

# FCC REPORT

**Applicant:** RF-LINK INTERNATIONAL LIMITED

**Address of Applicant:** Bldg 56A 3/F, Baotian Rd3, Xixiang Town, Bao'an District, Shenzhen, China

**Equipment Under Test (EUT)**

Product Name: RTL8188CTV WIFI module

Model No.: RL-UM02, RL-UM02BS, RL-UM02BL, RL-UM02B, RL-UM02L, RL-UM02TT, RL-UM02BT

**FCC ID:** A5LRL-UM02

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.247:2010

**Date of sample receipt:** June 15, 2012

**Date of Test:** June 18-19, 2012

**Date of report issued:** June 19, 2012

**Test Result :** PASS \*

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

Authorized Signature:



The image shows a circular logo for GTS (Global United Technology Services Co., Ltd.) with the text 'GLOBAL TESTING' inside. Overlaid on the logo is a handwritten signature in black ink.

Robinson Lo  
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 GTS 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. Any mention of GTS International Electrical Approvals or testing done by GTS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by GTS International Electrical Approvals in writing.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only."

## 2 Version

Version No.	Date	Description
00	June 19, 2012	Original

**Prepared By:**

*hank. yan.*

**Date:**

*June 19, 2012*

**Project Engineer**

**Check By:**

*Hans. Hu*

**Date:**

*June 19, 2012*

**Reviewer**

## 3 Contents

	Page
1 COVER PAGE.....	1
2 VERSION.....	2
3 CONTENTS.....	3
4 TEST SUMMARY.....	4
5 GENERAL INFORMATION.....	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF E.U.T.....	5
5.3 TEST MODE.....	7
5.4 TEST FACILITY.....	7
5.5 TEST LOCATION.....	7
5.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	7
5.7 DESCRIPTION OF SUPPORT UNITS.....	7
5.8 TEST INSTRUMENTS LIST.....	8
6 TEST RESULTS AND MEASUREMENT DATA.....	9
6.1 ANTENNA REQUIREMENT:.....	9
6.2 CONDUCTED EMISSIONS.....	10
6.3 CONDUCTED PEAK OUTPUT POWER.....	13
6.4 EMISSION BANDWIDTH.....	18
6.5 POWER SPECTRAL DENSITY.....	23
6.6 BAND EDGES.....	28
6.6.1 <i>Conducted Emission Method</i> .....	28
6.6.2 <i>Radiated Emission Method</i> .....	31
6.7 SPURIOUS EMISSION.....	36
6.7.1 <i>Conducted Emission Method</i> .....	36
6.7.2 <i>Radiated Emission Method</i> .....	43
7 TEST SETUP PHOTO.....	57
8 EUT CONSTRUCTIONAL DETAILS.....	59

## 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 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:	RF-LINK INTERNATIONAL LIMITED
Address of Applicant:	Bldg 56A 3/F,Baotian Rd3,Xixiang Town,Bao'an District, Shenzhen, China
Manufacturer:	RF-LINK INTERNATIONAL LIMITED
Address of Manufacturer/	Bldg 56A 3/F,Baotian Rd3,Xixiang Town,Bao'an District, Shenzhen, China
Factory:	RF-LINK INTERNATIONAL LIMITED
Address of Factory:	Bldg 56A 3/F,Baotian Rd3,Xixiang Town,Bao'an District, Shenzhen, China

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

Product Name:	RTL8188CTV WIFI module
Model No.:	RL-UM02, RL-UM02BS, RL-UM02BL, RL-UM02B, RL-UM02L, RL-UM02TT, RL-UM02BT
Operation Frequency:	2412MHz~2462MHz (802.11b/802.11g/802.11n(HT20)) 2422MHz~2452MHz (802.11n(HT40))
Channel numbers:	11 for 802.11b/802.11g /802.11n(HT20) 7 for 802.11(HT40)
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)
Antenna Type:	Integral
Antenna gain:	1.5dBi (declare by Applicant)
Remark:	Only the model No. RL-UM02 was tested. RL-UM02BS, RL-UM02BL, RL-UM02B, RL-UM02L, RL-UM02TT, RL-UM02BT and RL-UM02 are identical in the same PCB layout, interior structure and electrical circuits. The only differences are the model name.

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:

802.11b/802.11g/802.11n(HT20)

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

802.11n(HT40)

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

### 5.3 Test mode

WIFI mode	Keep transmitting mode
-----------	------------------------

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.**

Mode	Data rate
802.11b	1Mbps
802.11g	6Mbps
802.11n(HT20)	6.5Mbps
802.11n(HT40)	13.0Mbps

#### 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(HT20), 13Mbps for 802.11n(HT40)

### 5.4 Test Facility

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

- **FCC —Registration No.: 600491**

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 our files. Registration 600491, July 20, 2010.

- **Industry Canada (IC)**

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.

### 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

Tel: 0755-27798480

Fax: 0755-27798960

### 5.6 Other Information Requested by the Customer

None.

### 5.7 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
IBM	Notebook	T42	GTS209	DoC
IBM	AC Adapter	92P1024	N/A	DoC

## 5.8 Test Instruments list

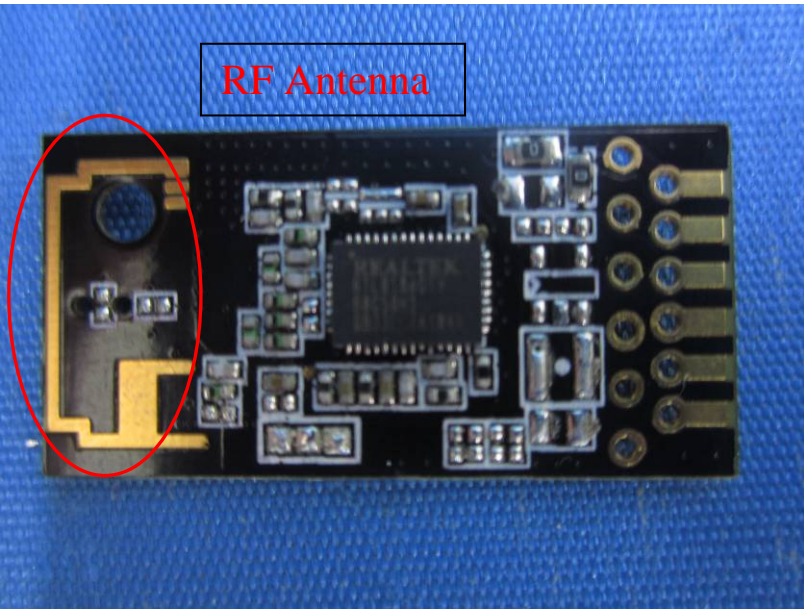
Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 30 2011	Mar. 29 2013
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 04 2011	Jul. 03 2012
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 25 2012	Feb. 24 2013
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 30 2011	June 29 2012
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2011	Mar. 29 2013
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Mar. 31 2012	Mar. 30 2013
9	Coaxial Cable	GTS	N/A	GTS211	Mar. 31 2012	Mar. 30 2013
10	Coaxial cable	GTS	N/A	GTS210	Mar. 31 2012	Mar. 30 2013
11	Coaxial Cable	GTS	N/A	GTS212	Mar. 31 2012	Mar. 30 2013
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 04 2011	Jul. 03 2012
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 04 2011	Jul. 03 2012
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 30 2011	June 29 2012
15	Band filter	Amindeon	82346	GTS219	Mar. 31 2012	Mar. 30 2013

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS264	Sep. 08 2011	Sep. 07 2013
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jul. 04 2011	Jul. 03 2012
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	Jul. 04 2011	Jul. 03 2012
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	Jul. 04 2011	Jul. 03 2012
5	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	Jul. 04 2011	Jul. 03 2012
6	Coaxial Cable	GTS	N/A	GTS227	Jul. 04 2011	Jul. 03 2012
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Thermo meter	KTJ	TA328	GTS233	Jul. 06 2011	Jul. 05 2012



## 6 Test results and Measurement Data

### 6.1 Antenna requirement:

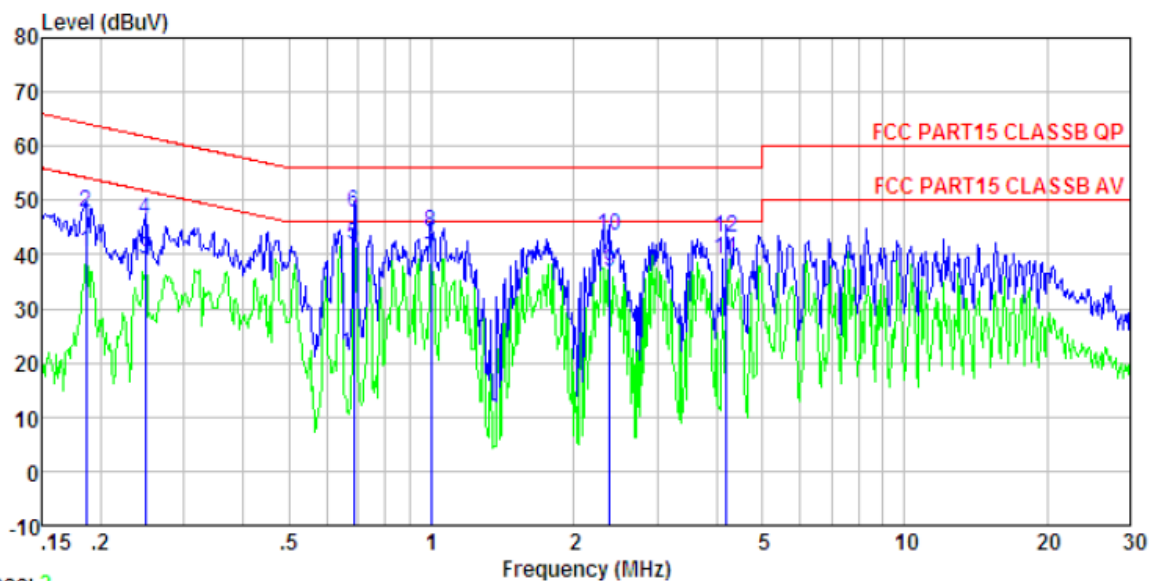
<b>Standard requirement:</b>	FCC Part15 C Section 15.203 /247(c)
<p><b>15.203 requirement:</b></p> <p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an 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.</p> <p><b>15.247(c) (1)(i) requirement:</b></p> <p>(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.</p>	
<b>E.U.T Antenna:</b>	
<p><i>The antenna is Integral antenna, the best case gain of the antenna is 1.5dBi</i></p> 	

## 6.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.4:2003														
Test Frequency Range:	150KHz to 30MHz														
Class / Severity:	Class B														
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto														
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> <p>* Decreases with the logarithm of the frequency.</p>	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													
Test setup:	<p><i>Remark</i>  E.U.T: Equipment Under Test  LISN: Line Impedance Stabilization Network  Test table height=0.8m</p>														
Test procedure:	<ol style="list-style-type: none"> <li>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.</li> <li>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).</li> <li>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.</li> </ol>														
Test Instruments:	Refer to section 5.8 for details														
Test mode:	Refer to section 5.3 for details														
Test results:	Pass														

### Measurement data:

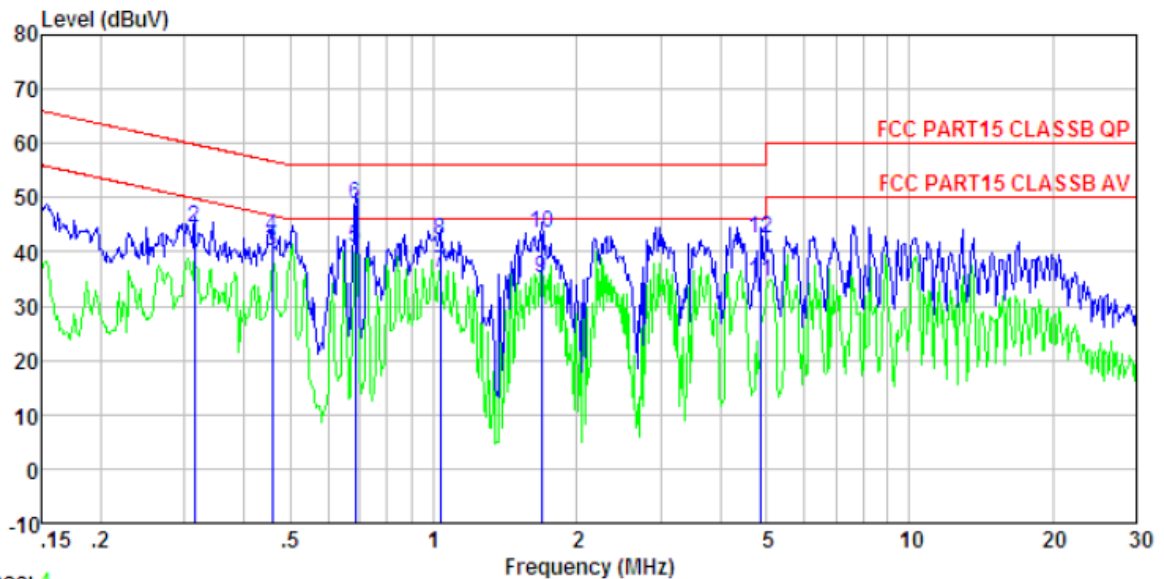
Line:



Trace: 2  
 Condition : FCC PART15 CLASSB QP LISN(2011) LINE  
 Job No. : 640RF  
 Test Mode : Transmitting mode  
 Test Engineer: Osccar

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.186	39.67	0.66	0.10	40.43	54.20	-13.77	Average
2	0.186	46.98	0.66	0.10	47.74	64.20	-16.46	QP
3	0.248	38.47	0.63	0.10	39.20	51.82	-12.62	Average
4	0.248	45.84	0.63	0.10	46.57	61.82	-15.25	QP
5	0.686	41.34	0.52	0.10	41.96	46.00	-4.04	Average
6	0.686	47.30	0.52	0.10	47.92	56.00	-8.08	QP
7	1.000	38.49	0.48	0.10	39.07	46.00	-6.93	Average
8	1.000	43.71	0.48	0.10	44.29	56.00	-11.71	QP
9	2.384	36.49	0.38	0.10	36.97	46.00	-9.03	Average
10	2.384	42.98	0.38	0.10	43.46	56.00	-12.54	QP
11	4.202	38.67	0.32	0.10	39.09	46.00	-6.91	Average
12	4.202	42.88	0.32	0.10	43.30	56.00	-12.70	QP

**Neutral:**



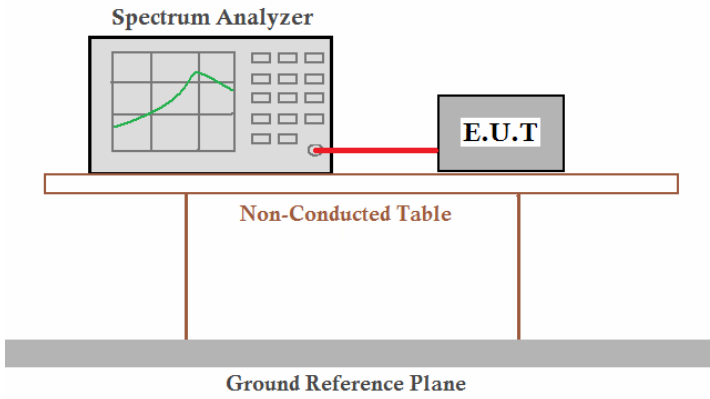
Trace: 4  
 Condition : FCC PART15 CLASSB QP LISN(2011) NEUTRAL  
 Job No. : 640RF  
 Test Mode : Transmitting mode  
 Test Engineer: Oscar

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.315	38.47	0.61	0.10	39.18	49.84	-10.66	Average
2	0.315	43.86	0.61	0.10	44.57	59.84	-15.27	QP
3	0.459	39.54	0.56	0.10	40.20	46.71	-6.51	Average
4	0.459	42.22	0.56	0.10	42.88	56.71	-13.83	QP
5	0.686	40.21	0.52	0.10	40.83	46.00	-5.17	Average
6	0.686	48.27	0.52	0.10	48.89	56.00	-7.11	QP
7	1.032	35.47	0.47	0.10	36.04	46.00	-9.96	Average
8	1.032	41.64	0.47	0.10	42.21	56.00	-13.79	QP
9	1.689	34.67	0.42	0.10	35.19	46.00	-10.81	Average
10	1.689	43.00	0.42	0.10	43.52	56.00	-12.48	QP
11	4.874	34.12	0.30	0.10	34.52	46.00	-11.48	Average
12	4.874	42.06	0.30	0.10	42.46	56.00	-13.54	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

### 6.3 Conducted Peak Output Power

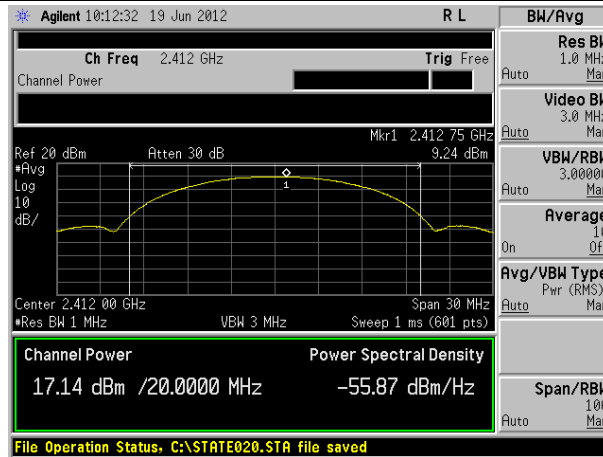
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	30dBm
Test setup:	 <p>The diagram shows a Spectrum Analyzer on the left and an E.U.T. on the right, connected by a red cable. They are both on a table labeled 'Non-Conducted Table'. Below the table is a 'Ground Reference Plane'.</p>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

#### Measurement Data

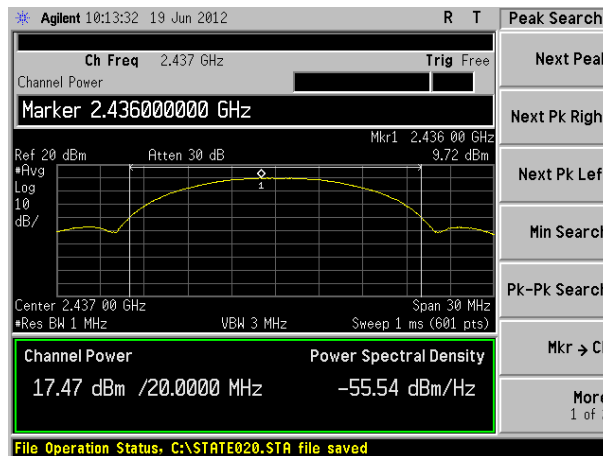
Test CH	Peak Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	17.14	13.52	12.63	12.22	30.00	Pass
Middle	17.47	13.59	12.67	12.58		
Highest	17.29	13.53	12.48	12.69		

Test plot as follows:

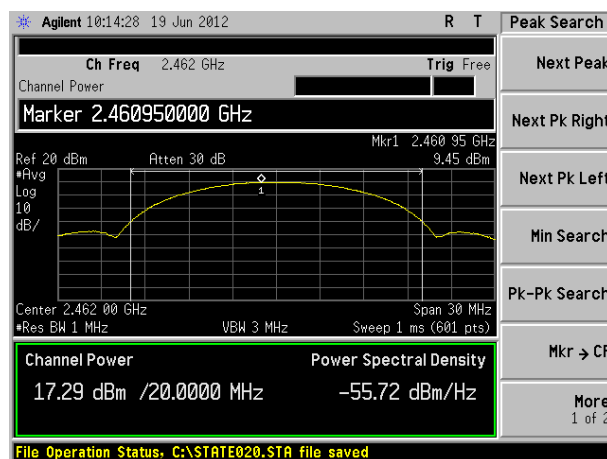
Test mode: 802.11b



Lowest channel

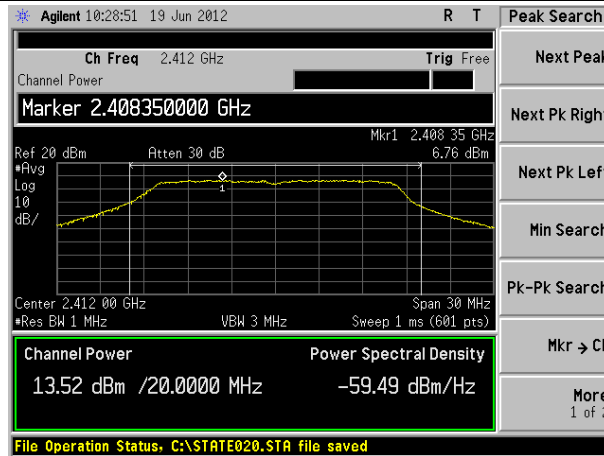


Middle channel

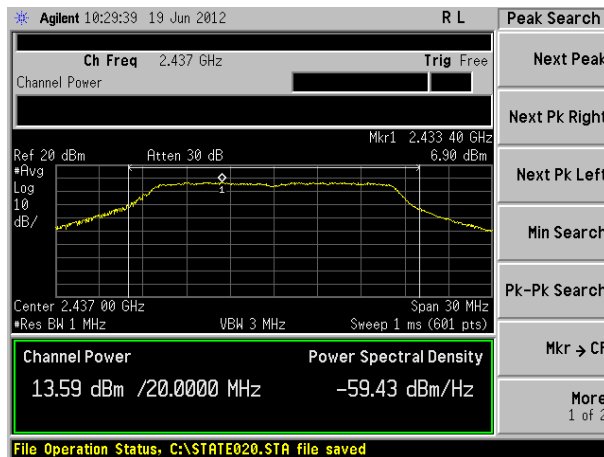


Highest channel

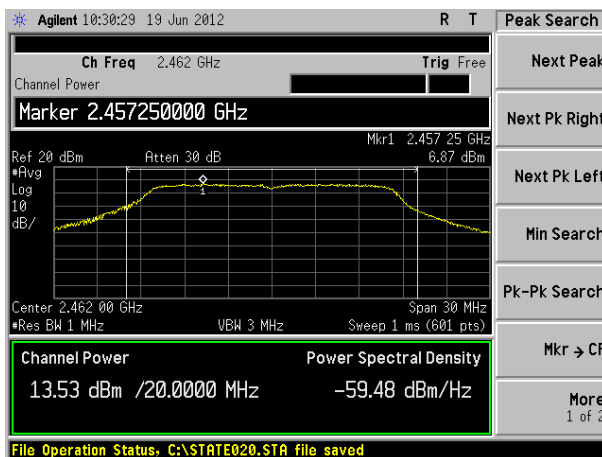
Test mode: 802.11g



Lowest channel

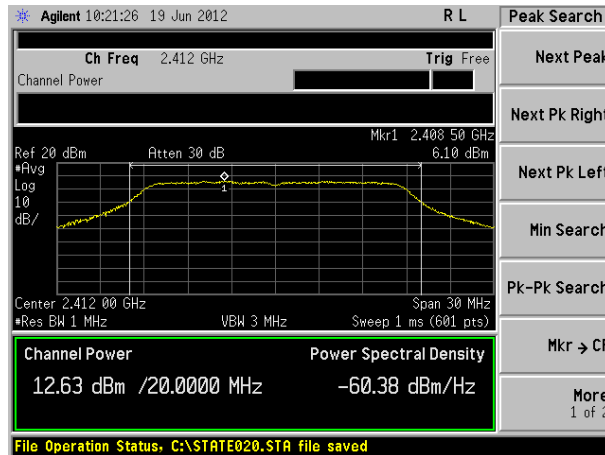


Middle channel

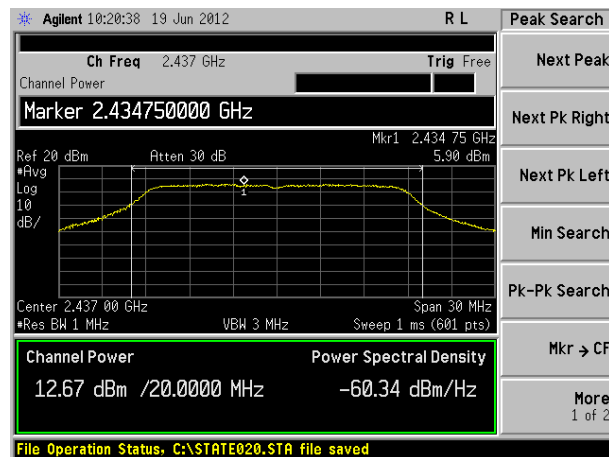


Highest channel

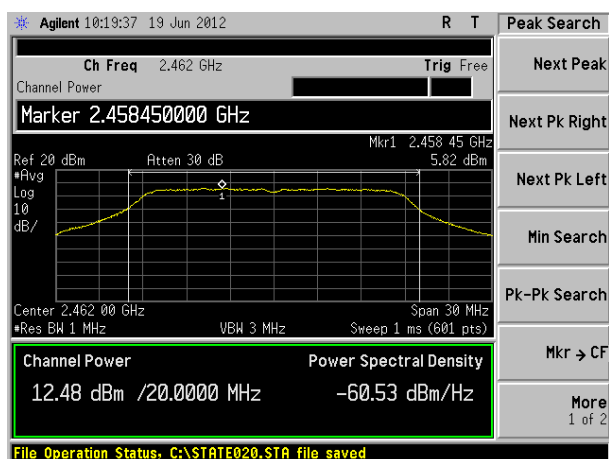
Test mode: 802.11n(HT20)



Lowest channel



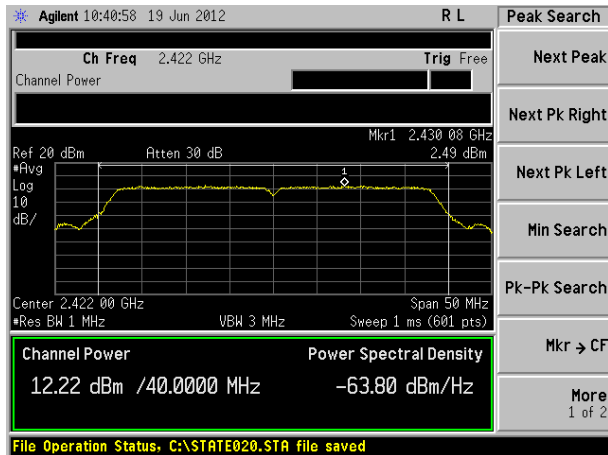
Middle channel



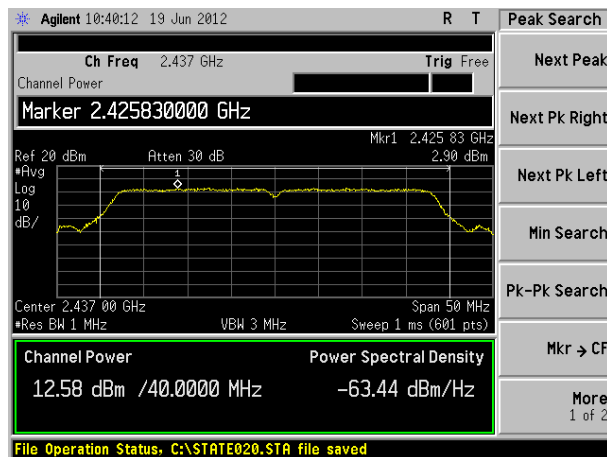
Highest channel



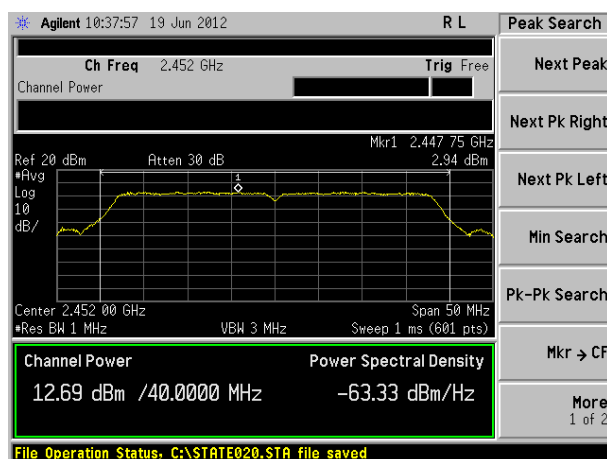
Test mode: 802.11n(HT40)



Lowest channel

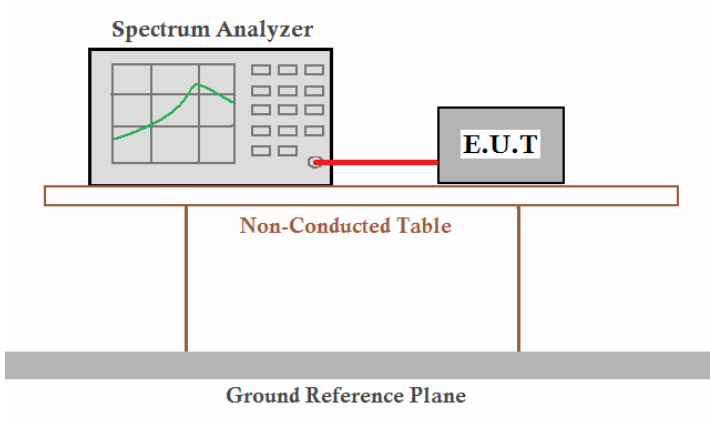


Middle channel



Highest channel

## 6.4 Emission Bandwidth

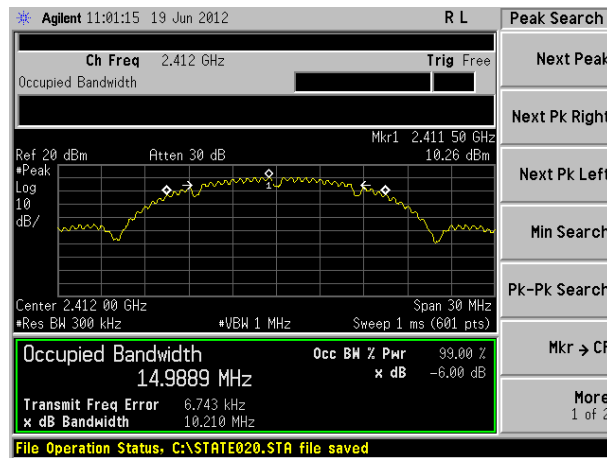
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	>500KHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

## Measurement Data

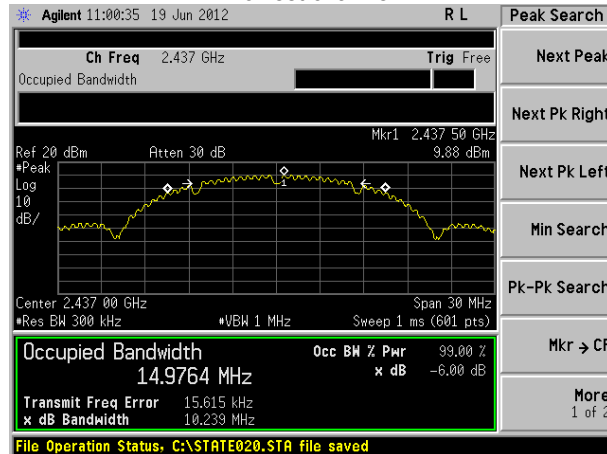
Test CH	Emission Bandwidth (MHz)				Limit(KHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	10.21	16.39	17.59	36.40	>500	Pass
Middle	10.24	16.44	17.60	36.38		
Highest	10.23	16.41	17.60	36.36		

## Test plot as follows:

Test mode:	802.11b
------------	---------



Lowest channel

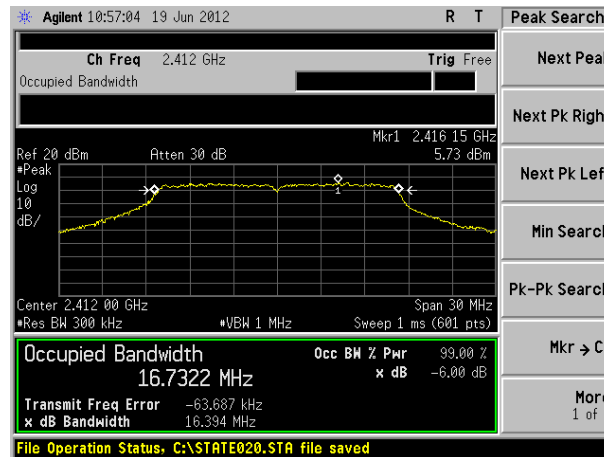


Middle channel

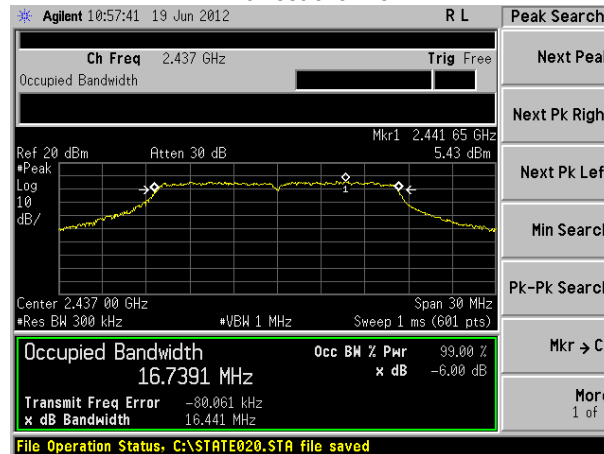


Highest channel

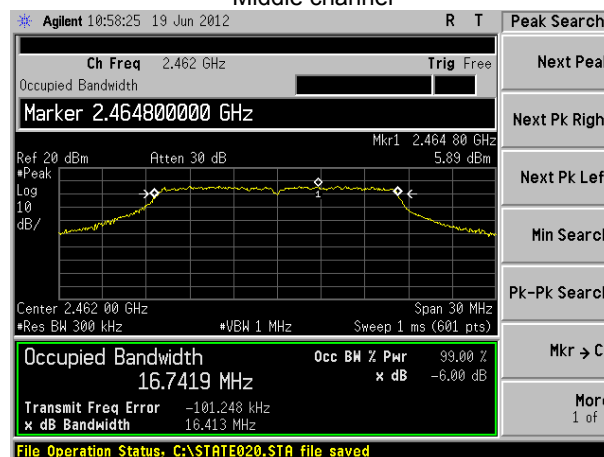
Test mode: 802.11g



Lowest channel

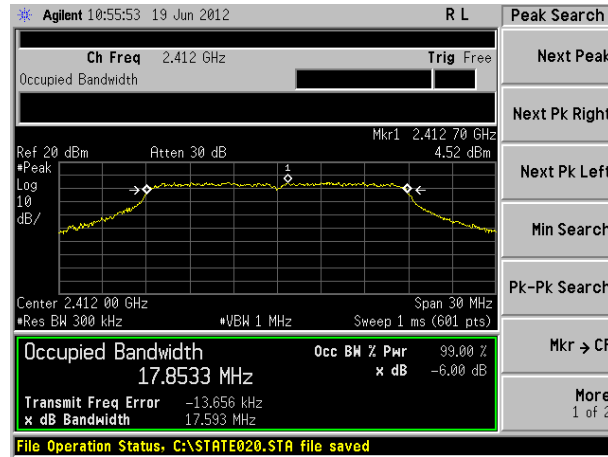


Middle channel

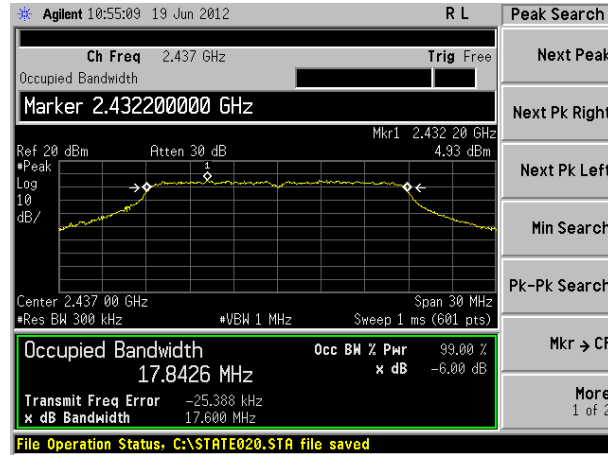


Highest channel

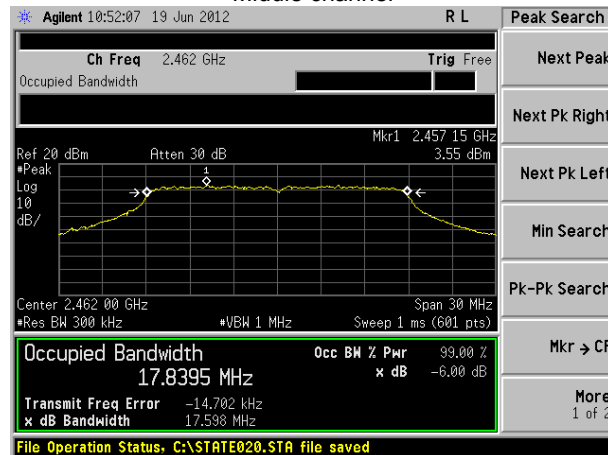
Test mode:	802.11n(HT20)
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Lowest channel

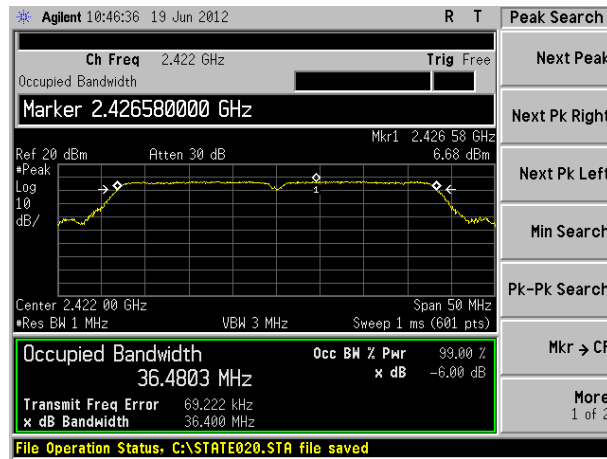


Middle channel

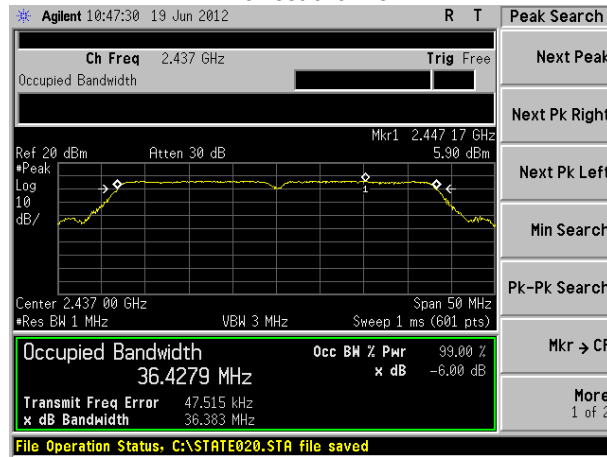


Highest channel

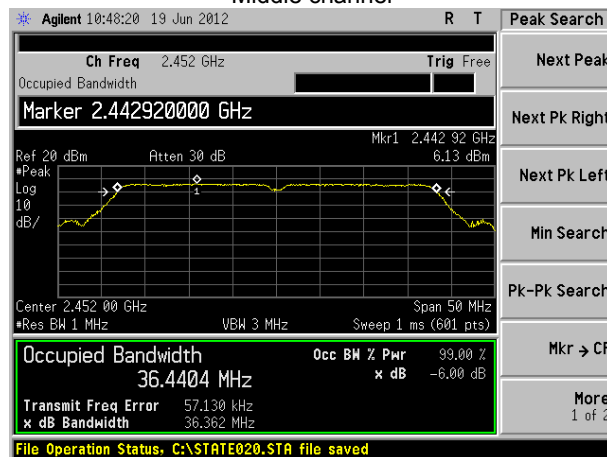
Test mode: 802.11n(HT40)



Lowest channel

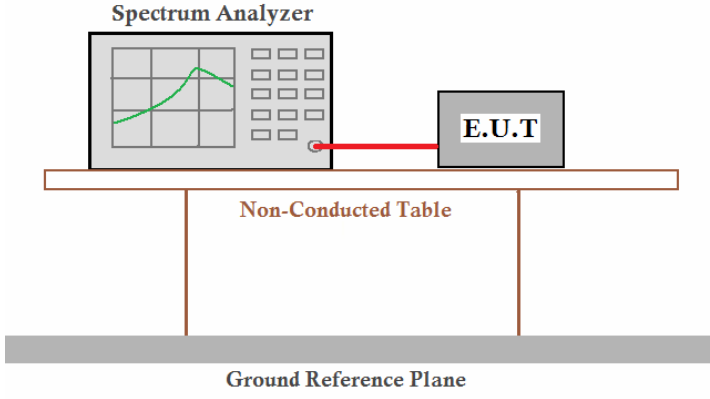


Middle channel



Highest channel

## 6.5 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	8dBm
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

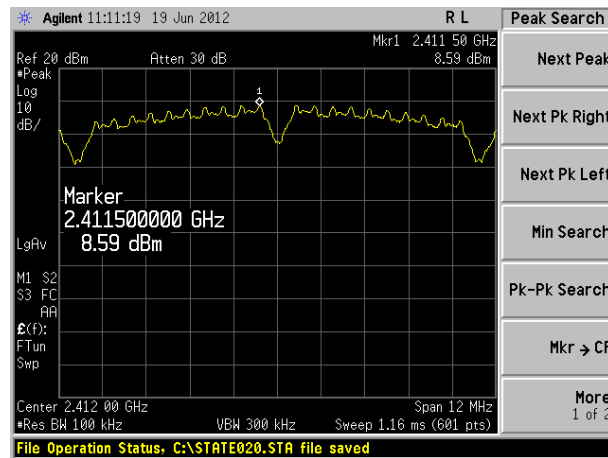
### Measurement Data

Test CH	Power Spectral Density (dBm/100KHz)		BWCF	Power Spectral Density (dBm/3KHz)		Limit (dBm/3KHz)	Result
	802.11b	802.11g		802.11b	802.11g		
Lowest	8.59	0.46	-15.20	-6.61	-14.74	8.00	Pass
Middle	8.85	0.43	-15.20	-6.35	-14.77		
Highest	8.50	0.89	-15.20	-6.70	-14.31		
Test CH	Power Spectral Density (dBm/100KHz)		BWCF	Power Spectral Density (dBm/3KHz)		Limit (dBm/3KHz)	Result
	802.11n(HT20)	802.11n(HT40)		802.11n(HT20)	802.11n(HT40)		
Lowest	0.13	-3.56	-15.20	-15.07	-18.76	8.00	Pass
Middle	0.28	-3.66	-15.20	-14.92	-18.86		
Highest	0.56	-3.67	-15.20	-14.64	-18.87		

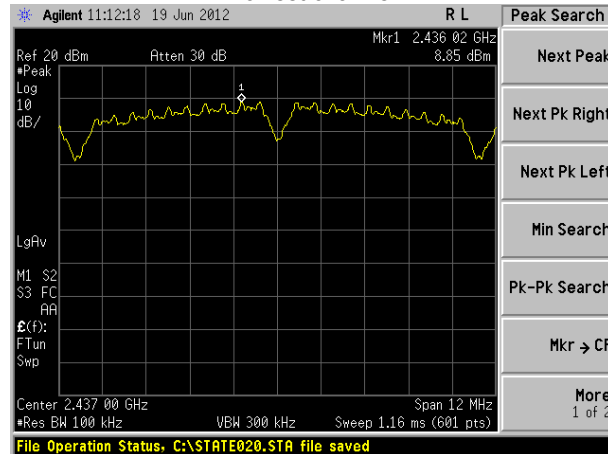
Remark: BWCF =  $10\log(3 \text{ kHz}/100 \text{ kHz}) = -15.20\text{dB}$

### Test plot as follows:

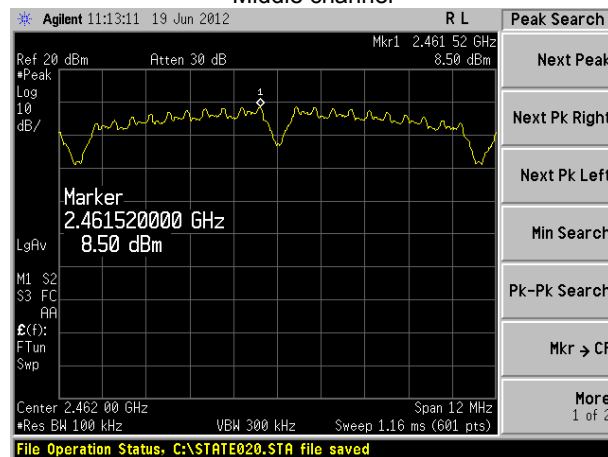
Test mode:	802.11b
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Lowest channel



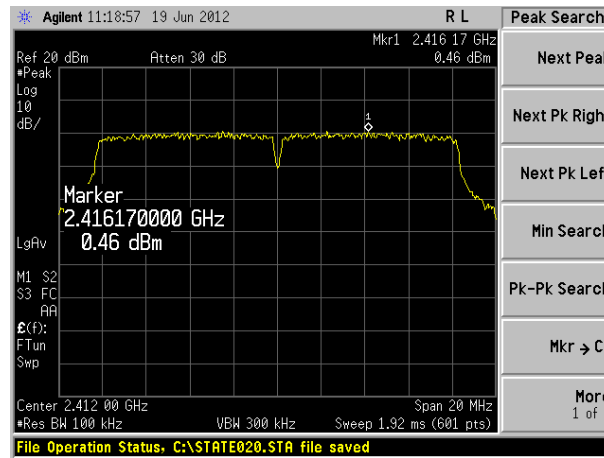
Middle channel



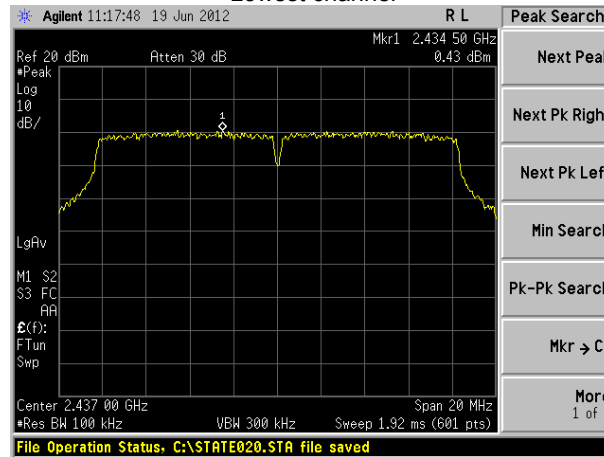
Highest channel



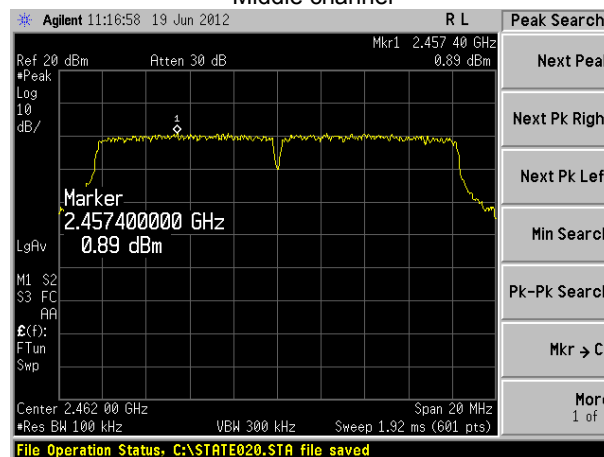
Test mode:	802.11g
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Lowest channel

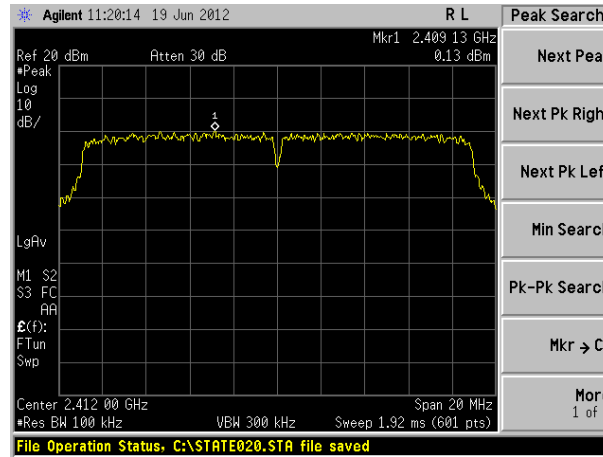


Middle channel

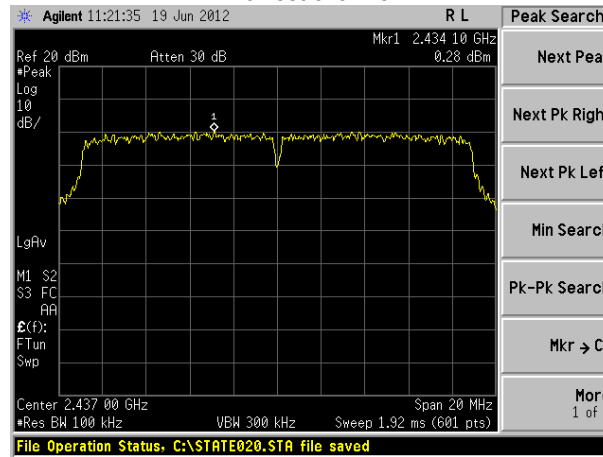


Highest channel

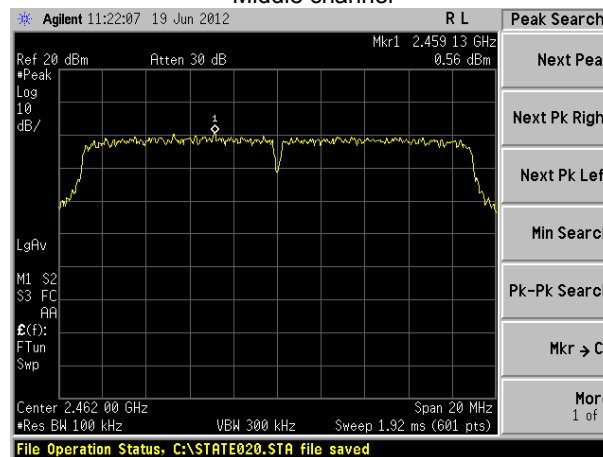
Test mode: 802.11n(HT20)



Lowest channel

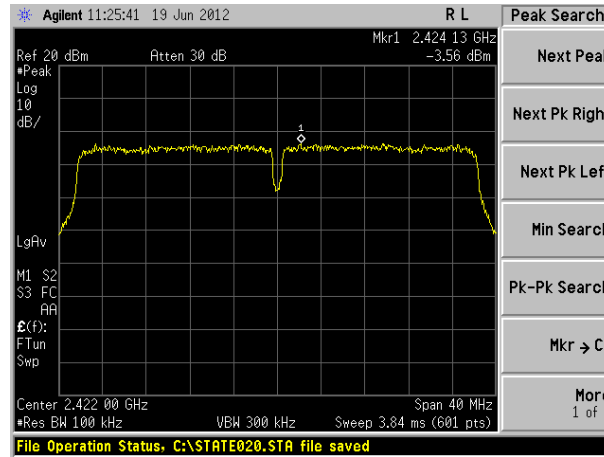


Middle channel

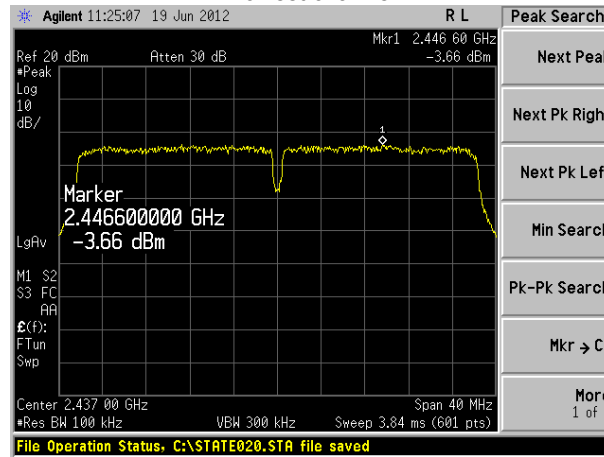


Highest channel

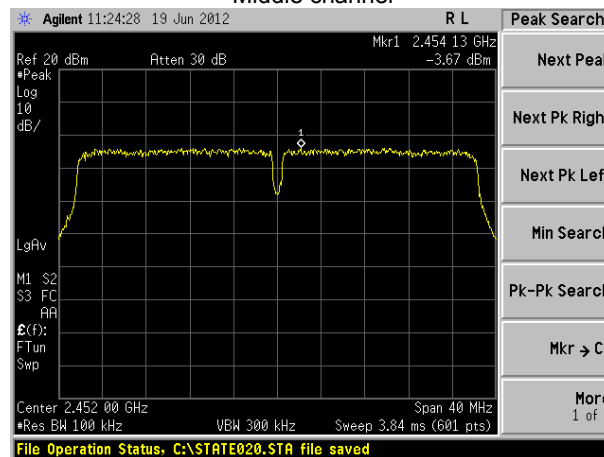
Test mode: 802.11n(HT40)



Lowest channel



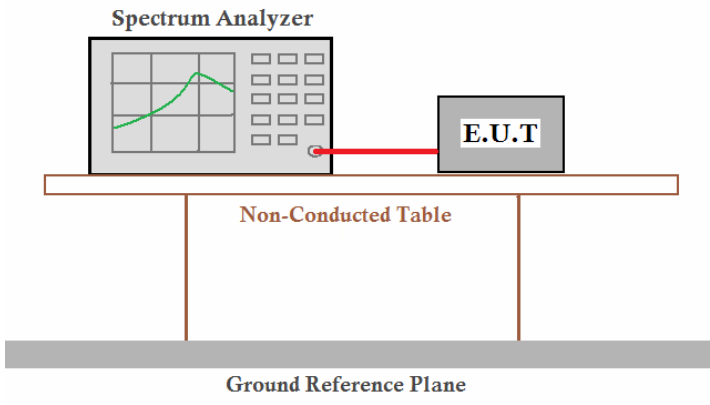
Middle channel



Highest channel

## 6.6 Band edges

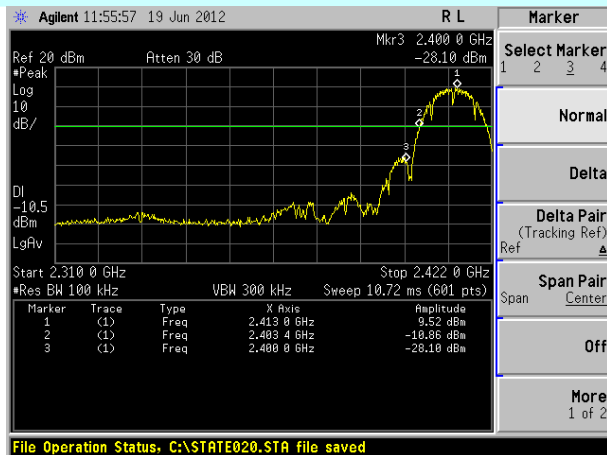
### 6.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
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:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

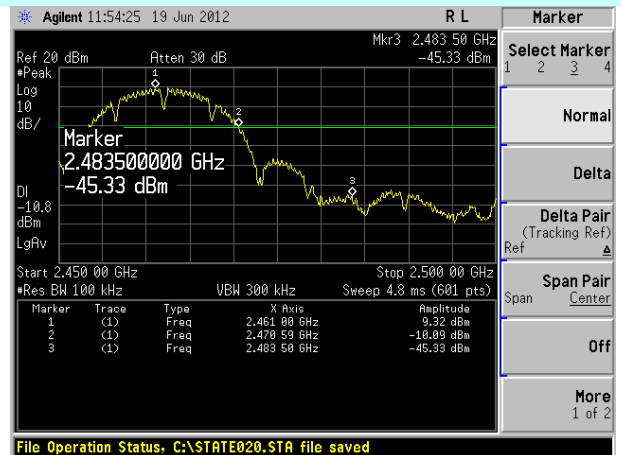
Test plot as follows:

Test mode:

802.11b



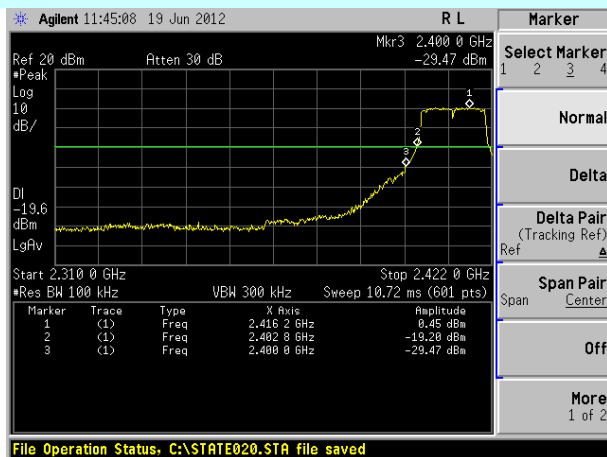
Lowest channel



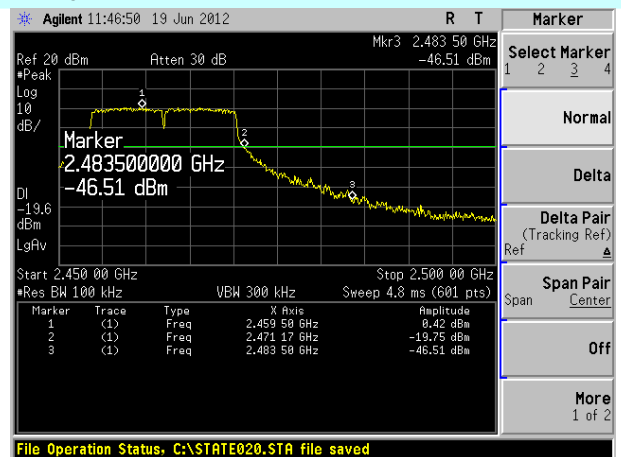
Highest channel

Test mode:

802.11g

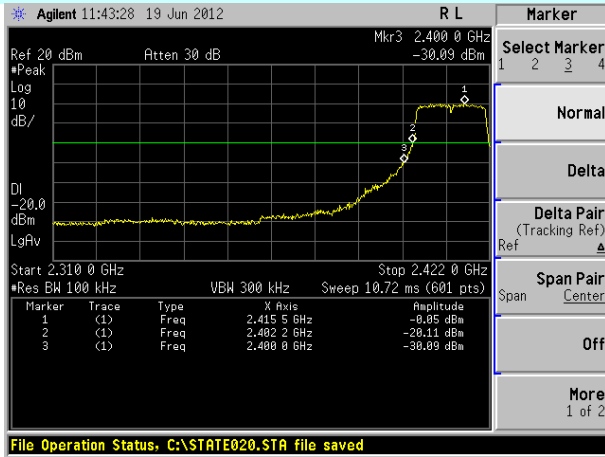


Lowest channel



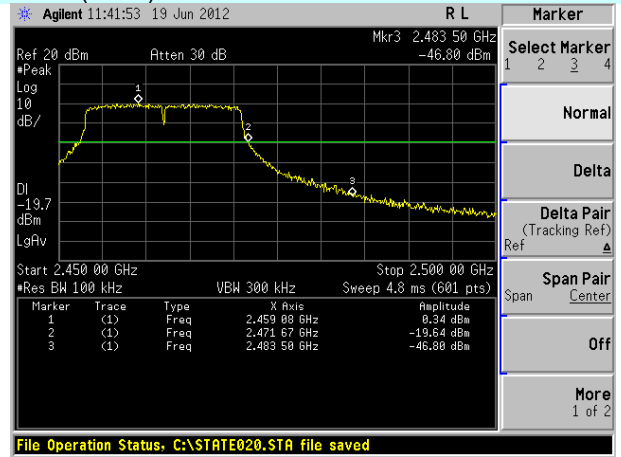
Highest channel

Test mode:



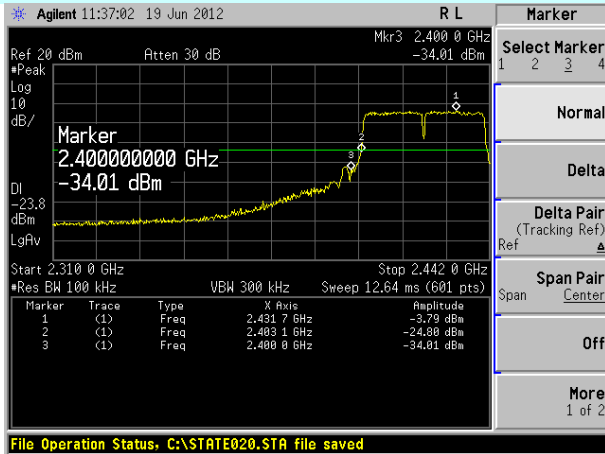
Lowest channel

802.11n(HT20)



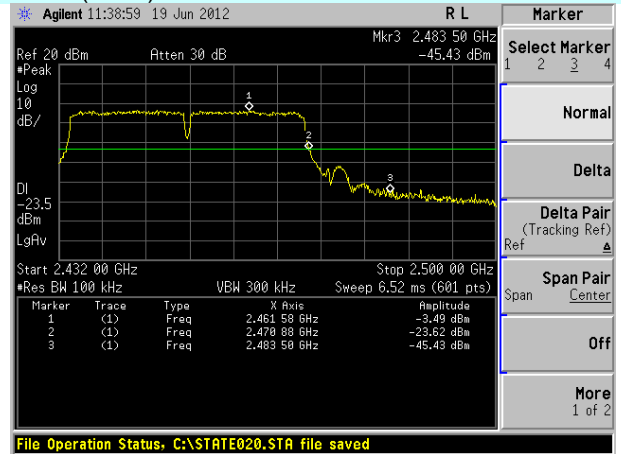
Highest channel

Test mode:



Lowest channel

802.11n(HT20)



Highest channel

## 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:	30MHz to 25GHz, only worse case is reported				
Test site:	Measurement Distance: 3m				
Receiver setup:	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 setup:					
Test Procedure:	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>6. 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 Instruments:	Refer to section 5.8 for details				
Test mode:	Refer to section 5.3 for details				
Test results:	Pass				

Remark:

Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

### Measurement data:

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
2390.00	46.33	27.58	3.81	34.83	42.89	74.00	-31.11	Horizontal
2400.00	46.44	27.58	3.83	34.83	43.02	74.00	-30.98	Horizontal
2390.00	52.34	27.58	3.81	34.83	48.90	74.00	-25.10	Vertical
2400.00	55.34	27.58	3.83	34.83	51.92	74.00	-22.08	Vertical

**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
2390.00	37.24	27.58	3.81	34.83	33.80	54.00	-20.20	Horizontal
2400.00	37.87	27.58	3.83	34.83	34.45	54.00	-19.55	Horizontal
2390.00	42.39	27.58	3.81	34.83	38.95	54.00	-15.05	Vertical
2400.00	44.69	27.58	3.83	34.83	41.27	54.00	-12.73	Vertical

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	47.35	27.52	3.89	34.86	43.90	74.00	-30.10	Horizontal
2500.00	44.37	27.55	3.90	34.87	40.95	74.00	-33.05	Horizontal
2483.50	53.67	27.52	3.89	34.86	50.22	74.00	-23.78	Vertical
2500.00	52.58	27.55	3.90	34.87	49.16	74.00	-24.84	Vertical

**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	39.57	27.52	3.89	34.86	36.12	54.00	-17.88	Horizontal
2500.00	36.57	27.55	3.90	34.87	33.15	54.00	-20.85	Horizontal
2483.50	44.65	27.52	3.89	34.86	41.20	54.00	-12.80	Vertical
2500.00	39.83	27.55	3.90	34.87	36.41	54.00	-17.59	Vertical

*Remark:*

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier 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
2390.00	46.37	27.58	3.81	34.83	42.93	74.00	-31.07	Horizontal
2400.00	48.39	27.58	3.83	34.83	44.97	74.00	-29.03	Horizontal
2390.00	46.67	27.58	3.81	34.83	43.23	74.00	-30.77	Vertical
2400.00	48.57	27.58	3.83	34.83	45.15	74.00	-28.85	Vertical

**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
2390.00	36.47	27.58	3.81	34.83	33.03	54.00	-20.97	Horizontal
2400.00	38.67	27.58	3.83	34.83	35.25	54.00	-18.75	Horizontal
2390.00	38.57	27.58	3.81	34.83	35.13	54.00	-18.87	Vertical
2400.00	39.68	27.58	3.83	34.83	36.26	54.00	-17.74	Vertical

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	45.67	27.52	3.89	34.86	42.22	74.00	-31.78	Horizontal
2500.00	43.67	27.55	3.90	34.87	40.25	74.00	-33.75	Horizontal
2483.50	46.37	27.52	3.89	34.86	42.92	74.00	-31.08	Vertical
2500.00	44.08	27.55	3.90	34.87	40.66	74.00	-33.34	Vertical

**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	37.59	27.52	3.89	34.86	34.14	54.00	-19.86	Horizontal
2500.00	35.49	27.55	3.90	34.87	32.07	54.00	-21.93	Horizontal
2483.50	35.49	27.52	3.89	34.86	32.04	54.00	-21.96	Vertical
2500.00	35.03	27.55	3.90	34.87	31.61	54.00	-22.39	Vertical

*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(HT20)	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
2390.00	45.89	27.58	3.81	34.83	42.45	74.00	-31.55	Horizontal
2400.00	47.57	27.58	3.83	34.83	44.15	74.00	-29.85	Horizontal
2390.00	42.37	27.58	3.81	34.83	38.93	74.00	-35.07	Vertical
2400.00	44.01	27.58	3.83	34.83	40.59	74.00	-33.41	Vertical

**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
2390.00	36.67	27.58	3.81	34.83	33.23	54.00	-20.77	Horizontal
2400.00	38.57	27.58	3.83	34.83	35.15	54.00	-18.85	Horizontal
2390.00	32.14	27.58	3.81	34.83	28.70	54.00	-25.30	Vertical
2400.00	34.44	27.58	3.83	34.83	31.02	54.00	-22.98	Vertical

Test mode:	802.11n(HT20)	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	44.39	27.52	3.89	34.86	40.94	74.00	-33.06	Horizontal
2500.00	42.34	27.55	3.90	34.87	38.92	74.00	-35.08	Horizontal
2483.50	46.57	27.52	3.89	34.86	43.12	74.00	-30.88	Vertical
2500.00	43.73	27.55	3.90	34.87	40.31	74.00	-33.69	Vertical

**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	35.67	27.52	3.89	34.86	32.22	54.00	-21.78	Horizontal
2500.00	33.54	27.55	3.90	34.87	30.12	54.00	-23.88	Horizontal
2483.50	36.89	27.52	3.89	34.86	33.44	54.00	-20.56	Vertical
2500.00	34.68	27.55	3.90	34.87	31.26	54.00	-22.74	Vertical

*Remark:*

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

Test mode:	802.11n(HT40)	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
2390.00	44.78	27.58	3.81	34.83	41.34	74.00	-32.66	Horizontal
2400.00	45.67	27.58	3.83	34.83	42.25	74.00	-31.75	Horizontal
2390.00	46.57	27.58	3.81	34.83	43.13	74.00	-30.87	Vertical
2400.00	49.57	27.58	3.83	34.83	46.15	74.00	-27.85	Vertical

**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
2390.00	35.67	27.58	3.81	34.83	32.23	54.00	-21.77	Horizontal
2400.00	38.47	27.58	3.83	34.83	35.05	54.00	-18.95	Horizontal
2390.00	36.57	27.58	3.81	34.83	33.13	54.00	-20.87	Vertical
2400.00	38.47	27.58	3.83	34.83	35.05	54.00	-18.95	Vertical

Test mode:	802.11n(HT40)	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	46.57	27.52	3.89	34.86	43.12	74.00	-30.88	Horizontal
2500.00	43.14	27.55	3.90	34.87	39.72	74.00	-34.28	Horizontal
2483.50	46.57	27.52	3.89	34.86	43.12	74.00	-30.88	Vertical
2500.00	43.47	27.55	3.90	34.87	40.05	74.00	-33.95	Vertical

**Average value:**

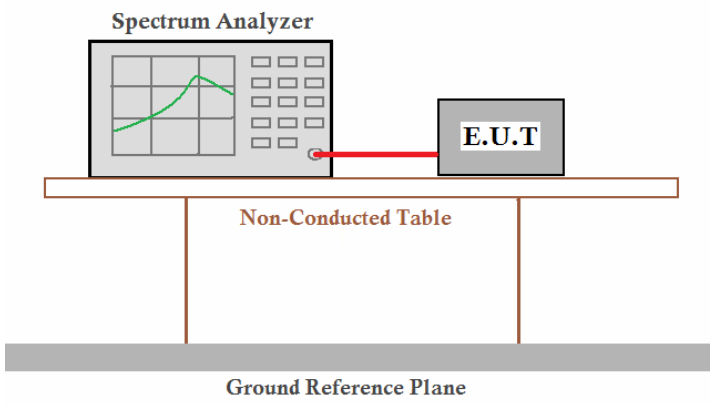
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	35.47	27.52	3.89	34.86	32.02	54.00	-21.98	Horizontal
2500.00	34.35	27.55	3.90	34.87	30.93	54.00	-23.07	Horizontal
2483.50	36.49	27.52	3.89	34.86	33.04	54.00	-20.96	Vertical
2500.00	34.42	27.55	3.90	34.87	31.00	54.00	-23.00	Vertical

*Remark:*

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

## 6.7 Spurious Emission

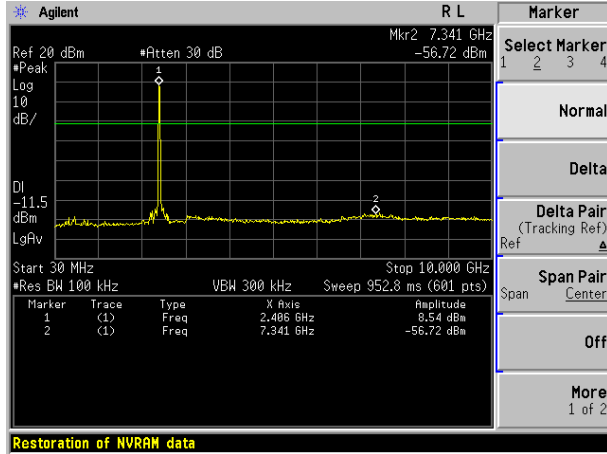
### 6.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
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:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

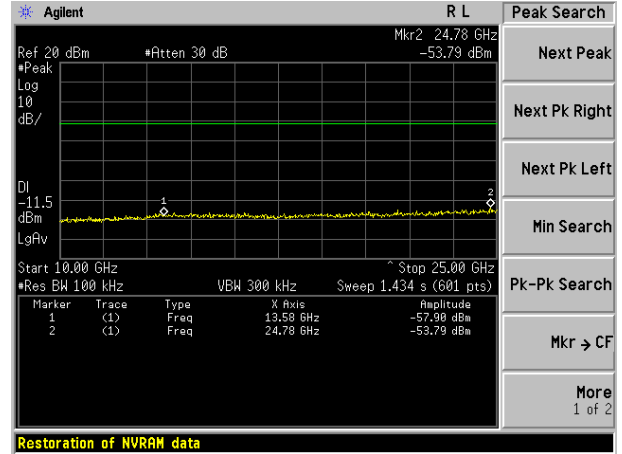
Test plot as follows:

Test mode: 802.11b

Lowest channel

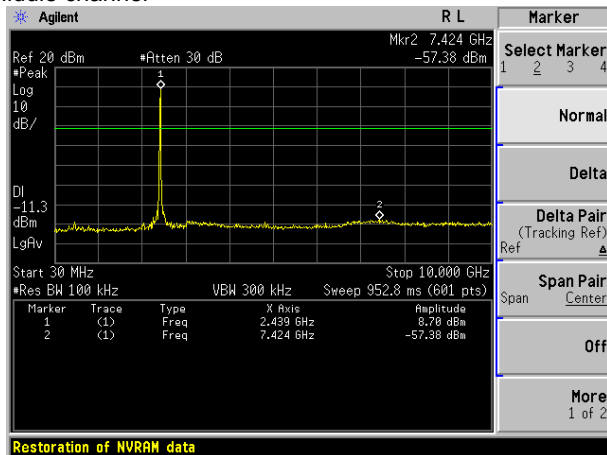


30MHz~10GHz

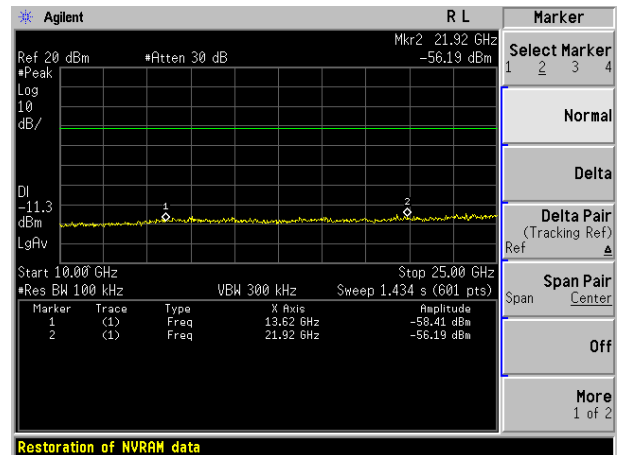


10GHz~25GHz

Middle channel

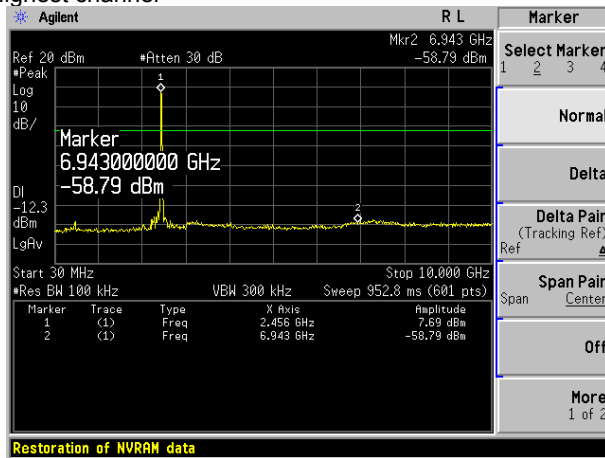


30MHz~10GHz

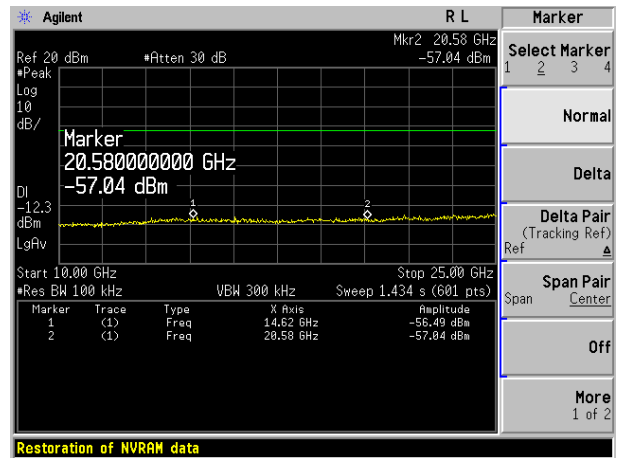


10GHz~25GHz

Highest channel



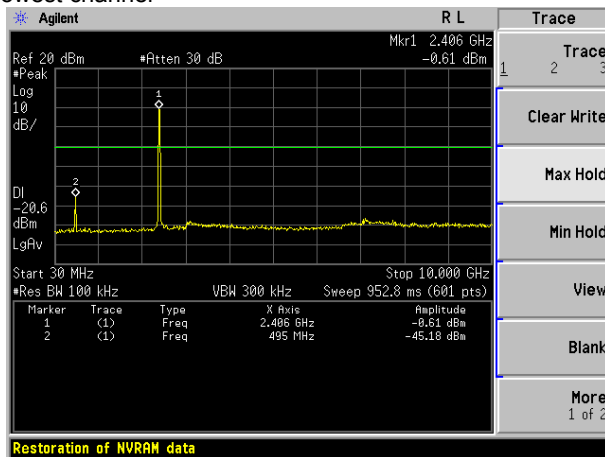
30MHz~10GHz



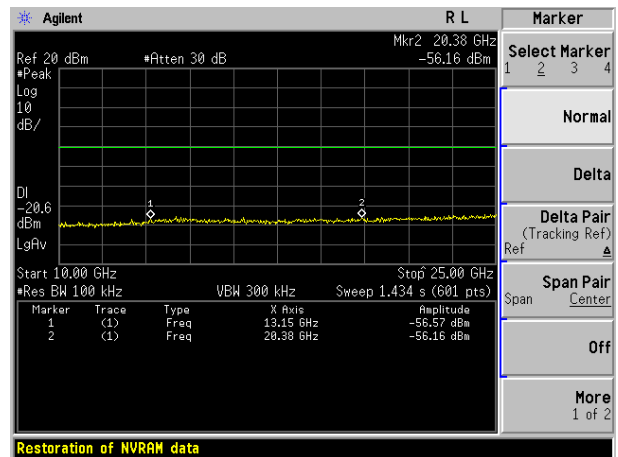
10GHz~25GHz

Test mode: 802.11g

Lowest channel

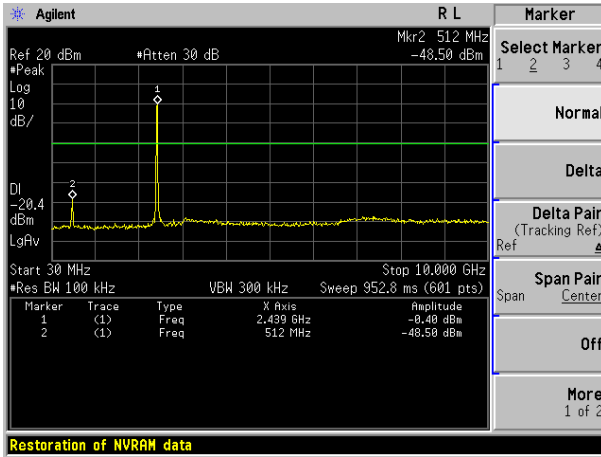


30MHz~10GHz

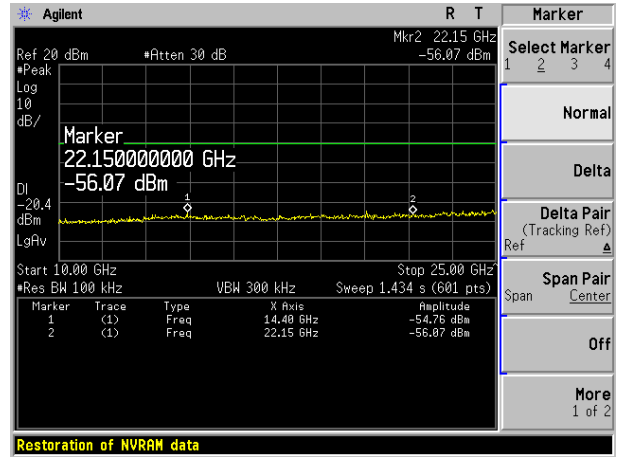


10GHz~25GHz

Middle channel

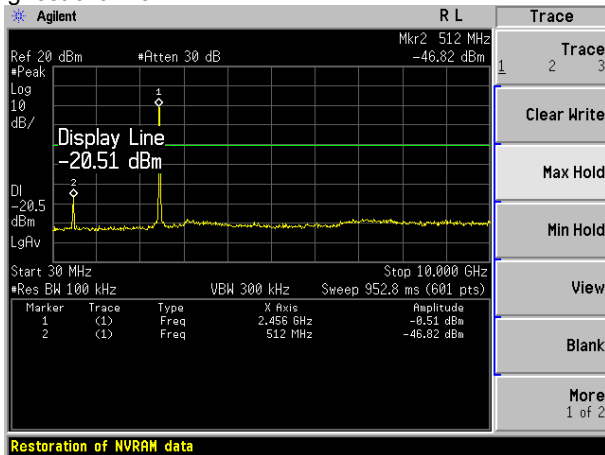


30MHz~10GHz

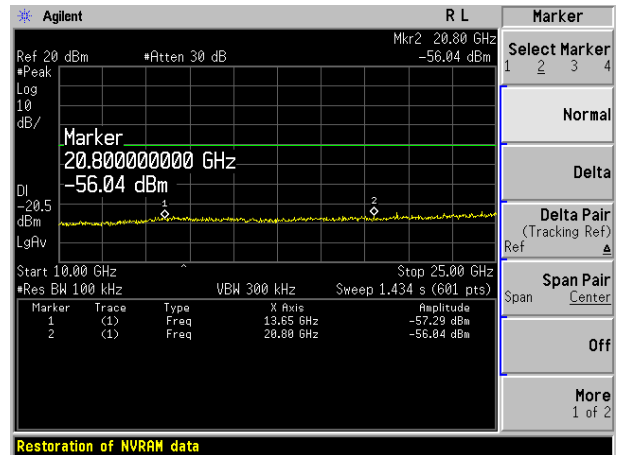


10GHz~25GHz

Highest channel



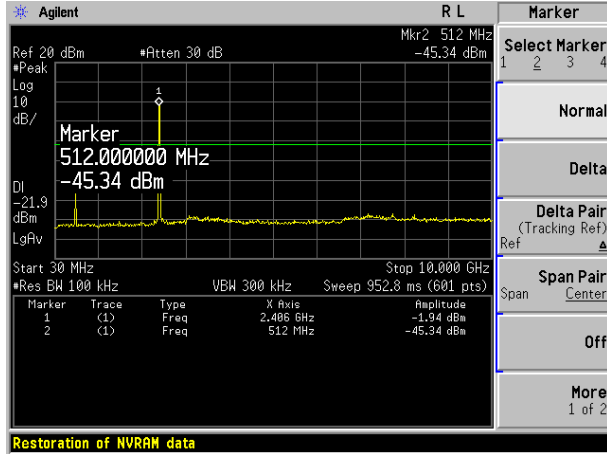
30MHz~10GHz



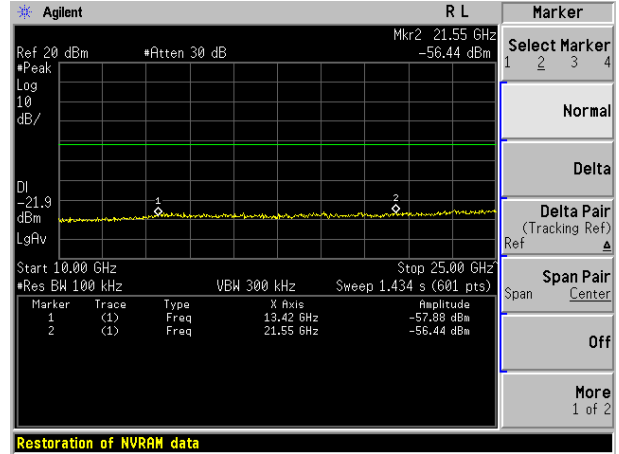
10GHz~25GHz

Test mode: 802.11n(HT20)

Lowest channel

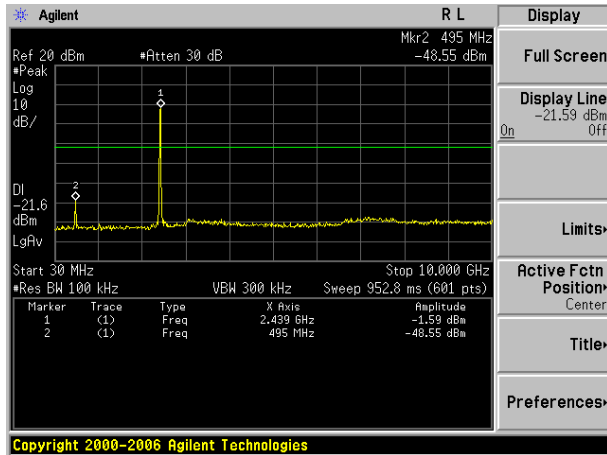


30MHz~10GHz

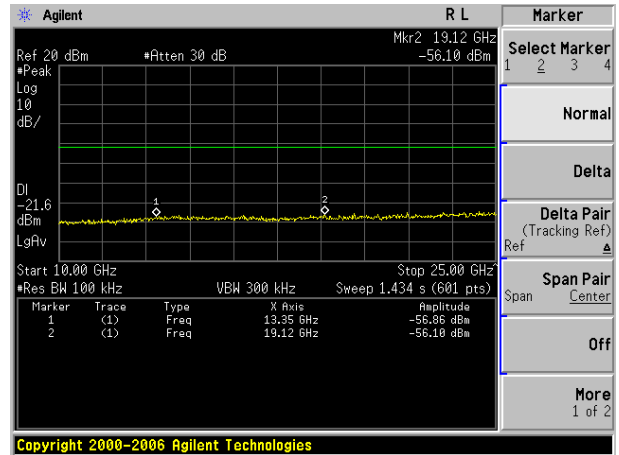


10GHz~25GHz

Middle channel



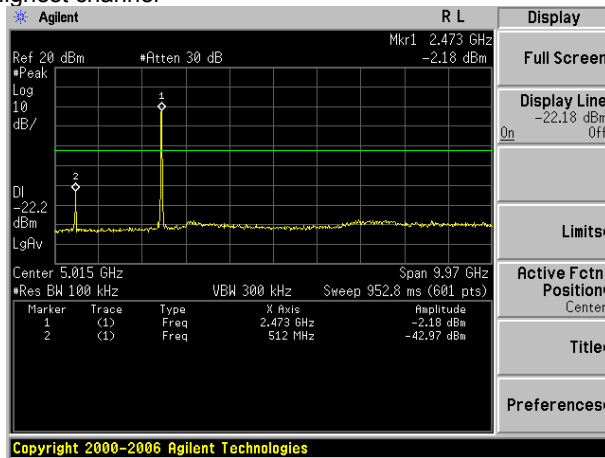
30MHz~10GHz



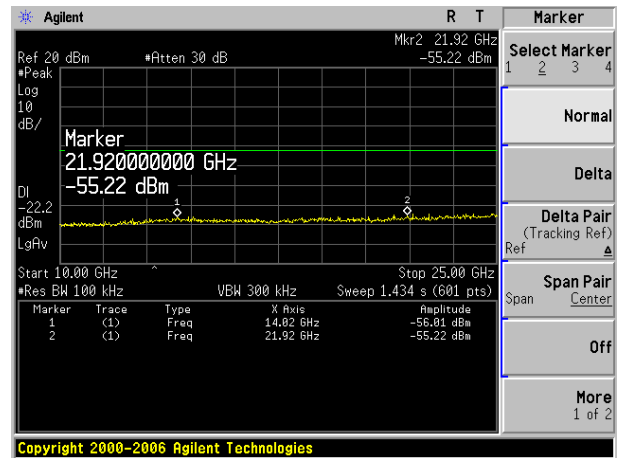
10GHz~25GHz



Highest channel



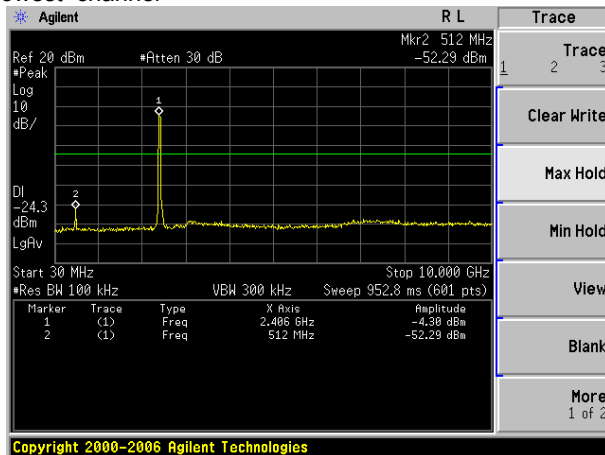
30MHz~10GHz



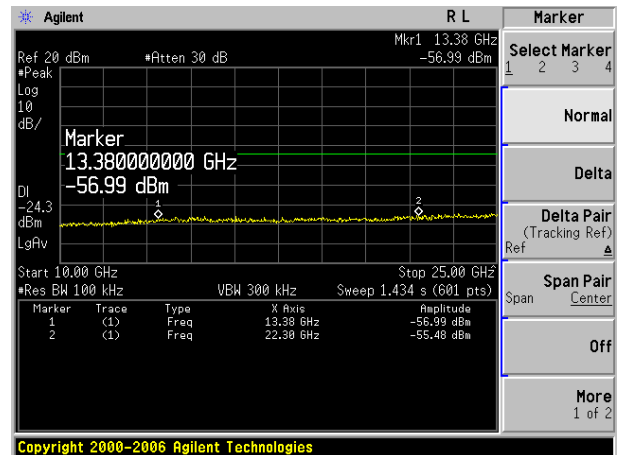
10GHz~25GHz

Test mode: 802.11n(HT40)

Lowest channel

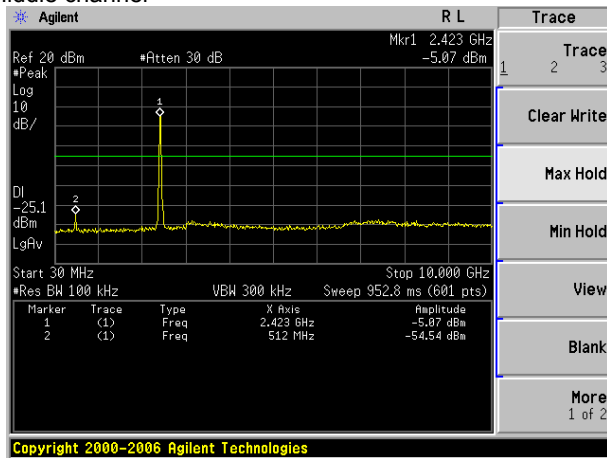


30MHz~10GHz

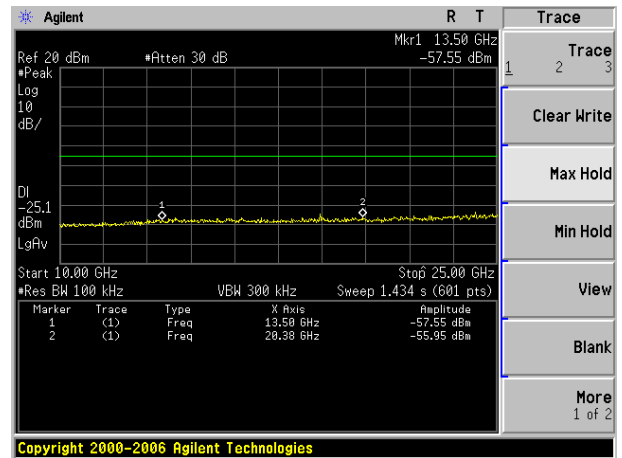


10GHz~25GHz

Middle channel

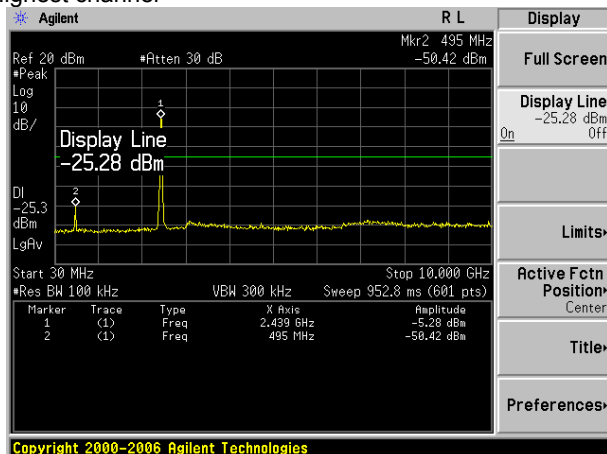


30MHz~10GHz

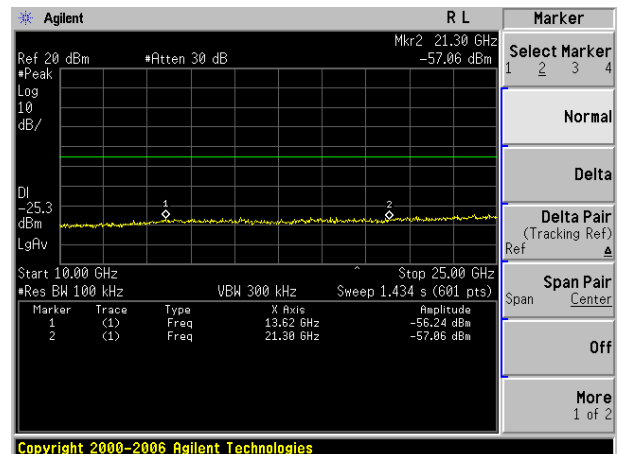


10GHz~25GHz

Highest channel



30MHz~10GHz



10GHz~25GHz

## 6.7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.4: 2003				
Test Frequency Range:	30MHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	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	40.0		Quasi-peak Value	
	88MHz-216MHz	43.5		Quasi-peak Value	
	216MHz-960MHz	46.0		Quasi-peak Value	
	Above 1GHz	54.0		Average Value	
		74.0		Peak Value	
Test setup:	Below 1GHz				
Test setup:	Above 1GHz				

Test Procedure:	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>6. 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 Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Remark:

Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

■ Below 1GHz

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
66.36	53.86	11.24	0.39	31.89	33.60	40.00	-6.40	Vertical
85.37	55.09	10.50	0.43	31.81	34.21	40.00	-5.79	Vertical
143.24	58.69	7.05	0.61	32.00	34.35	43.50	-9.15	Vertical
254.35	56.79	10.83	0.89	32.28	36.23	46.00	-9.77	Vertical
383.60	52.73	13.47	1.20	32.31	35.09	46.00	-10.91	Vertical
598.35	51.32	15.38	1.46	31.62	36.54	46.00	-9.46	Vertical
62.31	50.07	14.94	0.34	31.99	33.36	40.00	-6.64	Horizontal
78.35	51.60	10.50	0.43	31.81	30.72	40.00	-9.28	Horizontal
168.30	57.98	7.21	0.62	32.01	33.80	43.50	-9.70	Horizontal
255.35	59.84	10.83	0.89	32.28	39.28	46.00	-6.72	Horizontal
363.58	54.82	13.56	1.21	32.32	37.27	46.00	-8.73	Horizontal
459.37	55.48	14.88	1.42	31.75	40.03	46.00	-5.97	Horizontal

■ Above 1GHz

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
4824.00	29.01	31.79	8.61	24.17	45.24	74.00	-28.76	Vertical
7236.00	29.39	36.19	11.68	26.52	50.74	74.00	-23.26	Vertical
9648.00	29.94	38.07	14.16	25.44	56.73	74.00	-17.27	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	26.93	31.81	8.62	24.17	43.19	74.00	-30.81	Horizontal
7236.00	27.98	36.19	11.68	26.52	49.33	74.00	-24.67	Horizontal
9648.00	28.29	38.07	14.16	25.44	55.08	74.00	-18.92	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					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	19.24	31.79	8.61	24.17	35.47	54.00	-18.53	Vertical
7236.00	20.15	36.19	11.68	26.52	41.50	54.00	-12.50	Vertical
9648.00	21.48	38.07	14.16	25.44	48.27	54.00	-5.73	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	21.43	31.81	8.62	24.17	37.69	54.00	-16.31	Horizontal
7236.00	21.78	36.19	11.68	26.52	43.13	54.00	-10.87	Horizontal
9648.00	17.19	38.07	14.16	25.44	43.98	54.00	-10.02	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. “\*”, means this data is too weak instrument of signal is unable to test.

Test 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	29.63	31.85	8.66	24.12	46.02	74.00	-27.98	Vertical
7311.00	29.22	36.37	11.71	26.71	50.59	74.00	-23.41	Vertical
9748.00	30.93	38.27	14.25	25.38	58.07	74.00	-15.93	Vertical
12185.00	*					74.00		Vertical
14682.00	*					74.00		Vertical
17179.00	*					74.00		Vertical
4874.00	27.26	31.85	8.66	24.10	43.67	74.00	-30.33	Horizontal
7311.00	28.15	36.37	11.71	26.71	49.52	74.00	-24.48	Horizontal
9748.00	27.73	38.27	14.25	25.38	54.87	74.00	-19.13	Horizontal
12185.00	*					74.00		Horizontal
14682.00	*					74.00		Horizontal
17179.00	*					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	20.13	31.85	8.66	24.12	36.52	54.00	-17.48	Vertical
7311.00	20.16	36.37	11.71	26.71	41.53	54.00	-12.47	Vertical
9748.00	21.35	38.27	14.25	25.38	48.49	54.00	-5.51	Vertical
12185.00	*					54.00		Vertical
14682.00	*					54.00		Vertical
17179.00	*					54.00		Vertical
4874.00	22.06	31.85	8.66	24.10	38.47	54.00	-15.53	Horizontal
7311.00	21.75	36.37	11.71	26.71	43.12	54.00	-10.88	Horizontal
9748.00	16.33	38.27	14.25	25.38	43.47	54.00	-10.53	Horizontal
12185.00	*					54.00		Horizontal
14682.00	*					54.00		Horizontal
17179.00	*					54.00		Horizontal

*Remark:*

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor*
2. *“\*” , means this data is the too weak instrument of signal is unable to test.*

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
4924.00	28.99	31.89	8.70	24.05	45.53	74.00	-28.47	Vertical
7386.00	29.36	36.49	11.76	26.90	50.71	74.00	-23.29	Vertical
9848.00	27.95	38.62	14.31	25.30	55.58	74.00	-18.42	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	27.70	31.89	8.70	24.05	44.24	74.00	-29.76	Horizontal
7386.00	28.07	36.49	11.76	26.90	49.42	74.00	-24.58	Horizontal
9848.00	27.41	38.62	14.31	25.30	55.04	74.00	-18.96	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					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
4924.00	19.54	31.89	8.70	24.05	36.08	54.00	-17.92	Vertical
7386.00	20.34	36.49	11.76	26.90	41.69	54.00	-12.31	Vertical
9848.00	18.67	38.62	14.31	25.30	46.30	54.00	-7.70	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	22.10	31.89	8.70	24.05	38.64	54.00	-15.36	Horizontal
7386.00	21.27	36.49	11.76	26.90	42.62	54.00	-11.38	Horizontal
9848.00	15.11	38.62	14.31	25.30	42.74	54.00	-11.26	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

*Remark:*

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor*
2. *“\*” , means this data is the too weak instrument of signal is unable to test.*

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
4824.00	28.82	31.79	8.61	24.17	45.05	74.00	-28.95	Vertical
7236.00	28.47	36.19	11.68	26.52	49.82	74.00	-24.18	Vertical
9648.00	30.96	38.07	14.16	25.44	57.75	74.00	-16.25	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	28.23	31.81	8.62	24.17	44.49	74.00	-29.51	Horizontal
7236.00	29.50	36.19	11.68	26.52	50.85	74.00	-23.15	Horizontal
9648.00	28.17	38.07	14.16	25.44	54.96	74.00	-19.04	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					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	24.22	31.79	8.61	24.17	40.45	54.00	-13.55	Vertical
7236.00	22.07	36.19	11.68	26.52	43.42	54.00	-10.58	Vertical
9648.00	16.46	38.07	14.16	25.44	43.25	54.00	-10.75	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	24.03	31.81	8.62	24.17	40.29	54.00	-13.71	Horizontal
7236.00	22.80	36.19	11.68	26.52	44.15	54.00	-9.85	Horizontal
9648.00	16.97	38.07	14.16	25.44	43.76	54.00	-10.24	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

*Remark:*

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor*
2. *“\*”, means this data is too weak instrument of signal is unable to test.*



Test 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	29.35	31.79	8.61	24.17	45.58	74.00	-28.42	Vertical
7311.00	27.71	36.37	11.71	26.71	49.08	74.00	-24.92	Vertical
9748.00	28.16	38.27	14.25	25.38	55.30	74.00	-18.70	Vertical
12185.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4874.00	30.35	31.85	8.66	24.10	46.76	74.00	-27.24	Horizontal
7311.00	28.39	36.37	11.71	26.71	49.76	74.00	-24.24	Horizontal
9748.00	27.75	38.27	14.25	25.38	54.89	74.00	-19.11	Horizontal
12185.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					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	24.65	31.79	8.61	24.17	40.88	54.00	-13.12	Vertical
7311.00	21.21	36.37	11.71	26.71	42.58	54.00	-11.42	Vertical
9748.00	14.76	38.27	14.25	25.38	41.90	54.00	-12.10	Vertical
12185.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4874.00	26.25	31.85	8.66	24.10	42.66	54.00	-11.34	Horizontal
7311.00	19.99	36.37	11.71	26.71	41.36	54.00	-12.64	Horizontal
9748.00	15.65	38.27	14.25	25.38	42.79	54.00	-11.21	Horizontal
12185.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

*Remark:*

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor*
2. *“\*” , means this data is the too weak instrument of signal is unable to test.*

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
4924.00	28.07	31.85	8.66	24.12	44.46	74.00	-29.54	Vertical
7386.00	27.76	36.49	11.76	26.90	49.11	74.00	-24.89	Vertical
9848.00	27.00	38.62	14.31	25.30	54.63	74.00	-19.37	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	29.07	31.89	8.70	24.05	45.61	74.00	-28.39	Horizontal
7386.00	29.62	36.49	11.76	26.90	50.97	74.00	-23.03	Horizontal
9848.00	28.47	38.62	14.31	25.30	56.10	74.00	-17.90	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					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
4924.00	23.57	31.85	8.66	24.12	39.96	54.00	-14.04	Vertical
7386.00	21.06	36.49	11.76	26.90	42.41	54.00	-11.59	Vertical
9848.00	15.10	38.62	14.31	25.30	42.73	54.00	-11.27	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	24.57	31.89	8.70	24.05	41.11	54.00	-12.89	Horizontal
7386.00	20.72	36.49	11.76	26.90	42.07	54.00	-11.93	Horizontal
9848.00	15.07	38.62	14.31	25.30	42.70	54.00	-11.30	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

*Remark:*

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor*
2. *“\*” , means this data is the too weak instrument of signal is unable to test.*

Test mode:	802.11n(HT20)	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	29.17	31.81	8.62	24.17	45.43	74.00	-28.57	Vertical
7236.00	28.92	36.19	11.68	26.52	50.27	74.00	-23.73	Vertical
9648.00	29.08	38.07	14.16	25.44	55.87	74.00	-18.13	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	26.83	31.81	8.62	24.17	43.09	74.00	-30.91	Horizontal
7236.00	27.33	36.19	11.68	26.52	48.68	74.00	-25.32	Horizontal
9648.00	27.18	38.07	14.16	25.44	53.97	74.00	-20.03	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					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	25.07	31.81	8.62	24.17	41.33	54.00	-12.67	Vertical
7236.00	21.02	36.19	11.68	26.52	42.37	54.00	-11.63	Vertical
9648.00	16.68	38.07	14.16	25.44	43.47	54.00	-10.53	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	26.83	31.81	8.62	24.17	43.09	54.00	-10.91	Horizontal
7236.00	21.10	36.19	11.68	26.52	42.45	54.00	-11.55	Horizontal
9648.00	17.48	38.07	14.16	25.44	44.27	54.00	-9.73	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

*Remark:*

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor*
2. *“\*”*, means this data is the too weak instrument of signal is unable to test.

Test mode:	802.11n(HT20)	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	30.30	31.85	8.66	24.10	46.71	74.00	-27.29	Vertical
7311.00	28.54	36.37	11.71	26.71	49.91	74.00	-24.09	Vertical
9748.00	28.67	38.27	14.25	25.38	55.81	74.00	-18.19	Vertical
12185.00	*					74.00		Vertical
14682.00	*					74.00		Vertical
17179.00	*					74.00		Vertical
4874.00	28.63	31.85	8.66	24.10	45.04	74.00	-28.96	Horizontal
7311.00	27.79	36.37	11.71	26.71	49.16	74.00	-24.84	Horizontal
9748.00	28.46	38.27	14.25	25.38	55.60	74.00	-18.40	Horizontal
12185.00	*					74.00		Horizontal
14682.00	*					74.00		Horizontal
17179.00	*					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	26.30	31.85	8.66	24.10	42.71	54.00	-11.29	Vertical
7311.00	21.74	36.37	11.71	26.71	43.11	54.00	-10.89	Vertical
9748.00	15.27	38.27	14.25	25.38	42.41	54.00	-11.59	Vertical
12185.00	*					54.00		Vertical
14682.00	*					54.00		Vertical
17179.00	*					54.00		Vertical
4874.00	26.14	31.85	8.66	24.10	42.55	54.00	-11.45	Horizontal
7311.00	20.36	36.37	11.71	26.71	41.73	54.00	-12.27	Horizontal
9748.00	17.68	38.27	14.25	25.38	44.82	54.00	-9.18	Horizontal
12185.00	*					54.00		Horizontal
14682.00	*					54.00		Horizontal
17179.00	*					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.*

Test mode:	802.11n(HT20)	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
4924.00	28.96	31.89	8.70	24.05	45.50	74.00	-28.50	Vertical
7386.00	28.20	36.49	11.76	26.90	49.55	74.00	-24.45	Vertical
9848.00	28.03	38.62	14.31	25.30	55.66	74.00	-18.34	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	28.29	31.89	8.70	24.05	44.83	74.00	-29.17	Horizontal
7386.00	28.08	36.49	11.76	26.90	49.43	74.00	-24.57	Horizontal
9848.00	27.79	38.62	14.31	25.30	55.42	74.00	-18.58	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					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
4924.00	25.56	31.89	8.70	24.05	42.10	54.00	-11.90	Vertical
7386.00	21.50	36.49	11.76	26.90	42.85	54.00	-11.15	Vertical
9848.00	14.63	38.62	14.31	25.30	42.26	54.00	-11.74	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	25.47	31.89	8.70	24.05	42.01	54.00	-11.99	Horizontal
7386.00	22.54	36.49	11.76	26.90	43.89	54.00	-10.11	Horizontal
9848.00	16.87	38.62	14.31	25.30	44.50	54.00	-9.50	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

**Remark:**

- 1 Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
- 2 “\*”, means this data is too weak instrument of signal is unable to test.

Test mode:	802.11n(HT40)	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	28.91	31.82	8.63	24.15	45.21	74.00	-28.79	Vertical
7266.00	29.98	36.28	11.69	26.58	51.37	74.00	-22.63	Vertical
9688.00	29.97	38.13	14.21	25.41	56.90	74.00	-17.10	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4844.00	28.95	31.82	8.63	24.15	45.25	74.00	-28.75	Horizontal
7266.00	29.79	36.28	11.69	26.58	51.18	74.00	-22.82	Horizontal
9688.00	30.11	38.13	14.21	25.41	57.04	74.00	-16.96	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					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	24.41	31.82	8.63	24.15	40.71	54.00	-13.29	Vertical
7266.00	20.28	36.28	11.69	26.58	41.67	54.00	-12.33	Vertical
9688.00	16.57	38.13	14.21	25.41	43.50	54.00	-10.50	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4844.00	24.45	31.82	8.63	24.15	40.75	54.00	-13.25	Horizontal
7266.00	20.89	36.28	11.69	26.58	42.28	54.00	-11.72	Horizontal
9688.00	16.21	38.13	14.21	25.41	43.14	54.00	-10.86	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

*Remark:*

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. “\*”, means this data is too weak instrument of signal is unable to test.

Test mode:	802.11n(HT40)	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	30.30	31.85	8.66	24.10	46.71	74.00	-27.29	Vertical
7311.00	28.54	36.37	11.71	26.71	49.91	74.00	-24.09	Vertical
9748.00	28.67	38.27	14.25	25.38	55.81	74.00	-18.19	Vertical
12185.00	*					74.00		Vertical
14682.00	*					74.00		Vertical
17179.00	*					74.00		Vertical
4874.00	30.46	31.85	8.66	24.10	46.87	74.00	-27.13	Horizontal
7311.00	29.56	36.37	11.71	26.71	50.93	74.00	-23.07	Horizontal
9748.00	29.26	38.27	14.25	25.38	56.40	74.00	-17.60	Horizontal
12185.00	*					74.00		Horizontal
14682.00	*					74.00		Horizontal
17179.00	*					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	26.10	31.85	8.66	24.10	42.51	54.00	-11.49	Vertical
7311.00	21.84	36.37	11.71	26.71	43.21	54.00	-10.79	Vertical
9748.00	16.97	38.27	14.25	25.38	44.11	54.00	-9.89	Vertical
12185.00	*					54.00		Vertical
14682.00	*					54.00		Vertical
17179.00	*					54.00		Vertical
4874.00	25.06	31.85	8.66	24.10	41.47	54.00	-12.53	Horizontal
7311.00	21.16	36.37	11.71	26.71	42.53	54.00	-11.47	Horizontal
9748.00	15.06	38.27	14.25	25.38	42.20	54.00	-11.80	Horizontal
12185.00	*					54.00		Horizontal
14682.00	*					54.00		Horizontal
17179.00	*					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.

Test mode:	802.11n(HT40)	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
4904.00	28.15	31.88	8.68	24.08	44.63	74.00	-29.37	Vertical
7356.00	28.56	36.45	11.74	26.84	49.91	74.00	-24.09	Vertical
9808.00	28.80	38.52	14.29	25.33	56.28	74.00	-17.72	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4904.00	29.10	31.88	8.68	24.08	45.58	74.00	-28.42	Horizontal
7356.00	28.66	36.45	11.74	26.84	50.01	74.00	-23.99	Horizontal
9808.00	29.16	38.52	14.29	25.33	56.64	74.00	-17.36	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					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
4904.00	24.55	31.88	8.68	24.08	41.03	54.00	-12.97	Vertical
7356.00	22.06	36.45	11.74	26.84	43.41	54.00	-10.59	Vertical
9808.00	15.60	38.52	14.29	25.33	43.08	54.00	-10.92	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4904.00	24.80	31.88	8.68	24.08	41.28	54.00	-12.72	Horizontal
7356.00	19.56	36.45	11.74	26.84	40.91	54.00	-13.09	Horizontal
9808.00	16.86	38.52	14.29	25.33	44.34	54.00	-9.66	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

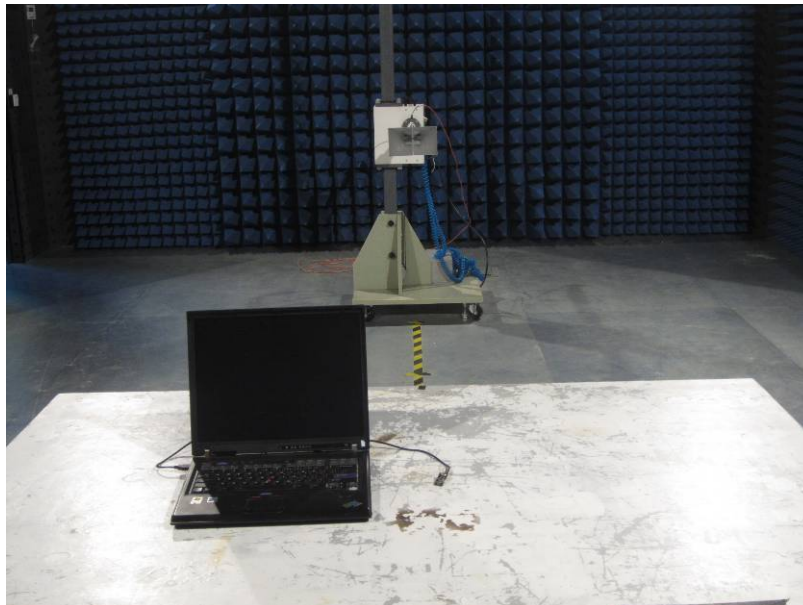
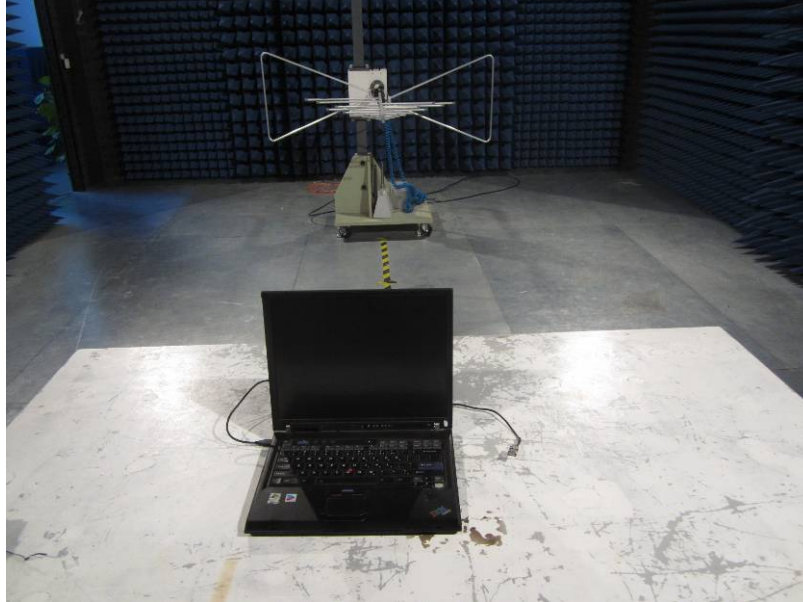
*Remark:*

- 1 Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
- 2 “\*”, means this data is too weak instrument of signal is unable to test.



## 7 Test Setup Photo

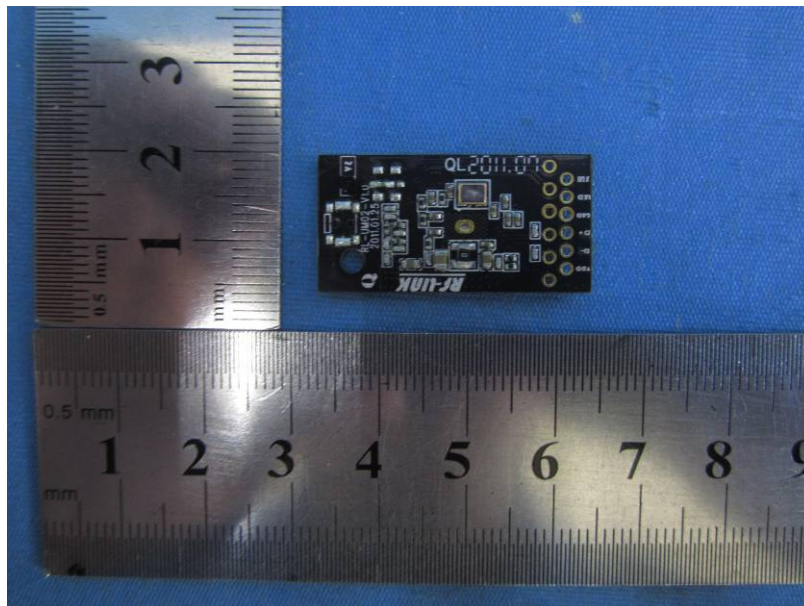
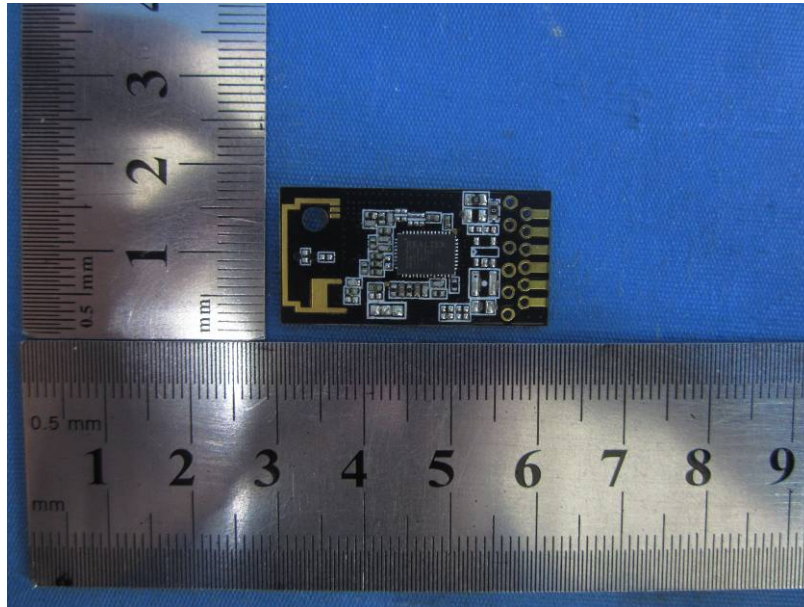
Radiated Emission

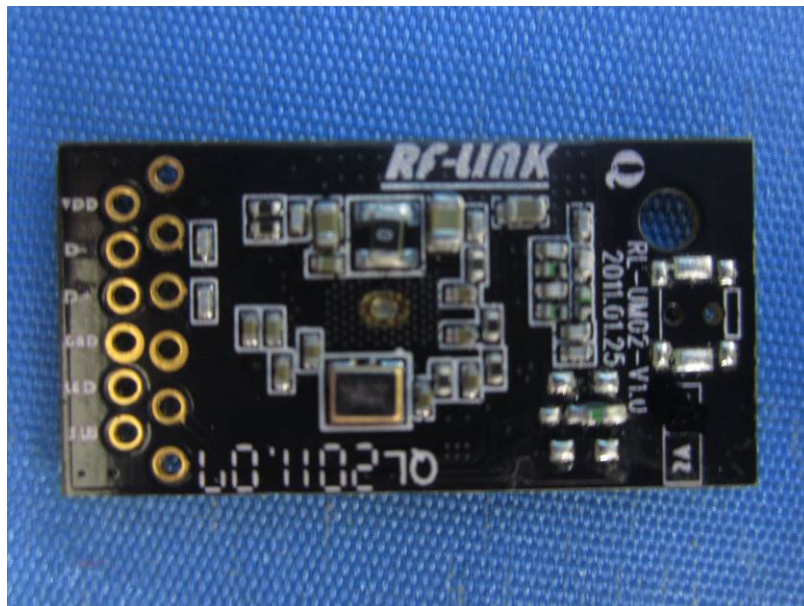
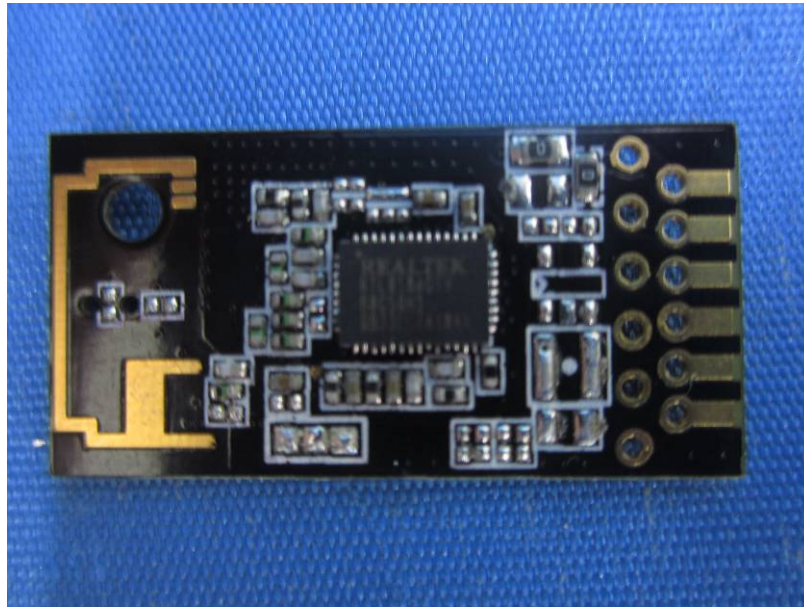


Conducted Emission



## 8 EUT Constructional Details





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