FCC TEST REPORT

for

Digital Photo Frame

MODEL: PhotoM@il-X, PhotoM@il, @Gallery-Mail, @Gallery15-P

Test Report Number:
SZ080808B01-RP

Issued for

Dongguan Simon Technology CO., LTD
JianAn Road, Wusha District, ChangAn Town, Dongguan, Guangdong, China

Issued by:

COMPLIANCE CERTIFICATION SERVICES (SHENZHEN) INC.
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Issued Date: September 24, 2008

Testing Laboratory
0363

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	September 24, 2008	Initial Issue	ALL	Clinton Kao

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1 TEST CERTIFICATION

Product:	Digital Photo Frame
Model:	PhotoM@il-X, PhotoM@il, @Gallery-Mail, @Gallery15-P
Brand:	NEXTBASE
Tested:	August 08-September 24, 2008
Applicant:	Dongguan Simon Technology CO., LTD JianAn Road, Wusha District, ChangAn Town, DongGuan, Guangdong, China
Manufacturer:	Dongguan Simon Technology CO., LTD JianAn Road, Wusha District, ChangAn Town, DongGuan, Guangdong, China

APPLICABLE STANDARDS			
Standard	**Test Type**	**Standard**	**Test Type**
15.207(a)	Power Line Conducted Emissions	15.247(d) 15.209(a)	● Spurious Emissions ● Conducted Measurement ● Radiated Emissions
15.247(a)(2)	6dB Bandwidth Measurement	15.247(b)(3) 15.247(b)(4)	Peak Power Measurement
15.247(d)	Band Edges Measurement	15.247(e)	Peak Power Spectral Density

DEVIATION FROM APPLICABLE STANDARD
None

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in **ANSI C63.4: 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.

Approved by:

Clinton Kao
Manager
Compliance Certification Service Inc.

Reviewed by:

Vincent Yao
Assistant manager
Compliance Certification Service Inc.

2 TEST RESULT SUMMARY

APPLICABLE STANDARDS			
Standard	**Test Type**	**Result**	**Remark**
15.247(a)(2)	6dB Bandwidth Measurement	Pass	Meet the requirement of limit.
15.247(b)(3) 15.247(b)(4)	Peak Power Measurement	Pass	Meet the requirement of limit.
15.247(d)	Band Edges Measurement	Pass	Meet the requirement of limit.
15.247(e)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.247(d) 15.209(a)	● Spurious Emissions ● Conducted Measurement ● Radiated Emissions	Pass	Meet the requirement of limit.
15.207(a)	Power line Conducted Emissions	Pass	Meet the requirement of limit.

Note: 1. The test result judgment is decided by the limit of test standard
2. The information of measurement uncertainty is available upon the customer's request.

3 EUT DESCRIPTION

Product	Digital Photo Frame
Trade Name	NEXBASE
Model Number	PhotoM@il-X, PhotoM@il, @Gallery-Mail, @Gallery15-P
Model Discrepancy	All models are identical to each other except for market designation for marketing purpose.
Serial Number	N/A
Power Supply	DC 3.8V powered by the Lithium battery Or DC5V powered by the adapter Adapter 1: Model name/ Manufacturer E-AWB100-050A / e-ONE AC input: AC100-240V, 50/60Hz,0.4 A DC output: DC5V, 2A DC output cable: Un-shielded, 1.80m Adapter 2: Model name/ Manufacturer AD-050200-US / CHI AC input: AC100-240V, 50/60Hz,0.4 A DC output: DC5V, 2A DC output cable: Un-shielded, 1.80m Adapter 3: Model name/ Manufacturer KSAC0500200W1US/ KTEC AC input: AC100-240V, 50/60Hz,0.4 A DC output: DC5V, 2A DC output cable: Un-shielded, 1.80m
Frequency Range	IEEE 802.11b mode: 2412 ~ 2462 MHz IEEE 802.11g mode: 2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b mode: 16.86dBm IEEE 802.11g mode: 13.29dBm
Modulation Technique	802.11b: DSSS (CCK; DQPSK; DBPSK) 802.11g: OFDM
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 (OFDM)
Number of Channels	IEEE 802.11b/g :11 Channels
Antenna Specification	PCB Antenna with 2dBi gain (Max)

Note: *1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*

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

4 TEST METHODOLOGY

4.1. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

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

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 with the adapter 3 (KSAC0500200W1/ KTEC).

IEEE802.11b: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 11Mbps highest data rate (worst case) are chosen for the final testing.

IEEE802.11g: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6Mbps data rate (the worst case) are chosen for the final testing.

5 SETUP OF EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
Notebook	IBM	992F2VG	DoC	N/A	N/A	Unshielded 1.8m

Note:

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.

5.2. CONFIGURATION OF SYSTEM UNDER TEST

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

6 FACILITIES AND ACCREDITATIONS

6.1. 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 C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6.2. ACCREDITATIONS

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

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.ccsemc.com.tw

6.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in ETR 028:

Measurement	Frequency		Uncertainty
Conducted emissions	9kHz~30MHz		± 3.5863
Radiated emissions	Horizontal	30MHz ~ 200MHz	± 4.7685
		200MHz ~1000MHz	± 4.9330
	Vertical	30MHz ~ 200MHz	± 5.0411
		200MHz ~1000MHz	± 4.9262

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

7 LIMITS AND RESULTS

7.1. POWER LINE CONDUCTED EMISSIONS MEASUREMENT

7.1.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

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

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

NOTE:

(1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

TEST INSTRUMENTS

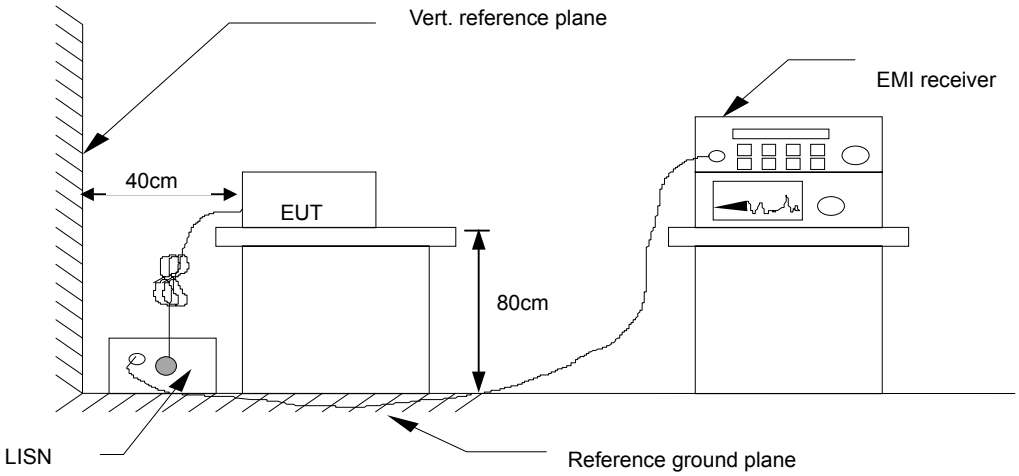
Conducted Emission Test Site G				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
ESCI EMI TEST RECEIV.ESCI	ROHDE&SCHWARZ	1166.5950 03	100088	02/24/2009
LISN	EMCO	3825/2	1371	02/24/2009
LISN	EMCO	3825/2	8901-1459	02/24/2009

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

7.1.2. TEST PROCEDURES (please refer to measurement standard)

- The EUT and Support equipment, if needed, was placed on a non-conducted table, which is 0.8m above the ground plane and 0.4m away from the conducted wall.
- The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane. All support equipment power received from a second LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The frequency range from 150 kHz to 30 MHz was searched. The test data of the worst-case condition(s) was recorded. Emission levels under limit 20dB were not recorded.

7.1.3. TEST SETUP



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

7.1.4. Data Sample:

Freq. (MHz)	Peak Raw (dBuV)	Q.P. Raw (dBuV)	Average Raw (dBuV)	Q.P. Limit (dBuV)	Average Limit (dBuV)	Q.P. Margin (dB)	Average Margin (dB)	Note
XX	38.10	36.01	31.18	60.00	50.00	-23.99	-18.82	L1

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer/Receiver reading
Correction factor (dB) = Insertion loss of LISN
Limit (dBuV) = Limit stated in standard
Margin (dB) = Reading (dBuV) – Limit (dBuV)
Note = Current carrying line of reading

7.1.5. TEST RESULTS

Model No.	PhotoM@il-X	**Test Mode**	Normal Link
Environmental Conditions	25deg.C,43% RH, 991 hPa	**6dB BANDWIDTH**	9 kHz
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
0.198	50.64	40.12	28.57	64.62	54.62	-24.50	-26.05	L1
0.242	45.09	---	---	63.35	53.35	---	-8.26	L1
0.372	43.83	---	---	59.64	49.64	---	-5.81	L1
0.676	41.15	24.69	17.58	56.00	46.00	-31.31	-28.42	L1
0.869	40.84	24.13	16.87	56.00	46.00	-31.87	-29.13	L1
8.164	35.73	---	---	60.00	50.00	---	-14.27	L1
0.190	52.74	50.02	29.37	64.83	54.83	-14.81	-25.46	L2
0.257	46.24	---	---	62.93	52.93	---	-6.69	L2
0.316	43.25	---	---	61.23	51.23	---	-7.98	L2
0.379	43.01	---	---	59.43	49.43	---	-6.42	L2
0.884	39.20	---	---	56.00	46.00	---	-6.80	L2
24.709	30.82	---	---	60.00	50.00	---	-19.18	L2

REMARKS: *L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*

7.2. SPURIOUS EMISSIONS MEASUREMENT

7.2.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

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)).

7.2.2. TEST INSTRUMENTS

Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2009

7.2.3. TEST PROCEDURE (please refer to measurement standard)

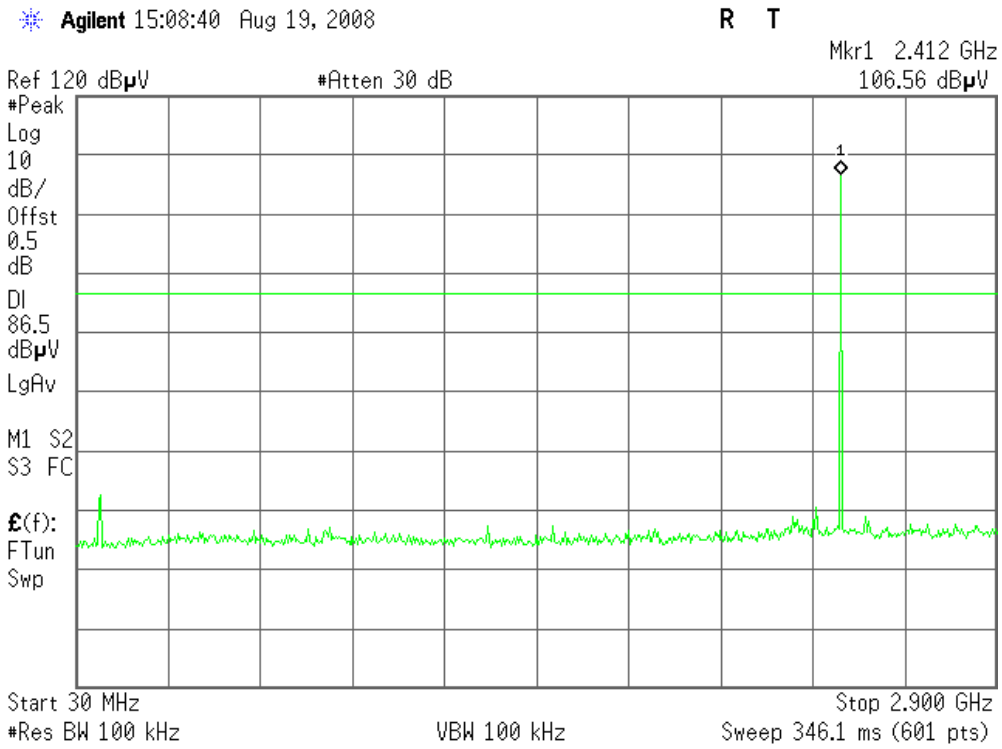
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site. The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.
Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

7.2.4. TEST RESULTS

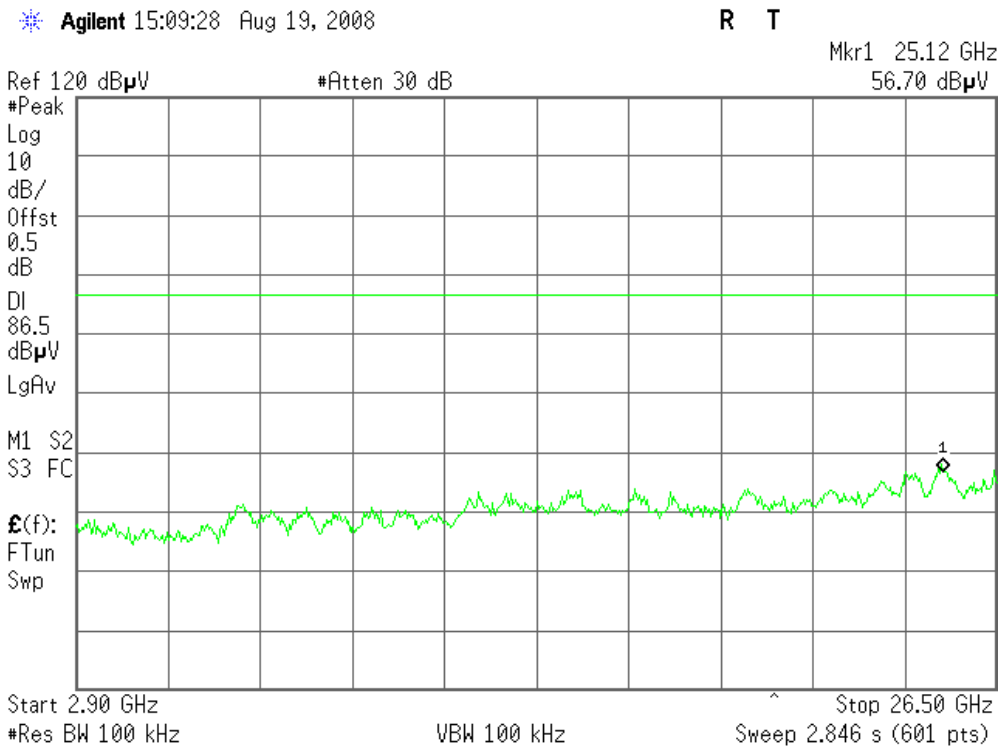
Test Plot (IEEE 802.11b mode)

CH Low

30MHz ~ 2.9GHz

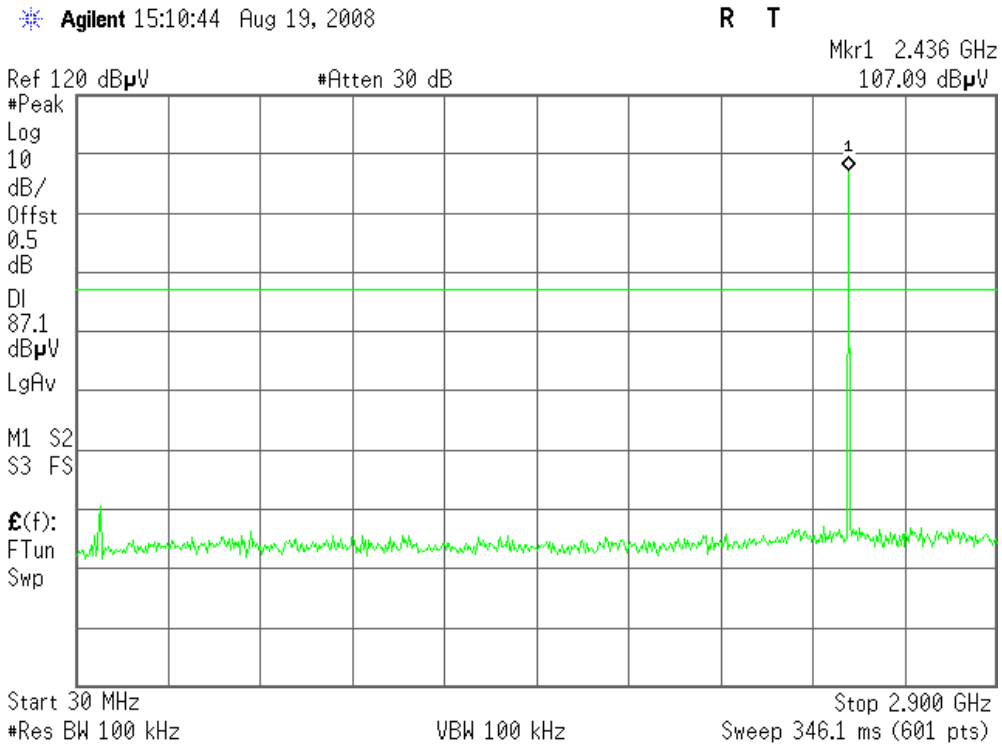


2.9GHz ~ 26.5GHz

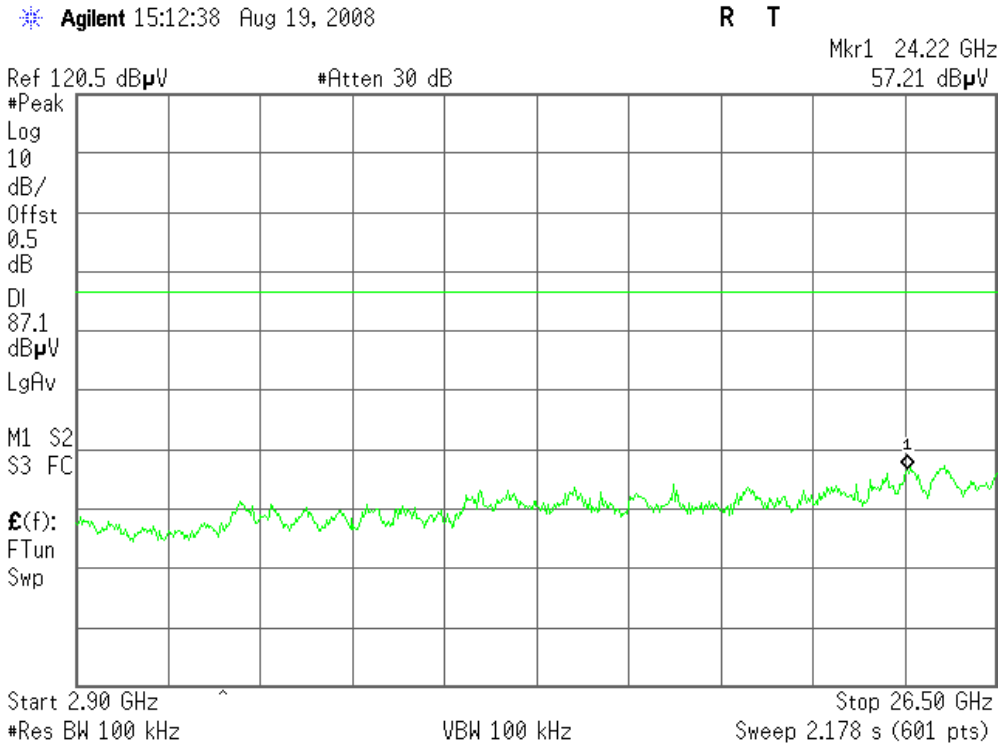


CH Mid

30MHz ~ 2.9GHz

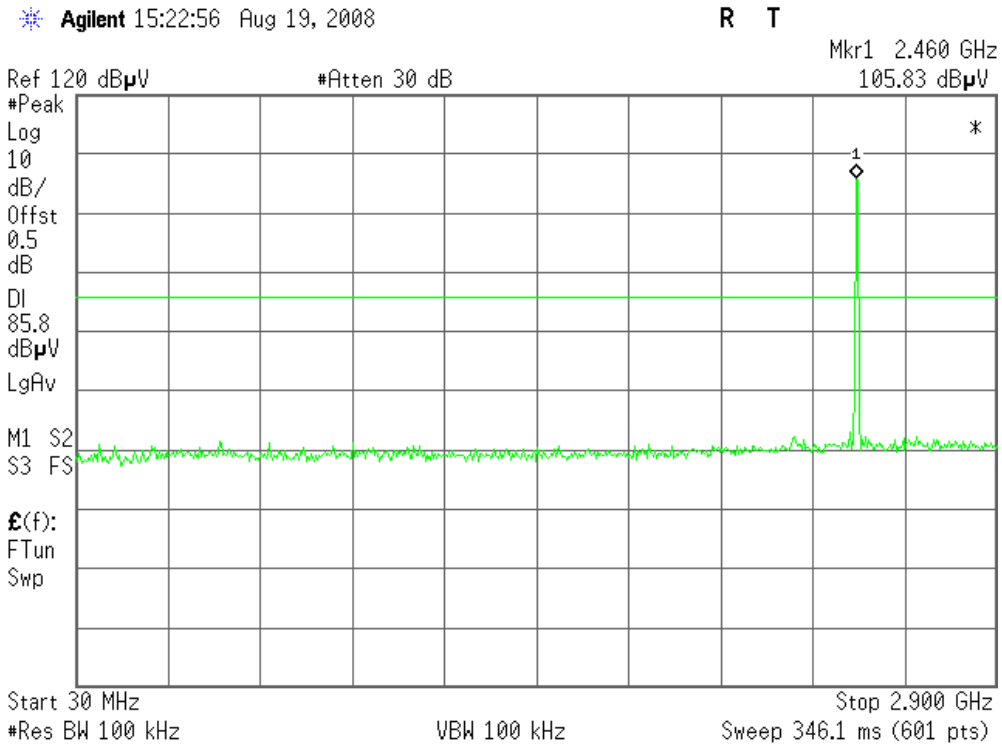


2.9GHz ~ 26.5GHz

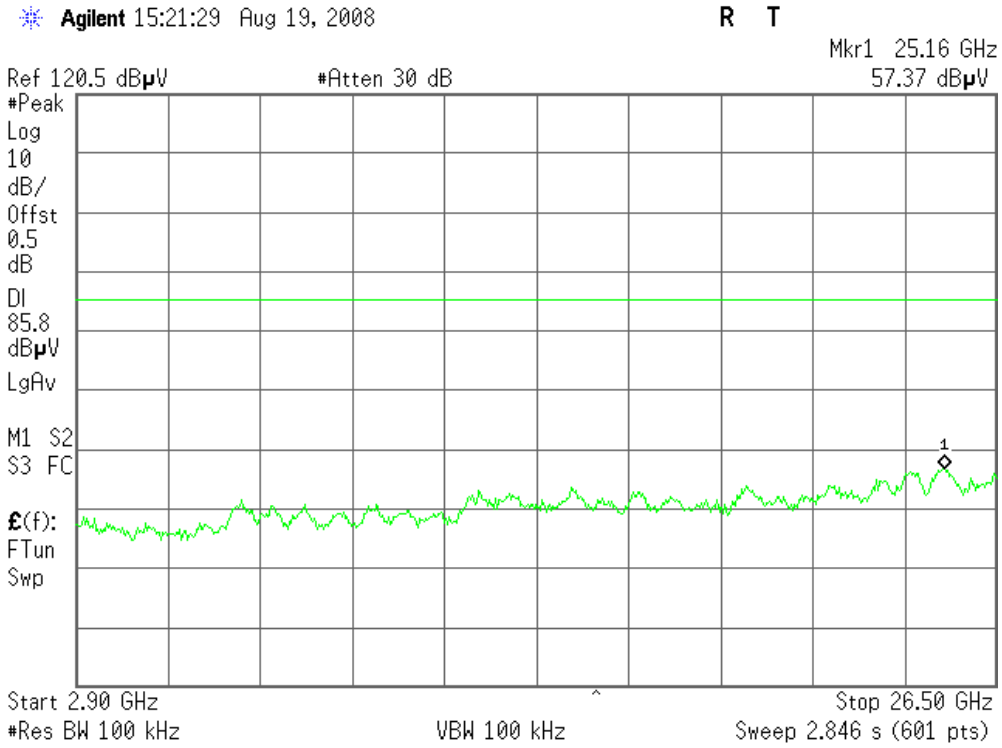


CH High

30MHz ~ 2.9GHz



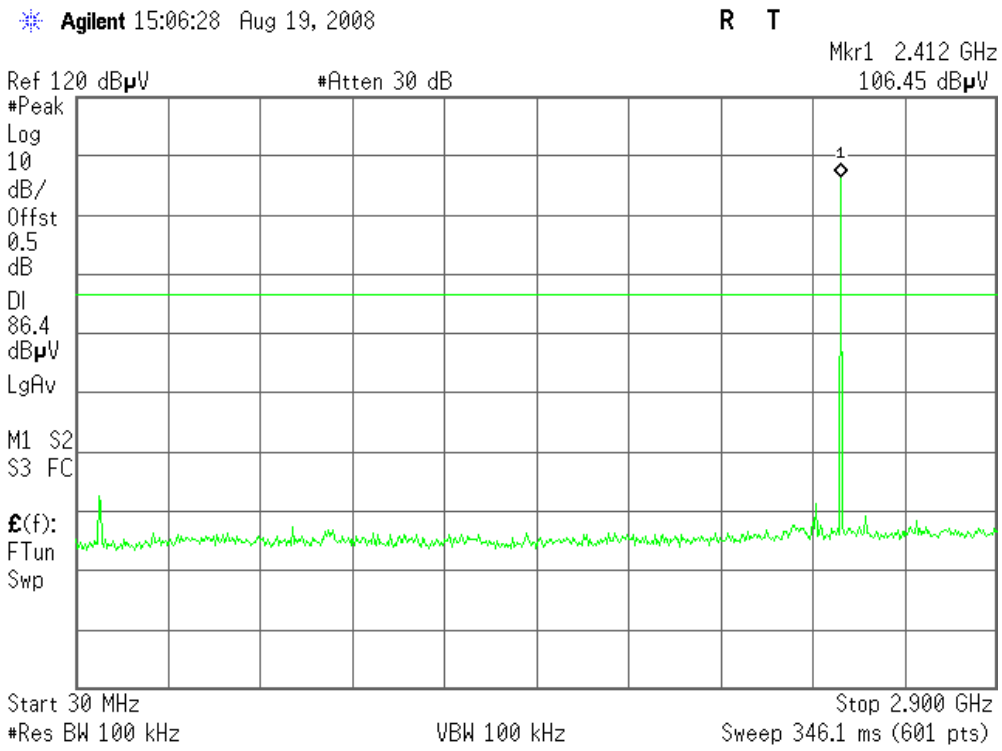
2.9GHz ~ 26.5GHz



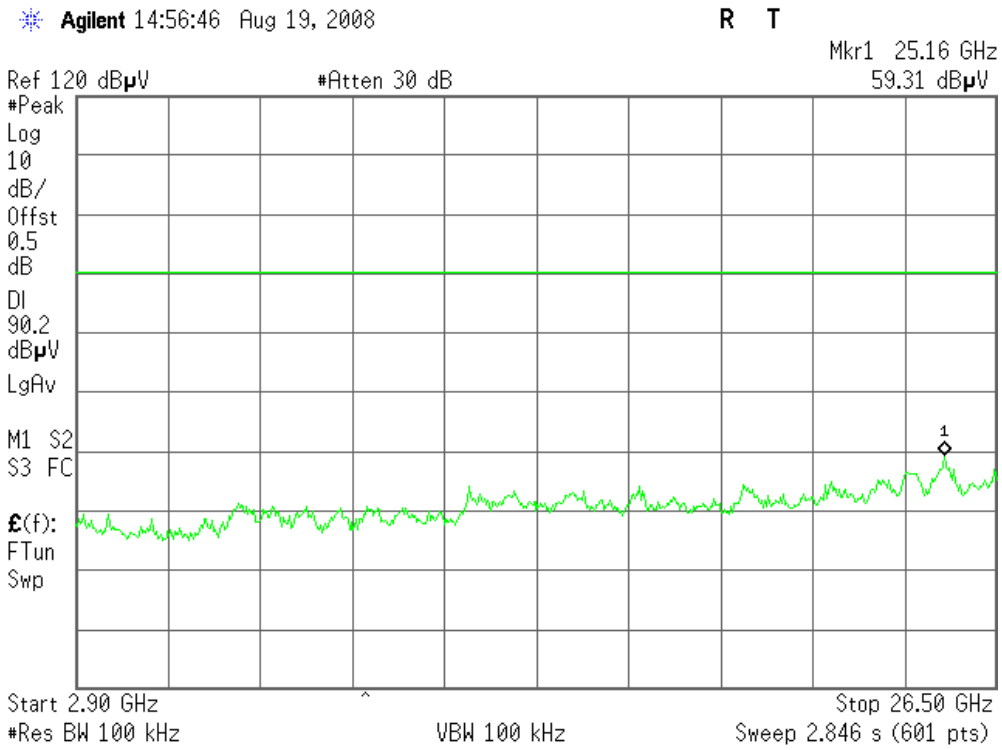
Test Plot (IEEE 802.11g mode)

CH Low

30MHz ~ 2.9GHz

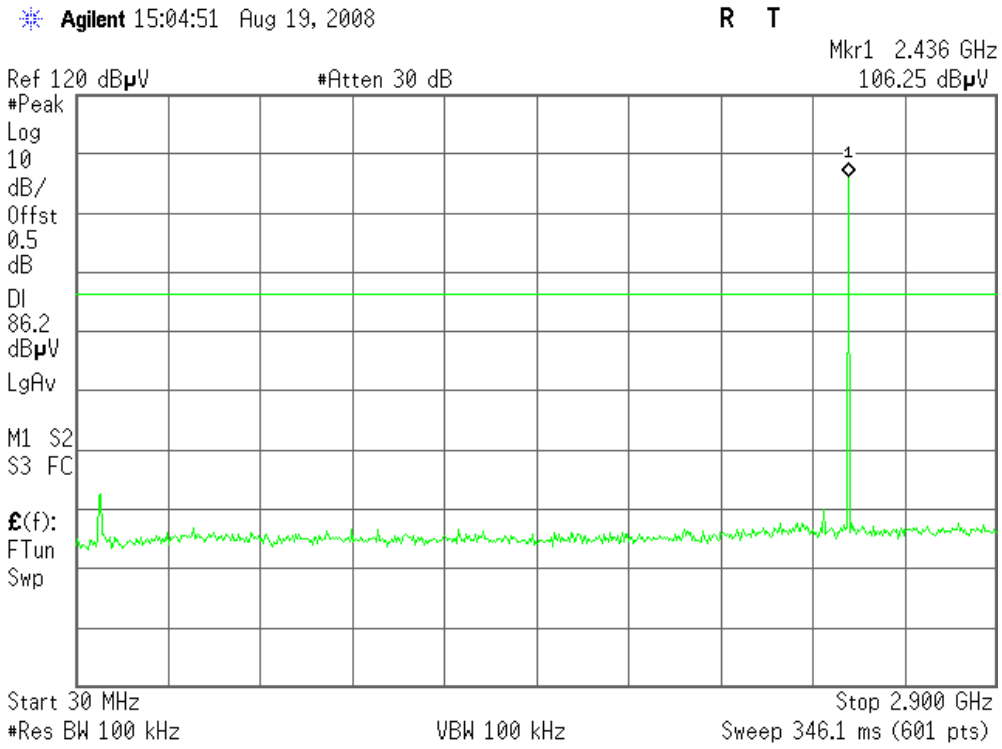


2.9GHz ~ 26.5GHz

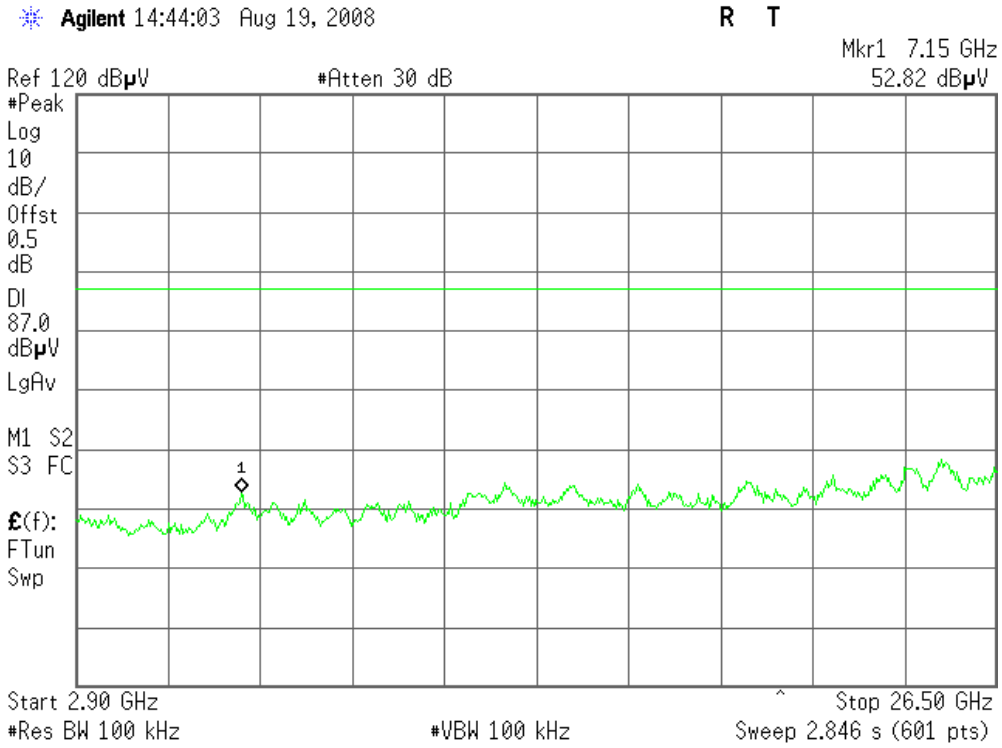


CH Mid

30MHz ~ 2.9GHz

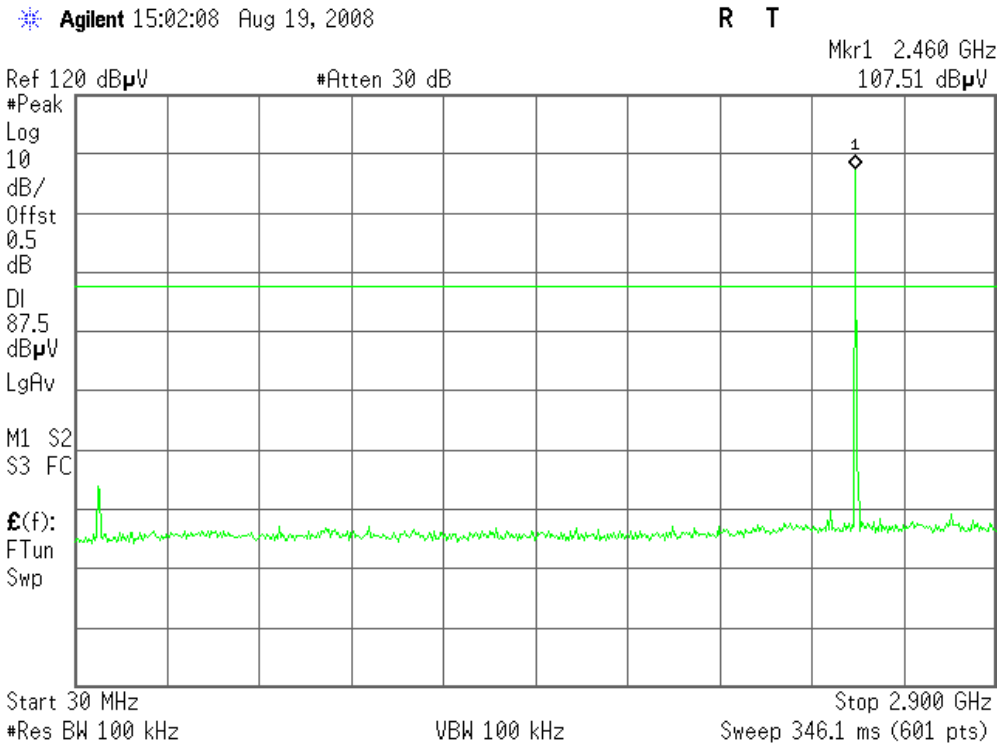


2.9GHz ~ 26.5GHz

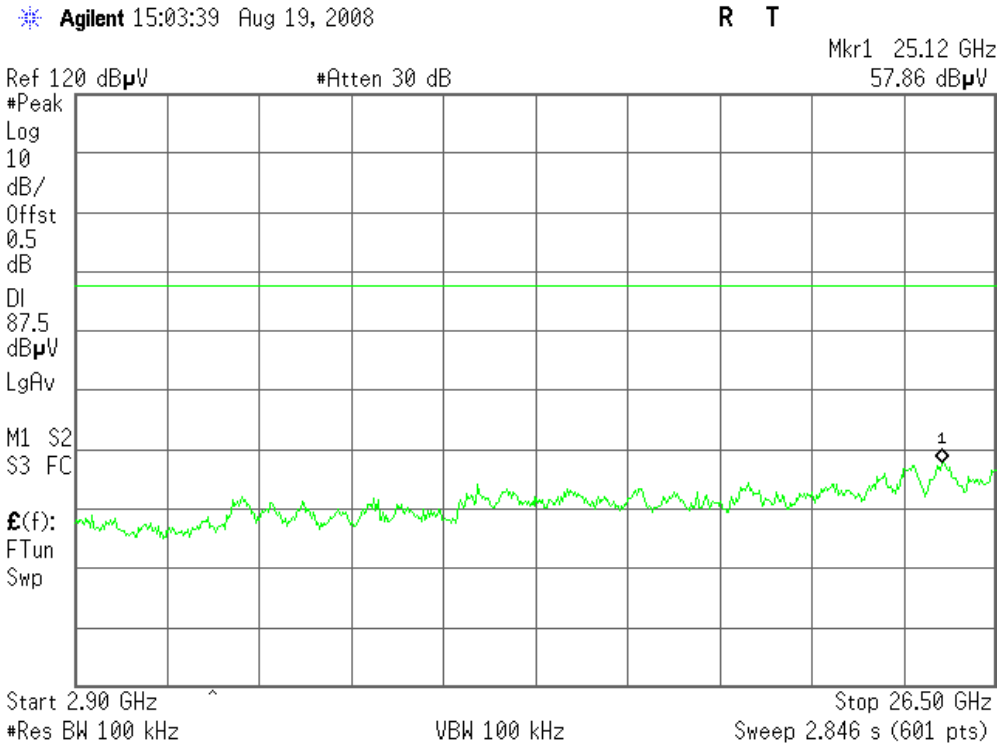


CH High

30MHz ~ 2.9GHz



2.9GHz ~ 26.5GHz



7.2.5. RADIATED EMISSIONS

7.2.5.1. LIMITS OF RADIATED EMISSIONS MEASUREMENT

1. 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 (μV/m)	Measurement Distance (m)
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.

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

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

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

7.2.5.2. TEST INSTRUMENTS

966 RF CHAMBER 2				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2009
EMI Test Receiver	R&S	ESCI	1166.5950 03	01/13/2009
Pre-Amplifier	MITEQ	N/A	AFS42-00102650-42-10P-42	02/14/2009
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
RF Comm. Test set	HP	8920B	US36142090	N.C.R
Site NSA	C&C	N/A	N/A	06/09/2009
Horn Antenna	TRC	N/A	N/A	03/04/2009
Loop Antenna	ARA	PLA-1030/B	1029	02/24/2009

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The FCC Site Registration number is 101879.

3. N.C.R = No Calibration Required.

7.2.5.3. TEST PROCEDURE (please refer to measurement standard)

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

   RBW=100kHz / VBW=300kHz / Sweep=AUTO

   Above 1GHz:

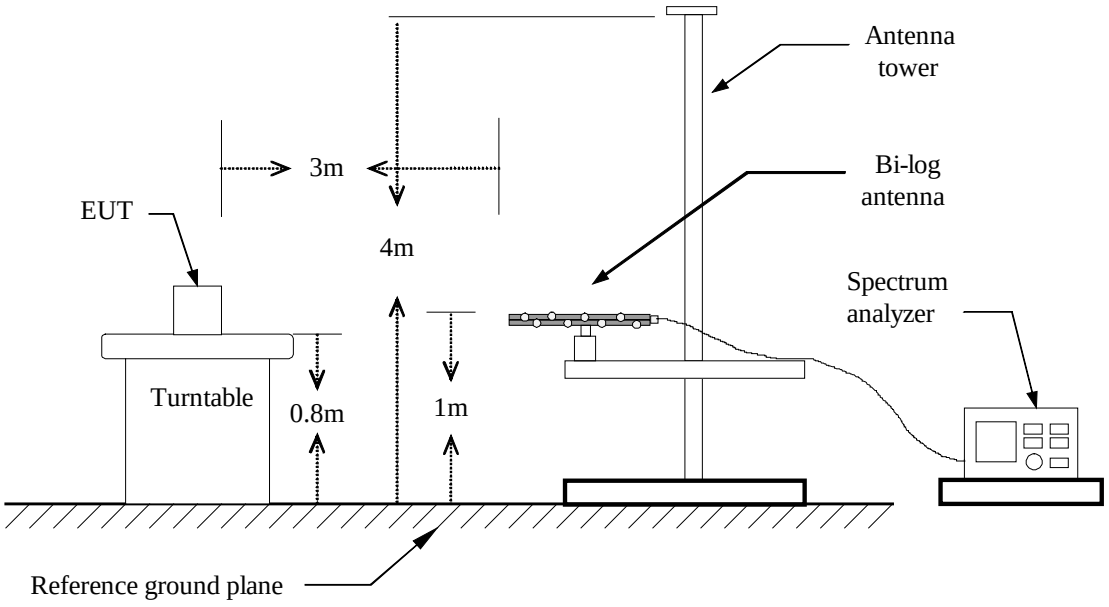
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

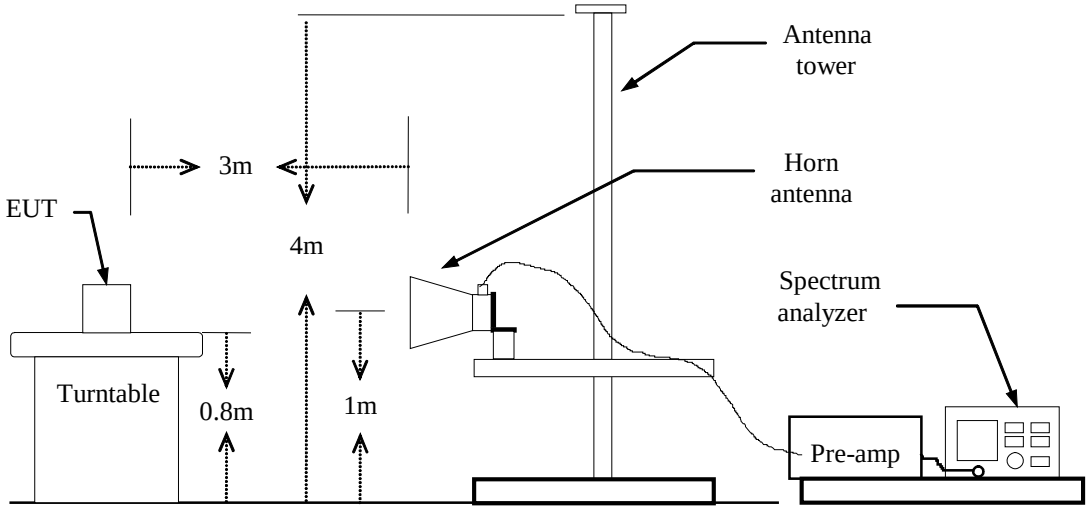
7. Repeat above procedures until the measurements for all frequencies are complete.

7.2.5.4. TEST SETUP

Below 1 GHz



Above 1 GHz



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

7.2.5.5. Data Sample:

Below 1 GHz

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Remark) (dBuV)	Correction Factor (dB/m)	Result (Remark) (dBuV/m)	Limit (Peak) (dBuV/m)	Margin (dB)	Remark
xxx	V	12.12	10.21	22.33	40.00	-17.67	Peak

Above 1 GHz

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
xxx	V	65.45	63.00	-11.12	54.33	51.88	74.00	54.00	-2.12	AVG

Frequency (MHz) = Emission frequency in MHz
Ant.Pol. (H/V) = Antenna polarization
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Remark Result (dBuV/m) – Limit (dBuV/m)
Peak = Peak Reading
QP = Quasi-peak Reading
AVG = Average Reading

7.2.5.6. TEST RESULTS

Below 1 GHz

Operation Mode: Normal Link
Test Date: August 12, 2008
Temperature: 26°C
Tested by: Breeze Jiang
Humidity: 50 % 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)
47.100	V	Peak	48.78	-19.25	29.53	40.00	-10.47
134.850	V	Peak	46.84	-19.35	27.49	43.50	-16.01
265.350	V	Peak	49.86	-15.93	33.93	46.00	-12.07
463.333	V	Peak	46.04	-9.96	36.08	46.00	-9.92
531.000	V	Peak	44.58	-8.85	35.73	46.00	-10.27
863.500	V	Peak	38.52	-2.70	35.82	46.00	-10.18
109.650	H	Peak	45.94	-19.97	25.97	43.50	-17.53
132.600	H	Peak	51.44	-19.39	32.05	43.50	-11.45
332.666	H	Peak	48.05	-13.67	34.38	46.00	-11.62
611.500	H	Peak	42.72	-5.76	36.96	46.00	-9.04
650.000	H	Peak	42.45	-5.24	37.21	46.00	-8.79
186.500	H	Peak	38.60	-3.48	35.12	46.00	-10.88

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

REMARKS:

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
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. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Above 1 GHz

Operation Mode: TX / IEEE 802.11b / CH Low **Test Date:** August 12, 2008

Temperature: 26°C **Tested by:** Breeze Jiang

Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1036.666	V	68.96	62.19	-11.97	56.99	50.22	74.00	54.00	-3.78	AVG.
1303.333	V	65.36	56.98	-10.50	54.86	46.48	74.00	54.00	-7.52	AVG.
1413.333	V	62.28	55.54	-9.90	52.38	45.64	74.00	54.00	-8.36	AVG.
3766.666	V	45.90	---	0.43	46.33	---	74.00	54.00	-7.67	Peak
N/A										
1146.666	H	64.34	57.88	-11.36	52.98	46.52	74.00	54.00	-7.48	AVG.
1306.666	H	63.57	54.74	-10.48	53.09	44.26	74.00	54.00	-9.74	AVG.
1593.333	H	62.28	52.39	-8.68	53.60	43.71	74.00	54.00	-10.29	AVG.
3100.000	H	45.29	---	-2.27	43.02	---	74.00	54.00	-10.98	Peak
N/A										

***REMARKS**:*

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	TX / IEEE 802.11b / CH Mid	**Test Date:**	August 12, 2008
Temperature:	26°C	**Tested by:**	Breeze Jiang
Humidity:	50% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1170.000	V	66.48	58.47	-11.23	55.25	47.24	74.00	54.00	-6.76	AVG.
1413.333	V	62.35	54.55	-9.90	52.45	44.65	74.00	54.00	-9.35	AVG.
1673.333	V	61.98	51.86	-8.05	53.93	43.81	74.00	54.00	-10.19	AVG.
3916.666	V	44.97	---	1.22	46.19	---	74.00	54.00	-7.81	Peak
N/A										
1040.000	H	66.57	60.96	-11.95	54.62	49.01	74.00	54.00	-4.99	AVG.
1153.333	H	63.83	53.70	-11.33	52.50	42.37	74.00	54.00	-11.63	AVG.
1283.333	H	64.06	55.20	-10.61	53.45	44.59	74.00	54.00	-9.41	AVG.
3783.333	H	44.94	---	-0.35	44.59	---	74.00	54.00	-9.41	Peak
N/A										

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode: TX / IEEE 802.11b / CH High **Test Date:** August 12, 2008

Temperature: 26°C **Tested by:** Breeze Jiang

Humidity: 50 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1153.333	V	66.43	59.45	-11.33	55.10	48.12	74.00	54.00	-5.88	AVG.
1413.333	V	63.35	55.95	-9.90	53.45	46.05	74.00	54.00	-7.95	AVG.
1810.000	V	61.31	51.52	-6.96	54.35	44.56	74.00	54.00	-9.44	AVG.
4100.000	V	45.08	---	1.75	46.83	---	74.00	54.00	-7.17	Peak
N/A										
1306.666	H	63.70	57.80	-10.48	53.22	47.32	74.00	54.00	-6.68	AVG.
1580.000	H	62.50	54.47	-8.79	53.71	45.68	74.00	54.00	-8.32	AVG.
1923.333	H	60.95	49.94	-6.07	54.88	43.87	74.00	54.00	-10.13	AVG.
4150.000	H	45.35	---	1.80	47.15	---	74.00	54.00	-6.85	Peak
N/A										

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode: TX / IEEE 802.11g / CH Low **Test Date:** August 12, 2008

Temperature: 26°C **Tested by:** Breeze Jiang

Humidity: 50 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1153.333	V	65.35	57.55	-11.33	54.02	46.22	74.00	54.00	-7.78	AVG.
1406.666	V	62.58	54.58	-9.93	52.65	44.65	74.00	54.00	-9.35	AVG.
1673.333	V	60.69	50.96	-8.05	52.64	42.91	74.00	54.00	-11.09	AVG.
3600.000	V	45.78	---	-0.44	45.34	---	74.00	54.00	-8.66	Peak
N/A										
1303.333	H	62.39	58.12	-10.50	51.89	47.62	74.00	54.00	-6.38	AVG.
1403.333	H	63.26	55.30	-9.95	53.31	45.35	74.00	54.00	-8.65	AVG.
1600.000	H	63.20	52.21	-8.63	54.57	43.58	74.00	54.00	-10.42	AVG.
3775.000	H	45.20	---	-0.42	44.78	---	74.00	54.00	-9.22	Peak
N/A										

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode: TX / IEEE 802.11g / CH Mid **Test Date:** August 12, 2008

Temperature: 26°C **Tested by:** Breeze Jiang

Humidity: 50 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1093.333	V	63.84	56.34	-11.66	52.18	44.68	74.00	54.00	-9.32	AVG.
1153.333	V	65.98	57.82	-11.33	54.65	46.49	74.00	54.00	-7.51	AVG.
1410.000	V	62.01	53.16	-9.91	52.10	43.25	74.00	54.00	-10.75	AVG.
3716.666	V	45.71	---	0.17	45.88	---	74.00	54.00	-8.12	Peak
N/A										
1053.333	H	66.43	57.74	-11.88	54.55	45.86	74.00	54.00	-8.14	AVG.
1093.333	H	65.06	54.95	-11.66	53.40	43.29	74.00	54.00	-10.71	AVG.
1600.000	H	63.10	51.34	-8.63	54.47	42.71	74.00	54.00	-11.29	AVG.
4250.000	H	44.50	---	1.89	46.39	---	74.00	54.00	-7.61	Peak
N/A										

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode: TX / IEEE 802.11g / CH High **Test Date:** August 12, 2008

Temperature: 26°C **Tested by:** Breeze Jiang

Humidity: 50 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1153.333	V	65.14	59.46	-11.33	53.81	48.13	74.00	54.00	-5.87	AVG.
1653.333	V	62.96	53.78	-8.21	54.75	45.57	74.00	54.00	-8.43	AVG.
1980.000	V	58.98	46.97	-5.62	53.36	41.35	74.00	54.00	-12.65	AVG.
4216.666	V	45.52	---	1.86	47.38	---	74.00	54.00	-6.62	Peak
N/A										
1093.333	H	65.06	60.71	-11.66	53.40	49.05	74.00	54.00	-4.95	AVG.
1290.000	H	63.53	57.85	-10.57	52.96	47.28	74.00	54.00	-6.72	AVG.
1593.333	H	62.71	53.01	-8.68	54.03	44.33	74.00	54.00	-9.67	AVG.
4458.333	H	43.97	---	2.08	46.05	---	74.00	54.00	-7.95	Peak
N/A										

REMARKS:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

7.3. 6dB BANDWIDTH MEASUREMENT

7.3.1. LIMITS

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

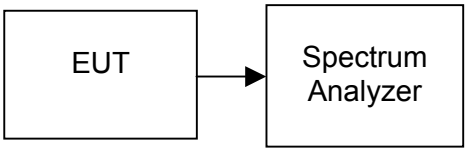
7.3.2. TEST INSTRUMENTS

Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2009

7.3.3. TEST PROCEDURES (please refer to measurement standard)

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 = 20MHz, Sweep = auto.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

7.3.4. TEST SETUP



7.3.5. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	10150	>500	PASS
Mid	2437	9500		PASS
High	2462	9550		PASS

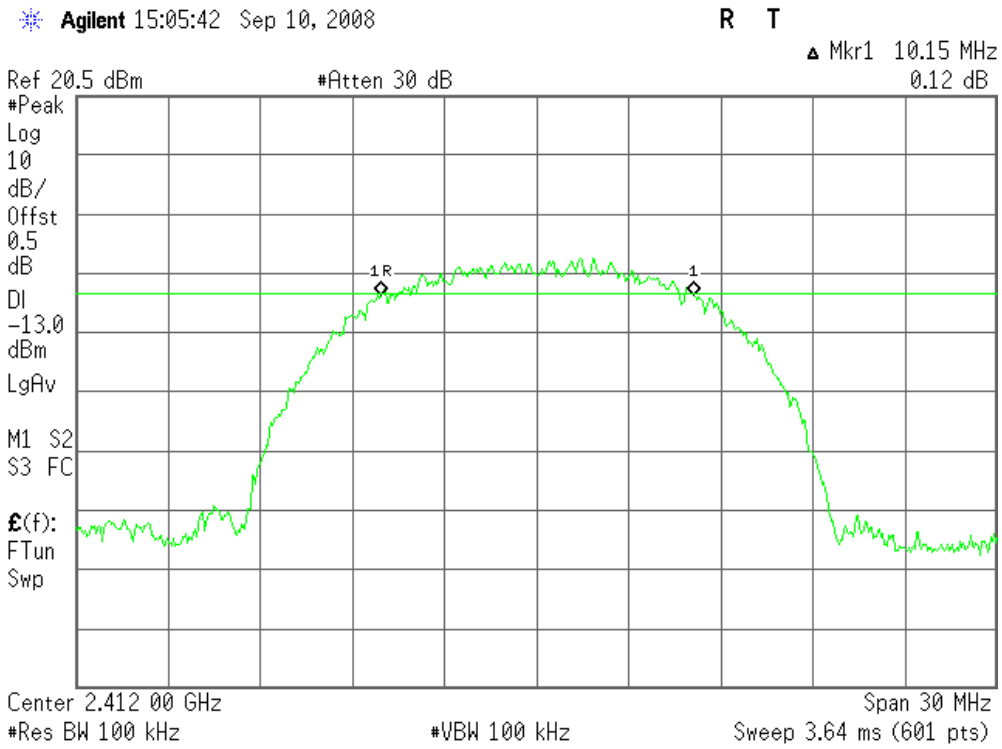
Test Data

Test mode: IEEE 802.11g

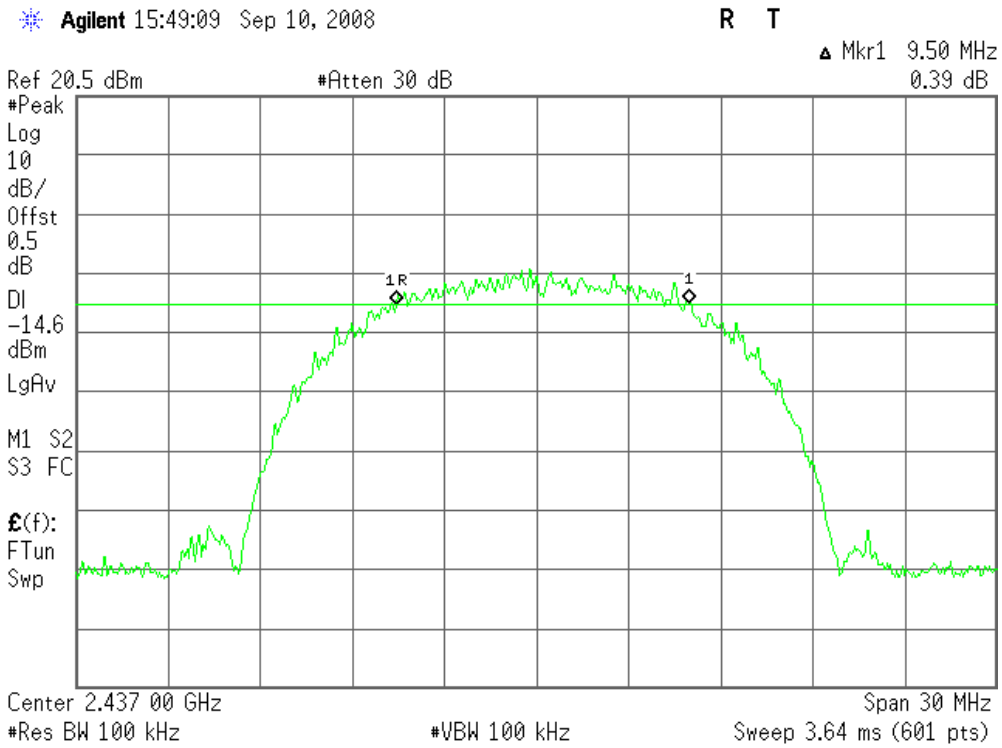
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	16350	>500	PASS
Mid	2437	16100		PASS
High	2462	16450		PASS

Test Plot (IEEE 802.11b mode)

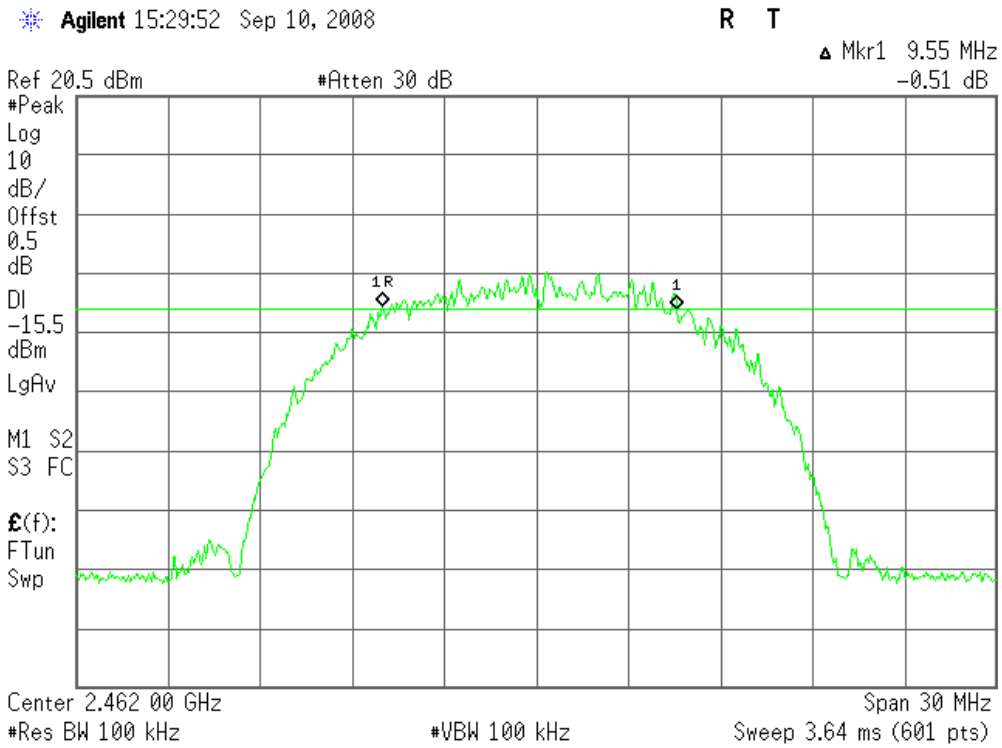
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

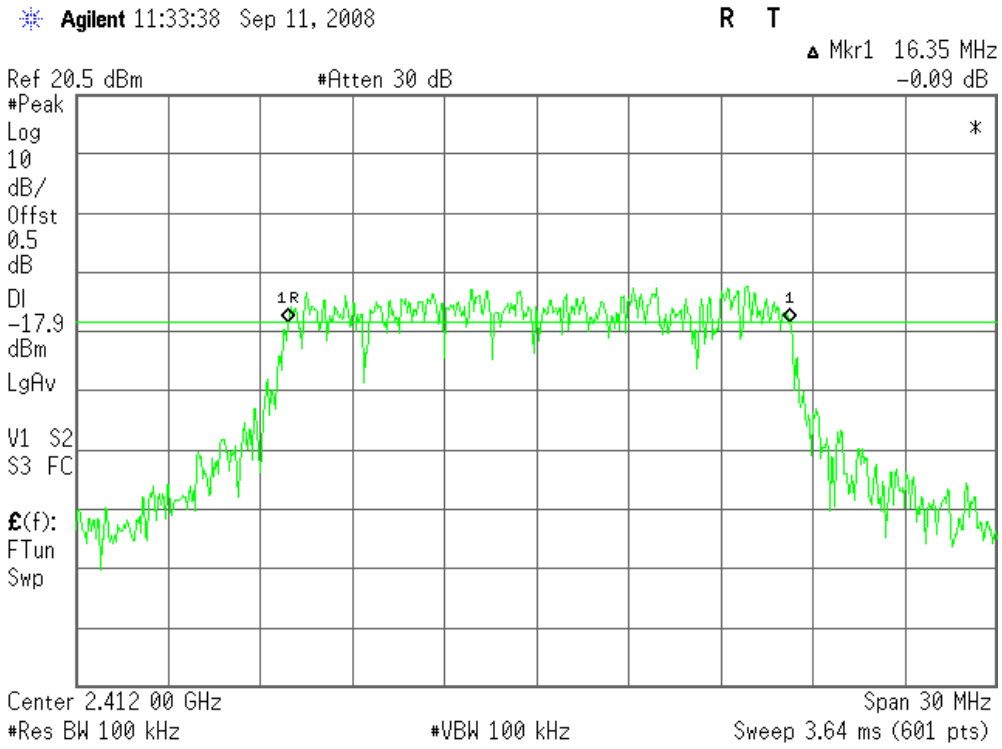


6dB Bandwidth (CH High)

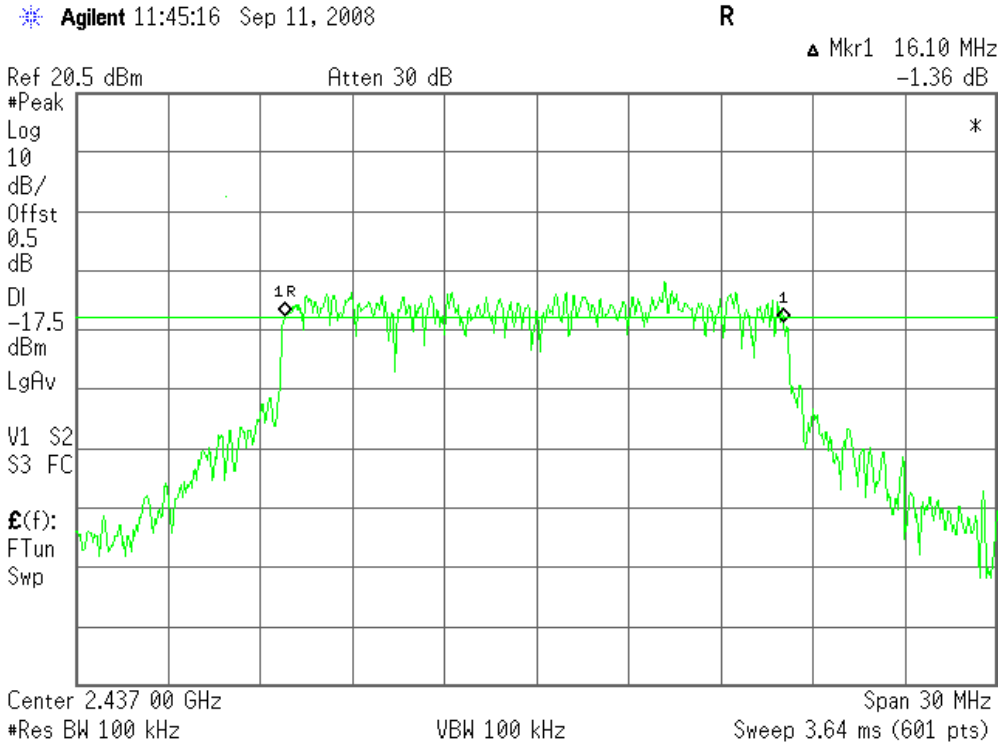


Test Plot (IEEE 802.11g mode)

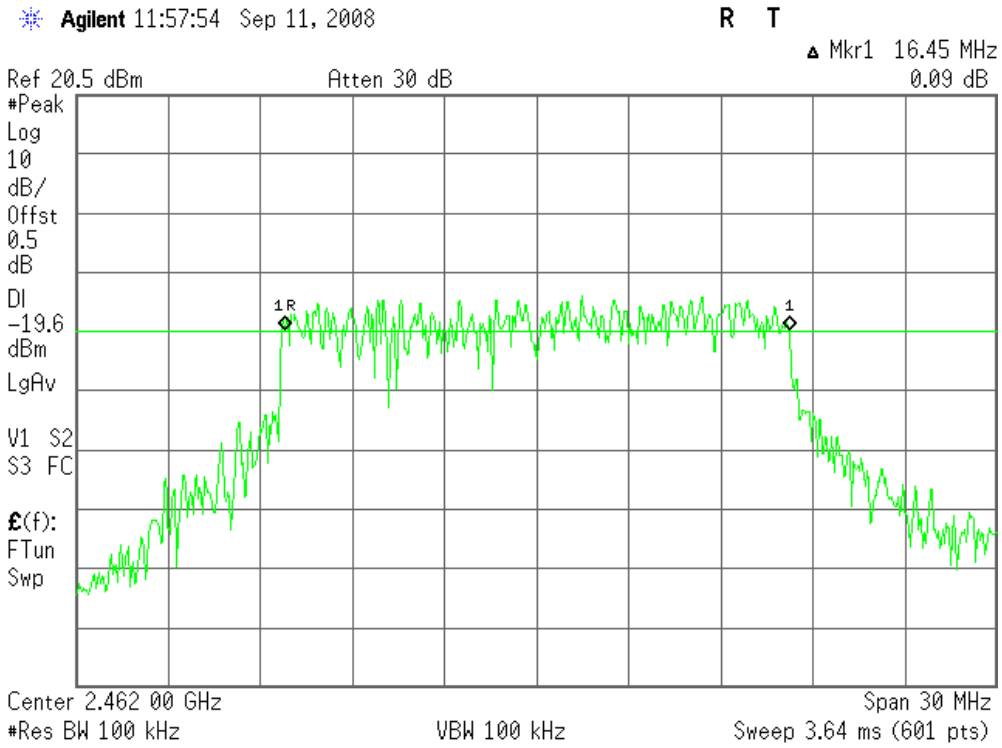
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)



7.4. PEAK OUTPUT POWER

7.4.1. LIMITS

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

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.

2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (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.

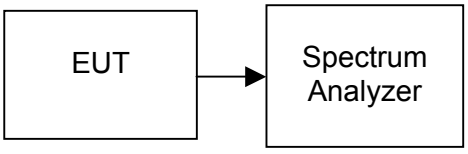
7.4.2. TEST INSTRUMENTS

Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2009

7.4.3. TEST PROCEDURES (please refer to measurement standard)

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.

7.4.4. TEST SETUP



7.4.5. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

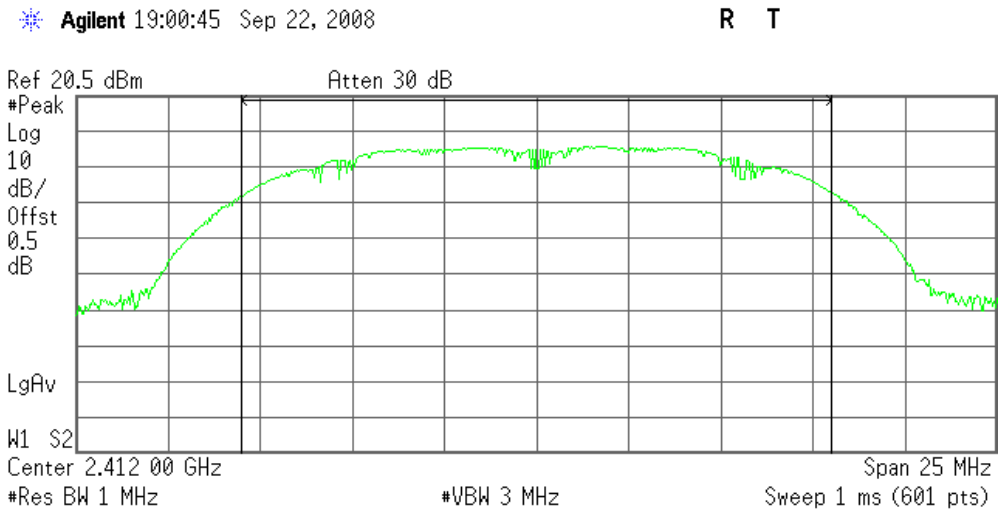
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.59	0.03622	1	PASS
Mid	2437	16.86	0.04853		PASS
High	2462	16.72	0.04699		PASS

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	13.07	0.02028	1	PASS
Mid	2437	13.02	0.02004		PASS
High	2462	13.29	0.02133		PASS

Test Plot (IEEE 802.11b mode)

Peak power (CH Low)



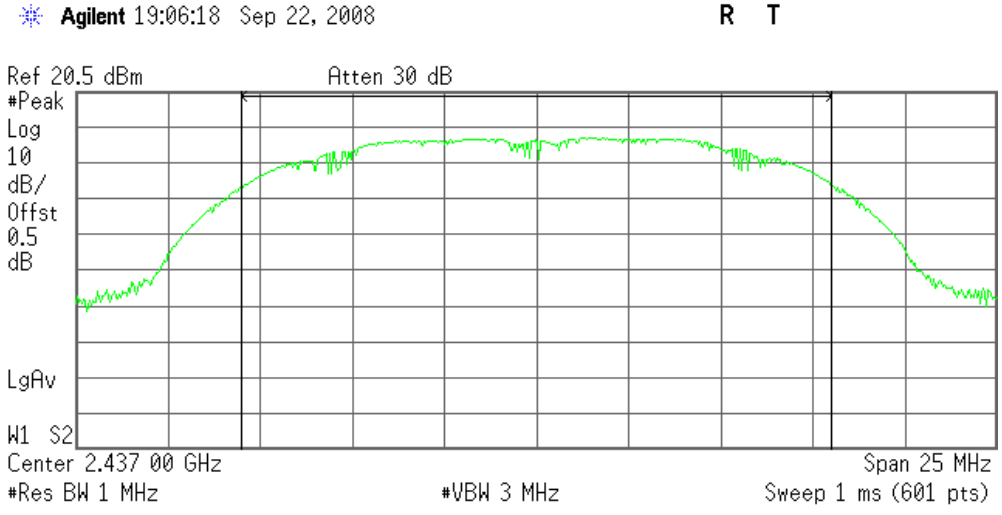
Channel Power

15.59 dBm /16.0000 MHz

Power Spectral Density

-56.45 dBm/Hz

Peak power (CH Mid)



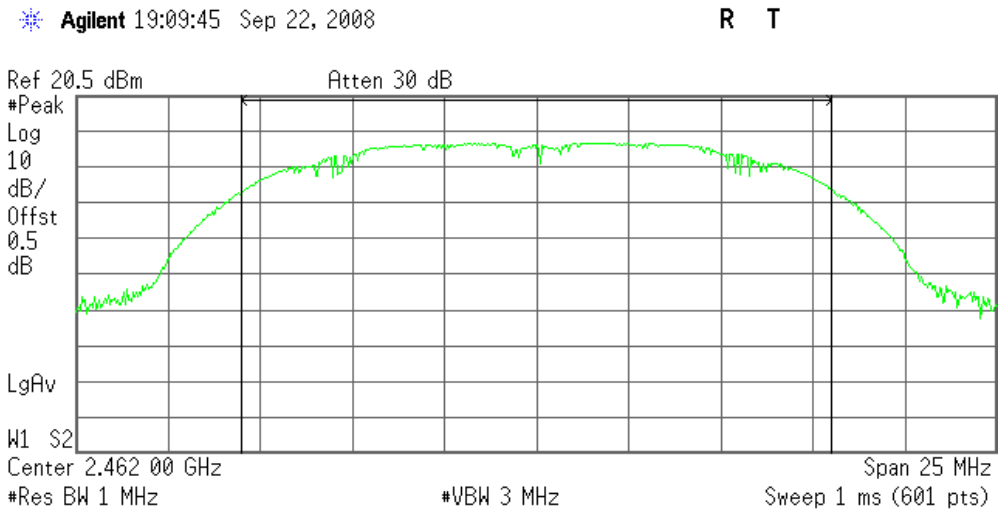
Channel Power

16.86 dBm /16.0000 MHz

Power Spectral Density

-55.18 dBm/Hz

Peak power (CH High)



Channel Power

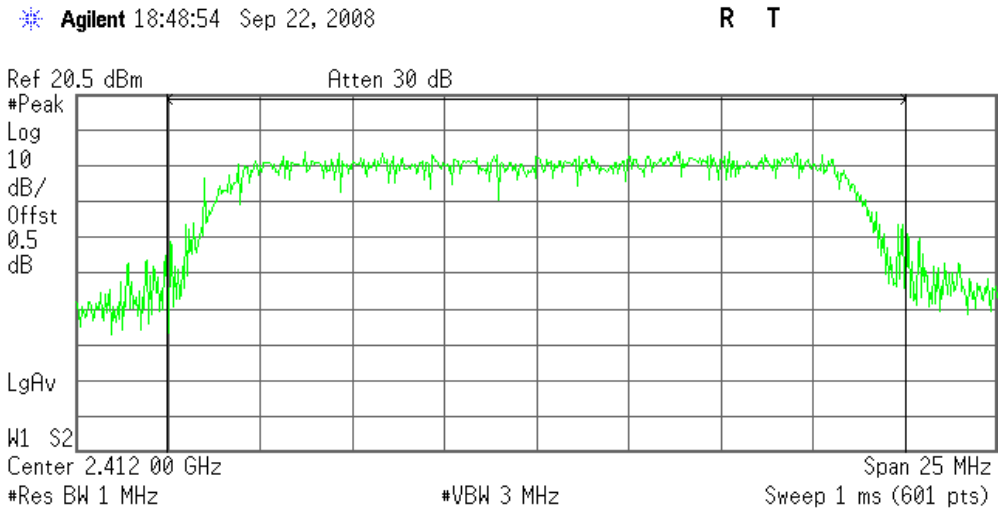
16.72 dBm /16.0000 MHz

Power Spectral Density

-55.32 dBm/Hz

Test Plot (IEEE 802.11g mode)

Peak power (CH Low)



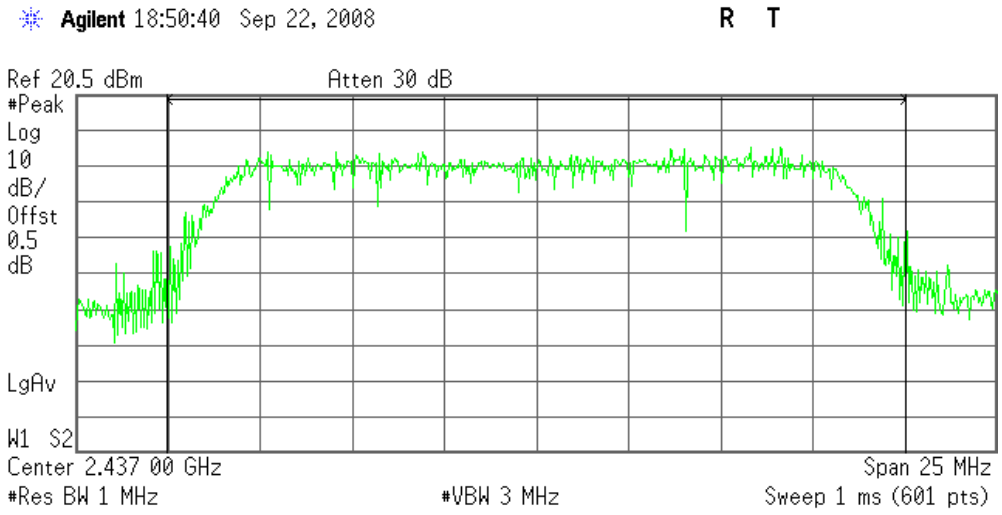
Channel Power

13.07 dBm /20.0000 MHz

Power Spectral Density

-59.94 dBm/Hz

Peak power (CH Mid)



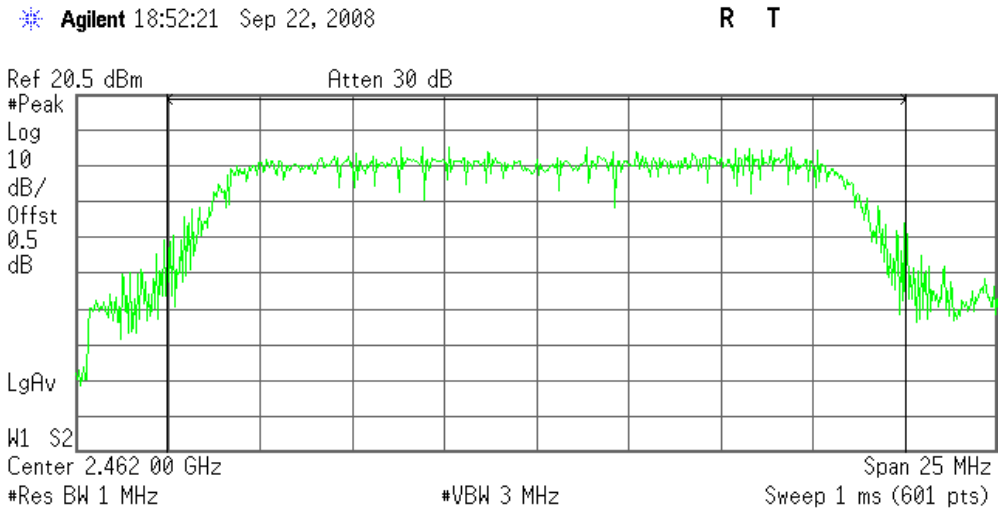
Channel Power

13.02 dBm /20.0000 MHz

Power Spectral Density

-59.99 dBm/Hz

Peak power (CH High)



Channel Power

13.29 dBm /20.0000 MHz

Power Spectral Density

-59.72 dBm/Hz

7.5. BAND EDGES MEASUREMENT:

7.5.1. LIMITS

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)).

7.5.2. TEST INSTRUMENTS

966 RF CHAMBER 2				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2009
EMI Test Receiver	R&S	ESCI	1166.5950 03	01/13/2009
Pre-Amplifier	MITEQ	N/A	AFS42-00102650-42-10P-42	02/14/2009
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
RF Comm. Test set	HP	8920B	US36142090	N.C.R
Site NSA	C&C	N/A	N/A	06/09/2009
Horn Antenna	TRC	N/A	N/A	03/04/2009

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

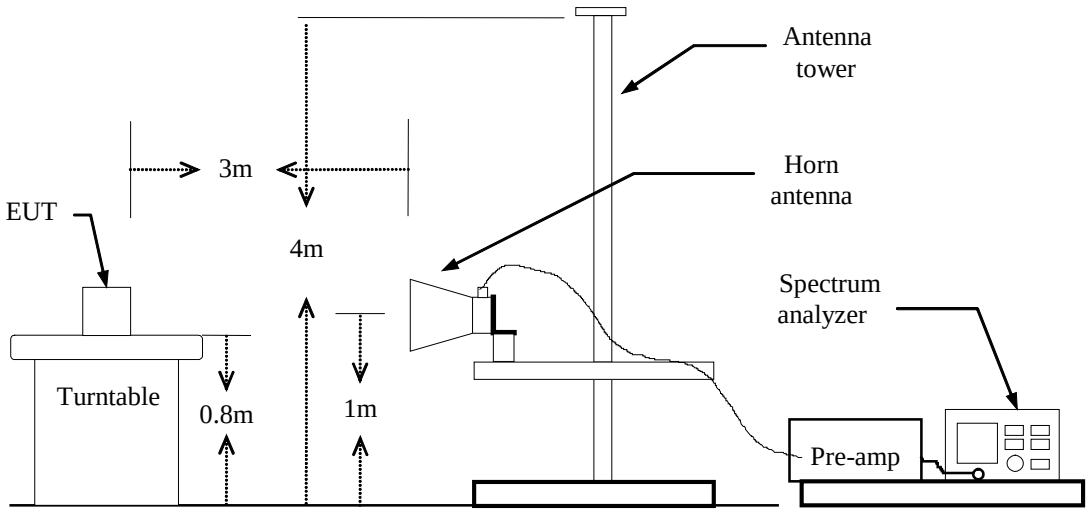
2. The FCC Site Registration number is 101879.

4. N.C.R = No Calibration Required.

7.5.3. TEST PROCEDURES (please refer to measurement standard)

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

7.5.4. TEST SETUP

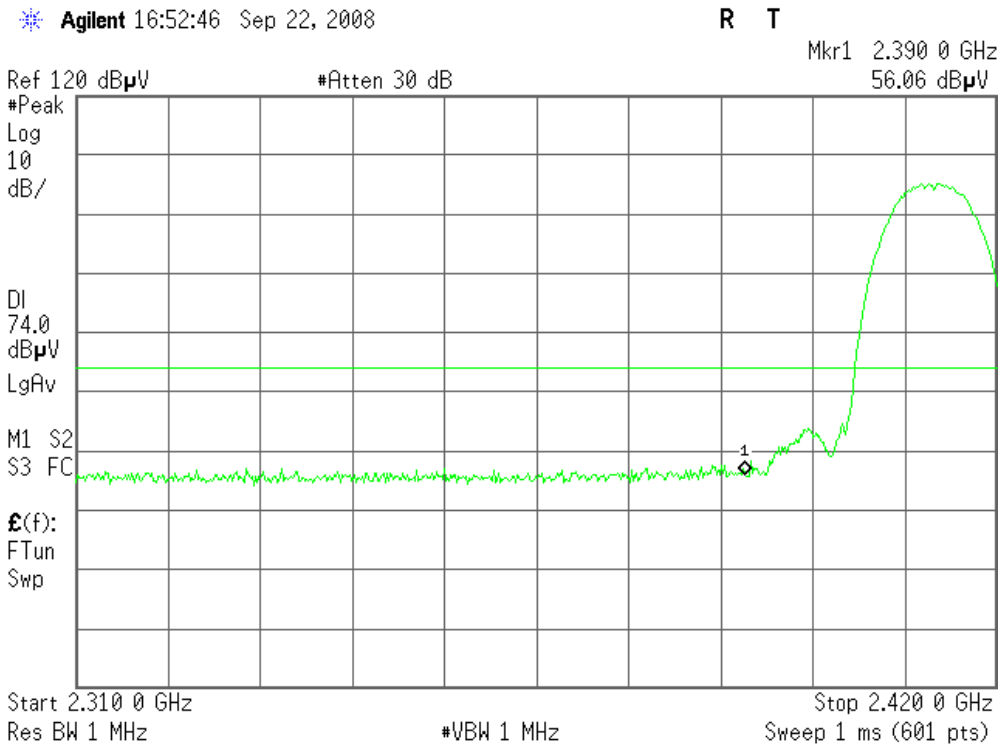


7.5.5. TEST RESULTS

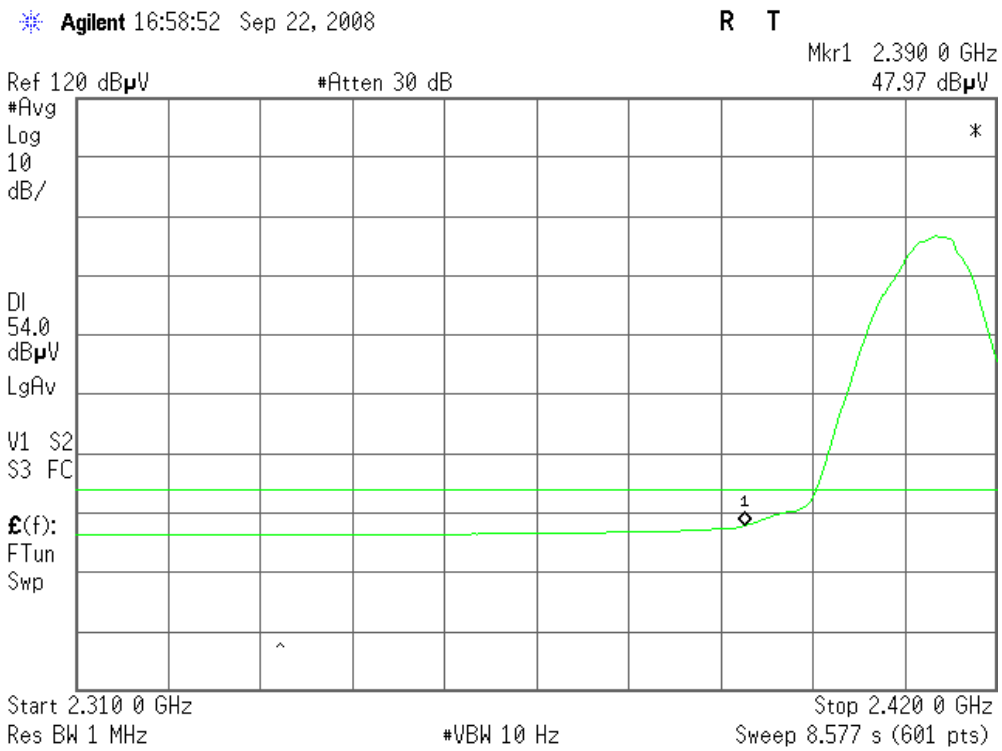
Test Plot (IEEE 802.11b mode)

Band Edges (CH Low)

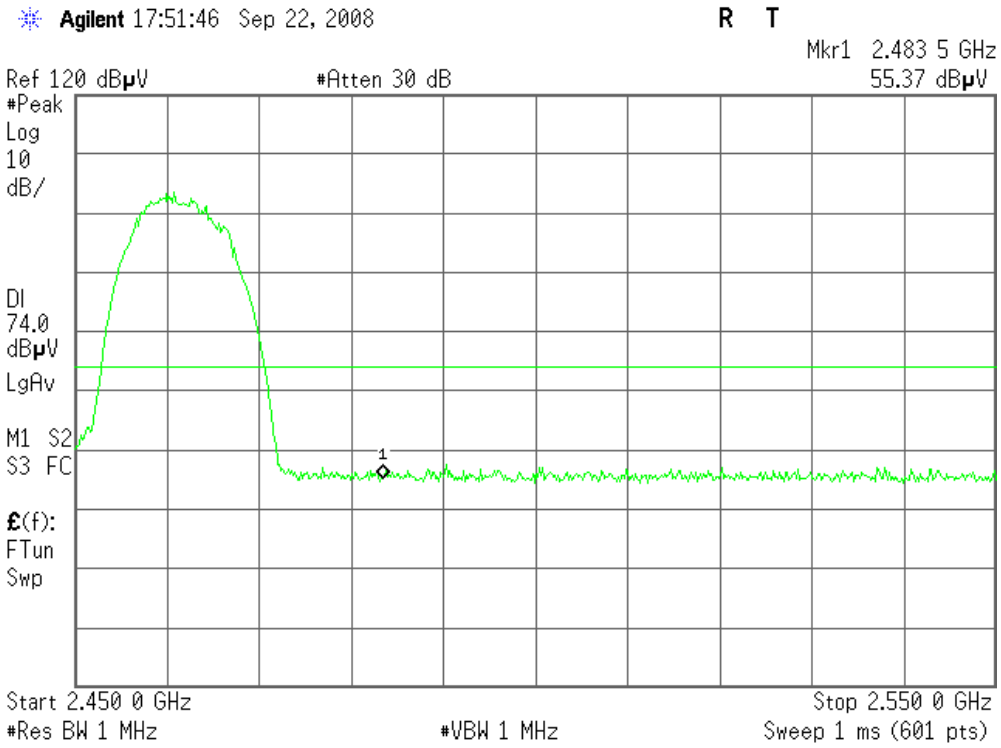
Detector mode: Peak **Polarity: Vertical**



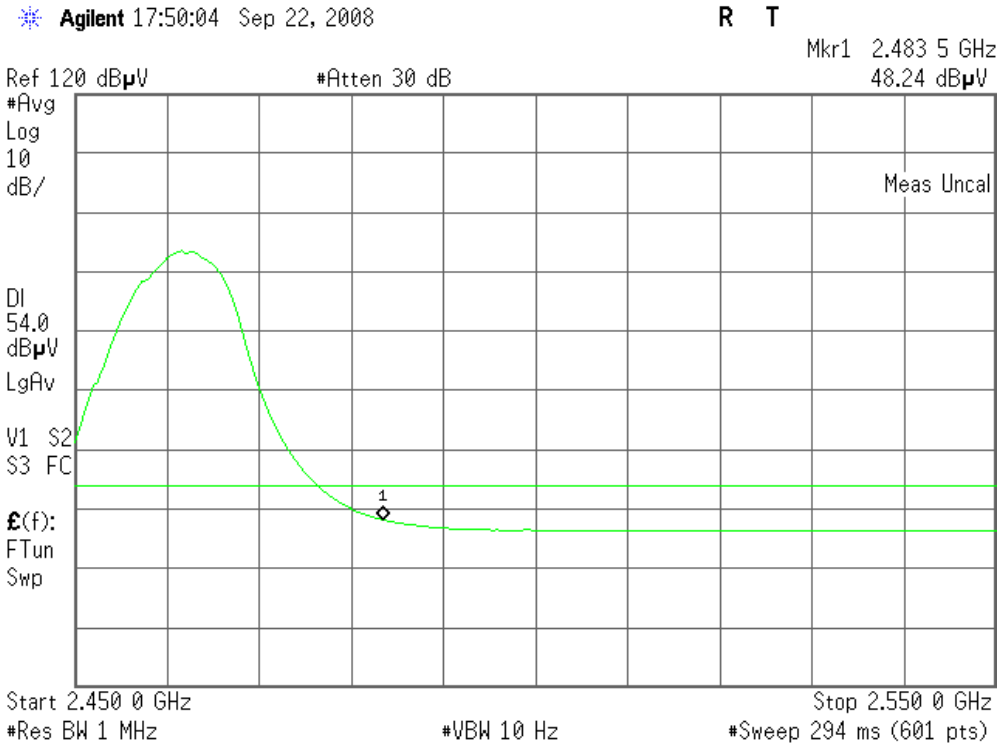
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**



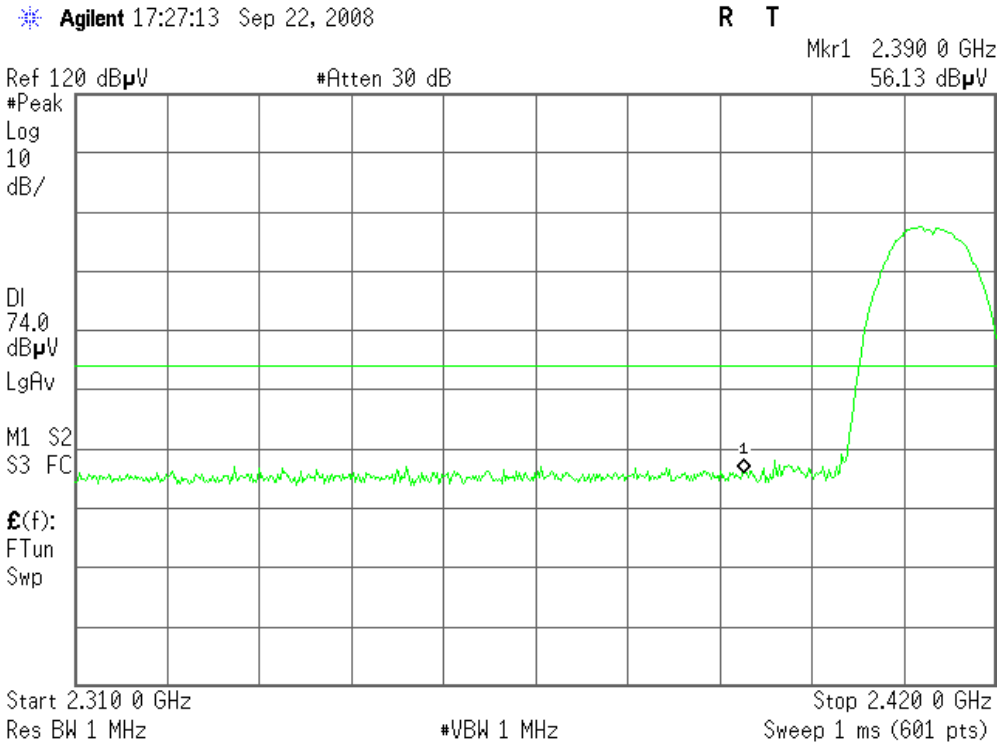
Detector mode: Average **Polarity: Horizontal**



Band Edges (CH High)

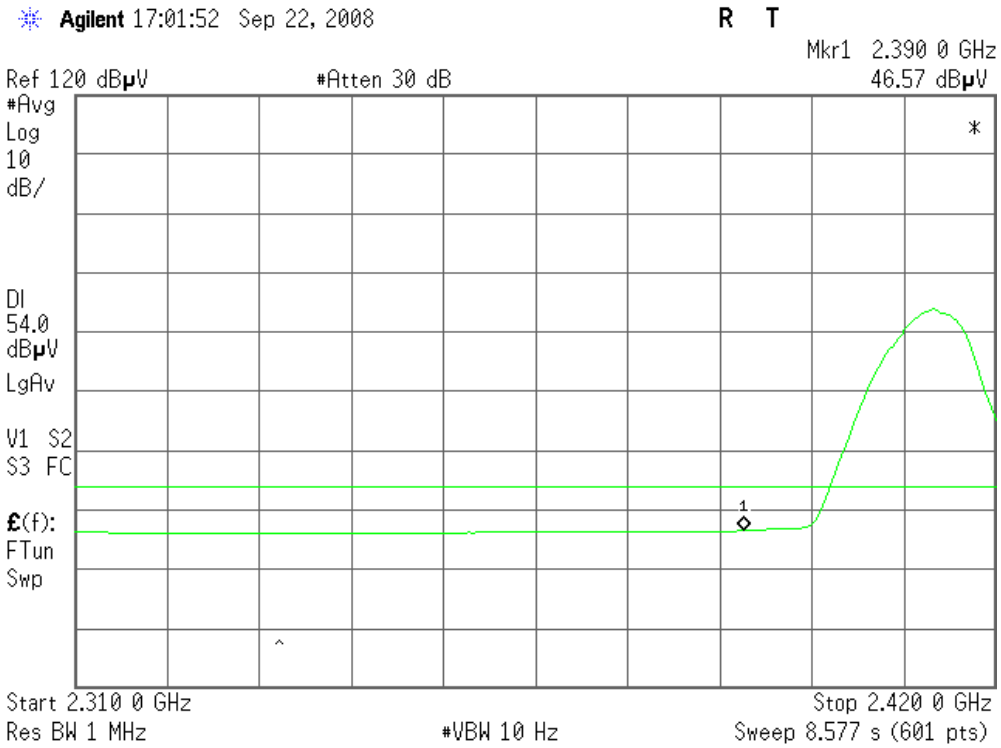
Detector mode: Peak

Polarity: Vertical

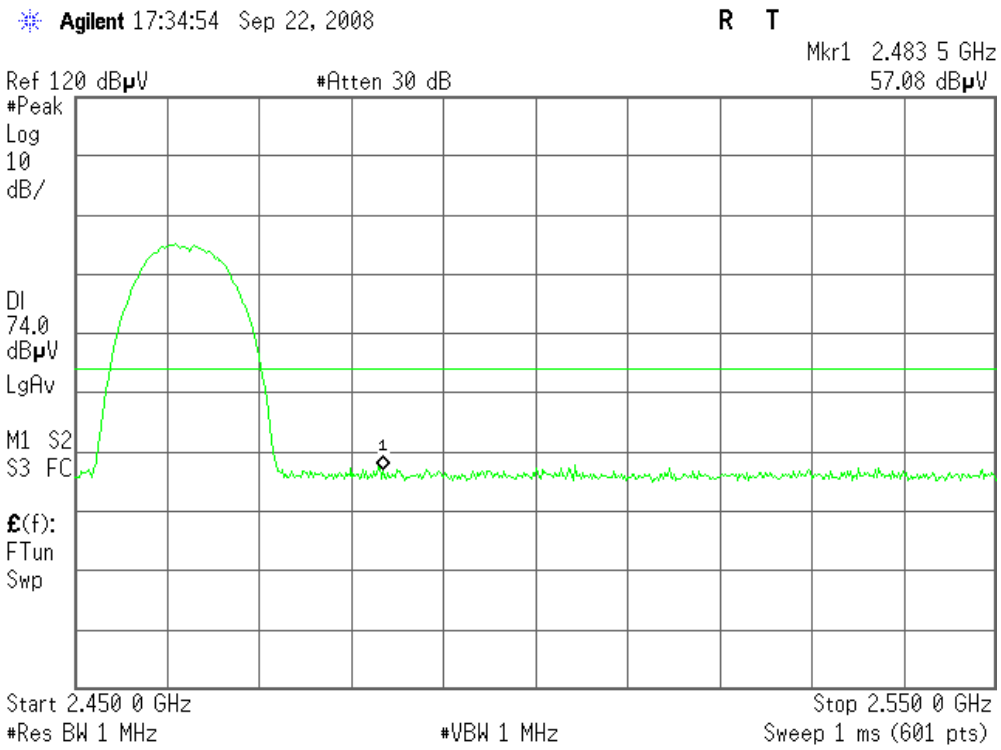


Detector mode: Average

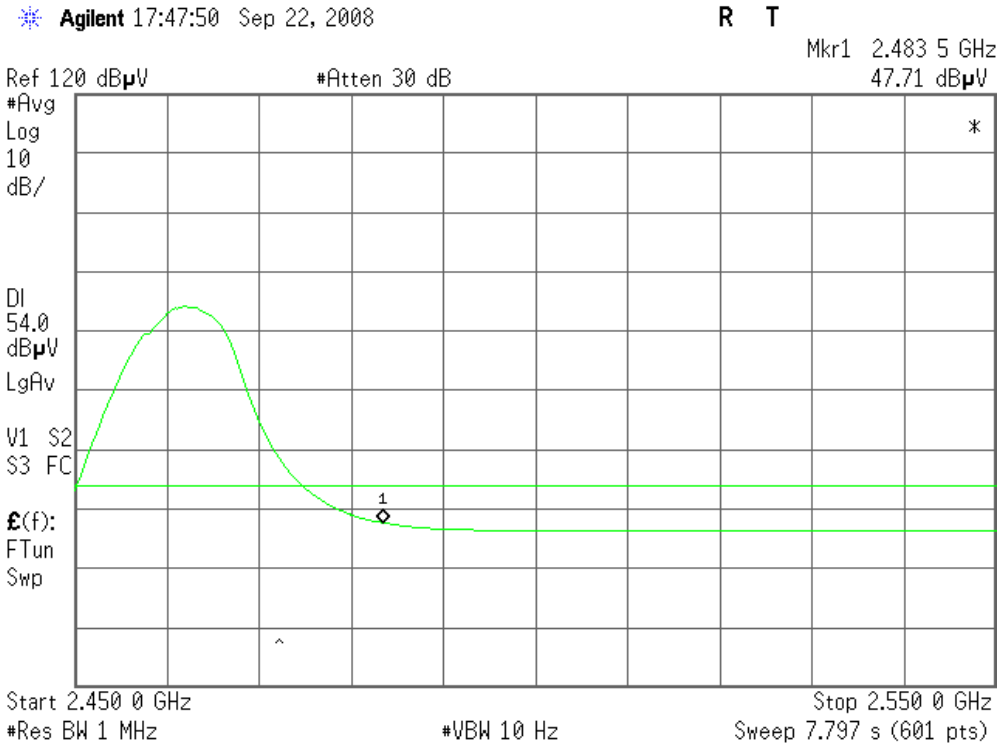
Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**



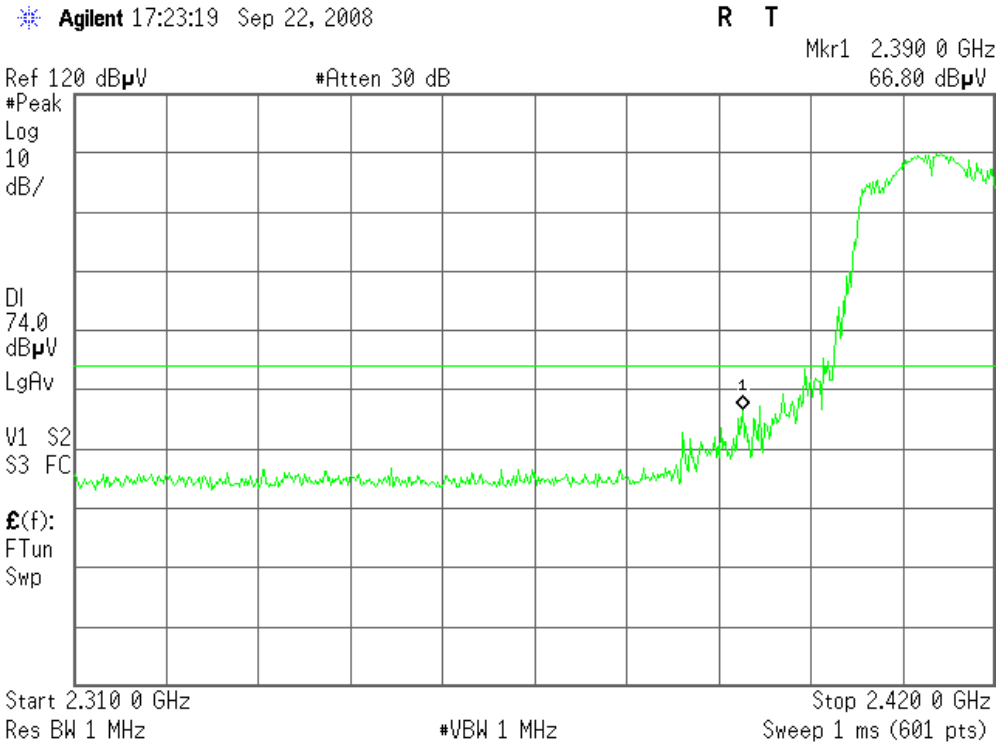
Detector mode: Average **Polarity: Horizontal**



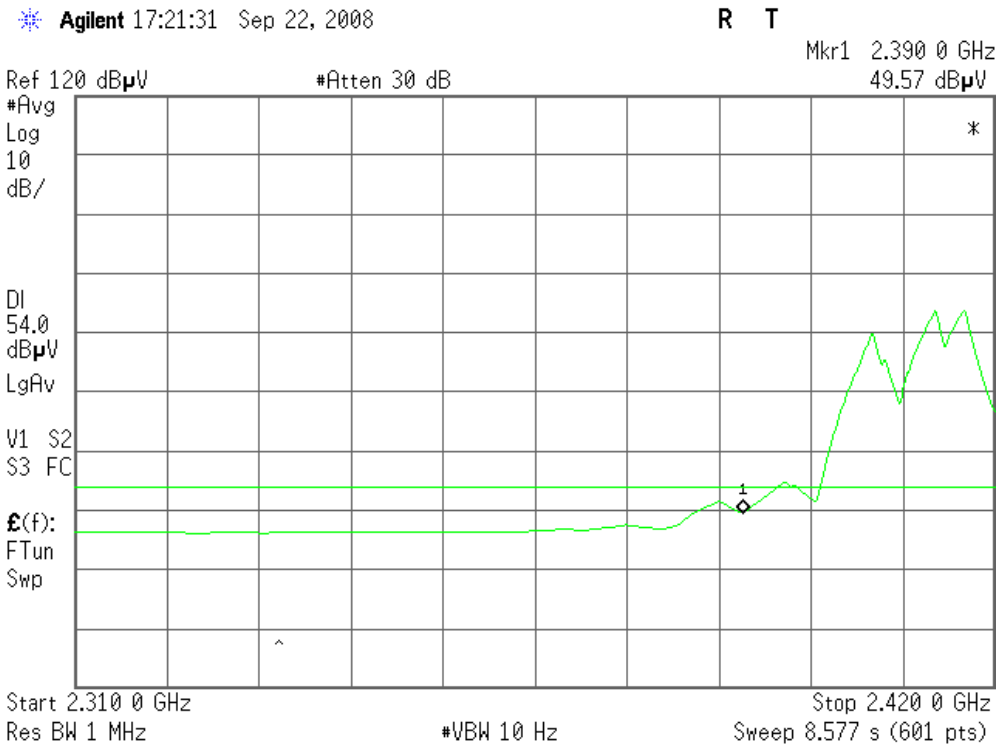
Test Plot (IEEE 802.11g mode)

Band Edges (CH Low)

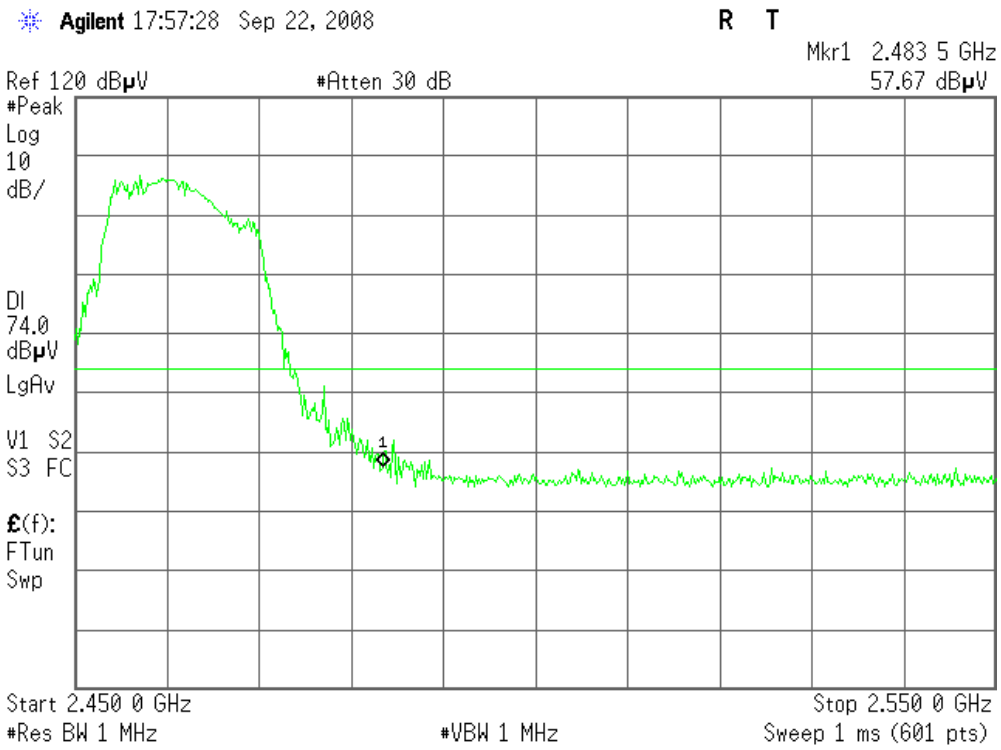
Detector mode: Peak **Polarity: Vertical**



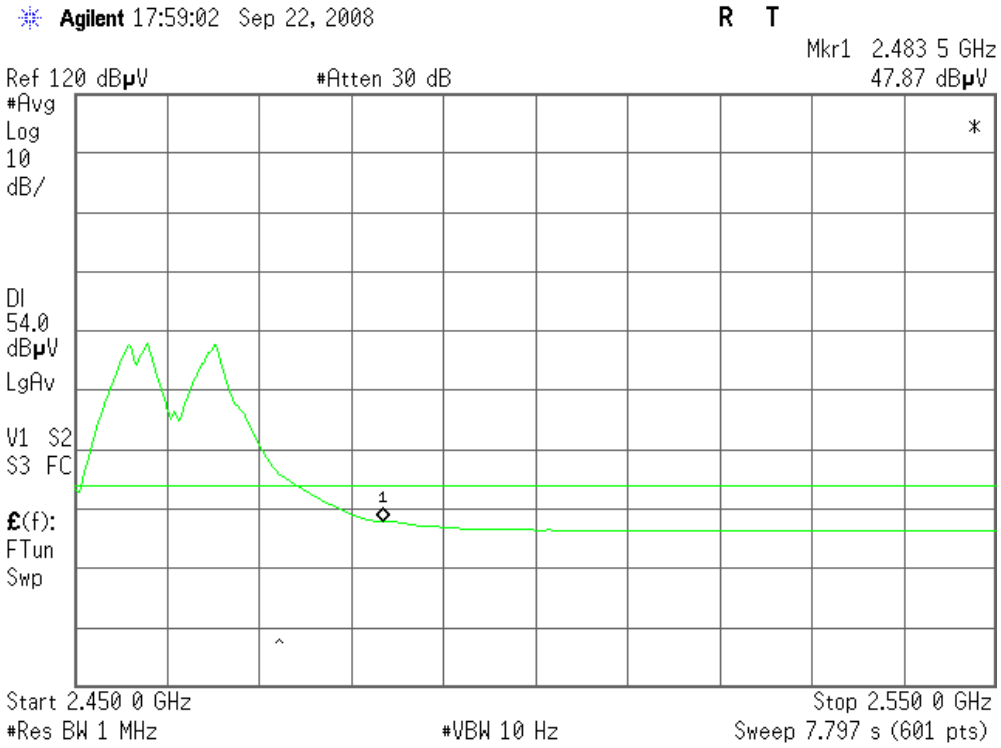
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**



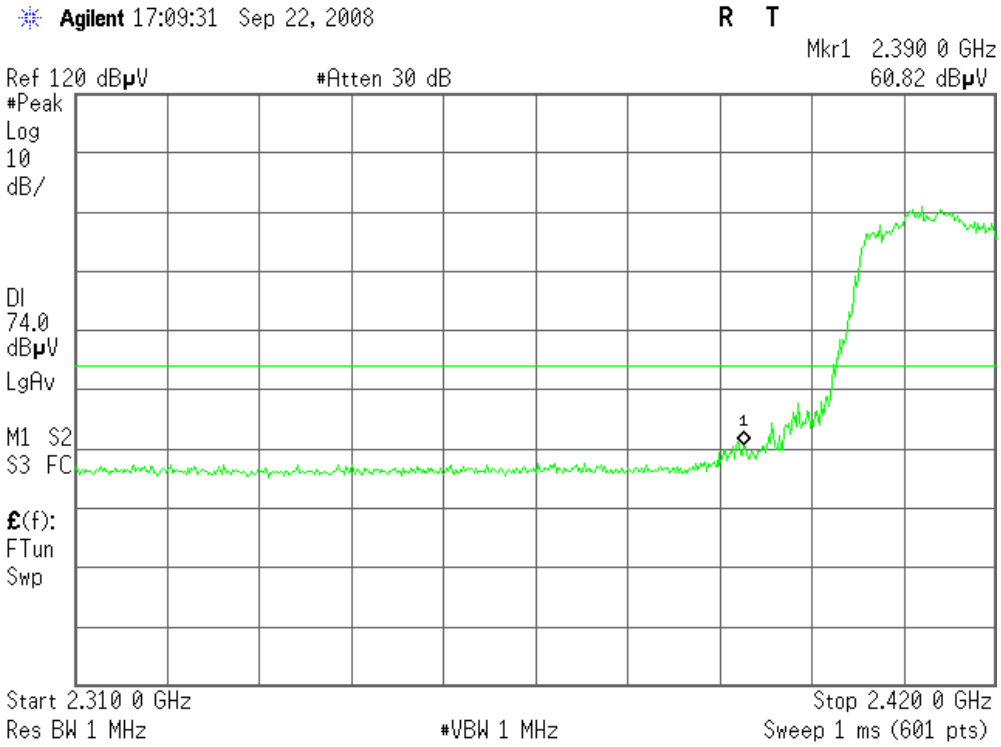
Detector mode: Average **Polarity: Horizontal**



Band Edges (CH High)

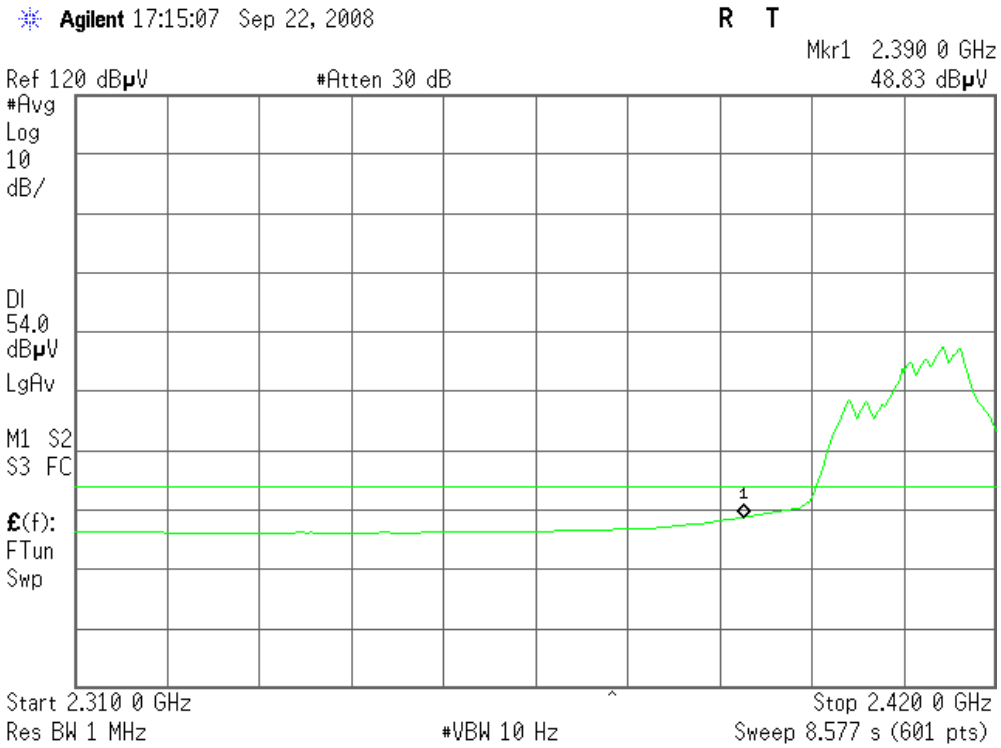
Detector mode: Peak

Polarity: Vertical

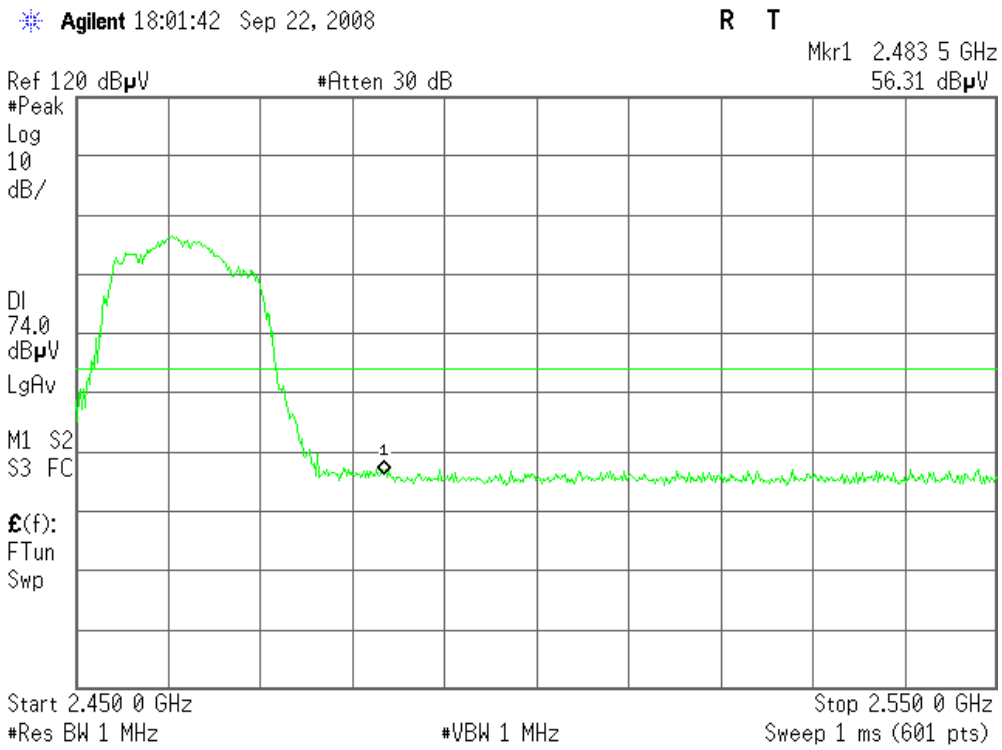


Detector mode: Average

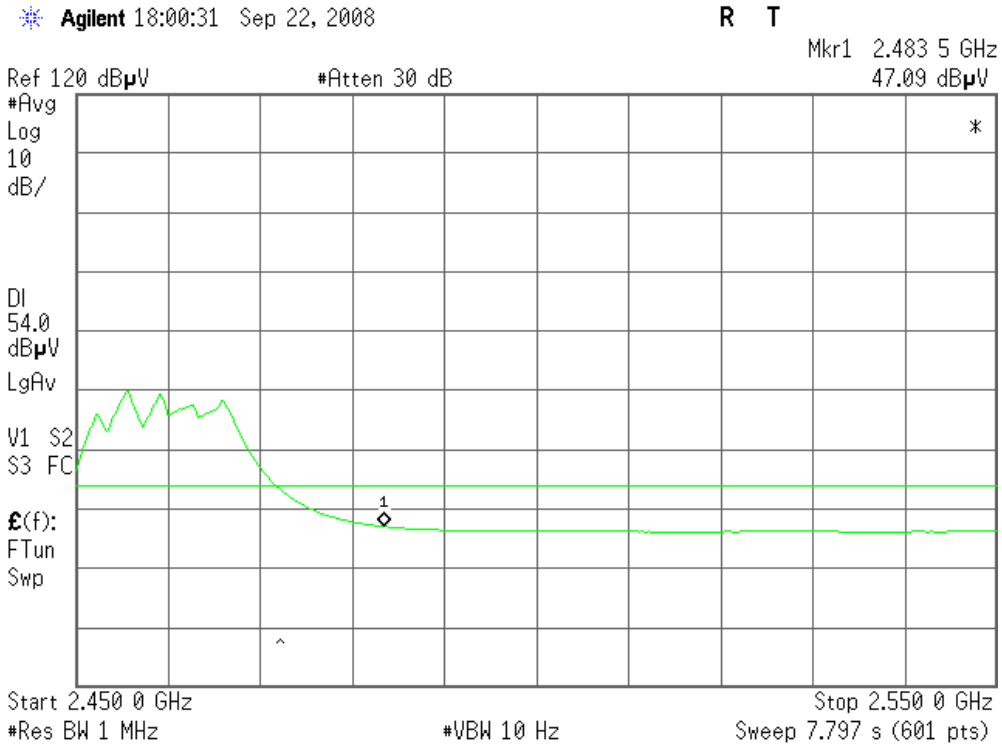
Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



7.6. PEAK POWER SPECTRAL DENSITY MEASUREMENT

7.6.1. LIMITS

8. 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.

9. 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.

7.6.2. TEST INSTRUMENTS

Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US44300399	02/24/2009

7.6.3. TEST PROCEDURES (please refer to measurement standard)

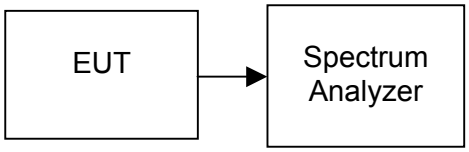
1. Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

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.

7.6.4. TEST SETUP



7.6.5. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	2.81	8.00	PASS
Mid	2437	2.27		PASS
High	2462	0.80		PASS

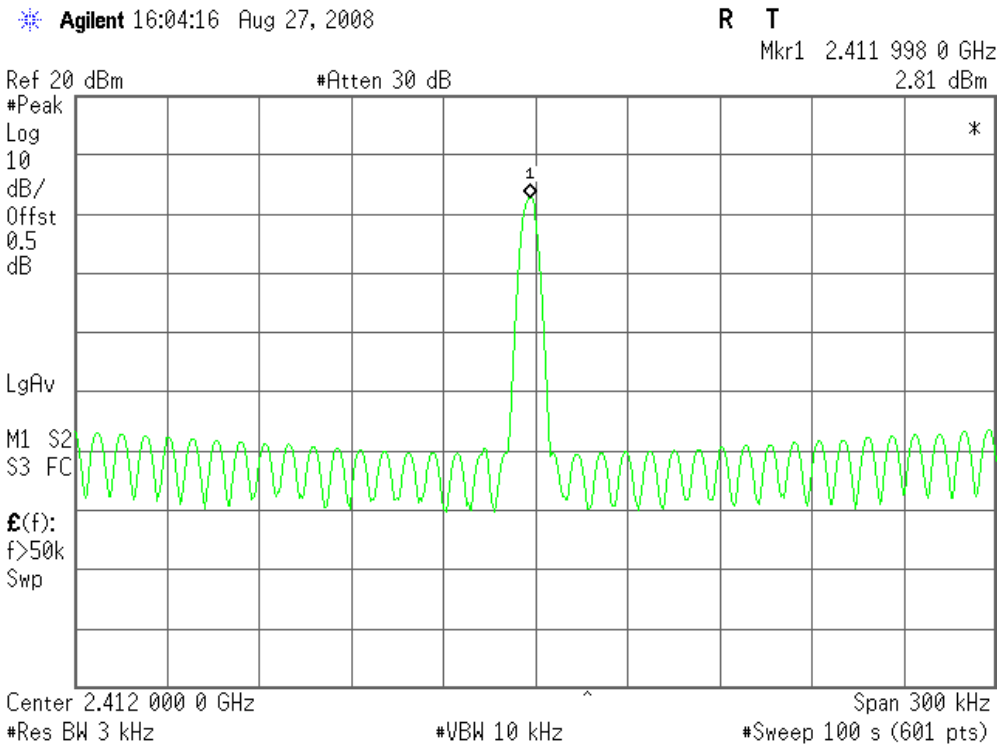
Test Data

Test mode: IEEE 802.11g

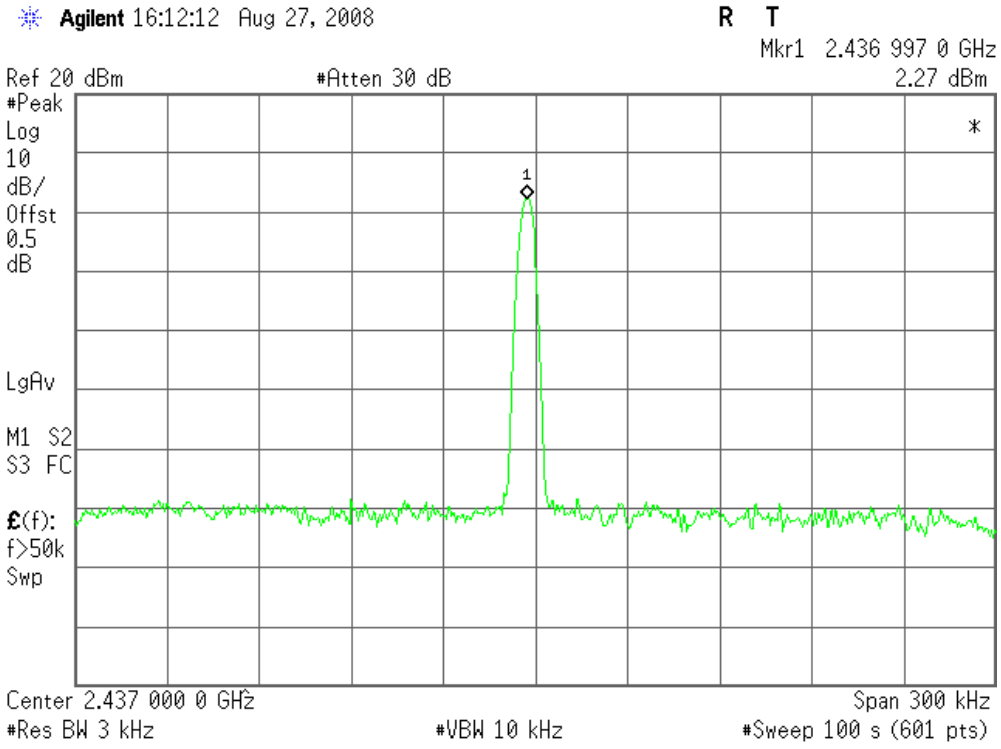
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	2.17	8.00	PASS
Mid	2437	2.23		PASS
High	2462	0.41		PASS

Test Plot (IEEE 802.11b mode)

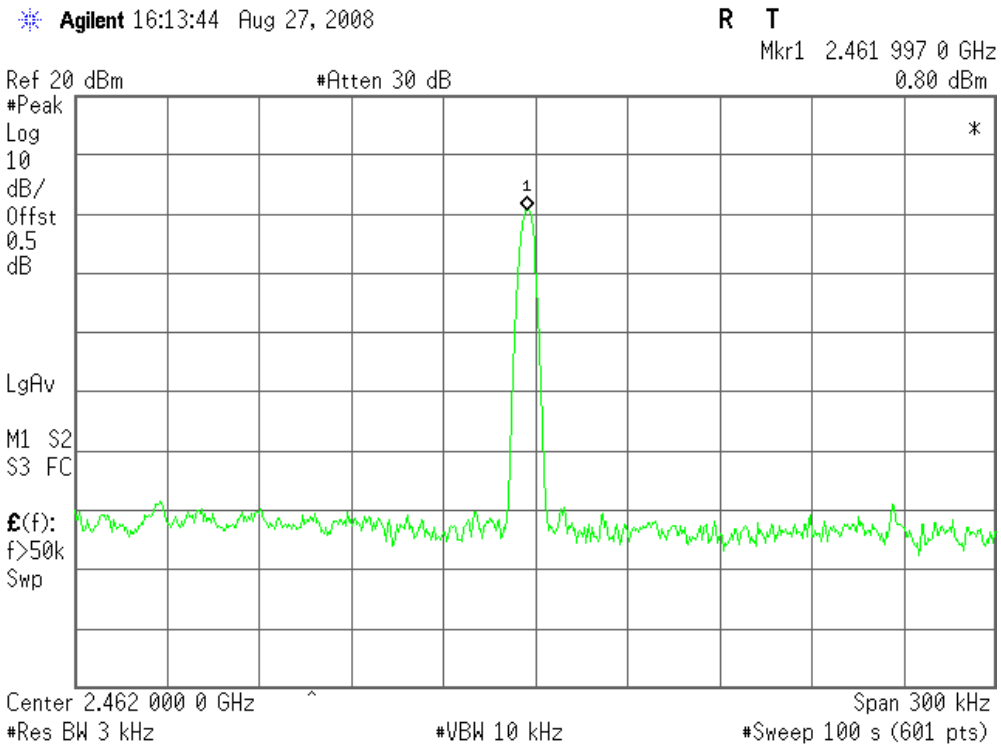
PPSD (CH Low)



PPSD (CH Mid)

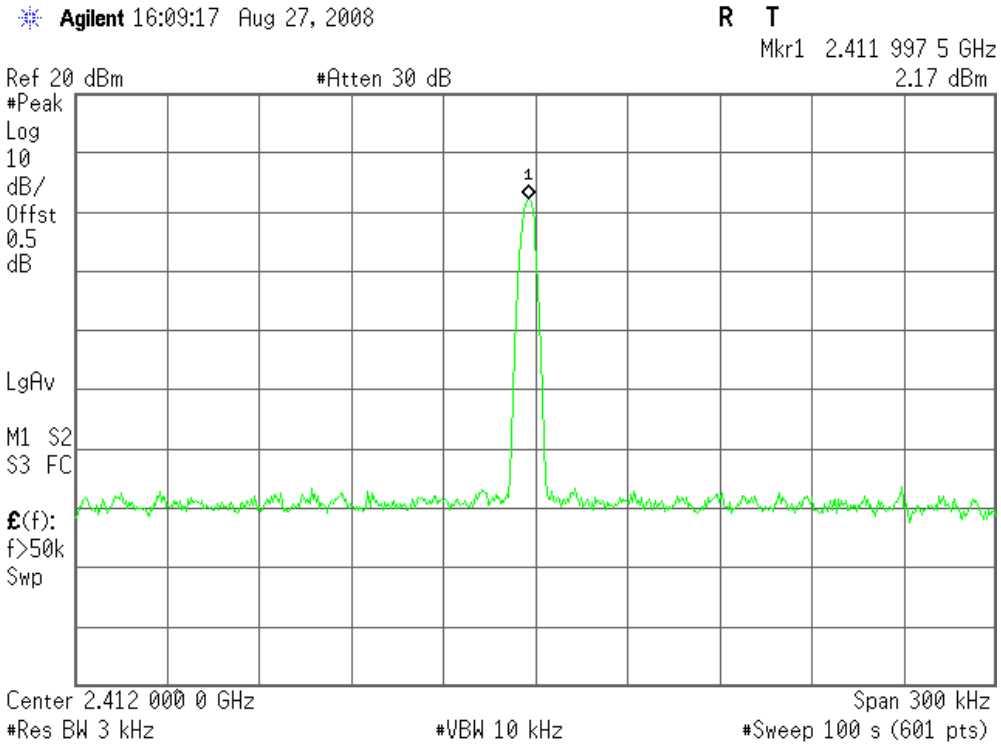


PPSD (CH High)

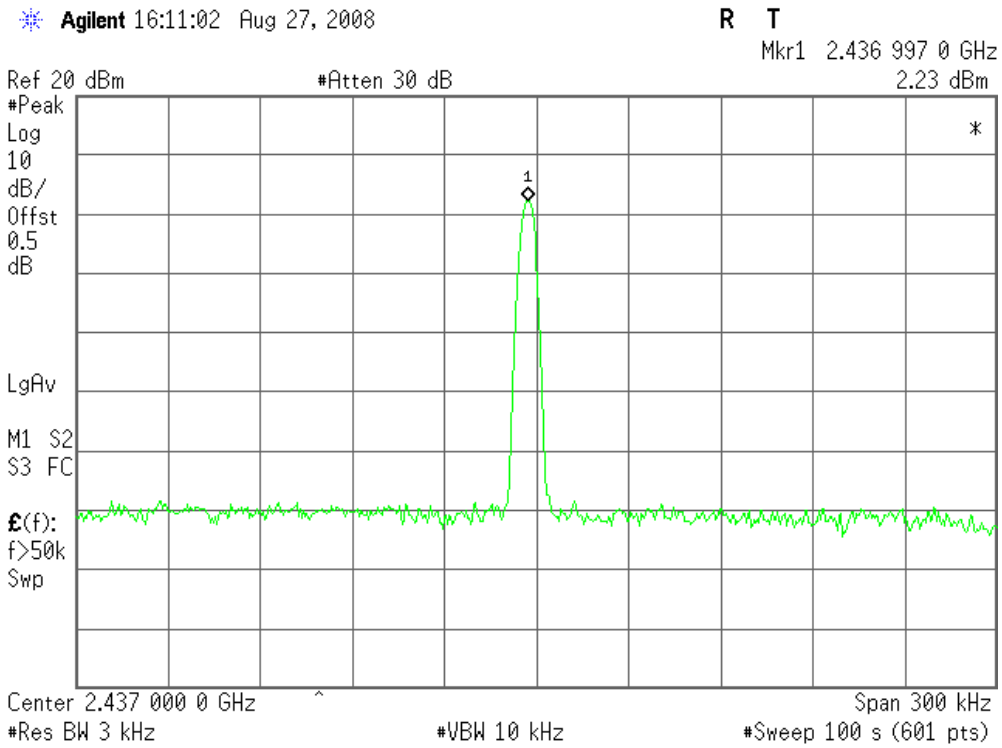


Test Plot (IEEE 802.11g mode)

PPSD (CH Low)



PPSD (CH Mid)



PPSD (CH High)