

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT**

*OF*

**802.11 b/g Wireless Network Adapter**

**MODEL No.: AWU50G-W**

**FCC ID: XB5-UD5001**

**REPORT NO: E0906089F**

**ISSUE DATE: July 16, 2009**

*Prepared for*

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## VERIFICATION OF COMPLIANCE

Applicant:	SHENZHEN ALLWINS TECHNOLOGY CORPORATION 902#, Block A, R &D Building, Tsinghua Hi-Tech Park, Nanshan District, Shenzhen, China
Manufacturer:	SHENZHEN ALLWINS TECHNOLOGY CORPORATION 902#, Block A, R &D Building, Tsinghua Hi-Tech Park, Nanshan District, Shenzhen, China
Product Description:	802.11 b/g Wireless Network Adapter
Brand Name:	N/A
Model Number:	AWU50G-W
Serial Number:	N/A
File Number:	E0906089F
Date of Test:	July 01, 2009 to July 16, 2009

### We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK 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 conducted and radiated emission limits of FCC Rules Part 15.247.

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

*Approved By*



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**David Lee / Q.A. Manager**  
**SHENZHEN EMTEK CO., LTD.**

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## 1. GENERAL INFORMATION

### 1.1 Product Description

A major technical descriptions of EUT is described as following:

- A). Standards: IEEE802.11b/g
- B). Operation Frequency: 2400-2483.5MHz
- C). Modulation: OFDM with BPSK, QPSK, 16QAM, 64QAM(11g), BPSK, QPSK, CCK (11b)
- D). Number of Channel: 11
- E). Max Data Rate: 11Mbps(802.11b), 54Mbps(802.11g)
- F). Transmit Power: 11dBm(802.11b), 11dBm(802.11g)
- G). Antenna GAIN: 2dBi
- H). Antenna Type: PCB Antenna
- I). Power Supply: DC5V from PC USB port

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447		

Note:

1. This device is a 2.4GHz 802.11 b/g Wireless Network Adapter included 802.11b and 802.11g 2.4GHz transceiver function.
2. Test of channel was included the lowest middle and highest frequency in highest data rate and to perform the test, then record on this report.

### 1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: XB5-UD5001 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (receiver) is compliance with Subpart B is authorized under a DOC procedure.

### 1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

### 1.4 Special Accessories

Not available for this EUT intended for grant.

## 1.5 Equipment Modifications

Not available for this EUT intended for grant.

## 1.6 Test Facility

### Site Description

#### EMC Lab.

: Accredited by CNAS, 2005.11.02

The certificate is valid until 2010.11

The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2006(identical to ISO/IEC17025: 2005)

The Certificate Registration Number is L2291

Accredited by TUV Rheinland Shenzhen 2008.3

The Laboratory has been assessed according to the requirements ISO/IEC 17025

Accredited by FCC, March 18, 2008

The Certificate Registration Number is 709623.

Accredited by Industry Canada, May 24, 2008

The Certificate Registration Number is 46405-4480.

#### Name of Firm

: SHENZHEN EMTEK CO., LTD

#### Site Location

: Bldg 69, Majialong Industry Zone,  
Nanshan District, Shenzhen, Guangdong, China

## 2. System Test Configuration

### 2.1 EUT Configuration

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

### 2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is a placed on as turn table 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 mode.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

### 2.4 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**



Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1.	802.11 b/g Wireless Network Adapter	ALLWINS	AWU50G-W	XB5-UD5001	N/A	<i>EUT</i>
2.	Notebook	Lenovo	IdeaPad Y450	DOC	EB11499355	

**Note:**

- (1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.



### 3. Description of test modes

The Transmitter of EUT is a 802.11 b/g Wireless Network Adapter and powered by host equipment. This is Digital Transmission system(DTS) and have four type of modulation DBPSK DQPSK CCK&OFDM. The data rates are 54Mbps.

The equipment enables high-speed access without wires to network assets. This adapter uses the IEEE 802.11b/g protocol to enable wireless communications between the host computer and computers, in the same way that the computer would use an Ethernet adapter.

1. For lowest channel : 2412MHz(Channel 1)
2. For middle channel : 2437MHz(Channel 6)
3. For highest channel: 2462MHz(Channel 11)

#### **EUT operating conditions:**

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to typical use, The exercise sequence is listed as below:

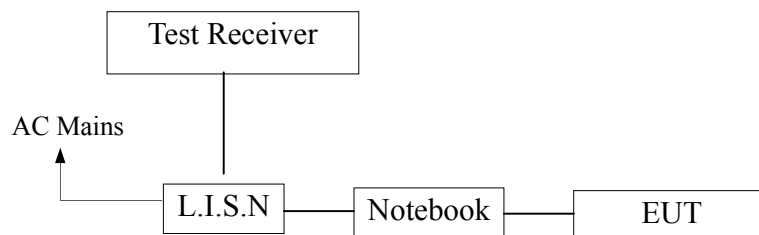
1. Setup the EUT and simulators as shown on 2.4.
2. Turn on the power of all equipments.
3. The EUT Ping with the wireless router.
4. Repeat the above steps.

## 4. Conducted Emissions Test

### 4.1 Measurement 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.

### 4.2 Test SET-UP (Block Diagram of Configuration)



### 4.3 Measurement Equipment Used:

Conducted Emission Test Site # 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2009	05/29/2010
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	05/29/2009	05/29/2010
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	05/29/2009	05/29/2010
50ΩCoaxial Switch	Anritsu	MP59B	M20531	005/29/2009	05/29/2010

### 4.4 Conducted Emission Limit

#### (7) Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

#### Note:

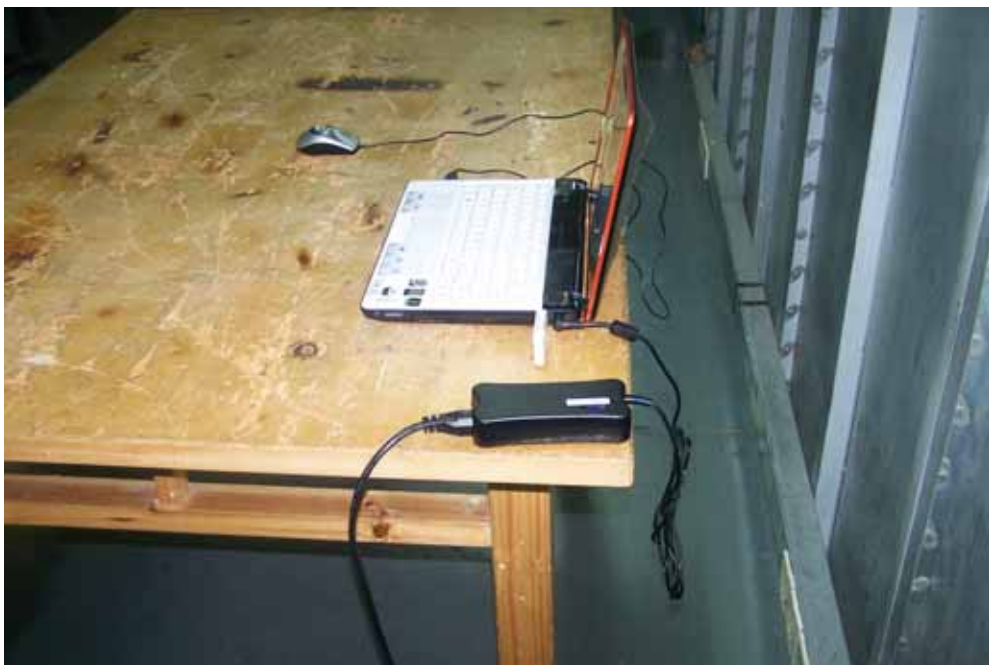
1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

#### 4.5 Measurement Result:

Date of Test:	July 01, 2009	Temperature:	22
Frequency Detector:	0.15~30MHz	Humidity:	50%
Test Result:	PASS	Test Mode:	WIFI Mode

Test Line	Frequency MHz	Emission Level QP dB(μV)	Emission Level AV dB(μV)	Limits QP dB(μV)	Limits AV dB(μV)	Margin QP dB(μV)	Margin AV dB(μV)
Neutral	0.185	45.52	44.35	64.26	54.26	-18.74	-9.91
	0.375	45.21	44.25	58.39	48.39	-13.18	-4.14
	0.625	45.04	43.10	56.00	46.00	-10.96	-2.90
	0.810	44.65	42.90	56.00	46.00	-11.35	-3.10
	2.810	42.53	40.28	56.00	46.00	-13.47	-5.72
	22.825	38.77	25.30	60.00	50.00	-21.23	-24.70
Line	0.185	45.38	44.56	64.26	54.26	-18.88	-9.70
	0.375	44.71	43.74	58.39	48.39	-13.68	-4.65
	0.560	45.17	42.83	56.00	46.00	-10.83	-3.17
	1.06	41.91	41.06	56.00	46.00	-14.09	-4.94
	3.120	38.37	36.84	56.00	46.00	-17.63	-9.16
	23.35	37.43	25.33	60.00	50.00	-22.57	-24.67

#### 4.6 Conducted Measurement Photos:



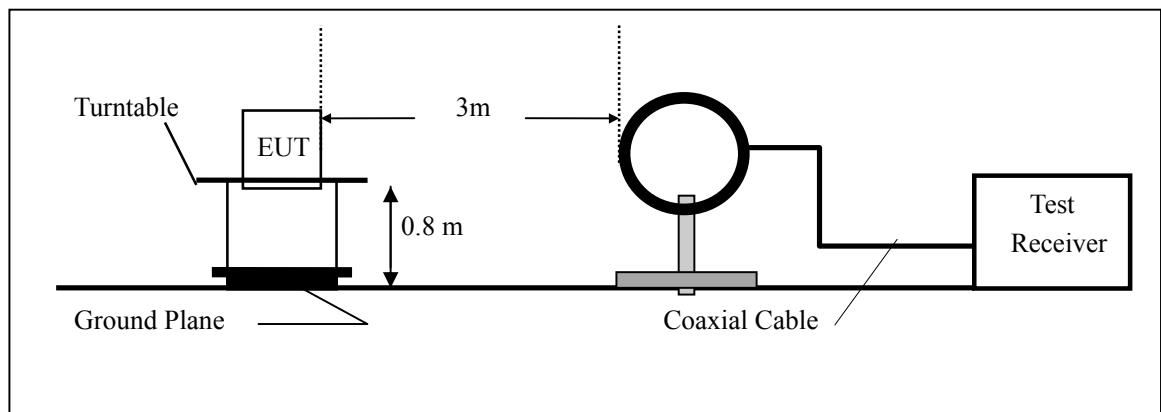
## 5. Radiated Emission Test

### 5.1 Measurement Procedure

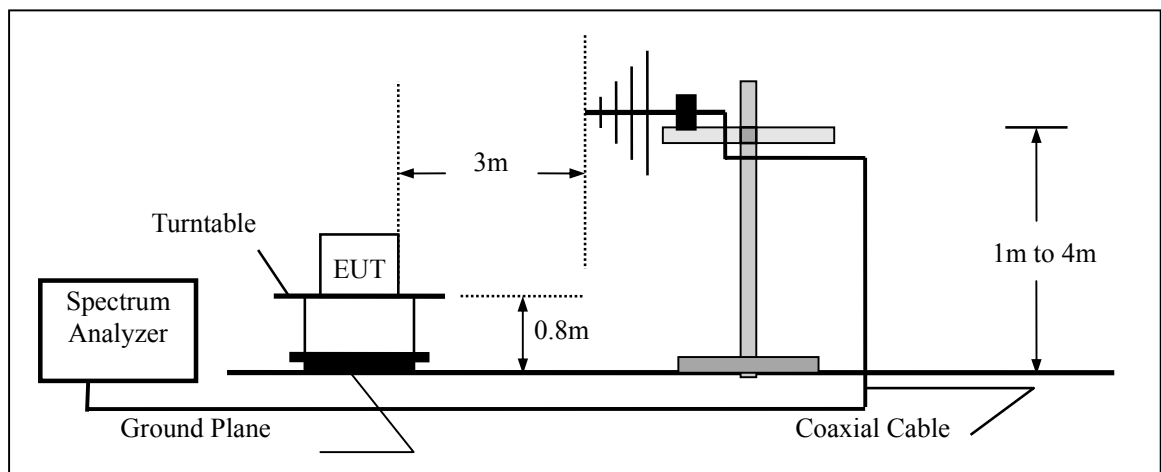
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### 5.2 Test SET-UP (Block Diagram of Configuration)

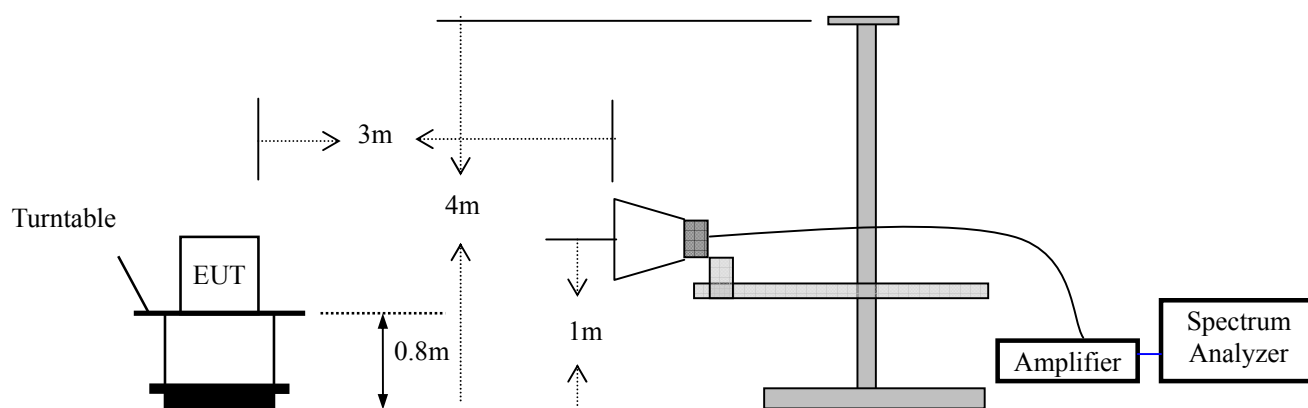
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



5.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	FSP7	839511/010	05/29/2009	05/29/2010
Spectrum Analyzer	HP	E4407B	839840481	05/29/2009	05/29/2010
EMI Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2009	05/29/2010
Pre-Amplifier	HP	8447D	2944A07999	05/29/2009	05/29/2010
Bilog Antenna	Schwarzbeck	VULB9163	142	05/29/2009	05/29/2010
Loop Antenna	ARA	PLA-1030/B	1029	05/29/2009	05/29/2010
Horn Antenna	Electro-Metrics	EM-6961	103314	05/29/2009	05/29/2010
Horn Antenna	Schwarzbeck	BBHA 9120	D143	05/29/2009	05/29/2010

5.4 Radiated emission limit

FCC Class B Limit at 3m

Frequency MHz	Distance Meter	Field Strength uV/m	Field Strength dBuV/m
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
Above 960	3	500	54.0

Note: The frequencies above 1000MHz, as measured using instrumentation with a peak detector function was corresponding to 20dB above maximum permitted average limit.

## 5.5 Measurement Result

Operation Mode: 802.11b TX Channel 1 Test Date : 07/12/2009  
Frequency Range: 30~1000MHz Temperature : 28  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
32.16	V	23.57	40.00	-16.43	PK
240.02	V	21.50	46.00	-24.5	PK
366.01	V	22.73	46.00	-23.27	PK
480.00	V	26.60	46.00	-19.4	PK
624.01	V	28.36	46.00	-17.64	PK
800.28	V	31.76	46.00	-14.24	PK
144.02	H	24.63	43.5	-18.87	PK
240.00	H	26.33	46.00	-19.67	PK
480.00	H	26.38	46.00	-19.62	PK
690.35	H	29.86	46.00	-16.14	PK
800.22	H	37.30	46.00	-8.7	PK
960.00	H	36.98	46.00	-9.02	PK

**Note:** (1) All Readings are Peak Value.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:	802.11b TX Channel 6	Test Date :	07/12/2009
Frequency Range:	30~1000MHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
240.00	V	23.00	46.00	-23	PK
480.00	V	26.50	46.00	-19.5	PK
624.00	V	25.05	46.00	-20.95	PK
677.90	V	26.35	46.00	-19.65	PK
813.50	V	27.06	46.00	-18.94	PK
960.00	V	33.01	46.00	-12.99	PK
144.00	H	23.53	43.50	-19.97	PK
240.00	H	26.83	46.00	-19.17	PK
480.00	H	28.37	46.00	-17.63	PK
720.35	H	27.31	46.00	-18.69	PK
816.80	H	35.24	46.00	-10.76	PK
960.01	H	40.41	53.90	-13.49	PK

**Note:**

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss
- (3) The average measurement was not performed when the peak measured data under the limit of average detection.



Operation Mode: 802.11b TX Channel 11 Test Date : 07/12/2009  
Frequency Range: 30~1000MHz Temperature : 28  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
240.00	V	23.22	46.00	-22.78	PK
365.14	V	21.94	46.00	-24.06	PK
432.01	V	25.86	46.00	-20.14	PK
480.00	V	25.98	46.00	-20.02	PK
624.00	V	28.09	46.00	-17.91	PK
959.95	V	32.91	46.00	-13.09	PK
144.02	H	22.93	43.50	-20.57	PK
240.01	H	26.81	46.00	-19.19	PK
480.00	H	28.67	46.00	-17.33	PK
624.03	H	28.43	46.00	-17.57	PK
809.55	H	29.98	46.00	-16.02	PK
960.00	H	38.03	46.00	-7.97	PK

**Note:** (1) All Readings are Peak Value and AV.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: 802.11g TX Channel 1 Test Date : 07/12/2009  
Frequency Range: 30~1000MHz Temperature : 28  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBUV)	Limit 3m (dBUV/m)	Margin (dB)	Note
53.30	V	33.63	40.00	-6.37	PK
144.06	V	25.74	43.50	-17.76	PK
487.58	V	31.98	46.00	-14.02	PK
623.97	V	30.45	46.00	-15.55	PK
720.00	V	30.14	46.00	-15.86	PK
960.01	V	30.27	53.90	-23.63	PK
144.02	H	18.44	43.50	-25.06	PK
478.50	H	25.30	46.00	-20.7	PK
620.47	H	25.96	46.00	-20.04	PK
666.25	H	27.96	46.00	-18.04	PK
956.50	H	27.80	46.00	-18.2	PK
959.98	H	35.18	46.00	-10.82	PK

**Note:** (1) All Readings are Peak Value.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:	802.11g TX Channel 6	Test Date :	07/12/2009
Frequency Range:	30~1000MHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
432.04	V	26.95	46.00	-19.05	PK
480.03	V	32.96	46.00	-13.04	PK
489.00	V	30.00	46.00	-16	PK
756.08	V	30.08	46.00	-15.92	PK
808.573	V	33.37	46.00	-12.63	PK
959.76	V	32.89	46.00	-13.11	PK
240.02	H	19.25	46.00	-26.75	PK
479.97	H	29.44	46.00	-16.56	PK
666.38	H	29.95	46.00	-16.05	PK
806.50	H	32.87	46.00	-13.13	PK
816.06	H	31.90	46.00	-14.1	PK
959.98	H	35.37	46.00	-10.63	PK

**Note:**

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss
- (3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: 802.11g TX Channel 11 Test Date : 07/12/2009  
Frequency Range: 30~1000MHz Temperature : 28  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
431.98	V	24.77	46.00	-21.23	PK
480.45	V	28.57	46.00	-17.43	PK
499.43	V	29.26	46.00	-16.74	PK
712.80	V	29.98	46.00	-16.02	PK
814.37	V	30.78	46.00	-15.22	PK
960.13	V	32.70	53.90	-21.2	PK
143.99	H	24.58	43.50	-18.92	PK
239.98	H	24.49	46.00	-21.51	PK
480.03	H	27.55	46.00	-18.45	PK
663.53	H	29.53	46.00	-16.47	PK
816.00	H	30.04	46.00	-15.96	PK
959.96	H	36.34	46.00	-9.66	PK

**Note:** (1) All Readings are Peak Value and AV.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:	802.11b TX Channel 1	Test Date :	07/12/2009
Frequency Range:	Above 1GHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4824.15	V	53.29	38.64	74	54	-20.71	-15.36
7236.25	V	55.38	45.47	74	54	-18.62	-8.53
9648.42	V	51.06	40.51	74	54	-22.94	-13.49
12060.44	V	49.63	39.55	74	54	-24.37	-14.45
1447236	V	--	--	74	54	--	--
16884.35	V	--	--	74	54	--	--
4824.34	H	55.39	40.23	74	54	-18.61	-13.77
7236.37	H	53.96	43.61	74	54	-20.04	-10.39
9647.67	H	50.63	41.22	74	54	-23.37	-12.78
12060.24	H	46.68	38.44	74	54	-27.32	-15.56
14472.60	H	--	--	74	54	--	--
16884.46	H	--	--	74	54	--	--

**All emissions not reported were more than 20dB below the specified limit or in the noise floor.**

**Note:**

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss
- (3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:	802.11b Channel 6	Test Date :	07/12/2009
Frequency Range:	Above 1GHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4870.50	V	50.66	38.63	74	54	-23.34	-15.37
7313.60	V	55.35	43.50	74	54	-18.65	-10.5
9749.90	V	53.65	42.53	74	54	-20.35	-11.47
12185.50	V	51.35	39.37	74	54	-22.65	-14.63
14621.70	V	--	--	74	54	--	--
17073.70	V	--	--	74	54	--	--
4873.30	H	52.34	39.34	74	54	-21.66	-14.66
7314.50	H	57.63	45.63	74	54	-16.37	-8.37
9745.10	H	53.62	42.36	74	54	-20.38	-11.64
12197.30	H	52.34	40.45	74	54	-21.66	-13.55
14621.70	H	--	--	74	54	--	--
17073.40	H	--	--	74	54	--	--

**All emissions not reported were more than 20dB below the specified limit or in the noise floor.**

**Note:** (1) All Readings are Peak Value and AV.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:	802.11b (Channel 11)	Test Date :	07/12/2009
Frequency Range:	Above 1GHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4923.07	V	50.27	41.85	74	54	-23.73	-12.15
7396.20	V	54.74	43.22	74	54	-19.26	-10.78
9854.10	V	52.38	40.26	74	54	-21.62	-13.74
12333.30	V	50.09	41.81	74	54	-23.91	-12.19
14785.20	V	--	--	74	54	--	--
17264.40	V	--	--	74	54	--	--
4923.70	H	54.24	43.88	74	54	-19.76	-10.12
7396.10	H	56.55	46.96	74	54	-17.45	-7.04
9854.10	H	53.77	43.92	74	54	-20.23	-10.08
12307.60	H	51.83	42.27	74	54	-22.17	-11.73
14785.20	H	--	--	74	54	--	--
17264.40	H	--	--	74	54	--	--

**All emissions not reported were more than 20dB below the specified limit or in the noise floor.**

**Note:** (1) All Readings are Peak Value and AV.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:	802.11g TX Channel 1	Test Date :	07/12/2009
Frequency Range:	Above 1GHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4817.40	V	50.39	39.22	74	54	-23.61	-14.78
7238.70	V	55.58	46.04	74	54	-18.42	-7.96
9608.90	V	53.79	42.37	74	54	-20.21	-11.63
12060.80	V	50.04	38.76	74	54	-23.96	-15.24
14485.50	V	--	--	74	54	--	--
16883.00	V	--	--	74	54	--	--
4814.10	H	51.38	40.08	74	54	-22.62	-13.92
7238.70	H	57.07	47.20	74	54	-16.93	-6.8
9648.50	H	51.87	41.16	74	54	-22.13	-12.84
12060.80	H	49.05	39.33	74	54	-24.95	-14.67
14485.50	H	--	--	74	54	--	--
16883.00	H	--	--	74	54	--	--

**All emissions not reported were more than 20dB below the specified limit or in the noise floor.**

**Note:** (1) All Readings are Peak Value and AV.  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss  
 (3) The average measurement was not performed when the peak measured data under the limit of average detection.



Operation Mode:	802.11g(Channel 6)	Test Date :	07/12/2009
Frequency Range:	Above 1GHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4868.50	V	51.73	42.86	74	54	-22.27	-11.14
7311.90	V	57.83	46.08	74	54	-16.17	-7.92
9745.10	V	52.94	41.58	74	54	-21.06	-12.42
12197.10	V	50.33	40.83	74	54	-23.67	-13.17
14621.70	V	--	--	74	54	--	--
17046.40	V	--	--	74	54	--	--
4868.50	H	52.07	41.26	74	54	-21.93	-12.74
7320.50	H	58.86	46.29	74	54	-15.14	-7.71
9745.10	H	53.37	42.31	74	54	-20.63	-11.69
12197.30	H	51.09	39.35	74	54	-22.91	-14.65
14649.00	H	--	--	74	54	--	--
17073.70	H	--	--	74	54	--	--

**All emissions not reported were more than 20dB below the specified limit or in the noise floor.**

**Note:** (1) All Readings are Peak Value and AV.  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss  
 (3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:	802.11g(Channel 11)	Test Date :	07/12/2009
Frequency Range:	Above 1GHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4923.00	V	52.82	41.58	74	54	-21.18	-12.42
7375.02	V	56.76	47.53	74	54	-17.24	-6.47
9854.10	V	51.04	41.68	74	54	-22.96	-12.32
12306.00	V	50.73	39.01	74	54	-23.27	-14.99
14785.20	V	--	--	74	54	--	--
17264.40	V	--	--	74	54	--	--
4923.07	H	53.77	42.34	74	54	-20.23	-11.66
7375.00	H	57.51	46.35	74	54	-16.49	-7.65
9854.10	H	52.07	41.38	74	54	-21.93	-12.62
12306.00	H	51.28	40.82	74	54	-22.72	-13.18
14785.20	H	--	--	74	54	--	--
17237.10	H	--	--	74	54	--	--

**No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.247.**

**Note:** (1) All Readings are Peak Value and AV.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

## 5.6 Radiated Measurement Photos:

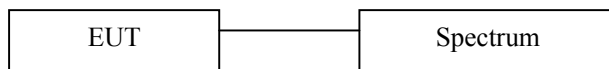


## 6. Occupied Bandwidth test

### 6.1 Measurement Procedure

The EUT was operating in IEEE 802.11b/g mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

### 6.2 Test SET-UP (Block Diagram of Configuration)



### 6.3 Measurement Equipment Used:

Same as 4.3 Radiated Emission Measurement.

### 6.4 Limit

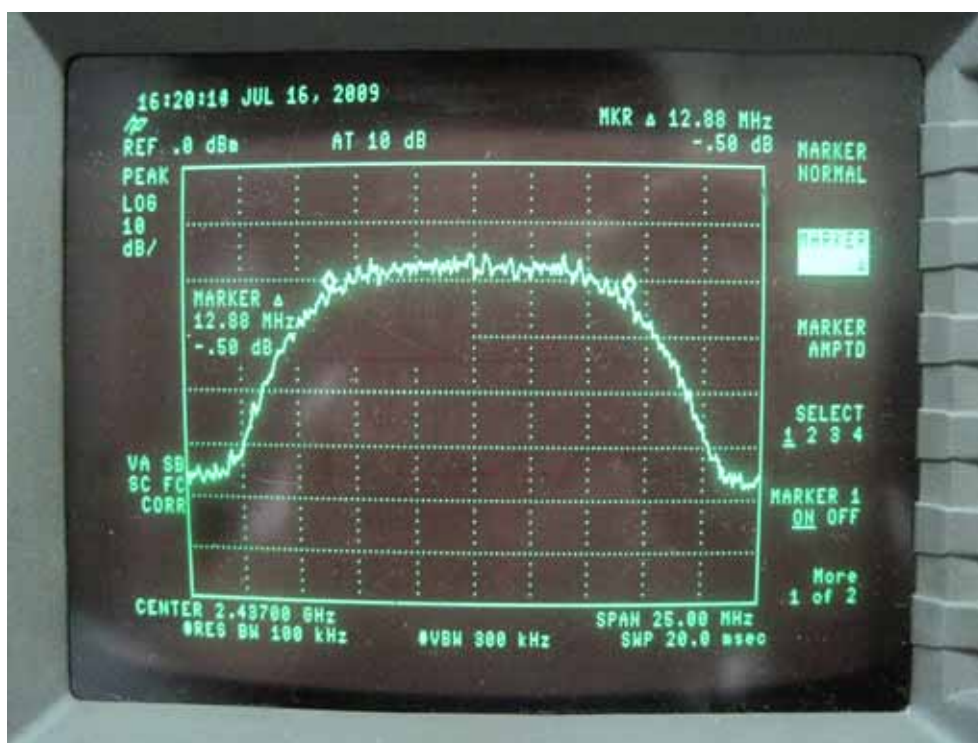
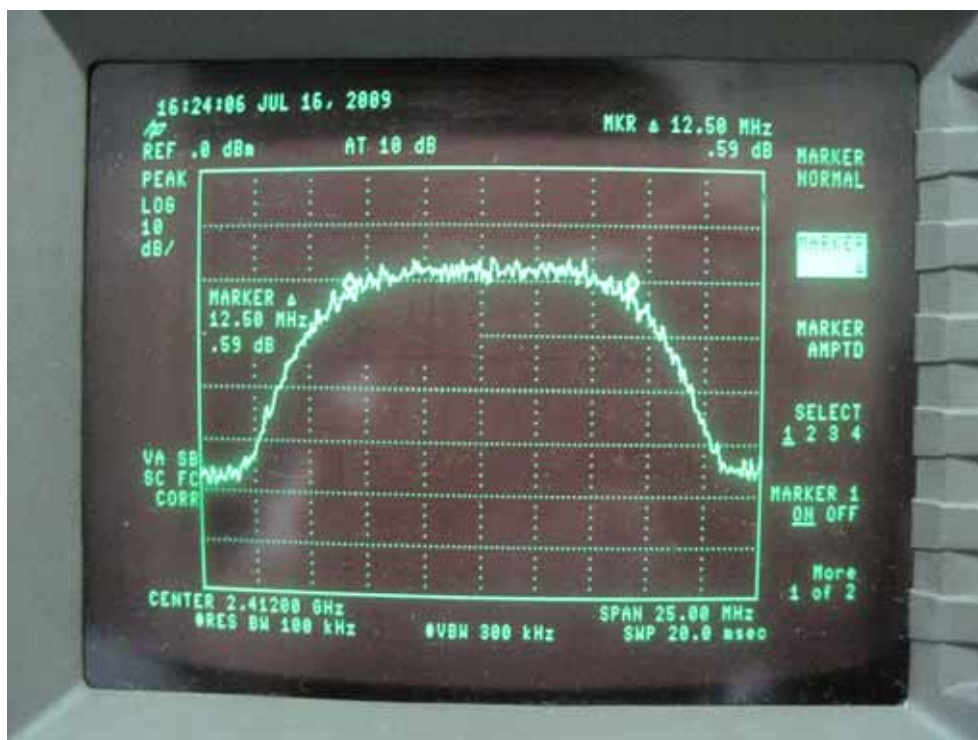
The minimum 6dB bandwidth shall be at least 500kHz.

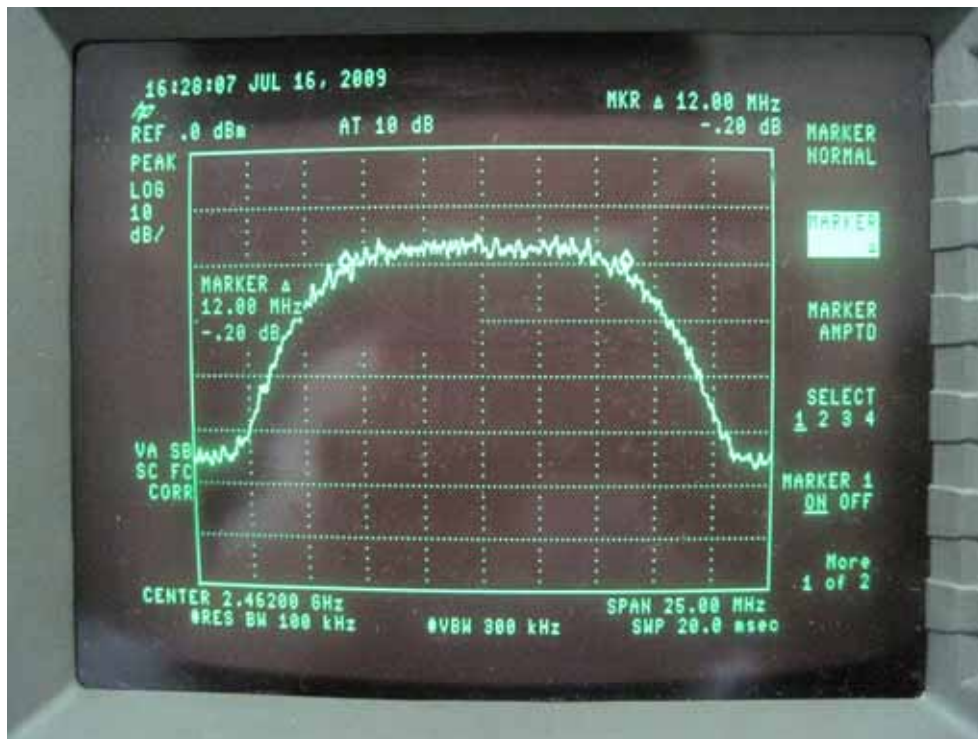
### 6.5 Measurement Results:

Refer to attached data chart.

Spectrum Detector:	PK	Test Date :	07/16/2009
Test By:	Andy	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Operation Mode:	802.11b		

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Required Limit (KHz)
1	2412	12.50	>500
6	2437	12.88	>500
11	2462	12.00	>500



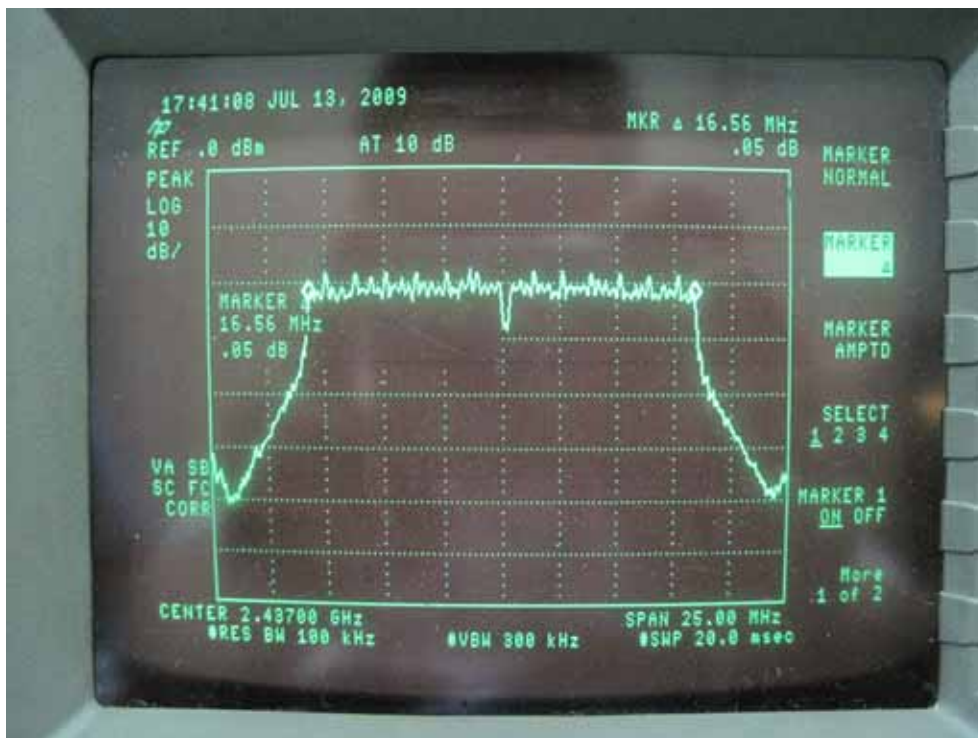
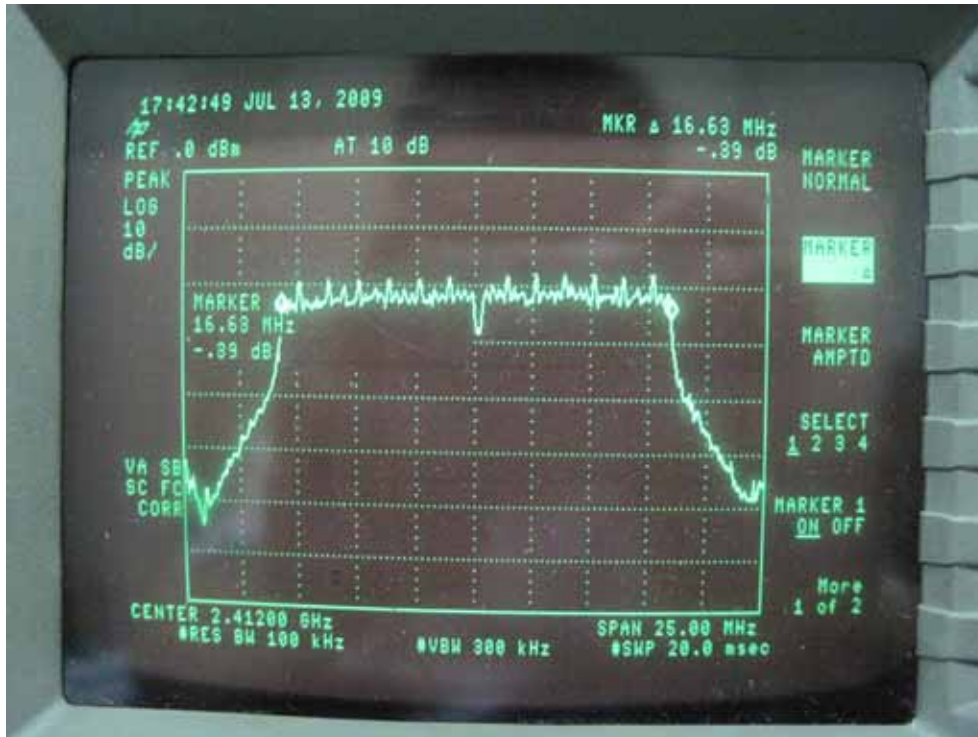


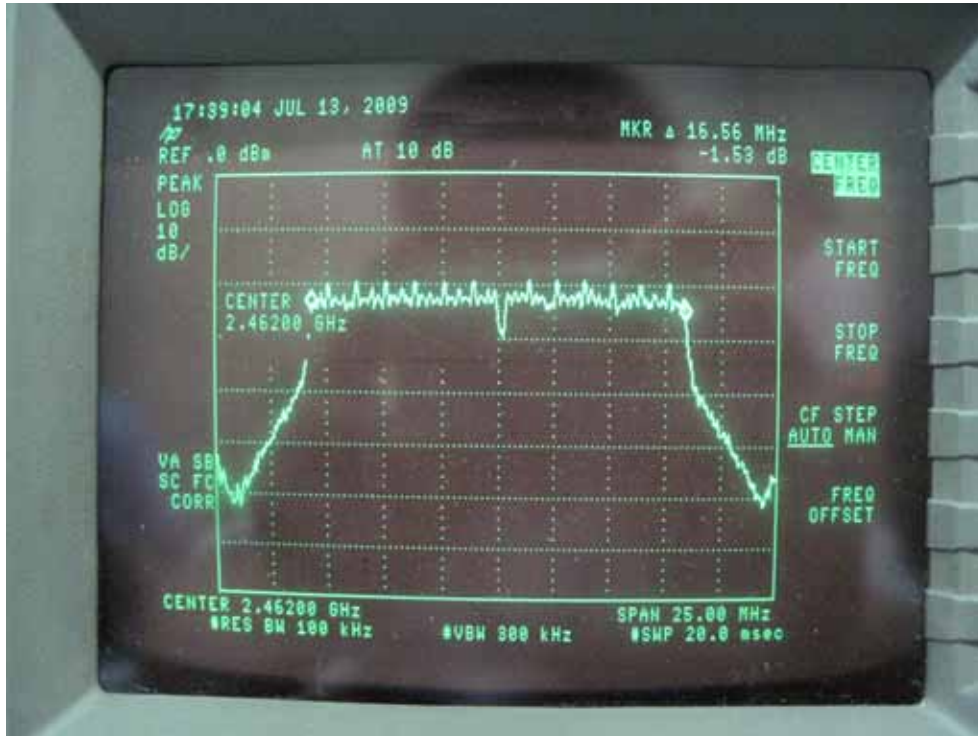
Spectrum Detector: PK  
 Test By: Andy  
 Test Result: PASS  
 Operation Mode: 802.11 g

Test Date : 07/13/2009  
 Temperature : 28  
 Humidity : 65 %

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Required Limit (KHz)
1	2412	16.63	>500
6	2437	16.56	>500
11	2462	16.56	>500







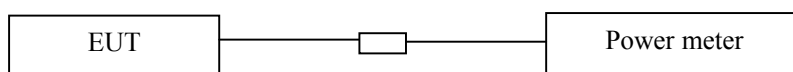


## 7. MAXIMUM PEAK OUTPUT POWER TEST

### 7.1 Measurement Procedure

- The Transmitter output (antenna port) was connected to the power meter.
- Turn on the EUT and power meter and then record the peak power value.
- Repeat above procedures on all channels needed to be tested.

### 7.2 Test SET-UP (Block Diagram of Configuration)



### 7.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power meter	Boonton	4232A	29001	05/29/2009	05/29/2010
Power sensor	Boonton	51011-EMC	31184	05/29/2009	05/29/2010

### 7.4 Peak Power output limit

The maximum peak power shall be less 1Watt.

### 7.5 Measurement Results:

Spectrum Detector: PK                      Test Date : 07/13/2009  
Test By: Andy                      Temperature : 28  
Test Result: PASS                      Humidity : 65 %  
Operation Mode: 802.11b

Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412.00	10.98	1W(30dBm)	PASS
6	2437.00	11.16	1W(30dBm)	PASS
11	2462.00	11.25	1W(30dBm)	PASS

Spectrum Detector: PK Test Date : 07/13/2009  
Test By: Andy Temperature : 28  
Test Result: PASS Humidity : 65 %  
Operation Mode: 802.11g

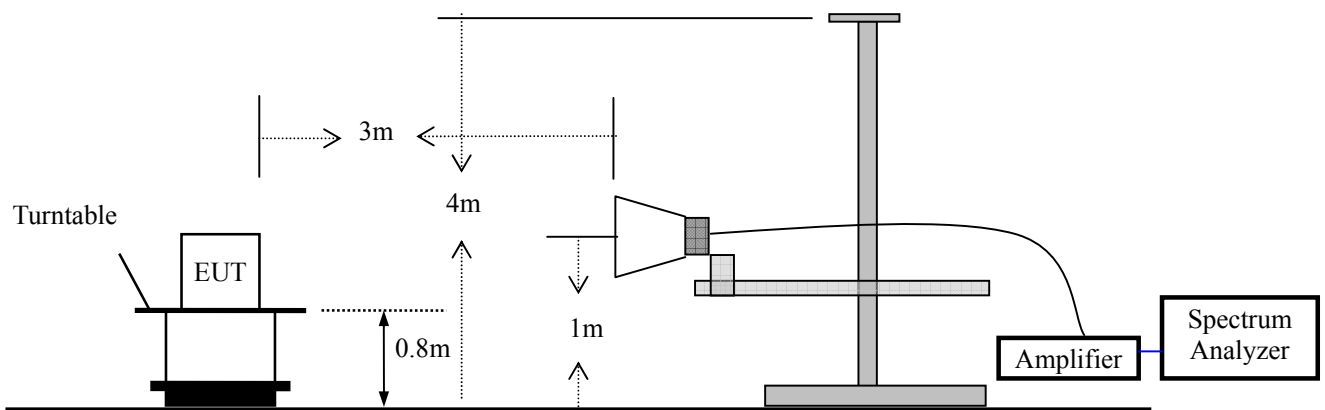
Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412.00	10.80	1W(30dBm)	PASS
6	2437.00	11.05	1W(30dBm)	PASS
11	2462.00	11.24	1W(30dBm)	PASS

## 8. Band EDGE test

### 8.1 Measurement Procedure

1. The EUT was Operating in hopping mode or could be controlled its channel. Printed out test result from the spectrum by hard copy function.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measured were complete.

### 8.2 Test SET-UP (Block Diagram of Configuration)



**8.3 Measurement Equipment Used:**

Same as 4.3 Radiated Emission Measurement.

**8.4 Measurement Results:**

Refer to attached data chart.

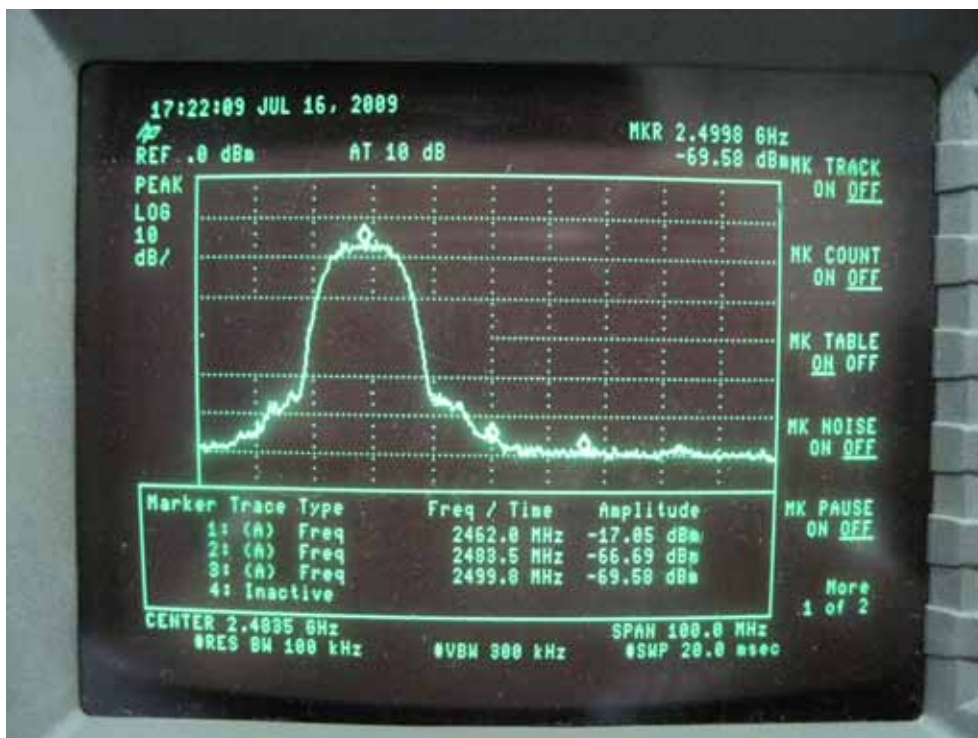
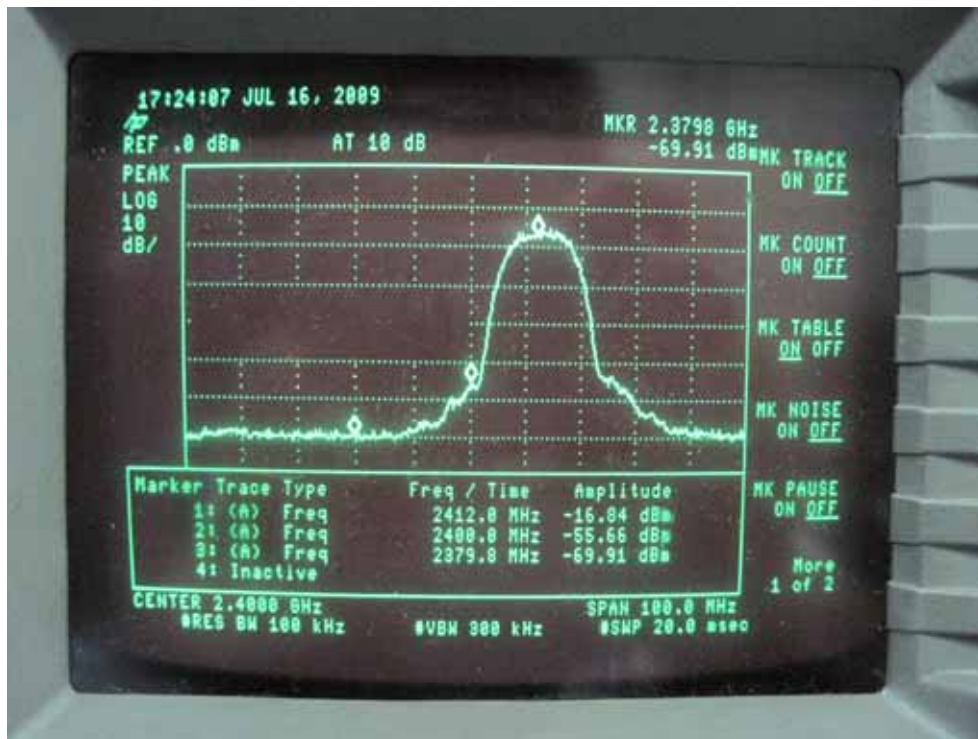
Spectrum Detector:	PK	Test Date :	07/16/2009
Test By:	Andy	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Operation Mode: 802.11b			

## 1. Conducted Test

Frequency (MHz)	Peak Power Output(dBm)	Emission read Value(dBm)	Result of Band edge(dBc)	Band edge Limit(dBc)
<2400	-16.84	-55.66	38.82	>20dBc
>2483.5	-17.05	-66.69	49.64	>20dBc

## 2. Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Emission (dBuV/m)		Band edge Limit (dBuV/m)	
		PK	AV	PK	AV
<2400	V	47.00	35.52	74.00	54.00
>2483.5	V	45.32	32.67	74.00	54.00



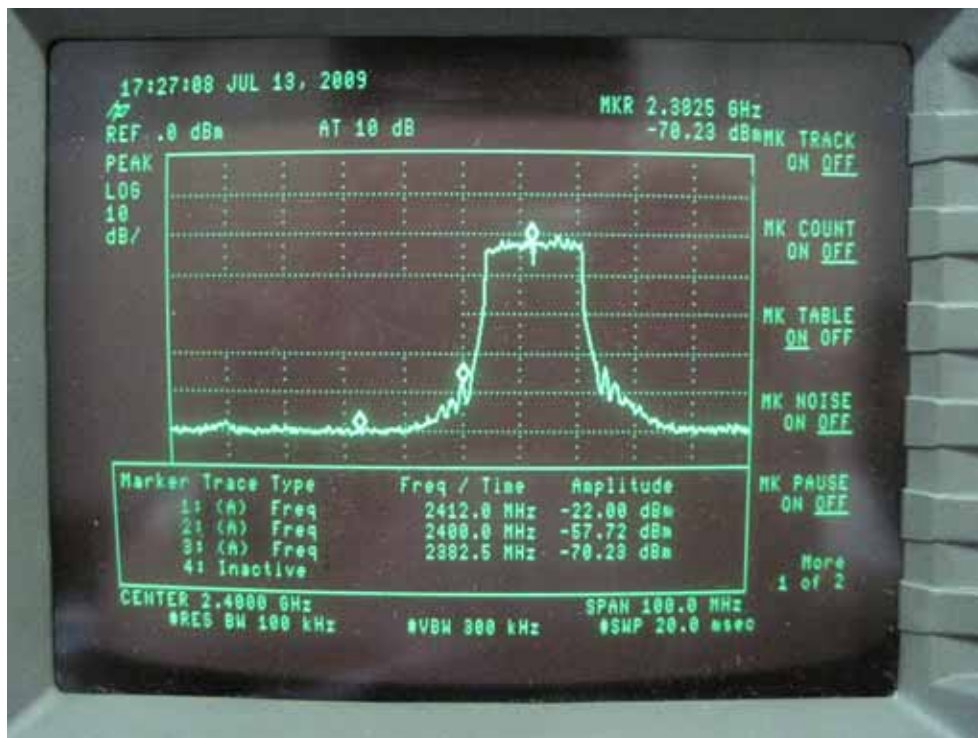
Spectrum Detector: PK                      Test Date : 07/13/2009  
 Test By: Andy                      Temperature : 28  
 Test Result: PASS                      Humidity : 65 %  
 Operation Mode: 802.11g

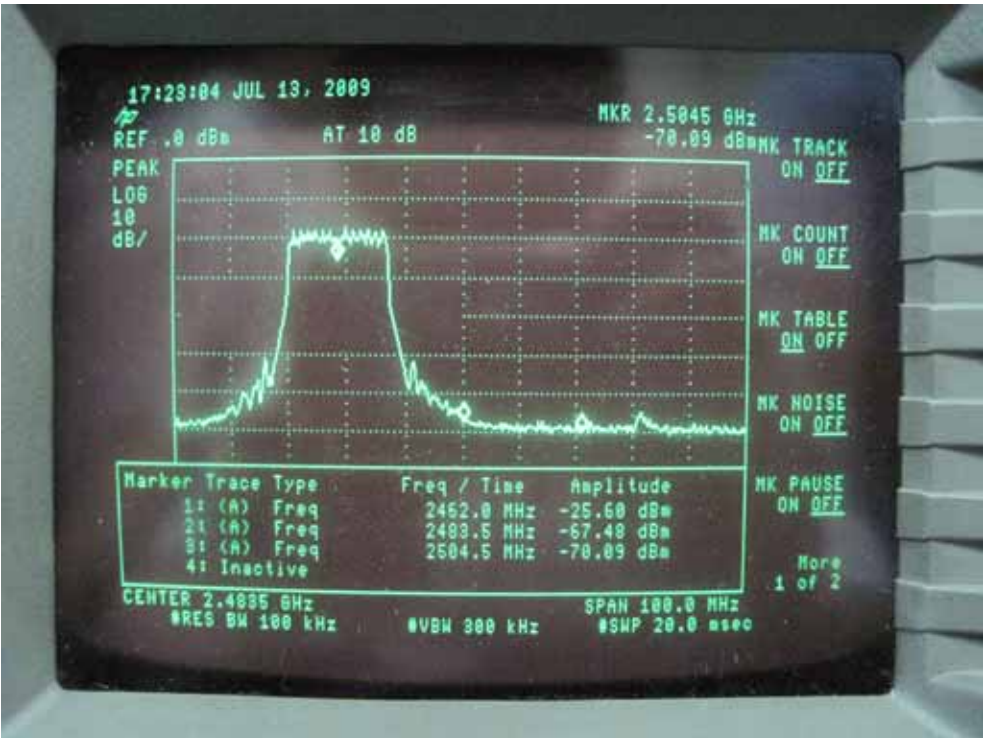
## 1. Conducted Test

Frequency (MHz)	Peak Power Output(dBm)	Emission read Value(dBm)	Result of Band edge(dBc)	Band edge Limit(dBc)
<2400	-22.00	-57.72	35.72	>20dBc
>2483.5	-25.60	-67.48	41.88	>20dBc

## 2. Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Emission (dBuV/m)		Band edge Limit (dBuV/m)	
		PK	AV	PK	AV
<2400	V	46.28	37.55	74.00	54.00
>2483.5	V	43.69	33.57	74.00	54.00





## 9. Power density

### 9.1 Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	HP	8594E	88156318	05/29/2009	05/29/2010

### 9.2 Measuring Instruments and setting

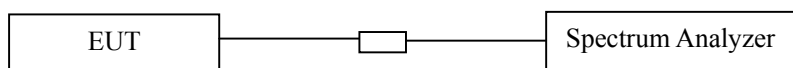
The following table is the setting of spectrum analyzer.

Spectrum analyzer	Setting
Attenuation	Auto
Span Frequency	300kHz
RB	3kHz
VB	30kHz
Detector	Peak
Trace	Max hold
Sweep Time	100s

### 9.3 Test Procedures

- The transmitter output (antenna port) was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz, Set Detector to Peak, Trace to Max Hold.
- Mark the frequency with maximum peak power as the center of the display of the spectrum.
- Set the span to 300kHz and the sweep time to 100s and record the maximum peak value.

### 9.4 Block Diagram of Test setup



### 9.5 Limit

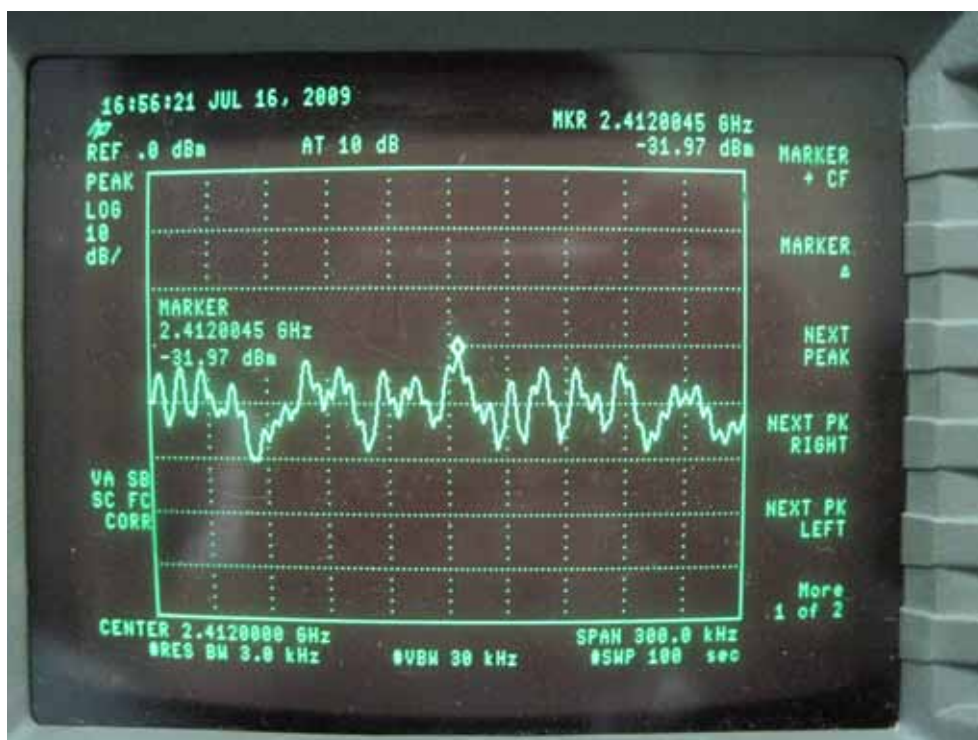
The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3KHz bandwidth.

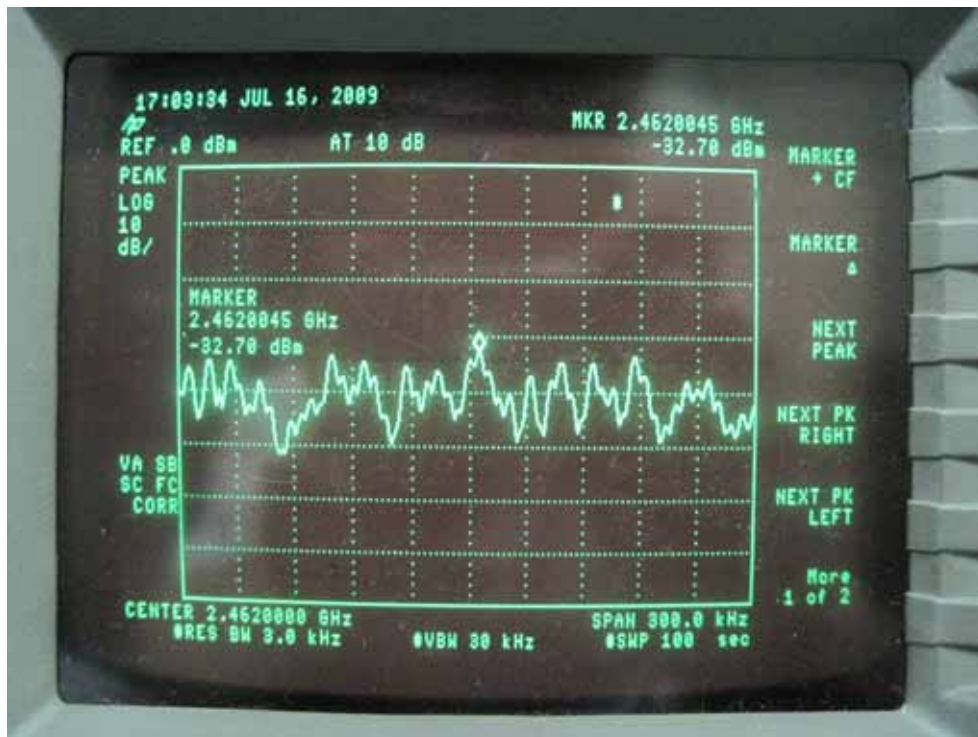
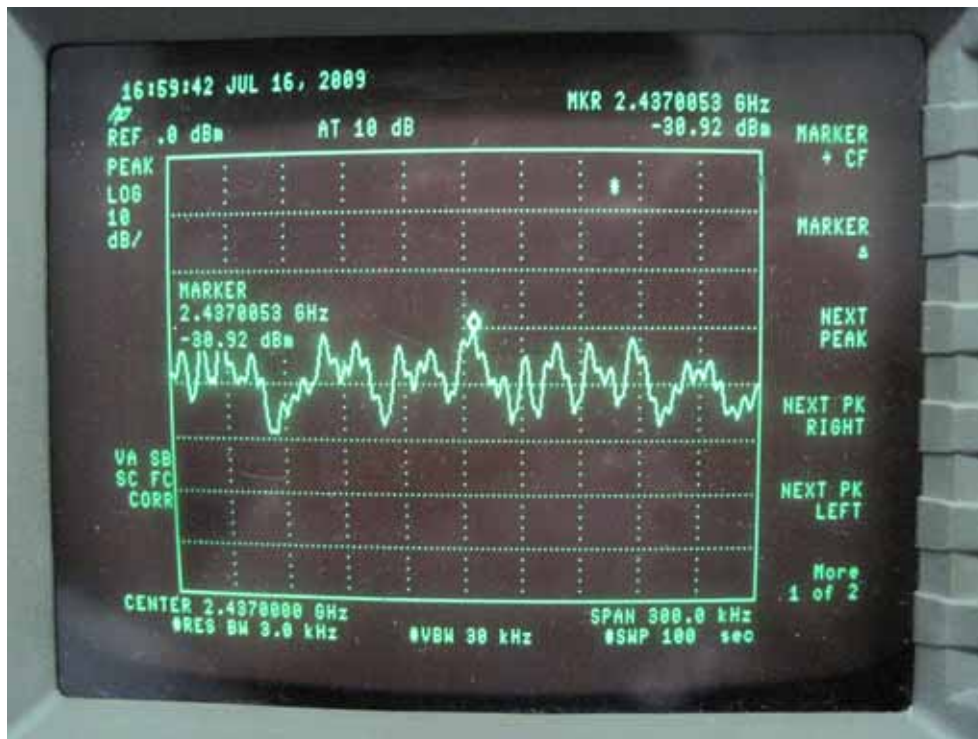


## 9.6. Test Result

Spectrum Detector:	PK	Test Date :	07/16/2009
Test By:	Andy	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Operation	Mode: 802.11 b		

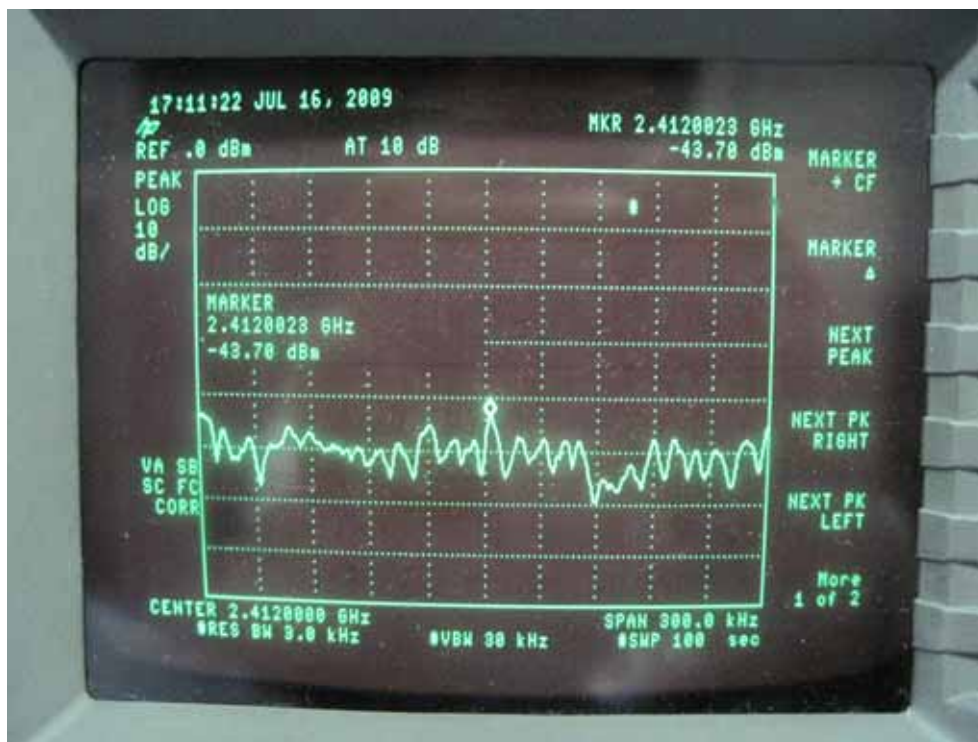
Frequency (MHz)	Measurement Level (dBm)	Required limit (dBm)	Result
2412.00	-31.97	<8dBm	PASS
2437.00	-30.92	<8dBm	PASS
2462.00	-32.78	<8dBm	PASS



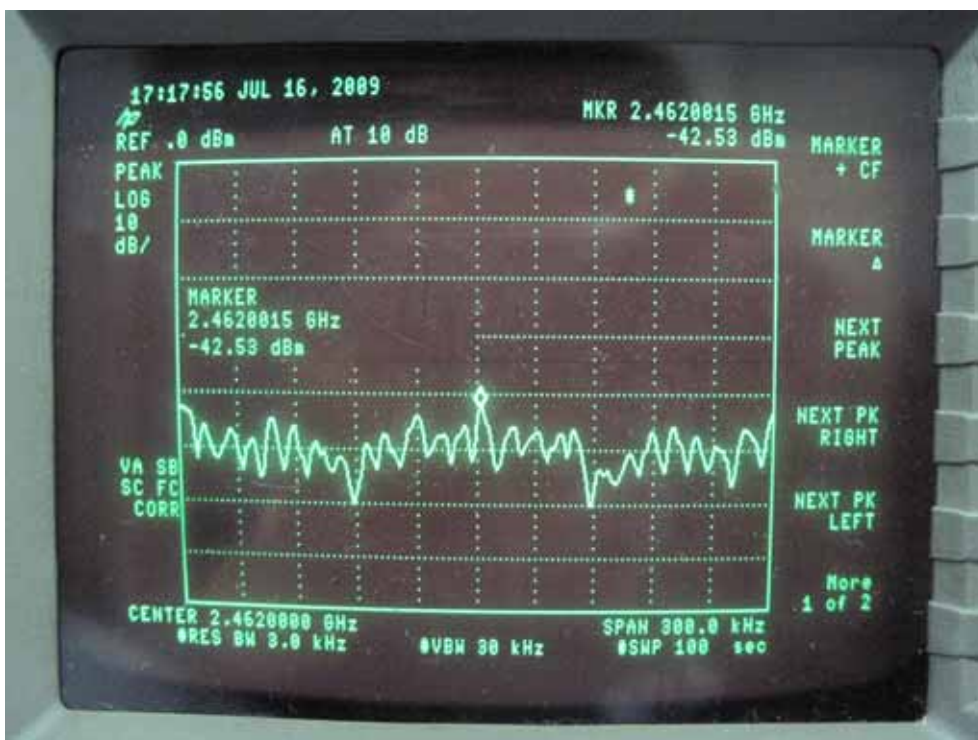
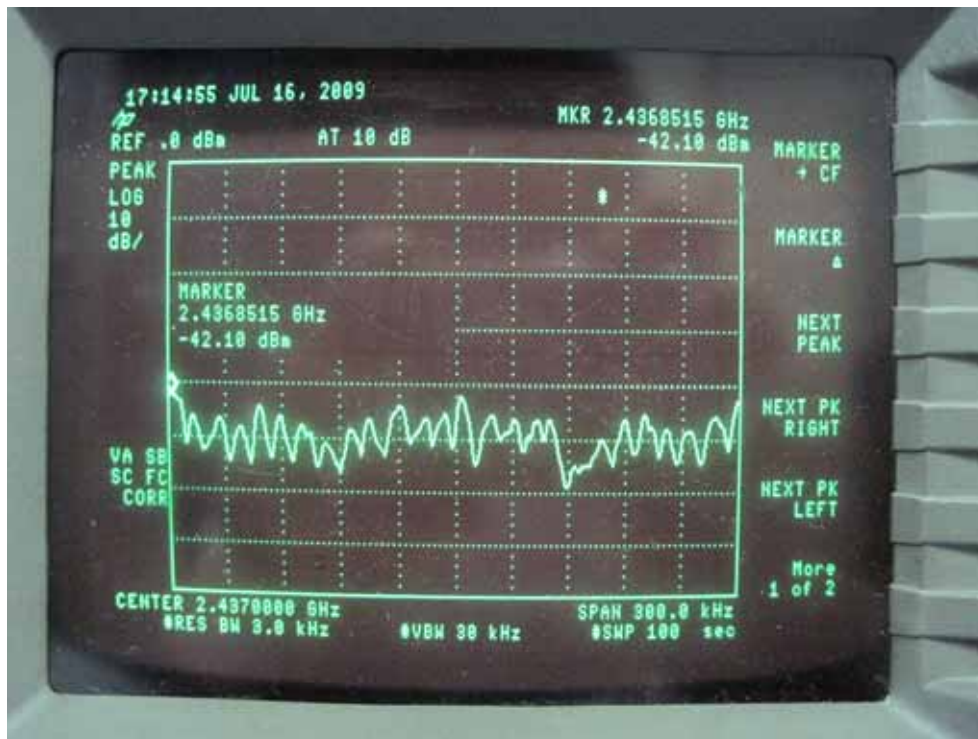


Spectrum Detector: PK                      Test Date : 07/16/2009  
 Test By: Andy                              Temperature : 28  
 Test Result: PASS                          Humidity : 65 %  
 Operation Mode: 802.11 g

Frequency (MHz)	Measurement Level (dBm)	Required limit (dBm)	Result
2412.00	-40.70	<8dBm	PASS
2437.00	-42.10	<8dBm	PASS
2462.00	-42.53	<8dBm	PASS







## **10. Antenna Application**

### **10.1 Antenna requirement**

The EUT'S antenna is met the requirement of FCC part 15C section 15.203.

### **10.2 Result**

The EUT'S antenna is PCB trace antenna. The antenna's gain is 2dBi and meets the requirement.