

# ***FCC Report***

## ***WIFI***

**Product Description: Smart Phone Projector**

**Trade Mark: Akyumen**

**Model No.: Hawk01, Hawk02, Hawk03, Hawk04, Hawk05, Hawk06, Hawk07,  
Hawk08, Hawk09, Hawk10, Hawk11, Hawk12, Hawk13,  
Hawk14, Hawk15, Hawk16, Hawk17, Hawk18, Hawk19,**

**FCC ID: 2ADLD-HAWK01**

**Applicant: Akyumen Technologies Corp.**

**Address: 7401 Wiles Road, Suite 123 Coral Spring, FL 33067 USA**

**Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247:2013**

**Test Date: 24 November ~ 08 December, 2014**

**Issued Date: 08 December, 2014**

**Test Result: Complied**



**James Wu**  
**Laboratory Manager**

The test result in this test report relate only to the tested samples in this report .

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## 2 Version

<i>Version No.</i>	<i>Date</i>	<i>Description</i>
00	08 December, 2014	Original

**Prepared By:**

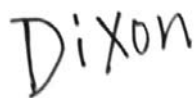


**Young Li**  
**Project Engineer**

**Date:**

08 December, 2014

**Check By:**



**Dixon Hao**  
**Reviewer**

**Date:**

08 December, 2014

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## 4 Test Summary

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

*Complied: The EUT has complied with the essential requirements in the standard.*

## 5 General Information

### 5.1 Client Information

Applicant:	Akyumen Technologies Corp.
Address:	7401 Wiles Road, Suite 123 Coral Spring, FL 33067 USA
Manufacturer:	Akyumen Technologies Corp.
Address:	7401 Wiles Road, Suite 123 Coral Spring, FL 33067 USA

### 5.2 General Description of EUT

Product Name:	Smart Phone Projector
Brand Mark:	Akyumen
Model No.:	Hawk01, Hawk02, Hawk03, Hawk04, Hawk05, Hawk06, Hawk07, Hawk08, Hawk09, Hawk10, Hawk11, Hawk12, Hawk13, Hawk14, Hawk15, Hawk16, Hawk17, Hawk18, Hawk19,
Test model No.:	Hawk01
Software version:	V1.0
Hardware version:	V1.0
<b>WIFI</b>	
Support Protocol:	802.11b/g/n(H20)/n(H40)
Operation Frequency:	802.11b/g/n(H20): 2412MHz~2462MHz 802.11n(H40): 2422MHz~2452MHz
Channel numbers:	802.11b/g/n(H20): 11 802.11n(H40): 7
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g/n(H20)/n(H40): Orthogonal Frequency Division Multiplexing(OFDM)
Antenna Type:	Integral Antenna
Antenna Gain:	0dBi
AC Adapter:	Model: JHD-AP012C-050150AB Input: AC 100~240V 50/60Hz 0.35A Output: DC 5.0V 1.5A
Power supply:	lithium-ion charge battery 3.7V

Operation Frequency each of channel							
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	X	

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:

Test channel	Frequency (MHz)	
	802.11b/802.11g/802.11n(HT20)	802.11n(HT40)
Lowest channel	2412MHz	2422MHz
Middle channel	2437MHz	2437MHz
Highest channel	2462MHz	2452MHz

### 5.3 Test Mode

Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: 1. During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data. 2. 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: 802.11b: 1Mbps; 802.11g: 6Mbps; 802.11n(H20): 6.5Mbps; 802.11n(H40): 13Mbps	

### 5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: <ul style="list-style-type: none"> <li>■ <b>CNAS —Registration No.: CNAS L5775</b>              CNAS has accredited Global United Technology Services Co., Ltd. to ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.</li> <li>■ <b>FCC —Registration No.: 600491</b>              Global United Technology Services Co., Ltd., Shenzhen 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 files. Registration 600491, July 20, 2010.</li> <li>■ <b>Industry Canada (IC) —Registration No.: 9079A-1</b>              The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-1.</li> </ul>
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### 5.5 Test Location

All tests were performed at: Global United Technology Services Co., Ltd. Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China
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## 6 Test Instruments list

Instrument	Manufacturer	Model No.	Inventory No.	Next Cal. Date
3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 27 2015
Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A
EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jun. 30 2015
BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 22 2015
Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 26 2015
Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 27 2015
EMI Test Software	AUDIX	E3	N/A	N/A
Coaxial Cable	GTS	N/A	GTS213	Mar. 28 2015
Coaxial Cable	GTS	N/A	GTS211	Mar. 28 2015
Coaxial cable	GTS	N/A	GTS210	Mar. 28 2015
Coaxial Cable	GTS	N/A	GTS212	Mar. 28 2015
Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jun. 30 2015
Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jun. 30 2015
Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 26 2015
Band filter	Amindeon	82346	GTS219	Mar. 28 2015
Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	May 09 2015
Signal Generator	Rohde & Schwarz	SML03	GTS236	May 09 2015
Temp. Humidity/ Barometer	Oregon Scientific	BA-888	GTS248	May 09 2015
D.C. Power Supply	Instek	PS-3030	GTS232	NA
Splitter	Agilent	11636B	GTS237	May 09 2015
Power meter	Rohde & Schwarz	OSP-B157	GTS266	Nov 09 2015

### Conducted Emission

Instrument	Manufacturer	Model No.	Inventory No.	Next Cal. Date
Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS264	Sep. 06 2015
EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jun. 30 2015
10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	Jun. 30 2015
Coaxial Switch	ANRITSU CORP	MP59B	GTS225	Jun. 30 2015
LISN	SCHWARZBECK MESS- ELEKTRONIK	NSLK 8127	GTS226	Jun. 30 2015
Coaxial Cable	GTS	N/A	GTS227	Jun. 30 2015
EMI Test Software	AUDIX	E3	N/A	N/A
Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS264	Sep. 06 2015
EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jun. 30 2015

## 7 Measurement Data and Test Results

### 7.1 Antenna requirement

#### Standard requirement

According to Standard: FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

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.

15.247(c) (1)(i) requirement:

(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.

#### EUT Antenna:

The antenna is unique integral antenna, the typical gain of the antenna is 0dBi.





## 7.2 Conducted Emissions

### ☞ Standard requirement

FCC Part15 C Section 15.207

### ☞ Test method

ANSI C63.4:2003

### ☞ Receiver set

RBW=9KHz, VBW=30KHz, Sweep time=auto

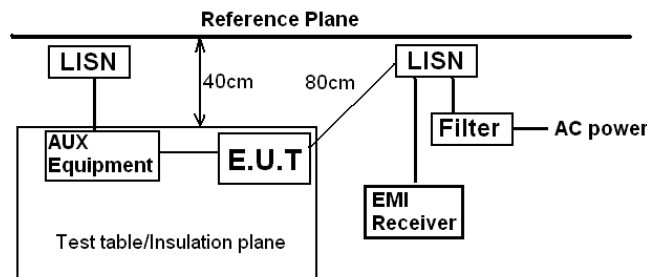
### ☞ Limit

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

### ☞ Test mode

Refer to section 5.3 for details

### ☞ Test setup



*Remark:*  
E.U.T: Equipment Under Test  
LISN: Line Impedance Stabilization Network  
Test table height=0.8m

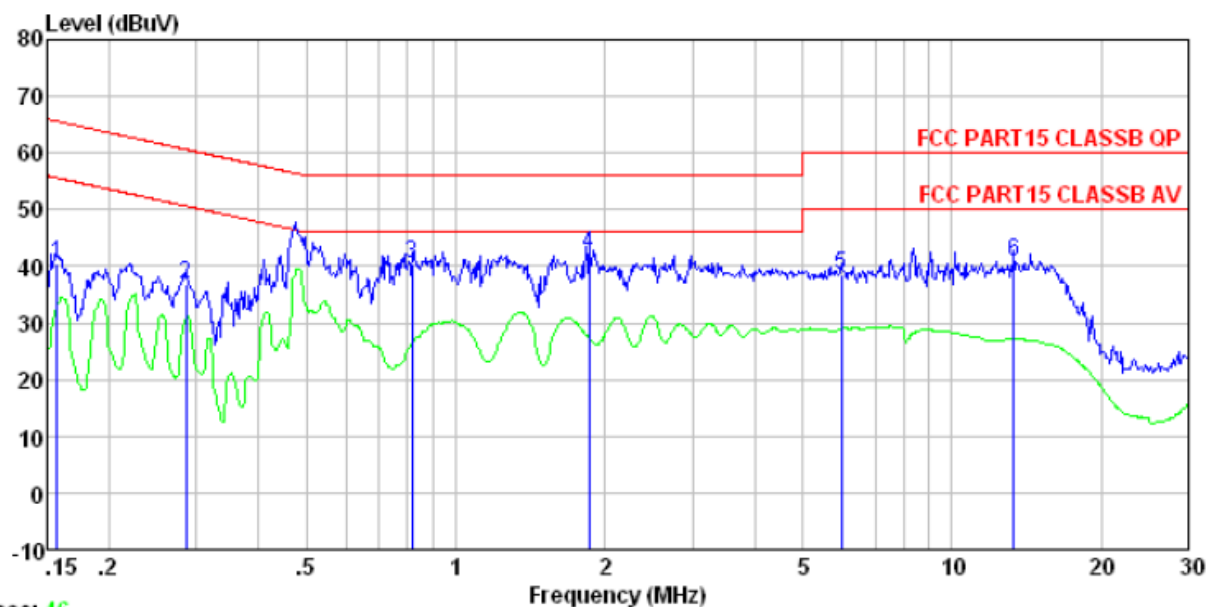
### ☞ Test mode

1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. 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).
3. 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.

### ☞ Test Result

**Complied**

Test mode:	WIFI mode	Temperature:	24~26°C
Phase Polarity:	Line	Relative Humidity:	50~53%

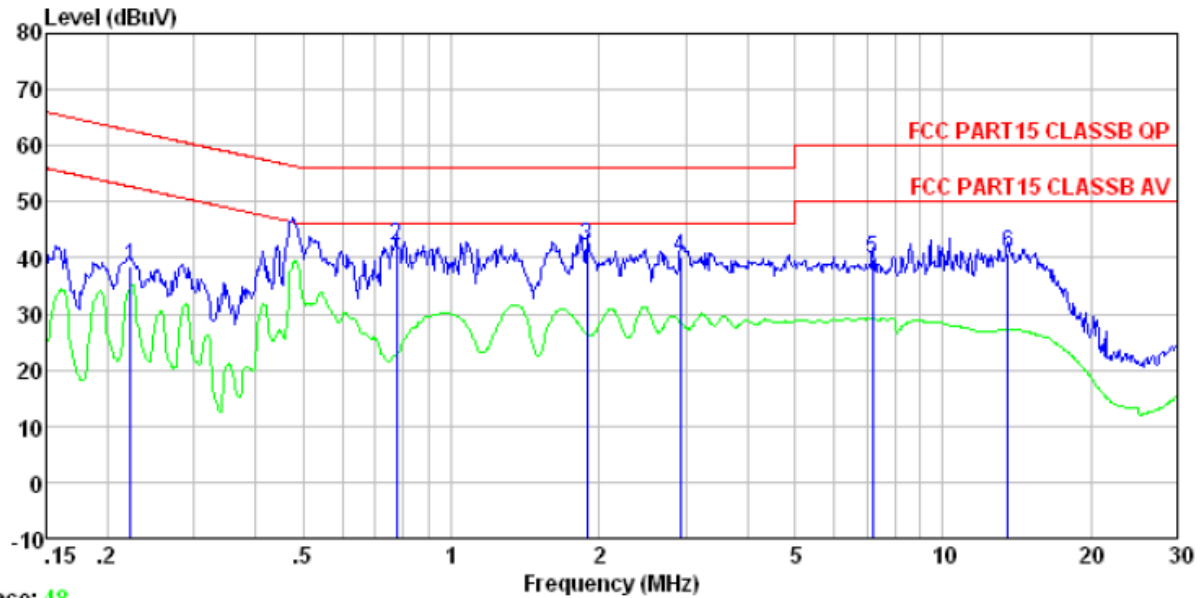


Condition: FCC PART15 CLASSB QP LISN-2013 LINE

Test mode: WiFi mode

	Read Freq	LISN Level	Cable Factor	Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.157	40.12	0.15	0.12	40.39	65.60	-25.21	QP
2	0.286	36.69	0.11	0.10	36.90	60.63	-23.73	QP
3	0.817	40.31	0.14	0.13	40.58	56.00	-15.42	QP
4	1.858	41.73	0.12	0.14	41.99	56.00	-14.01	QP
5	5.993	38.09	0.22	0.16	38.47	60.00	-21.53	QP
6	13.337	40.11	0.33	0.21	40.65	60.00	-19.35	QP

Test mode:	WIFI mode	Temperature:	24~26°C
Phase Polarity:	Nertral	Relative Humidity:	50~53%



Condition: FCC PART15 CLASSB QP LISN-2013 NEUTRAL

Test mode: WiFi mode

	Read Freq	LISN Level	Cable Factor	Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.223	38.19	0.06	0.12	38.37	62.70	-24.33	QP
2	0.775	41.94	0.07	0.13	42.14	56.00	-13.86	QP
3	1.888	42.00	0.09	0.14	42.23	56.00	-13.77	QP
4	2.931	39.99	0.11	0.15	40.25	56.00	-15.75	QP
5	7.213	39.46	0.18	0.17	39.81	60.00	-20.19	QP
6	13.551	40.15	0.33	0.21	40.69	60.00	-19.31	QP

#### Notes:

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

### 7.3 Conducted Peak Output Power

☞ **Standard requirement**

FCC Part15 C Section 15.247 (b)(3)

☞ **Test method**

ANSI C63.4:2003 and KDB558074 D01 DTS Meas Guidance V03

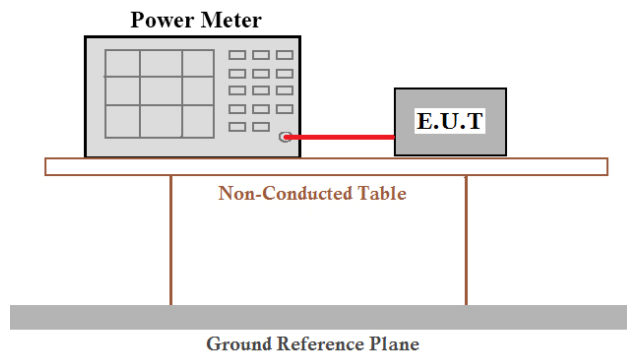
☞ **Limit**

30dBm

☞ **Test mode**

Refer to section 5.3 for details

☞ **Test setup**



☞ **Test Result**

**Complied**

Measurement Data

Test CH	Peak Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	13.42	12.54	12.61	11.41	30.00	Pass
Middle	14.08	12.65	12.73	10.90		
Highest	14.24	12.80	12.79	11.71		

## 7.4 Channel Bandwidth

### ☞ Standard requirement

FCC Part15 C Section 15.247 (a)(2)

### ☞ Test method

ANSI C63.4:2003 and KDB558074 D01 DTS Meas Guidance V03

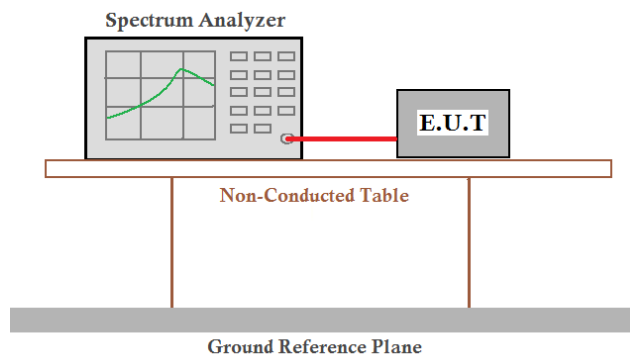
### ☞ Limit

>500KHz

### ☞ Test mode

Refer to section 5.3 for details

### ☞ Test setup



### ☞ Test Result

**Complied**

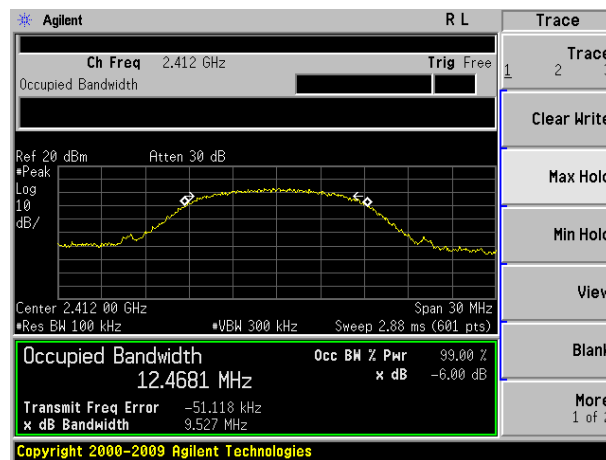
#### Measurement Data

Test CH	Channel Bandwidth (MHz)				Limit(KHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	9.527	15.058	15.168	35.308	>500	Pass
Middle	9.266	15.176	16.087	35.575		
Highest	9.484	15.166	15.173	35.368		

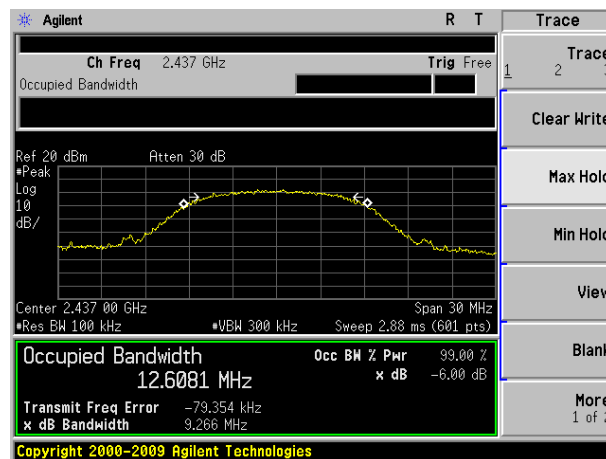
Mode

802.11b

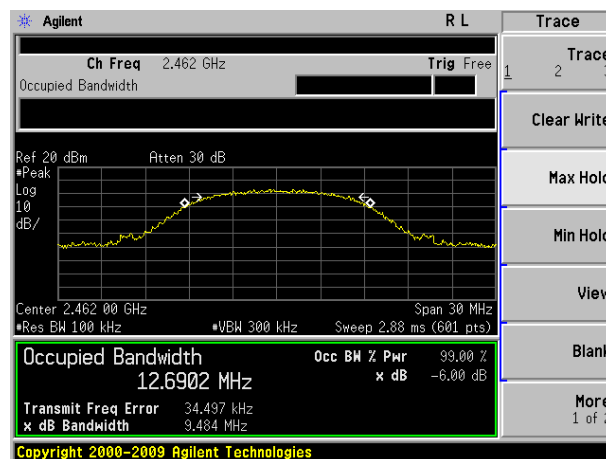
Lowest channel:



Middle channel:



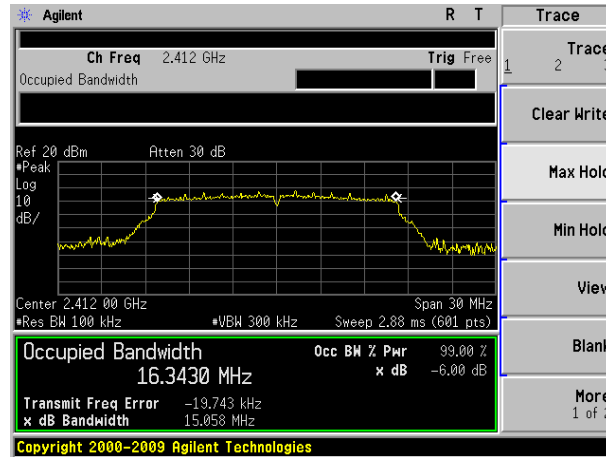
Highest channel:



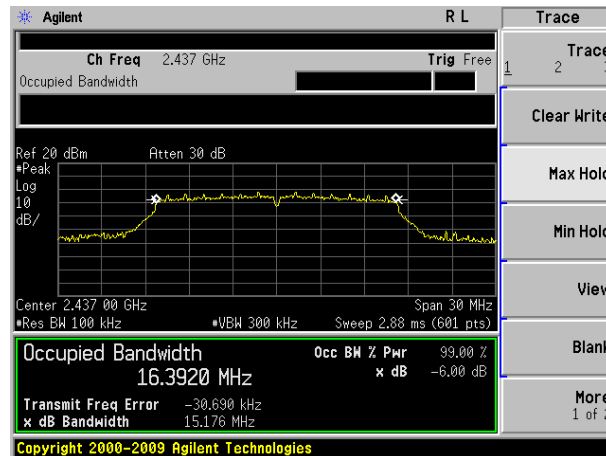
Mode

802.11g

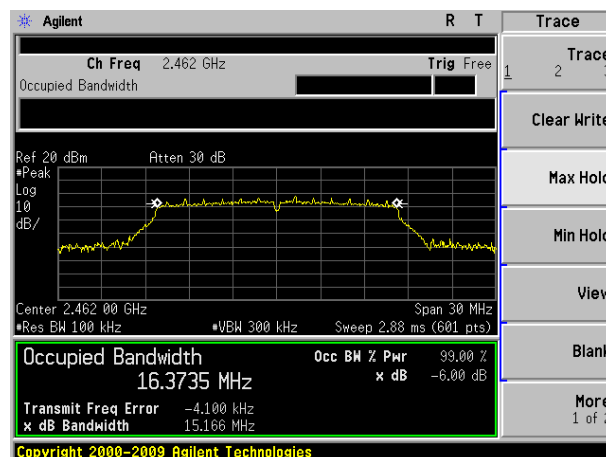
Lowest channel:



Middle channel:



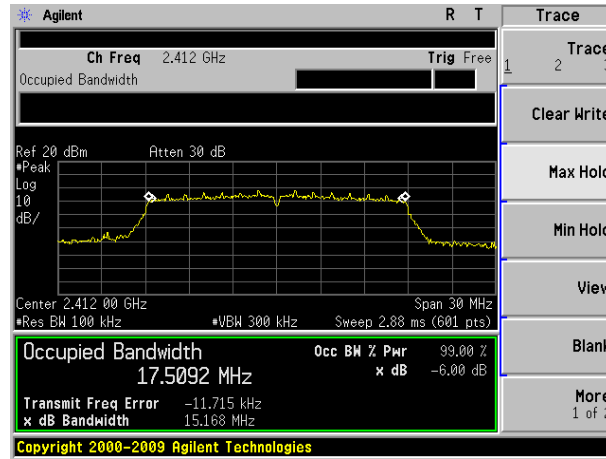
Highest channel:



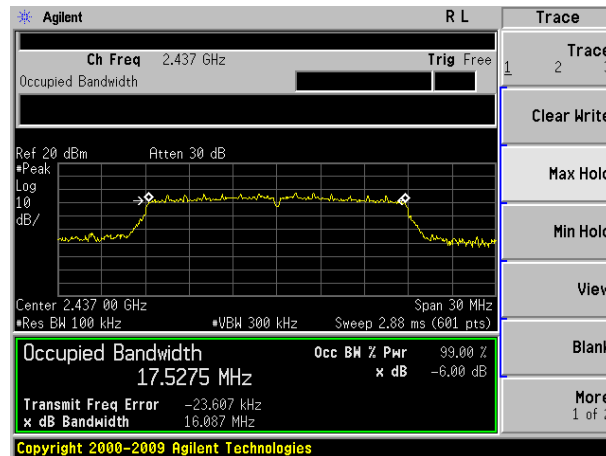
Mode

802.11n(H20)

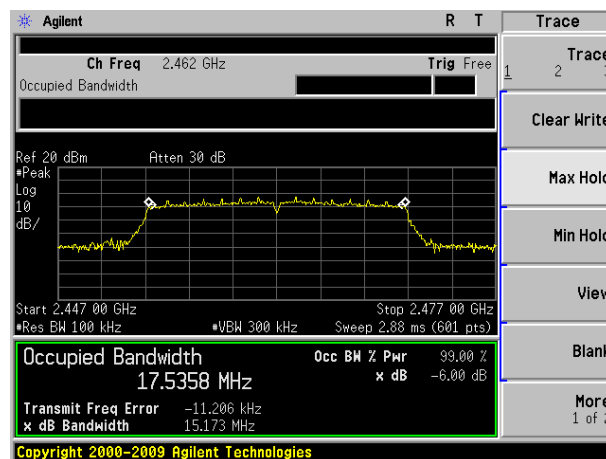
Lowest channel:



Middle channel:



Highest channel:

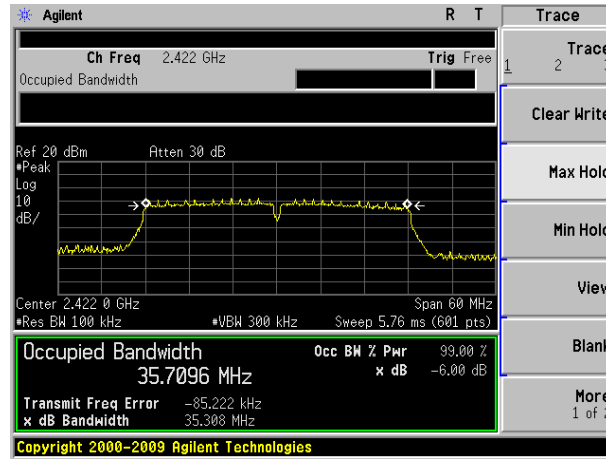




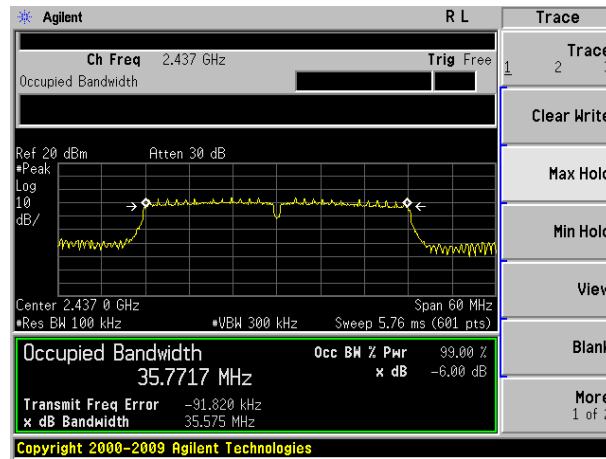
Mode

802.11n(H40)

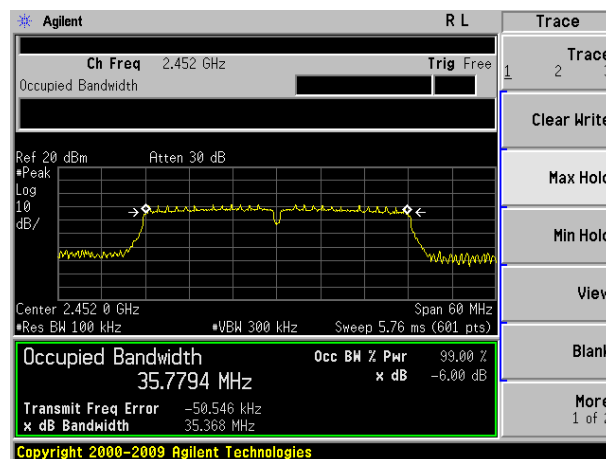
Lowest channel:



Middle channel:



Highest channel:



## 7.5 Power Spectral Density

### ☞ Standard requirement

FCC Part15 C Section 15.247 (e)

### ☞ Test method

ANSI C63.4:2003 and KDB558074 D01 DTS Meas Guidance V03

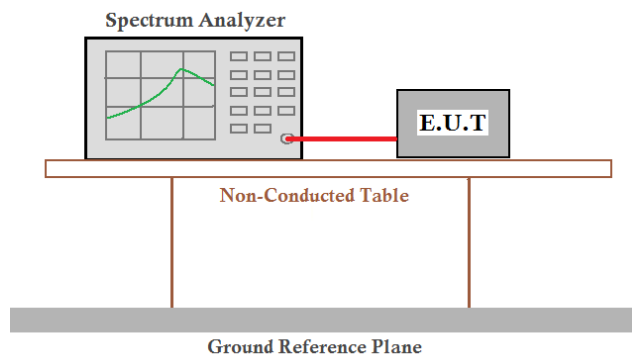
### ☞ Limit

8dBm

### ☞ Test mode

Refer to section 5.3 for details

### ☞ Test setup



### ☞ Test Result

**Complied**

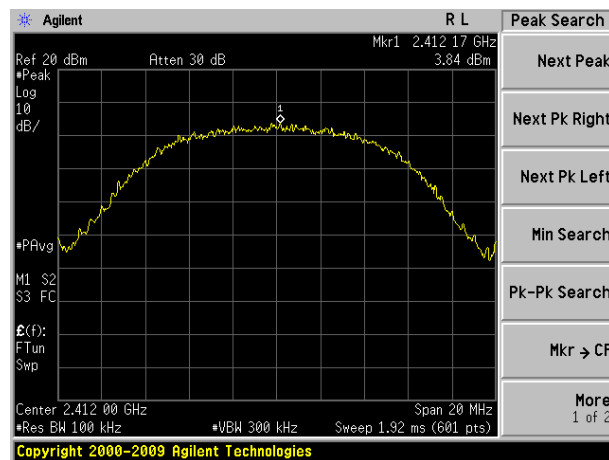
#### Measurement Data

Test CH	Power Spectral Density (dBm)				Limit(dBm/3kHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	3.84	-1.78	-2.10	-7.66	8.00	Pass
Middle	2.33	-1.69	-1.84	-6.29		
Highest	3.43	-2.01	-2.15	-8.13		

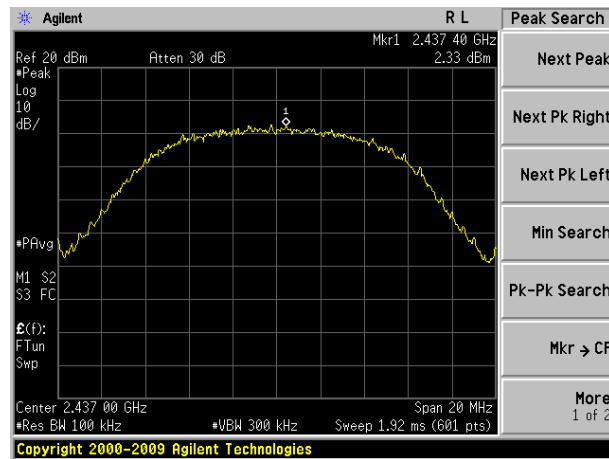
Mode

802.11b

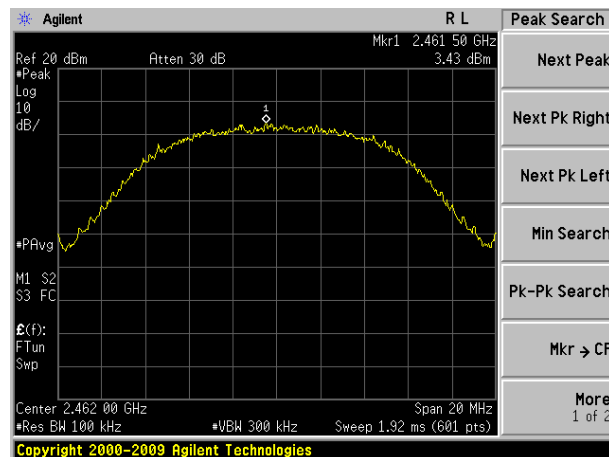
Lowest channel:



Middle channel:



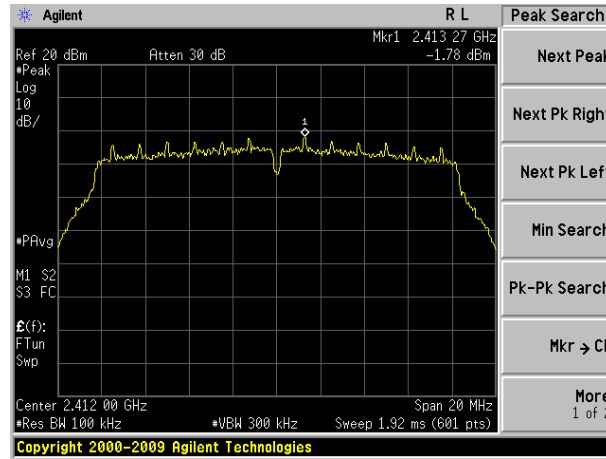
Highest channel:



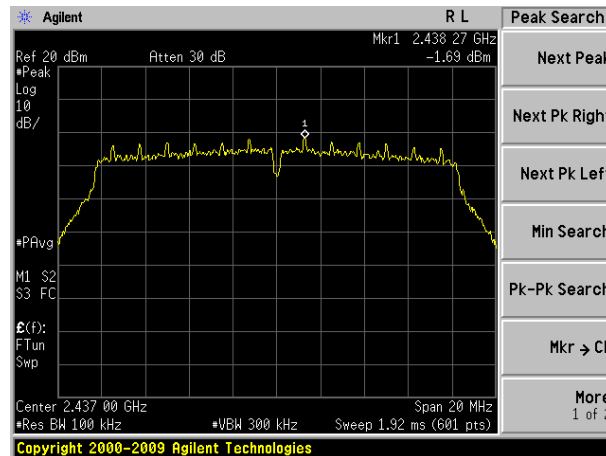
Mode

802.11g

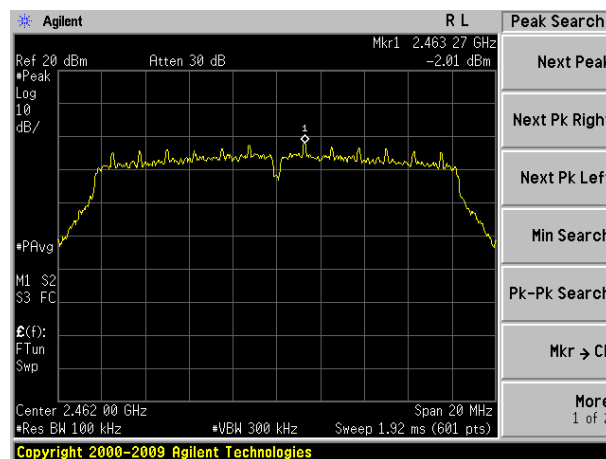
Lowest channel:



Middle channel:



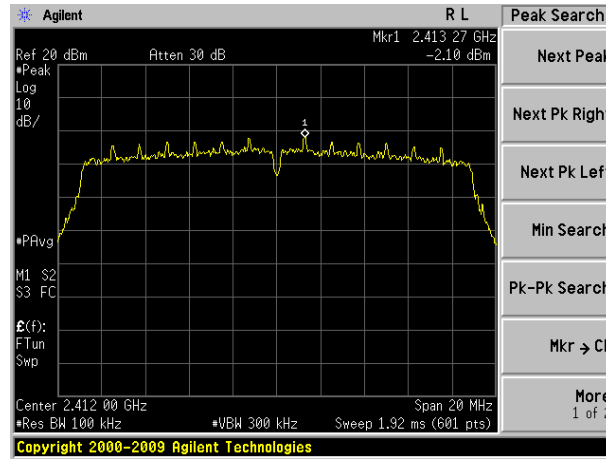
Highest channel:



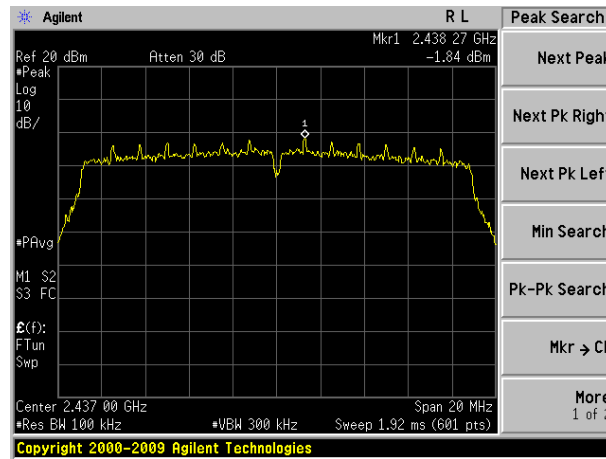
Mode

802.11n(H20)

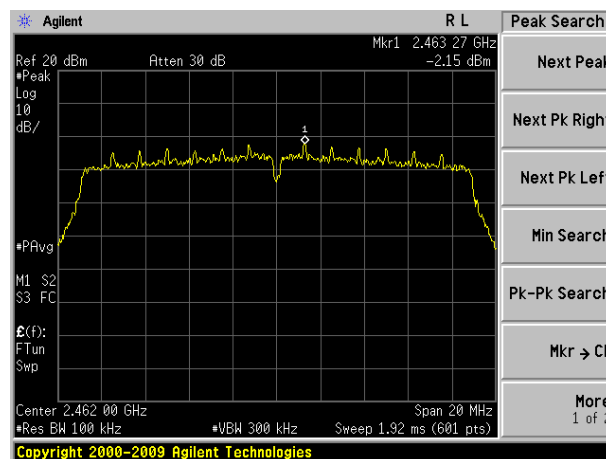
Lowest channel:



Middle channel:



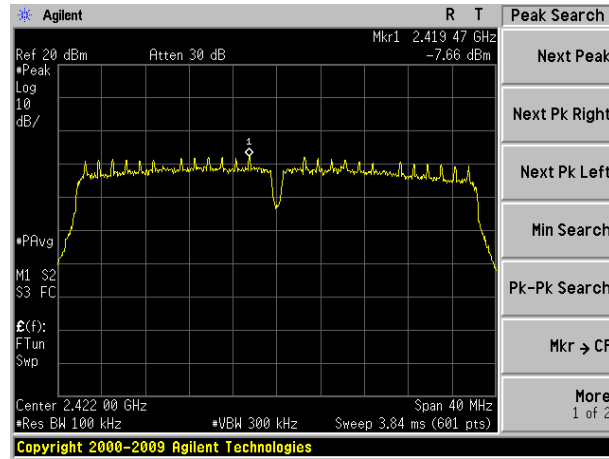
Highest channel:



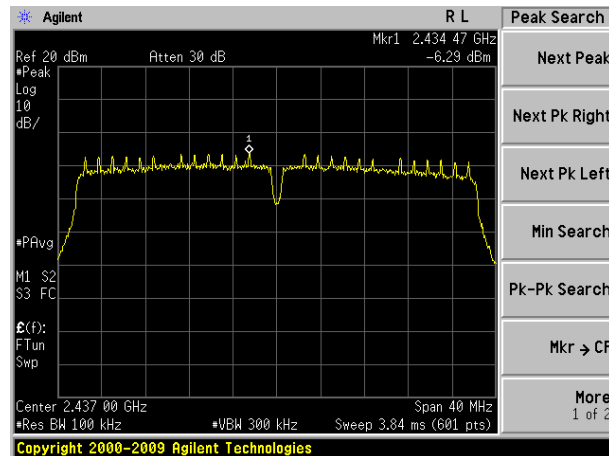
Mode

802.11n(H40)

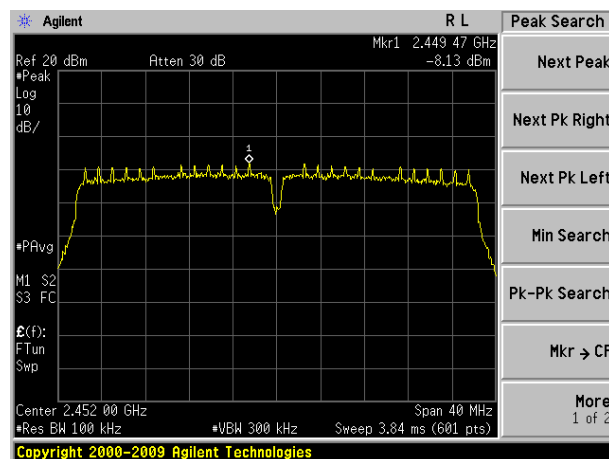
Lowest channel:



Middle channel:



Highest channel:



## 7.6 Band Edge

### 7.6.1 Conducted Emission Method

☞ **Test method**

FCC Part15 C Section 15.247 (d)

☞ **Test method**

ANSI C63.4:2003 and KDB558074 D01 DTS Meas Guidance V03

☞ **Receiver set**

RBW=100kHz, VBW=300kHz, Detector=Peak

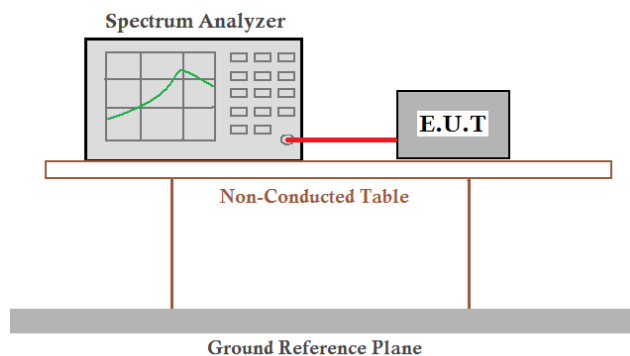
☞ **Limit**

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 mode**

Refer to section 5.3 for details

☞ **Test setup**

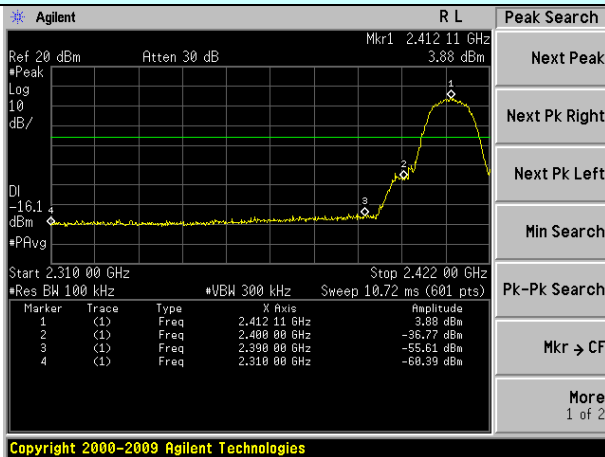


☞ **Test Result**

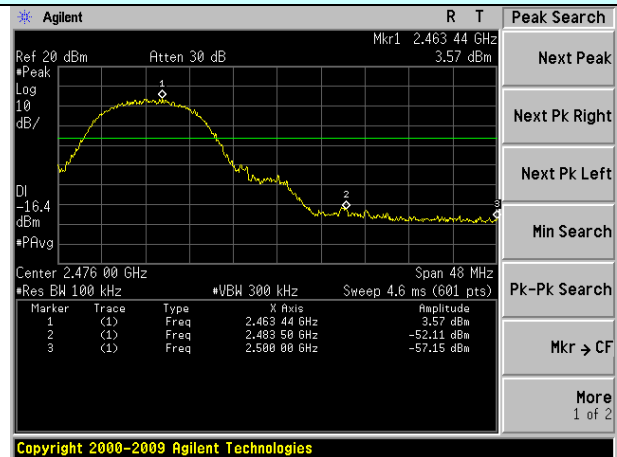
**Complied**

Mode

802.11b



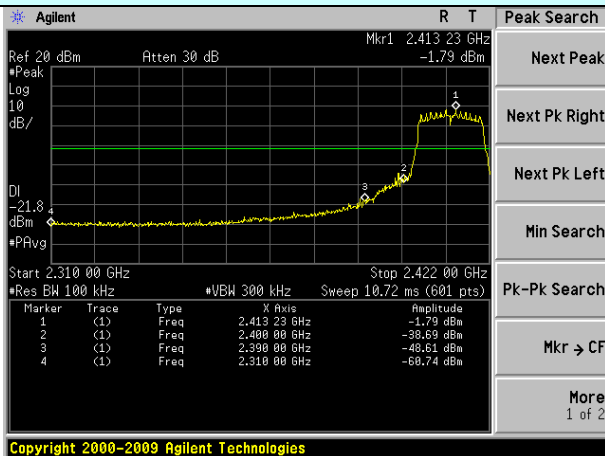
Lowest channel



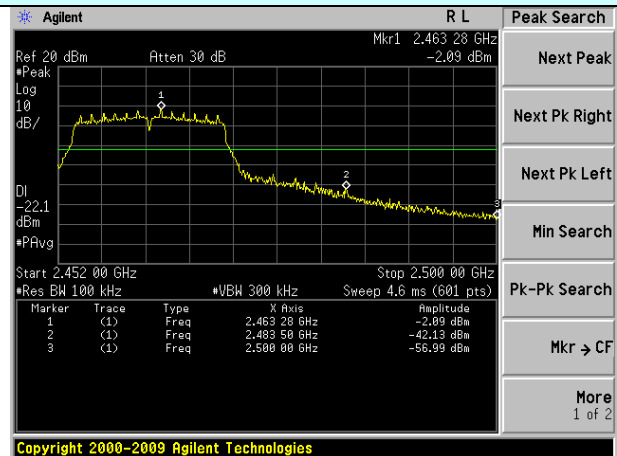
Highest channel

Mode

802.11g



Lowest channel

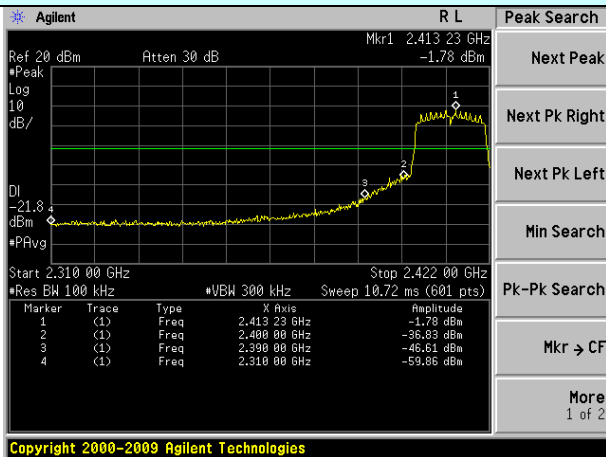


Highest channel

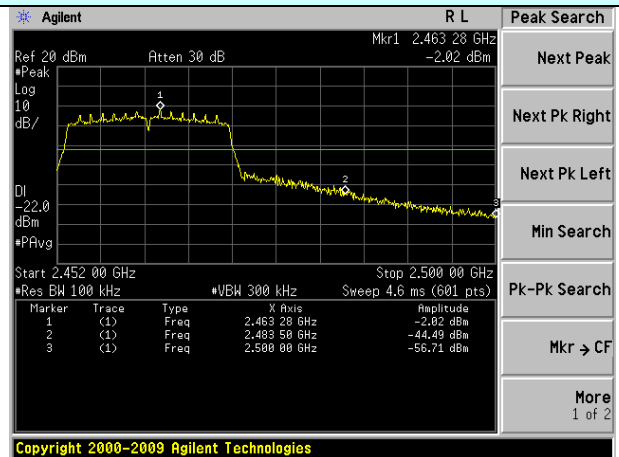


Mode

802.11n(H20)



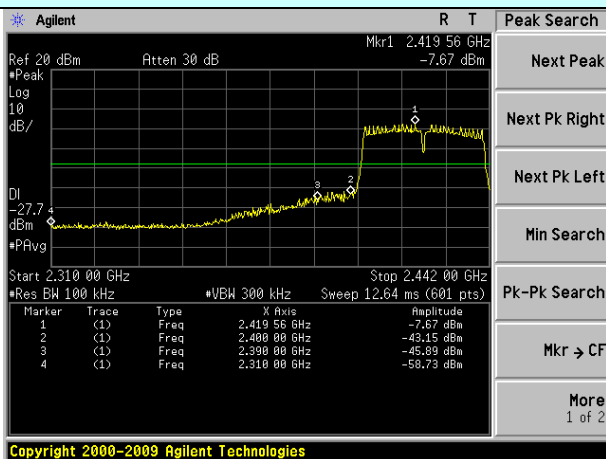
Lowest channel



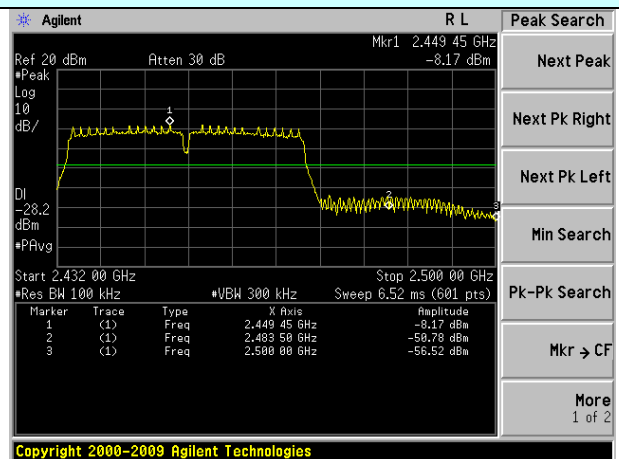
Highest channel

Mode

802.11n(H40)



Lowest channel



Highest channel

## 7.6.2 Radiated Emission Method

### ☞ Test method

FCC Part15 C Section 15.209 and 15.205

### ☞ Test method

ANSI C63.4:2003

### ☞ Receiver set

Frequency	Detector	RBW	VBW	Remark
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	Peak	1MHz	10Hz	Average Value

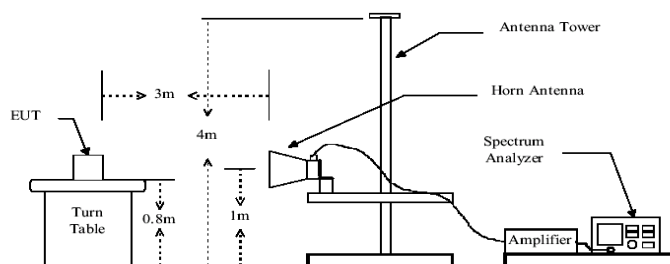
### ☞ Limit

Frequency	Limit (dBuV/m @3m)	Remark
Above 1GHz	54.00	Average Value
	74.00	Peak Value

### ☞ Test mode

Refer to section 5.3 for details

### ☞ Test setup



### ☞ Test Procedure

1. 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.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. 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.
4. 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.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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.

### ☞ Test Result

**Complied**

Remark:

During the test, pre-scan the GFSK, Pi/4QPSK, 8DPSK modulation, and found the GFSK modulation which it is worse case, so only show the test data of worse case modulation on the test report.

Test mode:	802.11b	Test channel:	Lowest
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**Peak value:**

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)	Polarization
2310.00	52.37	27.59	5.38	34.01	51.33	74.00	-22.67	Vertical
2390.00	61.63	27.58	5.39	34.01	60.59	74.00	-13.41	Vertical
2310.00	54.11	27.59	5.38	34.01	53.07	74.00	-20.93	Horizontal
2390.00	63.62	27.58	5.39	34.01	62.58	74.00	-11.42	Horizontal

**Average value:**

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)	Polarization
2310.00	38.93	27.59	5.38	34.01	37.89	54.00	-16.11	Vertical
2390.00	47.30	27.58	5.39	34.01	46.26	54.00	-7.74	Vertical
2310.00	40.80	27.59	5.38	34.01	39.76	54.00	-14.24	Horizontal
2390.00	48.48	27.58	5.39	34.01	47.44	54.00	-6.56	Horizontal

Test mode:	802.11b	Test channel:	Highest
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**Peak value:**

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)	Polarization
2483.50	53.34	27.53	5.47	33.92	52.42	74.00	-21.58	Vertical
2500.00	48.94	27.55	5.49	29.93	52.05	74.00	-21.95	Vertical
2483.50	55.75	27.53	5.47	33.92	54.83	74.00	-19.17	Horizontal
2500.00	51.58	27.55	5.49	29.93	54.69	74.00	-19.31	Horizontal

**Average value:**

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)	Polarization
2483.50	39.40	27.53	5.47	33.92	38.48	54.00	-15.52	Vertical
2500.00	35.36	27.55	5.49	29.93	38.47	54.00	-15.53	Vertical
2483.50	41.41	27.53	5.47	33.92	40.49	54.00	-13.51	Horizontal
2500.00	37.27	27.55	5.49	29.93	40.38	54.00	-13.62	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
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**Peak value:**

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)	Polarization
2310.00	50.50	27.59	5.38	34.01	49.46	74.00	-24.54	Vertical
2390.00	59.13	27.58	5.39	34.01	58.09	74.00	-15.91	Vertical
2310.00	52.10	27.59	5.38	34.01	51.06	74.00	-22.94	Horizontal
2390.00	60.62	27.58	5.39	34.01	59.58	74.00	-14.42	Horizontal

**Average value:**

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)	Polarization
2310.00	37.59	27.59	5.38	34.01	36.55	54.00	-17.45	Vertical
2390.00	45.76	27.58	5.39	34.01	44.72	54.00	-9.28	Vertical
2310.00	39.32	27.59	5.38	34.01	38.28	54.00	-15.72	Horizontal
2390.00	46.80	27.58	5.39	34.01	45.76	54.00	-8.24	Horizontal

Test mode:	802.11g	Test channel:	Highest
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**Peak value:**

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)	Polarization
2483.50	50.67	27.53	5.47	33.92	49.75	74.00	-24.25	Vertical
2500.00	46.86	27.55	5.49	29.93	49.97	74.00	-24.03	Vertical
2483.50	52.69	27.53	5.47	33.92	51.77	74.00	-22.23	Horizontal
2500.00	49.16	27.55	5.49	29.93	52.27	74.00	-21.73	Horizontal

**Average value:**

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)	Polarization
2483.50	37.79	27.53	5.47	33.92	36.87	54.00	-17.13	Vertical
2500.00	34.11	27.55	5.49	29.93	37.22	54.00	-16.78	Vertical
2483.50	39.63	27.53	5.47	33.92	38.71	54.00	-15.29	Horizontal
2500.00	35.94	27.55	5.49	29.93	39.05	54.00	-14.95	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 (H20)	Test channel:	Lowest
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**Peak value:**

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)	Polarization
2310.00	51.02	27.59	5.38	34.01	49.98	74.00	-24.02	Vertical
2390.00	59.82	27.58	5.39	34.01	58.78	74.00	-15.22	Vertical
2310.00	52.66	27.59	5.38	34.01	51.62	74.00	-22.38	Horizontal
2390.00	61.45	27.58	5.39	34.01	60.41	74.00	-13.59	Horizontal

**Average value:**

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)	Polarization
2310.00	37.96	27.59	5.38	34.01	36.92	54.00	-17.08	Vertical
2390.00	46.19	27.58	5.39	34.01	45.15	54.00	-8.85	Vertical
2310.00	39.73	27.59	5.38	34.01	38.69	54.00	-15.31	Horizontal
2390.00	47.27	27.58	5.39	34.01	46.23	54.00	-7.77	Horizontal

Test mode:	802.11n(H20)	Test channel:	Lowest
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**Peak value:**

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)	Polarization
2483.50	51.41	27.53	5.47	33.92	50.49	74.00	-23.51	Vertical
2500.00	47.44	27.55	5.49	29.93	50.55	74.00	-23.45	Vertical
2483.50	53.54	27.53	5.47	33.92	52.62	74.00	-21.38	Horizontal
2500.00	49.83	27.55	5.49	29.93	52.94	74.00	-21.06	Horizontal

**Average value:**

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)	Polarization
2483.50	38.23	27.53	5.47	33.92	37.31	54.00	-16.69	Vertical
2500.00	34.46	27.55	5.49	29.93	37.57	54.00	-16.43	Vertical
2483.50	40.12	27.53	5.47	33.92	39.20	54.00	-14.80	Horizontal
2500.00	36.31	27.55	5.49	29.93	39.42	54.00	-14.58	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
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**Peak value:**

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)	Polarization
2310.00	49.75	27.59	5.38	34.01	48.71	74.00	-25.29	Vertical
2390.00	58.12	27.58	5.39	34.01	57.08	74.00	-16.92	Vertical
2310.00	51.30	27.59	5.38	34.01	50.26	74.00	-23.74	Horizontal
2390.00	59.41	27.58	5.39	34.01	58.37	74.00	-15.63	Horizontal

**Average value:**

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)	Polarization
2310.00	37.06	27.59	5.38	34.01	36.02	54.00	-17.98	Vertical
2390.00	45.14	27.58	5.39	34.01	44.10	54.00	-9.90	Vertical
2310.00	38.72	27.59	5.38	34.01	37.68	54.00	-16.32	Horizontal
2390.00	46.12	27.58	5.39	34.01	45.08	54.00	-8.92	Horizontal

Test mode:	802.11n(H40)	Test channel:	Lowest
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**Peak value:**

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)	Polarization
2483.50	49.59	27.53	5.47	33.92	48.67	74.00	-25.33	Vertical
2500.00	46.02	27.55	5.49	29.93	49.13	74.00	-24.87	Vertical
2483.50	51.46	27.53	5.47	33.92	50.54	74.00	-23.46	Horizontal
2500.00	48.18	27.55	5.49	29.93	51.29	74.00	-22.71	Horizontal

**Average value:**

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)	Polarization
2483.50	37.13	27.53	5.47	33.92	36.21	54.00	-17.79	Vertical
2500.00	33.60	27.55	5.49	29.93	36.71	54.00	-17.29	Vertical
2483.50	38.91	27.53	5.47	33.92	37.99	54.00	-16.01	Horizontal
2500.00	35.40	27.55	5.49	29.93	38.51	54.00	-15.49	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.

## 7.7 Spurious Emission

### 7.7.1 Conducted Emission Method

☞ **Test method**

FCC Part15 C Section 15.247 (d)

☞ **Test method**

ANSI C63.4:2003 and KDB558074 D01 DTS Meas Guidance V03

☞ **Receiver set**

RBW=100kHz, VBW=300kHz, Detector=Peak

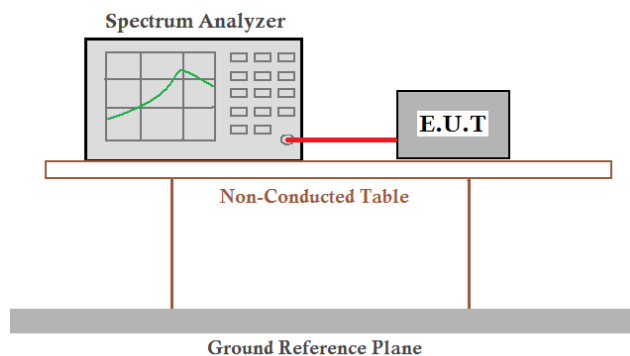
☞ **Limit**

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 mode**

Refer to section 5.3 for details

☞ **Test setup**



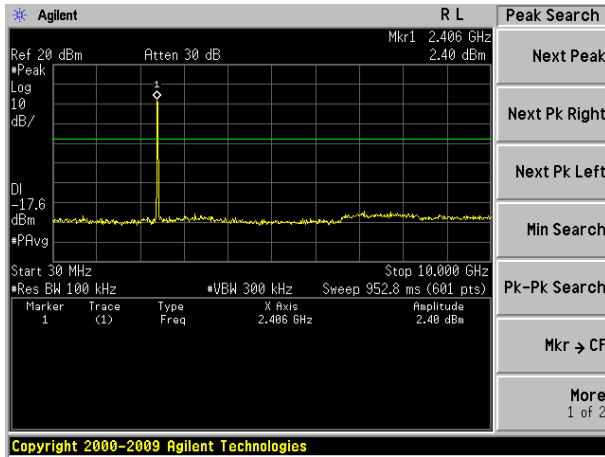
☞ **Test Result**

**Complied**

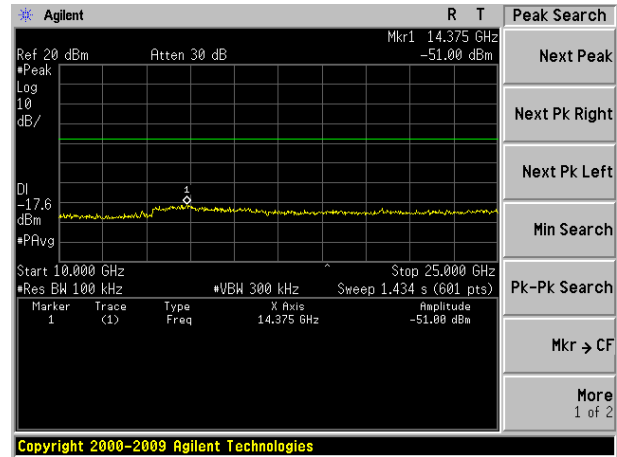
Test mode:

802.11b

Lowest channel

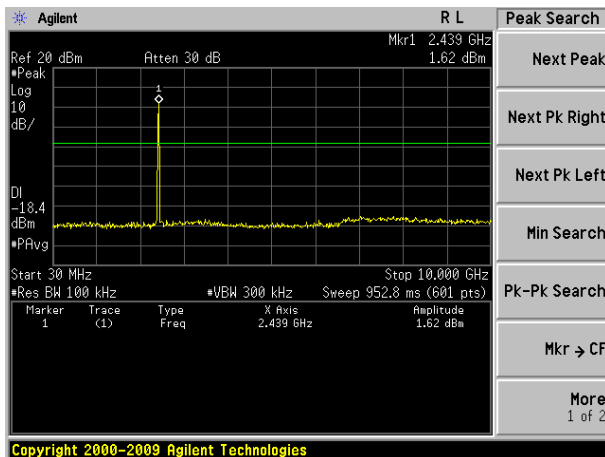


30MHz~10GHz

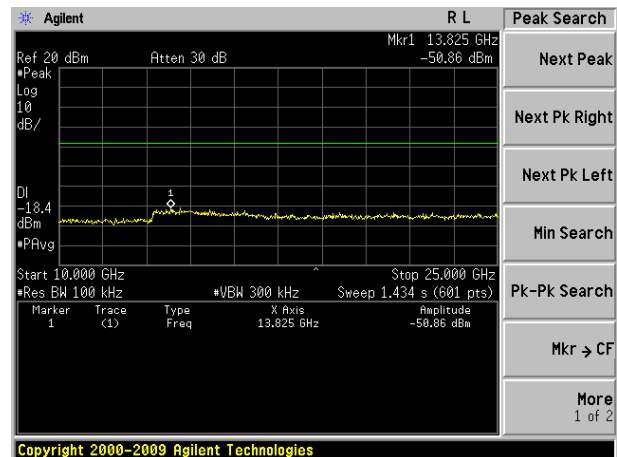


10GHz~25GHz

Middle channel

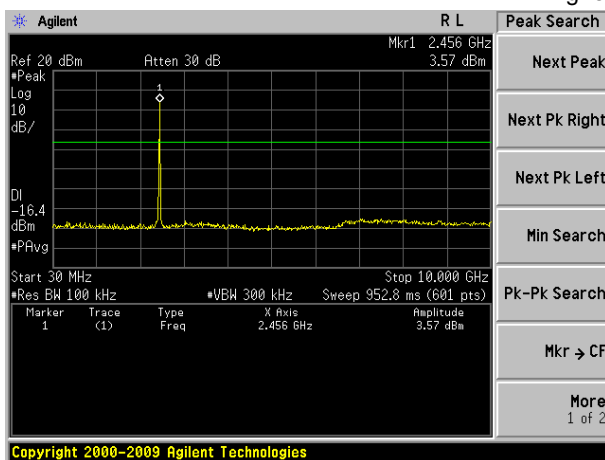


30MHz~10GHz

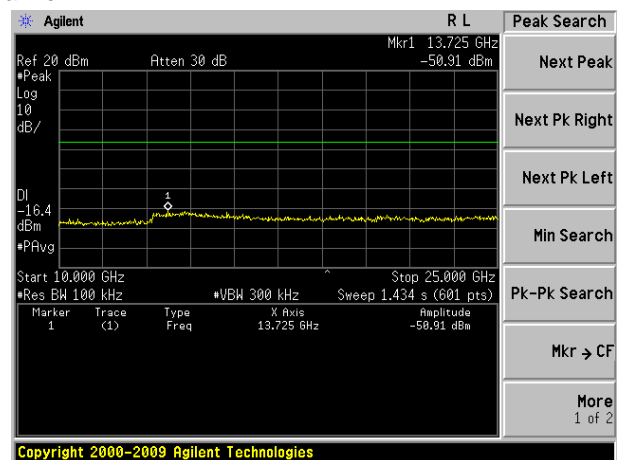


10GHz~25GHz

Highest channel



30MHz~10GHz



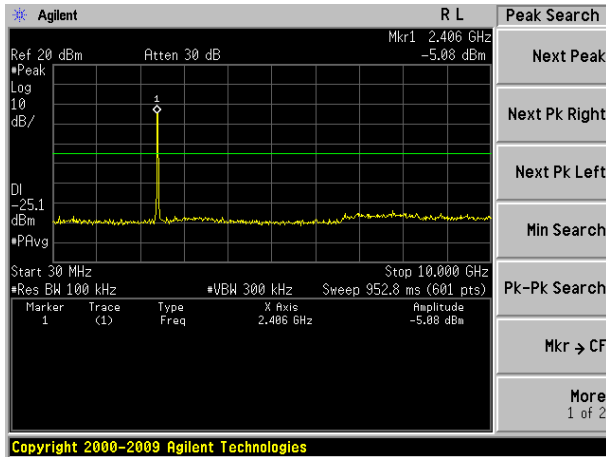
10GHz~25GHz



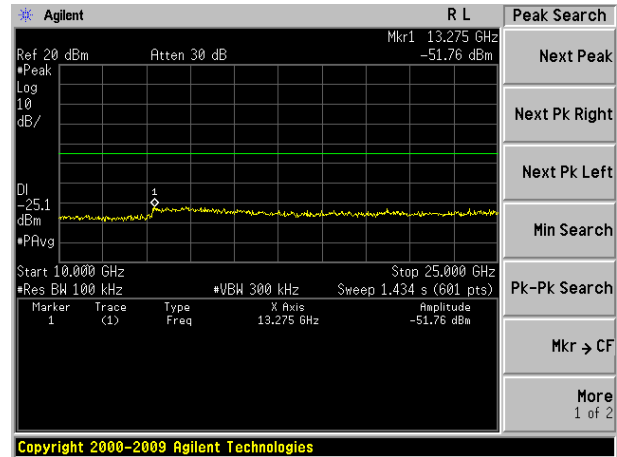
Test mode:

802.11g

Lowest channel

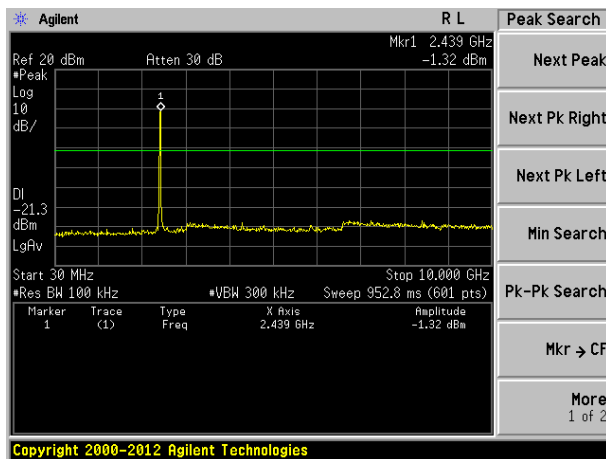


30MHz~10GHz

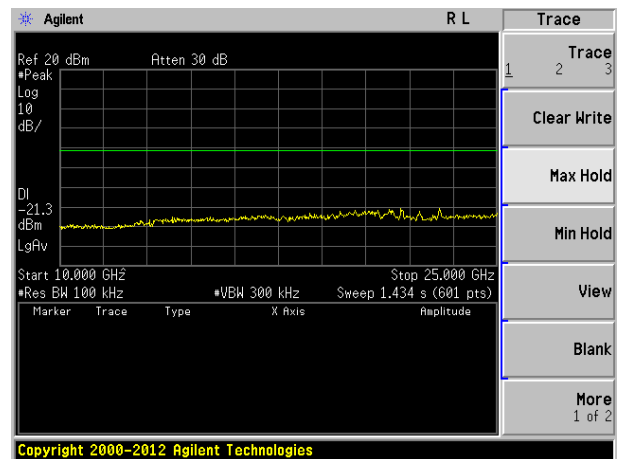


10GHz~25GHz

Middle channel

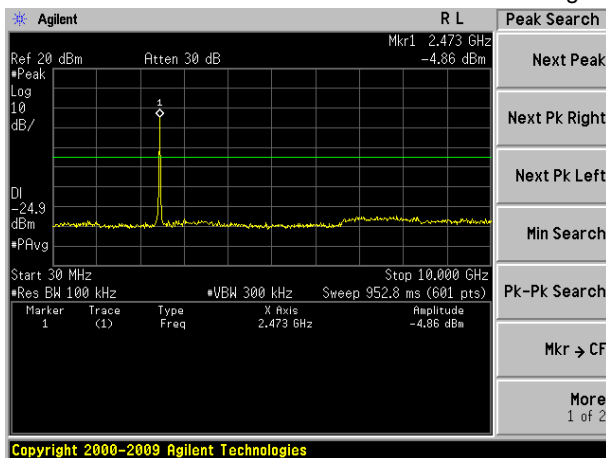


30MHz~10GHz

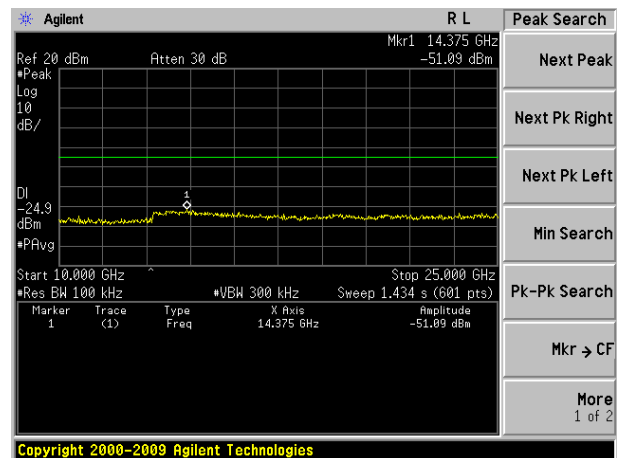


10GHz~25GHz

Highest channel



30MHz~10GHz

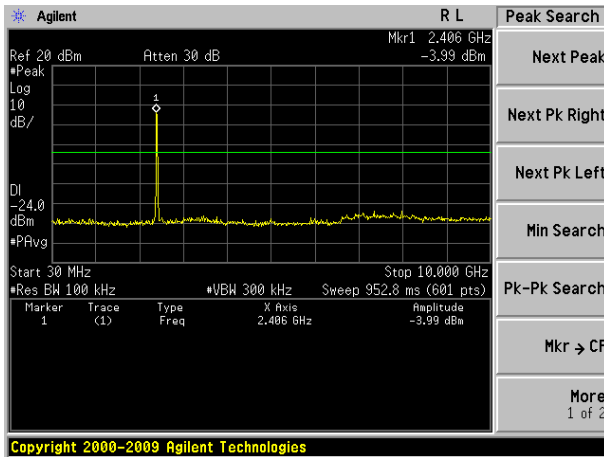


10GHz~25GHz

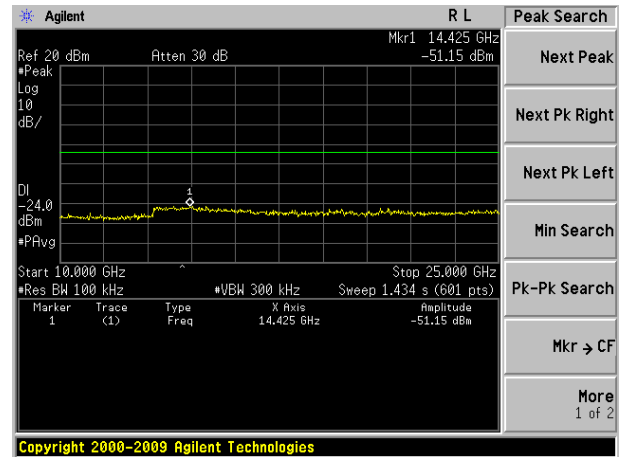
Test mode:

802.11n(H20)

Lowest channel

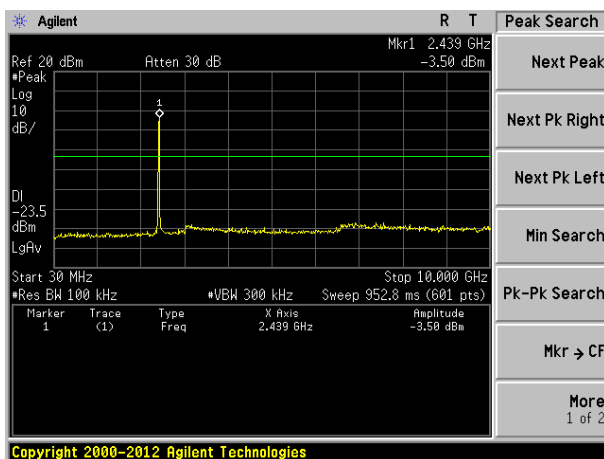


30MHz~10GHz

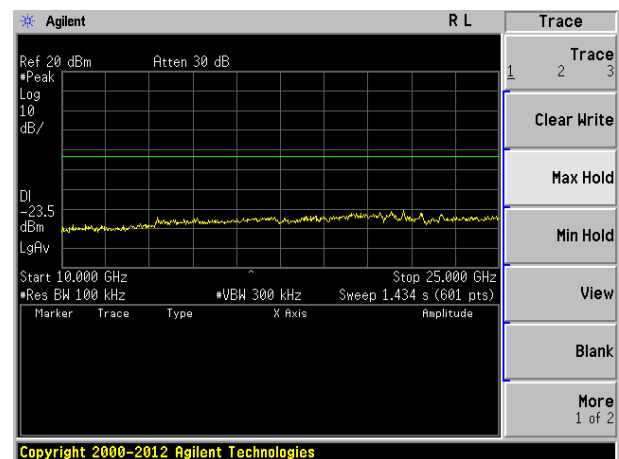


10GHz~25GHz

Middle channel

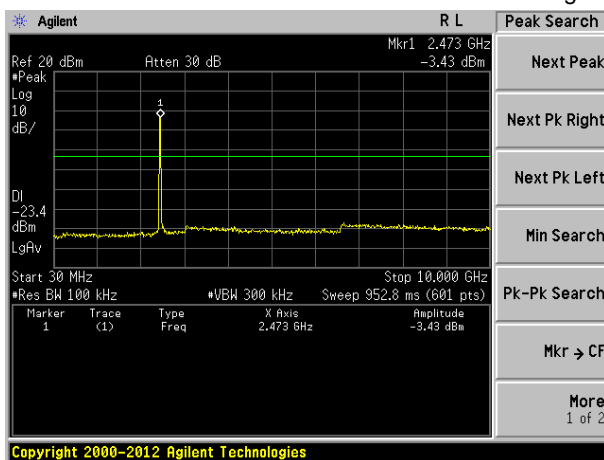


30MHz~10GHz

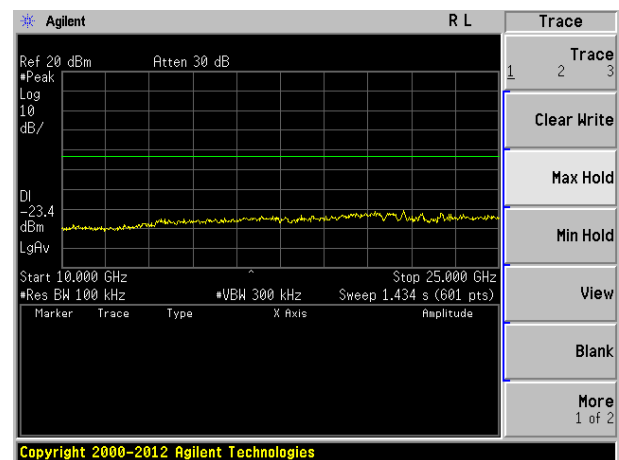


10GHz~25GHz

Highest channel



30MHz~10GHz

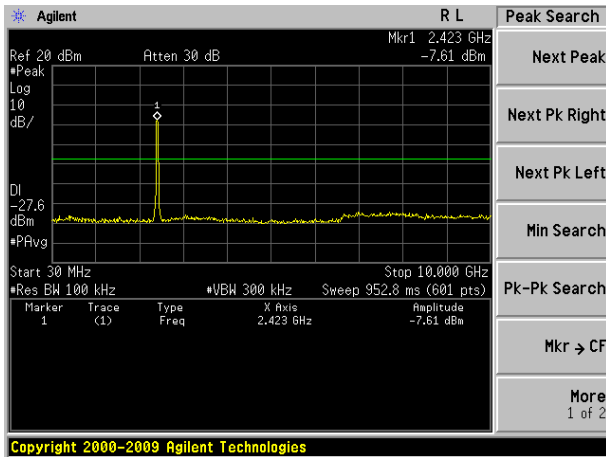


10GHz~25GHz

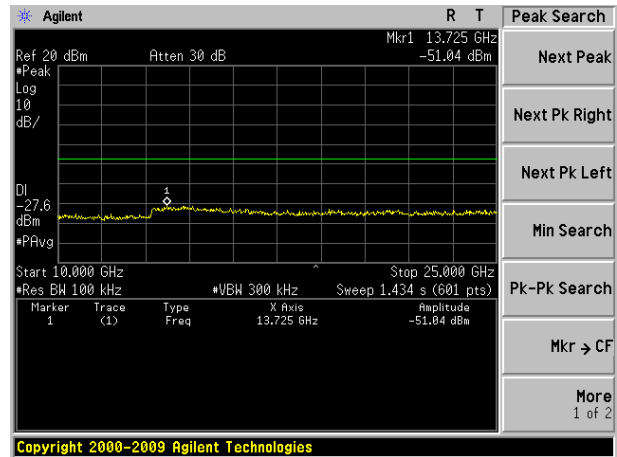
Test mode:

802.11n(H40)

Lowest channel

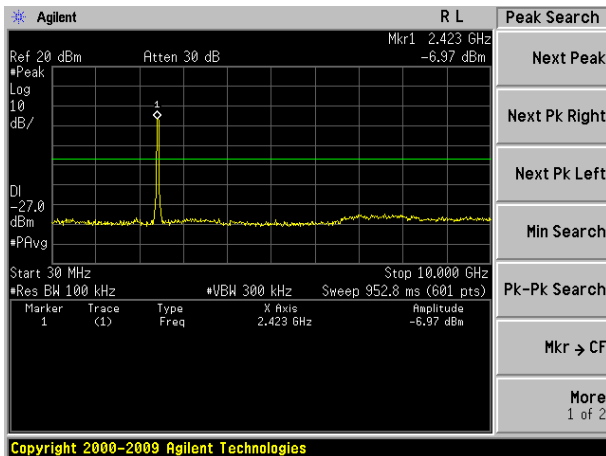


30MHz~10GHz

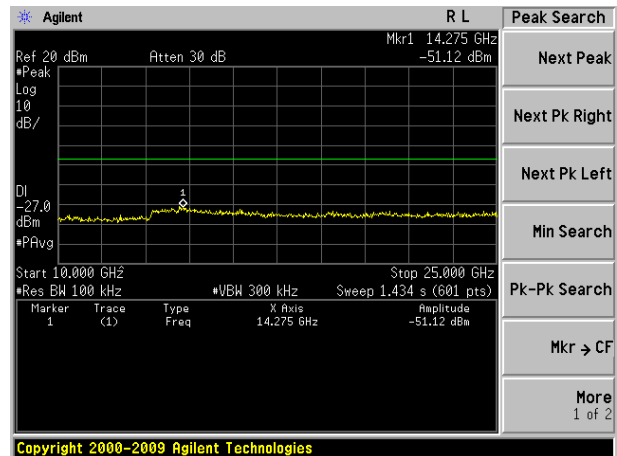


10GHz~25GHz

Middle channel

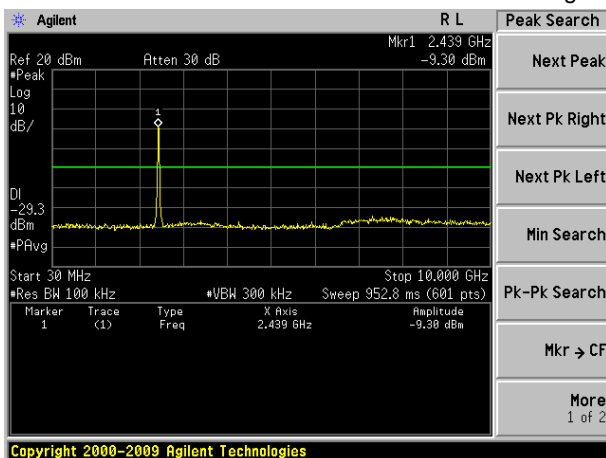


30MHz~10GHz

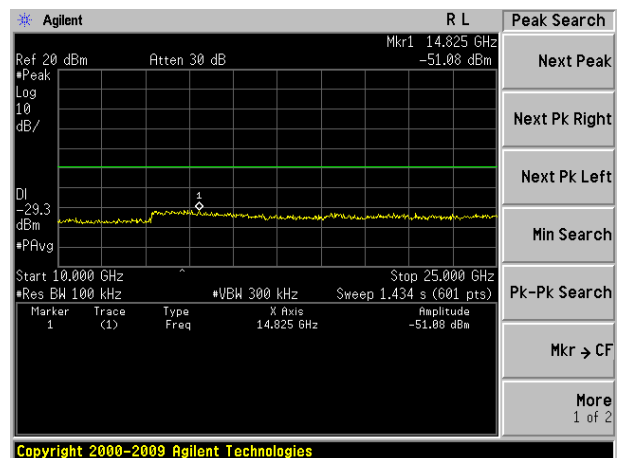


10GHz~25GHz

Highest channel



30MHz~10GHz



10GHz~25GHz

## 7.7.2 Radiated Emission Method

### ☞ Test method

FCC Part15 C Section 15.209 and 15.205

### ☞ Test method

ANSI C63.4:2003

### ☞ Receiver set

Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	Peak	1MHz	10Hz	Average Value

### ☞ Limit

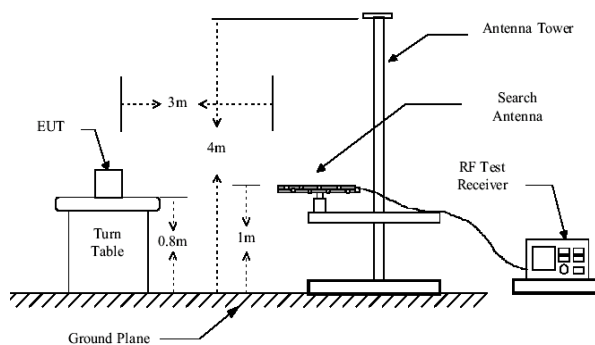
Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.00	Quasi-peak Value
88MHz-216MHz	43.50	Quasi-peak Value
216MHz-960MHz	46.00	Quasi-peak Value
960MHz-1GHz	54.00	Quasi-peak Value
Above 1GHz	54.00	Average Value
	74.00	Peak Value

### ☞ Test mode

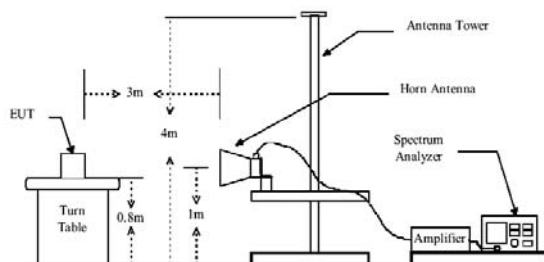
Refer to section 5.3 for details

### ☞ Test setup

Below 1GHz



Above 1GHz



## Test Procedure

6. 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.
7. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
8. 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.
9. 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.
10. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
11. 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.

## Test Result

**Complied**

Remark:

During the test, pre-scan the GFSK, Pi/4QPSK, 8DPSK modulation, and found the GFSK modulation which it is worse case, so only show the test data of worse case modulation on the test report.

### Measurement data:

#### Below 1GHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
31.18	43.52	14.32	0.56	32.06	26.34	40.00	-13.66	Vertical
59.86	45.98	14.71	0.86	31.94	29.61	40.00	-10.39	Vertical
96.10	43.28	14.90	1.16	31.75	27.59	43.50	-15.91	Vertical
191.75	43.03	12.56	1.80	32.12	25.27	43.50	-18.23	Vertical
552.88	43.17	19.62	3.53	31.28	35.04	46.00	-10.96	Vertical
601.43	41.96	20.46	3.73	31.04	35.11	46.00	-10.89	Vertical
59.86	43.08	14.71	0.86	31.94	26.71	40.00	-13.29	Horizontal
96.10	44.23	14.90	1.16	31.75	28.54	43.50	-14.96	Horizontal
191.75	50.92	12.56	1.80	32.12	33.16	43.50	-10.34	Horizontal
312.18	43.10	15.22	2.42	32.14	28.60	46.00	-17.40	Horizontal
504.71	42.54	18.68	3.33	31.53	33.02	46.00	-12.98	Horizontal
552.88	43.00	19.62	3.53	31.28	34.87	46.00	-11.13	Horizontal

**■ Above 1GHz**

Mode:	802.11b	Test channel:	Lowest
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**Peak value:**

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)	Polarization
4824.00	41.49	31.79	8.62	32.10	49.80	74.00	-24.20	Vertical
7236.00	34.98	36.19	11.68	31.97	50.88	74.00	-23.12	Vertical
9648.00	33.26	38.07	14.16	31.56	53.93	74.00	-20.07	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
4824.00	39.98	31.79	8.62	32.10	48.29	74.00	-25.71	Horizontal
7236.00	34.63	36.19	11.68	31.97	50.53	74.00	-23.47	Horizontal
9648.00	32.79	38.07	14.16	31.56	53.46	74.00	-20.54	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal

**Average value:**

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)	Polarization
4824.00	30.48	31.79	8.62	32.10	38.79	54.00	-15.21	Vertical
7236.00	23.82	36.19	11.68	31.97	39.72	54.00	-14.28	Vertical
9648.00	23.58	38.07	14.16	31.56	44.25	54.00	-9.75	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
4824.00	29.45	31.79	8.62	32.10	37.76	54.00	-16.24	Horizontal
7236.00	23.19	36.19	11.68	31.97	39.09	54.00	-14.91	Horizontal
9648.00	22.52	38.07	14.16	31.56	43.19	54.00	-10.81	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamp Factor*
2. *“\*”*, means this data is too weak; instrument of signal is unable to test.
3. *The emission levels of other frequencies are very lower than the limit and not shown in test report.*

Mode:	802.11b	Test channel:	Middle
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**Peak value:**

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)	Polarization
4874.00	40.34	31.85	8.66	32.12	48.73	74.00	-25.27	Vertical
7311.00	34.92	36.37	11.71	31.91	51.09	74.00	-22.91	Vertical
9748.00	34.18	38.27	14.25	31.56	55.14	74.00	-18.86	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
4874.00	40.67	31.85	8.66	32.12	49.06	74.00	-24.94	Horizontal
7311.00	33.48	36.37	11.71	31.91	49.65	74.00	-24.35	Horizontal
9748.00	34.04	38.27	14.25	31.56	55.00	74.00	-19.00	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal

**Average value:**

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)	Polarization
4874.00	31.12	31.85	8.66	32.12	39.51	54.00	-14.49	Vertical
7311.00	23.21	36.37	11.71	31.91	39.38	54.00	-14.62	Vertical
9748.00	23.42	38.27	14.25	31.56	44.38	54.00	-9.62	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
4874.00	30.73	31.85	8.66	32.12	39.12	54.00	-14.88	Horizontal
7311.00	22.55	36.37	11.71	31.91	38.72	54.00	-15.28	Horizontal
9748.00	23.74	38.27	14.25	31.56	44.70	54.00	-9.30	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *“\*”*, means this data is too weak instrument of signal is unable to test.
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Mode:	802.11b	Test channel:	Highest
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**Peak value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4924.00	46.59	31.90	8.70	32.15	55.04	74.00	-18.96	Vertical
7386.00	36.05	36.49	11.76	31.83	52.47	74.00	-21.53	Vertical
9848.00	34.36	38.62	14.31	31.77	55.52	74.00	-18.48	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
4924.00	45.63	31.90	8.70	32.15	54.08	74.00	-19.92	Horizontal
7386.00	34.81	36.49	11.76	31.83	51.23	74.00	-22.77	Horizontal
9848.00	33.91	38.62	14.31	31.77	55.07	74.00	-18.93	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal

**Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4924.00	37.37	31.90	8.70	32.15	45.82	54.00	-8.18	Vertical
7386.00	25.93	36.49	11.76	31.83	42.35	54.00	-11.65	Vertical
9848.00	24.35	38.62	14.31	31.77	45.51	54.00	-8.49	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
4924.00	35.90	31.90	8.70	32.15	44.35	54.00	-9.65	Horizontal
7386.00	24.17	36.49	11.76	31.83	40.59	54.00	-13.41	Horizontal
9848.00	23.15	38.62	14.31	31.77	44.31	54.00	-9.69	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"\*\*", means this data is the too weak instrument of signal is unable to test.*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*



Mode:	802.11g	Test channel:	Lowest
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**Peak value:**

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)	Polarization
4824.00	40.01	31.79	8.62	32.10	48.32	74.00	-25.68	Vertical
7236.00	34.04	36.19	11.68	31.97	49.94	74.00	-24.06	Vertical
9648.00	32.59	38.07	14.16	31.56	53.26	74.00	-20.74	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
4824.00	38.72	31.79	8.62	32.10	47.03	74.00	-26.97	Horizontal
7236.00	33.81	36.19	11.68	31.97	49.71	74.00	-24.29	Horizontal
9648.00	32.17	38.07	14.16	31.56	52.84	74.00	-21.16	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal

**Average value:**

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)	Polarization
4824.00	29.12	31.79	8.62	32.10	37.43	54.00	-16.57	Vertical
7236.00	22.91	36.19	11.68	31.97	38.81	54.00	-15.19	Vertical
9648.00	22.94	38.07	14.16	31.56	43.61	54.00	-10.39	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
4824.00	28.28	31.79	8.62	32.10	36.59	54.00	-17.41	Horizontal
7236.00	22.40	36.19	11.68	31.97	38.30	54.00	-15.70	Horizontal
9648.00	21.93	38.07	14.16	31.56	42.60	54.00	-11.40	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *“\*”*, means this data is too weak; instrument of signal is unable to test.
3. *The emission levels of other frequencies are very lower than the limit and not shown in test report.*

Mode:	802.11g	Test channel:	Middle
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**Peak value:**

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)	Polarization
4874.00	39.12	31.85	8.66	32.12	47.51	74.00	-26.49	Vertical
7311.00	34.14	36.37	11.71	31.91	50.31	74.00	-23.69	Vertical
9748.00	33.63	38.27	14.25	31.56	54.59	74.00	-19.41	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
4874.00	39.63	31.85	8.66	32.12	48.02	74.00	-25.98	Horizontal
7311.00	32.80	36.37	11.71	31.91	48.97	74.00	-25.03	Horizontal
9748.00	33.52	38.27	14.25	31.56	54.48	74.00	-19.52	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal

**Average value:**

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)	Polarization
4874.00	29.99	31.85	8.66	32.12	38.38	54.00	-15.62	Vertical
7311.00	22.46	36.37	11.71	31.91	38.63	54.00	-15.37	Vertical
9748.00	22.88	38.27	14.25	31.56	43.84	54.00	-10.16	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
4874.00	29.76	31.85	8.66	32.12	38.15	54.00	-15.85	Horizontal
7311.00	21.89	36.37	11.71	31.91	38.06	54.00	-15.94	Horizontal
9748.00	23.24	38.27	14.25	31.56	44.20	54.00	-9.80	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *“\*”*, means this data is too weak instrument of signal is unable to test.
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Mode:	802.11g	Test channel:	Highest
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**Peak value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4924.00	44.47	31.90	8.70	32.15	52.92	74.00	-21.08	Vertical
7386.00	34.71	36.49	11.76	31.83	51.13	74.00	-22.87	Vertical
9848.00	33.40	38.62	14.31	31.77	54.56	74.00	-19.44	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
4924.00	43.84	31.90	8.70	32.15	52.29	74.00	-21.71	Horizontal
7386.00	33.64	36.49	11.76	31.83	50.06	74.00	-23.94	Horizontal
9848.00	33.03	38.62	14.31	31.77	54.19	74.00	-19.81	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal

**Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4924.00	35.42	31.90	8.70	32.15	43.87	54.00	-10.13	Vertical
7386.00	24.63	36.49	11.76	31.83	41.05	54.00	-12.95	Vertical
9848.00	23.43	38.62	14.31	31.77	44.59	54.00	-9.41	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
4924.00	34.23	31.90	8.70	32.15	42.68	54.00	-11.32	Horizontal
7386.00	23.04	36.49	11.76	31.83	39.46	54.00	-14.54	Horizontal
9848.00	22.30	38.62	14.31	31.77	43.46	54.00	-10.54	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal

**Remark:**

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “\*”, means this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

Mode:	802.11n(H20)	Test channel:	Lowest
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**Peak value:**

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)	Polarization
4824.00	40.59	31.79	8.62	32.10	48.90	74.00	-25.10	Vertical
7236.00	34.41	36.19	11.68	31.97	50.31	74.00	-23.69	Vertical
9648.00	32.85	38.07	14.16	31.56	53.52	74.00	-20.48	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
4824.00	39.22	31.79	8.62	32.10	47.53	74.00	-26.47	Horizontal
7236.00	34.13	36.19	11.68	31.97	50.03	74.00	-23.97	Horizontal
9648.00	32.42	38.07	14.16	31.56	53.09	74.00	-20.91	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal

**Average value:**

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)	Polarization
4824.00	29.65	31.79	8.62	32.10	37.96	54.00	-16.04	Vertical
7236.00	23.27	36.19	11.68	31.97	39.17	54.00	-14.83	Vertical
9648.00	23.19	38.07	14.16	31.56	43.86	54.00	-10.14	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
4824.00	28.74	31.79	8.62	32.10	37.05	54.00	-16.95	Horizontal
7236.00	22.71	36.19	11.68	31.97	38.61	54.00	-15.39	Horizontal
9648.00	22.16	38.07	14.16	31.56	42.83	54.00	-11.17	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamp Factor*
2. *“\*” means this data is too weak; instrument of signal is unable to test.*
3. *The emission levels of other frequencies are very lower than the limit and not shown in test report.*

Mode:	802.11n(H20)	Test channel:	Middle
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**Peak value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4874.00	39.60	31.85	8.66	32.12	47.99	74.00	-26.01	Vertical
7311.00	34.45	36.37	11.71	31.91	50.62	74.00	-23.38	Vertical
9748.00	33.84	38.27	14.25	31.56	54.80	74.00	-19.20	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
4874.00	40.04	31.85	8.66	32.12	48.43	74.00	-25.57	Horizontal
7311.00	33.07	36.37	11.71	31.91	49.24	74.00	-24.76	Horizontal
9748.00	33.73	38.27	14.25	31.56	54.69	74.00	-19.31	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal

**Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4874.00	30.43	31.85	8.66	32.12	38.82	54.00	-15.18	Vertical
7311.00	22.76	36.37	11.71	31.91	38.93	54.00	-15.07	Vertical
9748.00	23.09	38.27	14.25	31.56	44.05	54.00	-9.95	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
4874.00	30.14	31.85	8.66	32.12	38.53	54.00	-15.47	Horizontal
7311.00	22.15	36.37	11.71	31.91	38.32	54.00	-15.68	Horizontal
9748.00	23.44	38.27	14.25	31.56	44.40	54.00	-9.60	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *“\*”*, means this data is too weak instrument of signal is unable to test.
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Mode:	802.11n(H20)	Test channel:	Highest
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**Peak value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4924.00	45.31	31.90	8.70	32.15	53.76	74.00	-20.24	Vertical
7386.00	35.24	36.49	11.76	31.83	51.66	74.00	-22.34	Vertical
9848.00	33.78	38.62	14.31	31.77	54.94	74.00	-19.06	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
4924.00	44.55	31.90	8.70	32.15	53.00	74.00	-21.00	Horizontal
7386.00	34.10	36.49	11.76	31.83	50.52	74.00	-23.48	Horizontal
9848.00	33.38	38.62	14.31	31.77	54.54	74.00	-19.46	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal

**Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4924.00	36.19	31.90	8.70	32.15	44.64	54.00	-9.36	Vertical
7386.00	25.14	36.49	11.76	31.83	41.56	54.00	-12.44	Vertical
9848.00	23.79	38.62	14.31	31.77	44.95	54.00	-9.05	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
4924.00	34.89	31.90	8.70	32.15	43.34	54.00	-10.66	Horizontal
7386.00	23.48	36.49	11.76	31.83	39.90	54.00	-14.10	Horizontal
9848.00	22.63	38.62	14.31	31.77	43.79	54.00	-10.21	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"\*\*", means this data is the too weak instrument of signal is unable to test.*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Mode:	802.11n(H40)	Test channel:	Lowest
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**Peak value:**

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)	Polarization
4844.00	39.11	31.81	8.63	32.11	47.44	74.00	-26.56	Vertical
7266.00	33.47	36.28	11.69	31.94	49.50	74.00	-24.50	Vertical
9688.00	32.18	38.13	14.21	31.52	53.00	74.00	-21.00	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
4844.00	37.97	31.81	8.63	32.11	46.30	74.00	-27.70	Horizontal
7266.00	33.32	36.28	11.69	31.94	49.35	74.00	-24.65	Horizontal
9688.00	31.80	38.13	14.21	31.52	52.62	74.00	-21.38	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal

**Average value:**

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)	Polarization
4844.00	28.29	31.81	8.63	32.11	36.62	54.00	-17.38	Vertical
7266.00	22.37	36.28	11.69	31.94	38.40	54.00	-15.60	Vertical
9688.00	22.55	38.13	14.21	31.52	43.37	54.00	-10.63	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
4844.00	27.57	31.81	8.63	32.11	35.90	54.00	-18.10	Horizontal
7266.00	21.92	36.28	11.69	31.94	37.95	54.00	-16.05	Horizontal
9688.00	21.57	38.13	14.21	31.52	42.39	54.00	-11.61	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamp Factor*
2. *“\*”*, means this data is too weak instrument of signal is unable to test.
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Mode:	802.11n(H40)	Test channel:	Middle
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**Peak value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4874.00	38.38	31.85	8.66	32.12	46.77	74.00	-27.23	Vertical
7311.00	33.67	36.37	11.71	31.91	49.84	74.00	-24.16	Vertical
9748.00	33.29	38.27	14.25	31.56	54.25	74.00	-19.75	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
4874.00	39.01	31.85	8.66	32.12	47.40	74.00	-26.60	Horizontal
7311.00	32.39	36.37	11.71	31.91	48.56	74.00	-25.44	Horizontal
9748.00	33.22	38.27	14.25	31.56	54.18	74.00	-19.82	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal

**Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4874.00	29.30	31.85	8.66	32.12	37.69	54.00	-16.31	Vertical
7311.00	22.01	36.37	11.71	31.91	38.18	54.00	-15.82	Vertical
9748.00	22.56	38.27	14.25	31.56	43.52	54.00	-10.48	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
4874.00	29.17	31.85	8.66	32.12	37.56	54.00	-16.44	Horizontal
7311.00	21.50	36.37	11.71	31.91	37.67	54.00	-16.33	Horizontal
9748.00	22.94	38.27	14.25	31.56	43.90	54.00	-10.10	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *“\*” means this data is too weak instrument of signal is unable to test.*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*



Mode:	802.11n(H40)	Test channel:	Highest
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**Peak value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4904.00	43.20	31.88	8.68	32.13	51.63	74.00	-22.37	Vertical
7356.00	33.90	36.45	11.75	31.86	50.24	74.00	-23.76	Vertical
9808.00	32.82	38.43	14.29	31.68	53.86	74.00	-20.14	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
4904.00	42.77	31.88	8.68	32.13	51.20	74.00	-22.80	Horizontal
7356.00	32.94	36.45	11.75	31.86	49.28	74.00	-24.72	Horizontal
9808.00	32.50	38.43	14.29	31.68	53.54	74.00	-20.46	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal

**Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4904.00	34.25	31.88	8.68	32.13	42.68	54.00	-11.32	Vertical
7356.00	23.86	36.45	11.75	31.86	40.20	54.00	-13.80	Vertical
9808.00	22.88	38.43	14.29	31.68	43.92	54.00	-10.08	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
4904.00	33.22	31.88	8.68	32.13	41.65	54.00	-12.35	Horizontal
7356.00	22.35	36.45	11.75	31.86	38.69	54.00	-15.31	Horizontal
9808.00	21.78	38.43	14.29	31.68	42.82	54.00	-11.18	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal

**Remark:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *“\*” means this data is too weak instrument of signal is unable to test.*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

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