



**World Standardization Certification & Testing CO.,LTD**  
**World Standardization Safety and EMC Testing Centre**

**FCC 47 CFR PART 15 SUBPART C**

**TEST REPORT**

**Report Number: WSCT08120305E-RF**

**For**

**WEB BOOK**

**Model: U-100 ,U-101 ,U-102**

**Trade Name: N/A**

*Prepared for*

**UNI-V CO.,LTD**

**Room501~503 COFCO.Property Tower.the 3rd Area.**

**Bao'an District,ShenZhen,china**

*Prepared by*

**WORLD STANDARDIZATION CERTIFICATION & TESTING CO., LTD.  
1-2/F, DACHONG KEJI BUILDING NO.25 OF TONGGU ROAD,  
NANSHAN DISTRICT, SHENZHEN. PRC**

**TEL: 86-755-26996192  
FAX: 86-755-26996253**

**Note:** This report shall not be reproduced except in full, without the written approval of World standardization Certification &Testing CO.,LTD. This document may be altered or revised by World standardization Certification &Testing CO.,LTD. personnel only, and shall be noted in the revision section of the document.

**Applicant: UNI-V Co.,Ltd  
REPORT NUMBER: WSCT08120305E-RF  
FCC ID: WZQU-100**



## TABLE OF CONTENTS

<b>1. TEST CERTIFICATION.....</b>	<b>3</b>
<b>2. TEST RESULT SUMMARY .....</b>	<b>5</b>
<b>3. EUT DESCRIPTION .....</b>	<b>5</b>
<b>4. TEST METHODOLOGY .....</b>	<b>6</b>
4.1 EUT CONFIGURATION .....	6
4.2 EUT EXERCISE.....	6
4.3 GENERAL TEST PROCEDURES.....	6
4.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS.....	7
4.5 DESCRIPTION OF TEST MODES .....	7
<b>5. INSTRUMENT CALIBRATION.....</b>	<b>8</b>
<b>6. FACILITIES AND ACCREDITATIONS .....</b>	<b>9</b>
6.1 FACILITIES .....	9
6.2 EQUIPMENT.....	9
6.3 LABORATORY ACCREDITATIONS AND LISTING.....	9
<b>7. SETUP OF EQUIPMENT UNDER TEST.....</b>	<b>10</b>
7.1 SETUP CONFIGURATION OF EUT.....	10
7.2 SUPPORT EQUIPMENT .....	10
<b>8. FCC PART 15.247 REQUIREMENTS.....</b>	<b>11</b>
8.1 6DB BANDWIDTH .....	11
8.2 PEAK POWER.....	17
8.3 BAND EDGES MEASUREMENT.....	23
8.4 PEAK POWER SPECTRAL DENSITY.....	32
8.5 SPURIOUS EMISSIONS .....	38
8.6 POWERLINE CONDUCTED EMISSIONS .....	60



## 1. TEST CERTIFICATION

**Applicant:** UNI-V CO.,LTD

Room501~503 COFCO.Property Tower.the 3<sup>rd</sup> Area. Bao'an District,  
ShenZhen,china

**Equipment Under Test:** WEB BOOK

**Trade Name:** N/A

**Model:** U-100, U-101, U-102

**Date of Test:** December 05,2008~January 08, 2009

### APPLICABLE STANDARDS

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

### Deviation from Applicable Standard

None

The above equipment was tested by World Standardization Certification& Testing CO., LTD. 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.

**Tested By:**

(Cheney Chen)

**Date:** 2009-01-08

**Check By:**

(Joe Lin)

**Date:** 2009-01-08

**Approved By:**

(Sula Huang)

**Date:** 2009-01-08



## 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

<b>Product</b>	WEB BOOK
<b>Trade Name</b>	N/A
<b>Model Number</b>	U-100, U-101, U-102
<b>Model Difference</b>	All models are identical to each other except for trade name and model name for marketing purpose.
<b>Power Supply</b>	DC 5V Powered by built-in battery or adapter (Adapter)Model number: KSAFD0500300W1US INPUT: 100-240V~50-60Hz 400mA Max OUTPUT: DC 5V, 3.0A
<b>Frequency Range</b>	802.11b mode: 2412 ~ 2462 MHz 802.11g mode: 2412 ~ 2462 MHz
<b>Transmit Power</b>	802.11b mode: 13.29 dBm 802.11g mode: 11.78 dBm
<b>Modulation Technique</b>	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: DSSS (CCK, DQPSK, DBPSK) + OFDM (QPSK, BPSK, 16-QAM, 64-QAM)
<b>Transmit Data Rate</b>	IEEE 802.11b: 11, 5.5, 2, 1 Mbps IEEE 802.11g: 54, 48, 18, 12, 11, 9, 6Mbps
<b>Number of Channels</b>	11 Channels
<b>Antenna Specification</b>	2.4GHz High Gain Built-in Antenna with 2 dBi gain(Max)

**Note:** This submittal(s) (test report) comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



## **4. TEST METHODOLOGY**

The tests documented in this report were performed in accordance with ANSI C63.4: 2003 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

### **EUT CONFIGURATION**

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

### **EUT EXERCISE**

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

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

### **GENERAL TEST PROCEDURES**

#### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

#### **Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

**FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS**

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

<b>MHz</b>	<b>MHz</b>	<b>MHz</b>	<b>GHz</b>
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
<sup>1</sup> 0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
2. 17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
2. 20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 –	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.52525	2655 – 2900	22.01 – 23.12
8.41425 – 8.41475	156.7 – 156.9	3260 – 3267	23.6 – 24.0
12.29 – 12.293	162.0125 – 167.17	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	167.72 – 173.2	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	240 – 285	3600 – 4400	( <sup>2</sup> )
13.36 – 13.41	322 – 335.4		

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

**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.

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.



**World Standardization Certification & Testing CO.,LTD**  
**World Standardization Safety and EMC Testing Centre**

## **5. INSTRUMENT CALIBRATION**

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



## **6. FACILITIES AND ACCREDITATIONS**

### **FACILITIES**

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

1-2/F, Dachong Science&Technology Building, No.28 of Tonggu Road, Nanshan District, ShenZhen.PRC.

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

### **EQUIPMENT**

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

### **LABORATORY ACCREDITATIONS AND LISTING**

The test facilities used to perform radiated and conducted emissions tests are accredited by FCC. Oct 06.2007. The certificate registration number is 276008 to perform Electromagnetic Interference tests according to FCC PART 15 and CISPR 22 requirements.



## 7. SETUP OF EQUIPMENT UNDER TEST

### SETUP CONFIGURATION OF EUT

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

### SUPPORT EQUIPMENT

No	Equipment	Model	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1.	PC	H1105	SS08502637	DoC	LENOVO	Shielded 1.5m	Unshielded 1.8m
2.	LCD MONITOR	L1706v	N/A	DoC	HP	shielded 1. 5m	Unshielded 1. 8m
3.	Keyboard	KB-0623	08G00704325D	DoC	LENOVO	N/A	Unshielded 1.8m
4.	Mouse	N/A	N/A	DoC	LENOVO	N/A	Unshielded 1.8m

**Notes:**

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

## 8. FCC PART 15.247 REQUIREMENTS

### 6dB BANDWIDTH

#### LIMIT

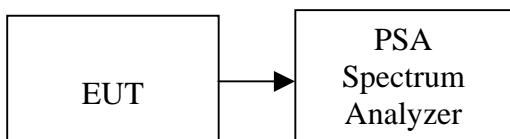
For the direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

#### MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/08/2009

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

#### Test Configuration



#### TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100kHz, VBW = RBW, Span = 20MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.



## TEST RESULTS

*No non-compliance noted*

### Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	9530	>500	PASS
Mid	2437	9530		PASS
High	2462	9530		PASS

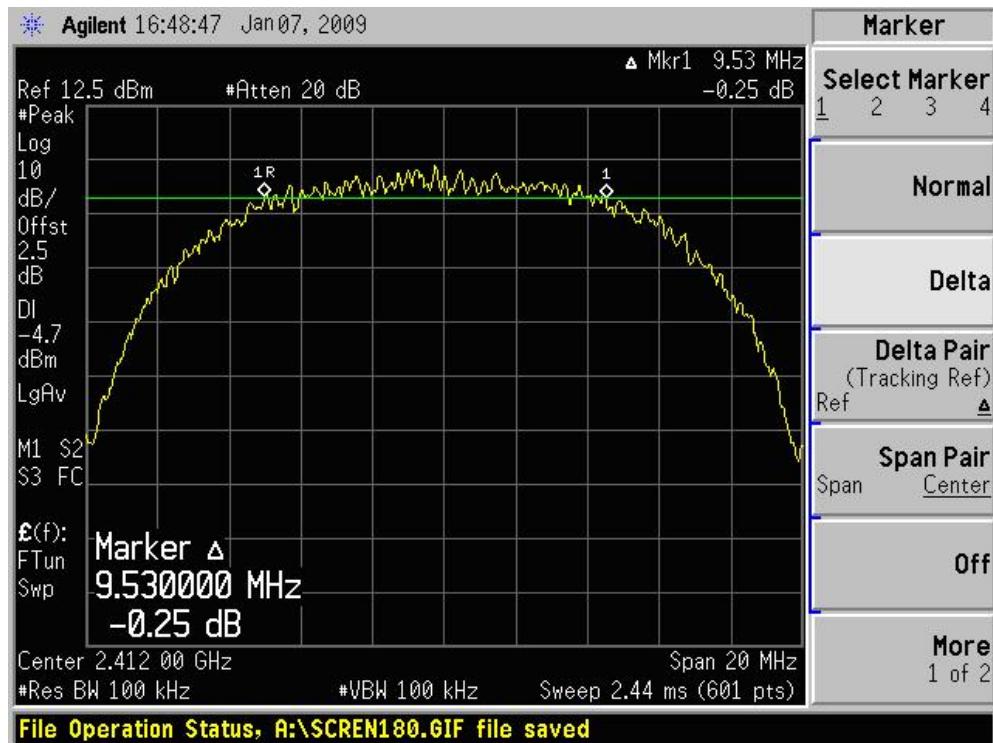
Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	16530	>500	PASS
Mid	2437	16530		PASS
High	2462	16530		PASS

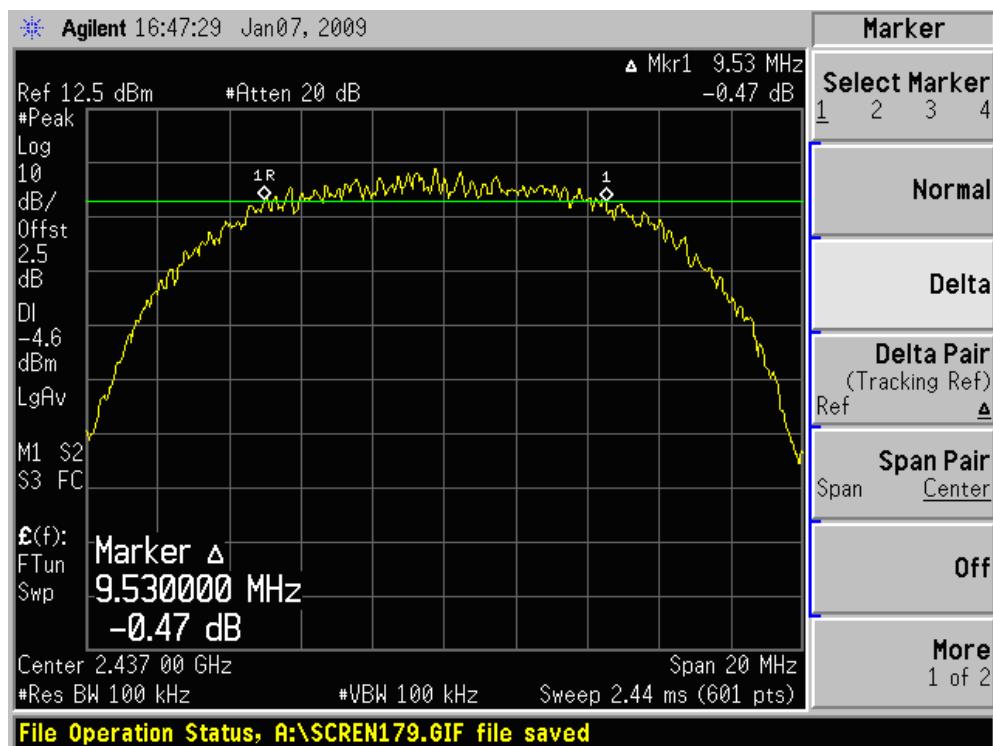
### Test Plot

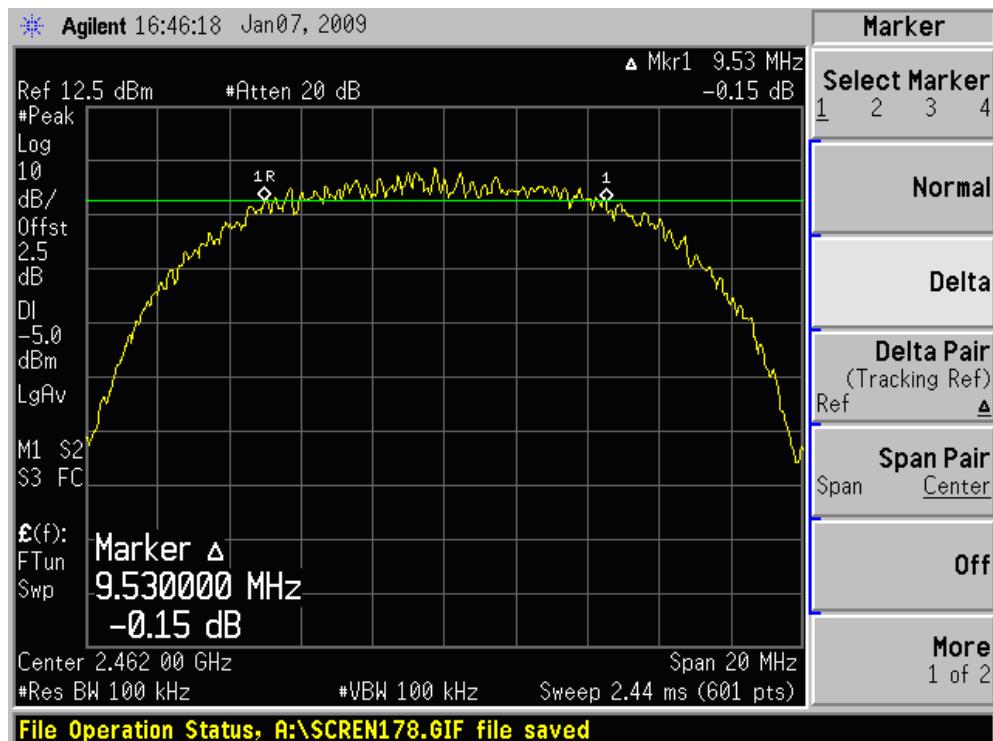
#### 802.11b mode

##### 6dB Bandwidth (CH Low)



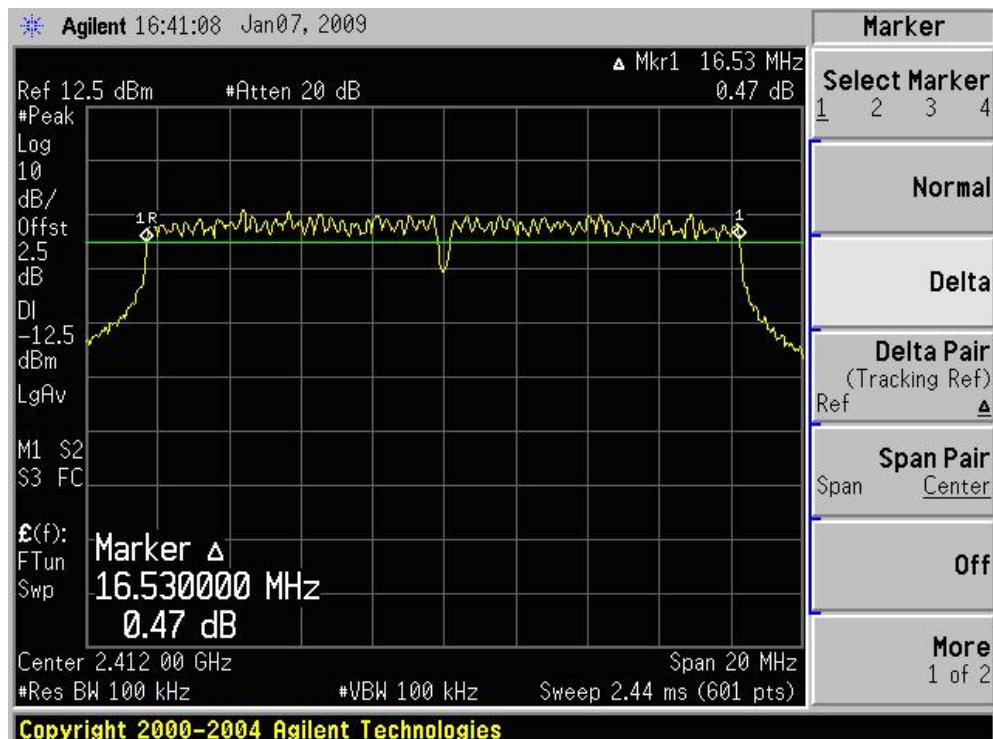
##### 6dB Bandwidth (CH Mid)



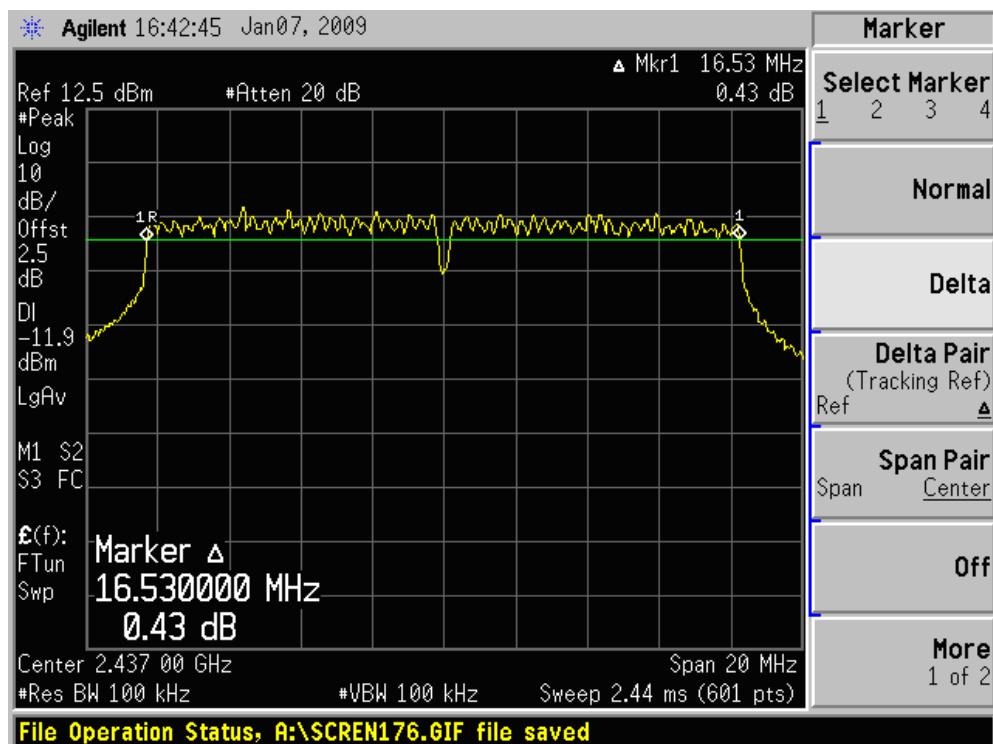
**6dB Bandwidth (CH High)**

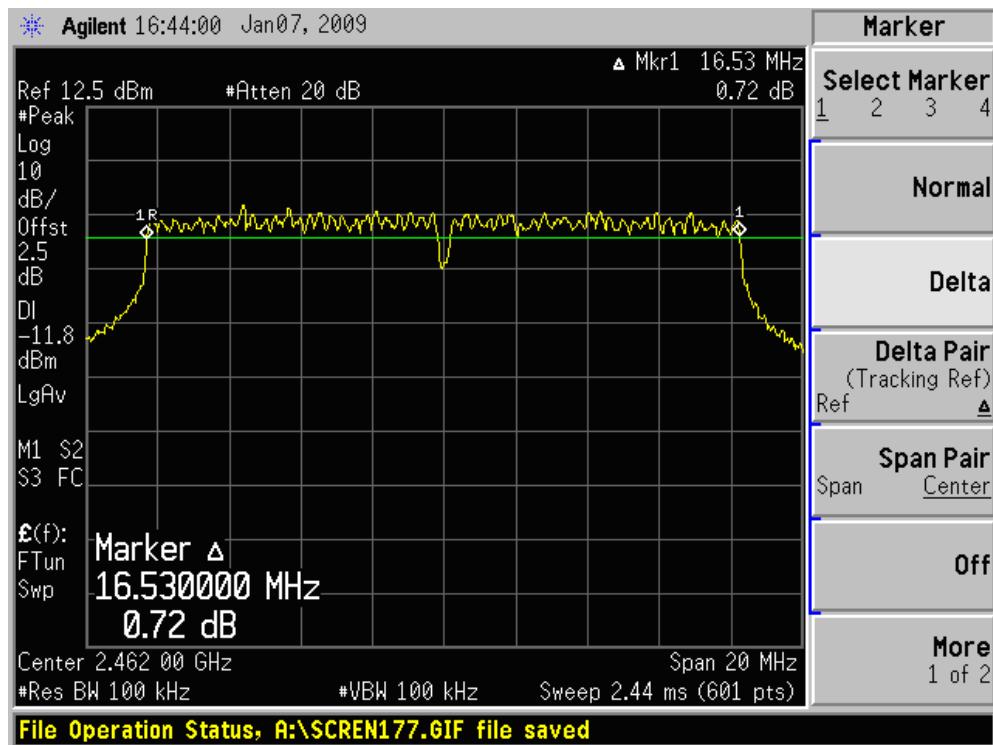
### 802.11g mode

#### 6dB Bandwidth (CH Low)



#### 6dB Bandwidth (CH Mid)



**6dB Bandwidth (CH High)**

**PEAK POWER****LIMIT**

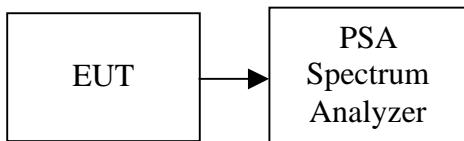
The maximum peak output power of the intentional radiator shall not exceed the following:

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.

**MEASUREMENT EQUIPMENT USED**

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/08/2009

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

**Test Configuration****TEST PROCEDURE**

*The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.*



## TEST RESULTS

*No non-compliance noted*

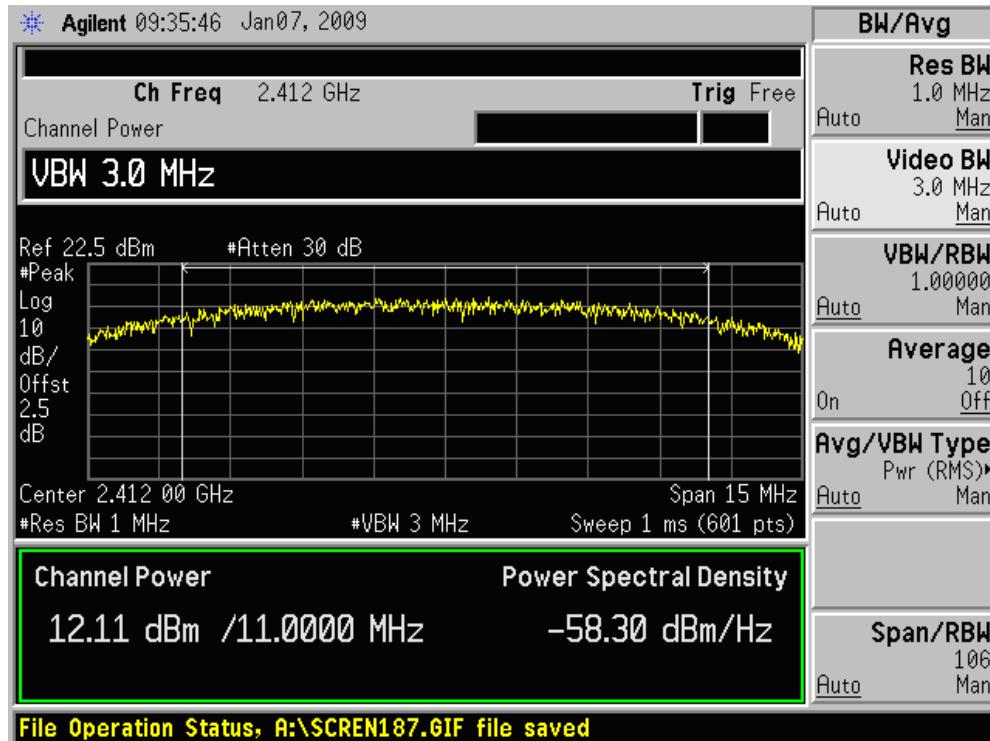
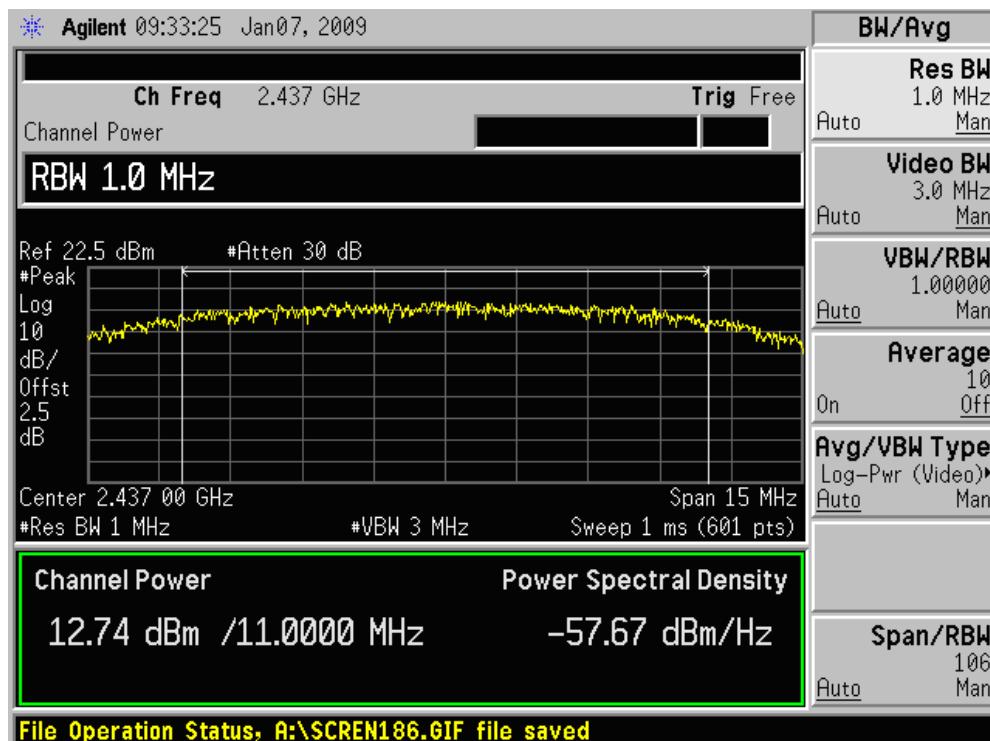
### Test Data

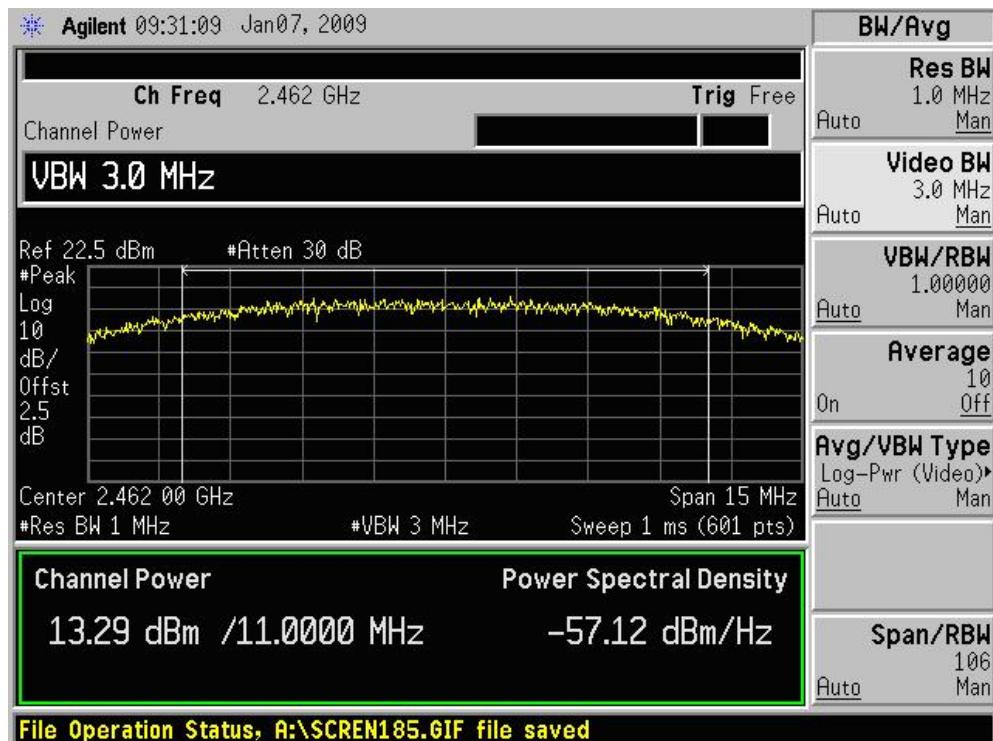
#### Test mode: IEEE 802.11b

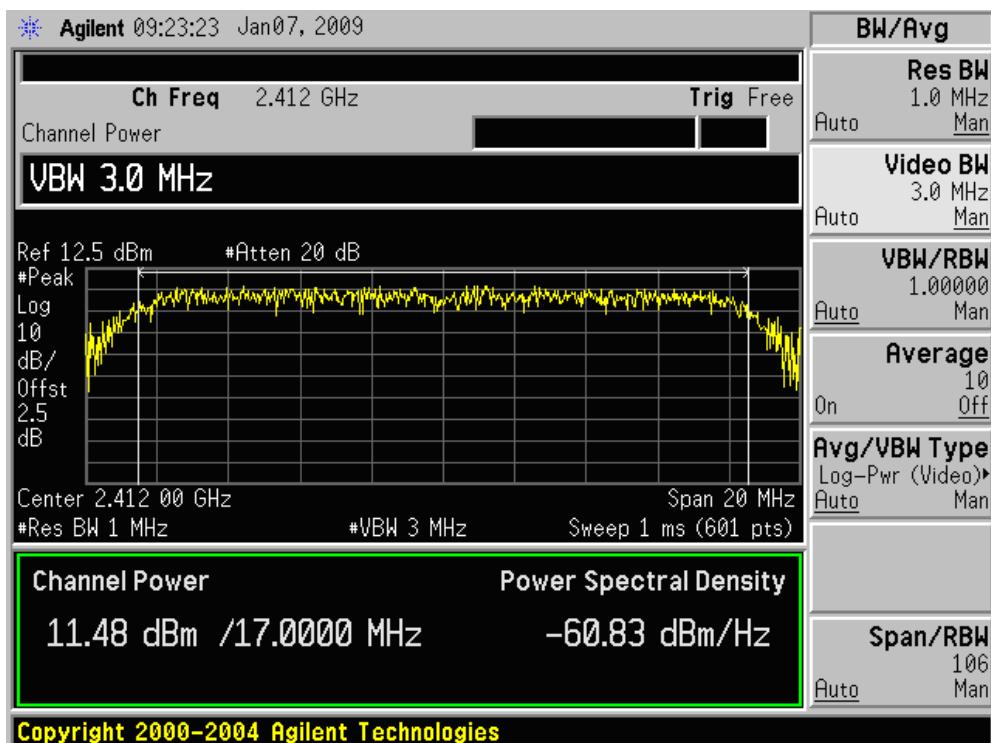
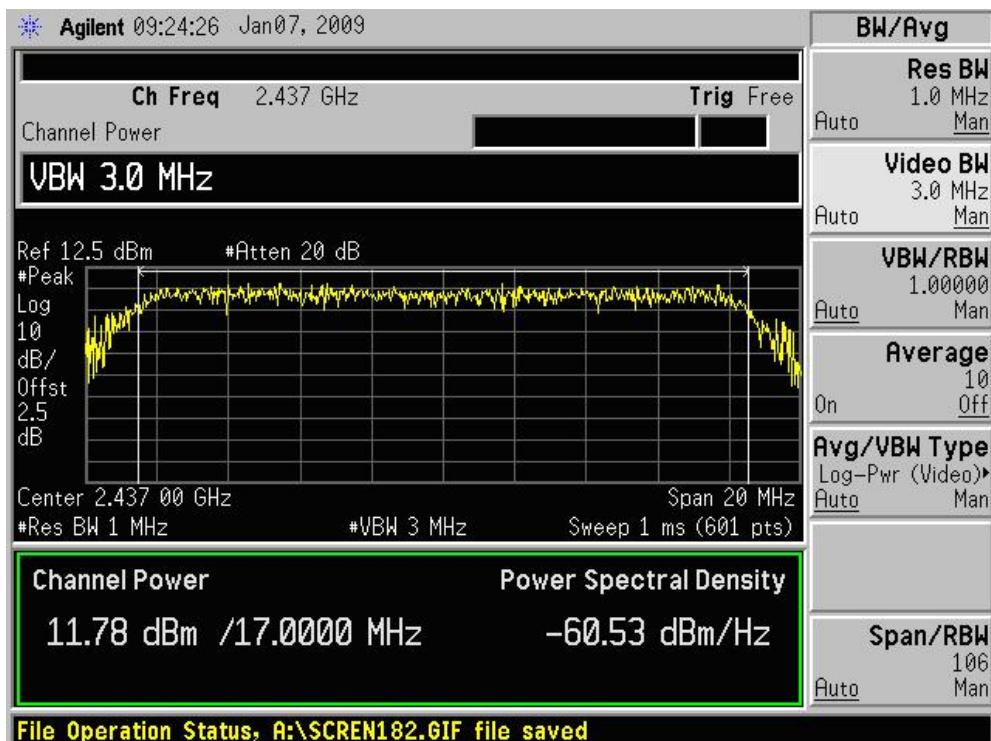
Channel	Frequency (MHz)	Output (dBm)	Factor (dB)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	9.61	2.50	12.11	0.01626	1	PASS
Mid	2437	10.24	2.50	12.74	0.01879	1	PASS
High	2462	10.79	2.50	13.29	0.02133	1	PASS

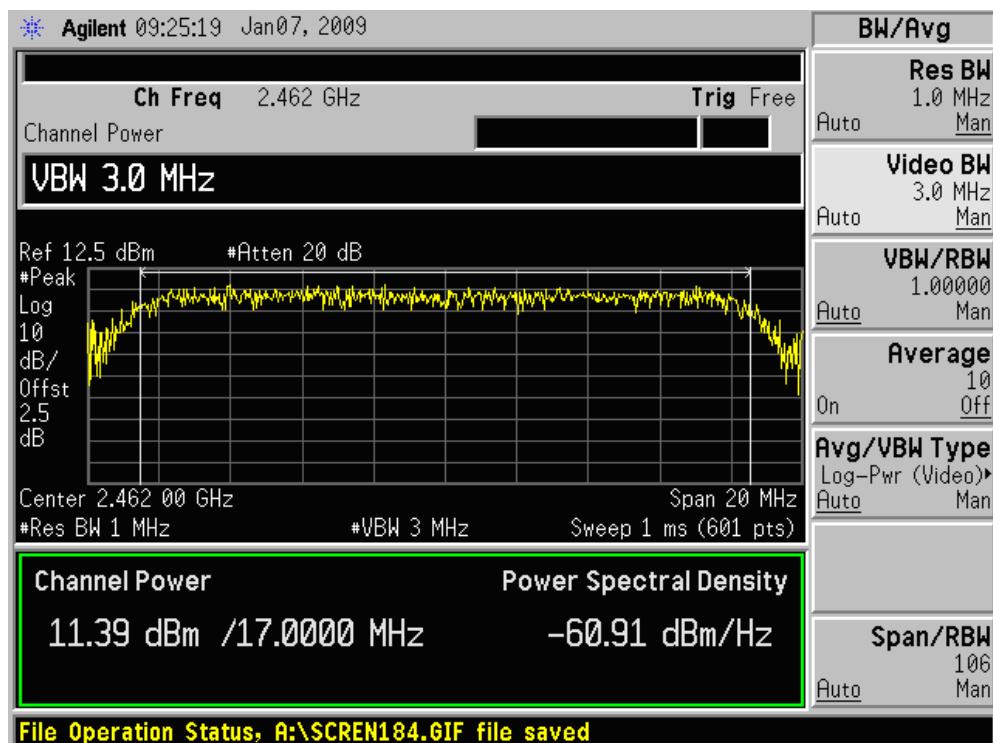
#### Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Output (dBm)	Factor (dB)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	8.98	2.50	11.48	0.01406	1	PASS
Mid	2437	9.28	2.50	11.78	0.01507	1	PASS
High	2462	8.89	2.50	11.39	0.01377	1	PASS

**Test Plot****802.11b mode****Peak power (CH Low)****Peak power (CH Mid)**

**Peak power (CH High)**

**802.11g mode****Peak power (CH Low)****Peak power (CH Mid)**

**Peak power (CH High)**

## BAND EDGES MEASUREMENT

### LIMIT

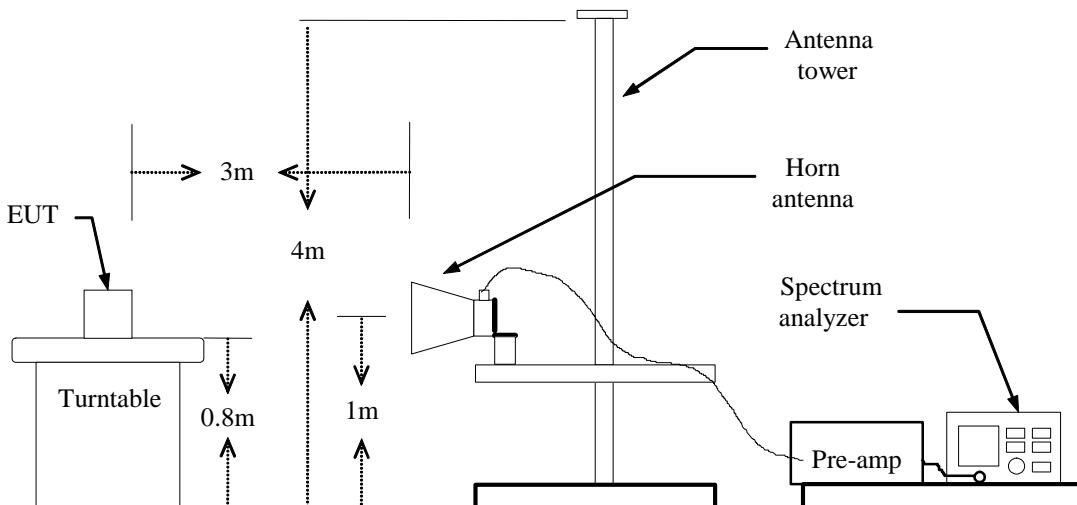
According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains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

### MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/08/2009

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

### Test Configuration



### TEST PROCEDURE

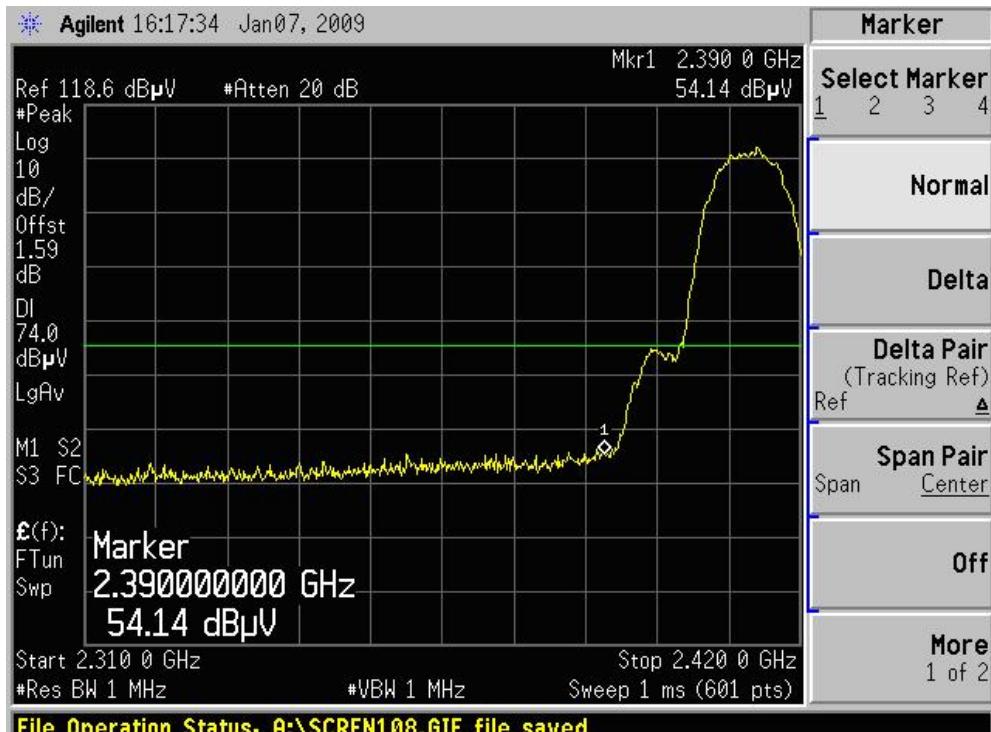
1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the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

### TEST RESULTS

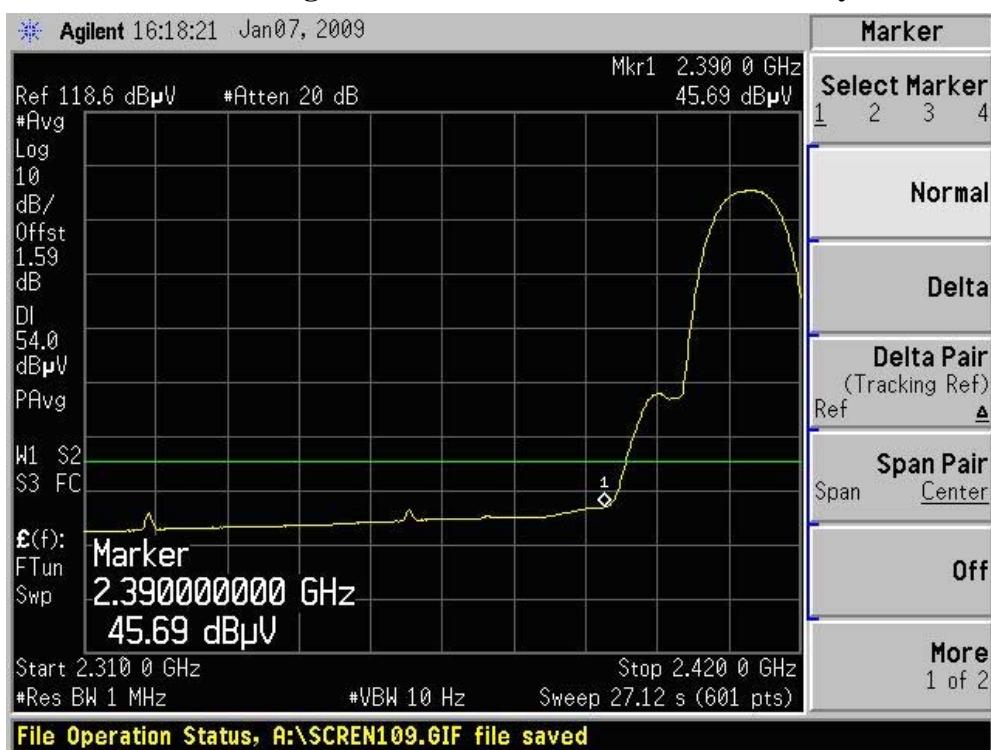
Refer to attach spectrum analyzer data chart.

### Band Edges (802.11b / CH Low)

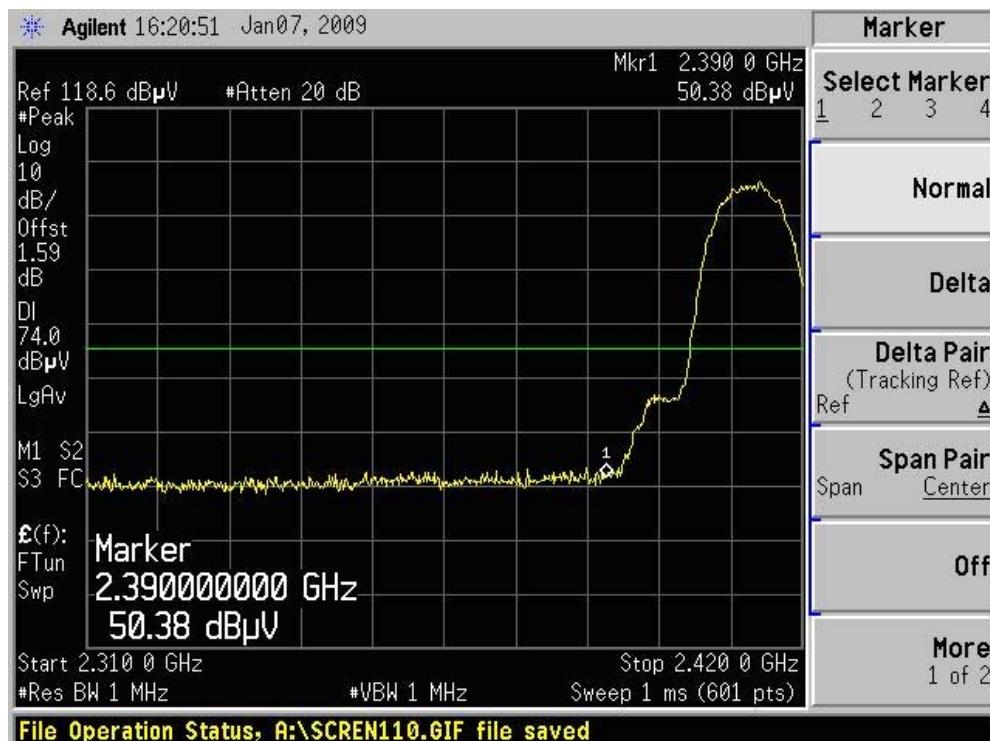
**Detector mode: Peak**



**Detector mode: Average**

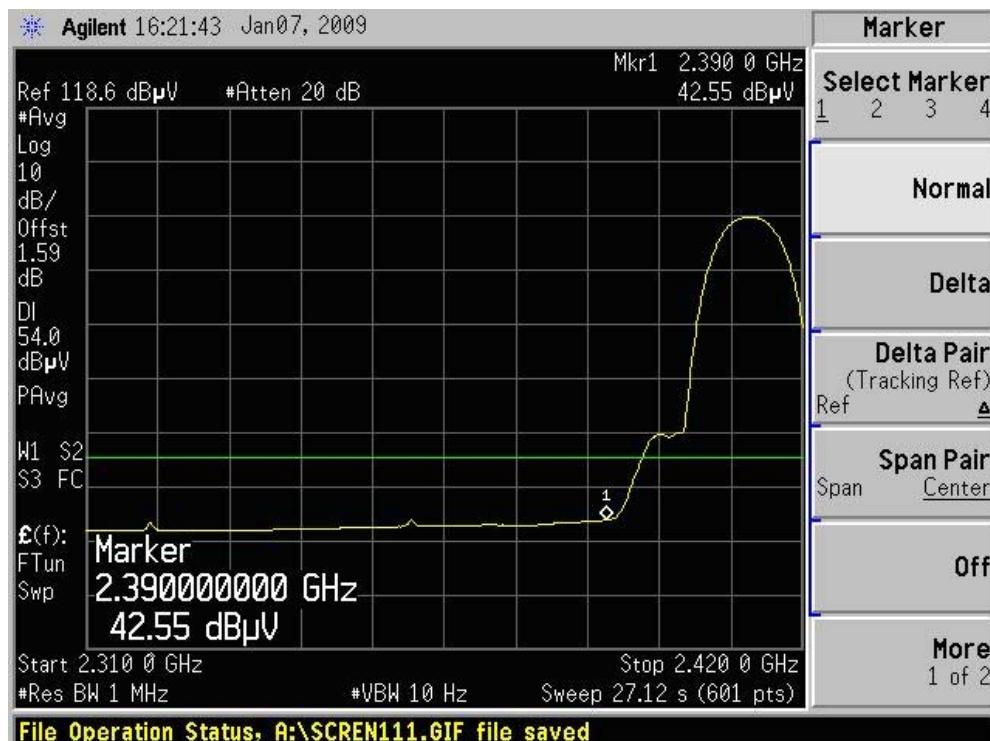


**Detector mode: Peak**



**Polarity: Horizontal**

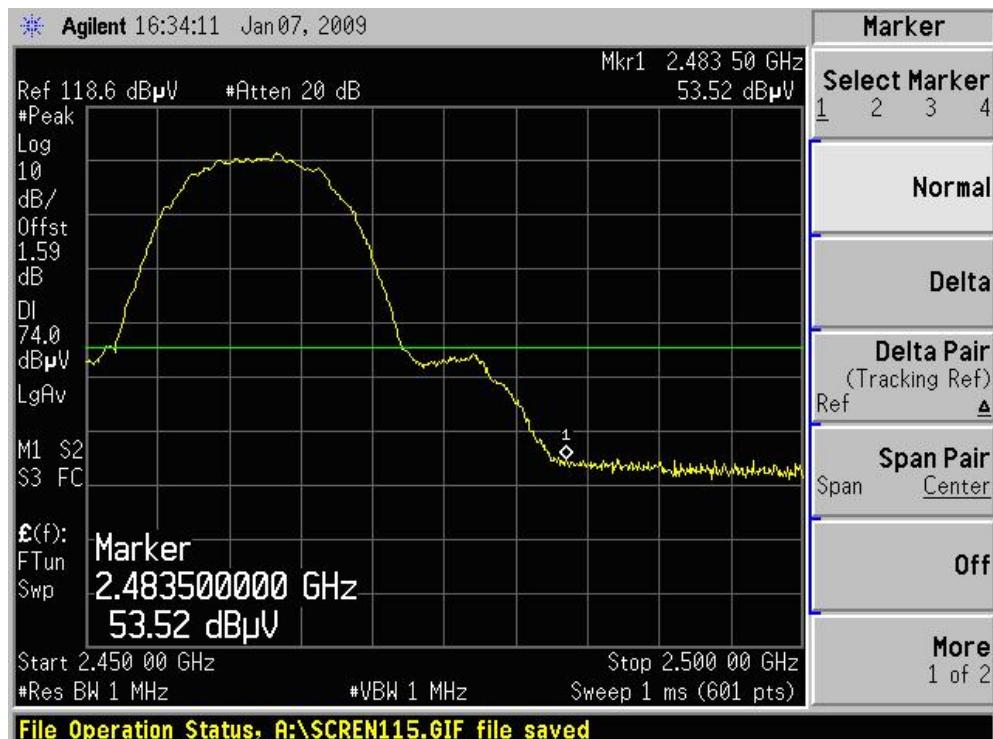
**Detector mode: Average**



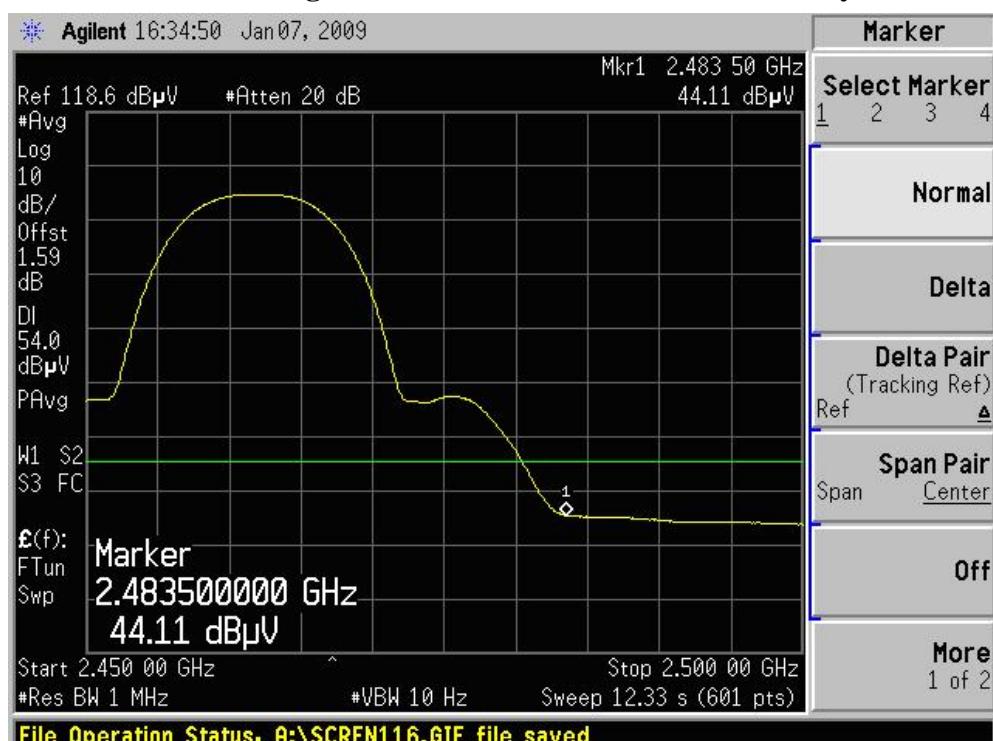
**Polarity: Horizontal**

### Band Edges (802.11b / CH High)

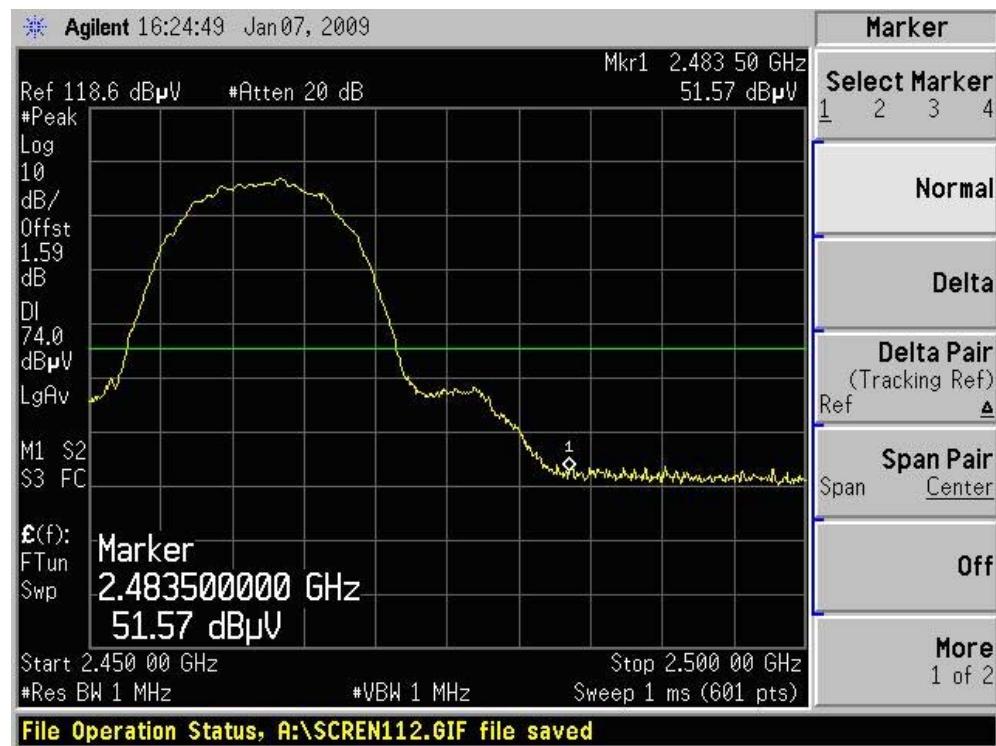
**Detector mode: Peak**



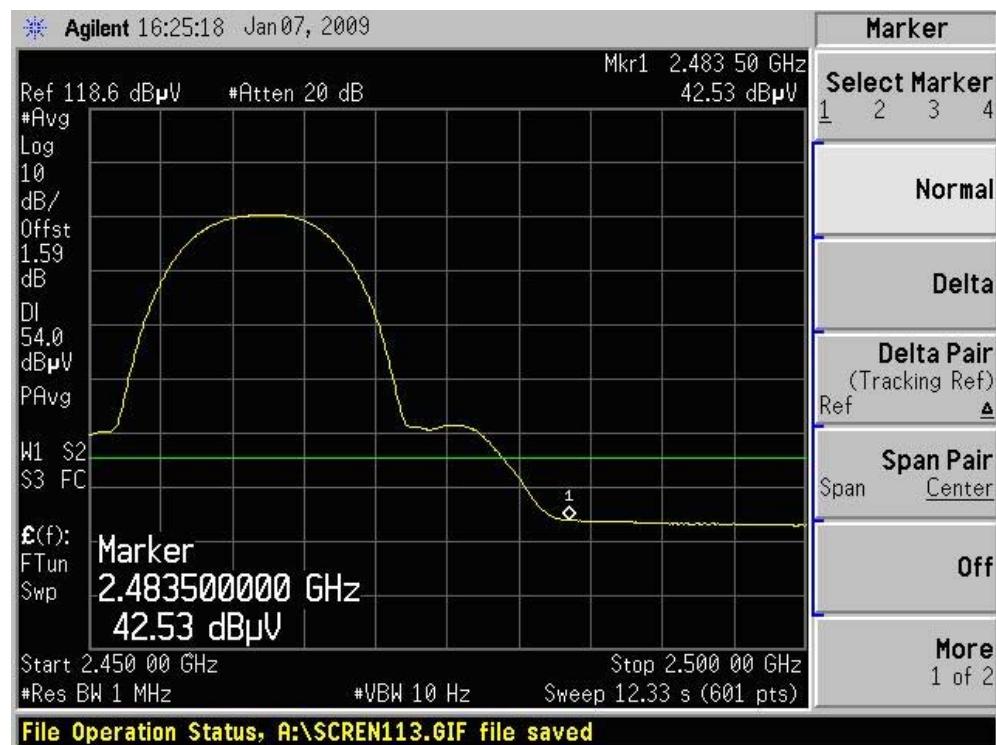
**Detector mode: Average**



**Detector mode: Peak**



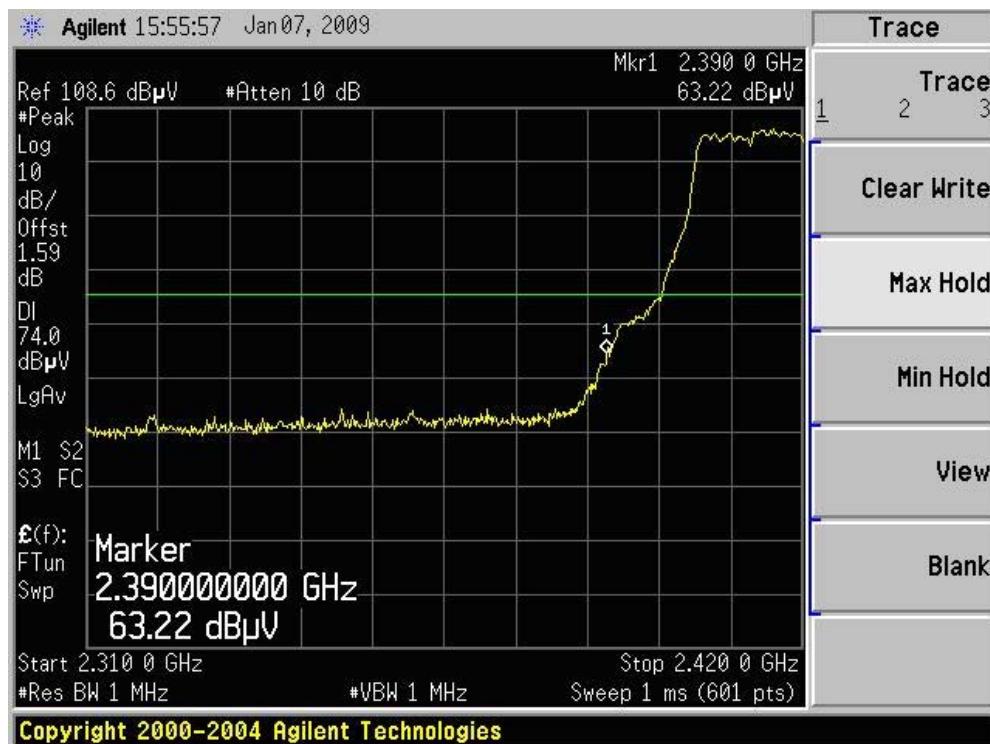
**Detector mode: Average**



### Band Edges (802.11g / CH Low)

**Detector mode: Peak**

**Polarity: Vertical**

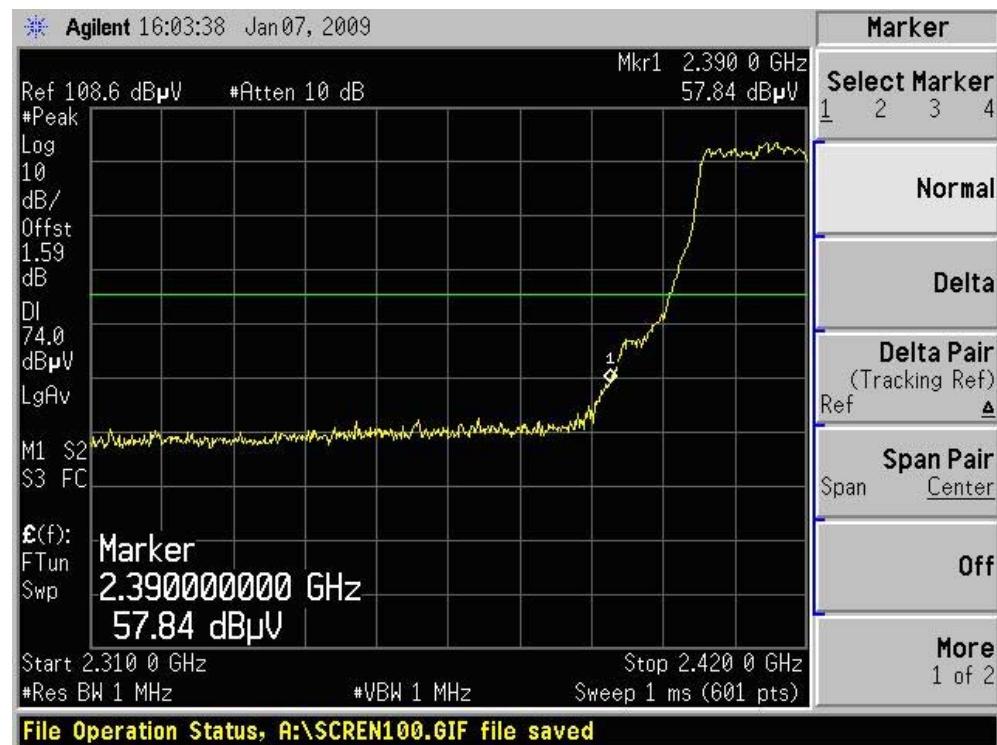


**Detector mode: Average**

**Polarity: Vertical**



**Detector mode: Peak**



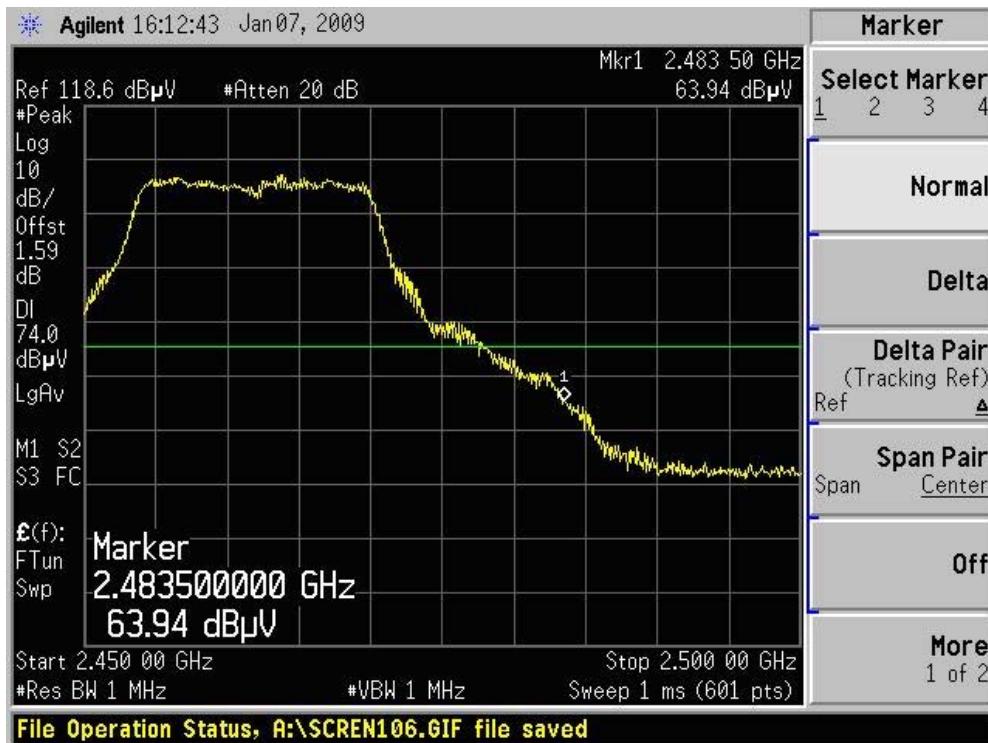
**Detector mode: Average**



### Band Edges (802.11g / CH High)

**Detector mode: Peak**

**Polarity: Vertical**



**Detector mode: Average**

**Polarity: Vertical**



**Detector mode: Peak**

**Polarity: Horizontal**



**Detector mode: Average**

**Polarity: Horizontal**



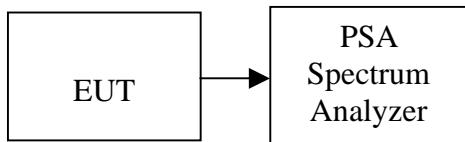
**PEAK POWER SPECTRAL DENSITY****LIMIT**

1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

**MEASUREMENT EQUIPMENT USED**

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/08/2009

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

**Test Configuration****TEST PROCEDURE**

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



## TEST RESULTS

*No non-compliance noted*

### Test Data

Test mode: IEEE 802.11b

Channel	Frequency	Reading (dBm)	Factor (dB)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-14.46	2.50	-11.96	8.00	PASS
Mid	2437	-14.90	2.50	-12.40		PASS
High	2462	-15.23	2.50	-12.73		PASS

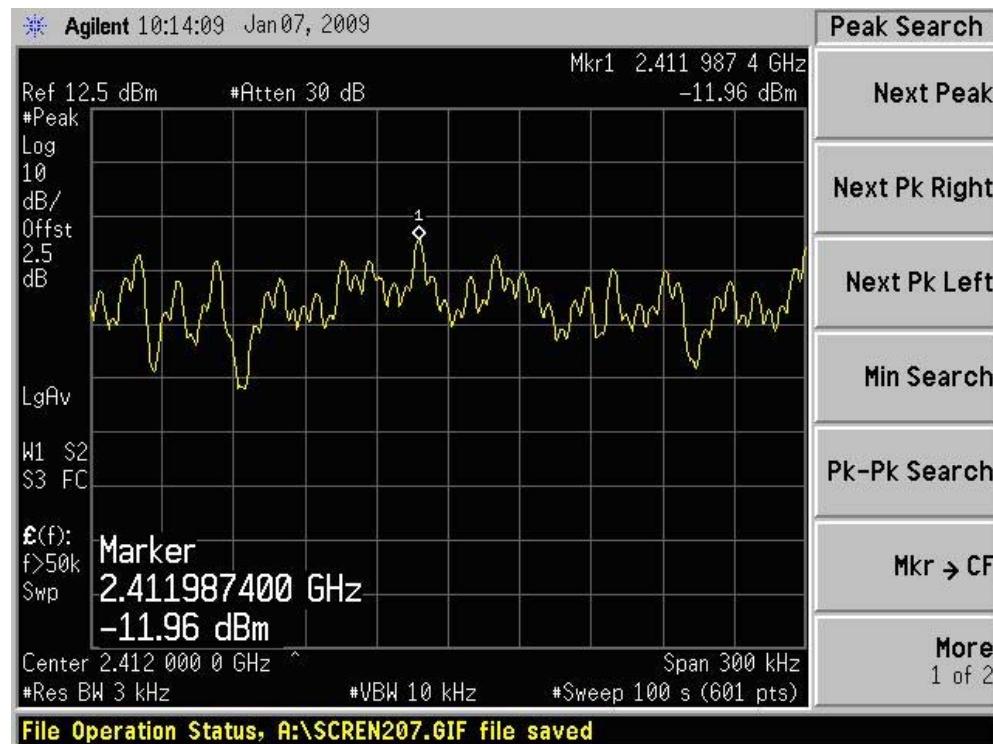
Test mode: IEEE 802.11g

Channel	Frequency	Reading (dBm)	Factor (dB)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-29.47	2.50	-26.97	8.00	PASS
Mid	2437	-29.44	2.50	-26.94		PASS
High	2462	-30.41	2.50	-27.91		PASS

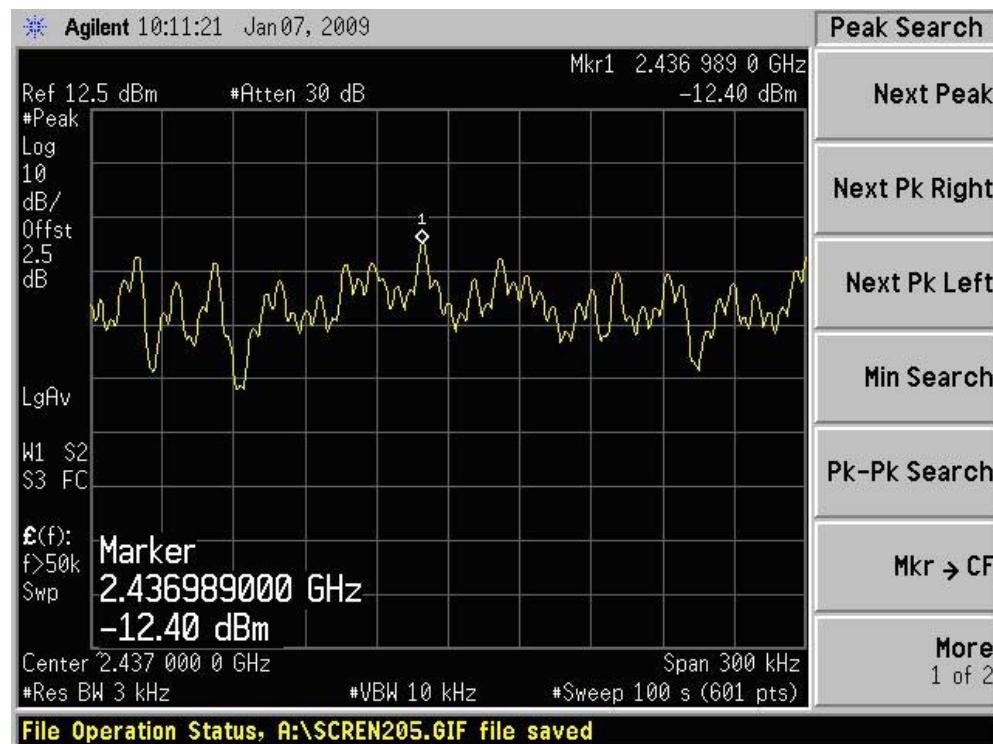
### Test Plot

#### 802.11b mode

##### PPSD (CH Low)



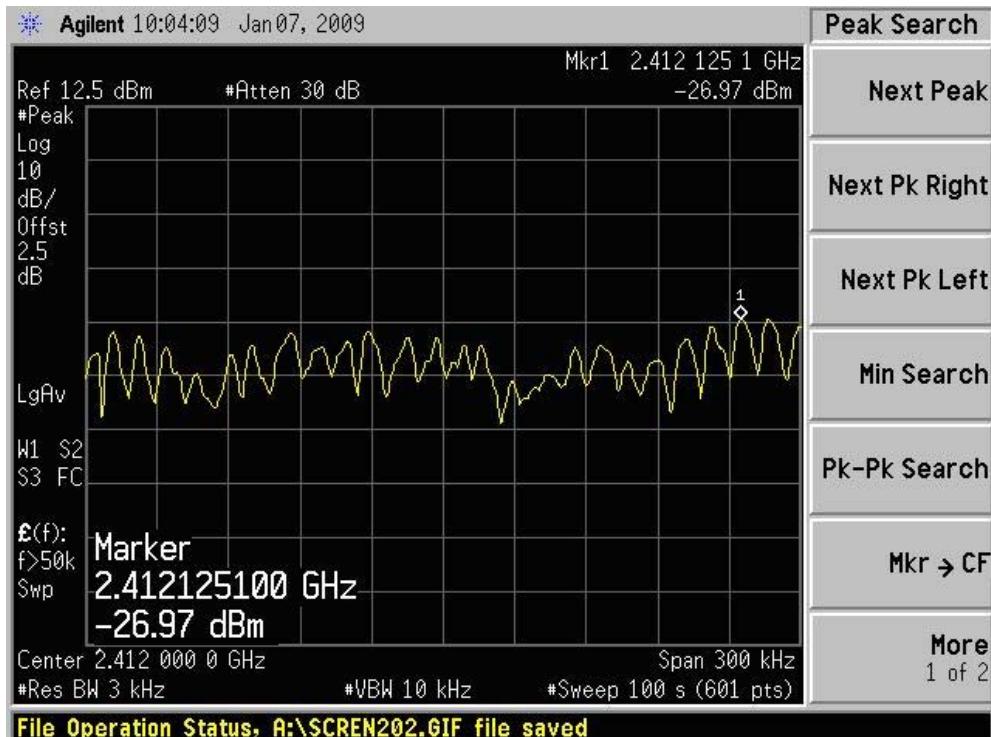
##### PPSD (CH Mid)



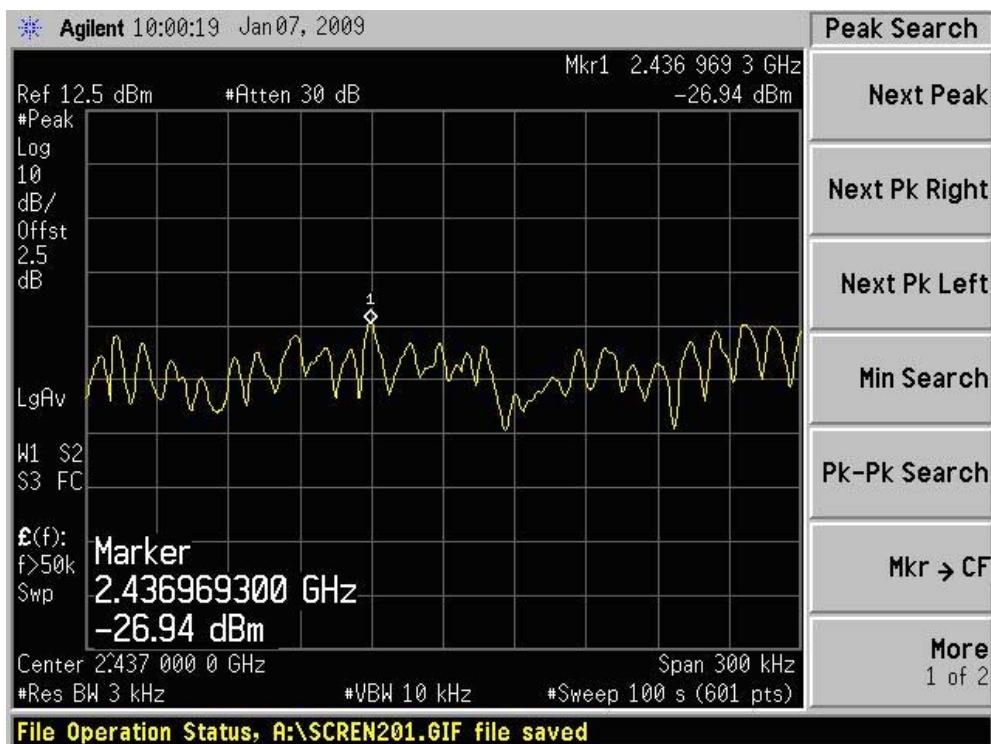
**PPSD (CH High)**

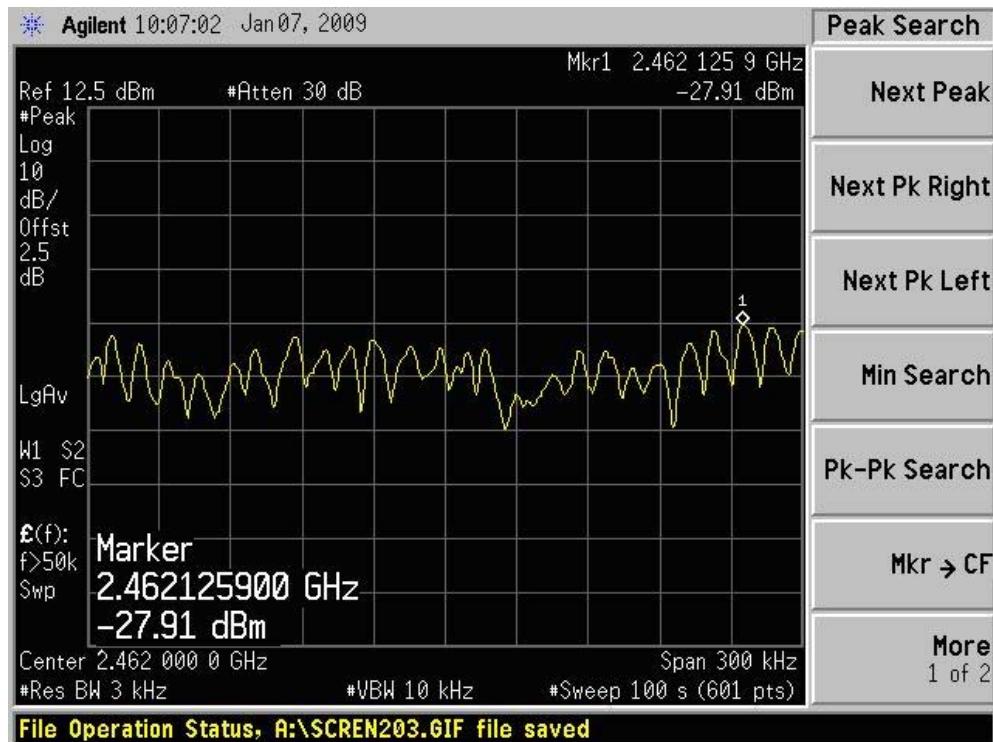
### 802.11g mode

#### PPSD (CH Low)



#### PPSD (CH Mid)



**PPSD (CH High)**

## SPURIOUS EMISSIONS

### 7.6.1 Conducted Measurement

#### LIMIT

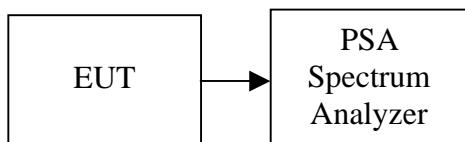
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

#### MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/08/2009

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

#### Test Configuration



#### TEST PROCEDURE

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

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

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

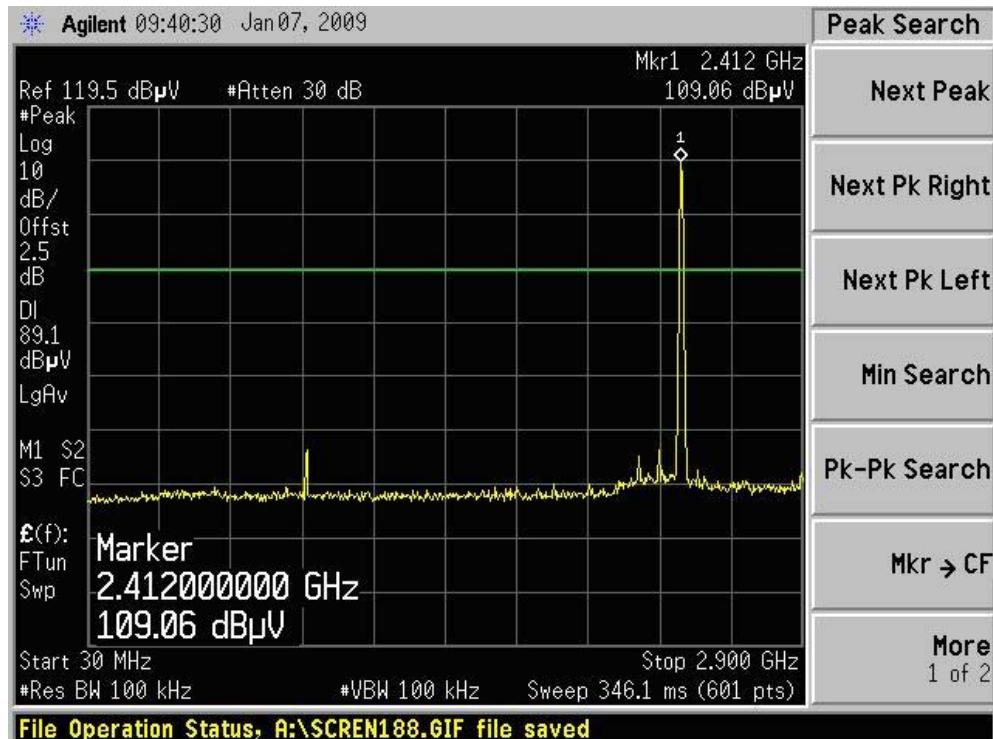
#### TEST RESULTS

*No non-compliance noted*

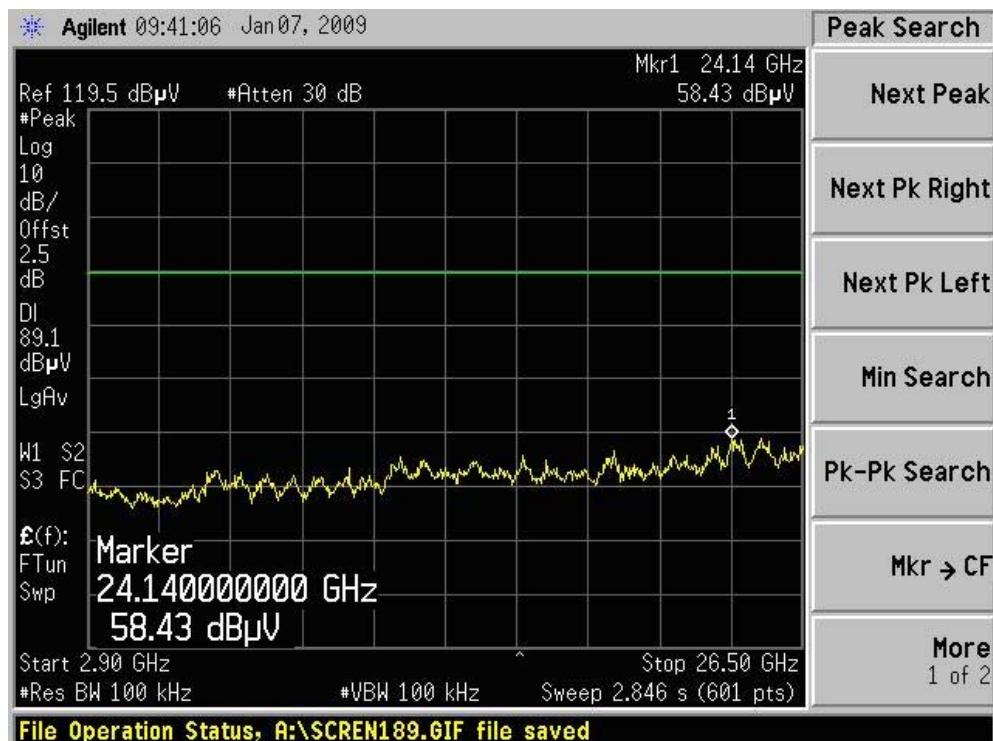
### Test Plot

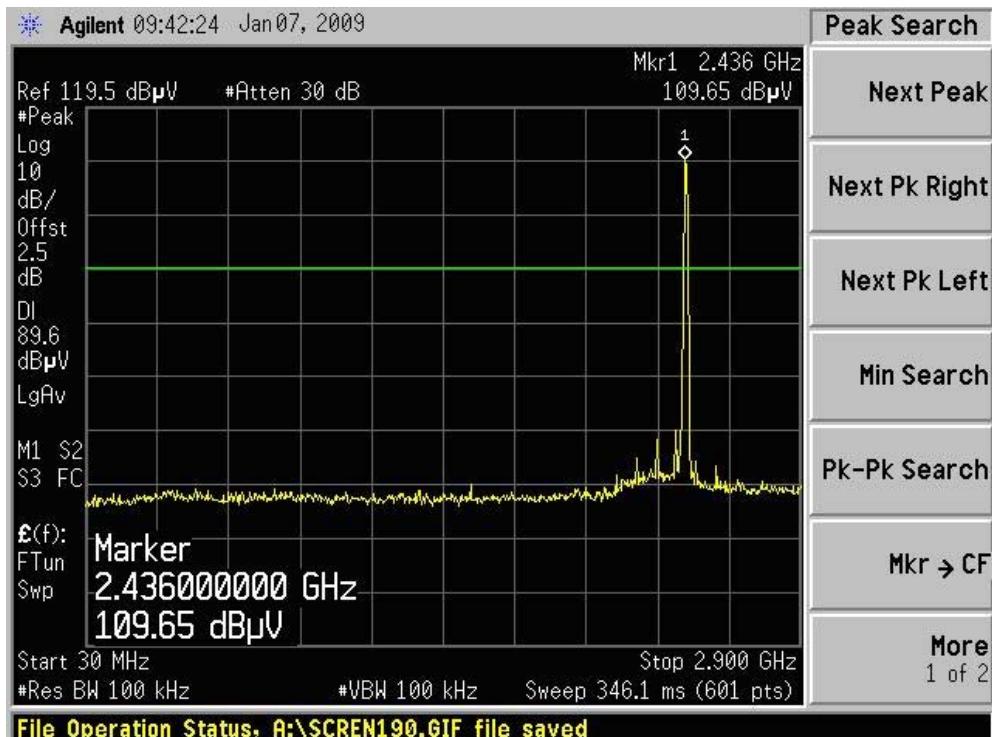
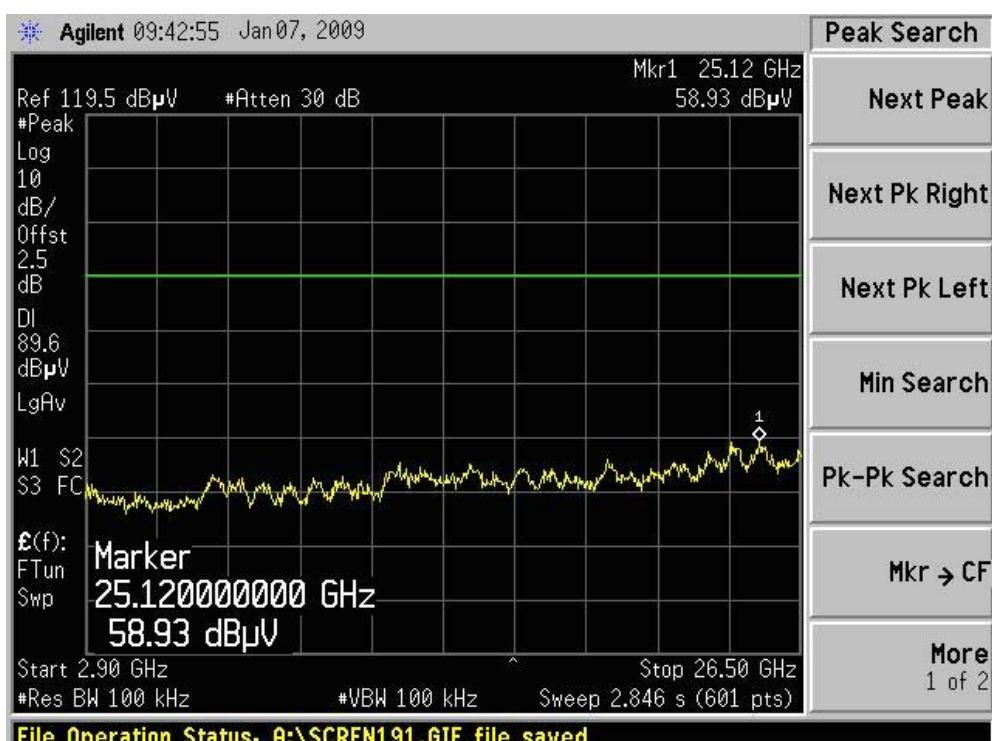
#### IEEE 802.11b / CH Low

30MHz ~ 2.9GHz



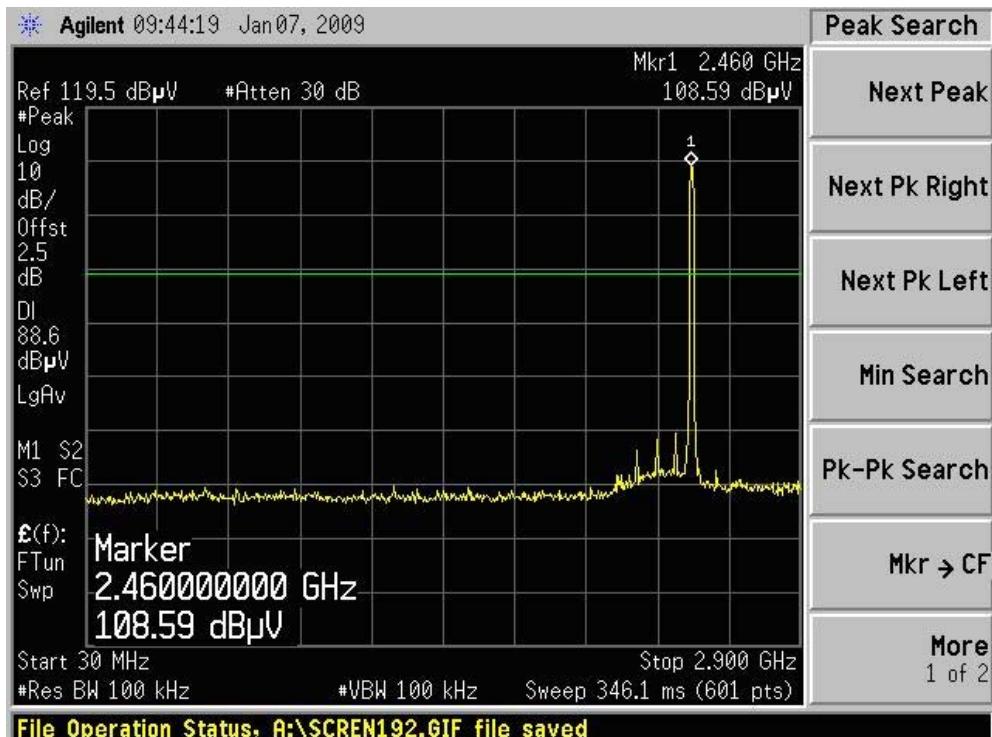
2.9GHz ~ 26.5GHz



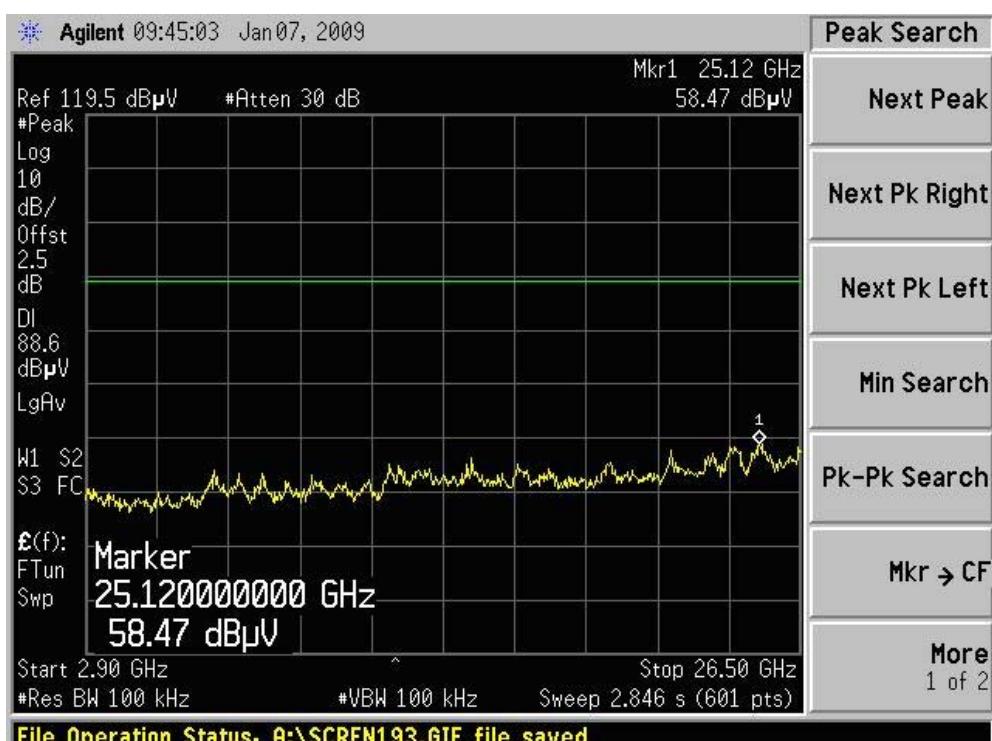
**IEEE 802.11b / CH Mid****30MHz ~ 2.9GHz****2.9GHz ~ 26.5GHz**

IEEE 802.11b / CH High

30MHz ~ 2.9GHz

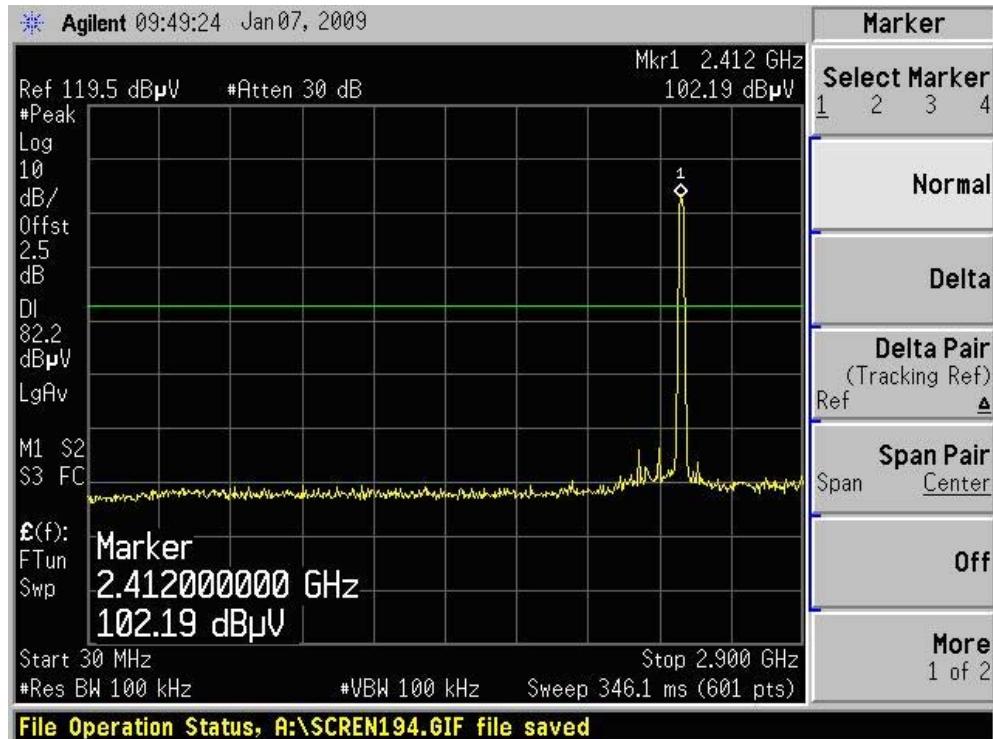


2.9GHz ~ 26.5GHz

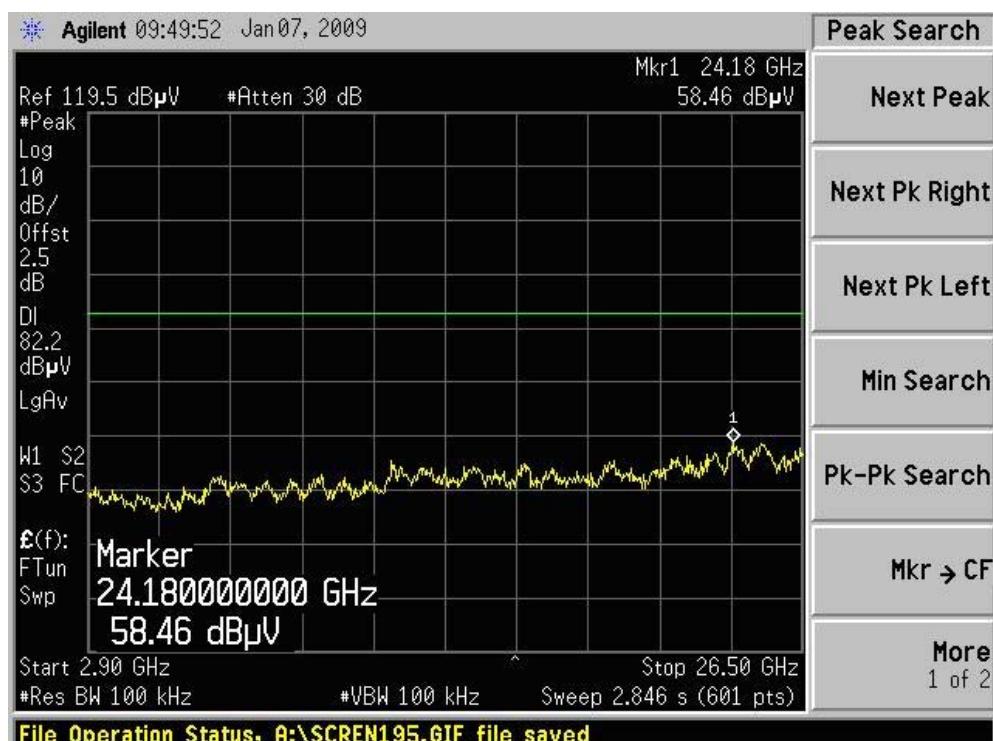


IEEE 802.11g / CH Low

30MHz ~ 2.9GHz

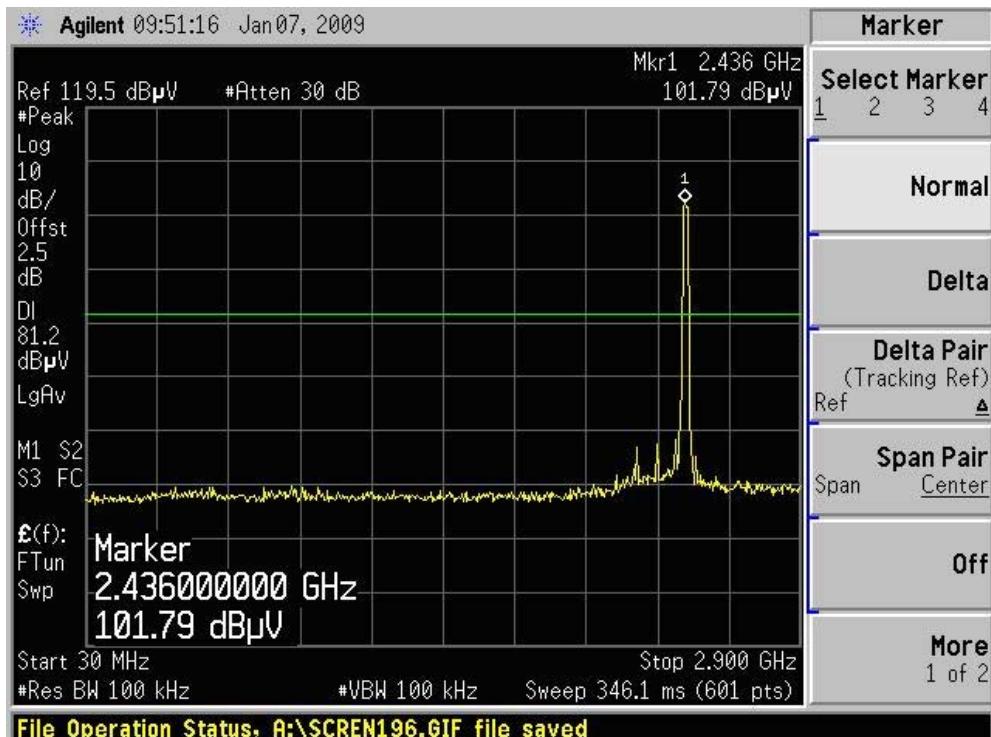


2.9GHz ~ 26.5GHz

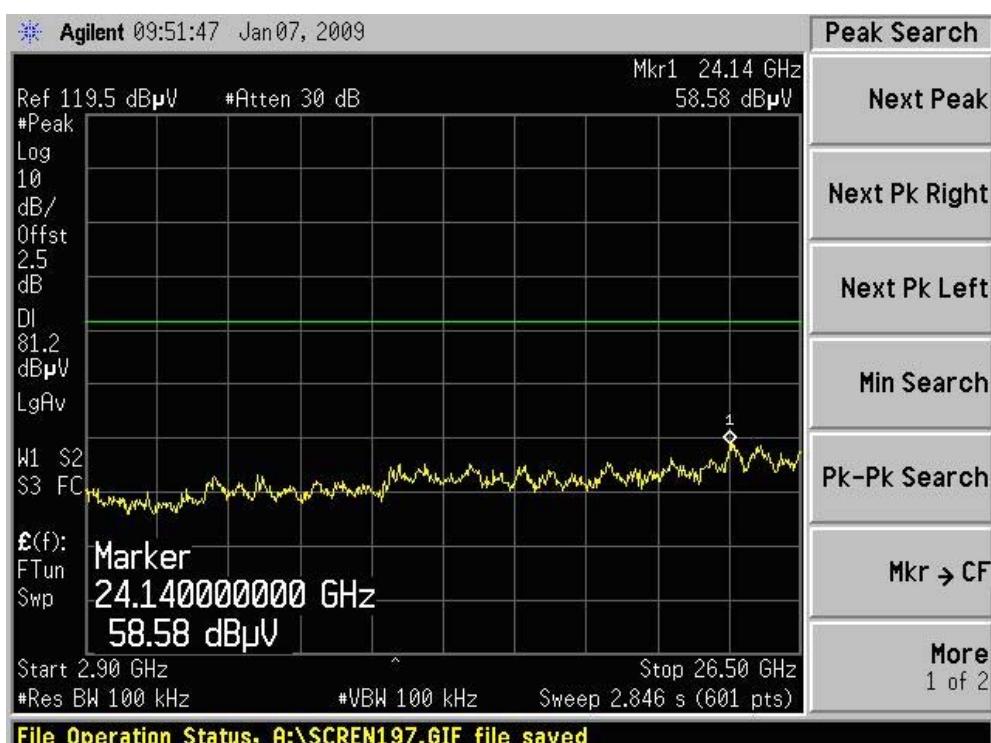


IEEE 802.11g / CH Mid

30MHz ~ 2.9GHz

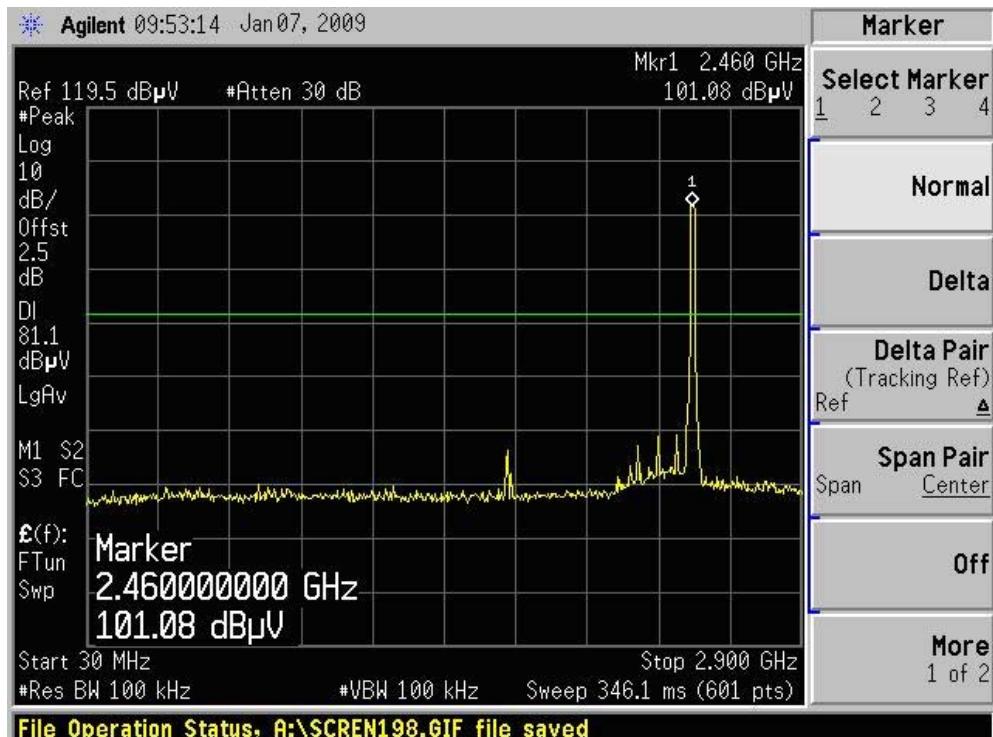


2.9GHz ~ 26.5GHz

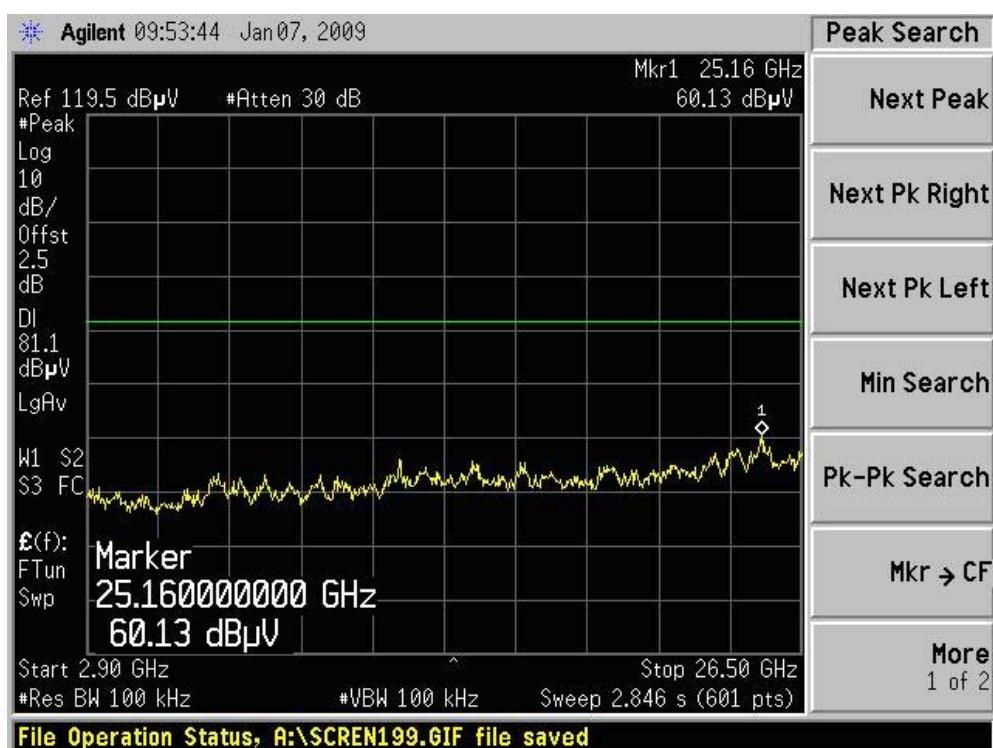


IEEE 802.11g / CH High

30MHz ~ 2.9GHz



2.9GHz ~ 26.5GHz



## 7.6.2 Radiated Emissions

### **LIMIT**

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

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

*Note: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

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

Frequency (Hz)	Field Strength ( $\mu$ V/m at 3-meter)	Field Strength (dB $\mu$ V/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

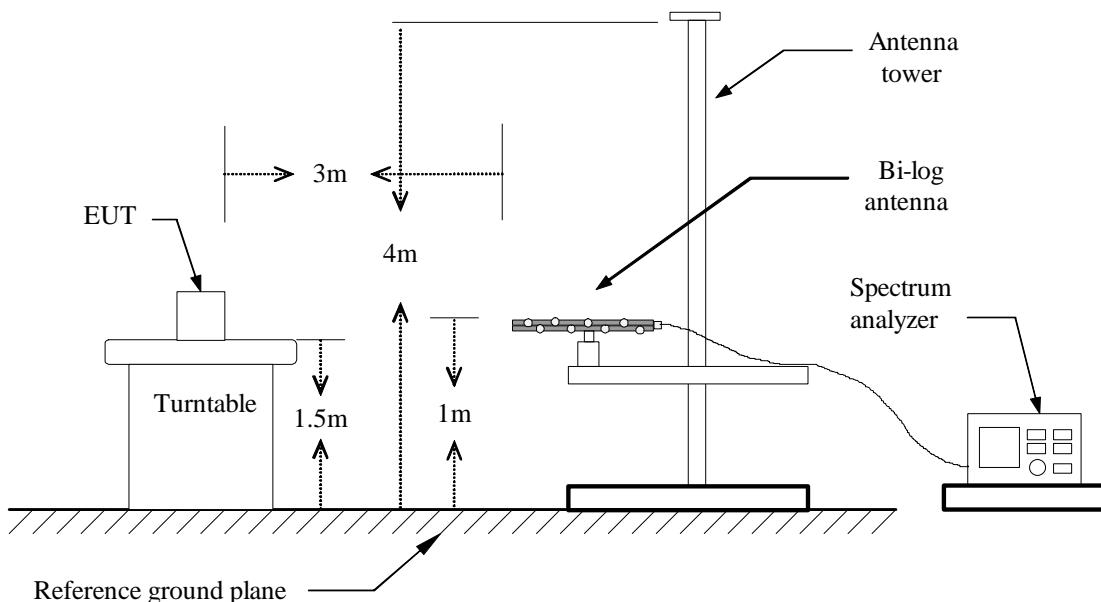
## **MEASUREMENT EQUIPMENT USED**

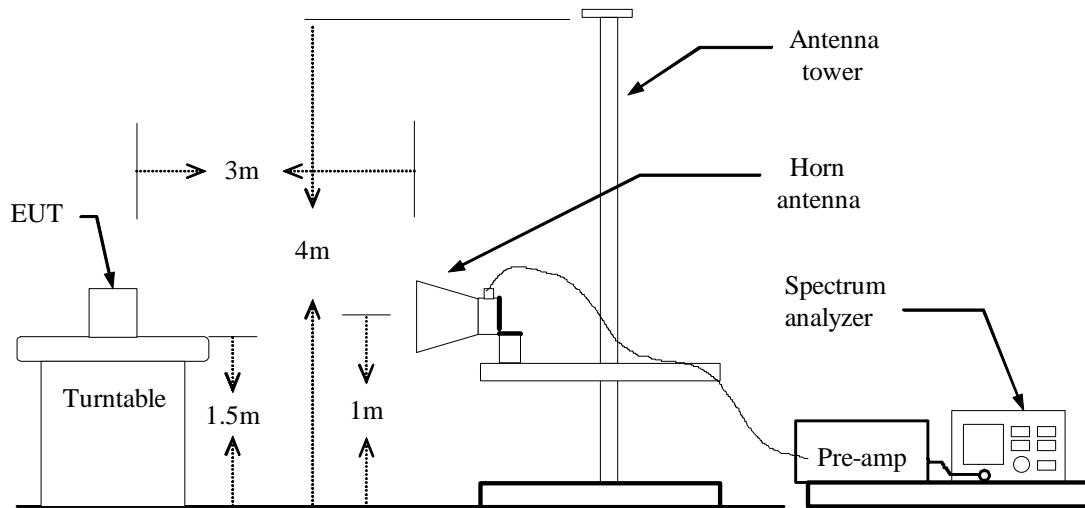
966 CHAMBER				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/08/2009
EMI Test Receiver	R&S	ESCI	100005	06/23/2009
Pre Amplifier	HP	HP8447E	2945A02715	06/15/2009
Pre Amplifier	Agilent	8449B	N/A	06/04/2009
Bilog Antenna	SUNOL Sciences	JB3	A021907	06/10/2009
Horn Antenna	TRC	N/A	N/A	06/10/2009
Turn Table	CCS	2081-1.21	N/A	N.C.R
Antenna Tower	CT	N/A	N/A	N.C.R
Controller	CCS	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

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

### **Test Configuration**

#### **Below 1 GHz**



**Above 1 GHz****TEST PROCEDURE**

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



## TEST RESULTS

### Below 1 GHz

**Operation Mode:** TX / IEEE 802.11b / CH Low

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55% RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
168.600	V	QP	49.05	-6.84	44.21	43.50	-1.29
222.150	V	QP	59.10	-14.62	44.48	46.00	-1.52
259.950	V	QP	55.17	-10.50	44.67	46.00	-1.33
498.333	V	QP	44.18	0.56	44.74	46.00	-1.26
519.333	V	QP	42.59	0.95	43.54	46.00	-2.46
598.666	V	QP	43.41	1.24	44.65	46.00	-1.35
120.000	H	QP	48.47	-7.05	41.42	43.50	-2.08
240.150	H	QP	55.22	-11.01	44.21	46.00	-1.79
259.950	H	QP	52.35	-7.82	44.53	46.00	-1.47
443.500	H	QP	50.27	-5.91	44.36	46.00	-1.64
465.666	H	QP	45.36	-0.82	44.54	46.00	-1.46
720.000	H	QP	48.58	-4.26	44.32	46.00	-1.68

### **Notes:**

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. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



**World Standardization Certification & Testing CO.,LTD**  
**World Standardization Safety and EMC Testing Centre**

**Operation Mode:** TX / IEEE 802.11b / CH Mid

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55 % RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
129.900	V	QP	50.24	-8.02	42.22	43.50	-1.28
194.700	V	QP	52.91	-11.42	41.49	43.50	-2.01
269.850	V	QP	56.93	-13.00	43.93	46.00	-2.07
499.500	V	QP	43.92	0.19	44.11	46.00	-1.89
519.333	V	QP	43.36	0.95	44.31	46.00	-1.69
664.000	V	QP	42.99	1.47	44.46	46.00	-1.54
51.150	H	QP	45.03	-6.79	38.24	40.00	-1.76
120.000	H	QP	49.21	-7.05	42.16	43.50	-1.34
259.950	H	QP	51.68	-7.82	43.86	46.00	-2.14
465.666	H	QP	44.75	-0.82	43.93	46.00	-2.07
667.500	H	QP	51.87	-7.83	44.04	46.00	-1.96
798.166	H	QP	48.40	-4.19	44.21	46.00	-1.79

**Notes:**

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. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



**Operation Mode:** TX / IEEE 802.11b / CH High

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55 % RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
129.900	V	QP	49.63	-8.02	41.61	43.50	-1.89
246.900	V	QP	51.97	-7.55	44.42	46.00	-1.58
269.850	V	QP	56.89	-13.00	43.89	46.00	-2.11
519.333	V	QP	43.49	0.95	44.44	46.00	-1.56
598.666	V	QP	42.84	1.24	44.08	46.00	-1.92
622.000	V	QP	44.20	-0.11	44.09	46.00	-1.91
133.500	H	QP	48.90	-6.94	41.96	43.50	-1.54
240.150	H	QP	55.64	-11.01	44.63	46.00	-1.37
259.950	H	QP	51.63	-7.82	43.81	46.00	-2.19
479.666	H	QP	46.38	-2.15	44.23	46.00	-1.77
665.166	H	QP	52.05	-7.91	44.14	46.00	-1.86
720.000	H	QP	49.14	-4.26	44.88	46.00	-1.12

**Notes:**

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. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



**Operation Mode:** TX / IEEE 802.11g / CH Low

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55 % RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
227.550	V	QP	57.03	-13.01	44.02	46.00	-1.98
259.950	V	QP	54.62	-10.50	44.12	46.00	-1.88
269.850	V	QP	57.82	-13.00	44.82	46.00	-1.18
292.350	V	QP	56.47	-11.75	44.72	46.00	-1.28
519.333	V	QP	43.38	0.95	44.33	46.00	-1.67
567.166	V	QP	42.71	1.26	43.97	46.00	-2.03
225.750	H	QP	59.21	-14.59	44.62	46.00	-1.38
240.150	H	QP	55.67	-11.01	44.66	46.00	-1.34
259.950	H	QP	41.85	-7.82	44.03	46.00	-1.97
280.200	H	QP	51.43	-7.07	43.36	46.00	-1.64
666.333	H	QP	51.83	-7.87	43.96	46.00	-2.04
798.166	H	QP	48.53	-4.19	44.34	46.00	-1.66

**Notes:**

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. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



**Operation Mode:** TX / IEEE 802.11g / CH Mid

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55 % RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
129.900	V	QP	49.56	-8.02	41.54	43.50	-1.96
250.950	V	QP	51.10	-6.68	44.42	46.00	-1.58
269.850	V	QP	57.60	-13.00	44.60	46.00	-1.40
292.350	V	QP	55.70	-11.75	43.95	46.00	-2.05
498.333	V	QP	45.30	0.56	44.86	46.00	-1.14
529.833	V	QP	43.25	1.39	44.64	46.00	-1.36
120.000	H	QP	49.29	-7.05	42.24	43.50	-1.26
240.150	H	QP	55.21	-11.01	44.20	46.00	-1.80
259.950	H	QP	52.40	-7.82	44.58	46.00	-1.42
480.833	H	QP	46.23	-2.16	44.07	46.00	-1.93
499.500	H	QP	44.16	0.70	44.86	46.00	-1.14
720.000	H	QP	48.80	-4.26	44.54	46.00	-1.46

**Notes:**

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. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



**World Standardization Certification & Testing CO.,LTD**  
**World Standardization Safety and EMC Testing Centre**

**Operation Mode:** TX / IEEE 802.11g / CH High

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55 % RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
194.700	V	QP	53.20	-11.42	38.78	43.50	-1.72
259.950	V	QP	55.23	-10.50	44.73	46.00	-1.27
269.850	V	QP	56.89	-13.00	43.89	46.00	-2.11
498.333	V	QP	44.12	0.56	44.68	46.00	-1.32
529.833	V	QP	42.77	1.39	44.16	46.00	-1.84
601.000	V	QP	43.26	1.06	44.32	46.00	-1.68
134.850	H	QP	48.64	-6.49	42.15	43.50	-1.35
240.150	H	QP	55.24	-11.01	45.23	46.00	-1.77
259.950	H	QP	51.86	-7.82	44.04	46.00	-1.96
431.833	H	QP	51.75	-7.14	44.61	46.00	-1.39
465.666	H	QP	45.54	-0.82	44.72	46.00	-1.28
720.000	H	QP	48.19	-4.26	43.93	46.00	-2.07

**Notes:**

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. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



**Above 1 GHz**

**Operation Mode:** TX / IEEE 802.11b / CH Low

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55 % RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1063.33	V	52.40	---	-2.20	50.20	---	74.00	54.00	-3.80	Peak
1600.00	V	52.26	---	-0.88	51.38	---	74.00	54.00	-2.62	Peak
4750.00	V	47.03	---	5.92	52.95	---	74.00	54.00	-1.05	Peak
N/A										
1596.66	H	48.33	---	-0.91	47.42	---	74.00	54.00	-6.58	Peak
1743.33	H	48.74	---	-0.75	47.99	---	74.00	54.00	-6.01	Peak
4775.00	H	47.35	---	5.91	53.26	---	74.00	54.00	-0.74	Peak
N/A										

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



**World Standardization Certification & Testing CO.,LTD**  
**World Standardization Safety and EMC Testing Centre**

**Operation Mode:** TX / IEEE 802.11b / CH Mid

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55% RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1153.33	V	51.83	---	-2.14	49.69	---	74.00	54.00	-4.31	Peak
1596.66	V	52.48	---	-0.91	51.57	---	74.00	54.00	-2.43	Peak
4700.00	V	47.80	---	5.93	53.73	---	74.00	54.00	-0.27	Peak
N/A										
1600.00	H	49.27	---	-0.88	48.39	---	74.00	54.00	-5.61	Peak
1810.00	H	48.39	---	-0.65	47.74	---	74.00	54.00	-6.26	Peak
4691.66	H	47.73	---	5.93	53.66	---	74.00	54.00	-0.34	Peak
N/A										

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



**Operation Mode:** TX / IEEE 802.11b / CH High

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55 % RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1826.66	V	51.52	---	-0.57	50.95	---	74.00	54.00	-3.05	Peak
1860.00	V	52.97	---	-0.40	52.57	---	74.00	54.00	-1.43	Peak
4708.33	V	47.38	---	5.92	53.30	---	74.00	54.00	-0.70	Peak
N/A										
1603.33	H	49.35	---	-0.88	48.47	---	74.00	54.00	-5.53	Peak
1813.33	H	47.78	---	-0.63	47.15	---	74.00	54.00	-6.85	Peak
4758.33	H	47.59	---	5.92	53.51	---	74.00	54.00	-0.49	Peak
N/A										

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

**Operation Mode:** TX / IEEE 802.11g / CH Low

**Temperature:** 20°C

**Humidity:** 55 % RH

**Test Date:** January 07, 2009

**Tested by:** Cheney

**Polarity:** Ver. / Hor.

<b>Freq. (MHz)</b>	<b>Ant. Pol H/V</b>	<b>Peak Reading (dBuV)</b>	<b>AV Reading (dBuV)</b>	<b>Ant. / CL CF (dB)</b>	<b>Actual Fs</b>		<b>Peak Limit (dBuV/m)</b>	<b>AV Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Remark</b>
					<b>Peak (dBuV/m)</b>	<b>AV (dBuV/m)</b>				
1153.33	V	52.52	---	-2.14	50.38	---	74.00	54.00	-3.62	Peak
1600.00	V	51.77	---	-0.88	50.89	---	74.00	54.00	-3.11	Peak
4675.00	V	47.02	---	5.93	52.95	---	74.00	54.00	-1.05	Peak
N/A										
1196.66	H	51.16	---	-2.10	49.06	---	74.00	54.00	-4.94	Peak
1600.00	H	48.89	---	-0.88	48.01	---	74.00	54.00	-5.99	Peak
4808.33	H	47.43	---	5.99	53.42	---	74.00	54.00	-0.58	Peak
N/A										

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



**World Standardization Certification & Testing CO.,LTD**  
**World Standardization Safety and EMC Testing Centre**

**Operation Mode:** TX / IEEE 802.11g / CH Mid

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55 % RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1063.33	V	54.03	---	-2.20	51.83	---	74.00	54.00	-2.17	Peak
1600.00	V	51.23	---	-0.88	50.35	---	74.00	54.00	-3.65	Peak
4691.66	V	48.29	---	5.93	54.22	---	74.00	54.00	-19.78	Avg.
N/A										
1600.00	H	49.62	---	-0.88	48.74	---	74.00	54.00	-5.26	Peak
1713.33	H	50.47	---	-0.78	49.69	---	74.00	54.00	-4.31	Peak
4750.00	H	46.98	---	5.92	52.90	---	74.00	54.00	-1.10	Peak
N/A										

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



**Operation Mode:** TX / IEEE 802.11g / CH High

**Test Date:** January 07, 2009

**Temperature:** 20°C

**Tested by:** Cheney

**Humidity:** 55 % RH

**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1066.66	V	53.62	---	-2.20	51.42	---	74.00	54.00	-2.58	Peak
1603.33	V	51.26	---	-0.88	50.38	---	74.00	54.00	-3.62	Peak
4750.00	V	46.76	---	5.92	52.68	---	74.00	54.00	-1.32	Peak
N/A										
1600.00	H	48.20	---	-0.88	47.32	---	74.00	54.00	-6.68	Peak
1810.00	H	48.17	---	-0.65	47.52	---	74.00	54.00	-6.48	Peak
4766.66	H	47.65	---	5.91	53.56	---	74.00	54.00	-0.44	Peak
N/A										

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
  - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
  - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



## **POWERLINE CONDUCTED EMISSIONS**

### **LIMIT**

For an intentional radiator which 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 250 microvolts (The limit decreases Linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

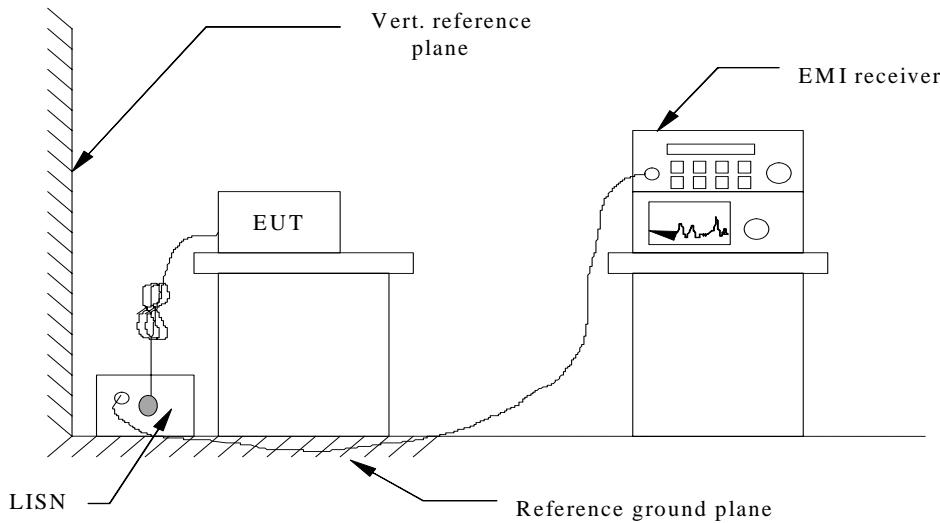
Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

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

### **MEASUREMENT EQUIPMENT USED**

Conducted Emission Test Site Shielding Room 743				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCI	100005	06/23/2009
LISN	AFJ	LS16	16010222119	04/02/2009
LISN	Meestec	AN3016	04/10040	04/02/2009

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

**Test Configuration**

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

**TEST PROCEDURE**

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

**TEST RESULTS**

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



**Test Data**

<b>Test Mode:</b> Normal link	<b>Location:</b> Shielding Room743
<b>Model Name:</b> U-100	<b>Test Date:</b> January 07, 2009
<b>Tested by:</b> Cheney	<b>Test Results:</b> Passed

(The chart below shows the highest readings taken from the final data)

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
0.309	50.44	47.66	43.32	61.45	51.45	-13.79	-8.13	L1
0.839	48.99	46.55	40.15	56.00	46.00	-9.45	-5.85	L1
1.043	48.72	45.99	36.89	56.00	46.00	-10.01	-9.11	L1
8.965	43.49	---	---	60.00	50.00	---	-6.51	L1
10.296	42.83	---	---	60.00	50.00	---	-7.17	L1
N/A								
0.309	52.90	50.66	46.35	61.45	51.45	-10.79	-5.10	L2
0.628	50.71	46.03	37.62	56.00	46.00	-9.97	-8.38	L2
0.839	52.67	50.16	40.36	56.00	46.00	-5.84	-5.64	L2
1.039	53.00	50.42	41.02	56.00	46.00	-5.58	-4.98	L2
1.569	51.25	47.34	37.92	56.00	46.00	-8.66	-8.08	L2
10.296	46.79	41.06	35.45	60.00	50.00	-18.94	-14.55	L2

***Remark:***

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

***Note:***

*Freq.* = Emission frequency in KHz

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

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

if it > 0.5 dB

*Limit dBuV* = Limit stated in standard

*Margin dB* = Reading in reference to limit



World Standardization Certification & Testing CO., LTD  
World Standardization Safety and EMC Testing Centre

### **Calculation Formula**

$$\text{Margin (dB)} = \text{Amptd (dBuV)} - \text{Limit (dBuV)}$$

### **Common Mode Conducted Emission**

*Not applicable*



**World Standardization Certification & Testing CO.,LTD**  
**World Standardization Safety and EMC Testing Centre**