




## TEST REPORT

Date: 2012-06-15

Report No.: 68.870.12.020.01F

**Applicant:** Shenzhen Yichen Technology Development Co., LTD  
5F, No.1, Honghualing 2nd Industrial Zone, Xili Town,  
Nanshan District, 518055 Shenzhen, Guangdong,  
People's Republic Of China.

**Description of Samples:** Model name: Intelligent Wireless Router  
Brand name:  JCG  
Model no.: JHR-N825R, JHR-N815R, JHR-N835R,  
JHR-N845R, JHR-N855R, JHR-N865R,  
JHR-N875R, JHR-N885R, JHR-N895R  
FCCID: HHOYC001

**Date Samples Received:** 2012-06-01

**Date Tested:** 2012-06-01 to 2012-06-11

**Investigation Requested:** FCC Part 15 Subpart C, Section 15.247

**Conclusions:** The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remarks:** ----

Checked by:

Approved by:-

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John Zhi  
Project Engineer  
Wireless & Telecom department

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Nicolas Cheng  
Project Manager  
Wireless & Telecom department

**CONTENT:**

Cover	Page 1 of 78	
Content	Page 2-3 of 78	
<b><u>1.0</u></b>	<b><u>General Details</u></b>	
1.1	Test Laboratory	Page 4 of 78
1.2	Applicant Details	Page 4 of 78
1.3	Equipment Under Test [EUT]	Page 5 of 78
1.4	Related Submittal(s) Grants	Page 5 of 78
<b><u>2.0</u></b>	<b><u>Technical Details</u></b>	
2.1	Investigations Requested	Page 6 of 78
2.2	Test Standards and Results Summary	Page 6 of 78
<b><u>3.0</u></b>	<b><u>Test Methodology</u></b>	
3.1	Radiated Emission	Page 7 of 78
3.2	Field Strength Calculation	Page 7 of 78
3.3	Conducted Emission	Page 7 of 78
<b><u>4.0</u></b>	<b><u>Test Results</u></b>	
4.1	6dB Bandwidth Measurement	Page 8-24 of 78
4.2	Power Spectral Density	Page 25-38 of 78
4.3	Band Edge Measurement	Page 39-48 of 78
4.4	Maximum Output Power	Page 49-62 of 78
4.5	Out of Band Emissions and Emissions in Restricted Bands	Page 63-71 of 78
4.6	Conducted Emission on AC Mains	Page 72-76 of 78
<b><u>5.0</u></b>	<b><u>RF Exposure Compliance Requirement</u></b>	Page 77 of 78
<b><u>6.0</u></b>	<b><u>List of Measurement Equipments</u></b>	Page 78 of 78



**Appendix A**

Photos of Test Setup

**Appendix B**

External EUT Photos

**Appendix C**

Internal EUT Photos



**1.0 General Details**

**1.1 Test Laboratory**

SEM.Test Compliance Services Co., Ltd.  
EMC Laboratory registered by FCC with  
FCC Registration Number: 994117

Test By: Susan Su  
Susan Su

**1.2 Applicant Details**  
**Applicant**

**Shenzhen Yichen Technology Development Co., LTD**  
5F, No.1, Honghualing 2nd Industrial Zone, Xili Town,  
Nanshan District, 518055 Shenzhen, Guangdong,  
People's Republic Of China.

**Manufacturers**

**Shenzhen Yichen Technology Development Co., LTD**  
5F, No.1, Honghualing 2nd Industrial Zone, Xili Town,  
Nanshan District, 518055 Shenzhen, Guangdong,  
People's Republic Of China.



### 1.3 Equipment Under Test [EUT]

#### Description of EUT

Product Description:	Intelligent Wireless Router
Model No.:	JHR-N825R, JHR-N815R, JHR-N835R, JHR-N845R, JHR-N855R, JHR-N865R, JHR-N875R, JHR-N885R, JHR-N895R
Brand Name:	<b>JCG</b>
FCCID:	HHOYC001
Rating:	DC12V, 1A powered by AC/DC adapter Model : HKA01212010-2F, XKD-C1000IC12.0-12W
Operated Frequency:	2412 -2462 MHz
No. of Operated Channel:	11 (802.11b/g/nHT20) 7 (802.11nHT40)
Data Rate:	802.11b: 1, 2, 5.5, 11Mbps; 802.11g: 6, 9, 12, 24, 36, 48, 54Mbps; 802.11nHT20: MCS0-15 · Support up to 150Mbps 802.11nHT40: MCS0-15, Support up to 300Mbps
Modulation:	BPSK, QPSK, CCK and OFDM (BPSK/QPSK/16-QAM/ 64-QAM)
Accessories and Auxiliary Equipments:	AC/DC power adaptor.
Antenna Type:	2x4dBi Fixed Antenna
Manufacture of Antenna:	SHENZHEN FLY ELECTRONIC CO., LTD
Antenna Gain:	4dBi
Antenna Model:	N/A

#### General Operation of EUT

The Equipment Under Test (EUT) is a Intelligent Wireless Router System operated at 2.4GHz. DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g/n Operation Principle:  
This Systems using embedded MIMO RF transceiver consists of two receivers and two transmitters used to form a complete 2.4GHz ISM band Wireless LAN application. The EUT shall be simultaneous transmission at the antenna 0 and antenna 1 for 802.11g , 802.11n HT20 or HT40, 802.11b mode shall be transmission only single antenna (antenna 0 or antenna 1).

As per client declaration, the model JHR-N815R, JHR-N835R, JHR-N845R, JHR-N855R, JHR-N865R, JHR-N875R, JHR-N885R, JHR-N895R, which utilize the identical circuit design, PCB layout, shielding and interface with the model JHR-N825R, only the cosmetic is difference. Therefore the mainly perform test on JHR-N825R model.

#### 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 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.  
IEEE802.11nHT20: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with MCS0 data rate (worst case) are chosen for the final testing.  
IEEE802.11nHT40: Channel 3(2422MHz), Channel 6(2437MHz) and Channel 9(2452MHz) with MCS0 data rate (the worst case) are chosen for the final testing.

### 1.4 Related Submittal(s) Grants

This is a signal application subject to Certificate Authorization.



## 2.0 Technical Details

### 2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2009 and ANSI C63.4: 2003 for FCC Verification

### 2.2 Test Standards and Results Summary Tables

Test Condition	Test Requirement	Test Result	
		Pass	N/A
Number of Frequency Hopping	Section 15.247 ( a1 )	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6dB Bandwidth Measurement	Section 15.247 ( a2 )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Power Spectral Density	Section 15.247 ( e )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pseudorandom Hopping Algorithm	Section 15.247 ( a1 )	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Band Edge Measurement	Section 15.247	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Maximum Output Power	Section 15.247 ( b3 )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Out of Band Emission	Section 15.247 ( d )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated Emission in Restricted Band	Section 15.247 ( d )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Conducted Emission on AC Mains	Section 15.207	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RF Exposure	Section 15.247 ( i )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Antenna Requirement	Section 15.203	<input checked="" type="checkbox"/> See note 1	<input type="checkbox"/>

Note 1 : The EUT uses a permanently attached antenna, which in accordance to Section 15.203, is considered sufficient to comply with the provisions of this section.

Remark: N/A - Not Applicable



### **3.0 Test Methodology**

#### **3.1 Radiated Emission**

The sample was placed 0.8m above the ground plane on a standard emission test site \*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\*On a standard emission test site with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 994117.

#### **3.2 Field Strength Calculation**

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$\text{FS} = \text{R} + \text{System Factor}$$
$$\text{System Factor} = \text{AF} + \text{CF} + \text{FA} - \text{PA}$$

Where FS = Net Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer / Test Receiver in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

#### **3.3 Conducted Emissions**

The test was performed in accordance with ANSI C63.4: 2003, with the following: initial measurements were performed in peak and average detection modes on the live line of personal computer, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.



## **4.0 Test Results**

### **4.1 6 dB Bandwidth Measurement**

Test Requirement:	FCC part 15 section 15.247 (a2)
Test Date:	2012-06-08
Mode of Operation:	Transmitting continuously mode.
Detector Function:	Max Hold

**Result: PASS**

#### **Test Setup:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

#### **Antenna 0**

##### **For 802.11B Mode**

<b>Channel</b>	<b>Measured frequency (MHz)</b>	<b>6dB Bandwidth (MHz)</b>
Lowest	2412	11.943
Middle	2437	11.132
Highest	2462	11.976

This result is used for checking the systems using digital modulation techniques may operate in the 2400–2483.5 MHz.

#### **Limits for 6 dB bandwidth [ Section 15.247 (a2) ]:**

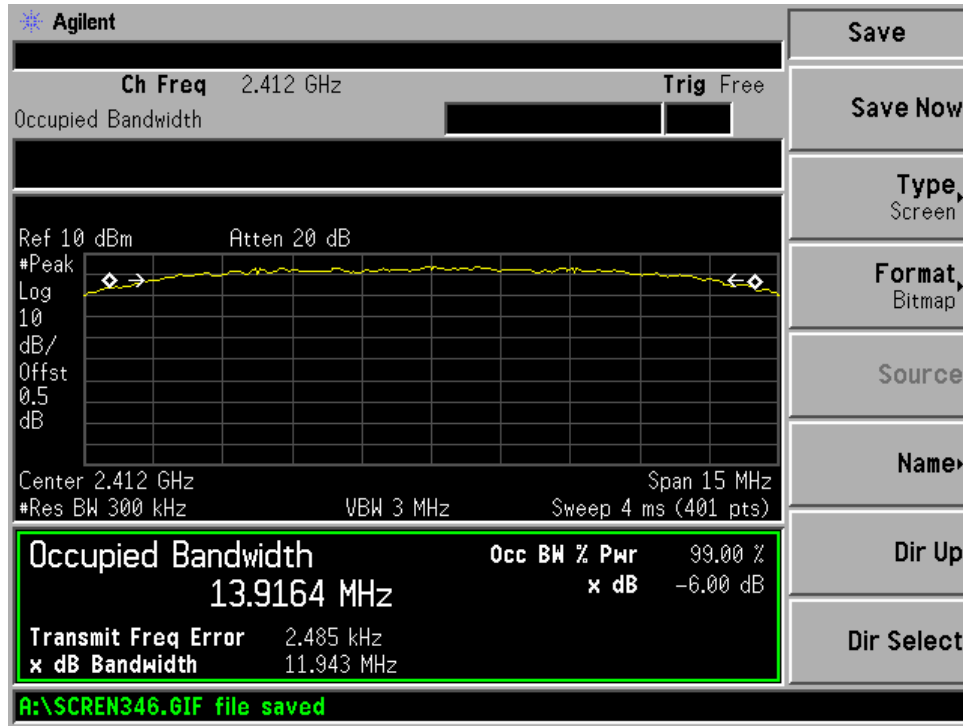
The minimum 6 dB bandwidth shall be at least 500 kHz.



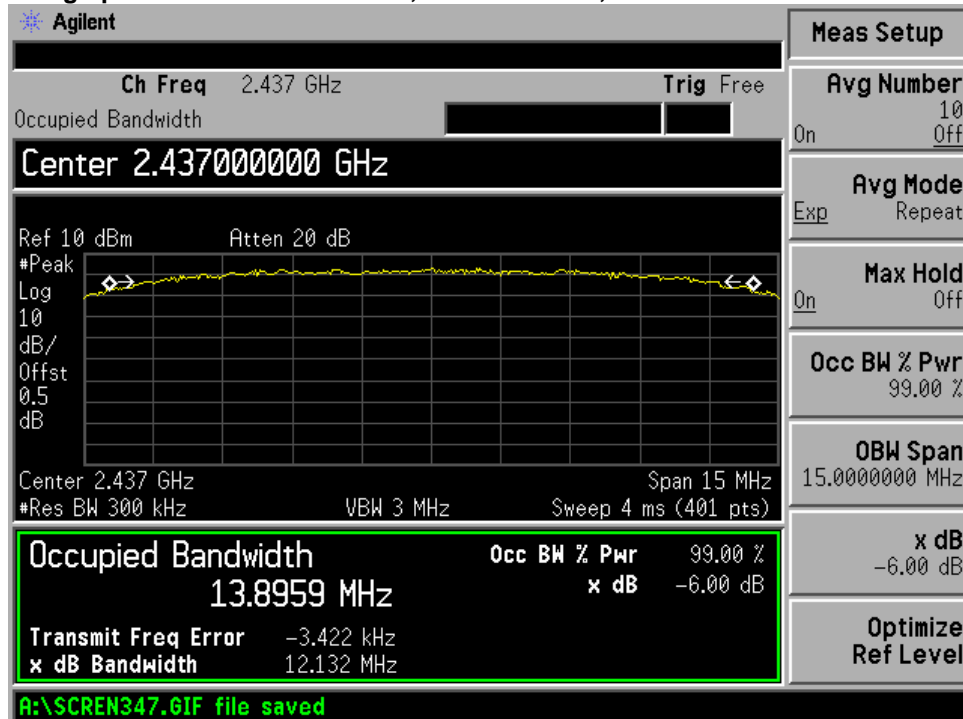


**For 802.11B Mode**

Result data graph shows 6 dB bandwidth, CF = 2.412GHz, BW = 11.943 MHz

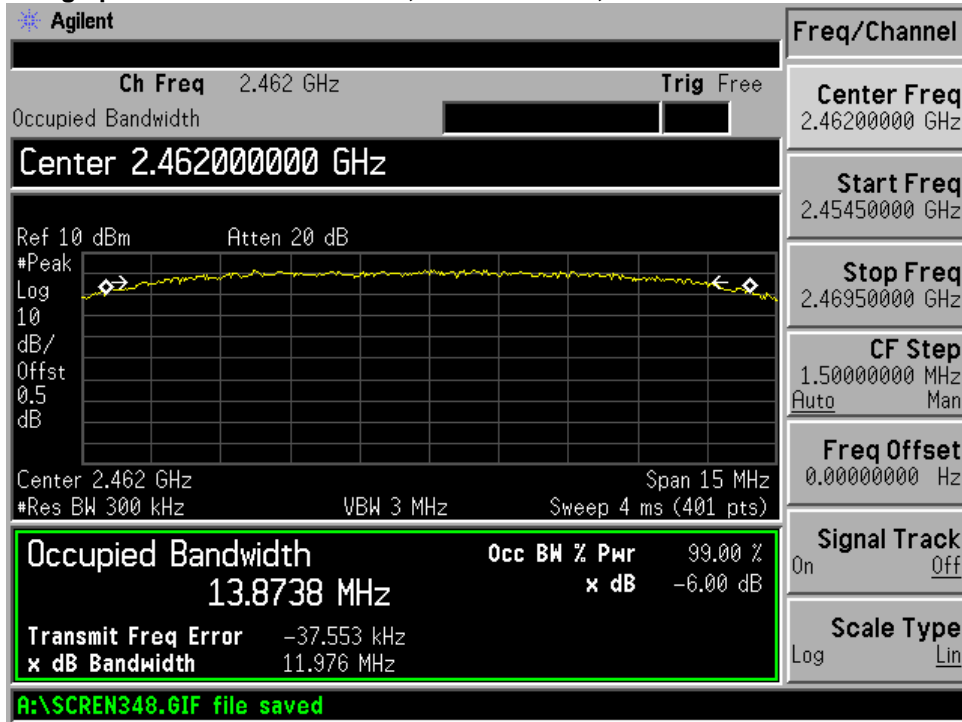


Result data graph shows 6 dB bandwidth, CF = 2.437GHz, BW = 12.132MHz





Result data graph shows 6 dB bandwidth, CF = 2.462GHz, BW = 11.976MHz





**For 802.11G Mode**

Channel	Measured frequency (MHz)	6dB Bandwidth (MHz)
Lowest	2412	16.006
Middle	2437	16.625
Highest	2462	16.124

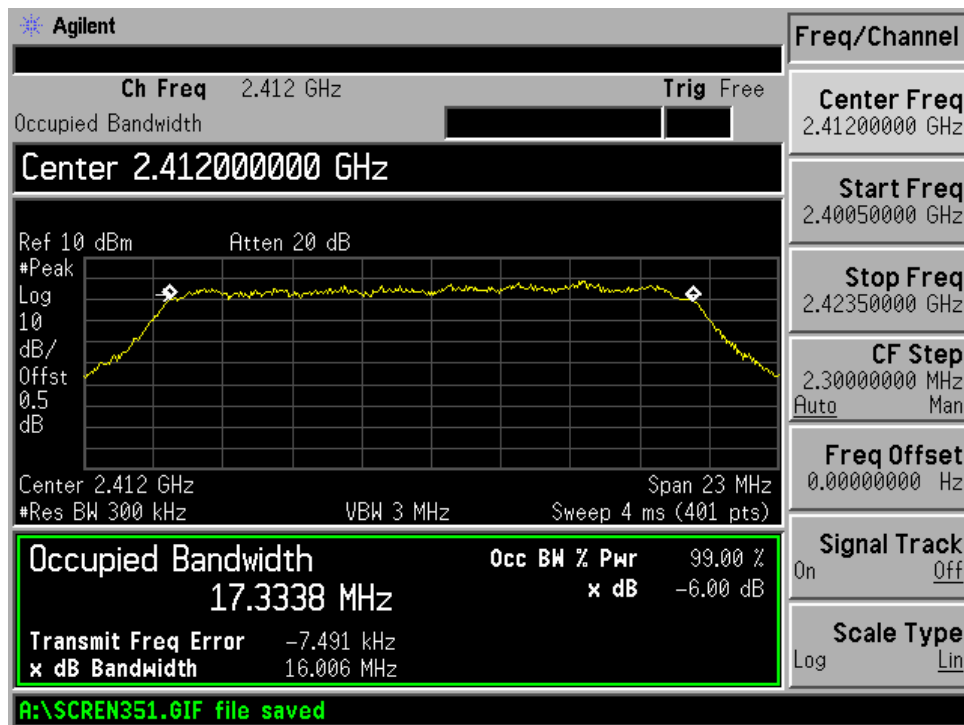
This result is used for checking the systems using digital modulation techniques may operate in the 2400–2483.5 MHz.

**Limits for 6 dB bandwidth [ Section 15.247 (a2) ]:**

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

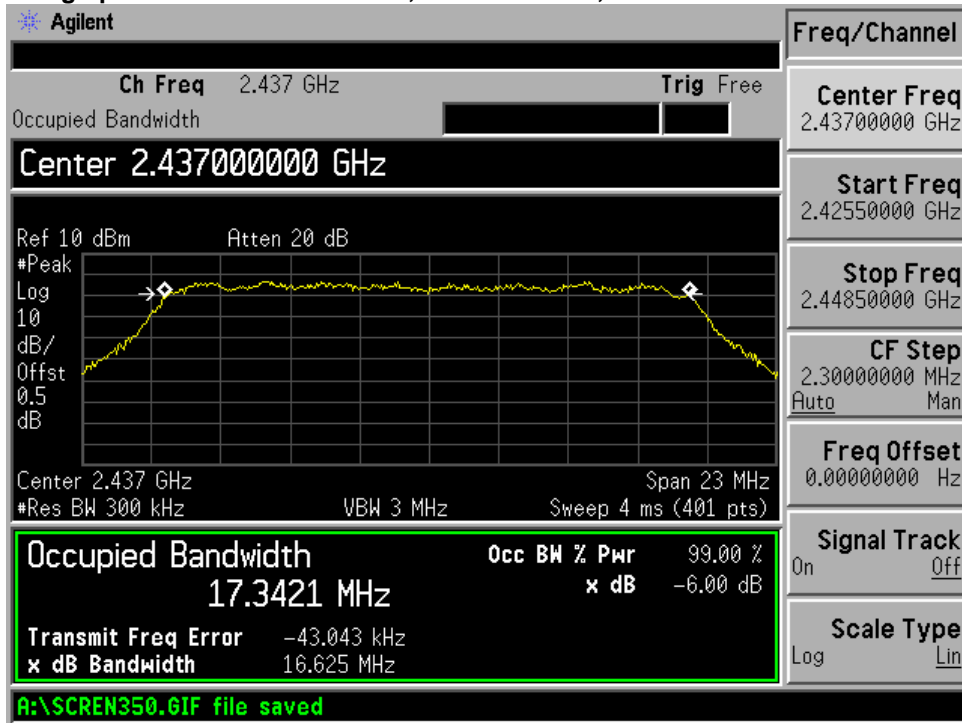
**For 802.11G Mode**

Result data graph shows 6 dB bandwidth, CF = 2.412GHz, BW = 16.006 MHz

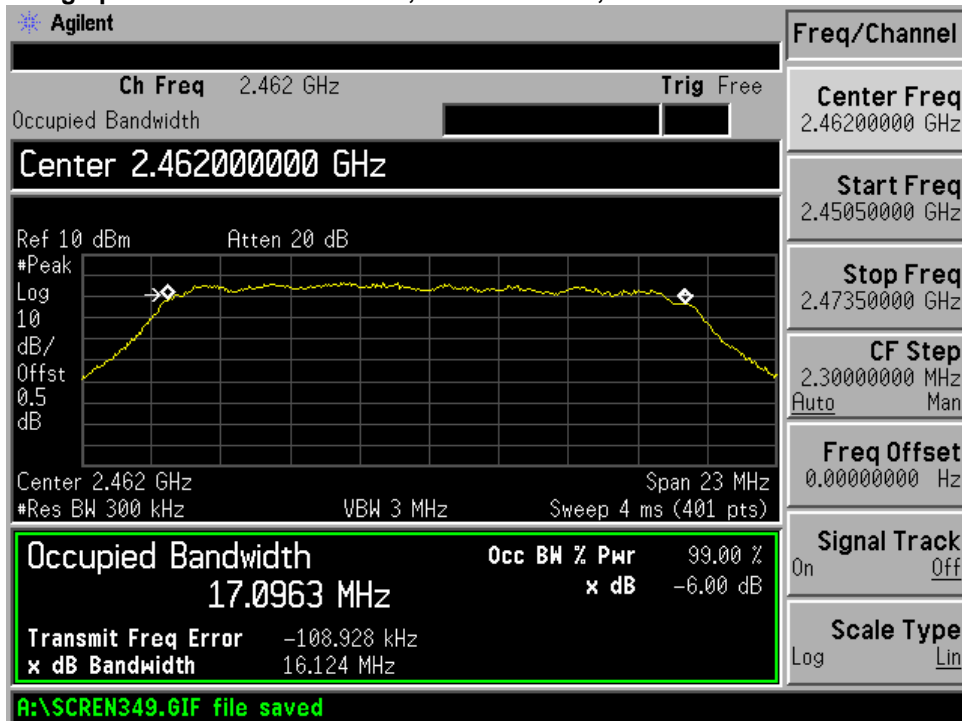




Result data graph shows 6 dB bandwidth, CF = 2.437GHz, BW = 16.625MHz



Result data graph shows 6 dB bandwidth, CF = 2.462GHz, BW = 16.124MHz





**For 802.11N HT20 Mode**

Channel	Measured frequency (MHz)	6dB Bandwidth (MHz)
Lowest	2412	17.191
Middle	2437	16.530
Highest	2462	17.049

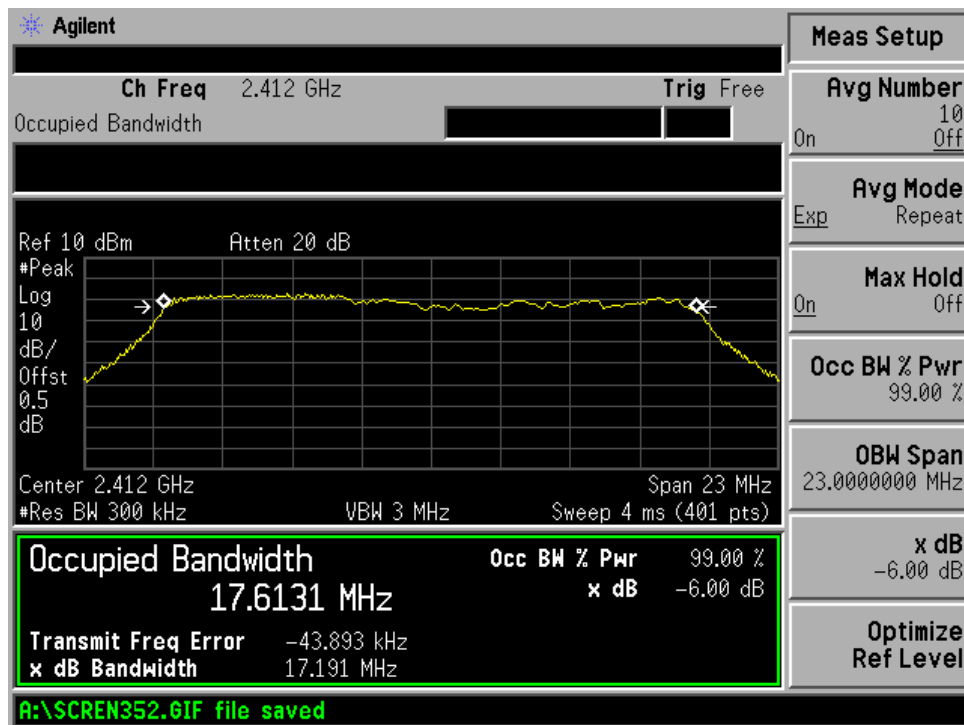
This result is used for checking the systems using digital modulation techniques may operate in the 2400–2483.5 MHz.

**Limits for 6 dB bandwidth [ Section 15.247 (a2) ]:**

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

**For 802.11N HT20 Mode**

**Result data graph shows 6 dB bandwidth, CF = 2.412GHz, BW = 17.191 MHz**







**For 802.11N HT40 Mode**

Channel	Measured frequency (MHz)	6dB Bandwidth (MHz)
Lowest	2422	34.877
Middle	2437	35.523
Highest	2452	34.940

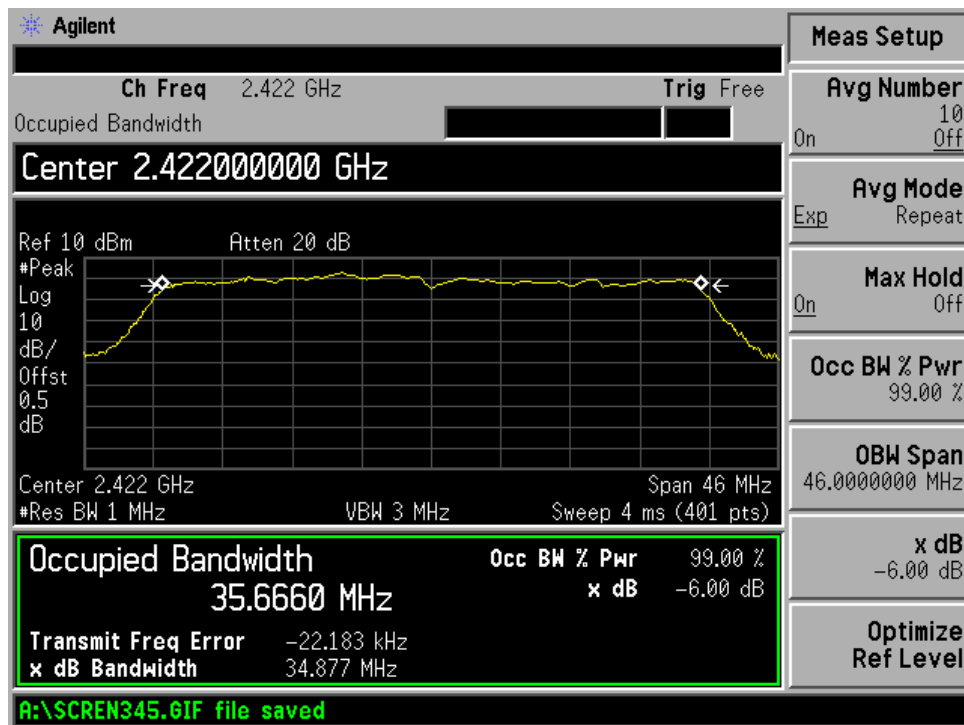
This result is used for checking the systems using digital modulation techniques may operate in the 2400–2483.5 MHz.

**Limits for 6 dB bandwidth [ Section 15.247 (a2) ]:**

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

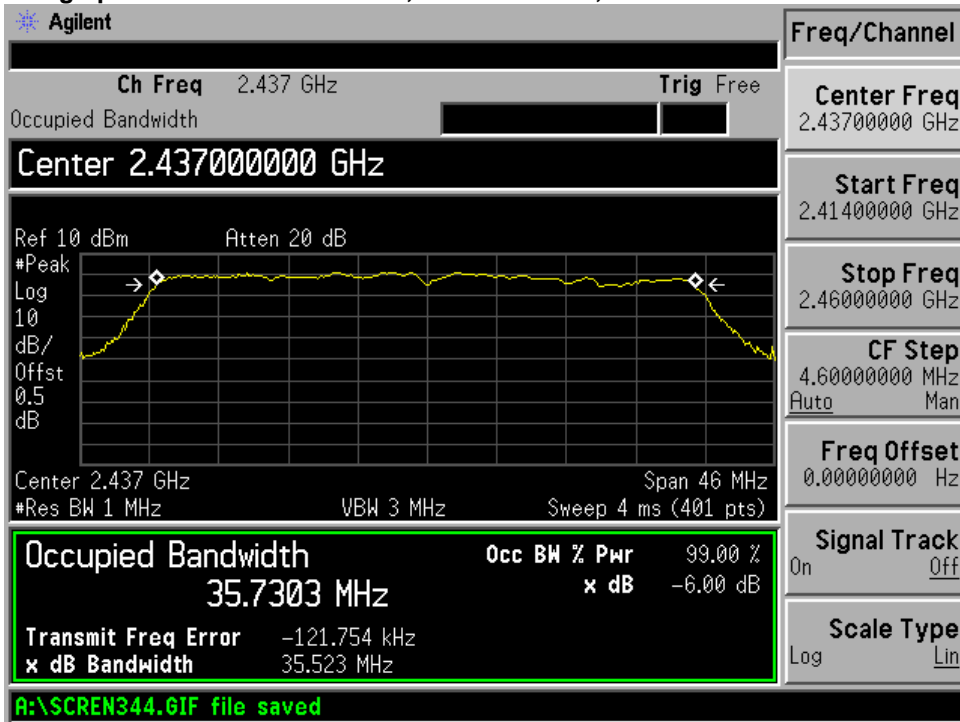
**For 802.11N HT40 Mode**

**Result data graph shows 6 dB bandwidth, CF = 2.422GHz, BW = 34.877 MHz**

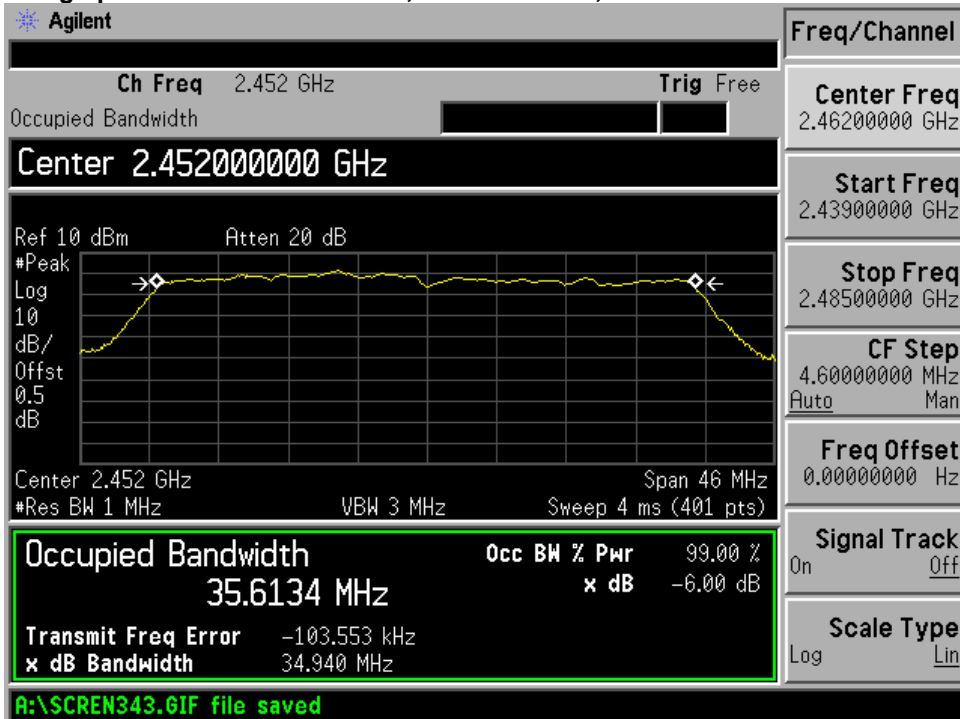




Result data graph shows 6 dB bandwidth, CF = 2.437GHz, BW = 35.523MHz



Result data graph shows 6 dB bandwidth, CF = 2.452GHz, BW = 34.940MHz







**Antenna 1**

**For 802.11B Mode**

Channel	Measured frequency (MHz)	6dB Bandwidth (MHz)
Lowest	2412	11.711
Middle	2437	11.698
Highest	2462	11.675

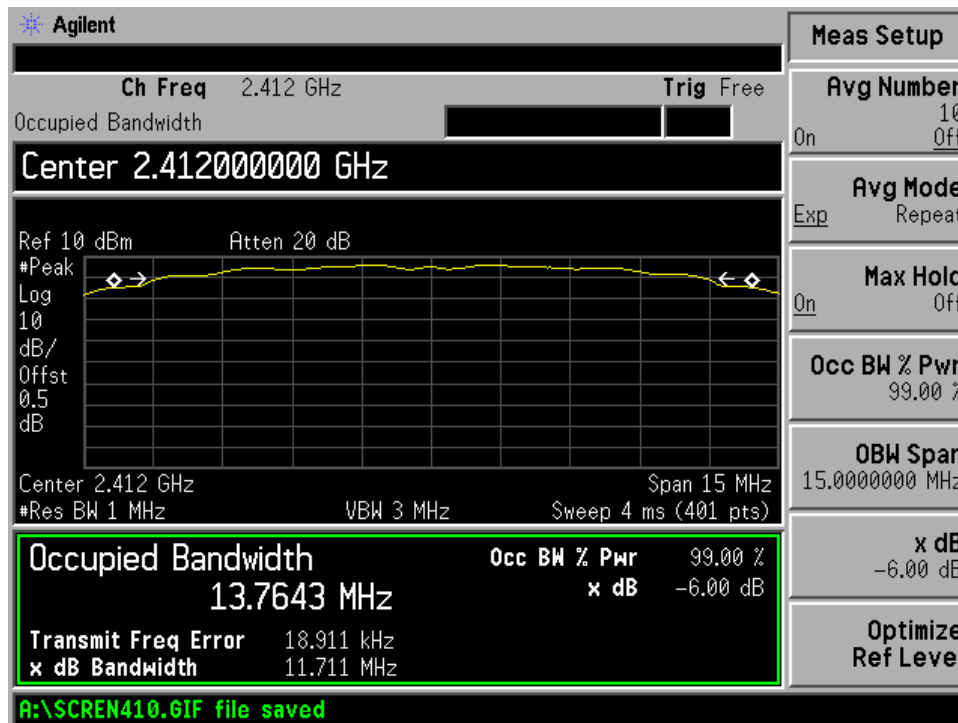
This result is used for checking the systems using digital modulation techniques may operate in the 2400–2483.5 MHz.

**Limits for 6 dB bandwidth [ Section 15.247 (a2) ]:**

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

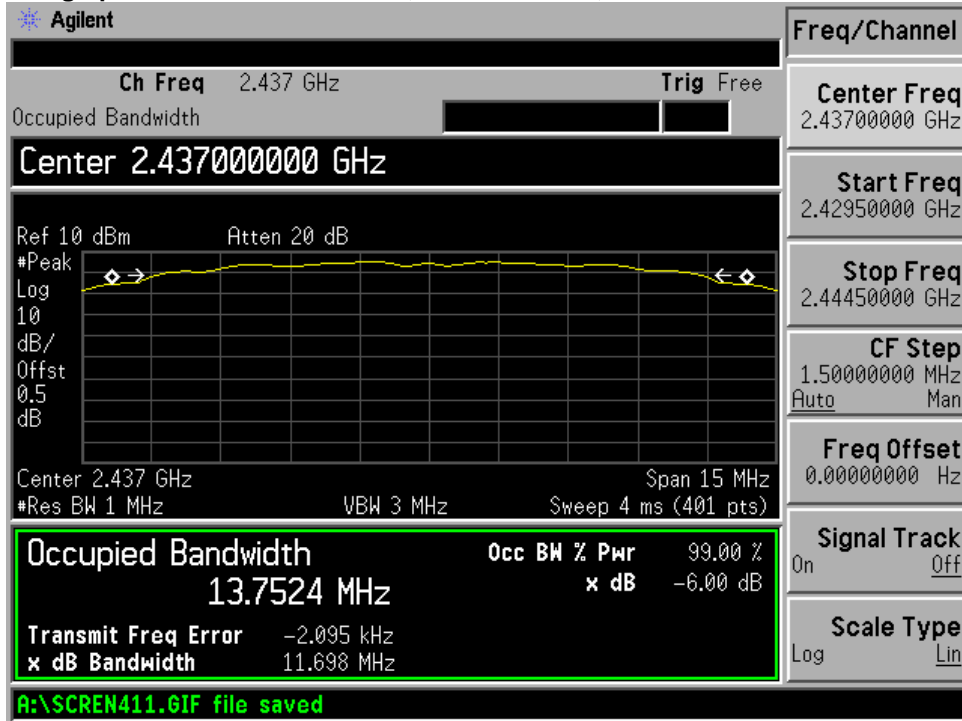
**For 802.11B Mode**

**Result data graph shows 6 dB bandwidth, CF = 2.412GHz, BW = 11.711 MHz**

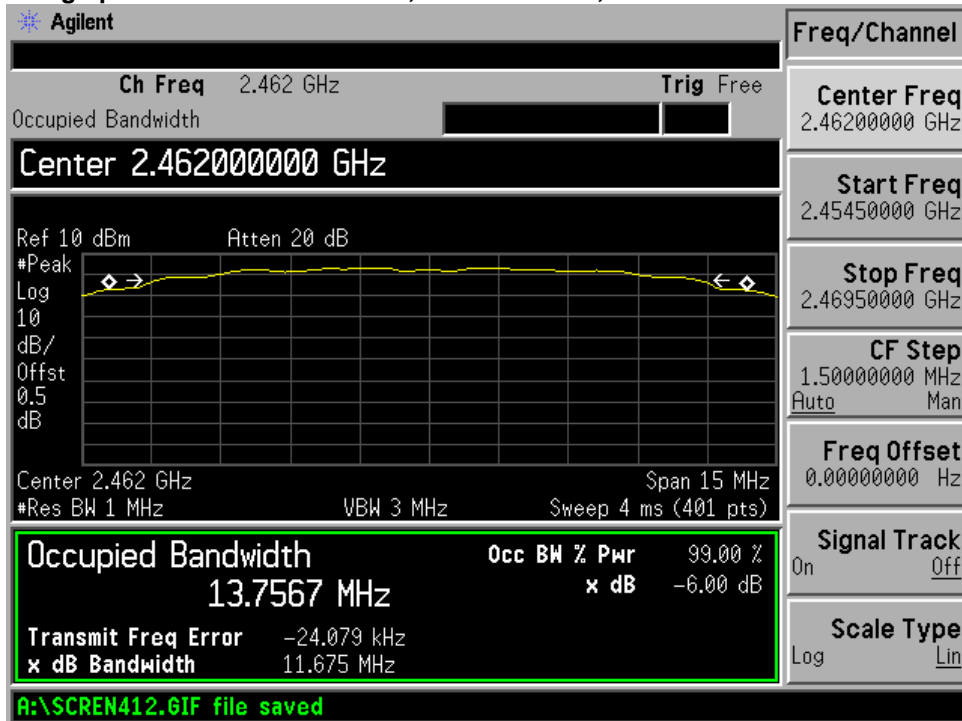




Result data graph shows 6 dB bandwidth, CF = 2.437GHz, BW = 11.698MHz



Result data graph shows 6 dB bandwidth, CF = 2.462GHz, BW = 11.675MHz





**For 802.11G Mode**

Channel	Measured frequency (MHz)	6dB Bandwidth (MHz)
Lowest	2412	16.171
Middle	2437	16.124
Highest	2462	16.156

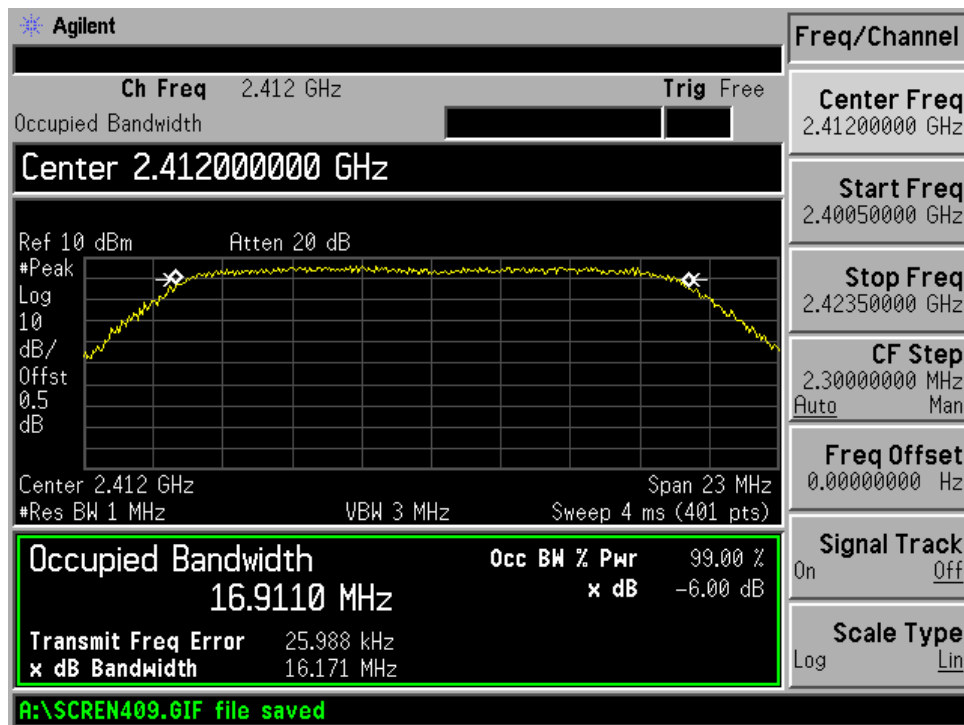
This result is used for checking the systems using digital modulation techniques may operate in the 2400–2483.5 MHz.

**Limits for 6 dB bandwidth [ Section 15.247 (a2) ]:**

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

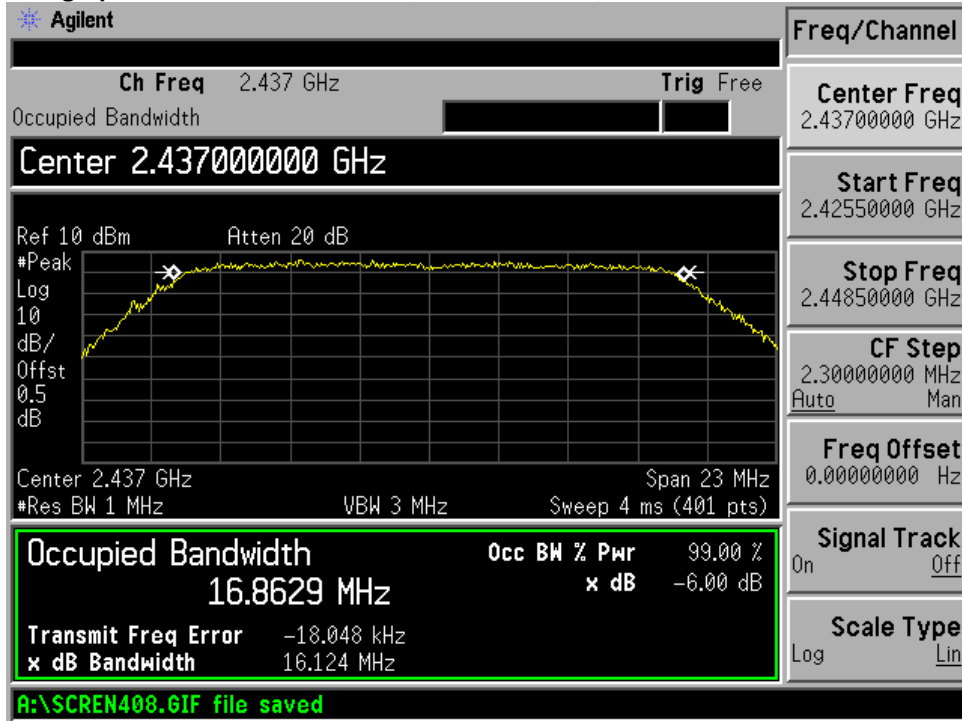
**For 802.11G Mode**

Result data graph shows 6 dB bandwidth, CF = 2.412GHz, BW = 16.171MHz

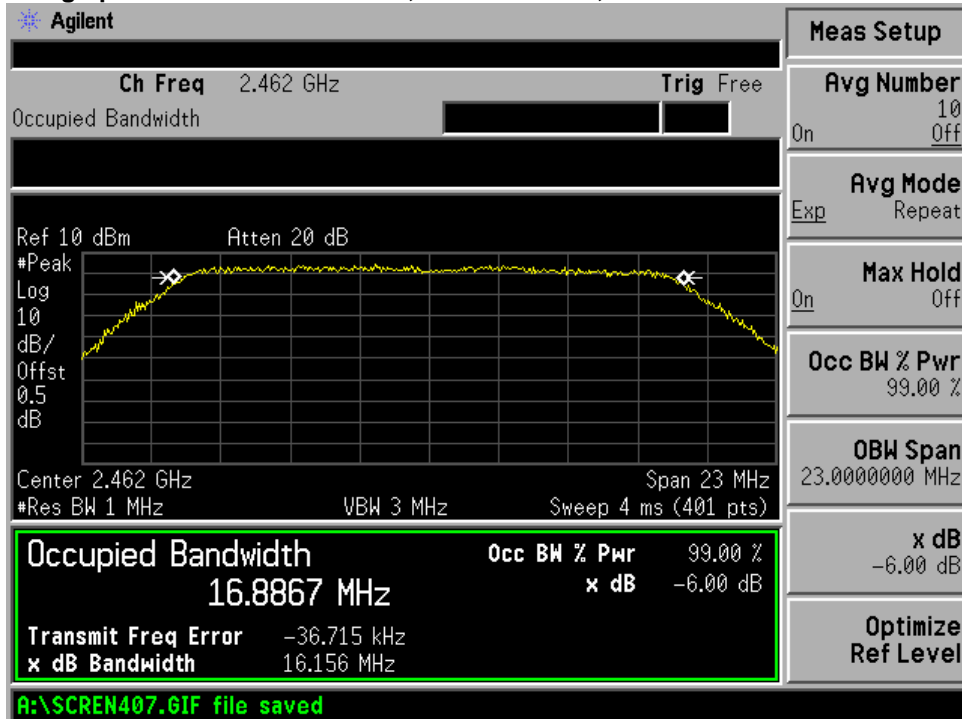




Result data graph shows 6 dB bandwidth, CF = 2.437GHz, BW = 16.124MHz



Result data graph shows 6 dB bandwidth, CF = 2.462GHz, BW = 16.156MHz





**For 802.11N HT20 Mode**

Channel	Measured frequency (MHz)	6dB Bandwidth (MHz)
Lowest	2412	17.138
Middle	2437	17.079
Highest	2462	16.971

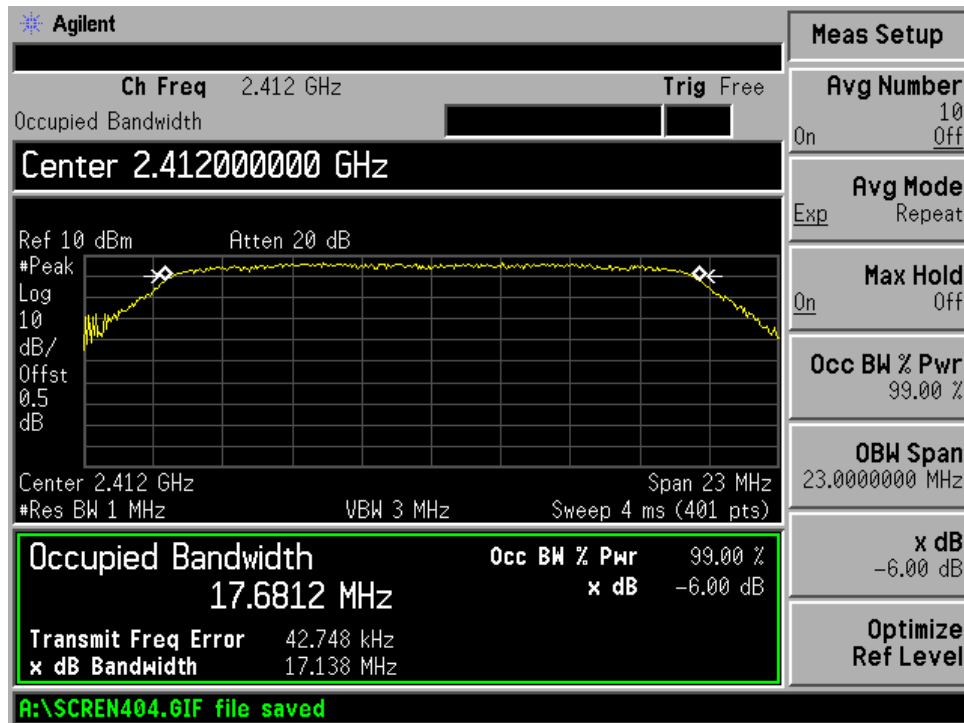
This result is used for checking the systems using digital modulation techniques may operate in the 2400–2483.5 MHz.

**Limits for 6 dB bandwidth [ Section 15.247 (a2) ]:**

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

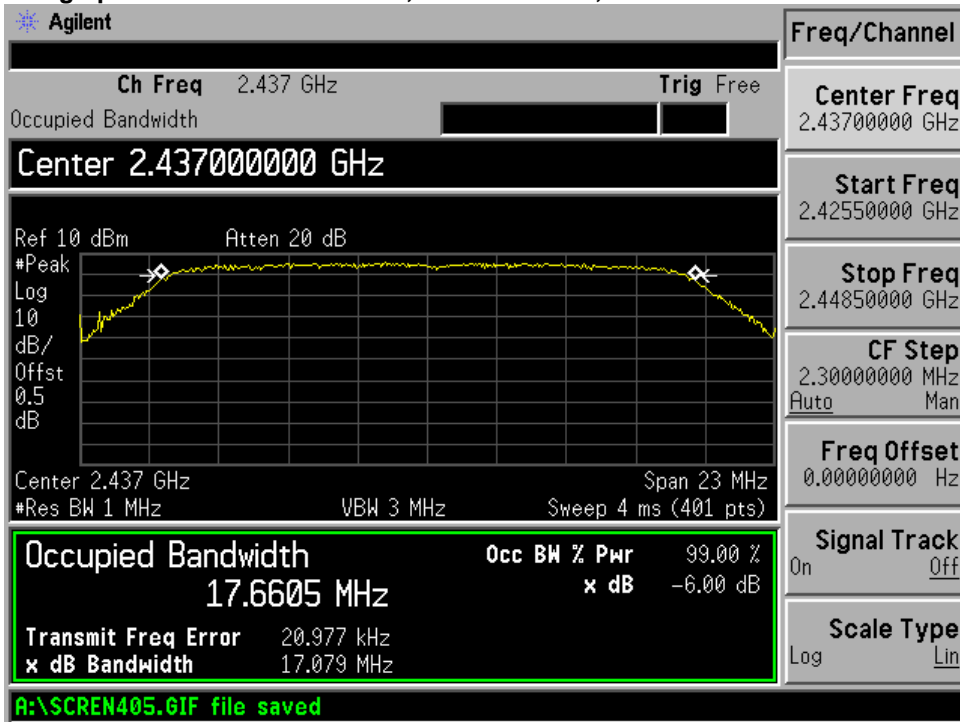
**For 802.11N HT20 Mode**

**Result data graph shows 6 dB bandwidth, CF = 2.412GHz, BW = 17.138 MHz**

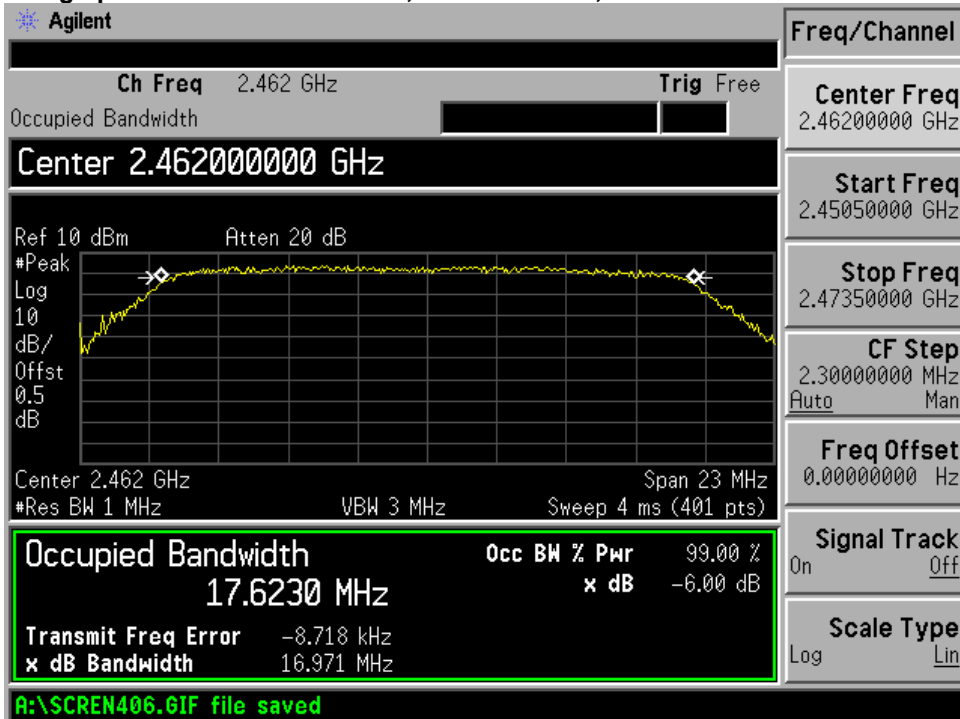




Result data graph shows 6 dB bandwidth, CF = 2.437GHz, BW = 17.079MHz



Result data graph shows 6 dB bandwidth, CF = 2.462GHz, BW = 16.971MHz





**For 802.11N HT40 Mode**

Channel	Measured frequency (MHz)	6dB Bandwidth (MHz)
Lowest	2422	35.307
Middle	2437	35.391
Highest	2452	35.294

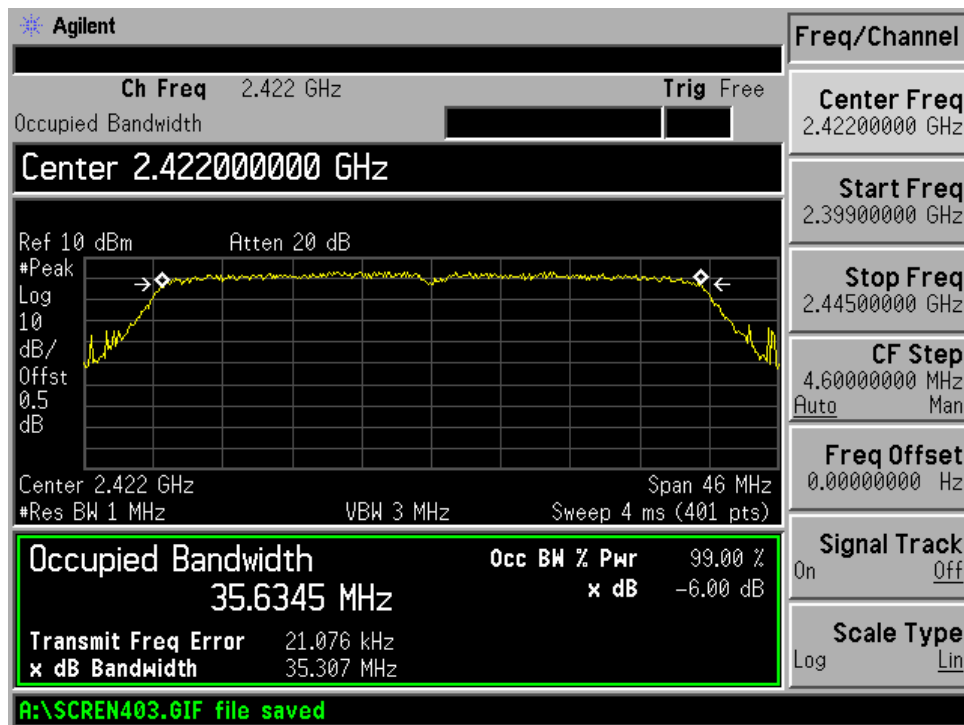
This result is used for checking the systems using digital modulation techniques may operate in the 2400–2483.5 MHz.

**Limits for 6 dB bandwidth [ Section 15.247 (a2) ]:**

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

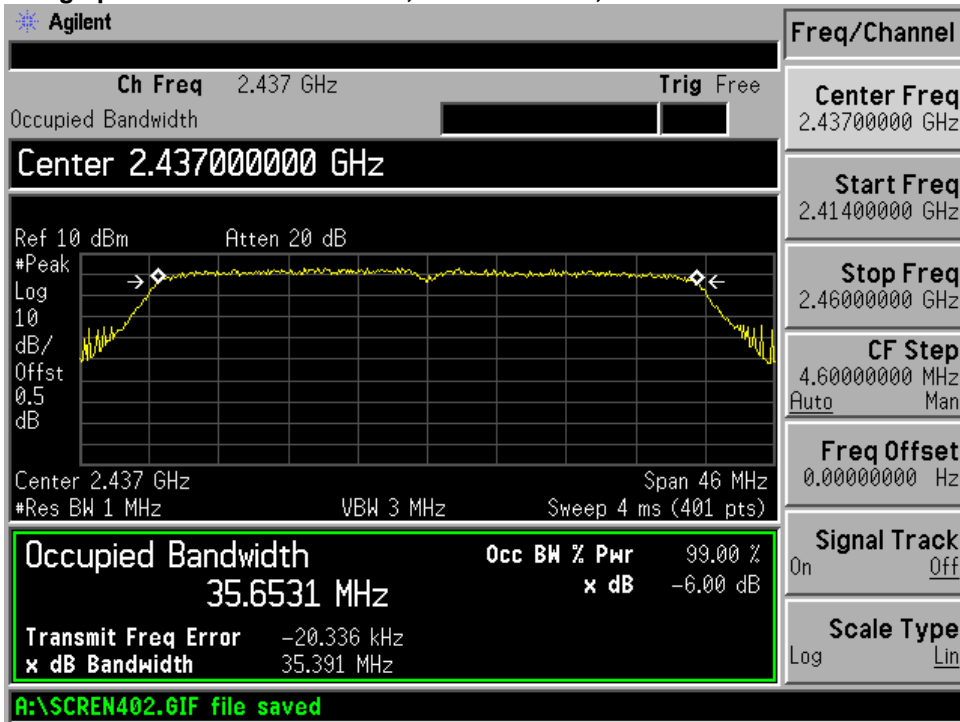
**For 802.11N HT40 Mode**

**Result data graph shows 6 dB bandwidth, CF = 2.422GHz, BW = 35.307 MHz**

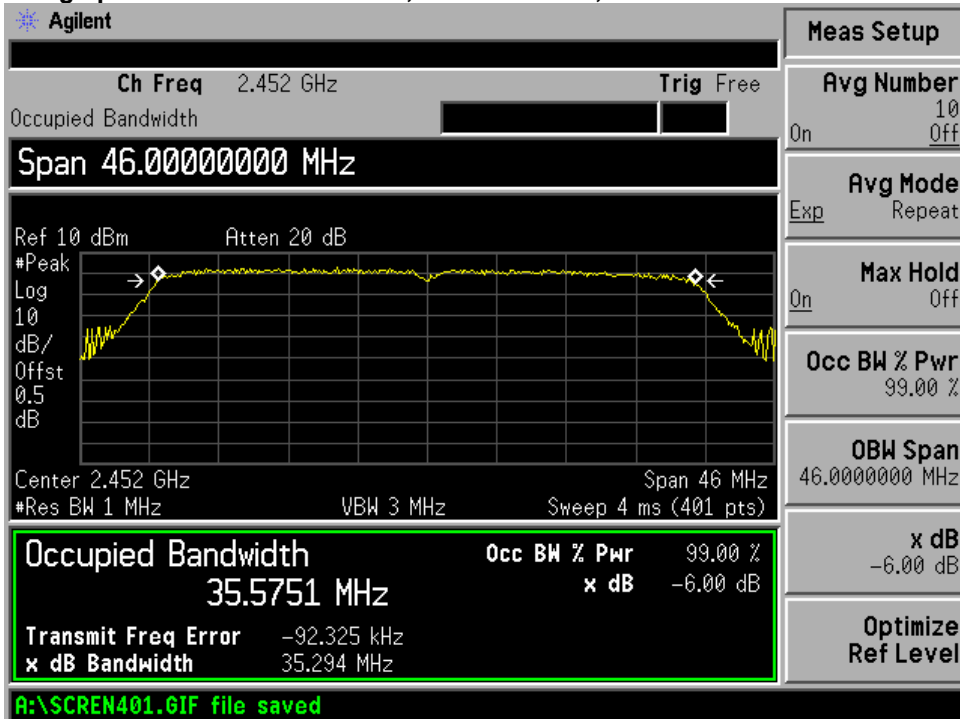




Result data graph shows 6 dB bandwidth, CF = 2.437GHz, BW = 35.391MHz



Result data graph shows 6 dB bandwidth, CF = 2.452GHz, BW = 35.294MHz







## 4.2 Power Spectral Density

Test Requirement: FCC part 15 section 15.247 (e)  
 Test Date: 2012-06-08  
 Mode of Operation: Transmitting continuously mode  
 Detector Function: Average

**Result : PASS**

### Measured Result :

For 802.11b

Test mode	Test channel	Antenna 0 Reading dBm/100kHz	Antenna 1 Reading dBm/100kHz	Antenna 0 Corrected dBm/3kHz	Antenna 1 Corrected dBm/3kHz	Limit dBm/3kHz
802.11b	Low channel (2412MHz)	-7.922	-6.941	-23.122	-22.141	8
	Mid channel (2437MHz)	-8.522	-7.494	-23.722	-22.694	8
	High channel (2462MHz)	-9.903	-9.244	-25.103	-24.444	8

For 802.11g

Test mode	Test channel	Antenna 0 Reading dBm/100kHz	Antenna 1 Reading dBm/100kHz	Corrected dBm/3kHz	Limit dBm/3kHz
802.11g	Low channel (2412MHz)	-12.91	-12.27	-24.77	8
	Middle channel (2437MHz)	-13.64	-13.04	-25.52	8
	High channel (2462MHz)	-14.66	-14.14	-26.58	8

For 802.11n HT20/HT40

Test mode	Test channel	Antenna 0 Reading dBm/100kHz	Antenna 1 Reading dBm/100kHz	Corrected dBm/3kHz	Limit dBm/3kHz
802.11n HT20 (MCS0)	Low channel (2412MHz)	-13.85	-12.18	-25.12	8
	Middle channel (2437MHz)	-13.94	-13.35	-25.82	8
	High channel (2462MHz)	-16.15	-15.09	-27.78	8
802.11n HT40 (MCS0)	Low channel (2422MHz)	-18.02	-16.48	-29.37	8
	Middle channel (2437MHz)	-20.31	-16.87	-30.45	8
	High channel (2452MHz)	-20.47	-17.62	-31.04	8



## Note:

1. The EUT shall be simultaneous transmission at the Antenna 0 and Antenna 1 of 802.11g and 802.11n HT20 or HT40, 802.11b mode shall be transmission only single Antenna (Antenna 0 or Antenna 1).
2. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3 \text{ kHz}/100 \text{ kHz}) = -15.2 \text{ dB}$ .

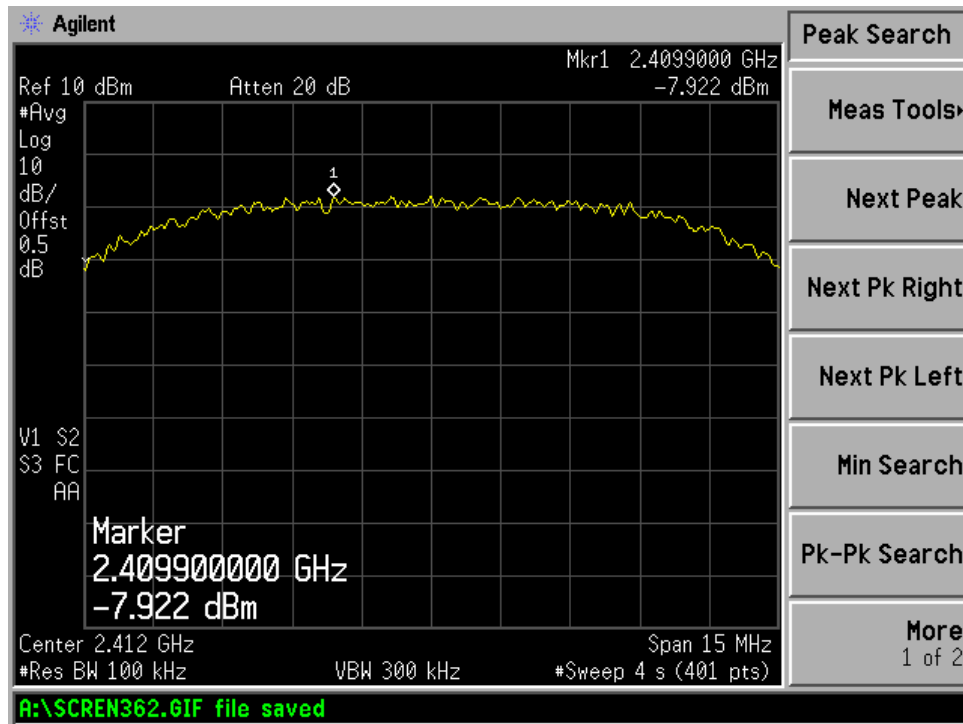
Above testing data is included of 0.5dB cable loss which between antenna port and spectrum.

**Limits for power spectral density [ Section 15.247 (e) ]:**

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

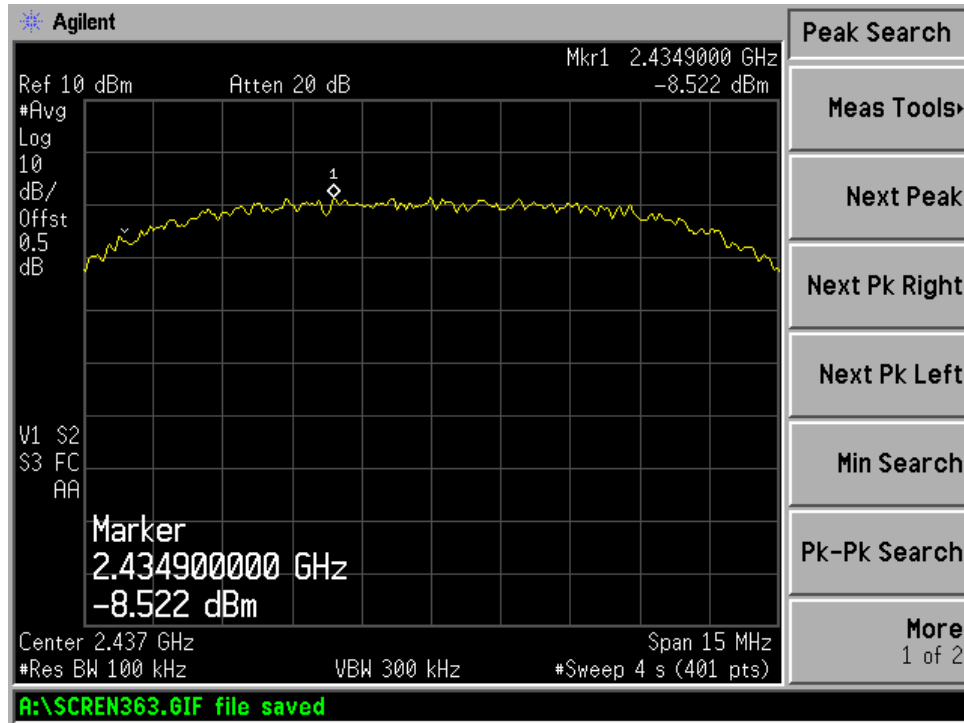
**Antenna 0****For 802.11B Mode**

Result data graph shows Low channel power spectrum density is -7.922dBm at 100kHz RBW

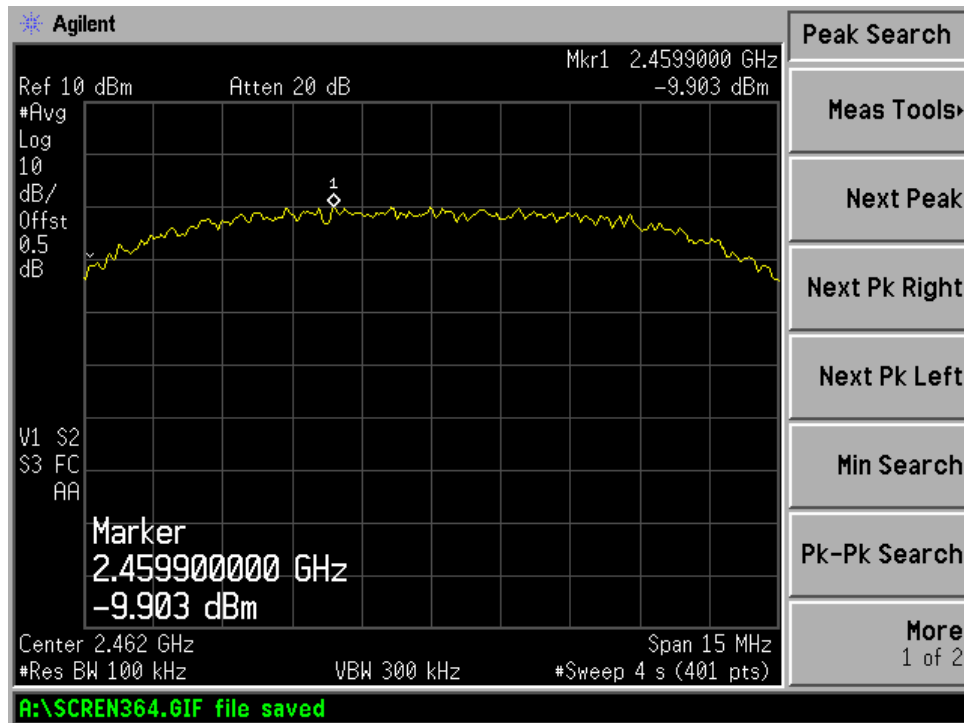




Result data graph shows middle channel power spectrum density is -8.522dBm at 100kHz RBW



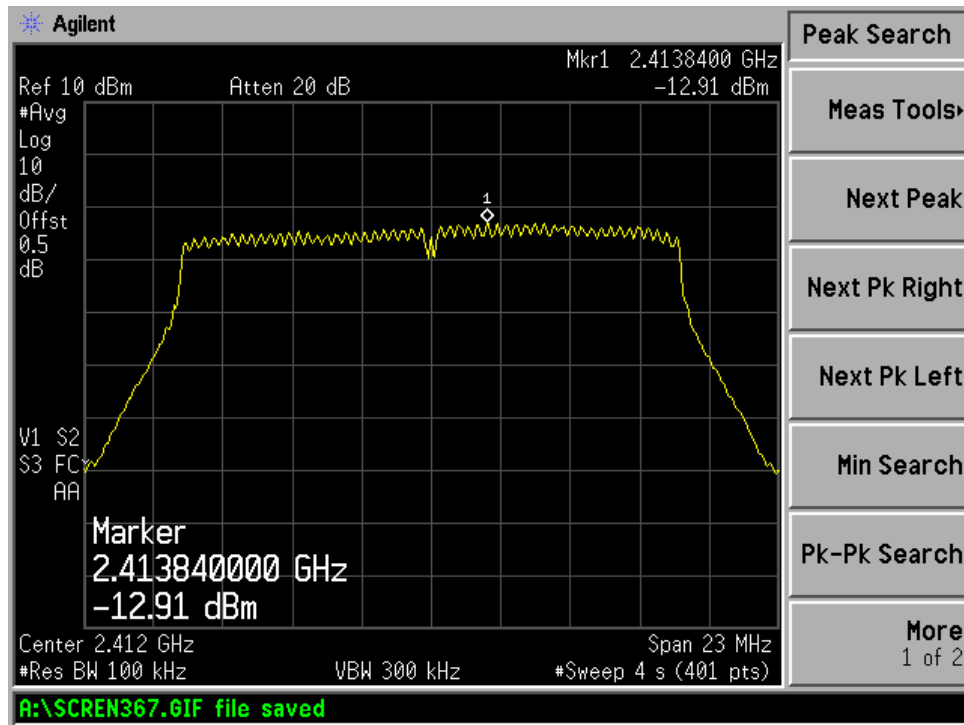
Result data graph shows high channel power spectrum density is -9.903dBm at 100kHz RBW



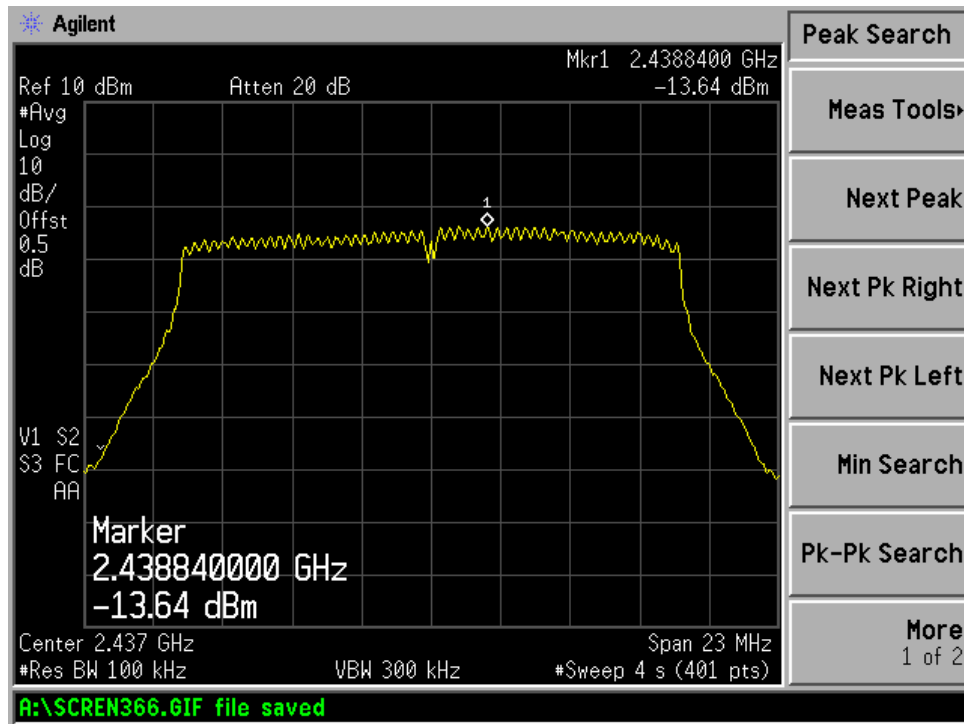


**For 802.11G Mode**

**Result data graph shows Low channel power spectrum density is -12.91dBm at 100kHz RBW**

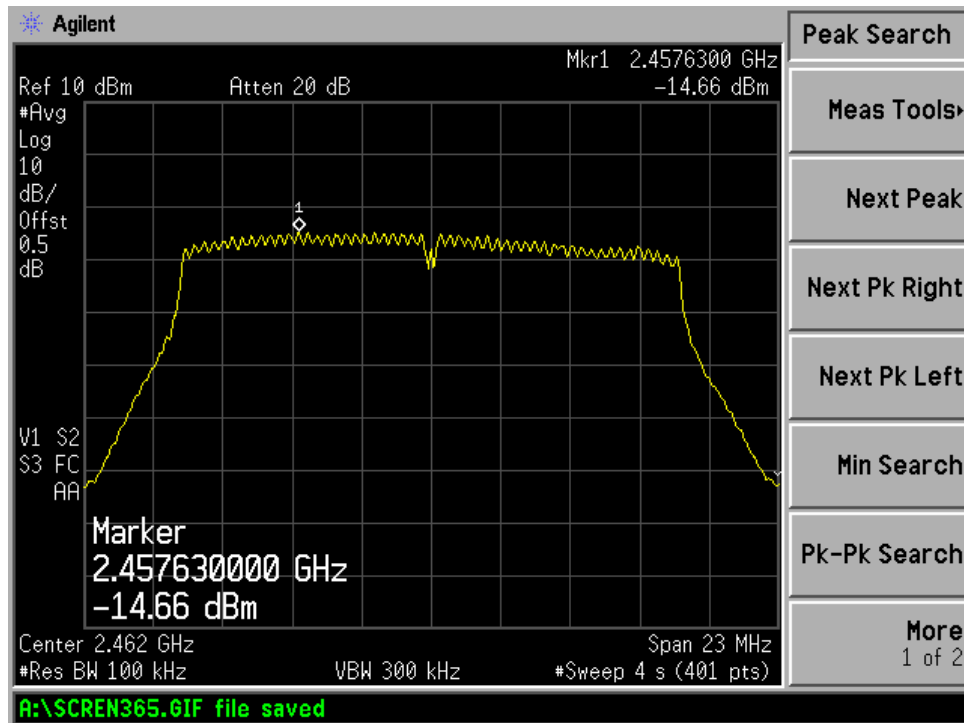


**Result data graph shows middle channel power spectrum density is -13.64dBm at 100kHz RBW**



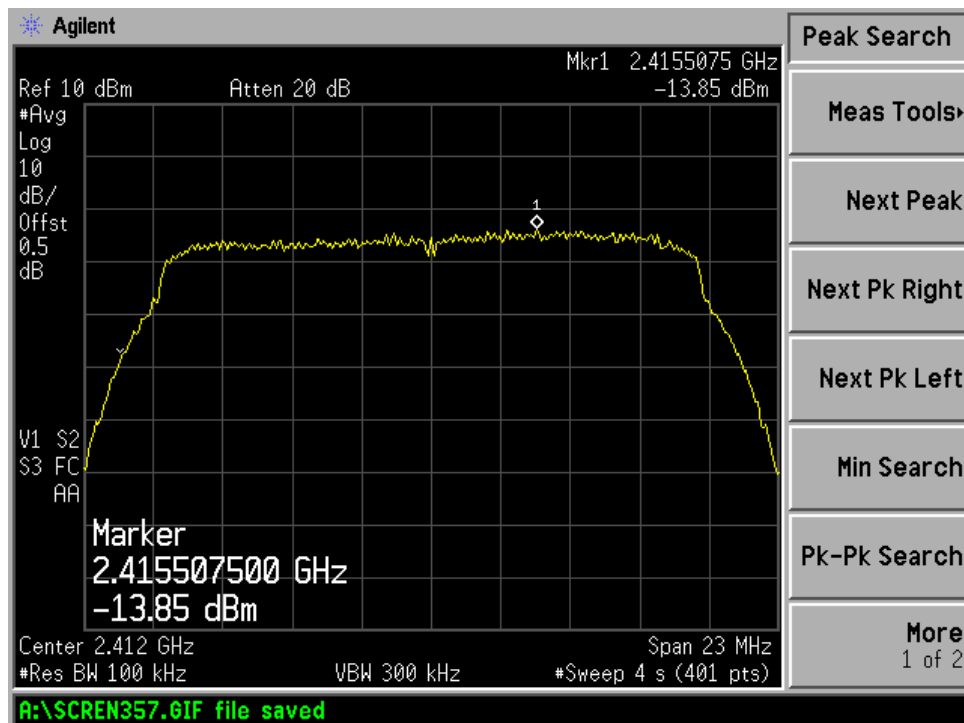


Result data graph shows high channel power spectrum density is -14.66dBm at 100kHz RBW



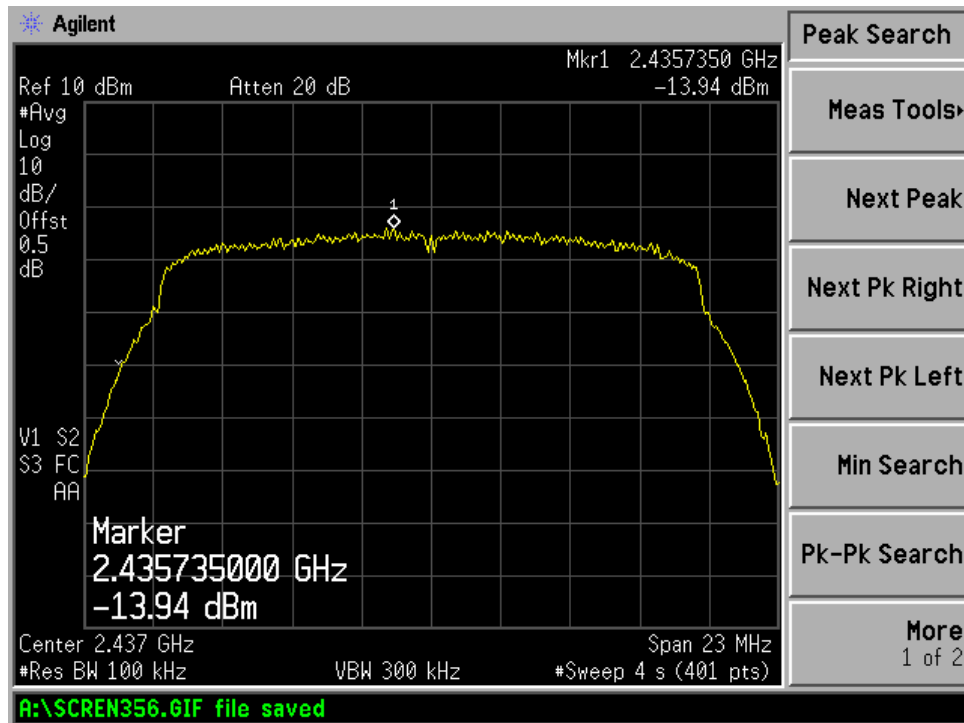
For 802.11HT20 Mode

Result data graph shows Low channel power spectrum density is -13.85dBm at 100kHz RBW

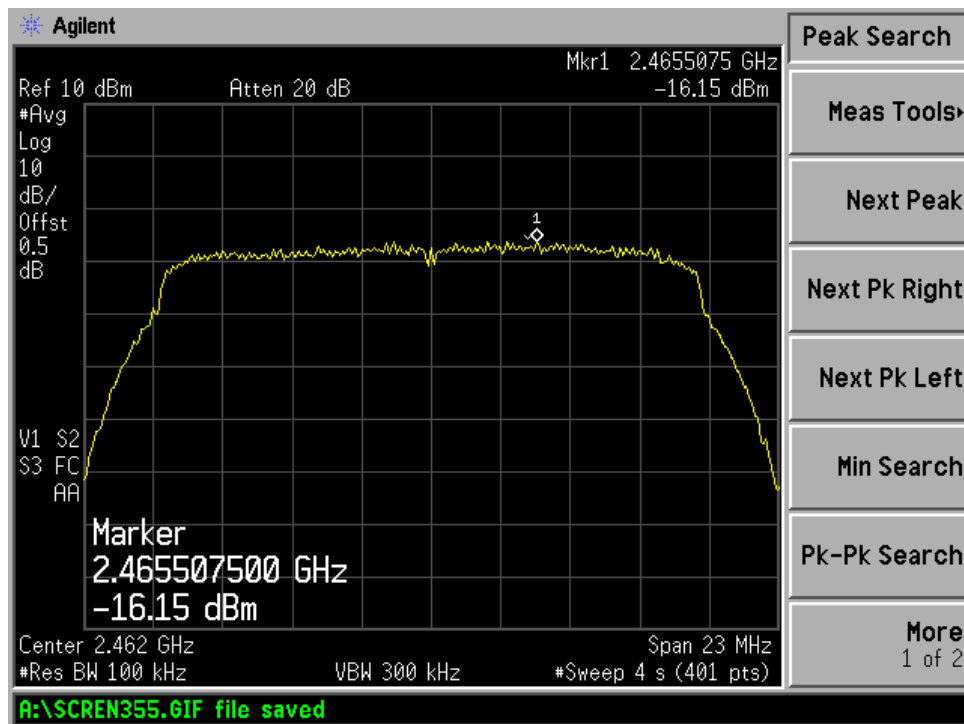




Result data graph shows middle channel power spectrum density is -13.94dBm at 100kHz RBW



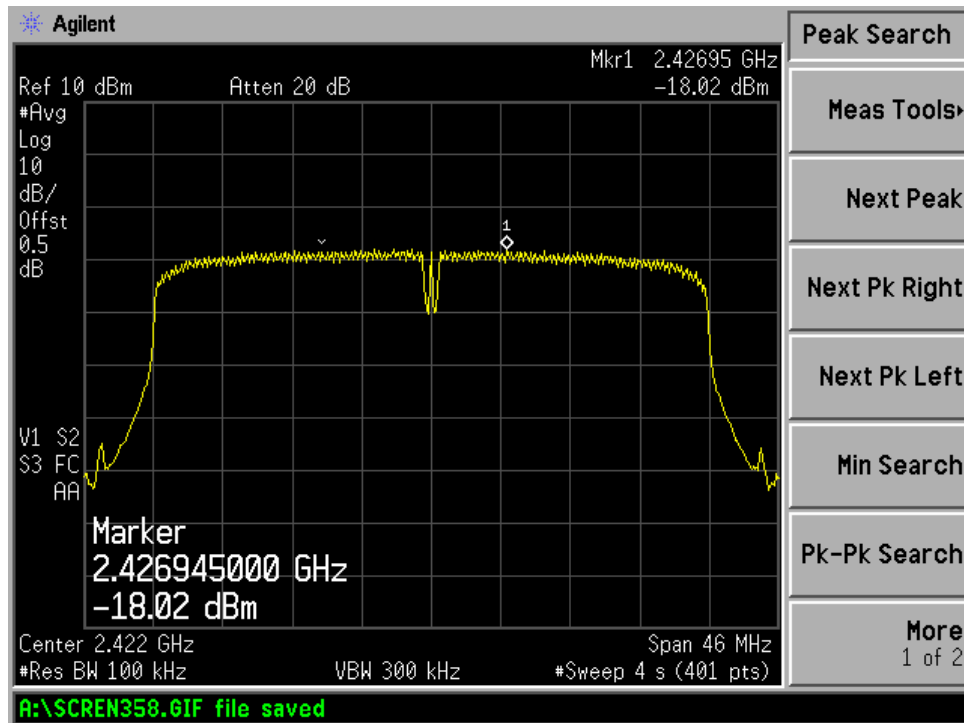
Result data graph shows high channel power spectrum density is -16.15dBm at 100kHz RBW



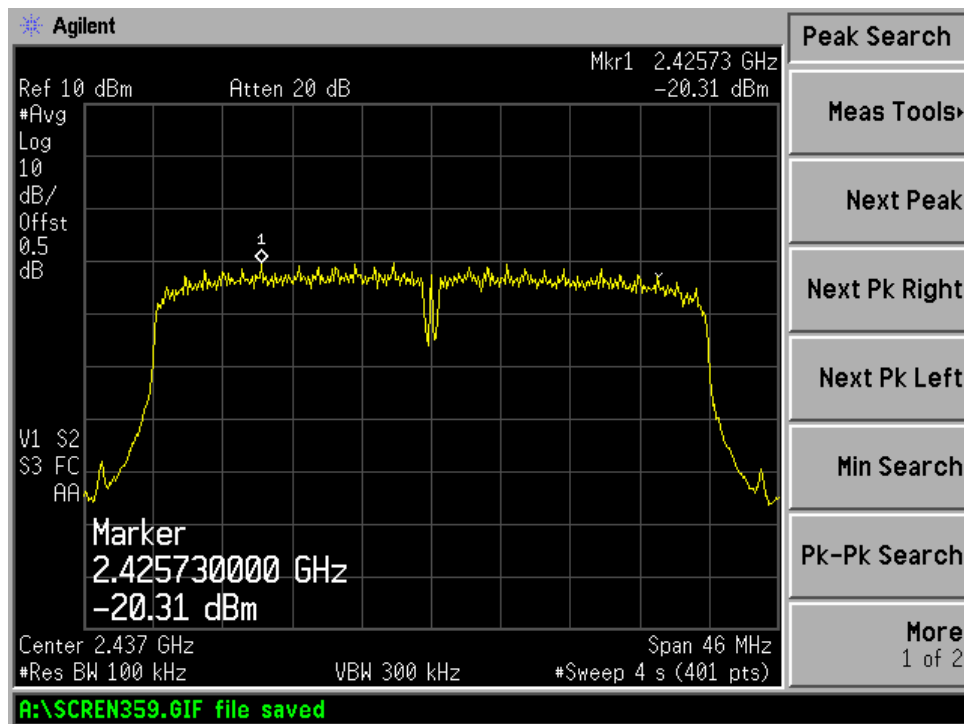


**For 802.11HT40 Mode**

**Result data graph shows Low channel power spectrum density is -18.02dBm at 100kHz RBW**

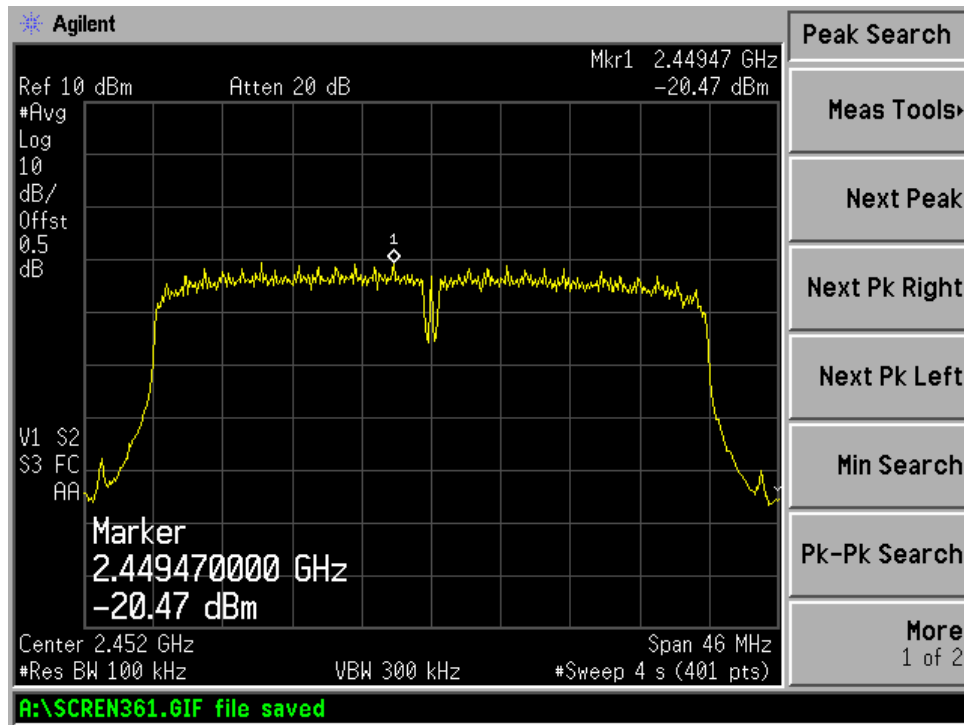


**Result data graph shows middle channel power spectrum density is -20.31dBm at 100kHz RBW**





Result data graph shows high channel power spectrum density is -20.47dBm at 100kHz RBW



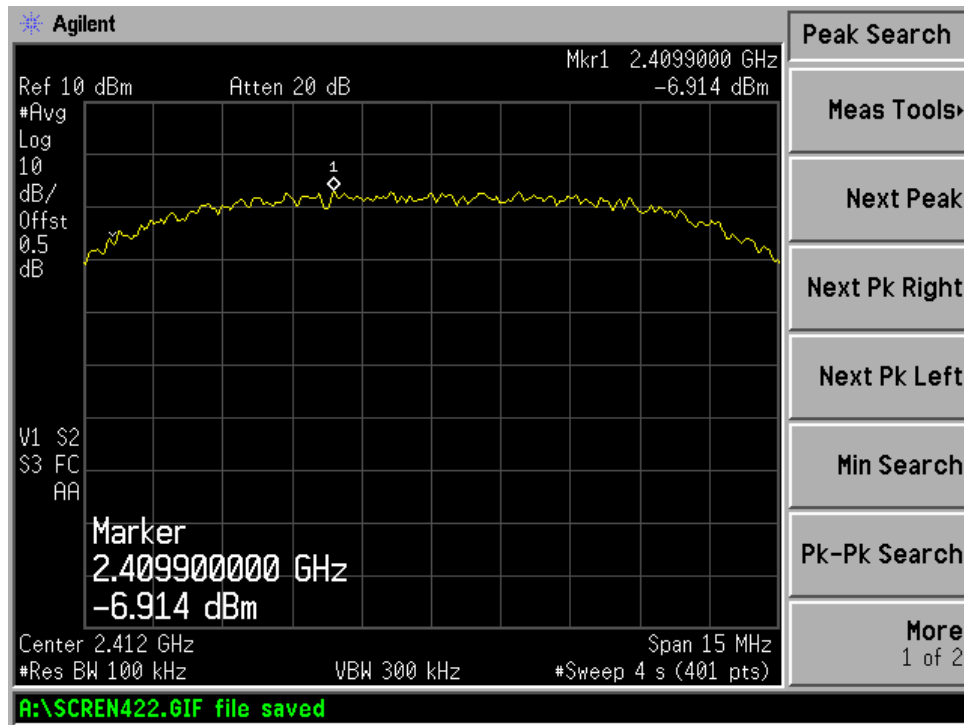




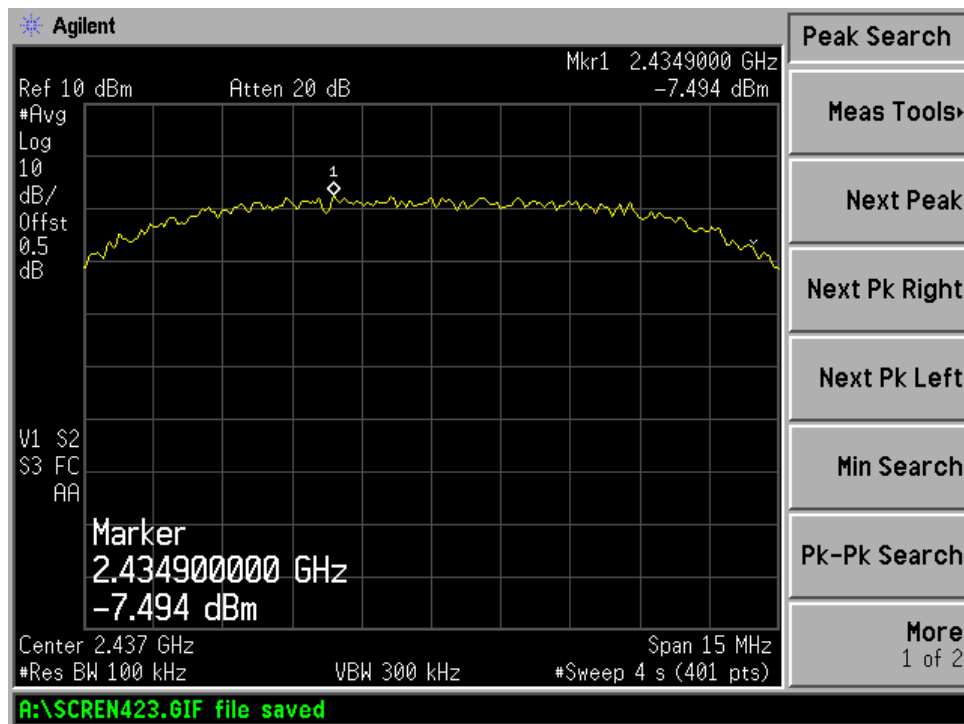
**Antenna 1**

**For 802.11B Mode**

**Result data graph shows Low channel power spectrum density is -6.914dBm at 100kHz RBW**

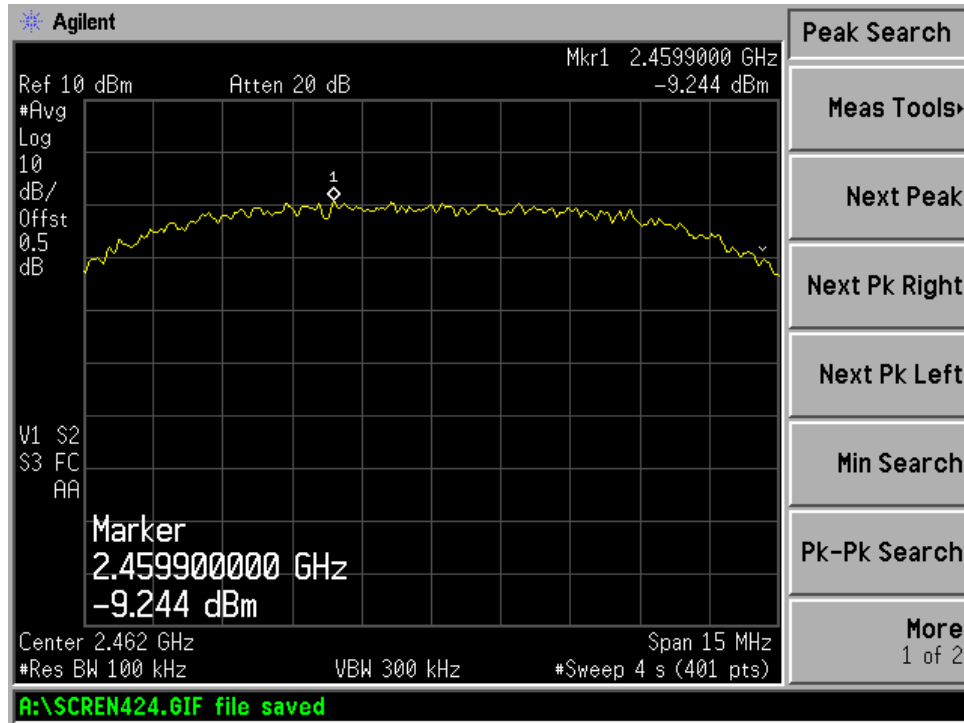


**Result data graph shows middle channel power spectrum density is -7.494dBm at 100kHz RBW**



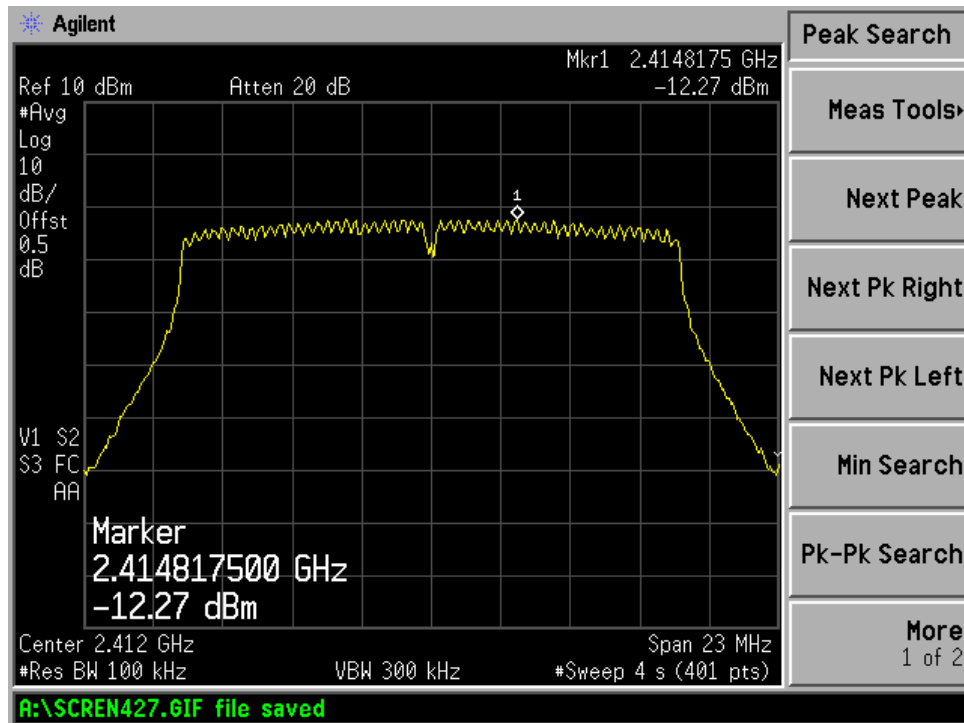


Result data graph shows high channel power spectrum density is -9.244dBm at 100kHz RBW



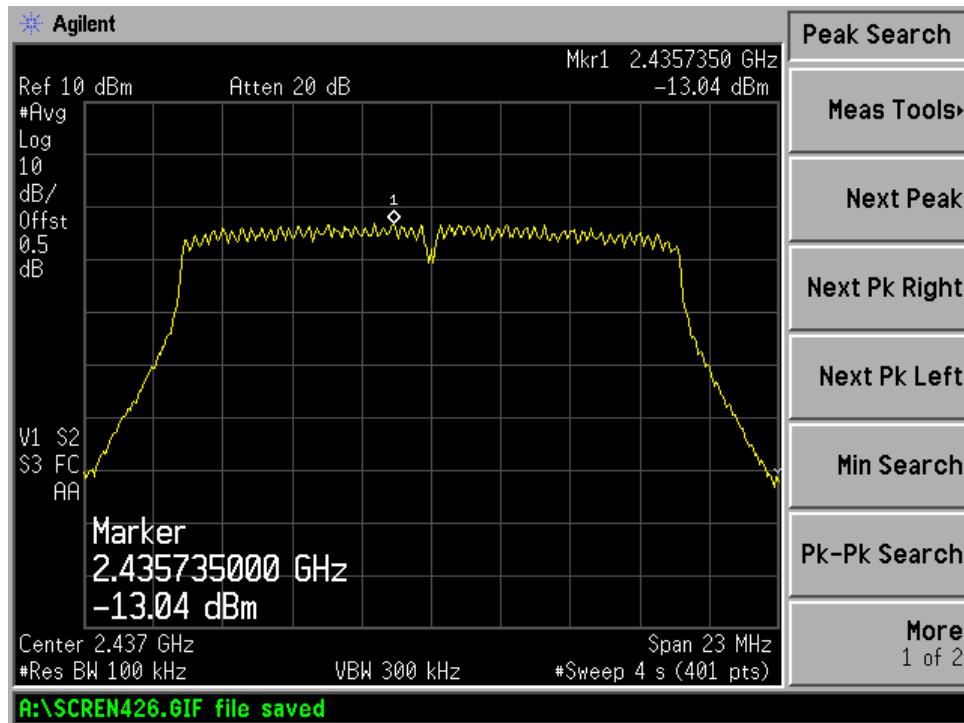
For 802.11G Mode

Result data graph shows Low channel power spectrum density is -12.27dBm at 100kHz RBW

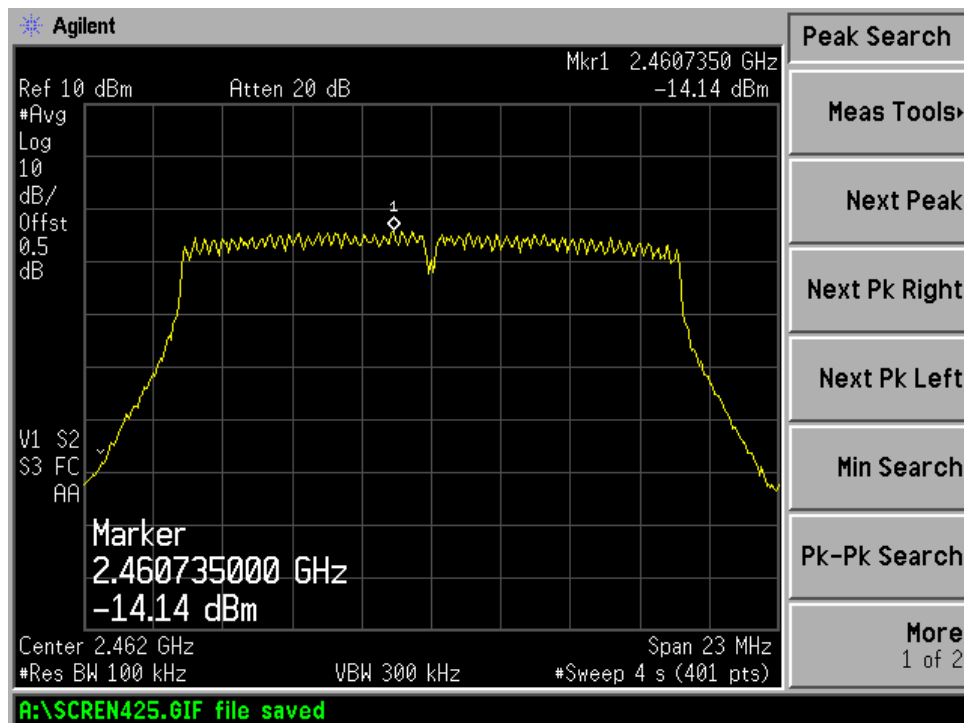




Result data graph shows middle channel power spectrum density is -13.04dBm at 100kHz RBW



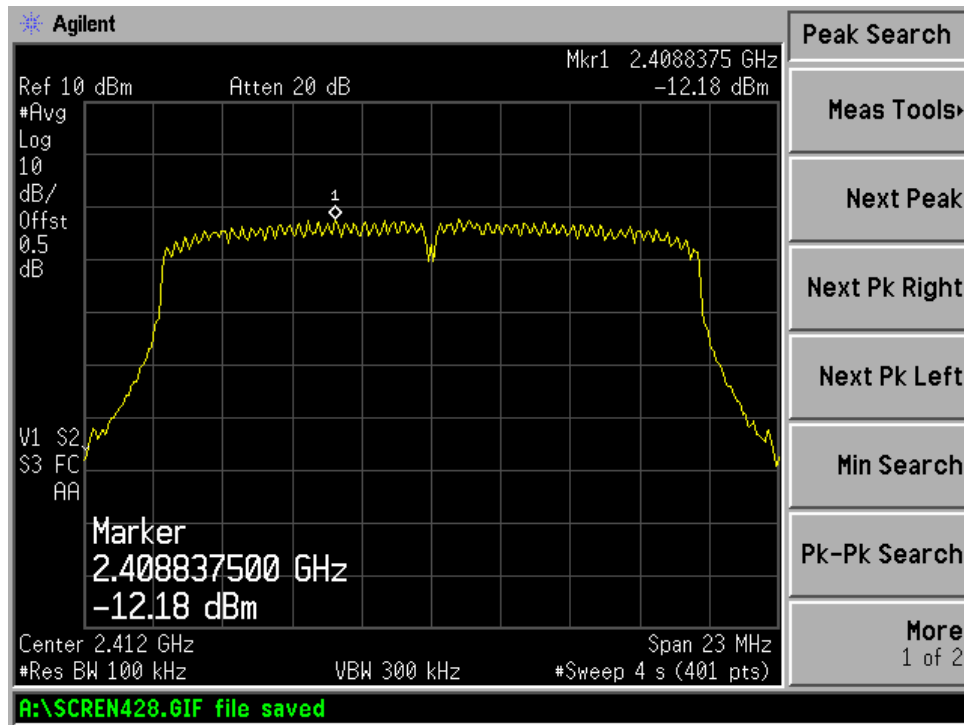
Result data graph shows high channel power spectrum density is -14.14dBm at 100kHz RBW



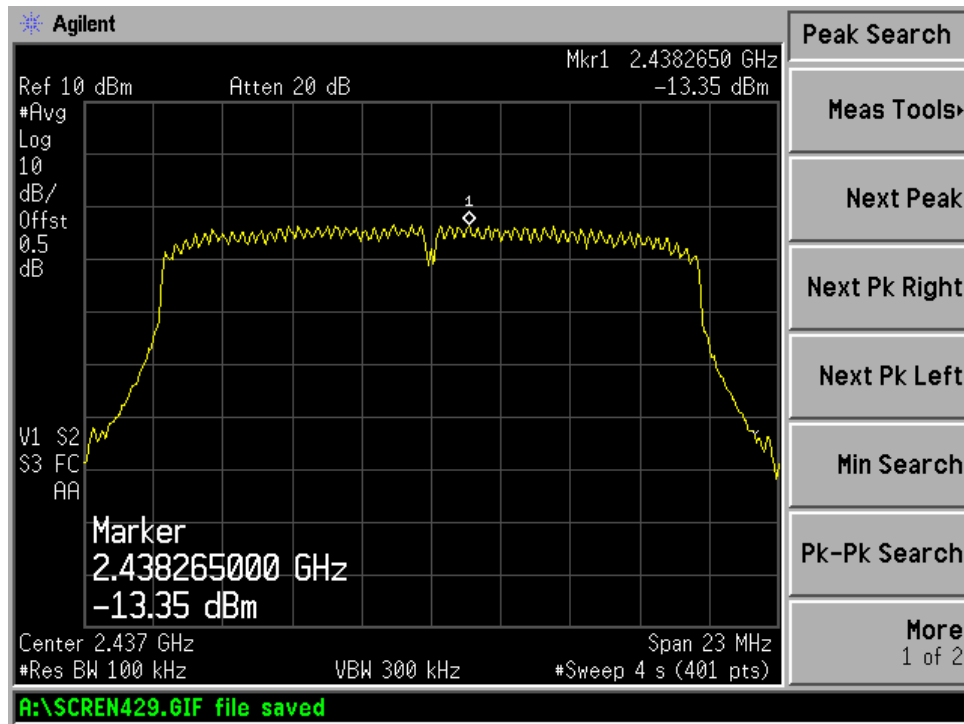


**For 802.11HT20 Mode**

**Result data graph shows Low channel power spectrum density is -12.18dBm at 100kHz RBW**

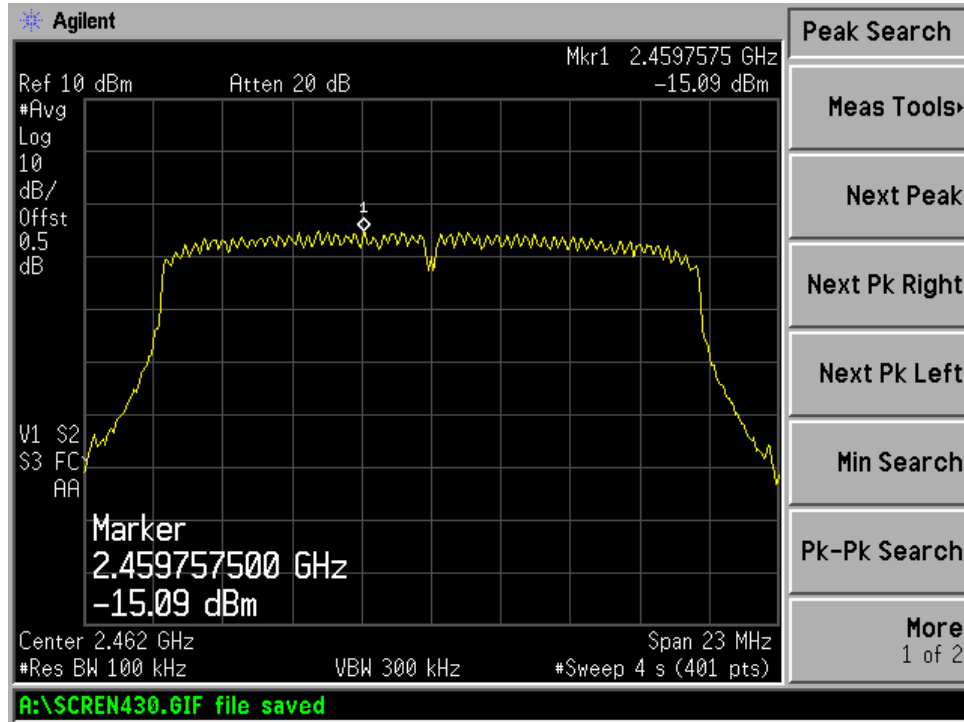


**Result data graph shows middle channel power spectrum density is -13.35dBm at 100kHz RBW**



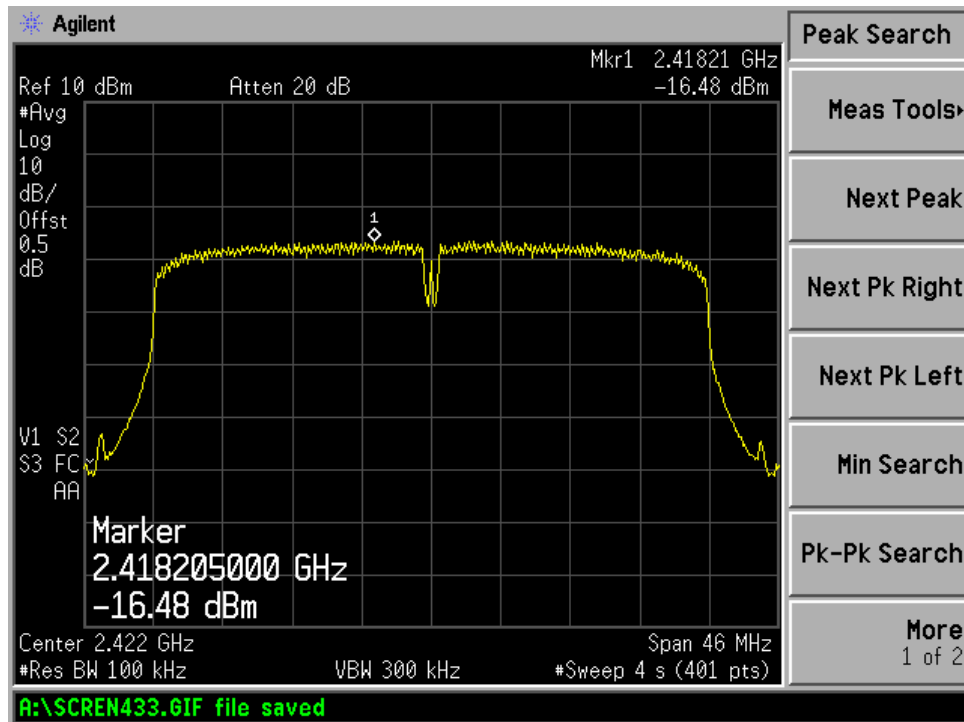


Result data graph shows high channel power spectrum density is -15.09dBm at 100kHz RBW



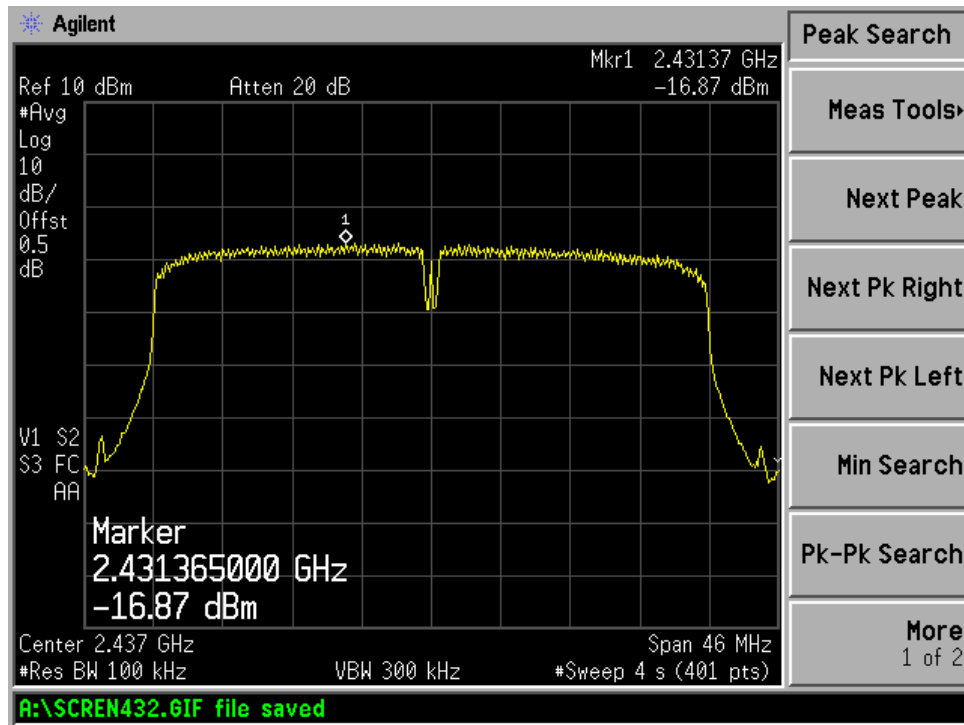
For 802.11HT40 Mode

Result data graph shows Low channel power spectrum density is -16.48dBm at 100kHz RBW

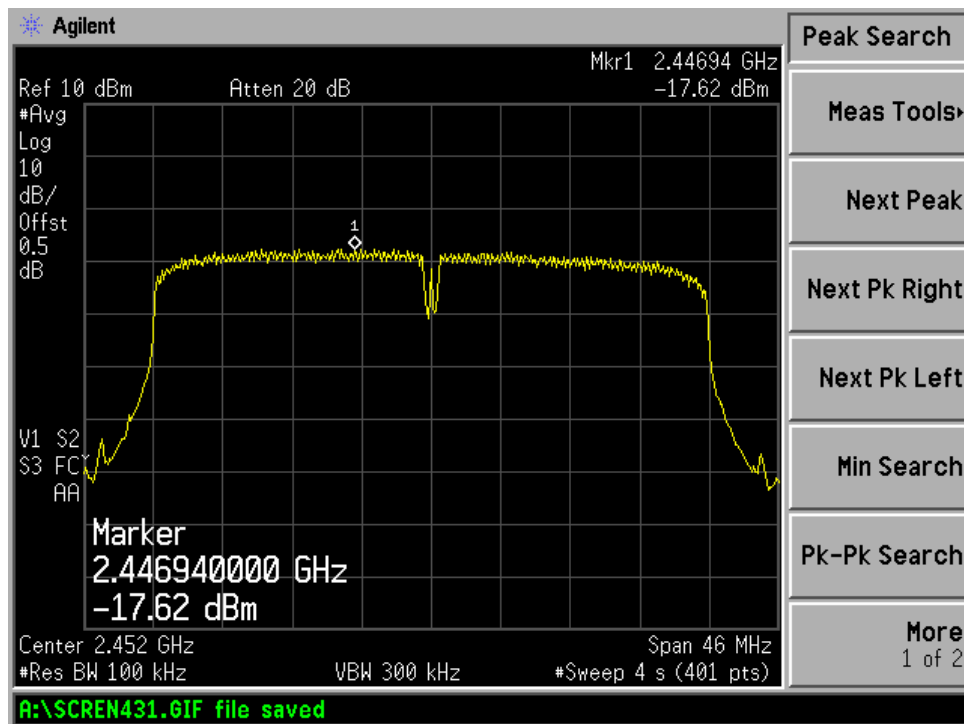




Result data graph shows middle channel power spectrum density is -16.87dBm at 100kHz RBW



Result data graph shows high channel power spectrum density is -17.62dBm at 100kHz RBW



### 4.3 Band Edge Measurement

Test Requirement: FCC part 15 section 15.247  
 Test Date: 2012-06-07  
 Mode of Operation: Transmitting continuously mode.  
 Detector Function: Max Hold

**Result: PASS**

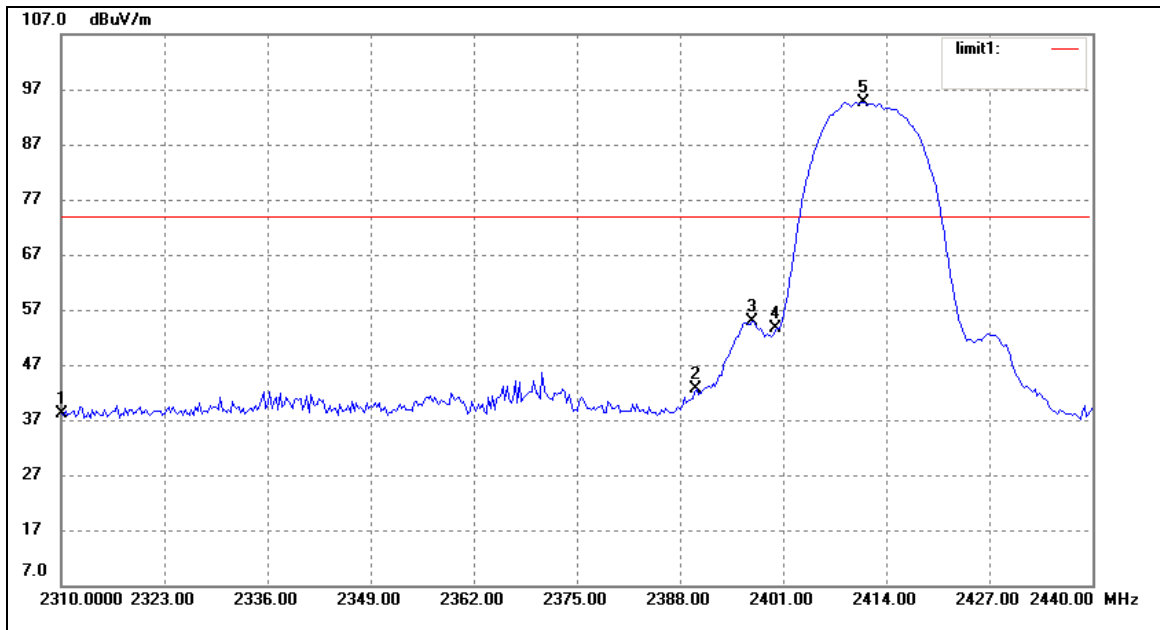
#### Measured Result :

Refer to the diagram and table, it shows the frequency of lower band edge and upper band edge is 2.412GHz and 2.462GHz separately.

#### Limits of Band Edge for Carrier Frequencies Operated within the Bands [ Section 15.247 ]:

The carrier frequencies should operate within 2400-2483.5MHz.

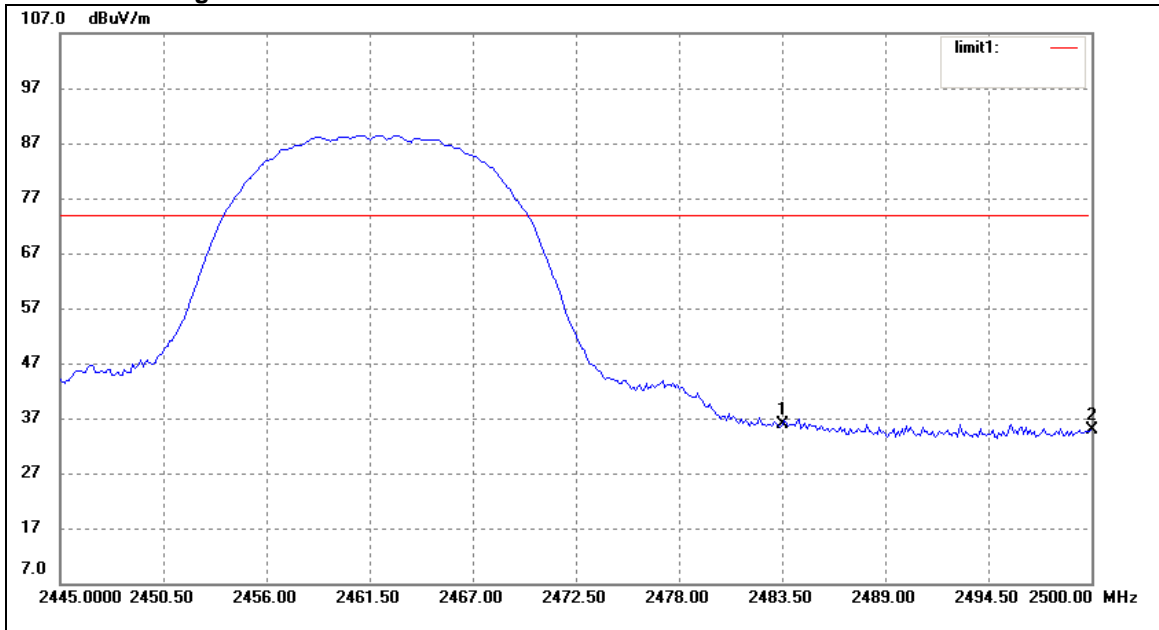
Result data graph shows the frequency of lowest channel.  
 For 802.11B Low Channel Mode (Antenna 0):



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	49.94	-11.72	38.22	74.00	-35.78	peak
2	2390.000	54.29	-11.75	42.54	74.00	-31.46	peak
3	2397.100	66.52	-11.75	54.77	74.00	-19.23	peak
4	2400.000	65.28	-11.75	53.53	74.00	-20.47	peak
5	2411.140	106.31	-11.75	94.56	fundamental		peak



**For 802.11B High Channel Mode**

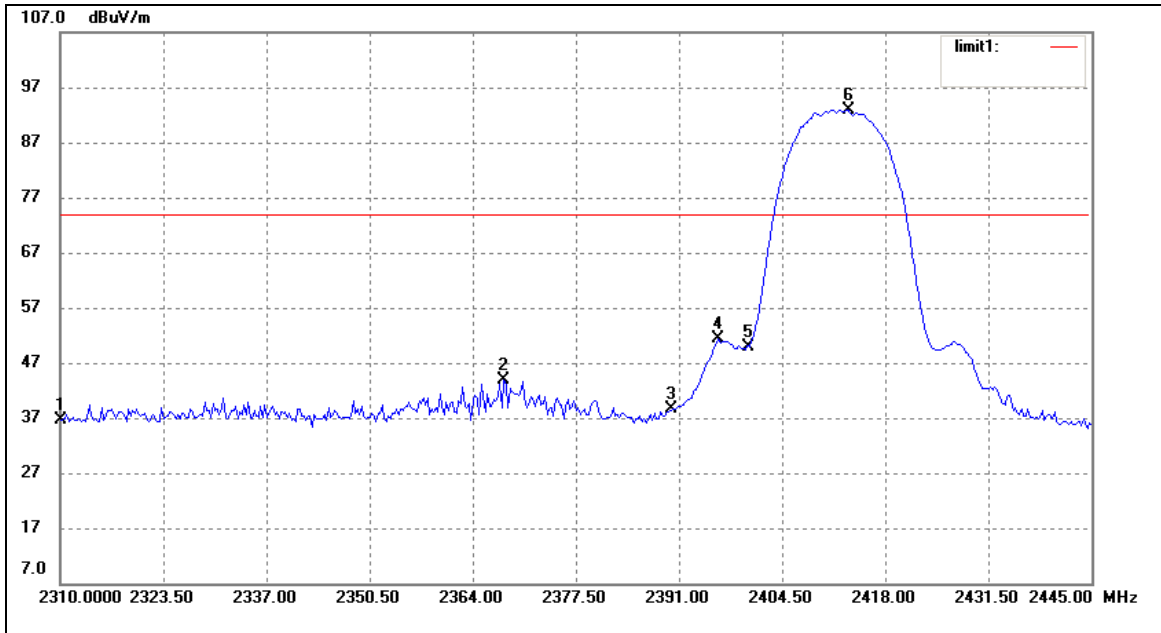


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	47.59	-11.78	35.81	74.00	-38.19	peak
2	2500.000	46.62	-11.78	34.84	74.00	-39.16	peak





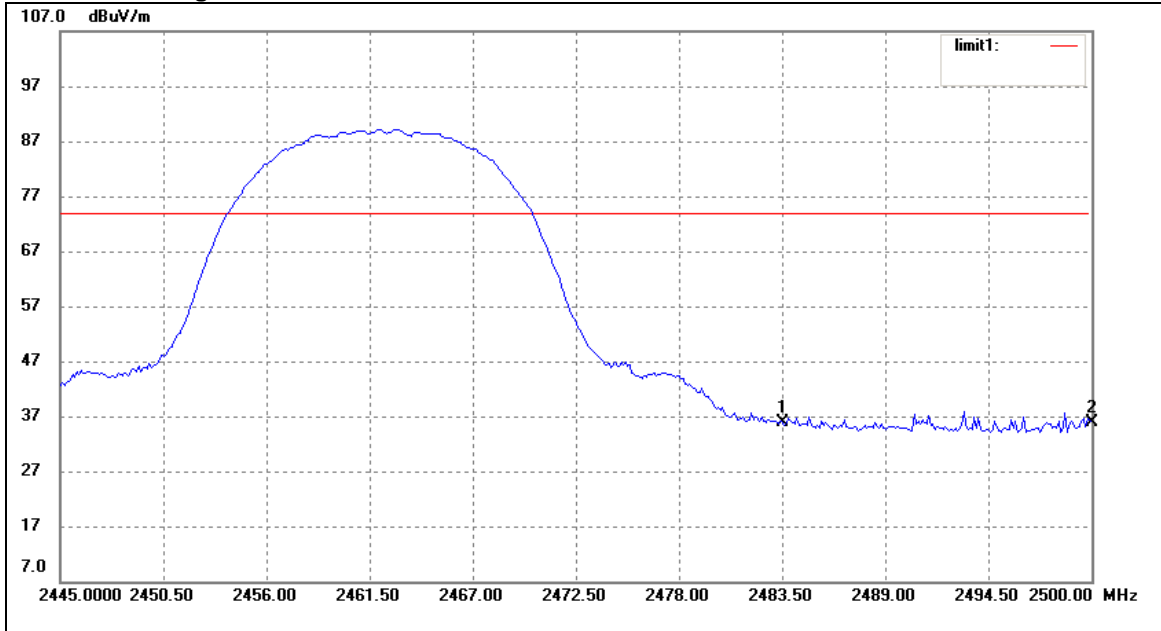
**For 802.11B Low Channel Mode (Antenna 1):**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	48.42	-11.72	36.70	74.00	-37.30	peak
2	2368.050	55.68	-11.74	43.94	74.00	-30.06	peak
3	2390.000	50.40	-11.75	38.65	74.00	-35.35	peak
4	2396.130	63.06	-11.75	51.31	74.00	-22.69	peak
5	2400.000	61.54	-11.75	49.79	74.00	-24.21	peak
6	2413.140	104.67	-11.76	92.91	fundamental		peak



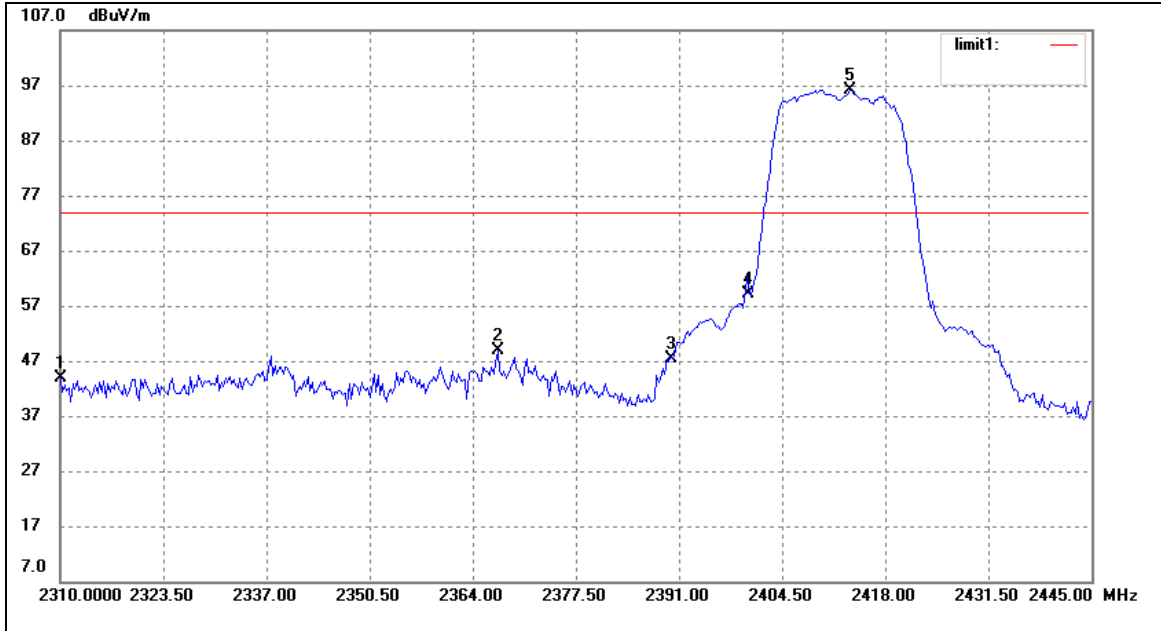
**For 802.11B High Channel Mode**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	47.65	-11.78	35.87	74.00	-38.13	peak
2	2500.000	47.71	-11.78	35.93	74.00	-38.07	peak



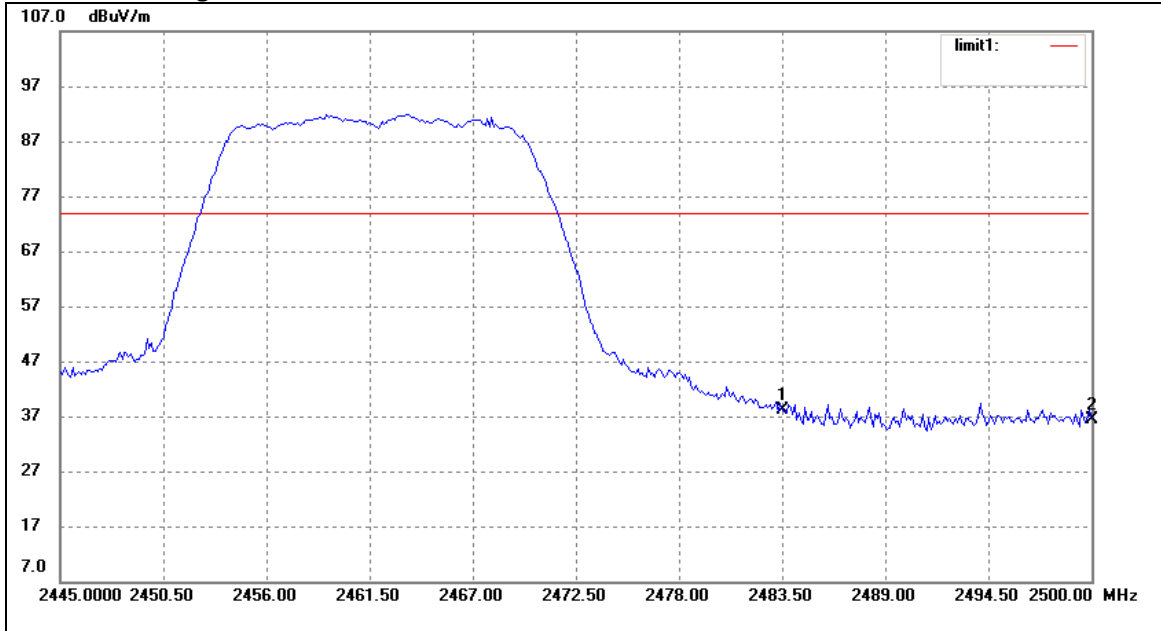
**For 802.11G Low Channel Mode**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	55.60	-11.72	43.88	74.00	-30.12	peak
2	2367.240	60.72	-11.74	48.98	74.00	-25.02	peak
3	2390.000	59.22	-11.75	47.47	74.00	-26.53	peak
4	2400.000	70.94	-11.75	59.19	74.00	-14.81	peak
5	2413.410	107.90	-11.76	96.14	fundamental		peak



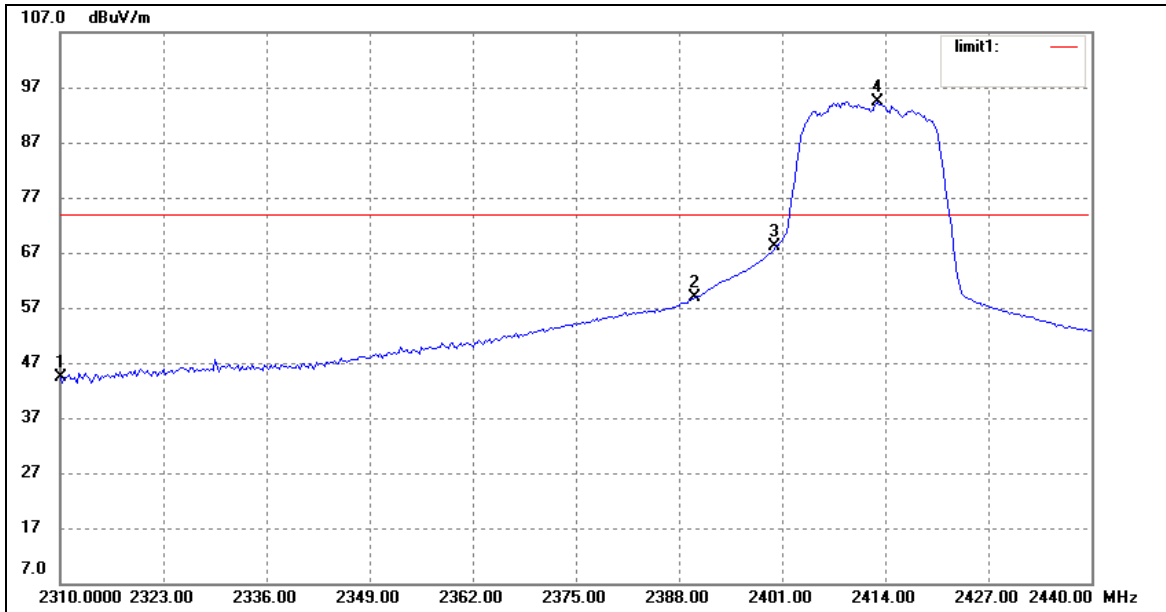
**For 802.11G High Channel Mode**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	49.97	-11.78	38.19	74.00	-35.81	Peak
2	2500.000	48.14	-11.78	36.36	74.00	-37.64	Peak



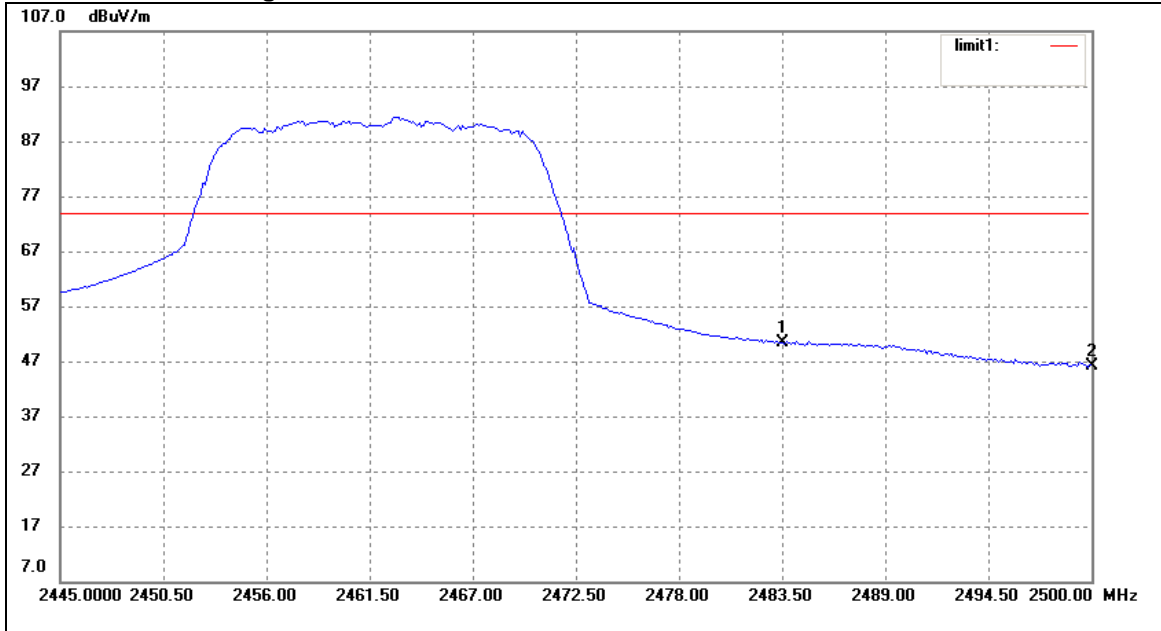
For 802.11N HT20 Low Channel Mode



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	56.16	-11.72	44.44	74.00	-29.56	peak
2	2390.000	70.66	-11.75	58.91	74.00	-15.09	peak
3	2400.000	79.80	-11.75	68.05	74.00	-5.95	peak
4	2412.960	106.21	-11.76	94.45	fundamental		peak



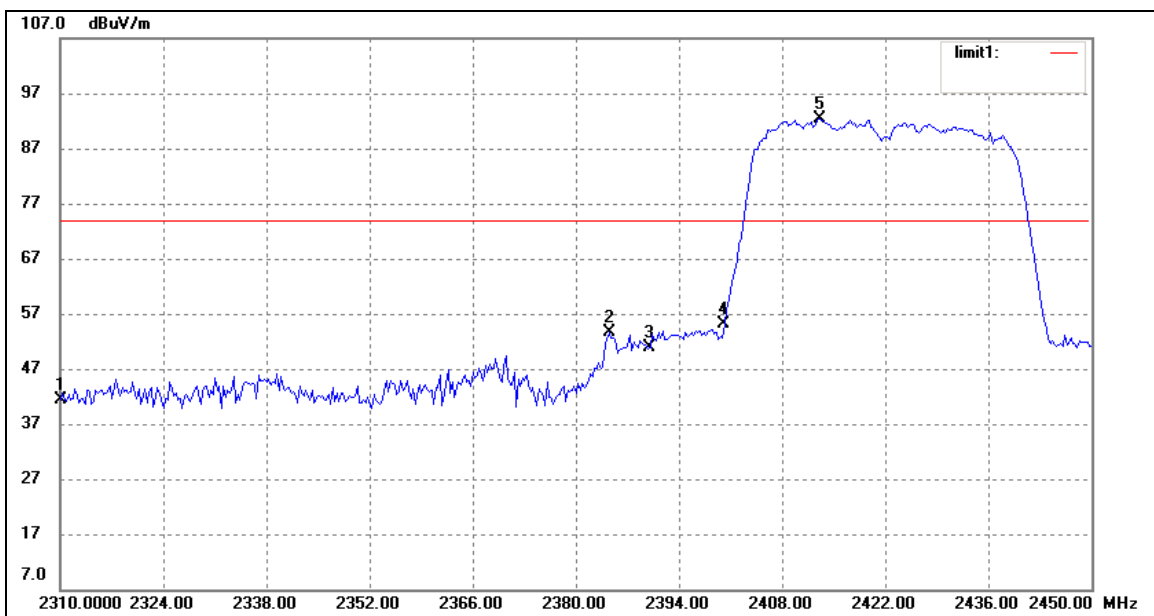
**For 802.11N HT20 High Channel Mode**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	62.17	-11.78	50.39	74.00	-23.61	Peak
2	2500.000	58.00	-11.78	46.22	74.00	-27.78	Peak



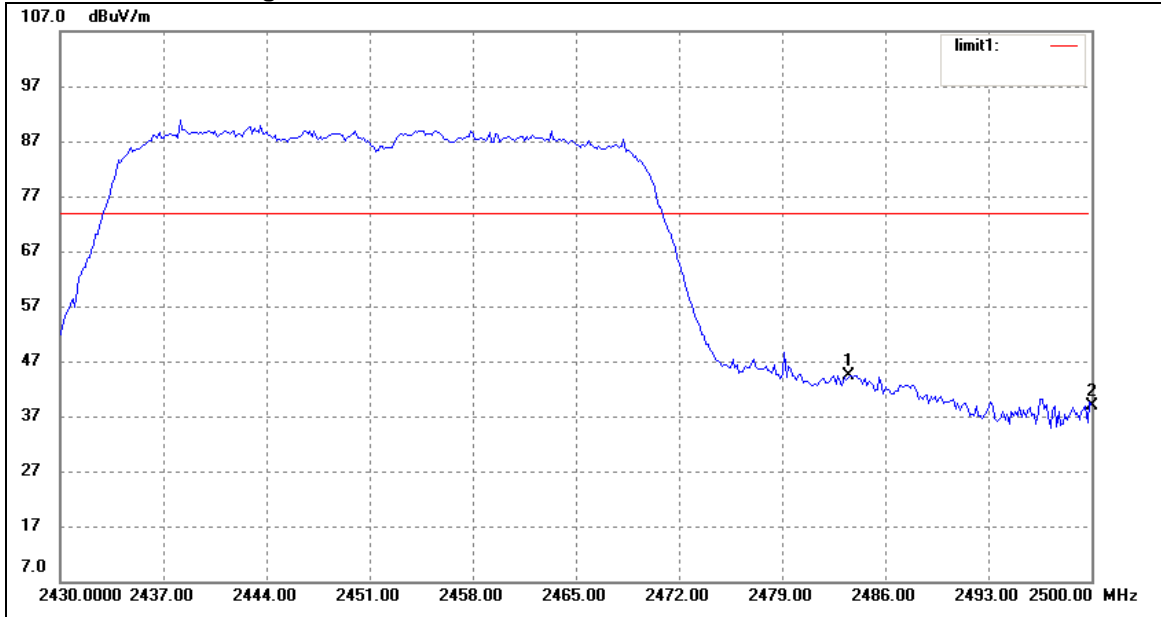
For 802.11N HT40 Low Channel Mode



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	53.03	-11.72	41.31	74.00	-32.69	peak
2	2384.480	65.48	-11.74	53.74	74.00	-20.26	peak
3	2390.000	62.75	-11.75	51.00	74.00	-23.00	peak
4	2400.000	66.76	-11.75	55.01	74.00	-18.99	peak
5	2413.040	104.16	-11.76	92.40	fundamental		peak



**For 802.11N HT40 High Channel Mode**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	56.17	-11.78	44.39	74.00	-29.61	Peak
2	2500.000	50.72	-11.78	38.94	74.00	-35.06	Peak





#### 4.4 Maximum Output Power

Test Requirement:	FCC part 15 section 15.247 (b3)
Test Method:	ANSI C63.4:2003
Test Date:	2012-06-08
Mode of Operation:	Transmitting continuously mode.
Detector Function:	Average
Measurement BW:	RBW 1MHz ; VBW 3MHz

#### Test Procedure :

According to section 15.247(b)-power output of the KDB-558074 (2012), the method #1 of the power output option2 was used, the following is the measurement procedure.

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW  $\geq$  3 MHz.
4. Use sample detector mode if bin width (i.e., span/number of points in spectrum display)  $<$  0.5 RBW. Otherwise use peak detector mode.
5. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to "free run".
6. Trace average 100 traces in power averaging mode.
7. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges.

**Result : PASS**

*Transmitting Mode: Transmits continuously*

For 802.11b/g

Test mode	Frequency MHz	Reading Antenna 0 (dBm)	Reading Antenna 1 (dBm)	Output power Antenna 0 (W)	Output power Antenna 1 (W)	Total Power (W)	Limit W
802.11b (1M)	2412	9.54	9.10	0.00899	0.00813	/	1
	2437	8.45	7.49	0.00670	0.00561	/	1
	2462	7.03	5.86	0.00505	0.00385	/	1
802.11g (6M)	2412	5.32	6.73	0.00340	0.00471	0.008114	1
	2437	4.54	6.33	0.00284	0.00430	0.007140	1
	2462	3.51	5.66	0.00224	0.00368	0.005925	1

For 802.11n HT20/HT40

Test mode	Frequency MHz	Reading Antenna 0 (dBm)	Reading Antenna 1 (dBm)	Output power Antenna 0 (W)	Output power Antenna 1 (W)	Total Power (W)	Limit W
802.11n HT20 (MCS0)	2412	5.33	5.84	0.00341	0.00384	0.007249	1
	2437	4.84	5.26	0.00305	0.00336	0.006405	1
	2462	3.25	6.10	0.00211	0.00407	0.006187	1
802.11n HT40 (MCS0)	2422	6.70	6.51	0.00468	0.00448	0.009154	1
	2437	6.24	6.31	0.00421	0.00428	0.008483	1
	2452	4.97	4.64	0.00314	0.00291	0.006051	1

Note: The EUT shall be simultaneous transmission at the Antenna 0 and Antenna 1 for the 802.11g, 802.11n HT20 or HT40, 802.11b mode shall be transmission only single Antenna (Antenna 0 or Antenna 1).

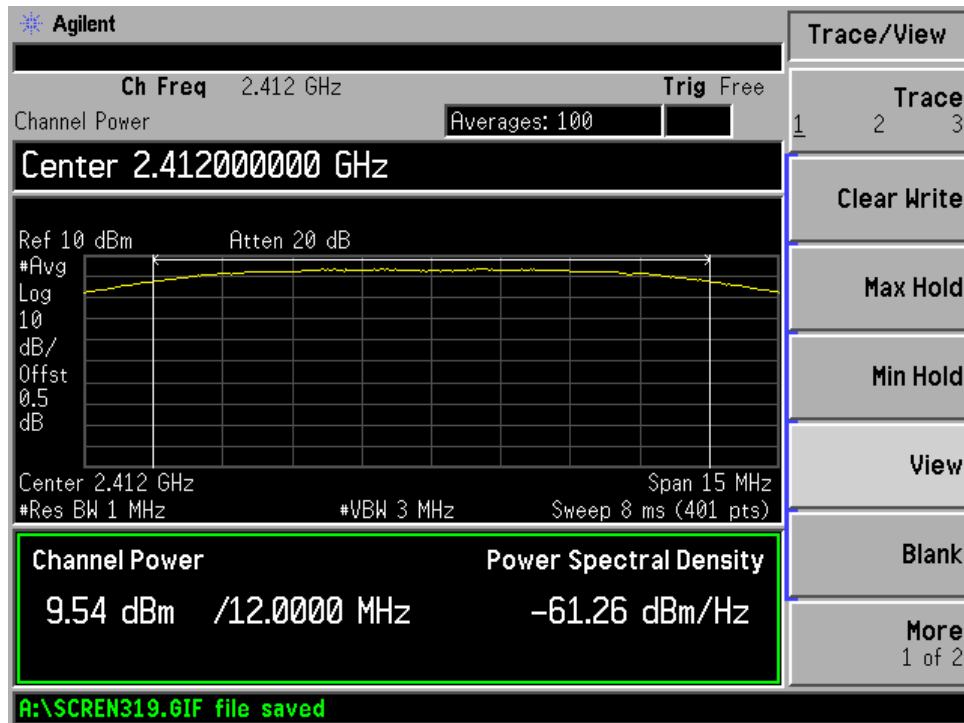
Above testing data is included of 0.5dB cable loss which between antenna port and spectrum.

**Limits for Maximum Output Power [ Section 15.247 (b3)]:**

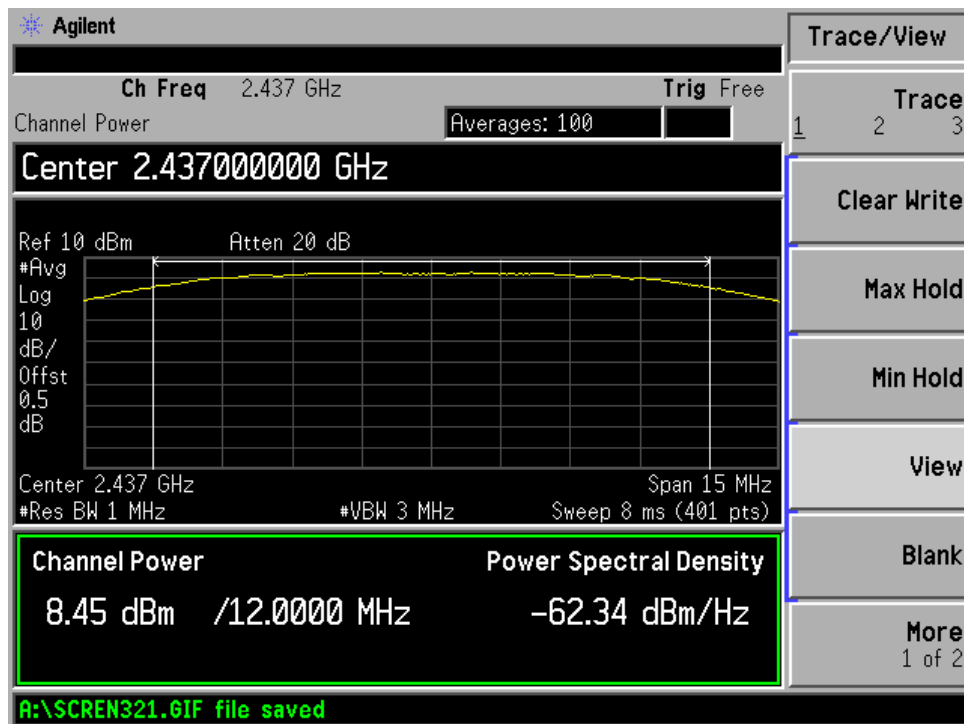
For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.



**For 802.11B 1Mbps Mode (Antenna 0)**  
**Result data graph shows Low channel conducted power = 9.54dBm**

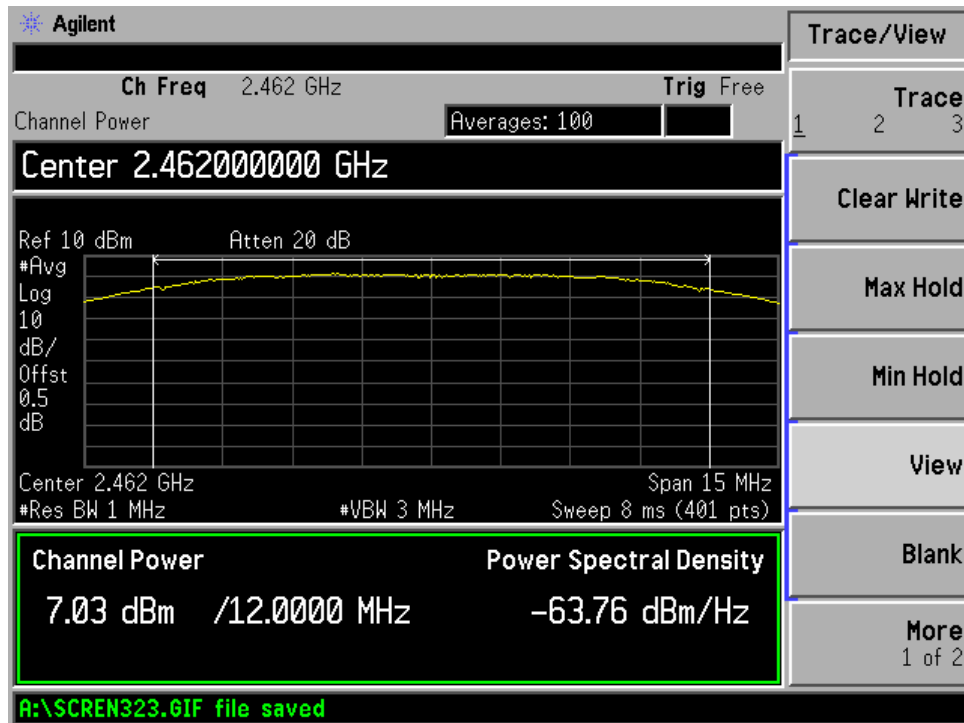


**Result data graph shows middle channel conducted power = 8.45dBm**



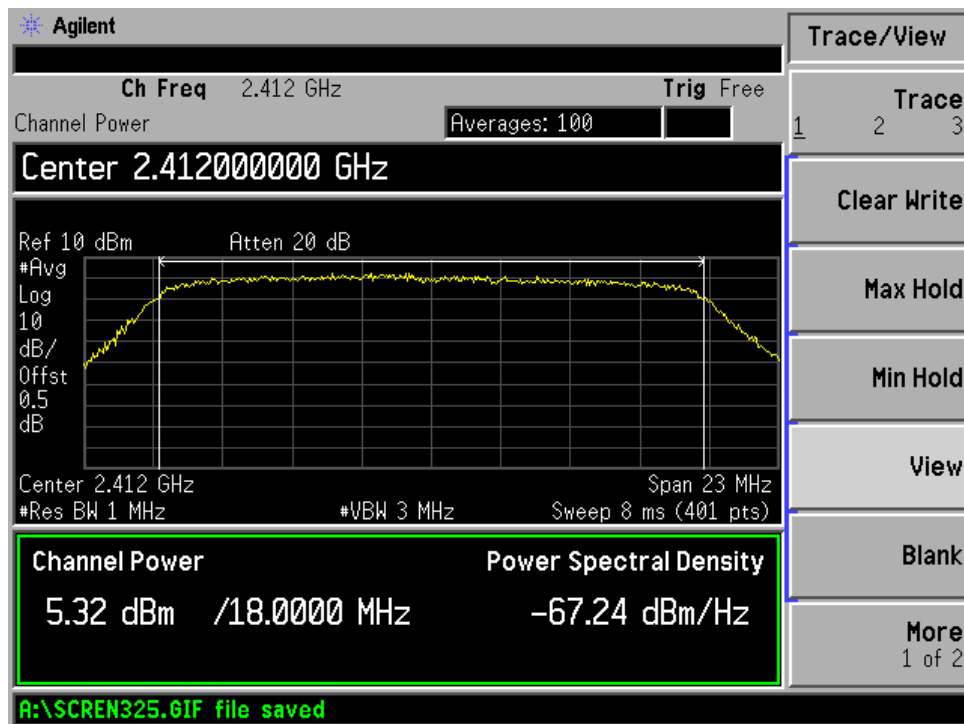


Result data graph shows high channel conducted power = 7.03dBm



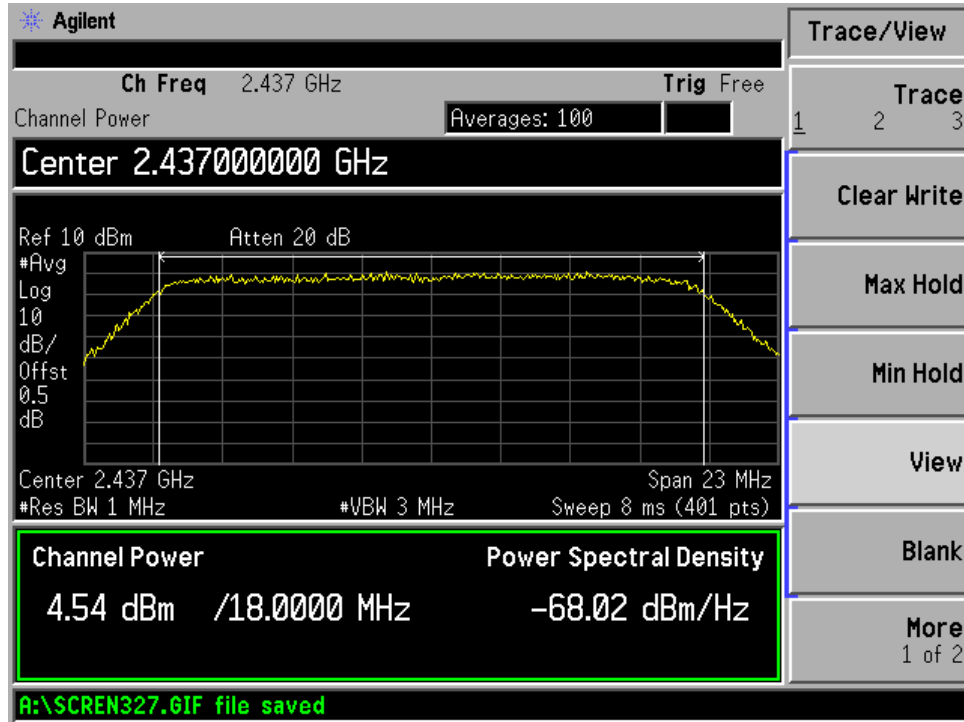
For 802.11G 6Mbps Mode

Result data graph shows Low channel conducted power = 5.32dBm

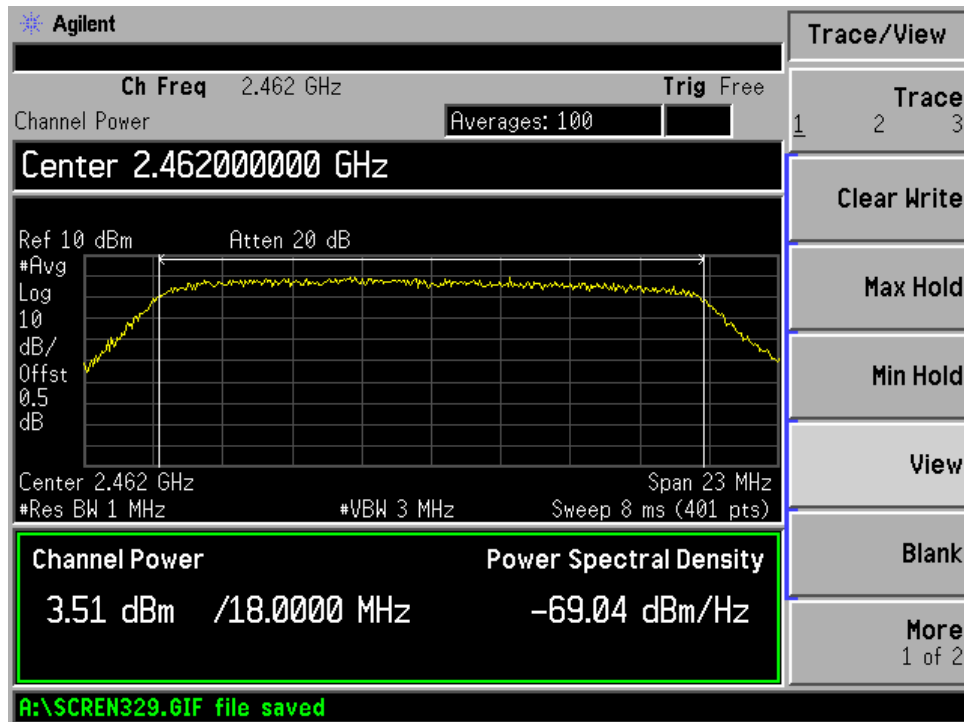




Result data graph shows middle channel conducted power = 4.54dBm

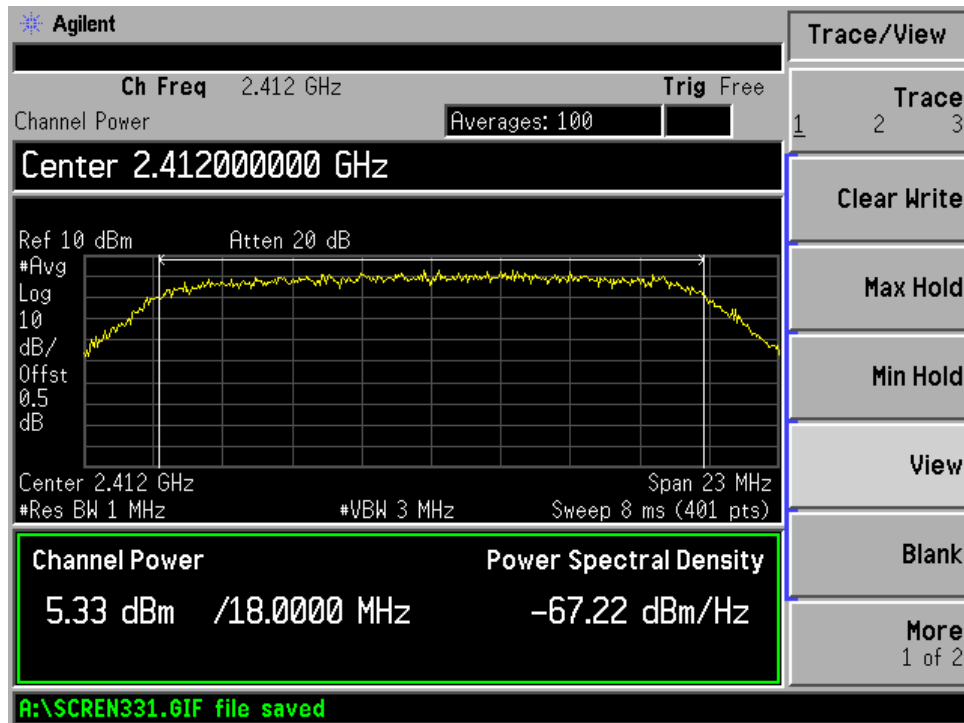


Result data graph shows high channel conducted power = 3.51dBm

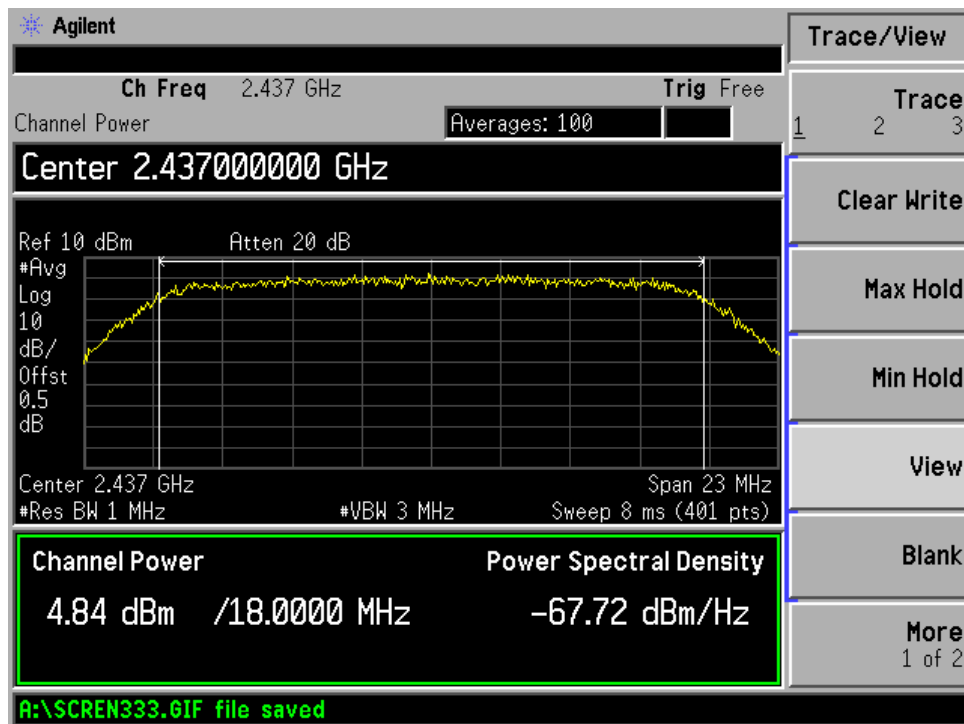




**For 802.11N HT20 MCS0Mbps Mode**  
**Result data graph shows Low channel conducted power = 5.33dBm**

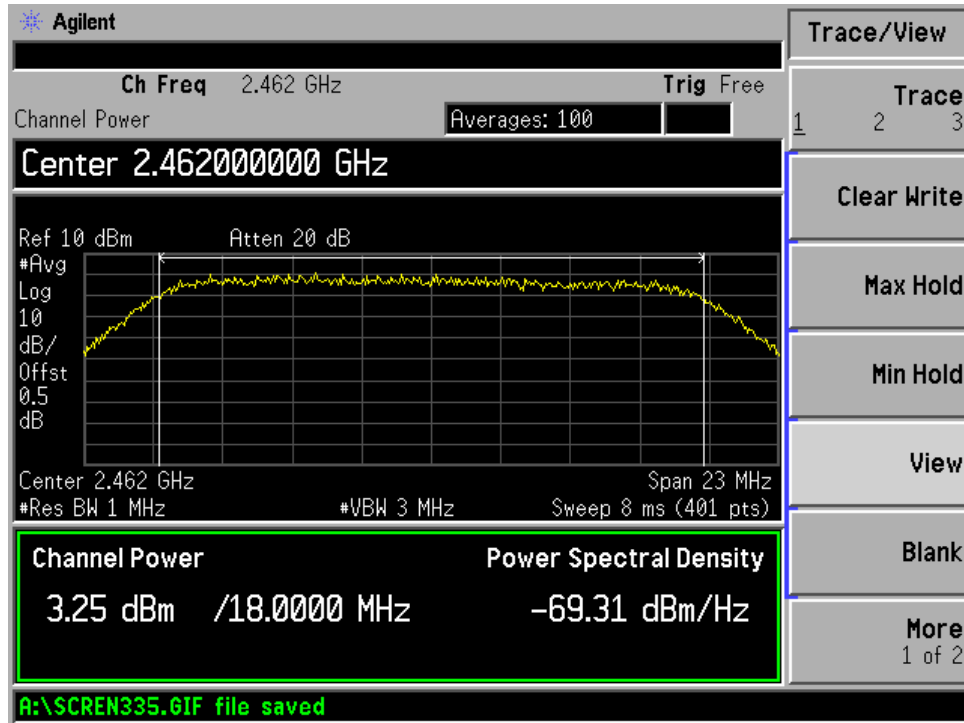


**Result data graph shows middle channel conducted power = 4.84dBm**

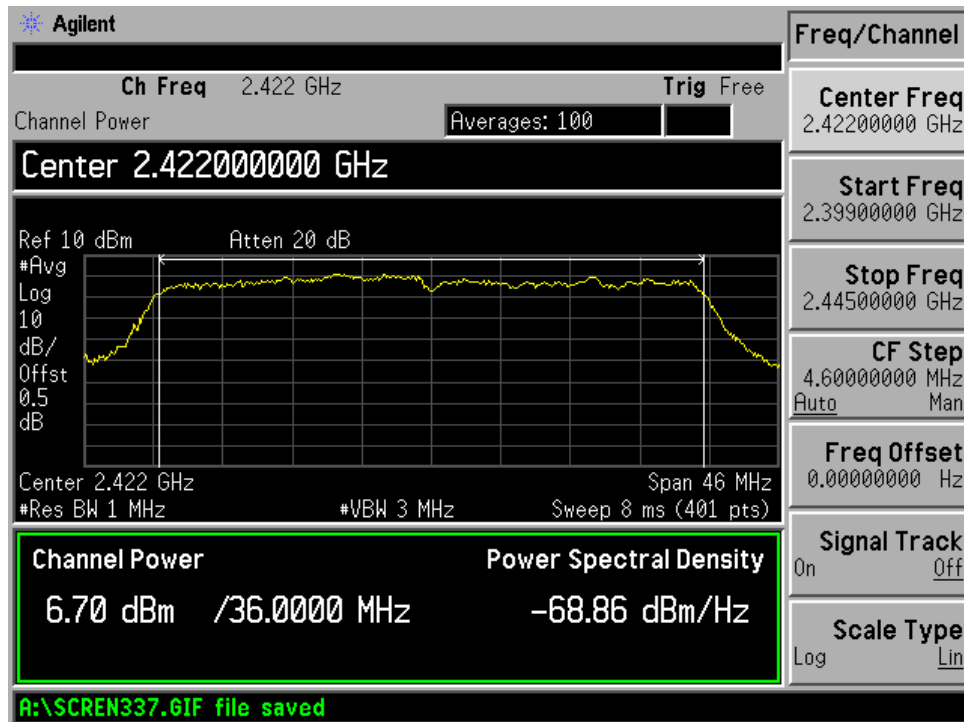




Result data graph shows high channel conducted power = 3.25dBm

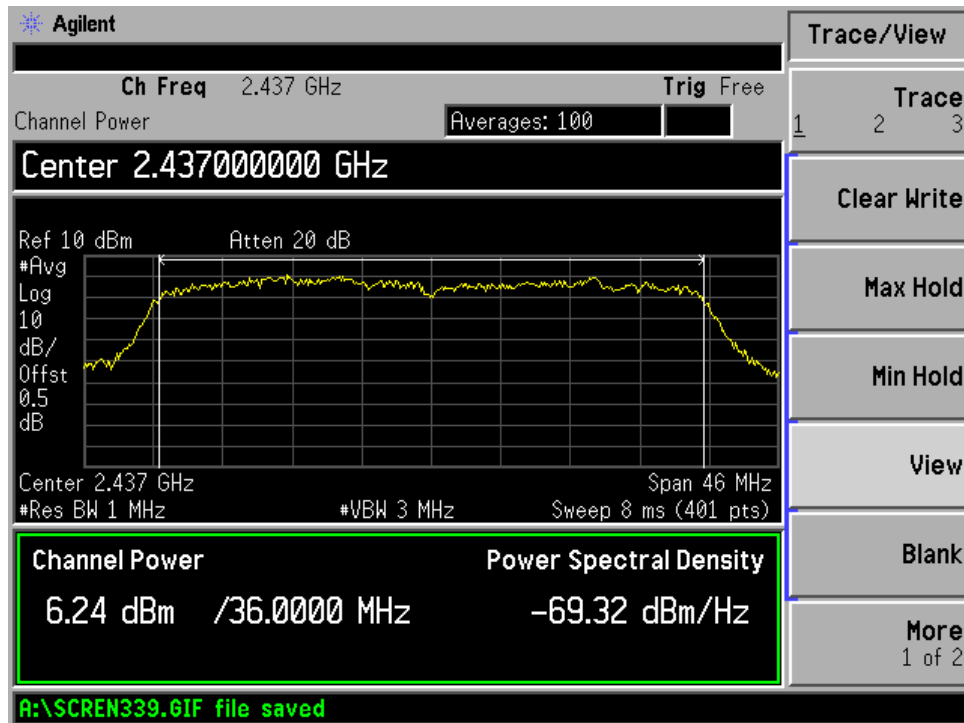


For 802.11N HT40 MCS0 Mbps Mode  
Result data graph shows Low channel conducted power = 6.70dBm

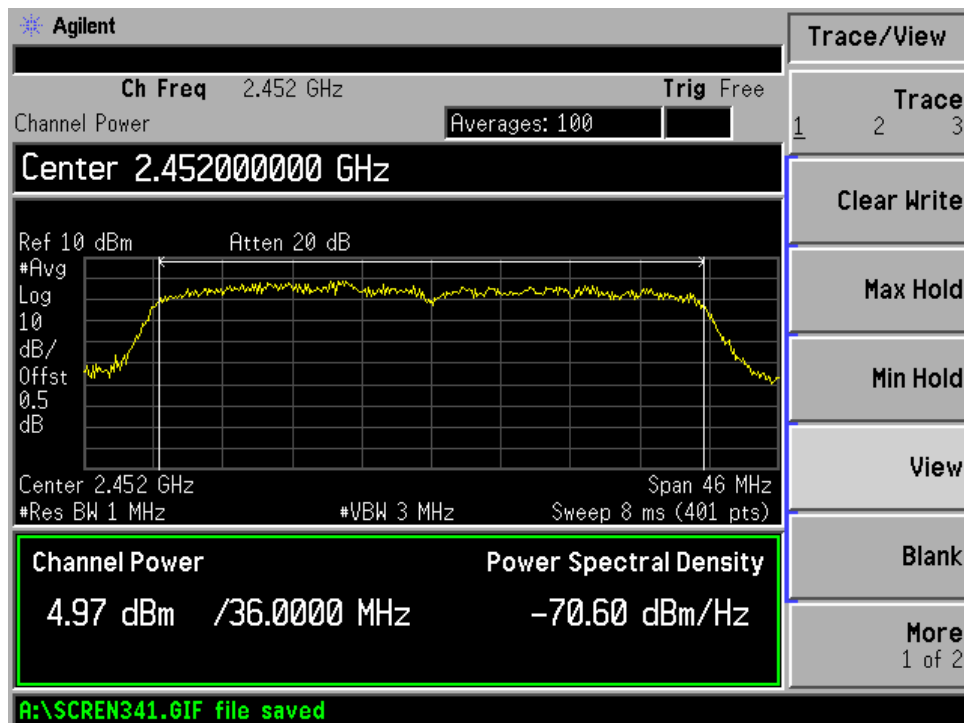




Result data graph shows middle channel conducted power = 6.24dBm



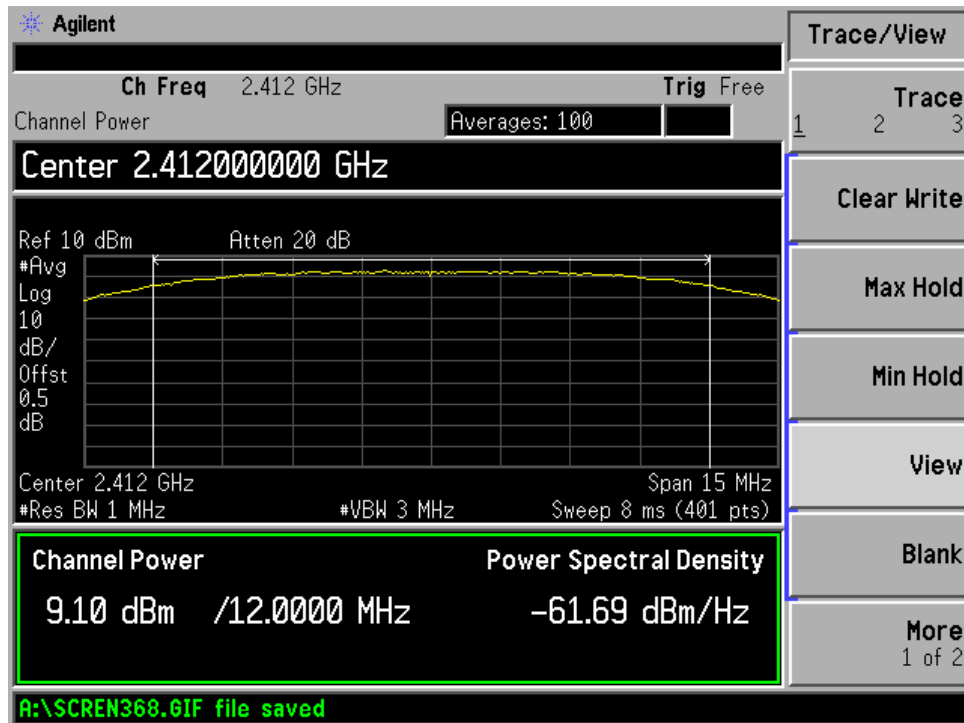
Result data graph shows high channel conducted power = 4.97dBm



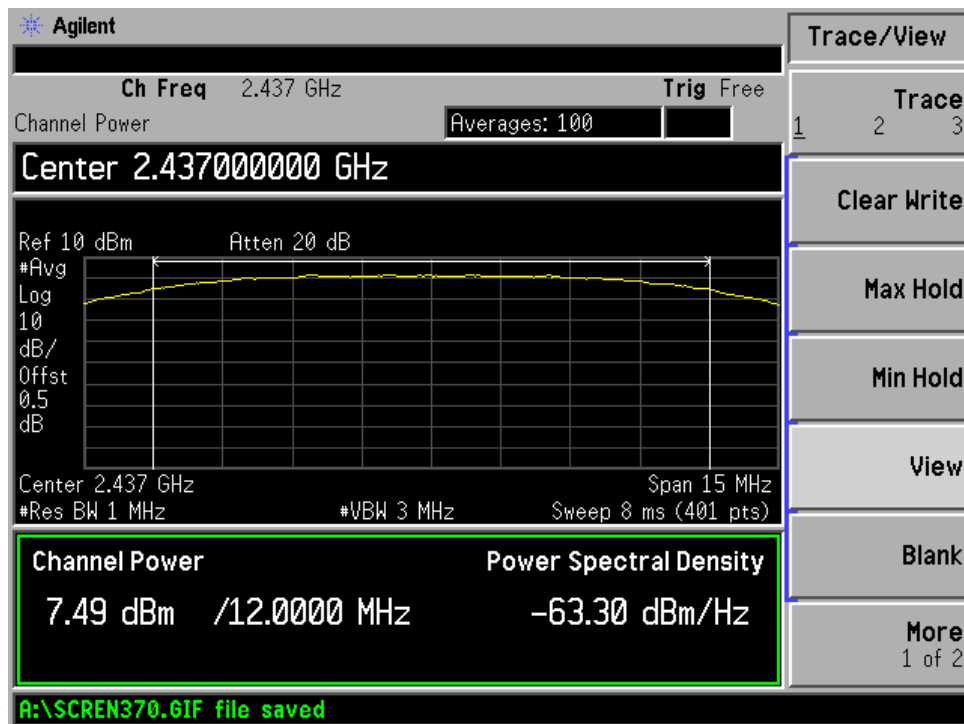




**For 802.11B 1Mbps Mode (Antenna 1)**  
**Result data graph shows Low channel conducted power = 9.10dBm**

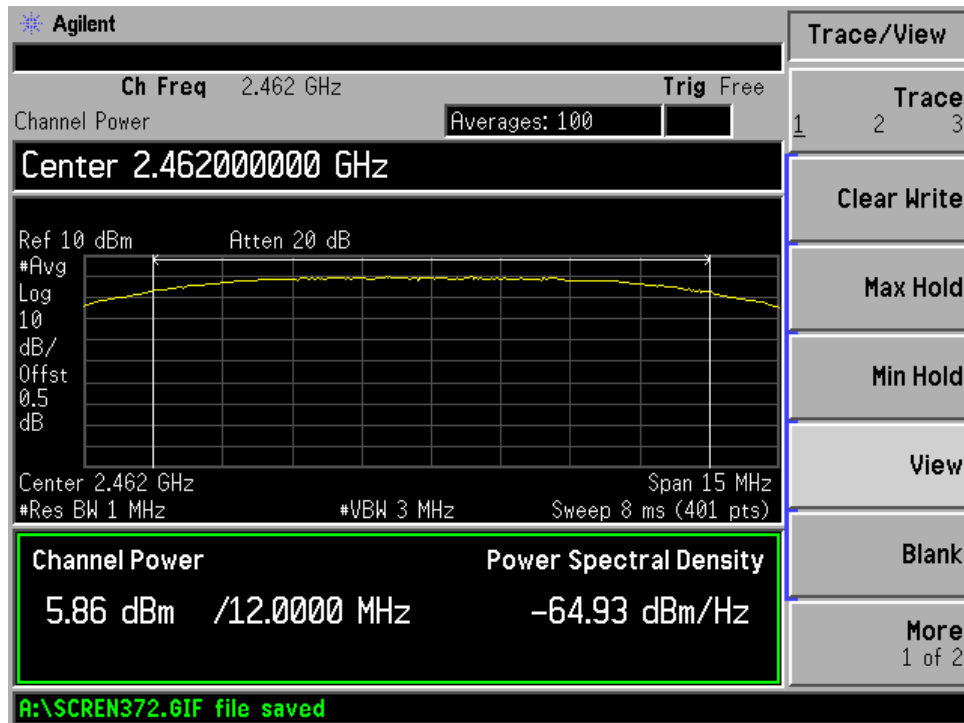


**Result data graph shows middle channel conducted power = 7.49dBm**



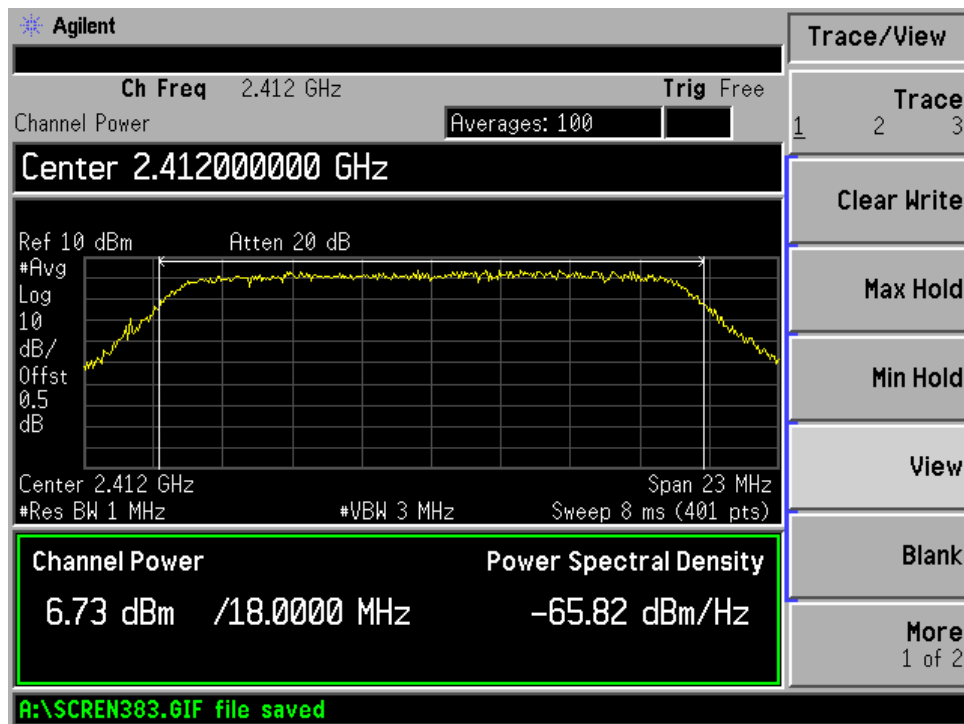


Result data graph shows high channel conducted power = 5.86dBm



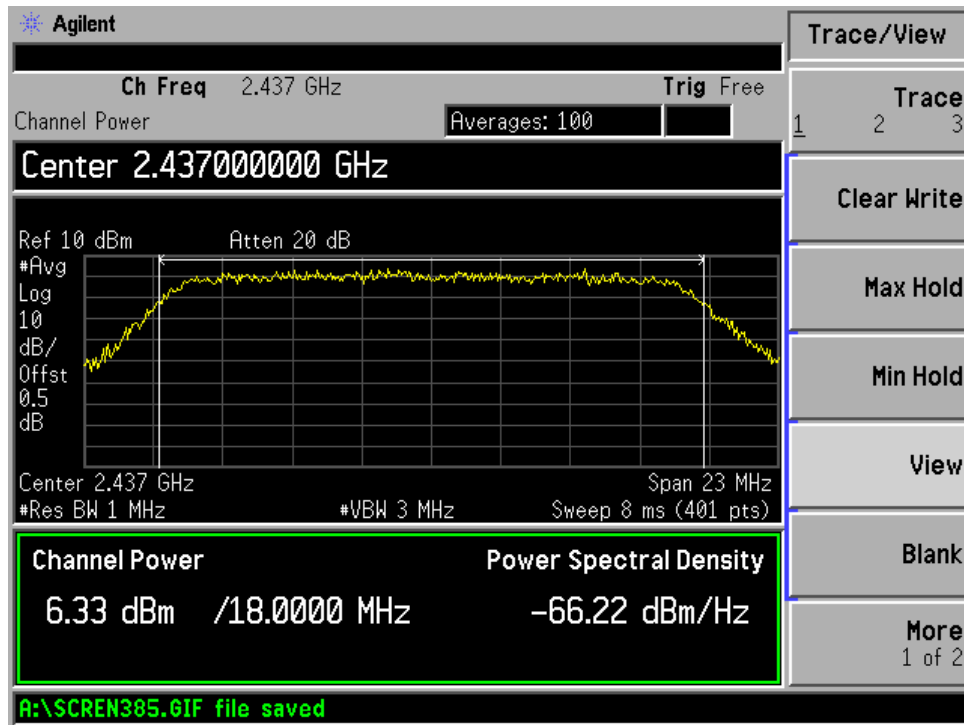
For 802.11G 6Mbps Mode

Result data graph shows Low channel conducted power = 6.73dBm

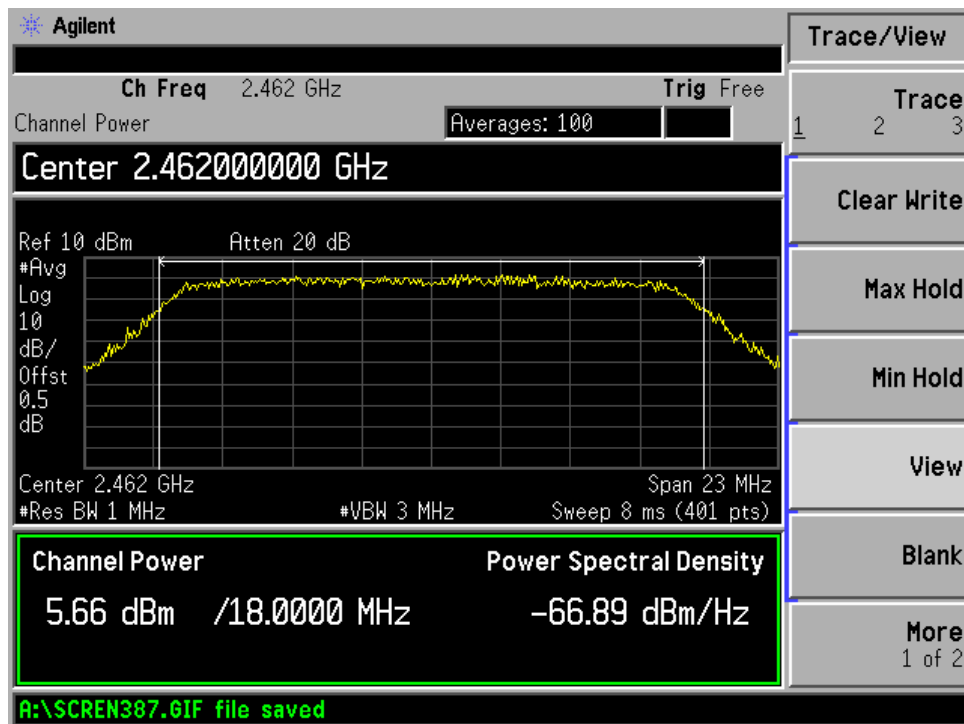




Result data graph shows middle channel conducted power = 6.33dBm

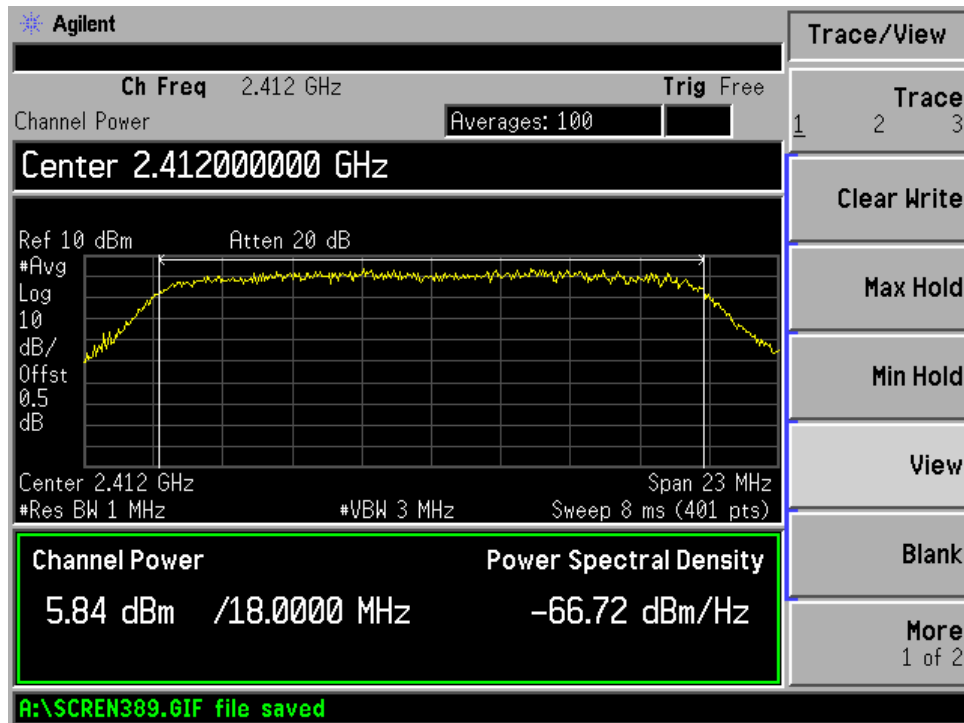


Result data graph shows high channel conducted power = 5.66dBm

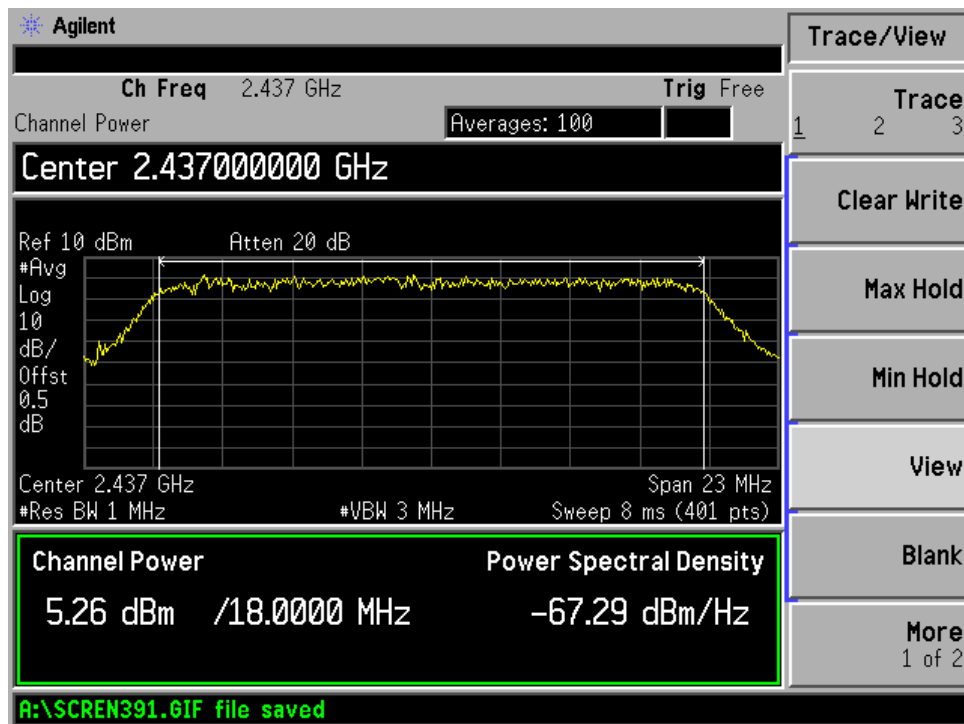




**For 802.11N HT20 MCS0Mbps Mode**  
**Result data graph shows Low channel conducted power = 5.84dBm**

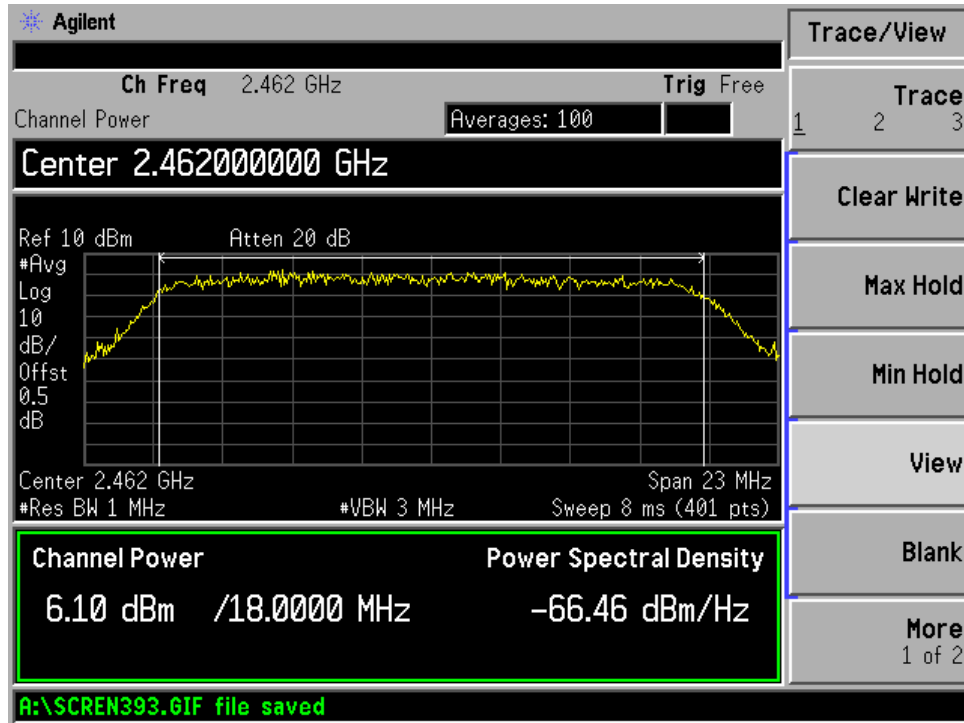


**Result data graph shows middle channel conducted power = 5.26dBm**

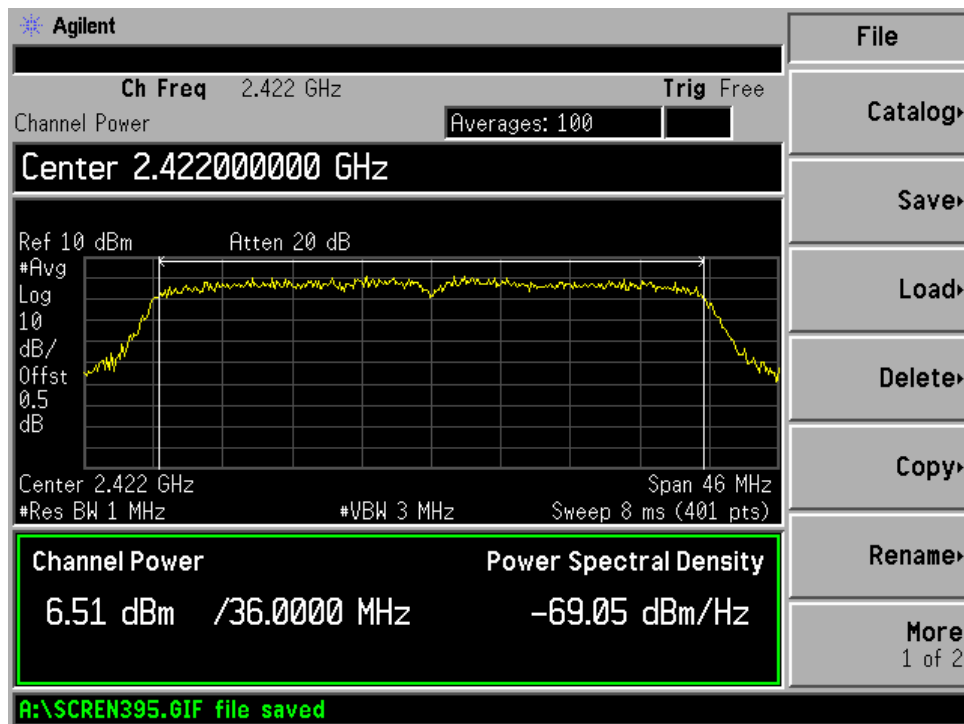




Result data graph shows high channel conducted power = 6.10dBm

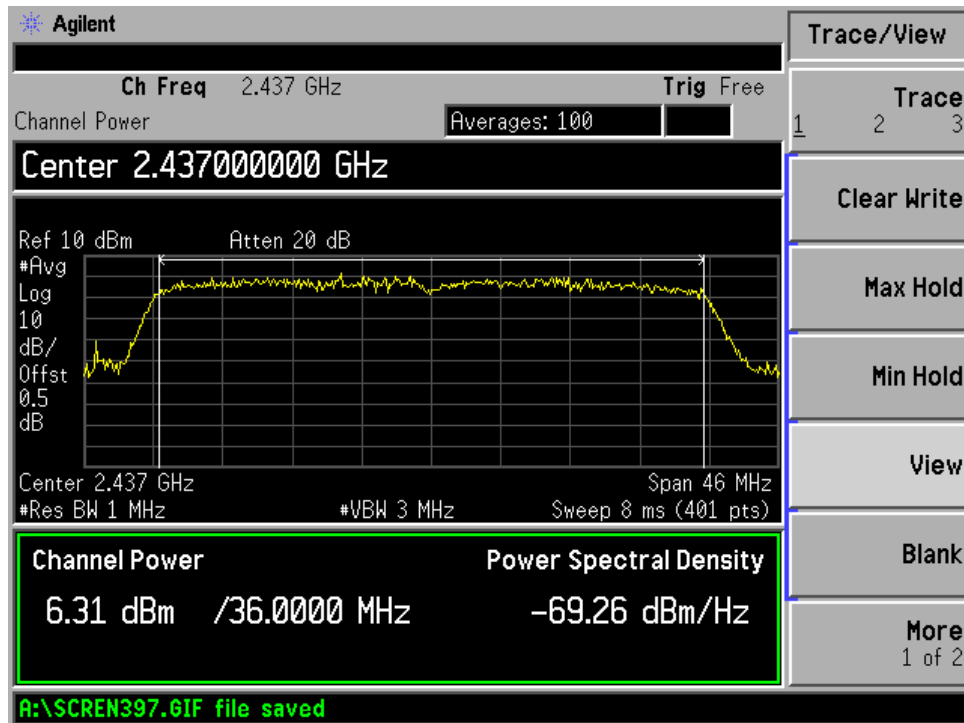


For 802.11N HT40 MCS0 Mbps Mode  
Result data graph shows Low channel conducted power = 6.51dBm

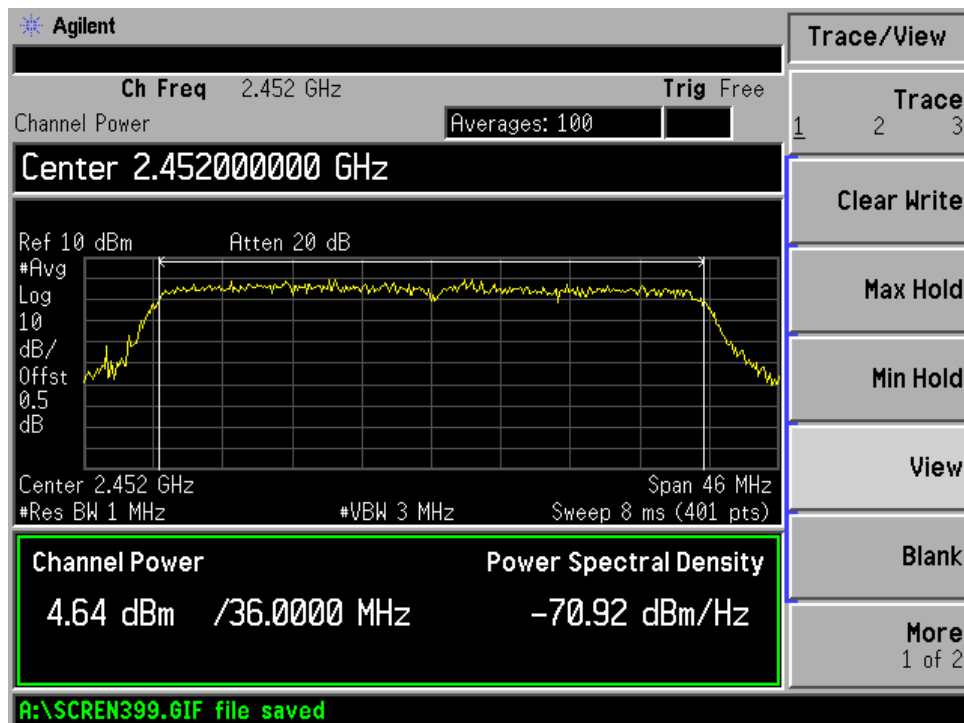




Result data graph shows middle channel conducted power = 6.31dBm



Result data graph shows high channel conducted power = 4.64dBm

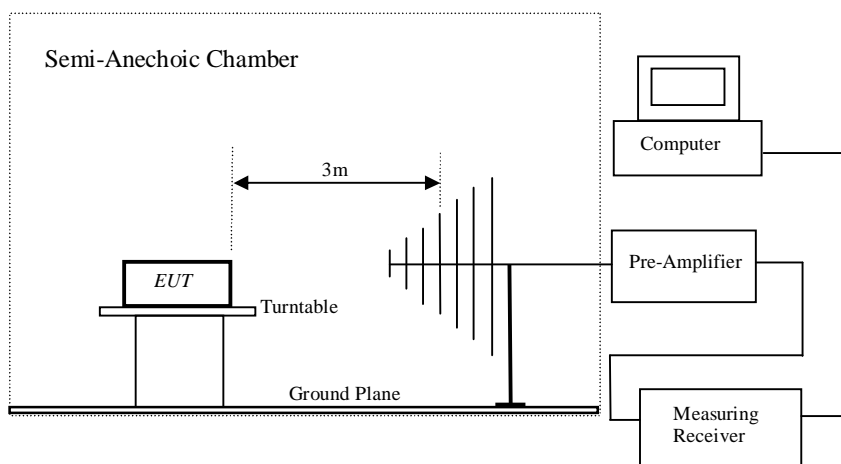




#### 4.5 Out of Band Emissions and Emissions in Restricted Bands

Test Requirement:	FCC part 15 section 15.247 (d )
Test Method:	ANSI C63.4:2003
Test Date:	2012-06-07
Mode of Operation:	Transmitting continuously mode.
Detector Function:	Peak
Measurement BW:	RBW 100KHz ; VBW 300KHz

#### Test Setup:





**Result : PASS**

**Out of Frequency Band Emissions:**

For out of band emissions that are close to or exceed 20dB attenuation requirement, and emission falls into restricted band, radiated emission was performed in order to show compliance with the general radiated emission requirement.

**Result Summary:**

Refer to Figure 10 to 11 for the emission data graph, result shows that the significant emissions detected are with more than 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

**Limits for Out of Frequency Band Emission [ Section 15.247 (d) ]:**

In any 100kHz 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 100kHz bandwidth within the band that contains the highest level of the desired power. Attenuation below the general limits specified in Section 15.209(a) is not required.

**Limit for Radiated Emission Falling in Restricted Bands [ Section 15.209 ]:**

Frequency (MHz)	Field Strength [ $\mu\text{V}/\text{m}$ ]	Field Strength [dB $\mu\text{V}/\text{m}$ ]
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

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.

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

**Result : PASS**

**All Emission and Emissions Fall into Restricted Band were recorded as below:**





For IEEE 802.11b Mode

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Polarization
<b>Lowest Channel</b>							
178.1327	29.17	3.74	32.91	43.50	-10.59	peak	H
251.1804	33.78	7.34	41.12	46.00	-4.88	peak	H
642.8613	27.18	15.14	42.32	46.00	-3.68	peak	H
36.0007	24.62	9.04	33.66	40.00	-6.34	peak	V
178.1327	27.53	3.74	31.27	43.50	-12.23	peak	V
251.1804	24.63	7.34	31.97	46.00	-14.03	peak	V
<b>Antenna 0</b>							
4761.303	47.66	-4.06	43.60	74.00	-30.40	peak	H
4832.823	35.60	-3.85	31.75	54.00	-22.25	AVG	H
7373.297	47.99	1.74	49.73	74.00	-24.27	peak	H
7484.052	35.67	2.23	37.90	54.00	-16.10	AVG	H
4832.823	51.99	-3.85	48.14	74.00	-25.86	peak	V
4832.823	39.93	-3.85	36.08	54.00	-17.92	AVG	V
7484.052	48.13	2.23	50.36	74.00	-23.64	peak	V
7521.339	35.69	2.26	37.95	54.00	-16.05	AVG	V
<b>Antenna 1</b>							
4905.418	51.03	-4.56	46.47	74.00	-27.53	peak	H
5364.466	38.56	-4.15	34.41	54.00	-19.59	AVG	H
8905.934	38.33	-0.25	38.08	54.00	-15.92	AVG	H
8950.306	50.80	-0.17	50.63	74.00	-23.37	peak	H
5364.466	38.76	-4.15	34.61	54.00	-19.39	AVG	V
5445.047	51.26	-4.08	47.18	74.00	-26.82	peak	V
8905.934	50.29	-0.25	50.04	74.00	-23.96	peak	V
8905.934	38.39	-0.25	38.14	54.00	-15.86	AVG	V



For IEEE 802.11b Mode

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Polarization
<b>Middle Channel</b>							
128.1130	26.73	4.27	31.00	43.50	-12.50	peak	H
176.8878	33.61	3.73	37.34	43.50	-6.16	peak	H
251.1804	35.30	7.34	42.64	46.00	-3.36	peak	H
642.8613	22.18	15.14	37.32	46.00	-8.68	peak	H
36.0007	24.62	9.04	33.66	40.00	-6.34	peak	V
176.8878	28.66	3.73	32.39	43.50	-11.11	peak	V
249.4250	28.27	7.27	35.54	46.00	-10.46	peak	V
900.1474	19.99	19.38	39.37	46.00	-6.63	peak	V
<b>Antenna 0</b>							
4785.025	46.82	-3.99	42.83	74.00	-31.17	peak	H
4832.823	34.68	-3.85	30.83	54.00	-23.17	AVG	H
7446.950	46.63	2.07	48.70	74.00	-25.30	peak	H
7521.339	34.96	2.26	37.22	54.00	-16.78	AVG	H
4881.099	49.24	-3.71	45.53	74.00	-28.47	peak	V
4881.099	38.25	-3.71	34.54	54.00	-19.46	AVG	V
7484.052	47.46	2.23	49.69	74.00	-24.31	peak	V
7521.339	34.94	2.26	37.20	54.00	-16.80	AVG	V
<b>Antenna 1</b>							
4954.419	50.94	-4.51	46.43	74.00	-27.57	peak	H
5337.872	38.43	-4.18	34.25	54.00	-19.75	AVG	H
8905.934	38.33	-0.25	38.08	54.00	-15.92	AVG	H
8950.306	49.76	-0.17	49.59	74.00	-24.41	peak	H
5104.379	51.14	-4.38	46.76	74.00	-27.24	peak	V
5364.466	38.71	-4.15	34.56	54.00	-19.44	AVG	V
8225.185	51.27	-1.04	50.23	74.00	-23.77	peak	V
8905.934	38.37	-0.25	38.12	54.00	-15.88	AVG	V



For IEEE 802.11b Mode

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Polarization
<b>Highest Channel</b>							
128.1130	27.74	4.27	32.01	43.50	-11.49	peak	H
178.1327	29.65	3.74	33.39	43.50	-10.11	peak	H
249.4250	32.74	7.27	40.01	46.00	-5.99	peak	H
900.1474	21.96	19.38	41.34	46.00	-4.66	peak	H
34.5173	25.27	8.80	34.07	40.00	-5.93	peak	V
178.1327	25.19	3.74	28.93	43.50	-14.57	peak	V
251.1804	31.72	7.34	39.06	46.00	-6.94	peak	V
719.1995	17.40	16.59	33.99	46.00	-12.01	peak	V
<b>Antenna 0</b>							
4929.857	45.98	-3.57	42.41	74.00	-31.59	peak	H
4954.419	33.83	-3.50	30.33	54.00	-23.67	AVG	H
7373.297	47.13	1.74	48.87	74.00	-25.13	peak	H
7558.812	35.02	2.20	37.22	54.00	-16.78	AVG	H
4905.418	47.06	-3.65	43.41	74.00	-30.59	peak	V
4929.857	34.56	-3.57	30.99	54.00	-23.01	AVG	V
7484.052	47.49	2.23	49.72	74.00	-24.28	peak	V
7521.339	34.98	2.26	37.24	54.00	-16.76	AVG	V
<b>Antenna 1</b>							
4737.699	33.56	-4.13	29.53	54.00	-24.47	AVG	H
4761.303	45.54	-4.06	41.48	74.00	-32.52	peak	H
7410.032	46.72	1.91	48.63	74.00	-25.37	peak	H
7521.339	34.84	2.26	37.09	54.00	-16.91	AVG	H
4690.841	46.07	-4.26	41.91	74.00	-32.09	peak	V
4929.857	33.81	-3.57	30.24	54.00	-23.76	AVG	V
7558.812	34.85	2.20	37.05	54.00	-16.95	AVG	V
7596.471	48.13	2.15	50.28	74.00	-23.72	peak	V



For IEEE 802.11g Mode

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Polarization
<b>Lowest Channel</b>							
128.1130	25.71	4.27	29.98	43.50	-13.52	peak	H
251.1804	34.59	7.34	41.93	46.00	-4.07	peak	H
642.8613	21.81	15.14	36.95	46.00	-9.05	peak	H
900.1474	20.33	19.38	39.71	46.00	-6.29	peak	H
4856.901	45.66	-3.78	41.88	74.00	-32.12	peak	H
4929.857	33.76	-3.57	30.19	54.00	-23.81	AVG	H
7410.032	34.62	1.91	36.53	54.00	-17.47	AVG	H
7521.339	47.24	2.26	49.50	74.00	-24.50	peak	H
34.5173	24.16	8.80	32.96	40.00	-7.04	peak	V
249.4250	28.57	7.27	35.84	46.00	-10.16	peak	V
900.1474	17.03	19.38	36.41	46.00	-9.59	peak	V
4832.823	46.72	-3.85	42.87	74.00	-31.13	peak	V
4832.823	36.10	-3.85	32.25	54.00	-21.75	AVG	V
7521.339	47.48	2.26	49.74	74.00	-24.26	peak	V
7558.812	34.94	2.20	37.14	54.00	-16.86	AVG	V
<b>Middle Channel</b>							
30.6379	22.21	8.15	30.36	40.00	-9.64	peak	H
128.1130	23.48	4.27	27.75	43.50	-15.75	peak	H
249.4250	33.37	7.27	40.64	46.00	-5.36	peak	H
900.1474	21.57	19.38	40.95	46.00	-5.05	peak	H
3676.977	35.06	-5.95	29.11	54.00	-24.89	AVG	H
3713.707	46.47	-5.84	40.63	74.00	-33.37	peak	H
7558.812	47.26	2.20	49.46	74.00	-24.54	peak	H
7558.812	34.94	2.20	37.14	54.00	-16.86	AVG	H
34.0365	23.39	8.72	32.11	40.00	-7.89	peak	V
94.0979	23.20	5.37	28.57	43.50	-14.93	peak	V
178.1327	25.93	3.74	29.67	43.50	-13.83	peak	V
251.1804	25.70	7.34	33.04	46.00	-12.96	peak	V
900.1474	19.56	19.38	38.94	46.00	-7.06	peak	V
4881.099	46.08	-3.71	42.37	74.00	-31.63	peak	V
4881.099	34.81	-3.71	31.10	54.00	-22.90	AVG	V
7336.744	46.42	1.59	48.01	74.00	-25.99	peak	V
7558.812	34.92	2.20	37.12	54.00	-16.88	AVG	V
<b>Highest Channel</b>							
39.7147	20.41	9.64	30.05	40.00	-9.95	peak	H
176.8878	29.52	3.73	33.25	43.50	-10.25	peak	H
251.1804	28.33	7.34	35.67	46.00	-10.33	peak	H
900.1474	21.42	19.38	40.80	46.00	-5.20	peak	H
4856.901	45.94	-3.78	42.16	74.00	-31.84	peak	H
4979.103	33.78	-3.43	30.35	54.00	-23.65	AVG	H
7484.052	46.17	2.23	48.40	74.00	-25.60	peak	H
7558.812	34.91	2.20	37.11	54.00	-16.89	AVG	H
33.0950	25.57	8.56	34.13	40.00	-5.87	peak	V
176.8878	26.16	3.73	29.89	43.50	-13.61	peak	V
900.1474	19.42	19.38	38.80	46.00	-7.20	peak	V
4929.857	46.50	-3.57	42.93	74.00	-31.07	peak	V
5003.909	33.83	-3.36	30.47	54.00	-23.53	AVG	V
7410.032	47.19	1.91	49.10	74.00	-24.90	peak	V
7521.339	34.80	2.26	37.06	54.00	-16.94	AVG	V



For IEEE 802.11n/HT20 Mode

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Polarization
<b>Lowest Channel</b>							
176.8878	31.01	3.73	34.74	43.50	-8.76	peak	H
251.1804	31.10	7.34	38.44	46.00	-7.56	peak	H
642.8613	22.88	15.14	38.02	46.00	-7.98	peak	H
900.1474	19.98	19.38	39.36	46.00	-6.64	peak	H
4856.901	44.82	-3.78	41.04	74.00	-32.96	peak	H
4856.901	33.51	-3.78	29.73	54.00	-24.27	AVG	H
7558.812	34.93	2.20	37.13	54.00	-16.87	AVG	H
7596.471	47.06	2.15	49.21	74.00	-24.79	peak	H
33.0950	26.12	8.56	34.68	40.00	-5.32	peak	V
176.8878	25.91	3.73	29.64	43.50	-13.86	peak	V
249.4250	25.88	7.27	33.15	46.00	-12.85	peak	V
900.1474	19.99	19.38	39.37	46.00	-6.63	peak	V
4832.823	47.23	-3.85	43.38	74.00	-30.62	peak	V
4832.823	35.09	-3.85	31.24	54.00	-22.76	AVG	V
7410.032	47.15	1.91	49.06	74.00	-24.94	peak	V
7521.339	34.82	2.26	37.08	54.00	-16.92	AVG	V
<b>Middle Channel</b>							
128.1130	24.42	4.27	28.69	43.50	-14.81	peak	H
176.8878	29.43	3.73	33.16	43.50	-10.34	peak	H
251.1804	31.47	7.34	38.81	46.00	-7.19	peak	H
642.8613	25.49	15.14	40.63	46.00	-5.37	peak	H
4881.099	46.33	-3.71	42.62	74.00	-31.38	peak	H
4979.103	33.76	-3.43	30.33	54.00	-23.67	AVG	H
7521.339	47.18	2.26	49.44	74.00	-24.56	peak	H
7558.812	34.93	2.20	37.13	54.00	-16.87	AVG	H
36.0007	26.84	9.04	35.88	40.00	-4.12	peak	V
94.0979	24.71	5.37	30.08	43.50	-13.42	peak	V
249.4250	29.91	7.27	37.18	46.00	-8.82	peak	V
900.1474	17.34	19.38	36.72	46.00	-9.28	peak	V
4905.418	45.41	-3.65	41.76	74.00	-32.24	peak	V
4979.103	33.78	-3.43	30.35	54.00	-23.65	AVG	V
7373.297	47.01	1.74	48.75	74.00	-25.25	peak	V
7558.812	34.85	2.20	37.05	54.00	-16.95	AVG	V
<b>Highest Channel</b>							
128.1130	25.35	4.27	29.62	43.50	-13.88	peak	H
175.6516	27.94	3.73	31.67	43.50	-11.83	peak	H
249.4250	31.80	7.27	39.07	46.00	-6.93	peak	H
642.8613	25.34	15.14	40.48	46.00	-5.52	peak	H
4737.699	33.56	-4.13	29.43	54.00	-24.57	AVG	H
4761.303	45.54	-4.06	41.48	74.00	-32.52	peak	H
7410.032	46.72	1.91	48.63	74.00	-25.37	peak	H
7521.339	34.84	2.26	37.10	54.00	-16.90	AVG	H
33.0950	25.75	8.56	34.31	40.00	-5.69	peak	V
178.1327	28.45	3.74	32.19	43.50	-11.31	peak	V
249.4250	30.70	7.27	37.97	46.00	-8.03	peak	V
900.1474	19.15	19.38	38.53	46.00	-7.47	peak	V
4690.841	46.07	-4.26	41.81	74.00	-32.19	peak	V
4929.857	33.81	-3.57	30.24	54.00	-23.76	AVG	V
7558.812	34.85	2.20	37.05	54.00	-16.95	AVG	V
7596.471	48.13	2.15	50.28	74.00	-23.72	peak	V



For IEEE 802.11n/HT40 Mode

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Polarization
<b>Lowest Channel</b>							
128.1130	26.67	4.27	30.94	43.50	-12.56	peak	H
176.8878	29.50	3.73	33.23	43.50	-10.27	peak	H
249.4250	30.92	7.27	38.19	46.00	-7.81	peak	H
642.8613	21.44	15.14	36.58	46.00	-9.42	peak	H
4905.418	45.26	-3.65	41.61	74.00	-32.39	peak	H
4954.419	33.74	-3.50	30.24	54.00	-23.76	AVG	H
7446.950	46.53	2.07	48.60	74.00	-25.40	peak	H
7558.812	34.82	2.20	37.02	54.00	-16.98	AVG	H
176.8878	29.87	3.73	33.60	43.50	-9.90	peak	V
249.4250	23.71	7.27	30.98	46.00	-15.02	peak	V
642.8613	20.74	15.14	35.88	46.00	-10.12	peak	V
900.1474	19.64	19.38	39.02	46.00	-6.98	peak	V
4832.823	45.54	-3.85	41.69	74.00	-32.31	peak	V
4856.901	34.18	-3.78	30.40	54.00	-23.60	AVG	V
7373.297	46.63	1.74	48.37	74.00	-25.63	peak	V
7484.052	34.42	2.23	36.65	54.00	-17.35	AVG	V
<b>Middle Channel</b>							
128.1130	26.81	4.27	31.08	43.50	-12.42	peak	H
176.8878	31.30	3.73	35.03	43.50	-8.47	peak	H
251.1804	30.00	7.34	37.34	46.00	-8.66	peak	H
642.8613	21.92	15.14	37.06	46.00	-8.94	peak	H
4737.699	33.44	-4.13	29.31	54.00	-24.69	AVG	H
4761.303	45.73	-4.06	41.67	74.00	-32.33	peak	H
7336.744	46.74	1.59	48.33	74.00	-25.67	peak	H
7484.052	34.35	2.23	36.58	54.00	-17.42	AVG	H
33.0950	24.94	8.56	33.50	40.00	-6.50	peak	V
178.1327	27.76	3.74	31.50	43.50	-12.00	peak	V
249.4250	21.88	7.27	29.15	46.00	-16.85	peak	V
900.1474	19.78	19.38	39.16	46.00	-6.84	peak	V
4856.901	34.18	-3.78	30.40	54.00	-23.60	AVG	V
4881.099	46.42	-3.71	42.71	74.00	-31.29	peak	V
7484.052	46.72	2.23	48.95	74.00	-25.05	peak	V
7521.339	34.82	2.26	37.08	54.00	-16.92	AVG	V
<b>Highest Channel</b>							
33.0950	22.41	8.56	30.97	40.00	-9.03	peak	H
176.8878	30.29	3.73	34.02	43.50	-9.48	peak	H
251.1804	27.93	7.34	35.27	46.00	-10.73	peak	H
4881.099	45.10	-3.71	41.39	74.00	-32.61	peak	H
4929.857	33.56	-3.57	29.99	54.00	-24.01	AVG	H
7521.339	47.55	2.26	49.81	74.00	-24.19	peak	H
7558.812	34.86	2.20	37.06	54.00	-16.94	AVG	H
35.7491	26.03	9.00	35.03	40.00	-4.97	peak	V
94.0979	23.13	5.37	28.50	43.50	-15.00	peak	V
249.4250	21.15	7.27	28.42	46.00	-17.58	peak	V
642.8613	20.25	15.14	35.39	46.00	-10.61	peak	V
4929.857	45.90	-3.57	42.33	74.00	-31.67	peak	V
4979.103	33.71	-3.43	30.28	54.00	-23.72	AVG	V
7521.339	47.59	2.26	49.85	74.00	-24.15	peak	V
7558.812	34.86	2.20	37.06	54.00	-16.94	AVG	V



Remark: Only background noise was measured from 12GHz-26GHz.

**Result Summary:**

- 1) Communication mode: All other emissions are more than 20dB below FCC part 15.209 limit.
- 2) No further spurious emissions found between 30 MHz and lowest internal used/generated frequency and from 30MHz to 1GHz.
- 3) Test data is base on the worst case lowest channel's emission data graph from 30MHz-26GHz.

**Remarks:**

1. " \* " Radiated emissions which fall in the restricted bands as defined in Section 15.205(a).
2. Emission level with more than 20dB below the FCC required limit is not mentioned in table.
3. Delta to Limit = Field strength (dB $\mu$ V/m) – Limit (dB $\mu$ V/m).
4. Calculated measurement uncertainty: 9kHz -30MHz: 1.8dB.  
30MHz -1GHz: 5.2dB.  
1GHz -18GHz: 5.1dB.



#### 4.6 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC part 15 Section 15.207 Class B
Test Method:	ANSI C63.4:2003
Test Date:	2012-06-07
Mode of Operation:	-Transmitting continuously mode
Detector Function:	CISPR Quasi Peak
Measurement BW:	100 kHz
Worst Case Channel:	802.11b Lowest Channel 1Mbps

**Results: PASS**

- Refer following the result data graph.

#### Limits for Conducted Emission [ Section 15.207]:

Frequency Range [MHz]	Quasi-Peak Limit [dB $\mu$ V]	Average Limit [dB $\mu$ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

\* Decreases with the logarithm of the frequency.

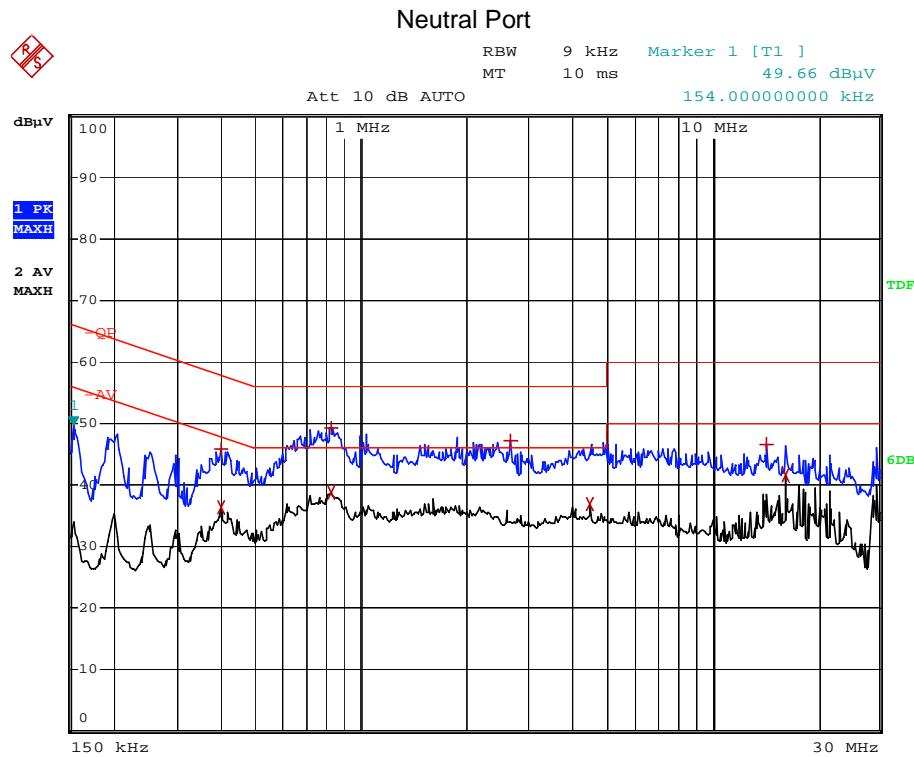
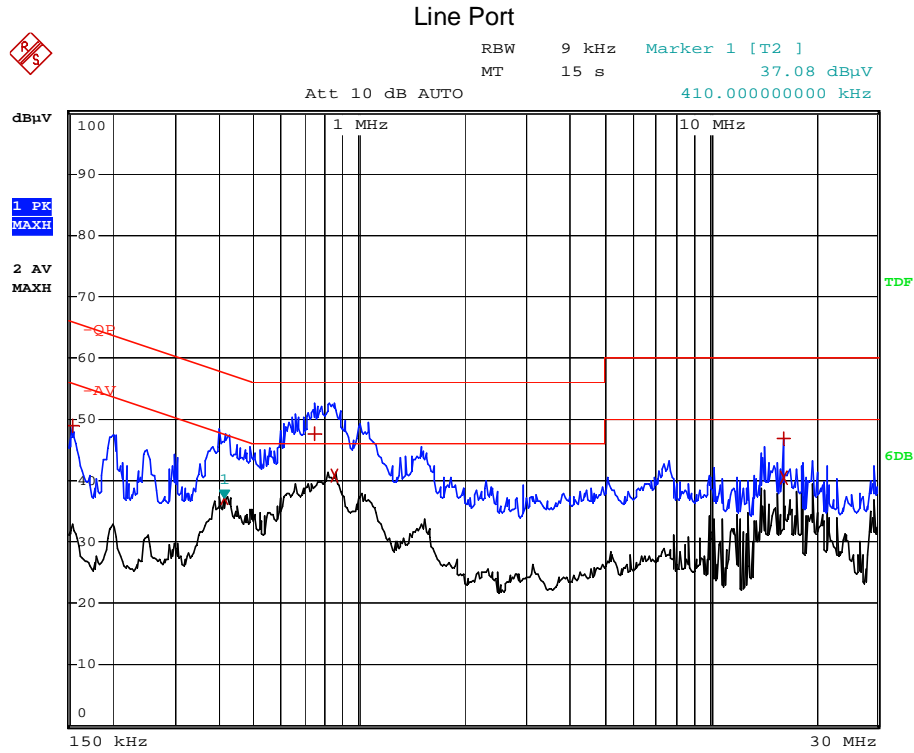
Remarks:

Calculated measurement uncertainty:  $\pm 2.8$ dB





**Result data graph shows the conducted emission (Live and Neutral).  
For Adapter 1: HKA01212010-2F**



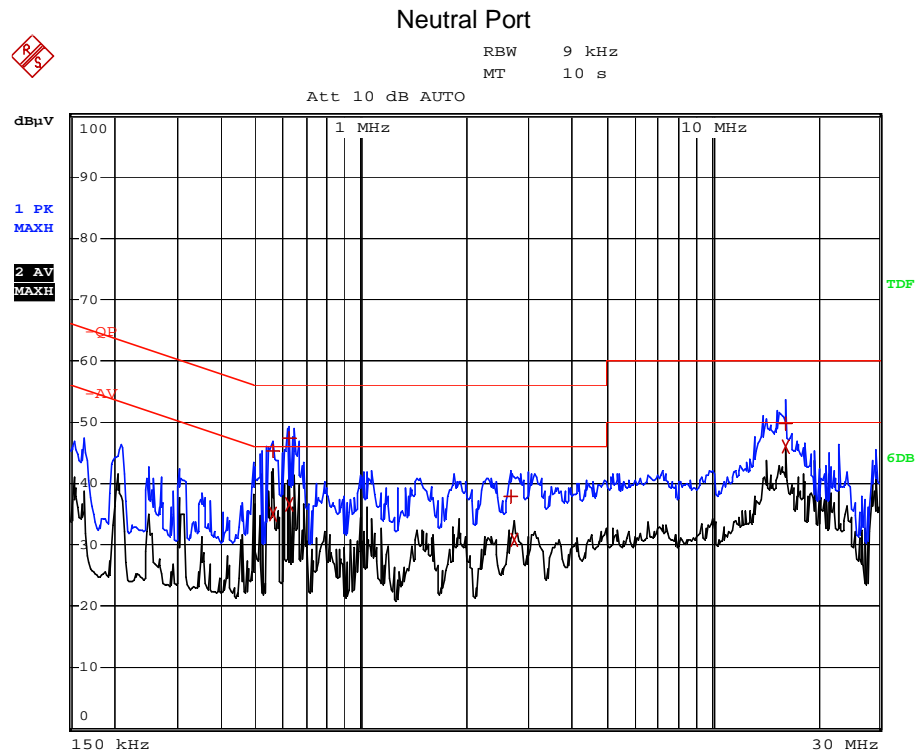
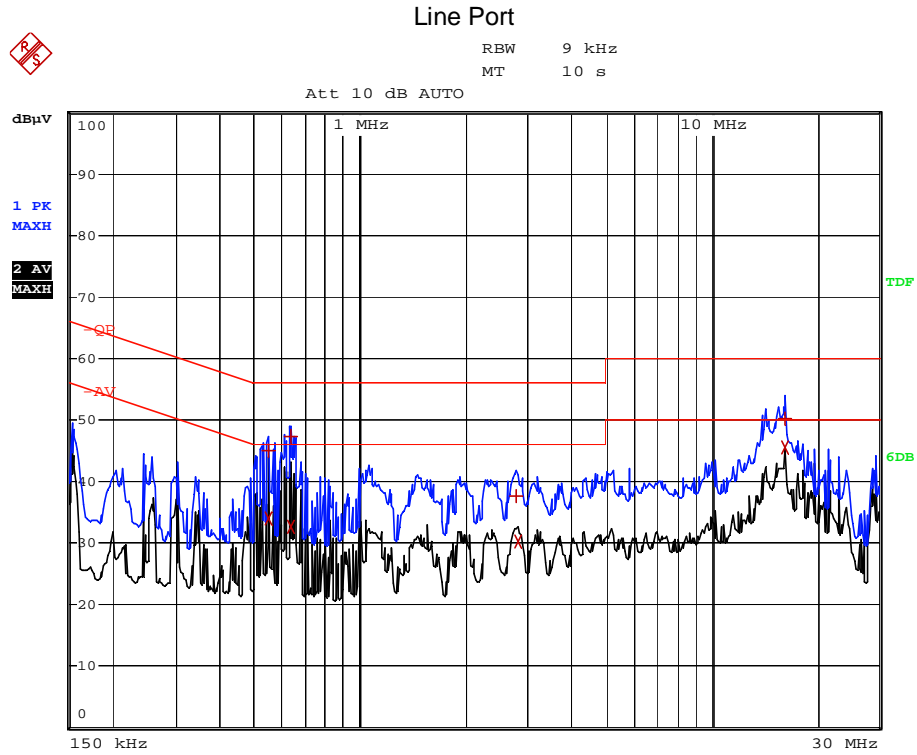


Result data table shows the conducted emission (Live and Neutral).

Frequency (MHz)	Detector (QP/AV)	Phase	Result (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin
0.154	QP	L	49.05	65.78	-16.73
0.410	AV	L	37.07	47.64	-10.57
0.750	QP	L	47.71	56.00	-8.29
0.850	AV	L	40.82	46.00	-5.18
16.230	AV	L	40.63	50.00	-9.37
16.230	QP	L	46.87	60.00	-13.13
0.398	QP	N	45.82	57.89	-12.07
0.398	AV	N	36.36	47.89	-11.53
0.826	QP	N	49.34	56.00	-6.66
0.826	AV	N	38.68	46.00	-7.32
2.686	QP	N	47.04	56.00	-8.96
4.478	AV	N	36.85	46.00	-9.15
14.334	QP	N	46.64	60.00	-13.36
16.230	AV	N	41.70	50.00	-8.30



Result data graph shows the conducted emission (Live and Neutral).  
For Adapter 2: XKD-C1000IC120-12.0W





Result data table shows the conducted emission (Live and Neutral).

Frequency (MHz)	Detector (QP/AV)	Phase	Result (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin
0.546	AV	L	34.01	46.00	-11.99
0.550	QP	L	45.01	56.00	-10.99
0.634	QP	L	47.35	56.00	-8.65
0.634	AV	L	32.61	46.00	-13.39
2.794	QP	L	37.65	56.00	-18.35
2.810	AV	L	30.35	46.00	-15.65
16.230	QP	L	50.25	60.00	-9.75
16.230	AV	L	45.64	50.00	-4.36
0.558	QP	N	45.19	56.00	-10.81
0.558	AV	N	35.05	46.00	-10.95
0.622	AV	N	36.67	46.00	-9.33
0.626	QP	N	47.41	56.00	-8.59
2.686	QP	N	37.81	56.00	-18.19
2.746	AV	N	30.94	46.00	-15.06
16.166	QP	N	49.70	60.00	-10.30
16.230	AV	N	45.97	50.00	-4.03



## 5.0 RF Exposure Compliance Requirement

Test Requirement: FCC part 15 section 15.247 (i)  
 Test Method: FCC part 15 section 1.1307 (b1)  
 OET Bulletin 65, Edition 01-01

### Results: PASS

Systems operation under the provision of this section shall be operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the Commission's guideline,

The EUT is considered as a mobile device according to OET Bulletin 65, Edition 01-01, therefore distance to human body of min. 20cm is determined.

Frequency Band:	2.412GHz ~2.462GHz
Device Category:	<input type="checkbox"/> Portable (< 20cm separation ) <input checked="" type="checkbox"/> Mobile (>20cm separation ) <input type="checkbox"/> Others :
Exposure Classification:	<input type="checkbox"/> Occupational/ Controlled exposure <input checked="" type="checkbox"/> General Population / Uncontrolled exposure
Max Transmit Power	22.99mW
Antenna Gain	4dBi ( Numeric gain:2.51)
Evaluation Applied:	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

MPE calculation:

Refer to clause 4.4 of this test report, it shows that The maximum output power =  
 $0.009154W=9.6161dBm$ ,

The maximum radiated power(EIRP)=the maximum output power+ antenna gain  
 $=9.6161dBm+4dBi=13.6161dBm=22.99mW$

The power density at 20cm from the antenna : =  $EIRP / 4\pi R^2$   
 $= 0.004576mW / cm^2$

### Limits for General Population/Uncontrolled Exposure [OET Bulletin 65, Edition 01-01]:

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) ( $mW/cm^2$ )	Averaging Time $ E ^2,  H ^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30



## 6.0 List of Measurement Equipment

### Radiated Emission

Manufacturer	Equipment	Model No.	Serial No.	Cal. Date	Due Date
R&S	Spectrum Analyzer	FSP30	836079/035	2012-03-28	2013-03-27
R&S	Test Receiver	ESI26	838786/013	2012-03-28	2013-03-27
Albatross Projects	Anechoic chamber	MCDC	---	2011-12-20	2012-12-19
SCHWARZBECK	Trilog Broadband Antenna	VULB9163	9163-333	2012-02-25	2013-02-24
ETS	Horn Antenna	3117	00086197	2012-02-25	2013-02-24
Agilent	Pre-amplifier	8447F	3113A06717	2012-03-28	2013-03-27
Compliance Direction	Pre-amplifier	PAP-0118	24002	2012-03-28	2013-03-27
Anechoic chamber	Albatross Projects	MCDC	----	2012-03-20	2013-03-19

### Line Conducted

Manufacturer	Equipment	Model No.	Serial No.	Cal. Date	Due Date
Rohde & Schwarz	EMI Test Receiver	ESPI	101611	2012-03-28	2013-03-27
Schwarz beck	L.I.S.N	NSLK8126	8126-224	2012-03-28	2013-03-27
Rohde & Schwarz	Pulse Limiter	ESH3-Z2	100911	2012-03-28	2013-03-27
EMCO	AMN	3825/2	11967C	2012-03-28	2013-03-27
FCC	Current Probe	F-33-4	091684	2012-03-28	2013-03-27

N/A Not Applicable or Not Available