

FCC 47 CFR PART 15 SUBPART C

Product Type : WiFi USB Dongle

Applicant : AEROMAX TECHNOLOGY CO., LTD.

Address : 16F.-2, No.77, Sec. 1, Sintai 5th Rd., Sijhih Dist., New Taipei City, Taiwan 2210101

Trade Name : Aeromax

Model Number : WU1112

Test Specification : FCC 47 CFR PART 15 SUBPART C: Oct., 2010
ANSI C63.4-2009

Application Purpose: : Original

Recive Date : Aug. 31, 2011

Issue Date : Oct. 25, 2011

Issue by

A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Oct. 25, 2011	Initial Issue	

Verification of Compliance

Issued Date: 10/25/2011

Product Type : WiFi USB Dongle
Applicant : AEROMAX TECHNOLOGY CO., LTD.
Address : 16F.-2, No.77, Sec. 1, Sintai 5th Rd., Sijhih Dist., New Taipei City, Taiwan 22101
Trade Name : Aeromax
Model Number : WU1112
FCC ID : Z6K-RT3070WU1112
EUT Rated Voltage : DC 5.0V (USB Interface)
Test Voltage : 120 Vac / 60 Hz
Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2010
ANSI C63.4-2009
Test Result : Complied
Application Purpose : Original
Performing Lab. : A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade City,
Taoyuan County 334, Taiwan R.O.C.
Tel : +86-3-2710188 / Fax : +86-3-2710190
Taiwan Accreditation Foundation accreditation number:
1330



<http://www.atl-lab.com.tw/e-index.htm>

The above equipment was tested by A Test Lab Techno Corp. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247 .

The test results of this report relate only to the tested sample identified in this report.


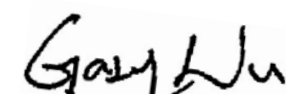
Approved By : 
(Manager) (Miller Lee)
Reviewed By : 
(Testing Engineer) (Gary Wu)

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1 General Information

1.1 Summary of Test Result

Standard		Item	Result	Remark
15.247	RSS-GEN			
15.207	7.2.2	AC Power Conducted Emission	PASS	-----
-----	6	Receiver Radiated Emissions	PASS	-----
Standard		Item	Result	Remark
15.247	RSS-210			
15.247(d)	A8.5	Transmitter Radiated Emissions	PASS	-----
15.247(b)(3)	A8.4	Max. Output Power	PASS	-----
15.247(a)(2)	A8.2 (a)	6dB RF Bandwidth	PASS	-----
15.247(e)	A8.2 (b)	Power Spectral Density	PASS	-----
15.247(c)	A8.5	Out of Band Conducted Spurious Emission	PASS	-----
15.247(d)	A8.5	Band Edge Measurement	PASS	-----
15.247(c)	A8.5	Occupied Bandwidth Measurement	PASS	-----
15.203	-	Antenna Requirement	PASS	-----

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2 Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.24 dB.

Radiated Emission

The measurement uncertainty of 30 MHz - 1GHz is evaluated as ± 3.072 dB.

2 EUT Description

Product	:	WiFi USB Dongle
Trade Name	:	Aeromax
Model No.	:	WU1112
Applicant	:	AEROMAX TECHNOLOGY CO., LTD. 16F.-2, No.77, Sec. 1, Sintai 5th Rd., Sijhih Dist., New Taipei City, Taiwan 22101
Manufacturer	:	AEROMAX TECHNOLOGY CO., LTD. 16F.-2, No.77, Sec. 1, Sintai 5th Rd., Sijhih Dist., New Taipei City, Taiwan 22101
FCC ID	:	Z6K-RT3070WU1112
Frequency Range	:	2412 ~ 2462 MHz
Modulation Type	:	IEEE 802.11b:DSSS IEEE 802.11g:DSSS/OFDM draft 802.11n Standard-20MHz channel mode: OFDM draft 802.11n Wide-40MHz channel mode: OFDM
RF Output Power	:	IEEE 802.11b: 0.037 W / 15.64 dBm IEEE 802.11g: 0.122 W / 20.85 dBm draft 802.11n Standard-20MHz: 0.091 W / 19.60 dBm draft 802.11n Wide-40MHz: 0.103 W / 20.14 dBm

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Normal Operation Mode
Mode 2: IEEE 802.11b Link Mode
Mode 3: IEEE 802.11g Link Mode
Mode 4: draft 802.11n Standard-20MHz Link Mode
Mode 5: draft 802.11n Wide-40MHz Link Mode
Mode 6: Receiver Mode

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

IEEE 802.11b mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE 802.11g mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

draft 802.11n Standard-20 MHz Channel mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.

draft 802.11n Wide-40 MHz Channel mode:

Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with 13.5Mbps data rate were chosen for full testing.

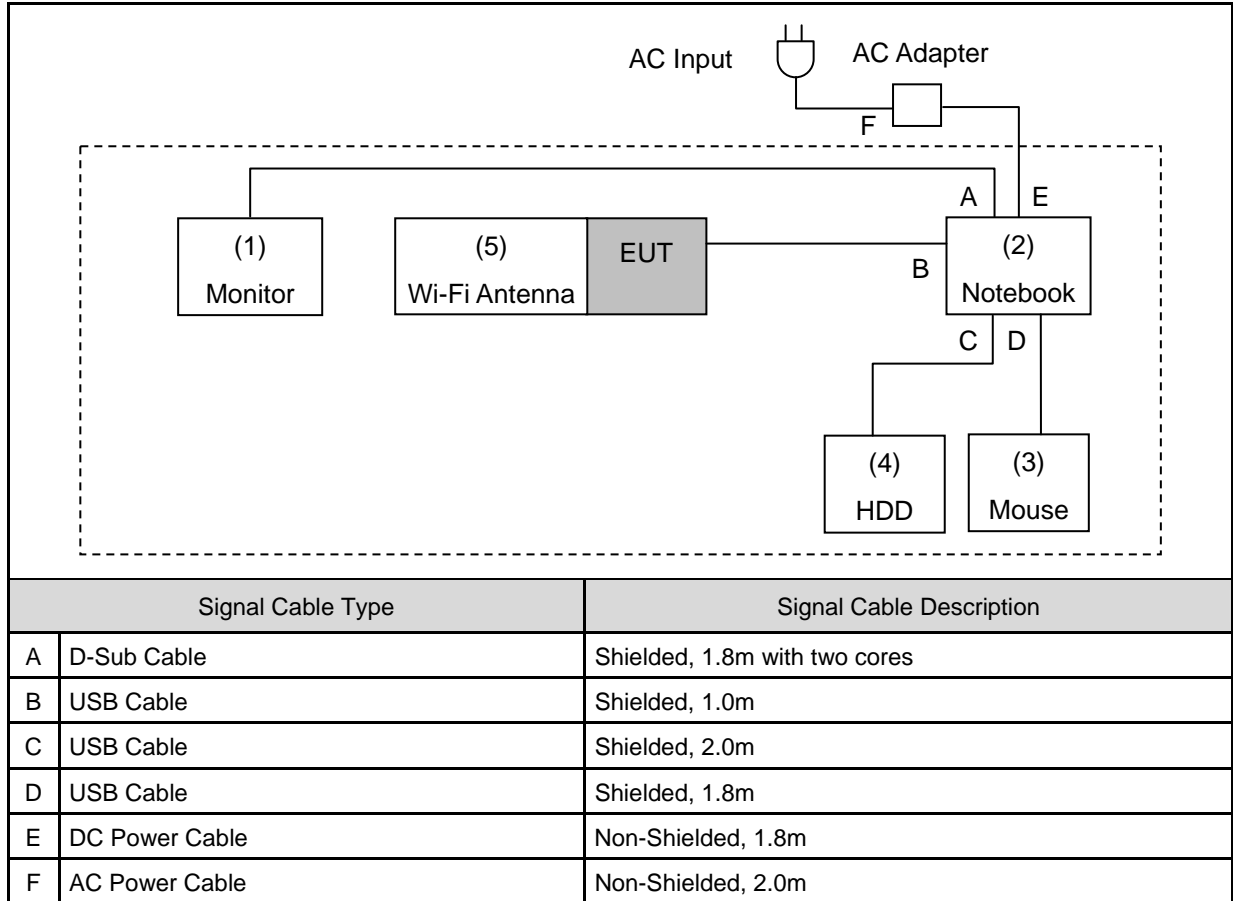
By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

3.2. EUT Exercise Software

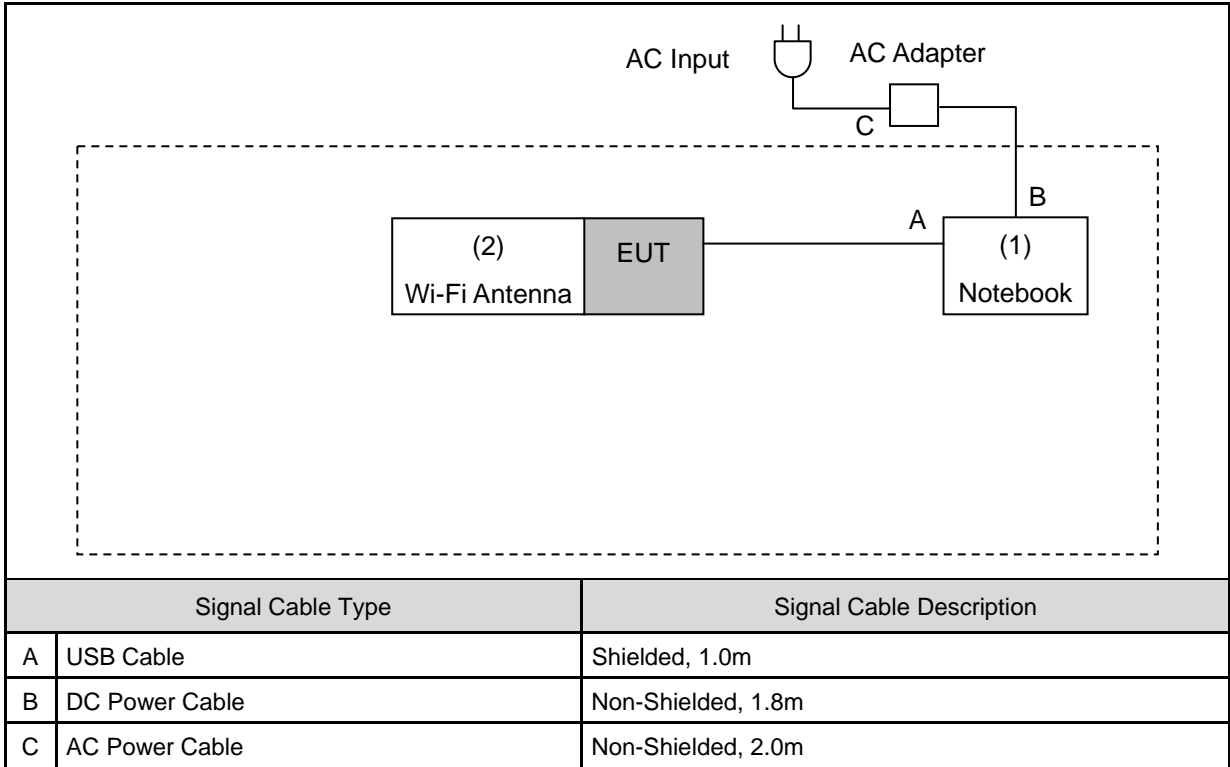
1.	Setup the EUT shown on 3.3.
2.	Turn on the power of all equipment.
3.	Turn on Wi-Fi function link to AP.
4.	EUT run test program.

3.3. Configuration of Test System Details

Conducted Emission



Devices Description					
	Product	Manufacturer	Model Number	Serial Number	Power Cord
1.	Monitor	Dell	U2410f	CN-0J257M-72872-08J-060L	Non-Shielded, 1.8m
2.	Notebook	Dell	D830	CN-OHN341-48643-88Q-1221	Non-Shielded, 2.0m
3.	Mouse	Logitech	M-UAG96B	PID-LZ815AA	Power by Notebook
4.	HDD	Buffalo	HD-HXU3	15564891205880	Non-Shielded, 1.5m
5.	Wi-Fi Antenna (Gain: 3.0dBi)	ARISTOTLE	RFA-25-T42-M62-1	N/A	N/A

Radiated Emission


Devices Description					
	Product	Manufacturer	Model Number	Serial Number	Power Cord
1.	Notebook	Dell	D830	CN-OHN341-48643-88Q-1221	Non-Shielded, 2.0m
2.	Wi-Fi Antenna (Gain: 3.0dBi)	ARISTOTLE	RFA-25-T42-M62-1	N/A	N/A

3.4. Test Site Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	25
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950

4 Conducted Emission Measurement

4.1. Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

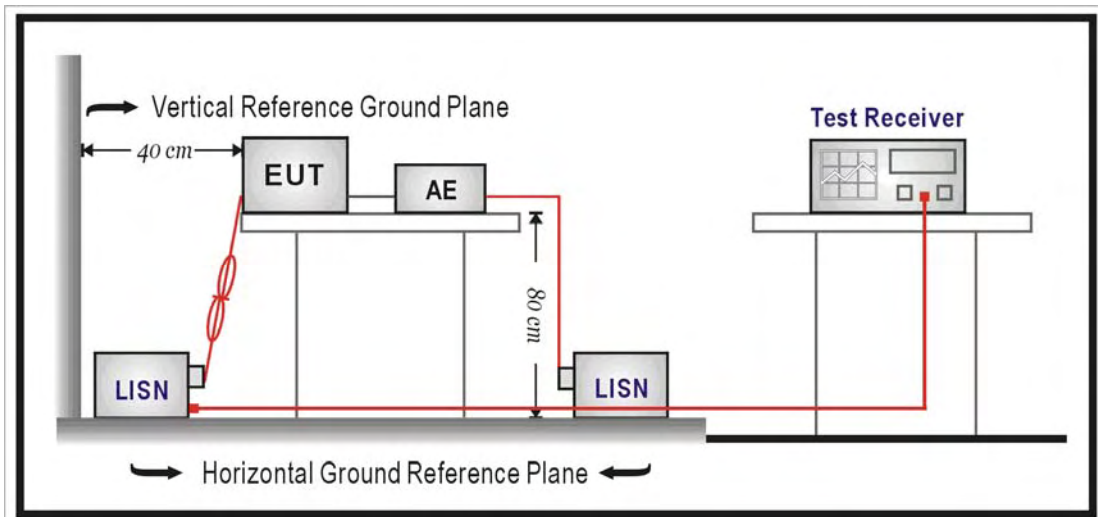
4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/30/2011	(1)
LISN	R&S	ENV216	101040	03/04/2011	(1)
LISN	R&S	ENV216	101041	03/04/2011	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

4.3. Test Setup



4.4. Test Procedure

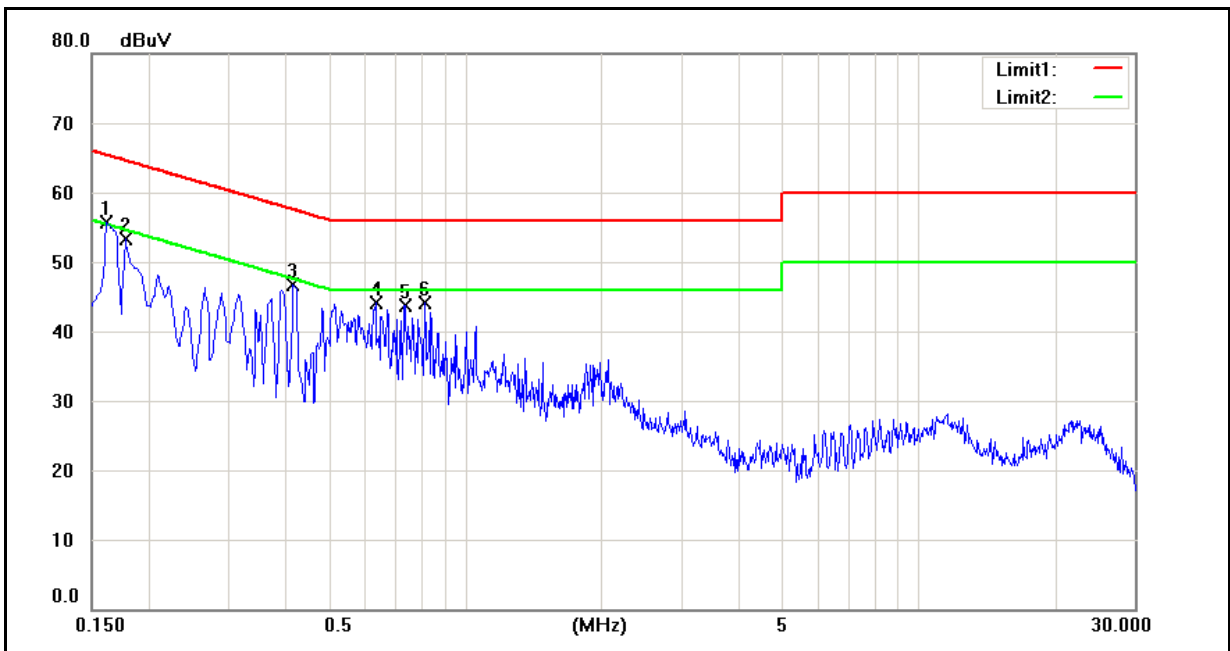
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

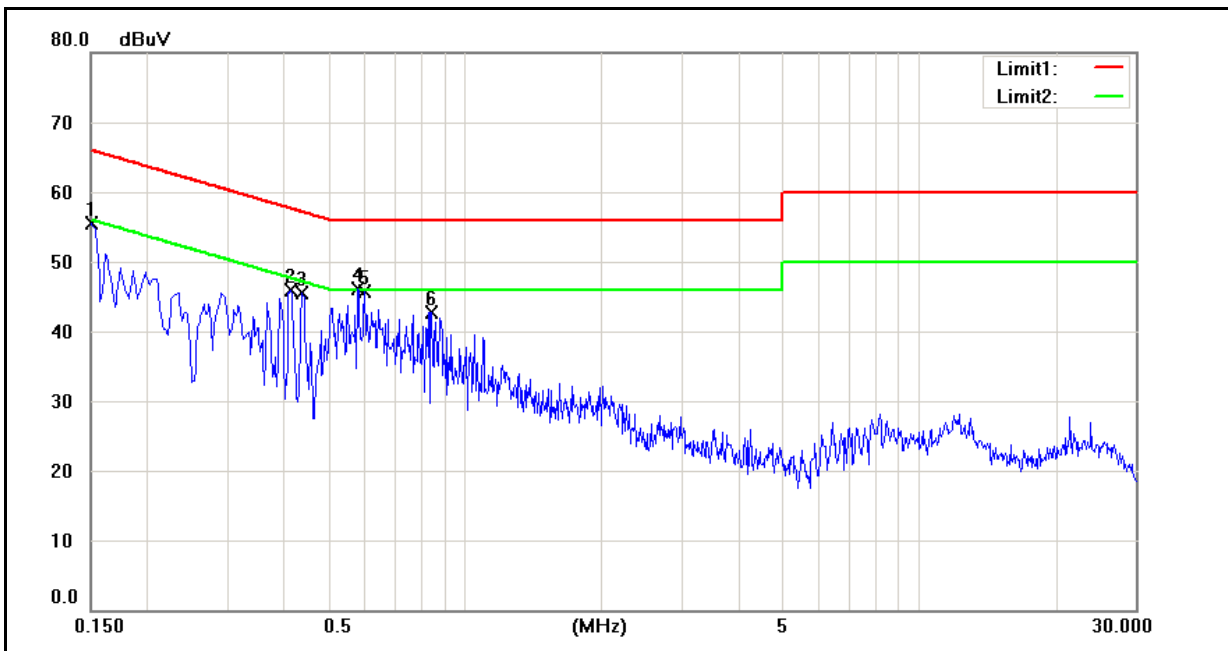
4.5. Test Result

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	25(°C)/55%RH
Mode:	Mode 1	Date:	09/02/2011
		Test By:	Gary Wu
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1620	41.73	27.53	10.07	51.80	37.60	65.36	55.36	-13.56	-17.76	Pass
2	0.1780	40.50	28.64	10.06	50.56	38.70	64.58	54.58	-14.02	-15.88	Pass
3	0.4180	31.97	18.12	9.96	41.93	28.08	57.49	47.49	-15.56	-19.41	Pass
4	0.6340	28.66	21.54	9.87	38.53	31.41	56.00	46.00	-17.47	-14.59	Pass
5	0.7380	31.95	25.21	9.84	41.79	35.05	56.00	46.00	-14.21	-10.95	Pass
6	0.8140	26.80	19.65	9.81	36.61	29.46	56.00	46.00	-19.39	-16.54	Pass

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	25(°C)/55%RH
Mode:	Mode 1	Date:	09/02/2011
		Test By:	Gary Wu
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1500	41.36	26.71	10.15	51.51	36.86	66.00	56.00	-14.49	-19.14	Pass
2	0.4140	30.72	15.97	10.05	40.77	26.02	57.57	47.57	-16.80	-21.55	Pass
3	0.4380	32.43	17.40	10.04	42.47	27.44	57.10	47.10	-14.63	-19.66	Pass
4	0.5820	31.91	24.20	9.98	41.89	34.18	56.00	46.00	-14.11	-11.82	Pass
5	0.6020	26.29	16.58	9.97	36.26	26.55	56.00	46.00	-19.74	-19.45	Pass
6	0.8460	25.99	16.18	9.86	35.85	26.04	56.00	46.00	-20.15	-19.96	Pass

5 Radiated Interference Measurement

5.1. Limit

Frequency Range (MHz)	Peak (dBuV)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960	54

5.2. Test Instruments

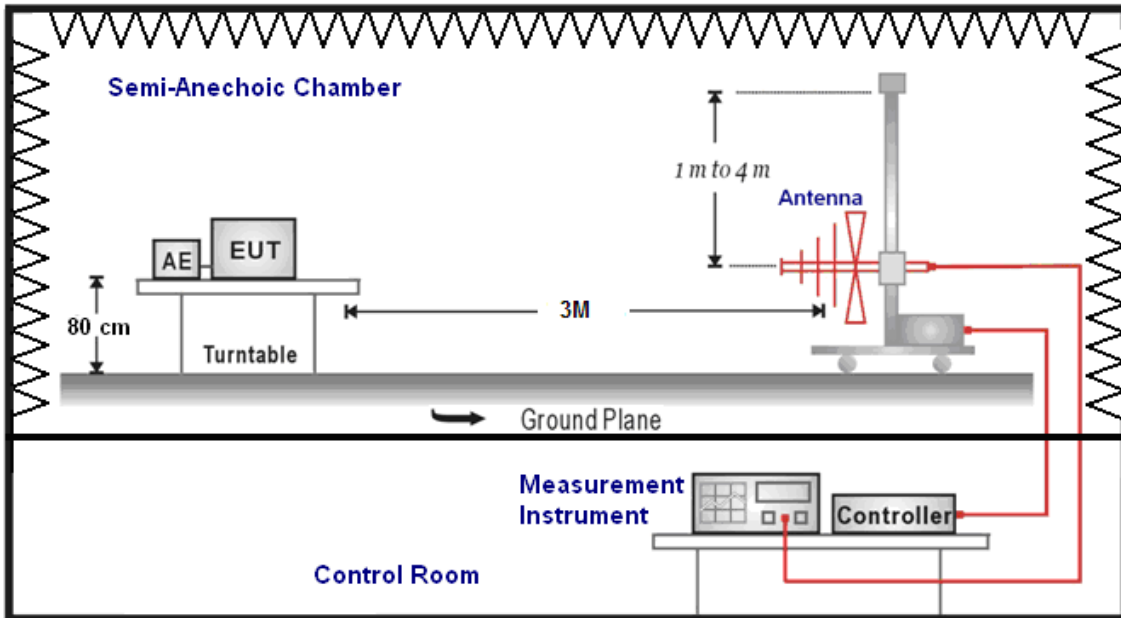
3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/18/2011	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/18/2011	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/23/2011	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/23/2011	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/29/2011	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/29/2011	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/28/2011	(1)
Test Site	ATL	TE01	888001	12/24/2010	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

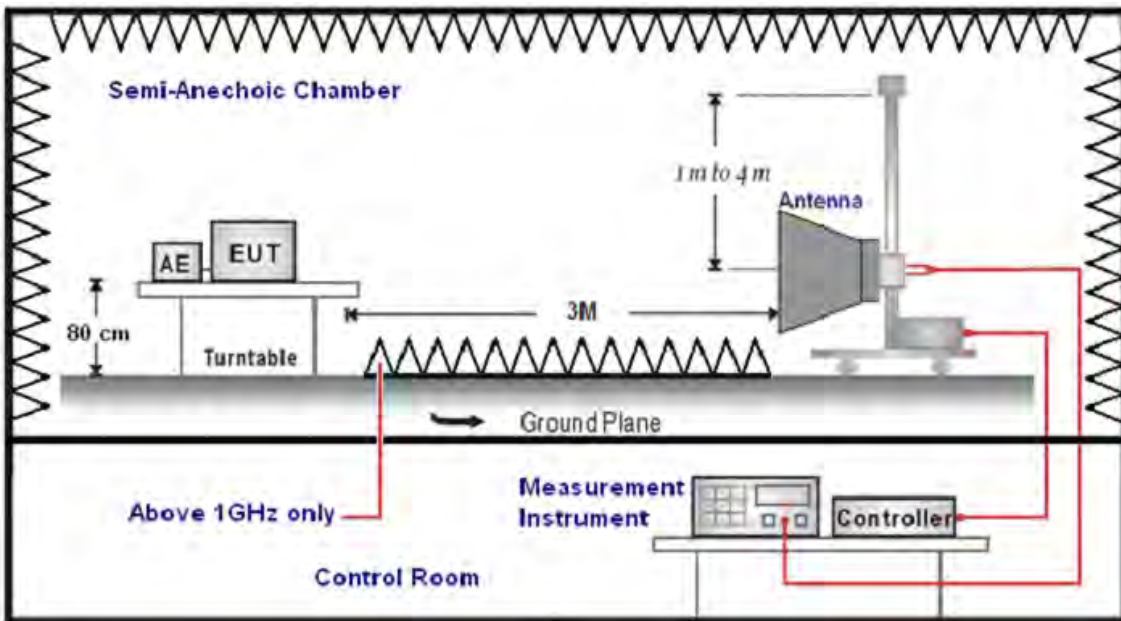
NOTE: N.C.R. = No Calibration Request.

5.3. Setup

Below 1GHz



Above 1GHz



5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 30 MHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (model VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m).

The actual field intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) $\text{Amplitude (dBuV/m)} = \text{FI (dBuV)} + \text{AF (dBuV)} + \text{CL (dBuV)} - \text{Gain (dB)}$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

(2) $\text{Actual Amplitude (dBuV/m)} = \text{Amplitude (dBuV)} - \text{Dis (dB)}$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

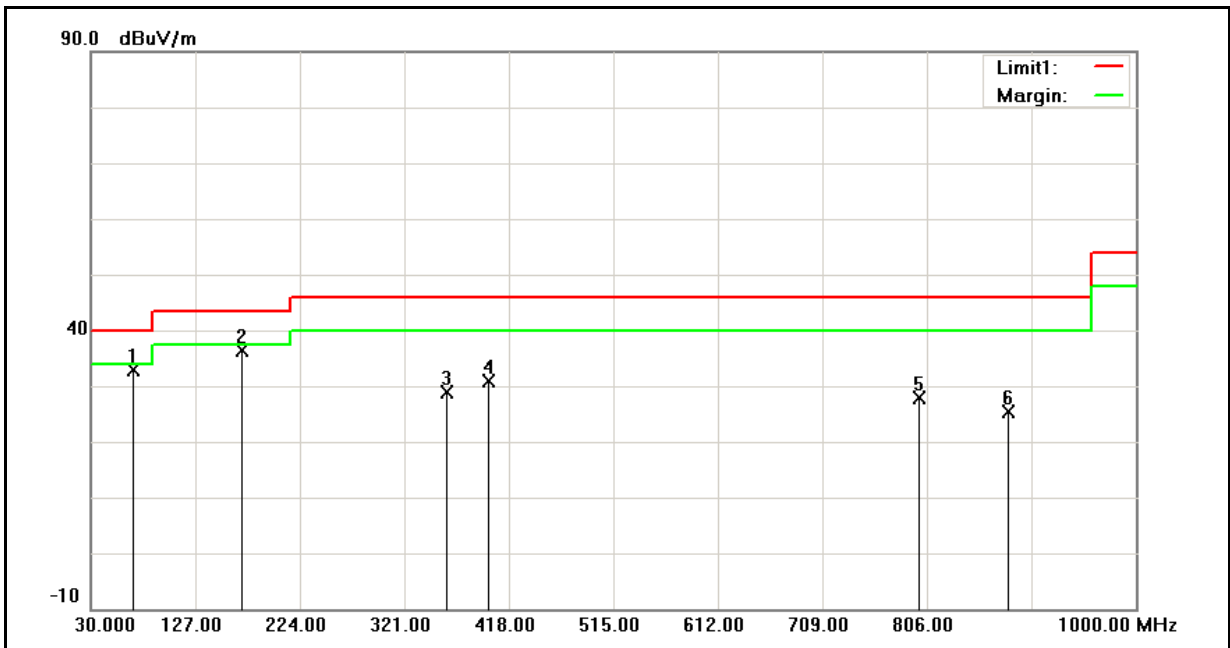
(a) For fundamental frequency : Transmitter Output < +30dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

5.5. Test Result

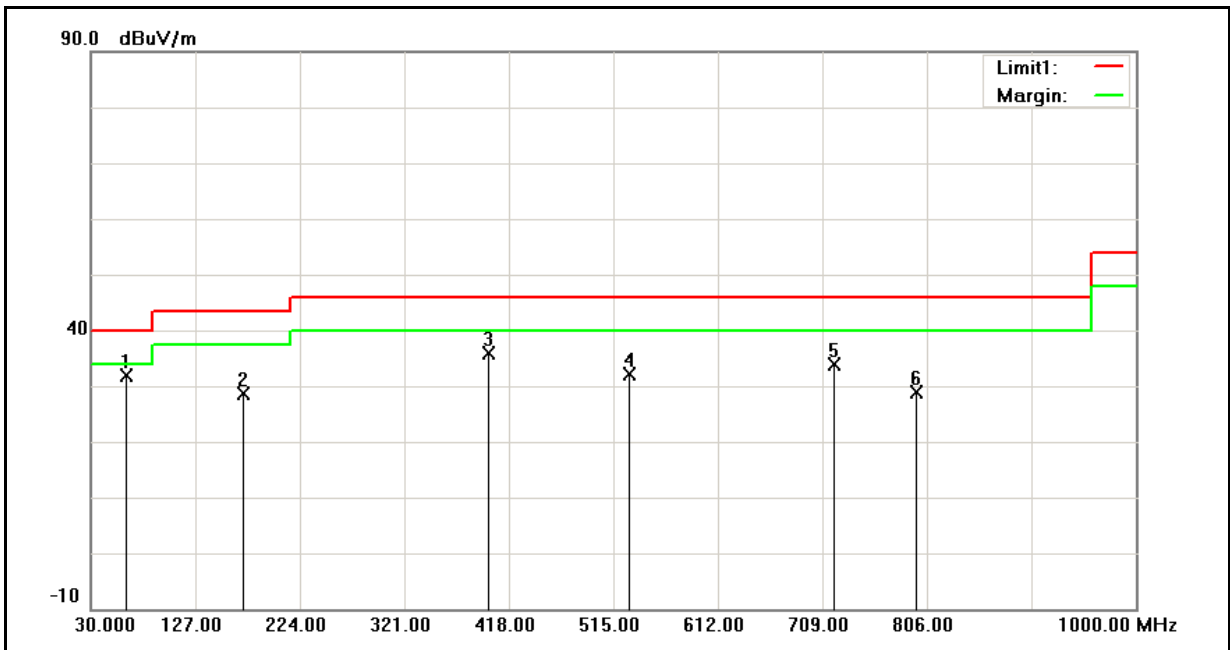
Below 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 1	Date:	09/26/2011
Ant.Polar.:	Horizontal	Test By:	Gary Wu



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	70.0000	49.39	-16.39	33.00	40.00	-7.00	QP
2	171.0000	52.35	-15.91	36.44	43.50	-7.06	QP
3	360.0000	37.60	-8.75	28.85	46.00	-17.15	QP
4	399.0000	39.58	-8.70	30.88	46.00	-15.12	QP
5	799.5000	29.36	-1.55	27.81	46.00	-18.19	QP
6	882.0000	25.74	-0.31	25.43	46.00	-20.57	QP

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 1	Date:	09/26/2011
Ant.Polar.:	Vertical	Test By:	Gary Wu



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	63.0000	45.39	-13.60	31.79	40.00	-8.21	QP
2	172.5000	44.53	-15.88	28.65	43.50	-14.85	QP
3	399.0000	44.60	-8.70	35.90	46.00	-10.10	QP
4	530.0000	38.76	-6.57	32.19	46.00	-13.81	QP
5	720.0000	36.84	-2.96	33.88	46.00	-12.12	QP
6	796.5000	30.41	-1.60	28.81	46.00	-17.19	QP

Above 1GHz

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 2			Date:	09/23/2011		
Frequency:	2412MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2092.000	44.29	-1.38	42.91	74.00	-31.09	peak	H
4290.000	37.48	6.27	43.75	74.00	-30.25	peak	H
5970.000	35.34	10.80	46.14	74.00	-27.86	peak	H
1196.000	55.91	-5.58	50.33	74.00	-23.67	peak	V
2092.000	49.73	-1.38	48.35	74.00	-25.65	peak	V
4824.000	43.78	7.95	51.73	74.00	-22.27	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 2			Date:	09/23/2011		
Frequency:	2437MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1196.000	55.70	-5.58	50.12	74.00	-23.88	peak	H
2456.000	40.48	0.23	40.71	74.00	-33.29	peak	H
4577.000	37.37	7.19	44.56	74.00	-29.44	peak	H
1595.000	53.72	-3.39	50.33	74.00	-23.67	peak	V
2092.000	50.37	-1.38	48.99	74.00	-25.01	peak	V
4874.000	45.99	8.11	54.10	74.00	-19.90	peak	V
4874.000	44.17	8.11	52.28	54.00	-1.72	AVG	V

Standard:	FCC Part 15C	Test Distance:	3m				
Test item:	Radiated Emission	Power:	AC 120V/60Hz				
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH				
Mode:	Mode 2	Date:	09/23/2011				
Frequency:	2462MHz	Test By:	Gary Wu				
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1196.000	54.17	-5.58	48.59	74.00	-25.41	peak	H
3898.000	38.12	4.92	43.04	74.00	-30.96	peak	H
5592.000	36.80	10.16	46.96	74.00	-27.04	peak	H
1595.000	55.23	-3.39	51.84	74.00	-22.16	peak	V
2092.000	50.20	-1.38	48.82	74.00	-25.18	peak	V
4924.000	44.27	8.26	52.53	74.00	-21.47	peak	V
4924.000	42.48	8.26	50.74	54.00	-3.26	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 3			Date:	09/23/2011		
Frequency:	2412MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1196.000	56.41	-5.58	50.83	74.00	-23.17	peak	H
1602.000	49.35	-3.36	45.99	74.00	-28.01	peak	H
3926.000	38.21	5.04	43.25	74.00	-30.75	peak	H
1196.000	55.33	-5.58	49.75	74.00	-24.25	peak	V
1595.000	52.96	-3.39	49.57	74.00	-24.43	peak	V
2092.000	50.82	-1.38	49.44	74.00	-24.56	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 3			Date:	09/23/2011		
Frequency:	2437MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1980.000	40.70	-1.87	38.83	74.00	-35.17	peak	H
3289.000	38.99	2.84	41.83	74.00	-32.17	peak	H
4941.000	36.79	8.31	45.10	74.00	-28.90	peak	H
2092.000	50.80	-1.38	49.42	74.00	-24.58	peak	V
3219.000	43.16	2.69	45.85	74.00	-28.15	peak	V
4815.000	38.86	7.93	46.79	74.00	-27.21	peak	V

Standard:	FCC Part 15C	Test Distance:	3m				
Test item:	Radiated Emission	Power:	AC 120V/60Hz				
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH				
Mode:	Mode 3	Date:	09/23/2011				
Frequency:	2462MHz	Test By:	Gary Wu				
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1196.000	54.95	-5.58	49.37	74.00	-24.63	peak	H
2092.000	44.81	-1.38	43.43	74.00	-30.57	peak	H
2421.000	43.22	0.07	43.29	74.00	-30.71	peak	H
1595.000	52.80	-3.39	49.41	74.00	-24.59	peak	V
2092.000	50.73	-1.38	49.35	74.00	-24.65	peak	V
3219.000	43.09	2.69	45.78	74.00	-28.22	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	09/23/2011		
Frequency:	2412MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3590.000	39.56	3.68	43.24	74.00	-30.76	peak	H
4766.000	36.81	7.77	44.58	74.00	-29.42	peak	H
5739.000	36.34	10.40	46.74	74.00	-27.26	peak	H
1196.000	55.11	-5.58	49.53	74.00	-24.47	peak	V
2092.000	49.93	-1.38	48.55	74.00	-25.45	peak	V
4824.000	39.47	7.95	47.42	74.00	-26.58	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	09/23/2011		
Frequency:	2437MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1595.000	48.33	-3.39	44.94	74.00	-29.06	peak	H
2092.000	45.05	-1.38	43.67	74.00	-30.33	peak	H
5102.000	37.11	8.80	45.91	74.00	-28.09	peak	H
1595.000	48.86	-3.39	45.47	74.00	-28.53	peak	V
6201.000	35.82	11.76	47.58	74.00	-26.42	peak	V
6880.000	35.88	14.32	50.20	74.00	-23.80	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	09/23/2011		
Frequency:	2462MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1196.000	55.56	-5.58	49.98	74.00	-24.02	peak	H
3219.000	39.10	2.69	41.79	74.00	-32.21	peak	H
5711.000	36.51	10.36	46.87	74.00	-27.13	peak	H
1196.000	56.80	-5.58	51.22	74.00	-22.78	peak	V
1595.000	53.92	-3.39	50.53	74.00	-23.47	peak	V
2092.000	49.42	-1.38	48.04	74.00	-25.96	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 5			Date:	09/23/2011		
Frequency:	2422MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1196.000	54.69	-5.58	49.11	74.00	-24.89	peak	H
2092.000	44.07	-1.38	42.69	74.00	-31.31	peak	H
4311.000	38.42	6.34	44.76	74.00	-29.24	peak	H
1595.000	51.17	-3.39	47.78	74.00	-26.22	peak	V
2092.000	50.86	-1.38	49.48	74.00	-24.52	peak	V
3219.000	43.44	2.69	46.13	74.00	-27.87	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 5			Date:	09/23/2011		
Frequency:	2437MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1595.000	47.68	-3.39	44.29	74.00	-29.71	peak	H
2092.000	43.48	-1.38	42.10	74.00	-31.90	peak	H
5102.000	36.09	8.80	44.89	74.00	-29.11	peak	H
1595.000	52.94	-3.39	49.55	74.00	-24.45	peak	V
2092.000	51.21	-1.38	49.83	74.00	-24.17	peak	V
4052.000	39.42	5.49	44.91	74.00	-29.09	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 5			Date:	09/23/2011		
Frequency:	2452MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1196.000	55.63	-5.58	50.05	74.00	-23.95	peak	H
3219.000	39.24	2.69	41.93	74.00	-32.07	peak	H
5627.000	36.39	10.21	46.60	74.00	-27.40	peak	H
1000.0000	44.42	-6.76	37.66	74.00	-36.34	peak	V
3219.000	43.89	2.69	46.58	74.00	-27.42	peak	V
6488.000	36.56	13.03	49.59	74.00	-24.41	peak	V

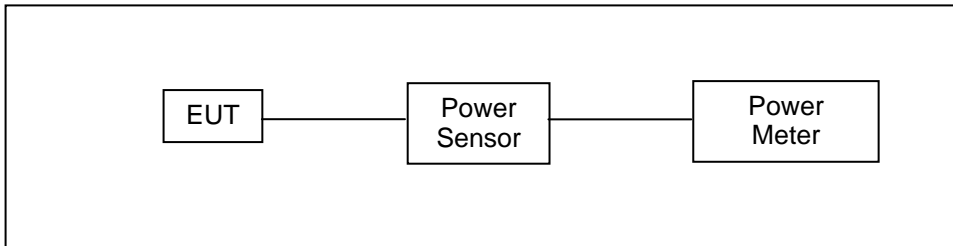
Standard:	FCC Part 15C			Test Distance:	3m			
Test item:	Radiated Emission			Power:	AC 120V/60Hz			
Model Number:	WU1112			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH			
Mode:	Mode 6			Date:	09/23/2011			
Modulation:	IEEE 802.11b			Test By:	Gary Wu			
Frequency:	2437MHz							
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Peak Limit (dBuV/m)	AVG. Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1595.000	47.43	-3.39	44.04	74.00	54.00	-29.96	peak	H
2484.000	41.53	0.35	41.88	74.00	54.00	-32.12	peak	H
4703.000	37.66	7.58	45.24	74.00	54.00	-28.76	peak	H
2288.000	38.63	-0.51	38.12	74.00	54.00	-35.88	peak	V
3219.000	43.89	2.69	46.58	74.00	54.00	-27.42	peak	V
4304.000	38.28	6.32	44.60	74.00	54.00	-29.40	peak	V

6 Maximum Conducted Output Power Measurement

6.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm.

6.2. Test Setup



6.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Single Channel PK Power Sensor	Agilent	N1911A	MY45101619	07/19/2010	(2)
Wideband Power Meter	Agilent	N1921A	MY45241957	07/19/2010	(2)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

6.4. Test Procedure

The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to $(\text{GAIN} - 6)/3$ dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

6.5. Test Result

Model Number	WU1112					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 2: IEEE 802.11b Link Mode					
Date of Test	09/02/2011			Test Site	TE02	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	1	12.87	0.019	15.64	0.037	< 30
2437		12.75	0.019	15.51	0.036	< 30
2462		12.02	0.016	14.74	0.030	< 30
2412	11	12.75	0.019	15.59	0.036	< 30
2437		12.41	0.017	15.16	0.033	< 30
2462		12.86	0.019	15.48	0.035	< 30

Model Number	WU1112					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 3: IEEE 802.11g Link Mode					
Date of Test	09/02/2011			Test Site	TE02	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	6	9.85	0.010	20.85	0.122	< 30
2437		9.05	0.008	19.86	0.097	< 30
2462		9.59	0.009	20.31	0.107	< 30
2412	54	9.71	0.009	20.80	0.120	< 30
2437		9.74	0.009	20.79	0.120	< 30
2462		8.54	0.007	19.54	0.090	< 30

Model Number	WU1112					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 4: draft 802.11n Standard-20MHz Link Mode					
Date of Test	09/02/2011			Test Site	TE02	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	6.5 M	8.92	0.008	19.60	0.091	< 30
2437		8.32	0.007	19.10	0.081	< 30
2462		8.44	0.007	19.22	0.084	< 30
2412	65 M	8.85	0.008	18.96	0.079	< 30
2437		8.33	0.007	18.55	0.072	< 30
2462		7.70	0.006	17.88	0.061	< 30

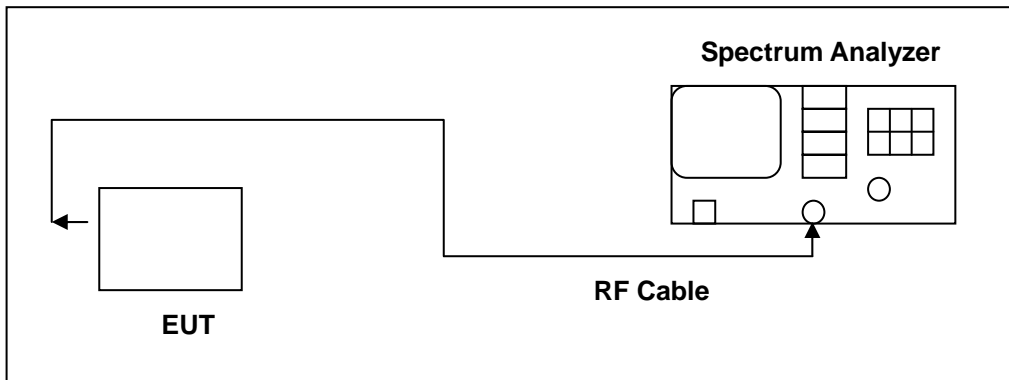
Model Number	WU1112					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 5: draft 802.11n Wide-40MHz Link Mode					
Date of Test	09/02/2011			Test Site	TE02	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2422	13.5 M	9.13	0.008	20.14	0.103	< 30
2437		8.71	0.007	19.70	0.093	< 30
2452		8.37	0.007	18.90	0.078	< 30
2422	135 M	8.84	0.008	19.04	0.080	< 30
2437		8.68	0.007	18.72	0.074	< 30
2452		8.20	0.007	17.95	0.062	< 30

7 6dB RF Bandwidth Measurement

7.1. Limit

Systems using digital modulation techniques may operate in the 2400–2483.5 MHz bands. The minimum 6 dB band-width shall be at least 500 kHz.

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/28/2010	(2)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

7.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A peak output reading was taken, a DISPLAY line was drawn 6 dB lower than peak level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

The test was performed at 3 channels (Channel 1, 6, 11)

7.5. Test Result

Model Number	WU1112		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	10250	> 500
	2437	10250	> 500
	2462	10500	> 500

Model Number	WU1112		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	09/28/2011	Test Site	TE06
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	16600	> 500
	2437	16600	> 500
	2462	16600	> 500

Model Number	WU1112		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 4: draft 802.11n Standard-20MHz Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	17800	> 500
	2437	17800	> 500
	2462	17800	> 500

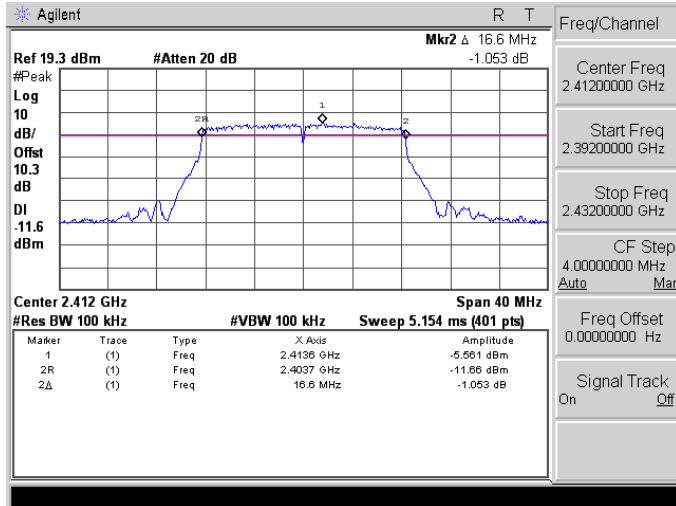
Model Number	WU1112		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 5: draft 802.11n Wide-40MHz Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2422	36250	> 500
	2437	36375	> 500
	2452	36375	> 500

7.6. Test Graphs

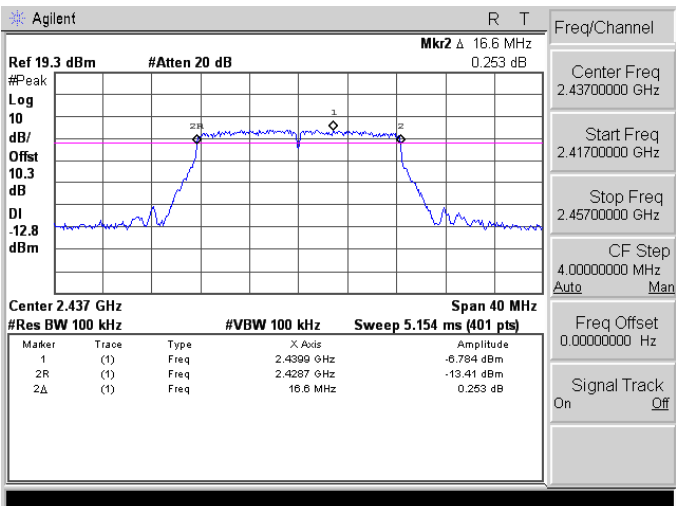
Mode 2: IEEE 802.11b Link Mode																					
2412	<p>Agilent R T</p> <p>Ref 19.3 dBm #Atten 20 dB Mkr2 Δ 10.250 MHz -2.262 dB</p> <p>#Peak Log 10 dB/Offset 10.3 dB DI 3.8 dBm</p> <p>Center 2.412 GHz Span 50 MHz</p> <p>#Res BW 100 kHz #VBW 100 kHz Sweep 6.442 ms (401 pts)</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.413000 GHz</td> <td>2.221 dBm</td> </tr> <tr> <td>2R</td> <td>(1)</td> <td>Freq</td> <td>2.406875 GHz</td> <td>-2.264 dBm</td> </tr> <tr> <td>2Δ</td> <td>(1)</td> <td>Freq</td> <td>10.250 MHz</td> <td>-2.262 dB</td> </tr> </tbody> </table> <p>Freq/Channel: Center Freq 2.41200000 GHz, Start Freq 2.38700000 GHz, Stop Freq 2.43700000 GHz, CF Step 5.00000000 MHz (Auto/Man), Freq Offset 0.00000000 Hz, Signal Track On/Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.413000 GHz	2.221 dBm	2R	(1)	Freq	2.406875 GHz	-2.264 dBm	2Δ	(1)	Freq	10.250 MHz	-2.262 dB
Marker	Trace	Type	X Axis	Amplitude																	
1	(1)	Freq	2.413000 GHz	2.221 dBm																	
2R	(1)	Freq	2.406875 GHz	-2.264 dBm																	
2Δ	(1)	Freq	10.250 MHz	-2.262 dB																	
2437	<p>Agilent R T</p> <p>Ref 19.3 dBm #Atten 20 dB Mkr2 Δ 10.250 MHz -0.825 dB</p> <p>#Peak Log 10 dB/Offset 10.3 dB DI 4.8 dBm</p> <p>Center 2.437 GHz Span 50 MHz</p> <p>#Res BW 100 kHz #VBW 100 kHz Sweep 6.442 ms (401 pts)</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.438000 GHz</td> <td>1.217 dBm</td> </tr> <tr> <td>2R</td> <td>(1)</td> <td>Freq</td> <td>2.431875 GHz</td> <td>-4.98 dBm</td> </tr> <tr> <td>2Δ</td> <td>(1)</td> <td>Freq</td> <td>10.250 MHz</td> <td>-0.825 dB</td> </tr> </tbody> </table> <p>Freq/Channel: Center Freq 2.43700000 GHz, Start Freq 2.41200000 GHz, Stop Freq 2.46200000 GHz, CF Step 5.00000000 MHz (Auto/Man), Freq Offset 0.00000000 Hz, Signal Track On/Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.438000 GHz	1.217 dBm	2R	(1)	Freq	2.431875 GHz	-4.98 dBm	2Δ	(1)	Freq	10.250 MHz	-0.825 dB
Marker	Trace	Type	X Axis	Amplitude																	
1	(1)	Freq	2.438000 GHz	1.217 dBm																	
2R	(1)	Freq	2.431875 GHz	-4.98 dBm																	
2Δ	(1)	Freq	10.250 MHz	-0.825 dB																	
2462	<p>Agilent R T</p> <p>Ref 19.3 dBm #Atten 20 dB Mkr2 Δ 10.500 MHz -0.308 dB</p> <p>#Peak Log 10 dB/Offset 10.3 dB DI 6.2 dBm</p> <p>Center 2.462 GHz Span 50 MHz</p> <p>#Res BW 100 kHz #VBW 100 kHz Sweep 6.442 ms (401 pts)</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.463000 GHz</td> <td>-0.219 dBm</td> </tr> <tr> <td>2R</td> <td>(1)</td> <td>Freq</td> <td>2.469750 GHz</td> <td>-8.272 dBm</td> </tr> <tr> <td>2Δ</td> <td>(1)</td> <td>Freq</td> <td>10.500 MHz</td> <td>-0.308 dB</td> </tr> </tbody> </table> <p>Freq/Channel: Center Freq 2.46200000 GHz, Start Freq 2.43700000 GHz, Stop Freq 2.48700000 GHz, CF Step 5.00000000 MHz (Auto/Man), Freq Offset 0.00000000 Hz, Signal Track On/Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.463000 GHz	-0.219 dBm	2R	(1)	Freq	2.469750 GHz	-8.272 dBm	2Δ	(1)	Freq	10.500 MHz	-0.308 dB
Marker	Trace	Type	X Axis	Amplitude																	
1	(1)	Freq	2.463000 GHz	-0.219 dBm																	
2R	(1)	Freq	2.469750 GHz	-8.272 dBm																	
2Δ	(1)	Freq	10.500 MHz	-0.308 dB																	

Mode 3: IEEE 802.11g Link Mode

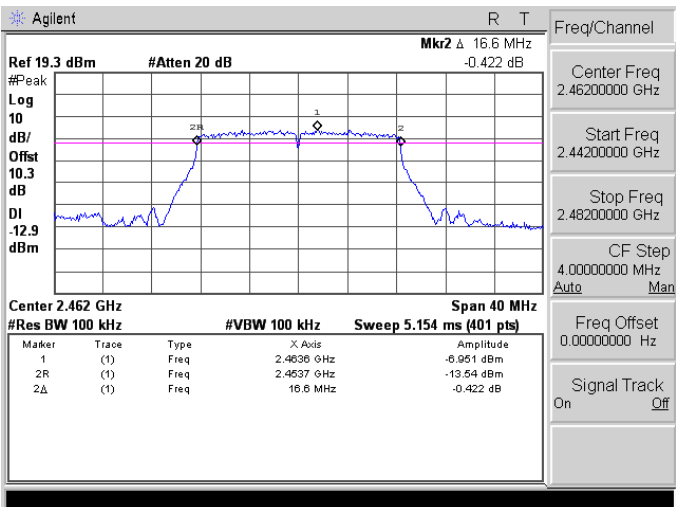
2412



2437

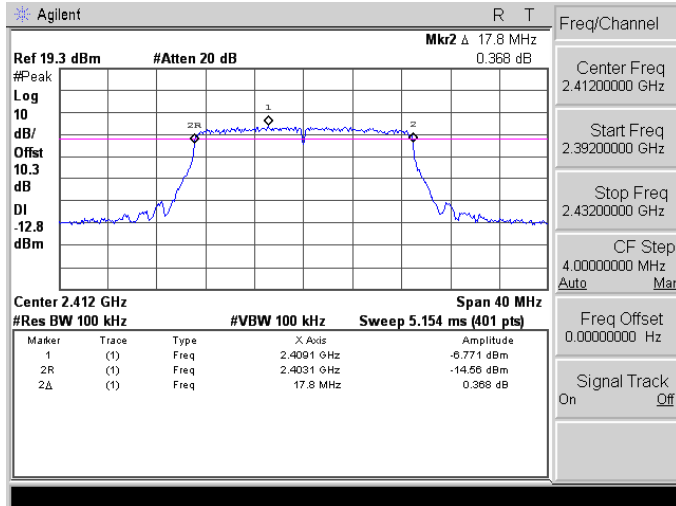


2462

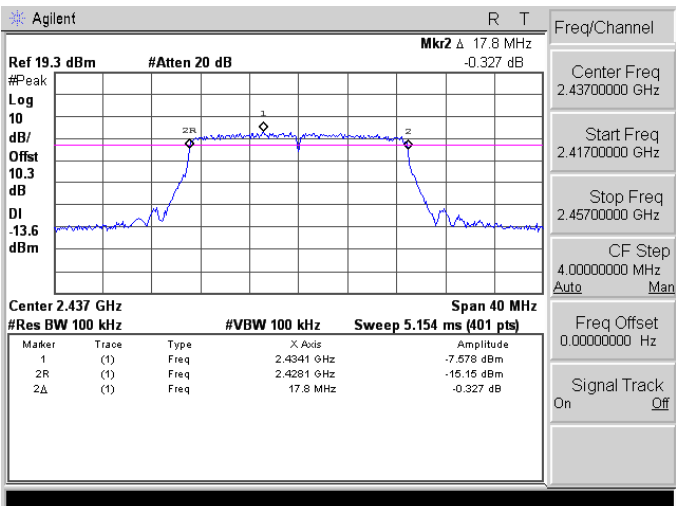


Mode 4: draft 802.11n Standard-20MHz Link Mode

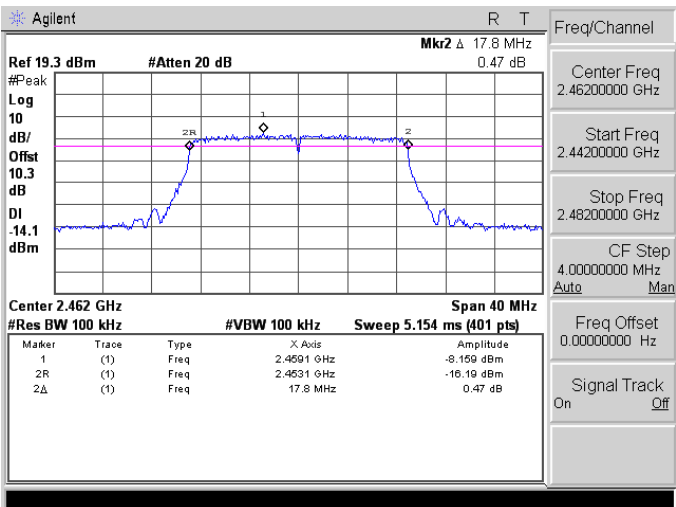
2412



2437



2462



Mode 5: draft 802.11n Wide-40MHz Link Mode

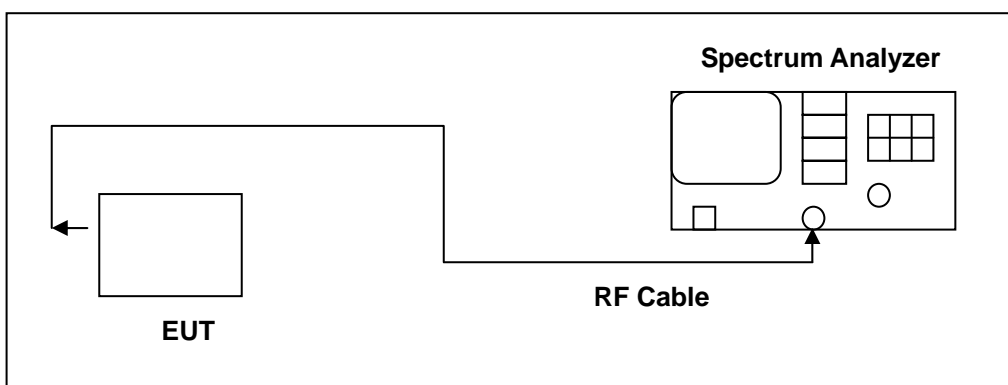
<p>2422</p>	<p>Agilent R T</p> <p>Ref 19.3 dBm #Atten 20 dB Mkr2 Δ 36.250 MHz 1.043 dB</p> <p>#Peak Log 10 dB/Offset 10.3 dB DI -15.9 dBm</p> <p>Center 2.422 GHz Span 50 MHz</p> <p>#Res BW 100 kHz #VBW 100 kHz Sweep 6.442 ms (401 pts)</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.414250 GHz</td> <td>-9.924 dBm</td> </tr> <tr> <td>2R</td> <td>(1)</td> <td>Freq</td> <td>2.403750 GHz</td> <td>-16.87 dBm</td> </tr> <tr> <td>2Δ</td> <td>(1)</td> <td>Freq</td> <td>36.250 MHz</td> <td>1.043 dB</td> </tr> </tbody> </table> <p>Freq/Channel</p> <p>Center Freq 2.42200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.44700000 GHz</p> <p>CF Step 5.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.414250 GHz	-9.924 dBm	2R	(1)	Freq	2.403750 GHz	-16.87 dBm	2Δ	(1)	Freq	36.250 MHz	1.043 dB
Marker	Trace	Type	X Axis	Amplitude																	
1	(1)	Freq	2.414250 GHz	-9.924 dBm																	
2R	(1)	Freq	2.403750 GHz	-16.87 dBm																	
2Δ	(1)	Freq	36.250 MHz	1.043 dB																	
<p>2437</p>	<p>Agilent R T</p> <p>Ref 19.3 dBm #Atten 20 dB Mkr2 Δ 36.375 MHz 1.015 dB</p> <p>#Peak Log 10 dB/Offset 10.3 dB DI -16.8 dBm</p> <p>Center 2.437 GHz Span 50 MHz</p> <p>#Res BW 100 kHz #VBW 100 kHz Sweep 6.442 ms (401 pts)</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.429250 GHz</td> <td>-10.77 dBm</td> </tr> <tr> <td>2R</td> <td>(1)</td> <td>Freq</td> <td>2.418750 GHz</td> <td>-17.36 dBm</td> </tr> <tr> <td>2Δ</td> <td>(1)</td> <td>Freq</td> <td>36.375 MHz</td> <td>1.015 dB</td> </tr> </tbody> </table> <p>Freq/Channel</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.41200000 GHz</p> <p>Stop Freq 2.46200000 GHz</p> <p>CF Step 5.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.429250 GHz	-10.77 dBm	2R	(1)	Freq	2.418750 GHz	-17.36 dBm	2Δ	(1)	Freq	36.375 MHz	1.015 dB
Marker	Trace	Type	X Axis	Amplitude																	
1	(1)	Freq	2.429250 GHz	-10.77 dBm																	
2R	(1)	Freq	2.418750 GHz	-17.36 dBm																	
2Δ	(1)	Freq	36.375 MHz	1.015 dB																	
<p>2452</p>	<p>Agilent R T</p> <p>Ref 19.3 dBm #Atten 20 dB Mkr2 Δ 36.375 MHz 1.984 dB</p> <p>#Peak Log 10 dB/Offset 10.3 dB DI -17.3 dBm</p> <p>Center 2.452 GHz Span 50 MHz</p> <p>#Res BW 100 kHz #VBW 100 kHz Sweep 6.442 ms (401 pts)</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.441125 GHz</td> <td>-11.29 dBm</td> </tr> <tr> <td>2R</td> <td>(1)</td> <td>Freq</td> <td>2.430750 GHz</td> <td>-18.49 dBm</td> </tr> <tr> <td>2Δ</td> <td>(1)</td> <td>Freq</td> <td>36.375 MHz</td> <td>1.984 dB</td> </tr> </tbody> </table> <p>Freq/Channel</p> <p>Center Freq 2.45200000 GHz</p> <p>Start Freq 2.42700000 GHz</p> <p>Stop Freq 2.47700000 GHz</p> <p>CF Step 5.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.441125 GHz	-11.29 dBm	2R	(1)	Freq	2.430750 GHz	-18.49 dBm	2Δ	(1)	Freq	36.375 MHz	1.984 dB
Marker	Trace	Type	X Axis	Amplitude																	
1	(1)	Freq	2.441125 GHz	-11.29 dBm																	
2R	(1)	Freq	2.430750 GHz	-18.49 dBm																	
2Δ	(1)	Freq	36.375 MHz	1.984 dB																	

8 Maximum Power Density Measurement

8.1. Limit

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.

8.2. Test Setup



8.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/28/2010	(2)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

8.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The spectrum analyzer RES BW was set to 3 kHz. The START and STOP frequencies were set to the band edges of the maximum output pass band. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs. The specification calls for a 1 second interval at each 3 kHz bandwidth; total SWEEP TIME is calculated as follows:

$$\text{SWEEP TIME (SEC)} = (\text{Fstop, kHz} - \text{Fstart, kHz}) / 3 \text{ kHz}$$

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

8.5. Test Result

Model Number	WU1112		
Test Item	Maximum Power Density		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (dBm)	Limit (dBm)
	2412	-18.33	< 8
	2437	-18.80	< 8
	2462	-19.53	< 8

Model Number	WU1112		
Test Item	Maximum Power Density		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (dBm)	Limit (dBm)
	2412	-20.24	< 8
	2437	-20.75	< 8
	2462	-21.36	< 8

Model Number	WU1112		
Test Item	Maximum Power Density		
Test Mode	Mode 4: draft 802.11n Standard-20MHz Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (dBm)	Limit (dBm)
	2412	-19.33	< 8
	2437	-21.04	< 8
	2462	-22.18	< 8

Model Number	WU1112		
Test Item	Maximum Power Density		
Test Mode	Mode 5: draft 802.11n Wide-40MHz Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (dBm)	Limit (dBm)
	2422	-22.66	< 8
	2437	-22.44	< 8
	2452	-22.76	< 8

8.6. Test Graphs

Mode 2: IEEE 802.11b Link Mode	
2412	<p>Agilent R T Mkr1 2.41125675 GHz Ref 20 dBm #Atten 20 dB -18.33 dBm Peak Log 10 dB/ Offset 10.3 dB DI 8.0 dBm M1 S2 S3 FC AA Center 2.411 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel Center Freq 2.41125675 GHz Start Freq 2.41110675 GHz Stop Freq 2.41140675 GHz CF Step 30.0000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2437	<p>Agilent R T Mkr1 2.43626450 GHz Ref 20 dBm #Atten 20 dB -18.8 dBm Peak Log 10 dB/ Offset 10.3 dB DI 8.0 dBm M1 S2 S3 FC AA Center 2.436 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel Center Freq 2.43626450 GHz Start Freq 2.43610625 GHz Stop Freq 2.43640625 GHz CF Step 30.0000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2462	<p>Agilent R T Mkr1 2.46125675 GHz Ref 20 dBm #Atten 20 dB -19.53 dBm Peak Log 10 dB/ Offset 10.3 dB DI 8.0 dBm M1 S2 S3 FC AA Center 2.461 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel Center Freq 2.46125675 GHz Start Freq 2.46110675 GHz Stop Freq 2.46140675 GHz CF Step 30.0000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

Mode 3: IEEE 802.11g Link Mode

<p>2412</p>	<p>Agilent R T</p> <p>Mkr1 2.41260575 GHz</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>Peak 20.24 dBm</p> <p>Log 10</p> <p>dB/Offset 10.3 dB</p> <p>DI 8.0 dBm</p> <p>M1 S2</p> <p>S3 FC</p> <p>AA</p> <p>Center 2.413 GHz Span 300 kHz</p> <p>#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.41260575 GHz</p> <p>Start Freq 2.41245575 GHz</p> <p>Stop Freq 2.41275575 GHz</p> <p>CF Step 30.0000000 kHz</p> <p>Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
<p>2437</p>	<p>Agilent R T</p> <p>Mkr1 2.43385575 GHz</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>Peak 20.75 dBm</p> <p>Log 10</p> <p>dB/Offset 10.3 dB</p> <p>DI 8.0 dBm</p> <p>M1 S2</p> <p>S3 FC</p> <p>AA</p> <p>Center 2.434 GHz Span 300 kHz</p> <p>#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.43385500 GHz</p> <p>Start Freq 2.43370500 GHz</p> <p>Stop Freq 2.43400500 GHz</p> <p>CF Step 30.0000000 kHz</p> <p>Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
<p>2462</p>	<p>Agilent R T</p> <p>Mkr1 2.46105775 GHz</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>Peak 21.36 dBm</p> <p>Log 10</p> <p>dB/Offset 10.3 dB</p> <p>DI 8.0 dBm</p> <p>M1 S2</p> <p>S3 FC</p> <p>AA</p> <p>Center 2.461 GHz Span 300 kHz</p> <p>#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.46105700 GHz</p> <p>Start Freq 2.46090700 GHz</p> <p>Stop Freq 2.46120700 GHz</p> <p>CF Step 30.0000000 kHz</p> <p>Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

Mode 4: draft 802.11n Standard-20MHz Link Mode

2412	<p>Agilent R T</p> <p>Mkr1 2.40978075 GHz</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>Peak -19.33 dBm</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offset 10.3 dB</p> <p>DI 8.0 dBm</p> <p>M1 S2</p> <p>S3 FC</p> <p>AA</p> <p>Center 2.41 GHz Span 300 kHz</p> <p>#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.40978000 GHz</p> <p>Start Freq 2.40963000 GHz</p> <p>Stop Freq 2.40993000 GHz</p> <p>CF Step 30.0000000 kHz</p> <p>Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2437	<p>Agilent R T</p> <p>Mkr1 2.43478125 GHz</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>Peak 21.04 dBm</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offset 10.3 dB</p> <p>DI 8.0 dBm</p> <p>M1 S2</p> <p>S3 FC</p> <p>AA</p> <p>Center 2.435 GHz Span 300 kHz</p> <p>#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.43478125 GHz</p> <p>Start Freq 2.43463125 GHz</p> <p>Stop Freq 2.43493125 GHz</p> <p>CF Step 30.0000000 kHz</p> <p>Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2462	<p>Agilent R T</p> <p>Mkr1 2.46133925 GHz</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>Peak 22.18 dBm</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offset 10.3 dB</p> <p>DI 8.0 dBm</p> <p>M1 S2</p> <p>S3 FC</p> <p>AA</p> <p>Center 2.461 GHz Span 300 kHz</p> <p>#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel</p> <p>Center Freq 2.46133925 GHz</p> <p>Start Freq 2.46118925 GHz</p> <p>Stop Freq 2.46148925 GHz</p> <p>CF Step 2.46133925 GHz</p> <p>Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

Mode 5: draft 802.11n Wide-40MHz Link Mode

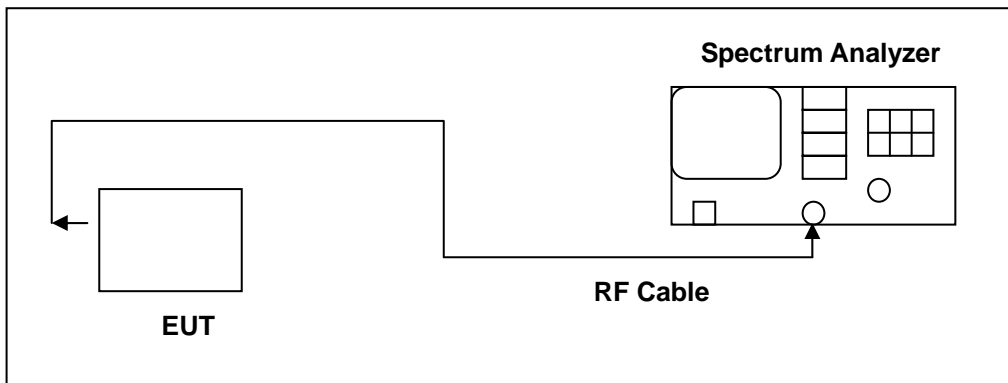
2422	<p>Agilent R T Mkr1 2.41416925 GHz Ref 20 dBm #Atten 20 dB Peak 22.66 dBm Log 10 dB/Offset 10.3 dB DI 8.0 dBm M1 S2 S3 FC AA Center 2.414 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel Center Freq 2.41416925 GHz Start Freq 2.41401925 GHz Stop Freq 2.41431925 GHz CF Step 2.46133925 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2437	<p>Agilent R T Mkr1 2.44480000 GHz Ref 20 dBm #Atten 20 dB Peak 22.44 dBm Log 10 dB/Offset 10.3 dB DI 8.0 dBm M1 S2 S3 FC AA Center 2.445 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel Center Freq 2.44480000 GHz Start Freq 2.44465000 GHz Stop Freq 2.44495000 GHz CF Step 2.46133925 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2452	<p>Agilent R T Mkr1 2.45980025 GHz Ref 20 dBm #Atten 20 dB Peak 22.76 dBm Log 10 dB/Offset 10.3 dB DI 8.0 dBm M1 S2 S3 FC AA Center 2.46 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (401 pts)</p> <p>Freq/Channel Center Freq 2.45979950 GHz Start Freq 2.45964950 GHz Stop Freq 2.45994950 GHz CF Step 2.46133925 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

9 Out of Band Conducted Emissions Measurement

9.1. Limit

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

9.2. Test Setup



9.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/28/2010	(2)
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/07/2011	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

9.4. Test Procedure

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels (Channel 1, 6, 11)

9.5. Test Graphs

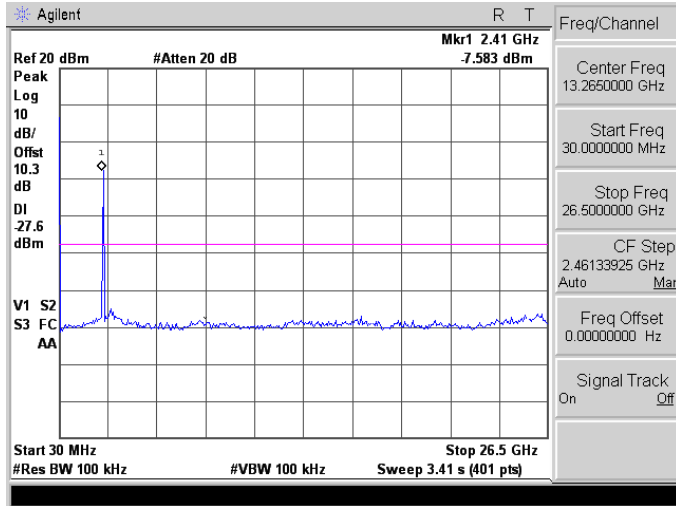
Mode 2: IEEE 802.11b Link Mode																
2412	<p>Agilent R T Mkr2 4.79 GHz -45.37 dBm</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>Peak Log 10 dB/Offset 10.3 dB DI -20.4 dBm</p> <p>Start 30 MHz Stop 26.5 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 3.41 s (401 pts)</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.41 GHz</td> <td>-0.367 dBm</td> </tr> <tr> <td>2</td> <td>(1)</td> <td>Freq</td> <td>4.79 GHz</td> <td>-45.37 dBm</td> </tr> </tbody> </table> <p>Freq/Channel Center Freq 13.2650000 GHz Start Freq 30.0000000 MHz Stop Freq 26.5000000 GHz CF Step 2.46133925 GHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.41 GHz	-0.367 dBm	2	(1)	Freq	4.79 GHz	-45.37 dBm
Marker	Trace	Type	X Axis	Amplitude												
1	(1)	Freq	2.41 GHz	-0.367 dBm												
2	(1)	Freq	4.79 GHz	-45.37 dBm												
2437	<p>Agilent R T Mkr2 4.86 GHz -44.18 dBm</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>Peak Log 10 dB/Offset 10.3 dB DI -21.5 dBm</p> <p>Start 30 MHz Stop 26.5 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 3.41 s (401 pts)</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.44 GHz</td> <td>-1.48 dBm</td> </tr> <tr> <td>2</td> <td>(1)</td> <td>Freq</td> <td>4.86 GHz</td> <td>-44.18 dBm</td> </tr> </tbody> </table> <p>Freq/Channel Center Freq 13.2650000 GHz Start Freq 30.0000000 MHz Stop Freq 26.5000000 GHz CF Step 2.46133925 GHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.44 GHz	-1.48 dBm	2	(1)	Freq	4.86 GHz	-44.18 dBm
Marker	Trace	Type	X Axis	Amplitude												
1	(1)	Freq	2.44 GHz	-1.48 dBm												
2	(1)	Freq	4.86 GHz	-44.18 dBm												
2462	<p>Agilent R T Mkr2 4.93 GHz -45.39 dBm</p> <p>Ref 20 dBm #Atten 20 dB</p> <p>Peak Log 10 dB/Offset 10.3 dB DI -22.3 dBm</p> <p>Start 30 MHz Stop 26.5 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 3.41 s (401 pts)</p> <table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(1)</td> <td>Freq</td> <td>2.46 GHz</td> <td>-2.287 dBm</td> </tr> <tr> <td>2</td> <td>(1)</td> <td>Freq</td> <td>4.93 GHz</td> <td>-45.39 dBm</td> </tr> </tbody> </table> <p>Freq/Channel Center Freq 13.2650000 GHz Start Freq 30.0000000 MHz Stop Freq 26.5000000 GHz CF Step 2.46133925 GHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.46 GHz	-2.287 dBm	2	(1)	Freq	4.93 GHz	-45.39 dBm
Marker	Trace	Type	X Axis	Amplitude												
1	(1)	Freq	2.46 GHz	-2.287 dBm												
2	(1)	Freq	4.93 GHz	-45.39 dBm												

Mode 3: IEEE 802.11g Link Mode

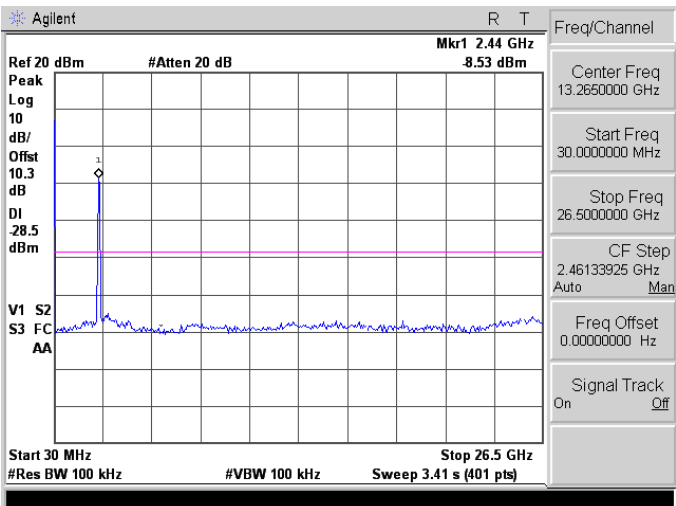
<p>2412</p>	
<p>2437</p>	
<p>2462</p>	

Mode 4: draft 802.11n Standard-20MHz Link Mode

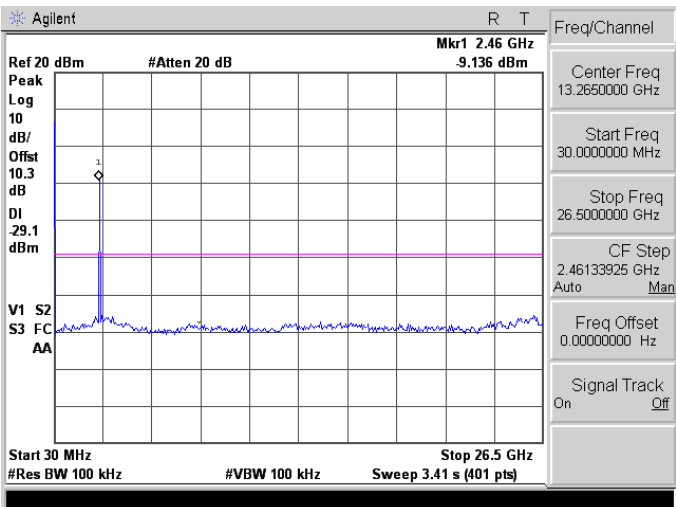
2412



2437

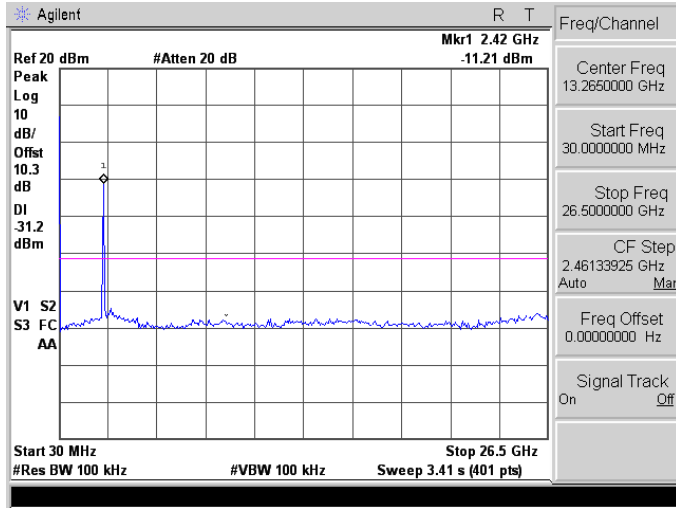


2462

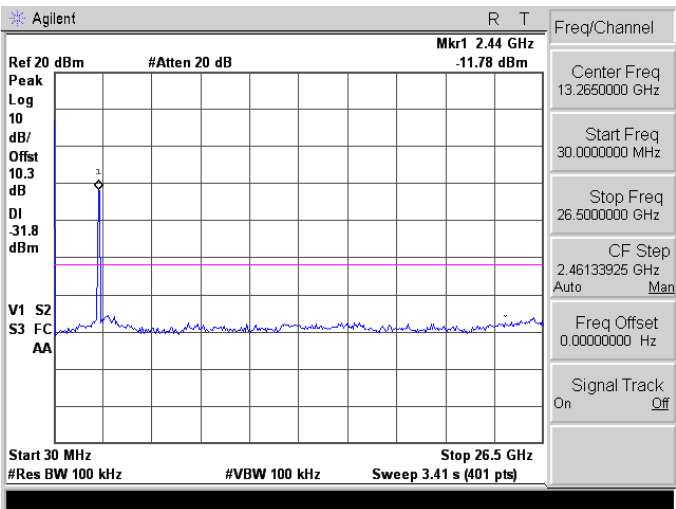


Mode 5: draft 802.11n Wide-40MHz Link Mode

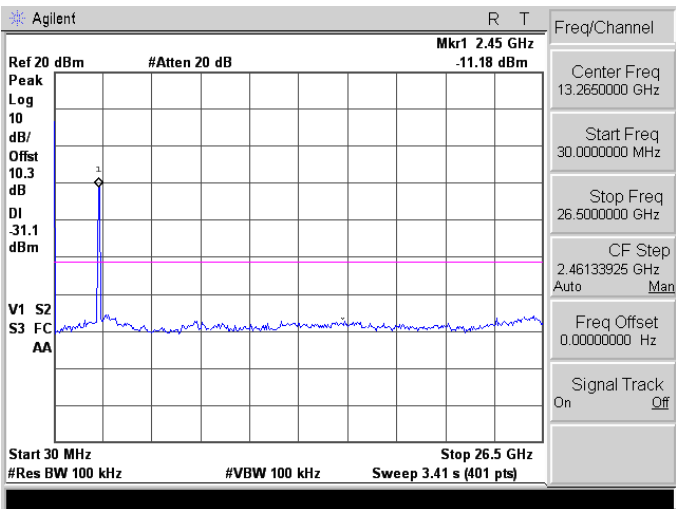
2422



2437



2452

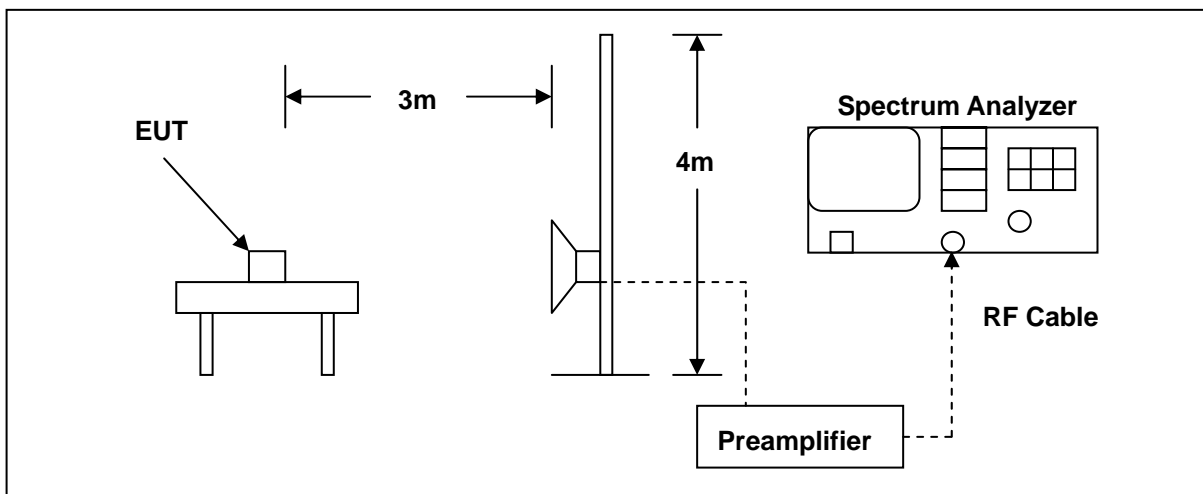


10 Band Edges Measurement

10.1.Limit

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

10.2.Test Setup



10.3.Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/07/2011	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/23/2011	(1)
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	9120D	9120D-550	06/29/2011	(1)
Test Site	ATL	TE01	888001	12/24/2010	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

10.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

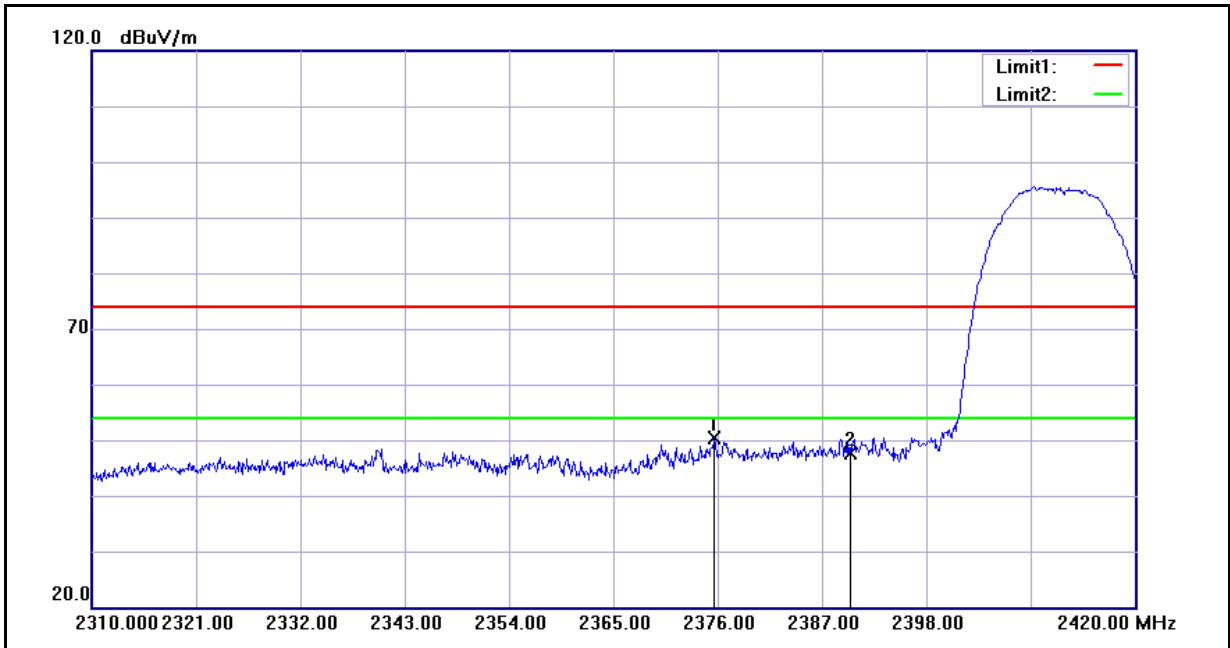
The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

For measurements the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

10.5.Test Result

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	09/14/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



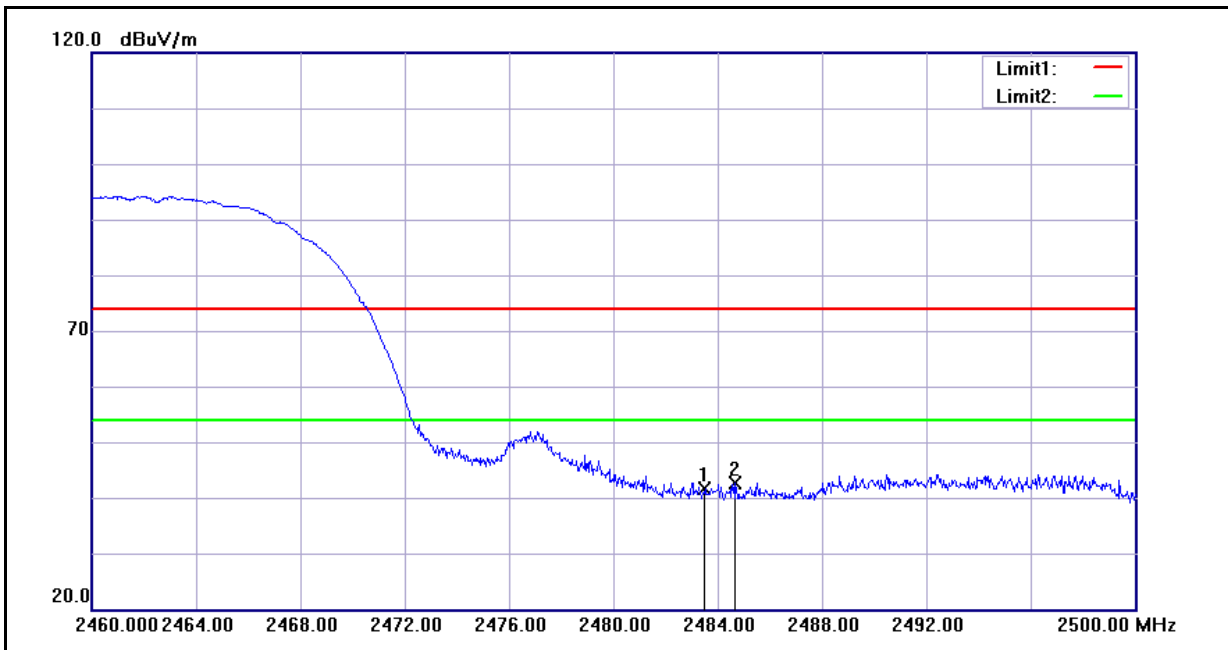
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2375.670	50.55	-0.12	50.43	74.00	-23.57	peak
2	2390.000	47.74	-0.06	47.68	74.00	-26.32	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	09/14/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



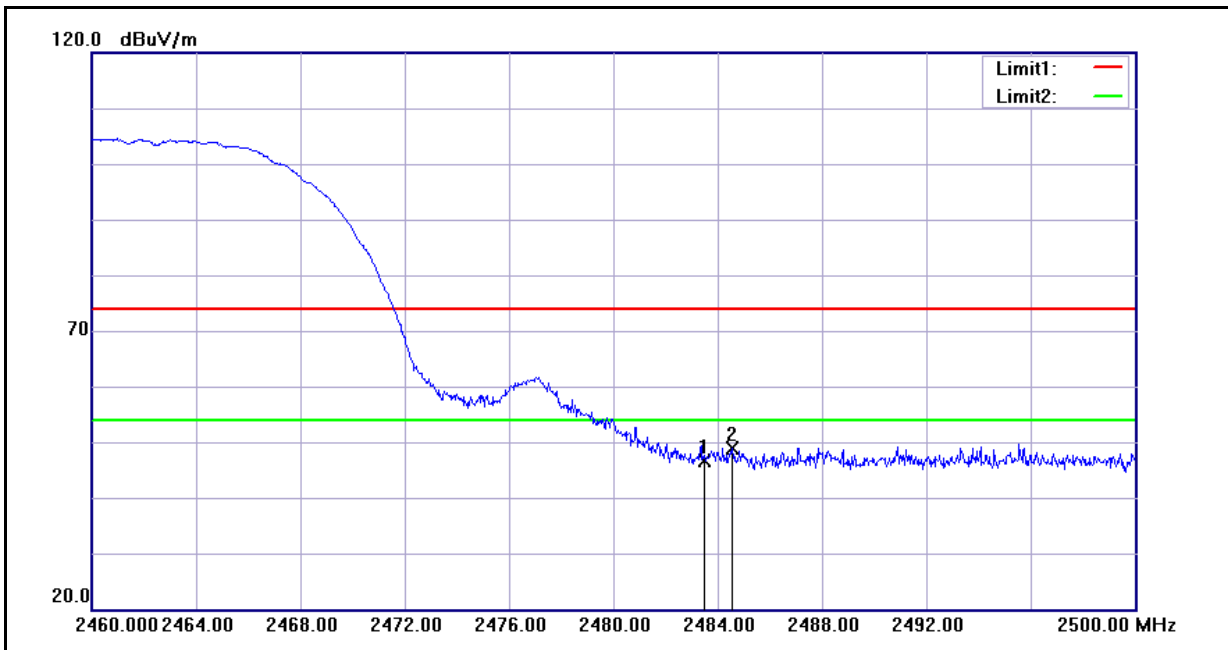
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2387.440	51.04	-0.07	50.97	74.00	-23.03	peak
2	2390.000	49.93	-0.06	49.87	74.00	-24.13	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	09/14/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



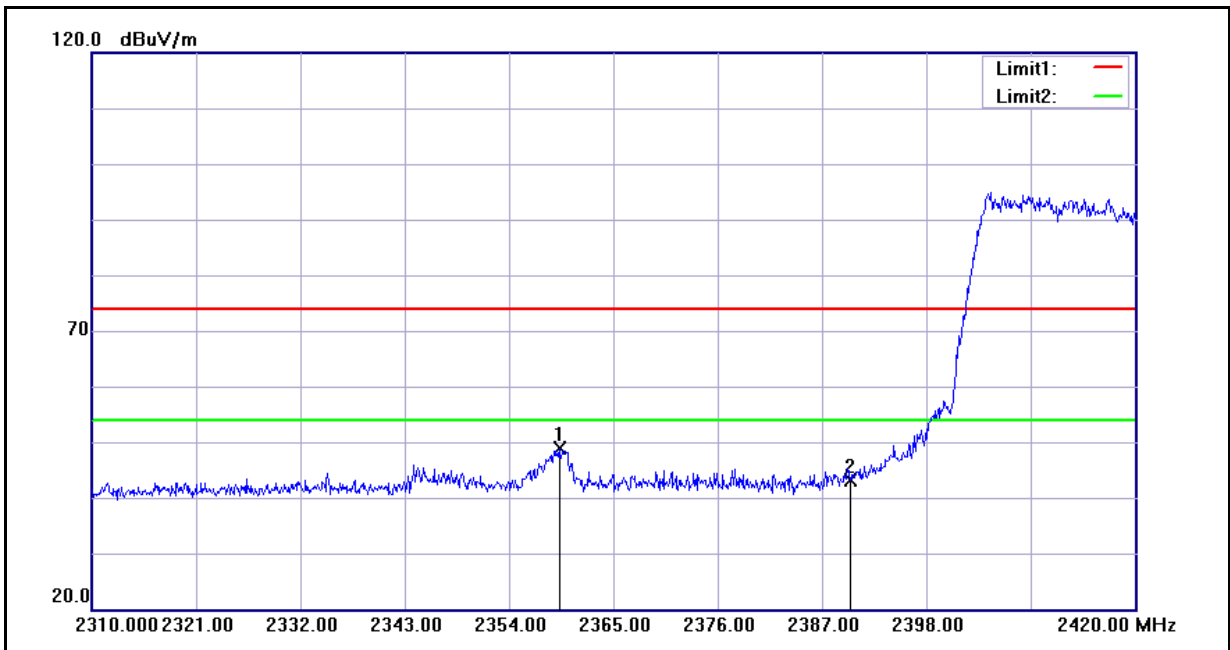
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	41.20	0.35	41.55	74.00	-32.45	peak
2	2484.680	42.26	0.35	42.61	74.00	-31.39	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	09/14/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



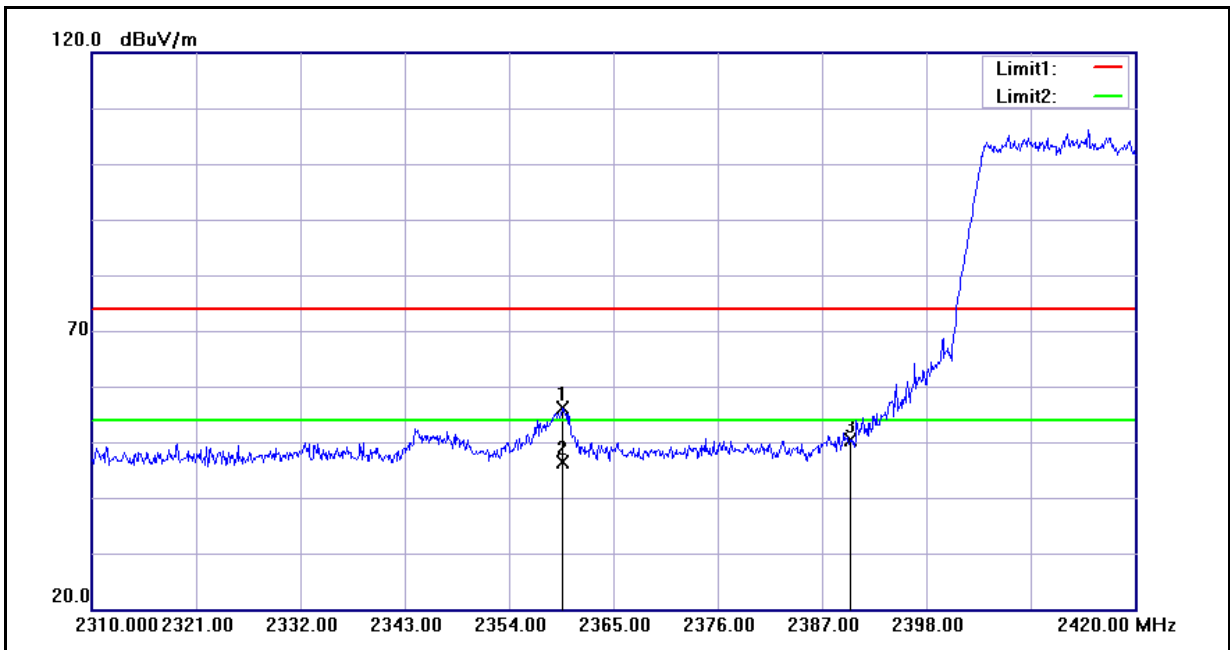
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	46.31	0.35	46.66	74.00	-27.34	peak
2	2484.560	48.45	0.35	48.80	74.00	-25.20	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	09/14/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



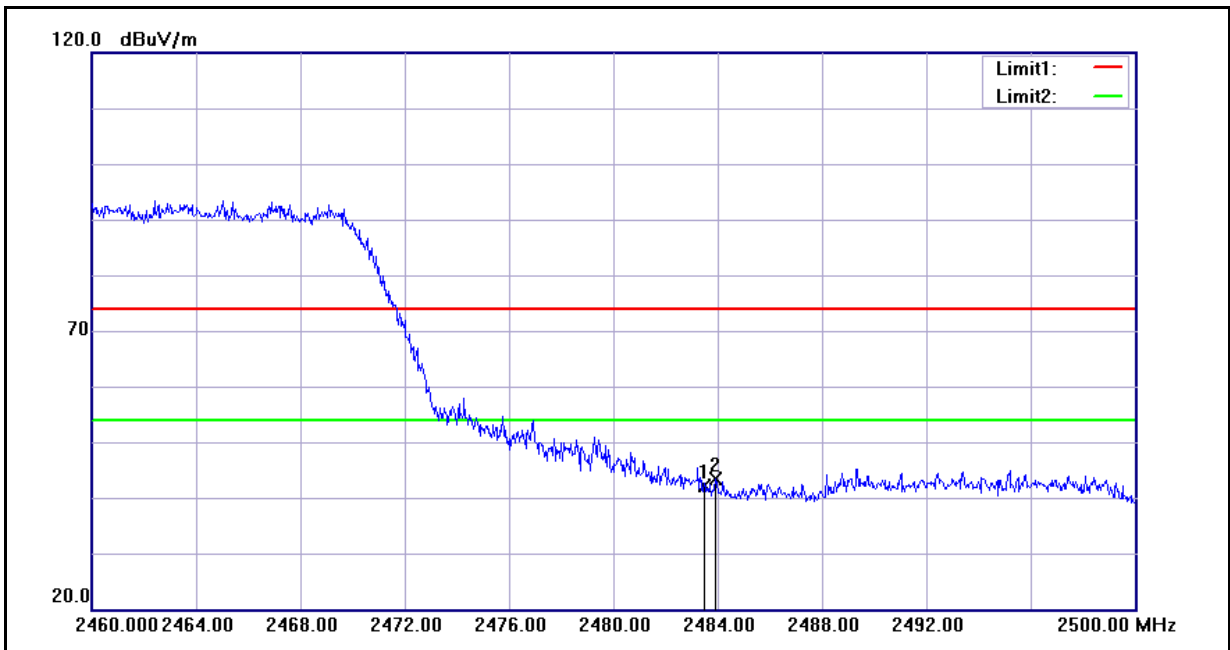
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2359.280	49.15	-0.19	48.96	74.00	-25.04	peak
2	2390.000	43.31	-0.06	43.25	74.00	-30.75	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	09/14/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



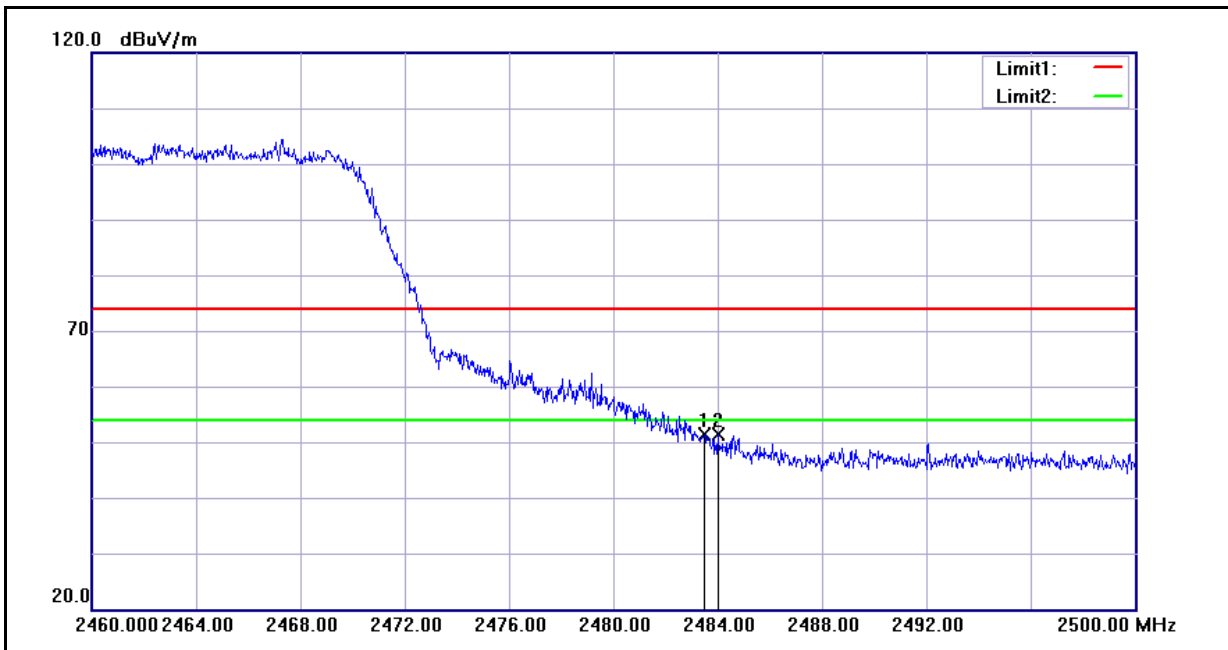
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2359.610	56.25	-0.19	56.06	74.00	-17.94	peak
2	2359.610	46.54	-0.19	46.35	54.00	-7.65	AVG
3	2390.000	50.46	-0.06	50.40	74.00	-23.60	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	09/14/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



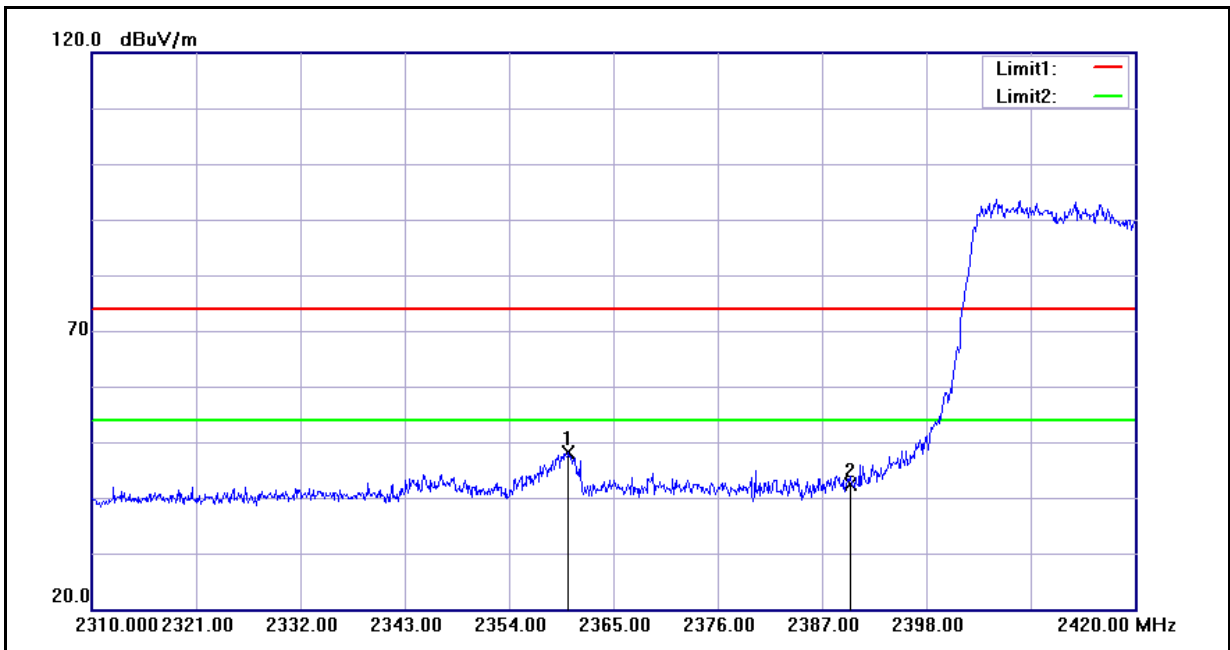
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	41.74	0.35	42.09	74.00	-31.91	peak
2	2483.920	42.93	0.35	43.28	74.00	-30.72	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	09/14/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



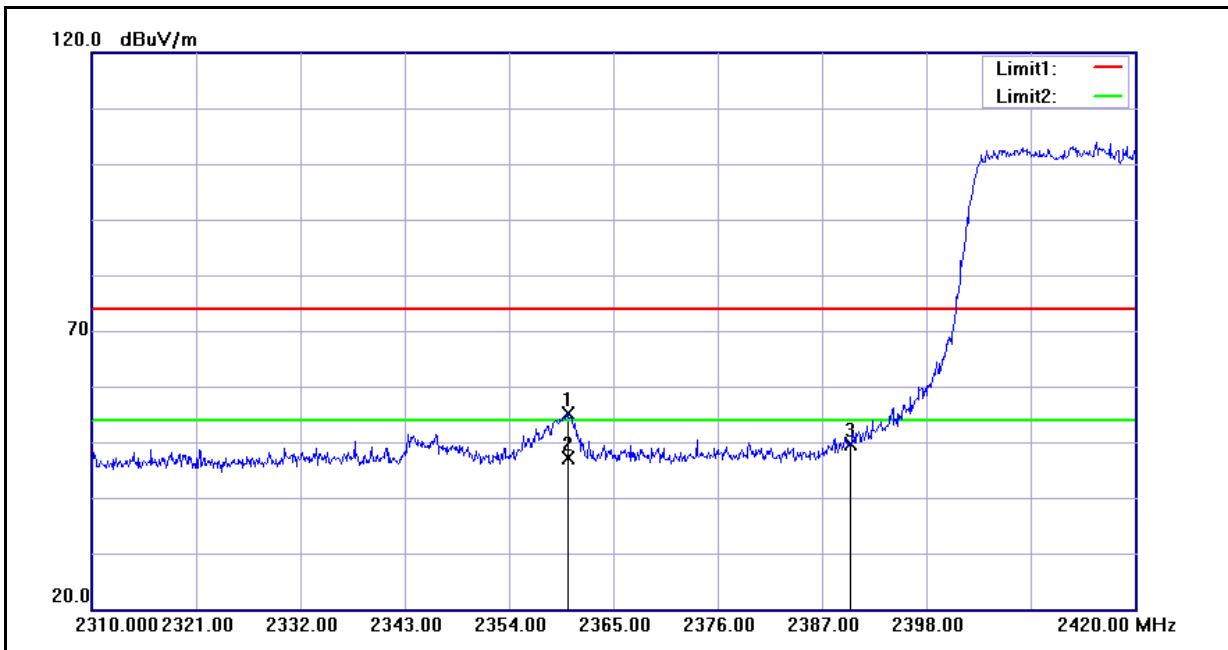
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	50.99	0.35	51.34	74.00	-22.66	peak
2	2484.000	51.10	0.35	51.45	74.00	-22.55	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	09/14/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



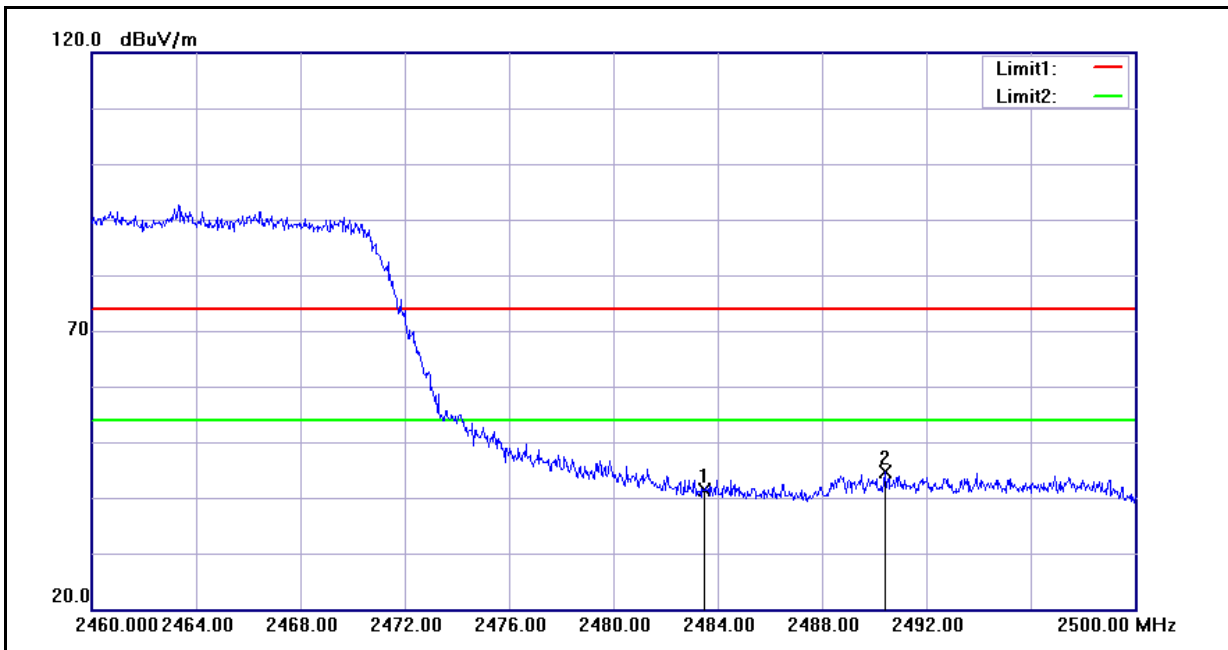
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2360.270	48.21	-0.19	48.02	74.00	-25.98	peak
2	2390.000	42.51	-0.06	42.45	74.00	-31.55	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	09/14/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



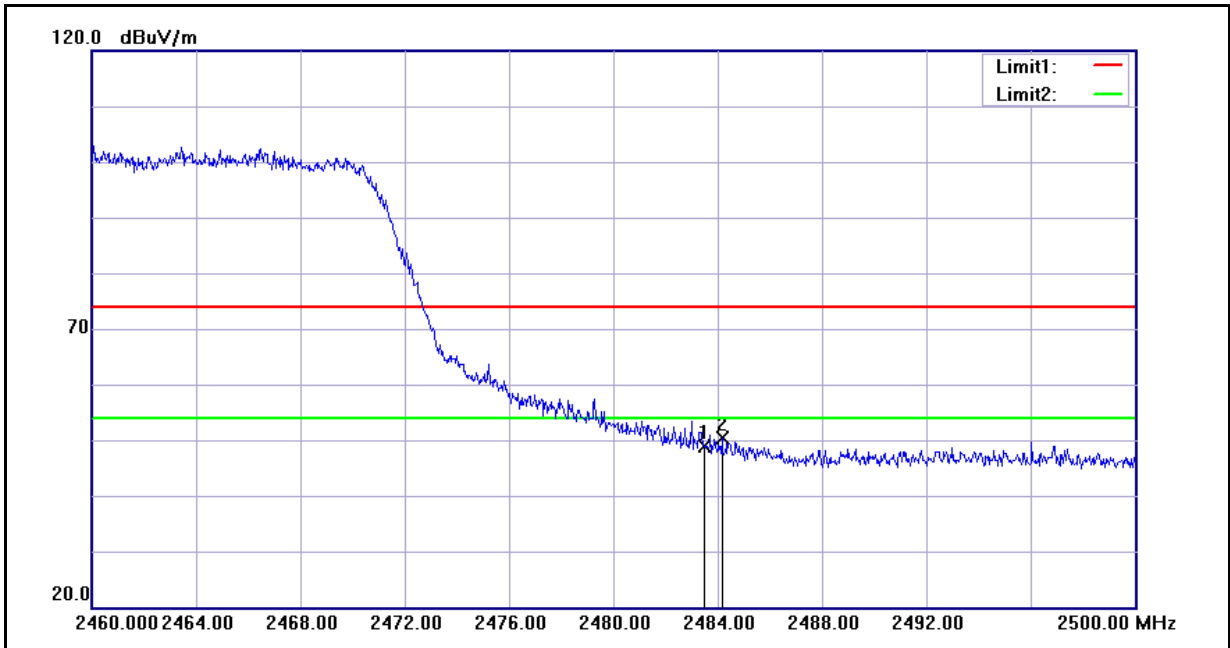
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2360.160	55.34	-0.19	55.15	74.00	-18.85	peak
2	2360.160	47.34	-0.19	47.15	54.00	-6.85	AVG
3	2390.000	49.73	-0.06	49.67	74.00	-24.33	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	09/14/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



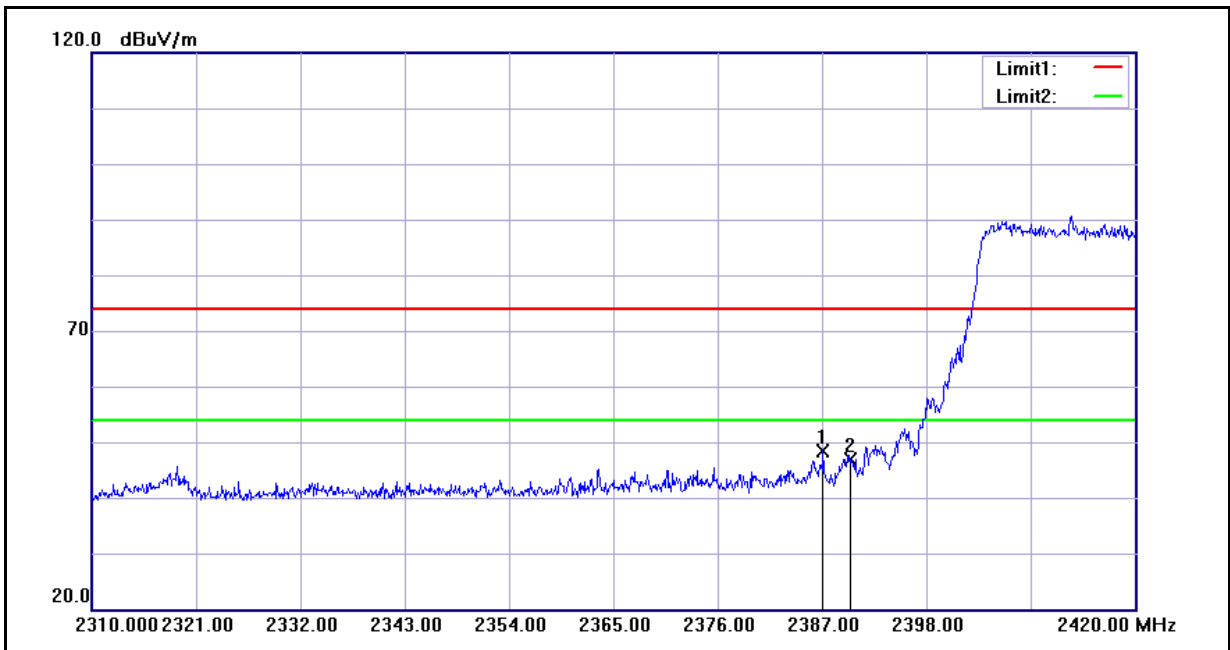
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	40.98	0.35	41.33	74.00	-32.67	peak
2	2490.400	44.28	0.38	44.66	74.00	-29.34	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	09/14/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



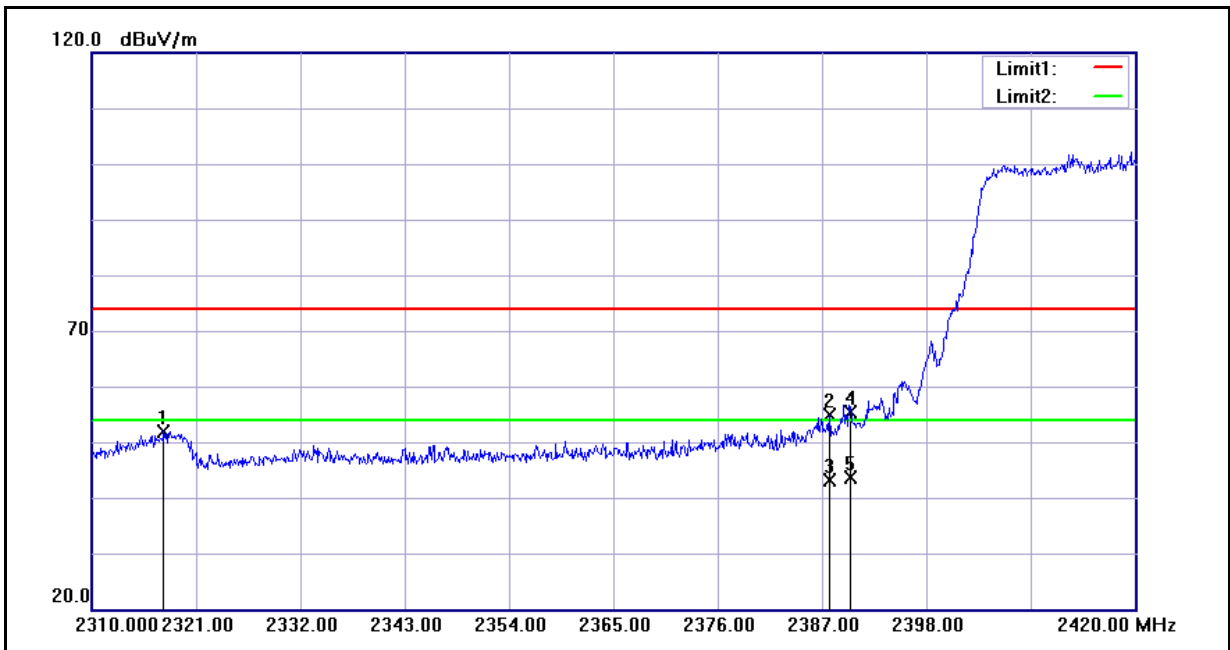
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	48.52	0.35	48.87	74.00	-25.13	peak
2	2484.160	50.13	0.35	50.48	74.00	-23.52	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	09/14/2011
Frequency:	2422 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



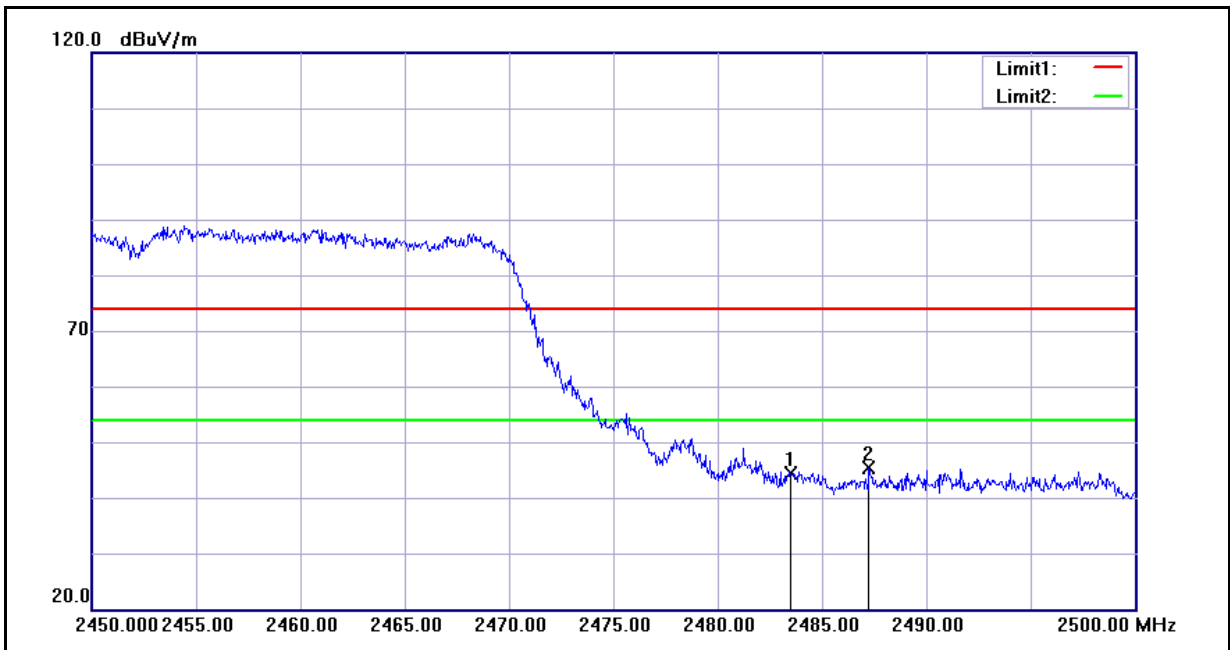
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2387.110	48.48	-0.07	48.41	74.00	-25.59	peak
2	2390.000	46.84	-0.06	46.78	74.00	-27.22	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	09/14/2011
Frequency:	2422 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



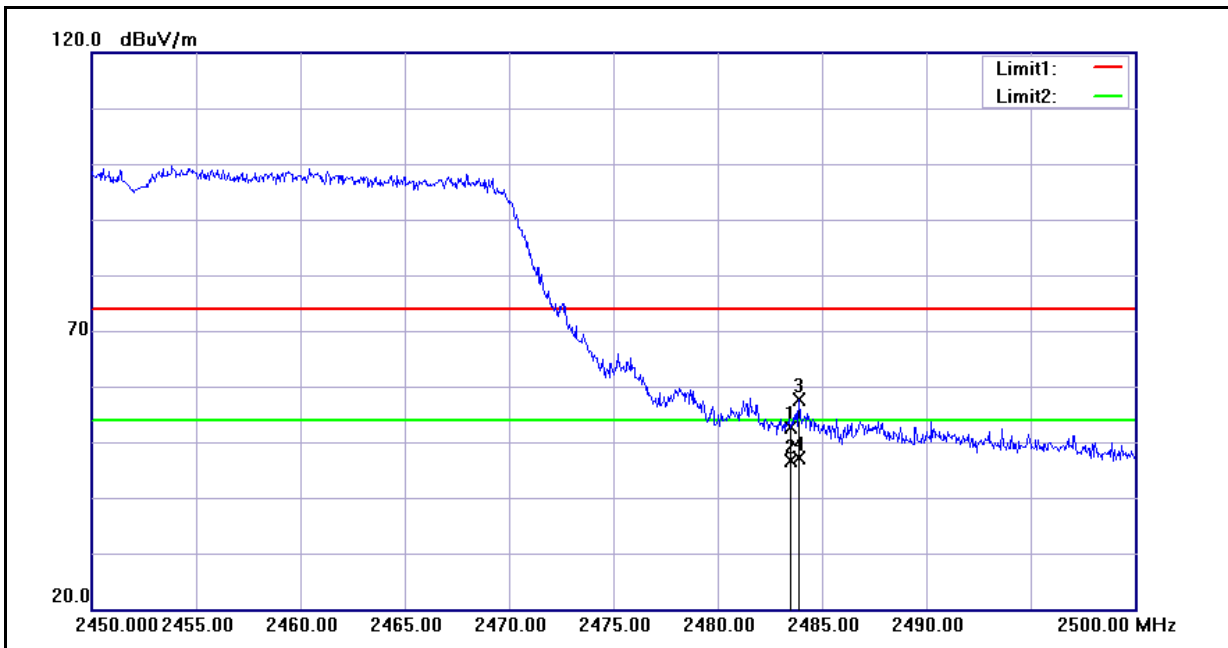
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2317.590	52.38	-0.38	52.00	74.00	-22.00	peak
2	2387.770	54.89	-0.07	54.82	74.00	-19.18	peak
3	2387.770	43.30	-0.07	43.23	54.00	-10.77	AVG
4	2390.000	55.48	-0.06	55.42	74.00	-18.58	peak
5	2390.000	43.65	-0.06	43.59	54.00	-10.41	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	09/14/2011
Frequency:	2452 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	44.14	0.35	44.49	74.00	-29.51	peak
2	2487.250	44.89	0.37	45.26	74.00	-28.74	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WU1112	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	09/14/2011
Frequency:	2452 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



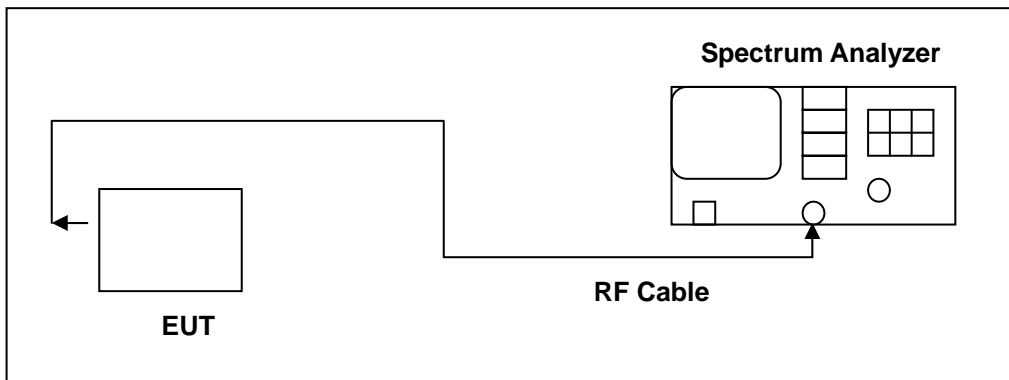
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	52.31	0.35	52.66	74.00	-21.34	peak
2	2483.500	46.24	0.35	46.59	54.00	-7.41	AVG
3	2483.900	57.16	0.35	57.51	74.00	-16.49	peak
4	2483.900	46.70	0.35	47.05	54.00	-6.95	AVG

11 99 % Occupied Bandwidth Measurement

11.1.Limit

N/A

11.2.Test Setup



11.3.Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/28/2010	(2)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

11.4.Test Procedure

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

11.5.Test Result

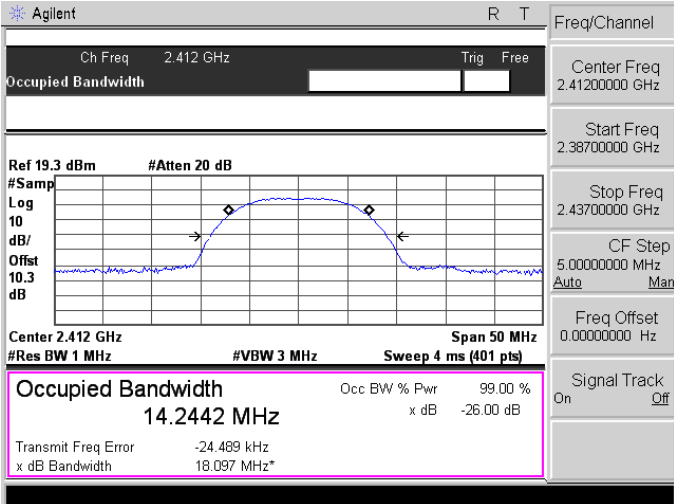
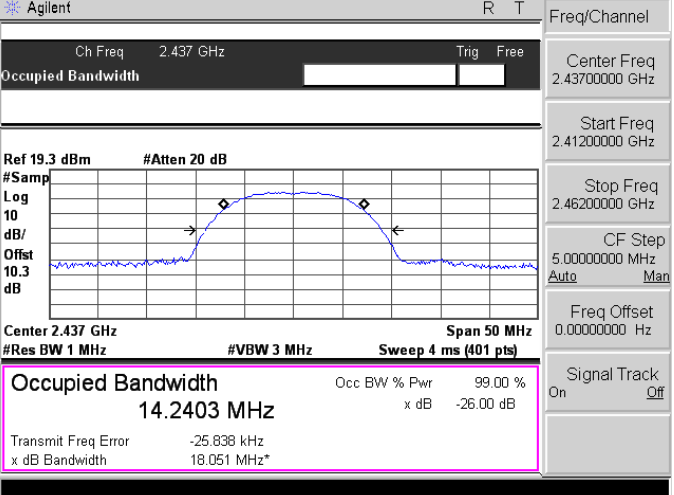
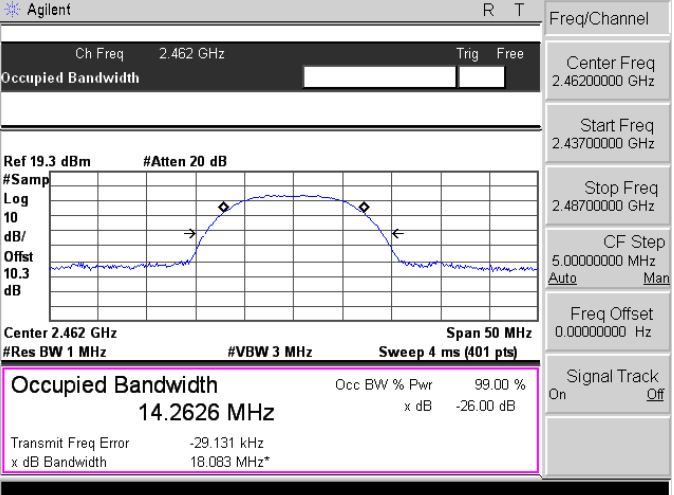
Model Number	WU1112		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	14.2442	-----
	2437	14.2403	-----
	2462	14.2626	-----

Model Number	WU1112		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	17.5117	-----
	2437	17.1117	-----
	2462	17.2164	-----

Model Number	WU1112		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 4: draft 802.11n Standard-20MHz Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	18.0563	-----
	2437	18.1735	-----
	2462	18.0649	-----

Model Number	WU1112		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 5: draft 802.11n Wide-40MHz Link Mode		
Date of Test	09/28/2011	Test Site	TE02
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2422	36.1103	-----
	2437	36.1404	-----
	2452	36.1175	-----

11.6. Test Graphs

Mode 2: IEEE 802.11b Link Mode	
2412	 <p>Agilent R T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 19.3 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.3 dB</p> <p>Center 2.412 GHz Span 50 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth 14.2442 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error -24.489 kHz x dB Bandwidth 18.097 MHz*</p> <p>Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.38700000 GHz Stop Freq 2.43700000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2437	 <p>Agilent R T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 19.3 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.3 dB</p> <p>Center 2.437 GHz Span 50 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth 14.2403 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error -25.838 kHz x dB Bandwidth 18.051 MHz*</p> <p>Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.41200000 GHz Stop Freq 2.46200000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
2462	 <p>Agilent R T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 19.3 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.3 dB</p> <p>Center 2.462 GHz Span 50 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth 14.2626 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error -29.131 kHz x dB Bandwidth 18.083 MHz*</p> <p>Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.43700000 GHz Stop Freq 2.48700000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

Mode 3: IEEE 802.11g Link Mode

<p>2412</p>	
<p>2437</p>	
<p>2462</p>	

Mode 4: draft 802.11n Standard-20MHz Link Mode

<p>2412</p>	<p>Agilent R T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 19.3 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.3 dB</p> <p>Center 2.412 GHz Span 50 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 % 18.0563 MHz x dB -26.00 dB</p> <p>Transmit Freq Error -6.221 kHz x dB Bandwidth 21.185 MHz*</p> <p>Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.38700000 GHz Stop Freq 2.43700000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
<p>2437</p>	<p>Agilent R T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 19.3 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.3 dB</p> <p>Center 2.437 GHz Span 50 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 % 18.1735 MHz x dB -26.00 dB</p> <p>Transmit Freq Error -13.477 kHz x dB Bandwidth 20.999 MHz*</p> <p>Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.41200000 GHz Stop Freq 2.46200000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
<p>2462</p>	<p>Agilent R T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 19.3 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.3 dB</p> <p>Center 2.462 GHz Span 50 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 % 18.0649 MHz x dB -26.00 dB</p> <p>Transmit Freq Error -37.554 kHz x dB Bandwidth 21.077 MHz*</p> <p>Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.43700000 GHz Stop Freq 2.48700000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

Mode 5: draft 802.11n Wide-40MHz Link Mode

<p>2422</p>	
<p>2437</p>	
<p>2452</p>	

12 Antenna Measurement

12.1.Limit

For intentional device, 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.

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

12.2.Antenna Connector Construction

The antenna used in this product is **External Fixed antenna**. And the maximum Gain of this antenna is only **3.0 dBi**.