Report No: GTSE10090022801

FCC REPORT

Applicant:	Topstar Overseas Electronics Co., Ltd.
Address of Applicant:	4-7/F, Building B, ChengChengFa Industrial Zone, Shenzhen export Processing Zone, PingShan new District, Shenzhen, China.

Equipment Under Test (EUT)

Product Name:	All-In-One PC
Model No.:	P81
FCC ID:	YVW-P81
Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247:2009
Date of Receipt:	08 Oct., 2010
Date of Test:	08-22 Oct., 2010
Date of Issue:	22 Oct., 2010
Test Result :	PASS *

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

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Contents

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3 Test Summary

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

Remark:

- *Passed: The EUT complies with the essential requirements in the standard.*
- *Failed: The EUT does not comply with the essential requirements in the standard.*
- *Tx: In this whole report Tx (or tx) means Transmitter.*
- *Rx: In this whole report Rx (or rx) means Receiver.*

4 General Information

4.1 Client Information

Applicant:	Topstar Overseas Electronics Co., Ltd.
Address of Applicant:	4-7/F, Building B, ChengChengFa Industrial Zone, Shenzhen export Processing Zone, PingShan new District, Shenzhen, China.
Manufacturer/ Factory:	Topstar Overseas Electronics Co., Ltd.
Address of Manufacturer/ Factory:	4-7/F, Building B, ChengChengFa Industrial Zone, Shenzhen export Processing Zone, PingShan new District, Shenzhen, China.

4.2 General Description of E.U.T.

Product Name:	All-In-One PC
Model No.:	P81
Operation Frequency:	2412MHz~2462MHz
Channel numbers:	11 for 802.11b/802.11g/802.11(H20) 7 for 802.11(H40)
Channel separation:	5MHz
Modulation technology: (IEEE 802.11b)	Direct Sequence Spread Spectrum (DSSS)
Modulation technology: (IEEE 802.11g/802.11n)	Orthogonal Frequency Division Multiplexing(OFDM)
Data speed (IEEE 802.11b):	1Mbps, 2Mbps, 5.5Mbps, 11Mbps
Data speed (IEEE 802.11g):	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps
Data speed (IEEE 802.11n):	Up to 150Mbps
Antenna Type:	Integral
Antenna gain:	2dBi (declare by Applicant)
Power supply:	Input: AC 100-240V, 2A, 50-60Hz Output: DC 19V 3.42A

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		

Note:

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

802.11b/802.11g/802.11n(H20)

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

802.11n(H40)

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

Test environment and mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Operation mode	Keep the EUT in running with full load.

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(H20)	6.5Mbps
802.11n(H40)	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(H20), 13Mbps for 802.11n(H40)

4.3 Test Facility

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

● **FCC —Registration No.: 600491**

Global United Technology Service Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in out files. Registration 600491, July 20, 2010.

● **Industry Canada (IC)**

The 3m Semi-anechoic chamber of Global United Technology Service Co., Ltd. Has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-1.

4.4 Test Location

All tests were performed at:

Global United Technology Service Co., Ltd.
Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China
Tel: 0755-27798480
Fax: 0755-27798960

4.5 Other Information Requested by the Customer

None.

4.6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS201	Mar. 30 2010	Mar. 30 2011
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS202	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Sep. 10 2010	Sep. 10 2011
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS204	Sep. 10 2010	Sep. 10 2011
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS205	June 30 2010	June 30 2011
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Coaxial Cable	GTS	N/A	GTS400	Apr. 01 2010	Apr. 01 2011
8	Coaxial Cable	GTS	N/A	GTS401	Apr. 01 2010	Apr. 01 2011
9	Coaxial cable	GTS	N/A	GTS402	Apr. 01 2010	Apr. 01 2011
10	Coaxial Cable	GTS	N/A	GTS407	Apr. 01 2010	Apr. 01 2011
11	Coaxial Cable	GTS	N/A	GTS408	Apr. 01 2010	Apr. 01 2011
12	Amplifier(10KHz-5GHz)	Sonnoma Instrument	305-1052	GTS210	Aug. 03 2010	Aug. 03 2011
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS231	Aug. 03 2010	Aug. 03 2011
14	Power Meter	Rohde & Schwarz	NRVD	SEL0069	June 23 2010	June 23 2011
14	Power Sensor	Rohde & Schwarz	URV5-Z2	SEL0071	June 23 2010	June 23 2011

Conducted Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS206	Apr. 10 2010	Apr. 10 2011
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS208	Sep. 14 2010	Sep. 14 2011
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS209	Sep. 14 2010	Sep. 14 2011
4	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS207	Apr. 14 2010	Apr. 14 2011
5	Coaxial Cable	GTS	N/A	GTS406	Apr. 01 2010	Apr. 01 2011
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

5 Test results and Measurement Data

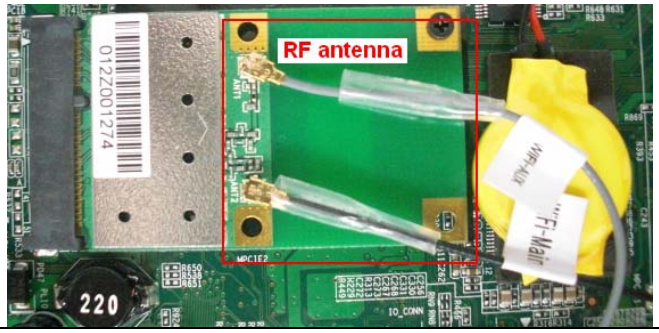
5.1 Antenna requirement:

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

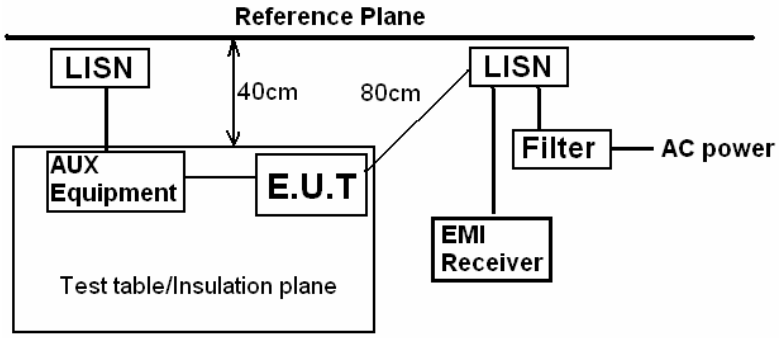
15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer 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.

E.U.T Antenna:	

The antenna is no consideration of replacement. The best case gain of the antenna is 2.0dBi.



5.2 Conducted Emissions

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4: 2003</td></tr>
<tr><td>Test Frequency Range:</td><td>150KHz to 30MHz</td></tr>
<tr><td>Class / Severity:</td><td>Class B</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9KHz, VBW=30KHz</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<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>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test procedure</td><td>The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 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.</td></tr>
<tr><td>Test setup:</td><td> 

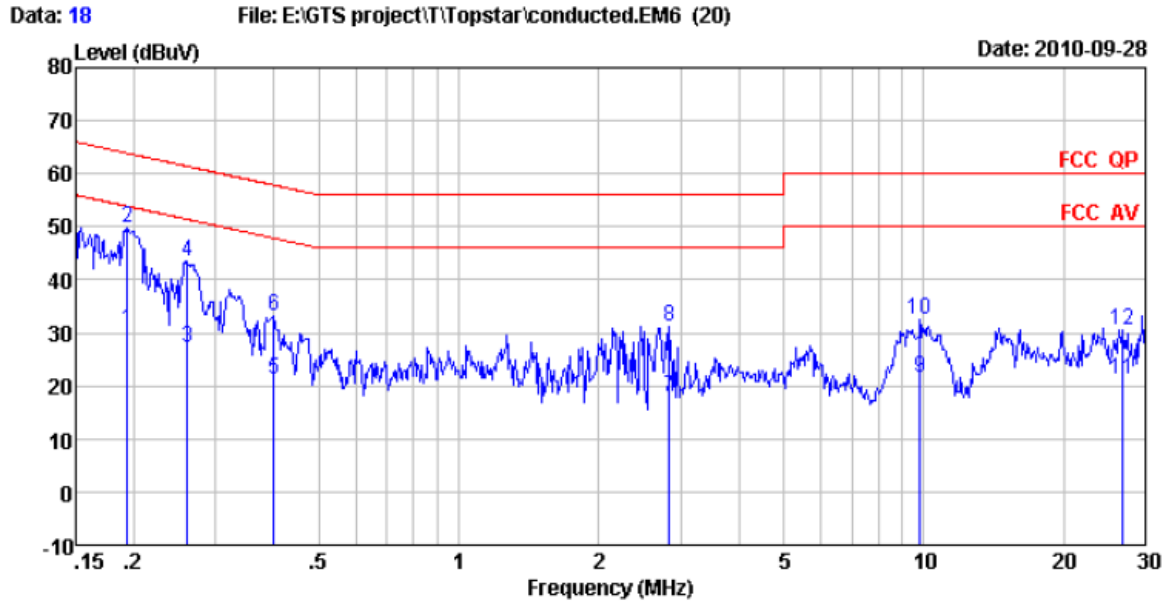
Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 4.7 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 4.3 for details</td></tr>
<tr><td>Test results:</td><td>Passed</td></tr>
</table>

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

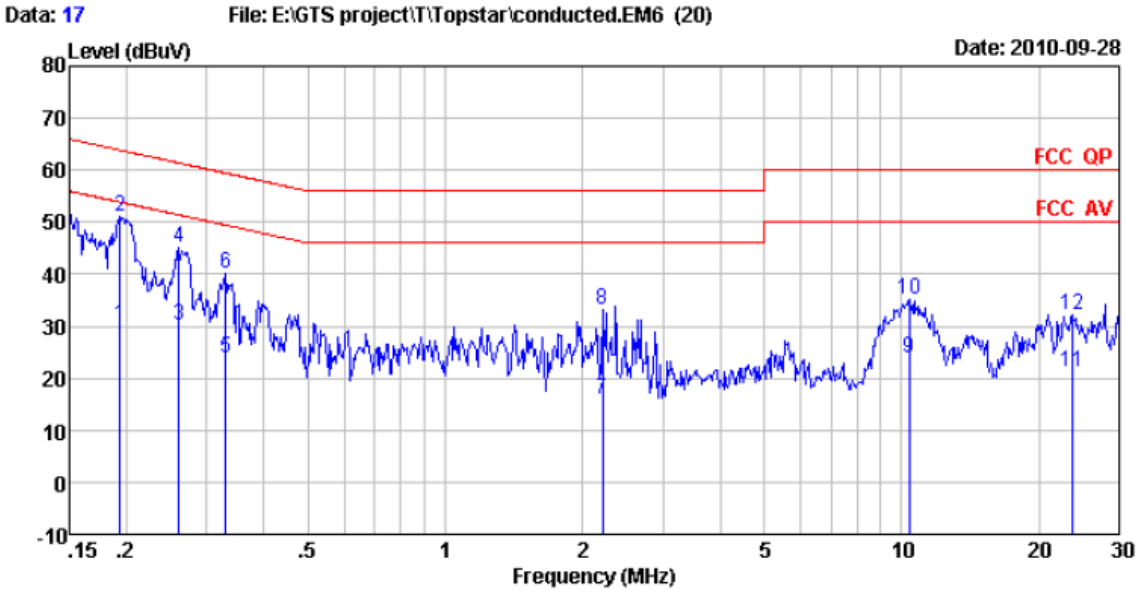
Live Line:



Condition : FCC QP LISN LINE
Job No. : 228IT
EUT : All-In-One PC
Test Mode : Operation mode
Test Engineer: Franks

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.193	26.70	3.66	0.01	30.37	53.89	-23.52	Average
2	0.193	46.00	3.66	0.01	49.67	63.89	-14.22	QP
3	0.260	23.40	3.63	0.01	27.04	51.42	-24.38	Average
4	0.260	39.83	3.63	0.01	43.47	61.42	-17.95	QP
5	0.400	17.50	3.58	0.01	21.09	47.86	-26.77	Average
6	0.400	29.73	3.58	0.01	33.32	57.86	-24.54	QP
7	2.839	14.50	3.36	0.19	18.05	46.00	-27.95	Average
8	2.839	27.48	3.36	0.19	31.03	56.00	-24.97	QP
9	9.809	17.80	3.22	0.40	21.42	50.00	-28.58	Average
10	9.809	28.92	3.22	0.40	32.54	60.00	-27.46	QP
11	26.841	17.80	3.11	0.45	21.36	50.00	-28.64	Average
12	26.841	27.04	3.11	0.45	30.60	60.00	-29.40	QP

Neutral Line:



Condition : FCC QP LISN NEUTRAL
Job No. : 228IT
EUT : All-In-One PC
Test Mode : Operation mode
Test Engineer: Franks

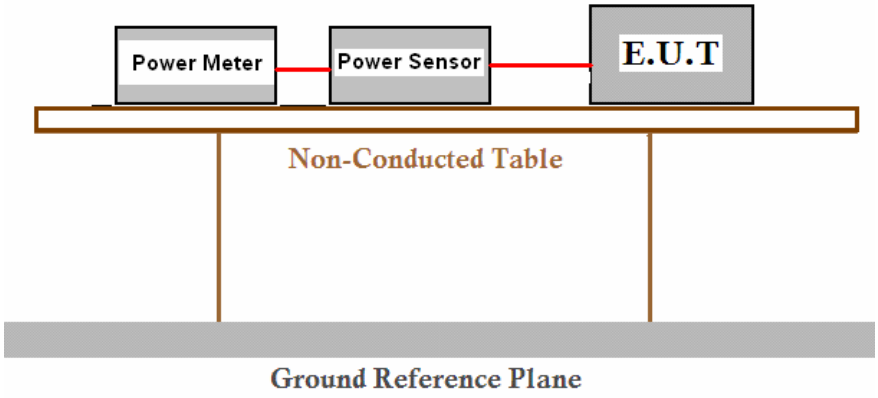
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.193	26.50	3.66	0.01	30.17	53.89	-23.72	Average
2	0.193	47.55	3.66	0.01	51.22	63.89	-12.67	QP
3	0.260	26.50	3.63	0.01	30.14	51.42	-21.28	Average
4	0.260	41.41	3.63	0.01	45.05	61.42	-16.37	QP
5	0.330	20.10	3.60	0.01	23.71	49.44	-25.73	Average
6	0.330	36.61	3.60	0.01	40.22	59.44	-19.22	QP
7	2.213	12.40	3.39	0.13	15.92	46.00	-30.08	Average
8	2.213	29.49	3.39	0.13	33.01	56.00	-22.99	QP
9	10.397	20.10	3.22	0.40	23.72	50.00	-26.28	Average
10	10.397	31.51	3.22	0.40	35.13	60.00	-24.87	QP
11	23.636	17.50	3.13	0.45	21.08	50.00	-28.92	Average
12	23.636	28.45	3.13	0.45	32.03	60.00	-27.97	QP

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

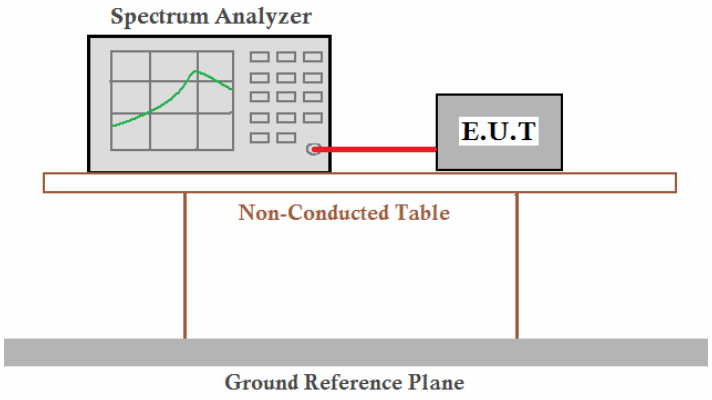
5.3 Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	30dBm
Test setup:	
Test procedure:	A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.
Test Instruments:	Refer to section 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

Measurement Data

802.11b mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	21.57	30.00	Pass
Middle	21.67	30.00	Pass
Highest	20.38	30.00	Pass
802.11g mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	22.56	30.00	Pass
Middle	21.55	30.00	Pass
Highest	20.75	30.00	Pass
802.11n-H20 mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	24.76	30.00	Pass
Middle	23.83	30.00	Pass
Highest	23.33	30.00	Pass
802.11n-H40 mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	21.70	30.00	Pass
Middle	21.03	30.00	Pass
Highest	20.41	30.00	Pass

5.4 6dB Occupy Bandwidth

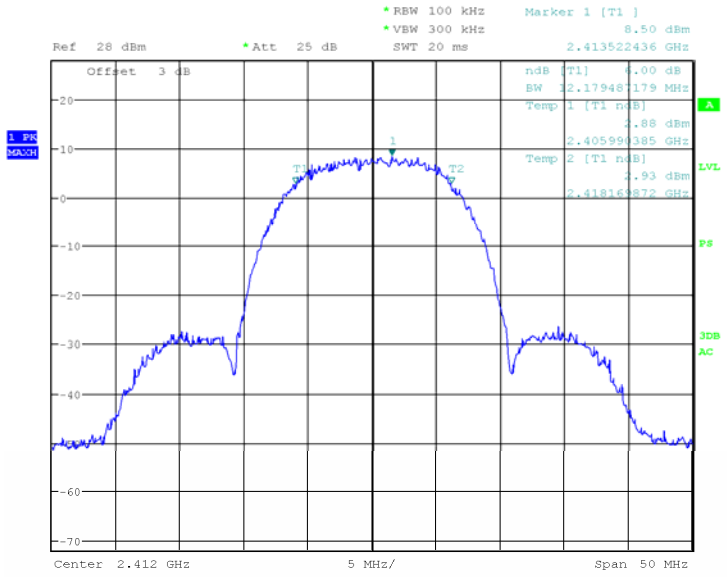
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	>500KHz
Test setup:	
Test Instruments:	Refer to section 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

Measurement Data

802.11b mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (KHz)	Result
Lowest	12.179	>500	Pass
Middle	11.618	>500	Pass
Highest	11.698	>500	Pass
802.11g mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (KHz)	Result
Lowest	16.410	>500	Pass
Middle	16.442	>500	Pass
Highest	16.602	>500	Pass
802.11n-H20 mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (KHz)	Result
Lowest	17.820	>500	Pass
Middle	17.724	>500	Pass
Highest	17.820	>500	Pass
802.11n-H40 mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (KHz)	Result
Lowest	36.699	>500	Pass
Middle	36.699	>500	Pass
Highest	36.699	>500	Pass

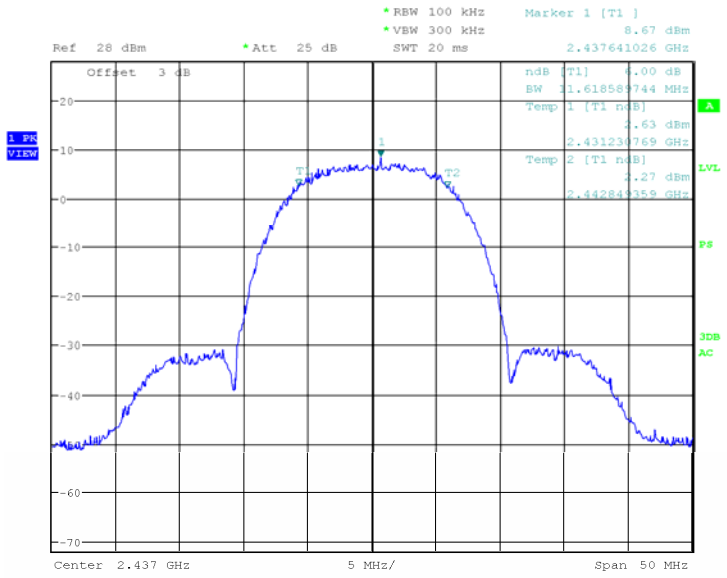
Test plot as follows:

Test mode:	802.11b	Test channel:	Lowest



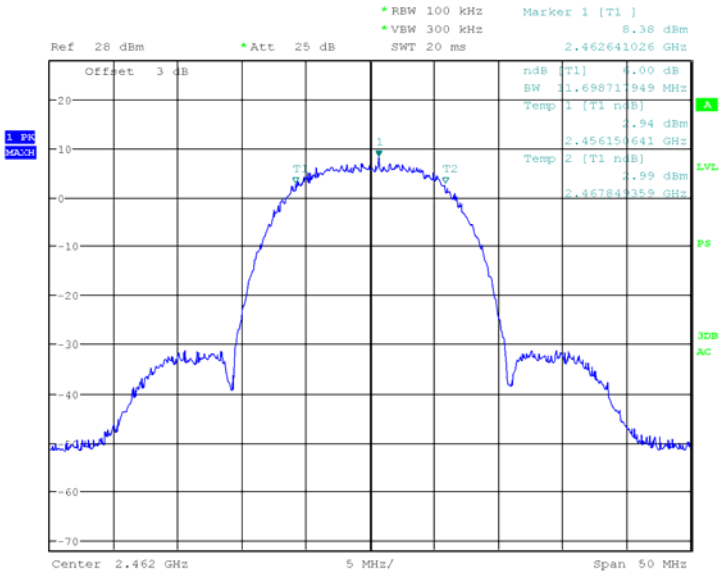
Date: 21.OCT.2010 12:17:53

Test mode:	802.11b	Test channel:	Middle

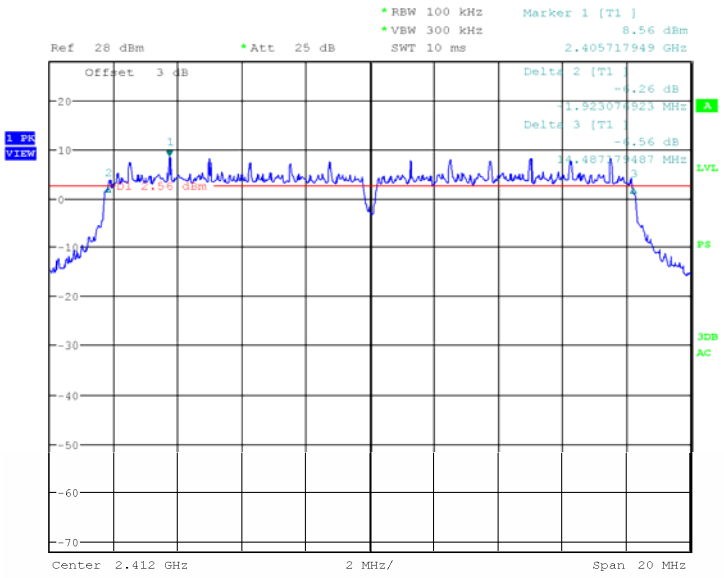


Date: 21.OCT.2010 12:24:48

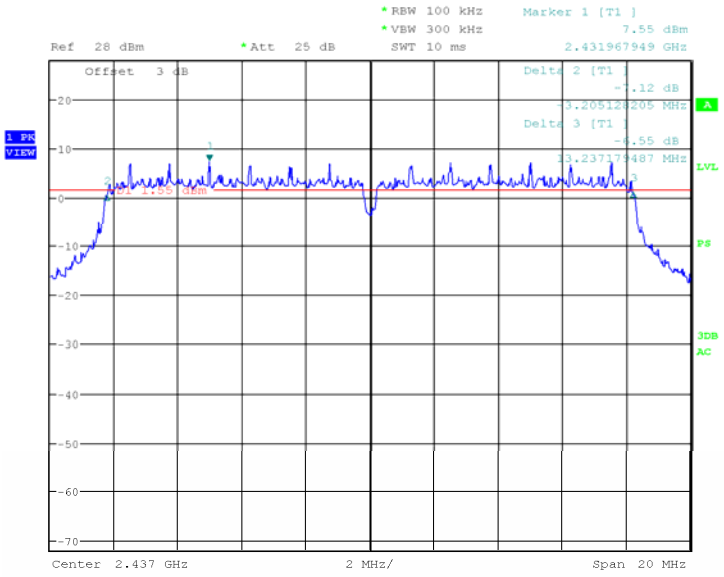
Test mode:	802.11b	Test channel:	Highest



Test mode:	802.11g	Test channel:	Lowest

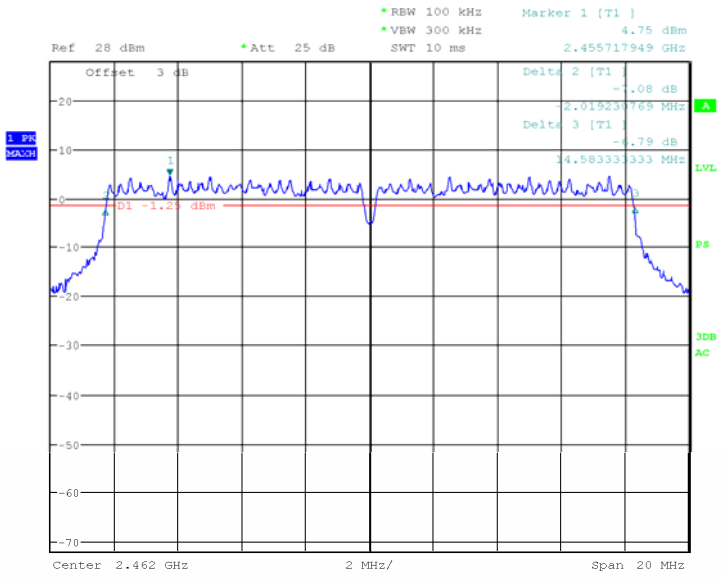


Test mode:	802.11g	Test channel:	Middle



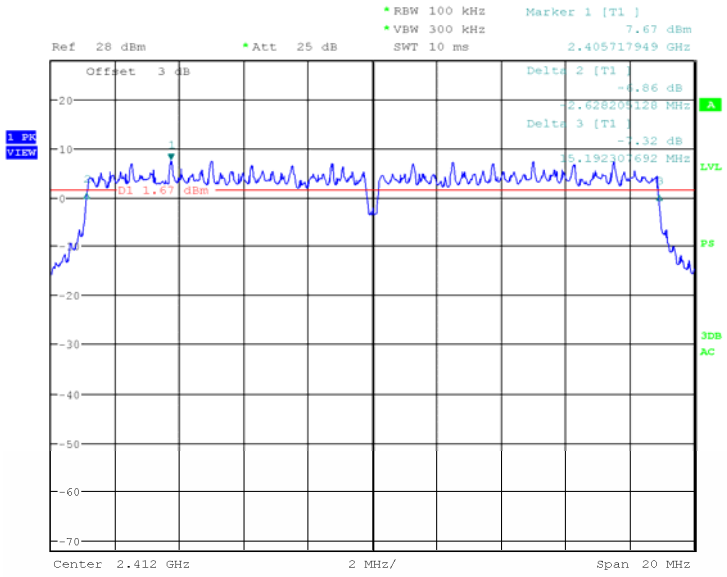
Date: 21.OCT.2010 09:36:59

Test mode:	802.11g	Test channel:	Highest



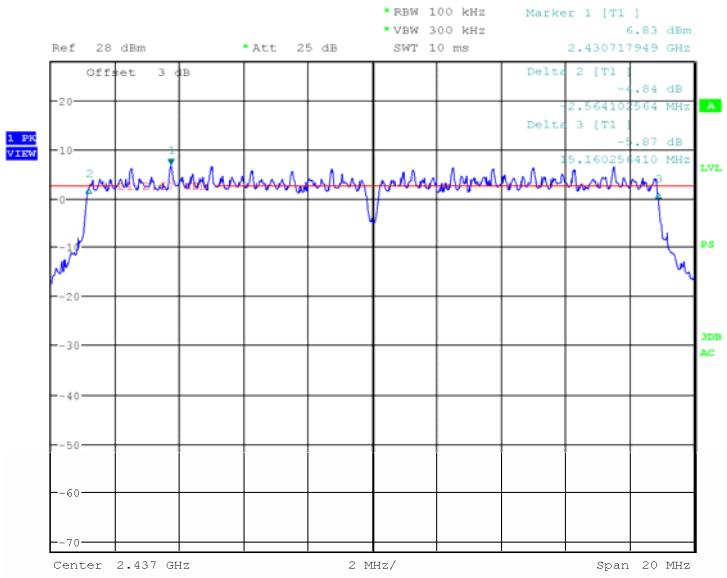
Date: 21.OCT.2010 09:25:17

Test mode:	802.11n-H20	Test channel:	Lowest



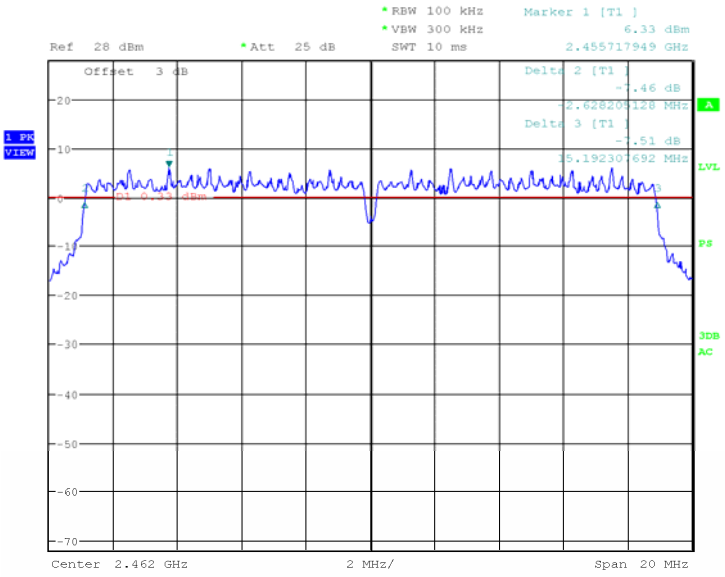
Date: 21.OCT.2010 12:35:20

Test mode:	802.11n-H20	Test channel:	Middle



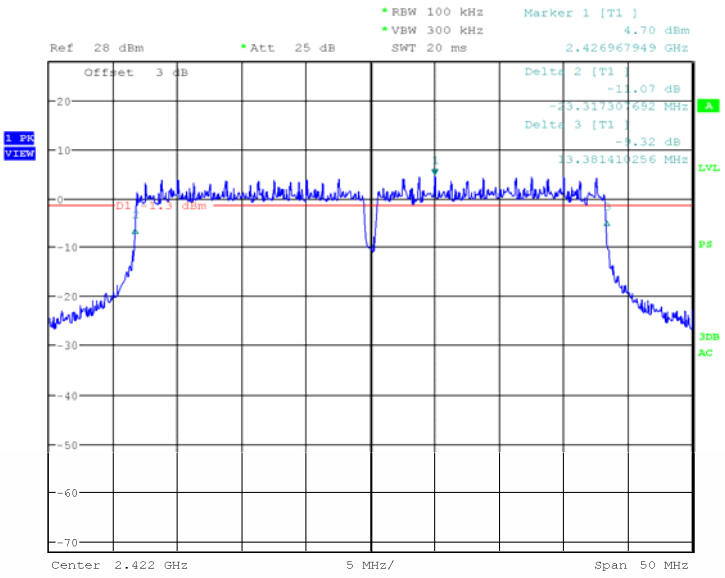
Date: 21.OCT.2010 12:30:19

Test mode:	802.11n-H20	Test channel:	Highest



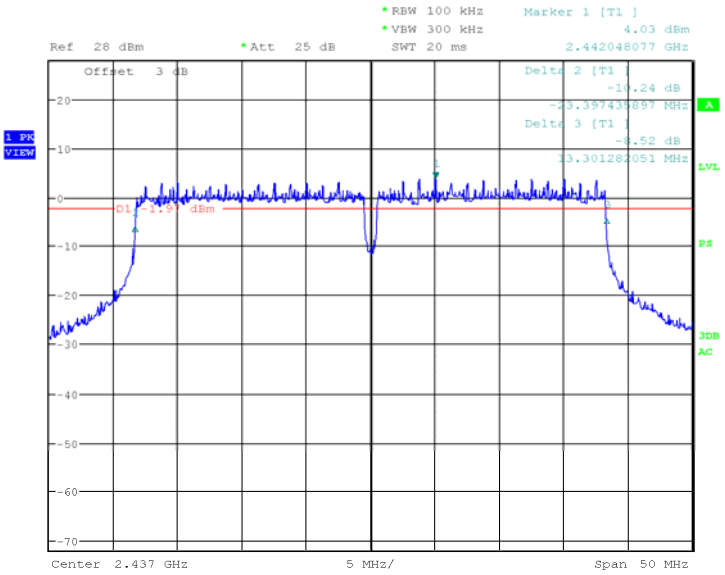
Date: 21.OCT.2010 12:41:44

Test mode:	802.11n-H40	Test channel:	Lowest



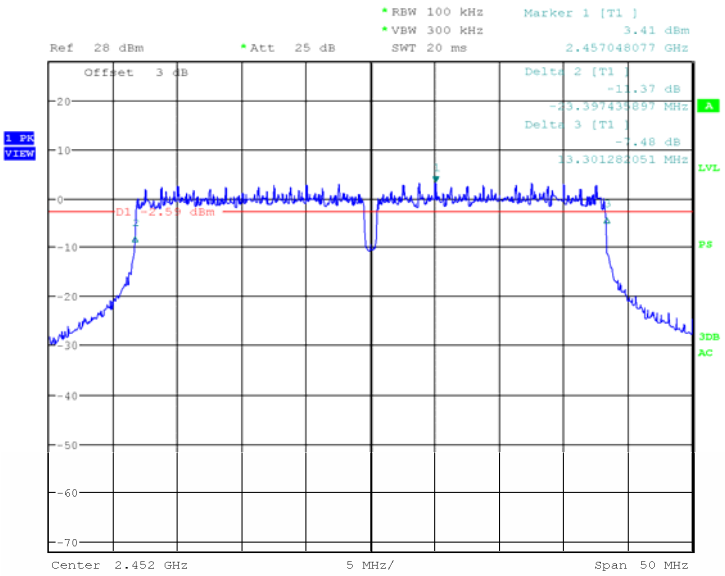
Date: 21.OCT.2010 13:01:07

Test mode:	802.11n-H40	Test channel:	Middle



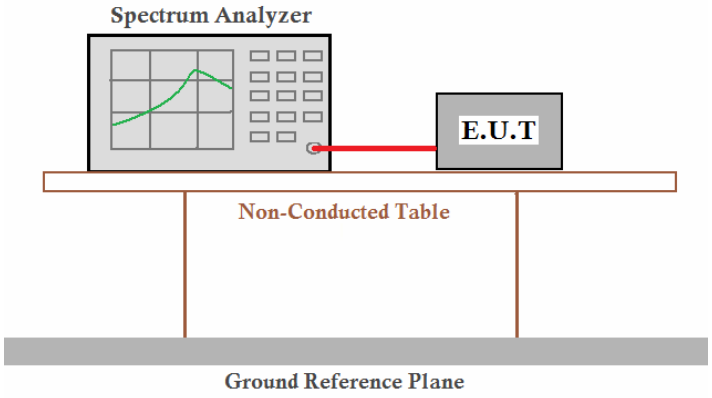
Date: 21.OCT.2010 12:56:15

Test mode:	802.11n-H40	Test channel:	Highest



Date: 21.OCT.2010 12:48:32

5.5 Power Spectral Density

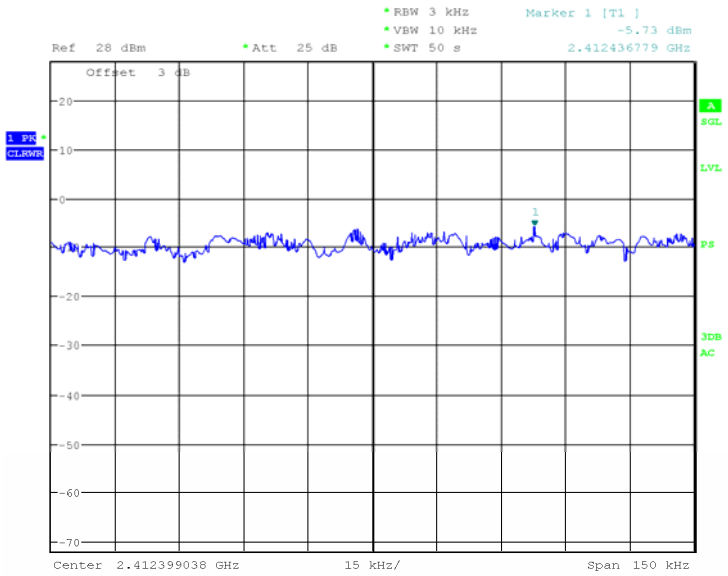
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	8dBm
Test setup:	 *Remark:* *Offset the High-Frequency cable loss 3.0dB in the spectrum analyzer.*
Test Instruments:	Refer to section 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

Measurement Data

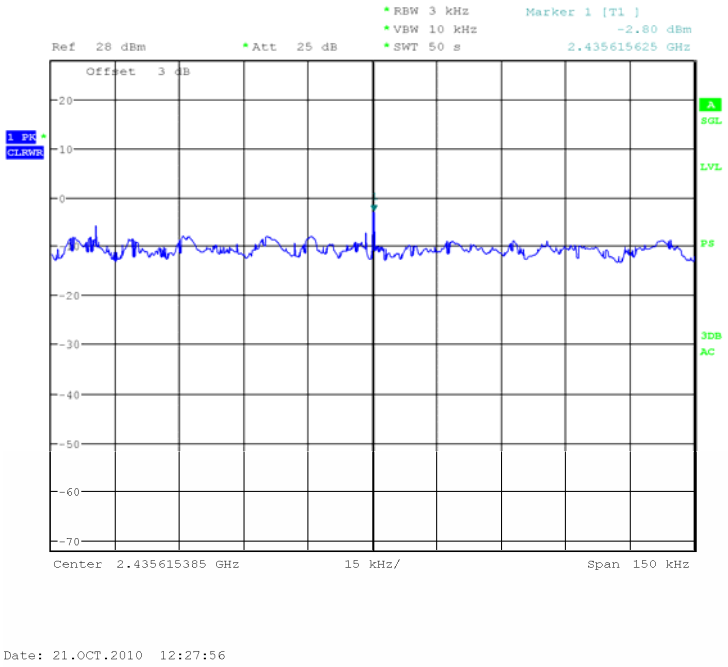
802.11b mode			
Test channel	Power Spectral Density (dBm)	Limit (dBm)	Result
Lowest	-5.73	8.00	Pass
Middle	-2.80	8.00	Pass
Highest	-1.82	8.00	Pass
802.11g mode			
Test channel	Power Spectral Density (dBm)	Limit (dBm)	Result
Lowest	-5.65	8.00	Pass
Middle	-6.00	8.00	Pass
Highest	-7.11	8.00	Pass
802.11n-H20 mode			
Test channel	Power Spectral Density (dBm)	Limit (dBm)	Result
Lowest	-5.61	8.00	Pass
Middle	-7.52	8.00	Pass
Highest	-7.60	8.00	Pass
802.11n-H40 mode			
Test channel	Power Spectral Density (dBm)	Limit (dBm)	Result
Lowest	-8.36	8.00	Pass
Middle	-9.01	8.00	Pass
Highest	-9.22	8.00	Pass

Test plot as follows:

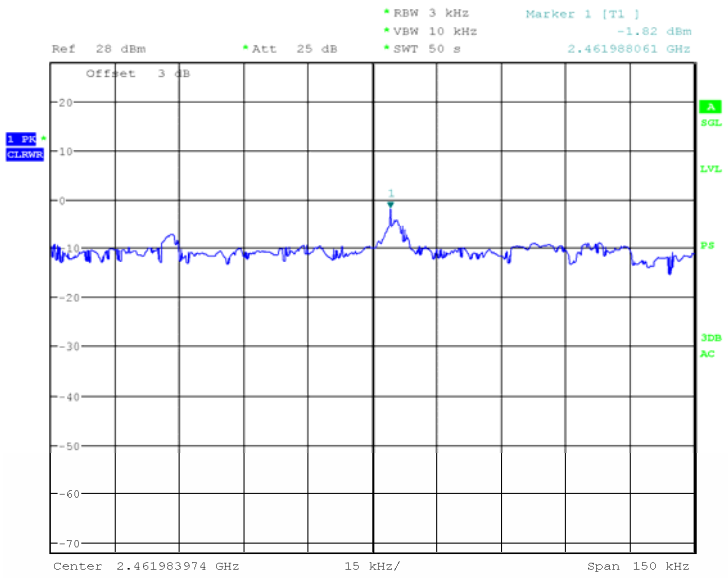
Test mode:	802.11b	Test channel:	Lowest



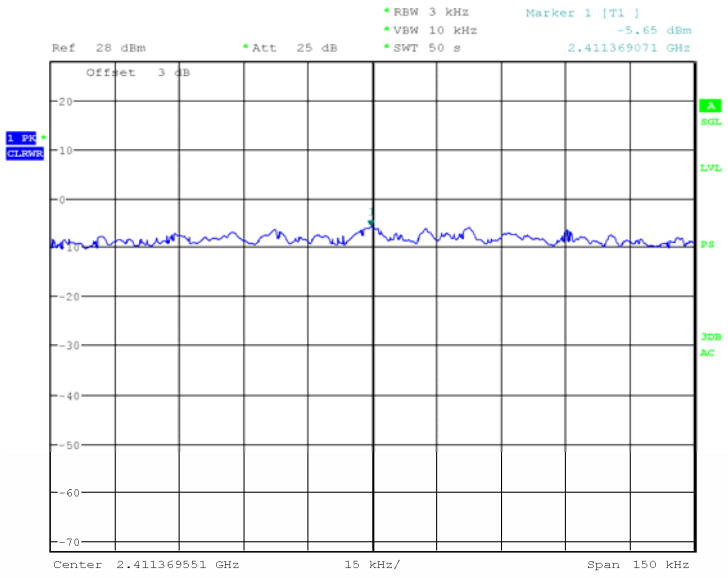
Test mode:	802.11b	Test channel:	Middle



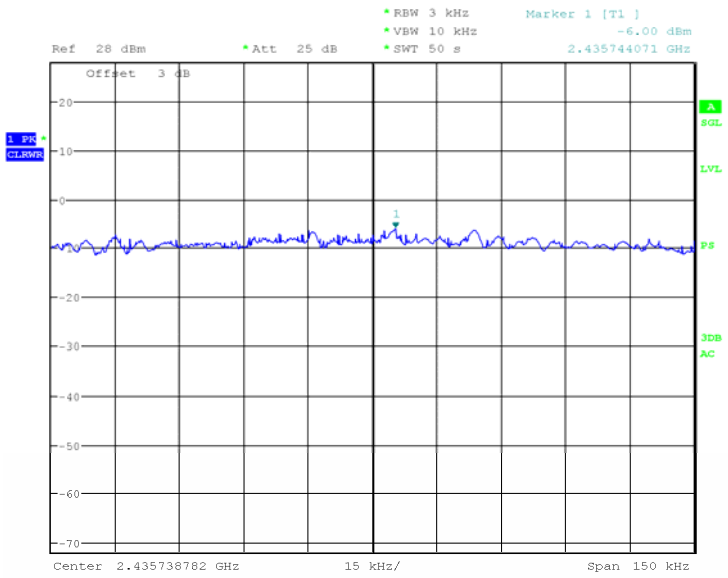
Test mode:	802.11b	Test channel:	Highest



Test mode:	802.11g	Test channel:	Lowest



Test mode:	802.11g	Test channel:	Middle



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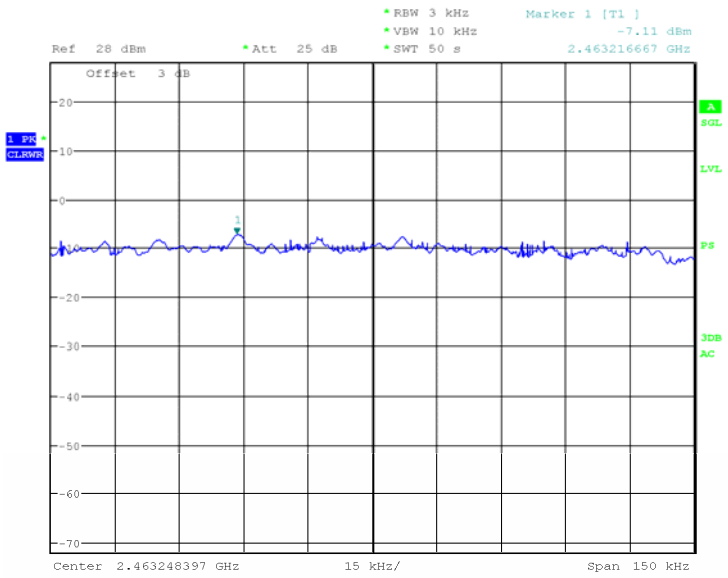
Test mode:	802.11g	Test channel:	Highest



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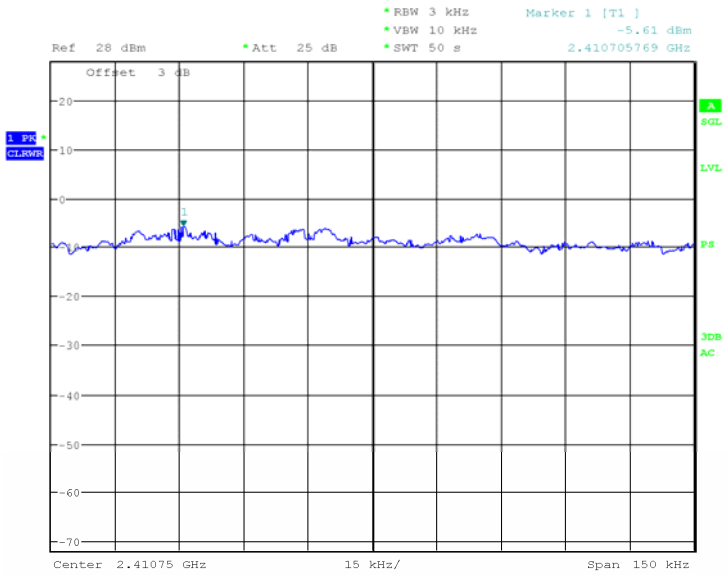
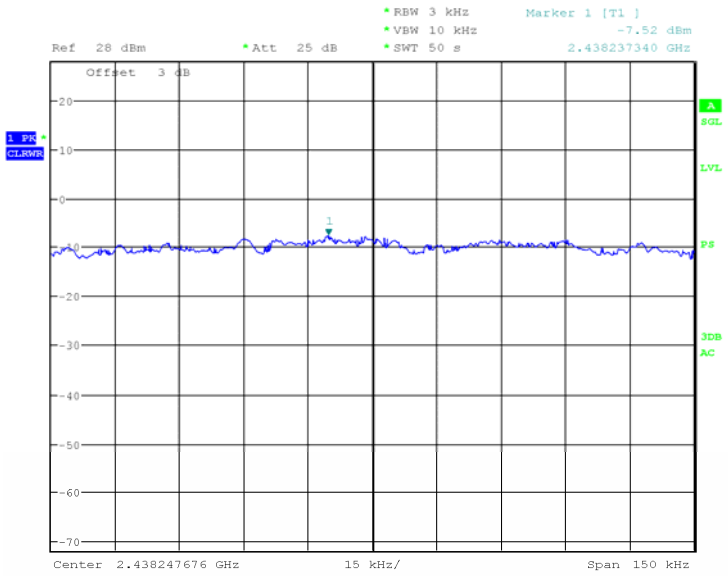
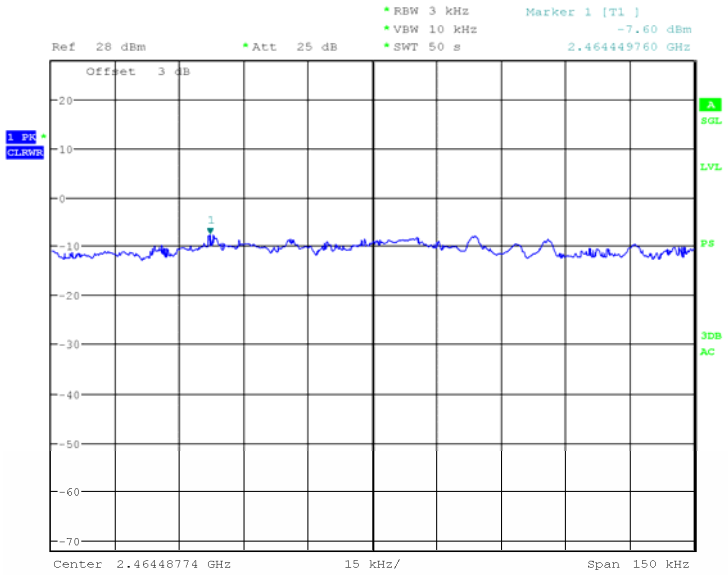
Test mode:	802.11n-H20	Test channel:	Lowest



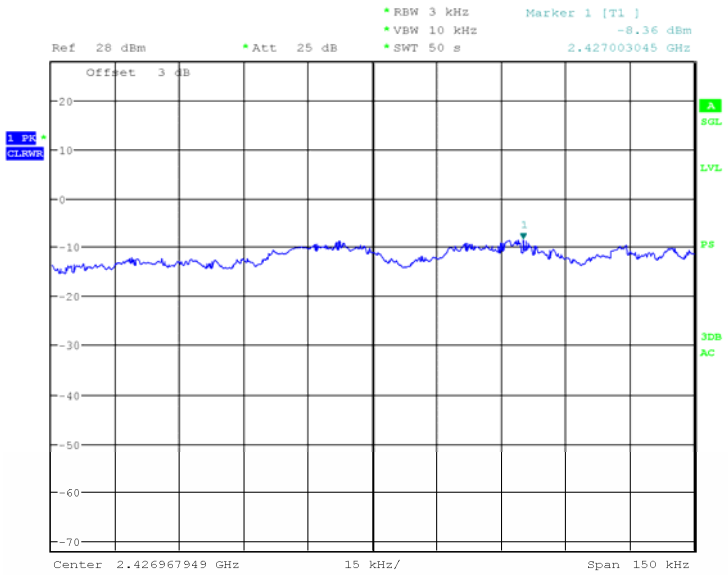
Test mode:	802.11n-H20	Test channel:	Middle



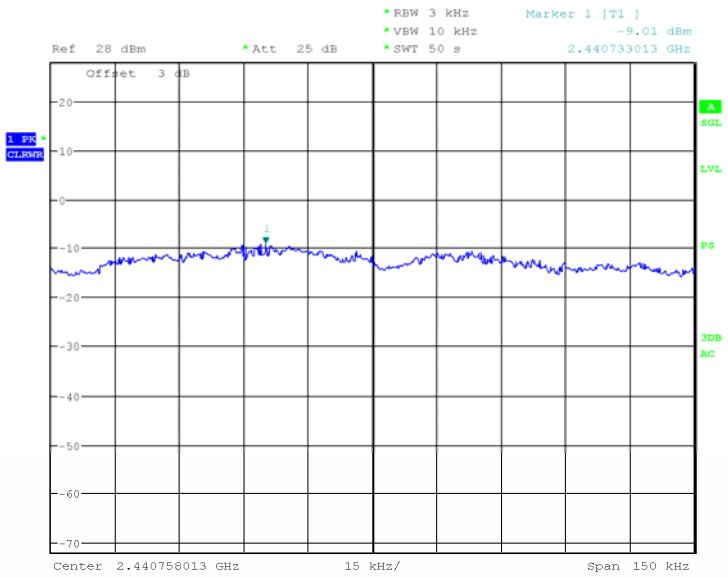
Test mode:	802.11n-H20	Test channel:	Highest



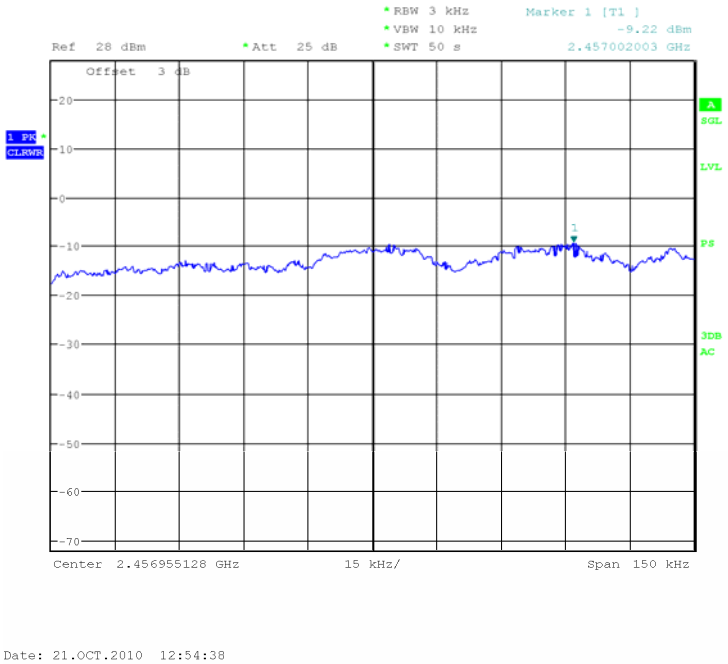
Test mode:	802.11n-H40	Test channel:	Lowest



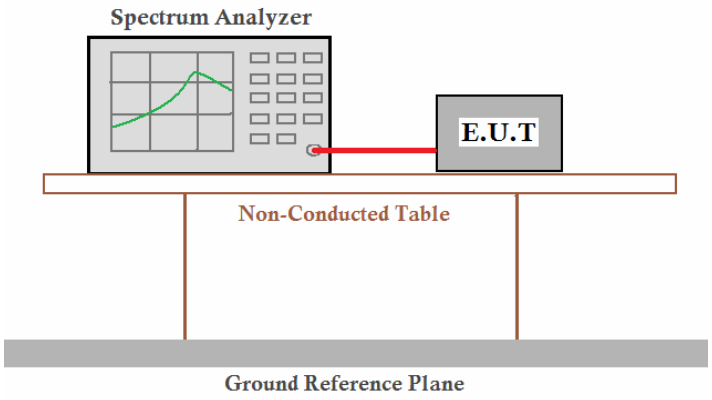
Test mode:	802.11n-H40	Test channel:	Middle



Test mode:	802.11n-H40	Test channel:	Highest

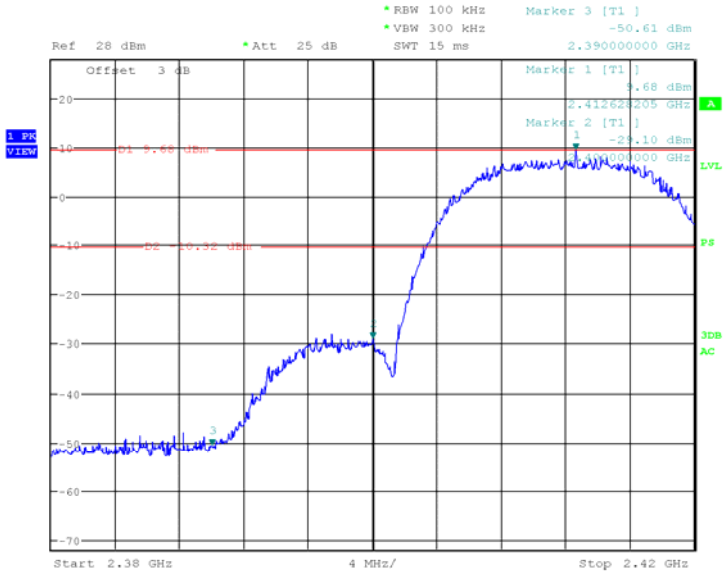


5.6 Band Edge

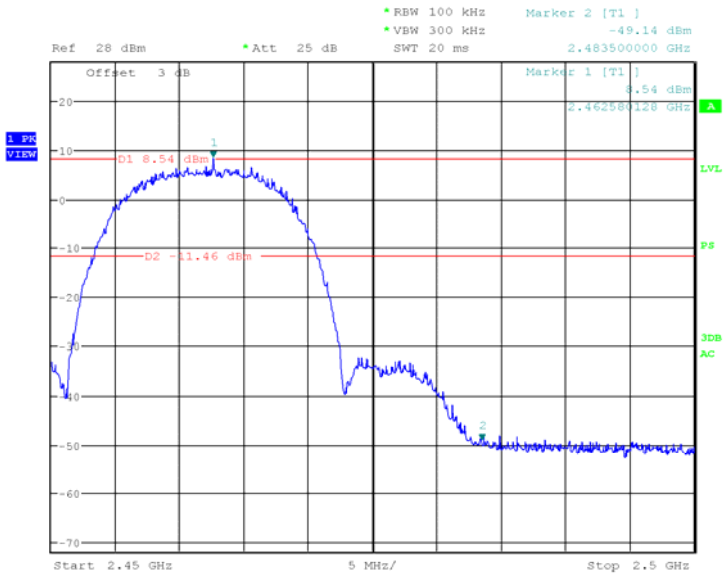
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 *Remark:* *Offset the High-Frequency cable loss 3.0dB in the spectrum analyzer.*
Test Instruments:	Refer to section 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

Test plot as follows:

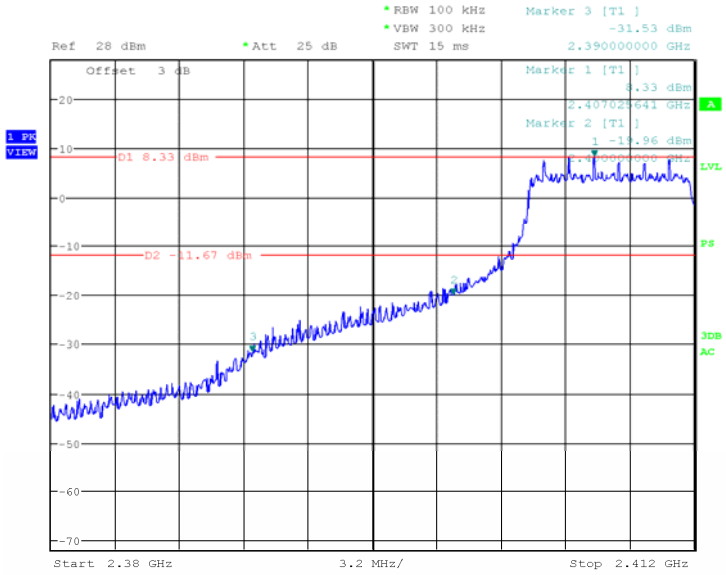
Test mode:	802.11b	Test channel:	Lowest



Test mode:	802.11b	Test channel:	Highest



Test mode:	802.11g	Test channel:	Lowest



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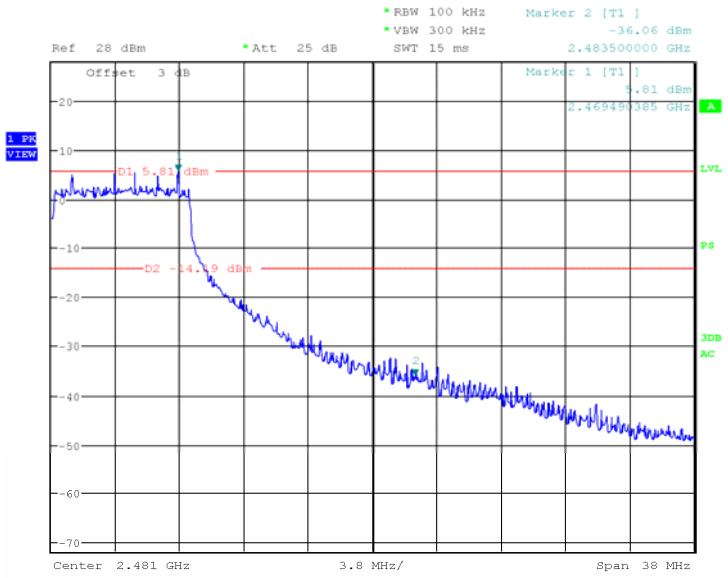
Test mode:	802.11g	Test channel:	Highest



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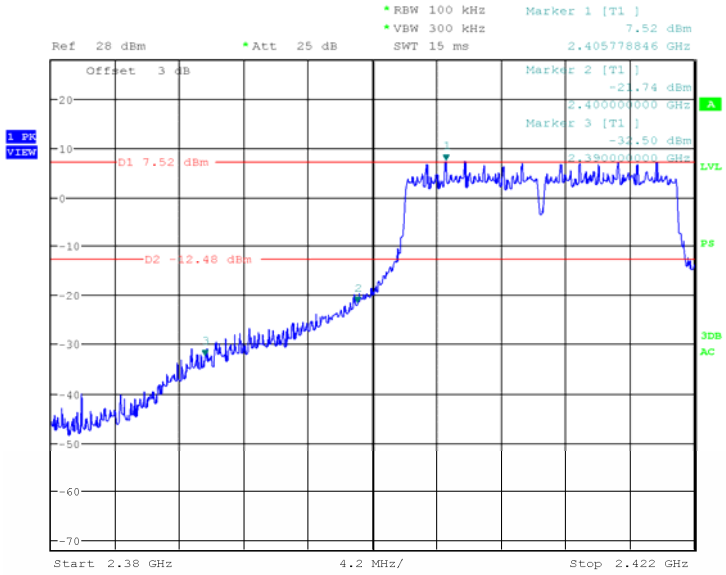
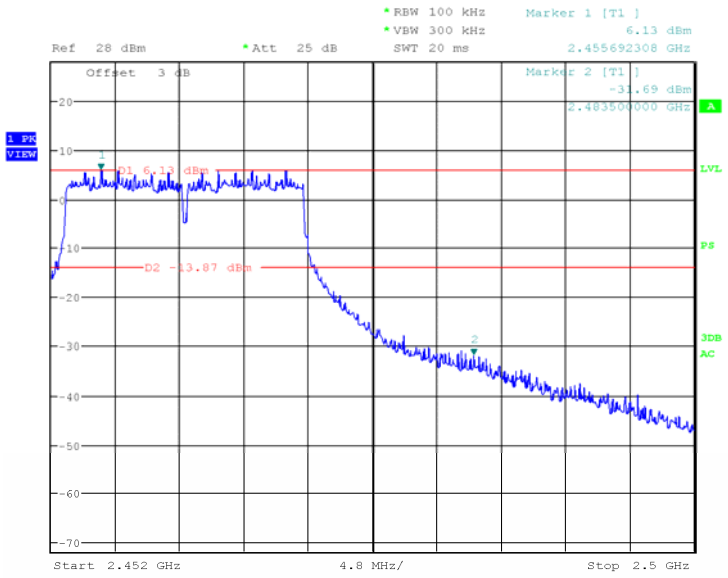
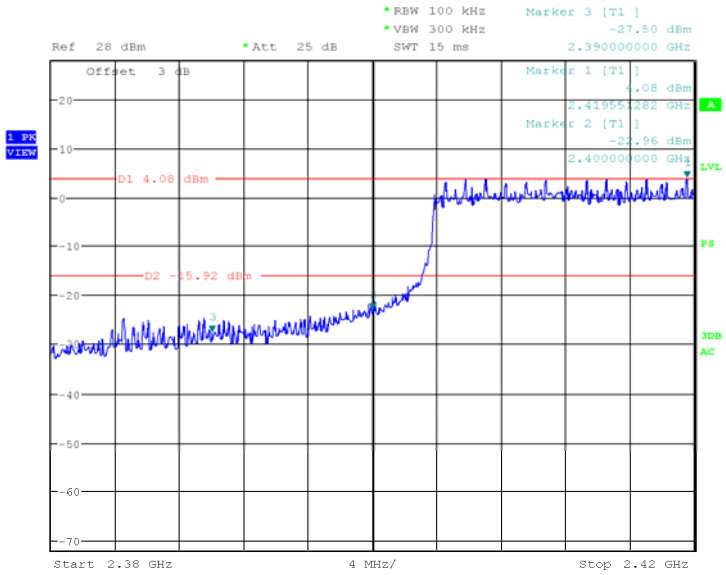
Test mode:	802.11n-H20	Test channel:	Lowest



Test mode:	802.11n-H20	Test channel:	Highest

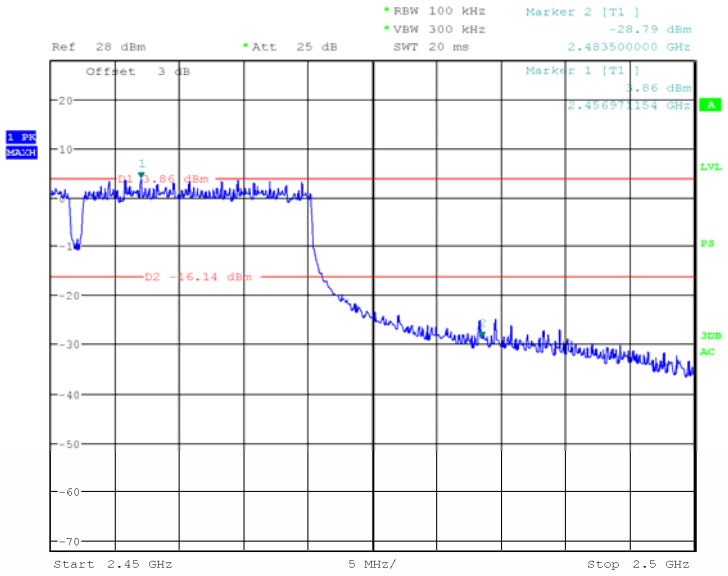


Test mode:	802.11n-H40	Test channel:	Lowest



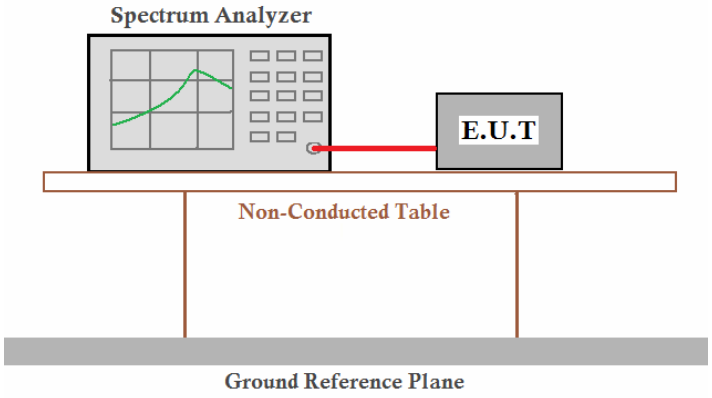
Date: 21.OCT.2010 13:03:07

Test mode:	802.11n-H40	Test channel:	Highest



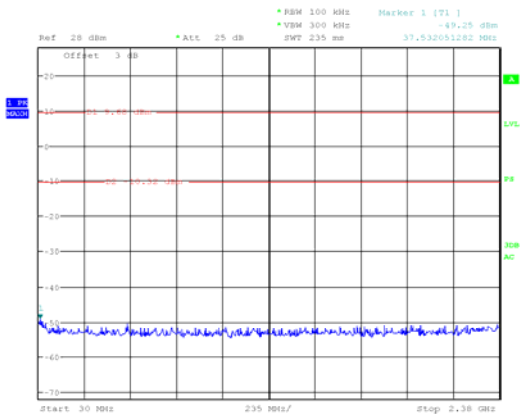
Date: 21.OCT.2010 12:51:45

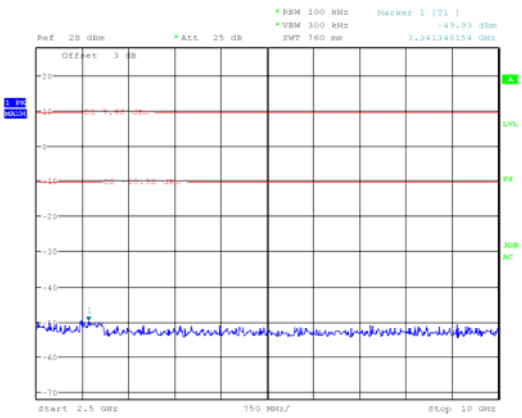
5.7 RF Antenna Conducted spurious emissions

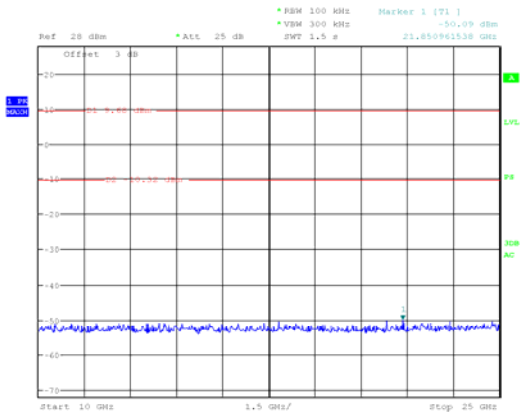
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 *Remark:* *Offset the High-Frequency cable loss 3.0dB in the spectrum analyzer.*
Test Instruments:	Refer to section 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

Test plot as follows:

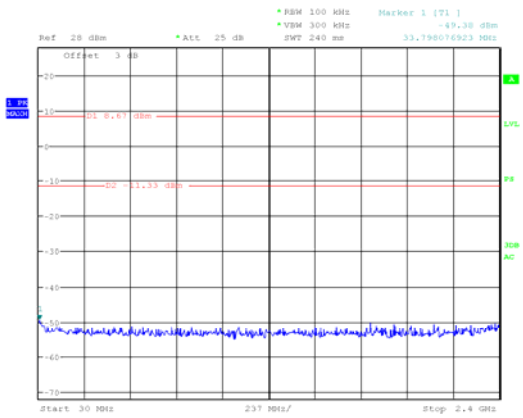
Test mode:	802.11b	Test channel:	Lowest

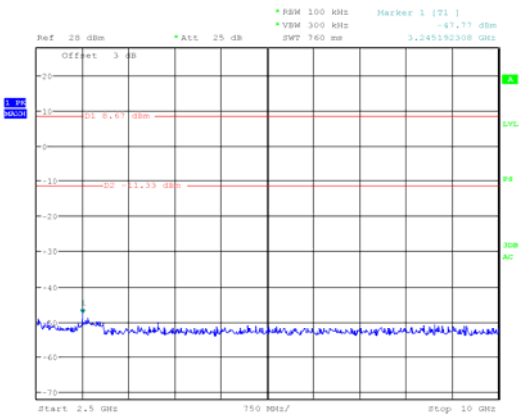


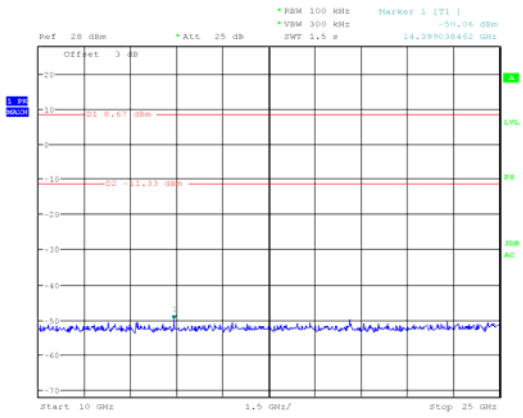




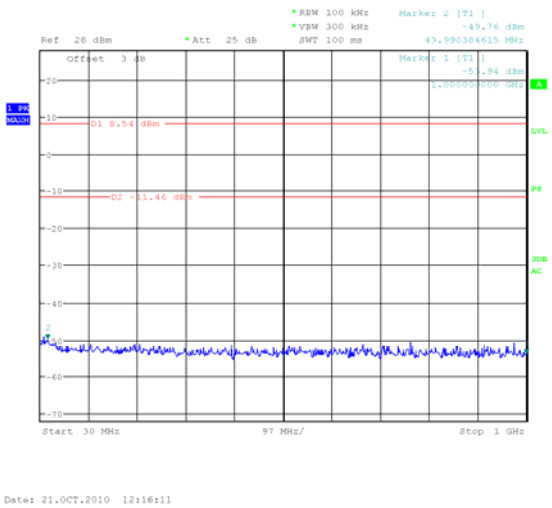
Test mode:	802.11b	Test channel:	Middle

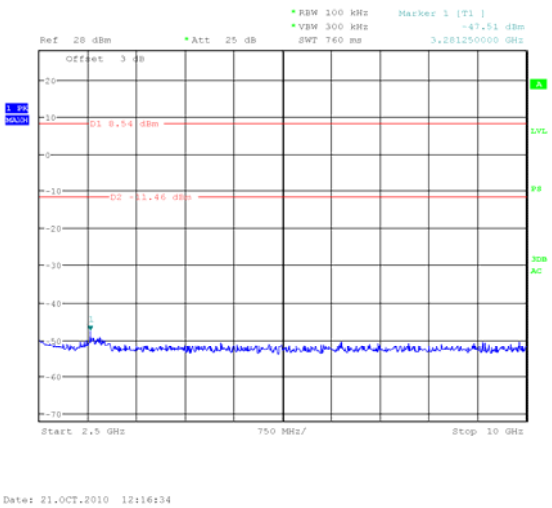


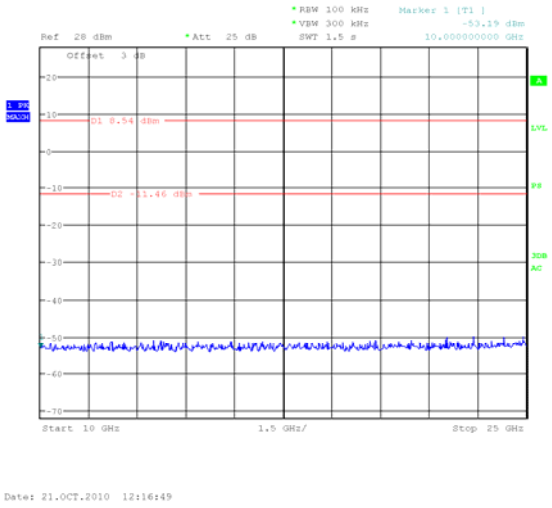




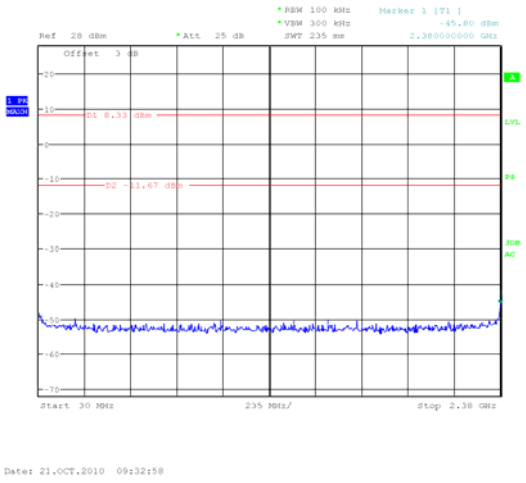
Test mode:	802.11b	Test channel:	Highest

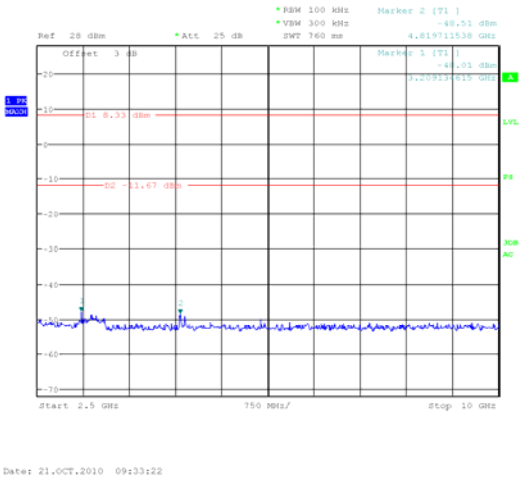


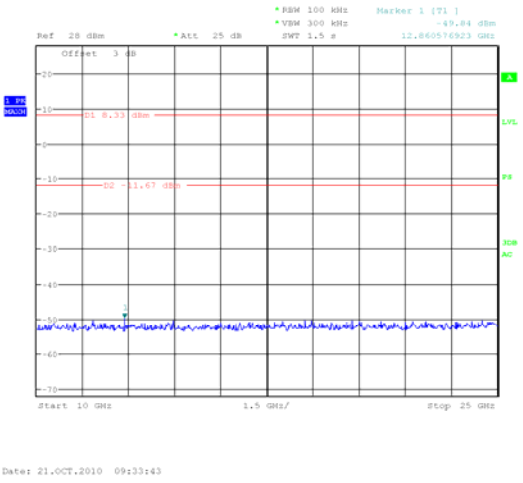




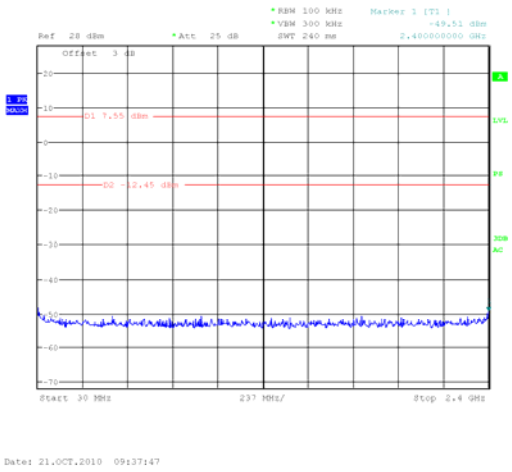
Test mode:	802.11g	Test channel:	Lowest

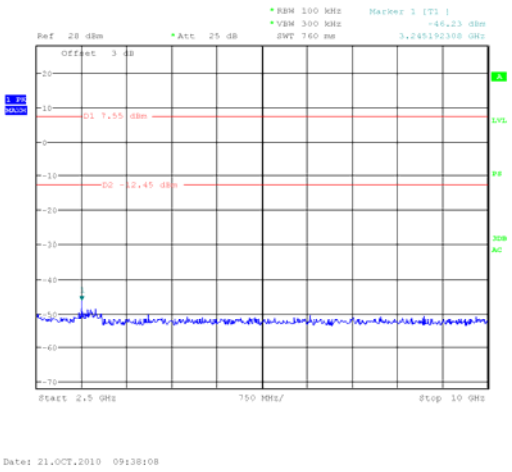


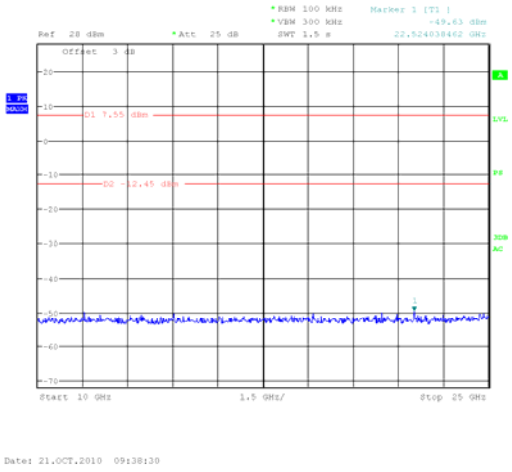




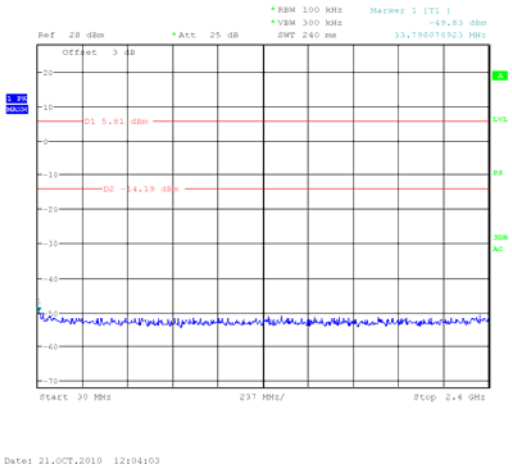
Test mode:	802.11g	Test channel:	Middle

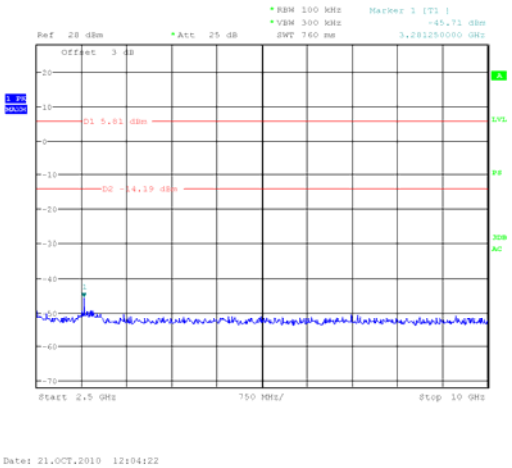


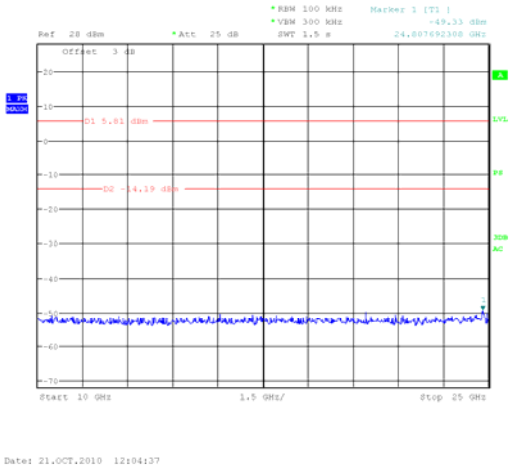




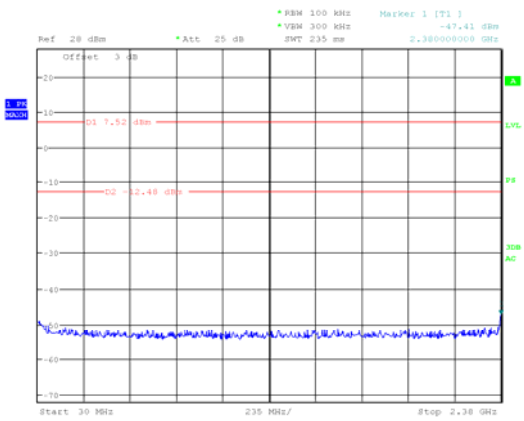
Test mode:	802.11g	Test channel:	Highest

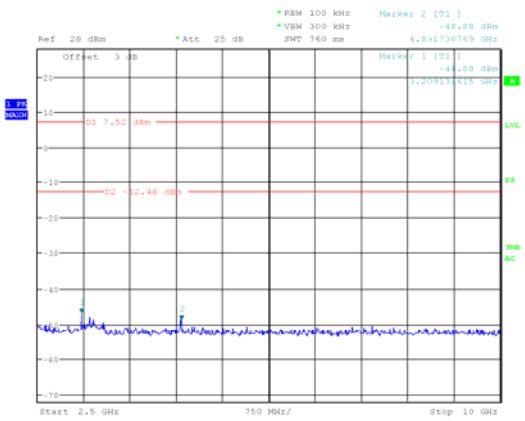


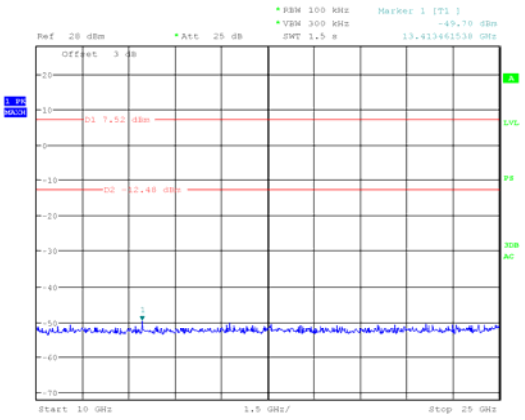




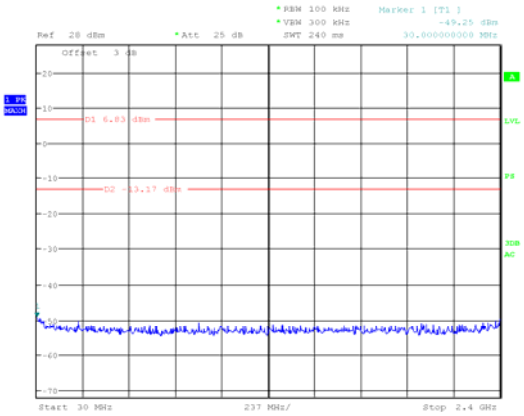
Test mode:	802.11n-H20	Test channel:	Lowest

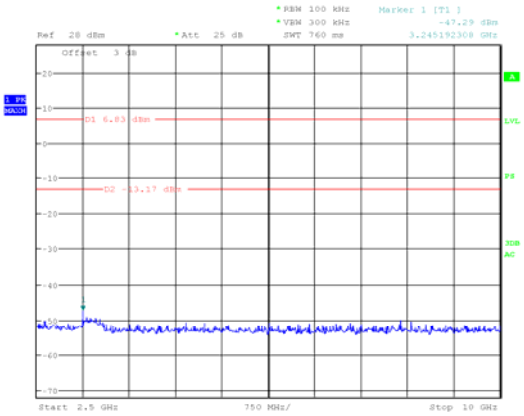


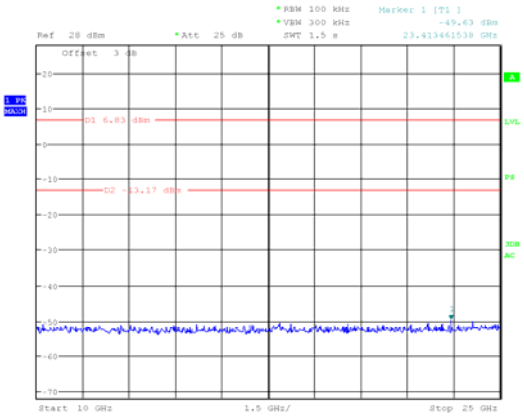




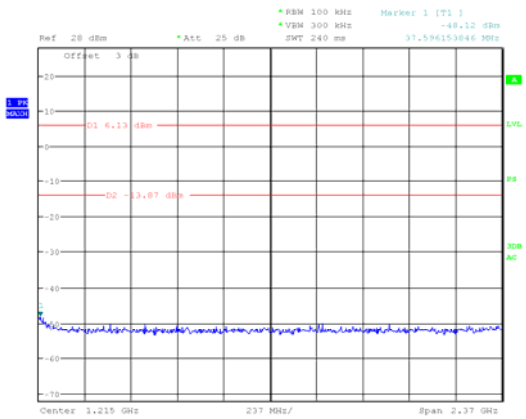
Test mode:	802.11n-H20	Test channel:	Middle

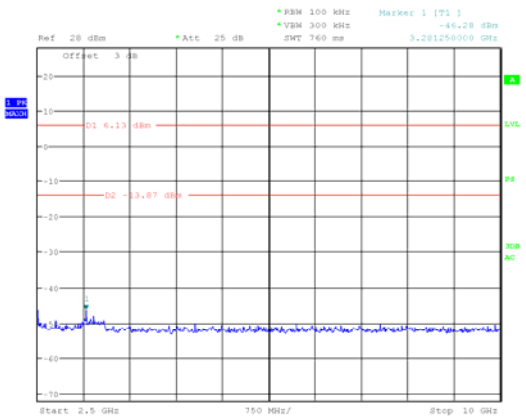


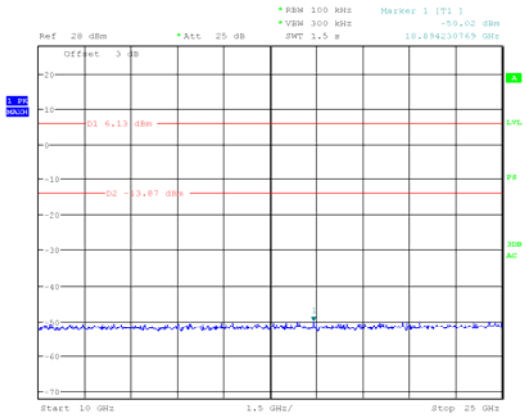




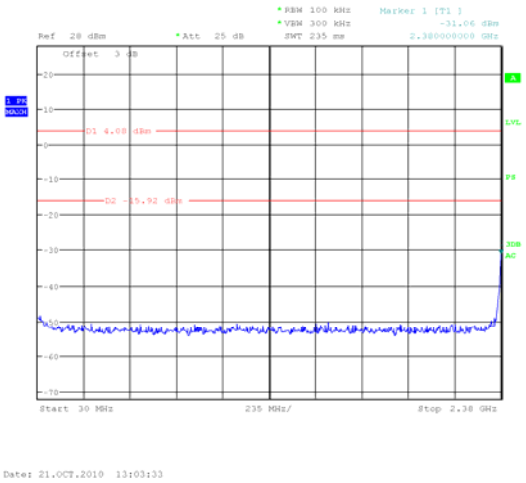
Test mode:	802.11n-H20	Test channel:	Highest

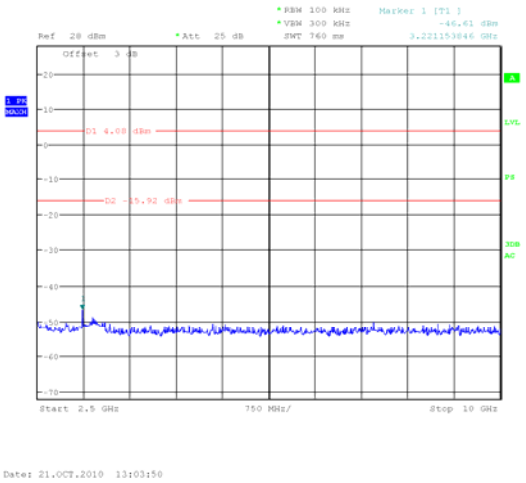


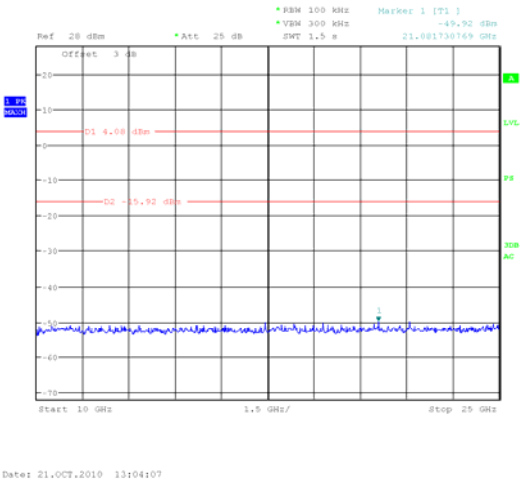




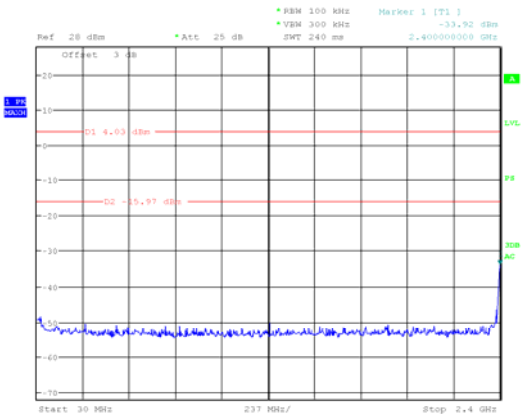
Test mode:	802.11n-H40	Test channel:	Lowest

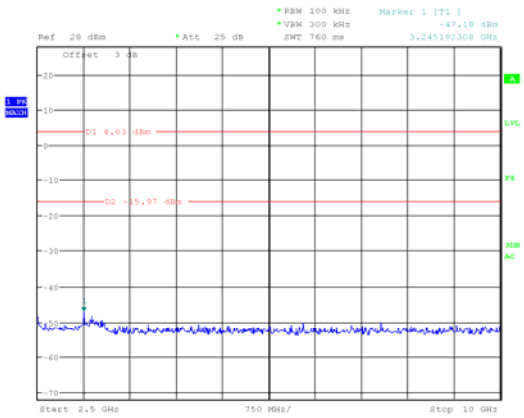


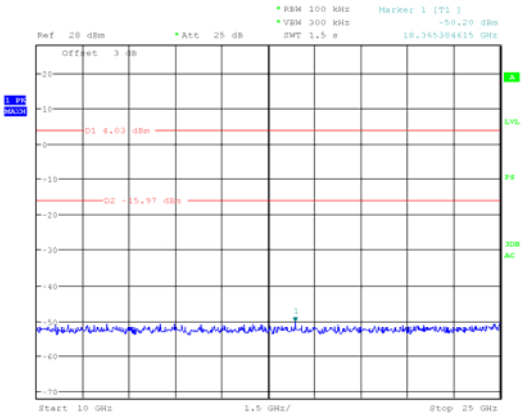




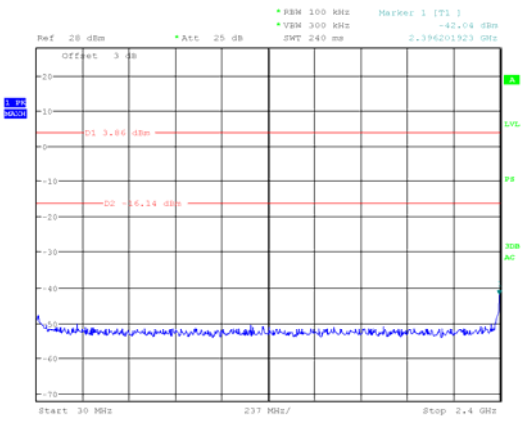
Test mode:	802.11n-H40	Test channel:	Middle

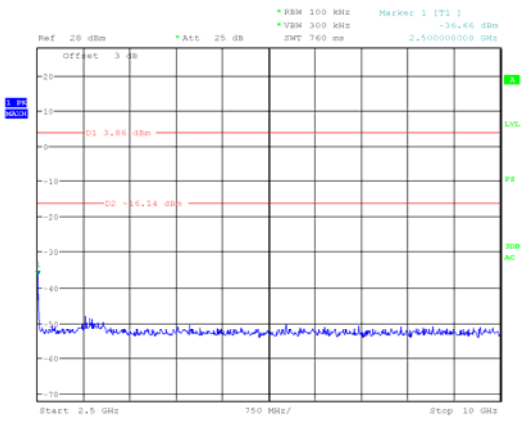


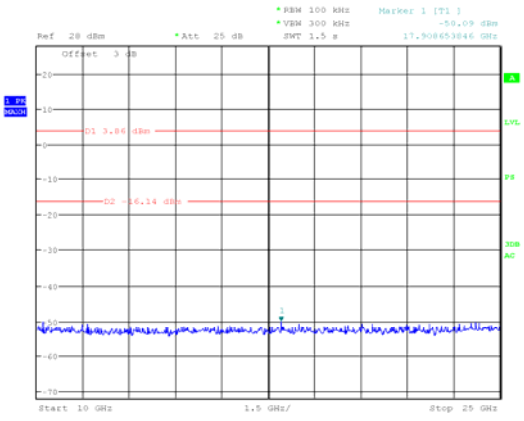




Test mode:	802.11n-H40	Test channel:	Highest

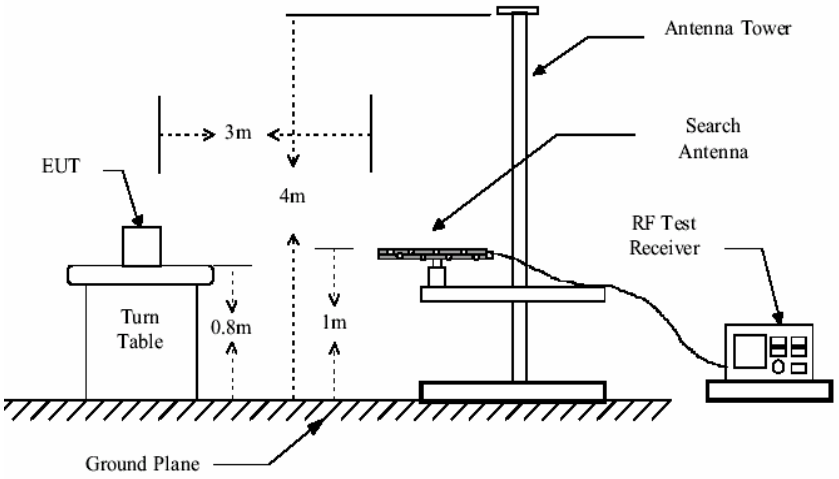




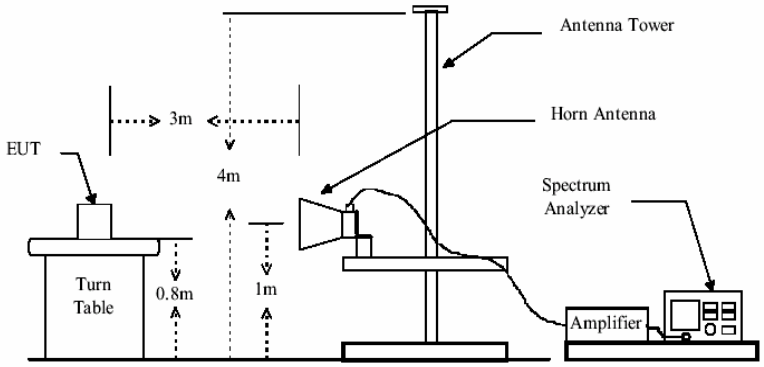


5.8 Radiated Emission

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4: 2003</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 25GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>74.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. 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.
d. 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 rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. 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.</td></tr>
<tr><td>Test setup:</td><td>Below 1GHz</td></tr>
</table>



Above 1GHz



Test Instruments:	Refer to section 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

Note:
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

5.8.1 Radiated emission 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
64.89	44.15	11.89	0.77	25.70	31.11	40.00	-8.89	Vertical
139.10	51.49	9.86	1.45	25.64	37.16	43.50	-6.34	Vertical
202.81	48.58	11.90	1.78	25.62	36.64	43.50	-6.86	Vertical
270.38	45.11	15.85	2.00	25.59	37.37	46.00	-8.63	Vertical
508.26	41.92	19.35	2.43	25.55	38.15	46.00	-7.85	Vertical
878.32	36.11	24.12	3.29	25.51	38.01	46.00	-7.99	Vertical
62.43	45.15	9.84	0.74	25.70	30.03	40.00	-9.97	Horizontal
138.87	47.26	10.47	1.45	25.64	33.54	43.50	-9.96	Horizontal
202.81	49.36	11.50	1.78	25.62	37.02	43.50	-6.48	Horizontal
323.32	43.95	14.42	2.12	25.58	34.91	46.00	-11.09	Horizontal
601.43	37.89	23.54	2.69	25.54	38.58	46.00	-7.42	Horizontal
875.25	34.67	29.06	3.28	25.51	41.50	46.00	-4.50	Horizontal

5.8.2 Transmitter emission above 1GHz

Test mode:	802.11b	Test channel:	Lowest	Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1384.00	33.93	25.63	2.43	21.35	40.64	74.00	-33.36	Vertical
2390.00	47.22	27.59	3.33	30.10	48.04	74.00	-25.96	Vertical
2400.00	52.26	27.58	3.37	30.10	53.11	74.00	-20.89	Vertical
4824.00	35.17	31.79	5.34	24.07	48.23	74.00	-25.77	Vertical
7236.00	31.95	36.19	6.88	26.44	48.58	74.00	-25.42	Vertical
9648.00	30.58	38.07	8.96	25.36	52.25	74.00	-21.75	Vertical
1384.00	35.01	25.63	2.43	21.35	41.72	74.00	-32.28	Horizontal
2390.00	48.24	27.59	3.33	30.10	49.06	74.00	-24.94	Horizontal
2400.00	53.22	27.58	3.37	30.10	54.07	74.00	-19.93	Horizontal
4824.00	36.07	31.79	5.34	24.07	49.13	74.00	-24.87	Horizontal
7236.00	32.79	36.19	6.88	26.44	49.42	74.00	-24.58	Horizontal
9648.00	31.36	38.07	8.96	25.36	53.03	74.00	-20.97	Horizontal

Test mode:	802.11b	Test channel:	Lowest	Remark:	Average			
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1384.00	21.47	25.63	2.43	21.35	28.18	54.00	-25.82	Vertical
2390.00	30.86	27.59	3.33	30.10	31.68	54.00	-22.32	Vertical
2400.00	35.25	27.58	3.37	30.10	36.10	54.00	-17.90	Vertical
4824.00	18.91	31.79	5.34	24.07	31.97	54.00	-22.03	Vertical
7236.00	15.95	36.19	6.88	26.44	32.58	54.00	-21.42	Vertical
9648.00	14.06	38.07	8.96	25.36	35.73	54.00	-18.27	Vertical
1384.00	22.55	25.63	2.43	21.35	29.26	54.00	-24.74	Horizontal
2390.00	31.88	27.59	3.33	30.10	32.70	54.00	-21.30	Horizontal
2400.00	36.21	27.58	3.37	30.10	37.06	54.00	-16.94	Horizontal
4824.00	19.81	31.79	5.34	24.07	32.87	54.00	-21.13	Horizontal
7236.00	16.79	36.19	6.88	26.44	33.42	54.00	-20.58	Horizontal
9648.00	14.84	38.07	8.96	25.36	36.51	54.00	-17.49	Horizontal

Test mode:	802.11b	Test channel:	Middle	Remark:	Peak			
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1754.00	42.03	25.09	2.61	28.59	41.14	74.00	-32.86	Vertical
4874.00	34.72	31.85	5.40	24.01	47.96	74.00	-26.04	Vertical
7311.00	29.53	36.37	6.90	26.58	46.22	74.00	-27.78	Vertical
9688.00	25.81	38.13	8.98	25.34	47.58	74.00	-26.42	Vertical
12185.00	26.79	38.92	10.38	25.04	51.05	74.00	-22.95	Vertical
14622.00	23.86	42.33	11.91	24.45	53.65	74.00	-20.35	Vertical
1754.00	42.18	25.09	2.61	28.59	41.29	74.00	-32.71	Horizontal
4874.00	34.90	31.85	5.40	24.01	48.14	74.00	-25.86	Horizontal
7311.00	29.74	36.37	6.90	26.58	46.43	74.00	-27.57	Horizontal
9688.00	26.05	38.13	8.98	25.34	47.82	74.00	-26.18	Horizontal
12185.00	27.06	38.92	10.38	25.04	51.32	74.00	-22.68	Horizontal
14622.00	24.16	42.33	11.91	24.45	53.95	74.00	-20.05	Horizontal

Test mode:	802.11b	Test channel:	Middle	Remark:	Average

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1754.00	28.27	25.09	2.61	28.59	27.38	54.00	-26.62	Vertical
4874.00	19.64	31.85	5.40	24.01	32.88	54.00	-21.12	Vertical
7311.00	16.43	36.37	6.90	26.58	33.12	54.00	-20.88	Vertical
9688.00	13.58	38.13	8.98	25.34	35.35	54.00	-18.65	Vertical
12185.00	14.67	38.92	10.38	25.04	38.93	54.00	-15.07	Vertical
14622.00	11.85	42.33	11.91	24.45	41.64	54.00	-12.36	Vertical
1754.00	28.42	25.09	2.61	28.59	27.53	54.00	-26.47	Horizontal
4874.00	19.82	31.85	5.40	24.01	33.06	54.00	-20.94	Horizontal
7311.00	16.64	36.37	6.90	26.58	33.33	54.00	-20.67	Horizontal
9688.00	13.82	38.13	8.98	25.34	35.59	54.00	-18.41	Horizontal
12185.00	14.94	38.92	10.38	25.04	39.20	54.00	-14.80	Horizontal
14622.00	12.15	42.33	11.91	24.45	41.94	54.00	-12.06	Horizontal

Test mode:	802.11b	Test channel:	Highest	Remark:	Peak

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1648.00	38.79	24.87	2.55	27.09	39.12	74.00	-34.88	Vertical
2483.50	48.34	27.53	3.49	29.93	49.43	74.00	-24.57	Vertical
2500.00	52.96	27.55	3.52	30.70	53.33	74.00	-20.67	Vertical
4924.00	32.55	31.89	5.46	23.96	45.94	74.00	-28.06	Vertical
7386.00	29.55	36.49	6.93	26.79	46.18	74.00	-27.82	Vertical
12310.00	27.16	38.83	10.41	24.90	51.50	74.00	-22.50	Vertical
1648.00	39.35	24.87	2.55	27.09	39.68	74.00	-34.32	Horizontal
2483.50	48.93	27.53	3.49	29.93	50.02	74.00	-23.98	Horizontal
2500.00	53.58	27.55	3.52	30.70	53.95	74.00	-20.05	Horizontal
4924.00	33.20	31.89	5.46	23.96	46.59	74.00	-27.41	Horizontal
7386.00	30.23	36.49	6.93	26.79	46.86	74.00	-27.14	Horizontal
12310.00	27.87	38.83	10.41	24.90	52.21	74.00	-21.79	Horizontal

Test mode:	802.11b	Test channel:	Highest	Remark:	Average

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1648.00	25.20	24.87	2.55	27.09	25.53	54.00	-28.47	Vertical
2483.50	35.20	27.53	3.49	29.93	36.29	54.00	-17.71	Vertical
2500.00	31.35	27.55	3.52	30.70	31.72	54.00	-22.28	Vertical
4924.00	20.32	31.89	5.46	23.96	33.71	54.00	-20.29	Vertical
7386.00	17.43	36.49	6.93	26.79	34.06	54.00	-19.94	Vertical
12310.00	15.15	38.83	10.41	24.90	39.49	54.00	-14.51	Vertical
1648.00	25.76	24.87	2.55	27.09	26.09	54.00	-27.91	Horizontal
2483.50	35.79	27.53	3.49	29.93	36.88	54.00	-17.12	Horizontal
2500.00	31.97	27.55	3.52	30.70	32.34	54.00	-21.66	Horizontal
4924.00	20.97	31.89	5.46	23.96	34.36	54.00	-19.64	Horizontal
7386.00	18.11	36.49	6.93	26.79	34.74	54.00	-19.26	Horizontal
12310.00	15.86	38.83	10.41	24.90	40.20	54.00	-13.80	Horizontal

Test mode:	802.11g	Test channel:	Lowest	Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1384.00	32.45	25.63	2.43	21.35	39.16	74.00	-34.84	Vertical
2390.00	45.67	27.59	3.33	30.10	46.49	74.00	-27.51	Vertical
2400.00	50.64	27.58	3.37	30.10	51.49	74.00	-22.51	Vertical
4824.00	33.48	31.79	5.34	24.07	46.54	74.00	-27.46	Vertical
7236.00	30.19	36.19	6.88	26.44	46.82	74.00	-27.18	Vertical
9648.00	28.75	38.07	8.96	25.36	50.42	74.00	-23.58	Vertical
1384.00	33.69	25.63	2.43	21.35	40.40	74.00	-33.60	Horizontal
2390.00	46.88	27.59	3.33	30.10	47.70	74.00	-26.30	Horizontal
2400.00	51.82	27.58	3.37	30.10	52.67	74.00	-21.33	Horizontal
4824.00	34.63	31.79	5.34	24.07	47.69	74.00	-26.31	Horizontal
7236.00	31.31	36.19	6.88	26.44	47.94	74.00	-26.06	Horizontal
9648.00	29.84	38.07	8.96	25.36	51.51	74.00	-22.49	Horizontal

Test mode:	802.11g	Test channel:	Lowest	Remark:	Average			
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1384.00	19.99	25.63	2.43	21.35	26.70	54.00	-27.30	Vertical
2390.00	29.31	27.59	3.33	30.10	30.13	54.00	-23.87	Vertical
2400.00	33.63	27.58	3.37	30.10	34.48	54.00	-19.52	Vertical
4824.00	17.22	31.79	5.34	24.07	30.28	54.00	-23.72	Vertical
7236.00	14.19	36.19	6.88	26.44	30.82	54.00	-23.18	Vertical
9648.00	12.23	38.07	8.96	25.36	33.90	54.00	-20.10	Vertical
1384.00	21.23	25.63	2.43	21.35	27.94	54.00	-26.06	Horizontal
2390.00	30.52	27.59	3.33	30.10	31.34	54.00	-22.66	Horizontal
2400.00	34.81	27.58	3.37	30.10	35.66	54.00	-18.34	Horizontal
4824.00	18.37	31.79	5.34	24.07	31.43	54.00	-22.57	Horizontal
7236.00	15.31	36.19	6.88	26.44	31.94	54.00	-22.06	Horizontal
9648.00	13.32	38.07	8.96	25.36	34.99	54.00	-19.01	Horizontal

Test mode:	802.11g	Test channel:	Middle	Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1754.00	41.42	25.09	2.61	28.59	40.53	74.00	-33.47	Vertical
4874.00	34.16	31.85	5.40	24.01	47.40	74.00	-26.60	Vertical
7311.00	29.02	36.37	6.90	26.58	45.71	74.00	-28.29	Vertical
9688.00	25.35	38.13	8.98	25.34	47.12	74.00	-26.88	Vertical
12185.00	26.38	38.92	10.38	25.04	50.64	74.00	-23.36	Vertical
14622.00	23.50	42.33	11.91	24.45	53.29	74.00	-20.71	Vertical
1754.00	41.67	25.09	2.61	28.59	40.78	74.00	-33.22	Horizontal
4874.00	34.34	31.85	5.40	24.01	47.58	74.00	-26.42	Horizontal
7311.00	29.13	36.37	6.90	26.58	45.82	74.00	-28.18	Horizontal
9688.00	25.39	38.13	8.98	25.34	47.16	74.00	-26.84	Horizontal
12185.00	26.35	38.92	10.38	25.04	50.61	74.00	-23.39	Horizontal
14622.00	23.40	42.33	11.91	24.45	53.19	74.00	-20.81	Horizontal

Test mode:	802.11g	Test channel:	Middle	Remark:	Average		
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1754.00	27.66	25.09	2.61	28.59	26.77	54.00	-27.23	Vertical
4874.00	19.08	31.85	5.40	24.01	32.32	54.00	-21.68	Vertical
7311.00	15.92	36.37	6.90	26.58	32.61	54.00	-21.39	Vertical
9688.00	13.12	38.13	8.98	25.34	34.89	54.00	-19.11	Vertical
12185.00	14.26	38.92	10.38	25.04	38.52	54.00	-15.48	Vertical
14622.00	11.49	42.33	11.91	24.45	41.28	54.00	-12.72	Vertical
1754.00	27.91	25.09	2.61	28.59	27.02	54.00	-26.98	Horizontal
4874.00	19.26	31.85	5.40	24.01	32.50	54.00	-21.50	Horizontal
7311.00	16.03	36.37	6.90	26.58	32.72	54.00	-21.28	Horizontal
9688.00	13.16	38.13	8.98	25.34	34.93	54.00	-19.07	Horizontal
12185.00	14.23	38.92	10.38	25.04	38.49	54.00	-15.51	Horizontal
14622.00	11.39	42.33	11.91	24.45	41.18	54.00	-12.82	Horizontal

Test mode:	802.11g	Test channel:	Highest	Remark:	Peak		
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1648.00	37.48	24.87	2.55	27.09	37.81	74.00	-36.19	Vertical
2483.50	47.08	27.53	3.49	29.93	48.17	74.00	-25.83	Vertical
2500.00	51.75	27.55	3.52	30.70	52.12	74.00	-21.88	Vertical
4924.00	31.39	31.89	5.46	23.96	44.78	74.00	-29.22	Vertical
7386.00	28.44	36.49	6.93	26.79	45.07	74.00	-28.93	Vertical
12310.00	26.10	38.83	10.41	24.90	50.44	74.00	-23.56	Vertical
1648.00	38.34	24.87	2.55	27.09	38.67	74.00	-35.33	Horizontal
2483.50	47.87	27.53	3.49	29.93	48.96	74.00	-25.04	Horizontal
2500.00	52.47	27.55	3.52	30.70	52.84	74.00	-21.16	Horizontal
4924.00	32.04	31.89	5.46	23.96	45.43	74.00	-28.57	Horizontal
7386.00	29.02	36.49	6.93	26.79	45.65	74.00	-28.35	Horizontal
12310.00	26.61	38.83	10.41	24.90	50.95	74.00	-23.05	Horizontal

Test mode:	802.11g	Test channel:	Highest	Remark:	Average		
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1648.00	23.89	24.87	2.55	27.09	24.22	54.00	-29.78	Vertical
2483.50	33.94	27.53	3.49	29.93	35.03	54.00	-18.97	Vertical
2500.00	30.14	27.55	3.52	30.70	30.51	54.00	-23.49	Vertical
4924.00	19.16	31.89	5.46	23.96	32.55	54.00	-21.45	Vertical
7386.00	16.32	36.49	6.93	26.79	32.95	54.00	-21.05	Vertical
12310.00	14.09	38.83	10.41	24.90	38.43	54.00	-15.57	Vertical
1648.00	24.75	24.87	2.55	27.09	25.08	54.00	-28.92	Horizontal
2483.50	34.73	27.53	3.49	29.93	35.82	54.00	-18.18	Horizontal
2500.00	30.86	27.55	3.52	30.70	31.23	54.00	-22.77	Horizontal
4924.00	19.81	31.89	5.46	23.96	33.20	54.00	-20.80	Horizontal
7386.00	16.90	36.49	6.93	26.79	33.53	54.00	-20.47	Horizontal
12310.00	14.60	38.83	10.41	24.90	38.94	54.00	-15.06	Horizontal

Test mode:	802.11n-H20	Test channel:	Lowest	Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1384.00	32.98	25.63	2.43	21.35	39.69	74.00	-34.31	Vertical
2390.00	46.22	27.59	3.33	30.10	47.04	74.00	-26.96	Vertical
2400.00	51.21	27.58	3.37	30.10	52.06	74.00	-21.94	Vertical
4824.00	34.07	31.79	5.34	24.07	47.13	74.00	-26.87	Vertical
7236.00	30.80	36.19	6.88	26.44	47.43	74.00	-26.57	Vertical
9648.00	29.38	38.07	8.96	25.36	51.05	74.00	-22.95	Vertical
1384.00	33.77	25.63	2.43	21.35	40.48	74.00	-33.52	Horizontal
2390.00	47.04	27.59	3.33	30.10	47.86	74.00	-26.14	Horizontal
2400.00	52.06	27.58	3.37	30.10	52.91	74.00	-21.09	Horizontal
4824.00	34.95	31.79	5.34	24.07	48.01	74.00	-25.99	Horizontal
7236.00	31.71	36.19	6.88	26.44	48.34	74.00	-25.66	Horizontal
9648.00	30.32	38.07	8.96	25.36	51.99	74.00	-22.01	Horizontal

Test mode:	802.11n-H20	Test channel:	Lowest	Remark:	Average			
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1384.00	20.52	25.63	2.43	21.35	27.23	54.00	-26.77	Vertical
2390.00	29.86	27.59	3.33	30.10	30.68	54.00	-23.32	Vertical
2400.00	34.20	27.58	3.37	30.10	35.05	54.00	-18.95	Vertical
4824.00	17.81	31.79	5.34	24.07	30.87	54.00	-23.13	Vertical
7236.00	14.80	36.19	6.88	26.44	31.43	54.00	-22.57	Vertical
9648.00	12.86	38.07	8.96	25.36	34.53	54.00	-19.47	Vertical
1384.00	21.31	25.63	2.43	21.35	28.02	54.00	-25.98	Horizontal
2390.00	30.68	27.59	3.33	30.10	31.50	54.00	-22.50	Horizontal
2400.00	35.05	27.58	3.37	30.10	35.90	54.00	-18.10	Horizontal
4824.00	18.69	31.79	5.34	24.07	31.75	54.00	-22.25	Horizontal
7236.00	15.71	36.19	6.88	26.44	32.34	54.00	-21.66	Horizontal
9648.00	13.80	38.07	8.96	25.36	35.47	54.00	-18.53	Horizontal

Test mode:	802.11n-H20	Test channel:	Middle	Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1754.00	40.51	25.09	2.61	28.59	39.62	74.00	-34.38	Vertical
4874.00	33.23	31.85	5.40	24.01	46.47	74.00	-27.53	Vertical
7311.00	28.07	36.37	6.90	26.58	44.76	74.00	-29.24	Vertical
9688.00	24.38	38.13	8.98	25.34	46.15	74.00	-27.85	Vertical
12185.00	25.39	38.92	10.38	25.04	49.65	74.00	-24.35	Vertical
14622.00	22.49	42.33	11.91	24.45	52.28	74.00	-21.72	Vertical
1754.00	41.24	25.09	2.61	28.59	40.35	74.00	-33.65	Horizontal
4874.00	33.99	31.85	5.40	24.01	47.23	74.00	-26.77	Horizontal
7311.00	28.86	36.37	6.90	26.58	45.55	74.00	-28.45	Horizontal
9688.00	25.20	38.13	8.98	25.34	46.97	74.00	-27.03	Horizontal
12185.00	26.24	38.92	10.38	25.04	50.50	74.00	-23.50	Horizontal
14622.00	23.37	42.33	11.91	24.45	53.16	74.00	-20.84	Horizontal

Test mode:	802.11n-H20	Test channel:	Middle	Remark:	Average		
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1754.00	26.75	25.09	2.61	28.59	25.86	54.00	-28.14	Vertical
4874.00	18.15	31.85	5.40	24.01	31.39	54.00	-22.61	Vertical
7311.00	14.97	36.37	6.90	26.58	31.66	54.00	-22.34	Vertical
9688.00	12.15	38.13	8.98	25.34	33.92	54.00	-20.08	Vertical
12185.00	13.27	38.92	10.38	25.04	37.53	54.00	-16.47	Vertical
14622.00	10.48	42.33	11.91	24.45	40.27	54.00	-13.73	Vertical
1754.00	27.48	25.09	2.61	28.59	26.59	54.00	-27.41	Horizontal
4874.00	18.91	31.85	5.40	24.01	32.15	54.00	-21.85	Horizontal
7311.00	15.76	36.37	6.90	26.58	32.45	54.00	-21.55	Horizontal
9688.00	12.97	38.13	8.98	25.34	34.74	54.00	-19.26	Horizontal
12185.00	14.12	38.92	10.38	25.04	38.38	54.00	-15.62	Horizontal
14622.00	11.36	42.33	11.91	24.45	41.15	54.00	-12.85	Horizontal

Test mode:	802.11n-H20	Test channel:	Highest	Remark:	Peak		
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1648.00	37.71	24.87	2.55	27.09	38.04	74.00	-35.96	Vertical
2483.50	47.24	27.53	3.49	29.93	48.33	74.00	-25.67	Vertical
2500.00	51.84	27.55	3.52	30.70	52.21	74.00	-21.79	Vertical
4924.00	31.41	31.89	5.46	23.96	44.80	74.00	-29.20	Vertical
7386.00	28.39	36.49	6.93	26.79	45.02	74.00	-28.98	Vertical
12310.00	25.98	38.83	10.41	24.90	50.32	74.00	-23.68	Vertical
1648.00	38.34	24.87	2.55	27.09	38.67	74.00	-35.33	Horizontal
2483.50	47.90	27.53	3.49	29.93	48.99	74.00	-25.01	Horizontal
2500.00	52.53	27.55	3.52	30.70	52.90	74.00	-21.10	Horizontal
4924.00	32.13	31.89	5.46	23.96	45.52	74.00	-28.48	Horizontal
7386.00	29.14	36.49	6.93	26.79	45.77	74.00	-28.23	Horizontal
12310.00	26.76	38.83	10.41	24.90	51.10	74.00	-22.90	Horizontal

Test mode:	802.11n-H20	Test channel:	Highest	Remark:	Average		
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1648.00	24.12	24.87	2.55	27.09	24.45	54.00	-29.55	Vertical
2483.50	34.10	27.53	3.49	29.93	35.19	54.00	-18.81	Vertical
2500.00	30.23	27.55	3.52	30.70	30.60	54.00	-23.40	Vertical
4924.00	19.18	31.89	5.46	23.96	32.57	54.00	-21.43	Vertical
7386.00	16.27	36.49	6.93	26.79	32.90	54.00	-21.10	Vertical
12310.00	13.97	38.83	10.41	24.90	38.31	54.00	-15.69	Vertical
1648.00	24.75	24.87	2.55	27.09	25.08	54.00	-28.92	Horizontal
2483.50	34.76	27.53	3.49	29.93	35.85	54.00	-18.15	Horizontal
2500.00	30.92	27.55	3.52	30.70	31.29	54.00	-22.71	Horizontal
4924.00	19.90	31.89	5.46	23.96	33.29	54.00	-20.71	Horizontal
7386.00	17.02	36.49	6.93	26.79	33.65	54.00	-20.35	Horizontal
12310.00	14.75	38.83	10.41	24.90	39.09	54.00	-14.91	Horizontal

Test mode:	802.11n-H40	Test channel:	Lowest	Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1725.00	39.25	25.02	2.59	28.36	38.50	74.00	-35.50	Vertical
2390.00	46.09	27.59	3.33	30.10	46.91	74.00	-27.09	Vertical
2400.00	49.73	27.58	3.37	30.10	50.58	74.00	-23.42	Vertical
4844.00	30.31	31.82	5.36	24.05	43.44	74.00	-30.56	Vertical
7266.00	27.80	36.28	6.89	26.51	44.46	74.00	-29.54	Vertical
12110.00	25.11	38.98	10.37	25.11	49.35	74.00	-24.65	Vertical
1725.00	40.49	25.02	2.59	28.36	39.74	74.00	-34.26	Horizontal
2390.00	47.30	27.59	3.33	30.10	48.12	74.00	-25.88	Horizontal
2400.00	50.91	27.58	3.37	30.10	51.76	74.00	-22.24	Horizontal
4844.00	31.46	31.82	5.36	24.05	44.59	74.00	-29.41	Horizontal
7266.00	28.92	36.28	6.89	26.51	45.58	74.00	-28.42	Horizontal
12110.00	26.20	38.98	10.37	25.11	50.44	74.00	-23.56	Horizontal

Test mode:	802.11n-H40	Test channel:	Lowest	Remark:	Average			
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1725.00	21.99	25.02	2.59	28.36	21.24	54.00	-32.76	Vertical
2390.00	26.64	27.59	3.33	30.10	27.46	54.00	-26.54	Vertical
2400.00	32.01	27.58	3.37	30.10	32.86	54.00	-21.14	Vertical
4844.00	18.08	31.82	5.36	24.05	31.21	54.00	-22.79	Vertical
7266.00	15.68	36.28	6.89	26.51	32.34	54.00	-21.66	Vertical
12110.00	12.10	38.98	10.37	25.11	36.34	54.00	-17.66	Vertical
1725.00	23.23	25.02	2.59	28.36	22.48	54.00	-31.52	Horizontal
2390.00	27.85	27.59	3.33	30.10	28.67	54.00	-25.33	Horizontal
2400.00	33.19	27.58	3.37	30.10	34.04	54.00	-19.96	Horizontal
4844.00	19.23	31.82	5.36	24.05	32.36	54.00	-21.64	Horizontal
7266.00	16.80	36.28	6.89	26.51	33.46	54.00	-20.54	Horizontal
12110.00	13.19	38.98	10.37	25.11	37.43	54.00	-16.57	Horizontal

Test mode:	802.11n-H40	Test channel:	Middle	Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1754.00	42.20	25.09	2.61	28.59	41.31	74.00	-32.69	Vertical
4874.00	35.06	31.85	5.40	24.01	48.30	74.00	-25.70	Vertical
7311.00	30.04	36.37	6.90	26.58	46.73	74.00	-27.27	Vertical
9688.00	26.49	38.13	8.98	25.34	48.26	74.00	-25.74	Vertical
12185.00	27.64	38.92	10.38	25.04	51.90	74.00	-22.10	Vertical
14622.00	24.88	42.33	11.91	24.45	54.67	74.00	-19.33	Vertical
1754.00	42.45	25.09	2.61	28.59	41.56	74.00	-32.44	Horizontal
4874.00	35.24	31.85	5.40	24.01	48.48	74.00	-25.52	Horizontal
7311.00	30.15	36.37	6.90	26.58	46.84	74.00	-27.16	Horizontal
9688.00	26.53	38.13	8.98	25.34	48.30	74.00	-25.70	Horizontal
12185.00	27.61	38.92	10.38	25.04	51.87	74.00	-22.13	Horizontal
14622.00	24.78	42.33	11.91	24.45	54.57	74.00	-19.43	Horizontal

Test mode:	802.11n-H40	Test channel:	Middle	Remark:	Average		
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1754.00	25.64	25.09	2.61	28.59	24.75	54.00	-29.25	Vertical
4874.00	22.61	31.85	5.40	24.01	35.85	54.00	-18.15	Vertical
7311.00	17.70	36.37	6.90	26.58	34.39	54.00	-19.61	Vertical
9688.00	14.26	38.13	8.98	25.34	36.03	54.00	-17.97	Vertical
12185.00	15.52	38.92	10.38	25.04	39.78	54.00	-14.22	Vertical
14622.00	12.87	42.33	11.91	24.45	42.66	54.00	-11.34	Vertical
1754.00	25.89	25.09	2.61	28.59	25.00	54.00	-29.00	Horizontal
4874.00	22.79	31.85	5.40	24.01	36.03	54.00	-17.97	Horizontal
7311.00	17.81	36.37	6.90	26.58	34.50	54.00	-19.50	Horizontal
9688.00	14.30	38.13	8.98	25.34	36.07	54.00	-17.93	Horizontal
12185.00	15.49	38.92	10.38	25.04	39.75	54.00	-14.25	Horizontal
14622.00	12.77	42.33	11.91	24.45	42.56	54.00	-11.44	Horizontal

Test mode:	802.11n-H40	Test channel:	Highest	Remark:	Peak		
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1954.00	37.97	25.95	2.74	30.69	35.97	74.00	-38.03	Vertical
2483.50	48.68	27.53	3.49	29.93	49.77	74.00	-24.23	Vertical
2500.00	42.84	27.55	3.52	30.70	43.21	74.00	-30.79	Vertical
4904.00	33.15	31.88	5.42	23.97	46.48	74.00	-27.52	Vertical
7356.00	30.28	36.45	6.92	26.70	46.95	74.00	-27.05	Vertical
9748.00	28.02	38.27	9.00	25.30	49.99	74.00	-24.01	Vertical
1954.00	38.83	25.95	2.74	30.69	36.83	74.00	-37.17	Horizontal
2483.50	49.47	27.53	3.49	29.93	50.56	74.00	-23.44	Horizontal
2500.00	43.56	27.55	3.52	30.70	43.93	74.00	-30.07	Horizontal
4904.00	33.80	31.88	5.42	23.97	47.13	74.00	-26.87	Horizontal
7356.00	30.86	36.45	6.92	26.70	47.53	74.00	-26.47	Horizontal
9748.00	28.53	38.27	9.00	25.30	50.50	74.00	-23.50	Horizontal

Test mode:	802.11n-H40	Test channel:	Highest	Remark:	Average		
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
1954.00	25.41	25.95	2.74	30.69	23.41	54.00	-30.59	Vertical
2483.50	35.54	27.53	3.49	29.93	36.63	54.00	-17.37	Vertical
2500.00	34.22	27.55	3.52	30.70	34.59	54.00	-19.41	Vertical
4904.00	20.92	31.88	5.42	23.97	34.25	54.00	-19.75	Vertical
7356.00	18.16	36.45	6.92	26.70	34.83	54.00	-19.17	Vertical
9748.00	16.01	38.27	9.00	25.30	37.98	54.00	-16.02	Vertical
1954.00	26.27	25.95	2.74	30.69	24.27	54.00	-29.73	Horizontal
2483.50	36.33	27.53	3.49	29.93	37.42	54.00	-16.58	Horizontal
2500.00	34.94	27.55	3.52	30.70	35.31	54.00	-18.69	Horizontal
4904.00	21.57	31.88	5.42	23.97	34.90	54.00	-19.10	Horizontal
7356.00	18.74	36.45	6.92	26.70	35.41	54.00	-18.59	Horizontal
9748.00	16.52	38.27	9.00	25.30	38.49	54.00	-15.51	Horizontal

5.9 RF Exposure Evaluation

5.9.1 Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz

Friis Formula
Friis transmission formula: **$Pd = (Pout*G)/(4*pi*r^2)$**

Where
Pd = power density in mW/cm^2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
Pi = 3.1416
R = distance between observation point and center of the radiator in cm

Pd id the limit of MPE, 1 mW/cm2 . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

5.9.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

5.9.3 Test Result of RF Exposure Evaluation

802.11b

Channel	Output power to antenna (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
Lowest	143.55	0.0451	1.0	Pass
Middle	146.89	0.0462	1.0	Pass
Highest	109.14	0.0343	1.0	Pass

802.11g

Channel	Output power to antenna (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
Lowest	180.30	0.0567	1.0	Pass
Middle	142.89	0.0449	1.0	Pass
Highest	118.85	0.0374	1.0	Pass

802.11n(H20)

Channel	Output power to antenna (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
Lowest	299.23	0.0941	1.0	Pass
Middle	241.55	0.0759	1.0	Pass
Highest	215.28	0.0677	1.0	Pass

802.11n(H40)

Channel	Output power to antenna (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
Lowest	147.91	0.0465	1.0	Pass
Middle	126.77	0.0398	1.0	Pass
Highest	109.90	0.0345	1.0	Pass

Remark: antenna gain=1.58dBi