

# FCC TEST REPORT

for

**802.11b/g USB Module**

**MODEL: SWG25MA**

**Test Report Number:**  
**SZ090828B02-RP**

Issued for

**Suga Electronics Limited**

**Units 1904-1907, 19/F, Chevalier Commercial Centre,  
8 Wang Hoi Road, Kowloon Bay, Kowloon, Hong Kong**

Issued by:

**COMPLIANCE CERTIFICATION SERVICES (SHENZHEN) INC.**

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**Issued Date: October 19, 2009**



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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	October 19, 2009	Initial Issue	ALL	Clinton Kao



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# 1 TEST CERTIFICATION

**Product:** 802.11b/g USB Module

**Model:** SWG25MA

**Brand:** SugaE

**Tested:** August 28- October 19, 2009

**Applicant:** Suga Electronics Limited

Units 1904-1907, 19/F, Chevalier Commercial Centre, 8 Wang Hoi Road, Kowloon Bay, Kowloon, Hong Kong

**Manufacturer:** Suga Electronics Limited

Units 1904-1907, 19/F, Chevalier Commercial Centre, 8 Wang Hoi Road, Kowloon Bay, Kowloon, Hong Kong

## APPLICABLE STANDARDS

Standard	Test Type	Standard	Test Type
15.207(a)	Power Line Conducted Emissions	15.247(d) 15.209(a)	<ul style="list-style-type: none"> <li>● Spurious Emissions</li> <li>● Conducted Measurement</li> <li>● Radiated Emissions</li> </ul>
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)	<ul style="list-style-type: none"> <li>● Spurious Emissions</li> <li>● Conducted Measurement</li> <li>● Radiated Emissions</li> </ul>	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

<b>Product</b>	802.11b/g USB Module
<b>Trade Name</b>	SugaE
<b>Model Number</b>	SWG25MA
<b>Model Discrepancy</b>	N/A
<b>Serial Number</b>	SZ090828B02-RP
<b>EUT Power Rating</b>	Powered by the notebook
<b>Frequency Range</b>	IEEE 802.11b mode: 2412 ~ 2462 MHz IEEE 802.11g mode: 2412 ~ 2462 MHz
<b>Transmit Power</b>	IEEE 802.11b mode: 17.03dBm IEEE 802.11g mode: 13.57dBm
<b>Modulation Technique</b>	802.11b: DSSS (CCK; DQPSK; DBPSK) 802.11g: OFDM
<b>Transmit Data Rate</b>	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)
<b>Number of Channels</b>	IEEE 802.11b/g :11 Channels
<b>Antenna Specification</b>	Ceramic 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: VZFSWG25MAF 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 .

IEEE802.11b: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 1Mbps 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.

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	NOTEBOOK	2672	992F2VG	N/A	IBM	N/A	Unshielded 1.80m
2	USB fixture	N/A	N/A	N/A	N/A	N/A	N/A

**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

**No10-1, Mingkeda Logistics Park, No.18 Huanguan South RD. Guan lan 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.

<b>USA</b>	<b>A2LA</b>
<b>Taiwan</b>	<b>TAF</b>

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

<b>USA</b>	<b>FCC</b>
<b>Japan</b>	<b>VCCI</b>
<b>Canada</b>	<b>INDUSTRY CANADA</b>
<b>Taiwan</b>	<b>BSMI</b>
<b>Norway</b>	<b>Nemko</b>

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

### 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	+/- 3.18dB
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.



## 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.

#### 7.1.2. TEST INSTRUMENTS

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

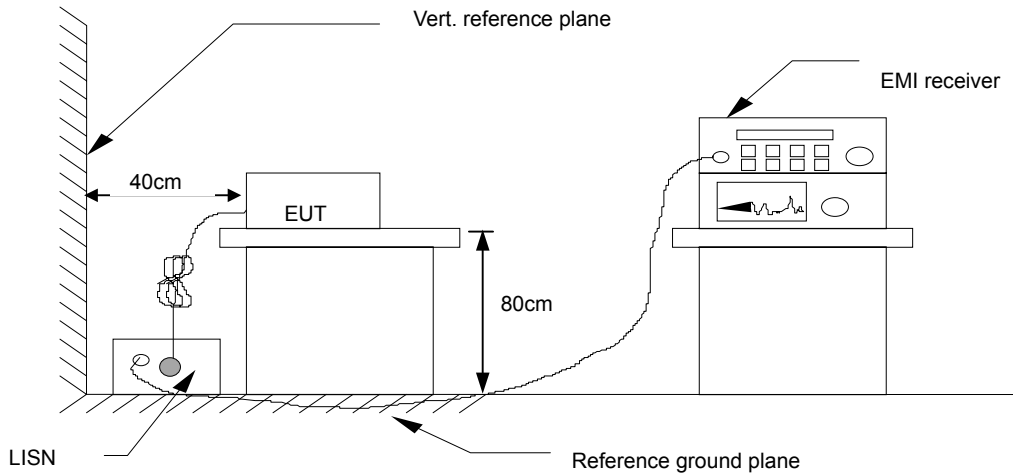
- NOTE:**
- 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  - 2. N.C.R = No Calibration Request.



**7.1.3. 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.

**7.1.4. TEST SETUP**



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

**7.1.5. Data Sample:**

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
x.xx	50.27	49.16	48.17	65.47	55.47	-16.31	-7.30	L

Freq. = Emission frequency in MHz  
 RAW dBuV = Uncorrected Analyzer/Received Reading +INSERTION LOSS of LISN+CABLE LOSS+pulse limiter loss  
 Q.P. Limit dBuV = Limit stated in standard  
 AVG Limit dBuV = Limit stated in standard  
 Q.P. Margin dB = Q.P. RAW (dBuV) –Q.P. Limit (dBuV)  
 AVG Margin dB = AVG RAW (dBuV) –AVG Limit (dBuV)  
 Note = Current carrying line of reading  
 Q.P.: =Quasi-Peak

**7.1.6. TEST RESULTS**

Not applicable. Since it is the module without the power supply port.



## 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 is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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	02/24/2010

### 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

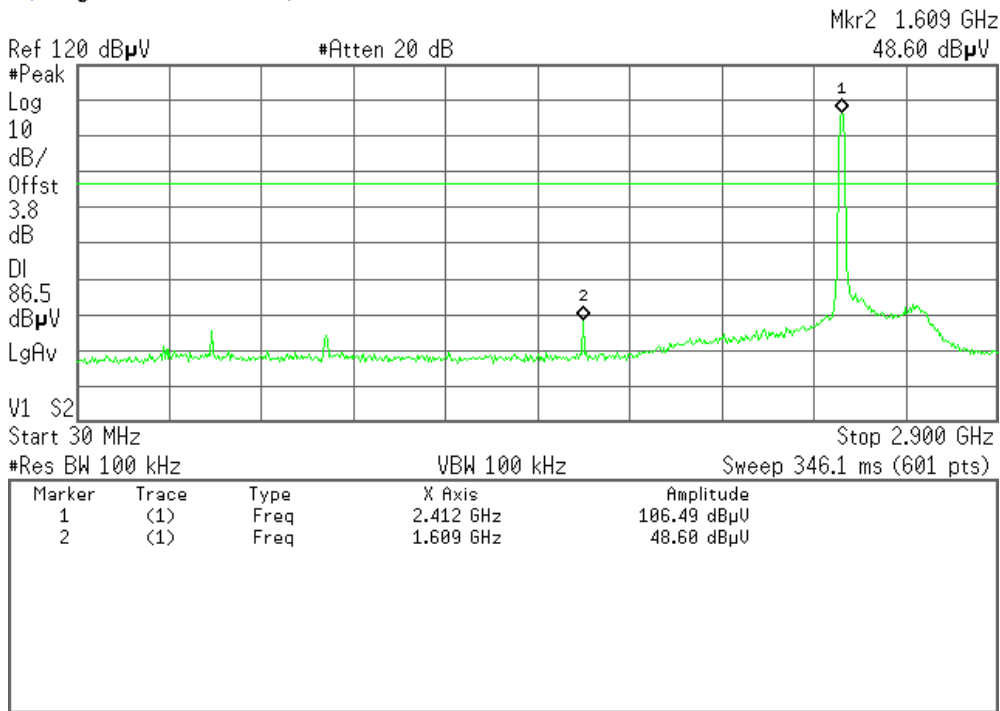
Test Plot

(IEEE 802.11b mode)

CH Low (30MHz ~2.9GHz)

Agilent 17:38:03 3 Sep 2009

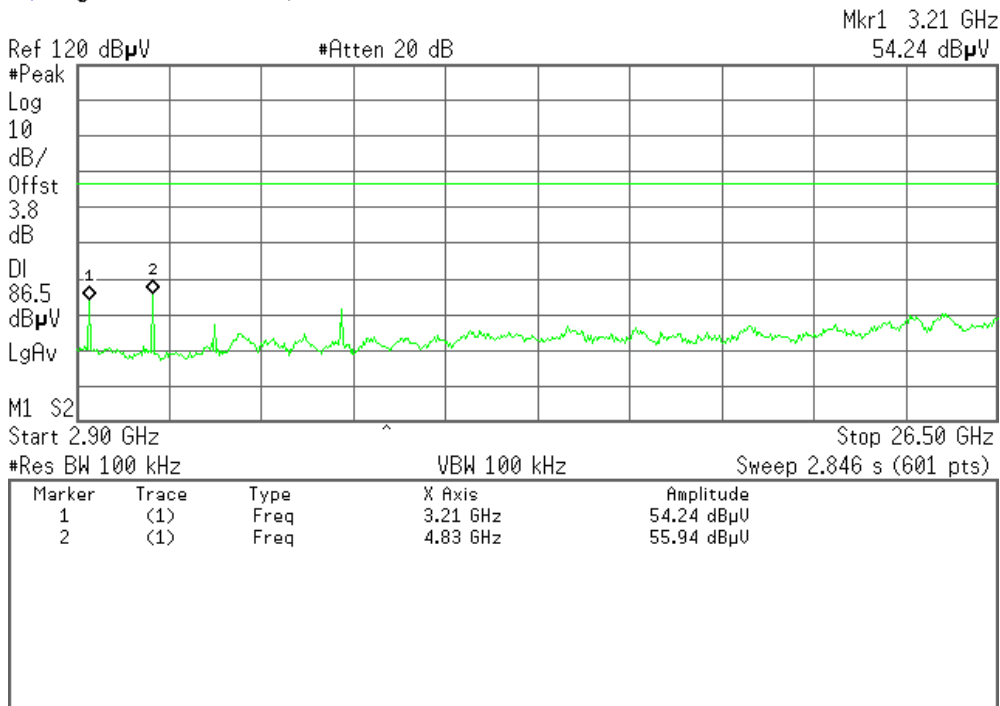
R T



(2.9MHz ~26.5GHz)

Agilent 17:39:08 3 Sep 2009

R T

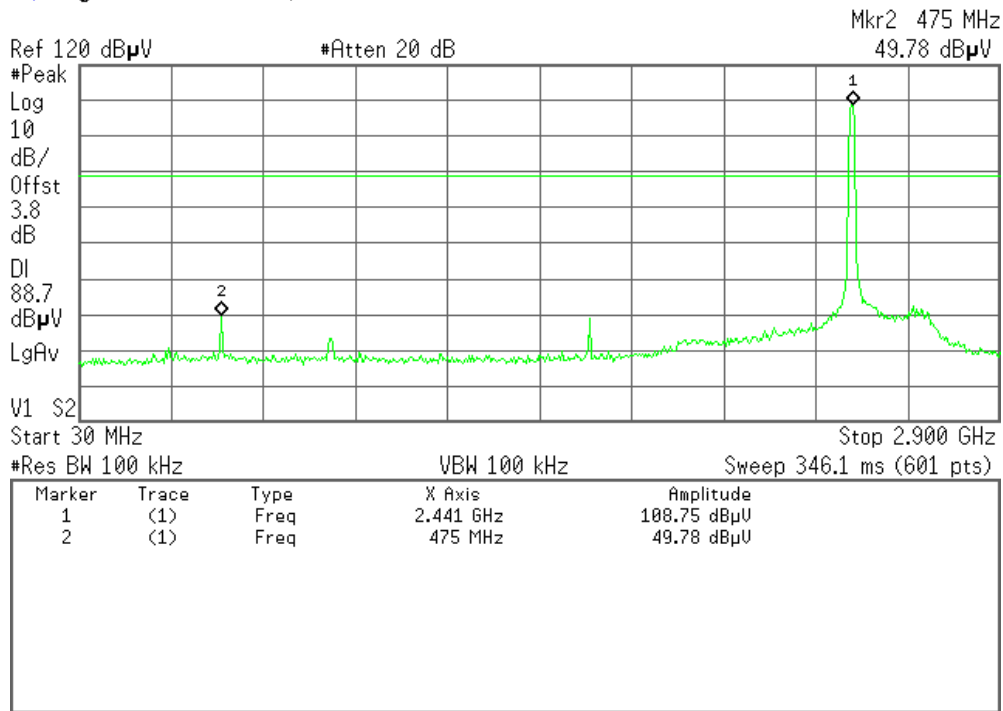




### CH Mid(30MHz ~ 2.9GHz)

Agilent 17:41:22 3 Sep 2009

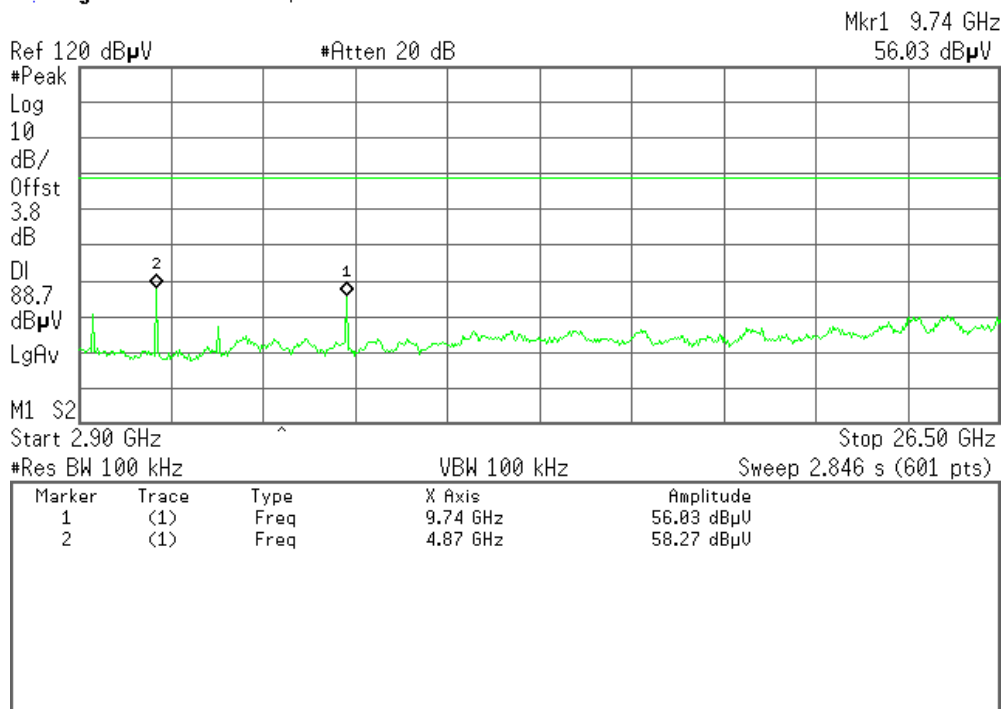
R T



### 2.9GHz ~ 26.5GHz

Agilent 17:42:39 3 Sep 2009

R T

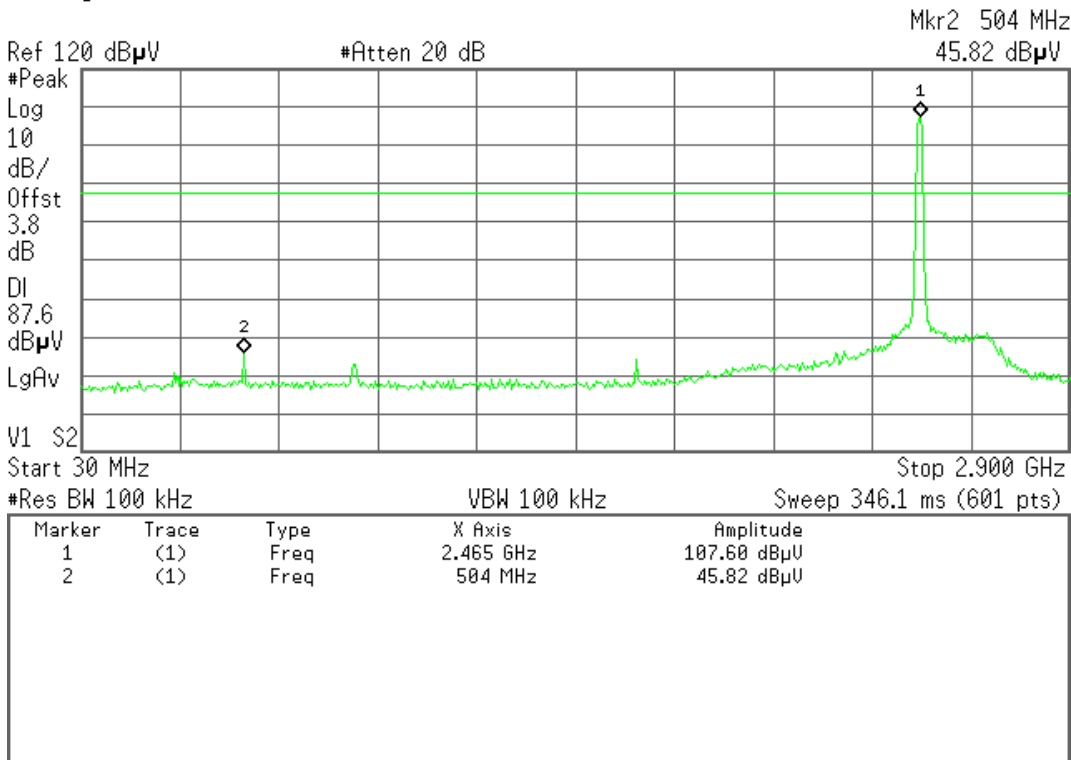




### CH High (30MHz ~ 2.9GHz)

Agilent 17:44:43 3 Sep 2009

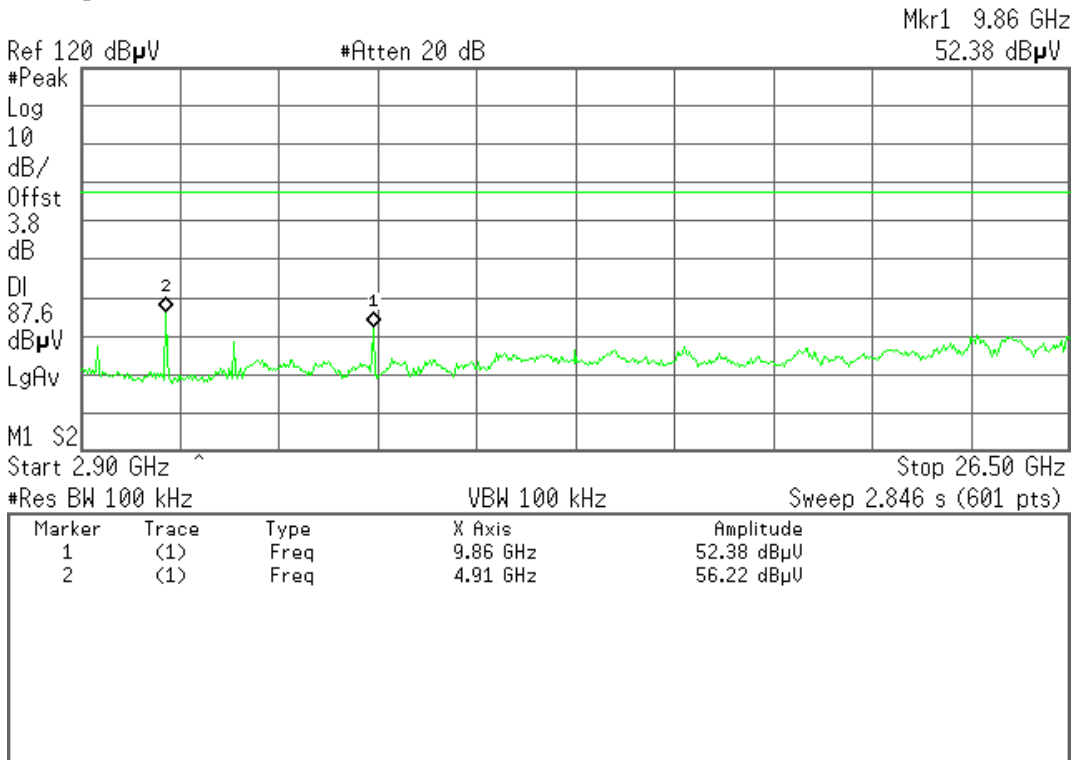
R T



### 2.9GHz ~ 26.5GHz

Agilent 17:45:45 3 Sep 2009

R T







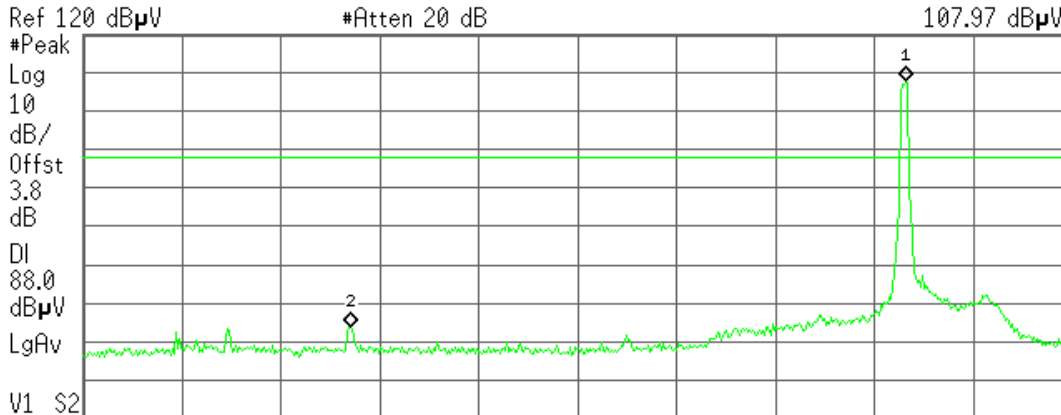
(IEEE 802.11g mode)

CH Low (30MHz ~2.9GHz)

Agilent 17:34:00 3 Sep 2009

R T

Mkr1 2.417 GHz  
107.97 dBµV



Start 30 MHz Stop 2.900 GHz  
#Res BW 100 kHz VBW 100 kHz Sweep 346.1 ms (601 pts)

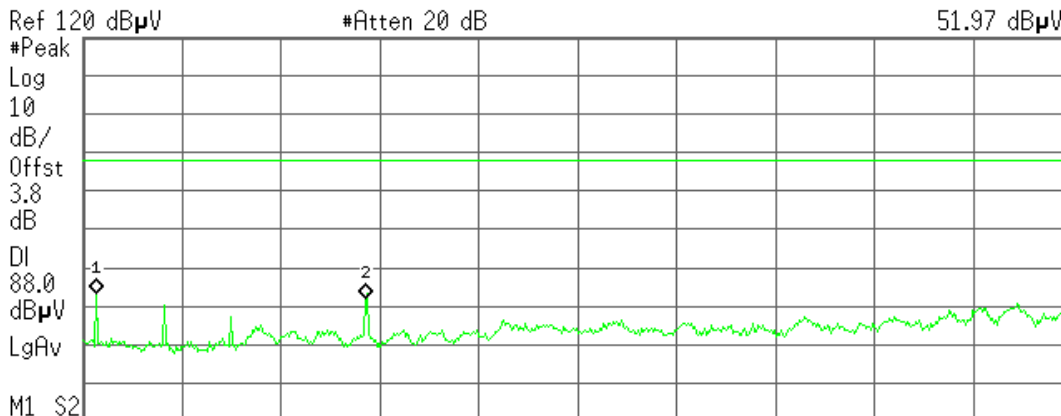
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.417 GHz	107.97 dBµV
2	(1)	Freq	805 MHz	43.86 dBµV

(2.9MHz ~26.5GHz)

Agilent 17:35:37 3 Sep 2009

R T

Mkr2 9.63 GHz  
51.97 dBµV



Start 2.90 GHz Stop 26.50 GHz  
#Res BW 100 kHz VBW 100 kHz Sweep 2.846 s (601 pts)

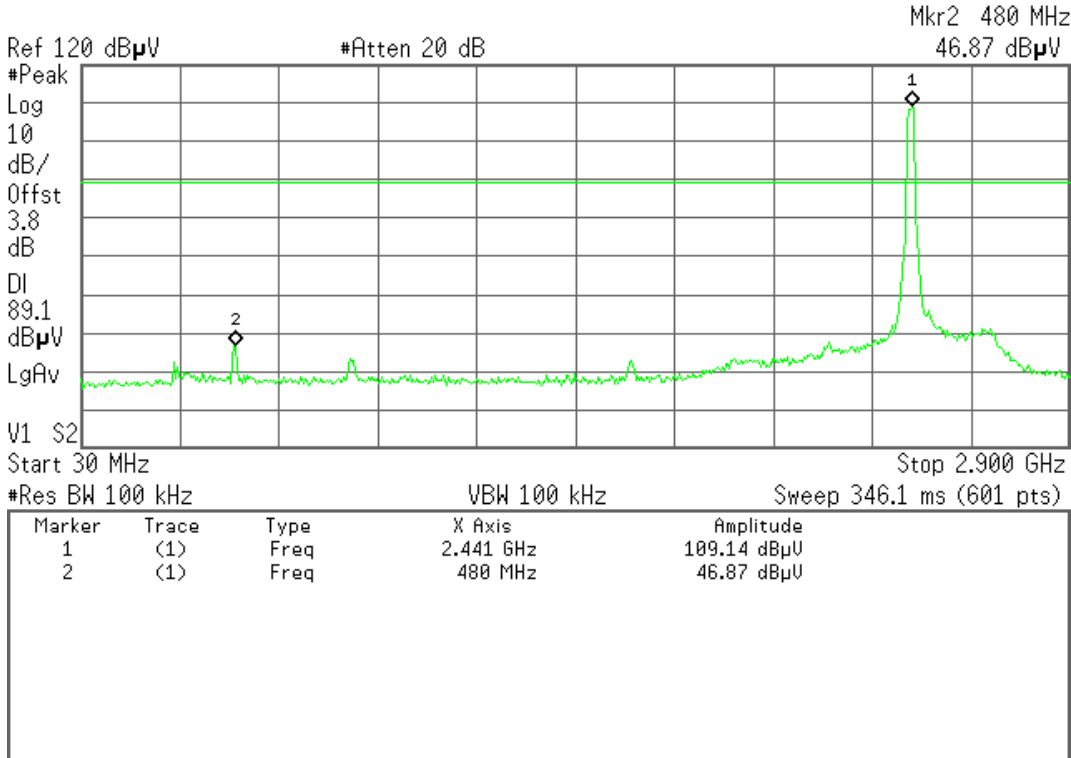
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	3.21 GHz	53.23 dBµV
2	(1)	Freq	9.63 GHz	51.97 dBµV



### CH Mid(30MHz ~ 2.9GHz)

Agilent 17:31:04 3 Sep 2009

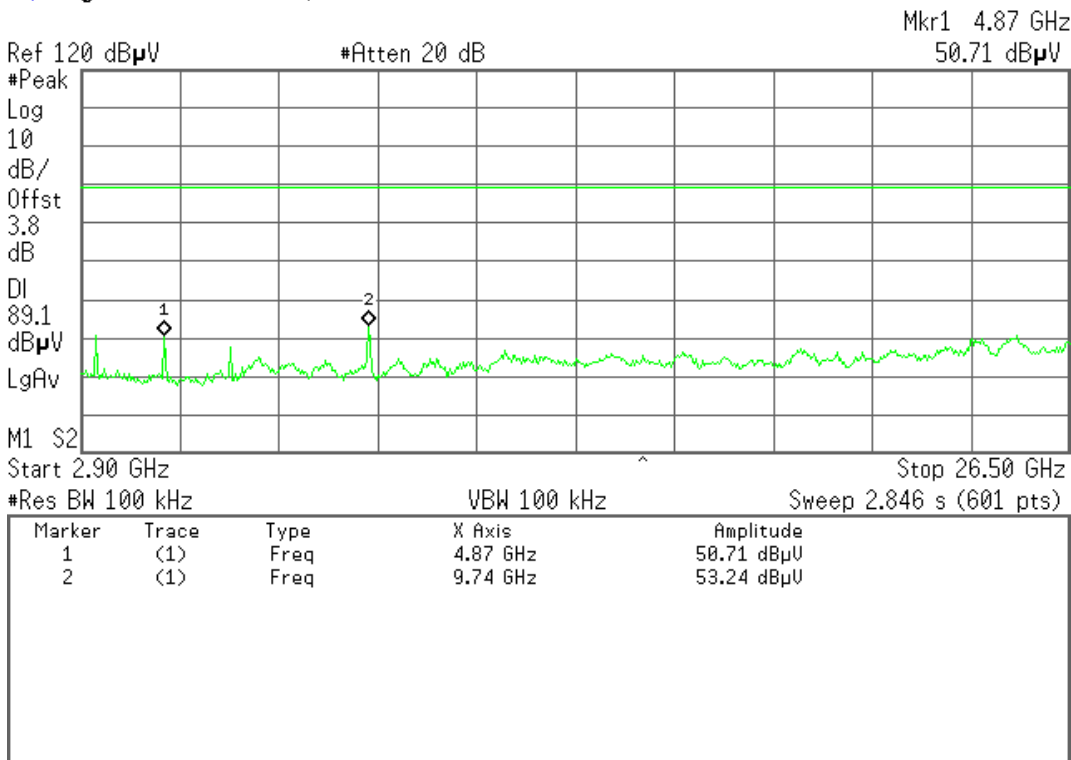
R T



### 2.9GHz ~ 26.5GHz

Agilent 17:32:18 3 Sep 2009

R T

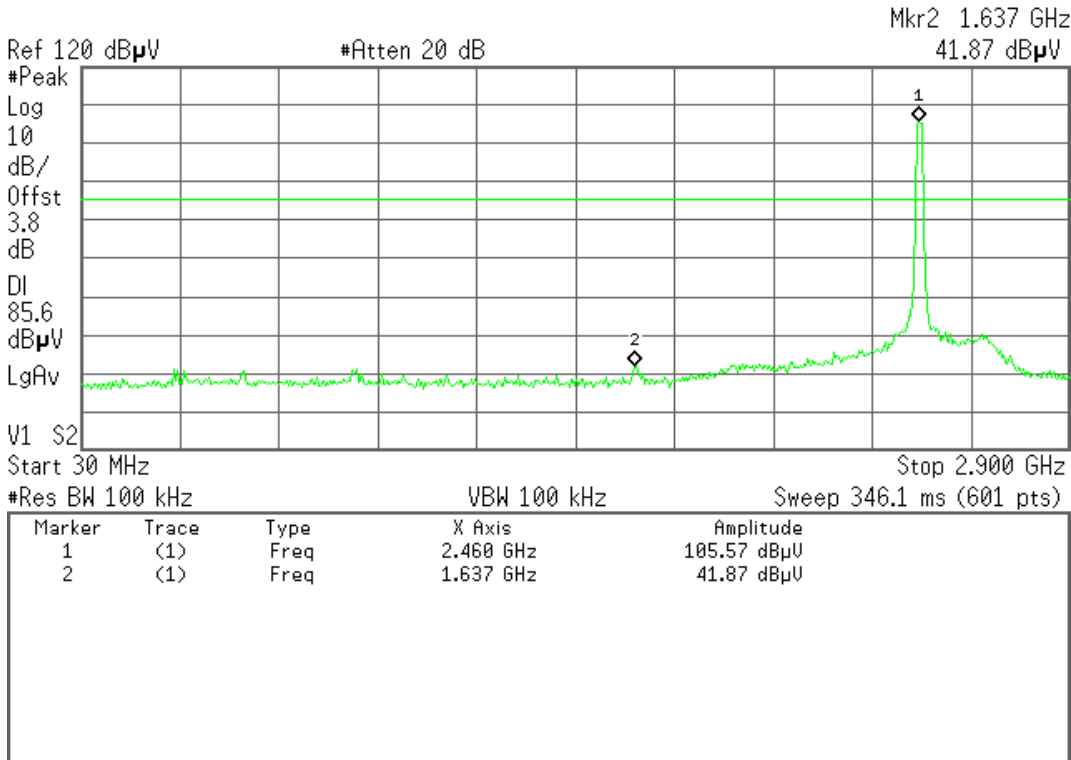




### CH High (30MHz ~ 2.9GHz)

Agilent 17:27:18 3 Sep 2009

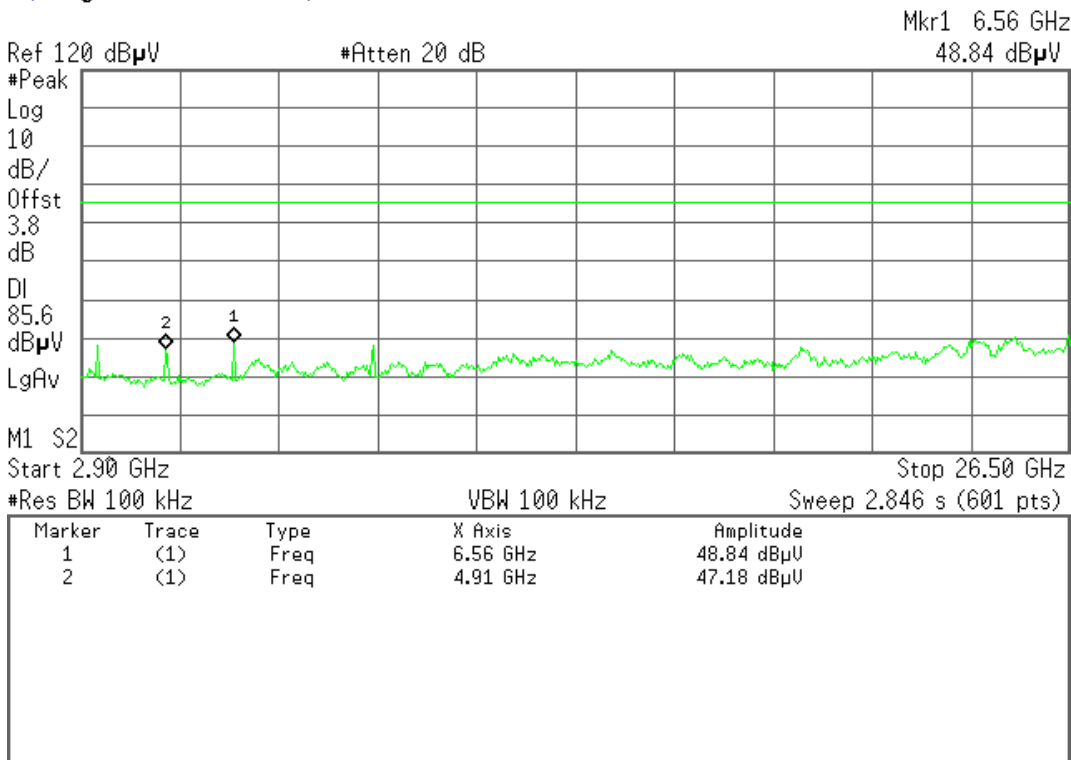
R T



### 2.9GHz ~ 26.5GHz

Agilent 17:28:37 3 Sep 2009

R T





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)					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	Calibration 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	06/08/2009	06/09/2010
Horn Antenna	SCHAFFNER	BBHA9120D	1201	03/19/2009	03/19/2010
Signal Generator	Anritsu	MG3694A	#050125	03/01/2009	03/01/2010

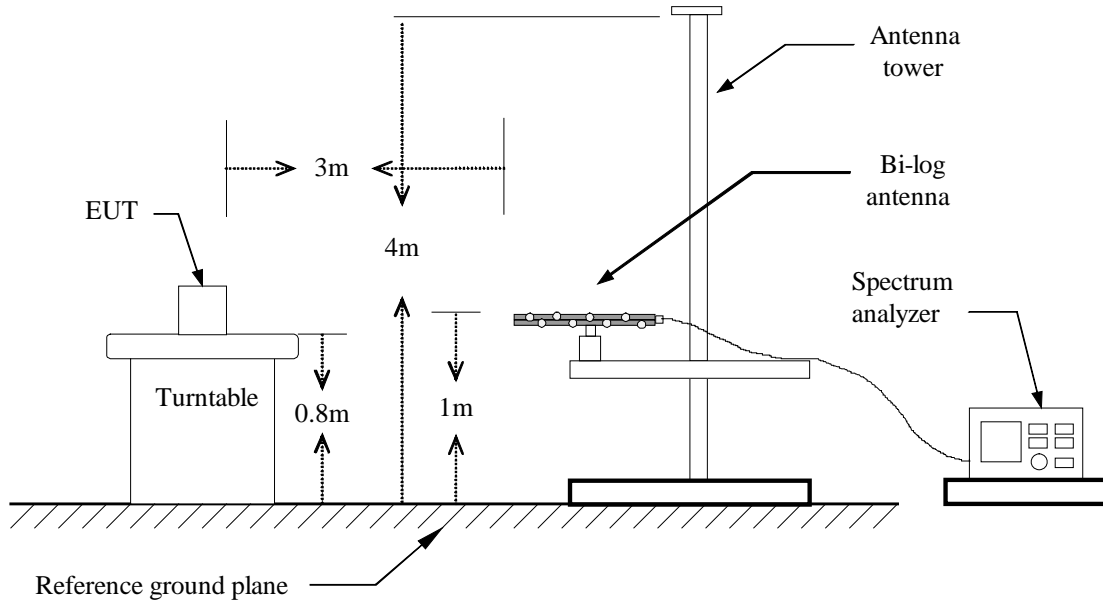
- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
 2. The FCC Site Registration number is 101879.  
 3. N.C.R = No Calibration Required.

7.2.5.3. TEST PROCEDURE (please refer to measurement standard)

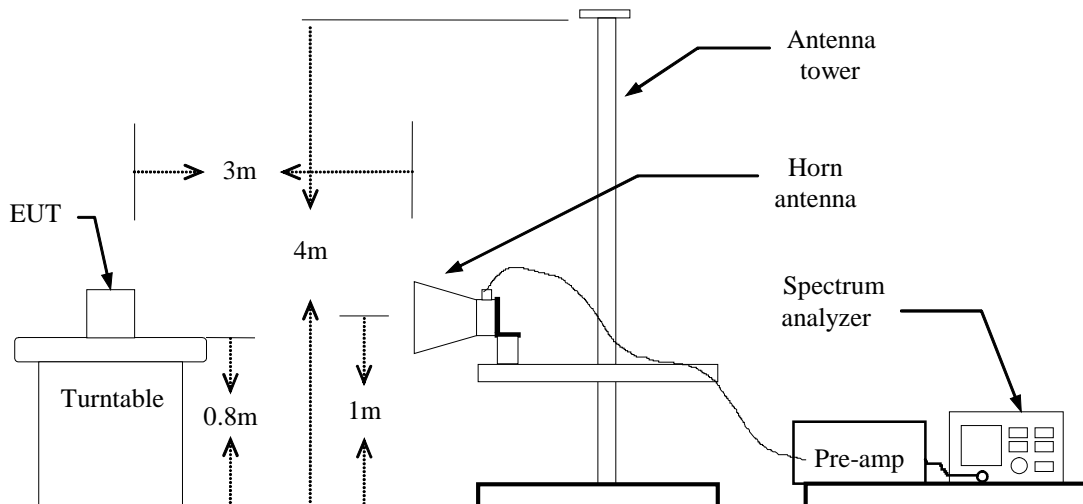
- The EUT is placed on a turntable, which is 0.8m above ground plane.
- The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 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
- 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: September 02, 2009

Temperature: 26°C

Tested by: Tom Gan

Humidity: 65 % 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)
151.950	V	Peak	50.63	-19.10	31.53	43.50	-11.97
213.600	V	Peak	55.56	-17.30	38.26	43.50	-5.24
479.666	V	Peak	46.25	-9.64	36.61	46.00	-9.39
599.833	V	Peak	48.67	-5.93	42.74	46.00	-3.26
790.000	V	Peak	38.55	-3.35	35.20	46.00	-10.80
960.333	V	Peak	39.18	-1.75	37.43	54.00	-16.57
37.200	H	Peak	44.81	-17.03	27.78	40.00	-12.22
71.850	H	Peak	42.78	-20.07	22.71	40.00	-17.29
182.100	H	Peak	48.86	-18.38	30.48	43.50	-13.02
452.833	H	Peak	41.05	-10.17	30.88	46.00	-15.12
597.500	H	Peak	34.15	-6.05	28.10	46.00	-17.90
960.333	H	Peak	34.18	-1.75	32.43	54.00	-21.57

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

**REMARKS:**

1. Measuring frequencies from 9kHz to the 1GHz.
2. Radiated emissions measured in frequency range from 9kHz 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:** September 02, 2009

**Temperature:** 26°C

**Tested by:** Tom Gan

**Humidity:** 65% 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
1233.333	V	52.05	---	-10.89	41.16	---	74.00	54.00	-12.84	Peak
1560.000	V	52.56	---	-8.94	43.62	---	74.00	54.00	-10.38	Peak
1920.000	V	50.46	---	-6.09	44.37	---	74.00	54.00	-9.63	Peak
4825.000	V	47.86	---	2.68	50.54	---	74.00	54.00	-3.46	Peak
N/A										
1560.000	H	53.51	---	-8.94	44.57	---	74.00	54.00	-9.43	Peak
1920.000	H	49.92	---	-6.09	43.83	---	74.00	54.00	-10.17	Peak
2246.666	H	49.94	---	-4.48	45.46	---	74.00	54.00	-8.54	Peak
4825.000	H	46.70	---	2.68	49.38	---	74.00	54.00	-4.62	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: September 02, 2009

Temperature: 26°C

Tested by: Tom Gan

Humidity: 65% 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
1233.333	V	52.92	---	-10.89	42.03	---	74.00	54.00	-11.97	Peak
1800.000	V	50.12	---	-7.04	43.08	---	74.00	54.00	-10.92	Peak
1916.666	V	49.83	---	-6.12	43.71	---	74.00	54.00	-10.29	Peak
4875.000	V	49.19	---	2.77	51.96	---	74.00	54.00	-2.04	Peak
N/A										
1560.000	H	55.90	---	-8.94	46.96	---	74.00	54.00	-7.04	Peak
1920.000	H	49.90	---	-6.09	43.81	---	74.00	54.00	-10.19	Peak
2080.000	H	47.90	---	-5.14	42.76	---	74.00	54.00	-11.24	Peak
4875.000	H	48.26	---	2.77	51.03	---	74.00	54.00	-2.97	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: September 02, 2009

Temperature: 26°C

Tested by: Tom Gan

Humidity: 65% 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
1233.333	V	53.00	---	-10.89	42.11	---	74.00	54.00	-11.89	Peak
1920.000	V	49.21	---	-6.09	43.12	---	74.00	54.00	-10.88	Peak
2040.000	V	49.86	---	-5.30	44.56	---	74.00	54.00	-9.44	Peak
2460.000	V	46.32	---	2.85	49.17	---	74.00	54.00	-4.83	Peak
N/A										
1560.000	H	56.17	---	-8.94	47.23	---	74.00	54.00	-6.77	Peak
1676.666	H	49.78	---	-8.02	41.76	---	74.00	54.00	-12.24	Peak
1920.000	H	48.93	---	-6.09	42.84	---	74.00	54.00	-11.16	Peak
4925.000	H	45.07	---	2.85	47.92	---	74.00	54.00	-6.08	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: September 02, 2009

Temperature: 26°C

Tested by: Tom Gan

Humidity: 65 % 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
1233.333	V	53.64	---	-10.89	42.75	---	74.00	54.00	-11.25	Peak
1916.666	V	51.05	---	-6.12	44.93	---	74.00	54.00	-9.07	Peak
2026.666	V	51.81	---	-5.35	46.46	---	74.00	54.00	-7.54	Peak
4825.000	V	43.87	---	2.68	46.55	---	74.00	54.00	-7.45	Peak
N/A										
1560.000	H	54.55	---	-8.94	45.61	---	74.00	54.00	-8.39	Peak
1800.000	H	51.92	---	-7.04	44.88	---	74.00	54.00	-9.12	Peak
2220.000	H	50.64	---	-4.59	46.05	---	74.00	54.00	-7.95	Peak
4825.000	H	45.81	---	2.68	48.49	---	74.00	54.00	-5.51	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: September 02, 2009

Temperature: 26°C

Tested by: Tom Gan

Humidity: 65 % 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
1240.000	V	53.14	---	-10.85	42.29	---	74.00	54.00	-11.71	Peak
1560.000	V	51.64	---	-8.94	42.70	---	74.00	54.00	-11.30	Peak
1910.000	V	52.05	---	-6.17	45.88	---	74.00	54.00	-8.12	Peak
4875.000	V	47.96	---	2.77	50.73	---	74.00	54.00	-3.27	Peak
N/A										
1560.000	H	54.99	---	-8.94	46.05	---	74.00	54.00	-7.95	Peak
1800.000	H	50.30	---	-7.04	43.26	---	74.00	54.00	-10.74	Peak
2206.666	H	50.06	---	-4.64	45.42	---	74.00	54.00	-8.58	Peak
4875.000	H	47.28	---	2.77	50.05	---	74.00	54.00	-3.95	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).



Operation Mode: TX / IEEE 802.11g / CH High  
Temperature: 26°C  
Humidity: 65 % RH

Test Date: September 02, 2009  
Tested by: Tom Gan  
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
1240.000	V	53.14	---	-10.85	42.29	---	74.00	54.00	-11.71	Peak
1913.333	V	51.86	---	-6.15	45.71	---	74.00	54.00	-8.29	Peak
2013.333	V	50.68	---	-5.41	45.27	---	74.00	54.00	-8.73	Peak
4933.333	V	44.03	---	2.87	46.90	---	74.00	54.00	-7.10	Peak
N/A										
1560.000	H	56.55	---	-8.94	47.61	---	74.00	54.00	-6.39	Peak
1683.333	H	51.74	---	-7.97	43.77	---	74.00	54.00	-10.23	Peak
2140.000	H	49.98	---	-4.91	45.07	---	74.00	54.00	-8.93	Peak
4933.333	H	45.13	---	2.87	48.00	---	74.00	54.00	-6.00	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.

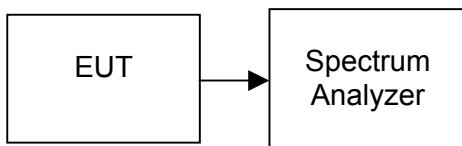
**7.3.2. TEST INSTRUMENTS**

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

**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 = 300kHz, Span = 25MHz, 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	11798	>500	PASS
Mid	2437	11796		PASS
High	2462	12712		PASS

**Test Data**

**Test mode: IEEE 802.11g**

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	16534	>500	PASS
Mid	2437	16571		PASS
High	2462	16156		PASS



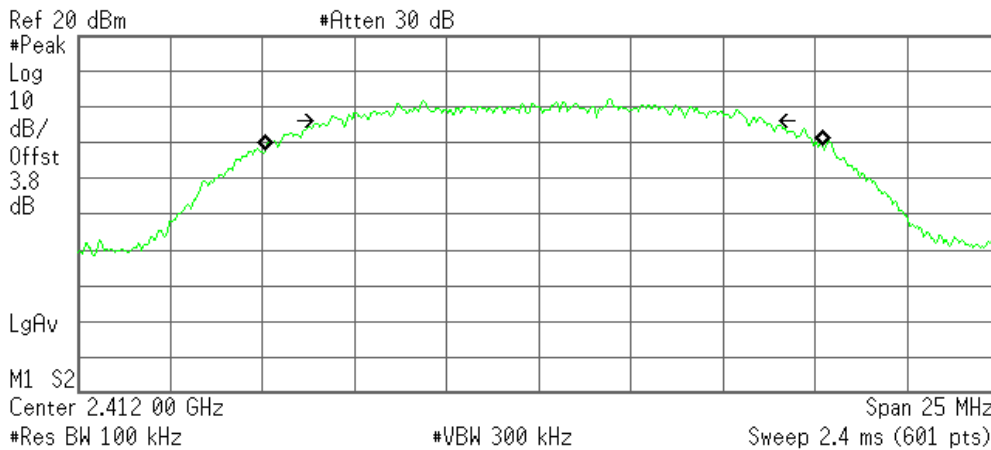


**Test Plot (IEEE 802.11b mode)**

**6dB Bandwidth (CH Low)**

Agilent 17:02:26 3 Sep 2009

R T



**Occupied Bandwidth**  
15.1152 MHz

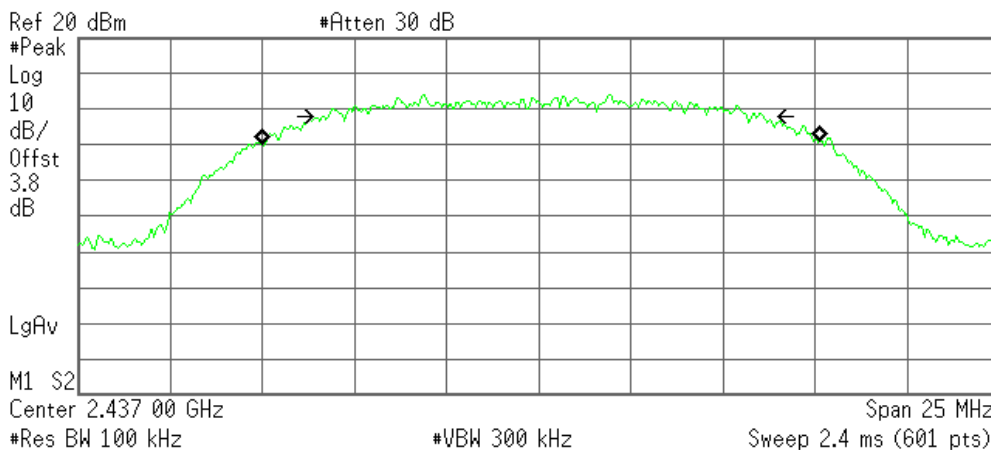
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 146.105 kHz  
**x dB Bandwidth** 11.798 MHz

**6dB Bandwidth (CH Mid)**

Agilent 17:03:13 3 Sep 2009

R T



**Occupied Bandwidth**  
15.1249 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 55.633 kHz  
**x dB Bandwidth** 11.796 MHz

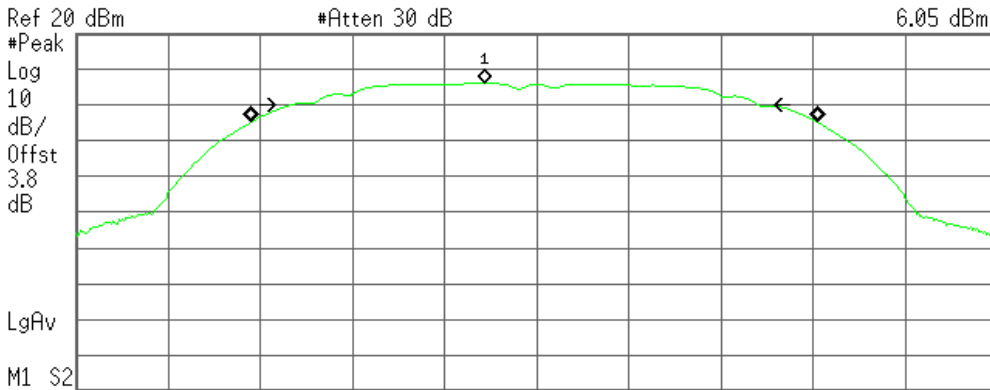


### 6dB Bandwidth (CH High)

Agilent 16:40:34 3 Sep 2009

R T

Mkr1 2.460 58 GHz  
6.05 dBm



Occupied Bandwidth  
15.3572 MHz

Occ BW % Pwr 99.00 %  
x dB -6.00 dB

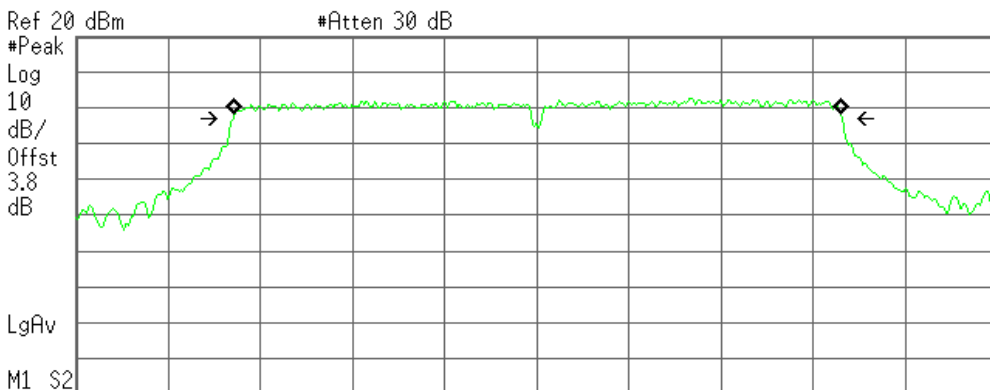
Transmit Freq Error -58.489 kHz  
x dB Bandwidth 12.712 MHz

### Test Plot (IEEE 802.11g mode)

### 6dB Bandwidth (CH Low)

Agilent 16:58:41 3 Sep 2009

R T



Occupied Bandwidth  
16.4299 MHz

Occ BW % Pwr 99.00 %  
x dB -6.00 dB

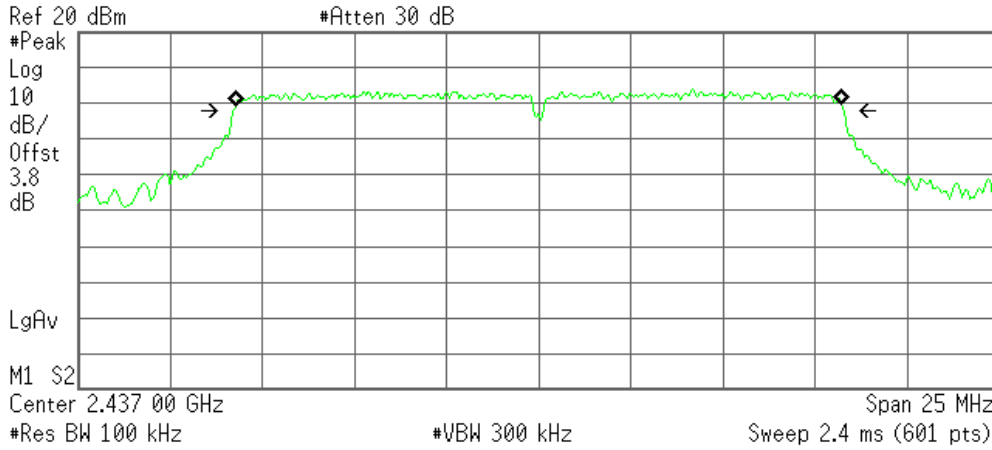
Transmit Freq Error 21.237 kHz  
x dB Bandwidth 16.534 MHz



### 6dB Bandwidth (CH Mid)

Agilent 16:57:17 3 Sep 2009

R T



Occupied Bandwidth  
16.4423 MHz

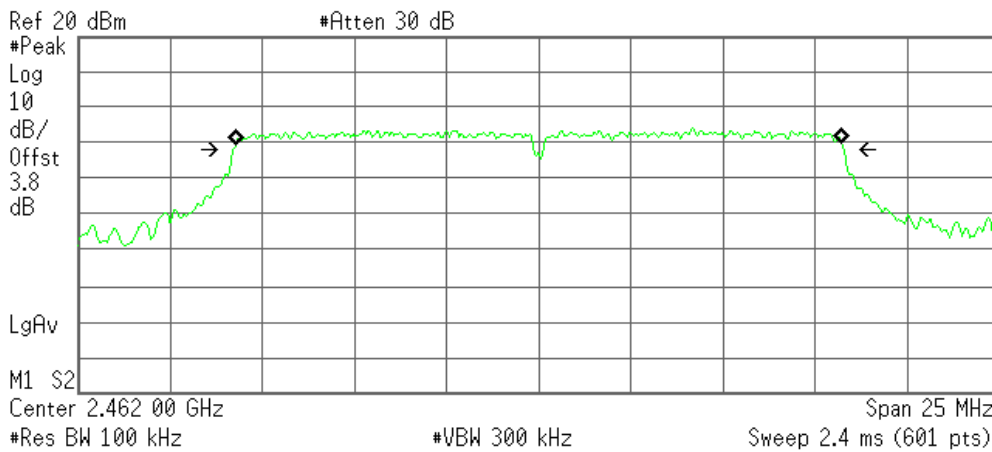
Occ BW % Pwr 99.00 %  
x dB -6.00 dB

Transmit Freq Error 1.158 kHz  
x dB Bandwidth 16.571 MHz

### 6dB Bandwidth (CH High)

Agilent 17:14:47 3 Sep 2009

R T



Occupied Bandwidth  
16.1163 MHz

Occ BW % Pwr 99.00 %  
x dB -6.00 dB

Transmit Freq Error -42.849 kHz  
x dB Bandwidth 16.156 MHz

**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.

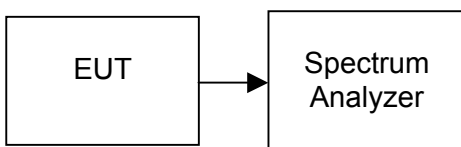
**7.4.2. TEST INSTRUMENTS**

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

**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	15.09	0.03228	1	PASS
Mid	2437	17.03	0.05047		PASS
High	2462	14.21	0.02636		PASS

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	12.80	0.01905	1	PASS
Mid	2437	13.57	0.02275		PASS
High	2462	11.82	0.01521		PASS



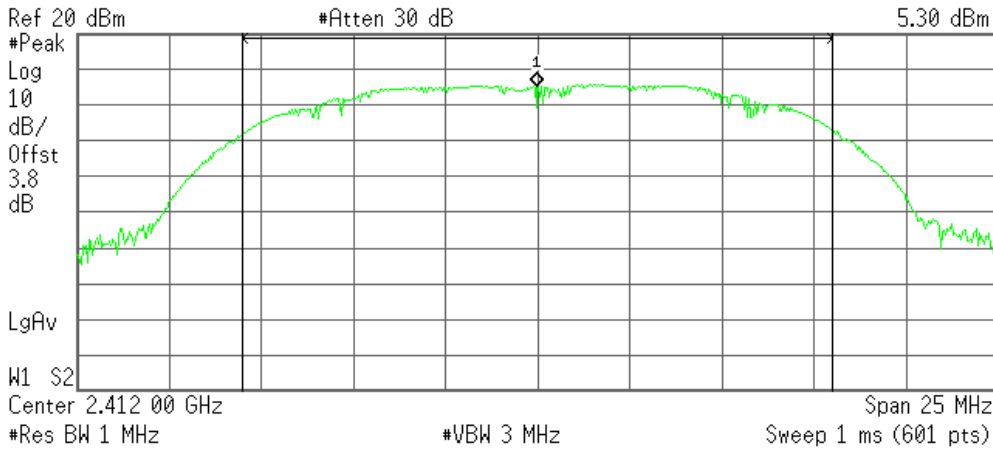
**Test Plot (IEEE 802.11b mode)**

**Peak power (CH Low)**

Agilent 16:46:27 3 Sep 2009

R T

Mkr1 2.412 00 GHz  
5.30 dBm



**Channel Power**

15.09 dBm /16.0000 MHz

**Power Spectral Density**

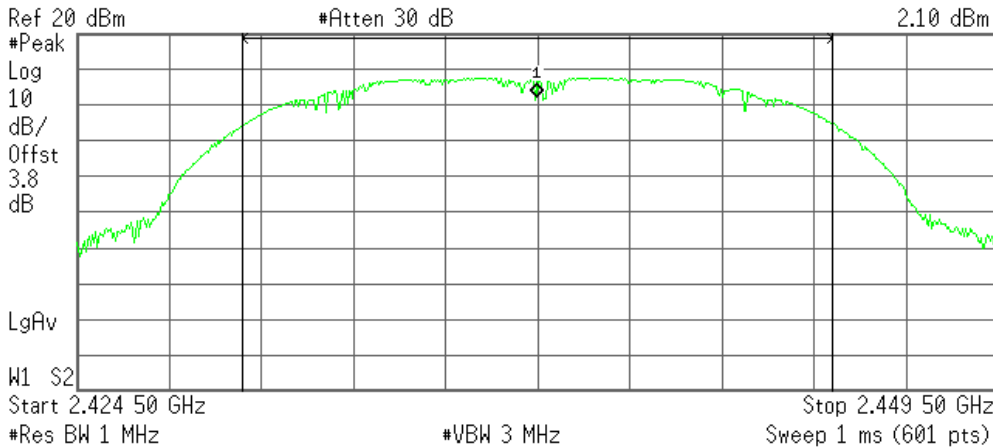
-56.96 dBm/Hz

**Peak power (CH Mid)**

Agilent 16:49:04 3 Sep 2009

R T

Mkr1 2.437 00 GHz  
2.10 dBm



**Channel Power**

17.03 dBm /16.0000 MHz

**Power Spectral Density**

-55.01 dBm/Hz

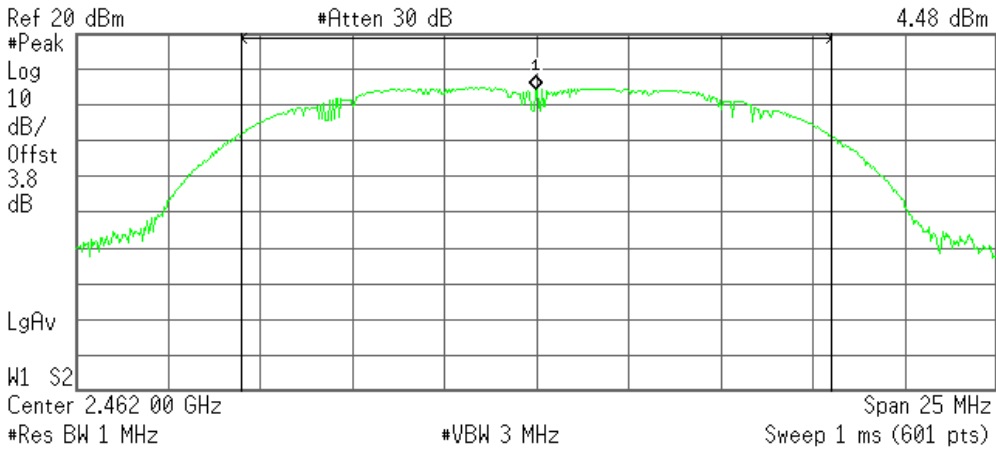


Peak power (CH High)

Agilent 16:48:33 3 Sep 2009

R T

Mkr1 2.462 00 GHz  
4.48 dBm



Channel Power

14.21 dBm /16.0000 MHz

Power Spectral Density

-57.83 dBm/Hz

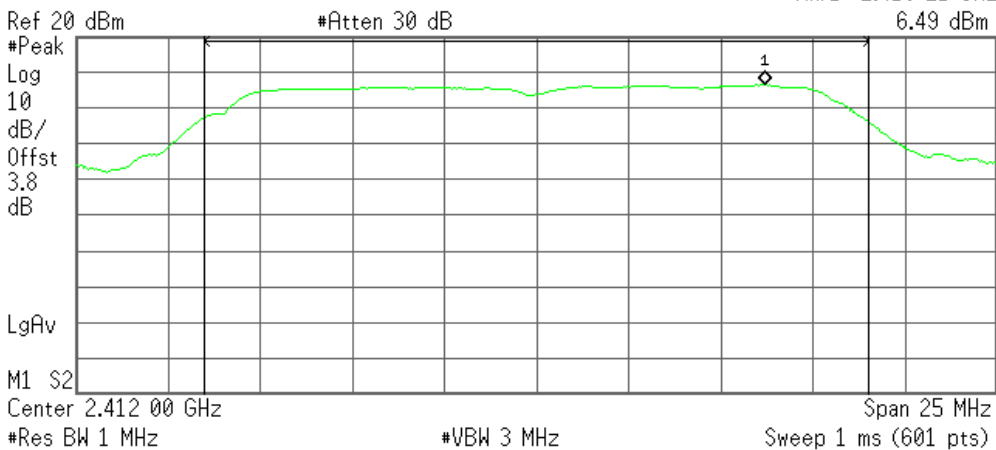
Test Plot (IEEE 802.11g mode)

Peak power (CH Low)

Agilent 14:55:11 21 Oct 2009

R T

Mkr1 2.418 21 GHz  
6.49 dBm



Channel Power

12.80 dBm /18.0000 MHz

Power Spectral Density

-59.75 dBm/Hz

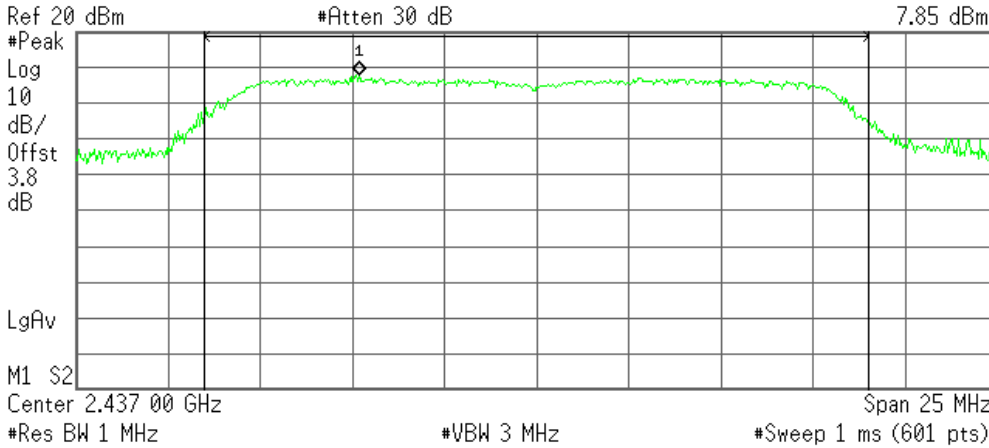


### Peak power (CH Mid)

Agilent 15:02:28 21 Oct 2009

R T

Mkr1 2.432 21 GHz  
7.85 dBm



Channel Power

13.57 dBm /18.0000 MHz

Power Spectral Density

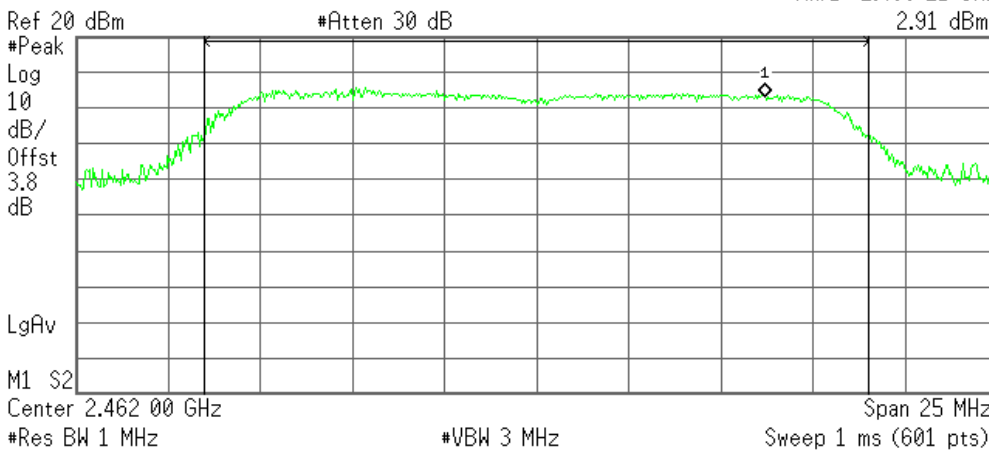
-58.99 dBm/Hz

### Peak power (CH High)

Agilent 15:00:32 21 Oct 2009

R T

Mkr1 2.468 21 GHz  
2.91 dBm



Channel Power

11.82 dBm /18.0000 MHz

Power Spectral Density

-60.73 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 is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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

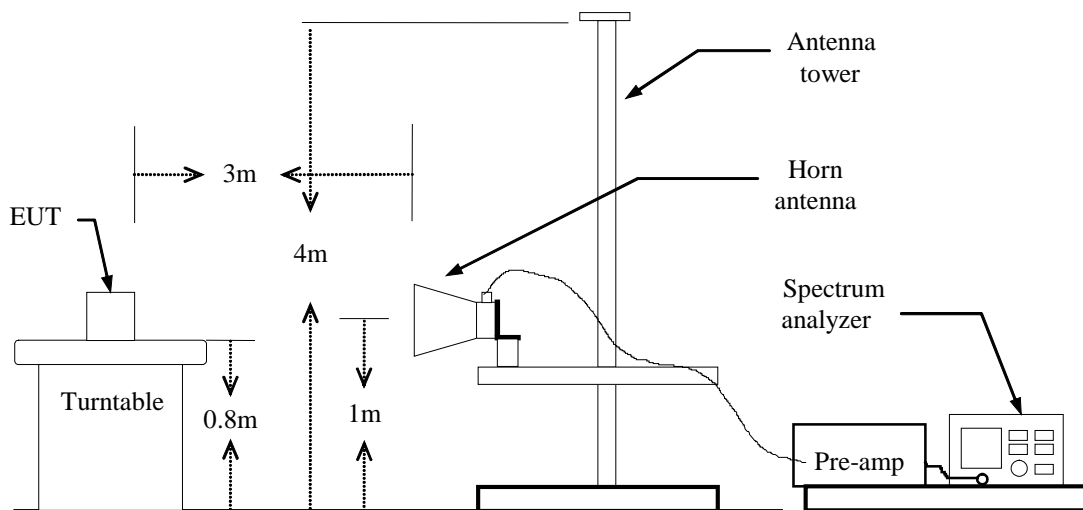
966 RF CHAMBER (2)					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	Calibration Due
ESCI EMI TEST RECEIVE.ESCI	ROHDE&SCHWARZ	1166.5950 03	100783	03/20/2009	03/20/2010
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2009	03/01/2010
Low Noise Amplifier	MITEQ	AM-1604-3000	1123808	02/06/2009	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	06/08/2009	06/09/2010
Horn Antenna	SCHAFFNER	BBHA9120D	1201	03/19/2009	03/19/2010
Signal Generator	Anritsu	MG3694A	#050125	03/01/2009	03/01/2010

- 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)

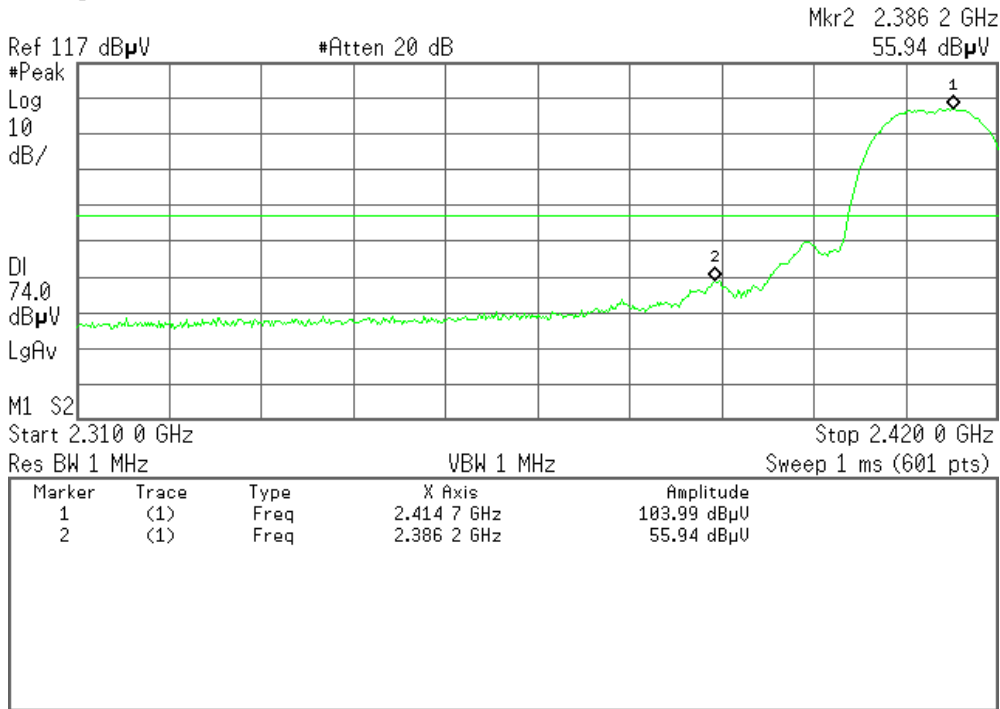
Band Edges (CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 10:32:50 3 Sep 2009

R T

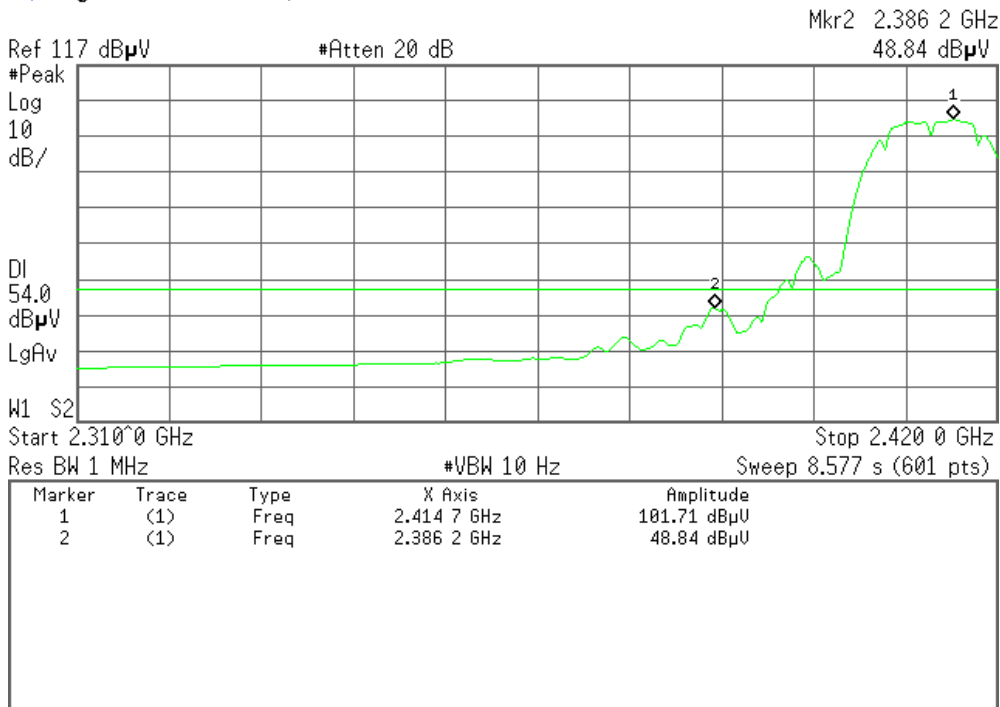


Detector mode: Average

Polarity: Vertical

Agilent 10:33:25 3 Sep 2009

R T



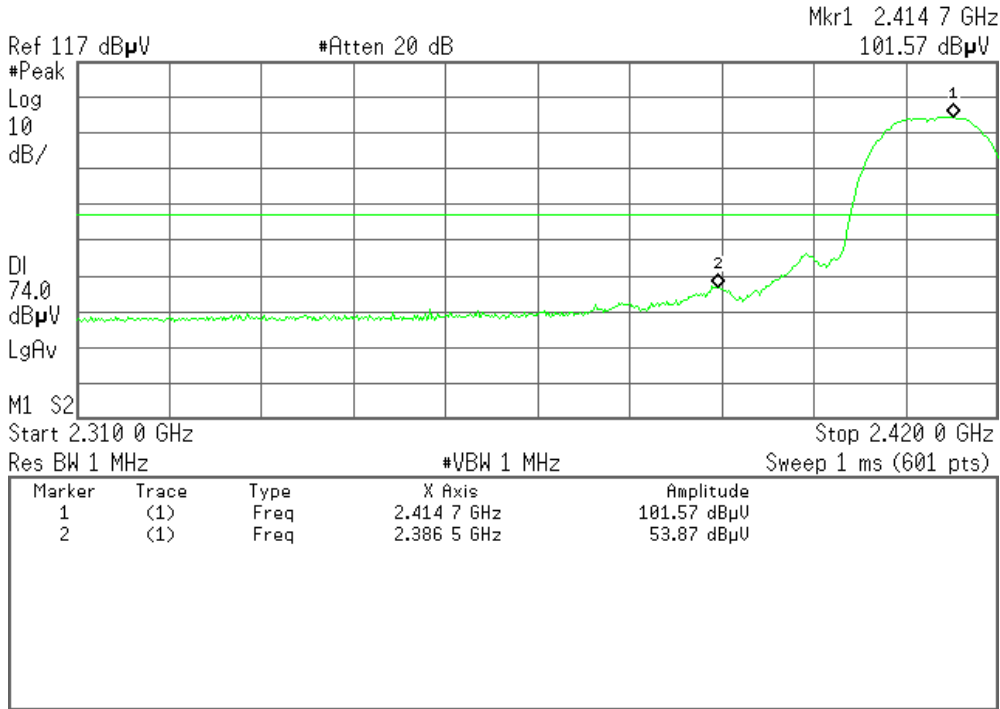


Detector mode: Peak

Polarity: Horizontal

Agilent 10:37:46 3 Sep 2009

R T

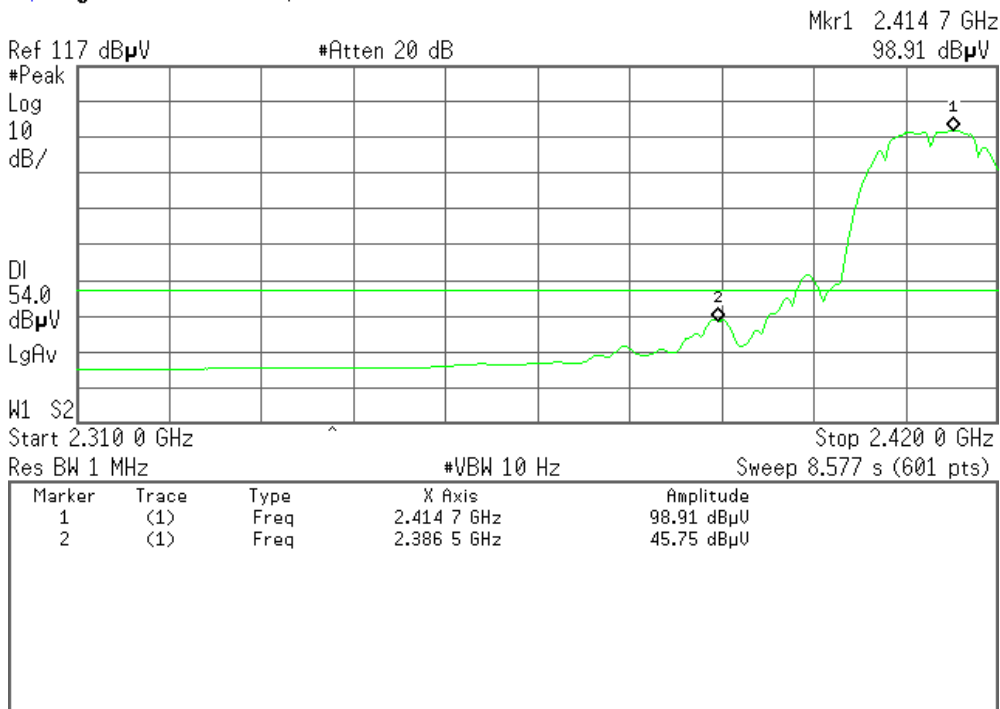


Detector mode: Average

Polarity: Horizontal

Agilent 10:38:25 3 Sep 2009

R T





Band Edges (CH High)

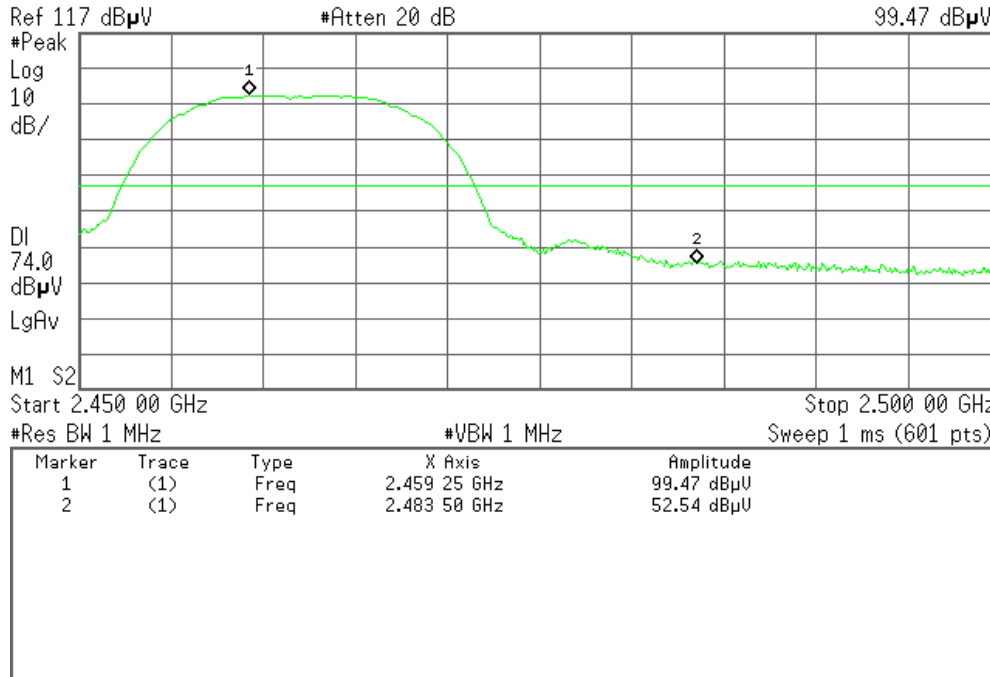
Detector mode: Peak

Polarity: Vertical

Agilent 11:34:07 3 Sep 2009

R T

Mkr1 2.459 25 GHz  
99.47 dBμV



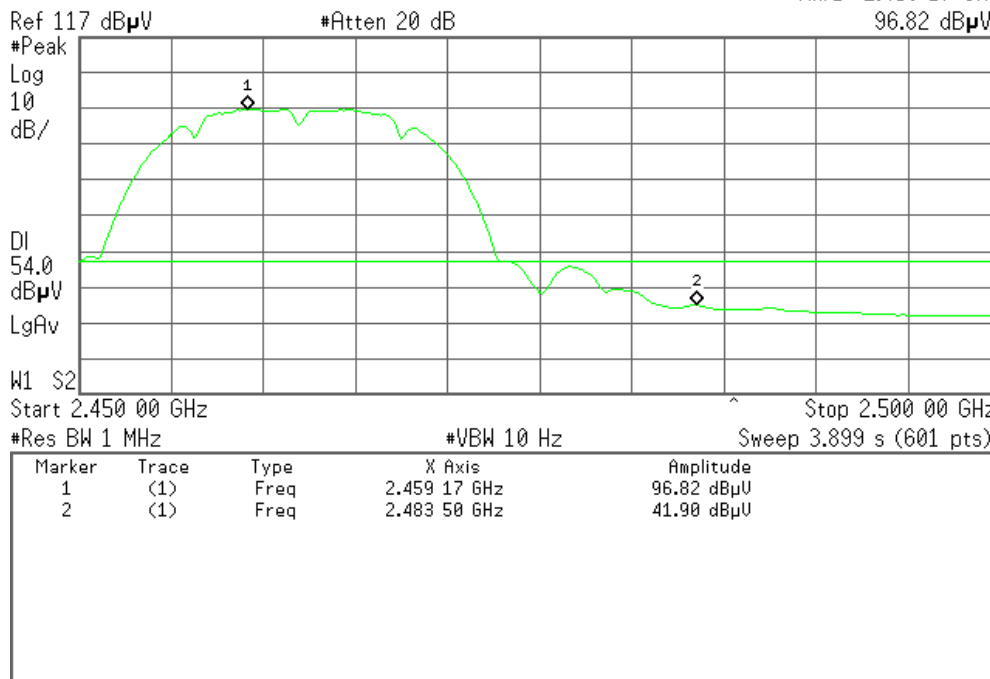
Detector mode: Average

Polarity: Vertical

Agilent 11:34:49 3 Sep 2009

R T

Mkr1 2.459 17 GHz  
96.82 dBμV





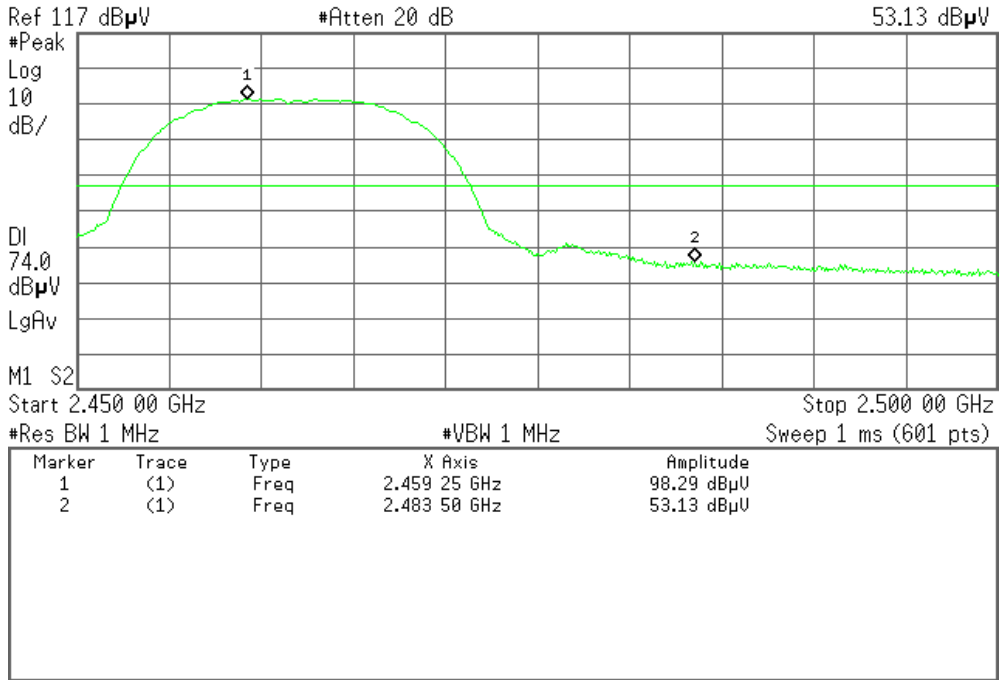
Detector mode: Peak

Polarity: Horizontal

Agilent 11:28:52 3 Sep 2009

R T

Mkr2 2.483 50 GHz  
53.13 dBµV



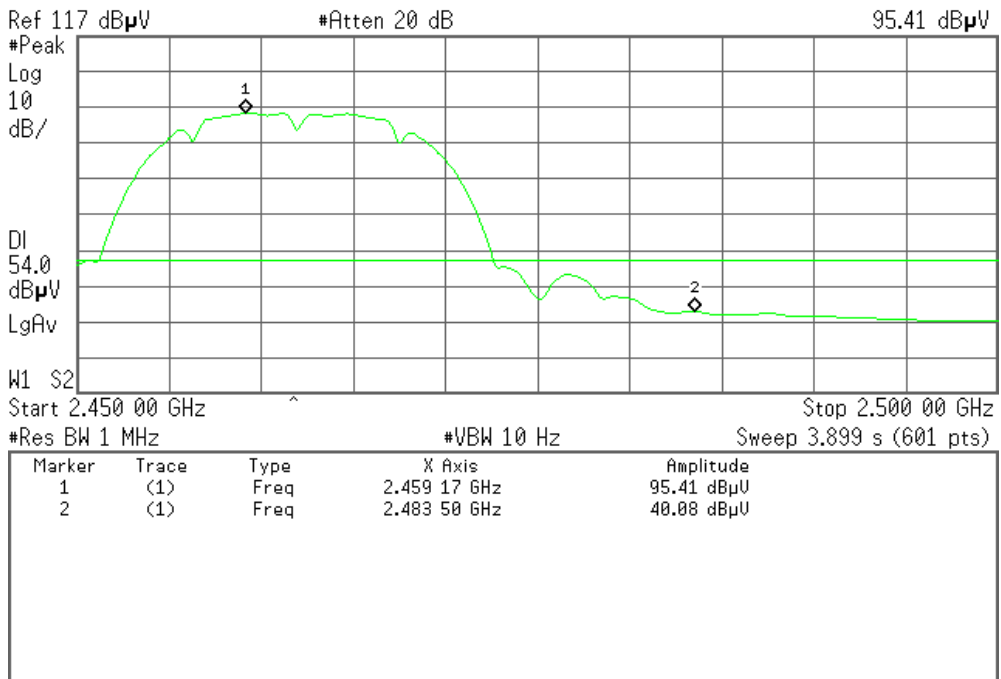
Detector mode: Average

Polarity: Horizontal

Agilent 11:30:10 3 Sep 2009

R T

Mkr1 2.459 17 GHz  
95.41 dBµV





**Test Plot (IEEE 802.11g mode)**

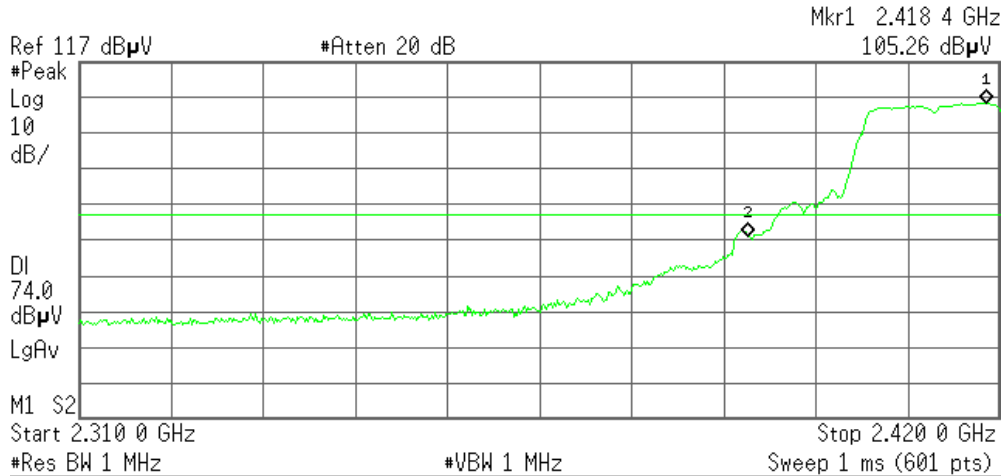
**Band Edges (CH Low)**

**Detector mode: Peak**

**Polarity: Vertical**

Agilent 12:02:06 3 Sep 2009

R T



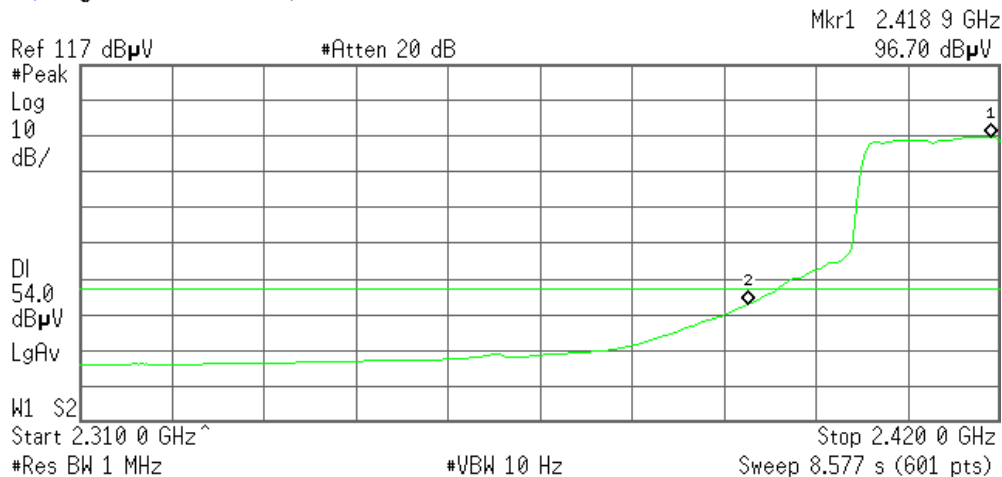
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.418 4 GHz	105.26 dBμV
2	(1)	Freq	2.398 0 GHz	67.89 dBμV

**Detector mode: Average**

**Polarity: Vertical**

Agilent 12:01:06 3 Sep 2009

R T



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.418 9 GHz	96.70 dBμV
2	(1)	Freq	2.398 0 GHz	50.06 dBμV

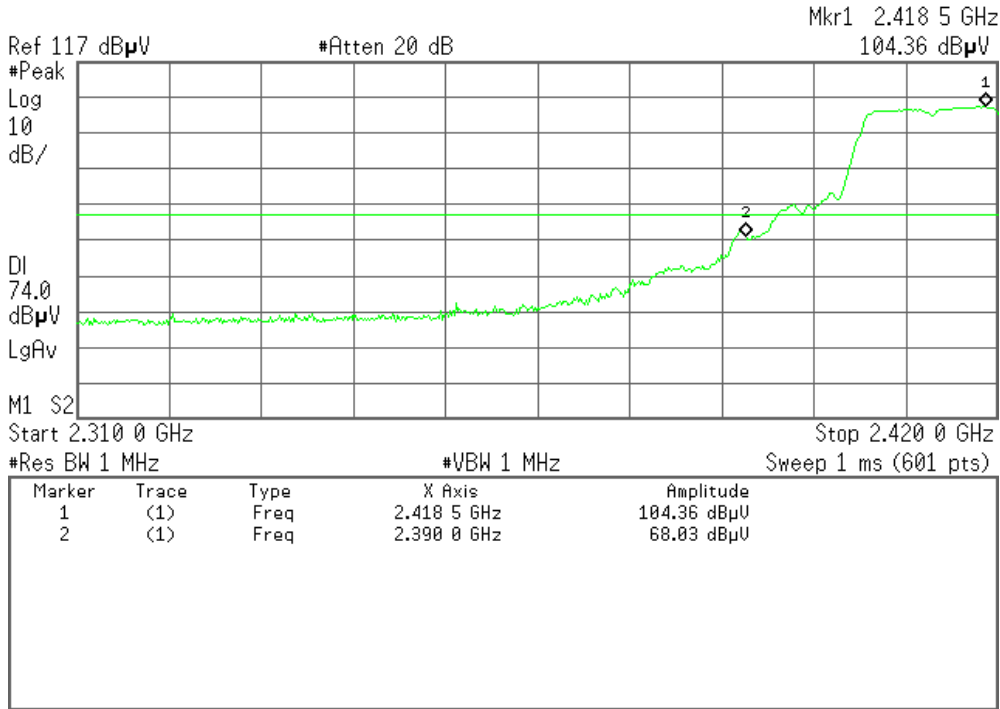


Detector mode: Peak

Polarity: Horizontal

Agilent 11:55:02 3 Sep 2009

R T

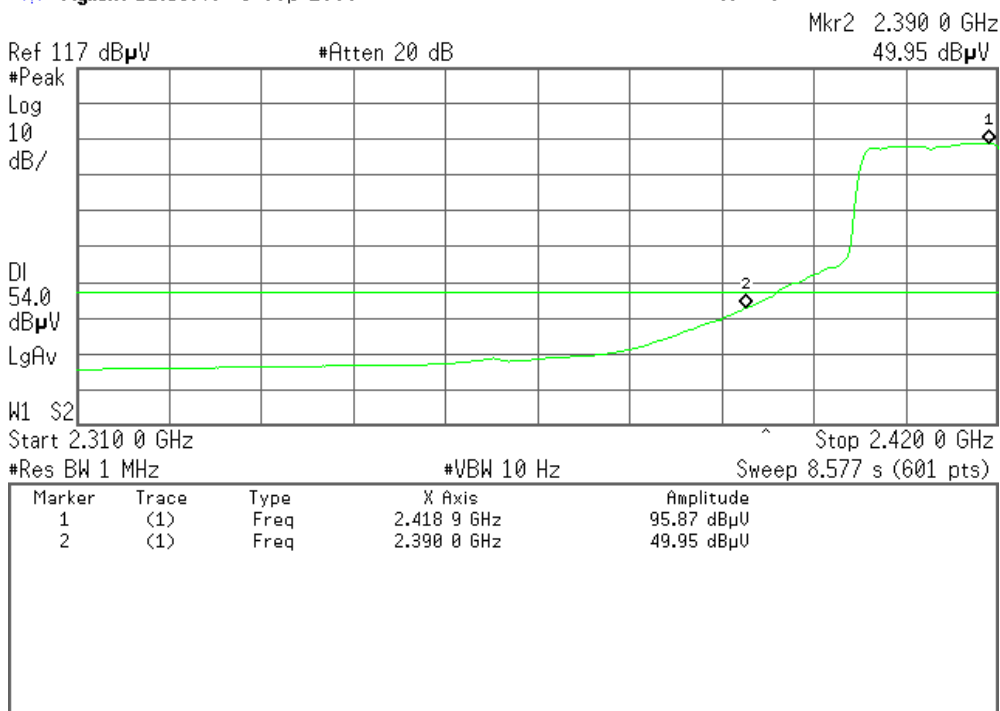


Detector mode: Average

Polarity: Horizontal

Agilent 11:53:46 3 Sep 2009

R T







Band Edges (CH High)

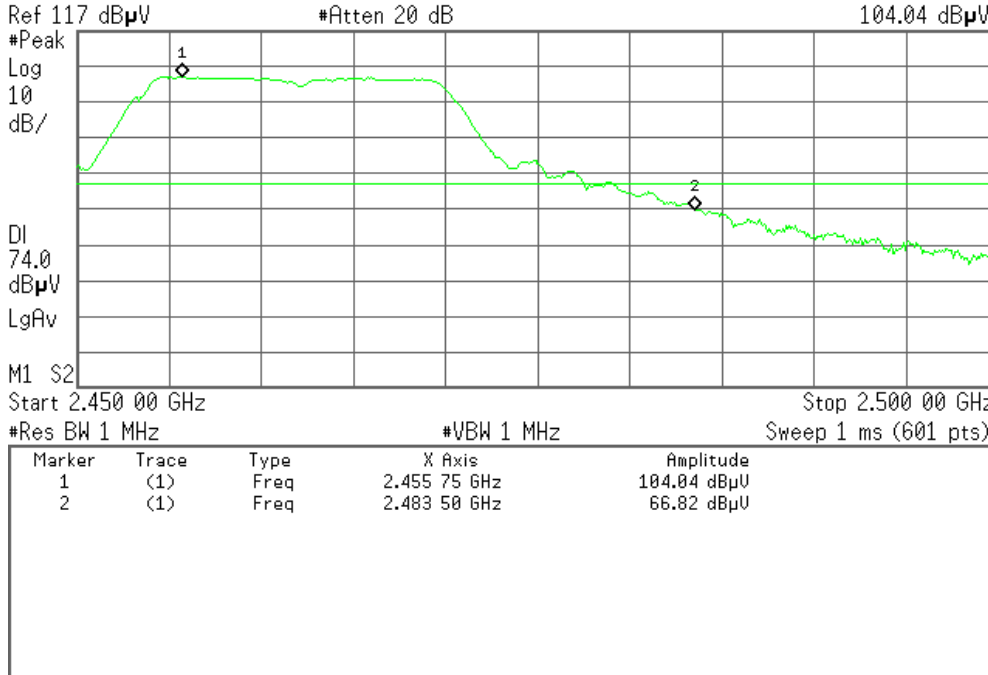
Detector mode: Peak

Polarity: Vertical

Agilent 11:39:35 3 Sep 2009

R T

Mkr1 2.455 75 GHz  
104.04 dBμV



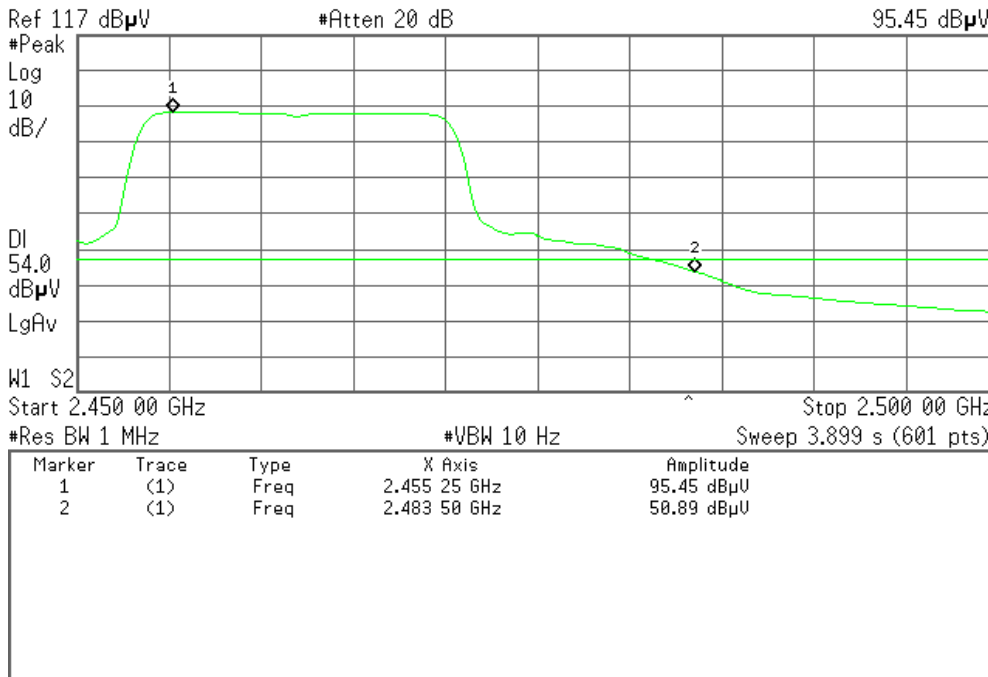
Detector mode: Average

Polarity: Vertical

Agilent 11:38:53 3 Sep 2009

R T

Mkr1 2.455 25 GHz  
95.45 dBμV





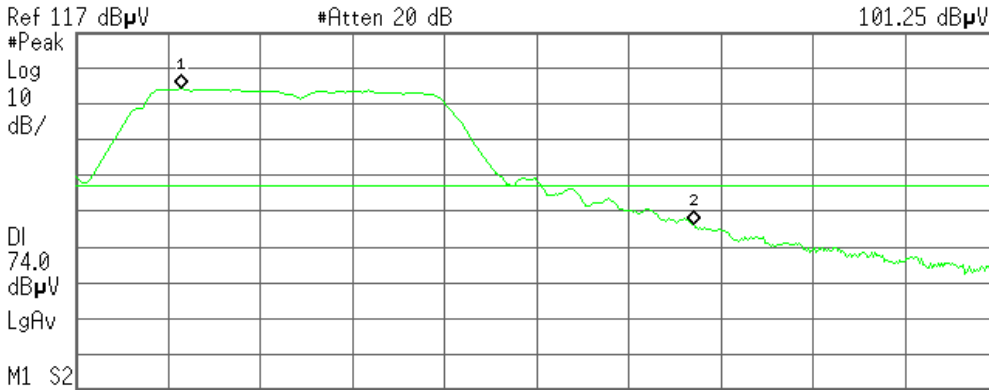
Detector mode: Peak

Polarity: Horizontal

Agilent 11:43:14 3 Sep 2009

R T

Mkr1 2.455 75 GHz  
101.25 dBμV



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.455 75 GHz	101.25 dBμV
2	(1)	Freq	2.483 50 GHz	63.30 dBμV

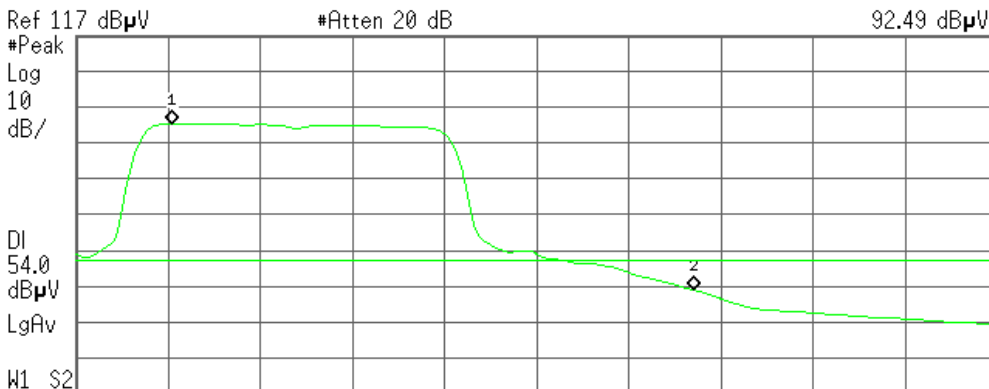
Detector mode: Average

Polarity: Horizontal

Agilent 11:44:08 3 Sep 2009

R T

Mkr1 2.455 25 GHz  
92.49 dBμV



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.455 25 GHz	92.49 dBμV
2	(1)	Freq	2.483 50 GHz	45.92 dBμV

**7.6. PEAK POWER SPECTRAL DENSITY MEASUREMENT**

**7.6.1. LIMITS**

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.

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.

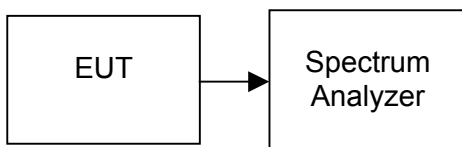
**7.6.2. TEST INSTRUMENTS**

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

**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 = 500kHz, 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	-13.11	8.00	PASS
Mid	2437	-10.52		PASS
High	2462	-11.26		PASS

Test Data

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-14.57	8.00	PASS
Mid	2437	-13.25		PASS
High	2462	-15.72		PASS



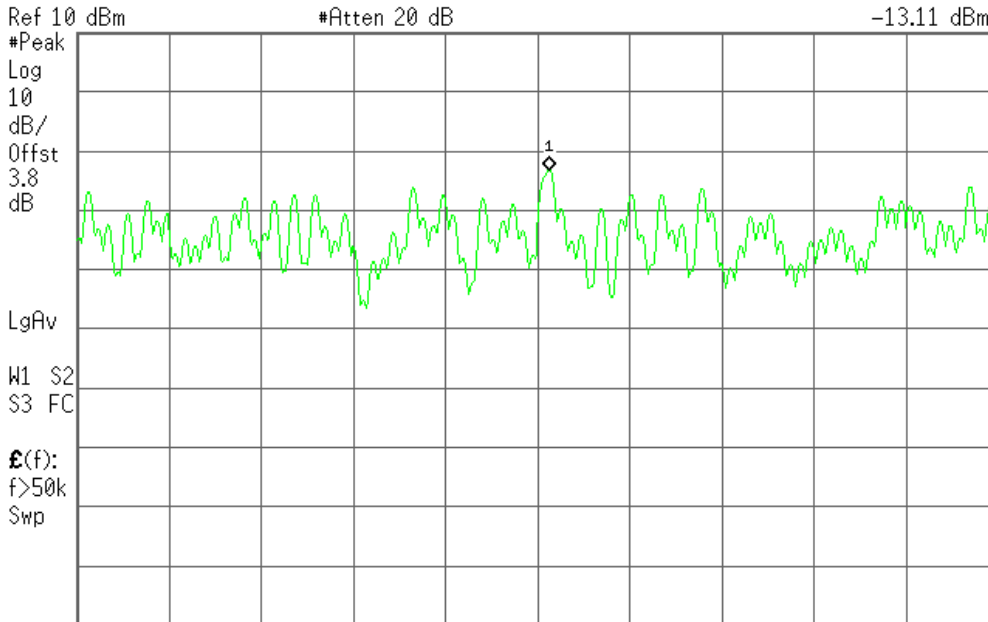
**Test Plot (IEEE 802.11b mode)**

**PPSD (CH Low)**

Agilent 17:15:14 3 Sep 2009

R T

Mkr1 2.412 006 7 GHz  
-13.11 dBm

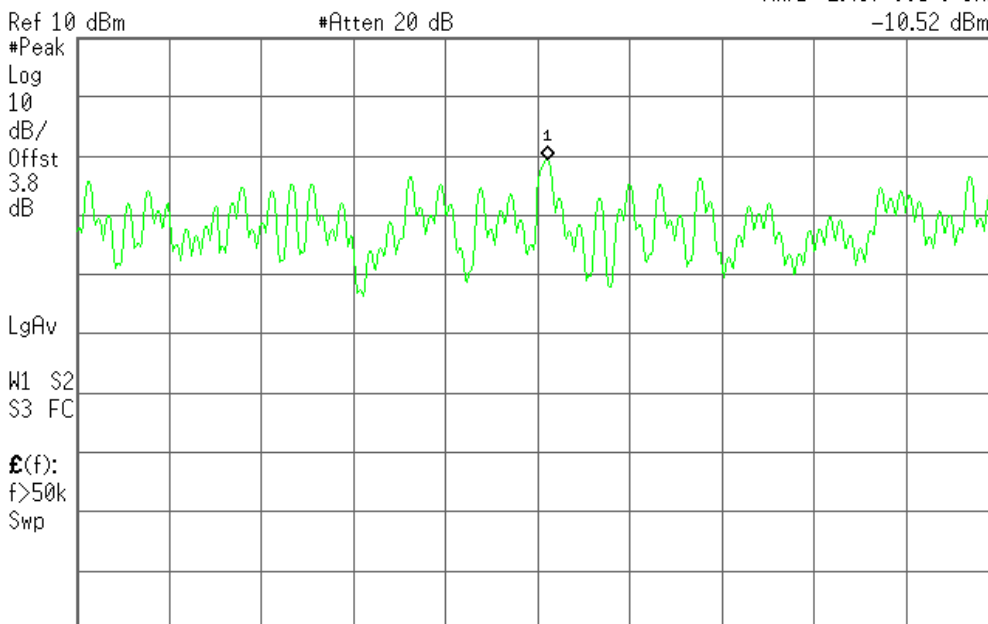


**PPSD (CH Mid)**

Agilent 17:12:53 3 Sep 2009

R T

Mkr1 2.437 005 9 GHz  
-10.52 dBm



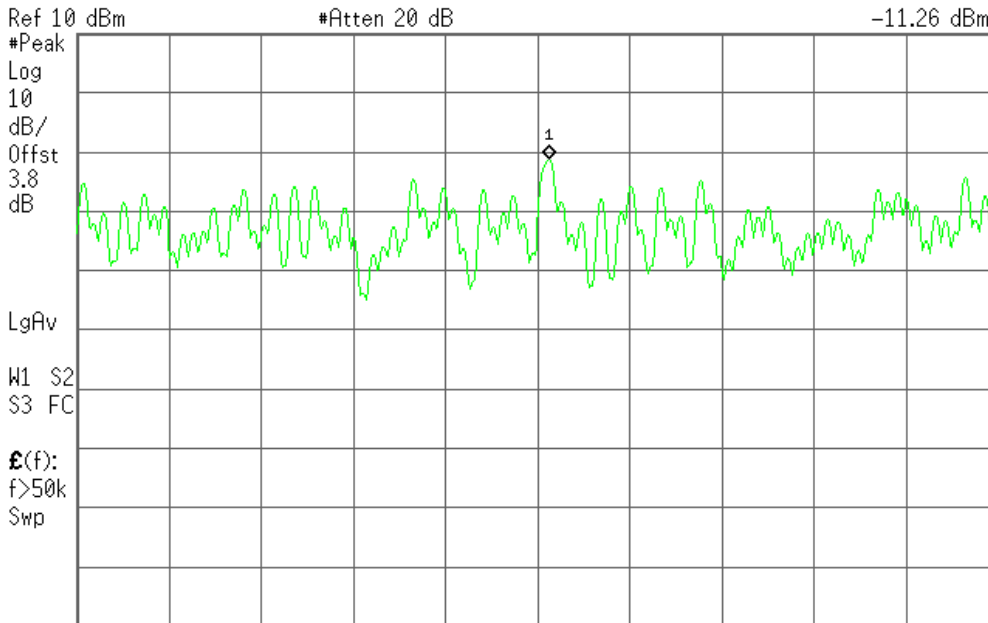


PPSD (CH High)

Agilent 17:10:30 3 Sep 2009

R T

Mkr1 2.462 006 7 GHz -11.26 dBm



Center 2.462 000 0 GHz Span 500 kHz  
#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)

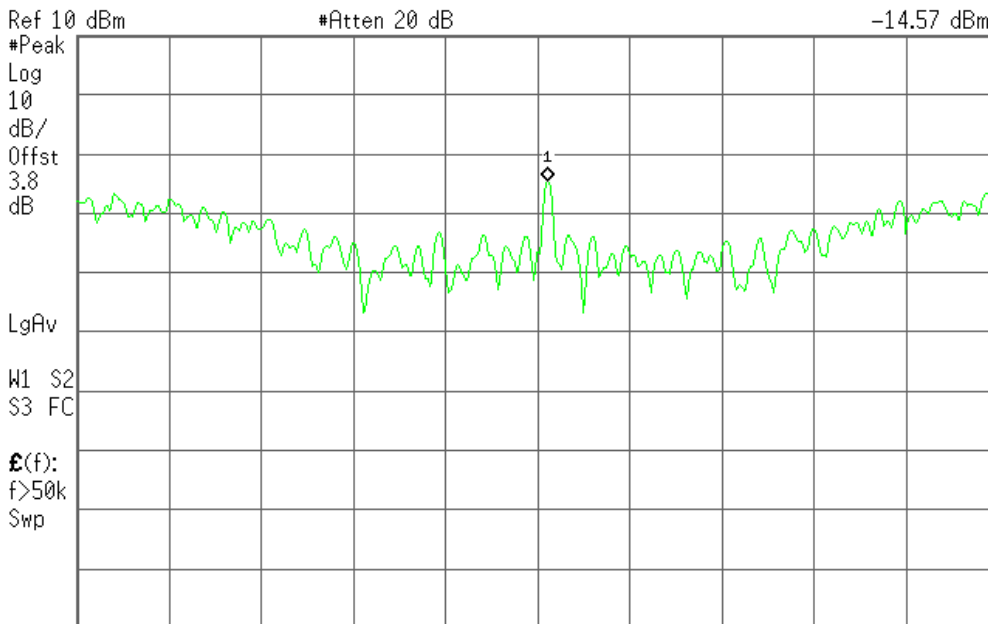
Test Plot (IEEE 802.11g mode)

PPSD (CH Low)

Agilent 17:18:40 3 Sep 2009

R T

Mkr1 2.412 005 9 GHz -14.57 dBm



Center 2.412 000 0 GHz Span 500 kHz  
#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)

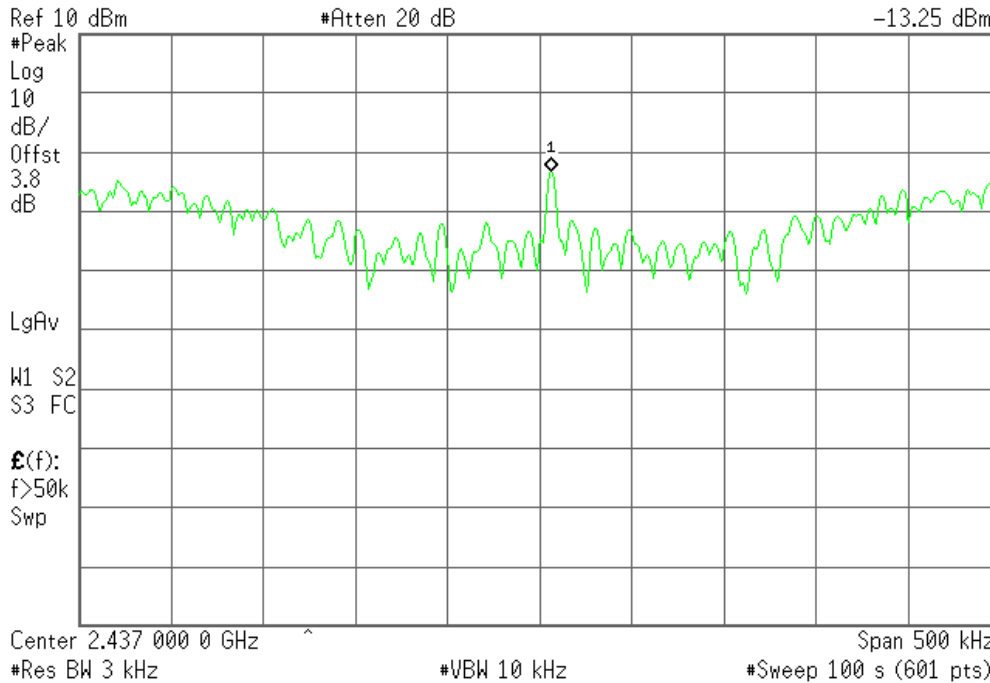


### PPSD (CH Mid)

Agilent 17:21:44 3 Sep 2009

R T

Mkr1 2.437 006 7 GHz  
-13.25 dBm



### PPSD (CH High)

Agilent 17:24:48 3 Sep 2009

R T

Mkr1 2.462 004 2 GHz  
-15.72 dBm

