

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

*OF*

**SP-5050**

**Model Name: Siragon SP-5050**

**FCC ID: 2AC6BSP-5050**

**Trademark: N/A**

**REPORT NO.: ES140807080E3**

**ISSUE DATE: September 19, 2014**

*Prepared for*

**Siragon Corporation.**

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*Prepared by*

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## VERIFICATION OF COMPLIANCE

Applicant:	Siragon Corporation. 8501 NW 17th Street Suite 128 Miami, Florida 33126.
Manufacturer:	Shenzhen Konka Telecommunications technology Co., Ltd. 9008, Shennan Avenue, Overseas Chinese Town, Shenzhen, China.
Product Description:	SP-5050
Model Number:	Siragon SP-5050
File Number:	ES140807080E3
Date of Test:	August 08, 2014 to September 19, 2014


### 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 (2009) 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.

Date of Test : August 08, 2014 to September 19, 2014

Prepared by :



Jack.Li/Editor

Reviewer :



Joe Xia/Supervisor

Approve & Authorized Signer :



Lisa Wang/Manager

## Table of Contents

<b>1. GENERAL INFORMATION .....</b>	<b>5</b>
1.1 PRODUCT DESCRIPTION .....	5
1.2 RELATED SUBMITTAL(S) / GRANT(S) .....	6
1.3 TEST METHODOLOGY .....	7
1.4 SPECIAL ACCESSORIES .....	7
1.5 EQUIPMENT MODIFICATIONS.....	7
1.6 TEST FACILITY.....	7
<b>2. SYSTEM TEST CONFIGURATION.....</b>	<b>8</b>
2.1 EUT CONFIGURATION.....	8
2.2 EUT EXERCISE .....	8
2.3 TEST PROCEDURE .....	8
2.4 CONFIGURATION OF TESTED SYSTEM.....	8
<b>3. DESCRIPTION OF TEST MODES.....</b>	<b>10</b>
<b>4. SUMMARY OF TEST RESULTS .....</b>	<b>11</b>
<b>5. CONDUCTED EMISSIONS TEST .....</b>	<b>12</b>
5.1 MEASUREMENT PROCEDURE .....	12
5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	12
5.3 MEASUREMENT EQUIPMENT USED.....	12
5.4 CONDUCTED EMISSION LIMIT .....	12
5.5 MEASUREMENT RESULT .....	13
<b>6. RADIATED EMISSION TEST.....</b>	<b>15</b>
6.1 MEASUREMENT PROCEDURE .....	15
6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	16
6.3 MEASUREMENT EQUIPMENT USED.....	17
6.4 RADIATED EMISSION LIMIT.....	17
6.5 MEASUREMENT RESULT .....	19
<b>7. 6DB BANDWIDTH TEST .....</b>	<b>28</b>
7.1 MEASUREMENT PROCEDURE .....	28
7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	28
7.3 MEASUREMENT EQUIPMENT USED.....	28
7.4 MEASUREMENT RESULTS .....	28
<b>8. MAXIMUM PEAK OUTPUT POWER TEST .....</b>	<b>37</b>
8.1 MEASUREMENT PROCEDURE .....	37
8.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	37
8.3 MEASUREMENT EQUIPMENT USED.....	37
8.4 PEAK POWER OUTPUT LIMIT .....	37
8.5 MEASUREMENT RESULTS .....	37
<b>9. BAND EDGE TEST .....</b>	<b>39</b>
9.1 MEASUREMENT PROCEDURE .....	39
9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	39
9.3 MEASUREMENT EQUIPMENT USED.....	39
9.4 MEASUREMENT RESULTS .....	39
<b>10. POWER DENSITY .....</b>	<b>42</b>
10.1 TEST EQUIPMENT.....	42
10.2 MEASURING INSTRUMENTS AND SETTING.....	42
10.3 TEST PROCEDURES .....	42
10.4 BLOCK DIAGRAM OF TEST SETUP .....	42

10.5	LIMIT .....	42
10.6	TEST RESULT .....	43
<b>11.</b>	<b>ANTENNA PORT EMISSION.....</b>	<b>51</b>
11.1	TEST EQUIPMENT.....	51
11.2	MEASURING INSTRUMENTS AND SETTING.....	51
11.3	TEST PROCEDURES .....	51
11.4	BLOCK DIAGRAM OF TEST SETUP .....	51
11.5	TEST RESULT .....	51
<b>12.</b>	<b>ANTENNA APPLICATION.....</b>	<b>55</b>
12.1	ANTENNA REQUIREMENT .....	55
12.2	RESULT.....	55

## 1. General Information

### 1.1 Product Description

<b>Device Type:</b>	Mobile Device
<b>Exposure Category:</b>	Uncontrolled Environment/General Population
<b>Product Name:</b>	SP-5050
<b>Model Number:</b>	Siragon SP-5050
<b>Power supply:</b>	3.7V internal rechargeable lithium battery or DC 5V from AC adapter
<b>Adapter:</b>	Model: A31-501000 Input: 100-240V~, 50/60Hz, 0.2A Output: DC 5.0V, 1000mA
<b>IMEI1:</b>	351372098150251
<b>IMEI2:</b>	351372098150269
<b>Hardware Version:</b>	1405411548
<b>Software Version:</b>	Android 4.4.2
<b>Operating Mode(s) &amp; Operating Frequency Range(s):</b>	802.11b/g/n HT20: 2412-2462MHz 802.11n HT40: 2422-2452MHz;
<b>Modulation:</b>	OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n HT20/n HT40, DSSS with DBPSK/DQPSK/CCK for 802.11b
<b>Number of Channels:</b>	802.11b/g/n HT20: 11Channels; 802.11n HT40: 7Channels;
<b>Type of Antenna:</b>	Ceramic Chip Antenna
<b>Antenna Gain:</b>	1dBi for Wifi;
<b>RF Output Power:</b>	Wifi: 14.25dBm MAX;

Note:

1. This device is included Bluetooth, 802.11b, 802.11g and 802.11n 2.4GHz and 2G, 3G transceiver function.
2. Test of channel was included the lowest middle and highest frequency in lowest 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: 2AC6BSP-5050 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system is compliance with Subpart B is authorized under a DOC procedure.

### 1.3 Test Methodology

All the test program has follow FCC new test procedure KDB558074 D02, Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2009). 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, 2013.10.29  
The certificate is valid until 2016.10.28  
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 2010.5.25  
The Laboratory has been assessed according to the requirements ISO/IEC 17025

Accredited by FCC, October 28, 2010  
The Certificate Registration Number is 406365.

Accredited by Industry Canada, March 05, 2010  
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

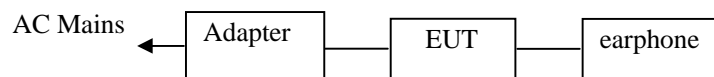
The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2009 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

#### 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 C63.4-2009.

### 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.	SP-5050	N/A	Siragon SP-5050	2AC6BSP-5050	N/A	EUT
3.	Adapter	N/A	A31-501000	N/A	N/A	

**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 an Mobile Phone and powered by host equipment; This EUT is a composite System, were conducted to determine the final configuration from all possible combinations. This Report Records Wifi DTS function test data.

These is Digital Transmission system (DTS) and have modulation OFDM, DSSS, DBPSK, DQPSK, CCK, 16QAM, 64QAM. According exploratory test, EUT will have maximum output power in those data rate (802.11b: 5.5 Mbps; 802.11g: 6 Mbps; 802.11n : MCS0), so those data rate were used for all test.

For 802.11b/g/n HT20:

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

For 802.11n HT40:

1. For lowest channel : 2422MHz (Channel 3)
2. For middle channel : 2437MHz (Channel 6)
3. For highest channel: 2452MHz (Channel 9)

#### 4. Summary of Test Results

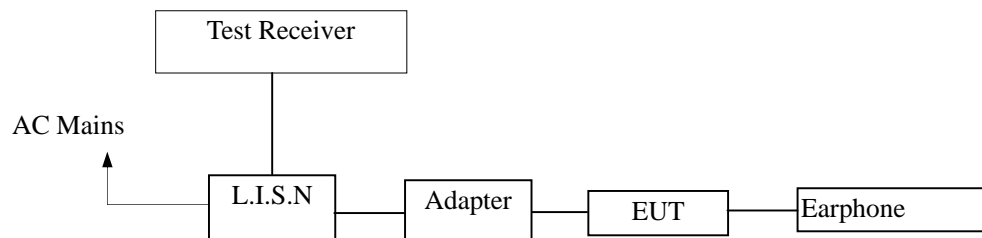
FCC Rules	Description Of Test	Result
§15.247(a)(2)	6dB bandwidth	Pass
§15.247(b)(3)	Max Peak output Power test	Pass
§15.247(e)	Power density	Pass
§15.247(d)	Band edge test	Pass
§15.207	AC Power Conducted Emission	Pass
§15.247(d), §15.209	Radiated Emission	Pass
§15.247(d)	Antenna Port Emission	Pass
§15.247(b)& §15.203	Antenna Application	Pass

## 5. Conducted Emissions Test

### 5.1 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.

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



### 5.3 Measurement Equipment Used

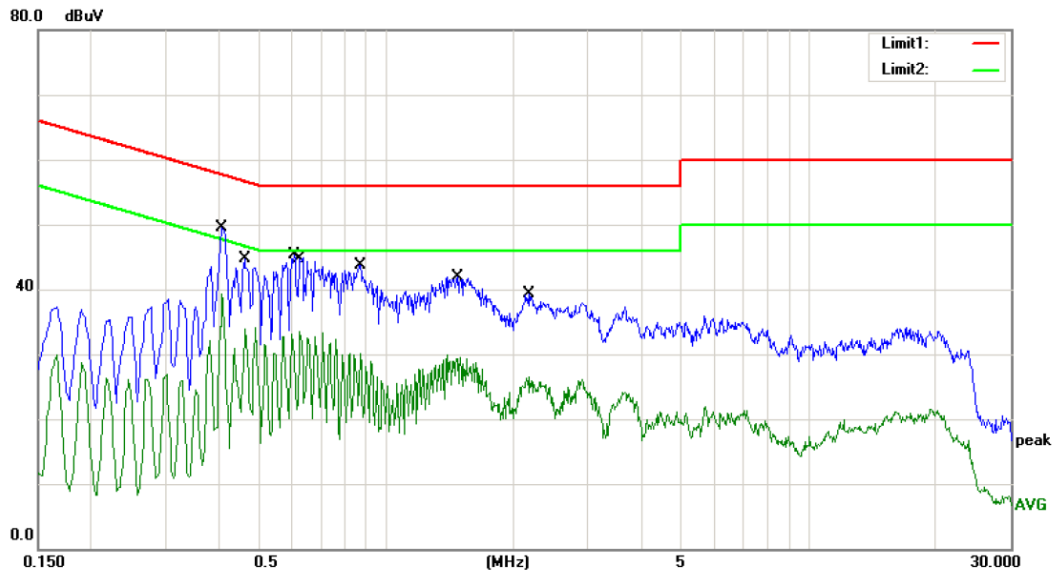
Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/17/2014	05/16/2015
L.I.S.N.	Schwarzbeck	NNLK8129	8129203	05/17/2014	05/16/2015
50Ω Coaxial Switch	Anritsu	MP59B	M20531	N/A	N/A
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	05/17/2014	05/16/2015
Voltage Probe	Rohde & Schwarz	TK9416	N/A	05/17/2014	05/16/2015
I.S.N	Rohde & Schwarz	ENY22	1109.9508.02	05/17/2014	05/16/2015

### 5.4 Conducted Emission Limit

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.

## 5.5 Measurement Result



Site Conduction #1

Phase: **L1**

Temperature: 26

Limit: (CE)FCC PART 15 class B\_QP

Power: AC 120V/60Hz

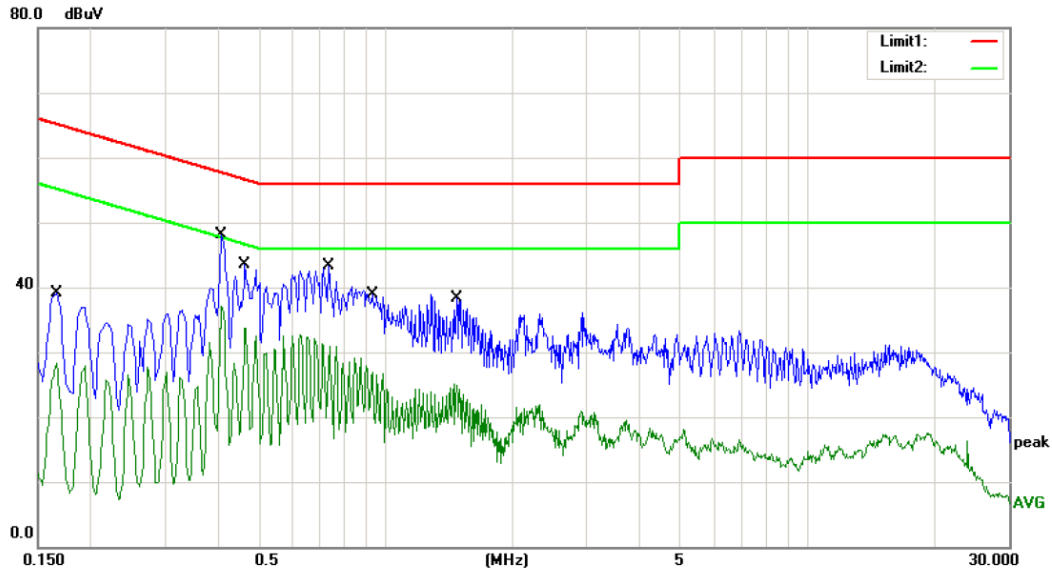
Humidity: 60 %

Mode: Middle Channel (WIFI)

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.4100	49.59	0.00	49.59	57.65	-8.06	QP	
2		0.4100	39.30	0.00	39.30	47.65	-8.35	AVG	
3		0.4620	44.68	0.00	44.68	56.66	-11.98	QP	
4		0.4620	34.20	0.00	34.20	46.66	-12.46	AVG	
5		0.6060	45.34	0.00	45.34	56.00	-10.66	QP	
6		0.6260	33.45	0.00	33.45	46.00	-12.55	AVG	
7		0.8700	43.80	0.00	43.80	56.00	-12.20	QP	
8		0.8700	32.39	0.00	32.39	46.00	-13.61	AVG	
9		1.4740	41.95	0.00	41.95	56.00	-14.05	QP	
10		1.4740	29.94	0.00	29.94	46.00	-16.06	AVG	
11		2.1700	39.39	0.00	39.39	56.00	-16.61	QP	
12		2.1700	26.43	0.00	26.43	46.00	-19.57	AVG	

\*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Cai



Site Conduction #1

Phase: **N**

Temperature: 26

Limit: (CE)FCC PART 15 class B\_QP

Power: AC 120V/60Hz

Humidity: 60 %

Mode: Middle Channel (WIFI)

Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1660	39.15	0.00	39.15	65.16	-26.01	QP	
2	0.1660	28.26	0.00	28.26	55.16	-26.90	AVG	
3 *	0.4100	48.04	0.00	48.04	57.65	-9.61	QP	
4	0.4100	37.08	0.00	37.08	47.65	-10.57	AVG	
5	0.4660	43.59	0.00	43.59	56.58	-12.99	QP	
6	0.4660	33.80	0.00	33.80	46.58	-12.78	AVG	
7	0.7340	43.39	0.00	43.39	56.00	-12.61	QP	
8	0.7340	32.80	0.00	32.80	46.00	-13.20	AVG	
9	0.9340	38.86	0.00	38.86	56.00	-17.14	QP	
10	0.9340	26.97	0.00	26.97	46.00	-19.03	AVG	
11	1.4740	38.29	0.00	38.29	56.00	-17.71	QP	
12	1.4740	25.14	0.00	25.14	46.00	-20.86	AVG	

\*:Maximum data    x:Over limit    !:over margin    Comment: Factor build in receiver.    Operator: Cai

## 6. Radiated Emission Test

### 6.1 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 was complete.

When spectrum scanned from 30 MHz to 1GHz setting resolution bandwidth 120 kHz and video bandwidth 300kHz.

EMI Test Receiver	Setting
Attenuation	Auto
RB	120kHz
VB	300kHz
Detector	QP
Trace	Max hold

When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 3MHz.

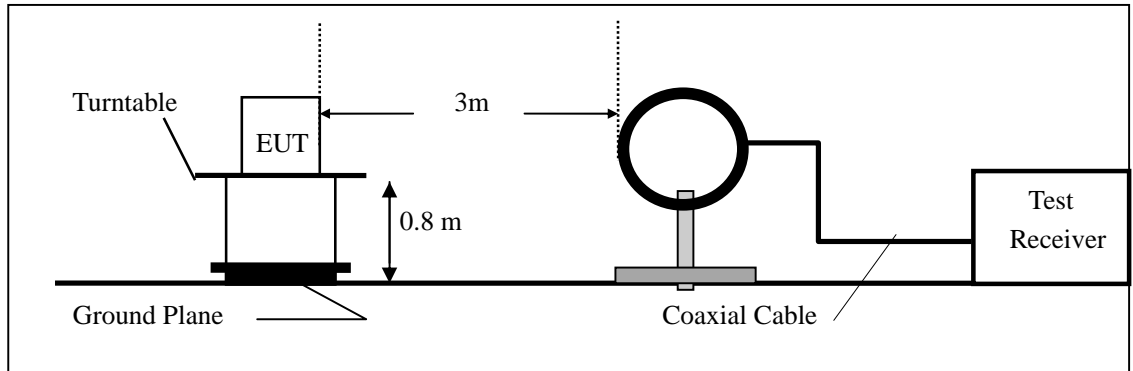
EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	3MHz
Detector	Peak
Trace	Max hold

When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 10Hz.

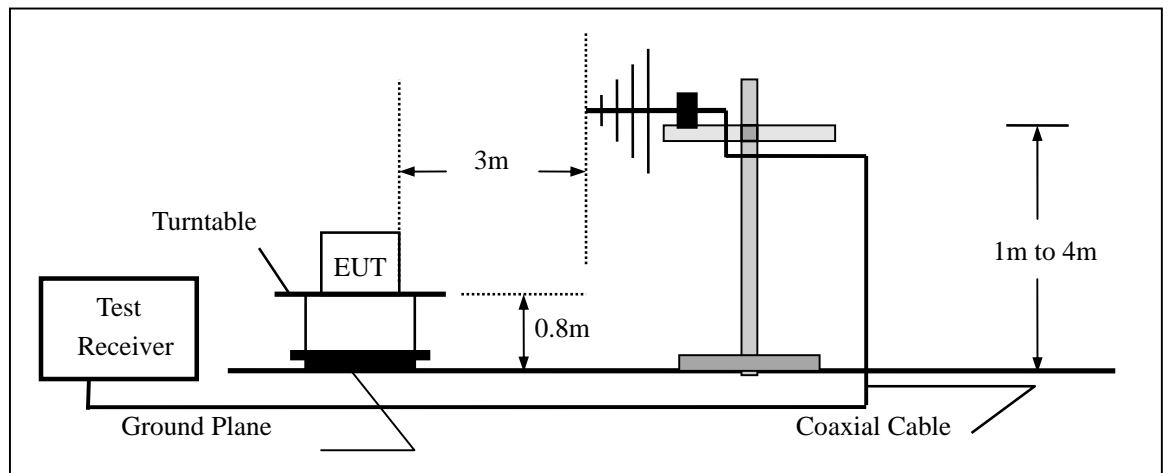
EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	10Hz
Detector	AVG
Trace	Max hold

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

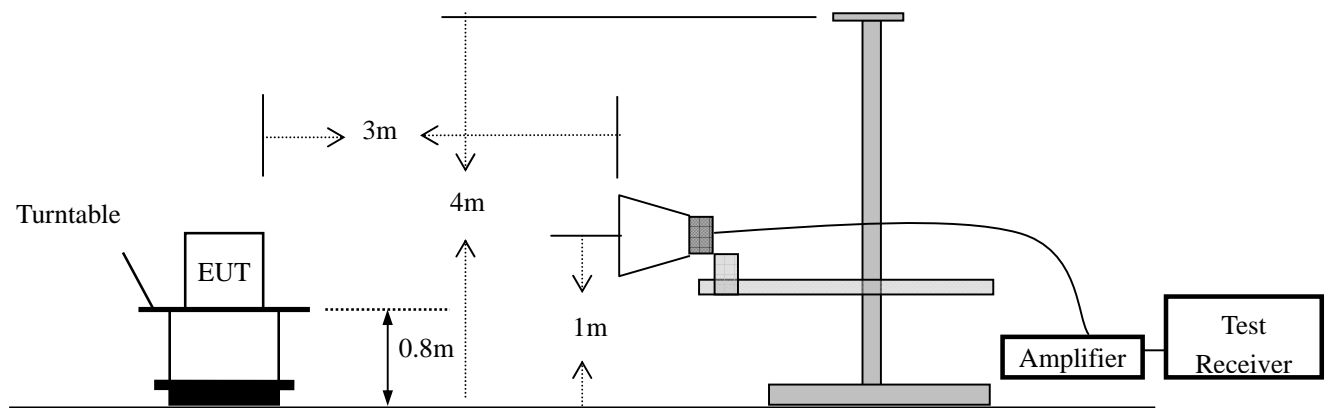
### (A) Radiated Emission Test Set-Up, Frequency Below 30MHz



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



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





### 6.3 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	05/17/2014	05/16/2015
Pre-Amplifier	HP	8447D	2944A07999	05/17/2014	05/16/2015
Bilog Antenna	Schwarzbeck	VULB9163	142	05/17/2014	05/16/2015
Loop Antenna	ARA	PLA-1030/B	1029	05/17/2014	05/16/2015
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	05/17/2014	05/16/2015
Horn Antenna	Schwarzbeck	BBHA 9120	D143	05/17/2014	05/16/2015
Cable	Schwarzbeck	AK9513	ACRX1	05/17/2014	05/16/2015
Cable	Rosenberger	N/A	FP2RX2	05/17/2014	05/16/2015
Cable	Schwarzbeck	AK9513	CRPX1	05/17/2014	05/16/2015
Cable	Schwarzbeck	AK9513	CRRX2	05/17/2014	05/16/2015

### 6.4 Radiated Emission Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

#### 15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
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
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 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 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )

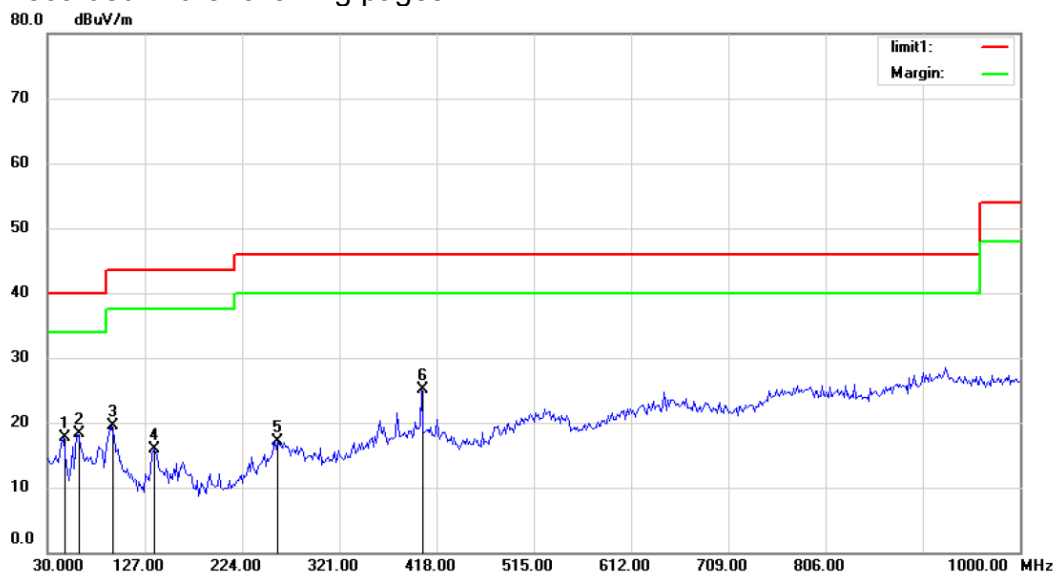
Remark 1. Emission level in dBuV/m=20 log (uV/m)

- :
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
  3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

## 6.5 Measurement Result

Below 1GHz:

All the modulation modes were tested the data of the worst mode (802.11b) are recorded in the following pages.



Site 3m Chamber #1

Polarization: **Horizontal**

Temperature: 24

Limit: ( RE)FCC PART 15 CLASS B

Power: AC 120V/60Hz

Humidity: 53 %

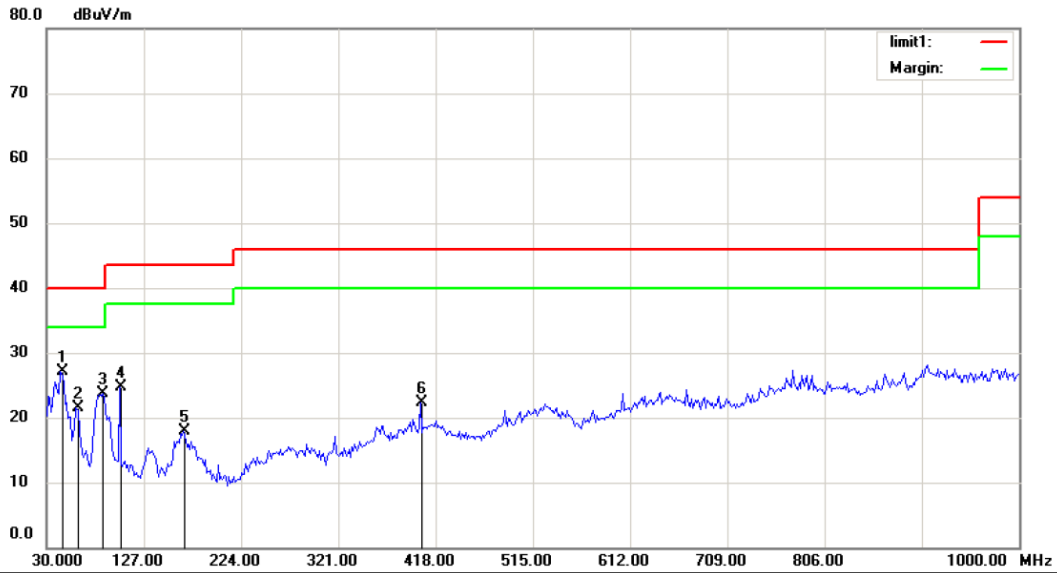
Mode:802.11b TX (Low Channel)

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		45.5450	3.65	14.11	17.76	40.00	-22.24	QP		
2		59.5353	5.64	12.71	18.35	40.00	-21.65	QP		
3		93.7340	7.81	11.61	19.42	43.50	-24.08	QP		
4		137.2596	6.63	9.36	15.99	43.50	-27.51	QP		
5		260.0641	2.53	14.57	17.10	46.00	-28.90	QP		
6	*	403.0770	6.37	18.79	25.16	46.00	-20.84	QP		

\*:Maximum data x:Over limit !:over margin

Operator: ZHL

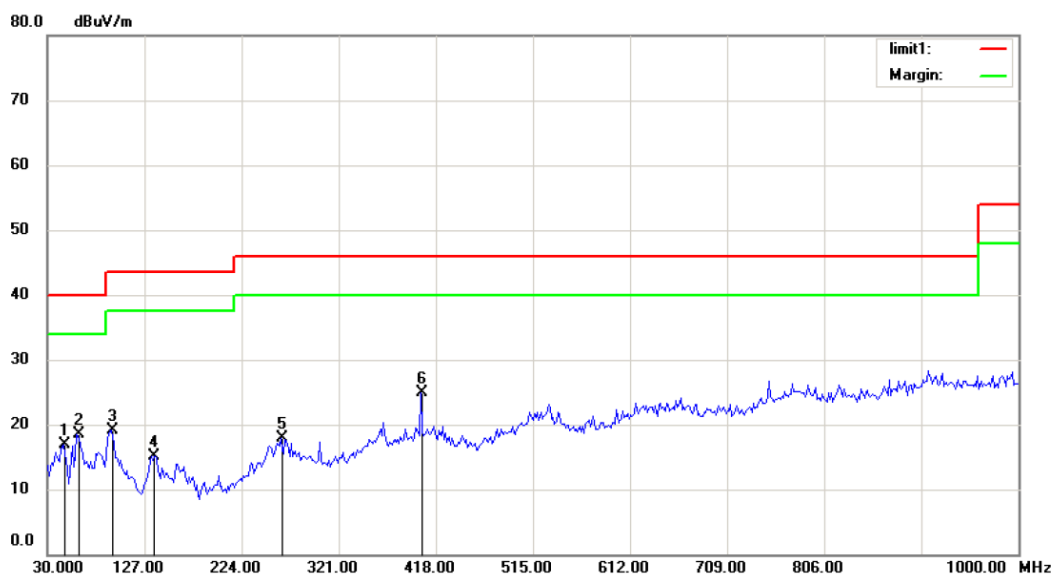


Site 3m Chamber #1 Polarization: **Vertical** Temperature: 24  
Limit: (RE)FCC PART 15 CLASS B Power: AC 120V/60Hz Humidity: 53 %  
Mode:802.11b TX (Low Channel)  
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	43.9904	11.89	15.18	27.07	40.00	-12.93	QP		
2		59.5353	8.74	12.71	21.45	40.00	-18.55	QP		
3		85.9615	14.72	8.92	23.64	40.00	-16.36	QP		
4		103.0610	11.83	12.87	24.70	43.50	-18.80	QP		
5		166.7950	9.99	7.95	17.94	43.50	-25.56	QP		
6		403.0770	3.59	18.79	22.38	46.00	-23.62	QP		

\*:Maximum data x:Over limit !:over margin

Operator: ZHL



Site 3m Chamber #1

Polarization: **Horizontal**

Temperature: 24

Limit: (RE)FCC PART 15 CLASS B

Power: AC 120V/60Hz

Humidity: 53 %

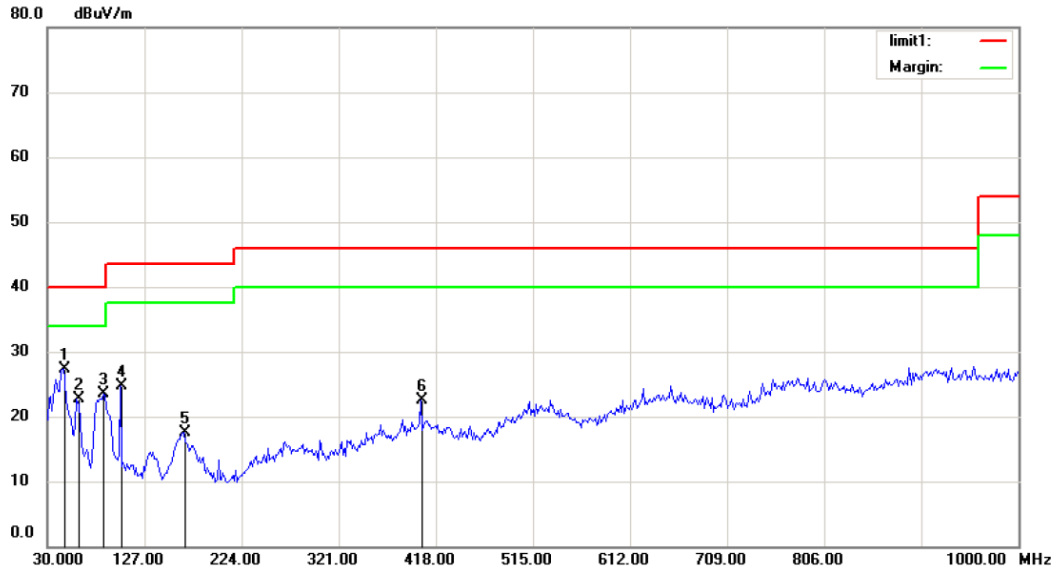
Mode:802.11b TX (Mid Channel)

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		45.5450	2.79	14.11	16.90	40.00	-23.10	QP		
2		59.5353	5.75	12.71	18.46	40.00	-21.54	QP		
3		93.7340	7.55	11.61	19.16	43.50	-24.34	QP		
4		137.2596	5.75	9.36	15.11	43.50	-28.39	QP		
5		263.1731	3.35	14.59	17.94	46.00	-28.06	QP		
6	*	403.0770	6.20	18.79	24.99	46.00	-21.01	QP		

\*:Maximum data x:Over limit !:over margin

Operator: ZHL

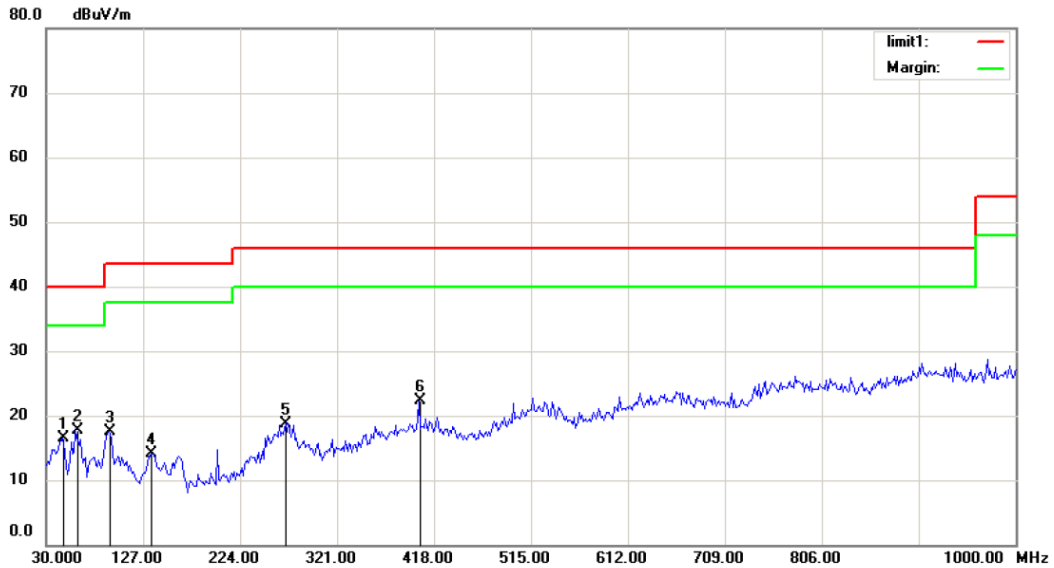


Site 3m Chamber #1 Polarization: **Vertical** Temperature: 24  
Limit: (RE)FCC PART 15 CLASS B Power: AC 120V/60Hz Humidity: 53 %  
Mode:802.11b TX (Mid Channel)  
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	45.5450	13.22	14.11	27.33	40.00	-12.67	QP		
2		59.5353	10.07	12.71	22.78	40.00	-17.22	QP		
3		85.9615	14.49	8.92	23.41	40.00	-16.59	QP		
4		103.0610	11.83	12.87	24.70	43.50	-18.80	QP		
5		166.7950	9.52	7.95	17.47	43.50	-26.03	QP		
6		403.0770	3.62	18.79	22.41	46.00	-23.59	QP		

\*:Maximum data x:Over limit !:over margin

Operator: ZHL

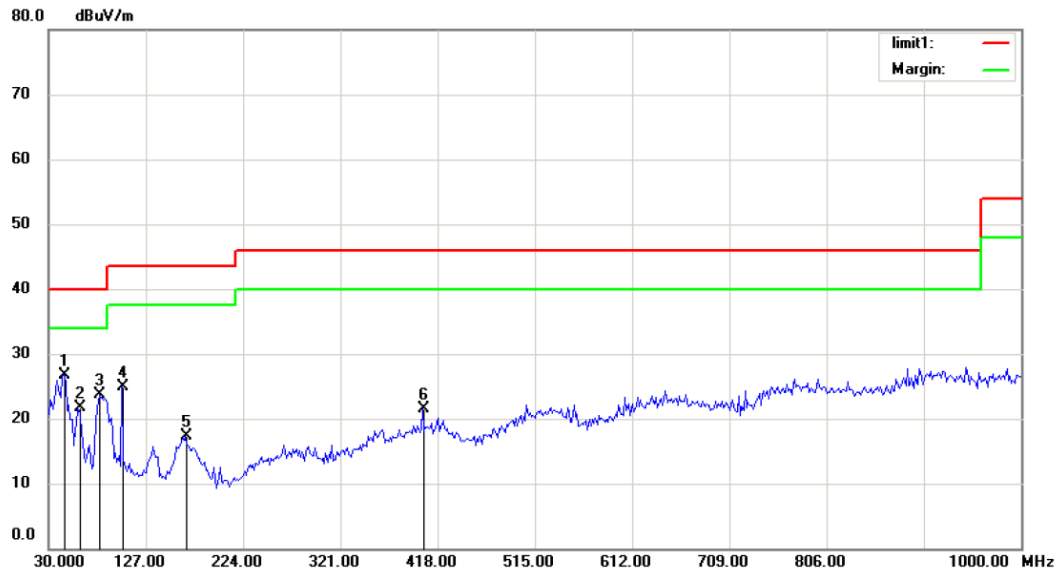


Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 24  
Limit: ( RE)FCC PART 15 CLASS B Power: AC 120V/60Hz Humidity: 53 %  
Mode:802.11b TX (High Channel)  
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		45.5450	2.42	14.11	16.53	40.00	-23.47	QP		
2	*	59.5353	4.97	12.71	17.68	40.00	-22.32	QP		
3		92.1795	6.45	11.07	17.52	43.50	-25.98	QP		
4		135.7051	4.66	9.52	14.18	43.50	-29.32	QP		
5		269.3910	3.92	14.88	18.80	46.00	-27.20	QP		
6		403.0770	3.56	18.79	22.35	46.00	-23.65	QP		

\*:Maximum data x:Over limit !:over margin

Operator: ZHL



Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 24

Limit: (RE)FCC PART 15 CLASS B

Power: AC 120V/60Hz

Humidity: 53 %

Mode:802.11b TX (High Channel)

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	43.9904	11.61	15.18	26.79	40.00	-13.21	QP		
2		59.5353	8.92	12.71	21.63	40.00	-18.37	QP		
3		81.2980	16.00	7.66	23.66	40.00	-16.34	QP		
4		103.0610	11.95	12.87	24.82	43.50	-18.68	QP		
5		166.7950	9.40	7.95	17.35	43.50	-26.15	QP		
6		403.0770	2.62	18.79	21.41	46.00	-24.59	QP		

\*:Maximum data x:Over limit !:over margin

Operator: ZHL



#### Above 1GHz:

All the modulation modes were tested the data of the worst mode (802.11b) are recorded in the following pages.

Operation Mode: 802.11b TX CH 1      Test Date : August 09, 2014  
Frequency Range: 1GHz~25GHz      Temperature : 24℃  
Test Result: PASS      Humidity : 53 %  
Measured Distance: 3m      Test By: ZHONG

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
4824.00	V	52.19	32.49	74.00	54.00	-21.81	-21.51
7236.00	V	53.13	34.34	74.00	54.00	-20.87	-19.66
9648.00	V	52.38	34.00	74.00	54.00	-21.62	-20.00
12060.00	V	52.40	33.32	74.00	54.00	-21.60	-20.68
14472.00	V	53.49	34.44	74.00	54.00	-20.51	-19.56
16884.00	V	53.36	34.29	74.00	54.00	-20.64	-19.71
4824.00	H	45.83	26.98	74.00	54.00	-28.17	-27.02
7236.00	H	46.70	17.83	74.00	54.00	-27.30	-36.17
9648.00	H	46.10	27.69	74.00	54.00	-27.90	-26.31
12060.00	H	47.88	29.60	74.00	54.00	-26.12	-24.40
14472.00	H	49.90	30.72	74.00	54.00	-24.10	-23.28
16884.00	H	51.49	33.14	74.00	54.00	-22.51	-20.86

**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) 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.

Operation Mode: 802.11b TX CH 6 Test Date : August 09, 2014  
Frequency Range: 1GHz~25GHz Temperature : 24℃  
Test Result: PASS Humidity : 53 %  
Measured Distance: 3m Test By: ZHONG

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
4874.00	V	51.32	32.12	74.00	54.00	-22.68	-21.88
7311.00	V	53.00	34.14	74.00	54.00	-21.00	-19.86
9748.00	V	51.08	32.70	74.00	54.00	-22.92	-21.30
12185.00	V	52.62	33.70	74.00	54.00	-21.38	-20.30
14622.00	V	53.31	34.34	74.00	54.00	-20.69	-19.66
17059.00	V	53.71	34.29	74.00	54.00	-20.29	-19.71
4874.00	H	52.38	33.93	74.00	54.00	-21.62	-20.07
7311.00	H	52.58	33.47	74.00	54.00	-21.42	-20.53
9748.00	H	53.54	35.00	74.00	54.00	-20.46	-19.00
12185.00	H	52.18	33.22	74.00	54.00	-21.82	-20.78
14622.00	H	52.49	33.28	74.00	54.00	-21.51	-20.72
17059.00	H	53.40	34.24	74.00	54.00	-20.60	-19.76

**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) 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.

Operation Mode: 802.11b TX CH11 Test Date : August 09, 2014  
Frequency Range: 1GHz~25GHz Temperature: 24℃  
Test Result: PASS Humidity : 53 %  
Measured Distance: 3m Test By: ZHONG

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
4924.00	V	51.91	33.00	74.00	54.00	-22.09	-21.00
7386.00	V	52.49	32.94	74.00	54.00	-21.51	-21.06
9848.00	V	52.90	33.57	74.00	54.00	-21.10	-20.43
12310.00	V	52.78	33.84	74.00	54.00	-21.22	-20.16
14772.00	V	54.47	35.74	74.00	54.00	-19.53	-18.26
17234.00	V	53.75	35.56	74.00	54.00	-20.25	-18.44
4924.00	H	51.49	32.30	74.00	54.00	-22.51	-21.70
7386.00	H	53.21	34.20	74.00	54.00	-20.79	-19.80
9848.00	H	53.65	33.99	74.00	54.00	-20.35	-20.01
12310.00	H	54.48	35.70	74.00	54.00	-19.52	-18.30
14772.00	H	54.15	35.50	74.00	54.00	-19.85	-18.50
17234.00	H	53.30	34.80	74.00	54.00	-20.70	-19.20

**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) 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.

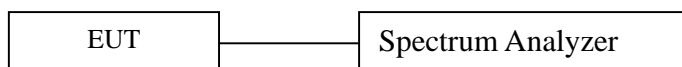
## 7. 6dB Bandwidth Test

### 7.1 Measurement Procedure

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

1. Set resolution bandwidth (RBW) = 100 kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequency) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

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



### 7.3 Measurement Equipment Used

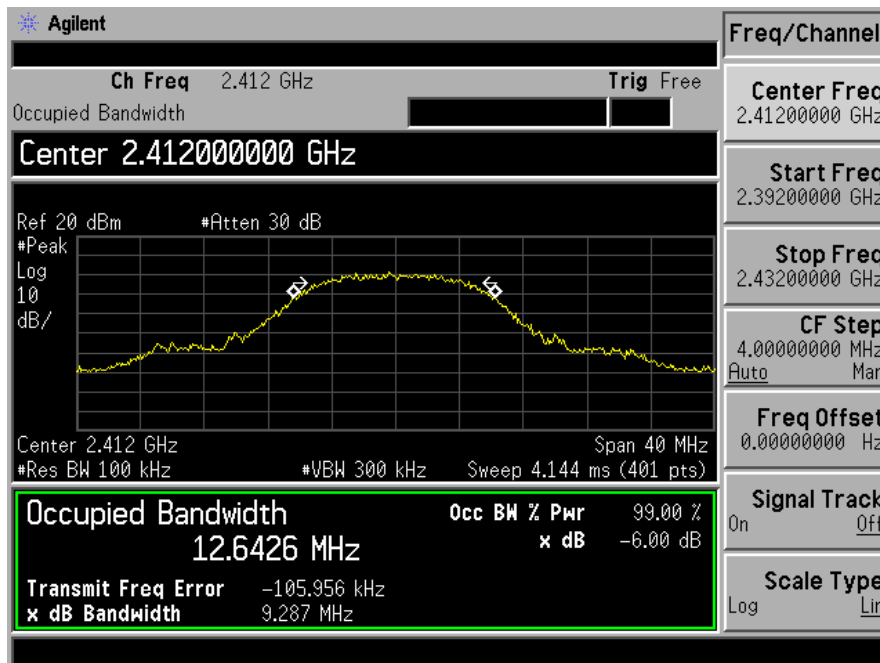
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4407B	88156318	05/17/2014	05/16/2015

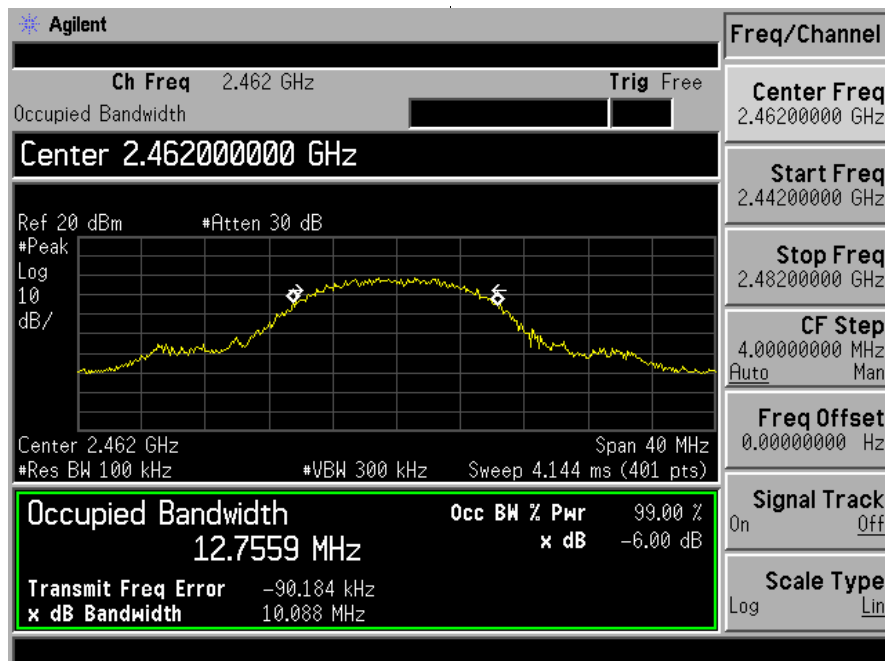
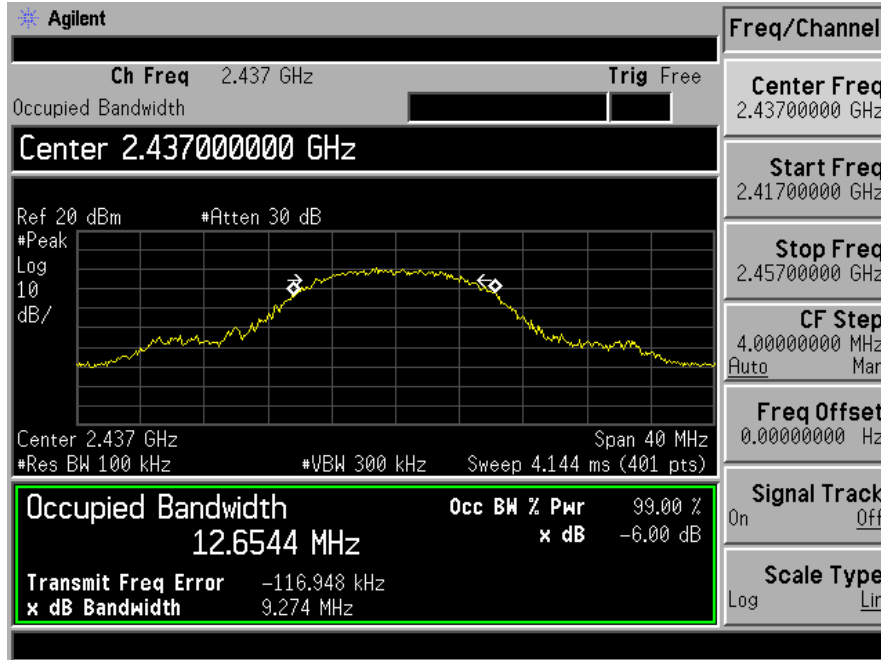
### 7.4 Measurement Results

6 Bandwidth Test Data Chart:  
Refer to attached data chart.

Spectrum Detector:	PK	Test Date :	September 02, 2014
Test By:	KK	Temperature :	24 °C
Test Result:	PASS	Humidity :	53 %
Operation Mode:	802.11b		

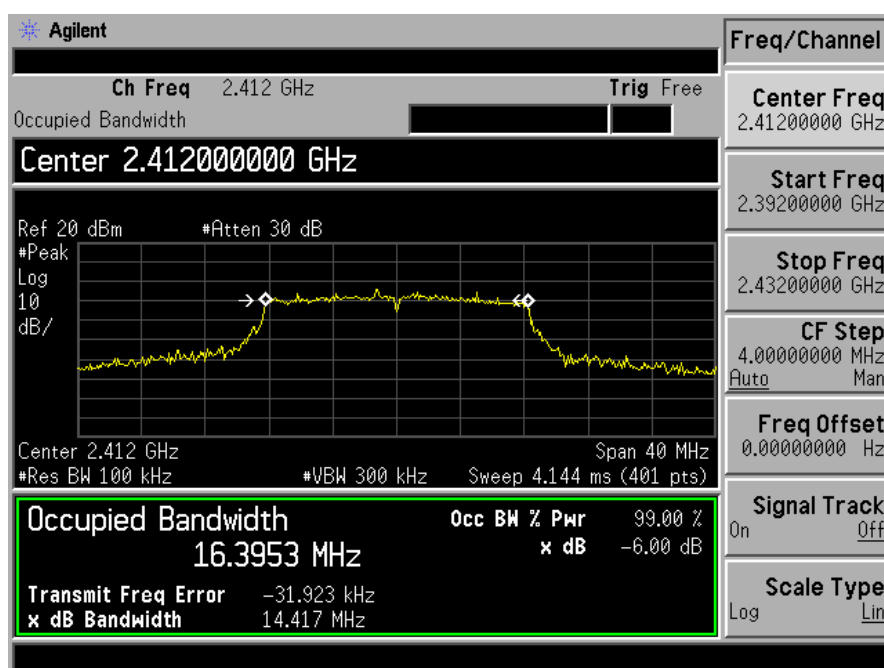
Channel number	Channel frequency (MHz)	Measurement level (MHz)	Required Limit (kHz)
1	2412	9.287	>500
6	2437	9.274	>500
11	2462	10.088	>500

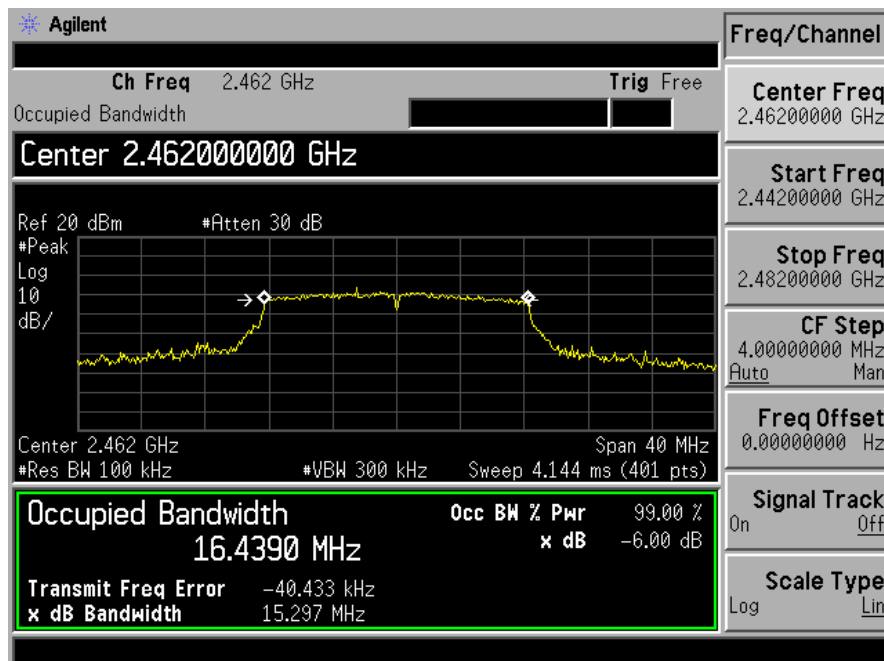
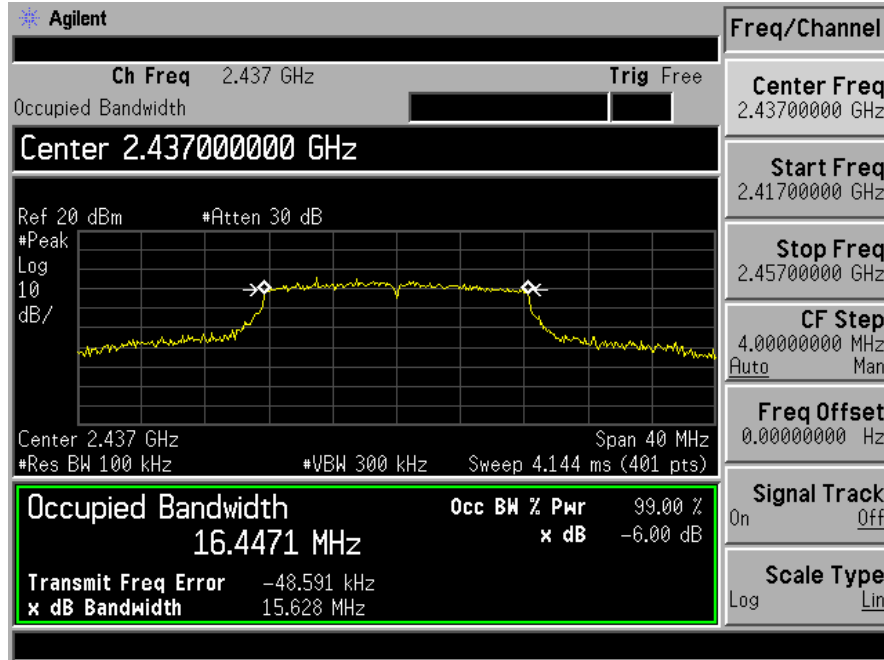




Spectrum Detector: PK Test Date : September 02, 2014  
 Test By: KK Temperature : 24℃  
 Test Result: PASS Humidity : 53 %  
 Operation Mode: 802.11g

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Required Limit (kHz)
1	2412	14.417	>500
6	2437	15.628	>500
11	2462	15.297	>500

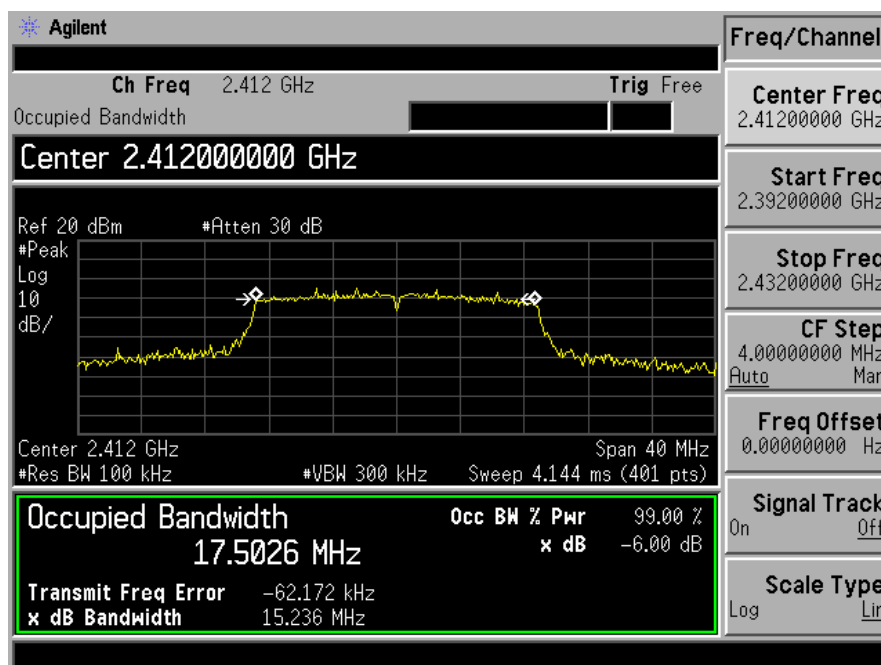


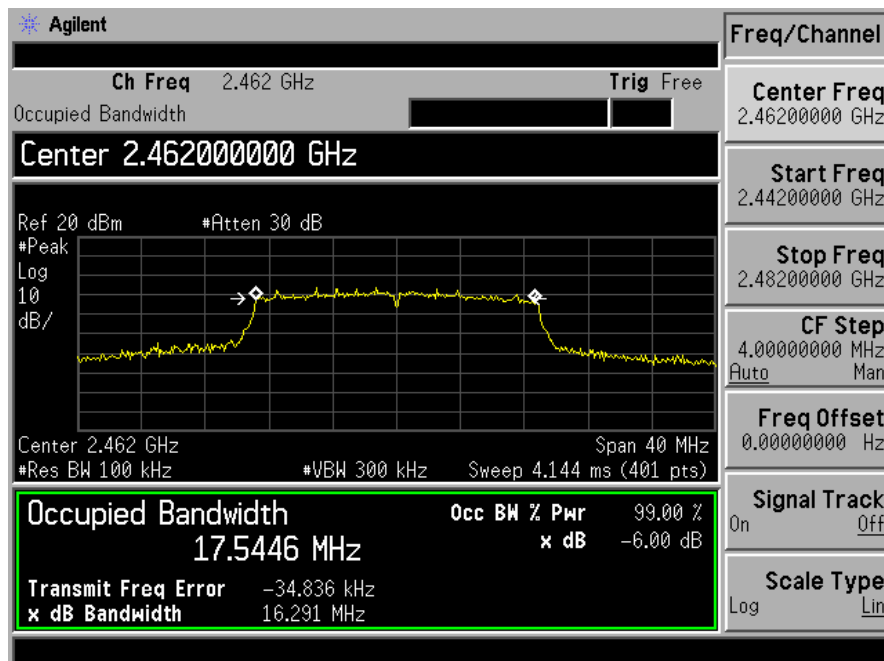
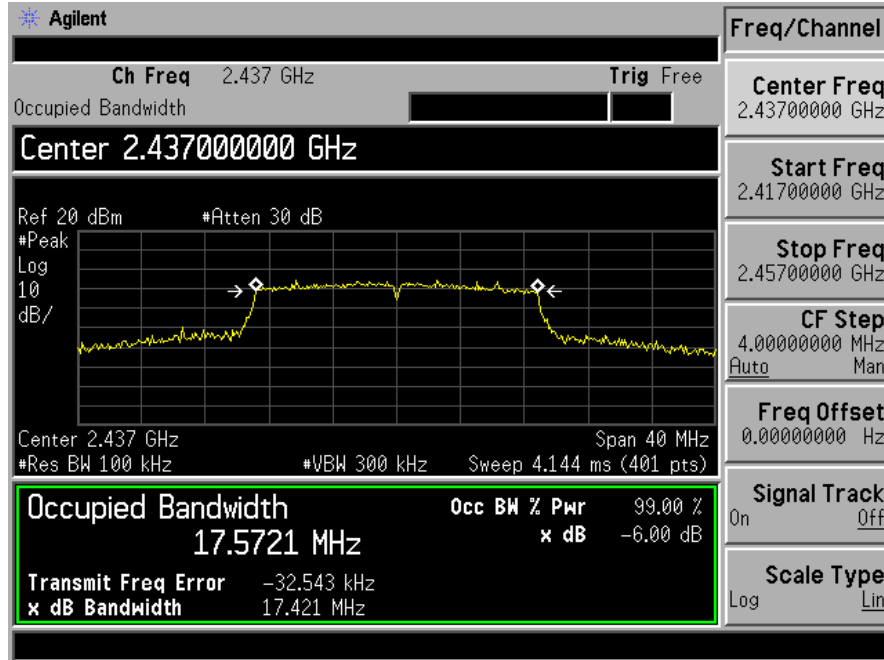




Spectrum Detector:	PK	Test Date :	September 02, 2014
Test By:	KK	Temperature :	24℃
Test Result:	PASS	Humidity :	53 %
Operation Mode: 802.11n HT20			

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Required Limit (kHz)
1	2412	15.236	>500
6	2437	17.421	>500
11	2462	16.291	>500

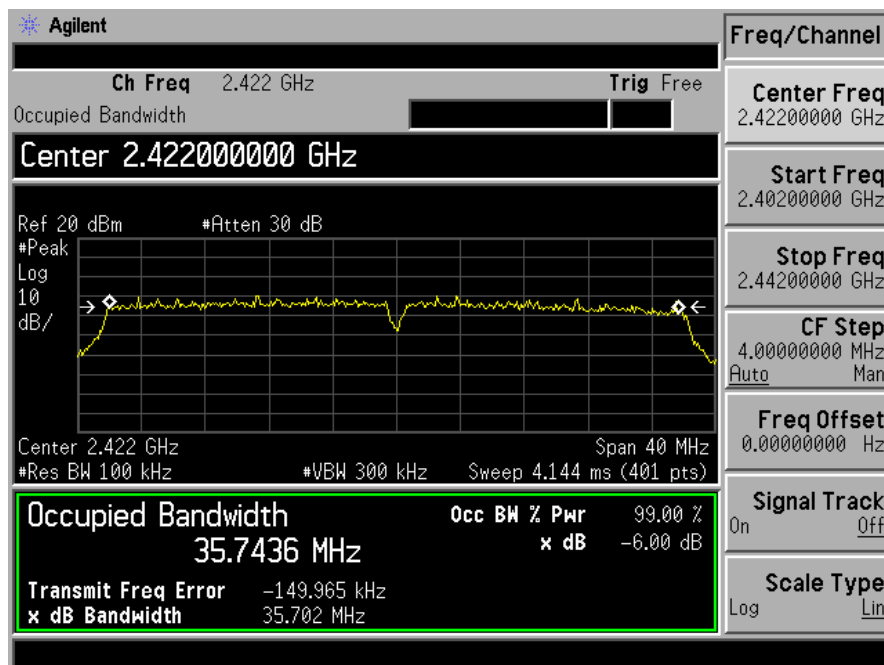


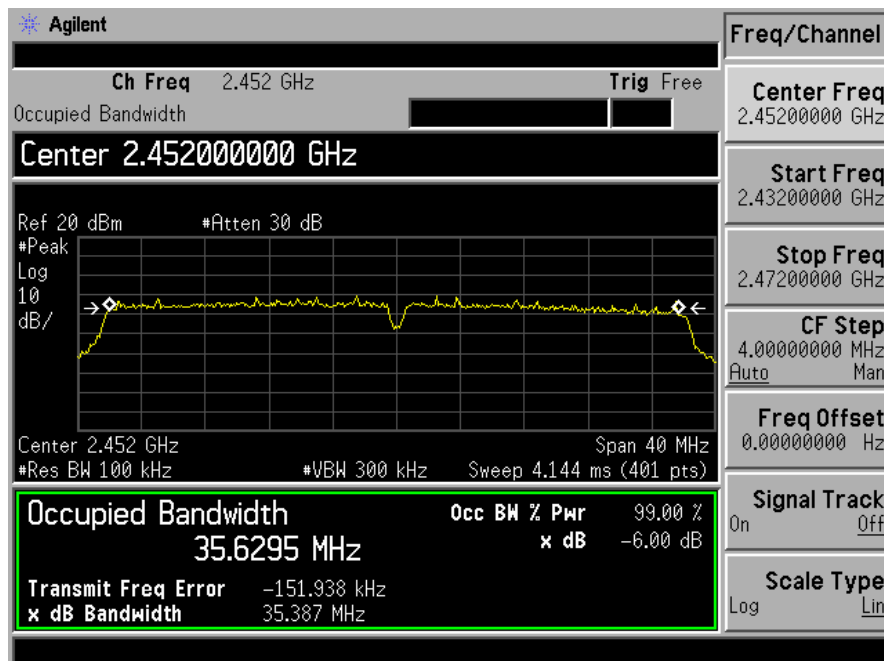
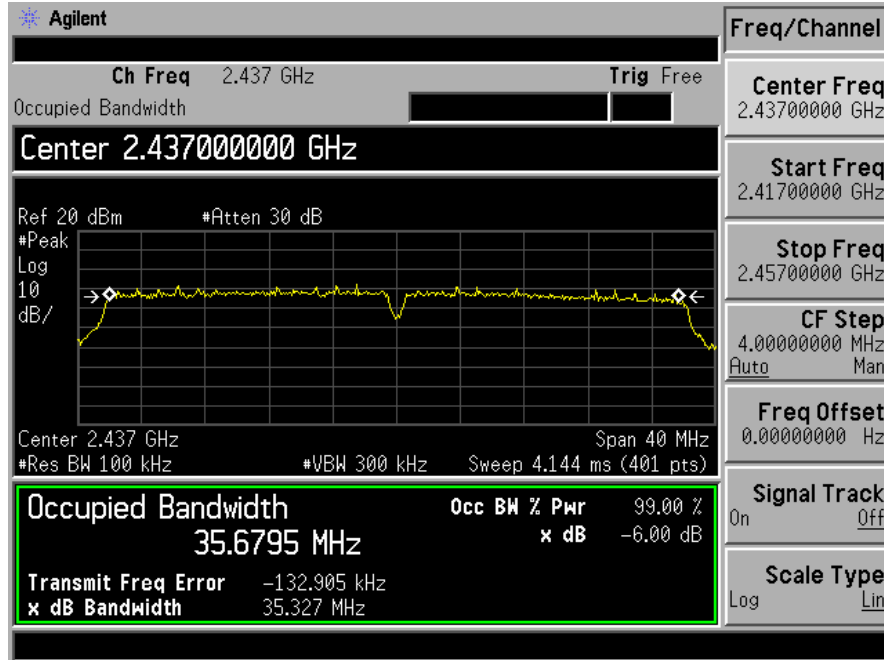


Spectrum Detector: PK  
Test By: KK  
Test Result: PASS  
Operation Mode: 802.11n HT40

Test Date : September 02, 2014  
Temperature : 24℃  
Humidity : 53 %

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Required Limit (kHz)
3	2422	35.702	>500
6	2437	35.327	>500
9	2452	35.387	>500





## 8. Maximum Peak Output Power Test

### 8.1 Measurement Procedure

- The testing follows FCC public Notice DA 00-705 Measurement Guidelines.
- The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- Set to the maximum output power setting and enable the EUT transmit continuously.
- Measure the conducted output power with cable loss and record the results in the test report.
- Measure and record the results in the report.

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



### 8.3 Measurement Equipment Used

EQUIPMENT TYPE	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power meter	ML2495A	0824006	05/17/2014	05/16/2015
Power sensor	MA2411B	0738172	05/17/2014	05/16/2015

### 8.4 Peak Power output limit

The maximum peak power shall be less 1Watt.

### 8.5 Measurement Results

Spectrum Detector: PK      Test Date : September 02, 2014  
 Test By: KK      Temperature : 24℃  
 Test Result: PASS      Humidity : 53 %  
 Operation Mode: 802.11b

Channel number	Channel Frequency(MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412	14.25	1W(30dBm)	PASS
6	2437	13.55	1W(30dBm)	PASS
11	2462	13.26	1W(30dBm)	PASS

Spectrum Detector: PK Test Date : September 02, 2014  
Test By: KK Temperature : 24℃  
Test Result: PASS Humidity : 53 %  
Operation Mode: 802.11g

Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412.00	11.17	1W(30dBm)	PASS
6	2437.00	11.56	1W(30dBm)	PASS
11	2462.00	10.51	1W(30dBm)	PASS

Spectrum Detector: PK Test Date : September 02, 2014  
Test By: KK Temperature : 24℃  
Test Result: PASS Humidity : 53 %  
Operation Mode: 802.11n HT20

Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412.00	11.11	1W(30dBm)	PASS
6	2437.00	11.66	1W(30dBm)	PASS
11	2462.00	10.63	1W(30dBm)	PASS

Spectrum Detector: PK Test Date : September 02, 2014  
Test By: KK Temperature : 24℃  
Test Result: PASS Humidity : 53 %  
Operation Mode: 802.11n HT40

Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
3	2422.00	8.63	1W(30dBm)	PASS
6	2437.00	8.62	1W(30dBm)	PASS
9	2452.00	8.48	1W(30dBm)	PASS

## 9. Band Edge Test

### 9.1 Measurement Procedure

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
6. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 kHz for  $f < 1$  GHz;  $VBW \geq RBW$ ; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz,  $VBW = 3$  MHz for  $f \geq 1$  GHz for peak measurement.

For average measurement:  
 $VBW = 10$  Hz, when duty cycle is no less than 98 percent.  
 $VBW \geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

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

As 6.2 Test set up (B) and (C)

### 9.3 Measurement Equipment Used

Same as 6.3 Radiated Emission Measurement.

### 9.4 Measurement Results

All the modulation modes were tested the data of the worst mode are recorded in the following pages.

Spectrum Detector:	PK/AV	Test Date :	September 02, 2014
Test By:	KK	Temperature :	24°C
Test channel:	01	Humidity :	53 %

802.11b –Lowest Bandedge  
Vertical(Worst case)

Frequency (MHz)	Polarity	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limited (dBuV/m)	Margin (dB)	Remark (Detector)
2390.00	V	44.89	-3.54	41.35	74.00	-32.65	PK
2390.00	V	31.52	-3.54	27.98	54.00	-26.02	AV
2400.00	V	46.84	-3.51	43.33	Delta=40.89dBc		AV
2412.00	V	87.70	-3.48	84.22			AV

802.11b –Highest Bandedge  
Vertical(Worst case)

Frequency (MHz)	Polarity	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limited (dBuV/m)	Margin (dB)	Remark (Detector)
2471.25	V	96.81	-3.35	93.46	/	/	PK
2470.90	V	91.85	-3.35	88.50	/	/	AV
2483.50	V	Delta=43.07dBc		45.43	74.00	-31.72	PK
2483.50	V			42.28	54.00	-8.57	AV

802.11g –Lowest Bandedge  
Vertical(Worst case)

Frequency (MHz)	Polarity	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limited (dBuV/m)	Margin (dB)	Remark (Detector)
2390.00	V	48.45	-3.54	44.91	74.00	-29.09	PK
2390.00	V	35.32	-3.54	31.78	54.00	-22.22	AV
2400.00	V	44.37	-3.51	40.86	Delta=38.94dBc		AV
2412.00	V	83.28	-3.48	79.80			AV

802.11g –Highest Bandedge  
Vertical(Worst case)

Frequency (MHz)	Polarity	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limited (dBuV/m)	Margin (dB)	Remark (Detector)
2474.05	V	95.45	-3.34	92.11	/	/	PK
2473.55	V	84.54	-3.35	81.20	/	/	AV
2483.50	V	Delta=42.67dBc		49.44	74.00	-24.56	PK
2483.50	V			38.53	54.00	-15.47	AV



802.11n HT20 –Lowest Bandedge  
Vertical(Worst case)

Frequency (MHz)	Polarity	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limited (dBuV/m)	Margin (dB)	Remark (Detector)
2390.00	V	47.76	-3.54	44.22	74.00	-29.78	PK
2390.00	V	34.66	-3.54	31.12	54.00	-22.88	AV
2400.00	V	45.00	-3.51	41.49	Delta=37.86dBc		AV
2412.00	V	82.84	-3.48	79.36			AV

802.11n HT20 –Highest Bandedge  
Vertical(Worst case)

Frequency (MHz)	Polarity	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limited (dBuV/m)	Margin (dB)	Remark (Detector)
2479.65	V	96.94	-3.35	93.59	/	/	PK
2471.50	V	85.47	-3.33	82.14	/	/	AV
2483.50	V	Delta=39.89dBc		53.70	74.00	-11.75	PK
2483.50	V			42.25	54.00	-20.30	AV

802.11n HT40 –Lowest Bandedge  
Vertical(Worst case)

Frequency (MHz)	Polarity	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limited (dBuV/m)	Margin (dB)	Remark (Detector)
2390.00	V	48.02	-3.54	44.48	74.00	-29.52	PK
2390.00	V	33.84	-3.54	30.30	54.00	-23.70	AV
2400.00	V	47.38	-3.51	43.87	Delta=33.49dBc		AV
2420.32	V	80.82	-3.46	77.36			AV

802.11n HT40 –Highest Bandedge  
Vertical(Worst case)

Frequency (MHz)	Polarity	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limited (dBuV/m)	Margin (dB)	Remark (Detector)
2453.03	V	89.92	-3.39	86.53	/	/	PK
2456.39	V	80.04	-3.38	76.66	/	/	AV
2483.50	V	Delta=42.75dBc		43.78	74.00	-30.22	PK
2483.50	V			33.91	54.00	-20.09	AV

## 10. Power Density

### 10.1 Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4407B	88156318	05/17/2014	05/16/2015

### 10.2 Measuring Instruments and Setting

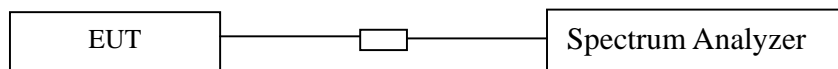
The following table is the setting of spectrum analyzer.

Spectrum analyzer	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS bandwidth.
RB	$3\text{kHz} \leq \text{RBW} \leq 100\text{KHz}$
VB	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max hold
Sweep Time	Automatic

### 10.3 Test Procedures

- The transmitter output (antenna port) was connected to the spectrum analyzer.
- Set analyzer center frequency to DTS channel center frequency.
- Set the analyzer span to a minimum of 1.5 times the DTS bandwidth.
- Set the RBW  $\geq 3$  kHz. Set the VBW  $\geq 3 \times$  RBW.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

### 10.4 Block Diagram of Test Setup



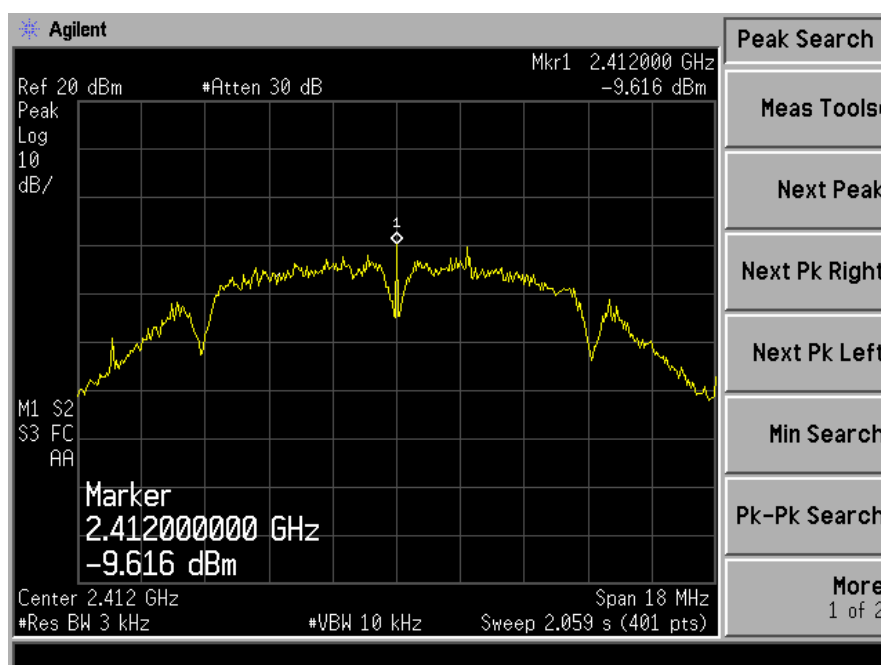
### 10.5 Limit

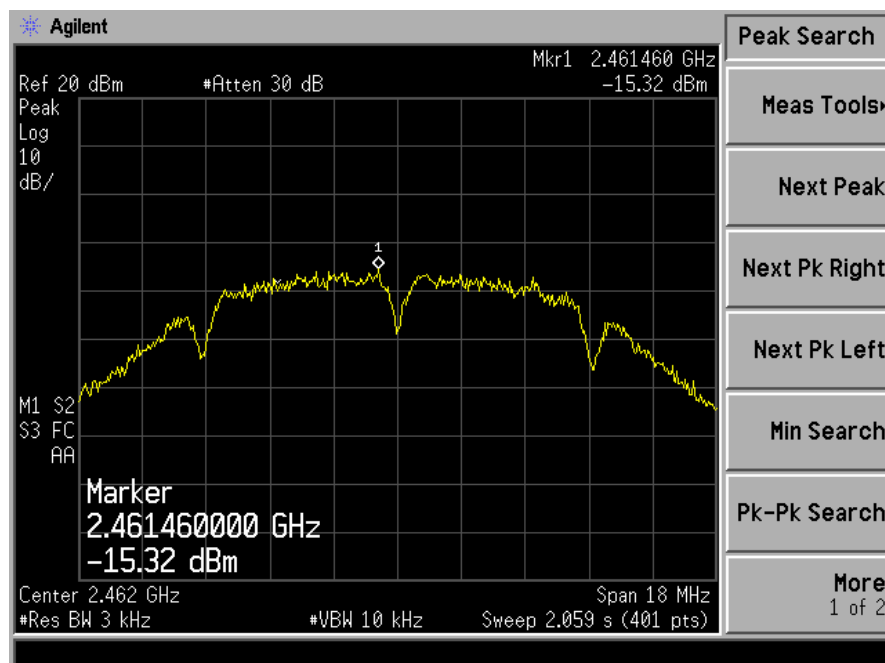
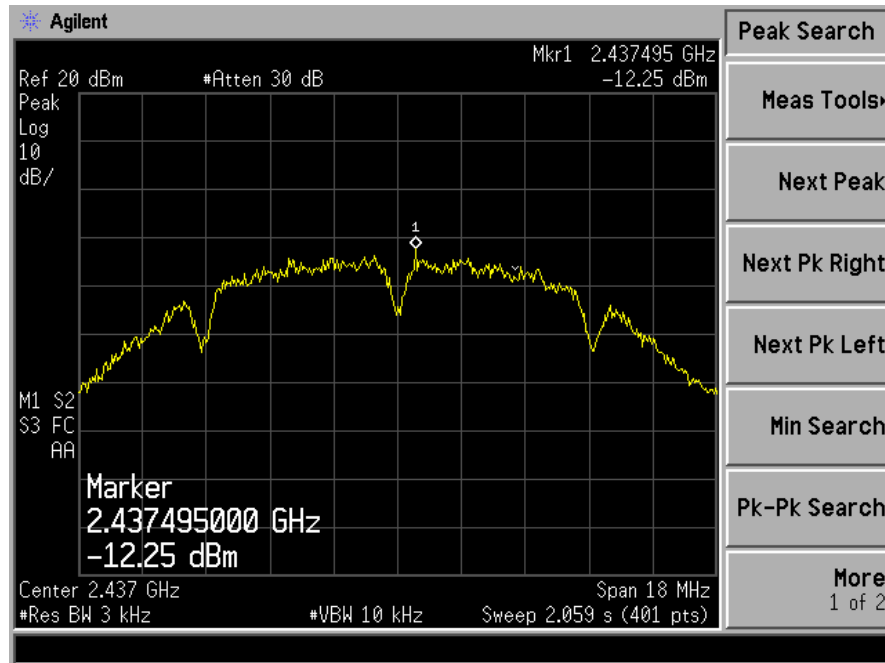
The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3 kHz bandwidth.

## 10.6 Test Result

Spectrum Detector:	PK	Test Date :	September 02, 2014
Test By:	KK	Temperature :	24℃
Test Result:	PASS	Humidity :	53 %
Operation Mode: 802.11b			

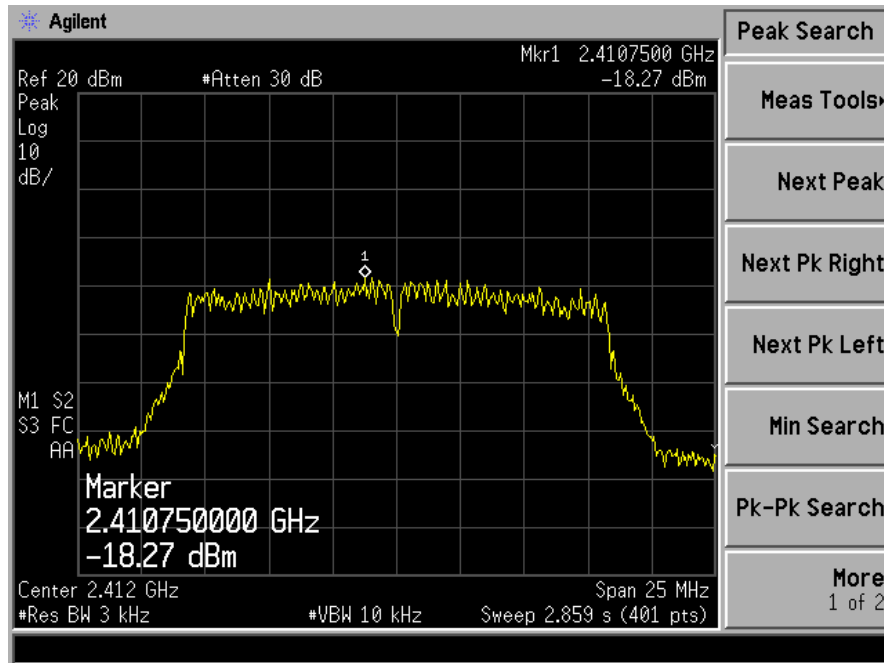
Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
1	-9.616	<8dBm	PASS
6	-12.25	<8dBm	PASS
11	-15.32	<8dBm	PASS

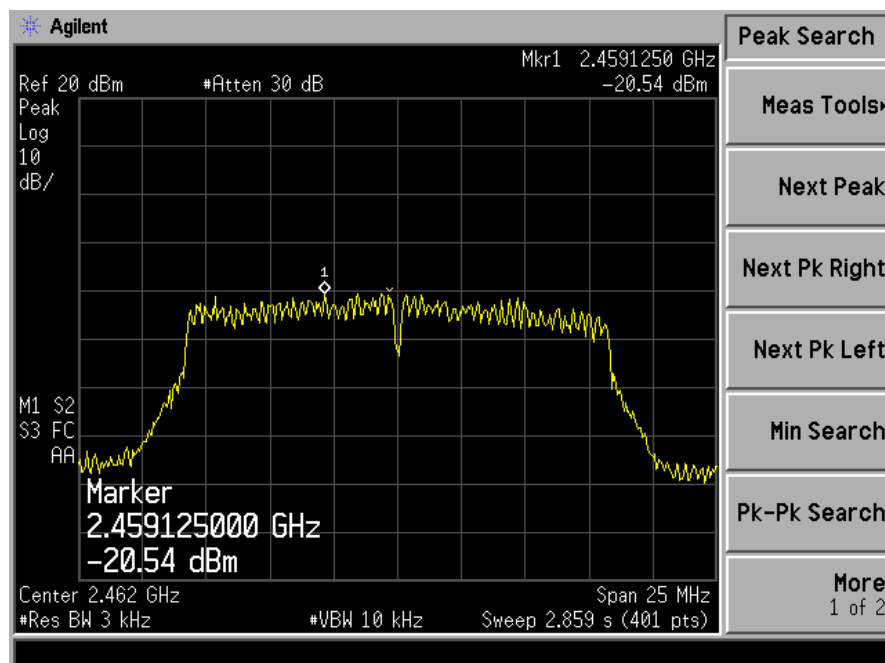
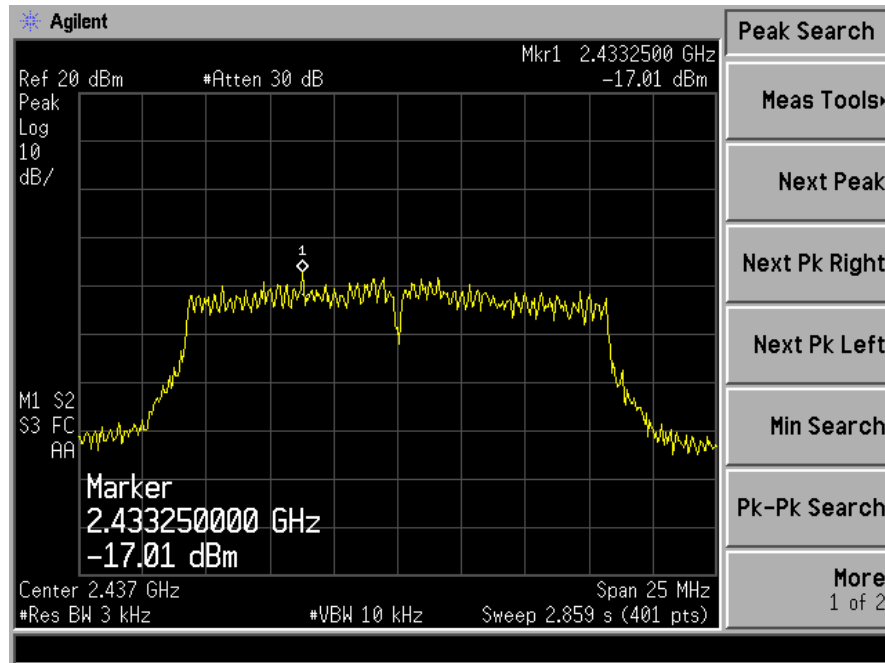




Spectrum Detector: PK Test Date : September 02, 2014  
 Test By: KK Temperature : 24 °C  
 Test Result: PASS Humidity : 53 %  
 Operation Mode: 802.11g

Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
1	-18.27	<8dBm	PASS
6	-17.01	<8dBm	PASS
11	-20.54	<8dBm	PASS

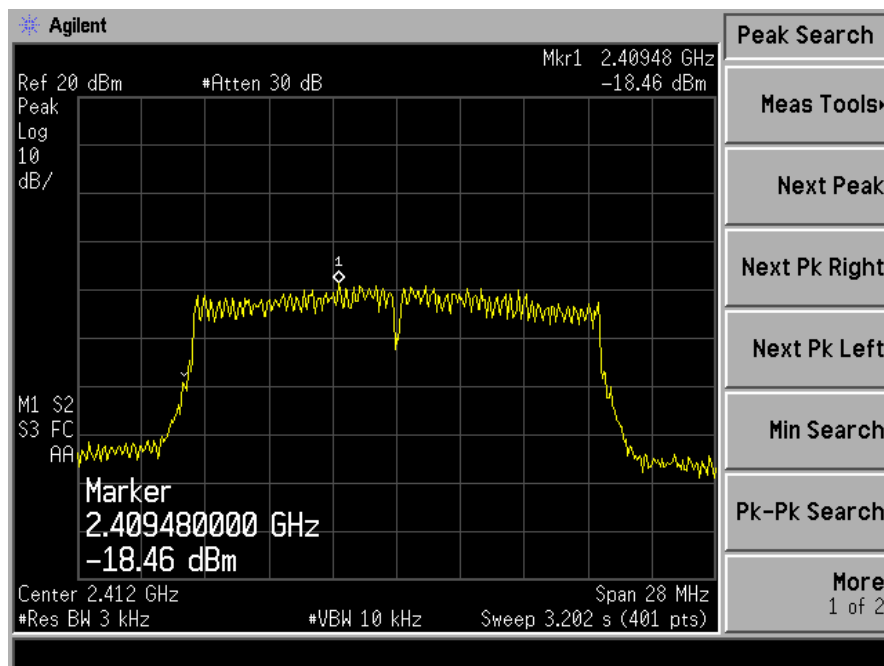


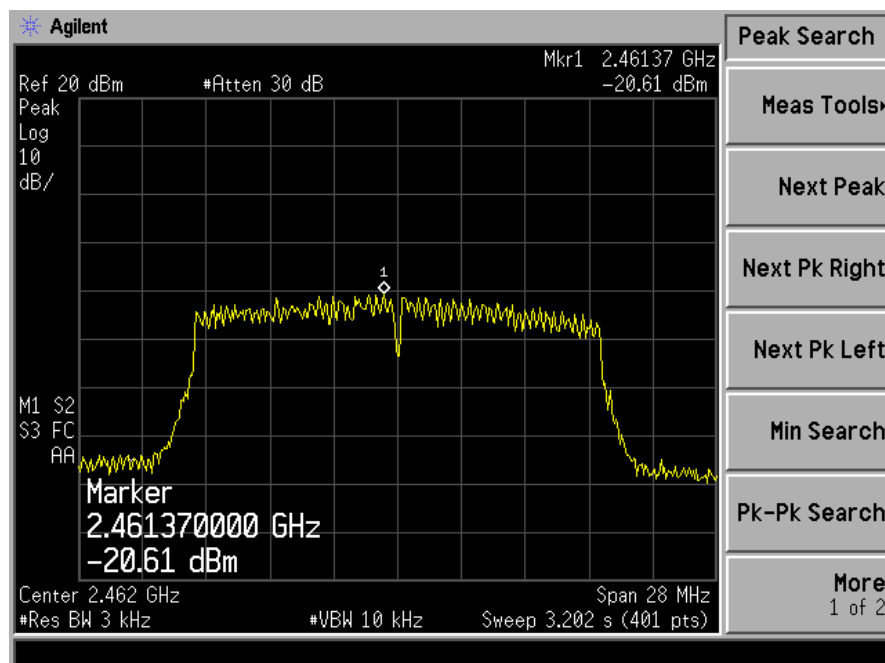
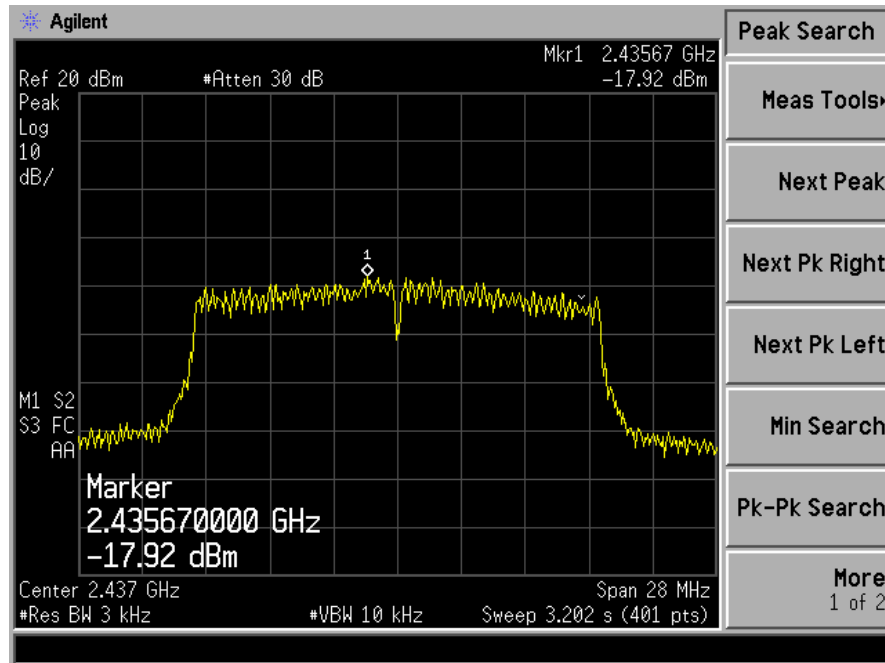


Spectrum Detector: PK  
 Test By: KK  
 Test Result: PASS  
 Operation Mode: 802.11n HT20

Test Date : September 02, 2014  
 Temperature : 24℃  
 Humidity : 53 %

Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
1	-18.46	<8dBm	PASS
6	-17.92	<8dBm	PASS
11	-20.61	<8dBm	PASS



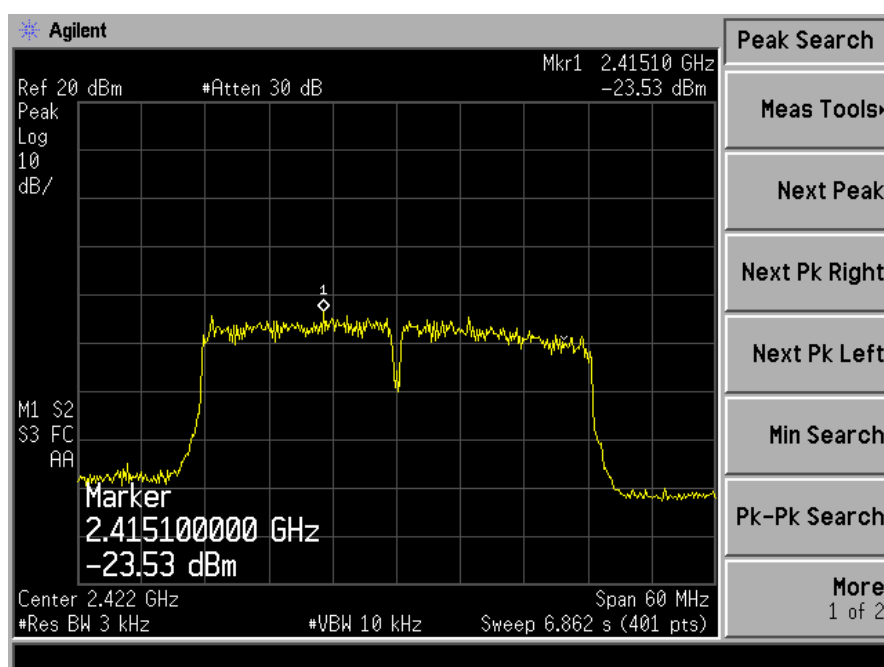


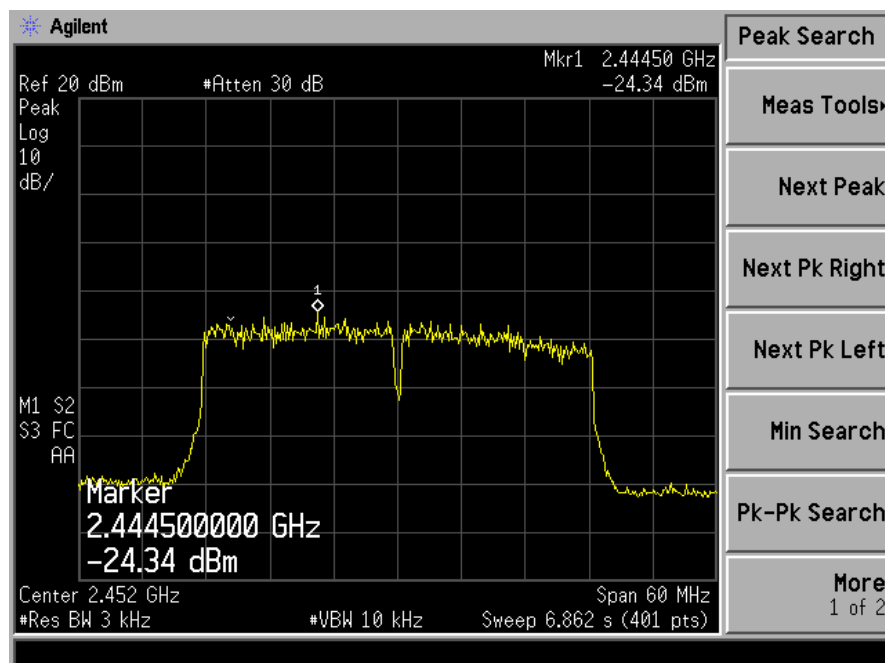
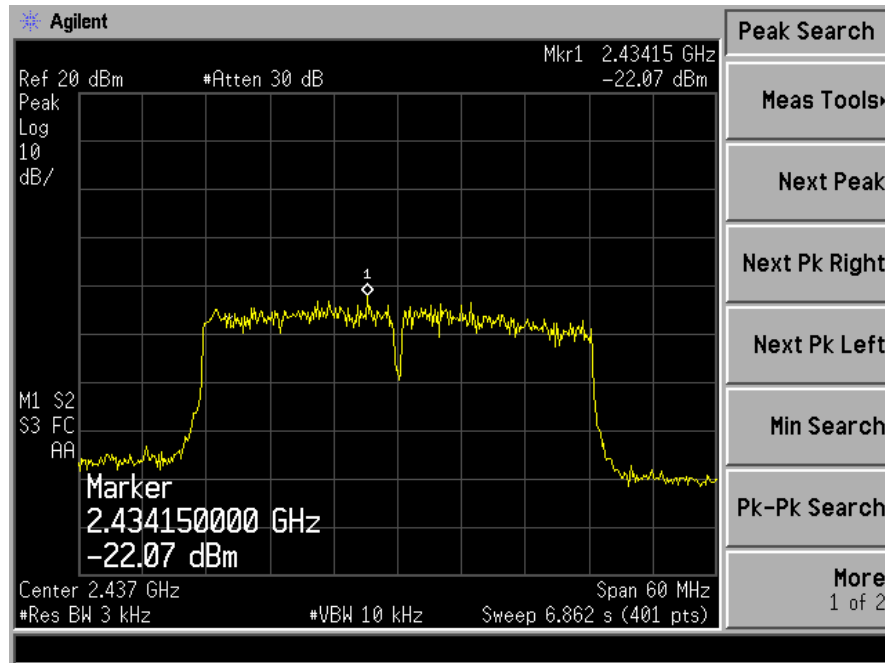


Spectrum Detector: PK  
 Test By: KK  
 Test Result: PASS  
 Operation Mode: 802.11n HT40

Test Date : September 02, 2014  
 Temperature : 24℃  
 Humidity : 53 %

Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
3	-23.53	<8dBm	PASS
6	-22.07	<8dBm	PASS
9	-24.34	<8dBm	PASS





## 11. Antenna Port Emission

### 11.1 Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4407B	88156318	05/17/2014	05/16/2015

### 11.2 Measuring Instruments and Setting

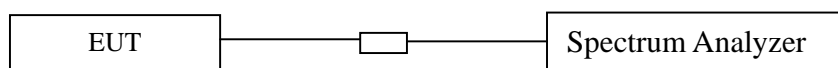
The following table is the setting of spectrum analyzer.

Spectrum analyzer	Setting
Attenuation	Auto
RB	100kHz for below 1GHz, 1MHz for above 1GHz
VB	300kHz for below 1GHz, 3MHz for above 1GHz
Detector	Peak
Trace	Max hold

### 11.3 Test Procedures

The conducted spurious emissions were measured conducted using a spectrum analyzer at low, Middle, and high channels, the limit was determined by attenuation 20dB of the RF peak power output.

### 11.4 Block Diagram of Test setup

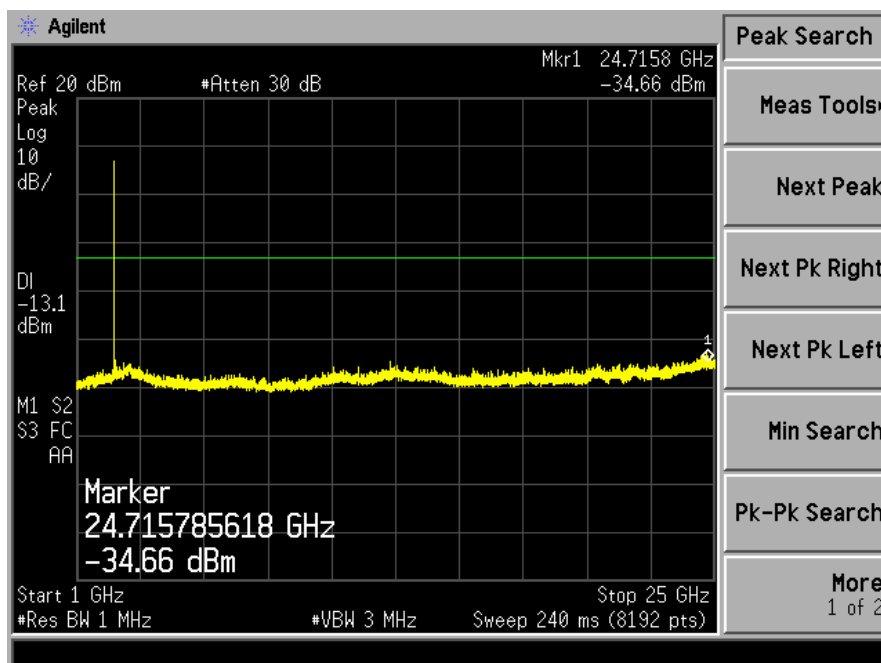
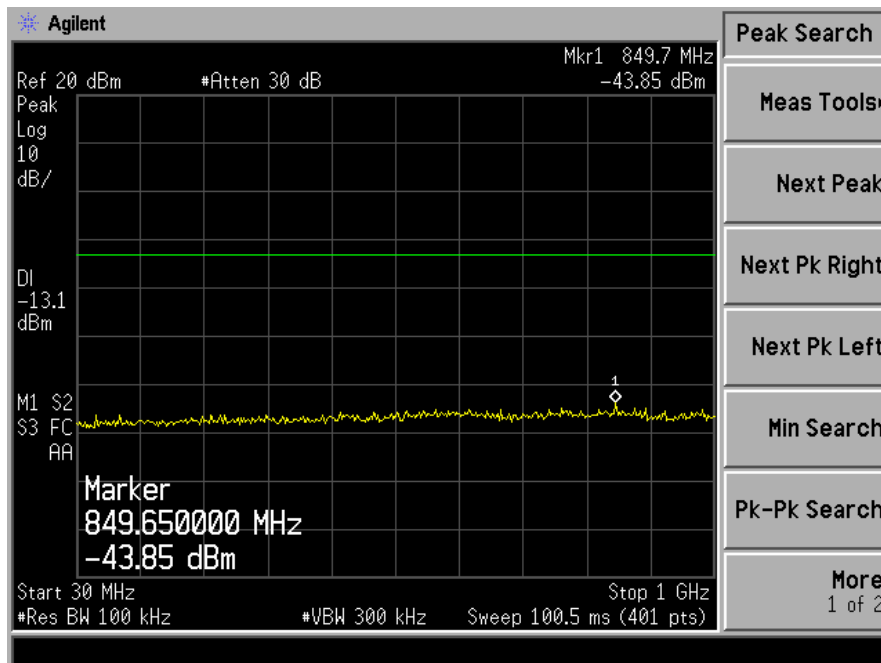


### 11.5 Test Result

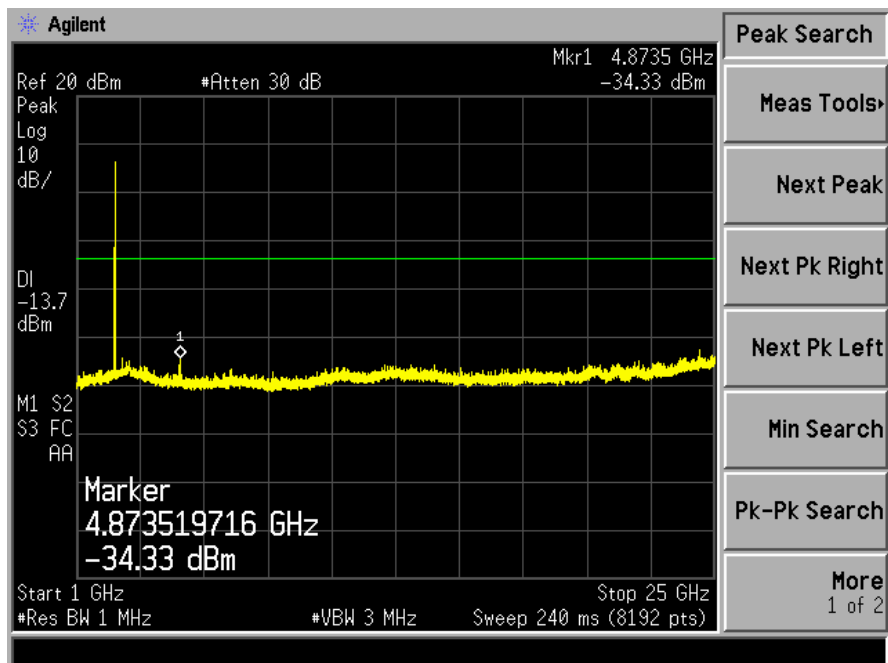
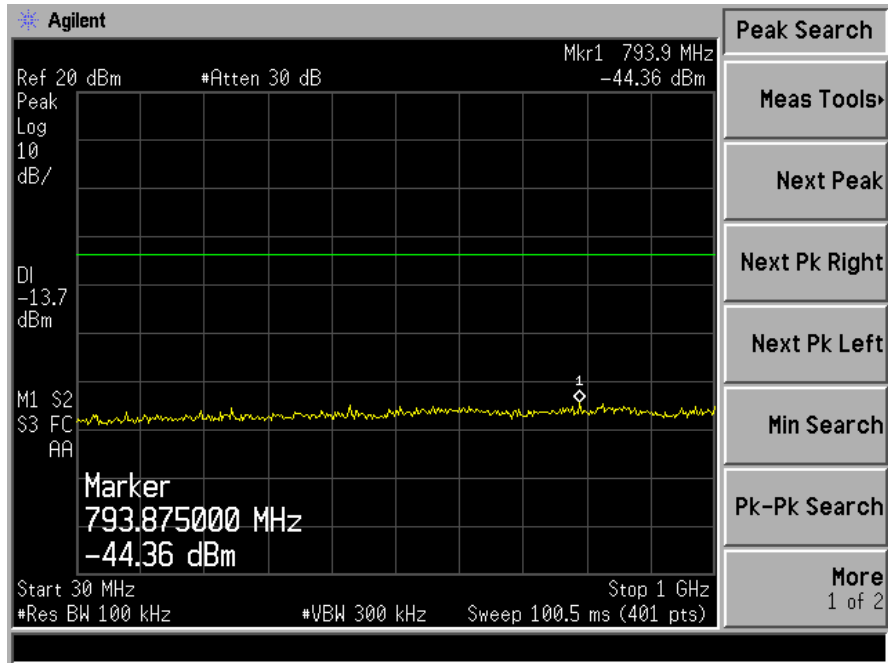
**PASS.**

All the modulation modes were tested the data of the worst mode (802.11b) are recorded in the following pages.

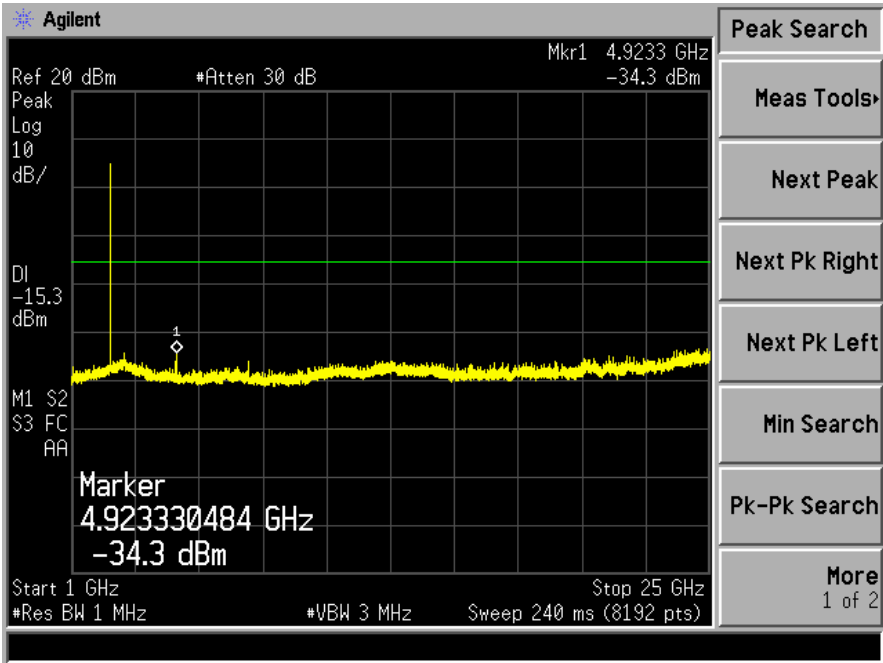
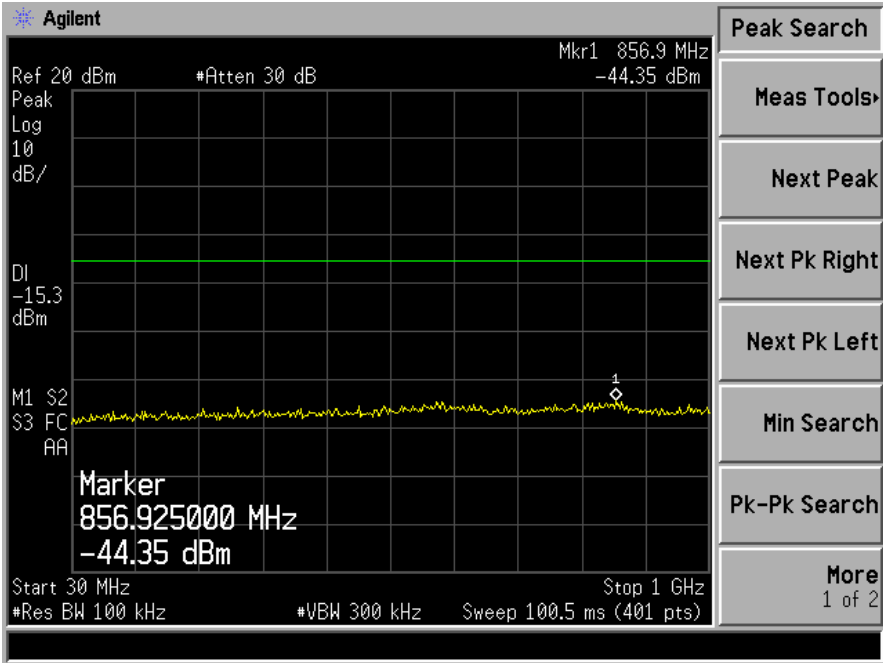
## 802.11b Low Channel 1



## 802.11b Mid Channel 6



802.11b High Channel 11



## **12. Antenna Application**

### **12.1 Antenna Requirement**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### **12.2 Result**

The EUT'S antenna is Ceramic Chip Antenna. The antenna's gain is 1dBi and meets the requirement.