FCC PART 15.247

EMI MEASUREMENT AND TEST REPORT

For

Shenzhen FREEDIO Electronic Technology Co., Limited

East Wing, 5/F, Block 2, Vision Business Park, No.9 Gaoxin 9th S. Rd.,
Hi-tech Ind. Park, Nanshan, Shenzhen, China

FCC ID: Q8Y-FR4020A2

September 25, 2012

This Report Concerns: Original Report	Equipment Type: WIFI MODULE
Test Engineer:	Eric Li
Test Engineer of performing the tests:	Adam Yang
Report No.:	BST12081027Y-1E-3
Receive EUT Date/Test Date:	September 17, 2012 / September 17-24, 2012
Reviewed By:	Christina Deng
Prepared By:	**Shenzhen BST Technology Co.,Ltd.** 3F,Weames Technology Building, No. 10 Kefa Road,Science Park, Nanshan District,Shenzhen,Guangdong,China Tel: 0755-26747751～3 Fax: 0755-26747751～3 ext.826

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1. GENERAL INFORMATION

1.1. Report information

1.1.1.This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BST approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BST in any way guarantees the later performance of the product/equipment.

1.1.2.The sample/s mentioned in this report is/are supplied by Applicant, BST therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through BST, unless the applicant has authorized BST in writing to do so.

Test Facility -
The test site used to collect the radiated data is located on the address of
Shenzhen Certification Technology Service Co., Ltd
(FCC Registered Test Site Number: 197647) on
2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road,
Bao'an District, shenzhen 518126, China
The Test Site is constructed and calibrated to meet the FCC requirements.

1.2. Measurement Uncertainty

Available upon request.

2. PRODUCT DESCRIPTION

2.1. EUT Description

Applicant	:	Shenzhen FREEDIO Electronic Technology Co., Limited
Address	:	East Wing, 5/F, Block 2, Vision Business Park, No.9 Gaoxin 9th S. Rd., Hi-tech Ind. Park, Nanshan, Shenzhen, China
Manufacturer	:	Shenzhen FREEDIO Electronic Technology Co., Limited
Address	:	East Wing, 5/F, Block 2, Vision Business Park, No.9 Gaoxin 9th S. Rd., Hi-tech Ind. Park, Nanshan, Shenzhen, China
EUT Description	:	WIFI MODULE
Trade Name	:	FREEDIO
Modulation	:	802.11b: DSSS 802.11g/n: OFDM
Wi-fi Frequency Band	:	IEEE 802.11b/g: 2412-2462MHz IEEE802.11n HT20: 2412-2462MHz IEEE802.11n HT40: 2422-2452MHz
Number of Channels	:	IEEE 802.11b/g: 11 Channels IEEE802.11n HT20: 11 Channels IEEE802.11n HT40: 7 Channels
Model Number	:	FR4020A2, FR4020A3, FR4020A5, FR4020A2F, FR4020A5F
Power Supply	:	DC 3.3V
Antenna gain	:	2dBi

2.2. Block Diagram of EUT Configuration

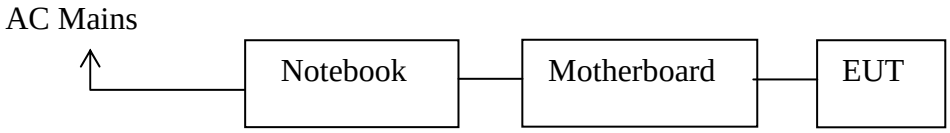


Figure 1 EUT SETUP

2.3. Support Equipment List

Table 2 Ancillary Equipment

Name	Model No	S/N	Manufacturer	Used "√"
Motherboard	--	--	--	√
Notebook	Y480N-IFI	--	Lenovo	√

2.4. Test Conditions

Temperature: 23~25℃
Relative Humidity: 50~63 %

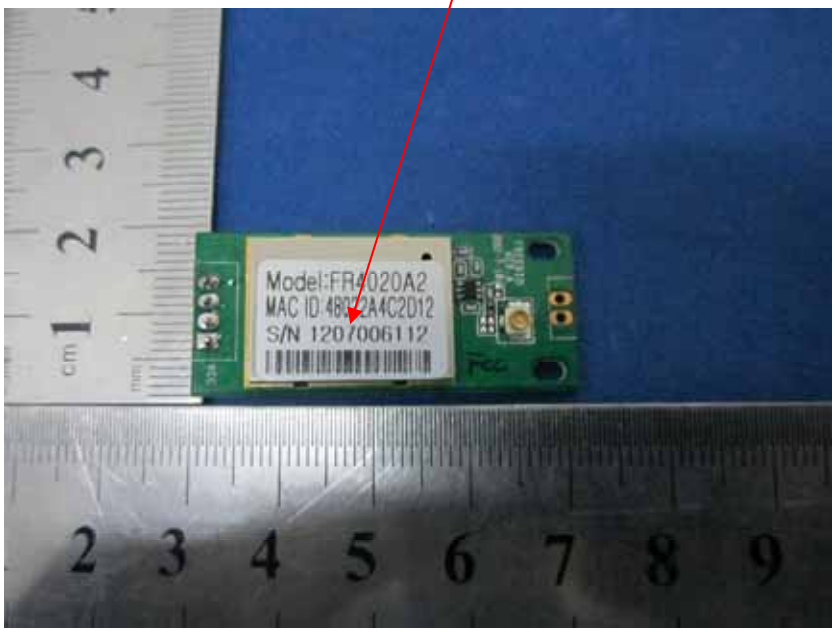
After the preliminary test, we found to emit the worst emissions and therefore had been tested under operating condition.
IEEE 802.11b:
Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.
IEEE 802.11g:
Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.
IEEE 802.11n HT20:
Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.
IEEE 802.11n HT40:
Channel Low (2422MHz), Channel Mid 2437MHz) and Channel High (2452MHz) with 13Mbpsdata rate were chosen for full testing.

3. FCC ID LABEL

FCC ID: Q8Y-FR4020A2

Label Location on EUT

EUT View/ FCC ID Label Location



4. TEST RESULTS SUMMARY

FCC 15 Subpart C,Paragraph 15.247

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247 (i) , §1.1307 (b) (1), §2.1093	RF Exposure	PASS
§15.203	Antenna Requirement	PASS
§15.207 (a)	Conducted Emissions	PASS
§15.247(d)	Spurious Emissions at Antenna Port	PASS
§15.205	Restricted Bands	PASS
§15.209, §15.205, §15.247(d)	Spurious Emissions	PASS
§15.247 (a)(2)	6 dB Bandwidth	PASS
§15.247(b)(3)	Maximum Peak Output Power	PASS
§15.247(d)	100kHz Bandwidth of Frequency Band Edge	PASS
§15.247(e)	Power Spectral Density	PASS

Statement: The EUT was setup according to ANSI C63.4-2003 and tested according to DTS test procedure of March 23, 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Modifications

No modification was made.

5. TEST EQUIPMENT USED

EQUIPMENT/FACILITIES	MANUFACTURER	MODEL	SERIAL NO.	DATE OF CAL.	CAL. INTERVAL
3m Semi-Anechoic Chamber	Changzhou Chengyu	EC3048	N/A	May 5, 2012	1 Year
Broadband antenna	SCHWARZBECK	VULB 9168	VULB9168-438	Aug. 14, 2012	1 Year
Horn antenna	R&S	HF906	10027	Aug. 14, 2012	1 Year
ETS Horn Antenna	ETS	3160	SEL0076	May 8, 2012	1 Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	Apr. 6, 2012	1 Year
Spectrum analyzer	Agilent	E4443A	MY46185649	Apr. 6, 2012	1 Year
Spectrum analyzer	Agilent	E4440A	MY46187335	Apr. 6, 2012	1 Year
Spectrum analyzer	Agilent	E4446A	MY45300103	Apr. 6, 2012	1 Year
Test receiver	R&S	ESCI	100492	Apr. 6, 2012	1 Year
Test receiver	R&S	ESCI	101202	Apr. 6, 2012	1 Year
L.I.S.N.	SCHWARZBECK	NSLK8126	8126466	Apr. 6, 2012	1 Year
L.I.S.N.	SCHWARZBECK	NSLK8126	8126487	Apr. 6, 2012	1 Year
Cable	Resenberger	N/A	NO.1	Apr. 6, 2012	1 Year
Cable	SCHWARZBECK	N/A	NO.2	Apr. 6, 2012	1 Year
Cable	SCHWARZBECK	N/A	NO.3	Apr. 6, 2012	1 Year
Pre-amplifier	SCHWARZBECK	BBV9743	9743-019	Apr. 6, 2012	1 Year
Pre-amplifier	R&S	AFS33-18002650-30-8P-44	SEL0080	Apr. 6, 2012	1 Year

6. §15.247 (I) AND §1.1307 (B) (1), §2.1093 – RF EXPOSURE

6.1. Standard Applicable

According to §15.247 (i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3–3.0	614	1.63	*(100)	30
3.0–30	824/f	2.19/f	*(180/f2)	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
* = Plane-wave equivalent power density

6.2. Test Data

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S = PG/4\pi R^2$
S: Power density, in mW/cm^2
P: Power input to the antenna, in mW
G: numeric gain of the antenna
R: distance to the center of the antenna, in cm

Maximum peak output power at antenna input terminal (dBm):	18.84
Maximum peak output power at antenna input terminal (mW):	76.56
Prediction distance (cm):	20
Prediction frequency (MHz):	2412
Antenna Gain, typical (dBi):	2
Maximum Antenna Gain (numeric):	1.58
Power density at predication frequency and distance (mW/cm^2):	0.024
MPE limit for Occupational exposure at predication frequency (mW/cm^2):	1.0

6.3. Test Result

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, Human proximity to the antenna shall not be less than 20cm(8 inches) during normal operation.

7. §15.203 - ANTENNA REQUIREMENT

7.1. Standard Applicable

According to § 15.203, 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 shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.2. Antenna Connector Construction

Device is equipped with unique antenna connector. Refer to the product photo.

8. §15.207 - CONDUCTED EMISSIONS

8.1. Applicable Standard

The specification used was with the FCC Part 15.207 limits.

8.2. Test Procedure

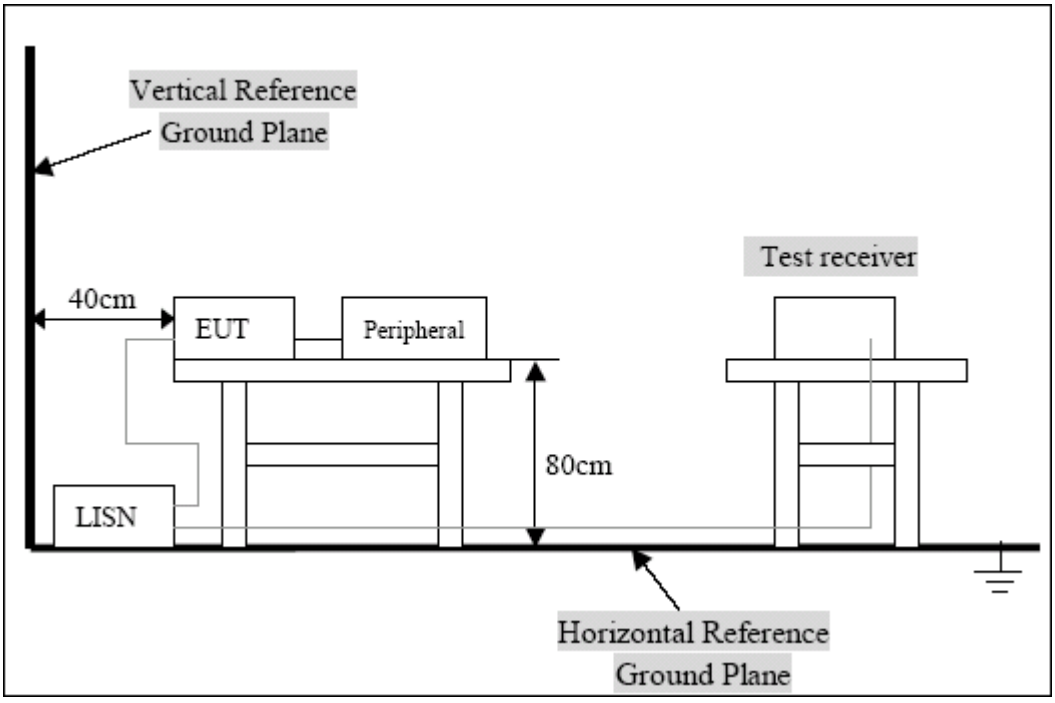
During the conducted emission test, the EUT was connected to the outlet of the LISN. Maximizing procedure was performed on the six (6) highest emissions of the EUT. All data was recorded in the Quasi-peak and average detection mode.

8.3. Conducted Power line Emission Limits

FCC Part 15 Paragraph 15.207 (dBuV)		
Frequency Range (MHz)	Class A QP/AV	Class B QP/AV
0.15-0.5	79/66	65-56/56-46
0.5-5.0	73/60	56-46
5.0-3.0	73/60	60-50

Note: In the above table, the tighter limit applies at the band edges.

8.4. Block Diagram of Test Setup

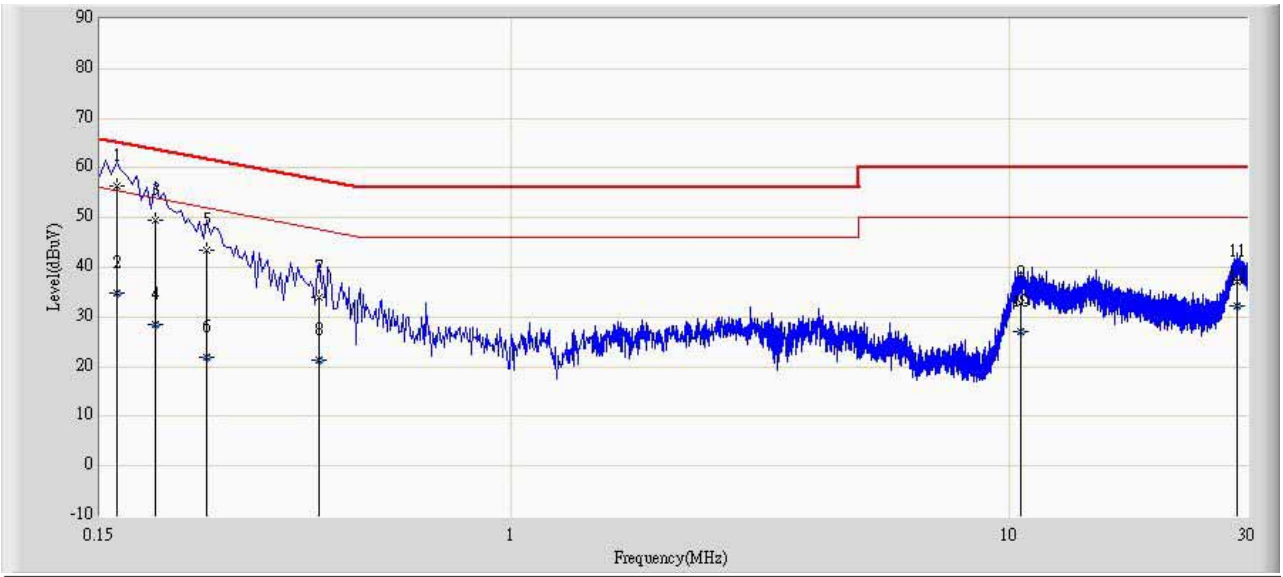


8.5. Conducted Power Line Test Result

Pass.

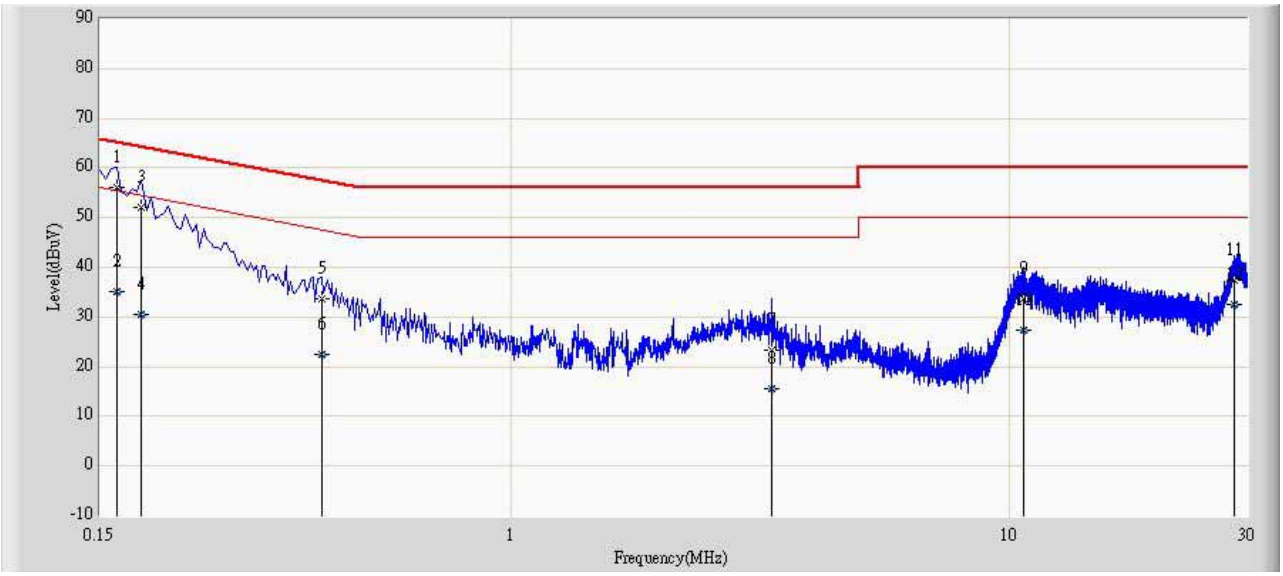
The worst test mode: Wi-Fi TX 802.11b 2437MHz

L line



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor	Type
1		*	0.162	56.452	46.863	-8.909	65.361	9.589	QP
2			0.162	34.951	25.362	-20.41	55.361	9.589	AV
3			0.194	49.383	39.725	-14.48	63.864	9.658	QP
4			0.194	28.557	18.899	-25.307	53.864	9.658	AV
5			0.246	43.496	33.816	-18.396	61.891	9.68	QP
6			0.246	21.8	12.12	-30.091	51.891	9.68	AV
7			0.414	33.943	24.255	-23.625	57.568	9.688	QP
8			0.414	21.326	11.637	-26.242	47.568	9.688	AV
9			10.522	32.883	22.9	-27.117	60	9.983	QP
10			10.522	27.015	17.032	-22.985	50	9.983	AV
11			28.61	37.25	26.77	-22.75	60	10.48	QP
12			28.61	32.248	21.768	-17.752	50	10.48	AV

N line



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor	Type
1		*	0.162	56.229	46.487	-9.132	65.361	9.741	QP
2			0.162	35.187	25.445	-20.174	55.361	9.741	AV
3			0.182	52.011	42.318	-12.383	64.394	9.693	QP
4			0.182	30.612	20.919	-23.781	54.394	9.693	AV
5			0.418	33.613	23.946	-23.875	57.488	9.667	QP
6			0.418	22.495	12.828	-24.993	47.488	9.667	AV
7			3.334	23.372	13.599	-32.628	56	9.773	QP
8			3.334	15.503	5.729	-30.497	46	9.773	AV
9			10.718	33.601	23.581	-26.399	60	10.021	QP
10			10.718	27.427	17.406	-22.573	50	10.021	AV
11			28.306	37.413	26.845	-22.587	60	10.568	QP
12			28.306	32.501	21.933	-17.499	50	10.568	AV

9. §15.209, §15.205, §15.247(D) - Spurious Emissions

9.1. Test Equipment

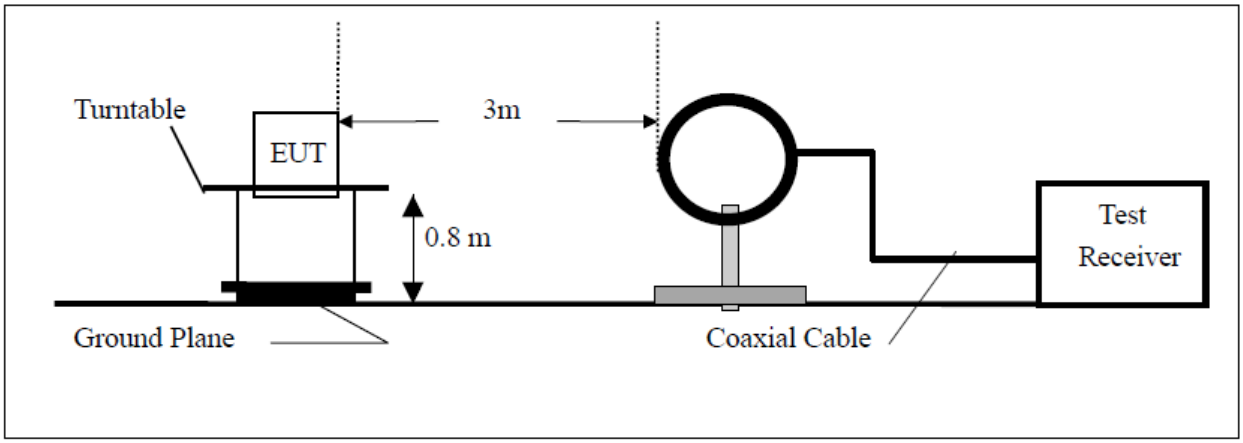
Please refer to section 5 this report.

9.2. Test Procedure

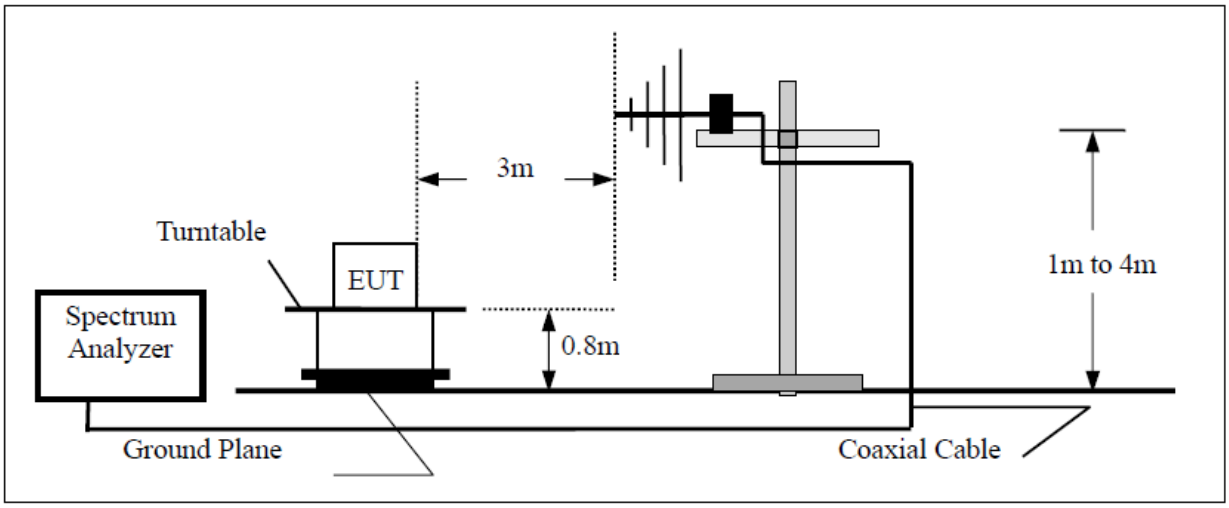
The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Calibrated Loop antenna is used as receiving antenna for frequencies below 30MHz, Calibrated Bilog antenna is used as receiving antenna for frequencies between 30 MHz and 1 GHz, Calibrated Horn antenna is used as receiving antenna for frequencies above 1000MHz. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.
The bandwidth of test receiver is set at 9kHz in below 30MHz. and set at 120kHz in 30-1000MHz, and 1MHz in above 1000MHz.
The frequency range from 9kHz to 25GHz is checked.
The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Peak detector and Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
Through three orthogonal axes to determine which attitude and equipment arrangement produces the highest emission relative to the limit.

9.3. Radiated Test Setup

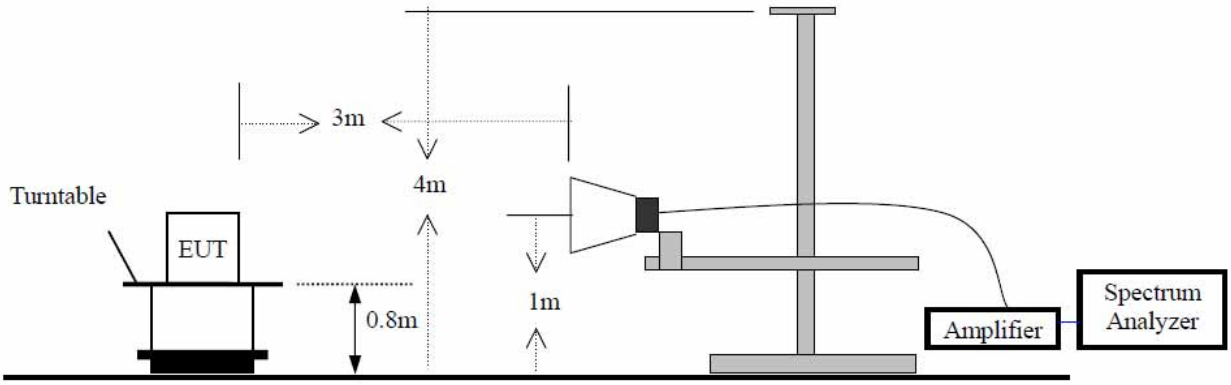
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



9.4. Radiated Emission Limit

Frequency (MHz)	Limit			
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dBμV/m)	Measurement distance (m)	The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
0.009 - 0.490	2400/F(kHz)	/	300	
0.490 - 1.705	24000/F(kHz)	/	30	
1.705-30	30	29.5	30	
30 - 88	100	40	3	
88 - 216	150	43.5	3	
216 - 960	200	46	3	
Above 960	500	54	3	

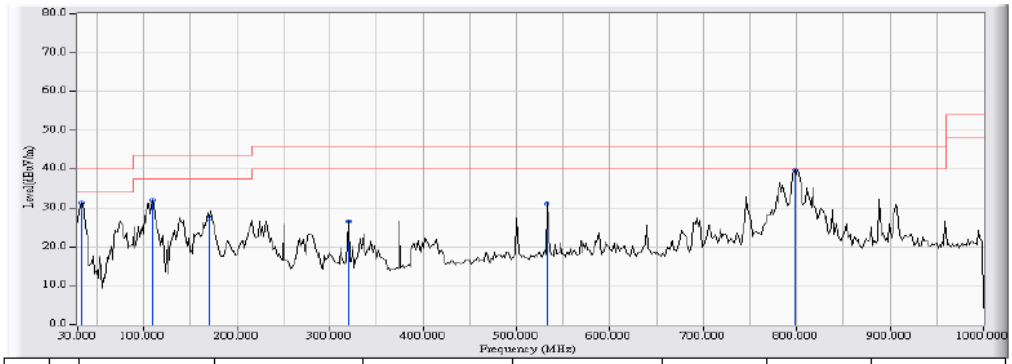
Note: (1) RF Voltage (dBuV)=20 log Voltage(uV)
(2) In the Above Table,the tighter limit applies at the band edges.
(3) Distaqnce refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

9.5. Radiated Emission Test Result

Pass.

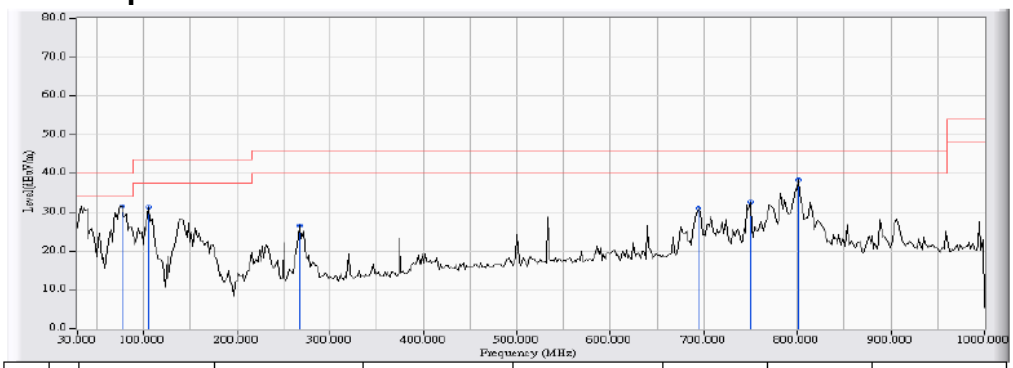
Date of Test:	September 27, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	Normal Linking	Test Engineer:	Adam Yang

Horizontal polarization



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		33.233	-10.505	41.812	31.307	-8.693	40.000	PEAK
2		109.217	-12.724	44.706	31.982	-11.518	43.500	PEAK
3		170.650	-14.349	41.763	27.413	-16.087	43.500	PEAK
4		319.383	-9.707	36.273	26.566	-19.434	46.000	PEAK
5		532.783	-4.952	36.006	31.054	-14.946	46.000	PEAK
6	*	797.917	-2.676	42.635	39.959	-6.041	46.000	PEAK

Vertical polarization



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		76.883	-17.261	48.757	31.496	-8.504	40.000	PEAK
2		105.983	-13.004	44.285	31.281	-12.219	43.500	PEAK
3		267.650	-10.785	37.368	26.582	-19.418	46.000	PEAK
4		694.450	-3.953	35.109	31.156	-14.844	46.000	PEAK
5		749.417	-3.297	35.831	32.535	-13.465	46.000	PEAK
6	*	801.150	-2.642	41.049	38.407	-7.593	46.000	PEAK

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11b Channel Low 2412MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4824.080	3.402	43.380	46.782	-27.218	74.000	54.00	PEAK
2		7240.900	9.905	41.490	51.395	-22.605	74.000	54.00	PEAK
3	*	9648.100	13.813	41.510	55.323	-18.677	74.000	54.00	PEAK
4		12056.000	18.636	33.820	52.455	-21.545	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	9647.940	13.813	32.990	46.803	-7.197	74.000	54.00	AVERAGE

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4824.000	5.539	43.380	48.919	-25.081	74.000	54.00	PEAK
2		7239.700	9.465	42.130	51.596	-22.404	74.000	54.00	PEAK
3	*	9648.100	13.813	39.840	53.653	-20.347	74.000	54.00	PEAK
4		12060.400	17.351	40.400	57.751	-16.249	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		9648.000	13.918	29.270	43.188	-10.812	74.000	54.00	AVERAGE
2	*	12057.200	17.357	29.840	47.198	-6.802	74.000	54.00	AVERAGE

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11b Channel Middle 2437MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4873.960	3.531	42.850	46.380	-27.620	74.000	54.00	PEAK
2		7311.040	10.227	36.690	46.917	-27.083	74.000	54.00	PEAK
3	*	9747.880	14.220	41.590	55.810	-18.190	74.000	54.00	PEAK
4		12184.800	18.123	34.170	52.292	-21.708	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	9748.000	14.220	31.510	45.730	-8.270	74.000	54.00	AVERAGE

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4873.960	5.577	42.820	48.397	-25.603	74.000	54.00	PEAK
2		7301.000	9.584	37.780	47.365	-26.635	74.000	54.00	PEAK
3		9747.880	14.419	41.680	56.099	-17.901	74.000	54.00	PEAK
4	*	12183.200	17.130	39.180	56.309	-17.691	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	9747.960	14.420	31.700	46.120	-7.880	74.000	54.00	AVERAGE
2		12183.400	17.129	26.430	43.559	-10.441	74.000	54.00	AVERAGE

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11b Channel High 2462MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4924.030	3.668	41.670	45.338	-28.662	74.000	54.00	PEAK
2		7386.040	10.582	40.420	51.002	-22.998	74.000	54.00	PEAK
3		9848.030	14.618	37.460	52.078	-21.922	74.000	54.00	PEAK
4	*	12310.050	17.632	35.080	52.712	-21.288	74.000	54.00	PEAK

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4924.050	5.605	42.460	48.065	-25.935	74.000	54.00	PEAK
2		7386.050	9.760	41.790	51.550	-22.450	74.000	54.00	PEAK
3		9848.040	14.922	37.090	52.012	-21.988	74.000	54.00	PEAK
4	*	12310.050	16.892	35.840	52.732	-21.268	74.000	54.00	PEAK

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11g Channel Low 2412MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4824.010	3.402	38.440	41.842	-32.158	74.000	54.00	PEAK
2	*	7236.020	9.883	43.420	53.303	-20.697	74.000	54.00	PEAK
3		9648.000	13.813	37.960	51.773	-22.227	74.000	54.00	PEAK
4		12310.030	17.633	34.718	52.350	-21.650	74.000	54.00	PEAK

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4824.000	5.539	38.020	43.559	-30.441	74.000	54.00	PEAK
2		7236.000	9.458	39.270	48.728	-25.272	74.000	54.00	PEAK
3		9648.000	13.918	38.050	51.968	-22.032	74.000	54.00	PEAK
4	*	12060.003	17.353	35.320	52.672	-21.328	74.000	54.00	PEAK

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11g Channel Middle 2437MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4874.000	3.531	38.600	42.130	-31.870	74.000	54.00	PEAK
2	*	7311.030	10.227	46.280	56.507	-17.493	74.000	54.00	PEAK
3		9748.040	14.220	38.230	52.450	-21.550	74.000	54.00	PEAK
4		12185.030	18.121	34.329	52.450	-21.550	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	7310.000	10.223	27.550	37.773	-16.227	74.000	54.00	AVERAGE

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4874.040	5.577	39.730	45.307	-28.693	74.000	54.00	PEAK
2	*	7311.020	9.604	44.550	54.154	-19.846	74.000	54.00	PEAK
3		9748.080	14.420	37.950	52.370	-21.630	74.000	54.00	PEAK
4		12185.060	17.127	34.509	51.636	-22.364	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	7309.400	9.601	26.140	35.741	-18.259	74.000	54.00	AVERAGE

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11g Channel High 2462MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4924.030	3.668	38.760	42.428	-31.572	74.000	54.00	PEAK
2	*	7386.200	10.582	45.960	56.542	-17.458	74.000	54.00	PEAK
3		9848.040	14.618	38.220	52.838	-21.162	74.000	54.00	PEAK
4		12310.050	17.632	34.838	52.470	-21.530	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	7391.200	10.605	26.720	37.325	-16.675	74.000	54.00	AVERAGE

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4924.040	5.605	38.730	44.335	-29.665	74.000	54.00	PEAK
2	*	7386.050	9.760	45.030	54.790	-19.210	74.000	54.00	PEAK
3		9848.020	14.922	37.930	52.852	-21.148	74.000	54.00	PEAK
4		12310.050	16.892	35.958	52.850	-21.150	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	7385.420	9.759	27.140	36.899	-17.101	74.000	54.00	AVERAGE

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT20 Channel Low 2412MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4824.000	3.402	38.510	41.912	-32.088	74.000	54.00	PEAK
2		7236.300	9.885	37.480	47.364	-26.636	74.000	54.00	PEAK
3		9648.400	13.815	38.240	52.055	-21.945	74.000	54.00	PEAK
4	*	12060.050	18.620	33.660	52.279	-21.721	74.000	54.00	PEAK

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4824.000	5.539	38.570	44.109	-29.891	74.000	54.00	PEAK
2		7212.700	9.413	38.910	48.323	-25.677	74.000	54.00	PEAK
3		9648.000	13.918	36.450	50.368	-23.632	74.000	54.00	PEAK
4	*	12059.800	17.353	34.560	51.913	-22.087	74.000	54.00	PEAK

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT20 Channel Middle 2437MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4874.020	3.531	38.960	42.491	-31.509	74.000	54.00	PEAK
2	*	7311.050	10.224	44.020	54.245	-19.755	74.000	54.00	PEAK
3		9748.040	14.220	38.040	52.260	-21.740	74.000	54.00	PEAK
4		12185.000	18.115	34.235	52.350	-21.650	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	7310.000	10.220	27.450	37.670	-16.330	74.000	54.00	AVERAGE

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4874.050	5.577	38.700	44.277	-29.723	74.000	54.00	PEAK
2	*	7311.050	9.601	43.320	52.922	-21.078	74.000	54.00	PEAK
3		9748.050	14.420	37.670	52.090	-21.910	74.000	54.00	PEAK
4		12185.000	17.121	35.350	52.470	-21.530	74.000	54.00	PEAK

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT20 Channel High 2462MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4924.200	3.668	38.600	42.268	-31.732	74.000	54.00	PEAK
2		7386.200	10.582	37.550	48.132	-25.868	74.000	54.00	PEAK
3	*	9847.600	14.615	38.380	52.996	-21.004	74.000	54.00	PEAK
4		12310.200	17.631	34.990	52.622	-21.378	74.000	54.00	PEAK

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4923.600	5.604	38.900	44.504	-29.496	74.000	54.00	PEAK
2		7386.500	9.761	38.300	48.061	-25.939	74.000	54.00	PEAK
3	*	9848.000	14.922	37.540	52.461	-21.539	74.000	54.00	PEAK
4		12310.400	16.891	35.480	52.371	-21.629	74.000	54.00	PEAK

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT40 Channel Low 2422MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4828.000	3.412	38.900	42.312	-31.688	74.000	54.00	PEAK
2		7268.800	10.033	38.430	48.463	-25.537	74.000	54.00	PEAK
3	*	9687.600	13.968	39.430	53.398	-20.602	74.000	54.00	PEAK
4		12110.020	18.425	34.266	52.690	-21.310	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	9755.200	14.250	25.690	39.940	-14.060	74.000	54.00	AVERAGE

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4844.800	5.557	38.100	43.657	-30.343	74.000	54.00	PEAK
2		7265.200	9.515	38.170	47.685	-26.315	74.000	54.00	PEAK
3	*	9685.200	14.106	39.550	53.656	-20.344	74.000	54.00	PEAK
4		12110.030	17.261	35.320	52.580	-21.420	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	9755.200	14.455	25.720	40.175	-13.825	74.000	54.00	AVERAGE

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT40 Channel Middle 2437MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4868.000	3.516	39.090	42.606	-31.394	74.000	54.00	PEAK
2		7138.000	9.423	39.090	48.513	-25.487	74.000	54.00	PEAK
3	*	9750.000	14.229	39.630	53.859	-20.141	74.000	54.00	PEAK
4		12185.020	18.121	34.749	52.870	-21.130	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	9750.000	14.229	25.760	39.989	-14.011	74.000	54.00	AVERAGE

Vertical

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4876.000	5.579	38.800	44.379	-29.621	74.000	54.00	PEAK
2		7312.000	9.606	37.630	47.236	-26.764	74.000	54.00	PEAK
3	*	9763.000	14.492	39.360	53.852	-20.148	74.000	54.00	PEAK
4		12185.000	17.127	35.323	52.450	-21.550	74.000	54.00	PEAK

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1	*	9750.000	14.430	25.990	40.420	-13.580	74.000	54.00	AVERAGE

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT40 Channel High 2452MHz	Test Engineer:	Adam Yang

For below 1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m) QP	Correct Factor (dB)	Result (dBμV/m) QP	Limit (dBμV/m) QP	Margin (dB) QP	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

For 1GHz-25GHz

Horizontal

		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4904.200	3.619	38.460	42.079	-31.921	74.000	54.00	PEAK
2		7356.400	10.442	39.940	50.383	-23.617	74.000	54.00	PEAK
3	*	9807.800	14.460	38.440	52.900	-21.100	74.000	54.00	PEAK
4		12260.030	17.832	34.628	52.460	-21.540	74.000	54.00	PEAK

Vertical

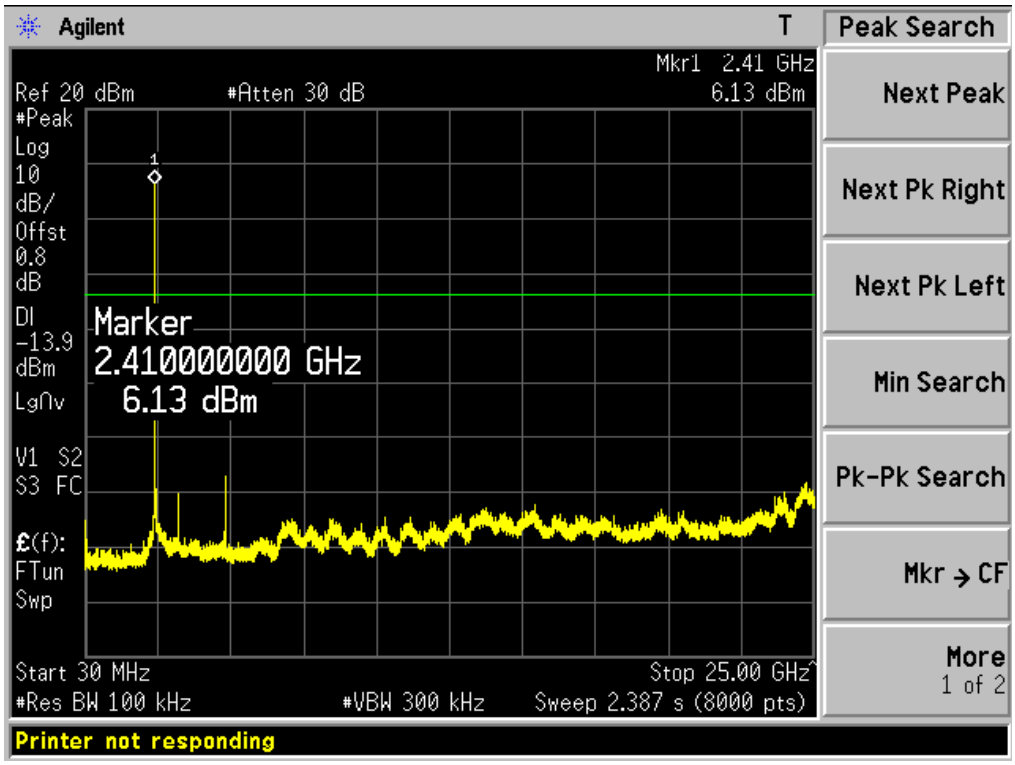
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		4904.200	5.590	38.360	43.950	-30.050	74.000	54.00	PEAK
2		7356.400	9.689	38.000	47.690	-26.310	74.000	54.00	PEAK
3	*	9807.800	14.718	38.270	52.988	-21.012	74.000	54.00	PEAK
4		12260.200	16.988	35.352	52.340	-21.660	74.000	54.00	PEAK

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

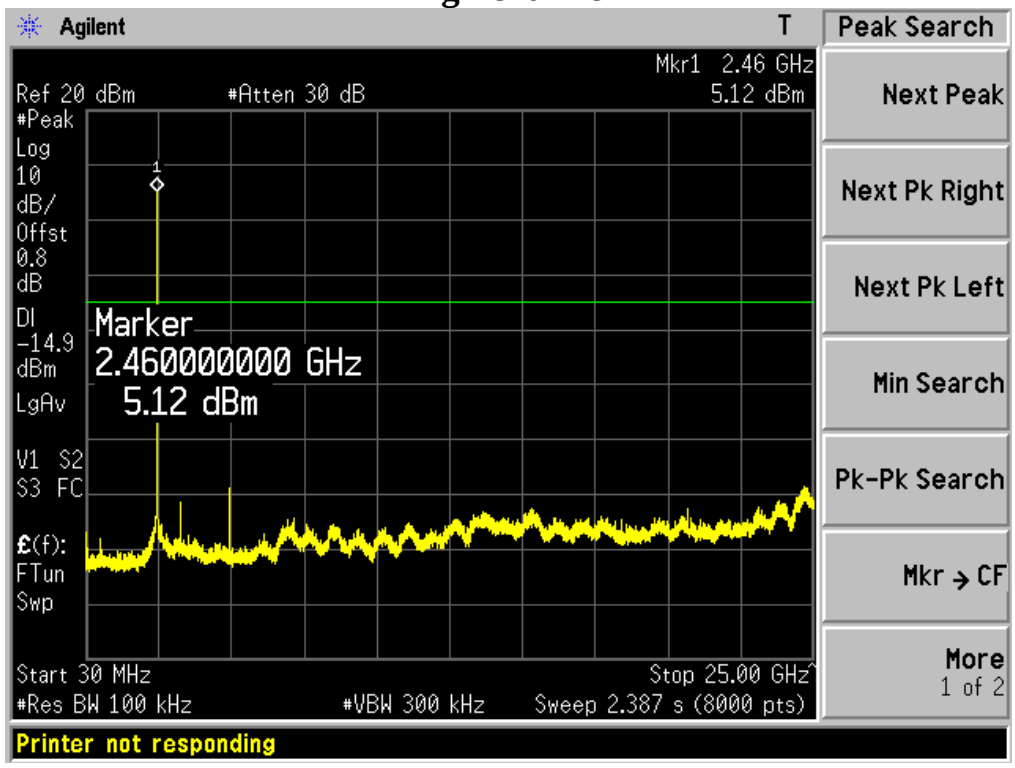
Antenna port conducted spurious emissions

802.11b mode:

Low channel

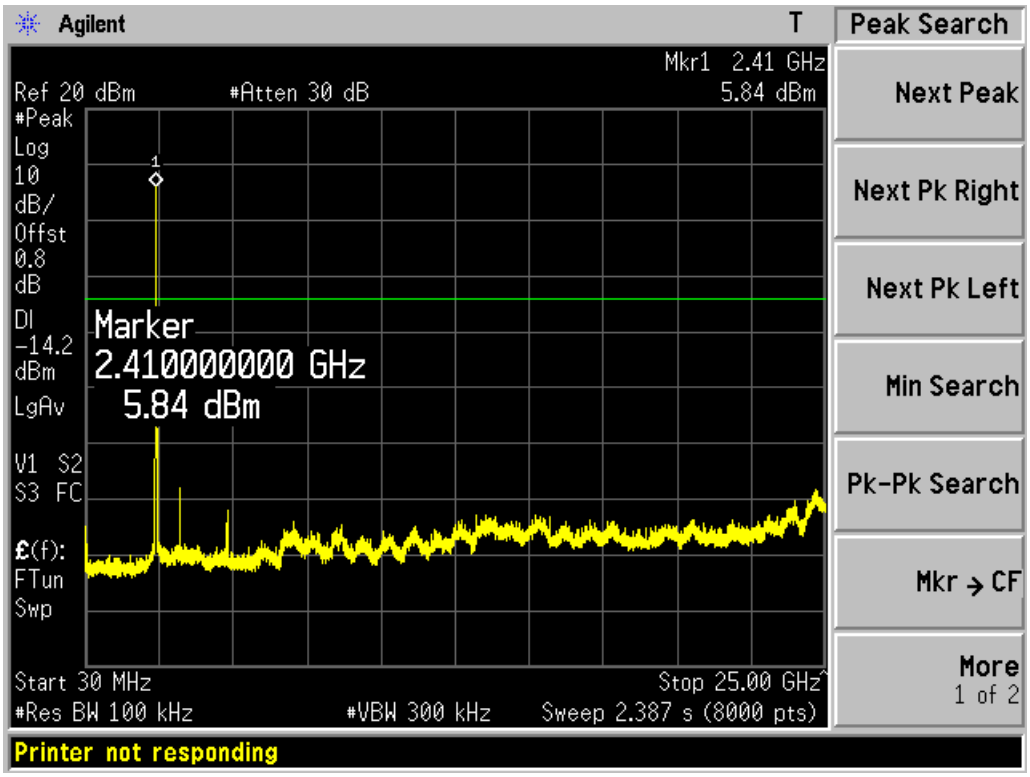


High channel

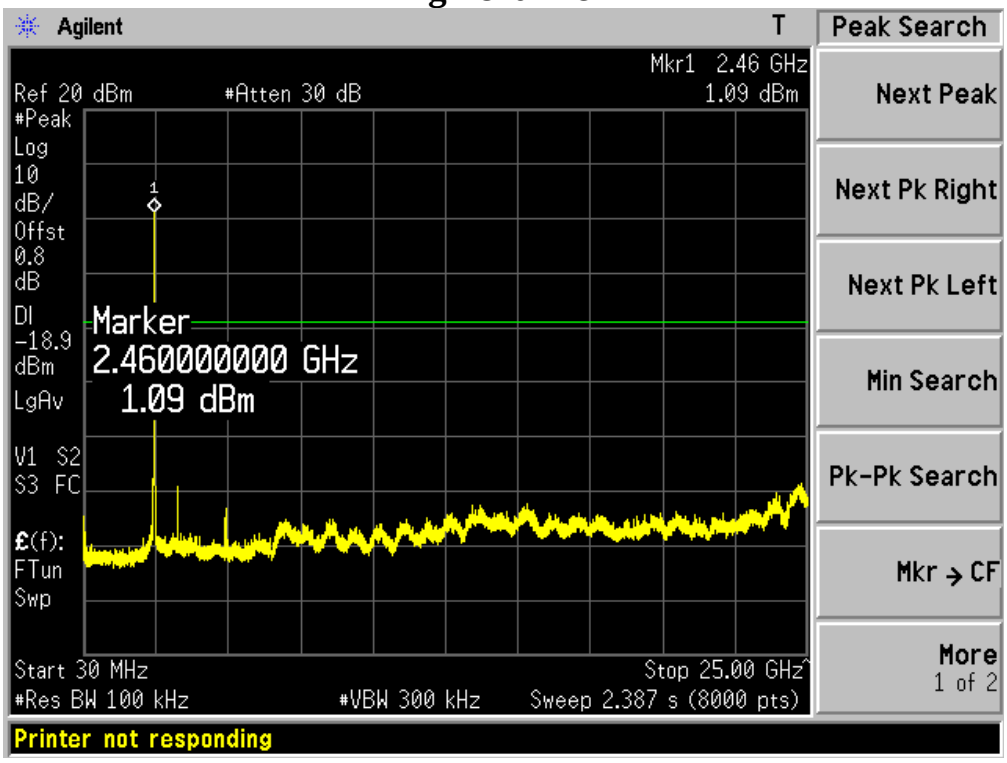


802.11g mode:

Low channel

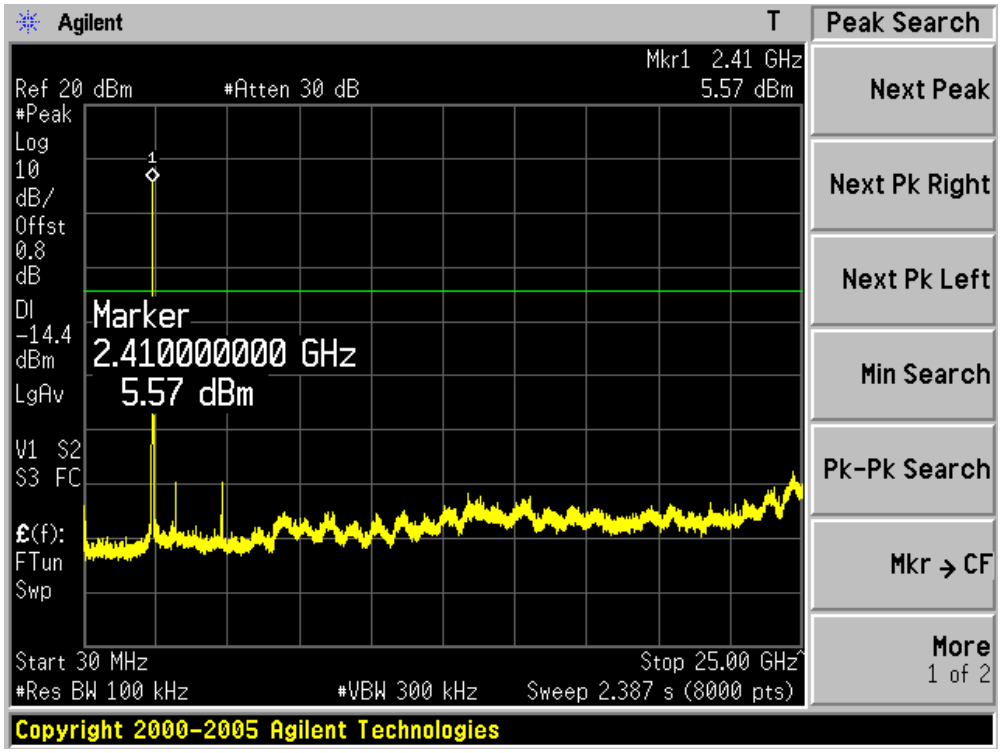


High channel

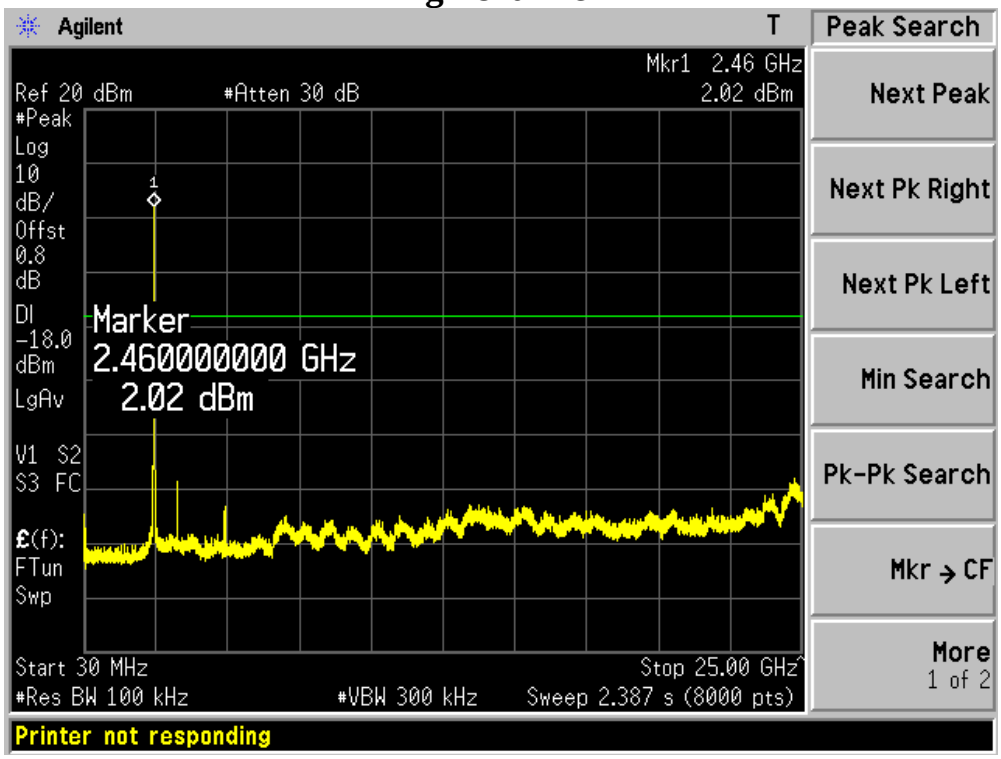


802.11n (20M) mode:

Low channel

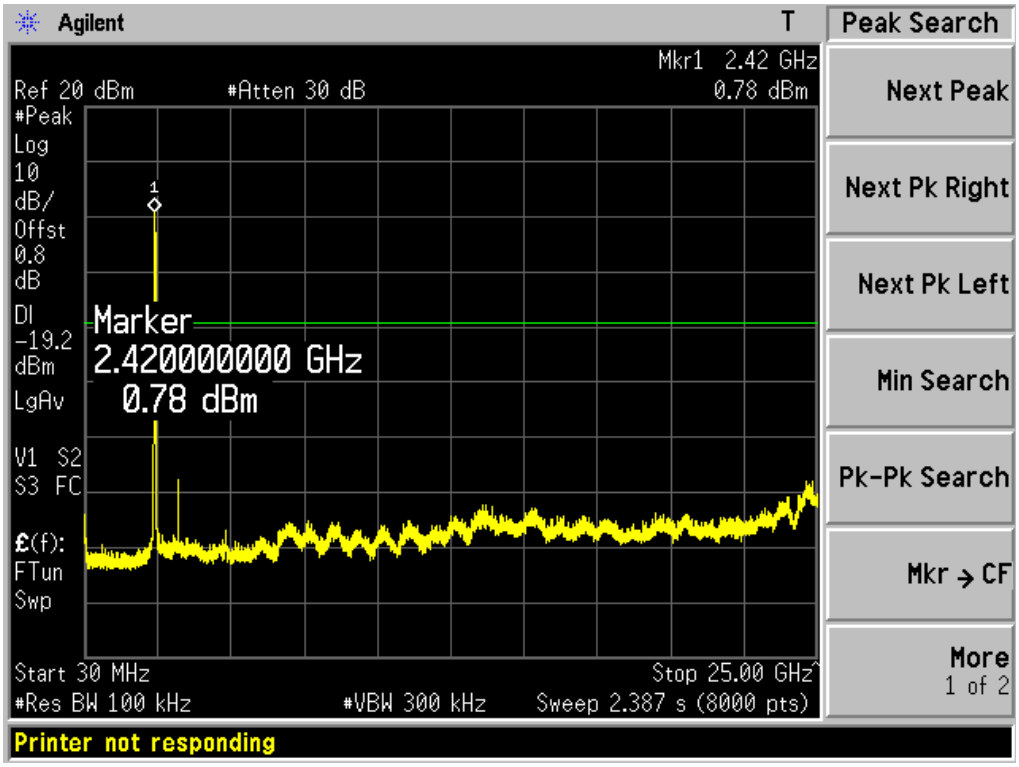


High channel

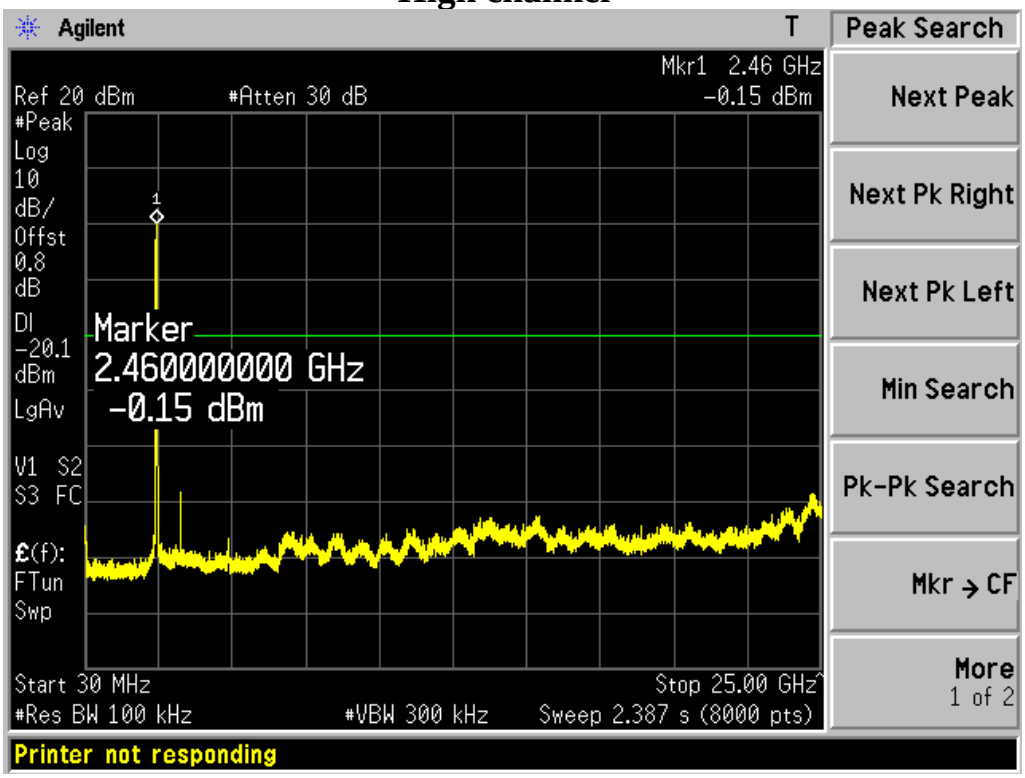


802.11n (40M) mode:

Low channel



High channel



10. §15.247(A) (2) – 6DB BANDWIDTH TESTING

10.1. Test Equipment

Please refer to Section 5 this report.

10.2.Test Procedure

1. Set EUT in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz,VB𝕎≥RBW,Span=50MHz,Sweep=auto.
4. Mark the peak frequency and -6dB(upper and lower)frequency.
5. Repeat until all the rest channels are investigated.

10.3.Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

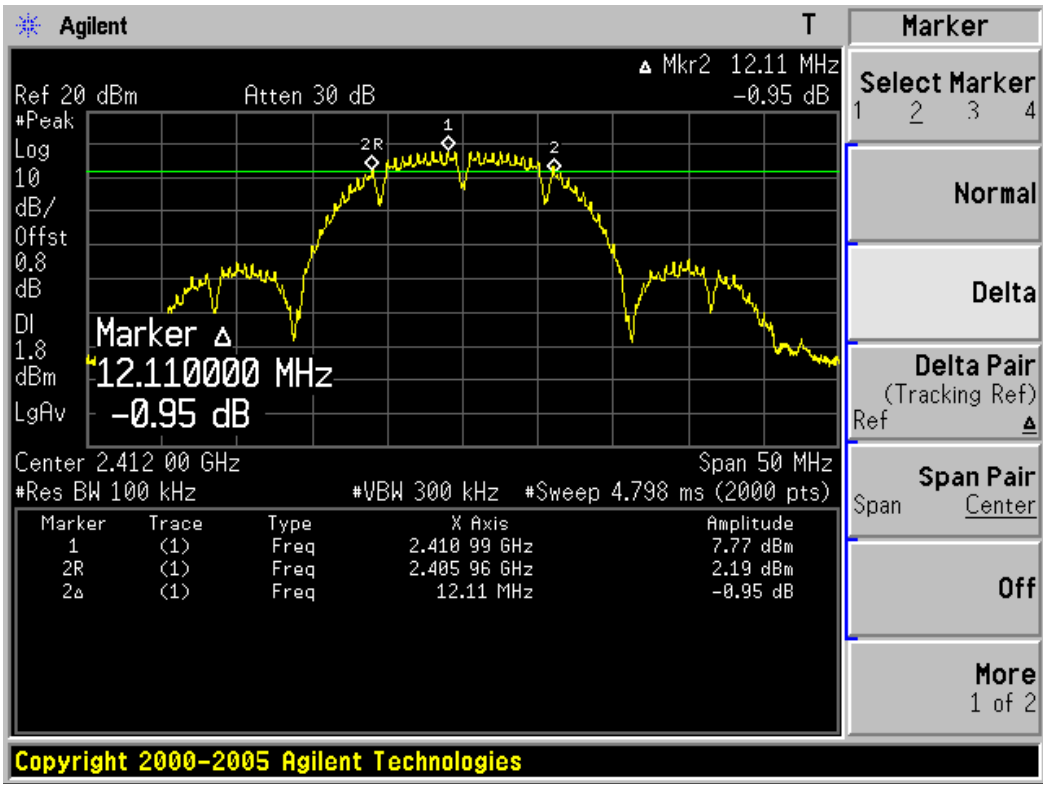
10.4.Test Result:Pass.

Please refer to the following tables

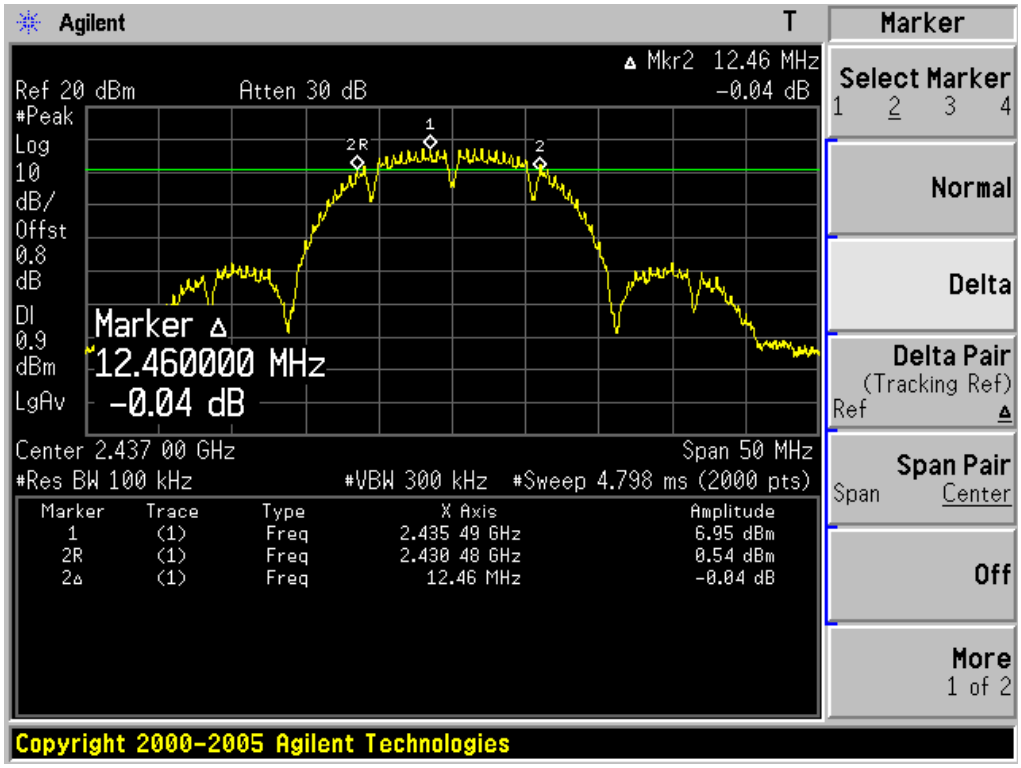
Channel Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)	Limit (kHz)	Result
802.11b Mode				
2412	1	12110	＞500	Pass
2437	1	12460	＞500	Pass
2462	1	12530	＞500	Pass
802.11g Mode				
2412	6	16430	＞500	Pass
2437	6	16110	＞500	Pass
2462	6	16410	＞500	Pass
802.11n (20M) Mode				
2412	6.5	17310	＞500	Pass
2437	6.5	17480	＞500	Pass
2462	6.5	17480	＞500	Pass
802.11n (40M) Mode				
2412	13	36150	＞500	Pass
2437	13	36240	＞500	Pass
2462	13	36150	＞500	Pass

802.11b Mode:

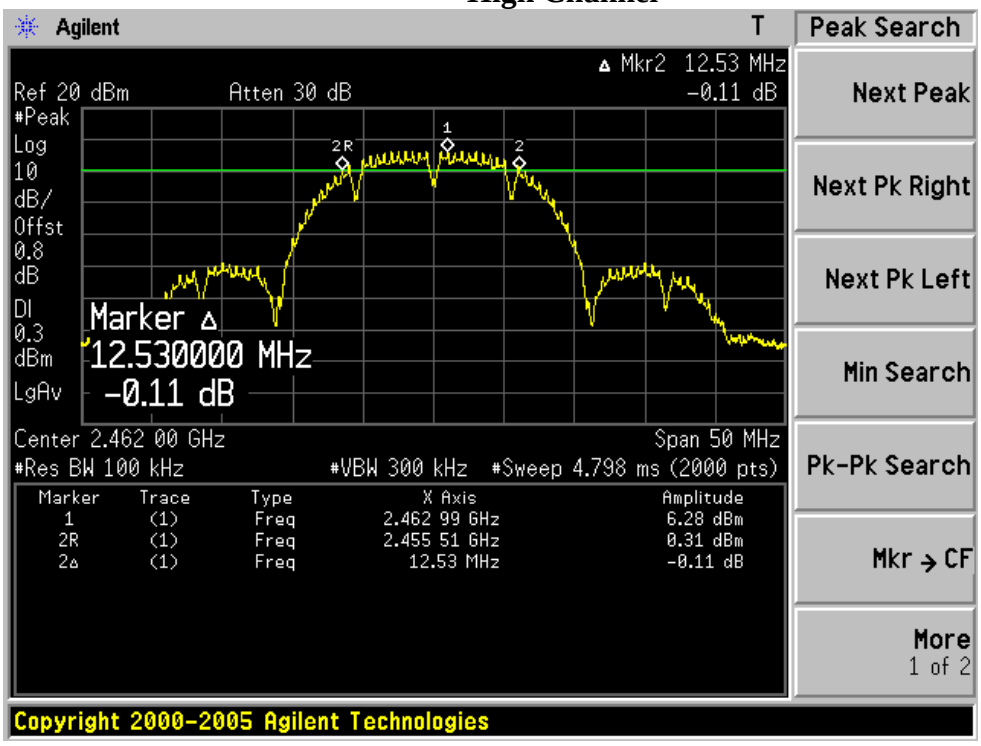
Low Channel



Middle Channel

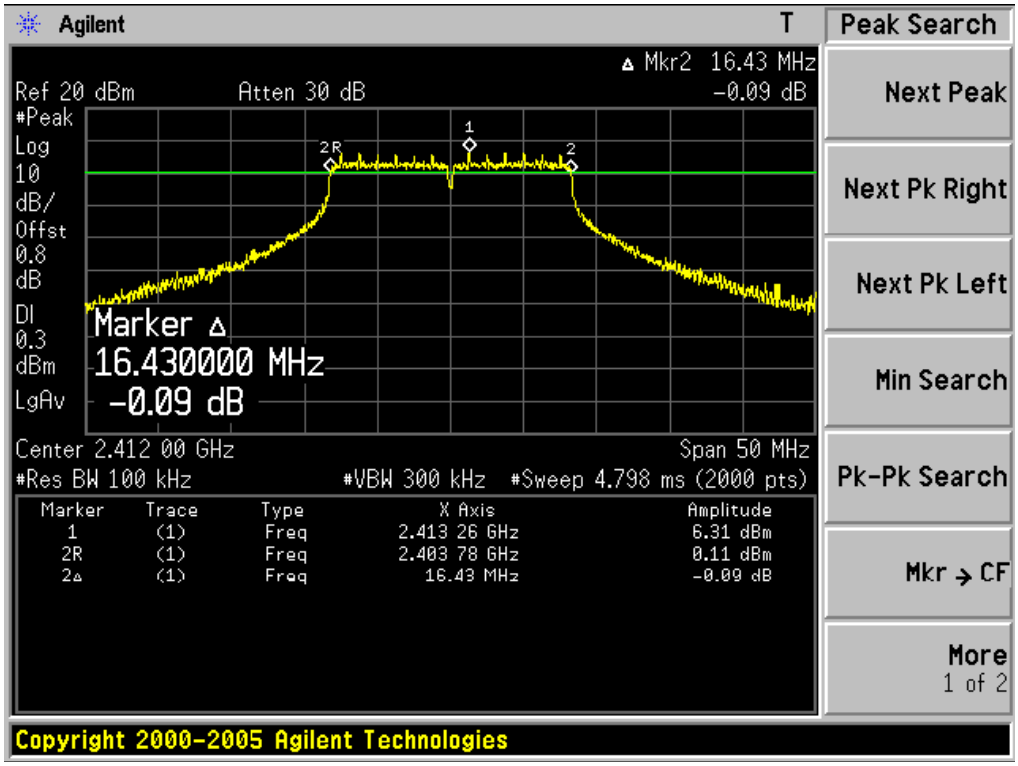


High Channel

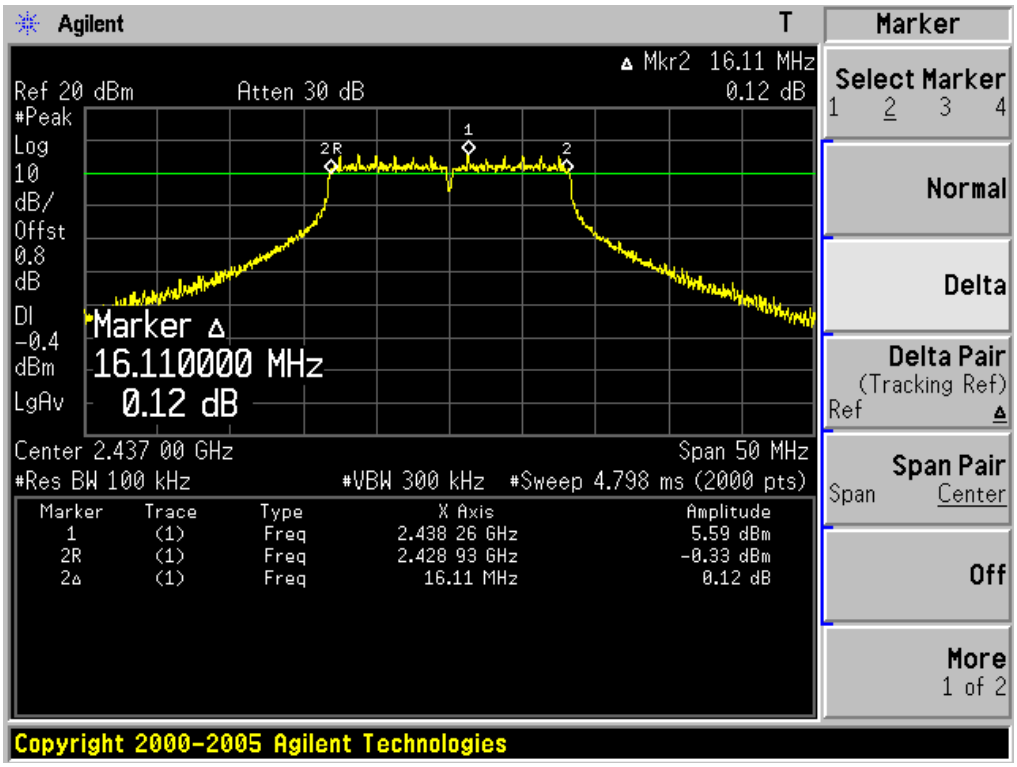


802.11g Mode:

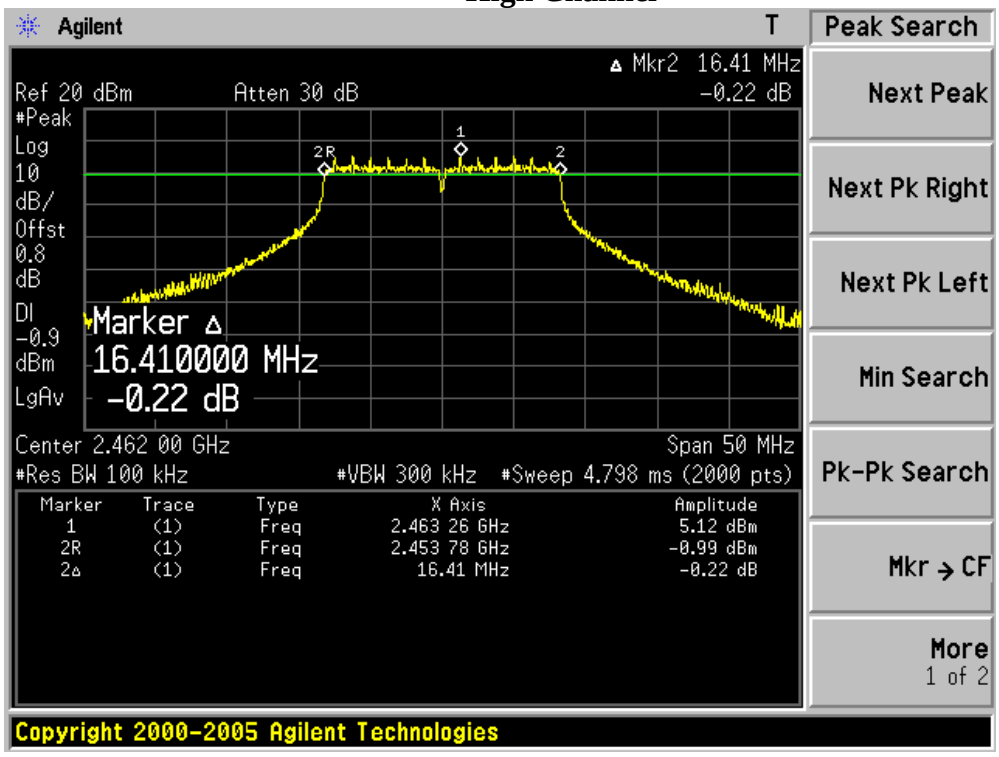
Low Channel



Middle Channel

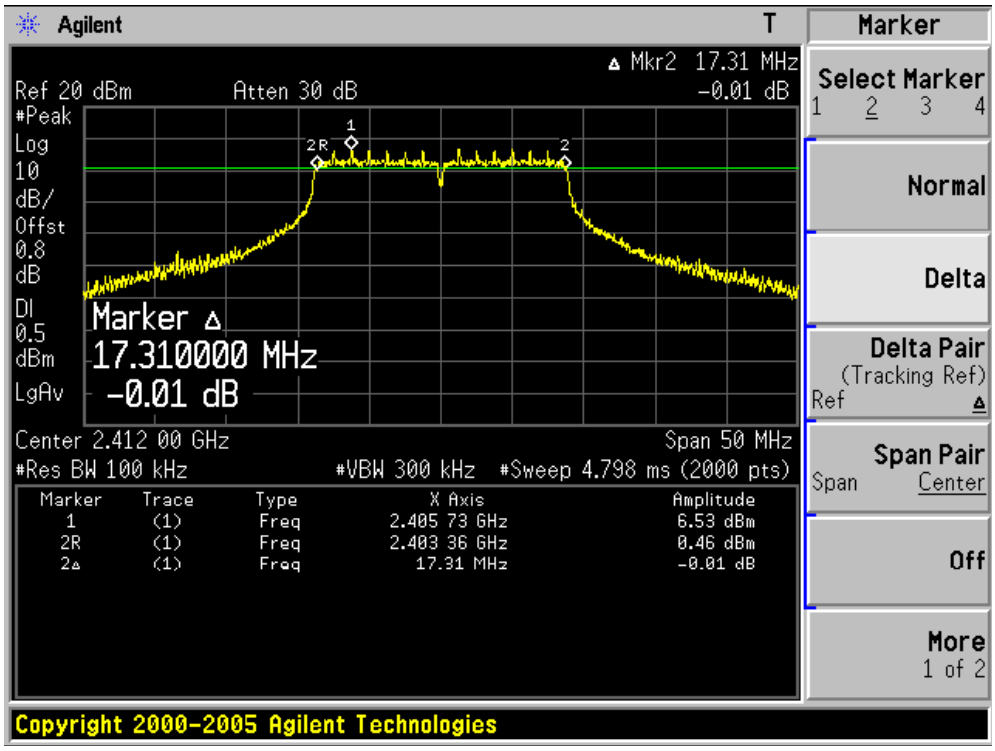


High Channel

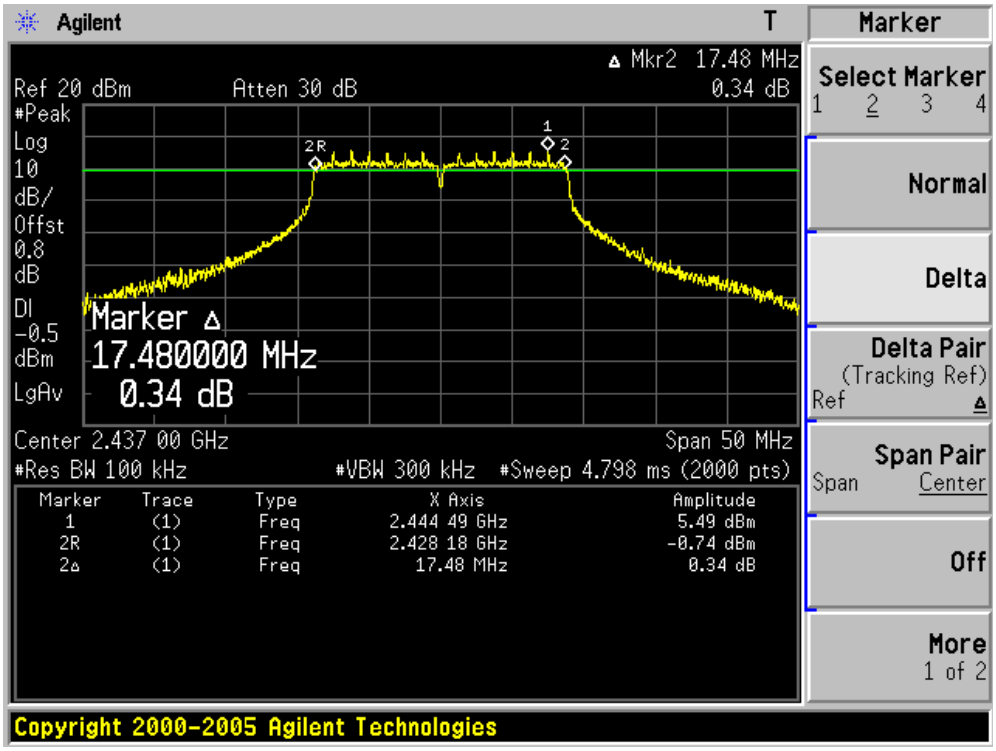


802.11n (20M) Mode:

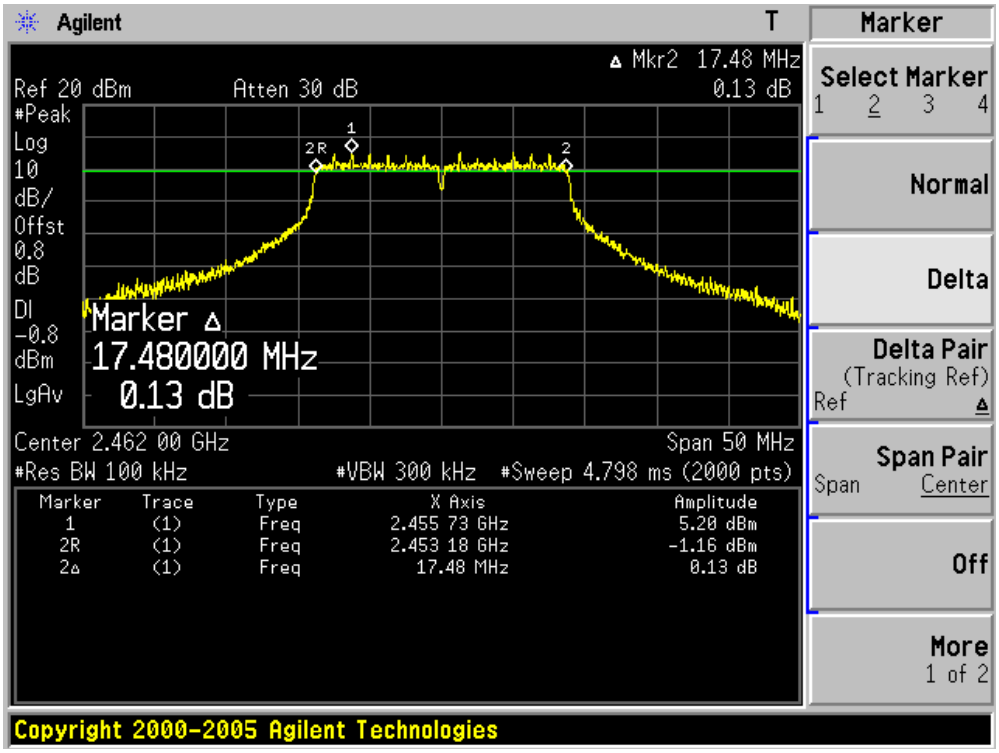
Low Channel



Middle Channel

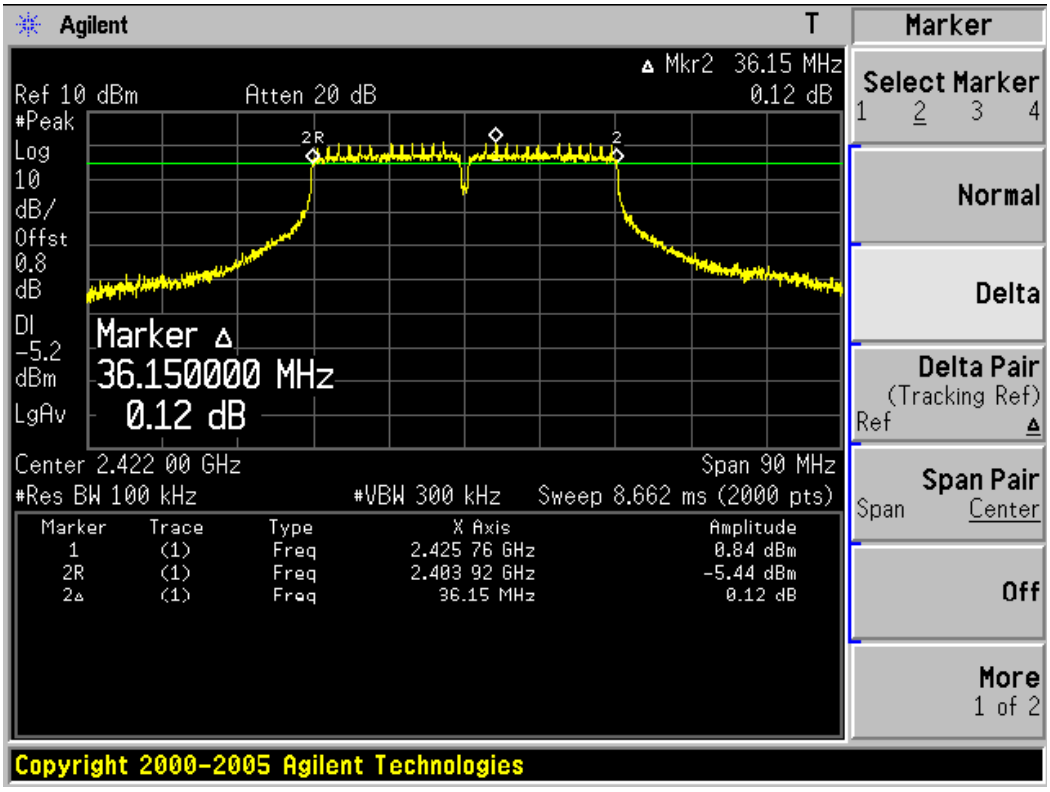


High Channel

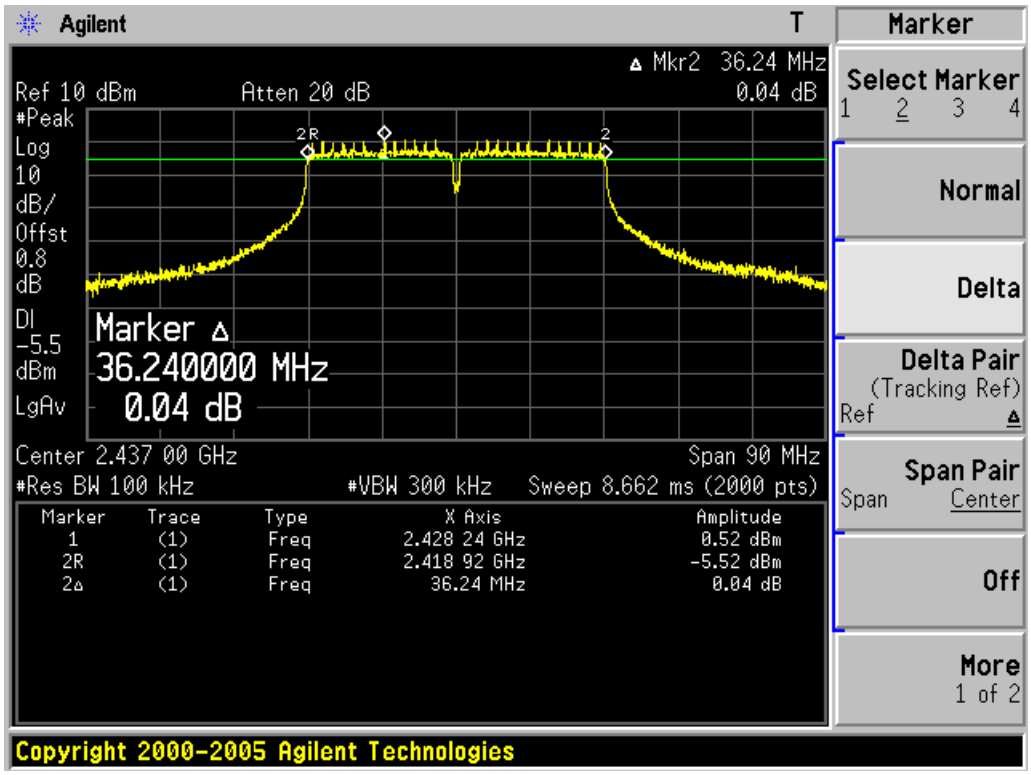


802.11n (40M) Mode:

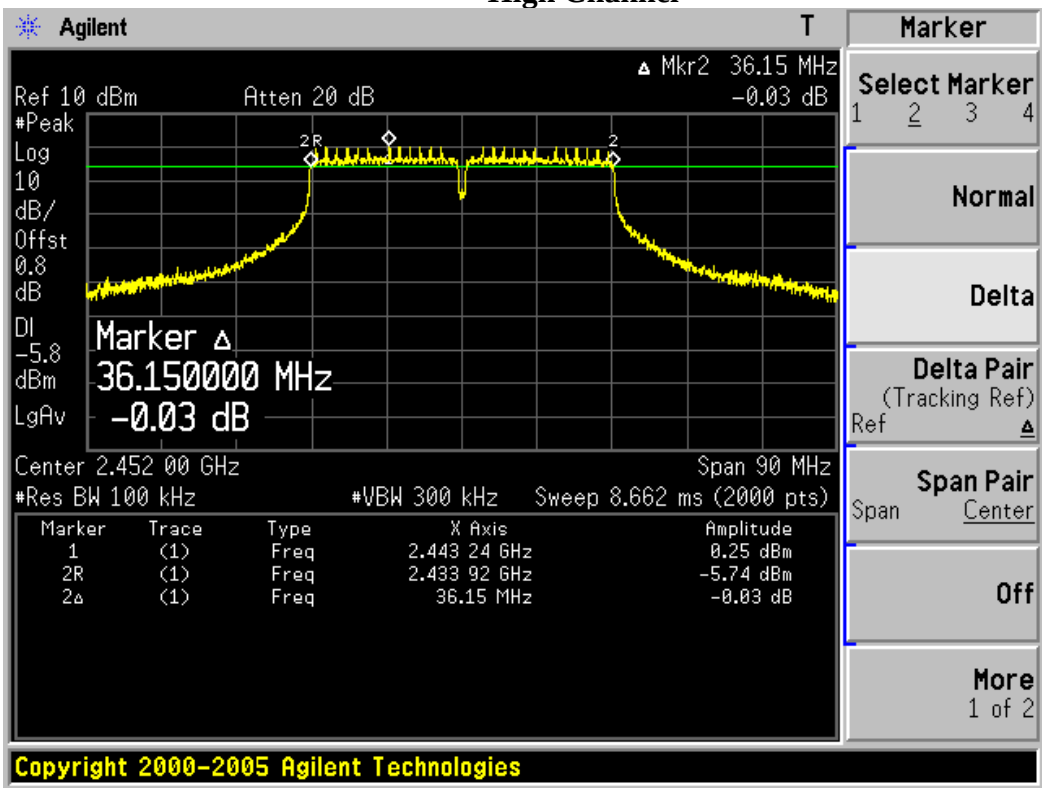
Low Channel



Middle Channel



High Channel



11. §15.247(B) (3) - Maximum Peak Output Power

11.1. Test Equipment

Please refer to Section 4 this report.

11.2.Test Procedure

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

11.3.Applicable Standard

According to §15.247(b) (3), for systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

11.4. Test Result

Pass

802.11b Mode:

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Power (dBm)	Limit (dBm)
Low	2412	1	18.84	30
Mid	2437	1	18.69	30
High	2462	1	18.73	30

802.11g Mode:

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Power (dBm)	Limit (dBm)
Low	2412	6	17.54	30
Mid	2437	6	17.31	30
High	2462	6	17.47	30

802.11n (20M) Mode:

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Power (dBm)	Limit (dBm)
Low	2412	6.5	17.12	30
Mid	2437	6.5	16.83	30
High	2462	6.5	16.97	30

802.11n (40M) Mode:

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Power (dBm)	Limit (dBm)
Low	2422	13.5	15.24	30
Mid	2437	13.5	15.68	30
High	2452	13.5	15.57	30

12. §15.247(D) – 100 KHZ Bandwidth of Frequency Band Edge

12.1.Test Equipment

Please refer to Section 4 this report.

12.2.Test Procedure

1, Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2, Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3, Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
Note: For Rdstricted Band
RBW=1MHz
VBW=1 MHz
4, Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5, Repeat above procedures until all measured frequencies were complete.

12.3.Applicable Standard

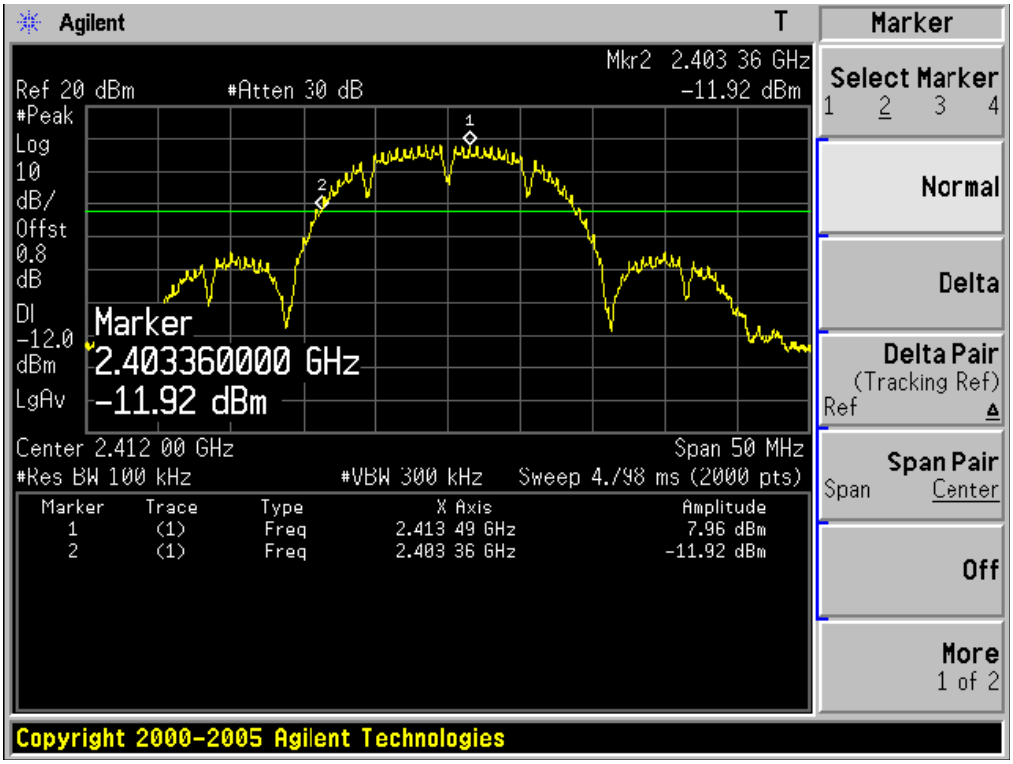
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

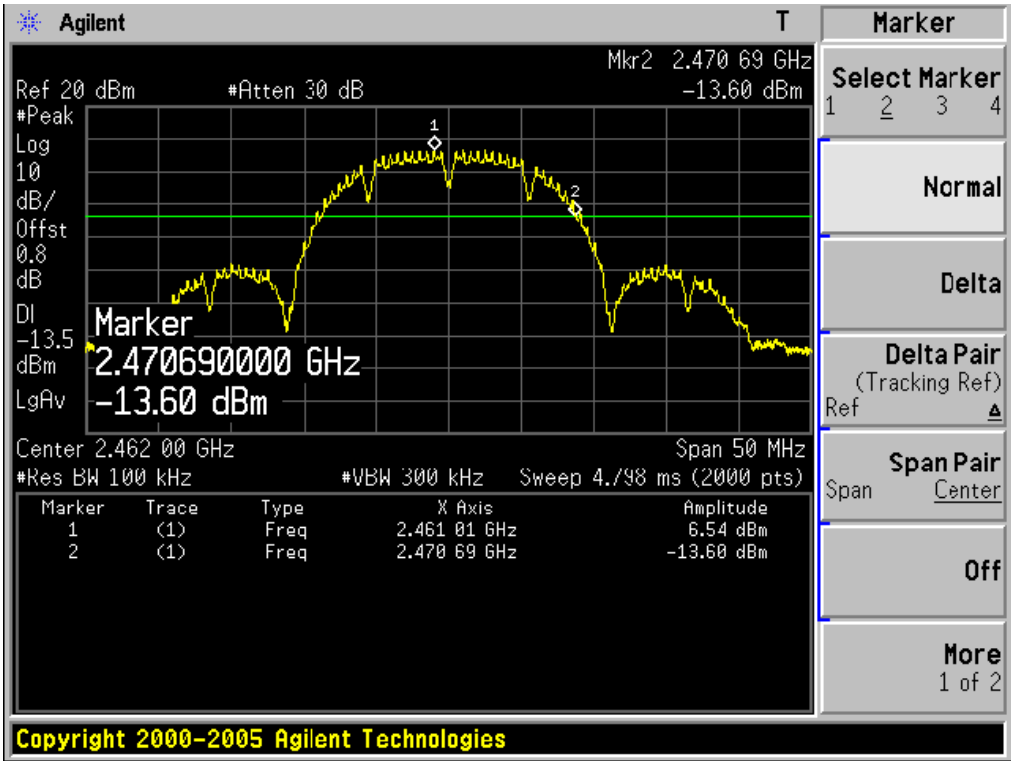
12.4.Test Result

Pass.

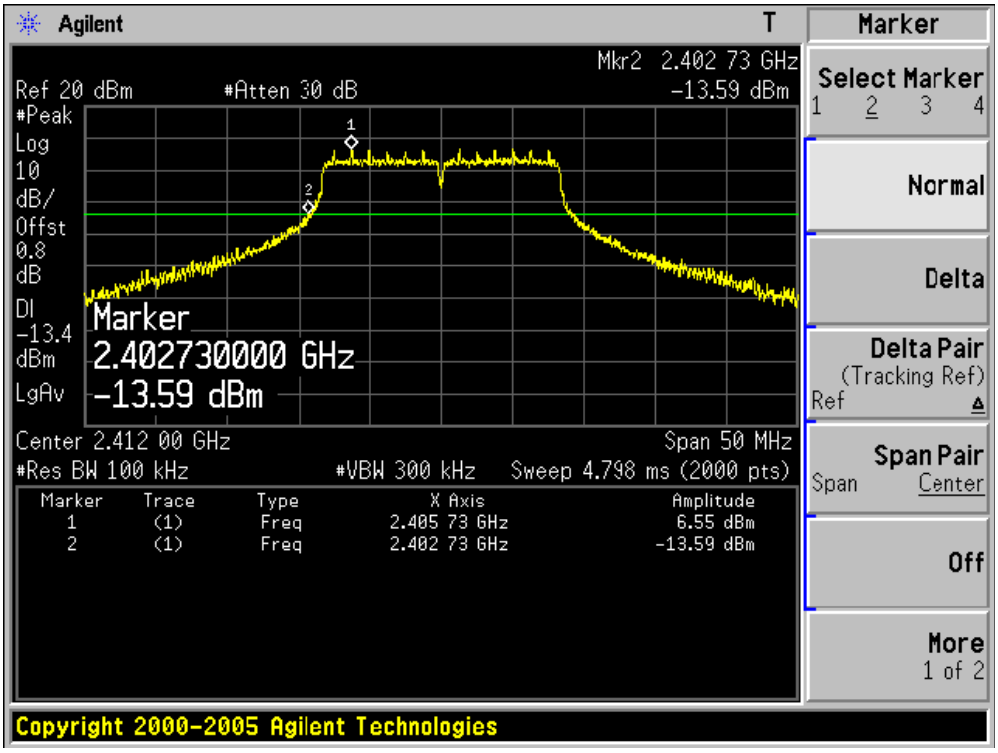
Conducted test

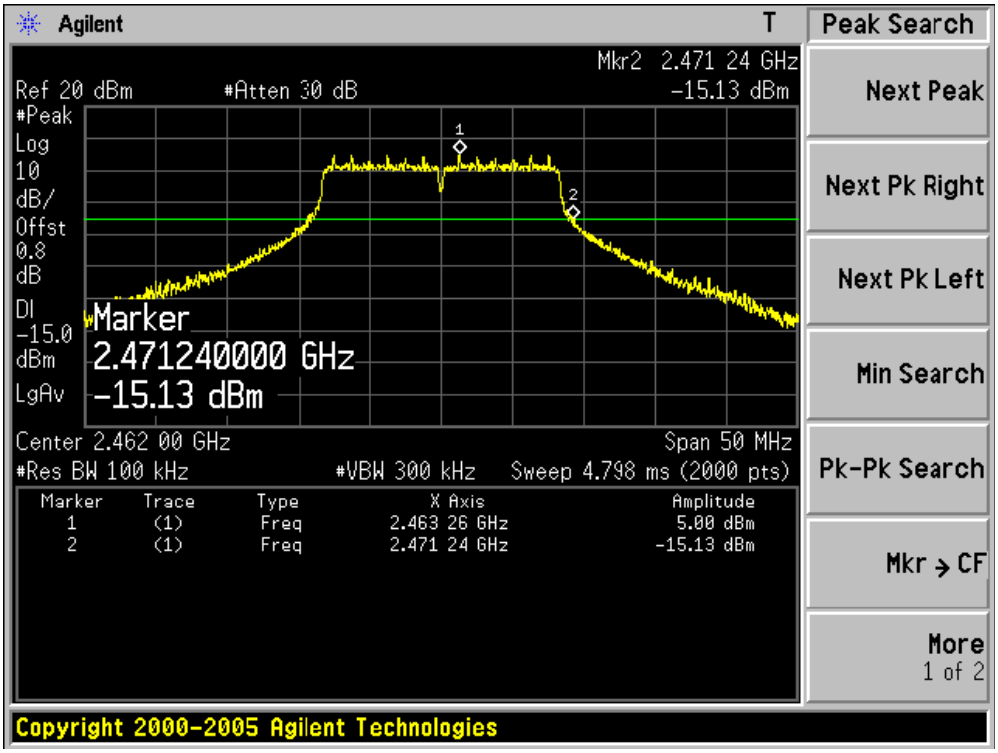
802.11b Mode:



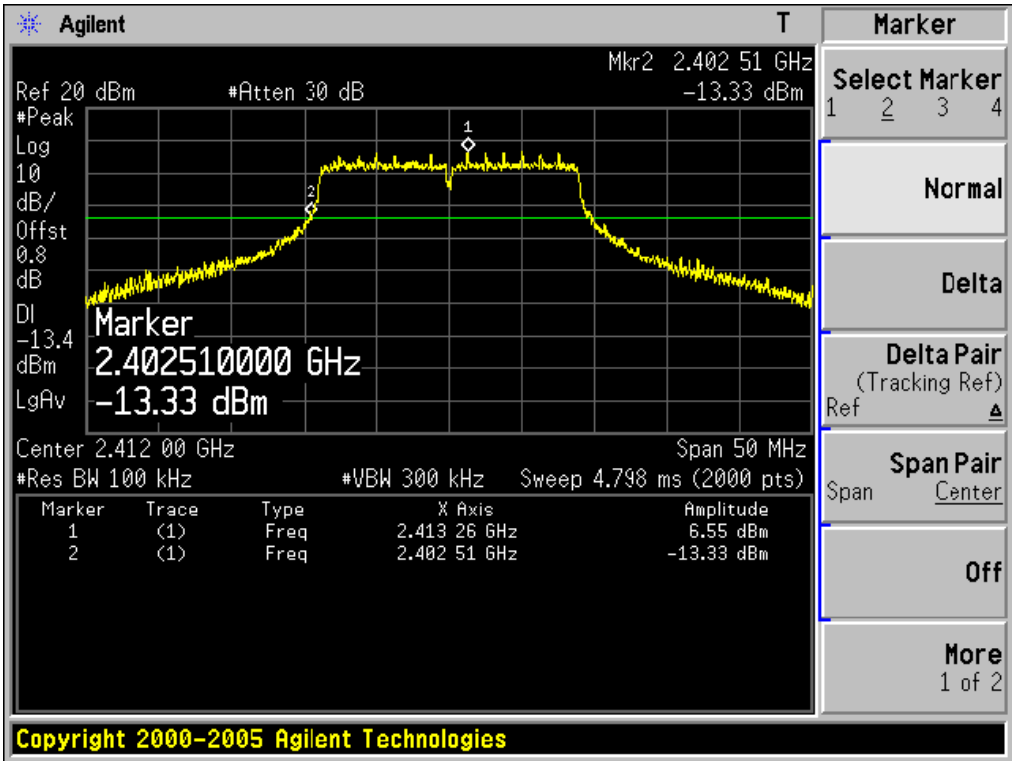


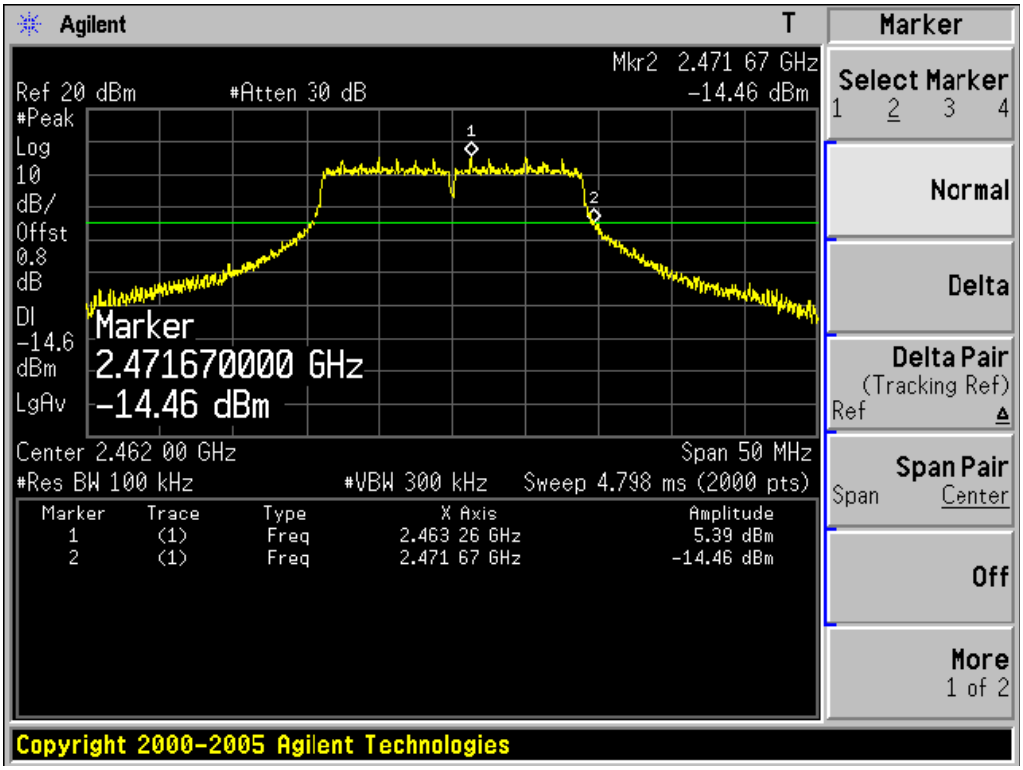
802.11g Mode:


Agilent
T
Marker
Mkr2 2.402 73 GHz
Ref 20 dBm
#Atten 30 dB
-13.59 dBm
#Peak
Log
10
dB/
Offst
0.8
dB
Dl
-13.4
dBm
LgAv
Marker
2.402730000 GHz
-13.59 dBm
Center 2.412 00 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.798 ms (2000 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.405 73 GHz 6.55 dBm
2 (1) Freq 2.402 73 GHz -13.59 dBm
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Copyright 2000-2005 Agilent Technologies

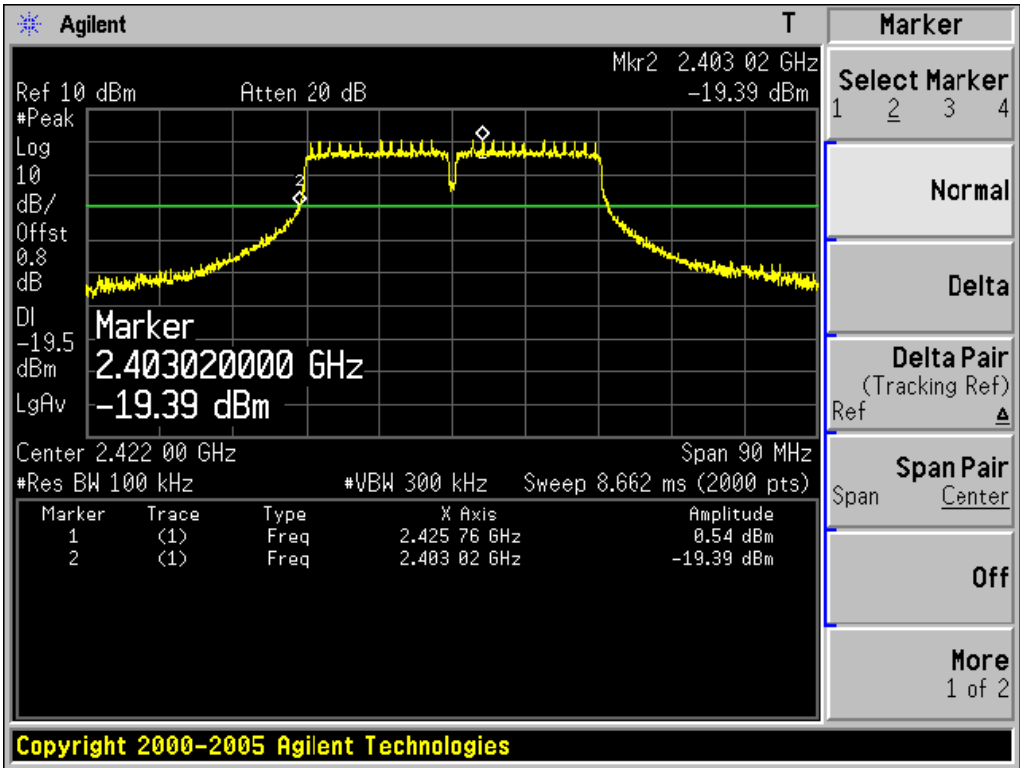

Agilent
T
Peak Search
Mkr2 2.471 24 GHz
Ref 20 dBm
#Atten 30 dB
-15.13 dBm
#Peak
Log
10
dB/
Offst
0.8
dB
Dl
-15.0
dBm
LgAv
Marker
2.471240000 GHz
-15.13 dBm
Center 2.462 00 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.798 ms (2000 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.463 26 GHz 5.00 dBm
2 (1) Freq 2.471 24 GHz -15.13 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Copyright 2000-2005 Agilent Technologies

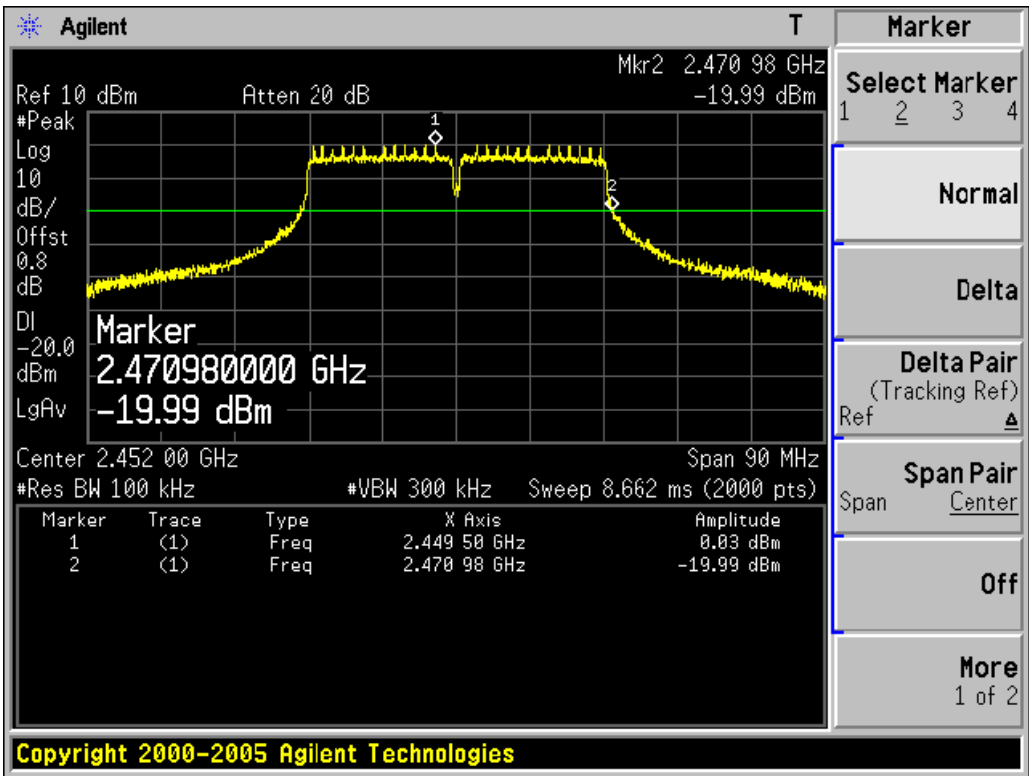
802.11n (20M) Mode:





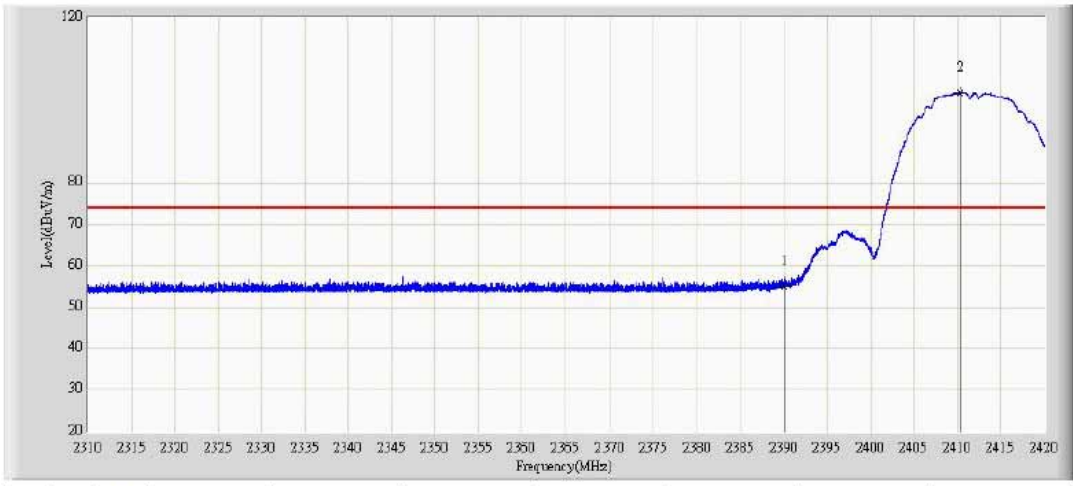
802.11n (40M) Mode:



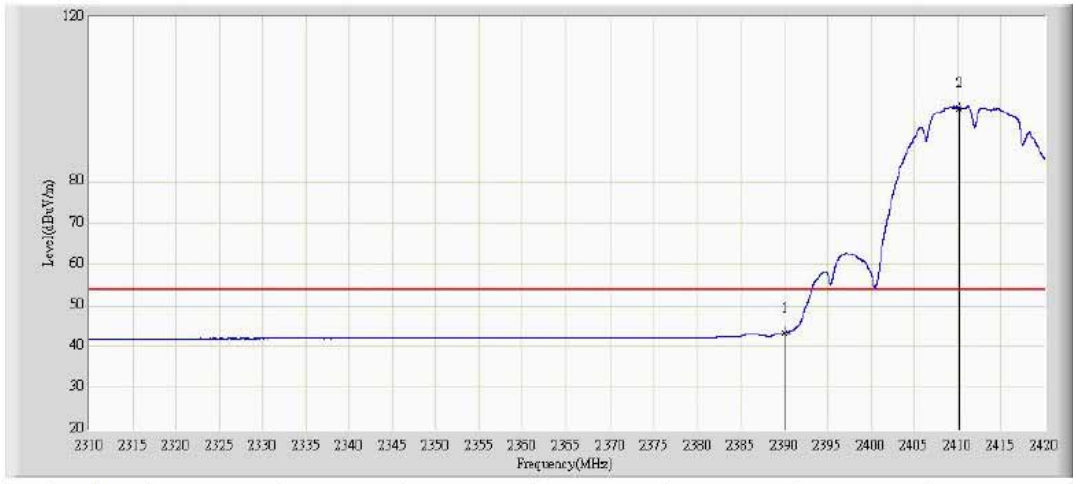


Radiated test

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11b Channel Low 2412MHz	Polarization:	HORIZONTAL



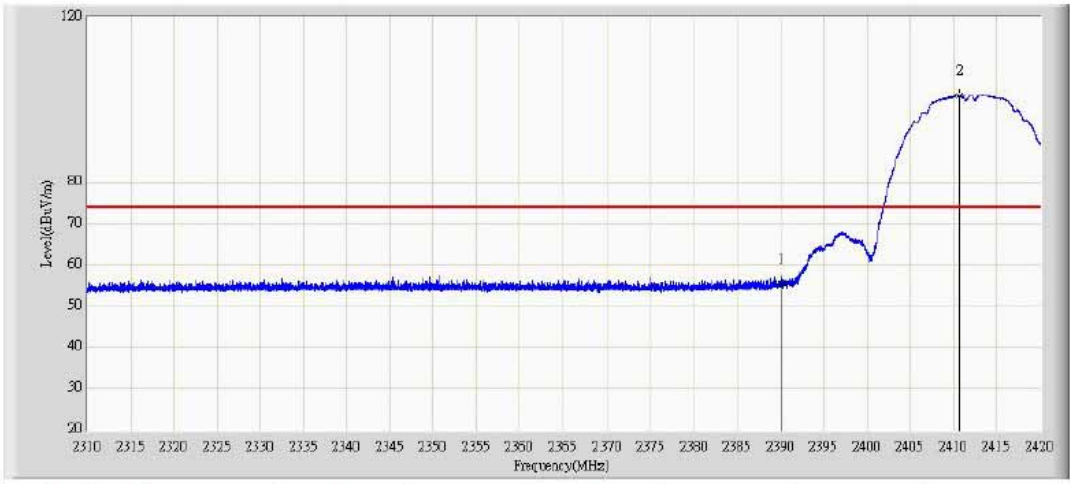
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	55.156	24.612	-18.844	74.000	30.543	PK
2		*	2410.347	101.912	71.344	N/A	N/A	30.568	PK



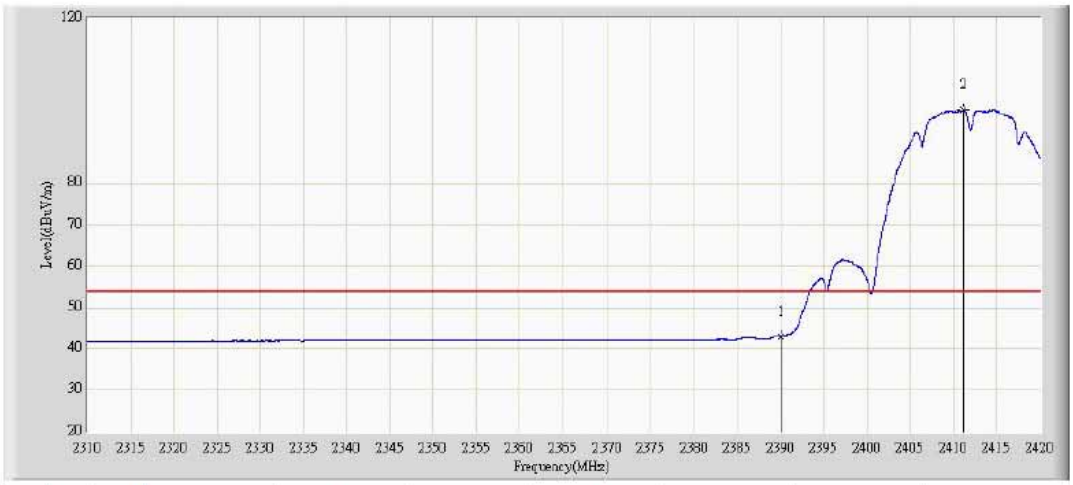
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	43.298	12.754	-10.702	54.000	30.543	AV
2		*	2410.169	97.991	67.423	N/A	N/A	30.568	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11b Channel Low 2412MHz	Polarization:	VERTICAL



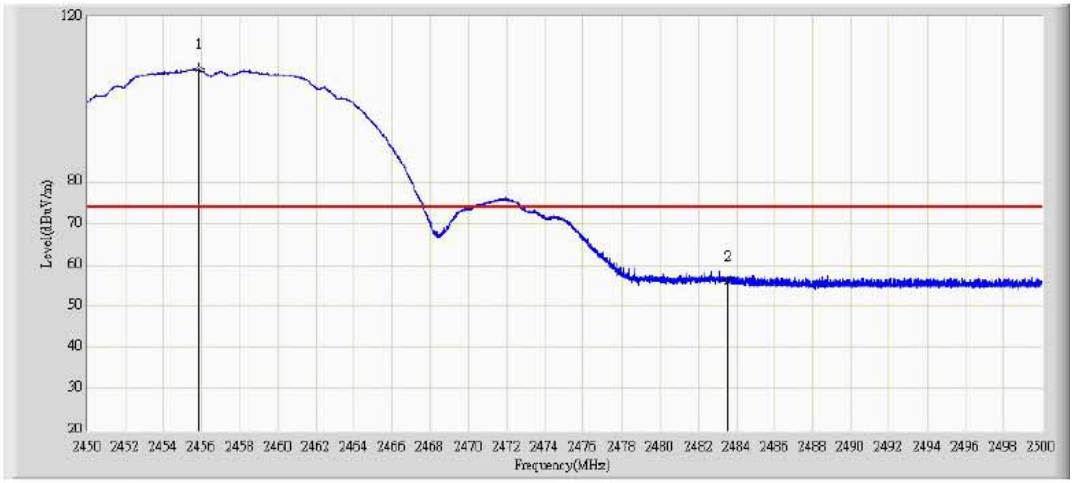
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	55.274	24.730	-18.726	74.000	30.543	PK
2		*	2410.677	101.076	70.507	N/A	N/A	30.569	PK



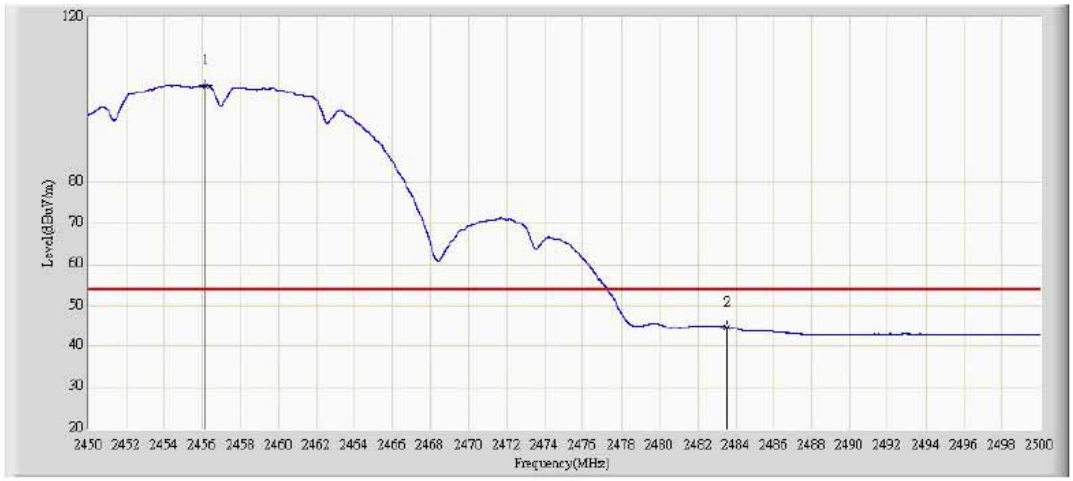
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	43.003	12.459	-10.997	54.000	30.543	AV
2		*	2411.090	97.803	67.232	N/A	N/A	30.571	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11b Channel High 2462MHz	Polarization:	HORIZONTAL



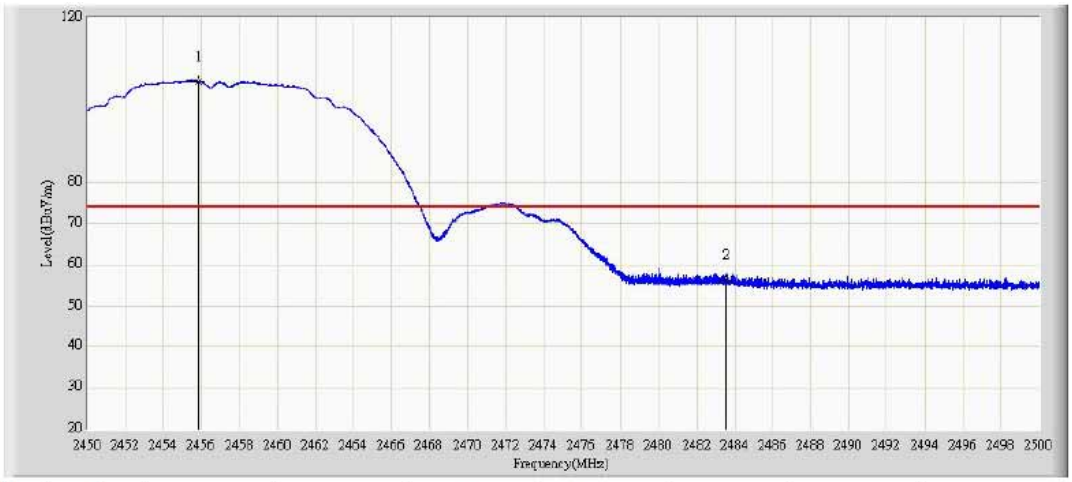
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2455.837	107.225	76.420	N/A	N/A	30.805	PK
2			2483.500	55.795	25.156	-18.205	74.000	30.638	PK



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2456.187	103.653	72.849	N/A	N/A	30.804	AV
2			2483.500	44.795	14.156	-9.205	54.000	30.638	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11b Channel High 2462MHz	Polarization:	VERTICAL



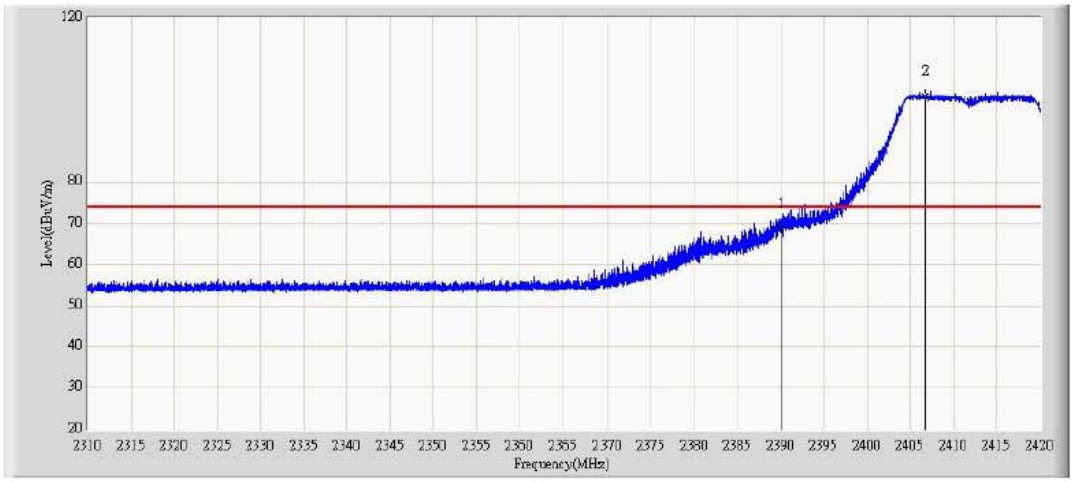
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2455.875	104.567	73.762	N/A	N/A	30.805	PK
2			2483.500	56.289	25.650	-17.711	74.000	30.638	PK

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2456.262	101.135	70.331	N/A	N/A	30.804	AV
2			2483.500	44.777	14.138	-9.223	54.000	30.638	AV

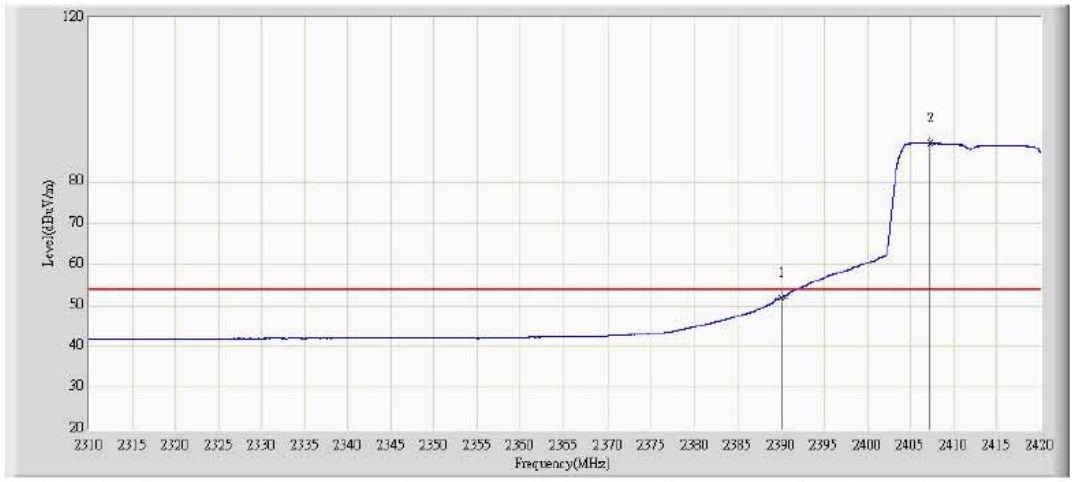
Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Radiated test

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11g Channel Low 2412MHz	Polarization:	HORIZONTAL



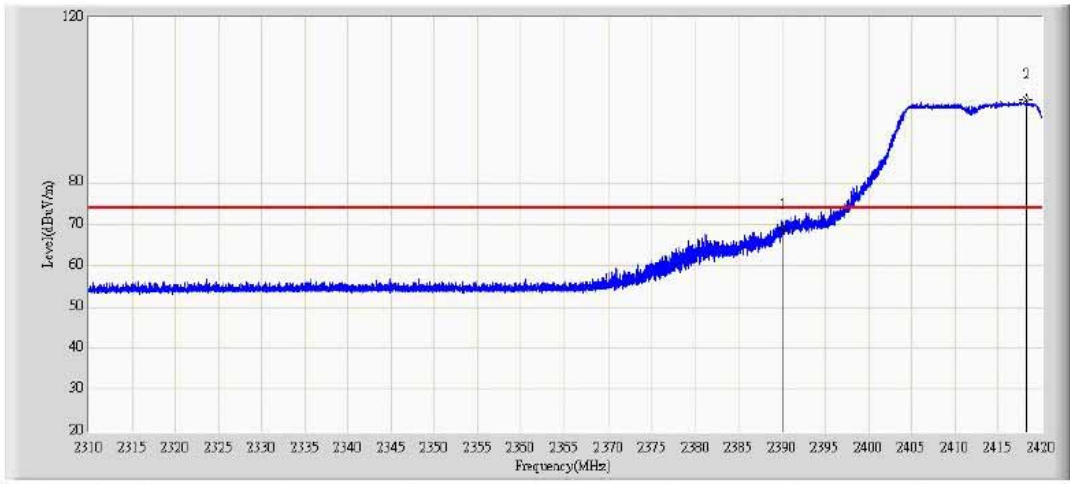
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	68.711	38.167	-5.289	74.000	30.543	PK
2		*	2406.759	101.002	70.444	N/A	N/A	30.558	PK



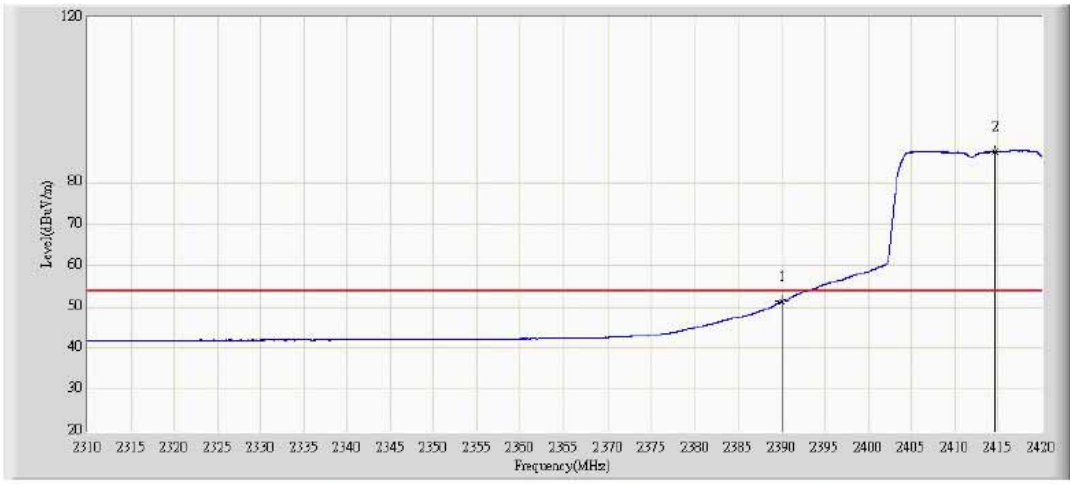
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	51.886	21.342	-2.114	54.000	30.543	AV
2		*	2407.268	89.475	58.916	N/A	N/A	30.559	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11g Channel Low 2412MHz	Polarization:	VERTICAL



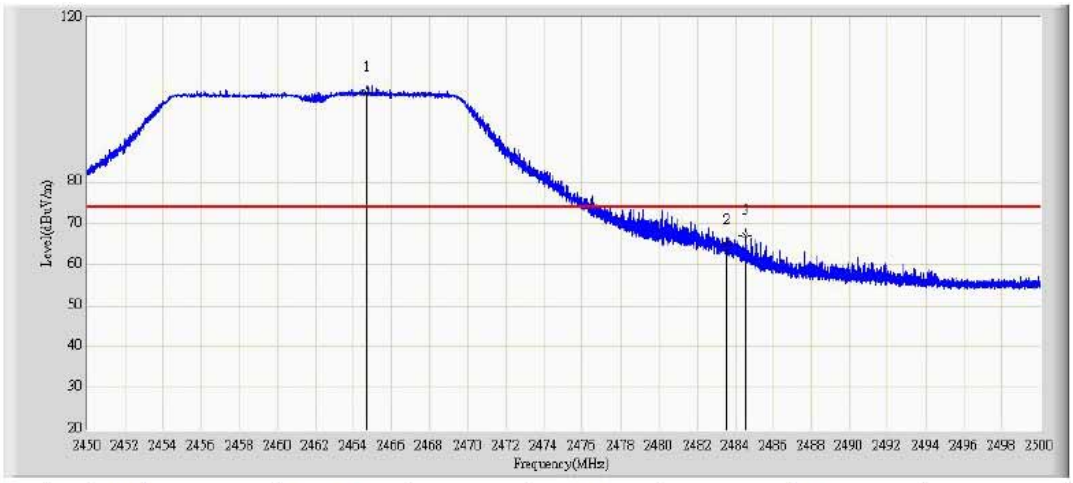
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	68.724	38.180	-5.276	74.000	30.543	PK
2		*	2418.240	100.152	69.518	N/A	N/A	30.634	PK



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	51.273	20.729	-2.727	54.000	30.543	AV
2		*	2414.610	87.551	56.949	N/A	N/A	30.602	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11g Channel High 2462MHz	Polarization:	HORIZONTAL

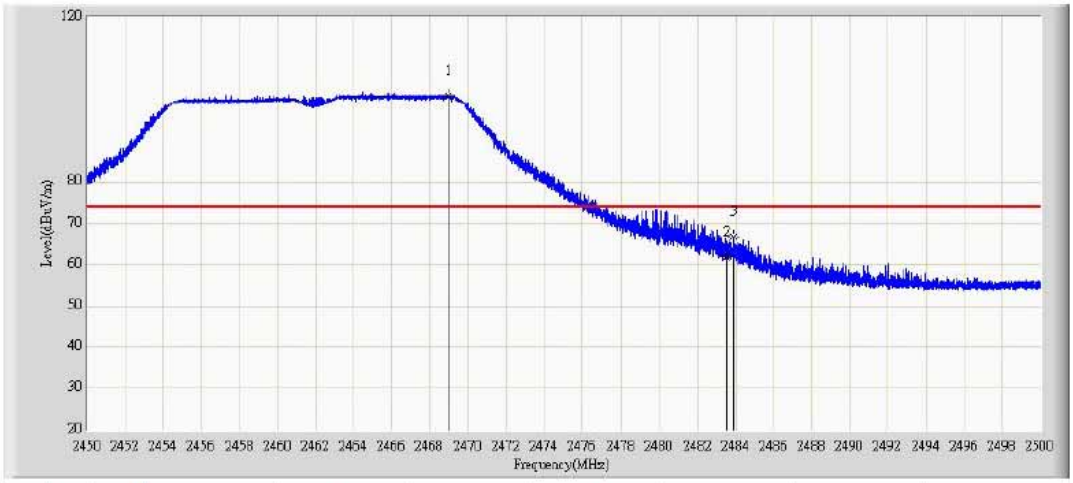


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2464.669	101.895	71.134	N/A	N/A	30.761	PK
2			2483.500	64.802	34.163	-9.198	74.000	30.638	PK
3			2484.525	67.235	36.601	-6.765	74.000	30.634	PK

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2464.663	90.712	59.951	N/A	N/A	30.761	AV
2			2483.500	47.052	16.413	-6.948	54.000	30.638	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11g Channel High 2462MHz	Polarization:	VERTICAL



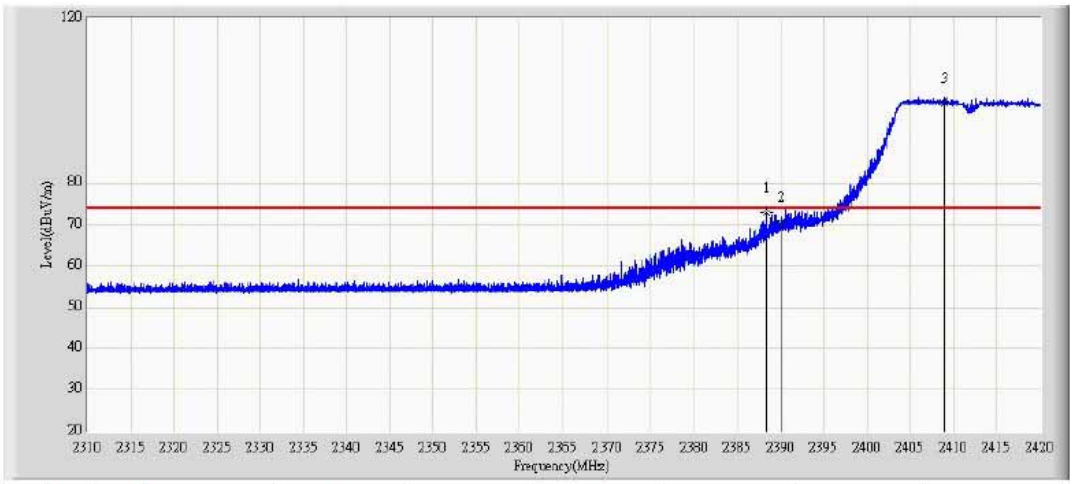
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2468.975	100.962	70.231	N/A	N/A	30.731	PK
2			2483.500	61.974	31.335	-12.026	74.000	30.638	PK
3			2483.881	66.906	36.269	-7.094	74.000	30.637	PK

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2465.369	90.029	59.273	N/A	N/A	30.756	AV
2			2483.500	46.533	15.894	-7.467	54.000	30.638	AV

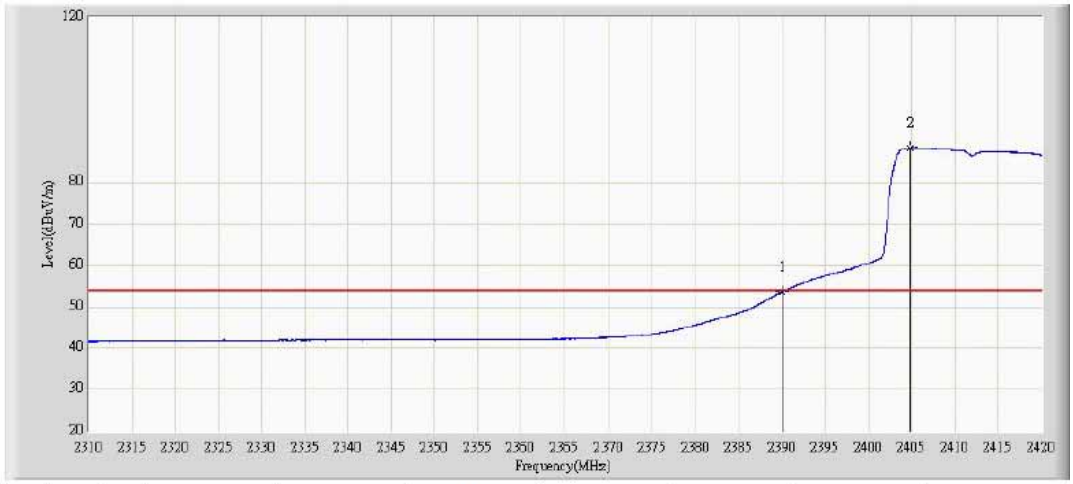
Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Radiated test

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT20 Channel Low 2412MHz	Polarization:	HORIZONTAL



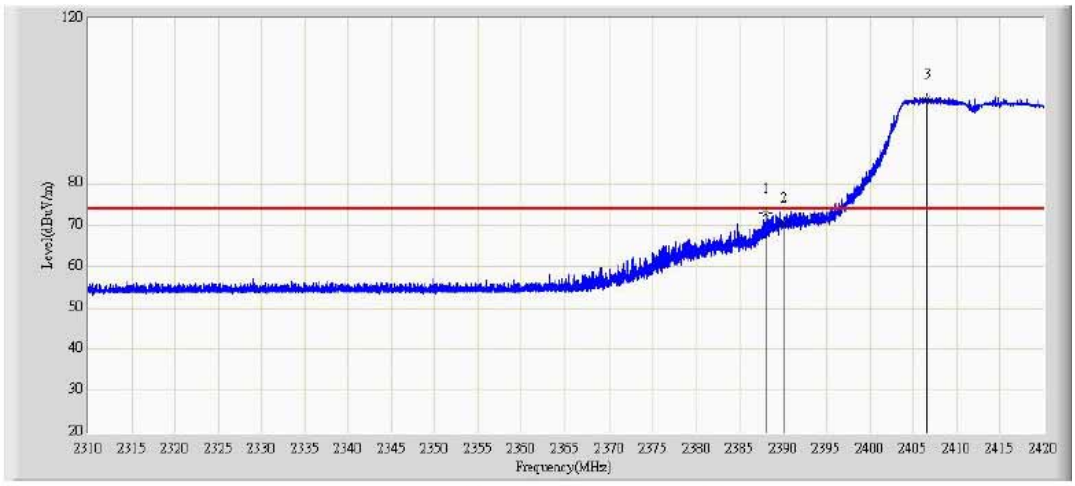
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2388.430	72.830	42.277	-1.170	74.000	30.552	PK
2			2390.000	70.574	40.030	-3.426	74.000	30.543	PK
3		*	2408.972	99.446	68.882	N/A	N/A	30.564	PK



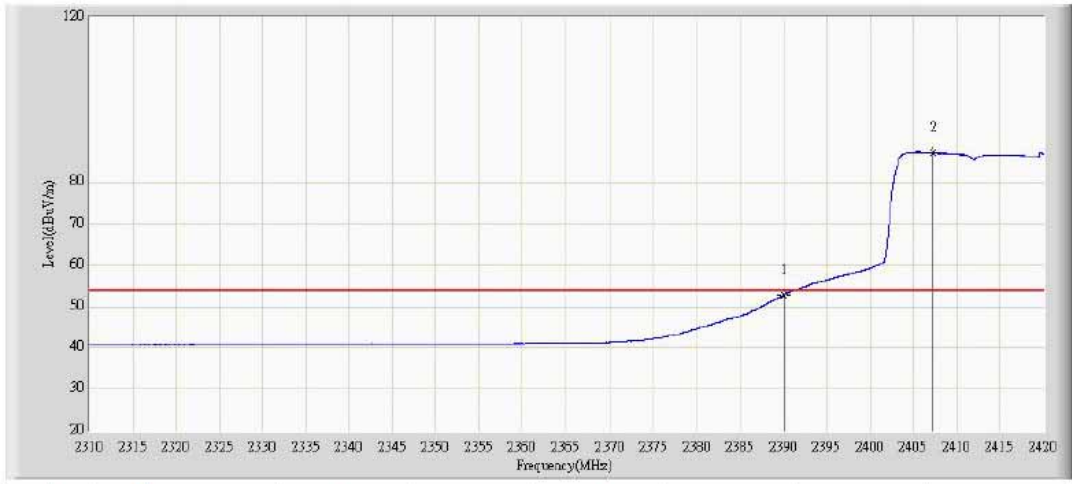
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	53.577	23.033	-0.423	54.000	30.543	AV
2		*	2404.875	88.479	57.927	N/A	N/A	30.552	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT20 Channel Low 2412MHz	Polarization:	VERTICAL



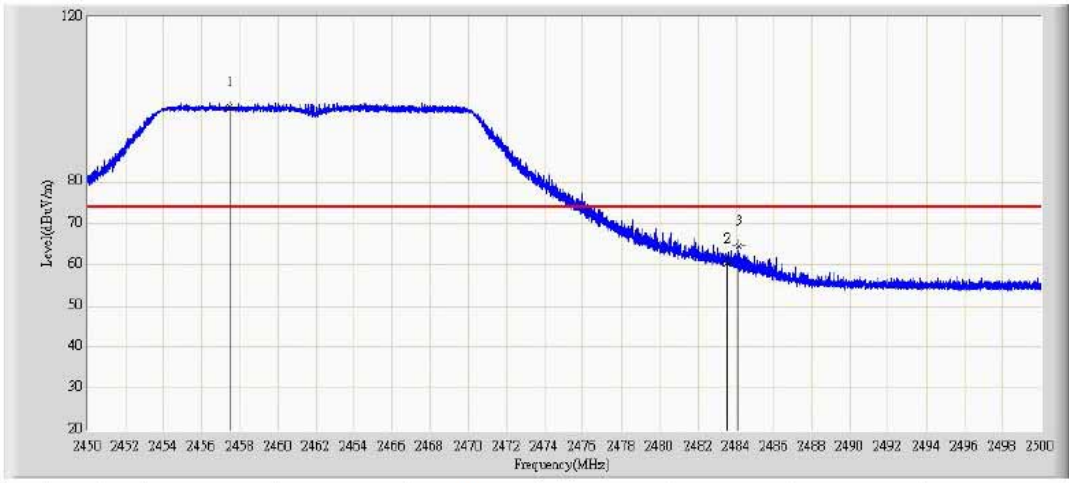
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2388.031	72.835	42.280	-1.165	74.000	30.555	PK
2			2390.000	70.440	39.896	-3.560	74.000	30.543	PK
3		*	2406.580	100.582	70.025	N/A	N/A	30.557	PK



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	52.752	22.208	-1.248	54.000	30.543	AV
2		*	2407.295	87.245	56.686	N/A	N/A	30.559	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT20 Channel High 2462MHz	Polarization:	HORIZONTAL

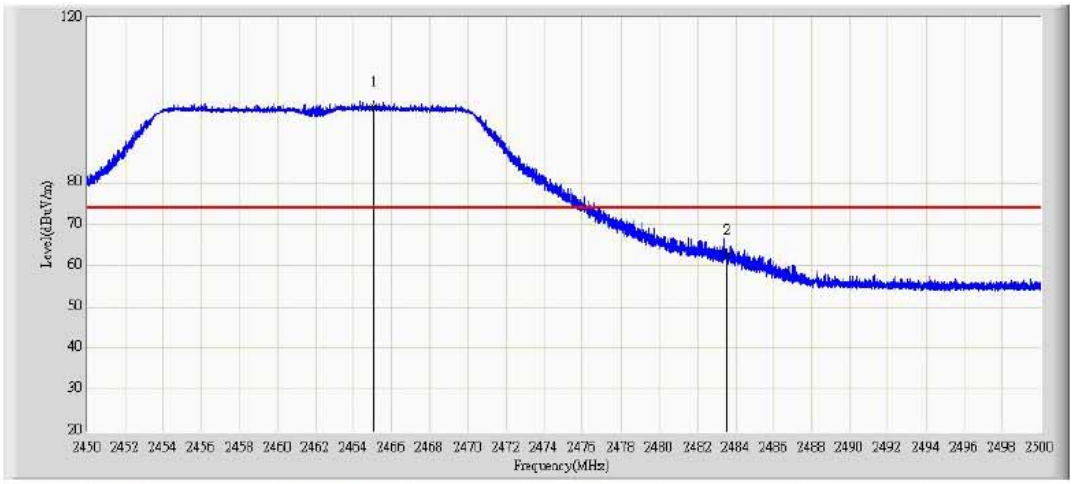


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2457.475	98.142	67.343	N/A	N/A	30.799	PK
2			2483.500	60.087	29.448	-13.913	74.000	30.638	PK
3			2484.125	64.540	33.904	-9.460	74.000	30.636	PK

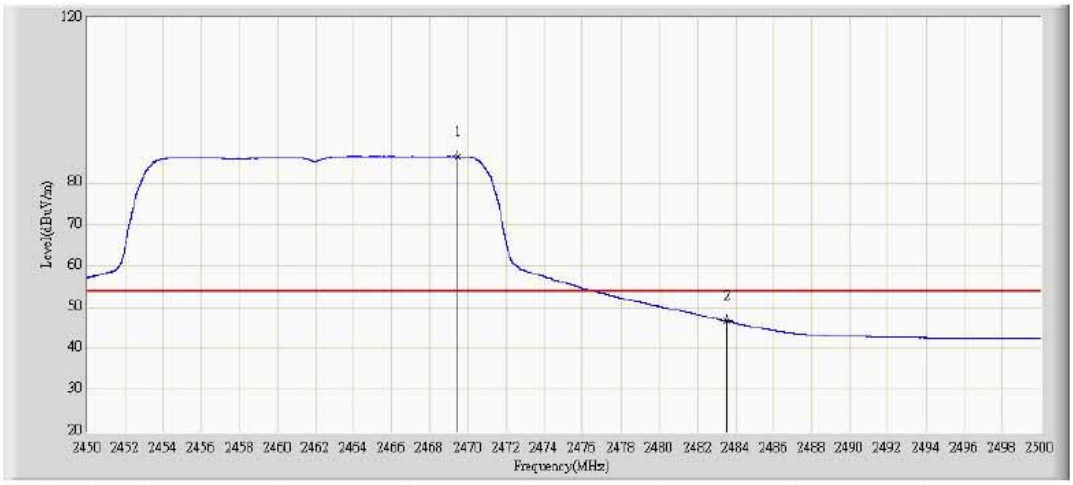
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2456.806	86.331	55.530	N/A	N/A	30.802	AV
2			2483.500	45.669	15.030	-8.331	54.000	30.638	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT20 Channel High 2462MHz	Polarization:	VERTICAL



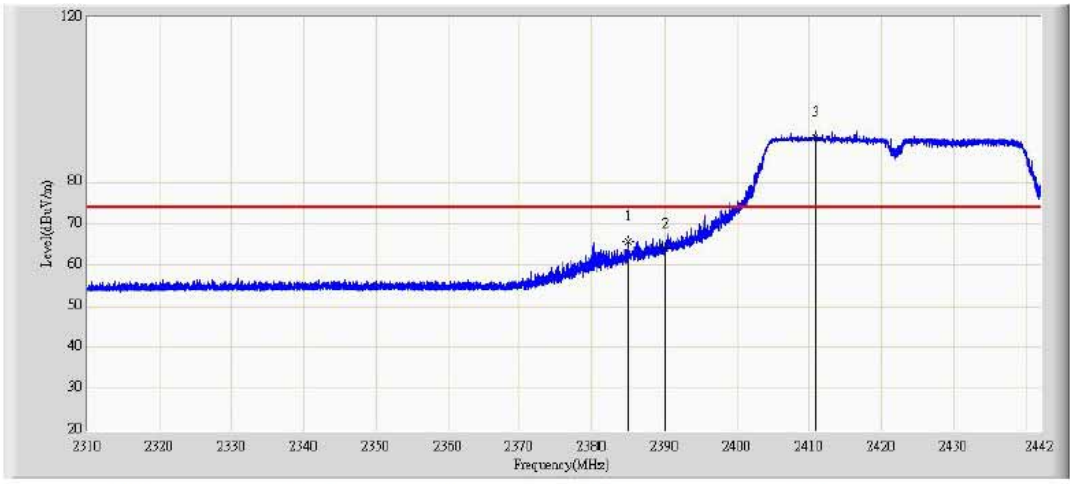
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2465.056	98.457	67.699	N/A	N/A	30.758	PK
2			2483.500	62.479	31.840	-11.521	74.000	30.638	PK



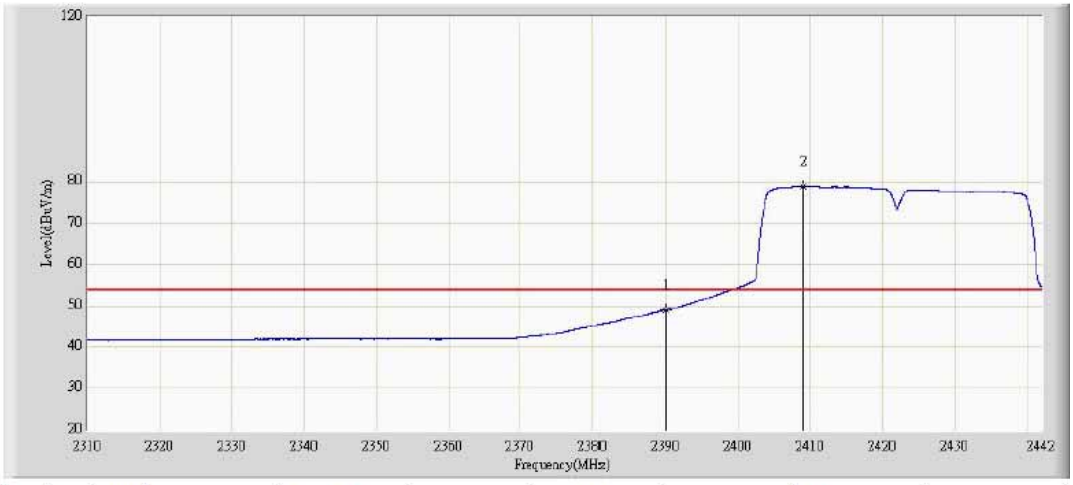
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2469.481	86.455	55.728	N/A	N/A	30.727	AV
2			2483.500	46.702	16.063	-7.298	54.000	30.638	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT40 Channel Low 2422MHz	Polarization:	HORIZONTAL



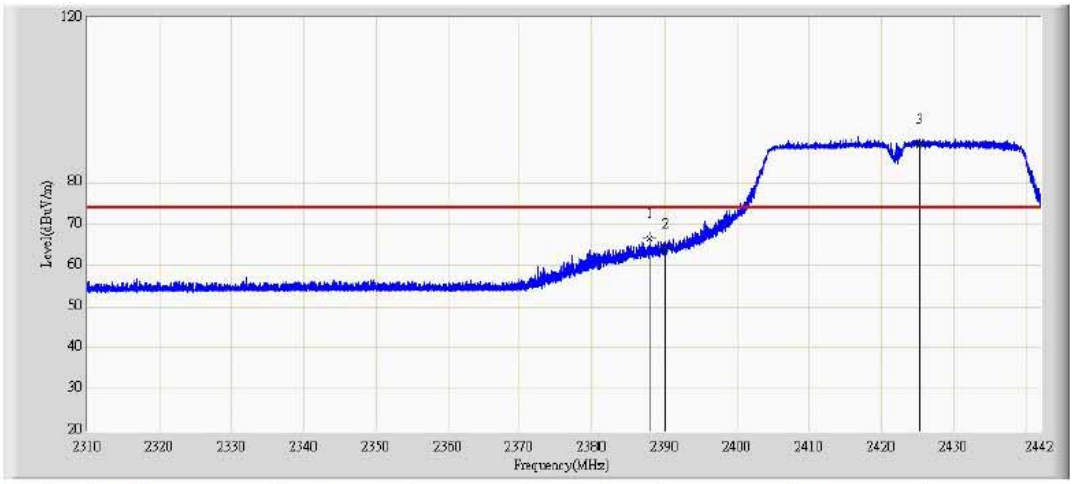
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2384.811	65.832	35.258	-8.168	74.000	30.574	PK
2			2390.000	63.846	33.302	-10.154	74.000	30.543	PK
3		*	2410.848	90.886	60.316	N/A	N/A	30.569	PK



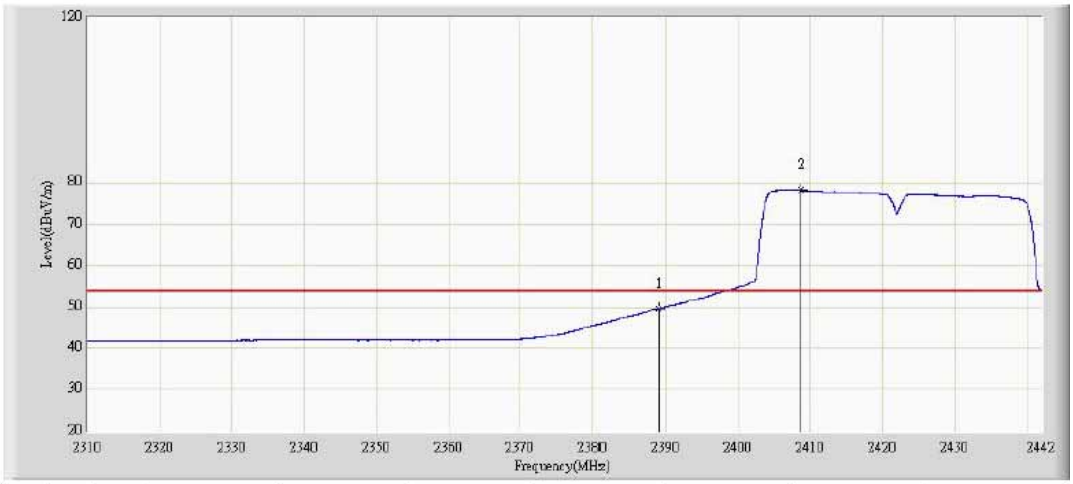
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	49.137	18.593	-4.863	54.000	30.543	AV
2		*	2409.066	78.834	48.270	N/A	N/A	30.564	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT40 Channel Low 2422MHz	Polarization:	VERTICAL



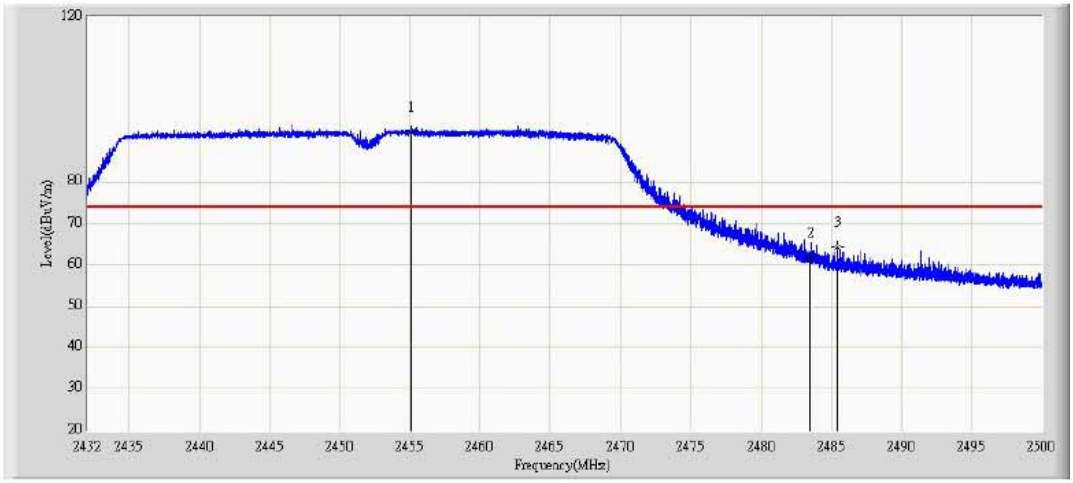
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2387.880	66.465	35.909	-7.535	74.000	30.556	PK
2			2390.000	63.898	33.354	-10.102	74.000	30.543	PK
3		*	2425.285	89.167	58.471	N/A	N/A	30.696	PK



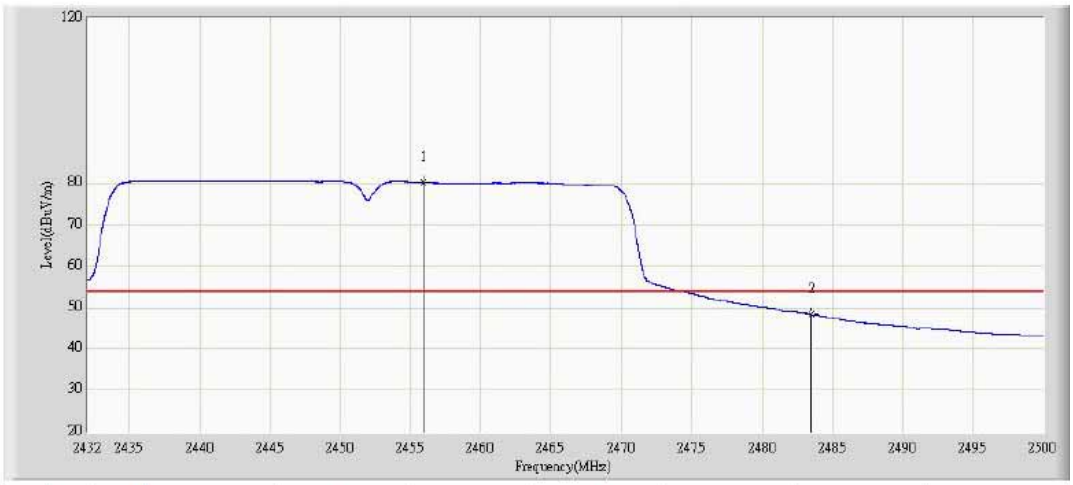
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2389.000	49.650	19.101	-4.350	54.000	30.549	AV
2		*	2408.604	78.222	47.659	N/A	N/A	30.563	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT40 Channel High 2452MHz	Polarization:	HORIZONTAL



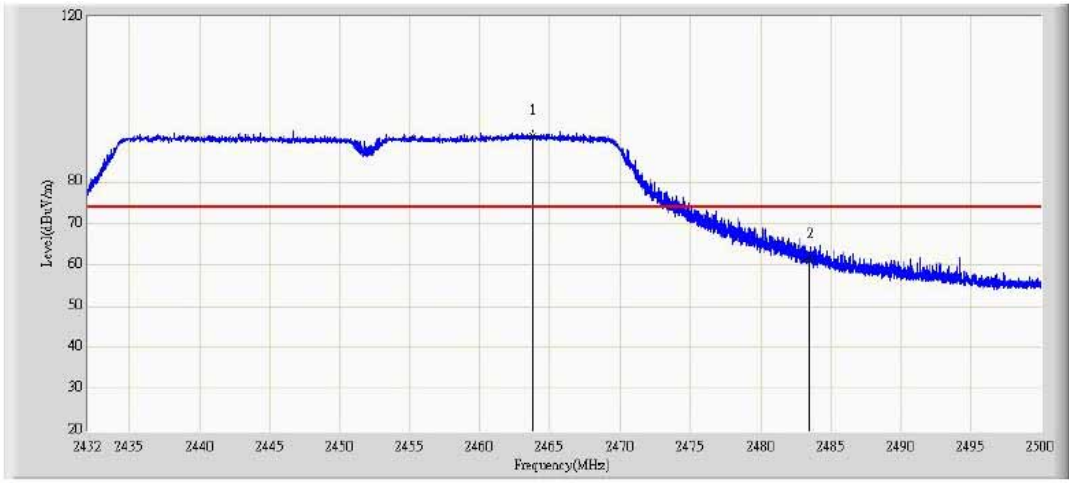
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2455.112	92.233	61.425	N/A	N/A	30.809	PK
2			2483.500	61.654	31.015	-12.346	74.000	30.638	PK
3			2485.473	64.170	33.540	-9.830	74.000	30.629	PK



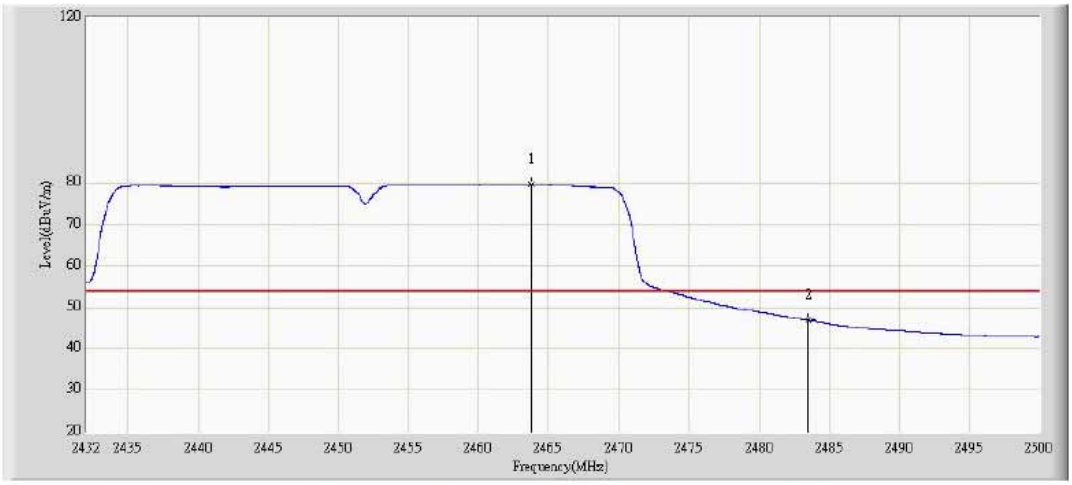
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2455.961	80.265	49.460	N/A	N/A	30.805	AV
2			2483.500	48.344	17.705	-5.656	54.000	30.638	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Date of Test:	September 21, 2012	Temperature:	25°C
EUT:	WIFI MODULE	Humidity:	56%
Model No.:	FR4020A2	Power Supply:	AC 120V/60Hz
Test Mode:	802.11n HT40 Channel High 2452MHz	Polarization:	VERTICAL



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2463.815	91.394	60.627	N/A	N/A	30.767	PK
2			2483.500	61.357	30.718	-12.643	74.000	30.638	PK



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2463.781	79.831	49.064	N/A	N/A	30.768	AV
2			2483.500	46.941	16.302	-7.059	54.000	30.638	AV

Note: 1. Measurement Level = Reading Level + Correct Factor.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

13. §15.247(E) - Power Spectral Density

13.1. Test Equipment

Please refer to Section 4 this report.

13.2.Test Procedure

1,Set EUT in the transmitting mode.
2,Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3,Set the spectrum analyzer as RBW=3kHz,VBW=10kHz,Span=300kHz,Sweep=100s.
4,Record the max.reading
5, Repeat the above procedure until the measurements for all frequencies are completed.

13.3.Applicable Standard

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

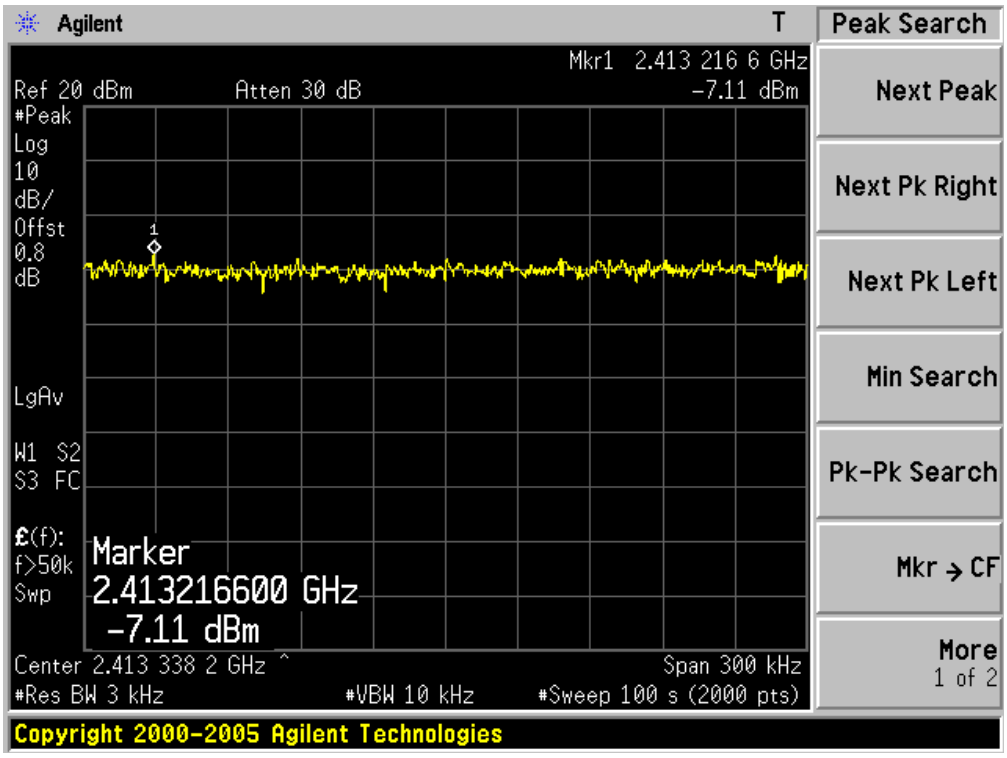
13.4.Test Result

PASS

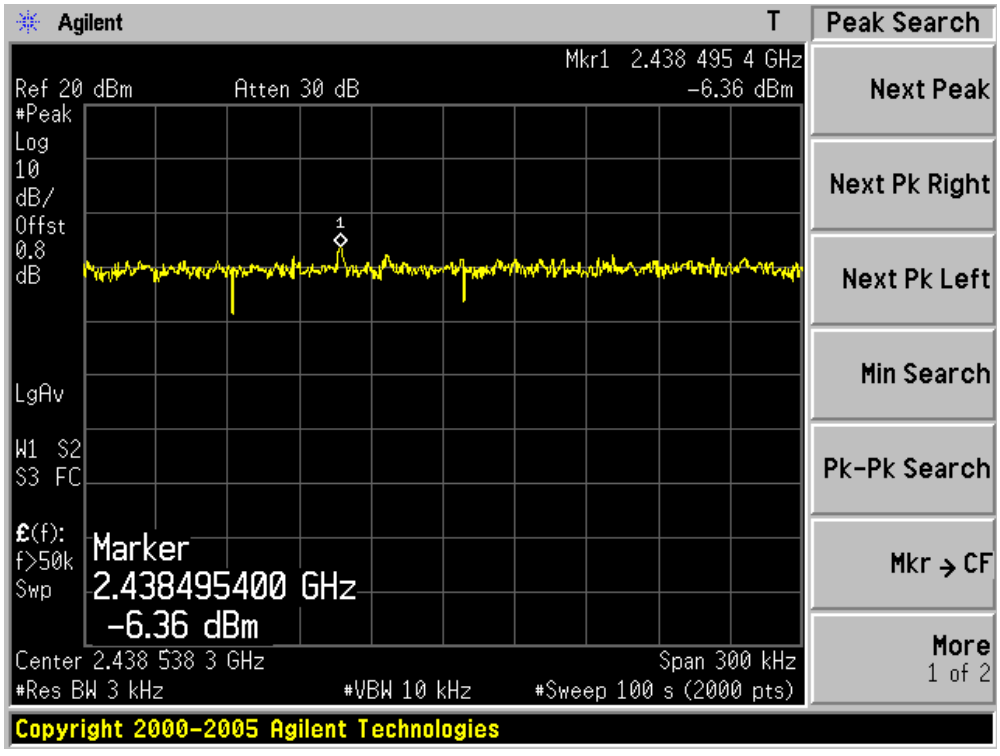
Channel Frequency (MHz)	Data Rate (Mbps)	PSD (dBm/3kHz)	Limit (dBm/3kHZ)	RESULT
802.11b Mode				
2412	1	-7.11	8	Compliant
2437	1	-6.36	8	Compliant
2462	1	-8.30	8	Compliant
802.11g Mode				
2412	6	-9.57	8	Compliant
2437	6	-8.39	8	Compliant
2462	6	-9.42	8	Compliant
802.11n (20M) Mode				
2412	6	-7.84	8	Compliant
2437	6	8.83	8	Compliant
2462	6	-9.09	8	Compliant
802.11n (40M) Mode				
2412	6	-12.37	8	Compliant
2437	6	-12.15	8	Compliant
2462	6	-13.57	8	Compliant

802.11b Mode:

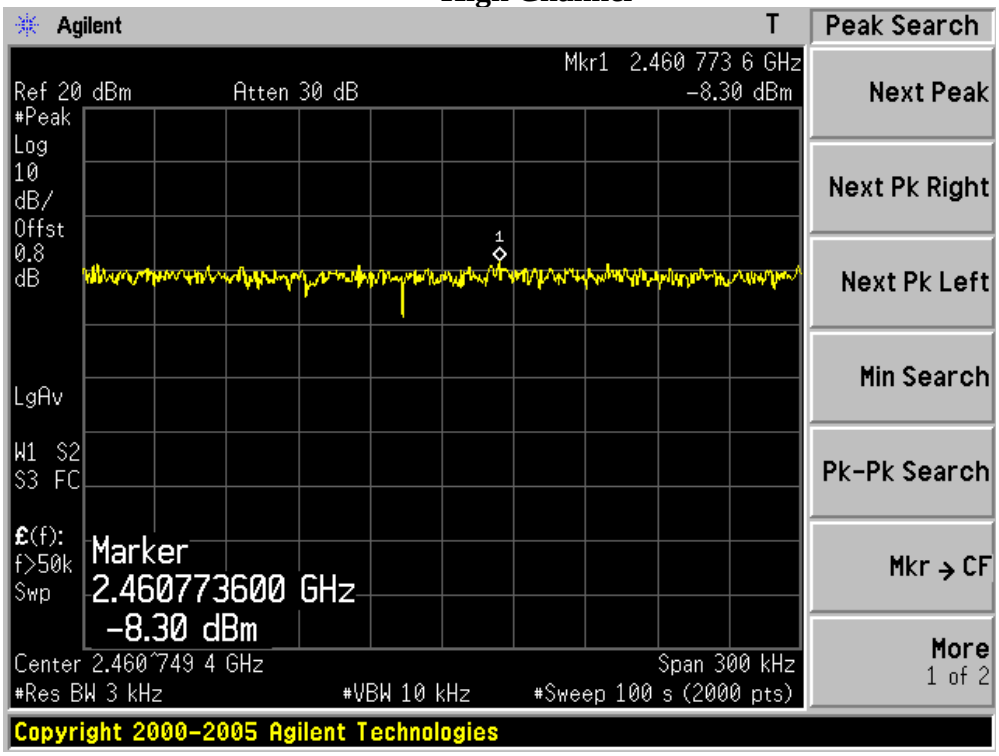
Low Channel



Middle Channel

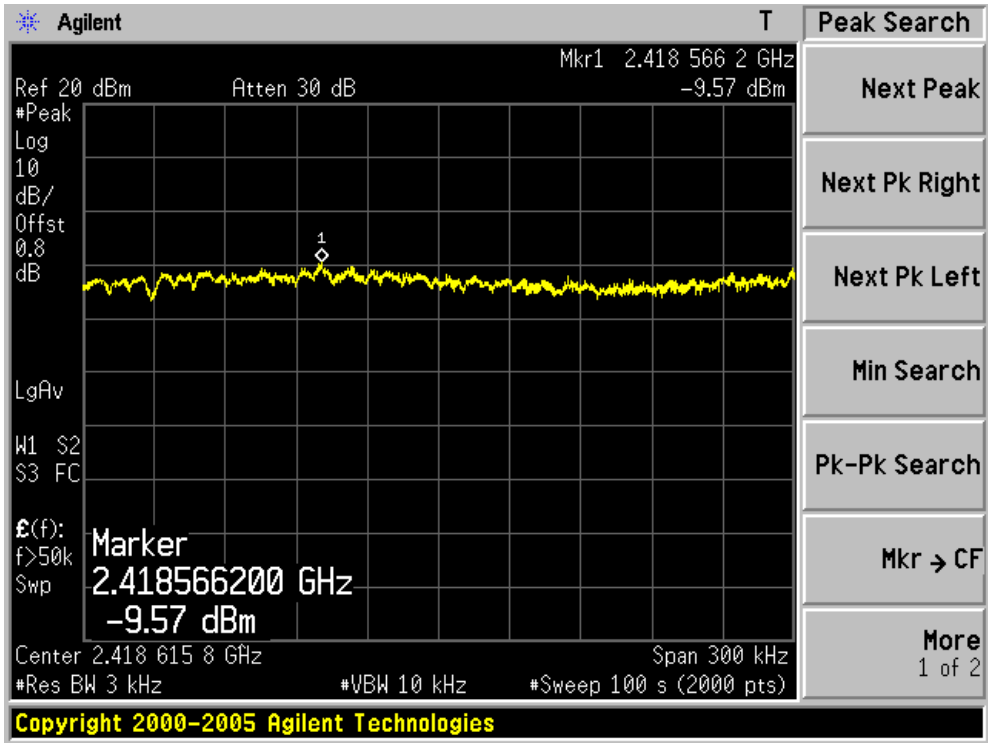


High Channel

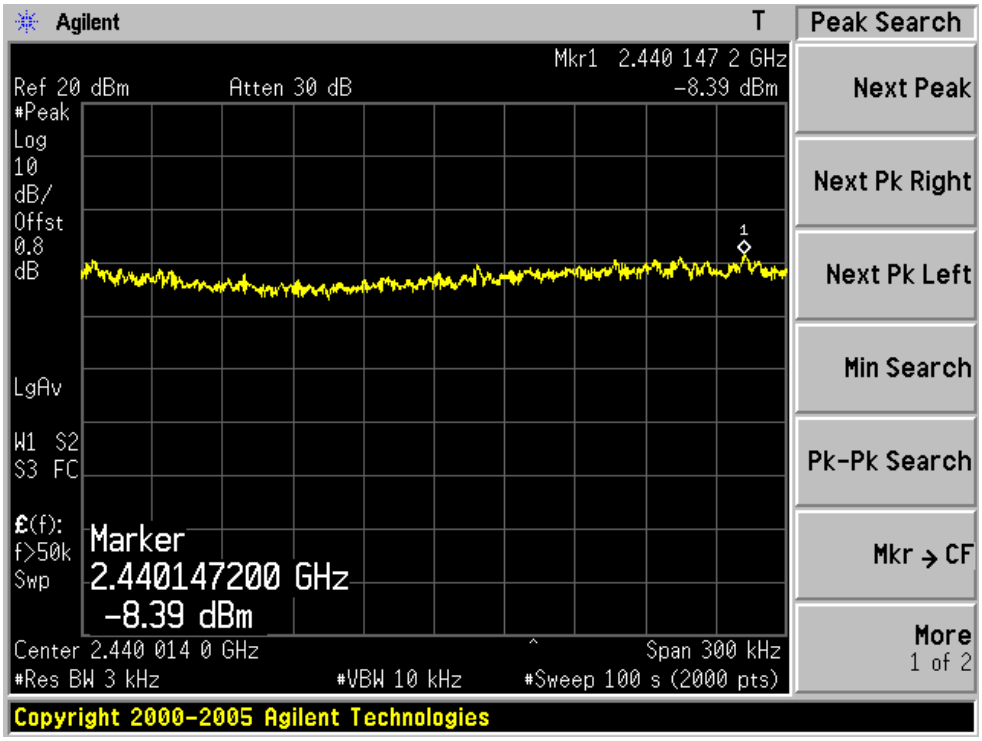


802.11g Mode:

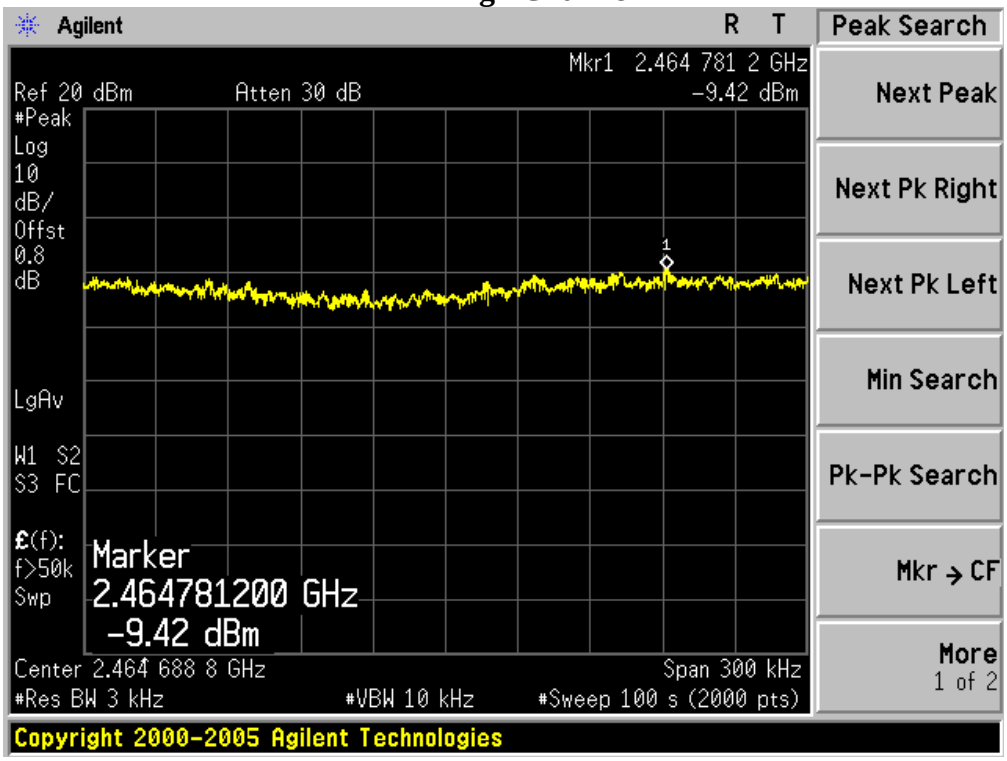
Low Channel



Middle Channel

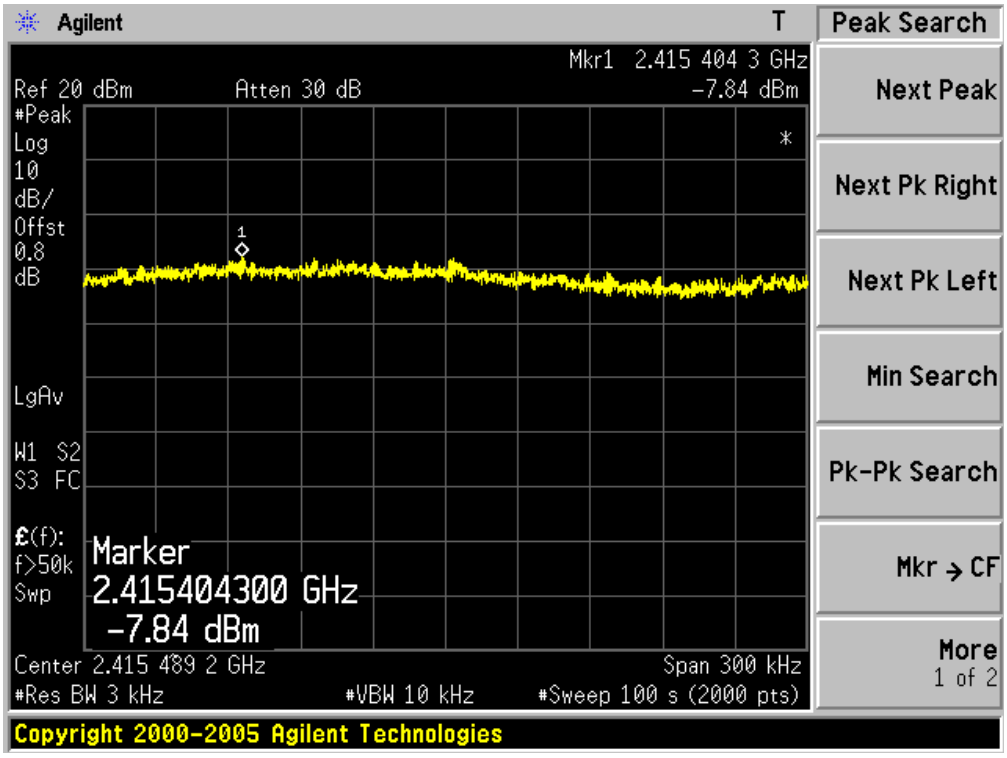


High Channel

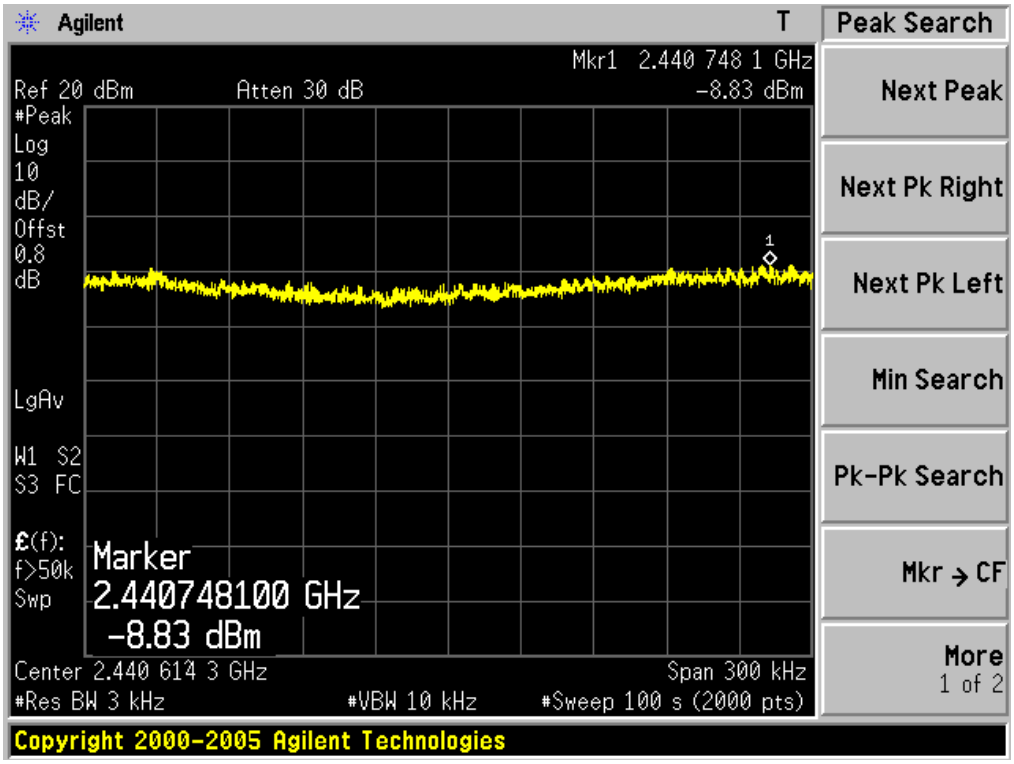


802.11n (20M) Mode:

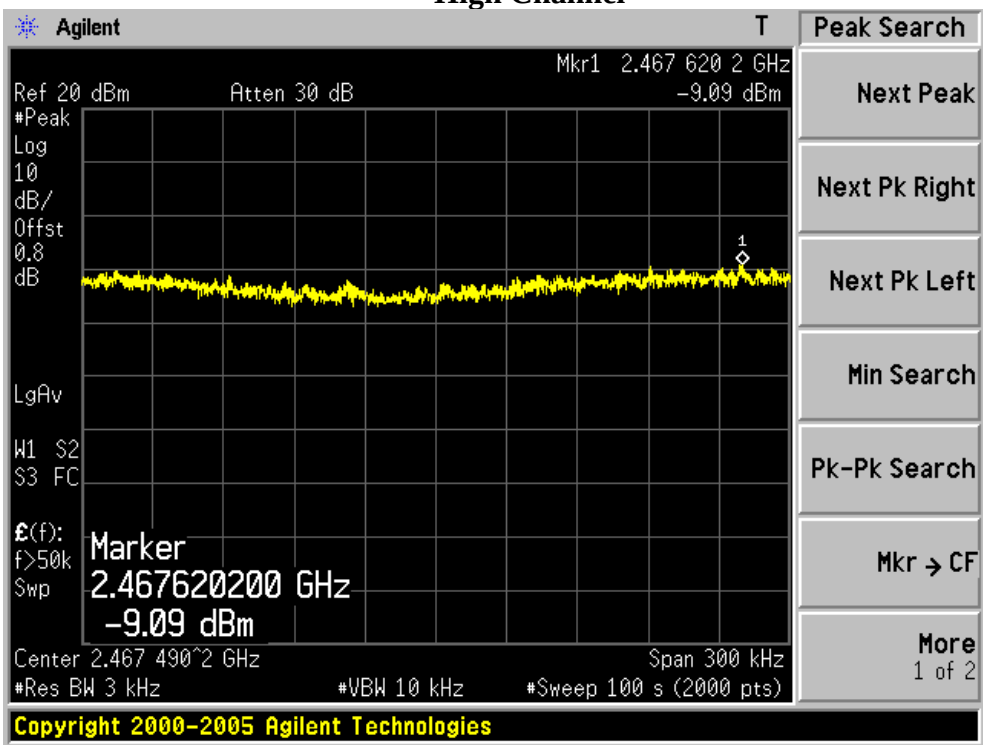
Low Channel



Middle Channel

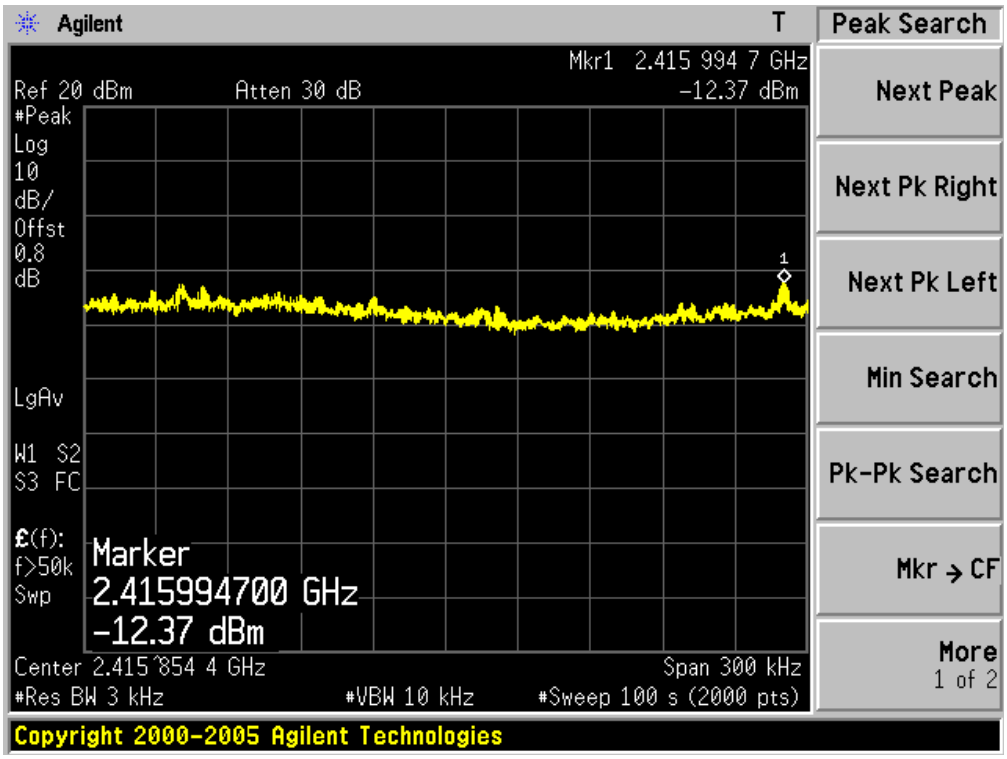


High Channel

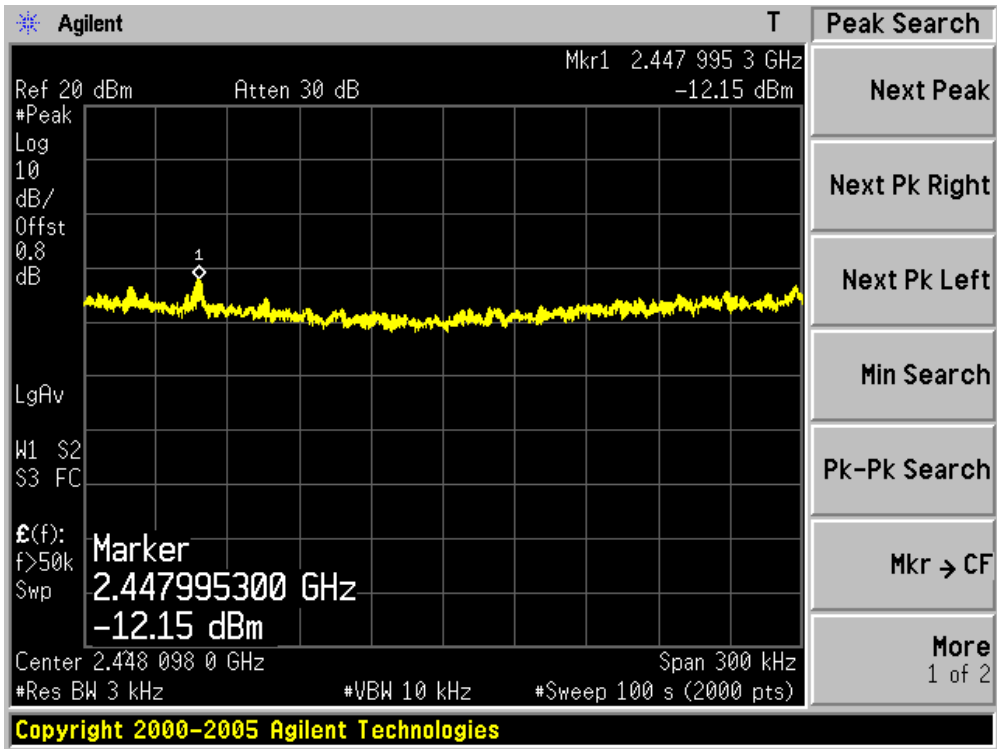


802.11n (40M) Mode:

Low Channel



Middle Channel



High Channel