FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Ultra Low Power 802.11 b/g/n Module

Model: RS9110-N-11-02

Trade Name: LiteFi

Prepared for

Redpine Signals Inc
2107 N.First Street, Suite 680, San Jose, CA95131-2019

Issued by:

COMPLIANCE CERTIFICATION SERVICES (SHENZHEN) INC.
(aka Compliance Engineering Service (China))
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Issued Date: June 01, 2009

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1. TEST RESULT CERTIFICATION

Applicant:	Redpine Signals Inc 2107 N.First Street, Suite 680, San Jose, CA95131-2019
Manufacturer:	Chung Nam Electronics Co., Ltd 12/F, Chung Nam Building, No. 1 Lockhart Road, Wanchai, Hong Kong
Equipment Under Test:	Ultra Low Power 802.11 b/g/n Module
Trade Name:	LiteFi
Model:	RS9110-N-11-02
Date of Test:	March 20-June 01, 2009

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services (Shenzhen) Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Clinton Kao
Manager
Compliance Certification Service Inc.

Reviewed by:

Vincent Yao
Assistant manager
Compliance Certification Service Inc.

2. EUT DESCRIPTION

Product	Ultra Low Power 802.11 b/g/n Module
Trade Name	LiteFi
Model Number	RS9110-N-11-02
Model Difference	N/A
Power Supply	Powered by the notebook
Frequency Range	IEEE 802.11b/g: 2412 ~ 2462 MHz IEEE 802.11n HT20 : 2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b mode: 16.06dBm IEEE 802.11g mode: 13.97dBm IEEE 802.11n HT20 MHz mode: 14.26dBm
Modulation Technique	IEEE 802.11b mode: DSSS with CCK IEEE 802.11g mode: OFDM with BPSK, QPSK,16-QAM and 64-QAM IEEE 802.11n HT20 MHz mode: OFDM with BPSK, QPKS,16-QAM and 64-QAM
Transmit Data Rate	802.11b: 11Mbps(CCK) with fall back rates of 5.5, 2, and 1Mbps 802.11g: 54Mbps with fall back rates of 48/36/24/18/12/9/6 Mbps IEEE 802.11n HT20 MHz mode: 65Mbps with fall back of 58.5/52/39/26/19.5/13/6.5Mbps
Number of Channels	IEEE 802.11b/g mode :11 Channels IEEE 802.11n HT20 MHz mode: 11 Channels
Antenna Specification	Chip Antenna with 0.5dBi gain (Max)

Note: *This submittal(s) (test report) is intended for FCC ID: XF6-RS9110N1102 filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.*

3. 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.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4:2003 Conducted emissions from the EUT measured

in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4:2003.

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(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
2. 17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
2. 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 –	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.52525	2655 – 2900	22.01 – 23.12
8.41425 – 8.41475	156.7 – 156.9	3260 – 3267	23.6 – 24.0
12.29 – 12.293	162.0125 – 167.17	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	167.72 – 173.2	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	240 – 285	3600 – 4400	([2])
13.36 – 13.41	322 – 335.4		

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

[2] Above 38.6

(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.

3.5 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

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

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

The worst-case data rates:

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

IEEE802.11g mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel

High (2462MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT20 MHz mode: Channel Low (2412MHz), Channel Mid

(2437MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.

All emissions tests were made with the worst-case data rates.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

No. 5, Jinao industrial park, No.35 Jukeng Road, Dashuikeng Village, Guanlan Town, Baoan District, Shenzhen, China

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

5.2 LABORATORY ACCREDITATIONS AND LISTING

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

Taiwan	**TAF**

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

USA	**FCC**
Japan	**VCCI**
Canada	**INDUSTRY CANADA**
Taiwan	**BSMI**

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

5.3 MEASUREMENT UNCERTAINTY

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

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	+/- 3.18dB
Radiated emissions	30MHz ~ 200MHz	+/- 3.79dB
	200MHz ~1000MHz	+/- 3.62dB

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

The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
Notebook	IBM	1706	DoC	LV-A3830 06/03	N/A	AC Input: Unshielded 1.80m DC Output: Unshielded 1.80m

Notes:

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

7. FCC PART 15.247 REQUIREMENTS

7.1 6dB BANDWIDTH

LIMIT

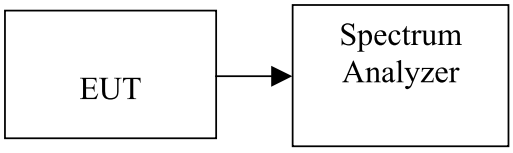
According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 -928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2010

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

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100kHz, VBW ≥ RBW, Span = 30MHz, Sweep = auto.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

No non-compliance noted

Test Data

IEEE 802.11b mode

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	10150	>500	PASS
Mid	2437	10150		PASS
High	2462	10150		PASS

IEEE 802.11g mode

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	16650	>500	PASS
Mid	2437	16650		PASS
High	2462	16650		PASS

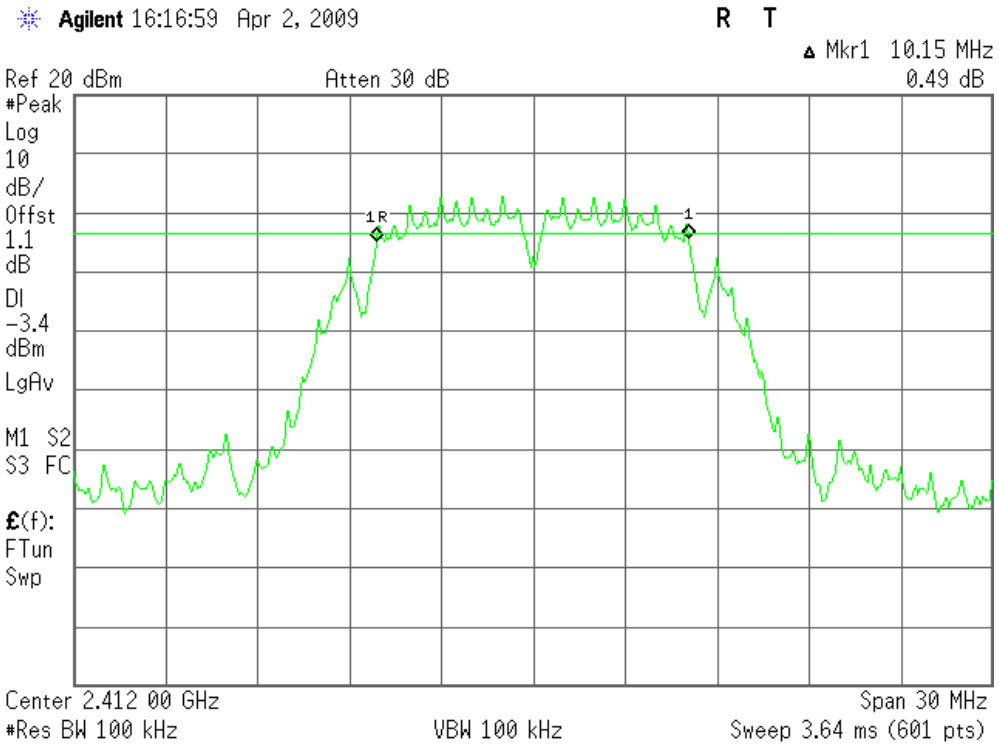
IEEE 802.11n HT20 MHz mode

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	17800	>500	PASS
Mid	2437	17800		PASS
High	2462	17850		PASS

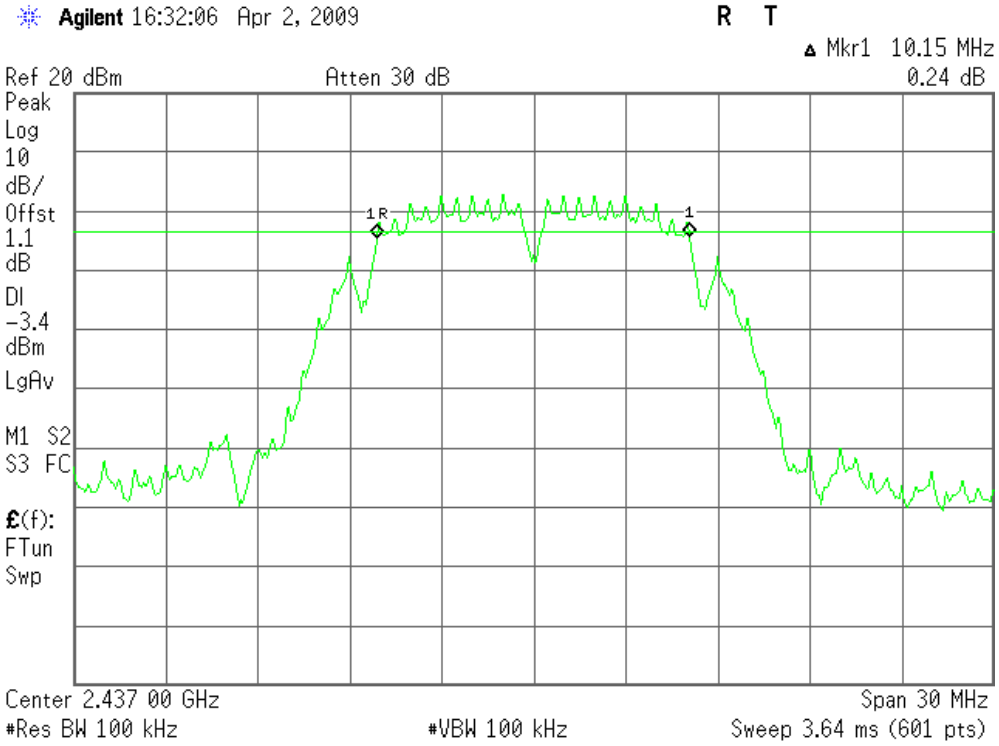
Test Plot

IEEE 802.11b mode

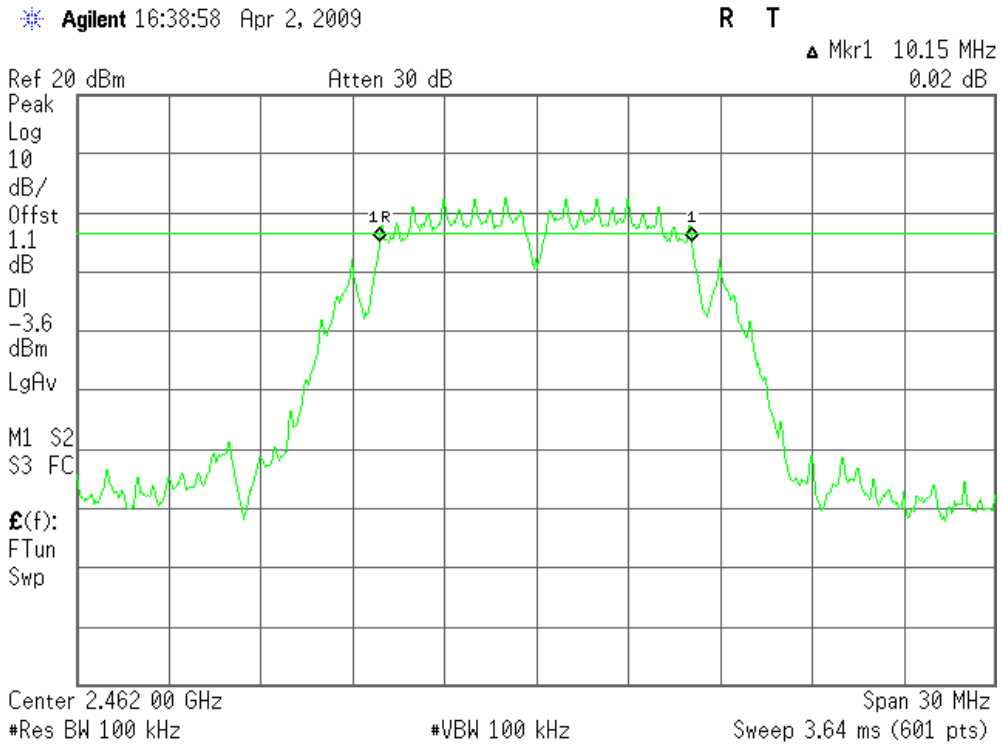
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

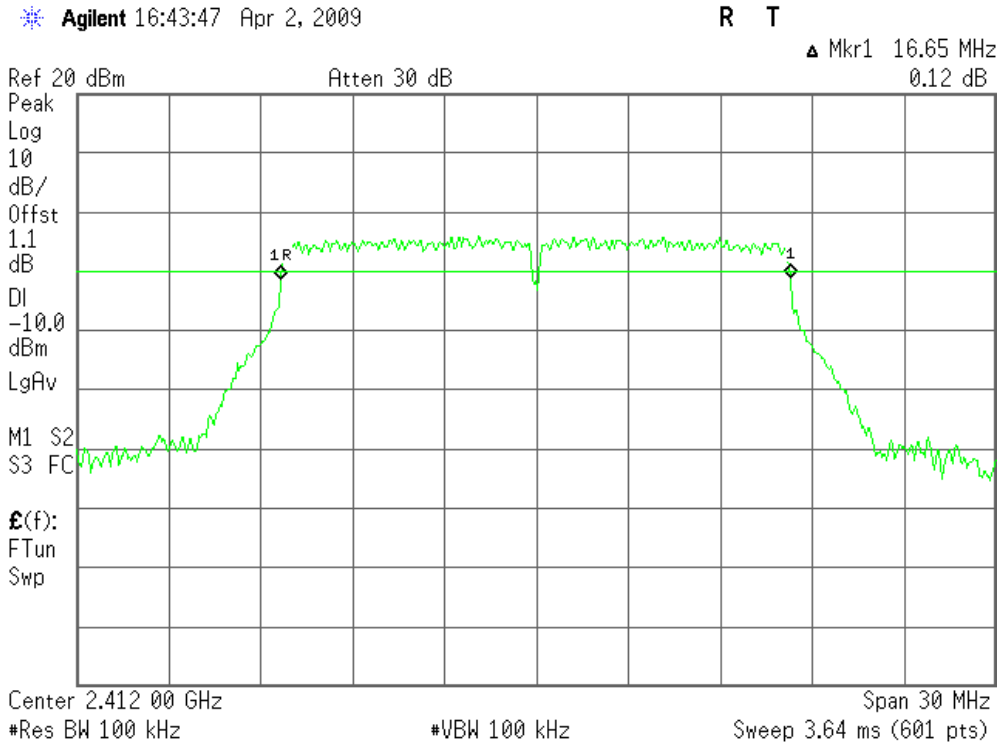


6dB Bandwidth (CH High)

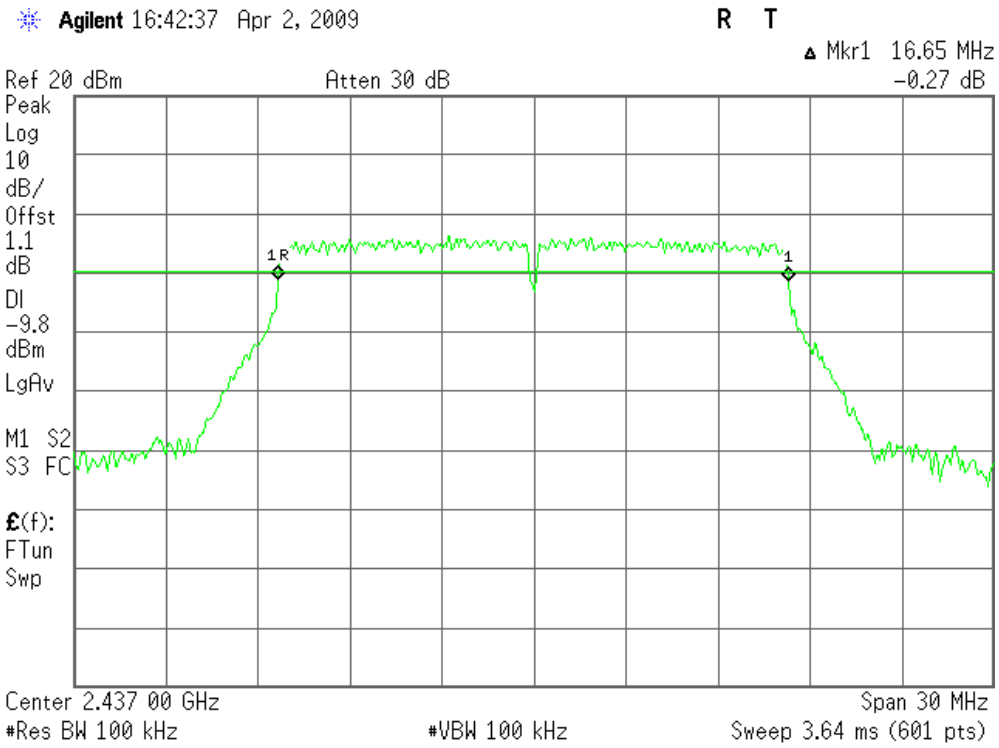


IEEE 802.11g mode

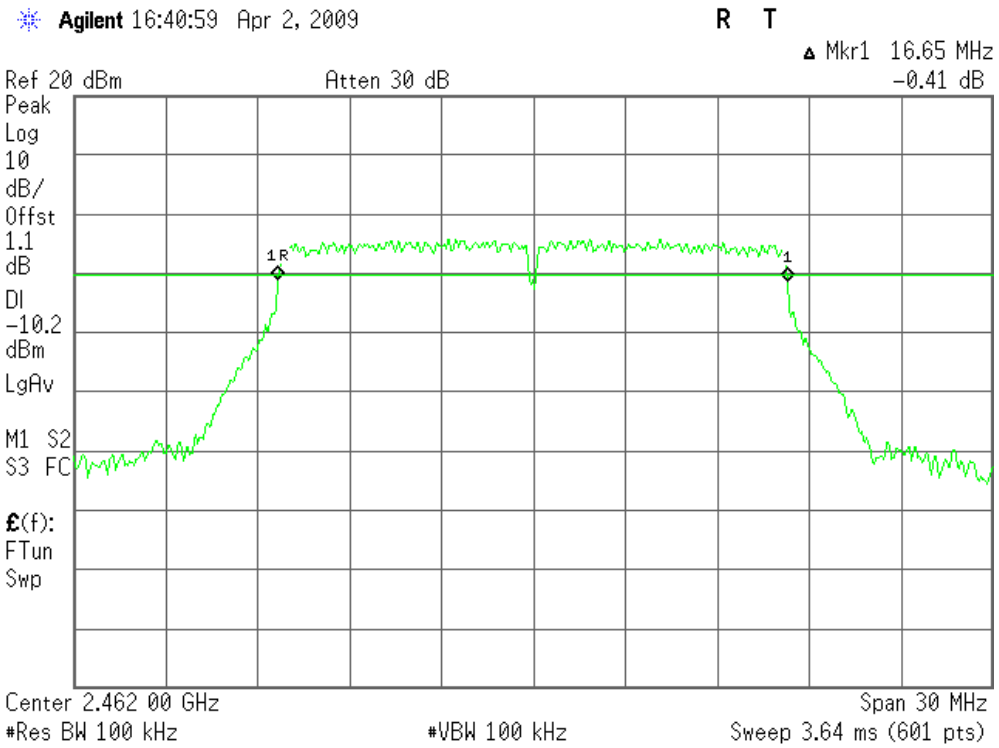
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

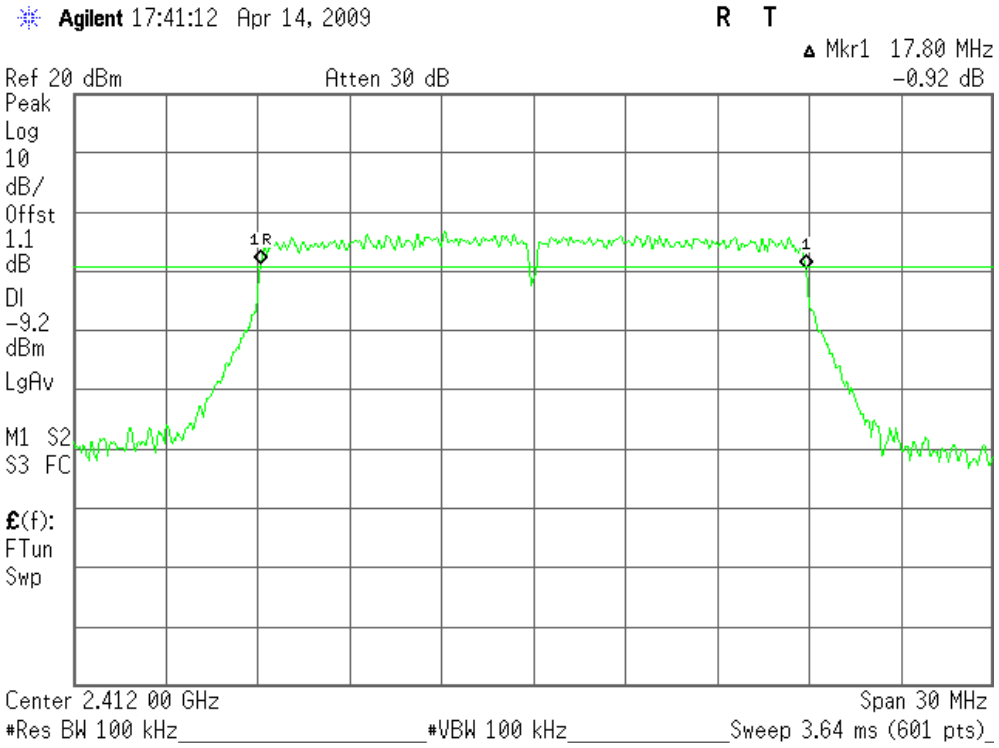


6dB Bandwidth (CH High)

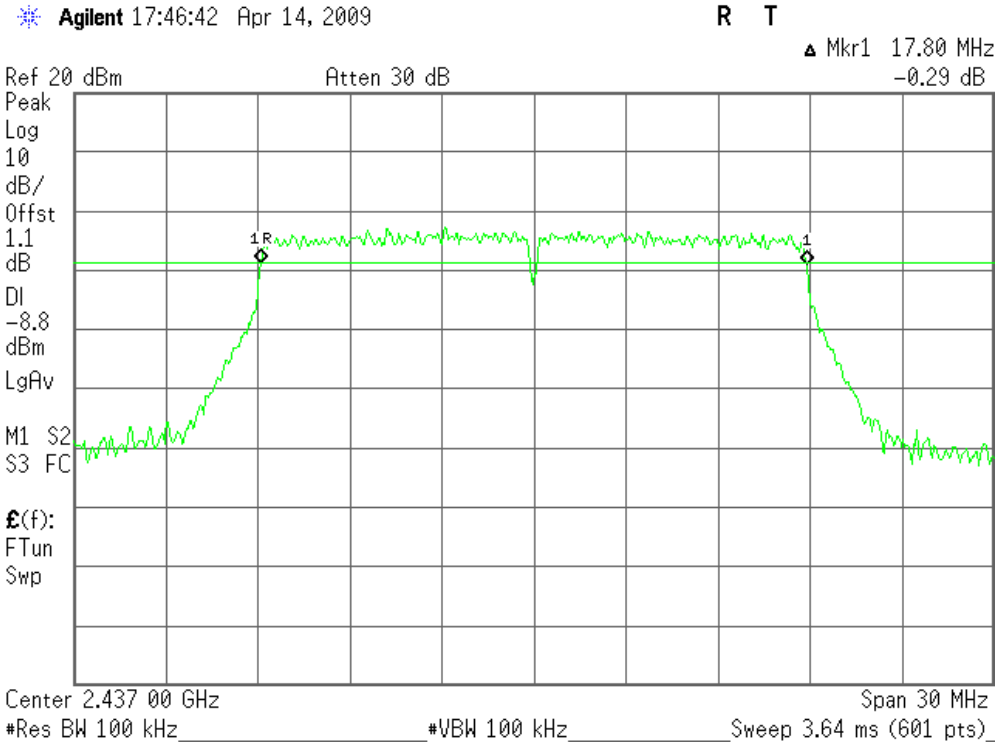


IEEE 802.11n HT20 MHz mode

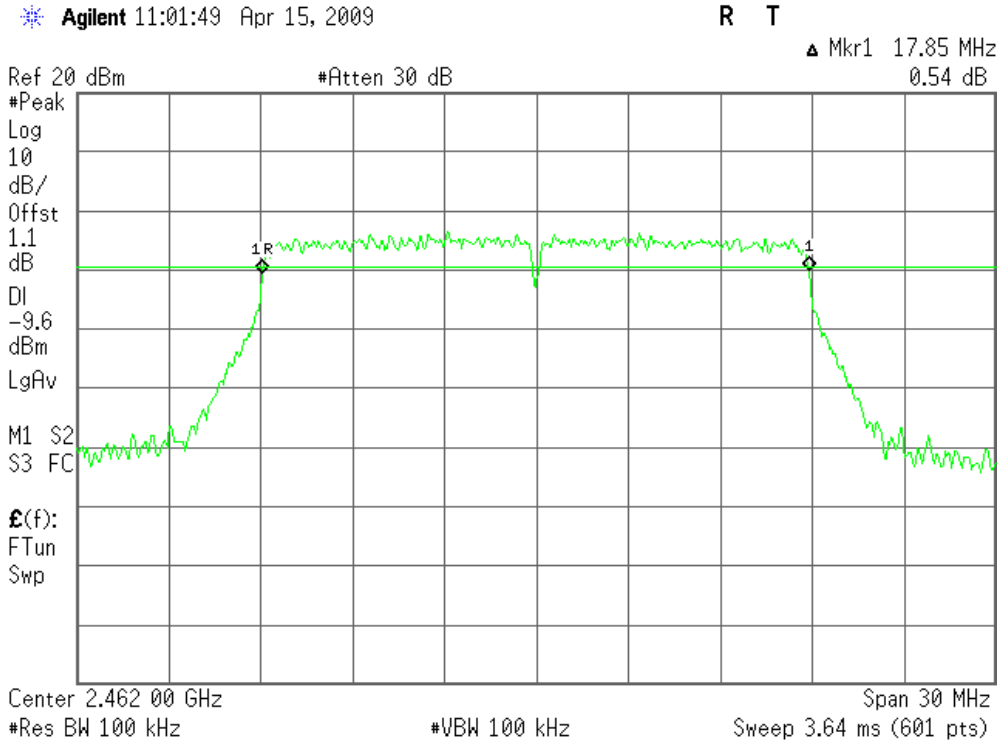
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)



7.2 PEAK POWER

LIMIT

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

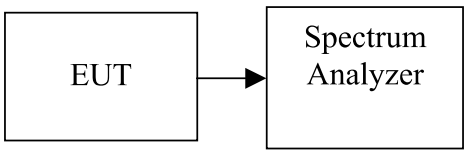
1. For systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt.
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2010

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

Test Configurations



TEST PROCEDURE

1 Set span to encompass the entire emission bandwidth (EBW) of the signal.
2 Set RBW = 1 MHz.
3 Set VBW ≥ 3 MHz.
4 Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode.
5 Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”.
6 Trace average 100 traces in power averaging mode.
7 Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

Measurement uncertainty = +/-1.914dB

TEST RESULTS

No non-compliance noted

Test Data

IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power Total(dBm)	Output Power (W)	Limit (W)	Result
Low	2412	16.06	0.04036	1	PASS
Mid	2437	15.98	0.03963		PASS
High	2462	15.88	0.03873		PASS

IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power Total(dBm)	Output Power (W)	Limit (W)	Result
Low	2412	13.95	0.02483	1	PASS
Mid	2437	13.97	0.02495		PASS
High	2462	13.87	0.02438		PASS

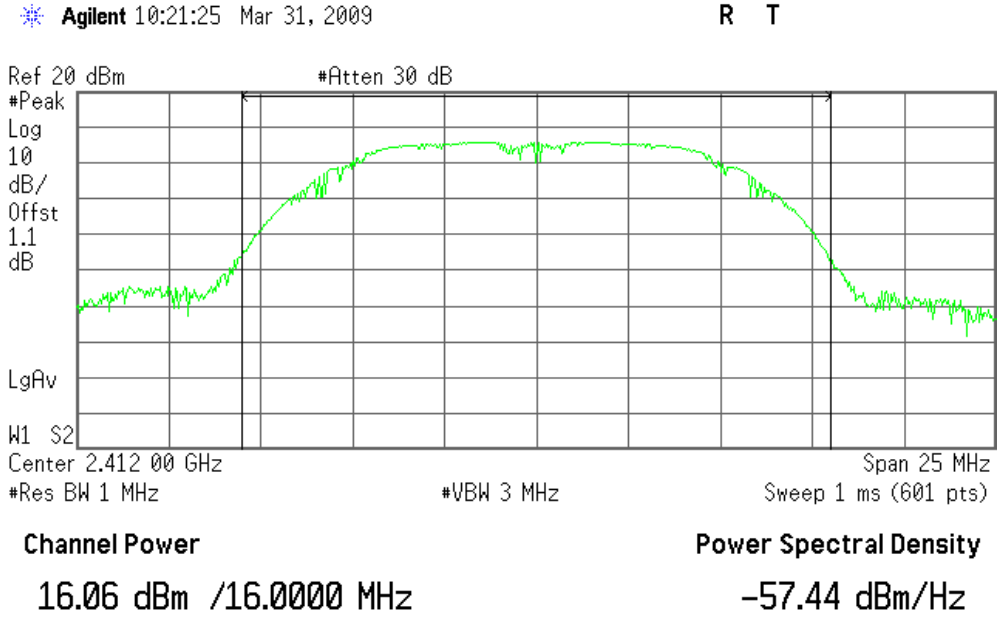
IEEE 802.11n HT20 MHz mode

Channel	Frequency (MHz)	Output Power Total(dBm)	Output Power (W)	Limit (W)	Result
Low	2412	14.26	0.02667	1	PASS
Mid	2437	14.22	0.02642		PASS
High	2462	14.10	0.02570		PASS

Test Plot

IEEE 802.11b mode

Peak power (CH Low)



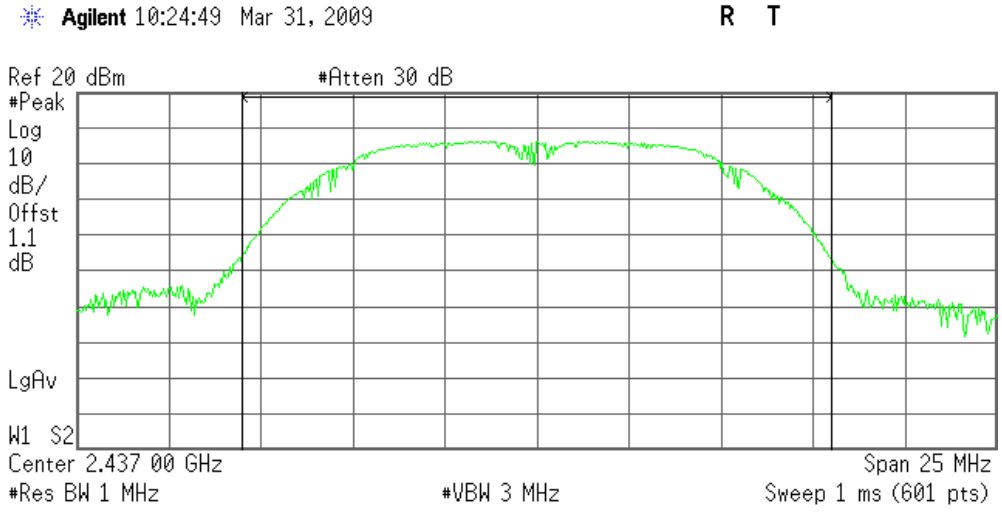
Channel Power

16.06 dBm /16.0000 MHz

Power Spectral Density

-57.44 dBm/Hz

Peak power (CH Mid)



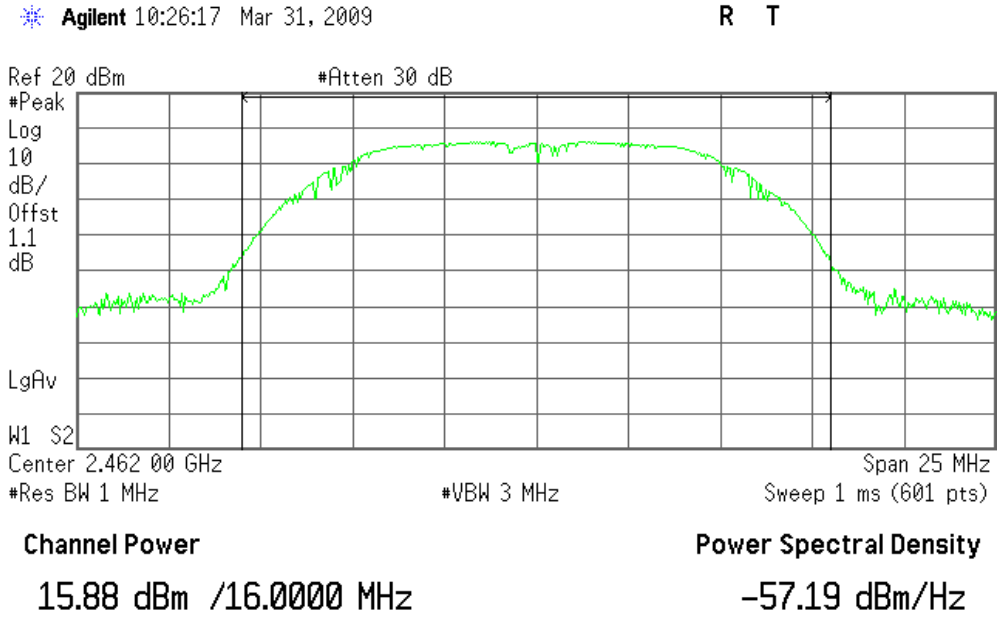
Channel Power

15.98 dBm /16.0000 MHz

Power Spectral Density

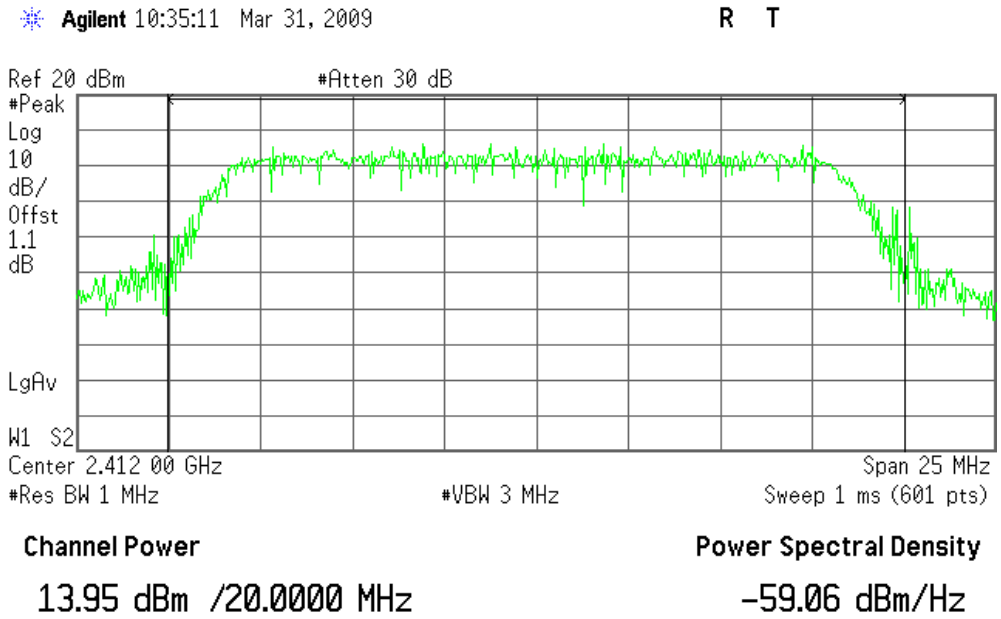
-57.14 dBm/Hz

Peak power (CH High)

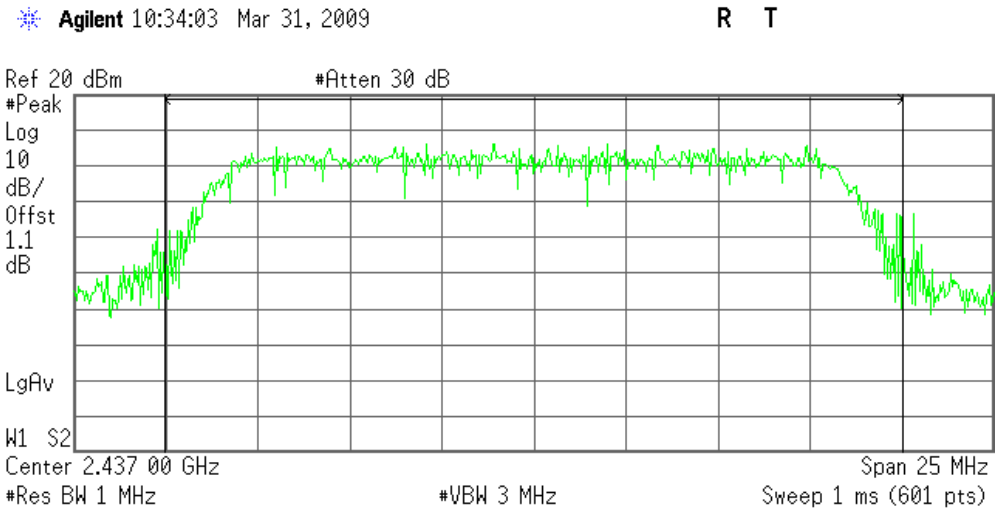


IEEE 802.11g mode

Peak power (CH Low)



Peak power (CH Mid)



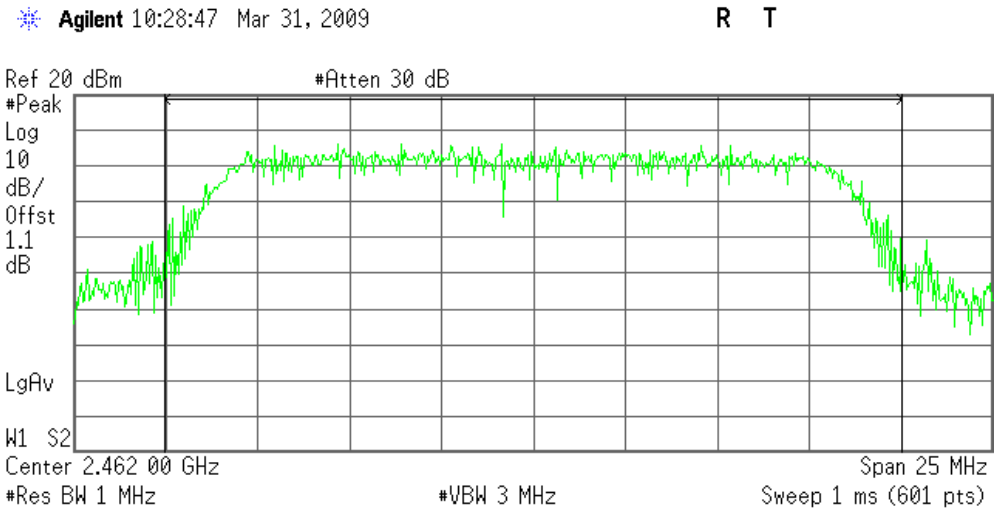
Channel Power

13.97 dBm /20.0000 MHz

Power Spectral Density

-59.04 dBm/Hz

Peak power (CH High)



Channel Power

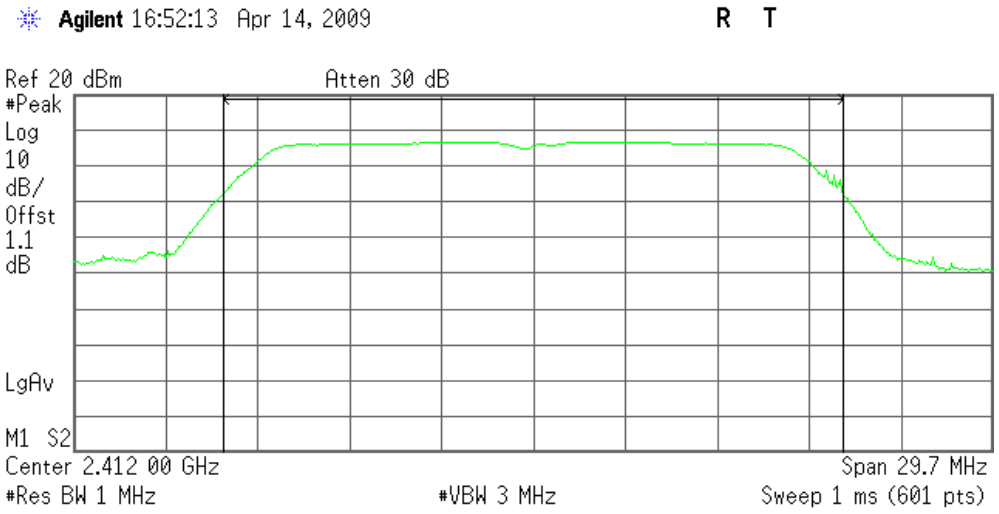
13.87 dBm /20.0000 MHz

Power Spectral Density

-59.14 dBm/Hz

IEEE 802.11n HT20 MHz mode

Peak power (CH Low)



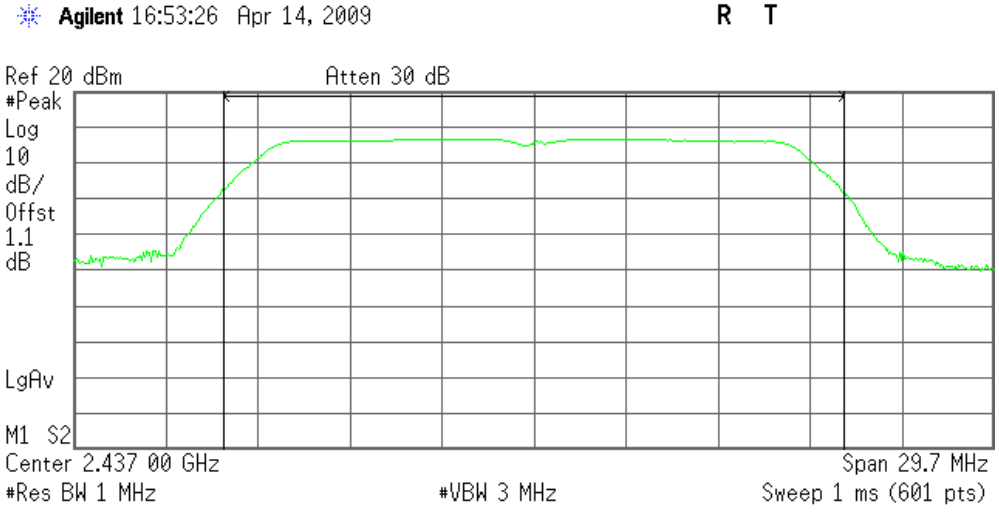
Channel Power

14.26 dBm /20.0000 MHz

Power Spectral Density

-58.75 dBm/Hz

Peak power (CH Mid)



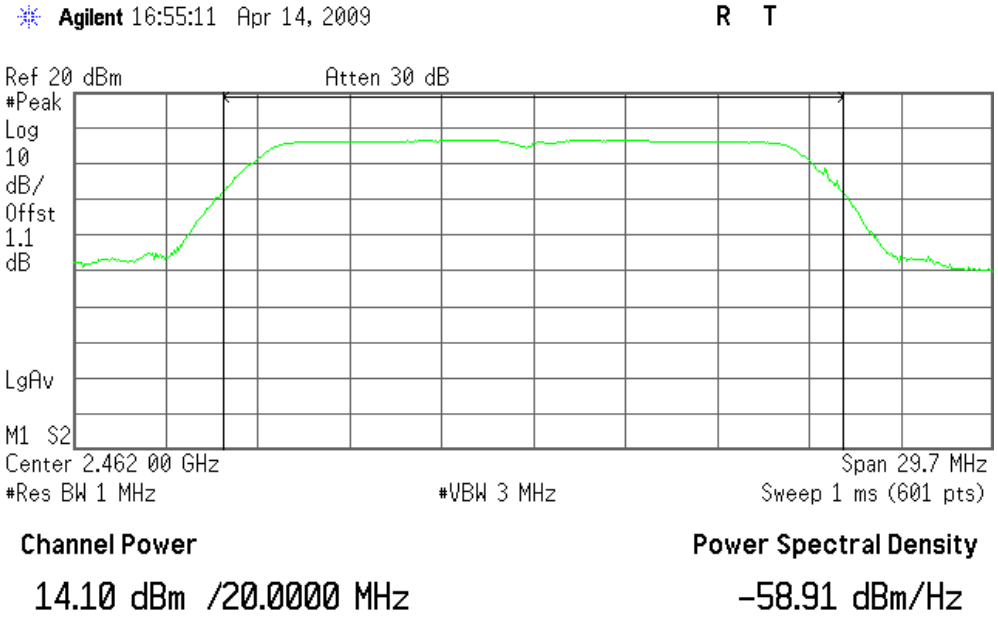
Channel Power

14.22 dBm /20.0000 MHz

Power Spectral Density

-58.79 dBm/Hz

Peak power (CH High)



7.3 AVERAGE POWER

LIMIT

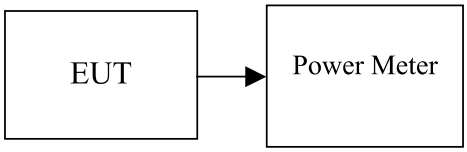
None; for reporting purposes only.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Anritsu	ML2487A	6K00001491	06/07/2008

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

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power meter.

TEST RESULTS

No non-compliance noted

Test Data

IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power Total(dBm)	Output Power (W)
Low	2412	12.12	0.01629
Mid	2437	12.36	0.01722
High	2462	12.29	0.01694

IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power Total(dBm)	Output Power (W)
Low	2412	10.32	0.01076
Mid	2437	10.46	0.01112
High	2462	10.51	0.01125

IEEE 802.11n HT20 MHz mode

Channel	Frequency (MHz)	Output Power Total(dBm)	Output Power (W)
Low	2412	10.38	0.01091
Mid	2437	10.27	0.01064
High	2462	10.62	0.01153

7.4 BAND EDGES MEASUREMENT

LIMIT

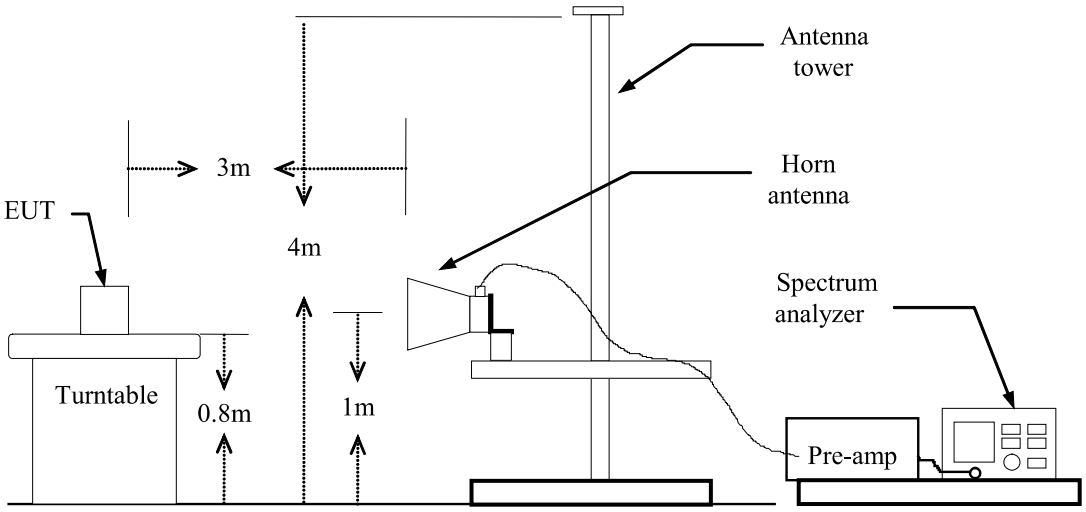
According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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 in15.209(a).

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2010
EMI Test Receiver	R&S	ESCI	1166.5950 03	01/13/2010
Low Noise Amplifier	MITEQ	AM-1604-3000	1123808	02/14/2010
Bilog Antenna	SCHWAZBECK	CBL6143	5082	06/09/2009
Turn Table	EMCO	2081-1.21	N/A	N.C.R
Antenna Tower	CT	N/A	N/A	N.C.R
Controller	CT	N/A	N/A	N.C.R
High Noise Amplifier	Agilent	89842	N/A	06/09/2010
Site NSA	C&C	N/A	N/A	06/09/2010
Horn Antenna	TRC	N/A	N/A	03/04/2010
Signal Generator	Anritsu	MG3694A	#050125	02/24/2010

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

Test Configuration



TEST PROCEDURE

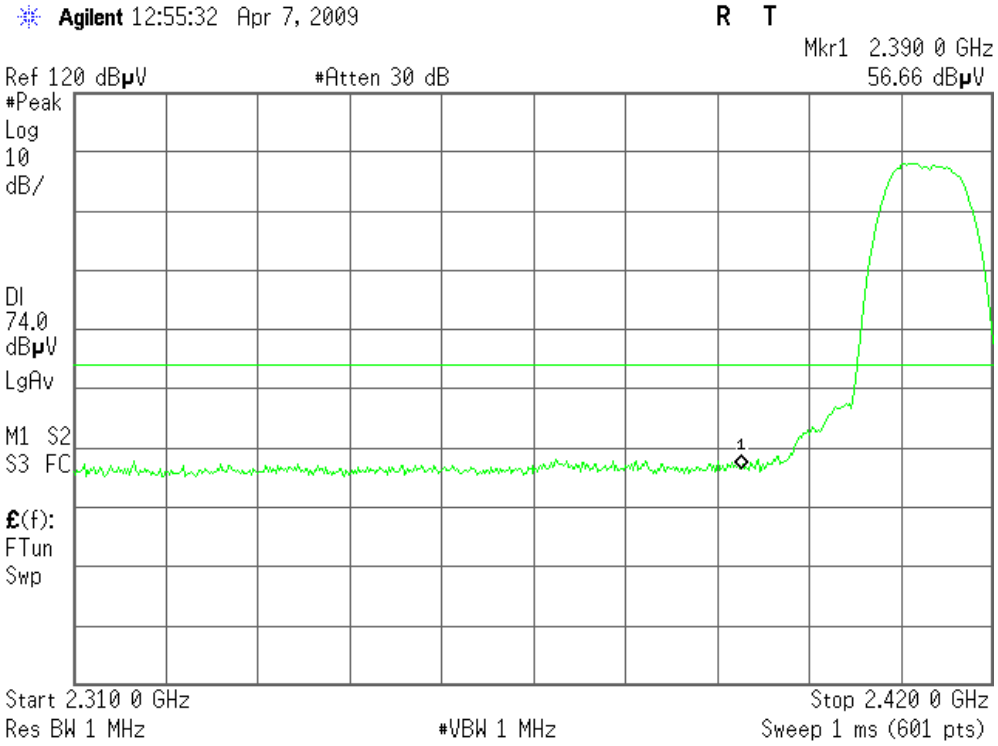
1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

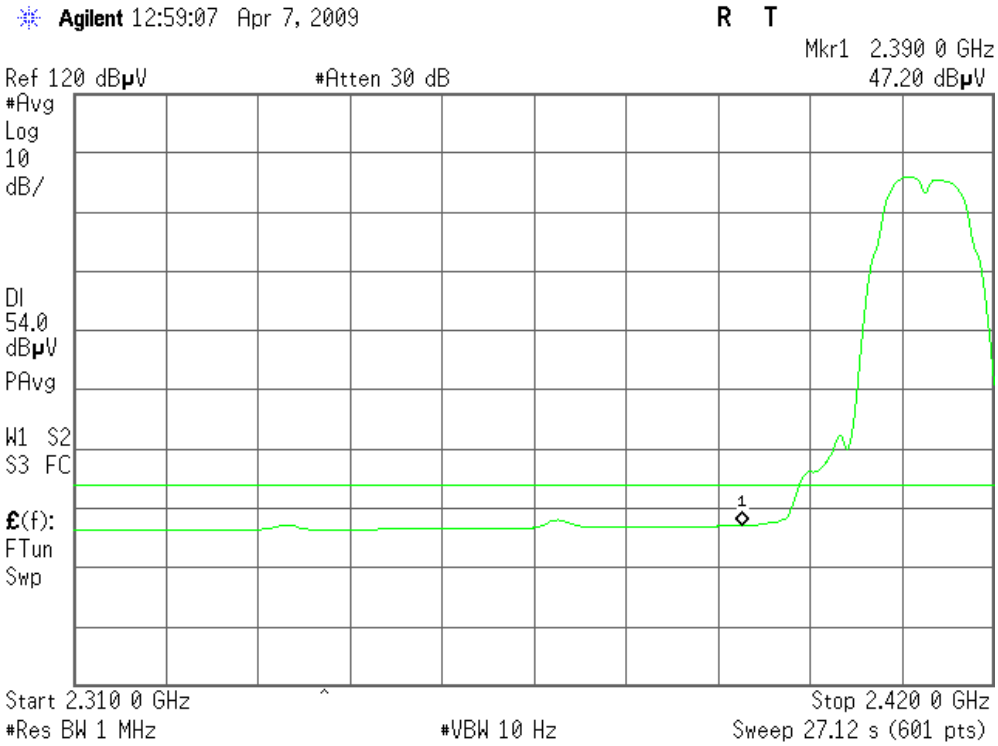
Refer to attach spectrum analyzer data chart.

Band Edges (IEEE 802.11b mode / CH Low)

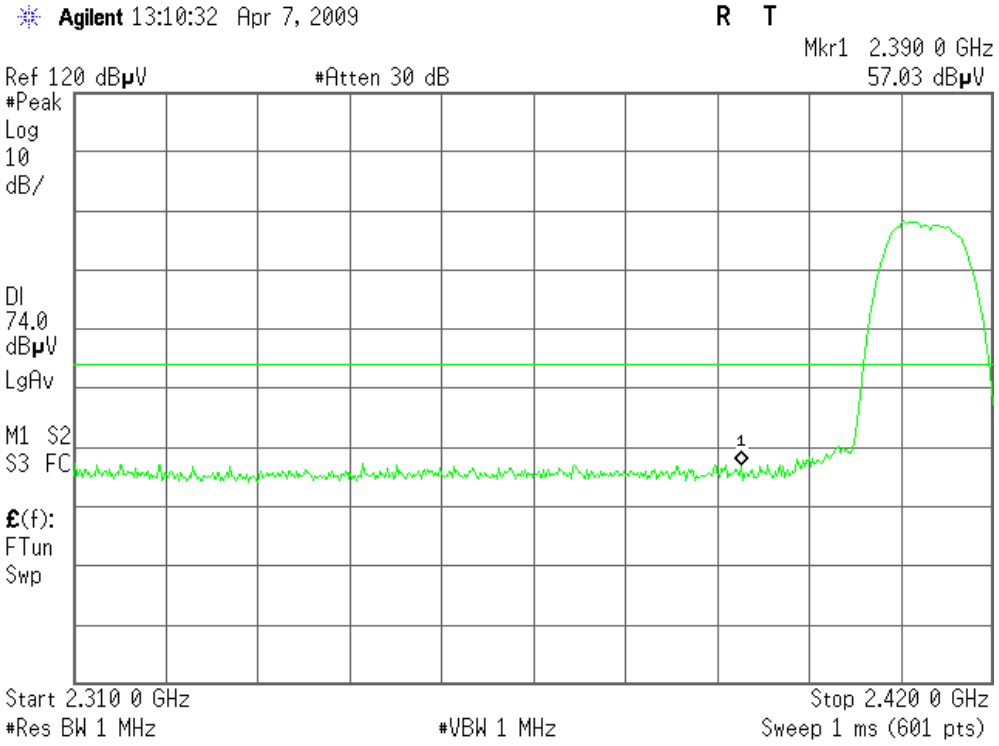
Detector mode: Peak **Polarity: Vertical**



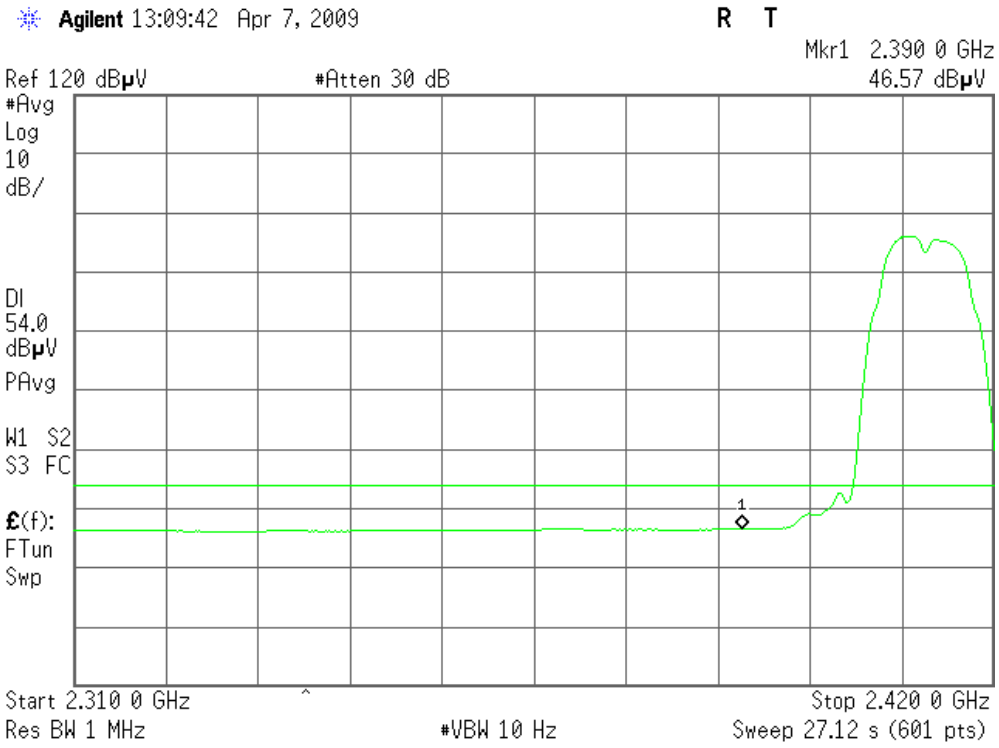
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

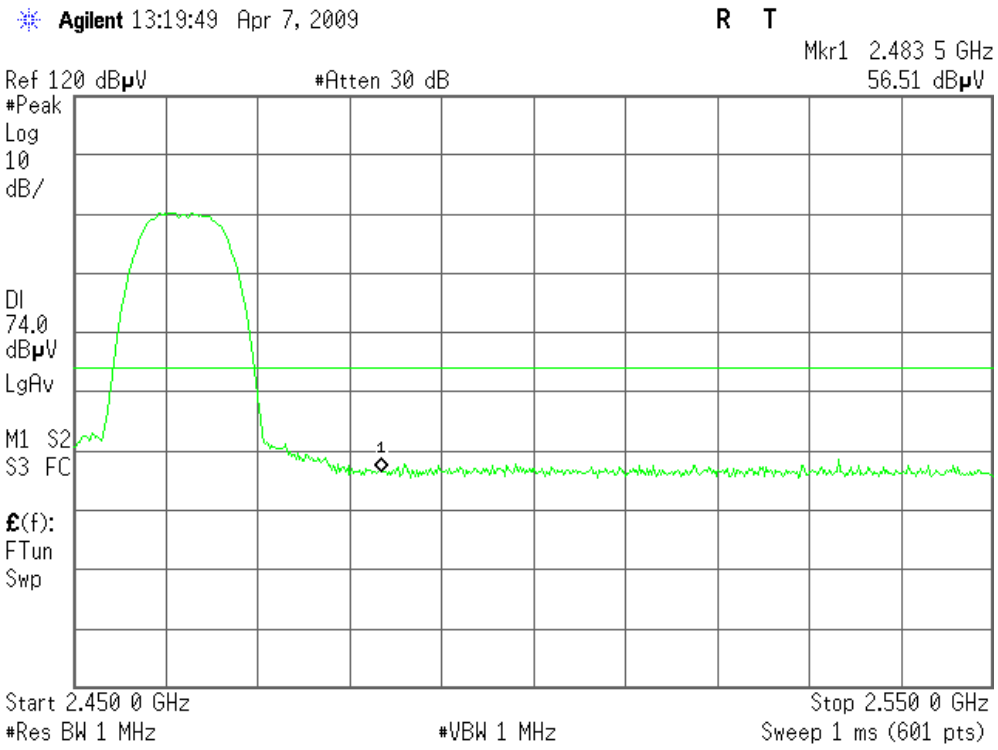


Detector mode: Average **Polarity: Horizontal**

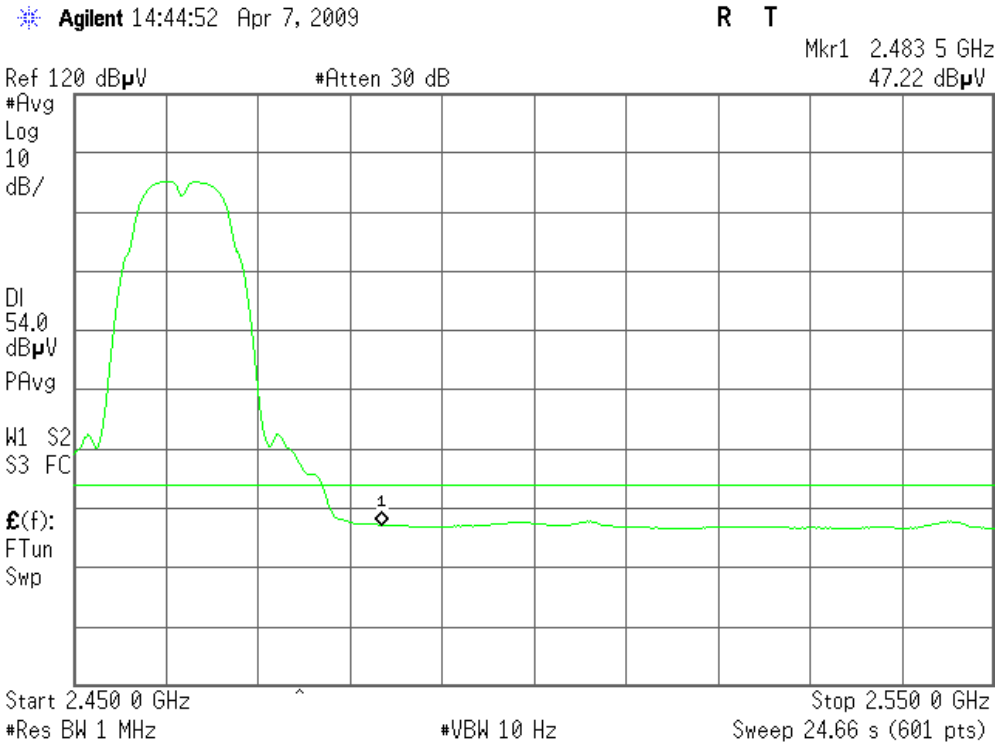


Band Edges (IEEE 802.11b mode/ CH High)

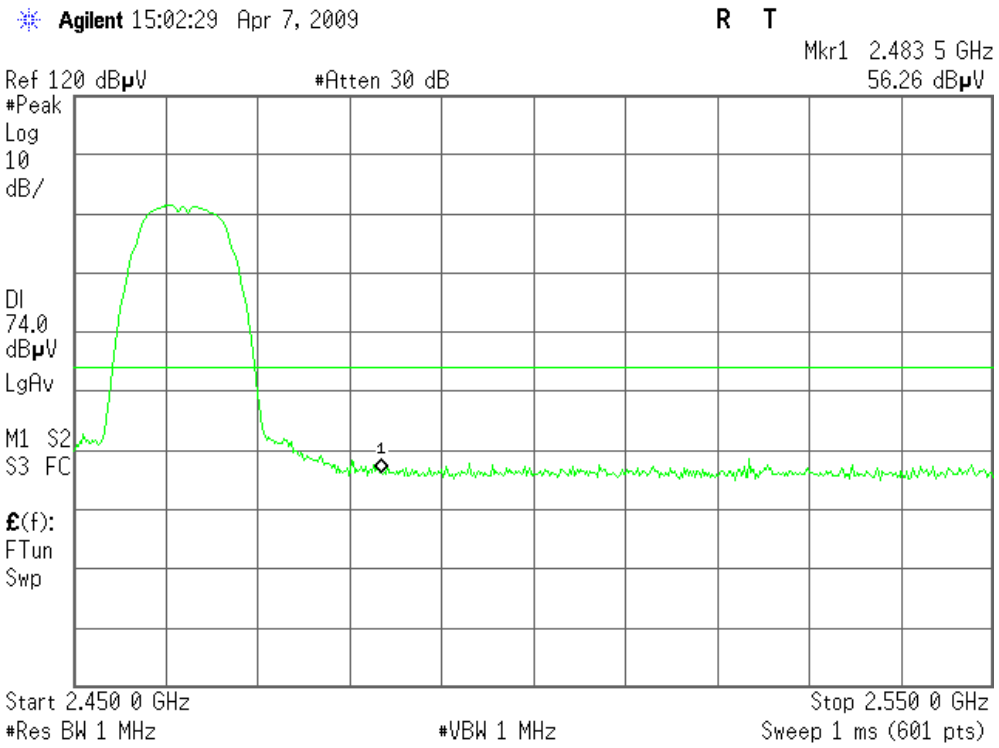
Detector mode: Peak **Polarity: Vertical**



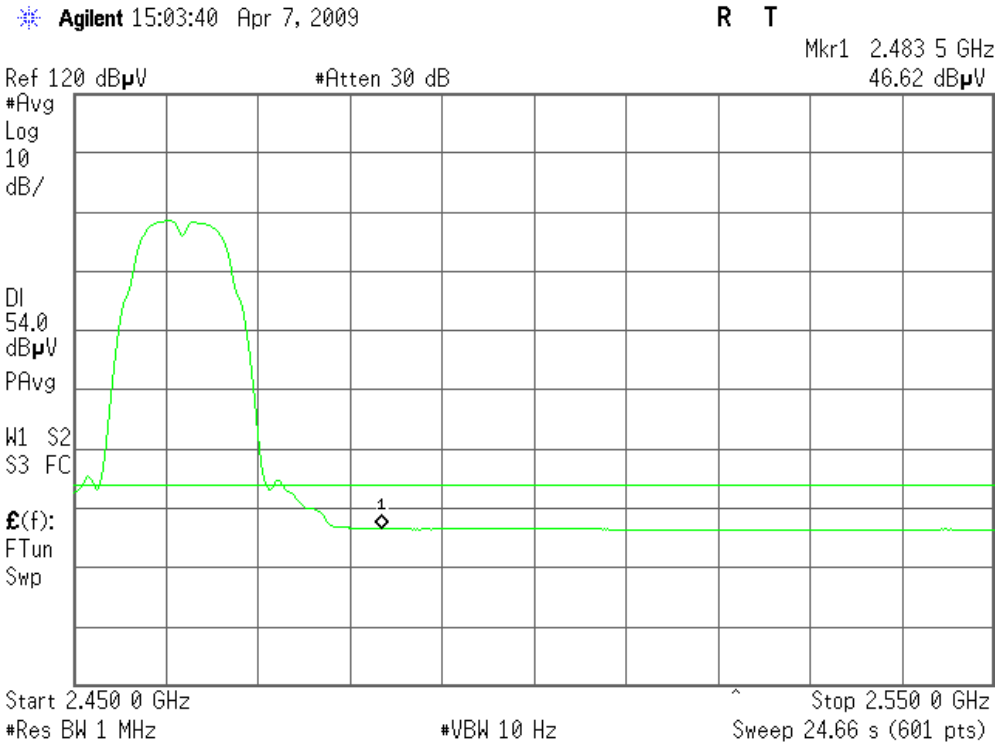
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

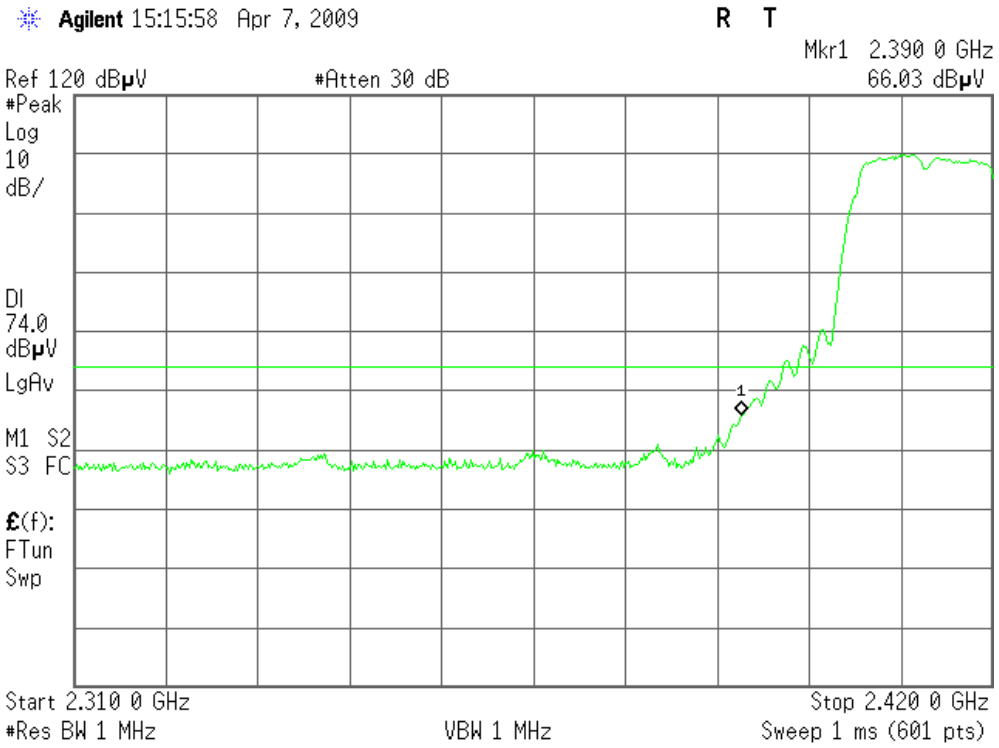


Detector mode: Average **Polarity: Horizontal**



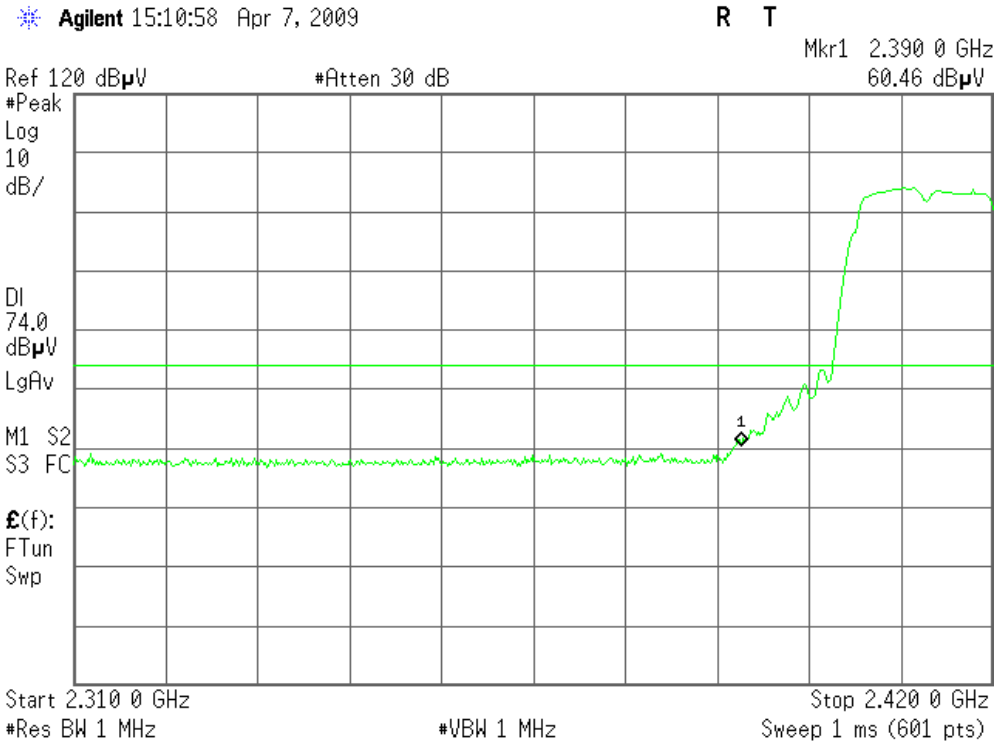
Band Edges (IEEE 802.11g mode / CH Low)

Detector mode: Peak **Polarity: Vertical**

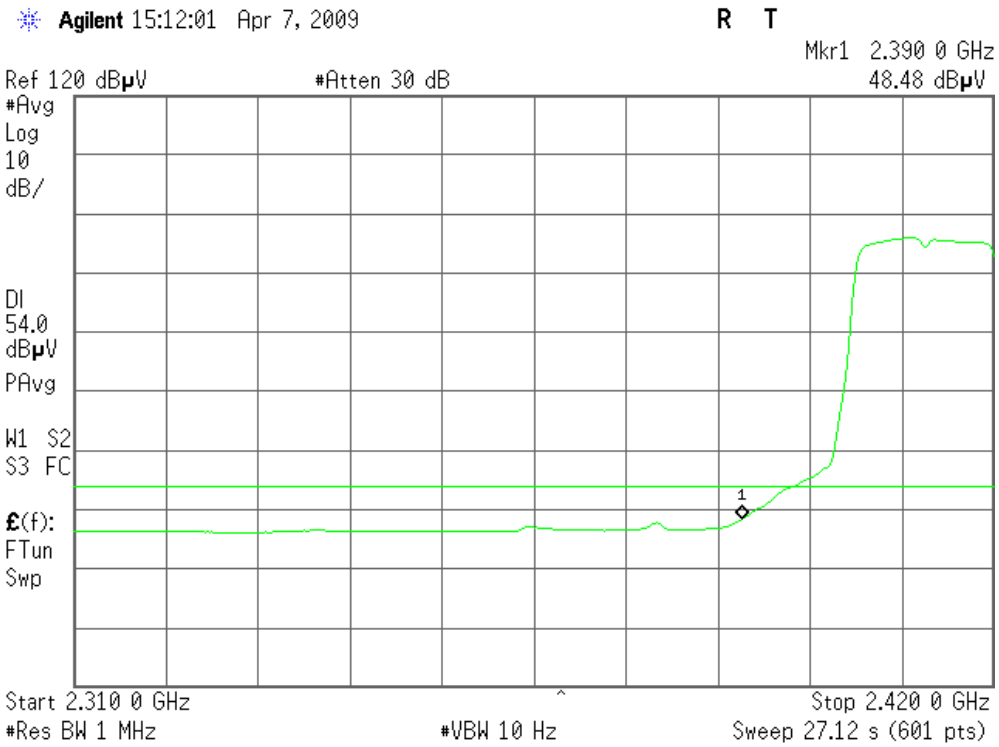


Detector mode: Average **Polarity: Vertical**

Detector mode: Peak **Polarity: Horizontal**

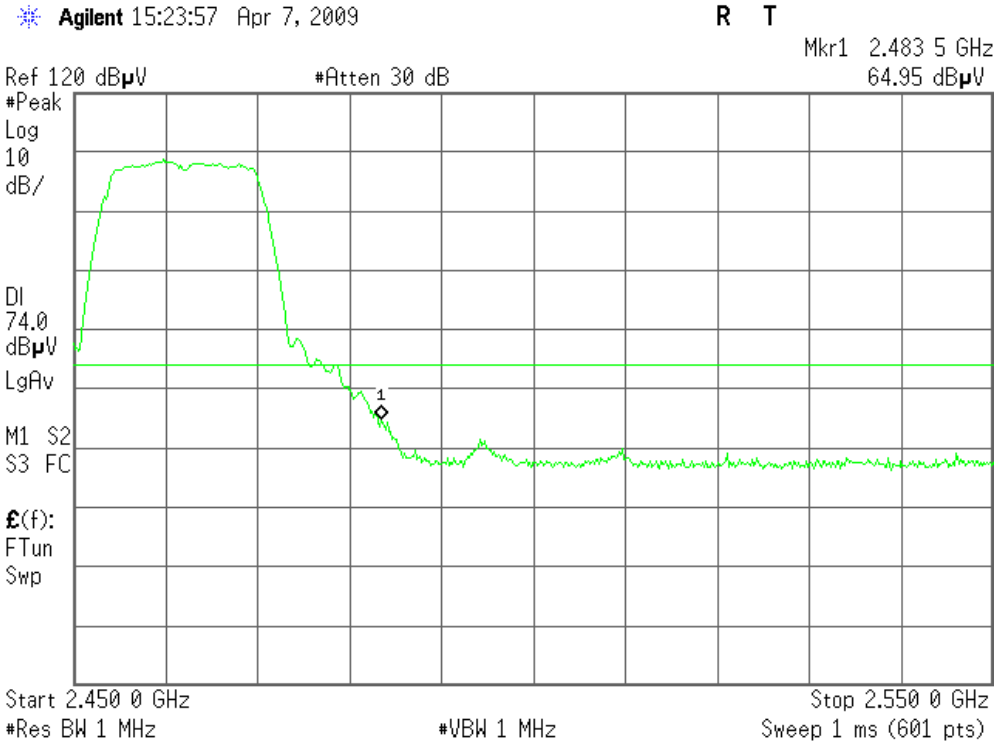


Detector mode: Average **Polarity: Horizontal**

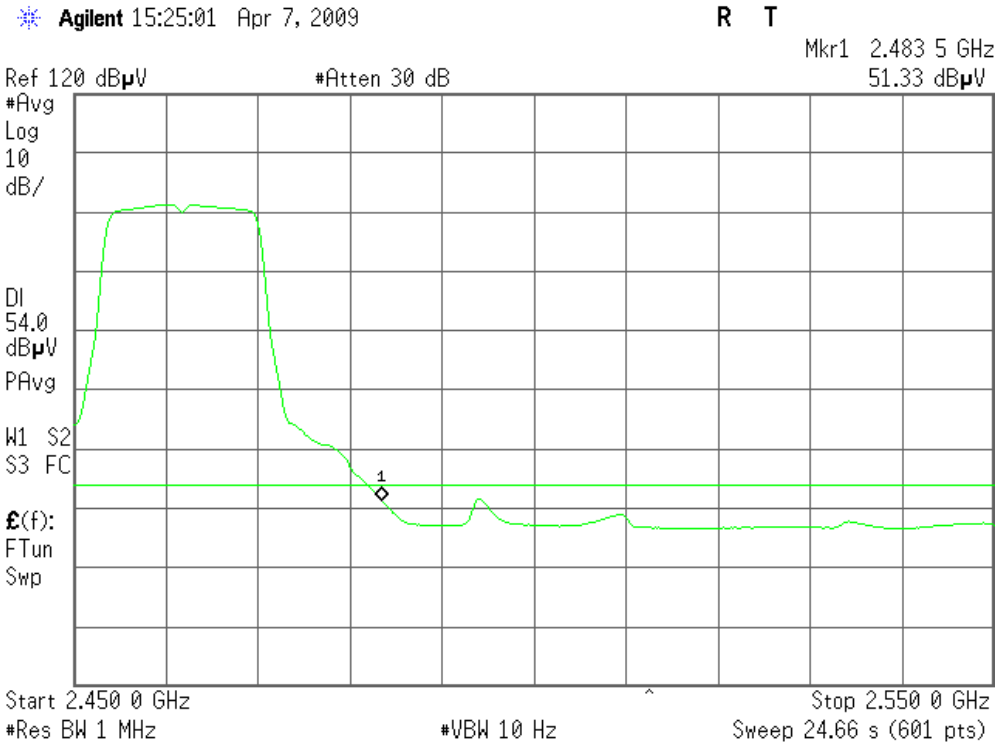


Band Edges (IEEE 802.11g mode / CH High)

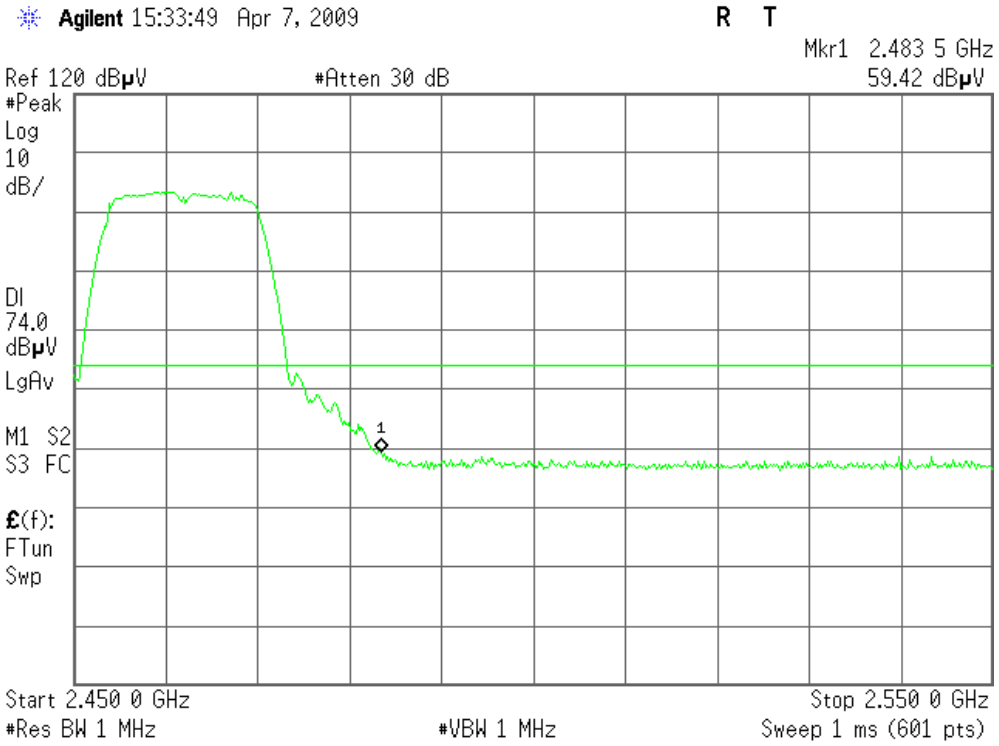
Detector mode: Peak **Polarity: Vertical**



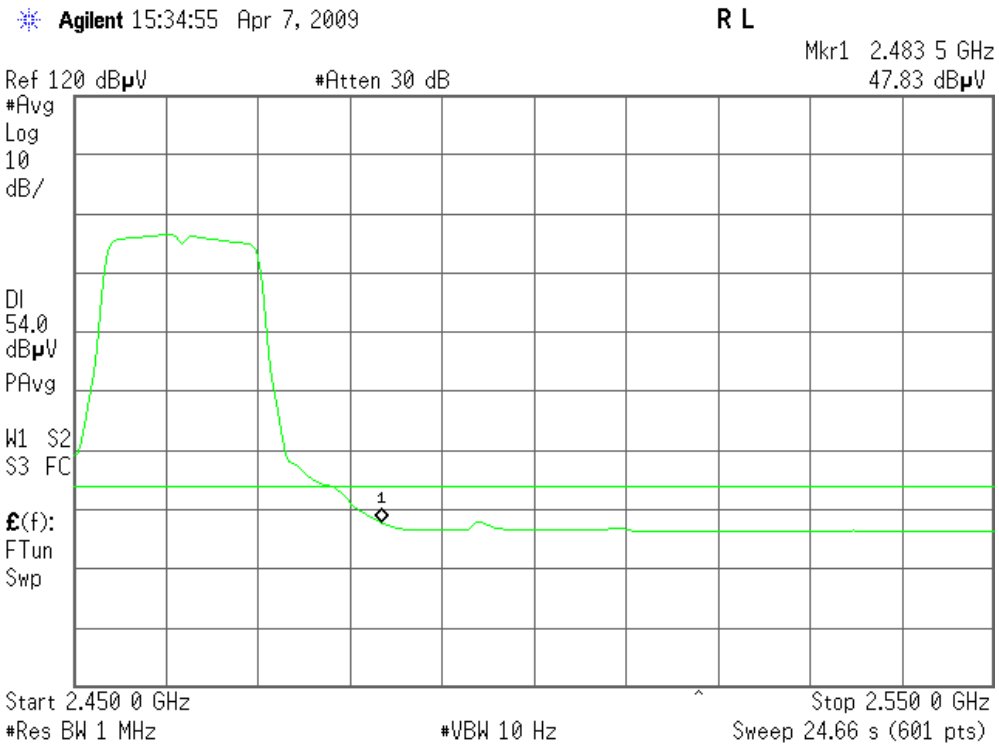
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

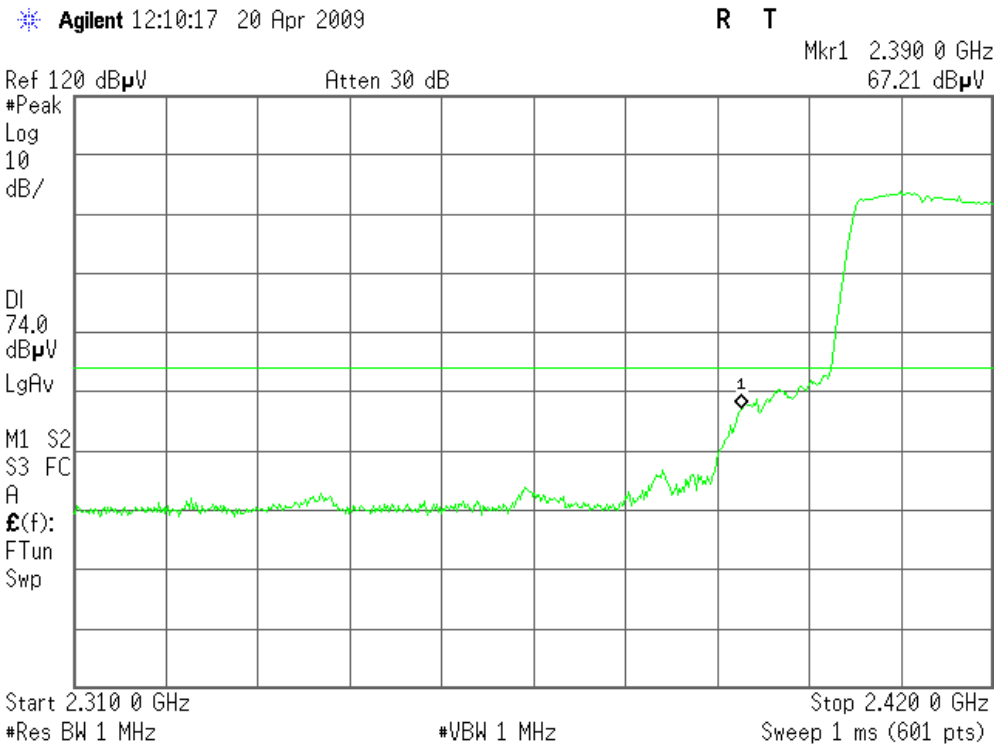


Detector mode: Average **Polarity: Horizontal**

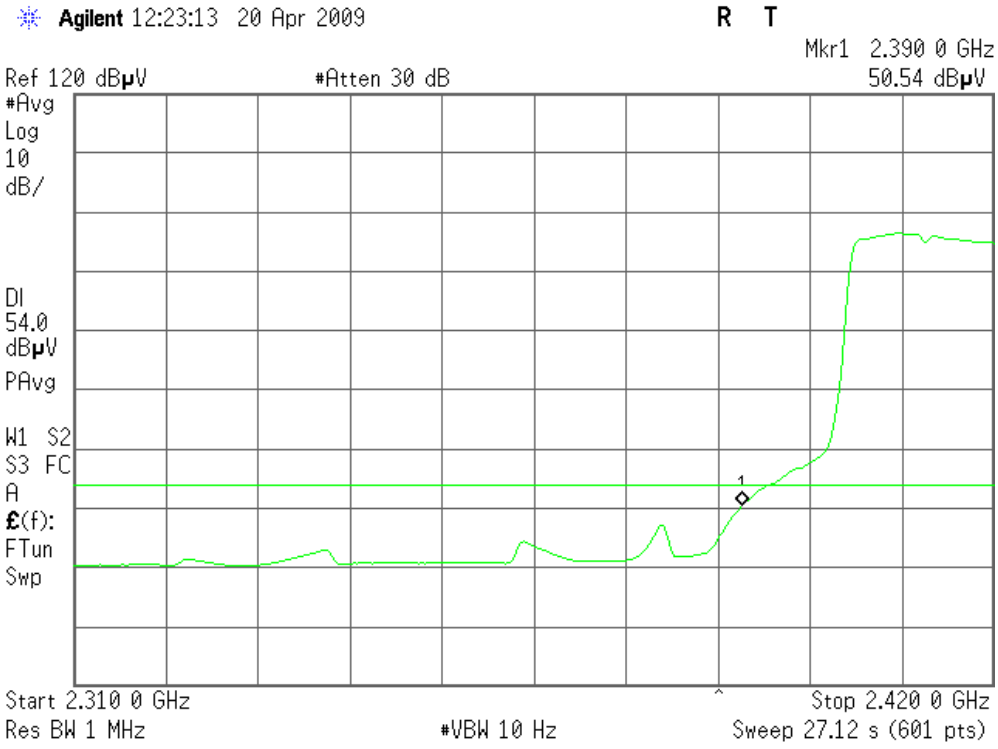


Band Edges (IEEE 802.11n HT20 MHz mode / CH Low)

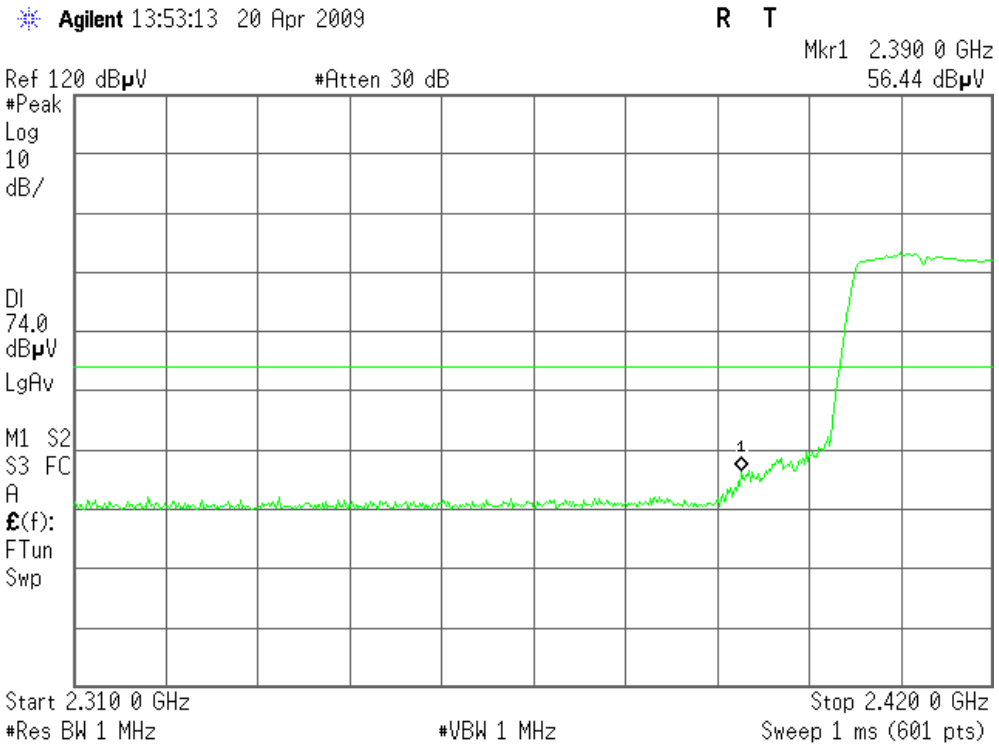
Detector mode: Peak **Polarity: Vertical**



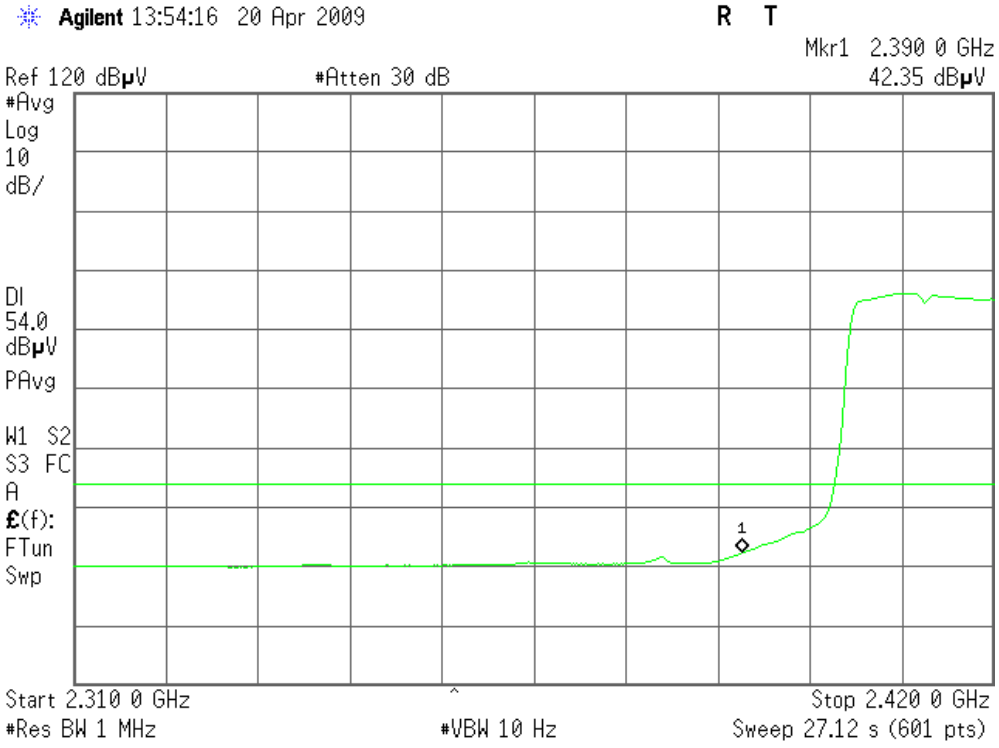
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

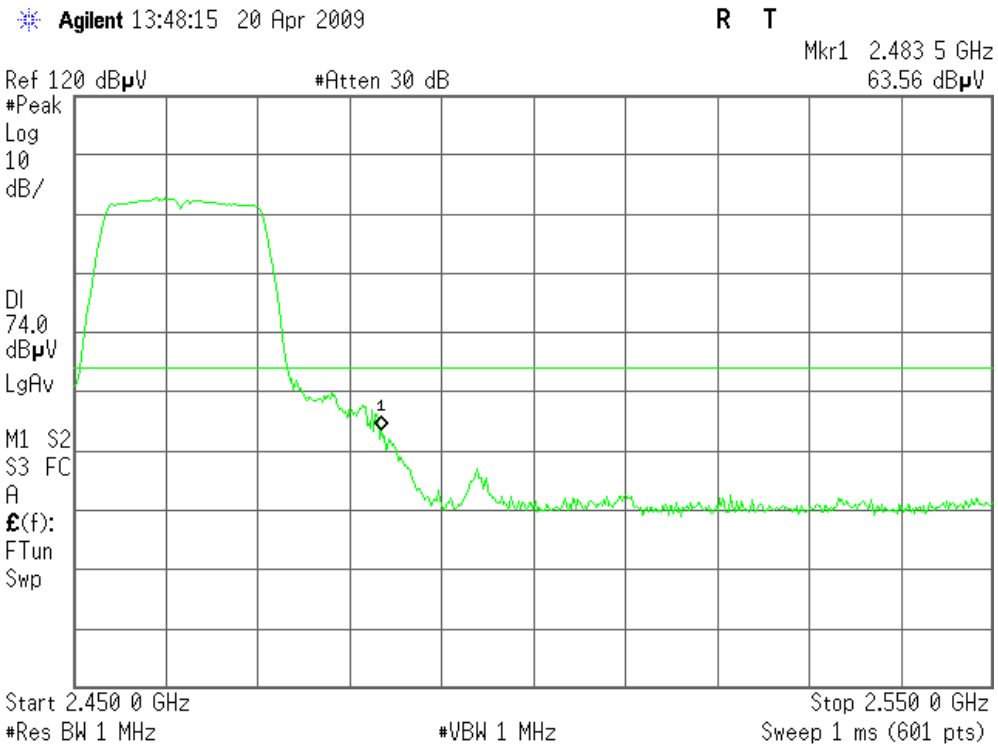


Detector mode: Average **Polarity: Horizontal**

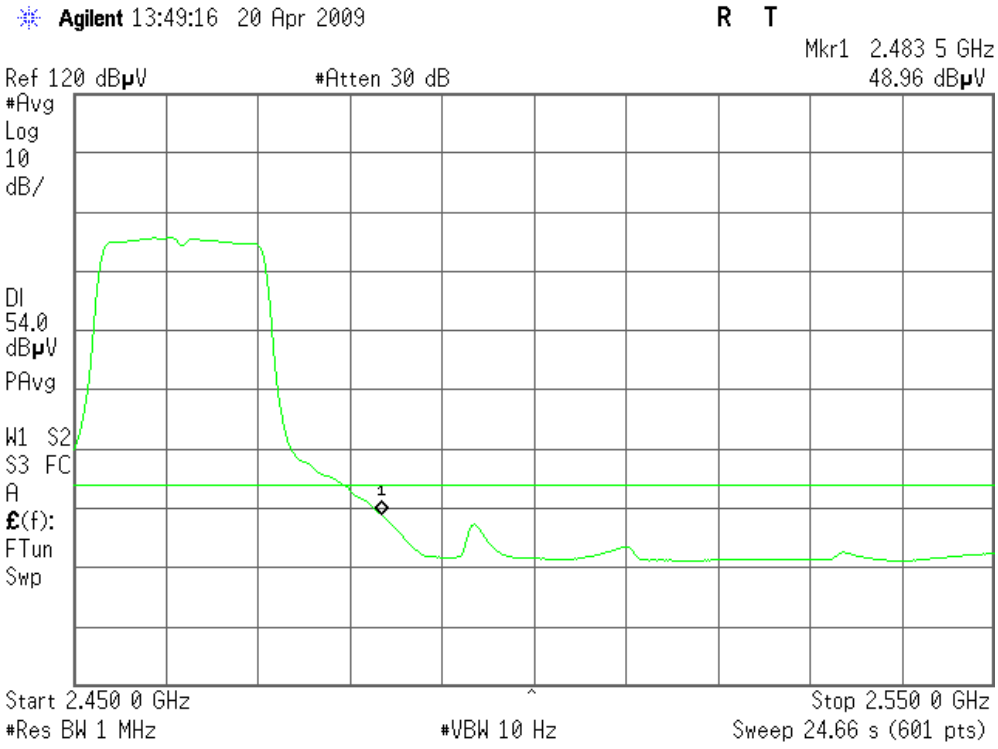


Band Edges (IEEE 802.11n HT20 MHz mode/ CH High)

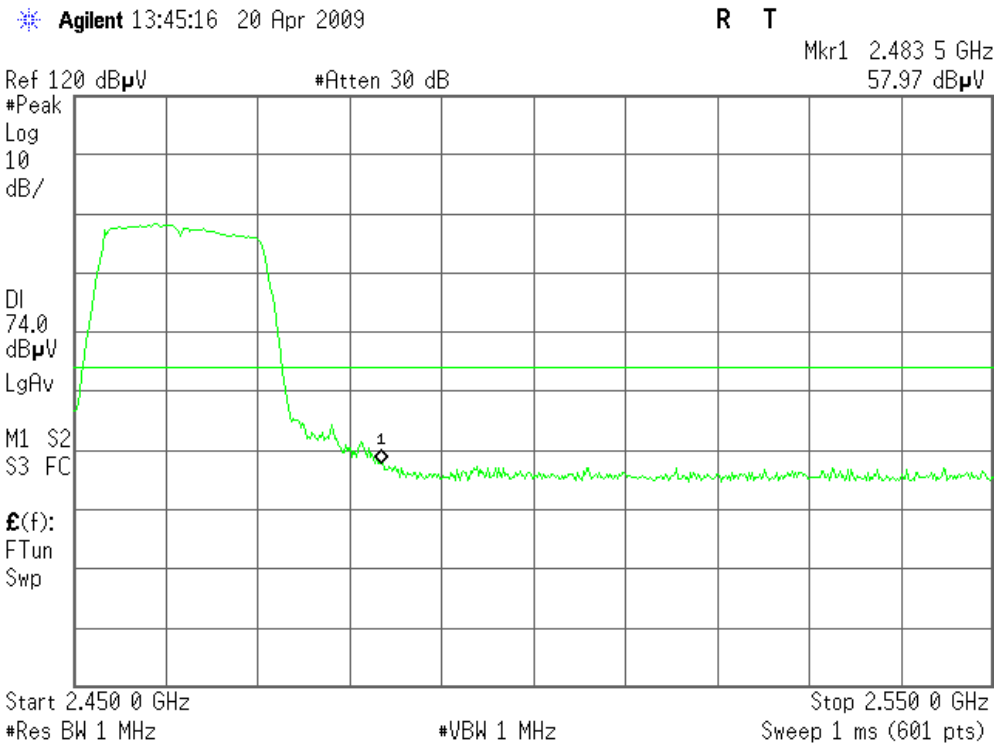
Detector mode: Peak **Polarity: Vertical**



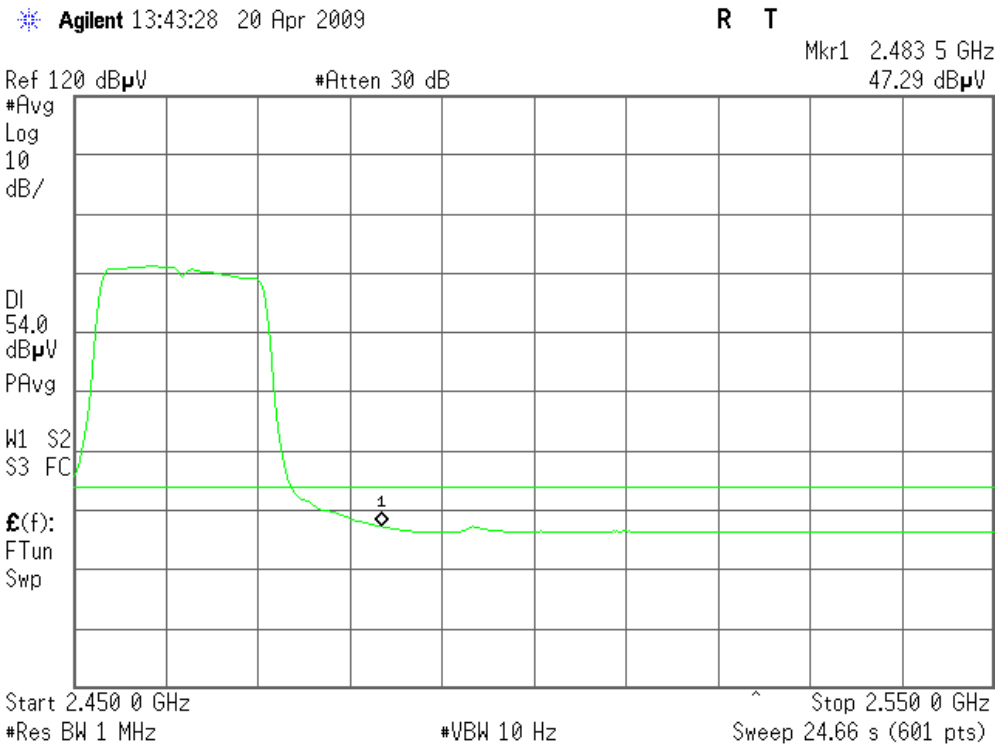
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



7.5 PEAK POWER SPECTRAL DENSITY

LIMIT

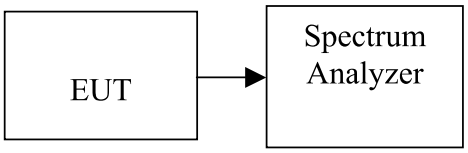
1. According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
2. According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2010

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

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
   Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

No non-compliance noted

Test Data

IEEE 802.11b mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-6.98	8.00	PASS
Mid	2437	-6.73		PASS
High	2462	-7.01		PASS

IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-22.40	8.00	PASS
Mid	2437	-21.95		PASS
High	2462	-21.73		PASS

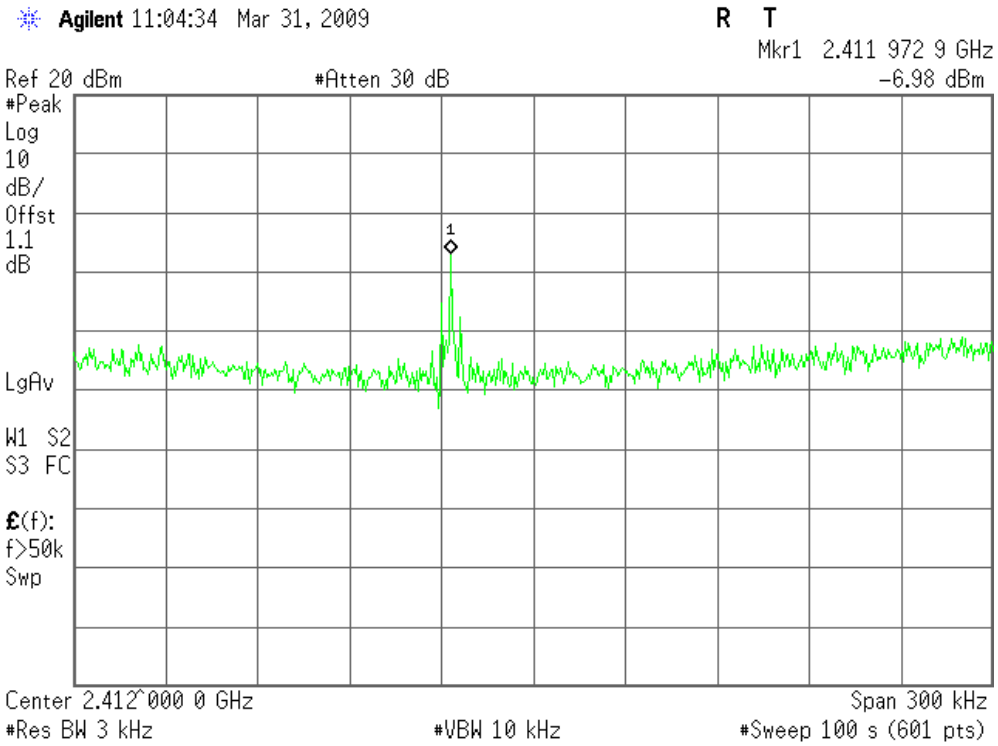
IEEE 802.11n HT20 MHz mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-22.33	8.00	PASS
Mid	2437	-22.35		PASS
High	2462	-22.29		PASS

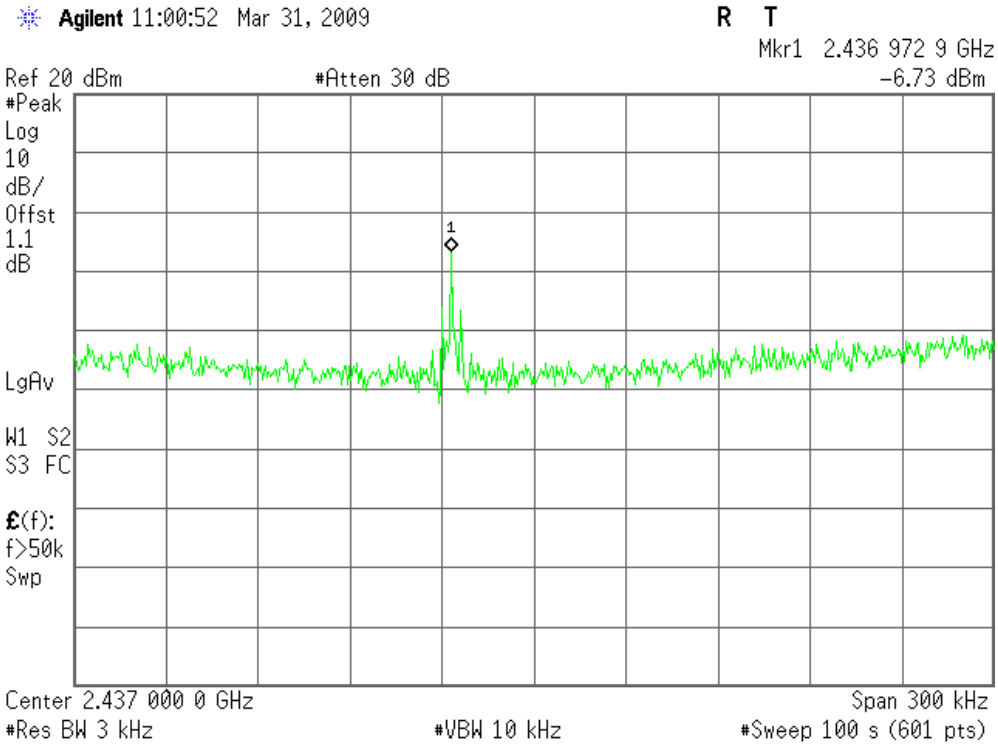
Test Plot

IEEE 802.11b mode

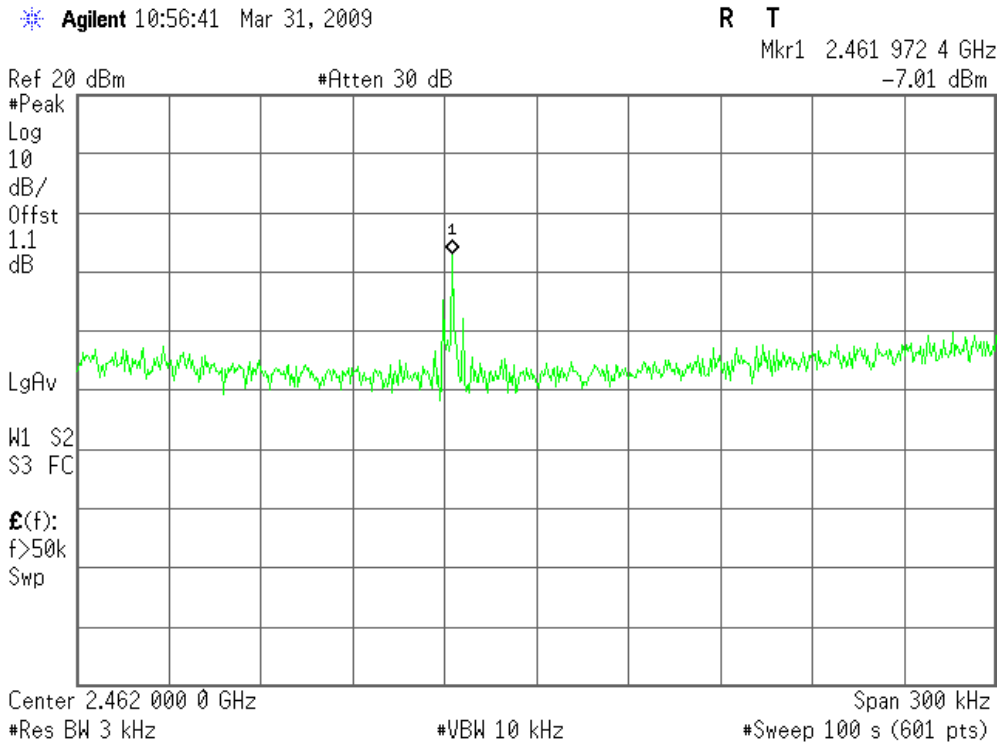
PPSD (CH Low)



PPSD (CH Mid)

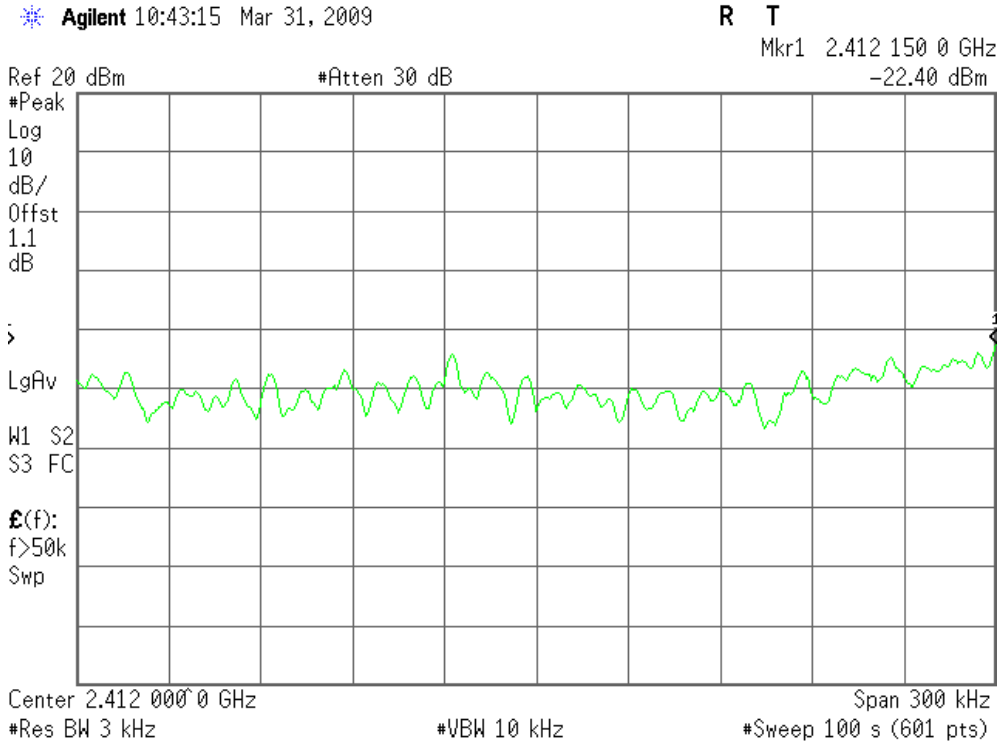


PPSD (CH High)

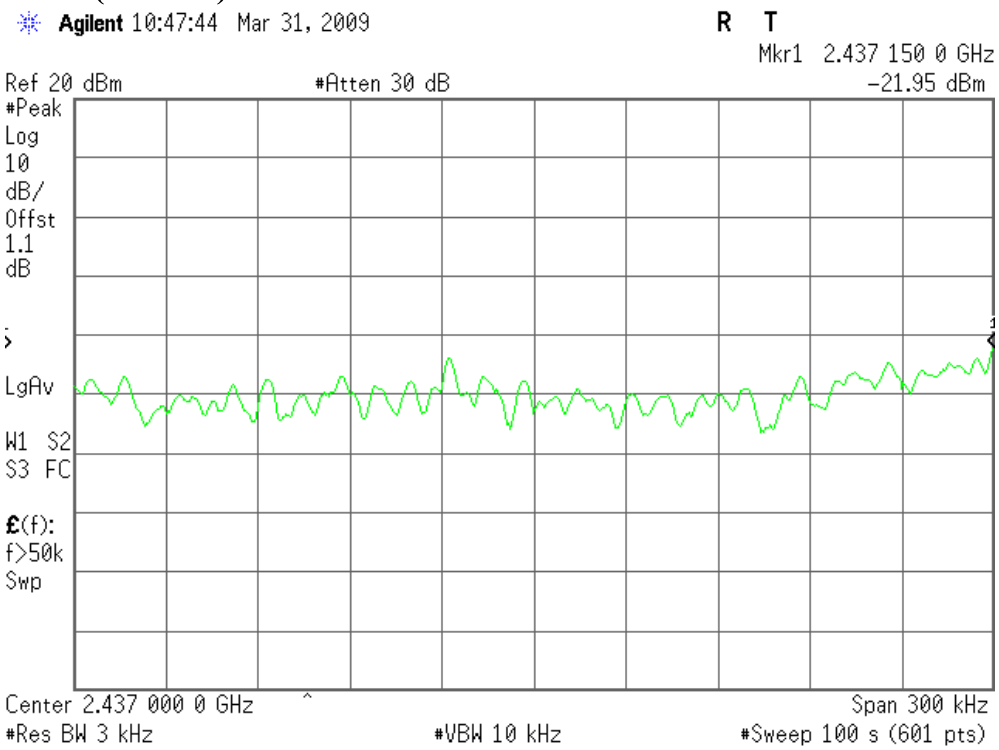


IEEE 802.11g mode

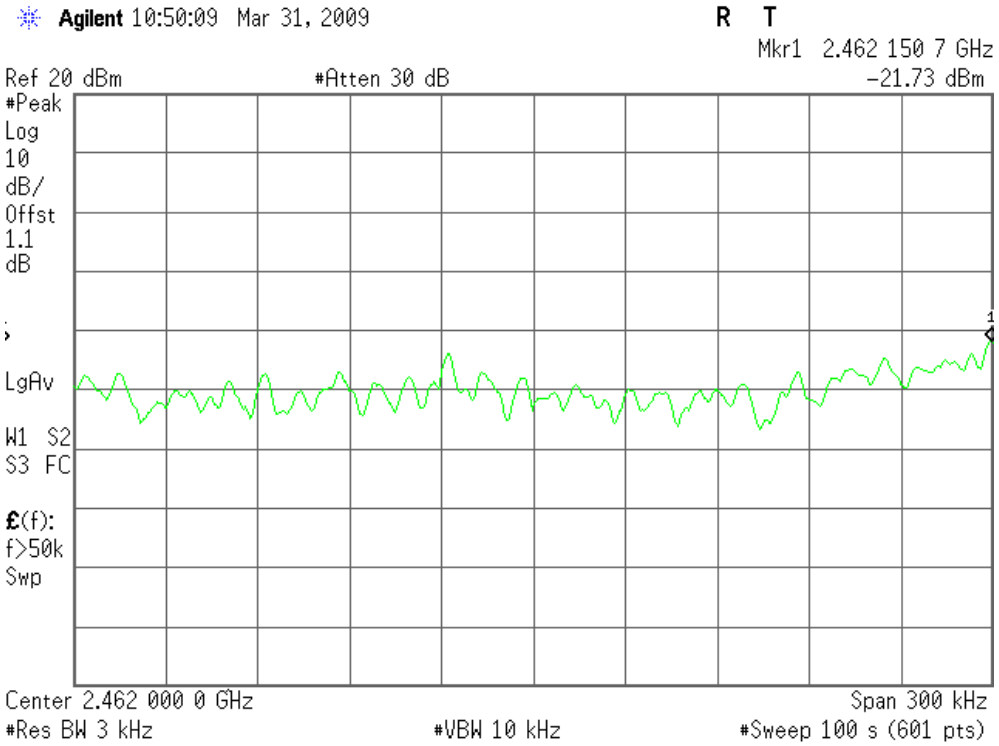
PPSD (CH Low)



PPSD (CH Mid)

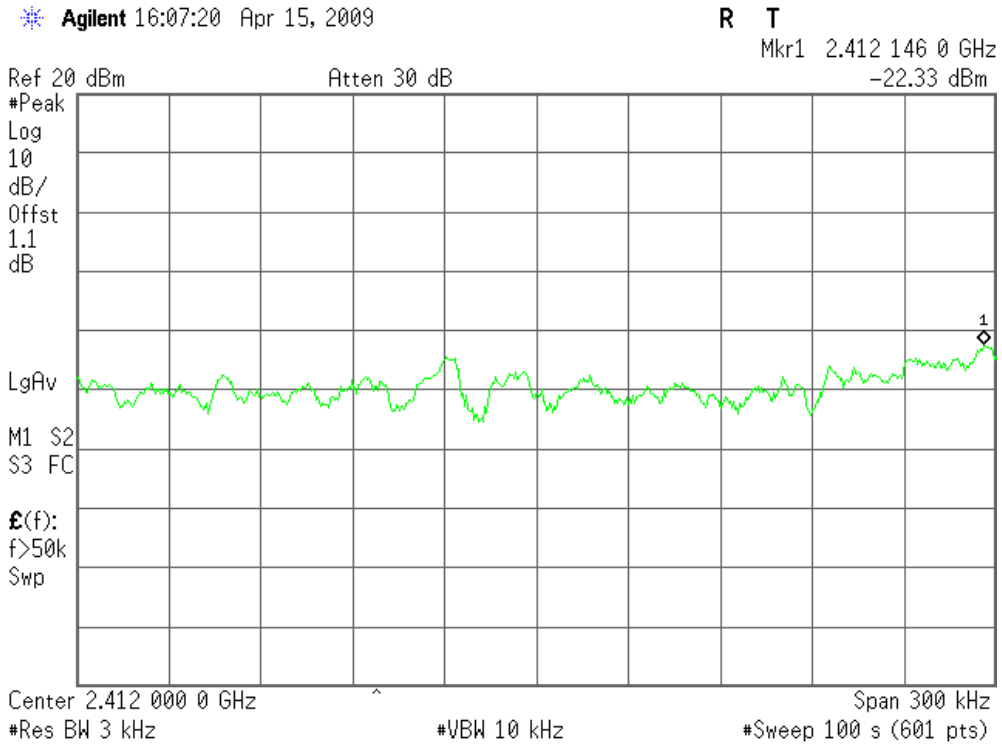


PPSD (CH High)

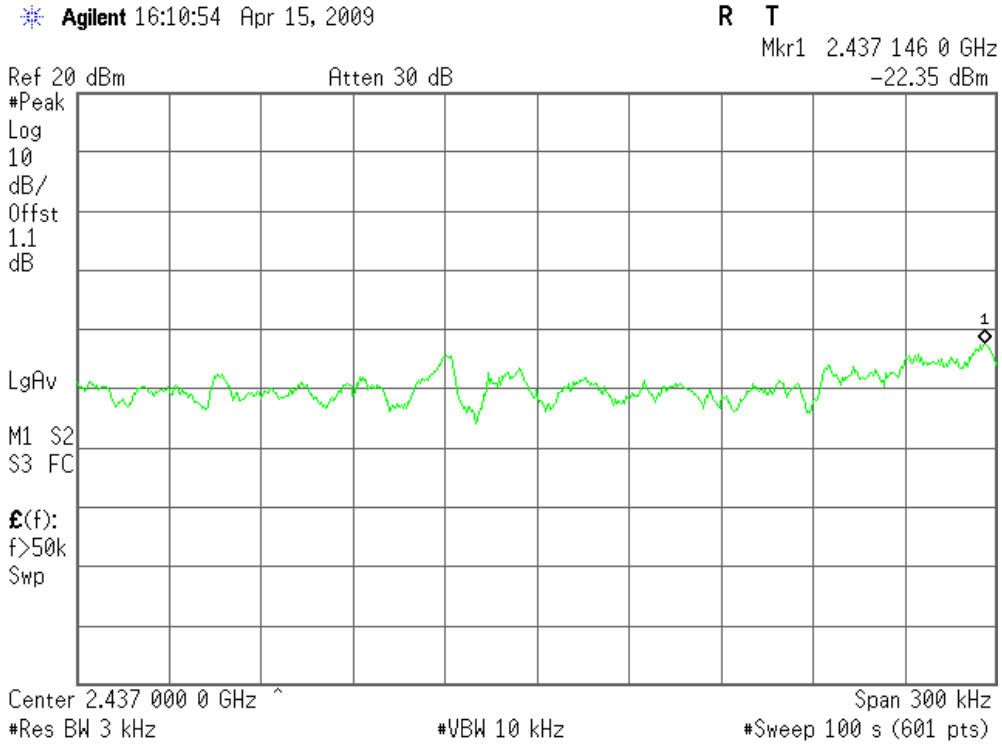


IEEE 802.11n HT20 MHz mode

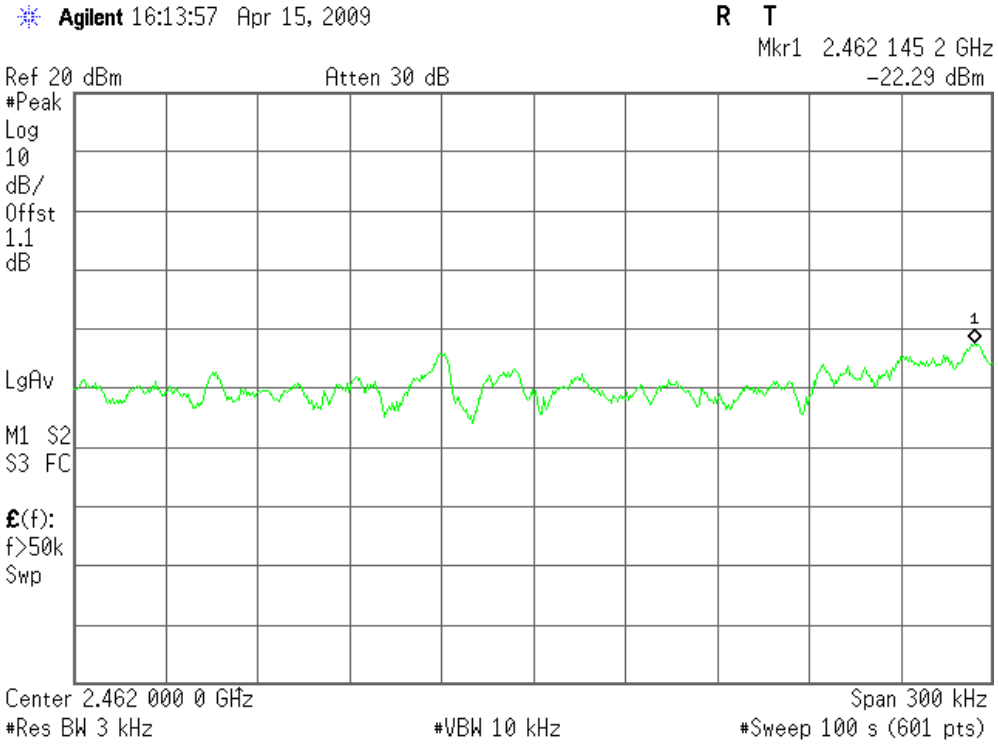
PPSD (CH Low)



PPSD (CH Mid)



PPSD (CH High)


Agilent 16:13:57 Apr 15, 2009
R T
Mkr1 2.462 145 2 GHz
-22.29 dBm
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
1.1
dB
1
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
Center 2.462 000 0 GHz
Span 300 kHz
#Res BW 3 kHz
#VBW 10 kHz
#Sweep 100 s (601 pts)

7.6 SPURIOUS EMISSIONS

7.6.1 Conducted Measurement

LIMIT

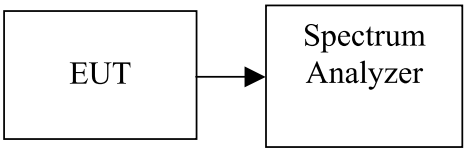
According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2010

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

Test Configuration



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 KHz. The video bandwidth is set to 100 KHz.

Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

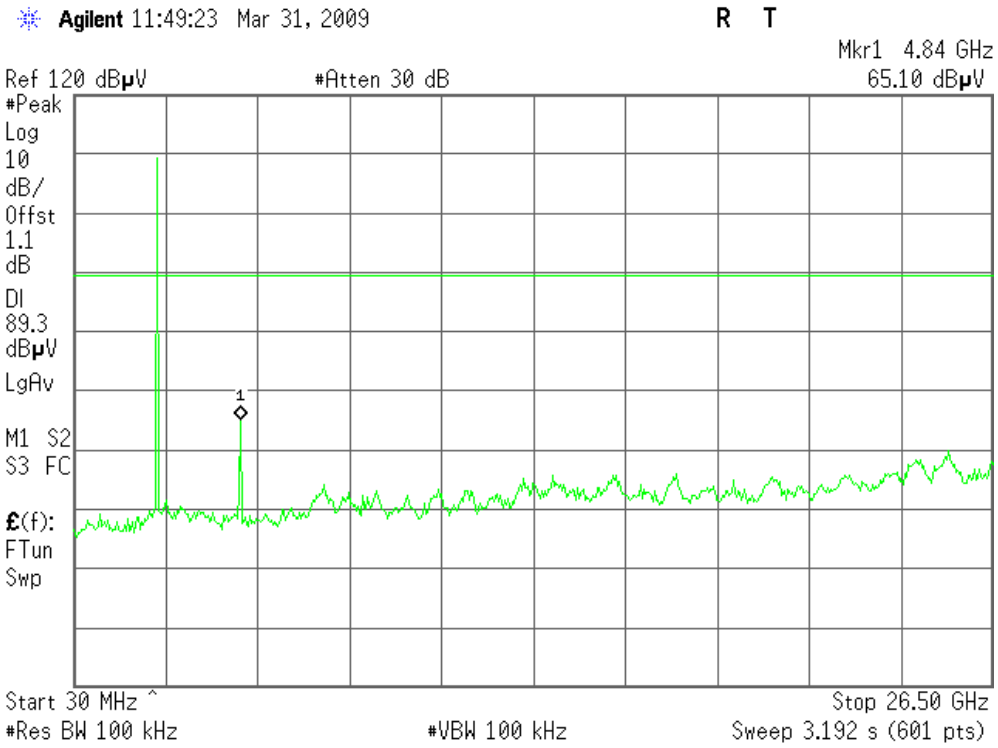
TEST RESULTS

No non-compliance noted

Test Plot

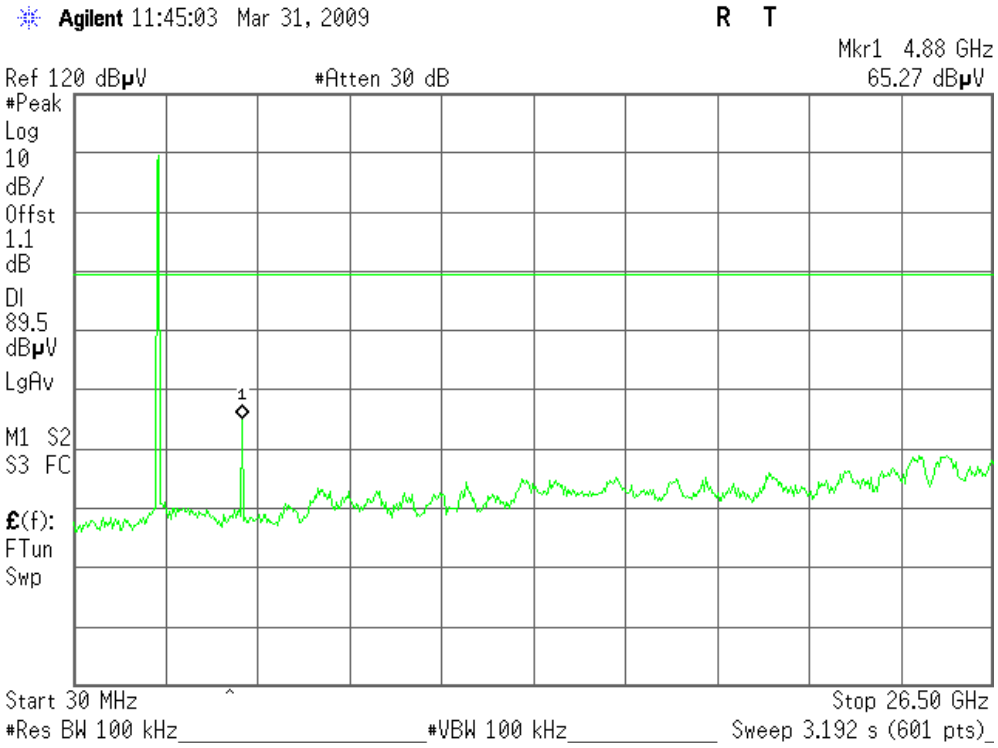
IEEE 802.11b mode / CH Low

30MHz ~ 26.5GHz



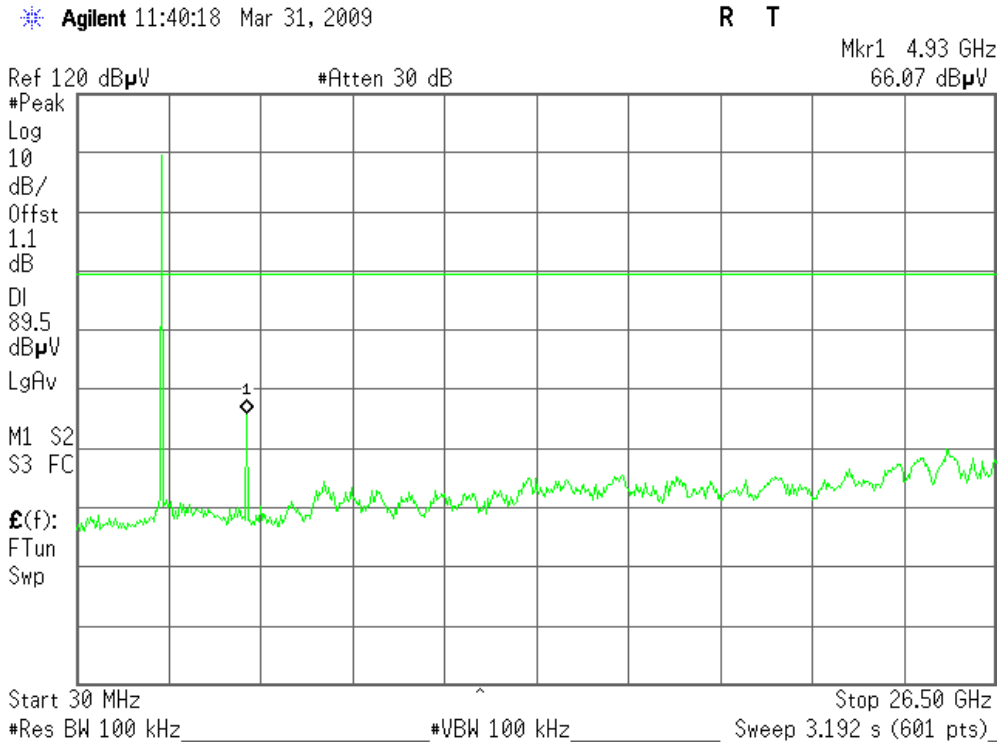
IEEE 802.11b mode / CH Mid

30MHz ~ 26.5GHz



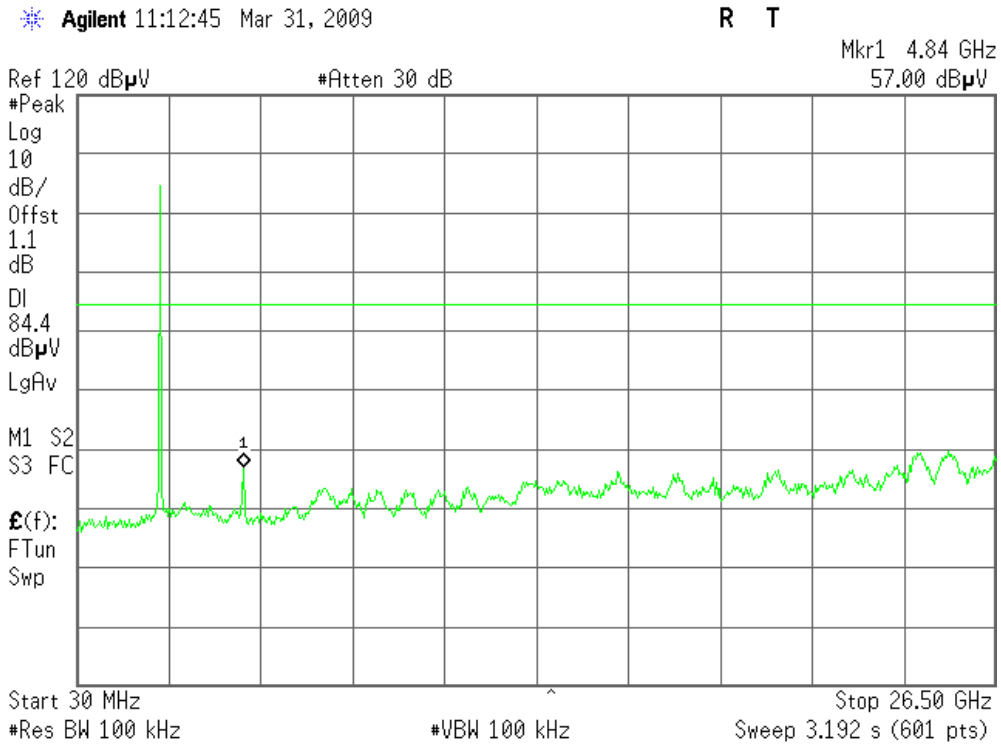
IEEE 802.11b mode / CH High

30MHz ~ 26.5GHz



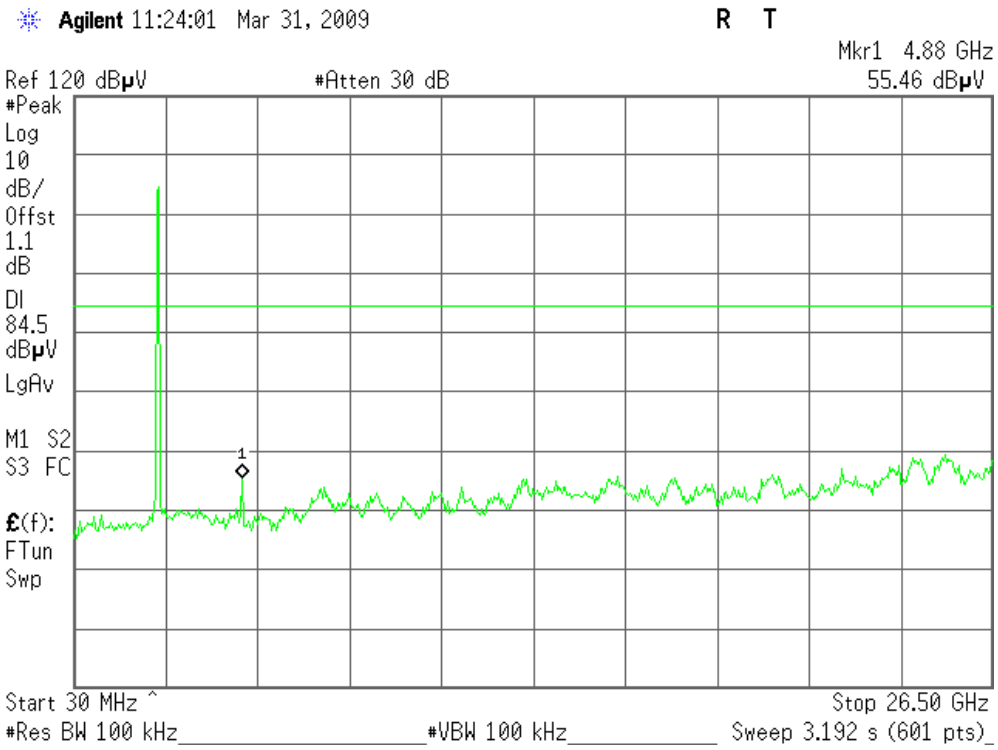
IEEE 802.11g mode/ CH Low

30MHz ~ 26.5GHz



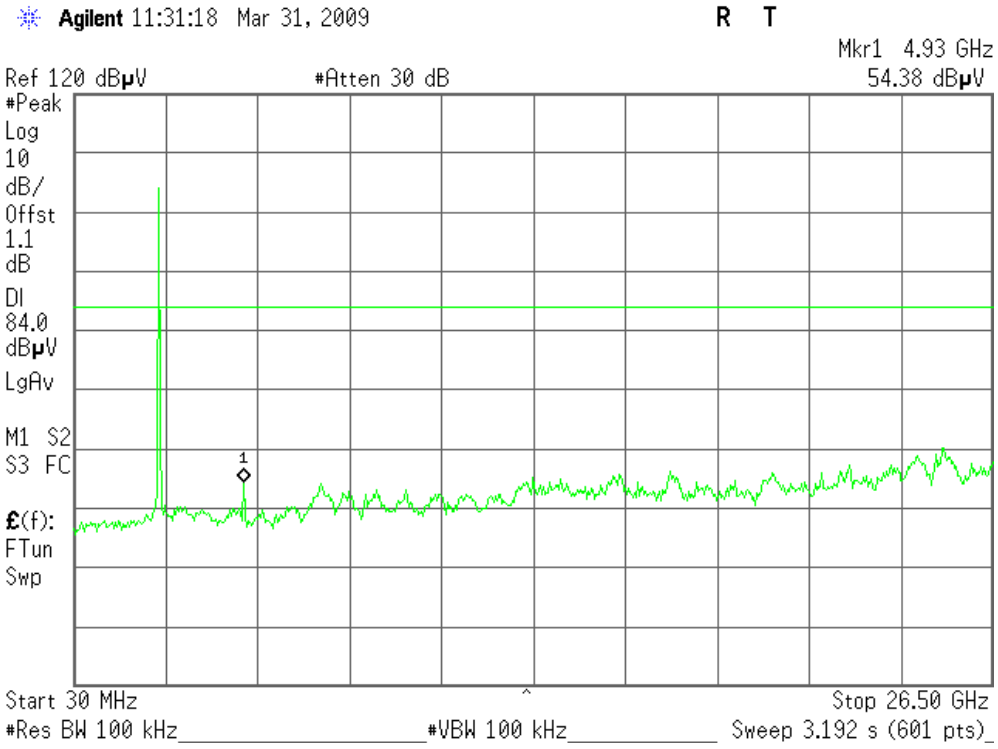
IEEE 802.11g / CH Mid

30MHz ~ 26.5GHz



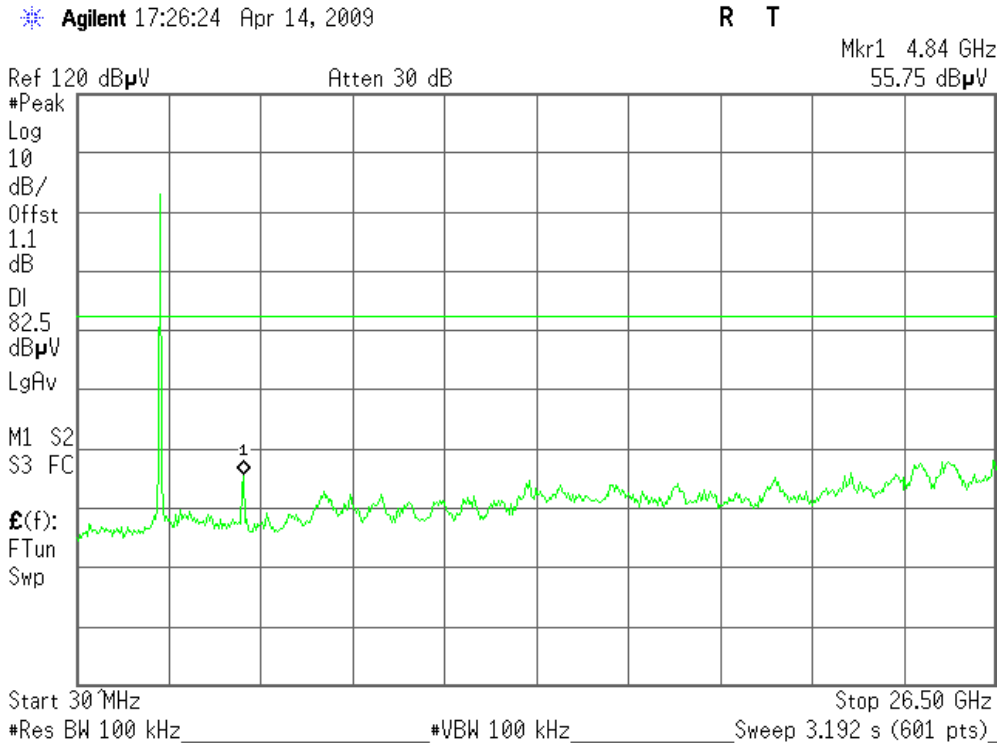
IEEE 802.11g / CH High

30MHz ~ 26.5GHz



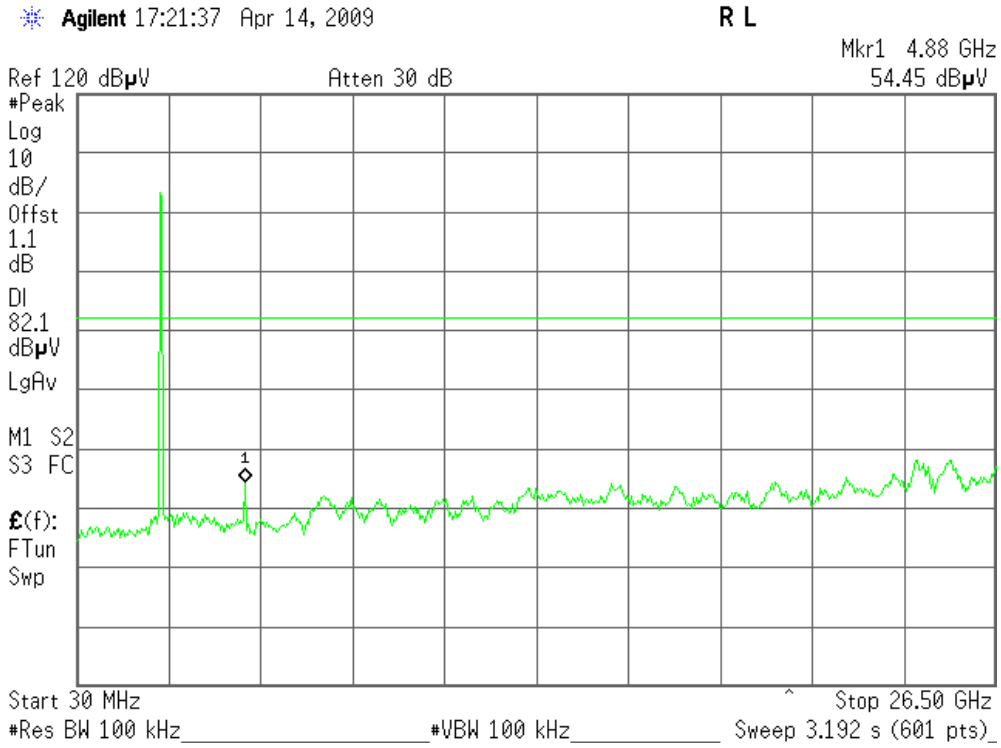
IEEE 802.11n HT20 MHz mode / CH Low

30MHz ~26.5GHz



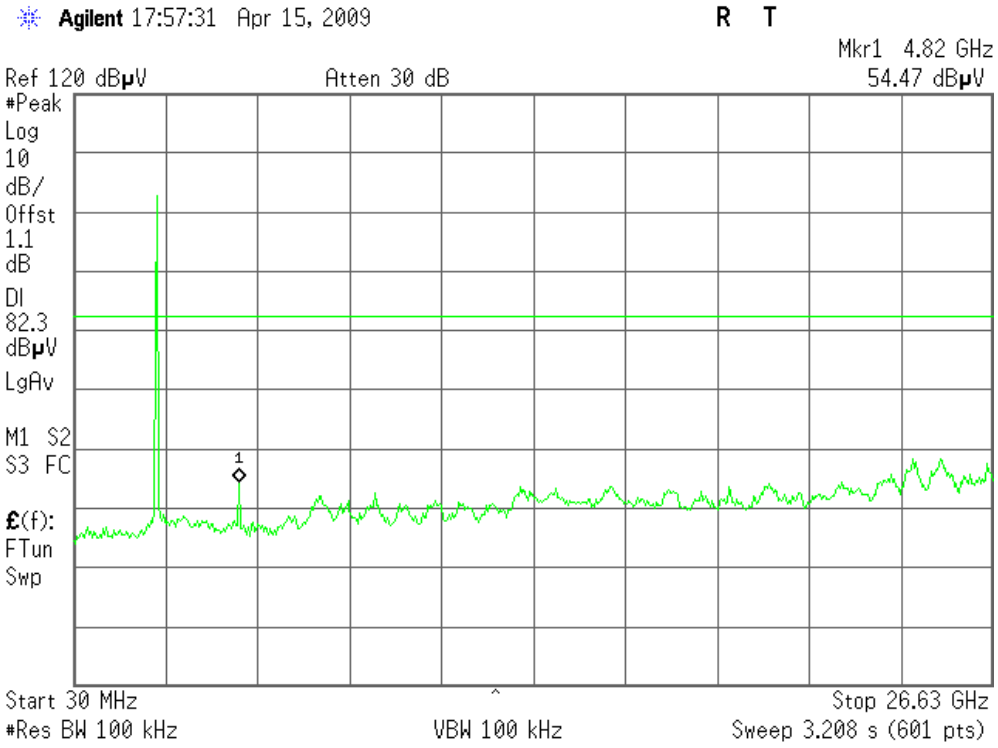
IEEE 802.11n HT20 MHz mode/ CH Mid

30MHz ~26.5GHz



IEEE 802.11n HT20 MHz mode / CH High

30MHz ~26.5GHz



7.6.2 Radiated Emissions

LIMIT

1. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Note: *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.*

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

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

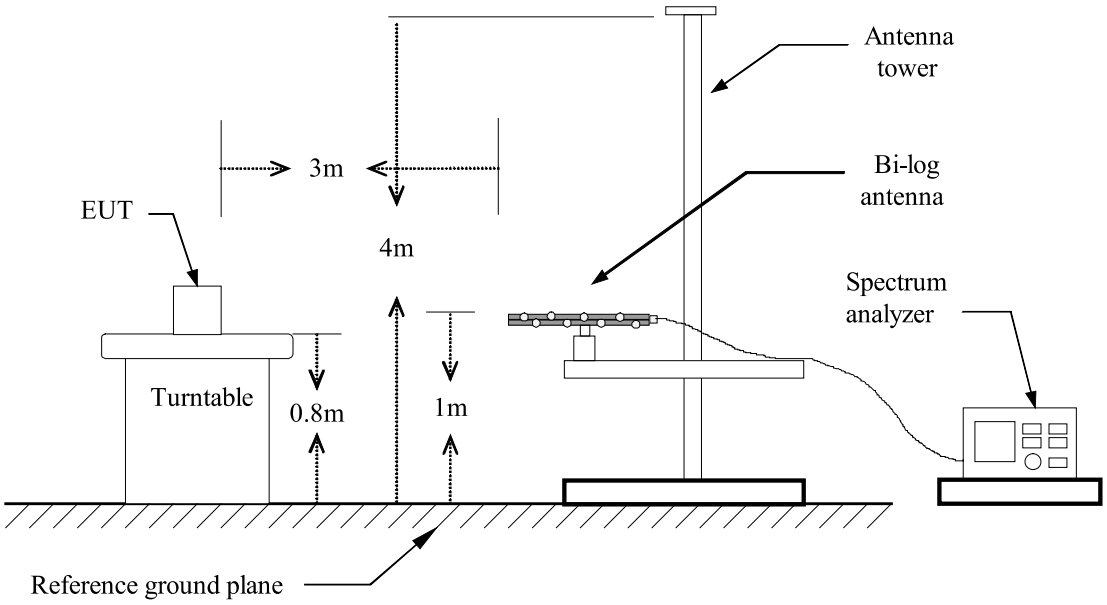
MEASUREMENT EQUIPMENT USED

966 RF CHAMBER (2)					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL. DUE**
ESCI EMI TEST RECEIVE.ESCI	ROHDE&SCHWARZ	1166.5950 03	100783	03/20/2009	03/20/2010
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2009	03/01/2010
Low Noise Amplifier	MITEQ	AM-1604-3000	1123808	02/06/2009	02/06/2010
Turn Table	EMCO	2081-1.21	N/A	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
High Noise Amplifier	Agilent	8449B	3008A01838	05/29/2009	05/29/2010
Site NSA	C&C	N/A	N/A	N.C.R	N.C.R
BILOG ANTENNA	SCHAFFNER	CBL6143	5082	06/08/2008	06/09/2009
Horn Antenna	SCHAFFNER	BBHA9120D	1201	03/19/2009	03/19/2010
Signal Generator	Anritsu	MG3694A	#050125	03/01/2009	03/01/2010

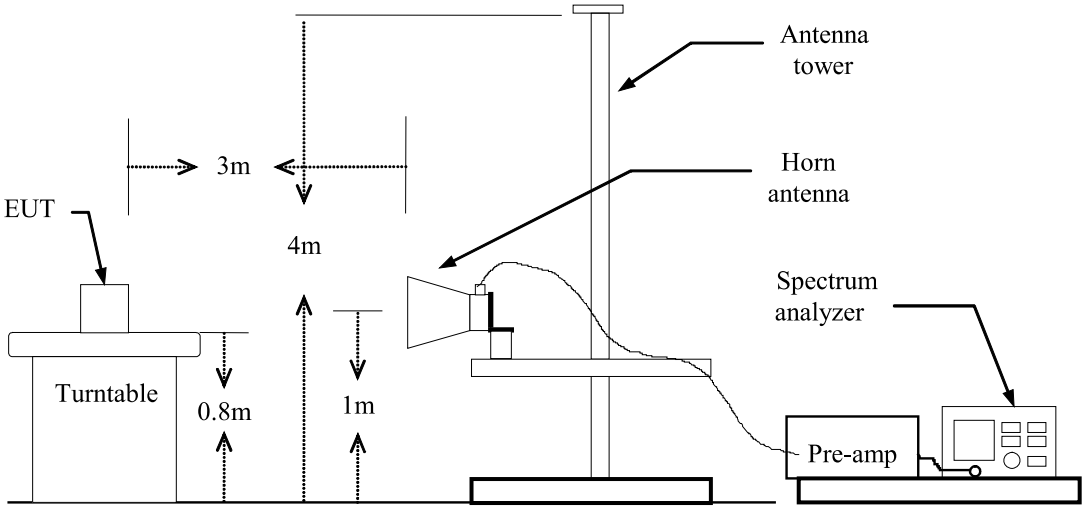
Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration

Below 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

Below 1 GHz

Operation Mode: Normal link **Test Date:** May 23, 2009

Temperature: 25°C **Tested by:** Breeze Jiang

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
142.004	V	Quasi-Peak	47.39	-20.04	27.35	43.50	-16.15
217.755	V	Quasi-Peak	43.16	-17.74	25.42	46.00	-20.58
278.897	V	Quasi-Peak	42.98	-16.05	26.93	46.00	-19.07
431.863	V	Quasi-Peak	47.94	-11.60	36.34	46.00	-9.66
566.533	V	Quasi-Peak	44.84	-8.56	36.28	46.00	-9.72
701.202	V	Quasi-Peak	43.68	-5.56	38.12	46.00	-7.88
220.460	H	Quasi-Peak	52.06	-17.68	34.38	46.00	-11.62
253.466	H	Quasi-Peak	54.62	-16.66	37.96	46.00	-8.04
295.671	H	Quasi-Peak	55.79	-15.65	40.14	46.00	-5.86
319.639	H	Quasi-Peak	55.37	-15.13	40.24	46.00	-5.76
335.070	H	Quasi-Peak	55.99	-14.81	41.18	46.00	-4.82
344.889	H	Quasi-Peak	55.18	-14.60	40.58	46.00	-5.42

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

Notes:

1. Measuring frequencies from 9kHz to the 1GHz.

2. Radiated emissions measured in frequency range from 30MHz to 1GHz were made with an instrument using Peak/Quasi-peak detector mode.

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. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.

Above 1 GHz

Operation Mode: TX / IEEE 802.11b / CH Low **Test Date:** April 07, 2009

Temperature: 25°C **Tested by:** Breeze Jiang

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1243.33	V	59.71	---	-10.83	48.88	---	74.00	54.00	-5.12	Peak
1710.00	V	59.80	---	-8.60	51.20	---	74.00	54.00	-2.80	Peak
3000.00	V	57.25	47.20	-4.09	53.16	43.11	74.00	54.00	-10.89	AVG
4825.00	V	70.62	50.60	0.68	71.30	51.28	74.00	54.00	-2.72	AVG
N/A										
1073.33	H	59.30	---	-11.77	47.53	---	74.00	54.00	-6.47	Peak
1200.00	H	59.54	---	-11.07	48.47	---	74.00	54.00	-5.53	Peak
3075.00	H	56.68	44.03	-3.92	52.76	40.11	74.00	54.00	-13.89	AVG
3475.00	H	56.02	52.25	-3.03	52.99	49.22	74.00	54.00	-4.78	AVG
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

Operation Mode: TX / IEEE 802.11b/ CH Mid **Test Date:** April 07, 2009

Temperature: 25°C **Tested by:** Breeze Jiang

Humidity: 55% RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1200.00	V	63.74	61.97	-11.07	52.67	50.90	74.00	54.00	-3.10	AVG
1600.00	V	59.06	---	-9.03	50.03	---	74.00	54.00	-3.97	Peak
3525.00	V	56.07	43.91	-2.90	53.17	41.01	74.00	54.00	-12.99	AVG
4875.00	V	70.55	48.00	0.77	71.32	48.77	74.00	54.00	-5.23	AVG
N/A										
1073.33	H	59.78	---	-11.77	48.01	---	74.00	54.00	-5.99	Peak
1203.33	H	59.58	---	-11.05	48.53	---	74.00	54.00	-5.47	Peak
3033.33	H	57.22	53.15	-4.02	53.20	49.13	74.00	54.00	-4.87	AVG
3350.00	H	56.19	51.90	-3.31	52.88	48.59	74.00	54.00	-5.41	AVG
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

Operation Mode: TX / IEEE 802.11b/ CH High **Test Date:** April 07, 2009

Temperature: 25°C **Tested by:** Breeze Jiang

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1330.00	V	59.28	---	-10.36	48.92	---	74.00	54.00	-5.08	Peak
1600.00	V	58.86	---	-9.03	49.83	---	74.00	54.00	-4.17	Peak
3341.66	V	56.81	45.90	-3.32	53.49	42.58	74.00	54.00	-11.42	AVG
4925.00	V	68.42	45.36	0.85	69.27	46.21	74.00	54.00	-7.79	AVG
N/A										
1073.33	H	62.91	---	-11.77	51.14	---	74.00	54.00	-2.86	Peak
1200.00	H	59.32	---	-11.07	48.25	---	74.00	54.00	-5.75	Peak
3075.00	H	56.79	50.00	-3.92	52.87	46.08	74.00	54.00	-7.92	AVG
3275.00	H	57.02	51.25	-3.47	53.55	47.78	74.00	54.00	-6.22	AVG
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

Operation Mode: TX / IEEE 802.11g/ CH Low **Test Date:** April 07, 2009

Temperature: 25°C **Tested by:** Breeze Jiang

Humidity: 55% RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1243.33	V	59.55	---	-10.83	48.72	---	74.00	54.00	-5.28	Peak
1600.00	V	58.40	---	-9.03	49.37	---	74.00	54.00	-4.63	Peak
3083.33	V	57.03	50.04	-3.90	53.13	46.14	74.00	54.00	-7.86	AVG
4816.66	V	67.16	48.39	0.66	67.82	49.05	74.00	54.00	-4.95	AVG
N/A										
1203.33	H	58.77	---	-11.05	47.72	---	74.00	54.00	-6.28	Peak
1373.33	H	58.09	---	-10.12	47.97	---	74.00	54.00	-6.03	Peak
3091.66	H	57.00	46.47	-3.88	53.12	42.59	74.00	54.00	-11.41	AVG
4000.00	H	55.43	45.43	-1.66	53.77	43.77	74.00	54.00	-10.23	AVG
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

Operation Mode: TX / IEEE 802.11g / CH Mid **Test Date:** April 07, 2009

Temperature: 25°C **Tested by:** Breeze Jiang

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1200.00	V	62.26	---	-11.07	51.19	---	74.00	54.00	-2.81	Peak
1246.66	V	61.04	---	-10.81	50.23	---	74.00	54.00	-3.77	Peak
3183.33	V	56.63	45.75	-3.68	52.95	42.07	74.00	54.00	-11.93	AVG
4875.00	V	68.77	50.02	0.77	69.54	50.79	74.00	54.00	-3.21	AVG
N/A										
1073.33	H	59.40	---	-11.77	47.63	---	74.00	54.00	-6.37	Peak
1483.33	H	57.86	---	-9.51	48.35	---	74.00	54.00	-5.65	Peak
3158.33	H	56.93	45.37	-3.74	53.19	41.63	74.00	54.00	-12.37	AVG
3591.66	H	56.13	43.01	-2.73	53.40	40.28	74.00	54.00	-13.72	AVG
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

Operation Mode: TX / IEEE 802.11g / CH High **Test Date:** April 07, 2009

Temperature: 25°C **Tested by:** Breeze Jiang

Humidity: 55% RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1200.00	V	62.59	---	-11.07	51.52	---	74.00	54.00	-2.48	Peak
1700.00	V	59.61	---	-8.64	50.97	---	74.00	54.00	-3.03	Peak
3083.33	V	56.84	45.23	-3.90	52.94	41.33	74.00	54.00	-12.67	AVG
4925.00	V	63.29	49.87	0.85	64.14	50.72	74.00	54.00	-3.28	AVG
N/A										
1073.33	H	58.90	---	-11.77	47.13	---	74.00	54.00	-6.87	Peak
1303.33	H	58.47	---	-10.50	47.97	---	74.00	54.00	-6.03	Peak
3116.66	H	56.89	48.22	-3.83	53.06	44.39	74.00	54.00	-9.61	AVG
3475.00	H	55.51	46.30	-3.03	52.48	43.27	74.00	54.00	-10.73	AVG
N/A						---				

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
   b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode: TX / IEEE 802.11n HT20 MHz / CH Low **Test Date:** April 17, 2009

Temperature: 25°C **Tested by:** Breeze Jiang

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1196.66	V	61.41	---	-11.09	50.32	---	74.00	54.00	-3.68	Peak
1500.00	V	57.80	---	-9.42	48.38	---	74.00	54.00	-5.62	Peak
4825.00	V	67.24	49.65	0.68	67.92	50.33	74.00	54.00	-3.67	AVG
7241.66	V	59.75	43.55	7.23	66.98	50.78	74.00	54.00	-3.22	AVG
N/A										
1200.00	H	58.81	---	-11.07	47.74	---	74.00	54.00	-6.26	Peak
1243.33	H	56.59	---	-10.83	45.76	---	74.00	54.00	-8.24	Peak
1376.66	H	55.52	---	-10.10	45.42	---	74.00	54.00	-8.58	Peak
3375.00	H	48.55	---	-3.25	45.30	---	74.00	54.00	-8.70	Peak
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

Operation Mode: TX / IEEE 802.11n HT20 MHz / CH Mid **Test Date:** April 17, 2009

Temperature: 25°C **Tested by:** Breeze Jiang

Humidity: 55% RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1200.00	V	62.58	---	-11.07	51.51	---	74.00	54.00	-2.49	Peak
1656.66	V	57.51	---	-8.81	48.70	---	74.00	54.00	-5.30	Peak
4875.00	V	66.83	49.12	0.77	67.60	49.89	74.00	54.00	-4.11	AVG
7316.66	V	60.17	42.75	7.38	67.55	50.13	74.00	54.00	-3.87	AVG
N/A										
1080.00	H	58.08	---	-11.73	46.35	---	74.00	54.00	-7.65	Peak
1243.33	H	56.22	---	-10.83	45.39	---	74.00	54.00	-8.61	Peak
1370.00	H	55.68	---	-10.13	45.55	---	74.00	54.00	-8.45	Peak
3358.33	H	49.96	---	-3.29	46.67	---	74.00	54.00	-7.33	Peak
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

Operation Mode: TX / IEEE 802.11n HT20 MHz / CH High **Test Date:** April 17, 2009

Temperature: 25°C **Tested by:** Breeze Jiang

Humidity: 55 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1200.00	V	61.72	---	-11.07	50.65	---	74.00	54.00	-3.35	Peak
1796.66	V	58.80	---	-8.26	50.54	---	74.00	54.00	-3.46	Peak
4925.00	V	66.63	49.28	0.85	67.48	50.13	74.00	54.00	-3.87	AVG
7383.33	V	60.63	43.50	7.52	68.15	51.02	74.00	54.00	-2.98	AVG
N/A										
1200.00	H	59.79	---	-11.07	48.72	---	74.00	54.00	-5.28	Peak
1243.33	H	55.57	---	-10.83	44.74	---	74.00	54.00	-9.26	Peak
3133.33	H	48.93	---	-3.79	45.14	---	74.00	54.00	-8.86	Peak
3725.00	H	48.72	---	-2.38	46.34	---	74.00	54.00	-7.66	Peak
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

7.7 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

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

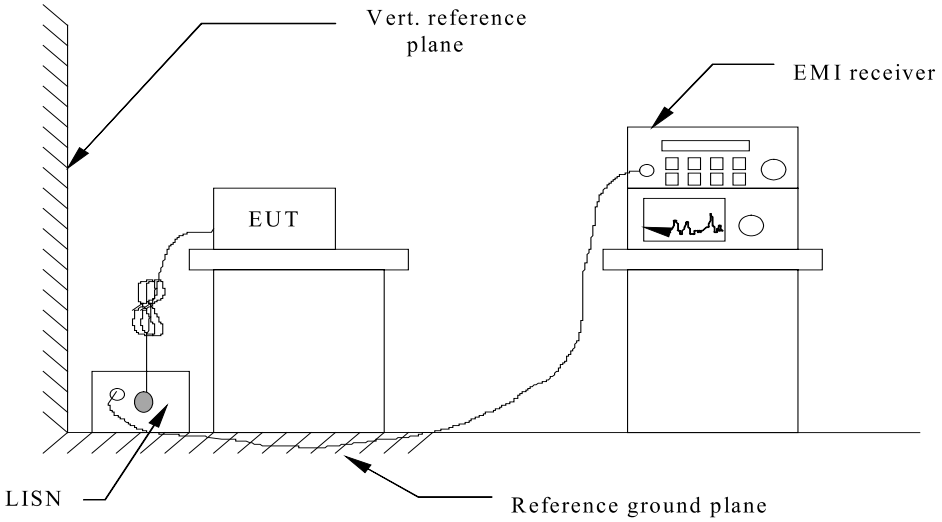
Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power Line (LINE and NEUTRAL) and ground at the power terminals.

MEASUREMENT EQUIPMENT USED

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
ESCI EMI TEST RECEIVE.ESCI	ROHDE&SCHWARZ	1166.5950 03	100145	03/20/2009	03/20/2010
LISN	FCC	FCC-LISN-50-50-2-M	01068	03/01/2009	03/01/2010
LISN	EMCO	3825/2	8901-1459	03/01/2009	03/01/2010
CDN	FCC	FCC-TILISN-T4	20182	03/01/2009	03/01/2010
CDN	FCC	FCC-TLISN-T8-02	20183	03/01/2009	03/01/2010
CDN	FCC	FCC-TLISN-T4-02	20382	03/01/2009	03/01/2010
CDN	FCC	FCC-TLISN-T4-02	20383	03/01/2009	03/01/2010
CDN	FCC	FCC-801-T8-RJ45	04030	03/01/2009	03/01/2010
Current Probe	STODDART AIRCRAFT	91550-1	345-73	03/01/2009	03/01/2010

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

Test Configuration



See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Test Data

Test Mode: Normal Link	**Test Date:** April 11, 2009
Model Name: RS9110-N-11-02	**Test Results:** Passed
Tested by: Breeze Jiang	

FREQ MHz	PEAK RAW dBuV	Q.P. RAW dBuV	AVG RAW dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
0.179	49.40	---	---	65.15	55.15	---	-5.75	L1
0.305	40.05	---	---	61.55	51.55	---	-11.50	L1
3.947	37.51	---	---	56.00	46.00	---	-8.49	L1
12.348	39.10	---	---	60.00	50.00	---	-10.90	L1
14.352	40.17	---	---	60.00	50.00	---	-9.83	L1
22.689	38.61	---	---	60.00	50.00	---	-11.39	L1
0.179	50.38	---	---	65.15	55.15	---	-4.77	L2
0.238	42.75	---	---	63.46	53.46	---	-10.71	L2
1.877	35.10	---	---	56.00	46.00	---	-10.90	L2
3.715	38.55	---	---	56.00	46.00	---	-7.45	L2
4.284	38.37	---	---	56.00	46.00	---	-7.63	L2
25.078	41.87	---	---	60.00	50.00	---	-8.13	L2

Note: The chart above shows the highest readings taken from the final data.

Remark:

1. *The measuring frequencies range between 0.15 MHz and 30 MHz.*
2. *The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.*
3. *"---" denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.*
4. *The IF bandwidth of SPA between 0.15MHz and 30MHz was 10KHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.*
5. *L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*

Note:

Freq. = Emission frequency in KHz

Factor (dB) = cable loss + Insertion loss of LISN+ Insertion loss of TRANSIENT LIMITER (The TRANSIENT LIMITER included 10 dB ATTENUATION)

Amptd dBuV = Uncorrected Analyzer/Receiver reading + cable loss + Insertion loss of LISN+ Insertion loss of TRANSIENT LIMITER,

if it > 0.5 dB

Limit dBuV = Limit stated in standard ; Margin dB= Reading in reference to limit

Calculation Formula

Margin (dB) = Amptd (dBuV) – Limit (dBuV)

Common Mode Conducted Emission

Not applicable