

# FCC REPORT (WIFI)

**Applicant:** GRUN MOBILE LLC

**Address of Applicant:** 2315 nw 107th Ave SUITE I M02 Mailbox # 33 Doral 33172,  
United States

## Equipment Under Test (EUT)

**Product Name:** mobile phone

**Model No.:** U452

**FCC ID:** 2ACFG-U452

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.247

**Date of sample receipt:** 10 Nov., 2014

**Date of Test:** 11 Nov., to 28 Nov., 2014

**Date of report issued:** 28 Nov., 2014

**Test Result:** PASS \*

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang  
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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## 2 Version

Version No.	Date	Description
00	28 Nov., 2014	Original

**Prepared by:**

**Date:**

28 Nov., 2014

**Report Clerk**

**Reviewed by:**

**Date:**

28 Nov., 2014

**Project Engineer**

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## 4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
6dB Emission Bandwidth 99% Occupied Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247(d)	Pass
Spurious Emission	15.205/15.209	Pass

*Pass: The EUT complies with the essential requirements in the standard.*

## 5 General Information

### 5.1 Client Information

Applicant:	GRUN MOBILE LLC
Address of Applicant:	2315 nw 107th Ave SUITE I M02 Mailbox # 33 Doral 33172, United States
Manufacturer:	shenzhen tianruixiang communication equipment limited
Address of Manufacturer:	12F,Shenzhen science building, zhongshan university, xuefu road, Hi-tech park, nanshan district Shenzhen, Guangdong, China
Factory:	dongguan tianruixiang communication equipment limited
Address of Factory:	1,2,3F,B building,NO.1, keyuan 9 road, tangxia district dongguan, Guangdong, China

### 5.2 General Description of E.U.T.

Product Name:	mobile phone
Model No.:	U452
Operation Frequency:	2412MHz~2462MHz (802.11b/802.11g/802.11n(H20)) 2422MHz~2452MHz (802.11n(H40))
Channel numbers:	11 for 802.11b/802.11g/802.11(H20) 7 for 802.11n(H40)
Channel separation:	5MHz
Modulation technology: (IEEE 802.11b)	Direct Sequence Spread Spectrum (DSSS)
Modulation technology: (IEEE 802.11g/802.11n)	Orthogonal Frequency Division Multiplexing(OFDM)
Data speed (IEEE 802.11b):	1Mbps, 2Mbps, 5.5Mbps, 11Mbps
Data speed (IEEE 802.11g):	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
Data speed (IEEE 802.11n):	Up to 150Mbps
Antenna Type:	Internal Antenna
Antenna gain:	1.4 dBi
AC adapter:	Input:100-240V AC, 50/60Hz 0.2A Output:5.0V DC, 1A
Power supply:	Rechargeable Li-ion Battery DC3.7V-1600mAh

**Operation Frequency each of channel For 802.11b/g/n(H20)**

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

**Operation Frequency each of channel For 802.11n(H40)**

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
		4	2427MHz	7	2442MHz		
		5	2432MHz	8	2447MHz		
3	2422MHz	6	2437MHz	9	2452MHz		

## Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

## 802.11b/802.11g/802.11n (H20)

Channel	Frequency
The lowest channel	2412MHz
The middle channel	2437MHz
The Highest channel	2462MHz

## 802.11n (H40)

Channel	Frequency
The lowest channel	2422MHz
The middle channel	2437MHz
The Highest channel	2452MHz

### 5.3 Test environment and mode

<b>Operating Environment:</b>	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
<b>Test mode:</b>	
Operation mode	Keep the EUT in continuous transmitting with modulation
The sample was placed 0.8m above the ground plane of 3m chamber. 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 the 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.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:										
Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.										
<table border="1"><thead><tr><th>Mode</th><th>Data rate</th></tr></thead><tbody><tr><td>802.11b</td><td>1Mbps</td></tr><tr><td>802.11g</td><td>6Mbps</td></tr><tr><td>802.11n(H20)</td><td>6.5Mbps</td></tr><tr><td>802.11n(H40)</td><td>13.5Mbps</td></tr></tbody></table>	Mode	Data rate	802.11b	1Mbps	802.11g	6Mbps	802.11n(H20)	6.5Mbps	802.11n(H40)	13.5Mbps
Mode	Data rate									
802.11b	1Mbps									
802.11g	6Mbps									
802.11n(H20)	6.5Mbps									
802.11n(H40)	13.5Mbps									

#### Final Test Mode:

According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup” 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n(H20) and 13.5 Mbps for 802.11n(H40). Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.

## 5.4 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Registration No.: 817957**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in out files. Registration 817957, February 27, 2012.

- **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

## 5.5 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,  
Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282

Fax: +86-755-23116366

## 5.6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2017
2	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	04-19-2014	04-19-2015
3	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	04-19-2014	04-19-2015
4	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
5	Amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2014	03-31-2015
6	Amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	06-09-2014	06-08-2015
7	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	04-01-2014	03-31-2015
8	Horn Antenna	ETS-LINDGREN	3160	GTS217	03-30-2014	03-29-2015
9	Printer	HP	HP LaserJet P1007	N/A	N/A	N/A
10	Positioning Controller	UC	UC3000	CCIS0015	N/A	N/A
11	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP	CCIS0023	04-19-2014	04-19-2015
12	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	04-01-2014	03-31-2015
13	Loop antenna	Laplace instrument	RF300	EMC0701	04-01-2014	03-31-2015
14	Universal radio communication tester	Rhode & Schwarz	CMU200	CCIS0069	05-29-2014	05-28-2015
15	Signal Analyzer	Rohde & Schwarz	FSIQ3	CCIS0088	04-19-2014	04-19-2015

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	10-10-2012	10-09-2015
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	04-10-2014	04-09-2015
3	LISN	CHASE	MN2050D	CCIS0074	04-10-2014	04-09-2015
4	Coaxial Cable	CCIS	N/A	CCIS0086	04-01-2014	03-31-2015
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

## 6 Test results and Measurement Data

### 6.1 Antenna requirement:

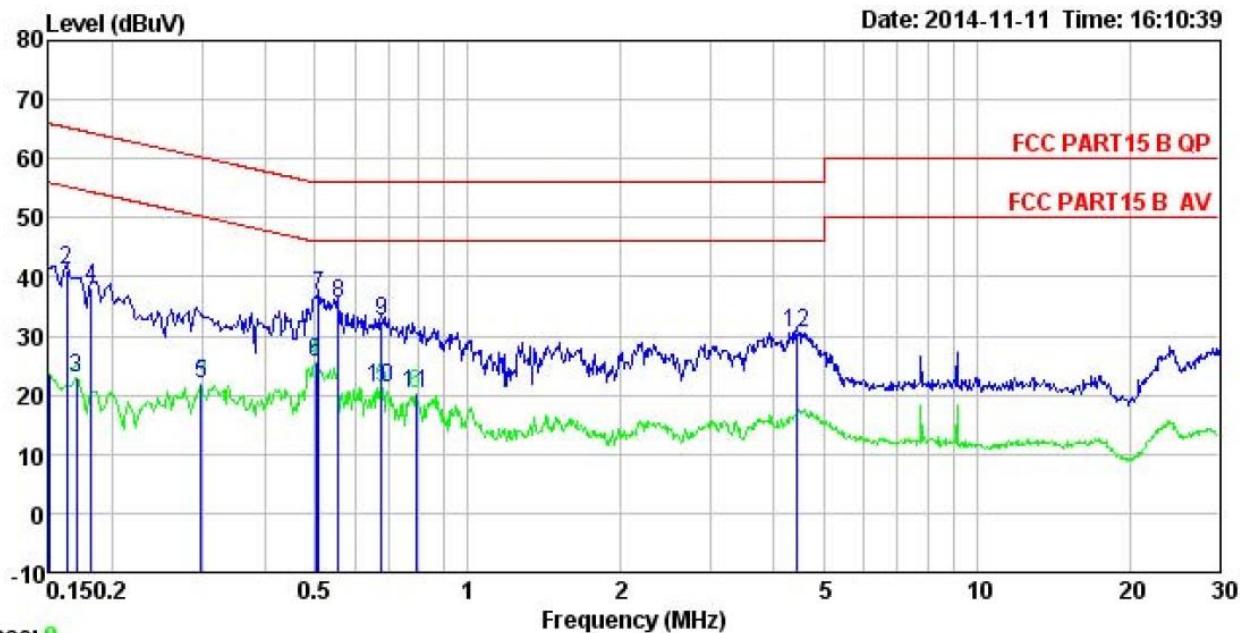
Standard requirement:	FCC Part15 C Section 15.203 /247(c)
<p>15.203 requirement: <i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</i></p>	
<p>15.247(c) (1)(i) requirement: <i>(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.</i></p>	
E.U.T Antenna:	
<p>The antenna is an internal antenna which cannot replace by end-user, the best case gain of the antenna is 1.4 dBi.</p>	

## 6.2 Conducted Emission

Test Requirement:	FCC Part15 C Section 15.207																
Test Method:	ANSI C63.4: 2003																
Test Frequency Range:	150 kHz to 30 MHz																
Class / Severity:	Class B																
Receiver setup:	RBW=9 kHz, VBW=30 kHz																
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>			Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)																
	Quasi-peak	Average															
0.15-0.5	66 to 56*	56 to 46*															
0.5-5	56	46															
5-30	60	50															
	<p>* Decreases with the logarithm of the frequency.</p>																
Test procedure	<ol style="list-style-type: none"> <li>The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.</li> </ol>																
Test setup:	<p><b>Reference Plane</b></p> <p><i>Remark:</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>																
Test Instruments:	Refer to section 5.6 for details																
Test mode:	Refer to section 5.3 for details																
Test results:	Passed																

### Measurement Data

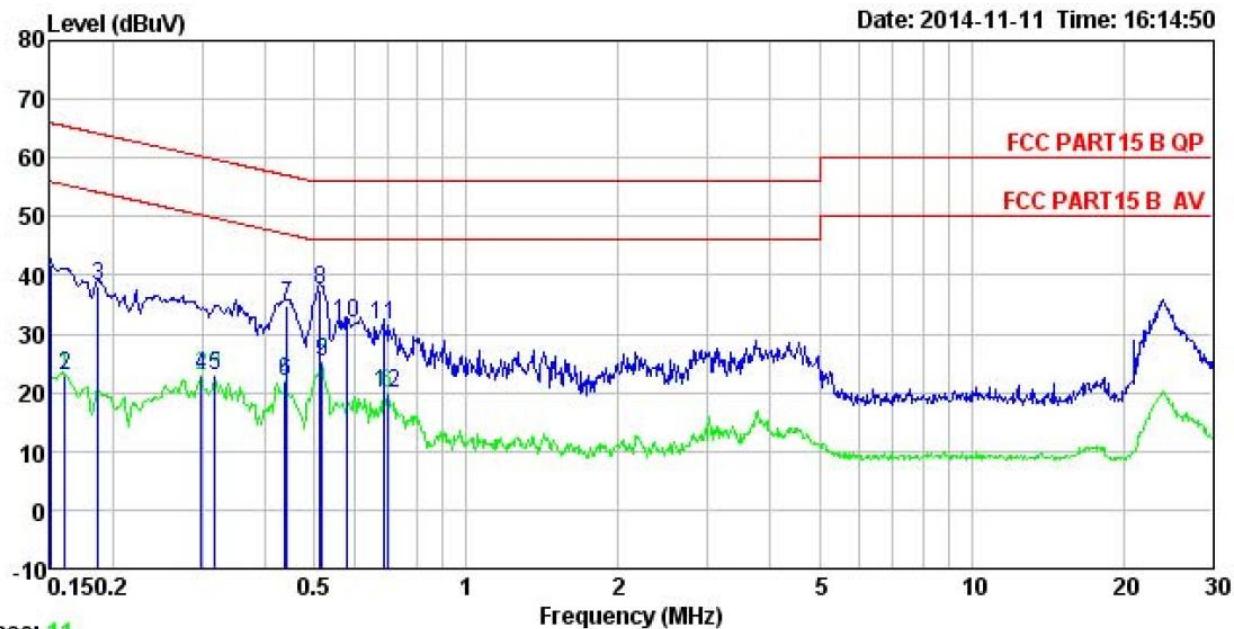
**Neutral:**



Site : CCIS Shielding Room  
 Condition : FCC PART15 B QP LISN NEUTRAL  
 Job No. : 934RF  
 EUT : mobile phone  
 Model : U452  
 Test Mode : WIFI mode  
 Power Rating : AC 120V/ 60 Hz  
 Environment : Temp: 23 °C Huni:56% Atmos:101KPa  
 Test Engineer: Carey  
 Remark :

Freq	Read	LISN	Cable	Limit	Over	Remark
	Level	Factor	Loss			
MHz	dBuV	dB	dB	dBuV	dBuV	dB
1	0.150	12.39	0.25	10.78	23.42	56.00 -32.58 Average
2	0.162	30.24	0.25	10.77	41.26	65.34 -24.08 QP
3	0.170	11.99	0.25	10.77	23.01	54.94 -31.93 Average
4	0.182	27.23	0.25	10.77	38.25	64.42 -26.17 QP
5	0.299	11.03	0.26	10.74	22.03	50.28 -28.25 Average
6	0.502	14.35	0.29	10.76	25.40	46.00 -20.60 Average
7	0.510	25.68	0.28	10.76	36.72	56.00 -19.28 QP
8	0.555	24.44	0.26	10.77	35.47	56.00 -20.53 QP
9	0.675	21.40	0.19	10.77	32.36	56.00 -23.64 QP
10	0.675	10.37	0.19	10.77	21.33	46.00 -24.67 Average
11	0.792	9.29	0.19	10.81	20.29	46.00 -25.71 Average
12	4.430	19.29	0.28	10.87	30.44	56.00 -25.56 QP

Line:



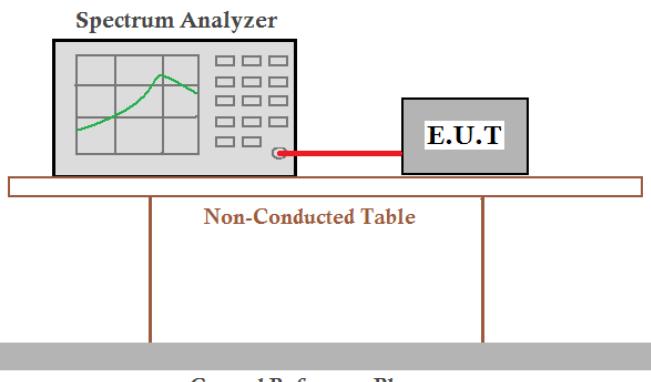
Site : CCIS Shielding Room  
 Condition : FCC PART15 B QP LISN LINE  
 Job No. : 934RF  
 EUT : mobile phone  
 Model : U452  
 Test Mode : WIFI mode  
 Power Rating : AC 120V/ 60 Hz  
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa  
 Test Engineer: Carey  
 Remark :

	Read Freq	LISN Level	Cable Factor	Limit Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB
1	0.150	30.77	0.27	10.78	41.82	66.00	-24.18 QP
2	0.161	11.94	0.27	10.78	22.99	55.43	-32.44 Average
3	0.186	27.18	0.28	10.76	38.22	64.20	-25.98 QP
4	0.299	11.85	0.26	10.74	22.85	50.28	-27.43 Average
5	0.318	11.72	0.26	10.74	22.72	49.75	-27.03 Average
6	0.437	11.02	0.28	10.74	22.04	47.11	-25.07 Average
7	0.442	23.93	0.28	10.74	34.95	57.02	-22.07 QP
8	0.513	26.32	0.28	10.76	37.36	56.00	-18.64 QP
9	0.518	14.30	0.28	10.76	25.34	46.00	-20.66 Average
10	0.582	20.96	0.26	10.77	31.99	56.00	-24.01 QP
11	0.686	20.63	0.22	10.77	31.62	56.00	-24.38 QP
12	0.697	8.98	0.22	10.77	19.97	46.00	-26.03 Average

## Notes:

- An initial pre-scan was performed on the live and neutral lines with peak detector.
- Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- Final Level = Receiver Read level + LISN Factor + Cable Loss

### 6.3 Conducted Output Power

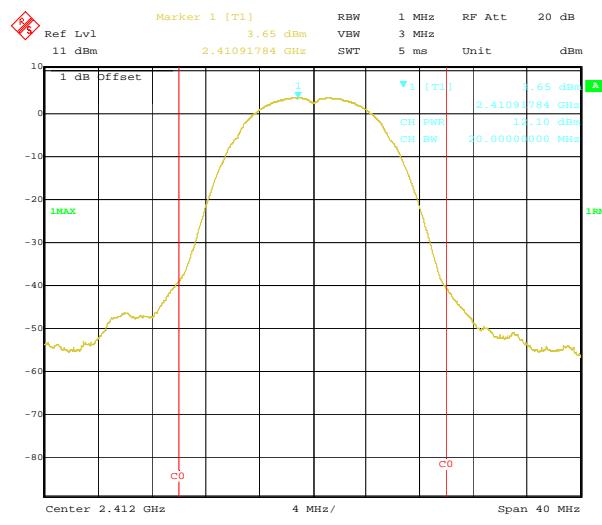
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	30dBm
Test setup:	 <p>The diagram illustrates the test setup for conducted output power. A Spectrum Analyzer is positioned at the top, connected by a red line to a gray rectangular box labeled 'E.U.T'. This assembly sits on a horizontal red bar labeled 'Non-Conducted Table'. Below the table is a thick gray horizontal bar labeled 'Ground Reference Plane'.</p>
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	Test method refer to KDB558074 (DTS Measure Guidance) section 8.2, option 1.

#### Measurement Data

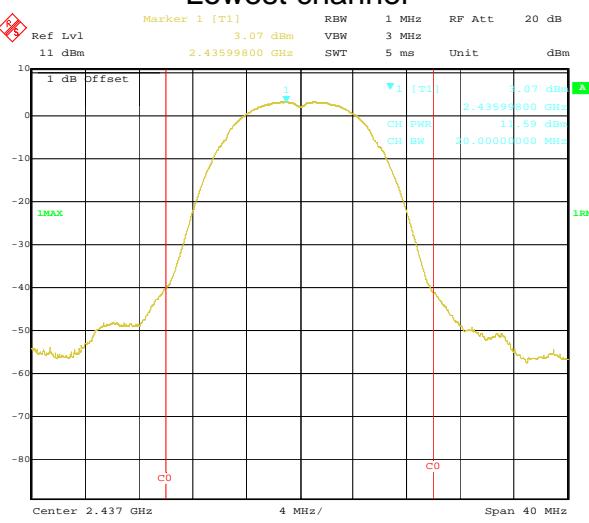
Test CH	Maximum Conducted Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	12.10	10.96	11.28	11.42		
Middle	11.59	10.22	10.71	11.02	30.00	Pass
Highest	10.99	9.86	10.12	10.91		

Test plot as follows:

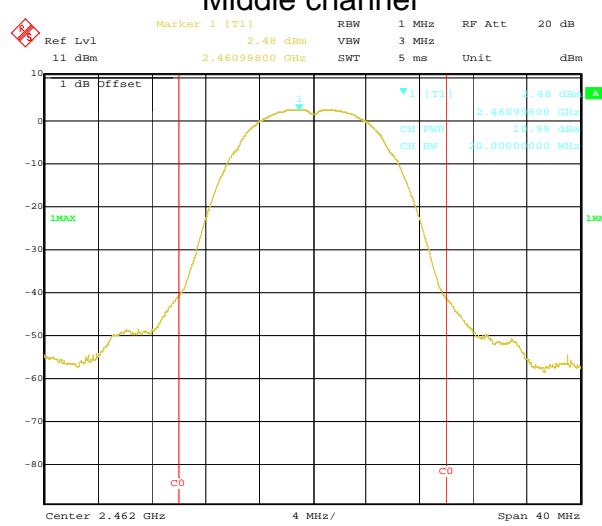
### Test mode: 802.11b



### Lowest channel

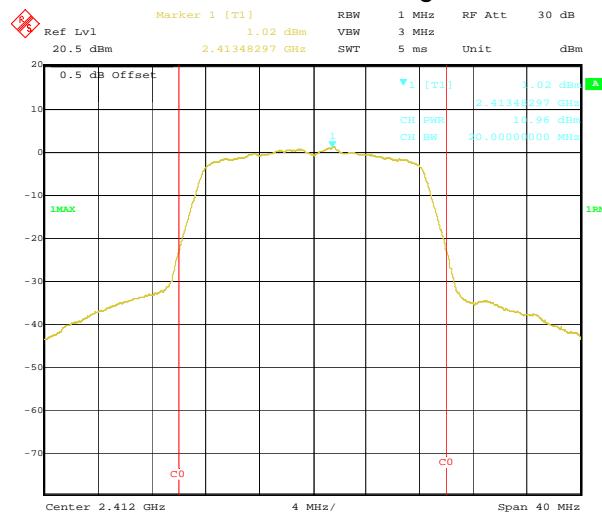


### Middle channel



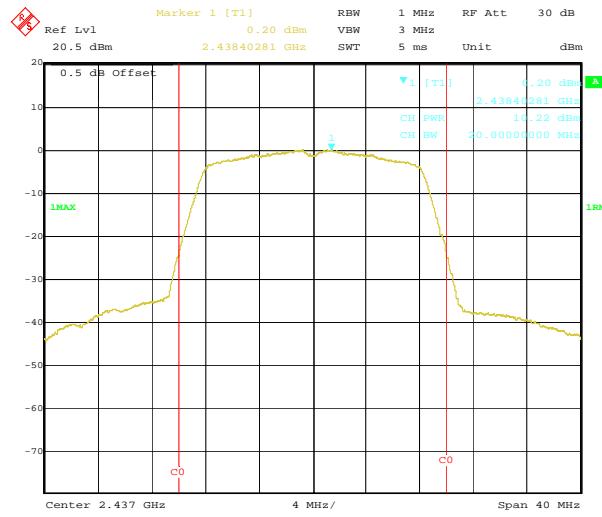
### Highest channel

Test mode: 802.11g



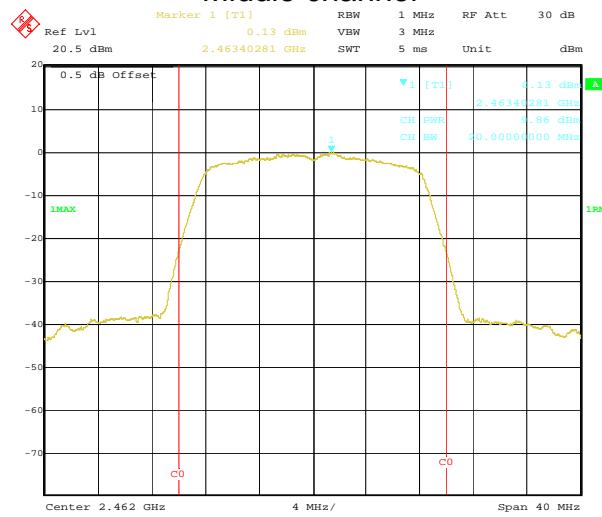
Date: 28.NOV.2014 15:32:45

Lowest channel



Date: 28.NOV.2014 15:33:58

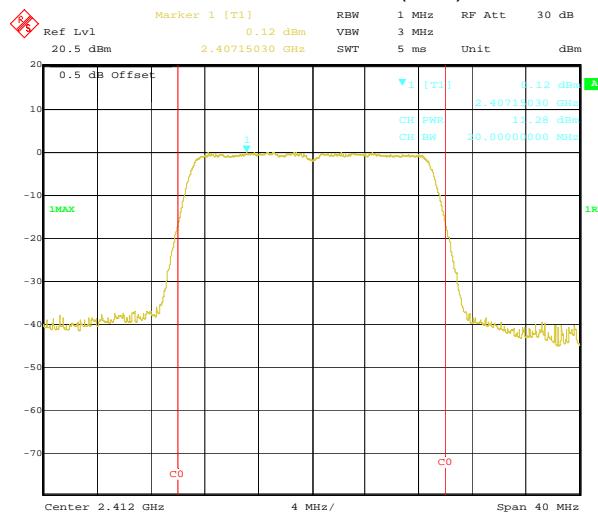
Middle channel



Date: 28.NOV.2014 15:34:43

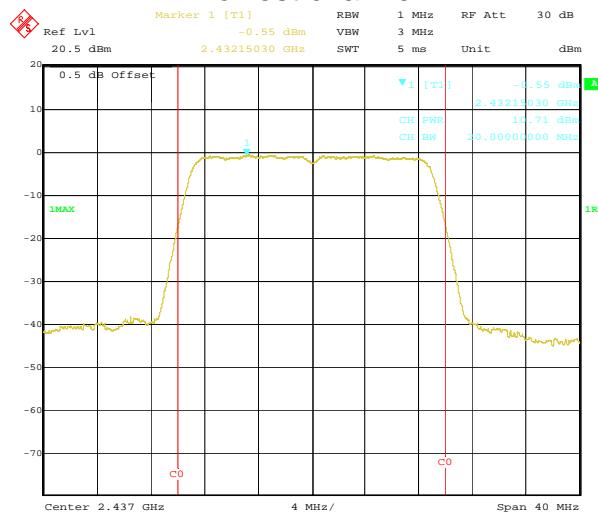
Highest channel

Test mode: 802.11n(H20)



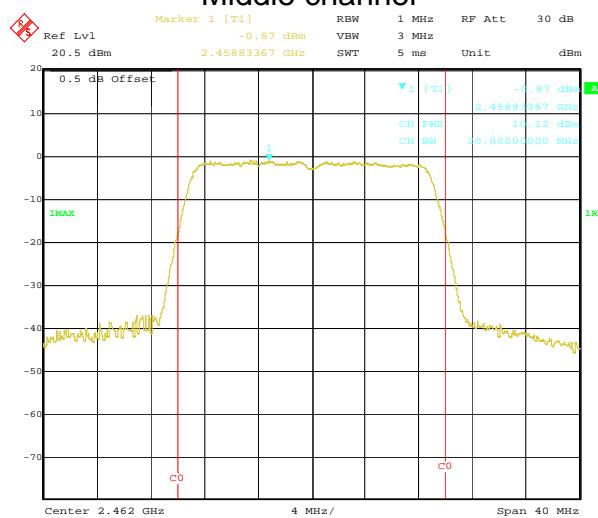
Date: 28.NOV.2014 15:37:25

Lowest channel



Date: 28.NOV.2014 15:36:43

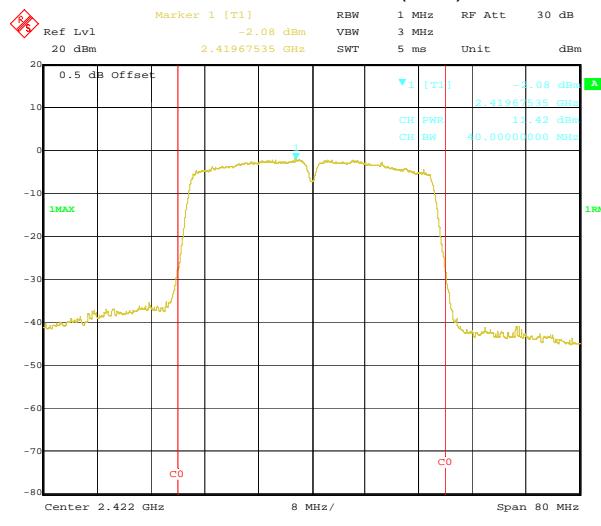
Middle channel



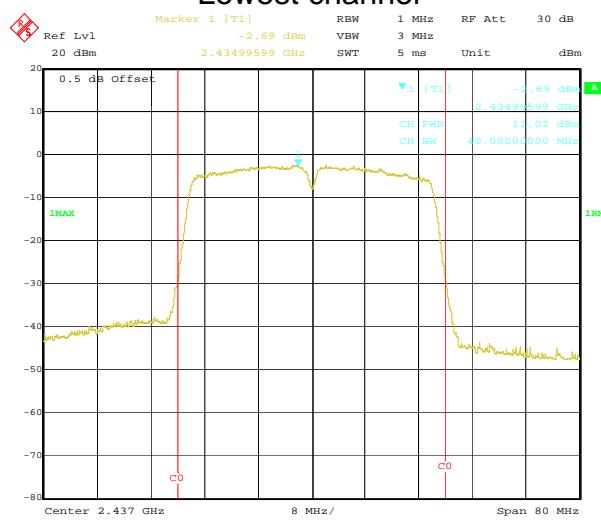
Date: 28.NOV.2014 15:37:45

Highest channel

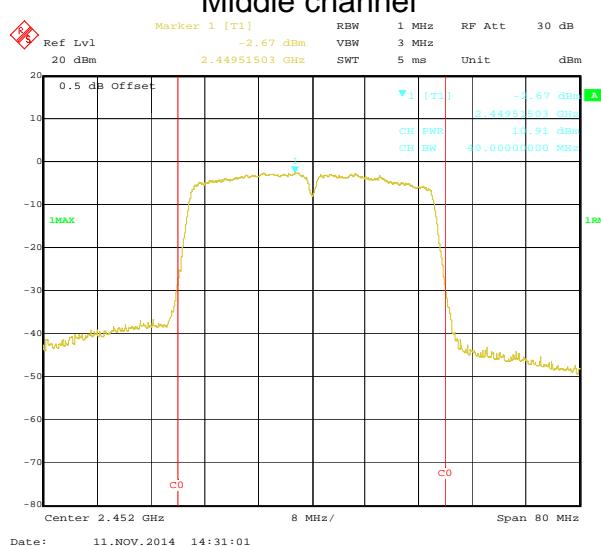
Test mode: 802.11n(H40)



Lowest channel

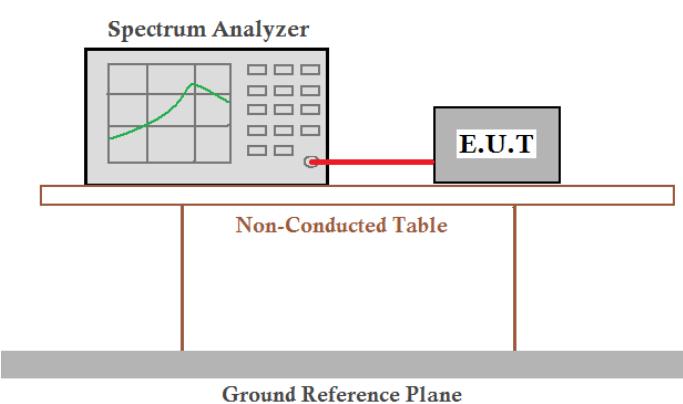


Middle channel



Highest channel

## 6.4 Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	>500kHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to the E.U.T (Equipment Under Test) via a coaxial cable. The setup is placed on a Non-Conducted Table above a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

### Measurement Data

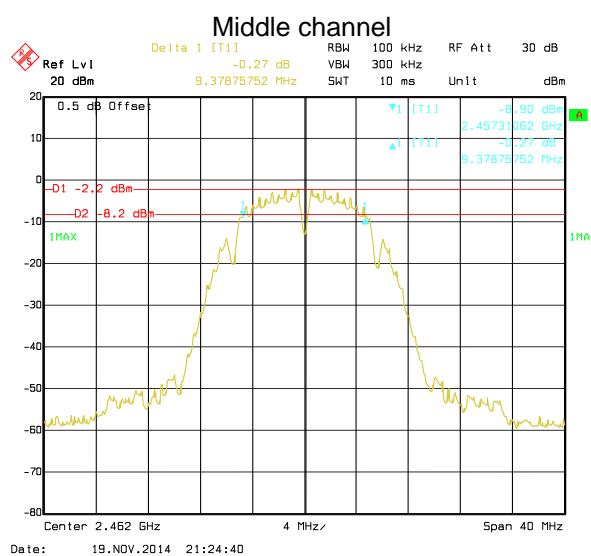
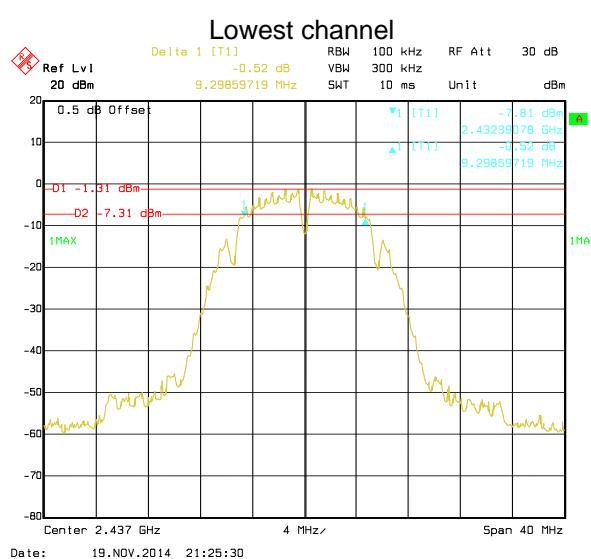
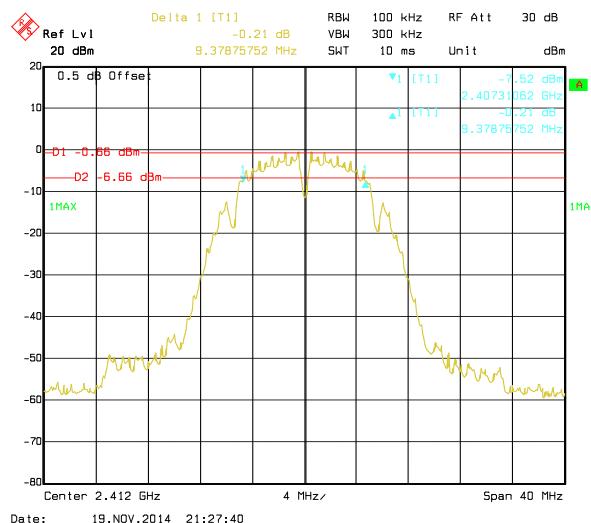
Test CH	6dB Emission Bandwidth (MHz)				Limit(kHz)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	9.38	16.51	17.80	36.71	>500	Pass
Middle	9.30	16.51	17.80	36.71		
Highest	9.38	16.51	17.80	36.71		

Test CH	99% Occupy Bandwidth (MHz)				Limit(kHz)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	12.34	16.43	17.64	36.07	N/A	N/A
Middle	12.34	16.43	17.64	36.07		
Highest	12.34	16.51	17.64	36.07		

Test plot as follows:

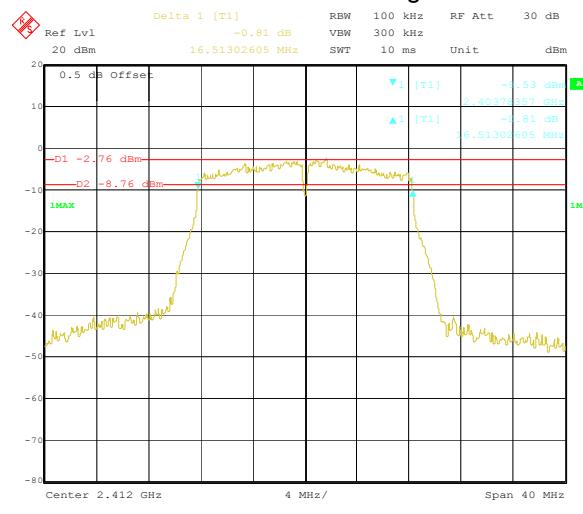
## 6dB EBW

Test mode: 802.11b

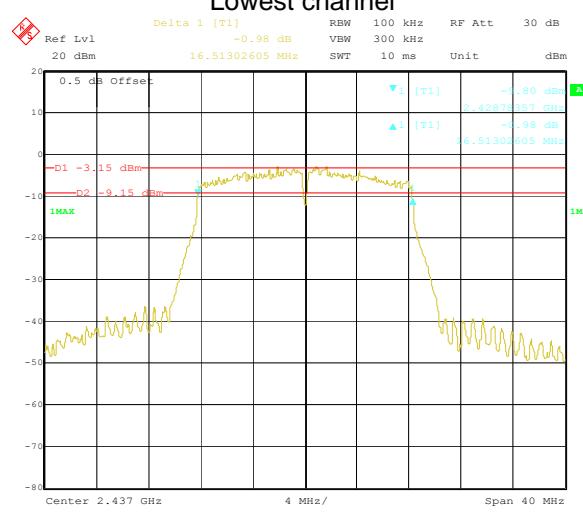


Highest channel

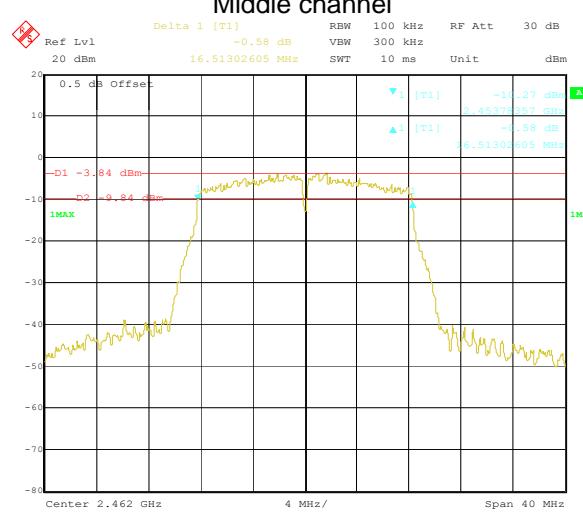
### Test mode: 802.11g



### Lowest channel

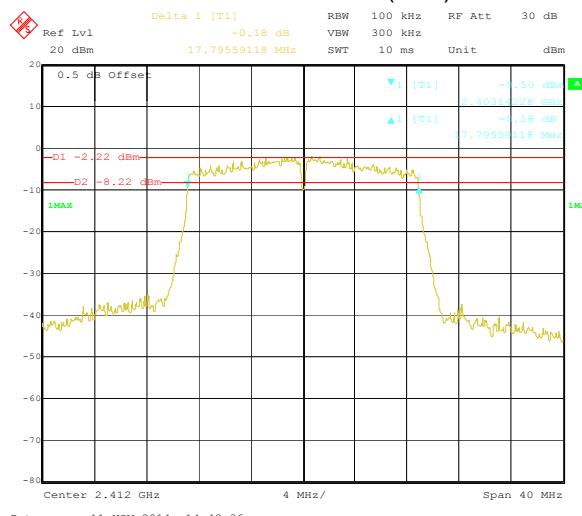


### Middle channel

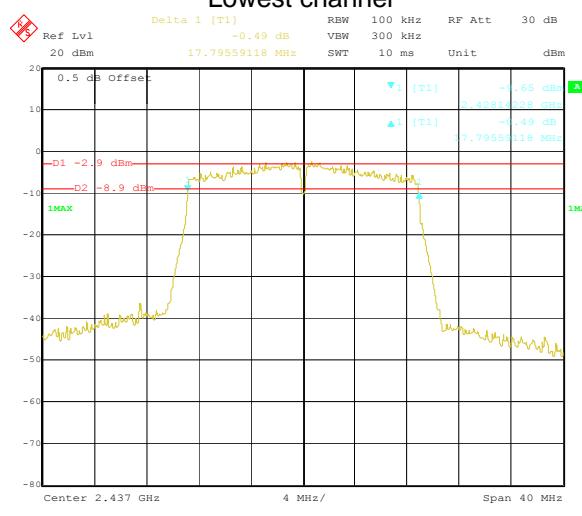


### Highest channel

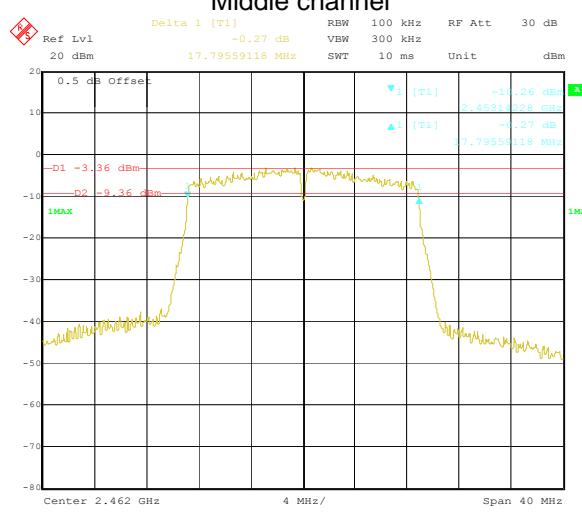
Test mode: 802.11n(H20)



Lowest channel

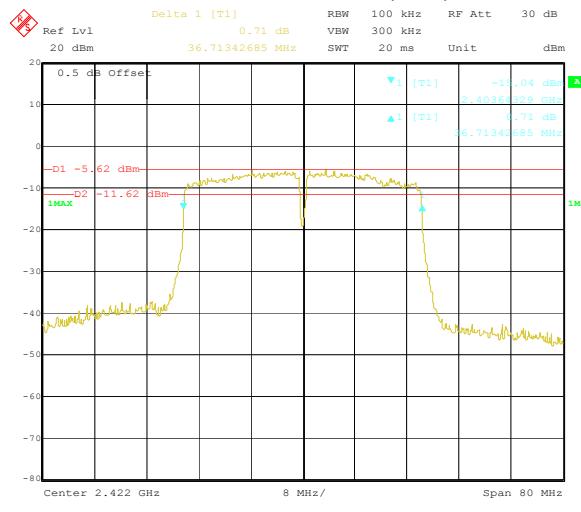


Middle channel

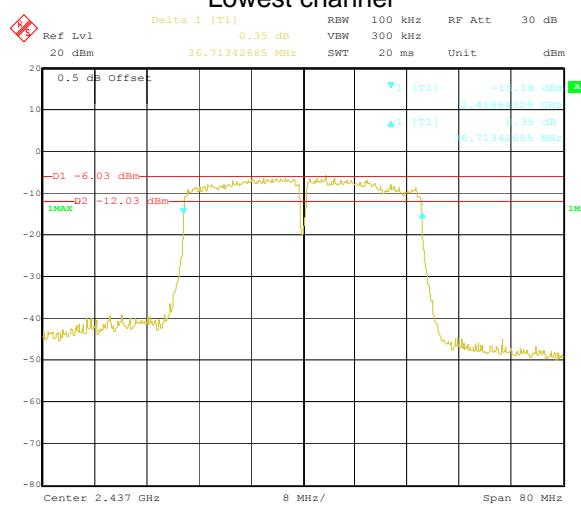


Highest channel

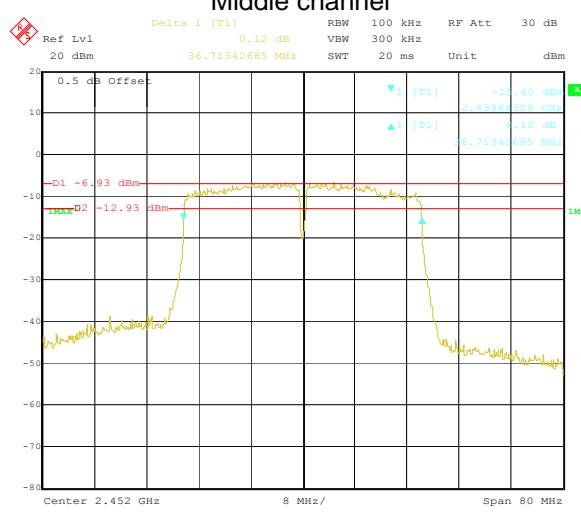
Test mode: 802.11n(H40)



Lowest channel



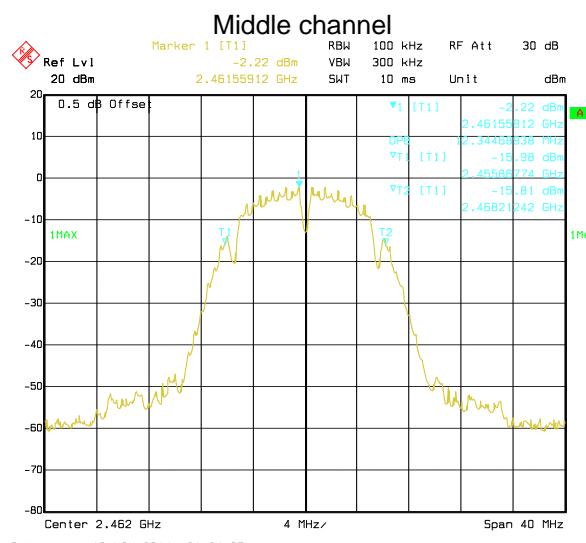
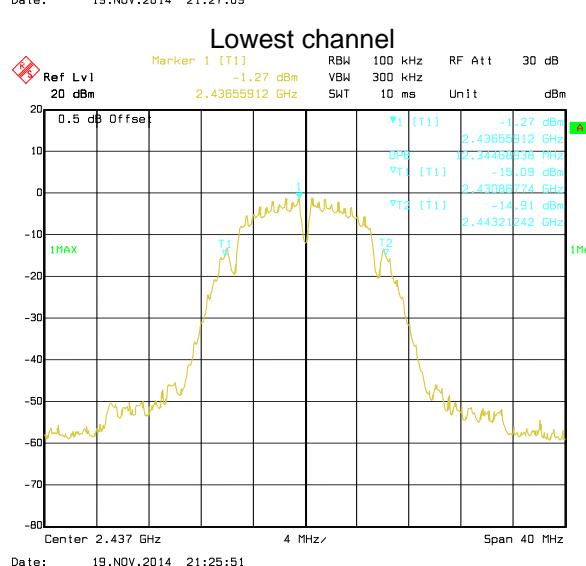
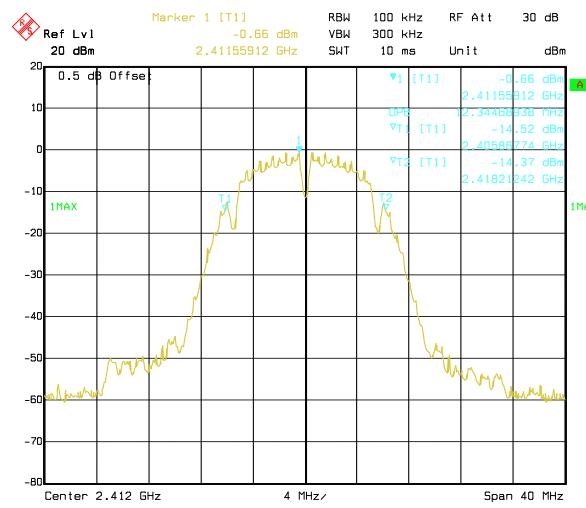
Middle channel



Highest channel

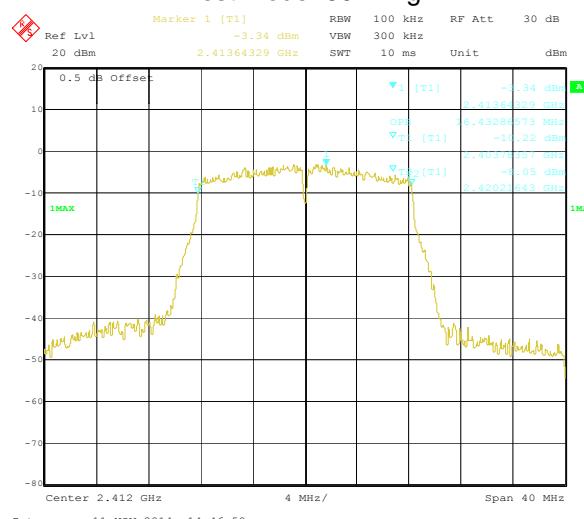
## 99% OBW

Test mode: 802.11b

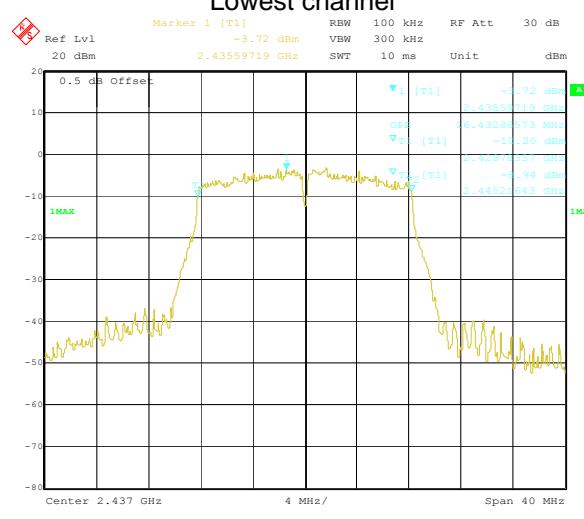


Highest channel

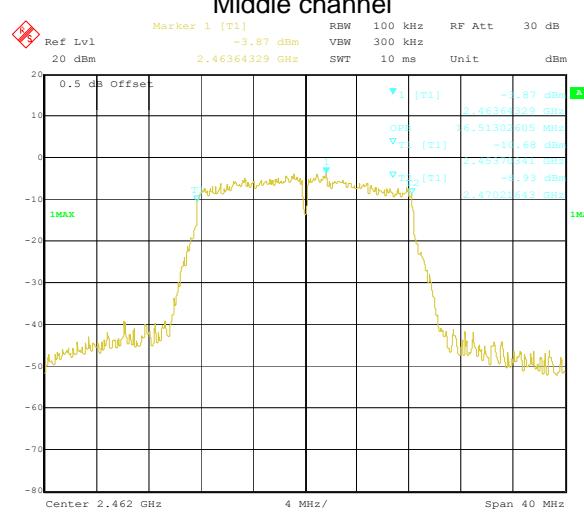
### Test mode: 802.11g



### Lowest channel

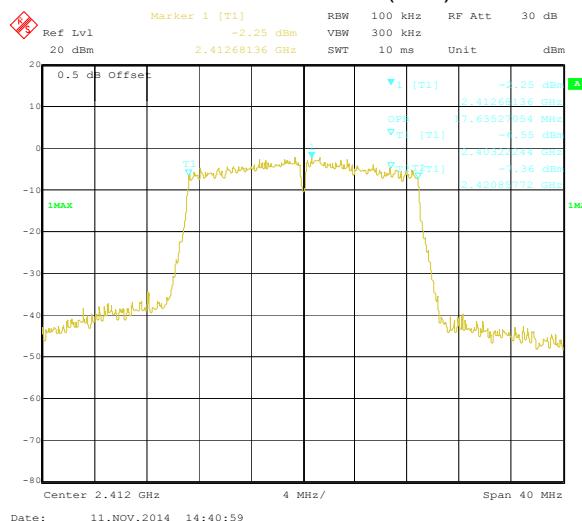


### Middle channel

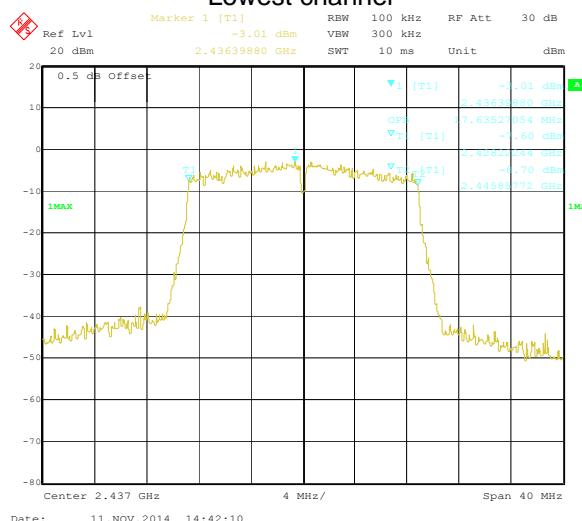


### Highest channel

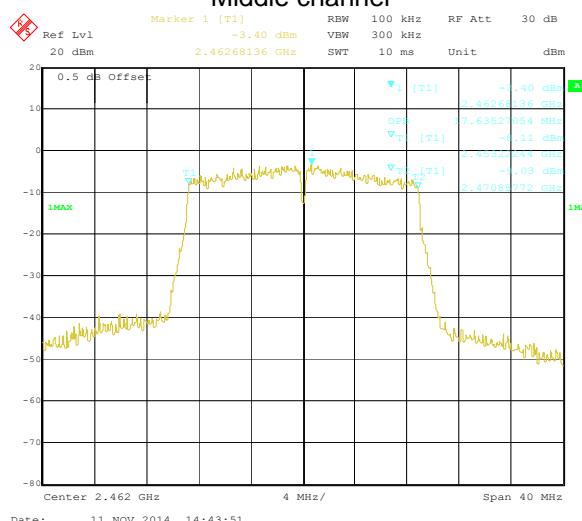
Test mode: 802.11n(H20)



Lowest channel

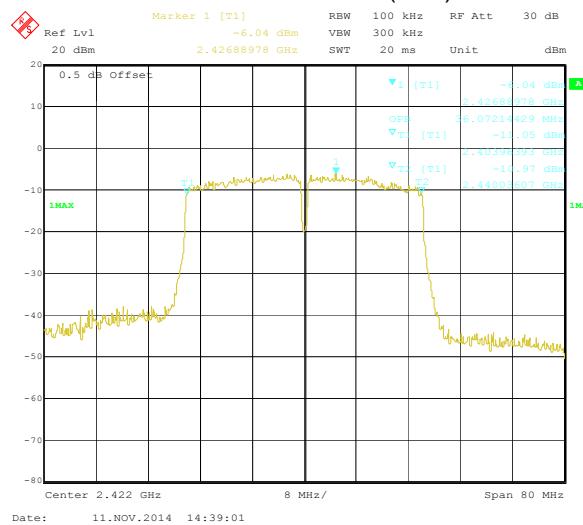


Middle channel

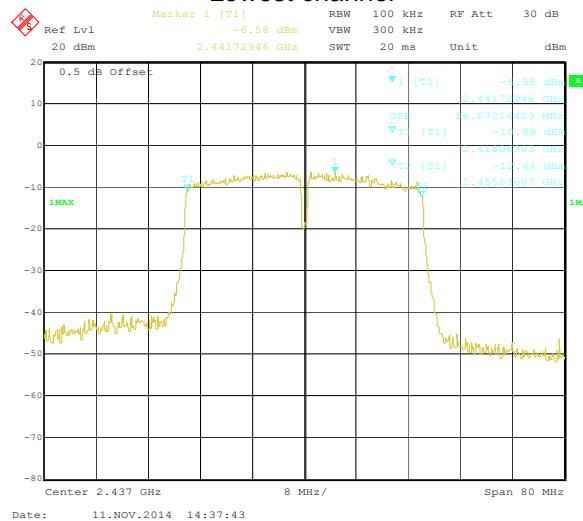


Highest channel

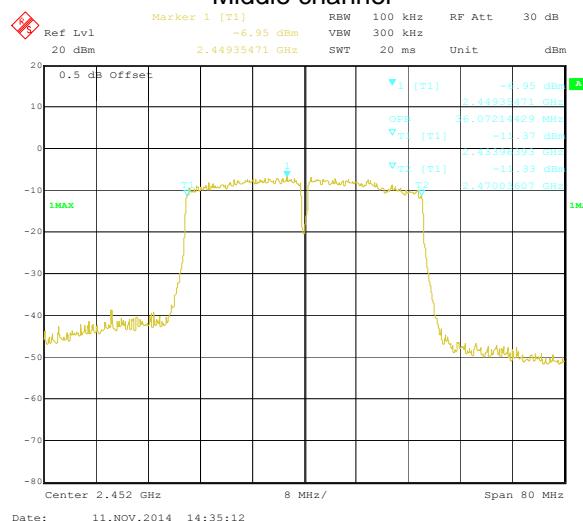
**Test mode: 802.11n(H40)**



**Lowest channel**

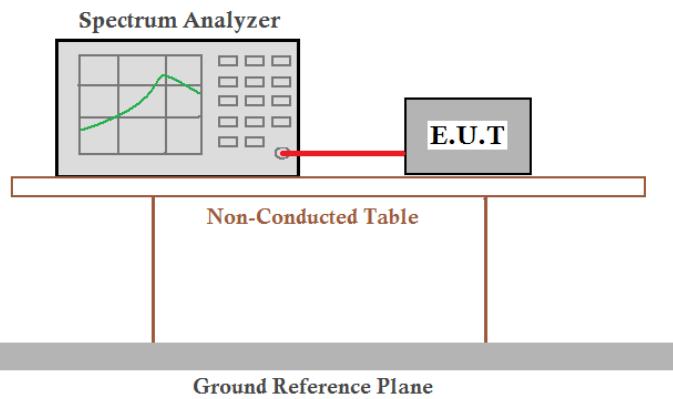


**Middle channel**



**Highest channel**

## 6.5 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	8dBm
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is positioned at the top left, displaying a green waveform on its screen. A red line extends from the analyzer's output port to a gray rectangular box labeled 'E.U.T' located on the right. This assembly sits on a light-colored rectangular platform labeled 'Non-Conducted Table'. Below the table is a thick gray horizontal bar labeled 'Ground Reference Plane'.</p>
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

### Measurement Data

Test CH	Power Spectral Density (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	-0.63	-2.63	-2.25	-5.90	8.00	Pass
Middle	-1.29	-3.26	-2.75	-6.44		
Highest	-2.12	-3.81	-3.32	-7.01		

Test plot as follows:

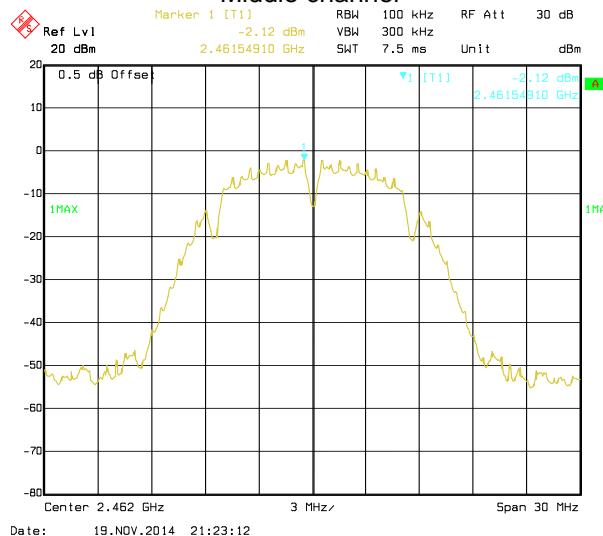
**Test mode: 802.11b**



**Lowest channel**

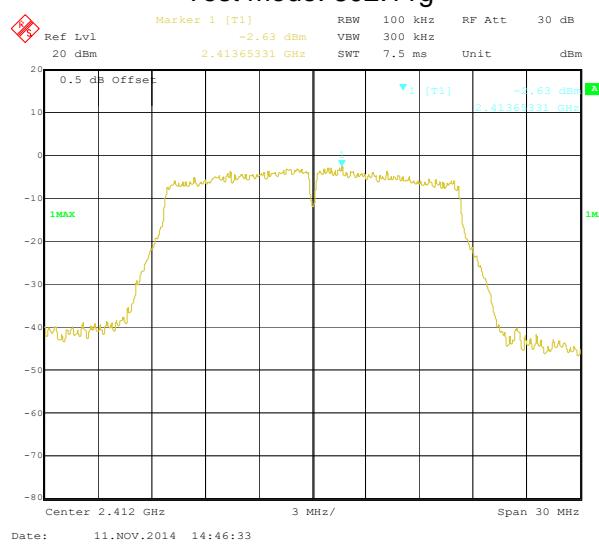


**Middle channel**

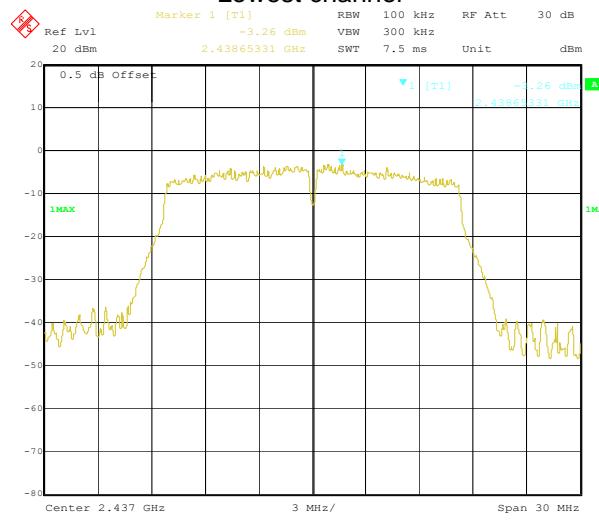


**Highest channel**

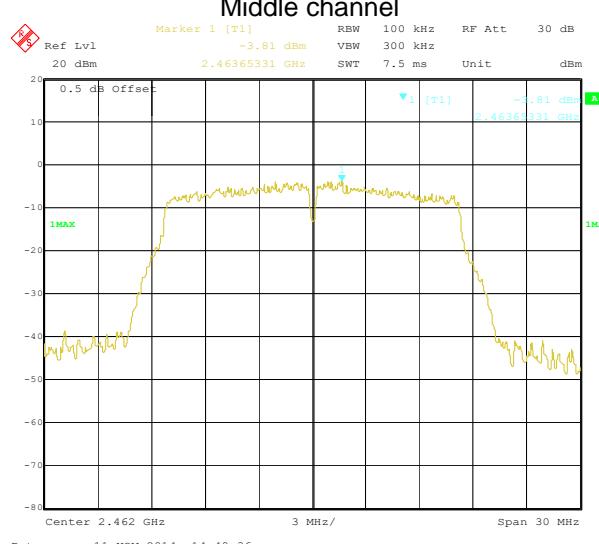
Test mode: 802.11g



Lowest channel

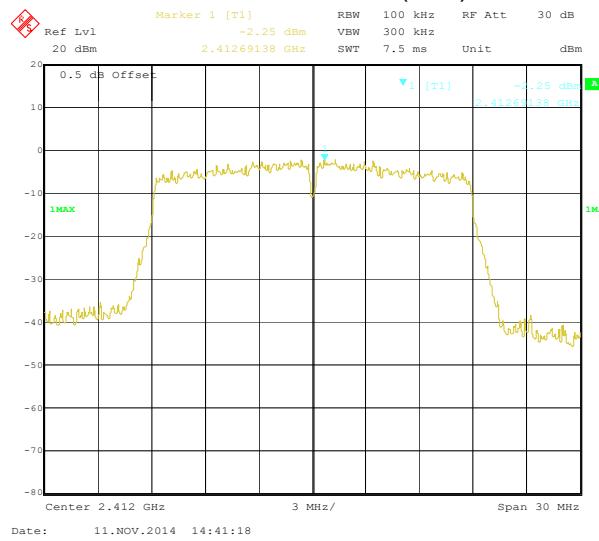


Middle channel

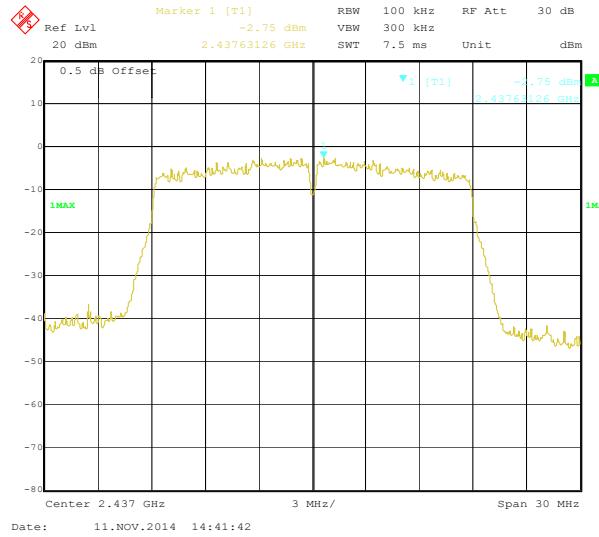


Highest channel

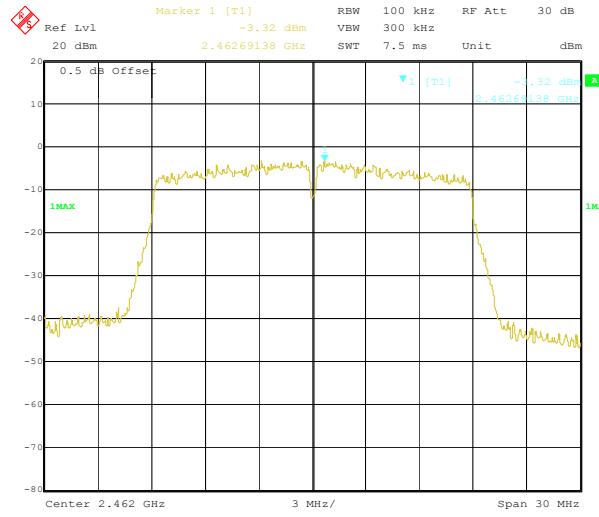
### Test mode: 802.11n(H20)



### Lowest channel

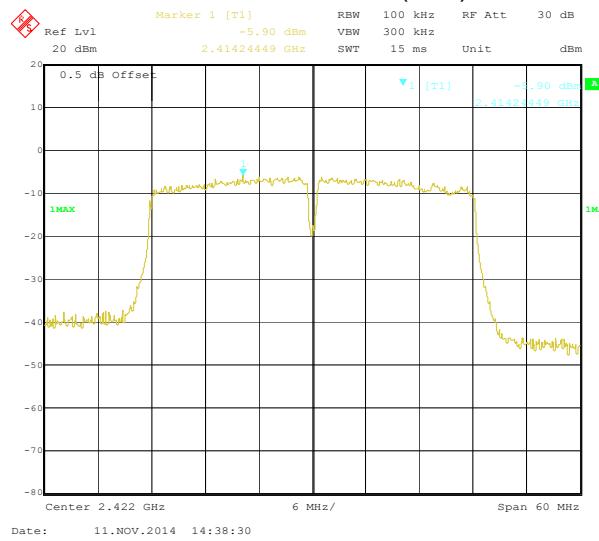


### Middle channel

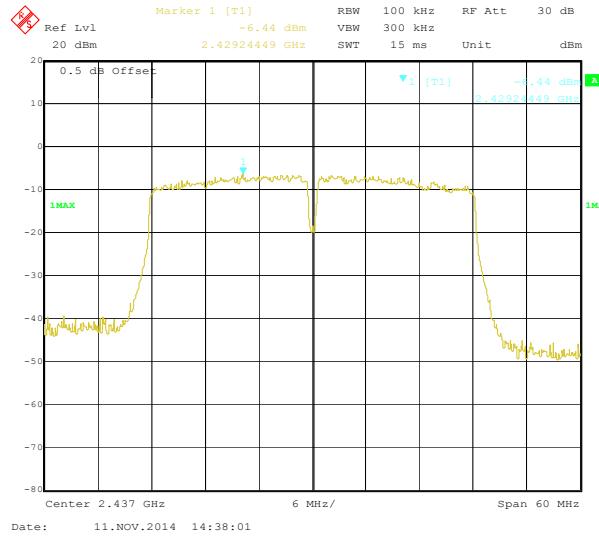


### Highest channel

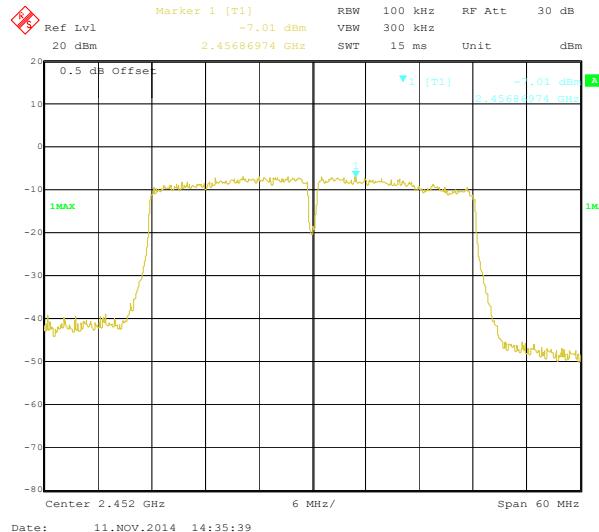
### Test mode: 802.11n(H40)



### Lowest channel



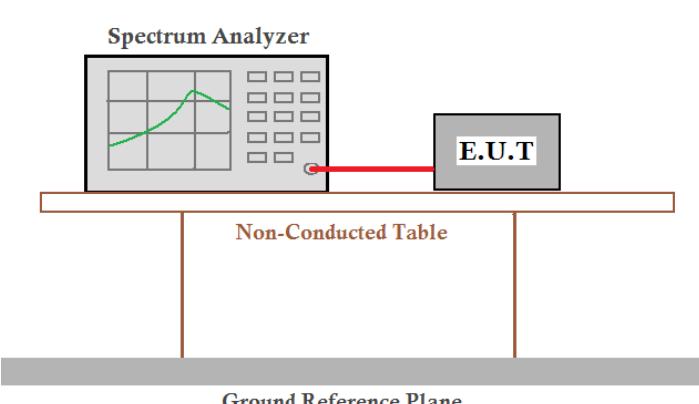
### Middle channel



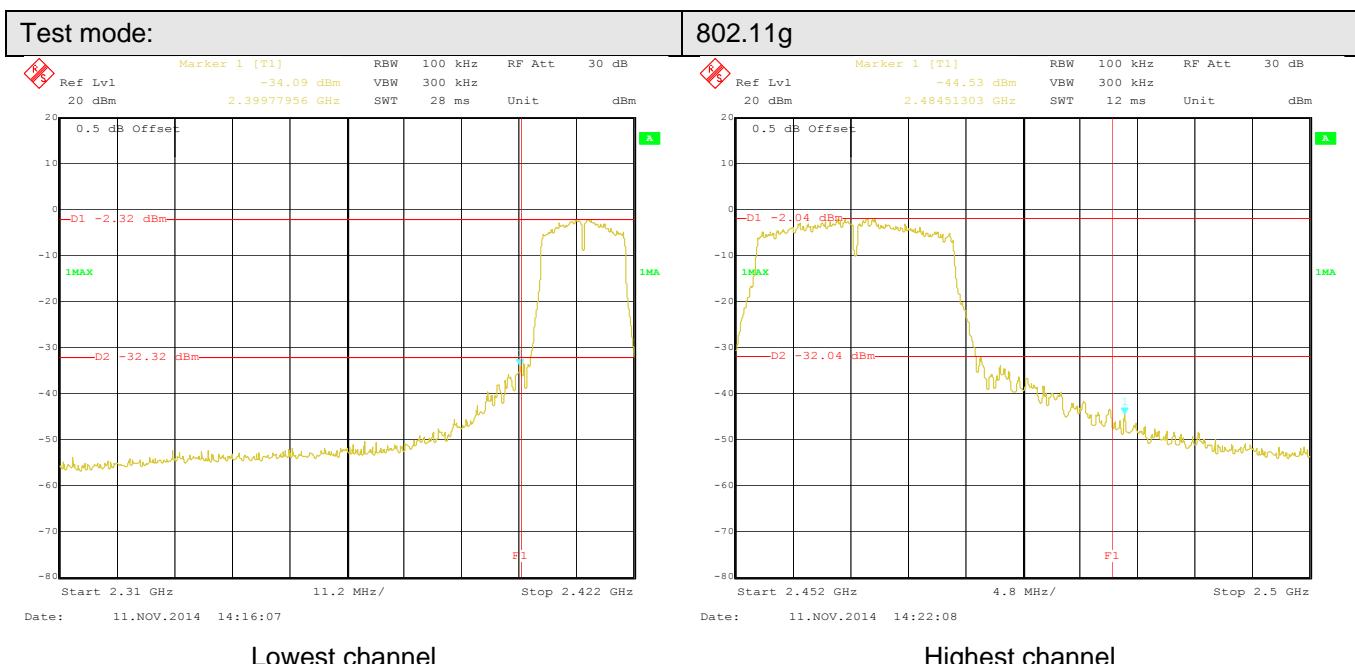
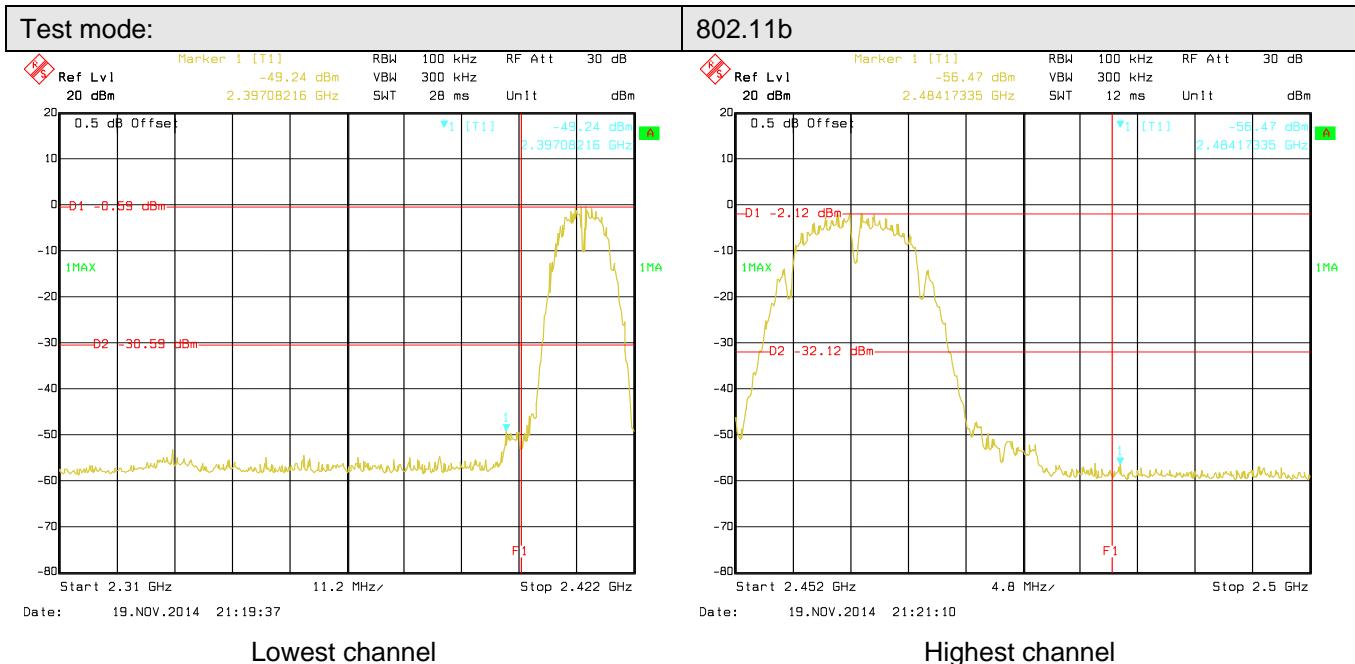
### Highest channel

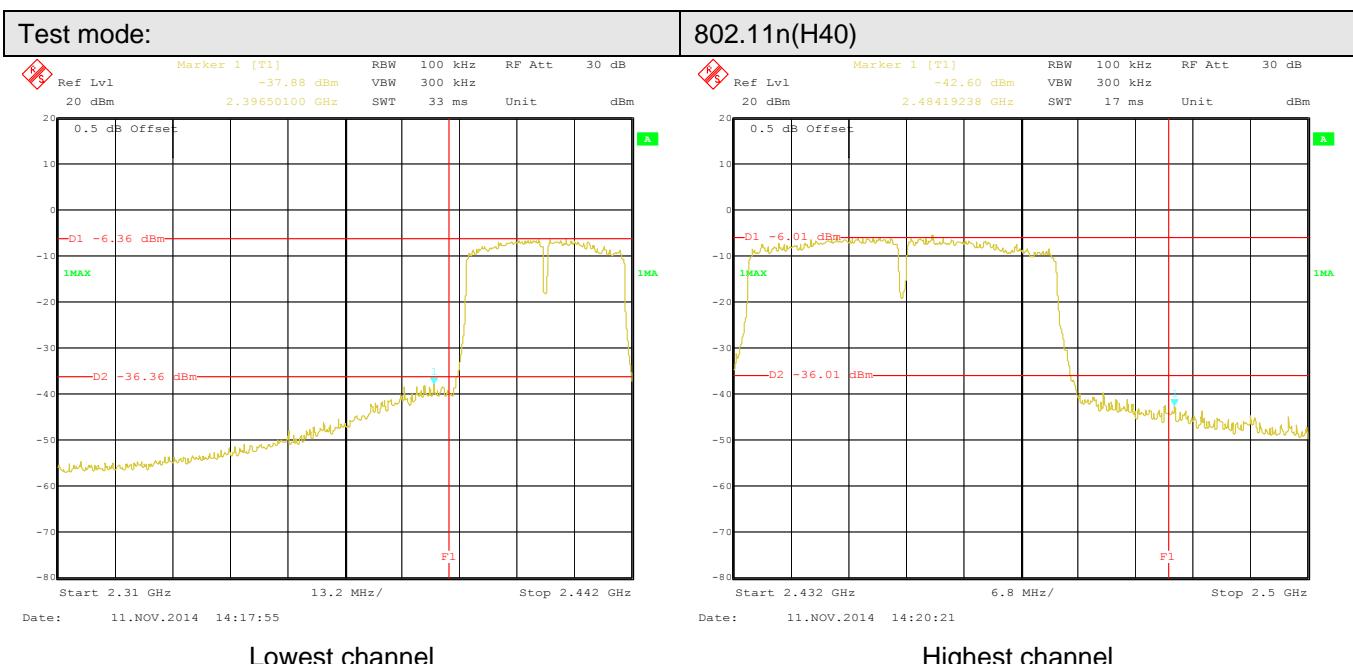
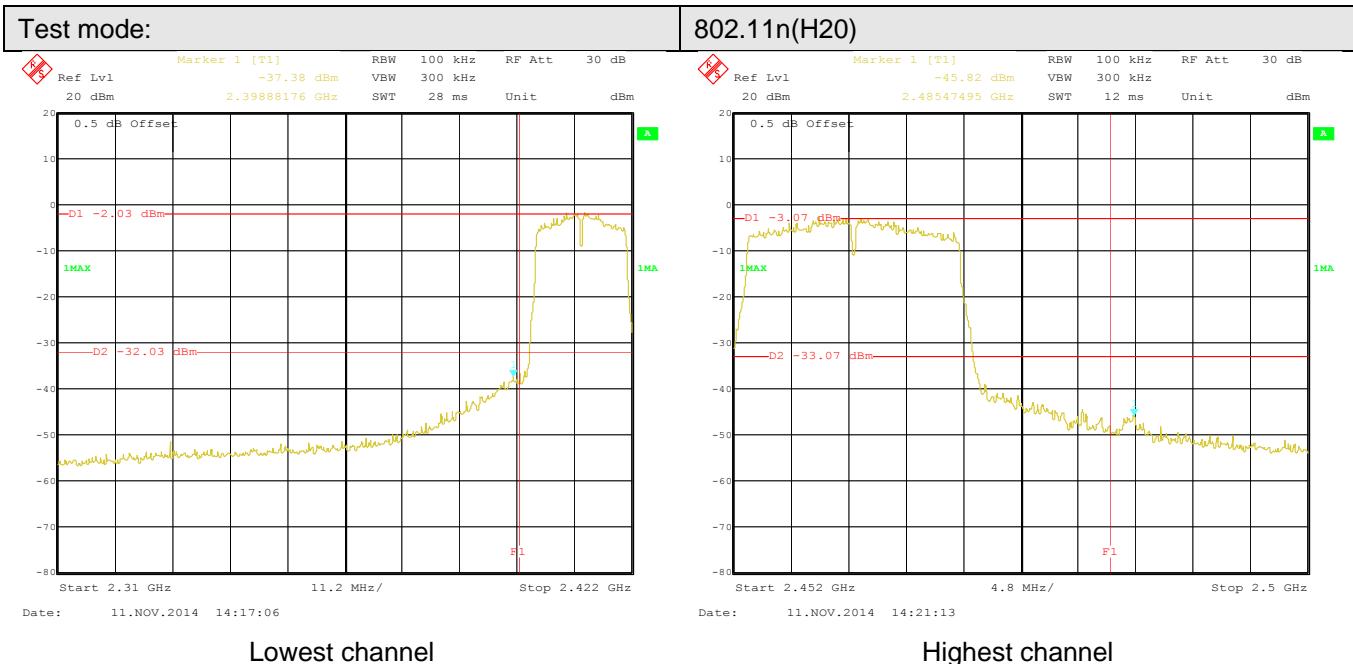
## 6.6 Band Edge

### 6.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plot as follows:





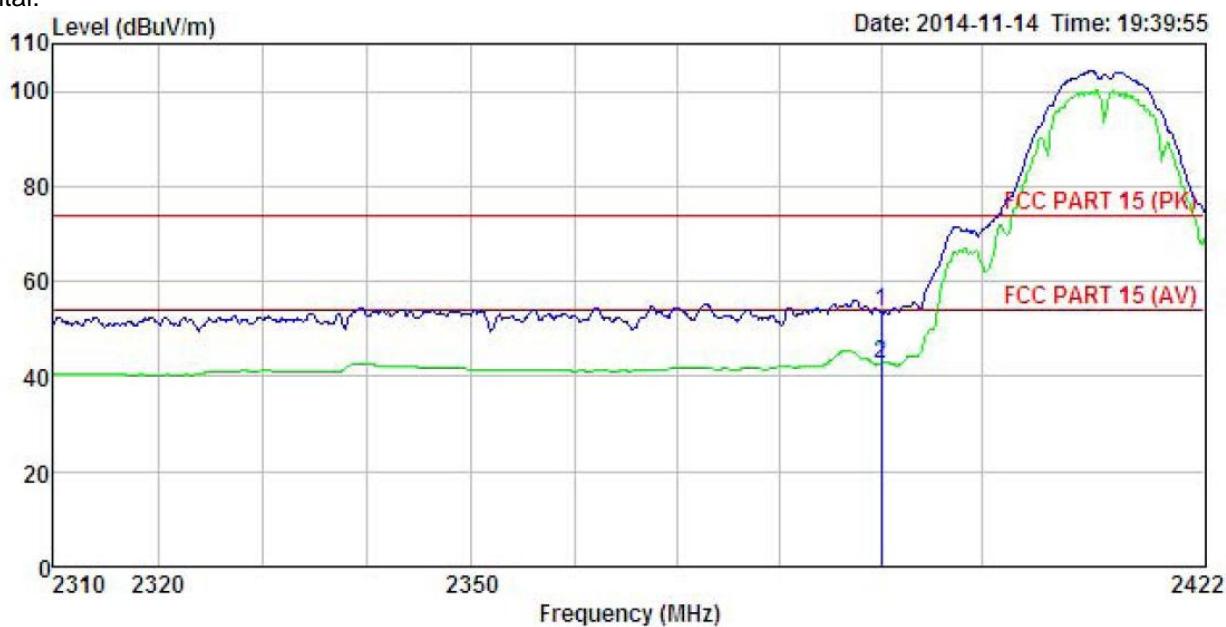
## 6.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205																			
Test Method:	ANSI C63.4: 2003																			
Test Frequency Range:	2.3GHz to 2.5GHz																			
Test site:	Measurement Distance: 3m																			
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>Above 1GHz</td> <td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak Value</td> </tr> <tr> <td></td> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average Value</td> </tr> </tbody> </table>					Frequency	Detector	RBW	VBW	Remark	Above 1GHz	Peak	1MHz	3MHz	Peak Value		Peak	1MHz	10Hz	Average Value
Frequency	Detector	RBW	VBW	Remark																
Above 1GHz	Peak	1MHz	3MHz	Peak Value																
	Peak	1MHz	10Hz	Average Value																
Limit:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (dBuV/m @3m)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>Above 1GHz</td> <td>54.00</td> <td>Average Value</td> </tr> <tr> <td></td> <td>74.00</td> <td>Peak Value</td> </tr> </tbody> </table>					Frequency	Limit (dBuV/m @3m)	Remark	Above 1GHz	54.00	Average Value		74.00	Peak Value						
Frequency	Limit (dBuV/m @3m)	Remark																		
Above 1GHz	54.00	Average Value																		
	74.00	Peak Value																		
Test Procedure:	<ol style="list-style-type: none"> <li>The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</li> </ol>																			
Test setup:																				
Test Instruments:	Refer to section 5.6 for details																			
Test mode:	Refer to section 5.3 for details																			
Test results:	Passed																			

802.11b

Test channel: Lowest

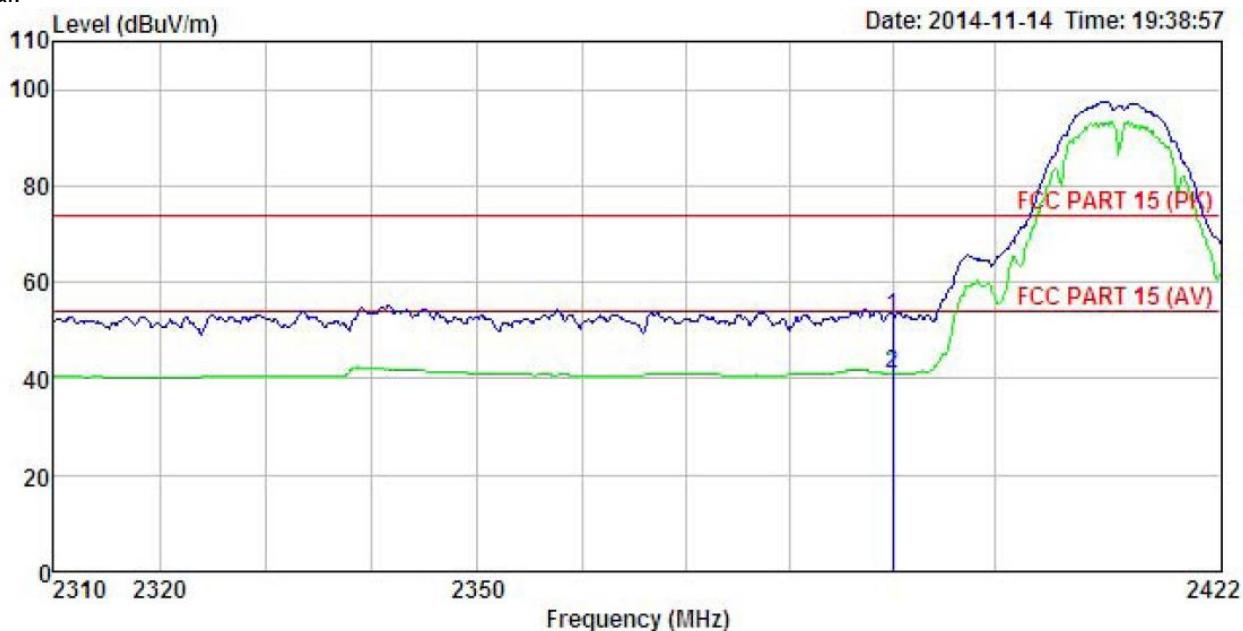
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : B-L mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: Carey  
Remark :

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.39	27.58	5.67	0.00	53.64	74.00	-20.36 Peak
2	2390.000	9.54	27.58	5.67	0.00	42.79	54.00	-11.21 Average

Vertical:

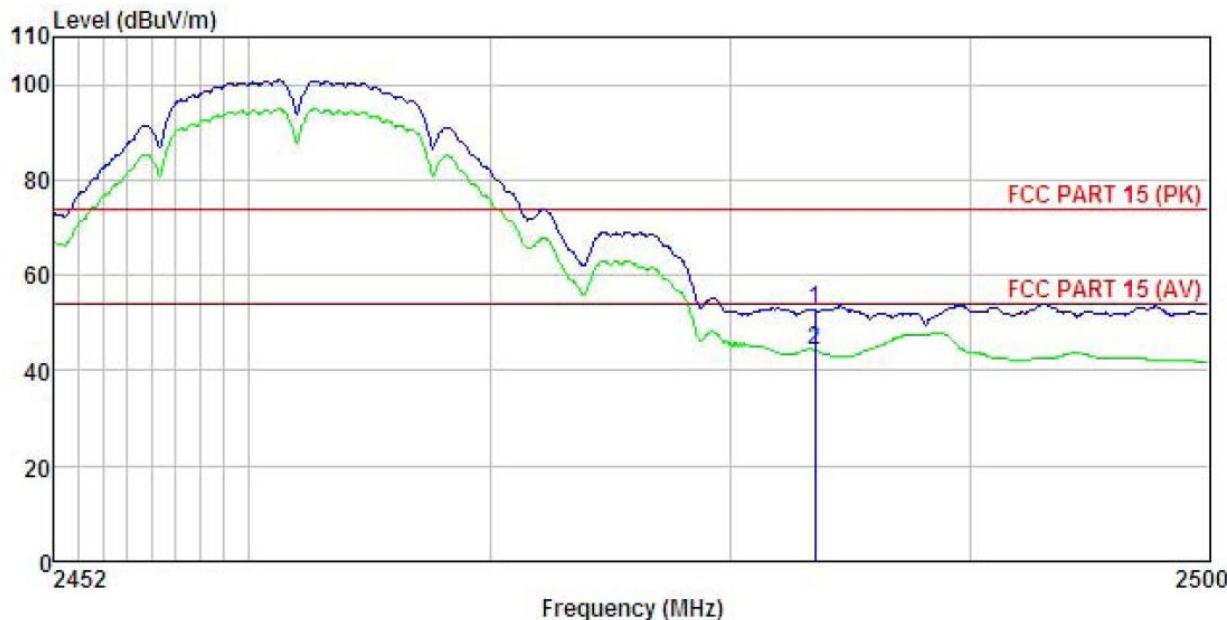


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : B-L mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: Carey  
Remark :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit Remark
	MHz	dB <sub>UV</sub>	dB/m	dB	dB	dB <sub>UV</sub> /m	dB <sub>UV</sub> /m
1	2390.000	19.67	27.58	5.67	0.00	52.92	74.00 -21.08 Peak
2	2390.000	7.84	27.58	5.67	0.00	41.09	54.00 -12.91 Average

Test channel: Highest

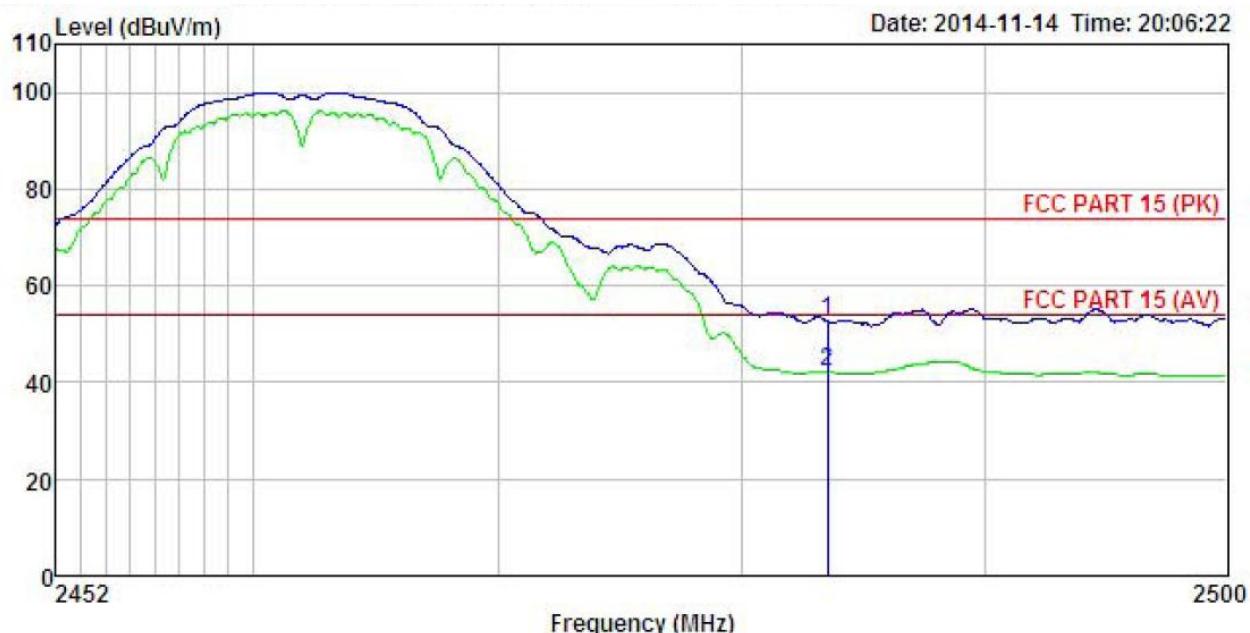
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : E-H mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Humi:55%  
Test Engineer: Carey  
Remark :

	ReadAntenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m
1	2483.500	19.52	27.52	5.70	0.00	52.74
2	2483.500	11.04	27.52	5.70	0.00	44.26
					74.00	-21.26
					54.00	-9.74
						Peak Average

Vertical:



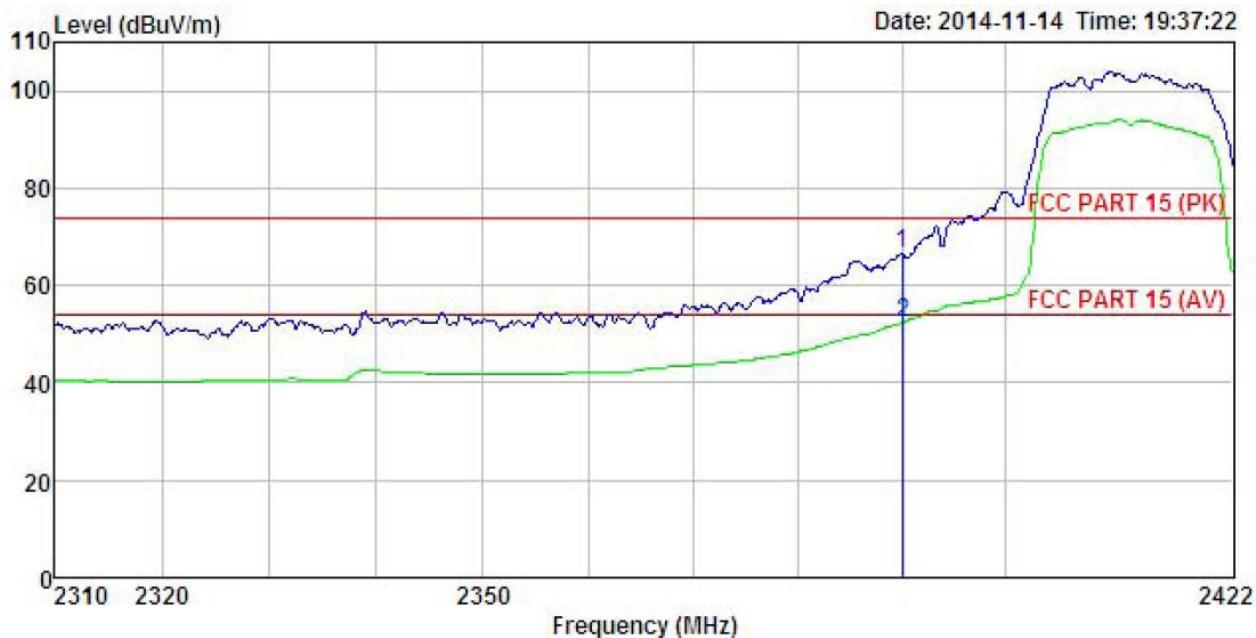
Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : B-H mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: Carey  
Remark :

	ReadAntenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dB
1	2483.500	19.36	27.52	5.70	0.00	52.58
2	2483.500	9.04	27.52	5.70	0.00	42.26
					74.00	-21.42 Peak
					54.00	-11.74 Average

802.11g

Test channel: Lowest

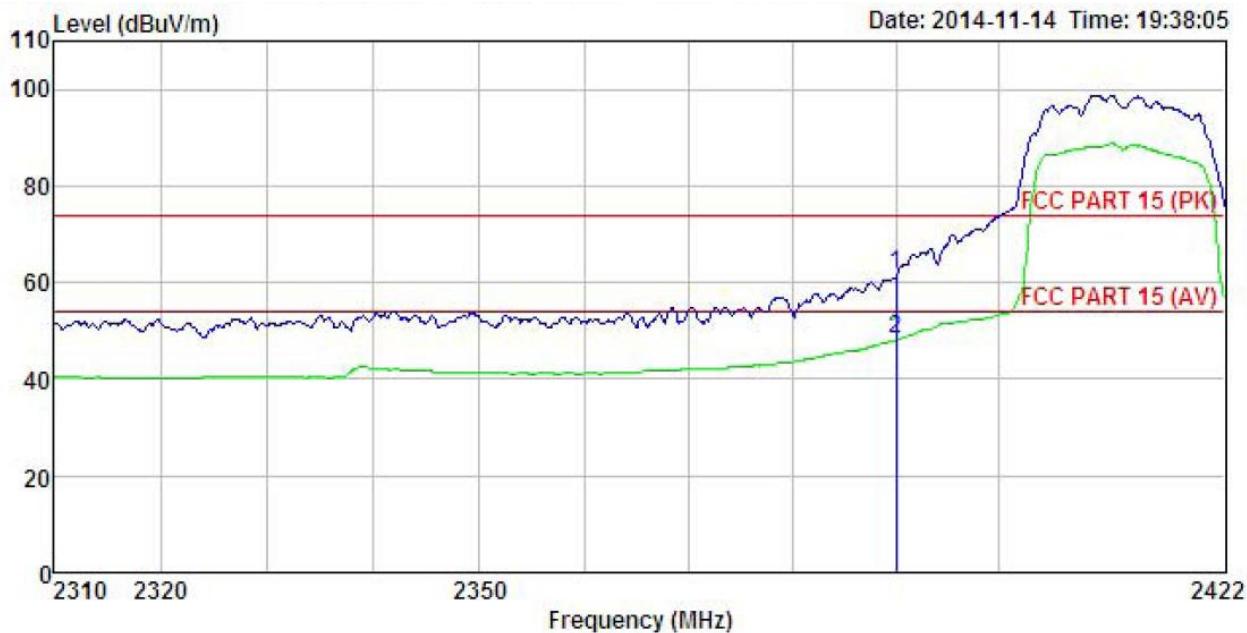
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : G-L mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: Carey  
Remark :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dB <sub>UV</sub>	dB/m	dB	dB	dB <sub>UV</sub> /m	dB <sub>UV</sub> /m	dB
1	2390.000	33.15	27.58	5.67	0.00	66.40	74.00 -7.60 Peak
2	2390.104	19.20	27.58	5.67	0.00	52.45	54.00 -1.55 Average

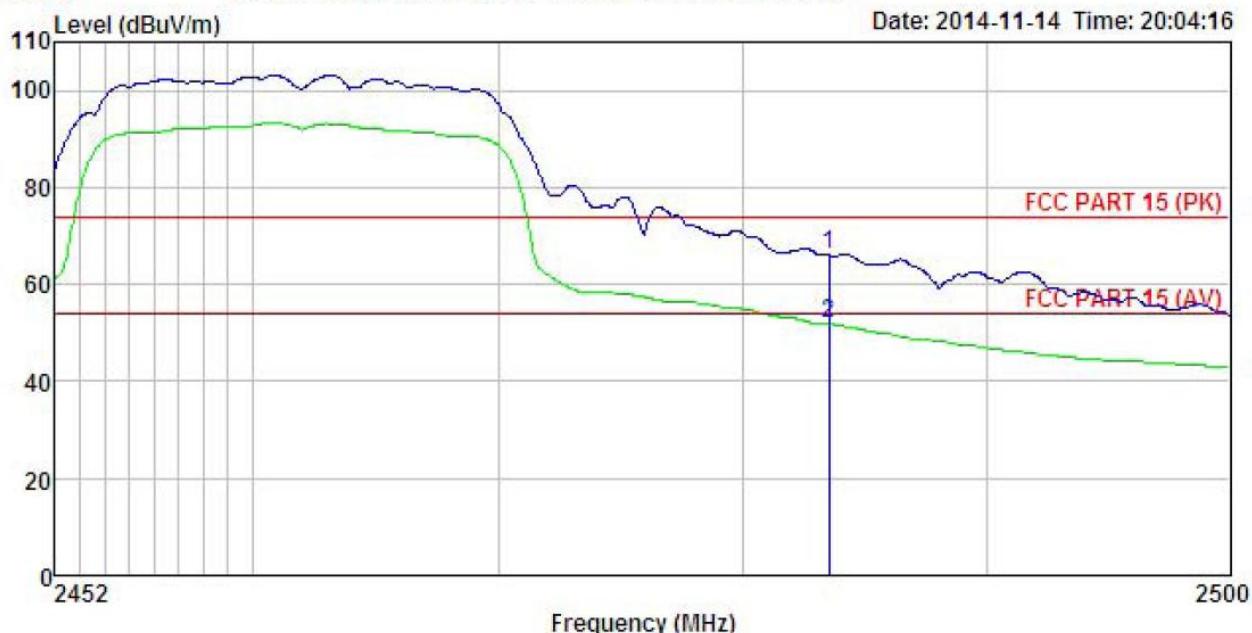
Vertical:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : G-L mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Humi:55%  
Test Engineer: Carey  
Remark :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit Remark
	MHz	dB <sub>UV</sub>	dB/m	dB	dB	dB <sub>UV</sub> /m	dB <sub>UV</sub> /m
1	2390.000	28.46	27.58	5.67	0.00	61.71	74.00 -12.29 Peak
2	2390.000	14.95	27.58	5.67	0.00	48.20	54.00 -5.80 Average

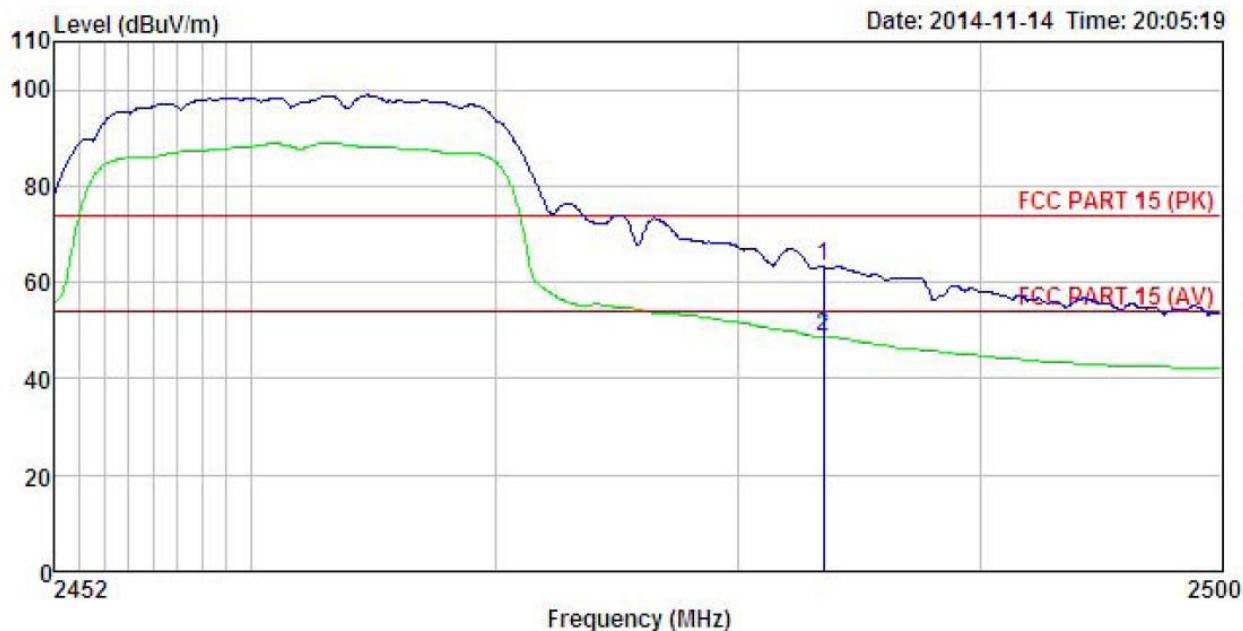
Test channel: Highest  
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : G-H mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Humi:55%  
Test Engineer: Carey  
Remark :

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	32.80	27.52	5.70	0.00	66.02	74.00	-7.98 Peak
2	2483.500	18.59	27.52	5.70	0.00	51.81	54.00	-2.19 Average

Vertical:



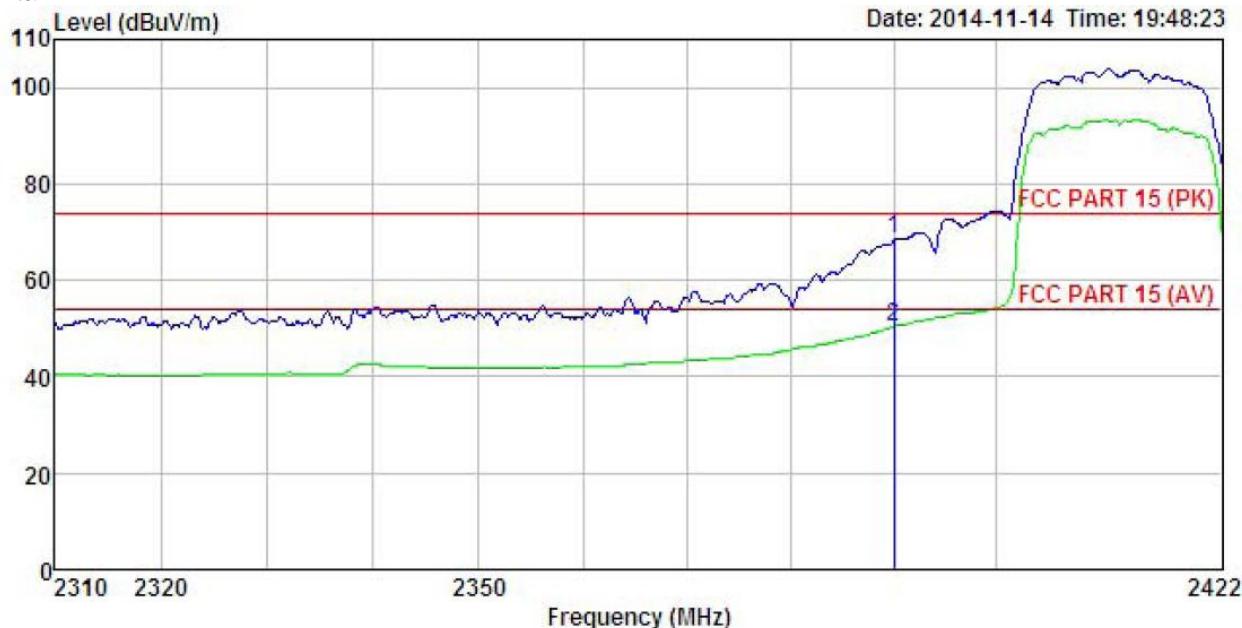
Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : G-H mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Humi:55%  
Test Engineer: Carey  
Remark :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	30.00	27.52	5.70	0.00	63.22	74.00 -10.78 Peak
2	2483.500	15.65	27.52	5.70	0.00	48.87	54.00 -5.13 Average

802.11n (H20)

Test channel: Lowest

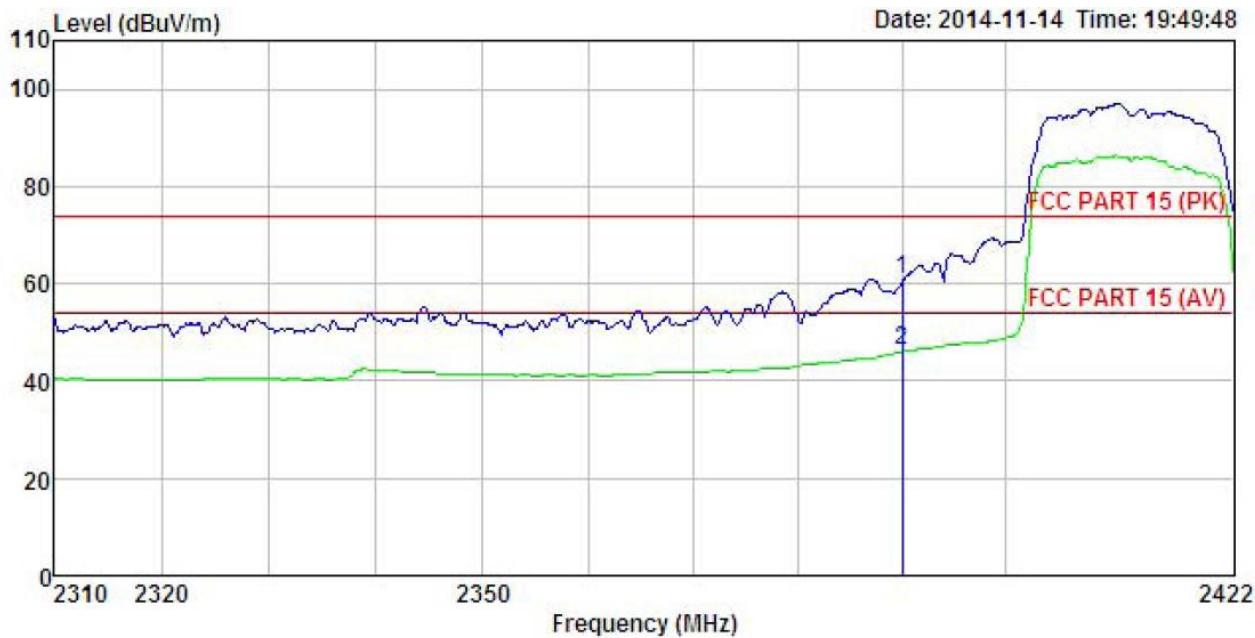
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : N20-L mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: Carey  
Remark :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit Remark
MHz	dB <sub>UV</sub>	dB/m	dB	dB	dB <sub>UV</sub> /m	dB <sub>UV</sub> /m	dB
1	2390.000	35.38	27.58	5.67	0.00	68.63	74.00 -5.37 Peak
2	2390.000	17.25	27.58	5.67	0.00	50.50	54.00 -3.50 Average

Vertical:

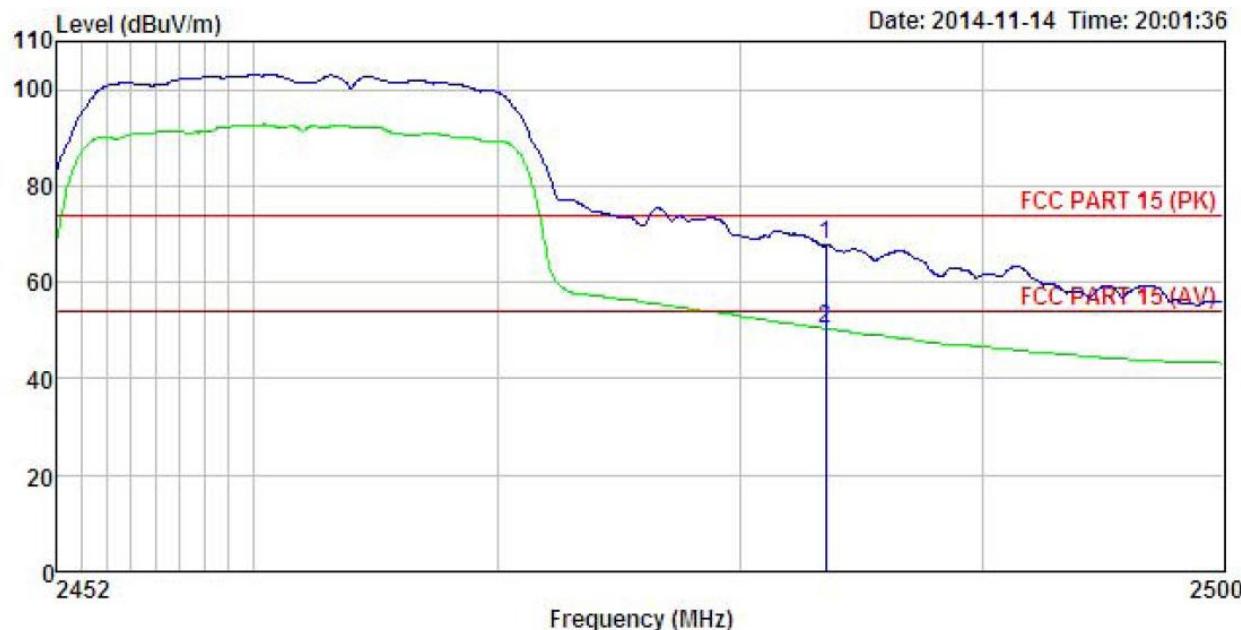


Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : N20-L mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: Carey  
Remark :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2390.000	27.51	27.58	5.67	0.00	60.76	74.00 -13.24 Peak
2	2390.000	12.84	27.58	5.67	0.00	46.09	54.00 -7.91 Average

Test channel: Highest

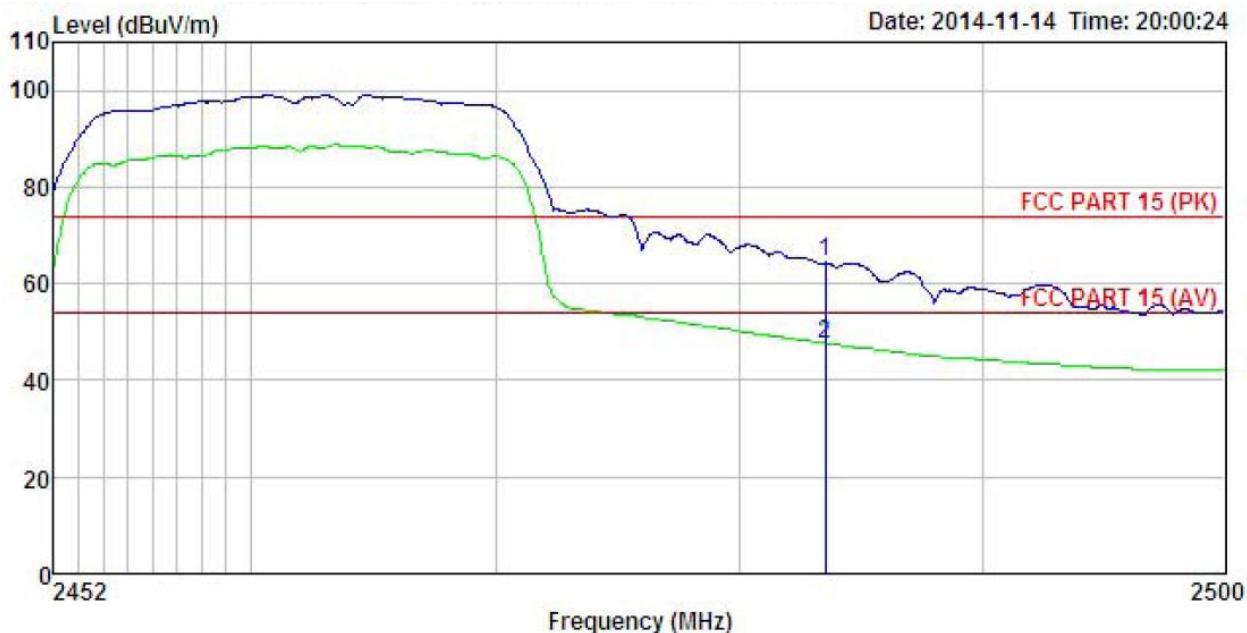
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : N20-H mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: Carey  
Remark :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	34.50	27.52	5.70	0.00	67.72	74.00 -6.28 Peak
2	2483.500	17.19	27.52	5.70	0.00	50.41	54.00 -3.59 Average

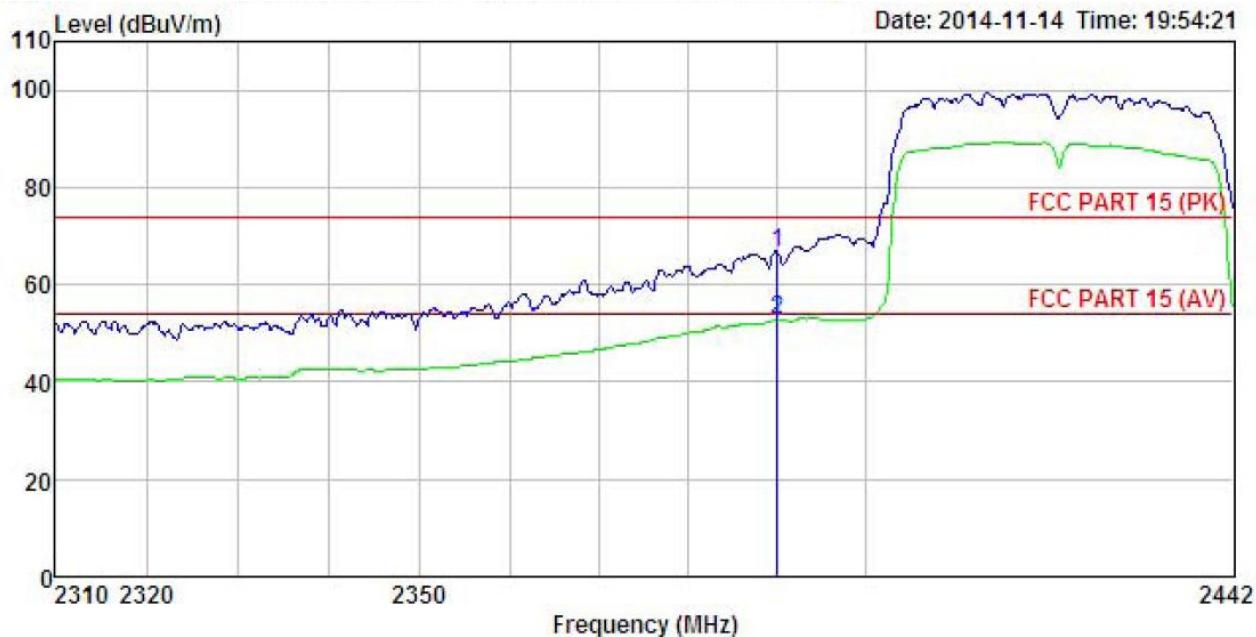
Vertical:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : N20-H mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Humi:55%  
Test Engineer: Carey  
Remark :

	Read	Antenna	Cable	Preamplifier	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	31.13	27.52	5.70	0.00	64.35	74.00 -9.65 Peak
2	2483.500	14.47	27.52	5.70	0.00	47.69	54.00 -6.31 Average

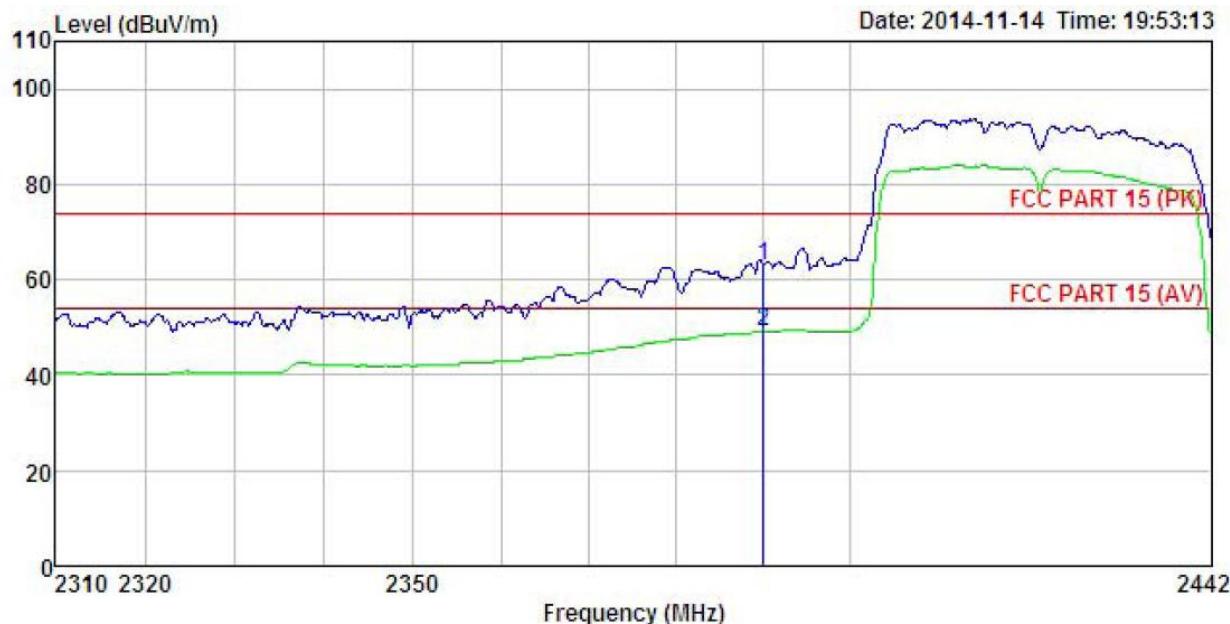
802.11n (H40)  
Test channel: Lowest  
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : N40-L mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: Carey  
Remark :

	ReadAntenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m
1	2390.000	33.37	27.58	5.67	0.00	66.62
2	2390.000	19.45	27.58	5.67	0.00	52.70
					74.00	-7.38 Peak
					54.00	-1.30 Average

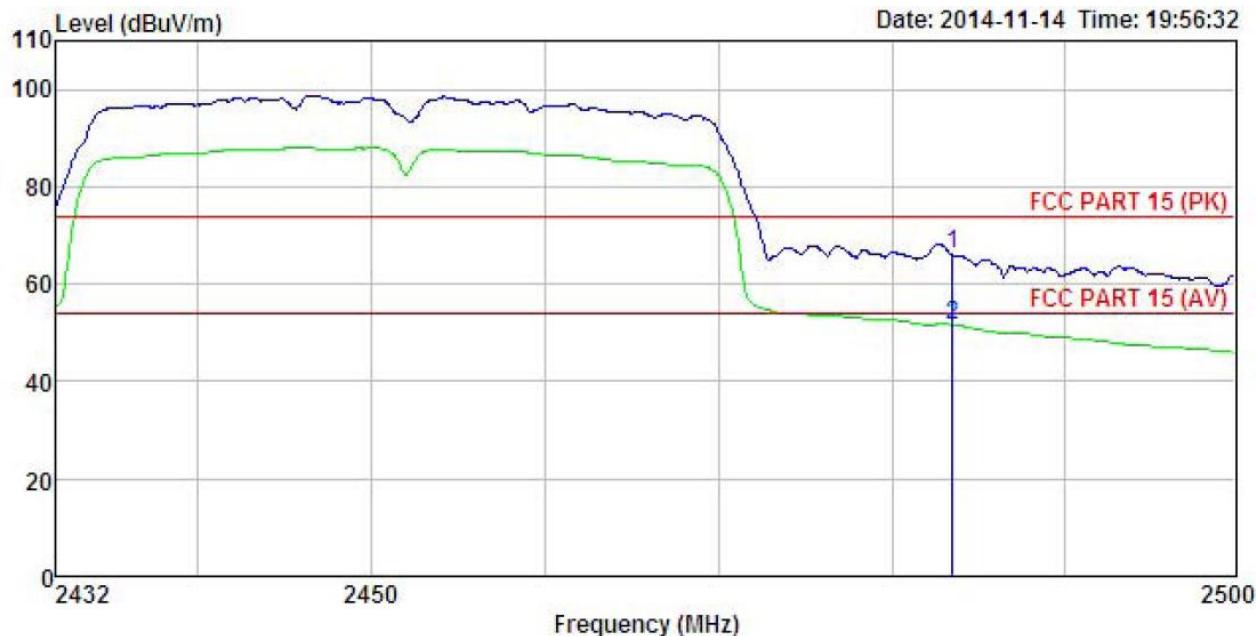
Vertical:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : N40-L mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Humi:55%  
Test Engineer: Carey  
Remark :

	ReadAntenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m
1	2390.000	29.79	27.58	5.67	0.00	63.04
2	2390.000	16.03	27.58	5.67	0.00	49.28
					74.00	-10.96
					54.00	-4.72
						Peak Average

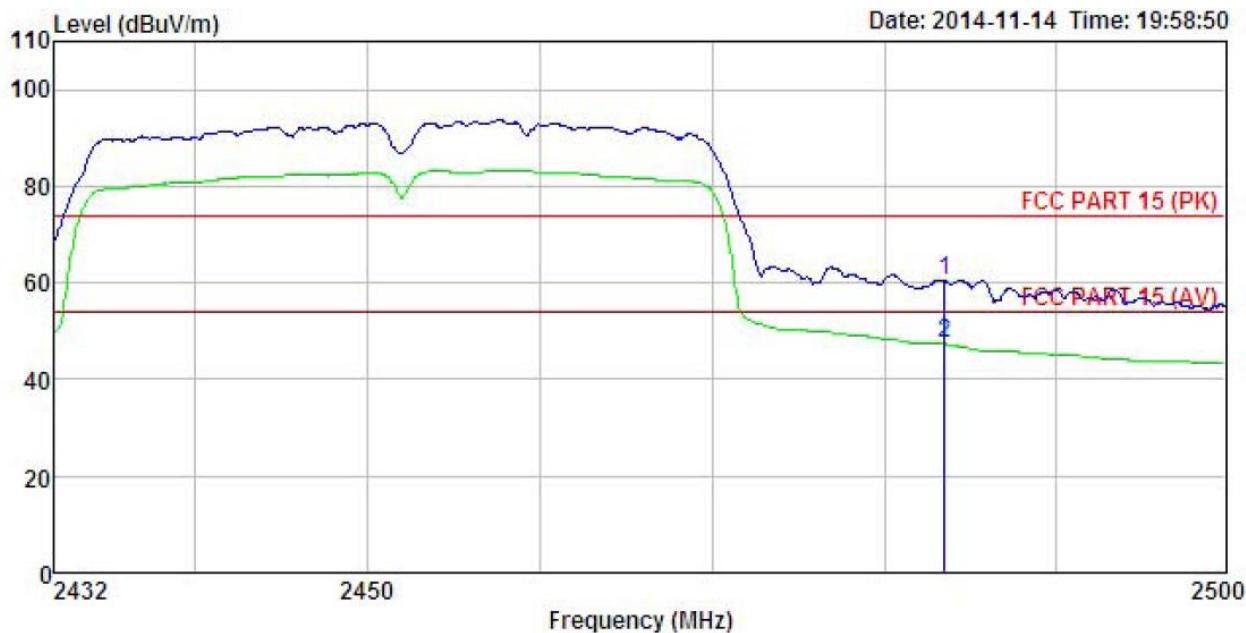
Test channel: Highest  
Horizontal:



Site : 3m chamber  
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : N40-H mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Humi:55%  
Test Engineer: Carey  
Remark :

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	32.79	27.52	5.70	0.00	66.01	74.00	-7.99 Peak
2	2483.500	18.50	27.52	5.70	0.00	51.72	54.00	-2.28 Average

Vertical:



Site : 3m chamber  
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL  
 Jobi NO. : 934RF  
 EUT : mobile phone  
 Model : U452  
 Test mode : N40-H mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Huni:55%  
 Test Engineer: Carey  
 Remark :

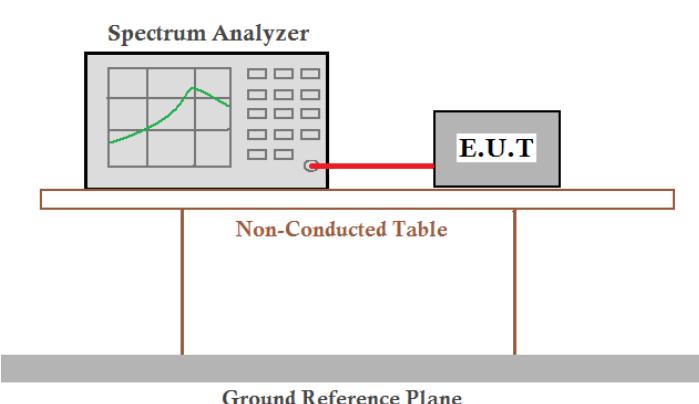
	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	27.24	27.52	5.70	0.00	60.46	74.00	-13.54 Peak
2	2483.500	14.12	27.52	5.70	0.00	47.34	54.00	-6.66 Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

## 6.7 Spurious Emission

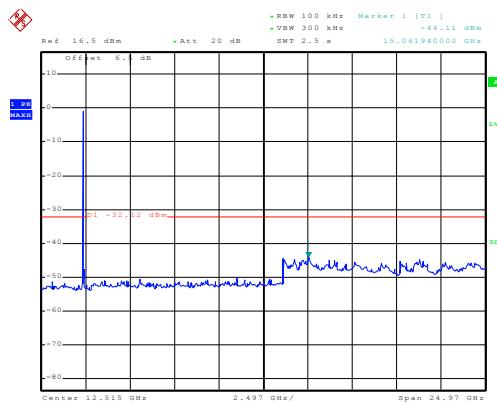
### 6.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plot as follows:

Test mode: 802.11b

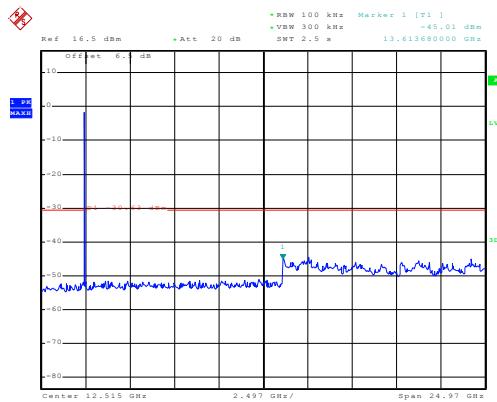
Lowest channel



Date: 19.NOV.2014 21:30:19

30MHz~25GHz

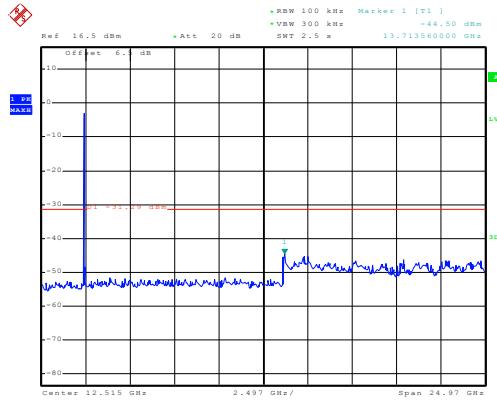
Middle channel



Date: 19.NOV.2014 21:30:52

30MHz~25GHz

Highest channel

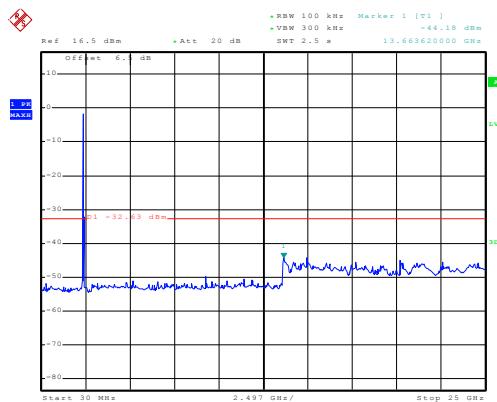


Date: 19.NOV.2014 21:32:06

30MHz~25GHz

Test mode: 802.11g

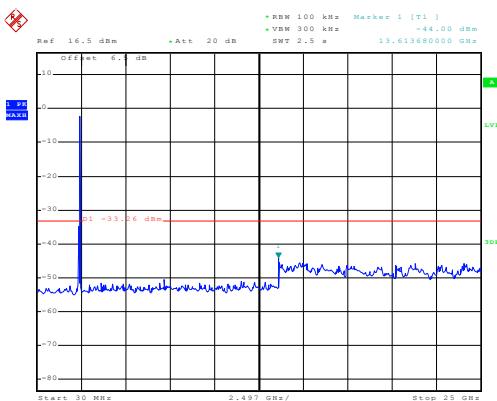
Lowest channel



Date: 11.NOV.2014 20:42:36

30MHz~25GHz

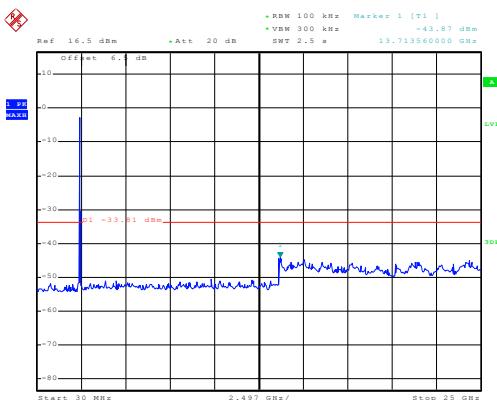
Middle channel



Date: 11.NOV.2014 20:42:55

30MHz~25GHz

Highest channel

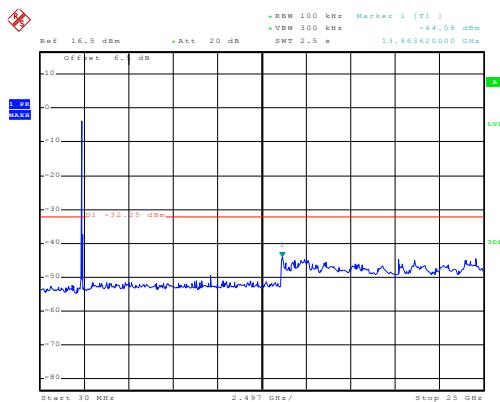


Date: 11.NOV.2014 20:43:51

30MHz~25GHz

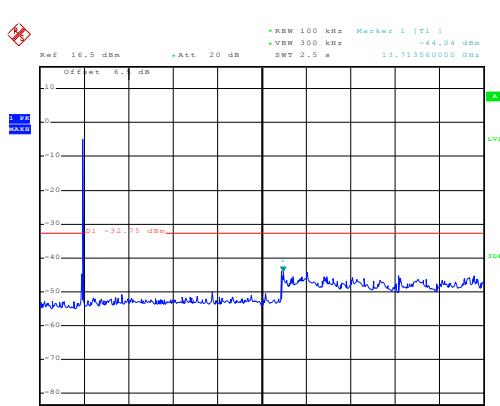
Test mode: 802.11n(H20)

### Lowest channel



30MHz~25GHz

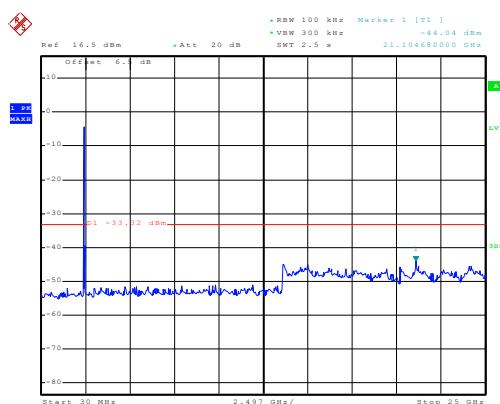
### Middle channel



Date: 11.NOV.2014 20:44:58

30MHz~25GHz

### Highest channel

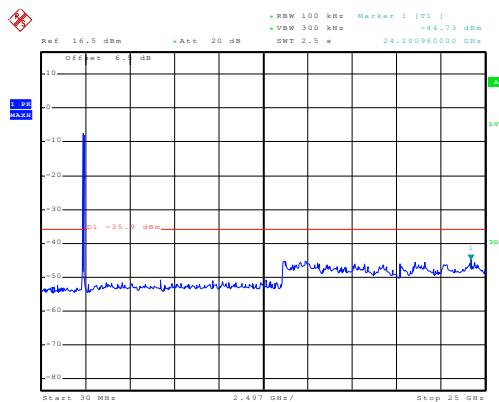


Date: 11.NOV.2014 20:45:47

30MHz~25GHz

Test mode: 802.11n(H40)

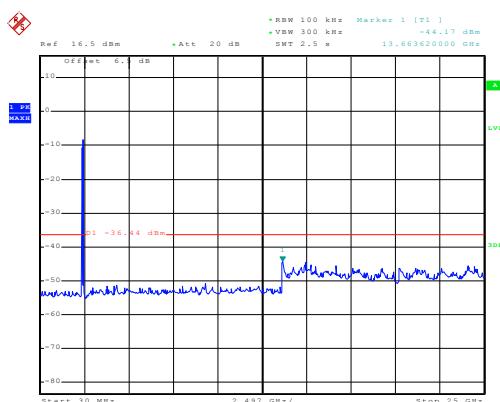
### Lowest channel



Date: 11.NOV.2014 20:46:19

### 30MHz~25GHz

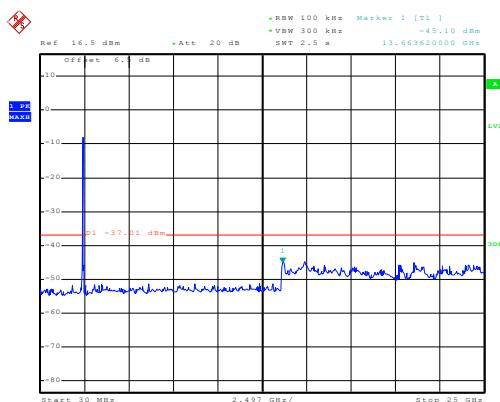
### Middle channel



Date: 11.NOV.2014 20:46:39

### 30MHz~25GHz

### Highest channel



Date: 11.NOV.2014 20:46:58

### 30MHz~25GHz

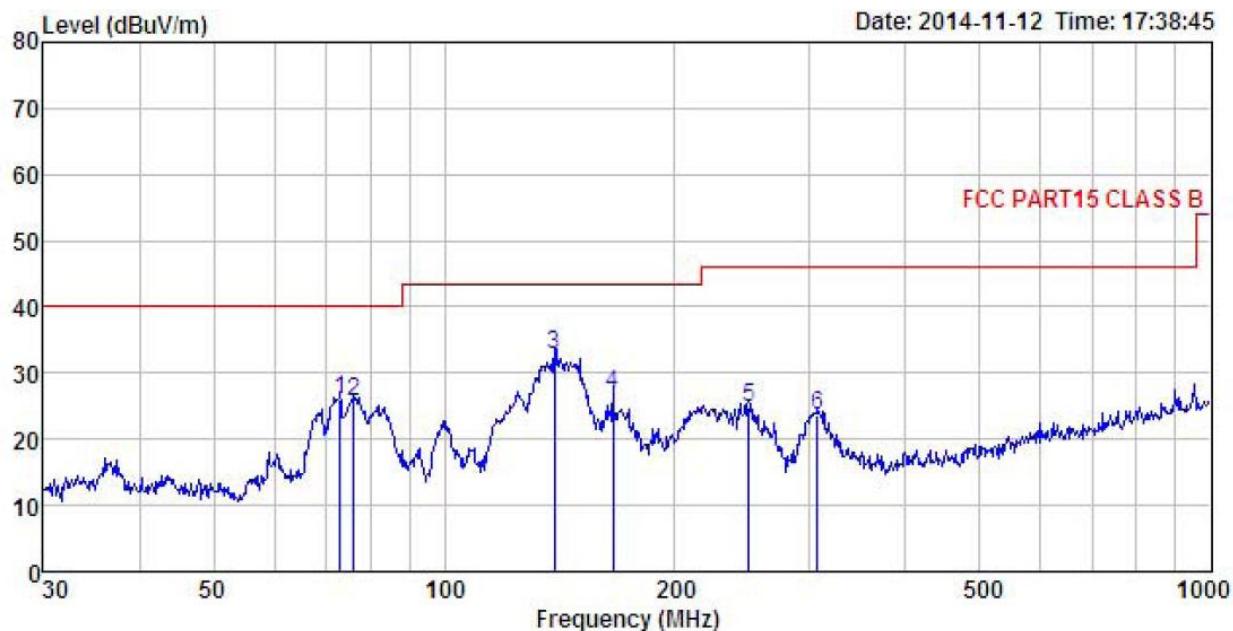
## 6.7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205																									
Test Method:	ANSI C63.4:2003																									
Test Frequency Range:	9KHz to 25GHz																									
Test site:	Measurement Distance: 3m																									
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>30MHz-1GHz</td> <td>Quasi-peak</td> <td>120KHz</td> <td>300KHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td>Above 1GHz</td> <td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak Value</td> </tr> <tr> <td></td> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average Value</td> </tr> </tbody> </table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value		Peak	1MHz	10Hz	Average Value	
Frequency	Detector	RBW	VBW	Remark																						
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value																						
Above 1GHz	Peak	1MHz	3MHz	Peak Value																						
	Peak	1MHz	10Hz	Average Value																						
Limit:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (dBuV/m @3m)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>30MHz-88MHz</td> <td>40.0</td> <td>Quasi-peak Value</td> </tr> <tr> <td>88MHz-216MHz</td> <td>43.5</td> <td>Quasi-peak Value</td> </tr> <tr> <td>216MHz-960MHz</td> <td>46.0</td> <td>Quasi-peak Value</td> </tr> <tr> <td>960MHz-1GHz</td> <td>54.0</td> <td>Quasi-peak Value</td> </tr> <tr> <td>Above 1GHz</td> <td>54.0</td> <td>Average Value</td> </tr> <tr> <td></td> <td>74.0</td> <td>Peak Value</td> </tr> </tbody> </table>					Frequency	Limit (dBuV/m @3m)	Remark	30MHz-88MHz	40.0	Quasi-peak Value	88MHz-216MHz	43.5	Quasi-peak Value	216MHz-960MHz	46.0	Quasi-peak Value	960MHz-1GHz	54.0	Quasi-peak Value	Above 1GHz	54.0	Average Value		74.0	Peak Value
Frequency	Limit (dBuV/m @3m)	Remark																								
30MHz-88MHz	40.0	Quasi-peak Value																								
88MHz-216MHz	43.5	Quasi-peak Value																								
216MHz-960MHz	46.0	Quasi-peak Value																								
960MHz-1GHz	54.0	Quasi-peak Value																								
Above 1GHz	54.0	Average Value																								
	74.0	Peak Value																								
Test Procedure:	<ol style="list-style-type: none"> <li>The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</li> </ol>																									

Test setup:	<p><b>Below 1GHz</b></p> <p><b>Above 1GHz</b></p>
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	<ol style="list-style-type: none"> <li>Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.</li> <li>9 kHz to 30MHz is too low, so only shows the data of above 30MHz in this report.</li> </ol>

**Below 1GHz**

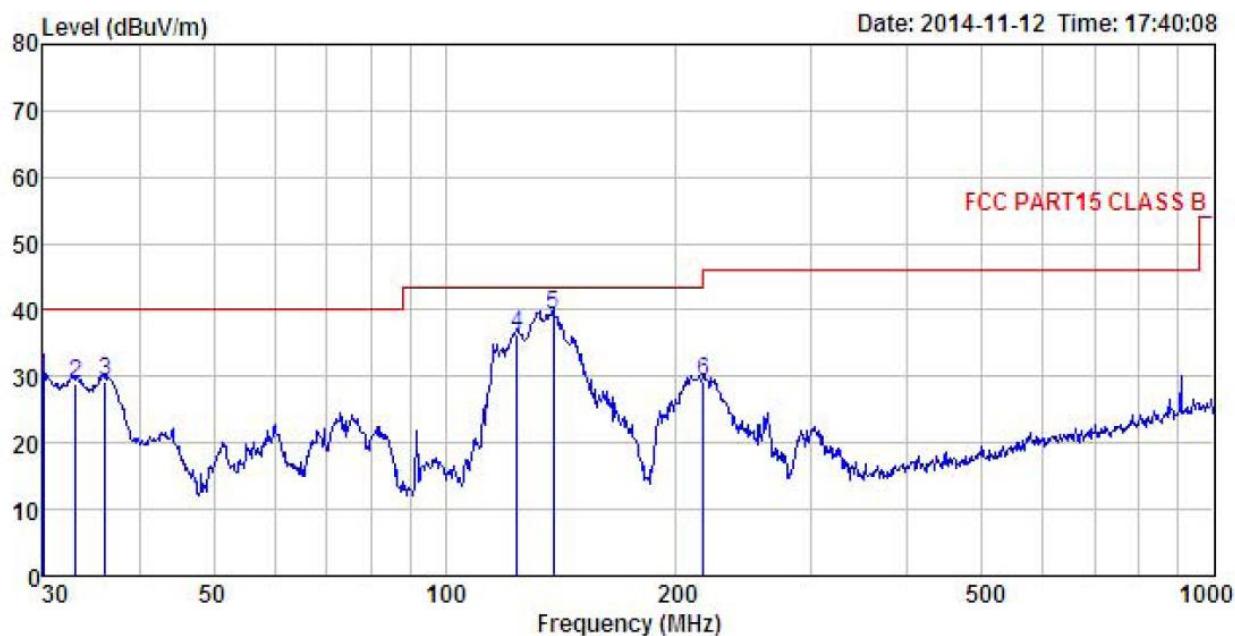
Horizontal :



Site : 3m chamber  
Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) HORIZONTAL  
Jobi NO. : 934RF  
EUT : mobile phone  
Model : U452  
Test mode : WIFI mode  
Power Rating : AC 120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: Carey  
Remark :

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark
	MHz	Level	Factor	Loss	Level	Line	Limit
1	73.103	46.77	8.13	0.81	29.69	26.02	40.00 -13.98 QP
2	76.244	46.43	8.03	0.83	29.67	25.62	40.00 -14.38 QP
3	139.361	52.70	8.19	1.25	29.28	32.86	43.50 -10.64 QP
4	166.068	45.88	8.85	1.34	29.08	26.99	43.50 -16.51 QP
5	249.425	39.72	12.07	1.62	28.54	24.87	46.00 -21.13 QP
6	306.754	37.22	13.15	1.79	28.47	23.69	46.00 -22.31 QP

Vertical :



Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163 (30M1G) VERTICAL  
 Jobi NO. : 934RF  
 EUT : mobile phone  
 Model : U452  
 Test mode : WIFI mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Huni:55%  
 Test Engineer: Carey  
 Remark :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	30.000	47.00	12.33	0.43	29.98	29.78	40.00	-10.22	QP
2	33.095	46.24	12.31	0.46	29.96	29.05	40.00	-10.95	QP
3	36.127	46.17	12.63	0.49	29.94	29.35	40.00	-10.65	QP
4	124.133	54.67	9.80	1.15	29.36	36.26	43.50	-7.24	QP
5	138.387	59.01	8.30	1.25	29.28	39.28	43.50	-4.22	QP
6	216.783	45.44	11.10	1.47	28.73	29.28	46.00	-16.72	QP

**Above 1GHz**

Test mode: 802.11b			Test channel: Lowest			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4824.00	49.85	31.53	8.90	40.24	50.04	74.00	-23.96	Vertical
4824.00	48.83	31.53	8.90	40.24	49.02	74.00	-24.98	Horizontal
Test mode: 802.11b			Test channel: Lowest			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4824.00	40.11	31.53	8.90	40.24	40.30	54.00	-13.70	Vertical
4824.00	39.12	31.53	8.90	40.24	39.31	54.00	-14.69	Horizontal

Test mode: 802.11b			Test channel: Middle			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4874.00	47.52	31.58	8.98	40.15	47.93	74.00	-26.07	Vertical
4874.00	47.84	31.58	8.98	40.15	48.25	74.00	-25.75	Horizontal
Test mode: 802.11b			Test channel: Middle			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4874.00	37.91	31.58	8.98	40.15	38.32	54.00	-15.68	Vertical
4874.00	38.22	31.58	8.98	40.15	38.63	54.00	-15.37	Horizontal

Test mode: 802.11b			Test channel: Highest			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4924.00	52.70	31.69	9.08	40.03	53.44	74.00	-20.56	Vertical
4924.00	50.98	31.69	9.08	40.03	51.72	74.00	-22.28	Horizontal
Test mode: 802.11b			Test channel: Highest			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4924.00	43.12	31.69	9.08	40.03	43.86	54.00	-10.14	Vertical
4924.00	40.88	31.69	9.08	40.03	41.62	54.00	-12.38	Horizontal

**Remark:**

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode: 802.11g			Test channel: Lowest			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4824.00	51.41	31.53	8.90	40.24	51.60	74.00	-22.40	Vertical
4824.00	51.14	31.53	8.90	40.24	51.33	74.00	-22.67	Horizontal
Test mode: 802.11g			Test channel: Lowest			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4824.00	42.13	31.53	8.90	40.24	42.32	54.00	-11.68	Vertical
4824.00	40.58	31.53	8.90	40.24	40.77	54.00	-13.23	Horizontal

Test mode: 802.11g			Test channel: Middle			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4874.00	52.76	31.58	8.98	40.15	53.17	74.00	-20.83	Vertical
4874.00	52.05	31.58	8.98	40.15	52.46	74.00	-21.54	Horizontal
Test mode: 802.11g			Test channel: Middle			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4874.00	43.38	31.58	8.98	40.15	43.79	54.00	-10.21	Vertical
4874.00	41.63	31.58	8.98	40.15	42.04	54.00	-11.96	Horizontal

Test mode: 802.11g			Test channel: Highest			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4924.00	56.99	31.69	9.08	40.03	57.73	74.00	-16.27	Vertical
4924.00	59.21	31.69	9.08	40.03	59.95	74.00	-14.05	Horizontal
Test mode: 802.11g			Test channel: Highest			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4924.00	37.08	31.69	9.08	40.03	37.82	54.00	-16.18	Vertical
4924.00	41.27	31.69	9.08	40.03	42.01	54.00	-11.99	Horizontal

**Remark:**

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode: 802.11n(H20)			Test channel: Lowest			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4824.00	52.49	31.53	8.90	40.24	52.68	74.00	-21.32	Vertical
4824.00	51.41	31.53	8.90	40.24	51.60	74.00	-22.40	Horizontal
Test mode: 802.11n(H20)			Test channel: Lowest			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4824.00	42.23	31.53	8.90	40.24	42.42	54.00	-11.58	Vertical
4824.00	40.92	31.53	8.90	40.24	41.11	54.00	-12.89	Horizontal

Test mode: 802.11n(H20)			Test channel: Middle			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4874.00	56.78	31.58	8.98	40.15	57.19	74.00	-16.81	Vertical
4874.00	56.71	31.58	8.98	40.15	57.12	74.00	-16.88	Horizontal
Test mode: 802.11n(H20)			Test channel: Middle			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4874.00	43.98	31.58	8.98	40.15	44.39	54.00	-9.61	Vertical
4874.00	44.15	31.58	8.98	40.15	44.56	54.00	-9.44	Horizontal

Test mode: 802.11n(H20)			Test channel: Highest			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4924.00	58.43	31.69	9.08	40.03	59.17	74.00	-14.83	Vertical
4924.00	57.34	31.69	9.08	40.03	58.08	74.00	-15.92	Horizontal
Test mode: 802.11n(H20)			Test channel: Highest			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4924.00	45.89	31.69	9.08	40.03	46.63	54.00	-7.37	Vertical
4924.00	43.75	31.69	9.08	40.03	44.49	54.00	-9.51	Horizontal

**Remark:**

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode: 802.11n(H40)			Test channel: Lowest			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4844.00	49.68	31.53	8.90	40.24	49.87	74.00	-24.13	Vertical
4844.00	50.21	31.53	8.90	40.24	50.40	74.00	-23.60	Horizontal
Test mode: 802.11n(H40)			Test channel: Lowest			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4844.00	39.33	31.53	8.90	40.24	39.52	54.00	-14.48	Vertical
4844.00	39.77	31.53	8.90	40.24	39.96	54.00	-14.04	Horizontal

Test mode: 802.11n(H40)			Test channel: Middle			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4874.00	51.86	31.58	8.98	40.15	52.27	74.00	-21.73	Vertical
4874.00	52.66	31.58	8.98	40.15	53.07	74.00	-20.93	Horizontal
Test mode: 802.11n(H40)			Test channel: Middle			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4874.00	41.41	31.58	8.98	40.15	41.82	54.00	-12.18	Vertical
4874.00	42.79	31.58	8.98	40.15	43.20	54.00	-10.80	Horizontal

Test mode: 802.11n(H40)			Test channel: Highest			Remark: Peak		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4904.00	50.64	31.69	9.08	40.03	51.38	74.00	-22.62	Vertical
4904.00	49.84	31.69	9.08	40.03	50.58	74.00	-23.42	Horizontal
Test mode: 802.11n(H40)			Test channel: Highest			Remark: Average		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4904.00	40.70	31.69	9.08	40.03	41.44	54.00	-12.56	Vertical
4904.00	40.12	31.69	9.08	40.03	40.86	54.00	-13.14	Horizontal

**Remark:**

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.