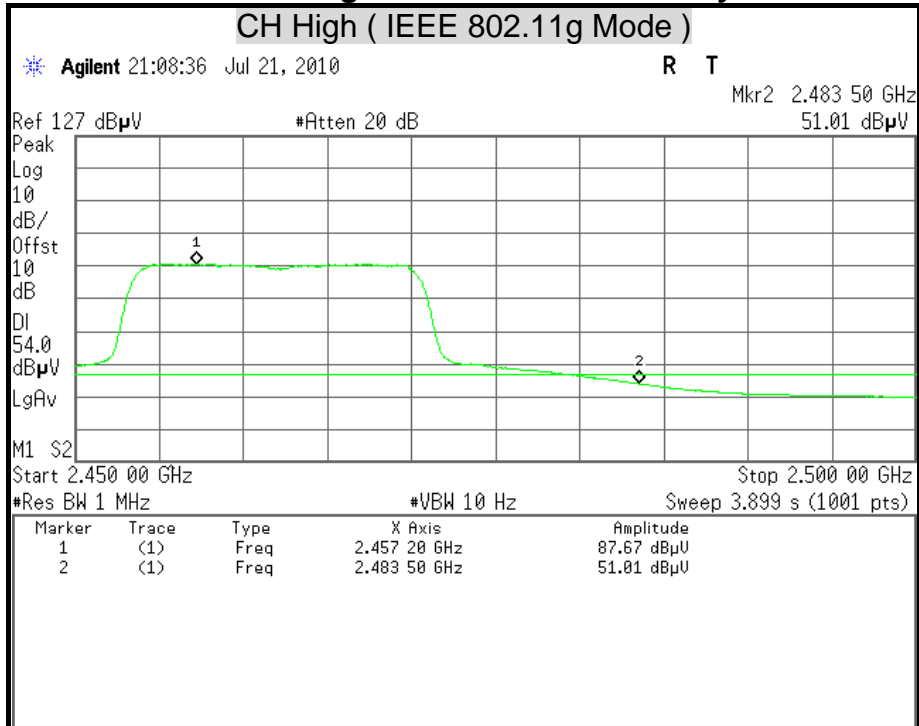
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

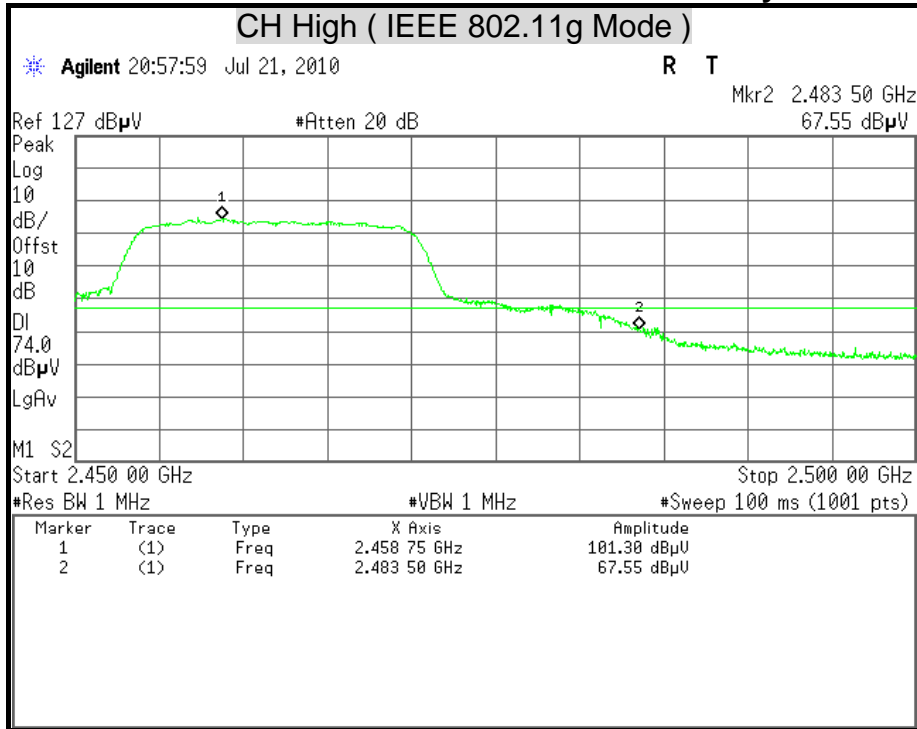
Polarity : Horizontal





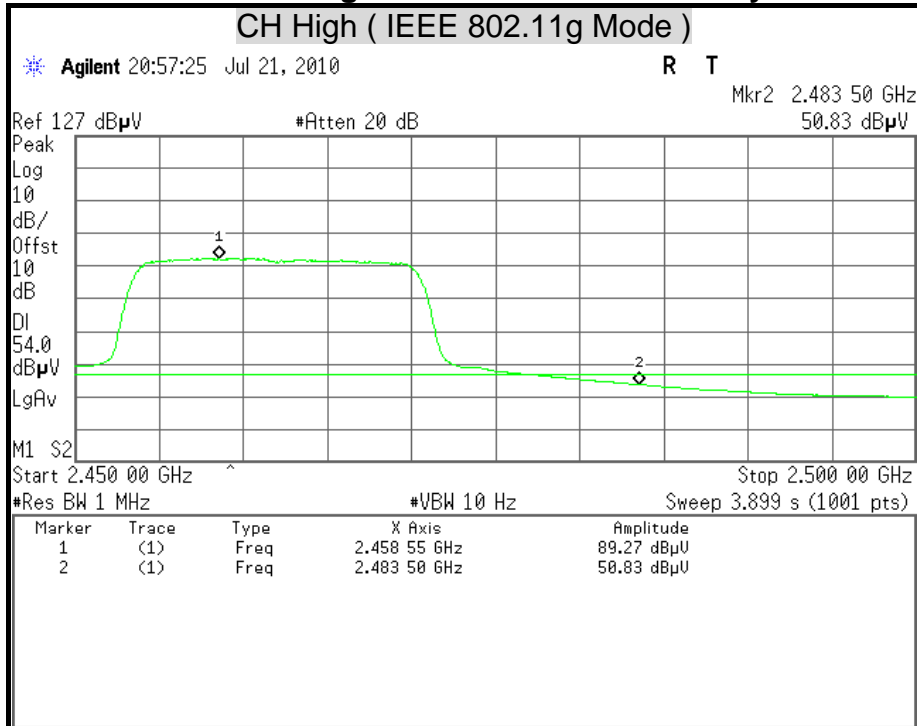
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

Polarity : Vertical





7.7 CONDUCTED EMISSION

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 Range (MHz)	Conducted Limit (dB μ v)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5.00	56	46
5.00 - 30.0	60	50

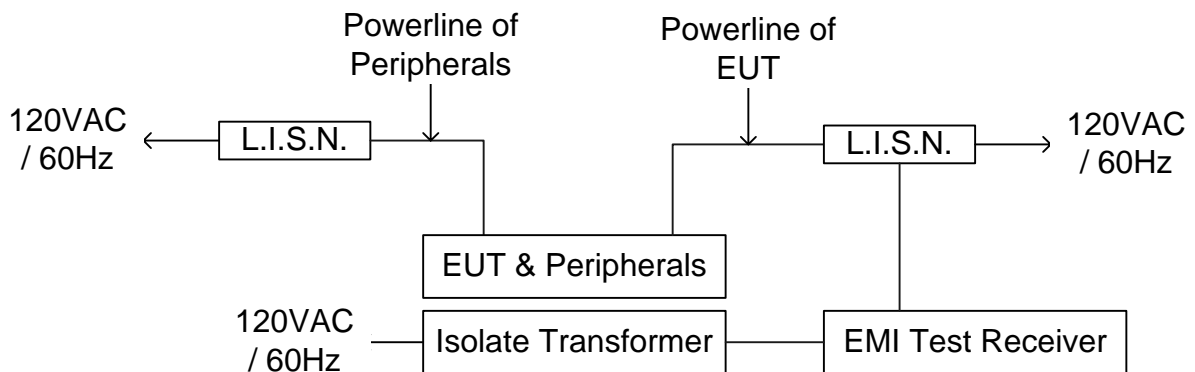
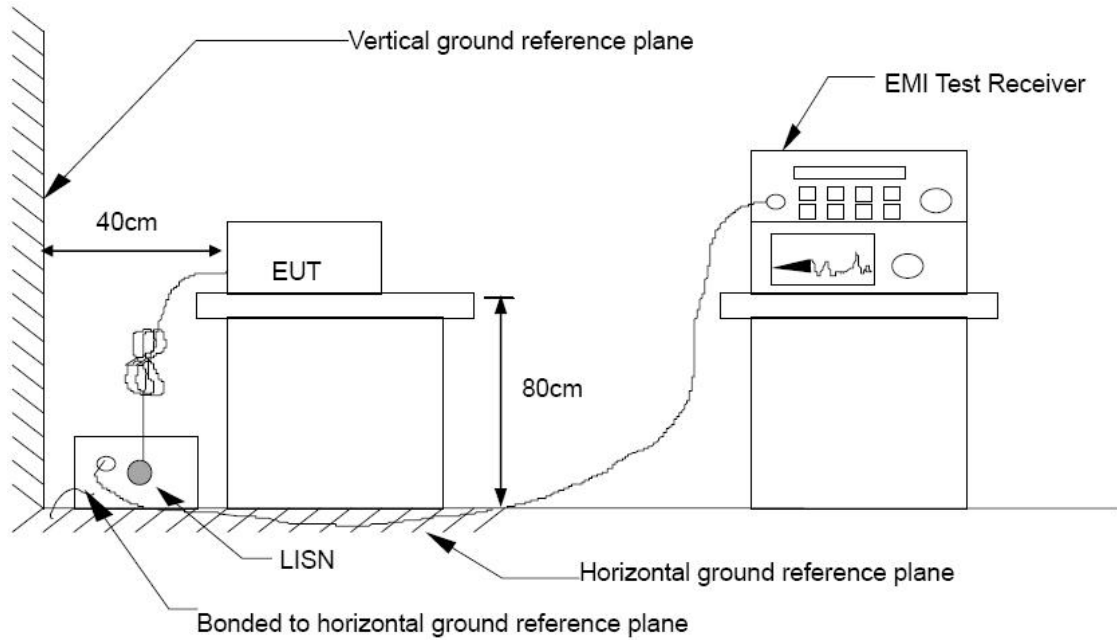
TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-465	08/13/2010
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-473	03/22/2011
EMI Test Receiver	ROHDE & SCHWARZ	ESHS 30	838550/003	01/28/2011
Pulse Limit	ROHDE & SCHWARZ	ESH3-Z2	100117	09/17/2010
N Type Coaxial Cable	BELDEN	8268 M17/164	003	07/09/2011

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



TEST SETUP





TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2003.

The test procedure is performed in a 4m x 3m x 2.4m (LxWxH) shielded room.

The EUT along with its peripherals were placed on a 1.0m (W) x 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.

The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.

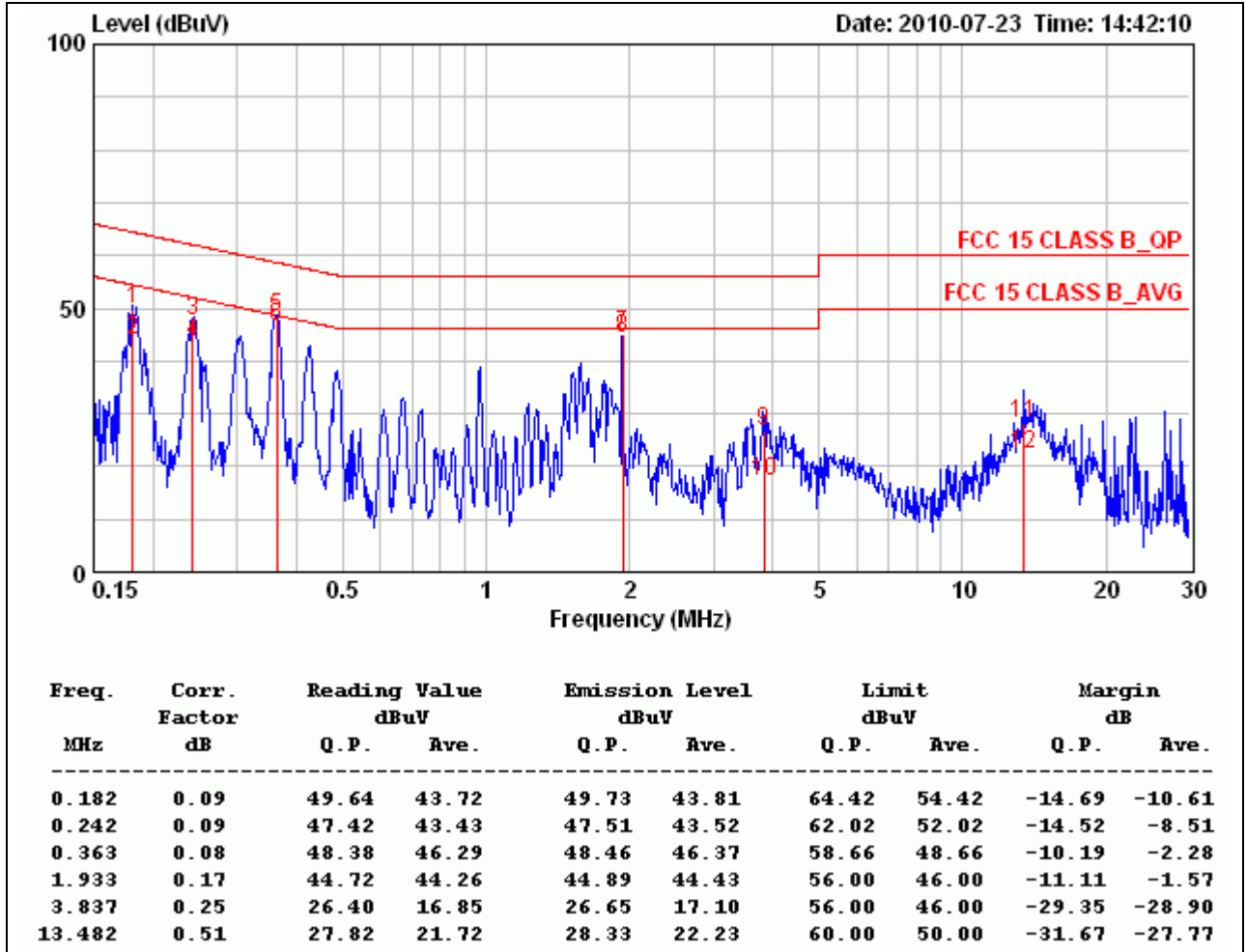
The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.



TEST RESULTS

Product Name	VOIP GATEWAY	Test By	Benny Wu
Model	GW5051	Test Date	2010/07/23
Test Mode	Normal operating (worst-case)	TEMP & Humidity	23.1°C, 74%

LINE



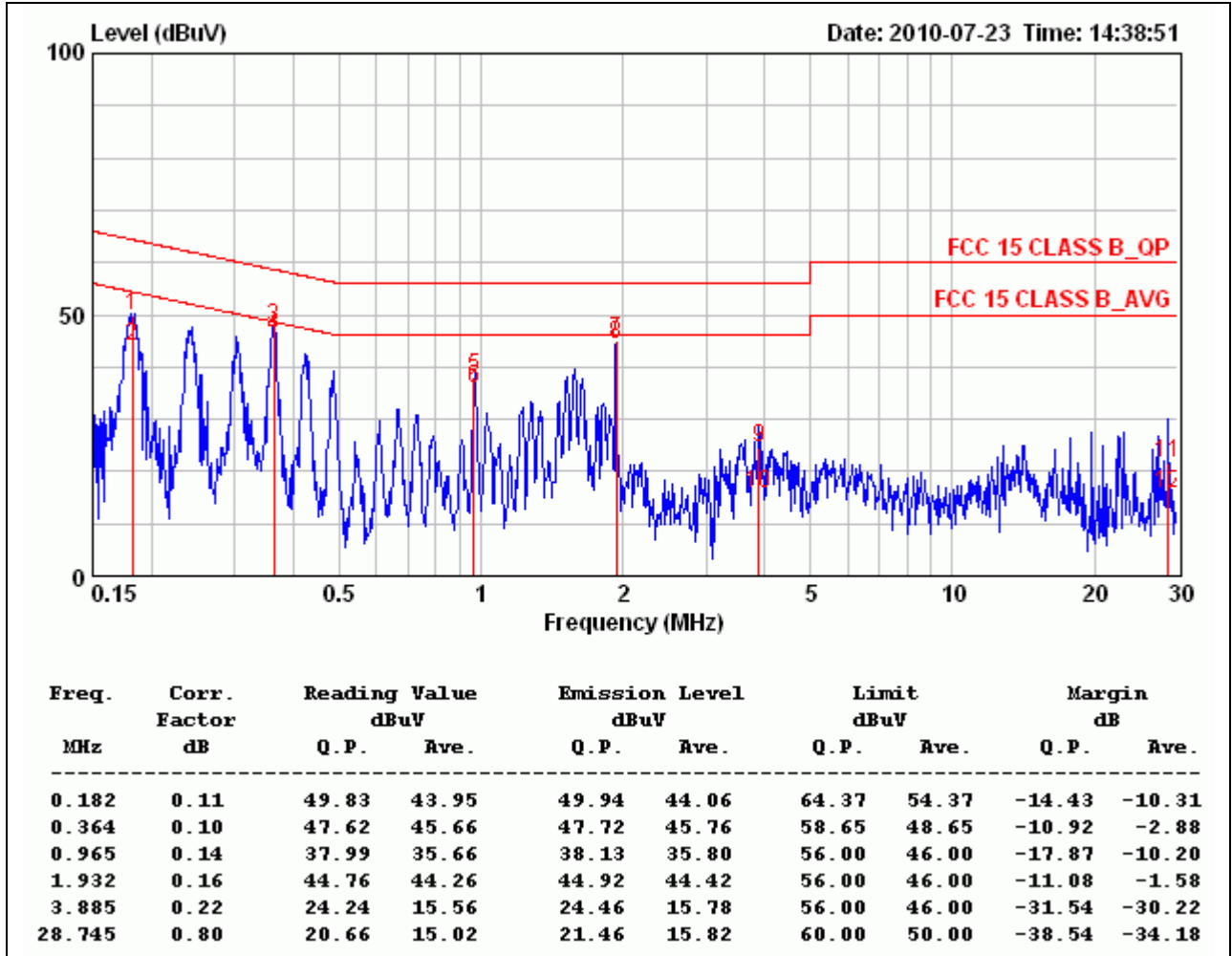
Remark:

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



Product Name	VOIP GATEWAY	Test By	Benny Wu
Model	GW5051	Test Date	2010/07/23
Test Mode	Normal operating (worst-case)	TEMP & Humidity	23.1°C, 74%

NEUTRAL



Remark:

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



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

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:

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

Changing to units of mW and cm, using:

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

$$d (cm) = d(m) / 100$$

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, $S=1.0\text{mW}/\text{cm}^2$

TEST RESULTS

Mode	Antenna Gain (dBi)	Minimum separation distance (cm)	Output Power (dBm)	Numeric antenna gain (mW)	Power Density Limit (mW/cm^2)	Power Density at 20cm (mW/cm^2)
IEEE 802.11b	4	20.0	20.38	2.51	1.00	0.054541
IEEE 802.11g	4	20.0	21.20	2.51	1.00	0.065875

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