

## FCC 47 CFR PART 15 SUBPART C

Product Type : 802.11b/g/n 1T1R Wireless Lan USB Module  
Applicant : LITE-ON TECHNOLOGY CORP.  
Address : 4F, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan,  
R.O.C.  
Trade Name : LITE-ON  
Model Number : WN4622R  
Test Specification : FCC 47 CFR PART 15 SUBPART C: Oct., 2011  
Canada RSS-210 ISSUE 8: Dec., 2010  
Canada RSS-Gen ISSUE 3: Dec., 2010  
ANSI C63.4-2009  
Receive Date : Dec. 04, 2012  
Test Period : Dec. 04 ~ Dec. 09, 2012  
Issue Date : Dec. 12, 2012

### 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	Dec. 12, 2012	Initial Issue	

## Verification of Compliance

Issued Date: 12/02/2011

Product Type : 802.11b/g/n 1T1R Wireless Lan USB Module  
Applicant : LITE-ON TECHNOLOGY CORP.  
Address : 4F, 90, Chien 1 Road, Chung Ho, New Taipei City 23585,  
Taiwan, R.O.C.  
Trade Name : LITE-ON  
Model Number : WN4622R  
FCC ID : PPQ-WN4622R  
IC : 4491A-WN4622R  
EUT Rated Voltage : DC 3.3V  
Test Voltage : 120 Vac / 60 Hz  
Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2011  
Canada RSS-210 ISSUE 8: Dec., 2010  
Canada RSS-Gen ISSUE 3: Dec., 2010  
ANSI C63.4-2009


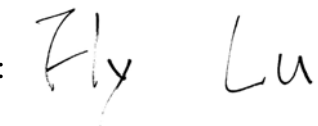
Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.  
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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 :  Reviewed By :   
(Manager) (Murphy Wang) (Testing Engineer) (Fly Lu)

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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  $\pm 2.24$  dB.

#### Radiated Emission

The measurement uncertainty is evaluated as  $\pm 3.072$ dB.

## 2 EUT Description

Product	802.11b/g/n 1T1R Wireless Lan USB Module
Trade Name	LITE-ON
Model No.	WN4622R
Applicant	LITE-ON TECHNOLOGY CORP. 4F, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C.
Manufacturer	LITE-ON TECHNOLOGY (Changzhou) CO., LTD A9 Building, No.88 Yanghu Road, Wujin Hi-Tech Industrial Development Zone, Changzhou City, Jiangsu Province 213100 China
FCC ID	PPQ-WN4622R
IC	4491A-WN4622R
Modulation Type	IEEE 802.11b: DSSS IEEE 802.11g: DSSS + OFDM IEEE 802.11n 2.4GHz: OFDM
Frequency Range	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz: 2412 – 2462 MHz IEEE 802.11n 2.4GHz 40MHz: 2422 – 2452 MHz
RF Output Power	IEEE 802.11b: 0.087 W / 19.41 dBm IEEE 802.11g: 0.275 W / 24.40 dBm IEEE 802.11n 2.4GHz 20MHz: 0.243 W / 23.86 dBm IEEE 802.11n 2.4GHz 40MHz: 0.166 W / 22.21 dBm
Antenna Type	METAL STAMPING ANTENNA
Antenna Gain	3.51 dBi

### 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: IEEE 802.11n 2.4GHz 20MHz Link Mode
Mode 5: IEEE 802.11n 2.4GHz 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.

IEEE 802.11n 2.4GHz 20MHz mode:

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

IEEE 802.11n 2.4GHz 40MHz mode:

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

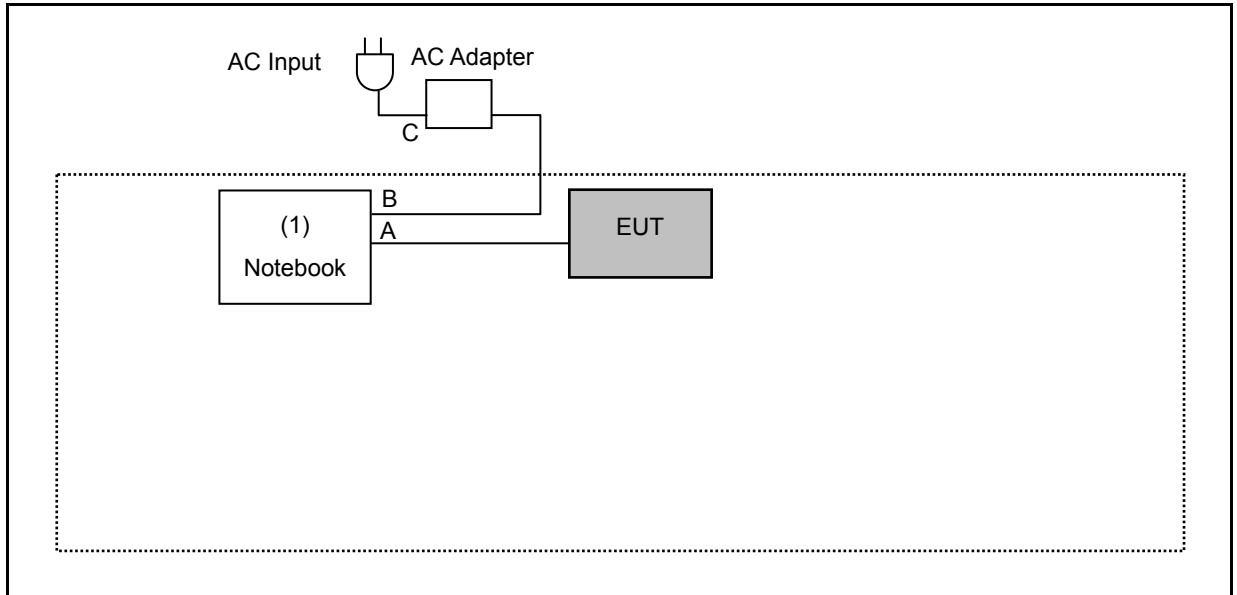
#### 3.2. EUT Exercise Software

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

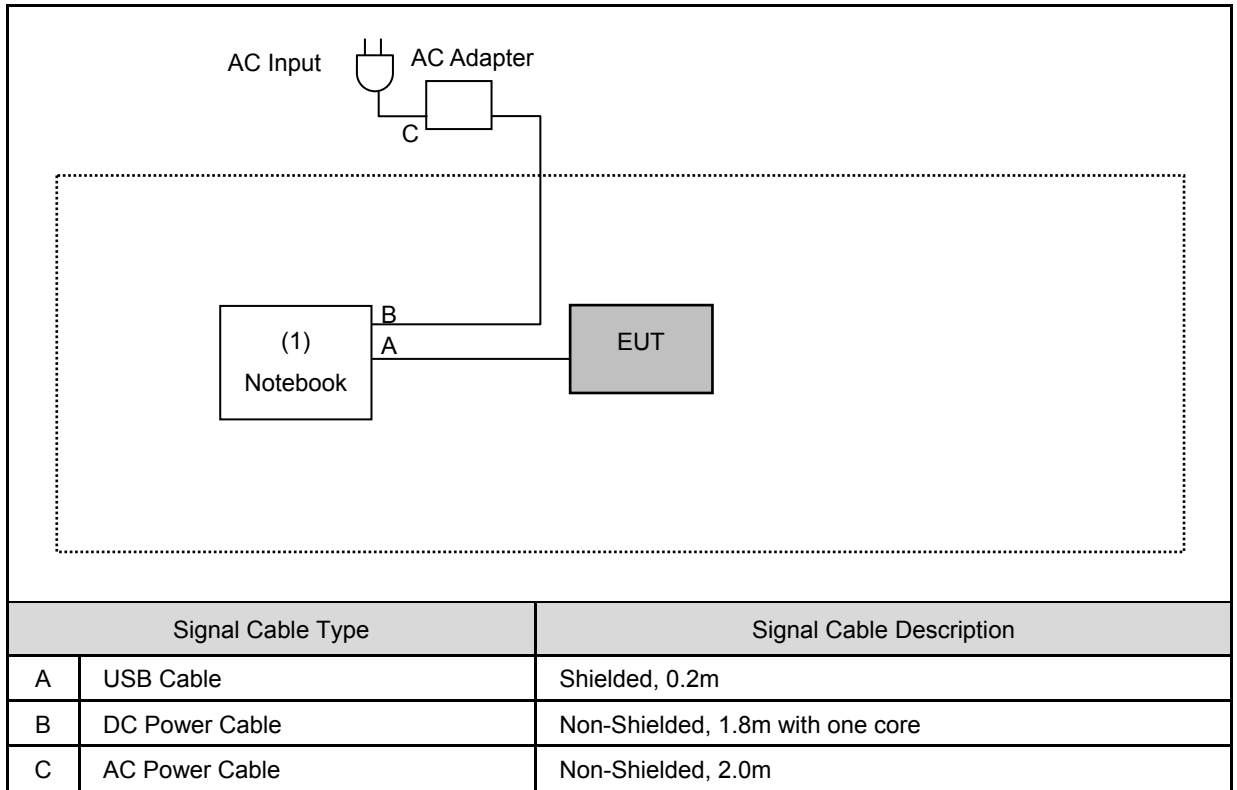
#### Conducted Emission



Signal Cable Type		Signal Cable Description
A	USB Cable	Shielded, 0.2m
B	DC Power Cable	Non-Shielded, 1.8m with one core
C	AC Power Cable	Non-Shielded, 2.0m

Devices Description				
Product	Manufacturer	Model Number	Serial Number	Power Cord
(1) Notebook	DELL	D531	CN-OXM006-48643 -87A-3398	Non-Shielded, 2.0m

**Radiated Emission**



Devices Description				
Product	Manufacturer	Model Number	Serial Number	Power Cord
(1) Notebook	DELL	D531	CN-OXM006-48643 -87A-3398	Non-Shielded, 2.0m

**3.4. Test Site Environment**

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
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

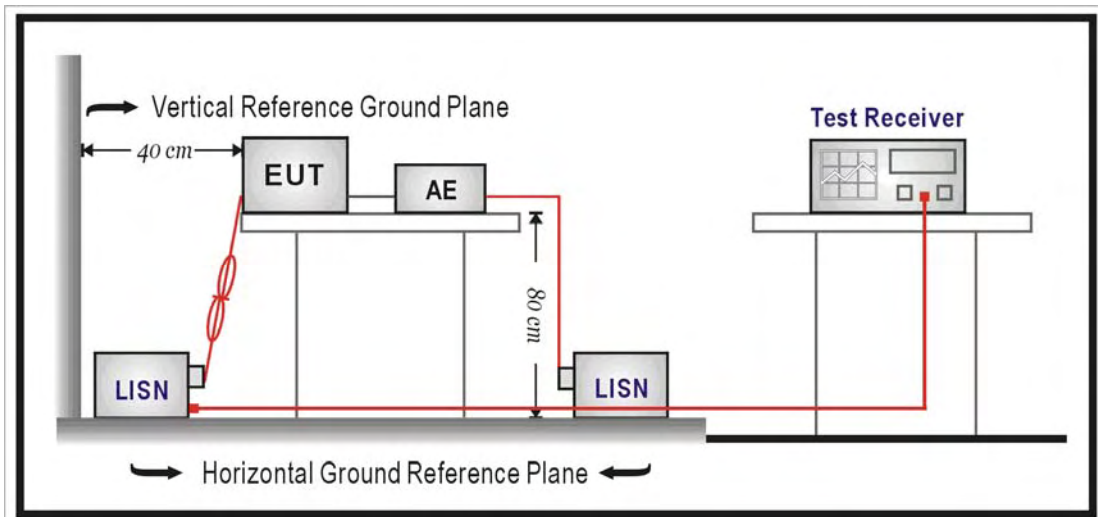
### 4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/18/2012	(1)
LISN	R&S	ENV216	101040	03/07/2012	(1)
LISN	R&S	ENV216	101041	03/07/2012	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

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

### 4.3. Test Setup



#### 4.4. Test Procedure

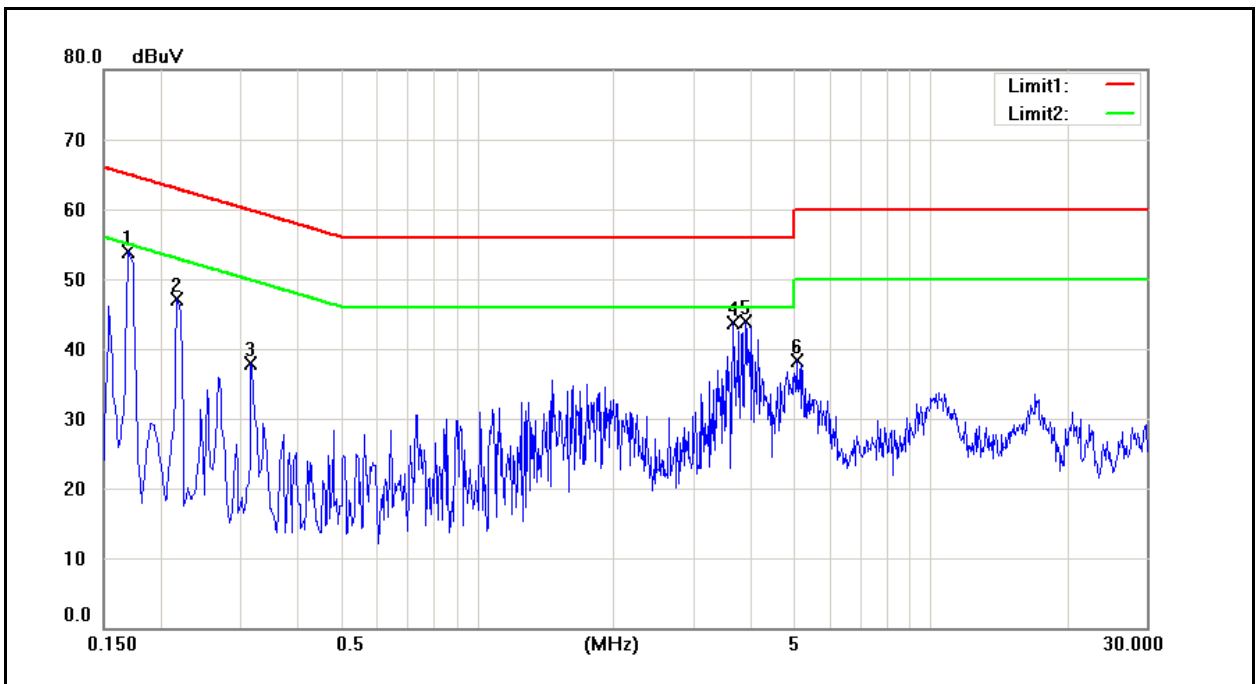
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

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.

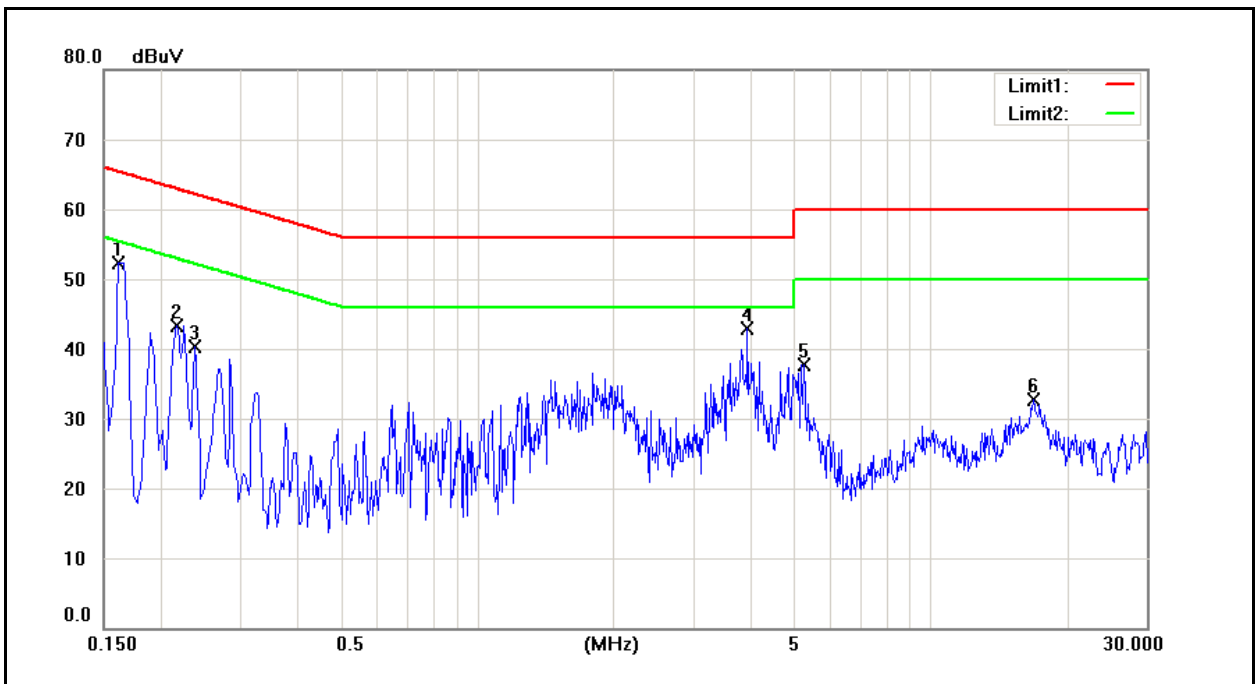
**4.5. Test Result**

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	12/09/2012
		Test By:	Fly Lu
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	0.1700	42.72	26.03	9.72	52.44	35.75	64.96	54.96	-12.52	-19.21	Pass
2	0.2180	34.56	20.74	9.72	44.28	30.46	62.89	52.89	-18.61	-22.43	Pass
3	0.3180	25.12	11.31	9.72	34.84	21.03	59.76	49.76	-24.92	-28.73	Pass
4	3.6740	28.02	13.84	9.81	37.83	23.65	56.00	46.00	-18.17	-22.35	Pass
5	3.9020	27.42	13.34	9.80	37.22	23.14	56.00	46.00	-18.78	-22.86	Pass
6	5.0820	25.72	13.81	9.75	35.47	23.56	60.00	50.00	-24.53	-26.44	Pass

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	12/09/2012
		Test By:	Fly Lu
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	43.10	28.95	9.65	52.75	38.60	65.36	55.36	-12.61	-16.76	Pass
2	0.2180	33.71	20.89	9.64	43.35	30.53	62.89	52.89	-19.54	-22.36	Pass
3	0.2380	18.59	3.28	9.64	28.23	12.92	62.17	52.17	-33.94	-39.25	Pass
4	3.9540	26.90	13.03	9.72	36.62	22.75	56.00	46.00	-19.38	-23.25	Pass
5	5.2500	22.68	10.76	9.71	32.39	20.47	60.00	50.00	-27.61	-29.53	Pass
6	16.8980	16.30	9.95	9.96	26.26	19.91	60.00	50.00	-33.74	-30.09	Pass

## 5 Radiated Emission Measurement

### 5.1. Limit

According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ( $\mu\text{V}/\text{m}$ at meter)	Measurement Distance (meters)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 - 88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

### 5.2. Test Instruments

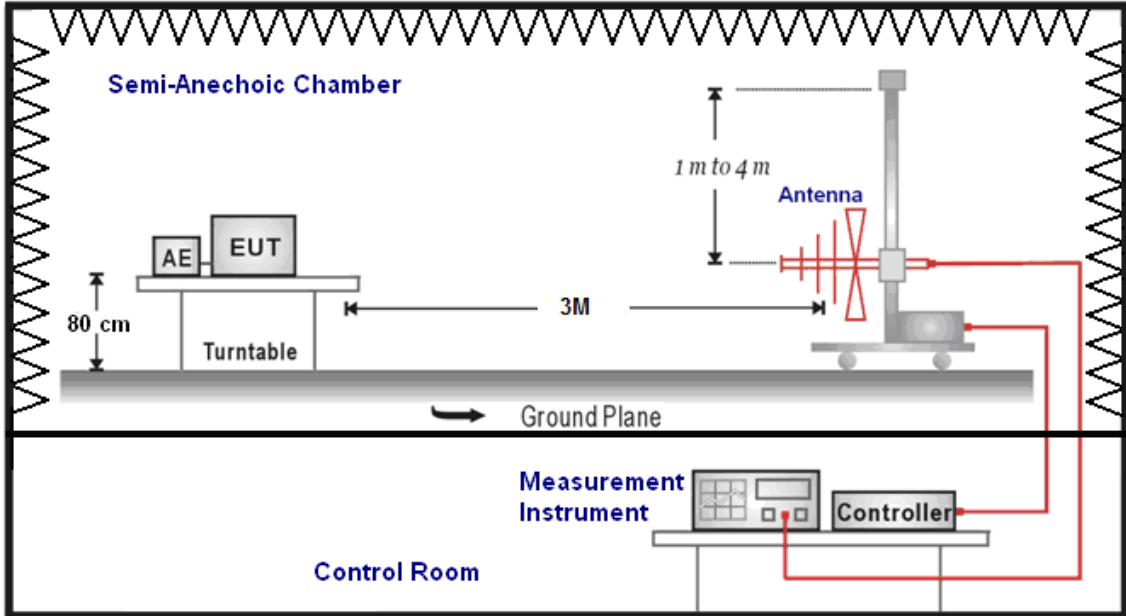
3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/16/2012	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/16/2012	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/22/2012	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/22/2012	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/29/2012	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/15/2012	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/21/2012	(1)
Test Site	ATL	TE01	888001	08/28/2012	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

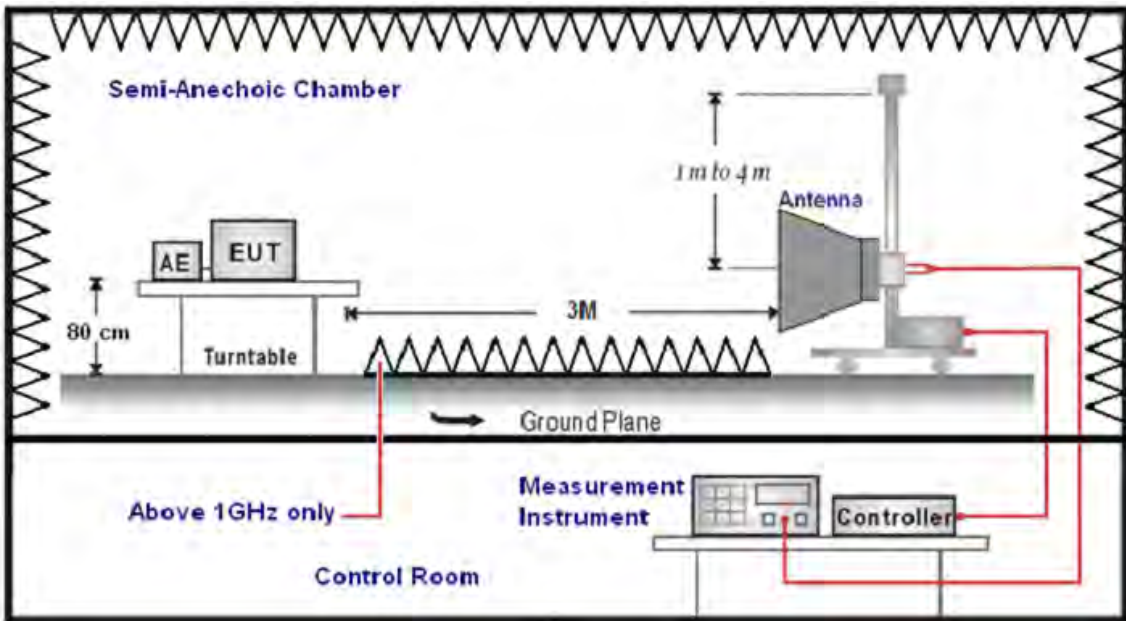
Note: N.C.R. = No Calibration Request.

### 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 9 kHz 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 (mode 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

Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

## 5.5. Test Result

### Below 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	12/05/2012
		Test By:	Fly Lu

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
111.0000	38.29	-14.53	23.76	43.50	-19.74	QP	H
278.5000	42.13	-11.22	30.91	46.00	-15.09	QP	H
429.0000	32.30	-8.24	24.06	46.00	-21.94	QP	H
629.0000	28.60	-4.45	24.15	46.00	-21.85	QP	H
767.5000	29.33	-2.16	27.17	46.00	-18.83	QP	H
901.5000	29.69	0.43	30.12	46.00	-15.88	QP	H
165.5000	44.73	-16.68	28.05	43.50	-15.45	QP	V
288.0000	39.97	-10.91	29.06	46.00	-16.94	QP	V
422.0000	36.13	-8.34	27.79	46.00	-18.21	QP	V
600.0000	30.79	-5.04	25.75	46.00	-20.25	QP	V
741.0000	32.74	-2.71	30.03	46.00	-15.97	QP	V
888.0000	27.13	0.04	27.17	46.00	-18.83	QP	V

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

**Above 1GHz**

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	12/04/2012		
Frequency:	2412MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3016.000	38.70	5.95	44.65	74.00	-29.35	peak	H
4549.000	36.65	11.01	47.66	74.00	-26.34	peak	H
5998.000	34.85	15.88	50.73	74.00	-23.27	peak	H
3128.000	38.32	6.19	44.51	74.00	-29.49	peak	V
4824.000	37.13	11.71	48.84	74.00	-25.16	peak	V
6159.000	33.58	16.37	49.95	74.00	-24.05	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	12/04/2012		
Frequency:	2437MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2974.000	38.05	5.84	43.89	74.00	-30.11	peak	H
4535.000	35.44	10.97	46.41	74.00	-27.59	peak	H
6047.000	34.49	16.03	50.52	74.00	-23.48	peak	H
2890.000	38.03	5.63	43.66	74.00	-30.34	peak	V
4535.000	36.87	10.97	47.84	74.00	-26.16	peak	V
5998.000	34.25	15.88	50.13	74.00	-23.87	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	12/04/2012		
Frequency:	2462MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2939.000	38.17	5.75	43.92	74.00	-30.08	peak	H
4542.000	36.41	10.99	47.40	74.00	-26.60	peak	H
6019.000	33.71	15.94	49.65	74.00	-24.35	peak	H
2841.000	39.14	5.49	44.63	74.00	-29.37	peak	V
4542.000	36.28	10.99	47.27	74.00	-26.73	peak	V
6040.000	34.55	16.00	50.55	74.00	-23.45	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	12/04/2012		
Frequency:	2412MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3023.000	36.22	5.96	42.18	74.00	-31.82	peak	H
4570.000	34.74	11.06	45.80	74.00	-28.20	peak	H
6131.000	33.29	16.29	49.58	74.00	-24.42	peak	H
3128.000	37.79	6.19	43.98	74.00	-30.02	peak	V
4521.000	34.94	10.93	45.87	74.00	-28.13	peak	V
6250.000	33.18	16.64	49.82	74.00	-24.18	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	12/04/2012		
Frequency:	2437MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2897.000	36.37	5.64	42.01	74.00	-31.99	peak	H
4549.000	35.19	11.01	46.20	74.00	-27.80	peak	H
6243.000	32.95	16.63	49.58	74.00	-24.42	peak	H
3142.000	37.69	6.22	43.91	74.00	-30.09	peak	V
4598.000	35.29	11.14	46.43	74.00	-27.57	peak	V
6082.000	33.93	16.13	50.06	74.00	-23.94	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	12/04/2012		
Frequency:	2462MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3030.000	36.82	5.97	42.79	74.00	-31.21	peak	H
4542.000	35.75	10.99	46.74	74.00	-27.26	peak	H
6075.000	33.62	16.11	49.73	74.00	-24.27	peak	H
3121.000	38.52	6.17	44.69	74.00	-29.31	peak	V
4570.000	35.90	11.06	46.96	74.00	-27.04	peak	V
5697.000	34.75	14.96	49.71	74.00	-24.29	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	12/04/2012		
Frequency:	2412MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2995.000	40.10	5.90	46.00	74.00	-28.00	peak	H
4584.000	36.13	11.09	47.22	74.00	-26.78	peak	H
5928.000	34.66	15.66	50.32	74.00	-23.68	peak	H
3023.000	37.54	5.96	43.50	74.00	-30.50	peak	V
4605.000	36.22	11.15	47.37	74.00	-26.63	peak	V
5991.000	33.21	15.85	49.06	74.00	-24.94	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	12/04/2012		
Frequency:	2437MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3065.000	37.99	6.06	44.05	74.00	-29.95	peak	H
4612.000	37.11	11.16	48.27	74.00	-25.73	peak	H
6145.000	34.42	16.32	50.74	74.00	-23.26	peak	H
3072.000	39.22	6.07	45.29	74.00	-28.71	peak	V
4745.000	37.08	11.51	48.59	74.00	-25.41	peak	V
6236.000	34.25	16.61	50.86	74.00	-23.14	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	12/04/2012		
Frequency:	2462MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	38.95	6.02	44.97	74.00	-29.03	peak	H
4710.000	36.08	11.41	47.49	74.00	-26.51	peak	H
6159.000	34.46	16.37	50.83	74.00	-23.17	peak	H
3107.000	38.66	6.14	44.80	74.00	-29.20	peak	V
4598.000	36.43	11.14	47.57	74.00	-26.43	peak	V
6180.000	34.81	16.43	51.24	74.00	-22.76	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	5			Date:	12/04/2012		
Frequency:	2422MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2995.000	38.92	5.90	44.82	74.00	-29.18	peak	H
4605.000	36.83	11.15	47.98	74.00	-26.02	peak	H
6152.000	34.32	16.35	50.67	74.00	-23.33	peak	H
3100.000	39.25	6.13	45.38	74.00	-28.62	peak	V
4570.000	36.40	11.06	47.46	74.00	-26.54	peak	V
5963.000	34.98	15.76	50.74	74.00	-23.26	peak	V



Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	5			Date:	12/04/2012		
Frequency:	2437MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2995.000	38.58	5.90	44.48	74.00	-29.52	peak	H
4556.000	36.61	11.02	47.63	74.00	-26.37	peak	H
6285.000	34.01	16.75	50.76	74.00	-23.24	peak	H
3121.000	38.70	6.17	44.87	74.00	-29.13	peak	V
4605.000	36.93	11.15	48.08	74.00	-25.92	peak	V
6187.000	34.88	16.45	51.33	74.00	-22.67	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	WN4622R			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	5			Date:	12/04/2012		
Frequency:	2452MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2953.000	38.06	5.79	43.85	74.00	-30.15	peak	H
4626.000	36.89	11.20	48.09	74.00	-25.91	peak	H
6236.000	34.12	16.61	50.73	74.00	-23.27	peak	H
3156.000	38.62	6.25	44.87	74.00	-29.13	peak	V
4563.000	36.25	11.05	47.30	74.00	-26.70	peak	V
6068.000	34.99	16.09	51.08	74.00	-22.92	peak	V

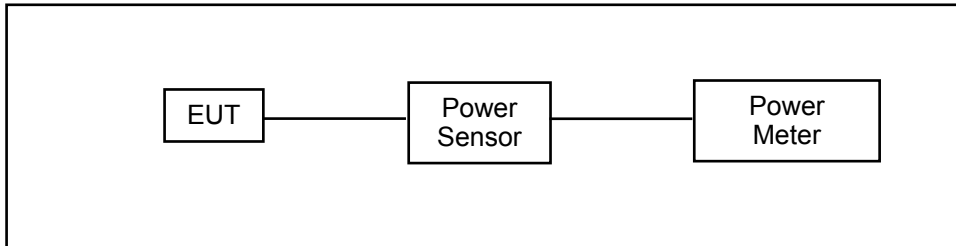
Standard:	RSS-Gen	Test Distance:	3m					
Test item:	Radiated Emission	Power:	AC 120V/60Hz					
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH					
Mode:	6	Date:	12/05/2012					
Modulation:	IEEE 802.11b	Test By:	Fly Lu					
Frequency:	2437MHz							
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/)	Peak (dBuV/m)	AVG. (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2967.000	38.13	5.82	43.95	74.00	54.00	-30.05	peak	H
4612.000	36.58	11.16	47.74	74.00	54.00	-26.26	peak	H
6271.000	34.40	16.71	51.11	74.00	54.00	-22.89	peak	H
3170.000	38.15	6.28	44.43	74.00	54.00	-29.57	peak	V
4612.000	36.35	11.16	47.51	74.00	54.00	-26.49	peak	V
6208.000	34.67	16.52	51.19	74.00	54.00	-22.81	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	12/15/2011	(1)
Wideband Power Meter	Agilent	N1921A	MY45241957	12/15/2011	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 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	WN4622R					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 2: IEEE 802.11b Link Mode					
Date of Test	12/04/2012			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	1 M	16.52	0.045	19.23	0.084	< 30
2437		16.50	0.045	19.10	0.081	< 30
2462		16.83	0.048	<b>19.41</b>	<b>0.087</b>	< 30

Model Number	WN4622R					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 3: IEEE 802.11g Link Mode					
Date of Test	12/04/2012			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	6 M	14.60	0.029	24.36	0.273	< 30
2437		14.08	0.026	23.62	0.230	< 30
2462		14.49	0.028	<b>24.40</b>	<b>0.275</b>	< 30

Model Number	WN4622R					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode					
Date of Test	12/04/2012			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	6.5 M	14.32	0.027	<b>23.86</b>	<b>0.243</b>	< 30
2437		14.47	0.028	23.55	0.226	< 30
2462		14.21	0.026	23.84	0.242	< 30

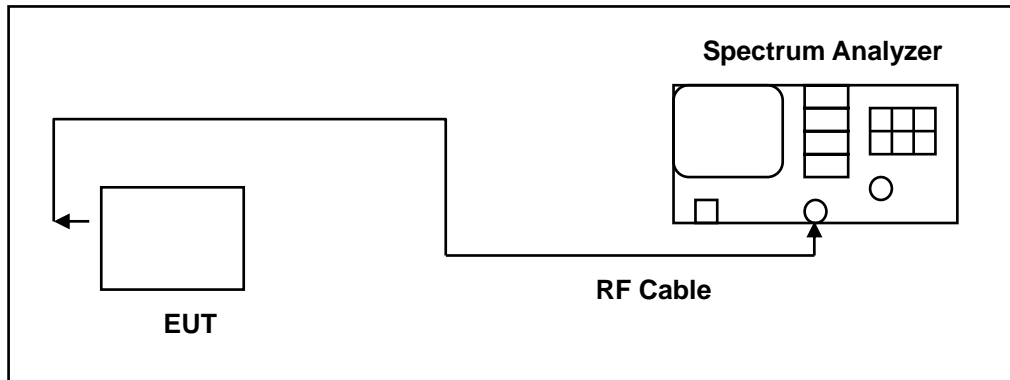
Model Number	WN4622R					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode					
Date of Test	12/04/2012			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2422	13 M	12.53	0.018	<b>22.21</b>	<b>0.166</b>	< 30
2437		12.37	0.017	22.20	0.166	< 30
2452		12.16	0.016	22.01	0.159	< 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	12/21/2011	(2)
Test Site	ATL	TE05	TE05	N.C.R.	-----

dRemark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 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 2012 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	WN4622R		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	12/05/2012	Test Site	TE05
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	12137	> 500
	2437	12125	> 500
	2462	12140	> 500

Model Number	WN4622R		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	12/05/2012	Test Site	TE06
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	16505	> 500
	2437	16550	> 500
	2462	16547	> 500

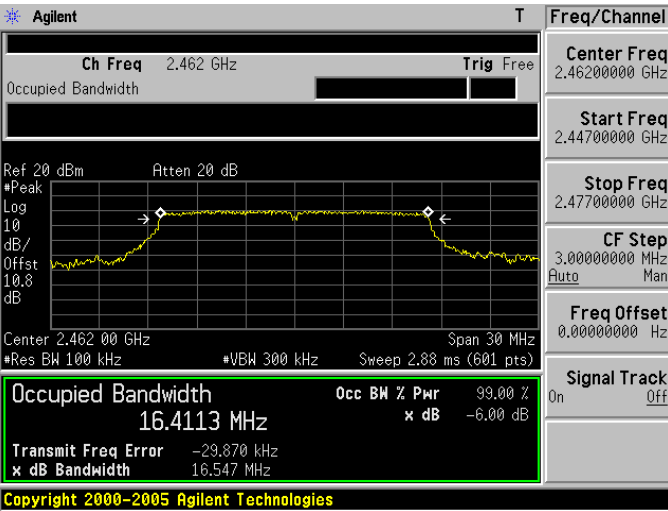
Model Number	WN4622R		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode		
Date of Test	12/05/2012	Test Site	TE05
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	17648	> 500
	2437	17642	> 500
	2462	17620	> 500

Model Number	WN4622R		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode		
Date of Test	12/05/2012	Test Site	TE05
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2422	36468	> 500
	2437	36471	> 500
	2452	36442	> 500

**7.6. 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>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.42700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 15.0008 MHz</p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB Bandwidth -6.00 dB</p> <p>Transmit Freq Error -36.334 kHz</p> <p>x dB Bandwidth 12.137 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	<p>Agilent T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 14.9524 MHz</p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB Bandwidth -6.00 dB</p> <p>Transmit Freq Error -52.736 kHz</p> <p>x dB Bandwidth 12.125 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	<p>Agilent T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44700000 GHz</p> <p>Stop Freq 2.47700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 14.9368 MHz</p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB Bandwidth -6.00 dB</p> <p>Transmit Freq Error -53.435 kHz</p> <p>x dB Bandwidth 12.140 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 3: IEEE 802.11g Link Mode

2412	 <p>Agilent T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.42700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst 10.8</p> <p>dB</p> <p>Center 2.412 00 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth 16.3833 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -15.736 kHz x dB Bandwidth 16.505 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	 <p>Agilent T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst 10.8</p> <p>dB</p> <p>Center 2.437 00 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth 16.3598 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -17.015 kHz x dB Bandwidth 16.550 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	 <p>Agilent T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44700000 GHz</p> <p>Stop Freq 2.47700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst 10.8</p> <p>dB</p> <p>Center 2.462 00 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth 16.4113 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -29.870 kHz x dB Bandwidth 16.547 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>



Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

2412	<p>Agilent T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.42700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst 10.8</p> <p>dB</p> <p>Center 2.412 00 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth 17.4960 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -6.166 kHz x dB Bandwidth 17.648 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	<p>Agilent T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst 10.8</p> <p>dB</p> <p>Center 2.437 00 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth 17.5011 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -12.942 kHz x dB Bandwidth 17.642 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	<p>Agilent T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44700000 GHz</p> <p>Stop Freq 2.47700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst 10.8</p> <p>dB</p> <p>Center 2.462 00 GHz Span 30 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth 17.4972 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -17.125 kHz x dB Bandwidth 17.620 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode

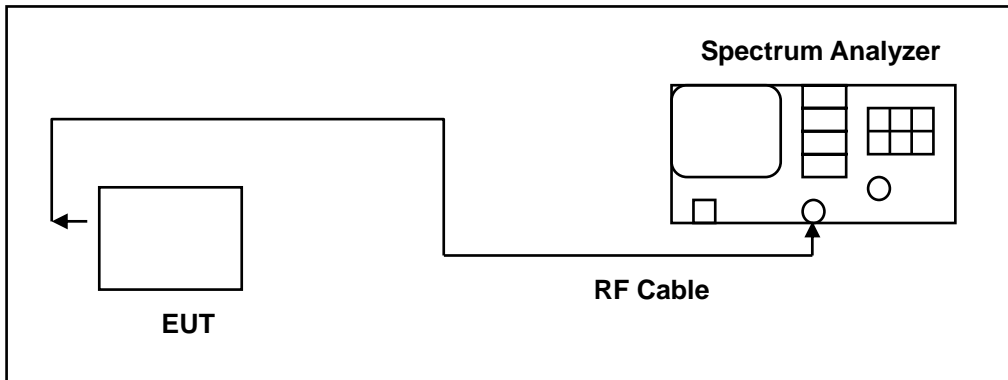
2412	<p>Agilent T</p> <p>Ch Freq 2.422 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>Center 2.422 00 GHz Span 60 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 5.76 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 %</p> <p><b>35.8655 MHz</b> x dB -6.00 dB</p> <p>Transmit Freq Error -25.922 kHz</p> <p>x dB Bandwidth 36.468 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</p> <p>Center Freq 2.42200000 GHz</p> <p>Start Freq 2.39200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 6.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2437	<p>Agilent T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>Center 2.437 00 GHz Span 60 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 5.76 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 %</p> <p><b>35.8661 MHz</b> x dB -6.00 dB</p> <p>Transmit Freq Error -35.881 kHz</p> <p>x dB Bandwidth 36.471 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.40700000 GHz</p> <p>Stop Freq 2.46700000 GHz</p> <p>CF Step 6.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2462	<p>Agilent T</p> <p>Ch Freq 2.452 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 20 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>Center 2.452 00 GHz Span 60 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 5.76 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 %</p> <p><b>35.8681 MHz</b> x dB -6.00 dB</p> <p>Transmit Freq Error -42.905 kHz</p> <p>x dB Bandwidth 36.442 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</p> <p>Center Freq 2.45200000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.48200000 GHz</p> <p>CF Step 6.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

## 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	12/21/2011	(2)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 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 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

- 1) The EUT was directly connectd to the spectrum analyzer and antenna output port as show in the block diagram below,
- 2) Spectrum Setting: RBW=100KHz, VBW=300KHz, Sweep time=Auto. Span to 5-30% greater than EBW
- 3) Scale the observed power level to an equivalent value in 3kHz by adjusting(reducing) the measured power by a bandwidth correction factor(BWCF) where  $BWCF=10\log(3\text{kHz}/100\text{kHz}=-15.2\text{dB})$ .
- 4) Use peak detector+BWCF.
- 5) The resulting peak PSD level must be  $\leq 8\text{dBm}$ .

**8.5. Test Result**

Model Number	WN4622R			
Test Item	Maximum Power Density			
Test Mode	Mode 2: IEEE 802.11b Link Mode			
Date of Test	12/05/2012		Test Site	TE05
Frequency (MHz)	Reading (dBm/100KHz)	BWCF (dB)	Results (dBm/3KHz)	Limit (dBm)
2412	5.18	-15.30	-10.12	< 8
2437	4.54	-15.30	-10.76	< 8
2462	4.44	-15.30	-10.86	< 8

Model Number	WN4622R			
Test Item	Maximum Power Density			
Test Mode	Mode 3: IEEE 802.11g Link Mode			
Date of Test	12/05/2012		Test Site	TE05
Frequency (MHz)	Reading (dBm/100KHz)	BWCF (dB)	Results (dBm/3KHz)	Limit (dBm)
2412	0.07	-15.30	-15.23	< 8
2437	-0.75	-15.30	-16.05	< 8
2462	-0.19	-15.30	-15.49	< 8

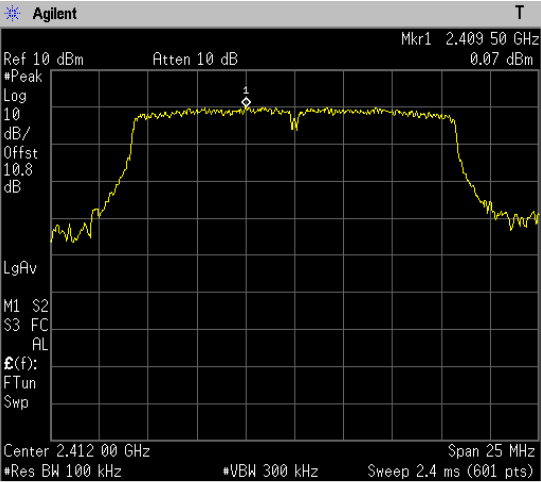
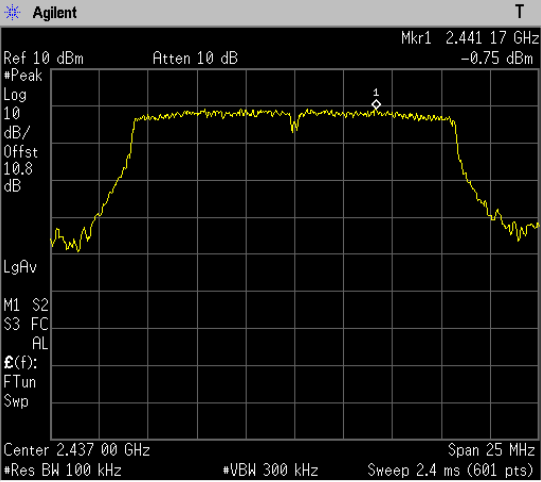
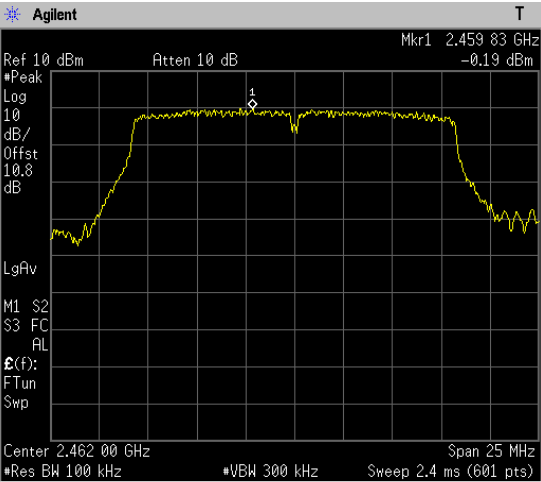
Model Number	WN4622R			
Test Item	Maximum Power Density			
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode			
Date of Test	12/05/2012		Test Site	TE05
Frequency (MHz)	Reading (dBm/100KHz)	BWCF (dB)	Results (dBm/3KHz)	Limit (dBm)
2412	0.30	-15.30	-15.00	< 8
2437	0.03	-15.30	-15.27	< 8
2462	0.10	-15.30	-15.20	< 8

Model Number	WN4622R			
Test Item	Maximum Power Density			
Test Mode	Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode			
Date of Test	12/05/2012		Test Site	TE05
Frequency (MHz)	Reading (dBm/100KHz)	BWCF (dB)	Results (dBm/3KHz)	Limit (dBm)
2422	-6.77	-15.30	-22.07	< 8
2437	-5.53	-15.30	-20.83	< 8
2452	-5.74	-15.30	-21.04	< 8

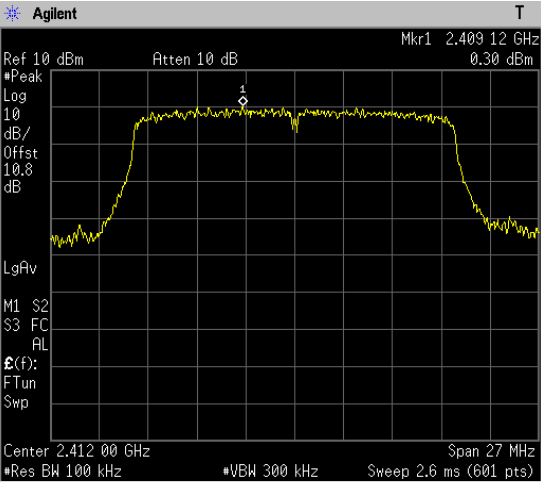
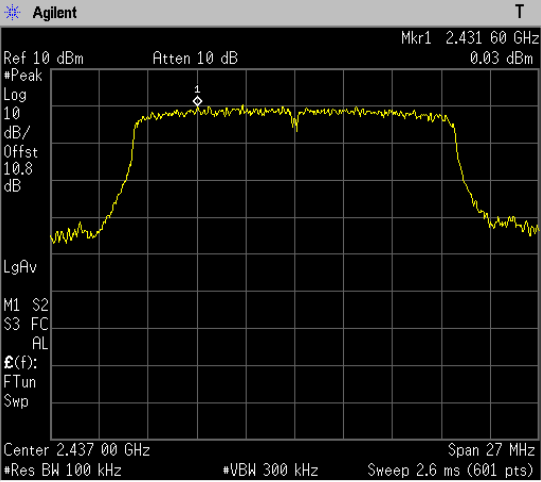
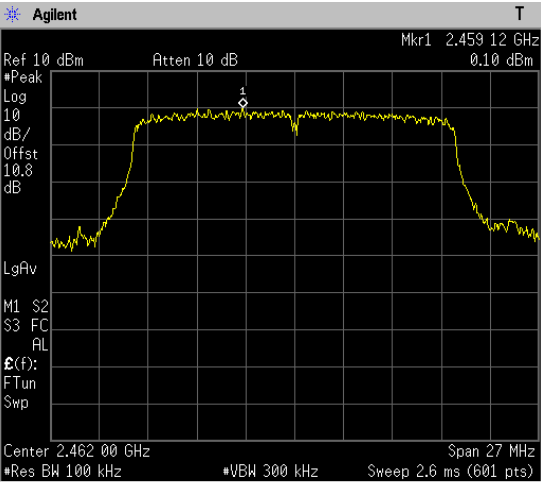
**8.6. Test Graphs**

Mode 2: IEEE 802.11b Link Mode	
2412	<p>Agilent T Freq/Channel</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.412 98 GHz      *Peak 5.18 dBm      Log      10      dB/      Offst      10.8      dB</p> <p>LgAv</p> <p>M1 S2      S3 FC      AL</p> <p>Ⓔ(f):      FTun      Swp</p> <p>Center 2.412 00 GHz Span 19 MHz      *Res BW 100 kHz *VBW 300 kHz Sweep 1.84 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Center Freq 2.41200000 GHz      Start Freq 2.40250000 GHz      Stop Freq 2.42150000 GHz      CF Step 1.90000000 MHz      Auto Man      Freq Offset 0.00000000 Hz      Signal Track On Off</p>
2437	<p>Agilent T Freq/Channel</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.437 98 GHz      *Peak 4.54 dBm      Log      10      dB/      Offst      10.8      dB</p> <p>LgAv</p> <p>M1 S2      S3 FC      AL</p> <p>Ⓔ(f):      FTun      Swp</p> <p>Center 2.437 00 GHz Span 19 MHz      *Res BW 100 kHz *VBW 300 kHz Sweep 1.84 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Center Freq 2.43700000 GHz      Start Freq 2.42750000 GHz      Stop Freq 2.44650000 GHz      CF Step 1.90000000 MHz      Auto Man      Freq Offset 0.00000000 Hz      Signal Track On Off</p>
2462	<p>Agilent T Freq/Channel</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.459 97 GHz      *Peak 4.44 dBm      Log      10      dB/      Offst      10.8      dB</p> <p>LgAv</p> <p>M1 S2      S3 FC      AL</p> <p>Ⓔ(f):      FTun      Swp</p> <p>Center 2.462 00 GHz Span 19 MHz      *Res BW 100 kHz *VBW 300 kHz Sweep 1.84 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Center Freq 2.46200000 GHz      Start Freq 2.45250000 GHz      Stop Freq 2.47150000 GHz      CF Step 1.90000000 MHz      Auto Man      Freq Offset 0.00000000 Hz      Signal Track On Off</p>

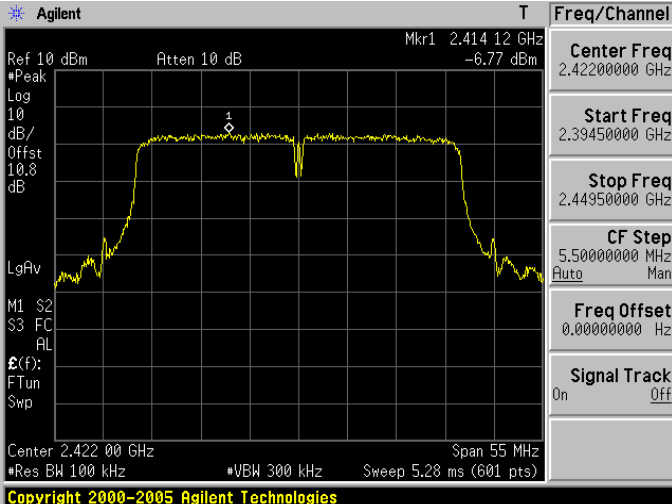
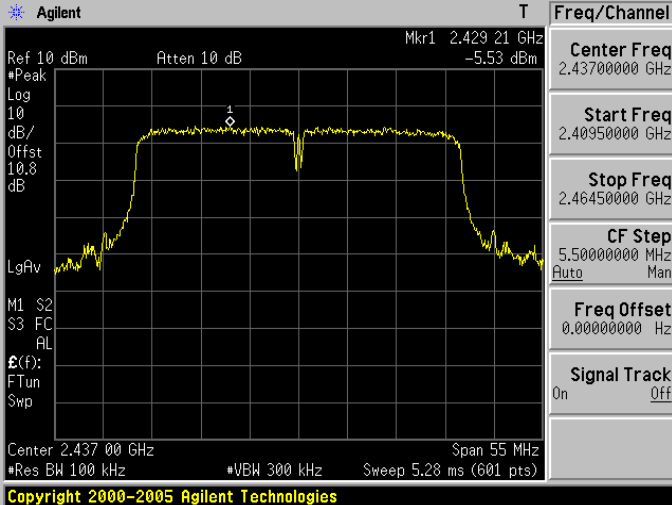
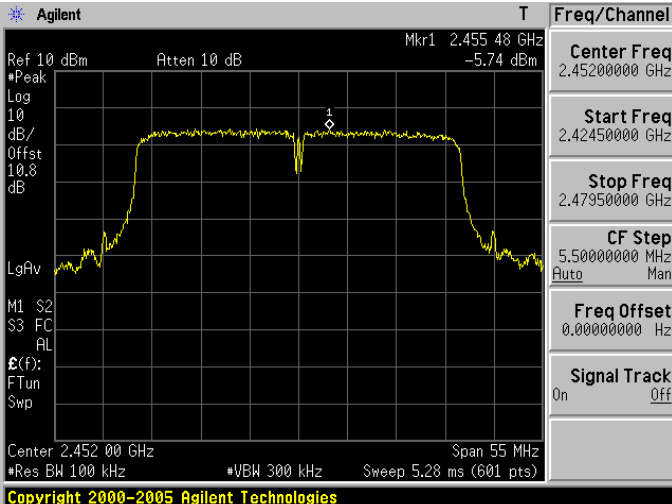
Mode 3: IEEE 802.11g Link Mode

2412	 <p>Agilent T</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.409 50 GHz 0.07 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>LgAv</p> <p>M1 S2</p> <p>S3 FC</p> <p>AL</p> <p><math>\mathcal{E}(f)</math>:</p> <p>FTun</p> <p>Swp</p> <p>Center 2.412 00 GHz Span 25 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1" data-bbox="1197 389 1324 869"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.41200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.39950000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.42450000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz</td> </tr> <tr> <td></td> <td>Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.41200000 GHz	Start Freq	2.39950000 GHz	Stop Freq	2.42450000 GHz	CF Step	2.50000000 MHz		Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel																	
Center Freq	2.41200000 GHz																
Start Freq	2.39950000 GHz																
Stop Freq	2.42450000 GHz																
CF Step	2.50000000 MHz																
	Auto Man																
Freq Offset	0.00000000 Hz																
Signal Track	On Off																
2437	 <p>Agilent T</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.441 17 GHz -0.75 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>LgAv</p> <p>M1 S2</p> <p>S3 FC</p> <p>AL</p> <p><math>\mathcal{E}(f)</math>:</p> <p>FTun</p> <p>Swp</p> <p>Center 2.437 00 GHz Span 25 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1" data-bbox="1197 918 1324 1397"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.43700000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.42450000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.44950000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz</td> </tr> <tr> <td></td> <td>Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.43700000 GHz	Start Freq	2.42450000 GHz	Stop Freq	2.44950000 GHz	CF Step	2.50000000 MHz		Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel																	
Center Freq	2.43700000 GHz																
Start Freq	2.42450000 GHz																
Stop Freq	2.44950000 GHz																
CF Step	2.50000000 MHz																
	Auto Man																
Freq Offset	0.00000000 Hz																
Signal Track	On Off																
2462	 <p>Agilent T</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.459 83 GHz -0.19 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>LgAv</p> <p>M1 S2</p> <p>S3 FC</p> <p>AL</p> <p><math>\mathcal{E}(f)</math>:</p> <p>FTun</p> <p>Swp</p> <p>Center 2.462 00 GHz Span 25 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1" data-bbox="1197 1444 1324 1924"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.46200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.44950000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.47450000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz</td> </tr> <tr> <td></td> <td>Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.46200000 GHz	Start Freq	2.44950000 GHz	Stop Freq	2.47450000 GHz	CF Step	2.50000000 MHz		Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel																	
Center Freq	2.46200000 GHz																
Start Freq	2.44950000 GHz																
Stop Freq	2.47450000 GHz																
CF Step	2.50000000 MHz																
	Auto Man																
Freq Offset	0.00000000 Hz																
Signal Track	On Off																

Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

2412	 <p>Agilent T Freq/Channel</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.409 12 GHz 0.30 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>LgAv</p> <p>M1 S2</p> <p>S3 FC</p> <p>AL</p> <p>Ⓔ(f):</p> <p>FTun</p> <p>Swp</p> <p>Center 2.412 00 GHz Span 27 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.6 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39850000 GHz</p> <p>Stop Freq 2.42550000 GHz</p> <p>CF Step 2.70000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2437	 <p>Agilent T Freq/Channel</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.431 60 GHz 0.03 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>LgAv</p> <p>M1 S2</p> <p>S3 FC</p> <p>AL</p> <p>Ⓔ(f):</p> <p>FTun</p> <p>Swp</p> <p>Center 2.437 00 GHz Span 27 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.6 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42350000 GHz</p> <p>Stop Freq 2.45050000 GHz</p> <p>CF Step 2.70000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2462	 <p>Agilent T Freq/Channel</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.459 12 GHz 0.10 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>LgAv</p> <p>M1 S2</p> <p>S3 FC</p> <p>AL</p> <p>Ⓔ(f):</p> <p>FTun</p> <p>Swp</p> <p>Center 2.462 00 GHz Span 27 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.6 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44850000 GHz</p> <p>Stop Freq 2.47550000 GHz</p> <p>CF Step 2.70000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode

<p>2422</p>	 <p>Agilent T</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.414 12 GHz -6.77 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>LgAv</p> <p>M1 S2</p> <p>S3 FC</p> <p>AL</p> <p>Ⓔ(f):</p> <p>F Tun</p> <p>Swp</p> <p>Center 2.422 00 GHz Span 55 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 5.28 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</p> <p>Center Freq 2.42200000 GHz</p> <p>Start Freq 2.39450000 GHz</p> <p>Stop Freq 2.44950000 GHz</p> <p>CF Step 5.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
<p>2437</p>	 <p>Agilent T</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.429 21 GHz -5.53 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>LgAv</p> <p>M1 S2</p> <p>S3 FC</p> <p>AL</p> <p>Ⓔ(f):</p> <p>F Tun</p> <p>Swp</p> <p>Center 2.437 00 GHz Span 55 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 5.28 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.40950000 GHz</p> <p>Stop Freq 2.46450000 GHz</p> <p>CF Step 5.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
<p>2452</p>	 <p>Agilent T</p> <p>Ref 10 dBm Atten 10 dB Mkr1 2.455 48 GHz -5.74 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>LgAv</p> <p>M1 S2</p> <p>S3 FC</p> <p>AL</p> <p>Ⓔ(f):</p> <p>F Tun</p> <p>Swp</p> <p>Center 2.452 00 GHz Span 55 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 5.28 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</p> <p>Center Freq 2.45200000 GHz</p> <p>Start Freq 2.42450000 GHz</p> <p>Stop Freq 2.47950000 GHz</p> <p>CF Step 5.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

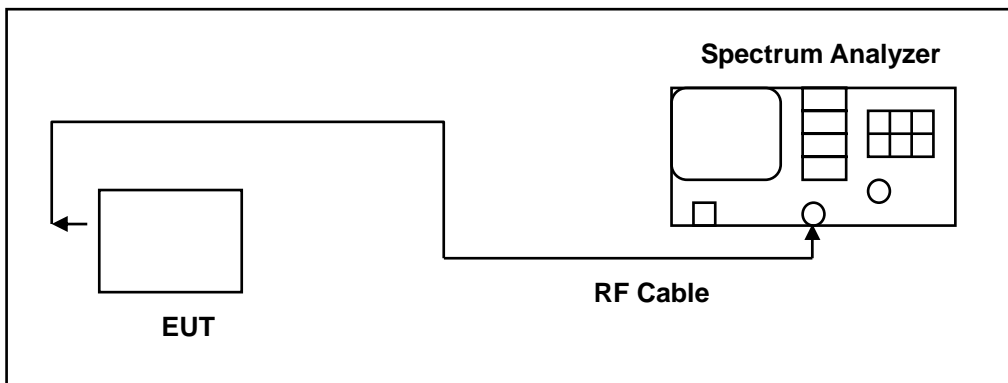


## 9 Out of Band Conducted Emissions Measurement

### 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	12/21/2011	(2)
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/09/2012	(1)
Test Site	ATL	TE05	TE05	N.C.R.	----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 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          Ref 20 dBm Atten 20 dB Mkr1 2.41 GHz 6.108 dBm          Peak Log 10 dB/ Offst 10.8 dB DI -14.8 dBm          Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.742 s (401 pts) Stop 26.5 GHz          Marker Trace Type X Axis Amplitude          1 (1) Freq 2.41 GHz 6.108 dBm</p> <p>Freq/Channel          Center Freq 13.2650000 GHz          Start Freq 30.0000000 MHz          Stop Freq 26.5000000 GHz          CF Step 2.64700000 GHz Auto Man          Freq Offset 0.0000000 Hz          Signal Track On Off</p>
2437	<p>Agilent R T          Ref 20 dBm Atten 20 dB Mkr1 2.44 GHz 4.693 dBm          Peak Log 10 dB/ Offst 10.8 dB DI -15.5 dBm          Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.742 s (401 pts) Stop 26.5 GHz          Marker Trace Type X Axis Amplitude          1 (1) Freq 2.44 GHz 4.693 dBm</p> <p>Freq/Channel          Center Freq 13.2650000 GHz          Start Freq 30.0000000 MHz          Stop Freq 26.5000000 GHz          CF Step 2.64700000 GHz Auto Man          Freq Offset 0.0000000 Hz          Signal Track On Off</p>
2462	<p>Agilent R T          Ref 20 dBm Atten 20 dB Mkr1 2.46 GHz 4.628 dBm          Peak Log 10 dB/ Offst 10.8 dB DI -15.6 dBm          Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.742 s (401 pts) Stop 26.5 GHz          Marker Trace Type X Axis Amplitude          1 (1) Freq 2.46 GHz 4.628 dBm</p> <p>Freq/Channel          Center Freq 13.2650000 GHz          Start Freq 30.0000000 MHz          Stop Freq 26.5000000 GHz          CF Step 2.64700000 GHz Auto Man          Freq Offset 0.0000000 Hz          Signal Track On Off</p>

Mode 3: IEEE 802.11g Link Mode

<p>2412</p>	<p>Agilent R T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.41 GHz -0.401 dBm</p> <p>Peak 10 dB/Offst 10.8 dB DI -19.9 dBm</p> <p>Start 30 MHz Stop 26.5 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.742 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>-0.401 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 2.64700000 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.41 GHz	-0.401 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.41 GHz	-0.401 dBm							
<p>2437</p>	<p>Agilent R T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.44 GHz -0.707 dBm</p> <p>Peak 10 dB/Offst 10.8 dB DI -20.8 dBm</p> <p>Start 30 MHz Stop 26.5 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.742 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>-0.707 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 2.64700000 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.44 GHz	-0.707 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.44 GHz	-0.707 dBm							
<p>2462</p>	<p>Agilent R T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.46 GHz -0.348 dBm</p> <p>Peak 10 dB/Offst 10.8 dB DI -20.2 dBm</p> <p>Start 30 MHz Stop 26.5 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.742 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>-0.348 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 2.64700000 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.46 GHz	-0.348 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.46 GHz	-0.348 dBm							

Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

2412	<p>Agilent R T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.41 GHz -0.34 dBm</p> <p>Peak Log 10 dB/Offst 10.8 dB DI -19.7 dBm</p> <p>Start 30 MHz Stop 26.5 GHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.742 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>-0.34 dBm</td> </tr> </tbody> </table> <p>Freq/Channel</p> <p>Center Freq 13.2650000 GHz</p> <p>Start Freq 30.0000000 MHz</p> <p>Stop Freq 26.5000000 GHz</p> <p>CF Step 2.64700000 GHz 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	2.41 GHz	-0.34 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.41 GHz	-0.34 dBm							
2437	<p>Agilent R T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.44 GHz -1.3 dBm</p> <p>Peak Log 10 dB/Offst 10.8 dB DI -20.0 dBm</p> <p>Start 30 MHz Stop 26.5 GHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.742 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>-1.3 dBm</td> </tr> </tbody> </table> <p>Freq/Channel</p> <p>Center Freq 13.2650000 GHz</p> <p>Start Freq 30.0000000 MHz</p> <p>Stop Freq 26.5000000 GHz</p> <p>CF Step 2.64700000 GHz 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	2.44 GHz	-1.3 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.44 GHz	-1.3 dBm							
2462	<p>Agilent R T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.46 GHz -1.833 dBm</p> <p>Peak Log 10 dB/Offst 10.8 dB DI -19.9 dBm</p> <p>Start 30 MHz Stop 26.5 GHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 2.742 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>-1.833 dBm</td> </tr> </tbody> </table> <p>Freq/Channel</p> <p>Center Freq 13.2650000 GHz</p> <p>Start Freq 30.0000000 MHz</p> <p>Stop Freq 26.5000000 GHz</p> <p>CF Step 2.64700000 GHz 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	2.46 GHz	-1.833 dBm
Marker	Trace	Type	X Axis	Amplitude							
1	(1)	Freq	2.46 GHz	-1.833 dBm							

Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode

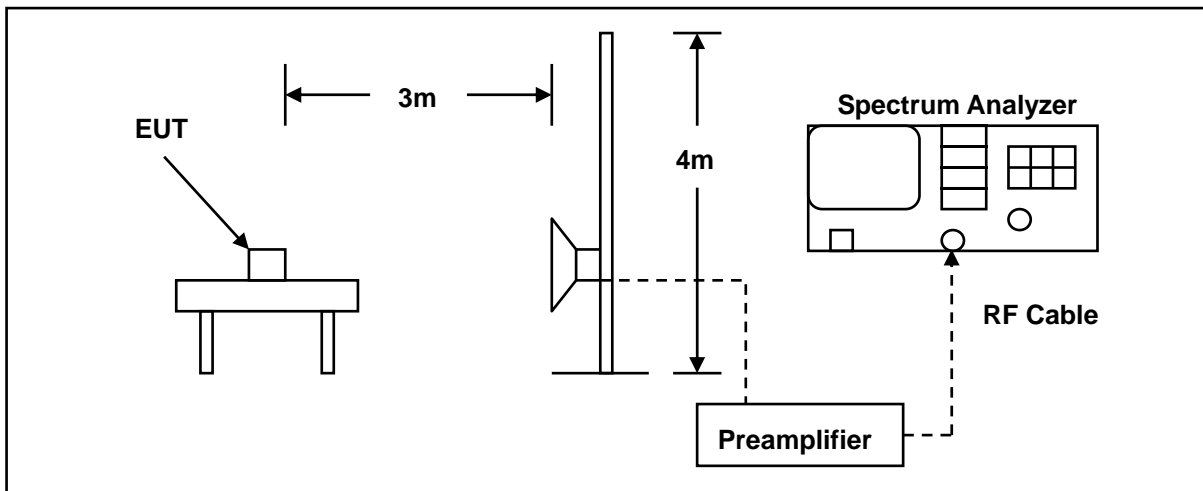
<p>2422</p>	
<p>2437</p>	
<p>2452</p>	

## 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

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/16/2012	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/16/2012	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/22/2012	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/22/2012	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/29/2012	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/15/2012	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/21/2012	(1)
Test Site	ATL	TE01	888001	08/28/2012	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 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 2012 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.

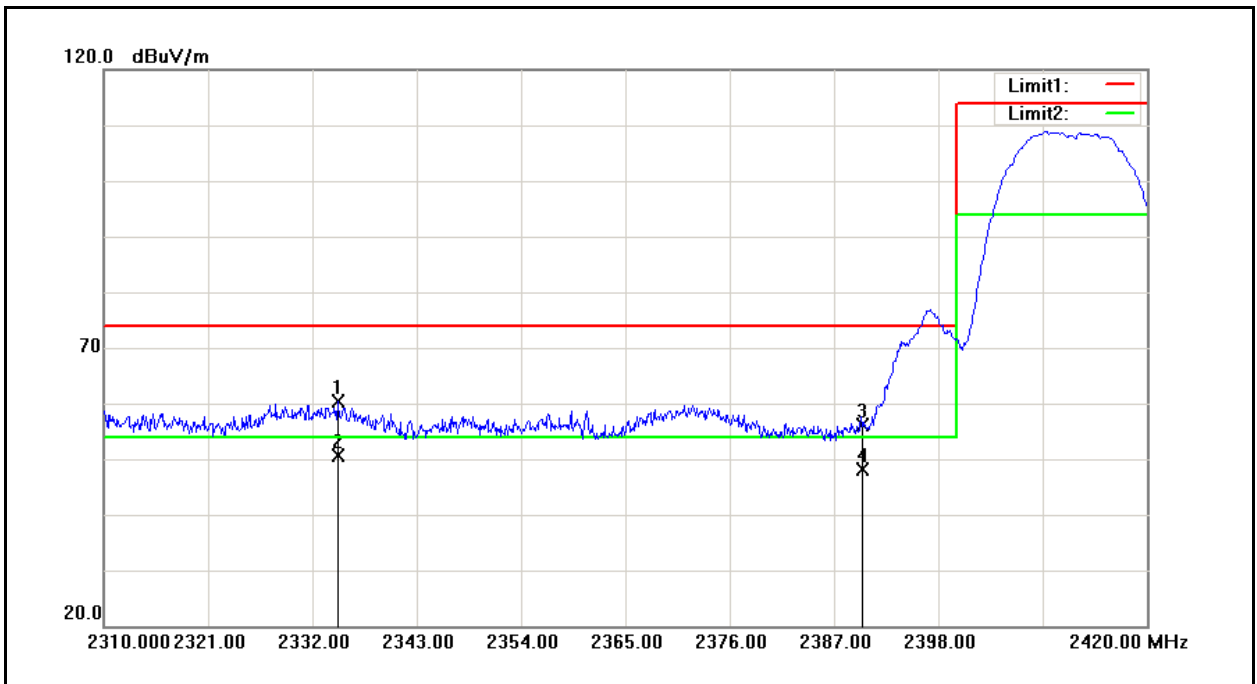
The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

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**

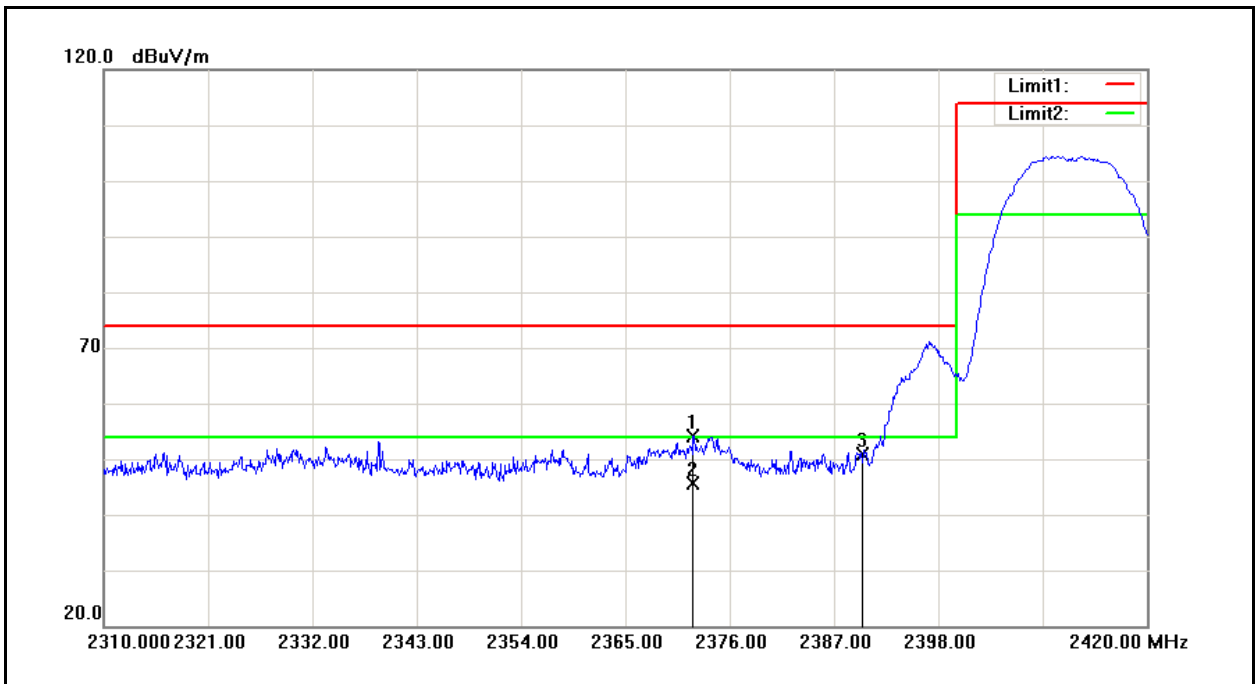
Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	12/04/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2334.640	56.92	3.51	60.43	74.00	-13.57	peak
2	2334.640	47.04	3.51	50.55	54.00	-3.45	AVG
3	2390.000	52.24	3.88	56.12	74.00	-17.88	peak
4	2390.000	44.36	3.88	48.24	54.00	-5.76	AVG

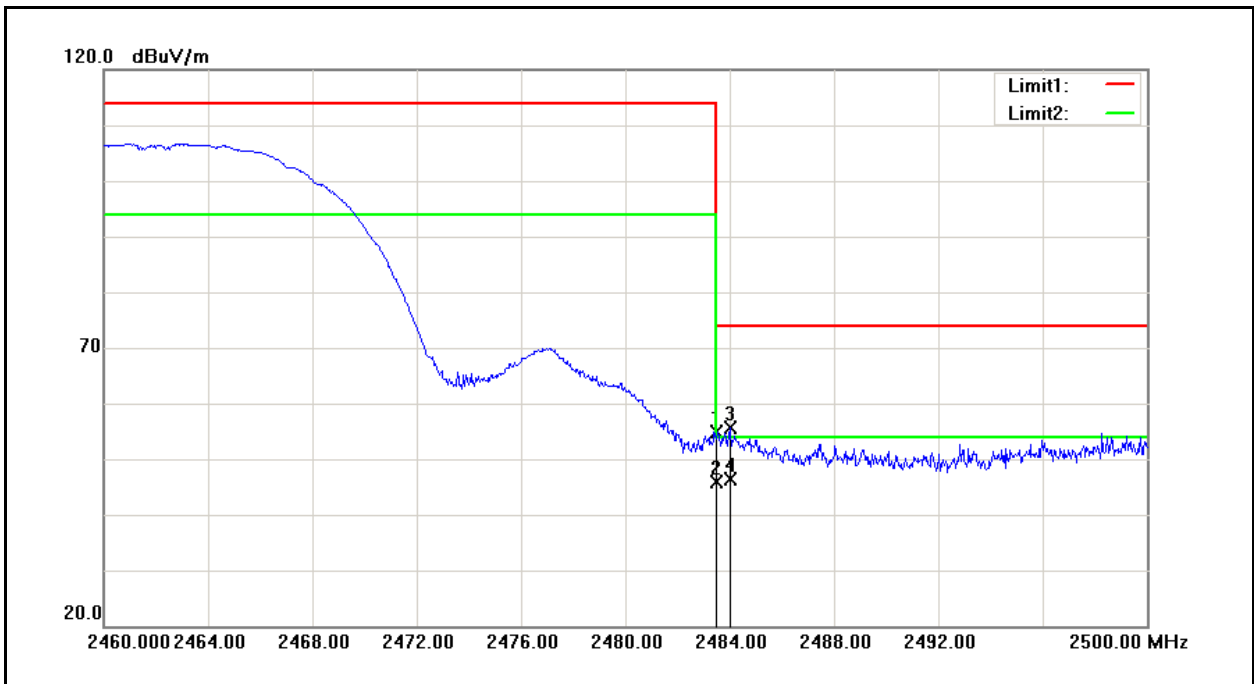


Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	12/04/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



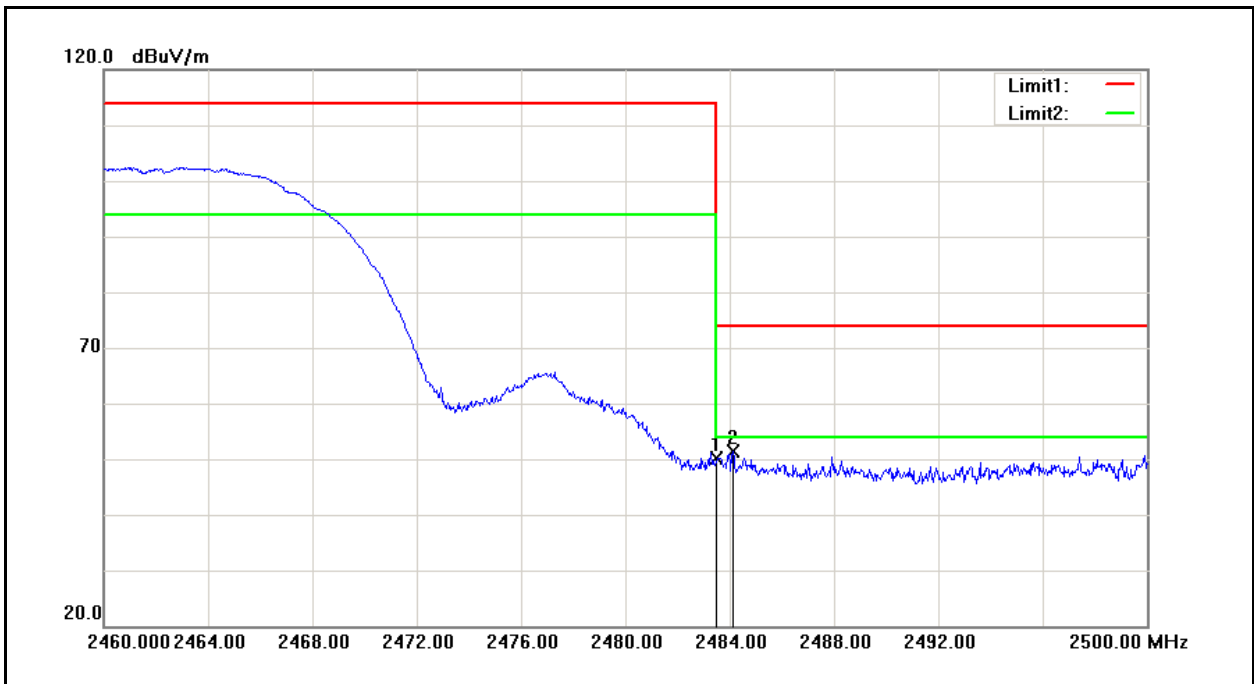
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2372.150	50.36	3.77	54.13	74.00	-19.87	peak
2	2372.150	41.86	3.77	45.63	54.00	-8.37	AVG
3	2390.000	47.09	3.88	50.97	74.00	-23.03	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	12/04/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



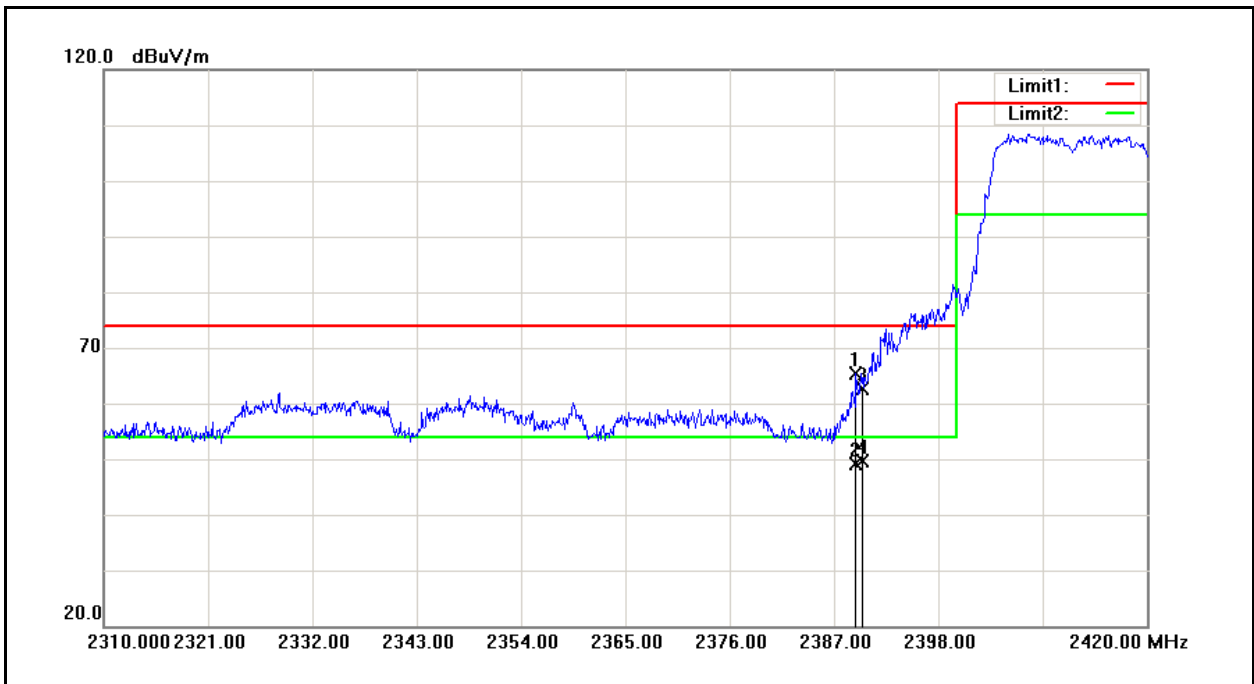
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	50.40	4.50	54.90	74.00	-19.10	peak
2	2483.500	41.33	4.50	45.83	54.00	-8.17	AVG
3	2484.000	51.22	4.51	55.73	74.00	-18.27	peak
4	2484.000	41.78	4.51	46.29	54.00	-7.71	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	12/04/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



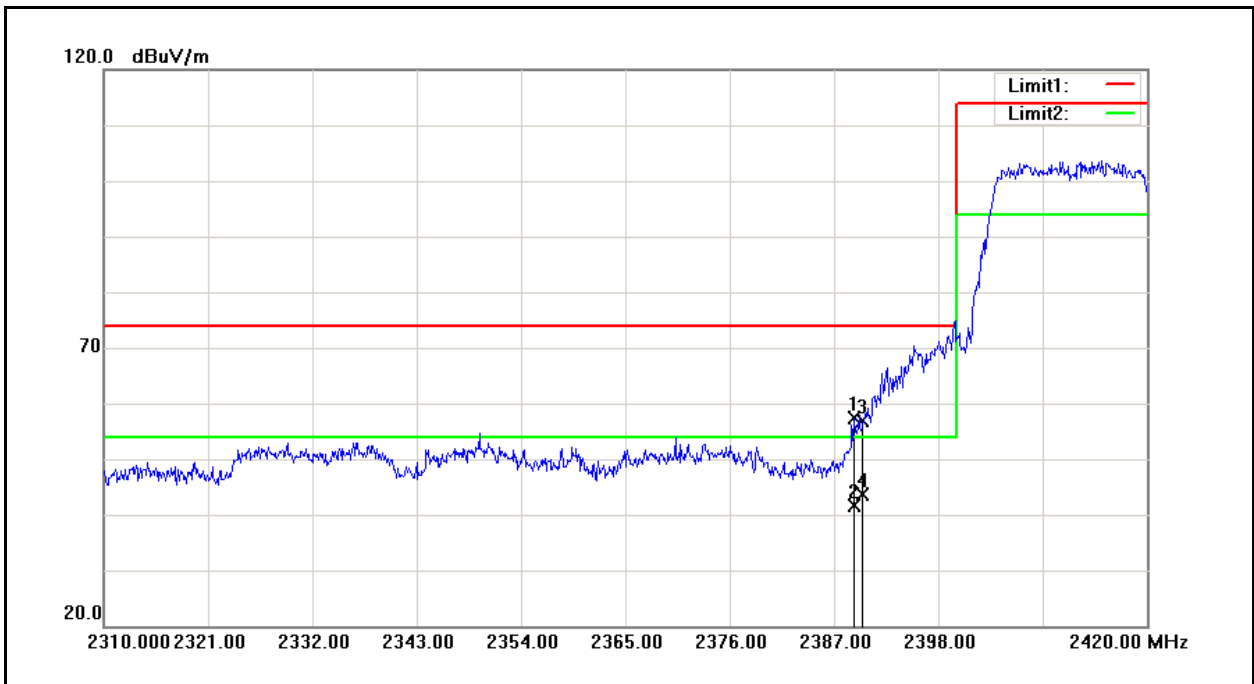
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	45.64	4.50	50.14	74.00	-23.86	peak
2	2484.120	46.87	4.51	51.38	74.00	-22.62	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	12/04/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



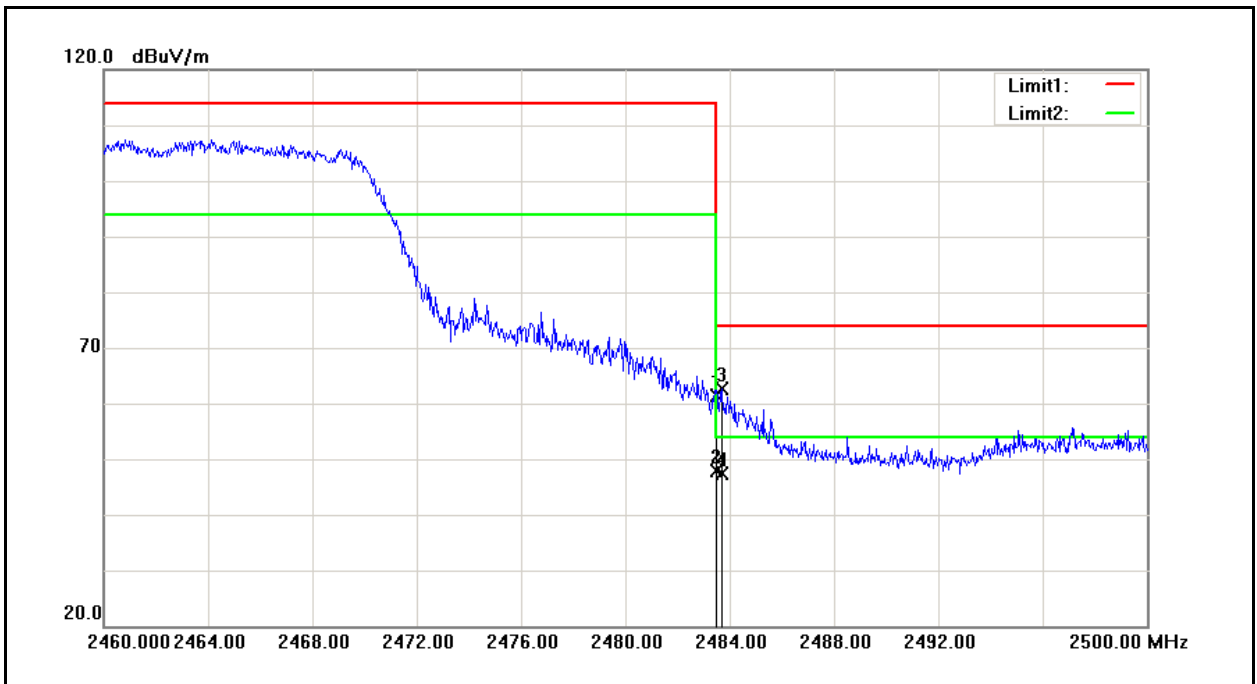
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.310	61.58	3.88	65.46	74.00	-8.54	peak
2	2389.310	45.24	3.88	49.12	54.00	-4.88	AVG
3	2390.000	58.87	3.88	62.75	74.00	-11.25	peak
4	2390.000	45.70	3.88	49.58	54.00	-4.42	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	12/04/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



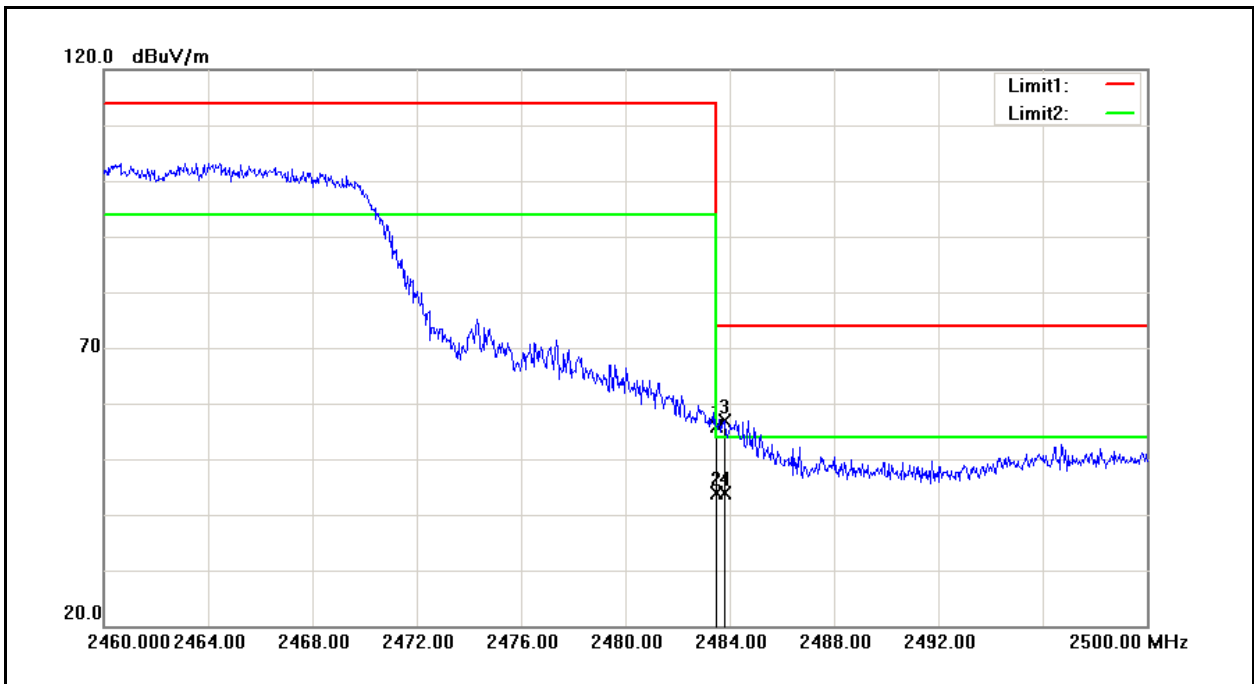
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.090	53.51	3.88	57.39	74.00	-16.61	peak
2	2389.090	37.82	3.88	41.70	54.00	-12.30	AVG
3	2390.000	53.12	3.88	57.00	74.00	-17.00	peak
4	2390.000	39.76	3.88	43.64	54.00	-10.36	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	12/04/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



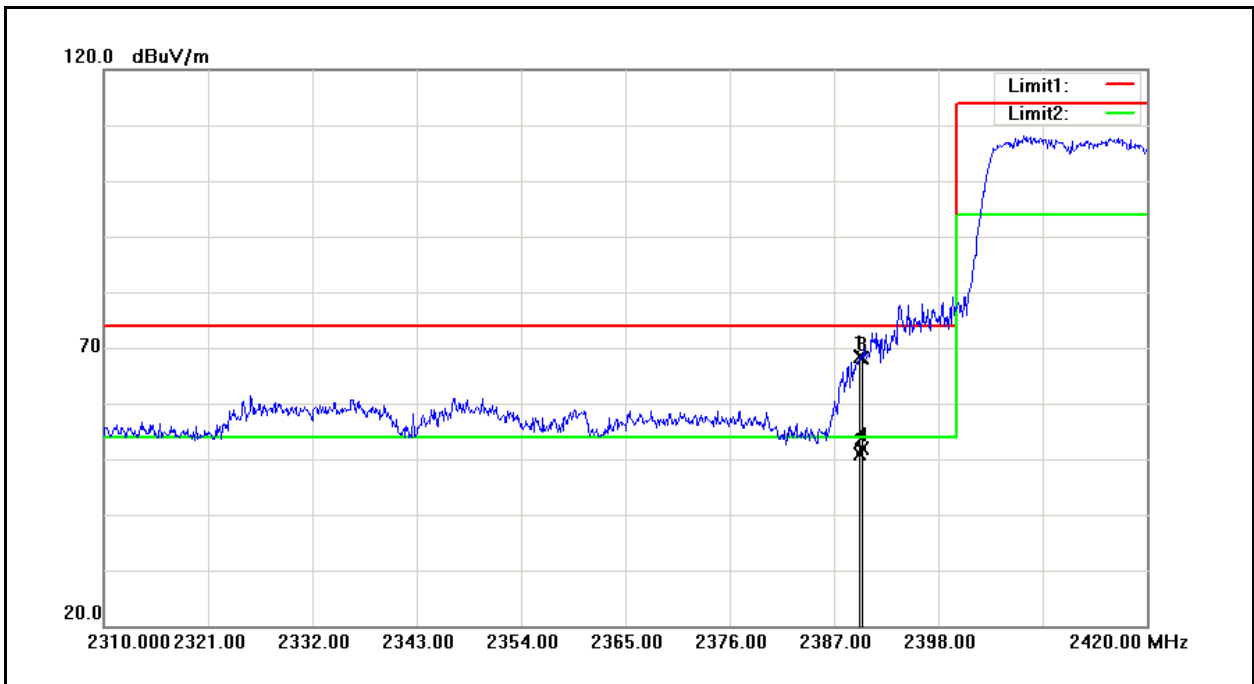
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	56.97	4.50	61.47	74.00	-12.53	peak
2	2483.500	43.43	4.50	47.93	54.00	-6.07	AVG
3	2483.680	58.07	4.50	62.57	74.00	-11.43	peak
4	2483.680	43.00	4.50	47.50	54.00	-6.50	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	12/04/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	51.34	4.50	55.84	74.00	-18.16	peak
2	2483.500	39.45	4.50	43.95	54.00	-10.05	AVG
3	2483.800	52.47	4.51	56.98	74.00	-17.02	peak
4	2483.800	39.26	4.51	43.77	54.00	-10.23	AVG

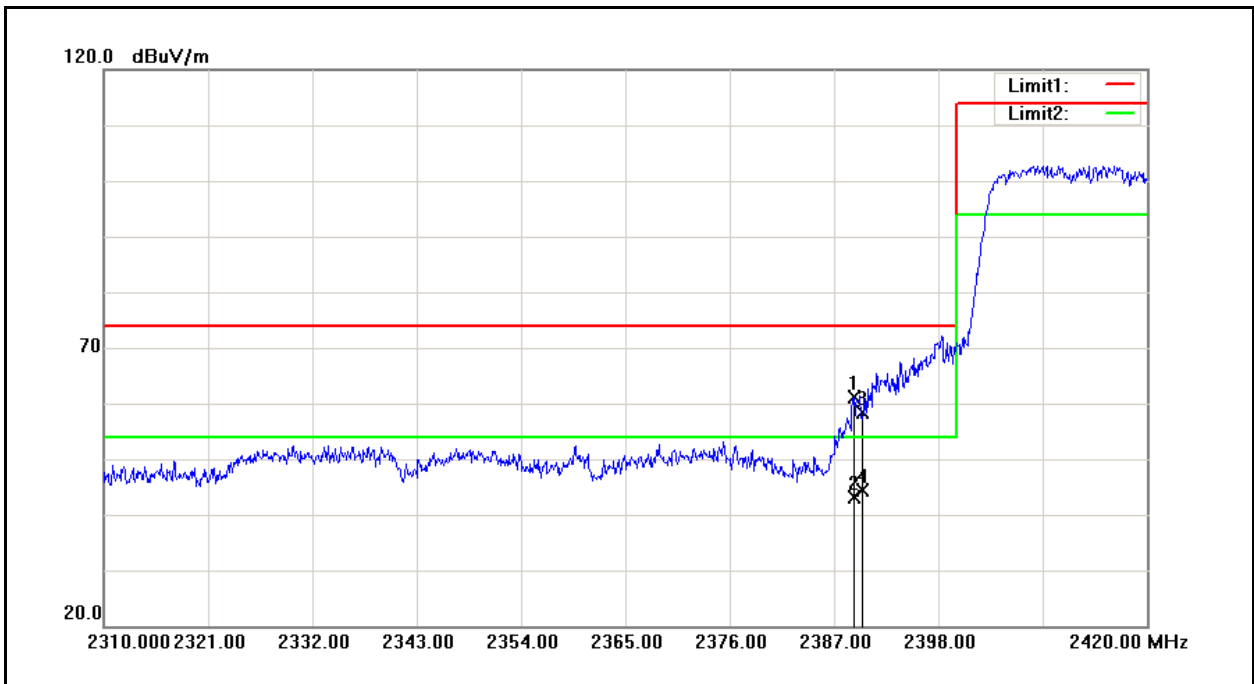
Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	12/04/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.640	64.60	3.88	68.48	74.00	-5.52	peak
2	2389.640	47.06	3.88	50.94	54.00	-3.06	AVG
3	2390.000	64.20	3.88	68.08	74.00	-5.92	peak
4	2390.000	47.92	3.88	51.80	54.00	-2.20	AVG

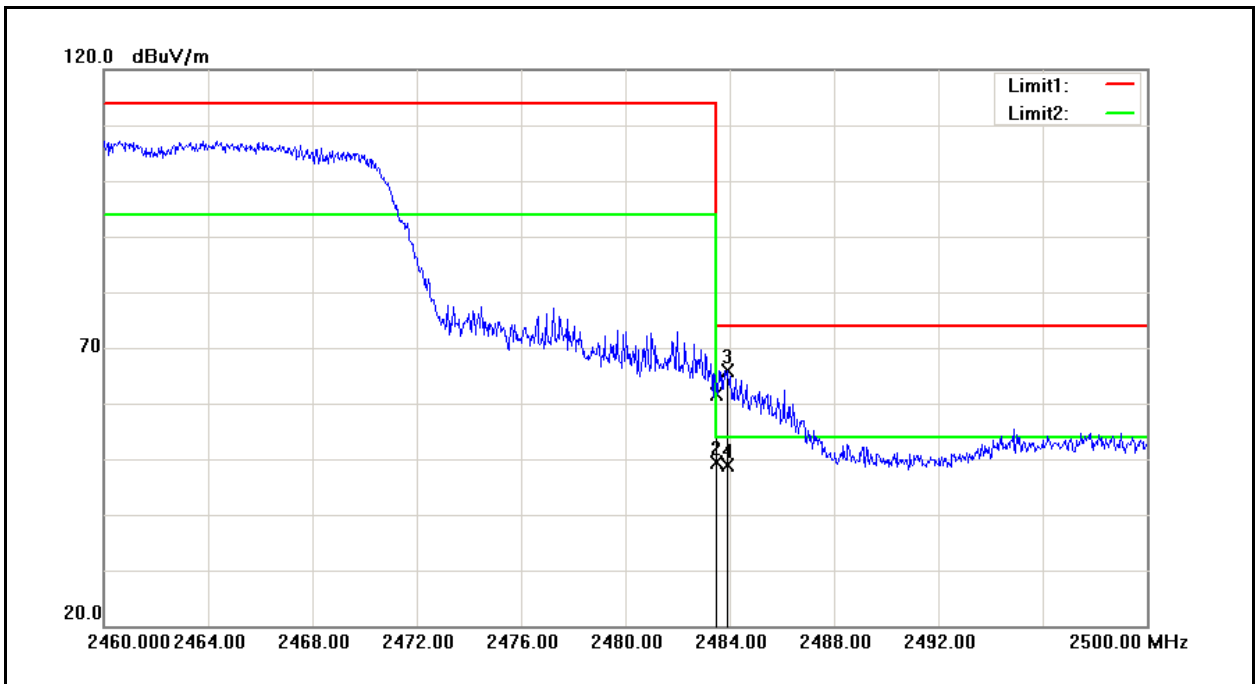


Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	12/04/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



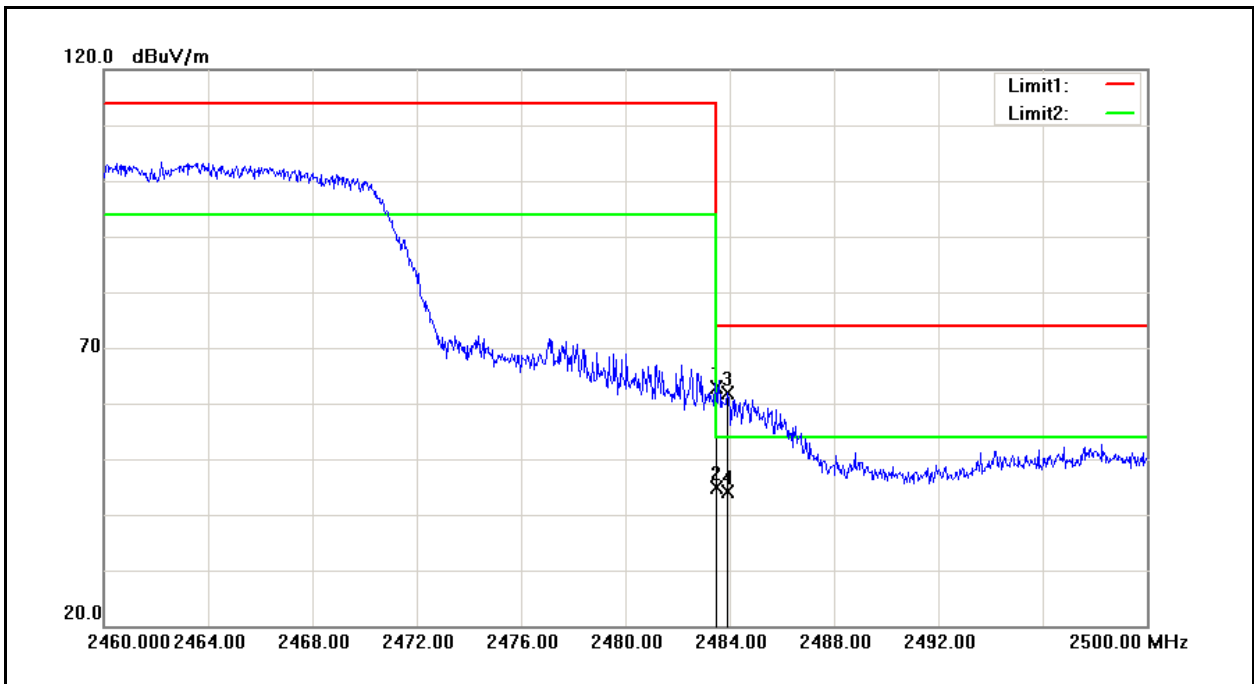
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.090	57.16	3.88	61.04	74.00	-12.96	peak
2	2389.090	39.29	3.88	43.17	54.00	-10.83	AVG
3	2390.000	54.54	3.88	58.42	74.00	-15.58	peak
4	2390.000	40.57	3.88	44.45	54.00	-9.55	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	12/04/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



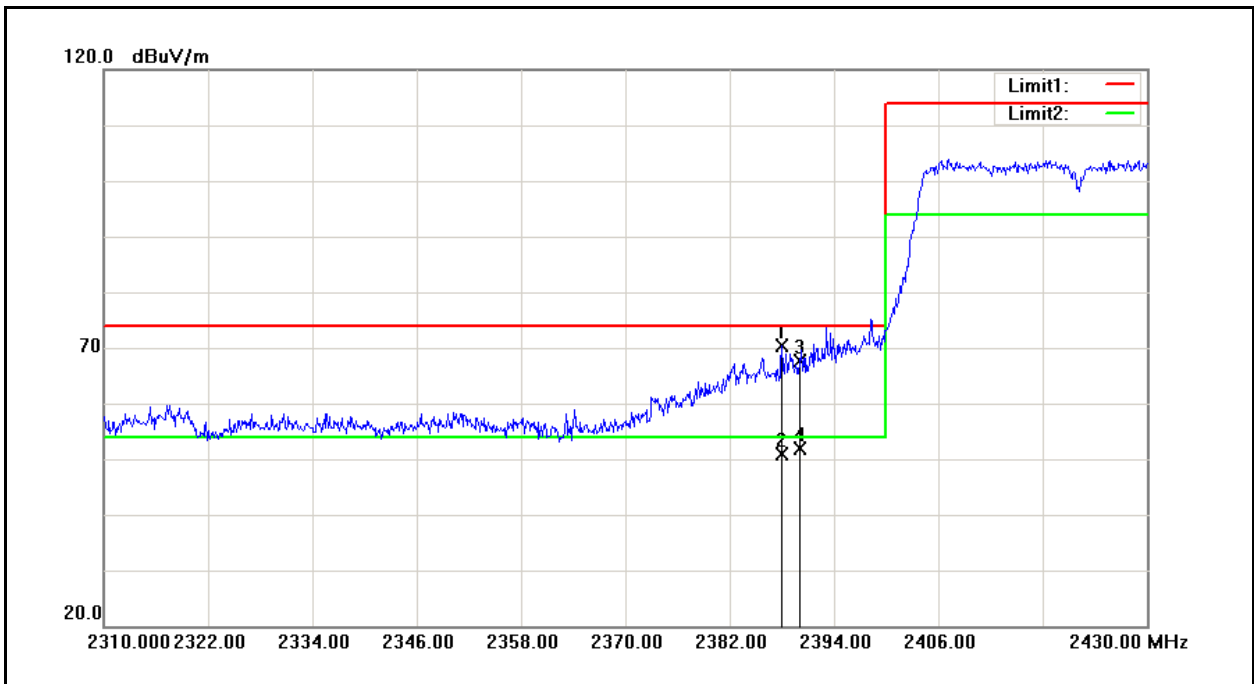
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	57.07	4.50	61.57	74.00	-12.43	peak
2	2483.500	44.89	4.50	49.39	54.00	-4.61	AVG
3	2483.920	61.36	4.51	65.87	74.00	-8.13	peak
4	2483.920	44.36	4.51	48.87	54.00	-5.13	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	12/04/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



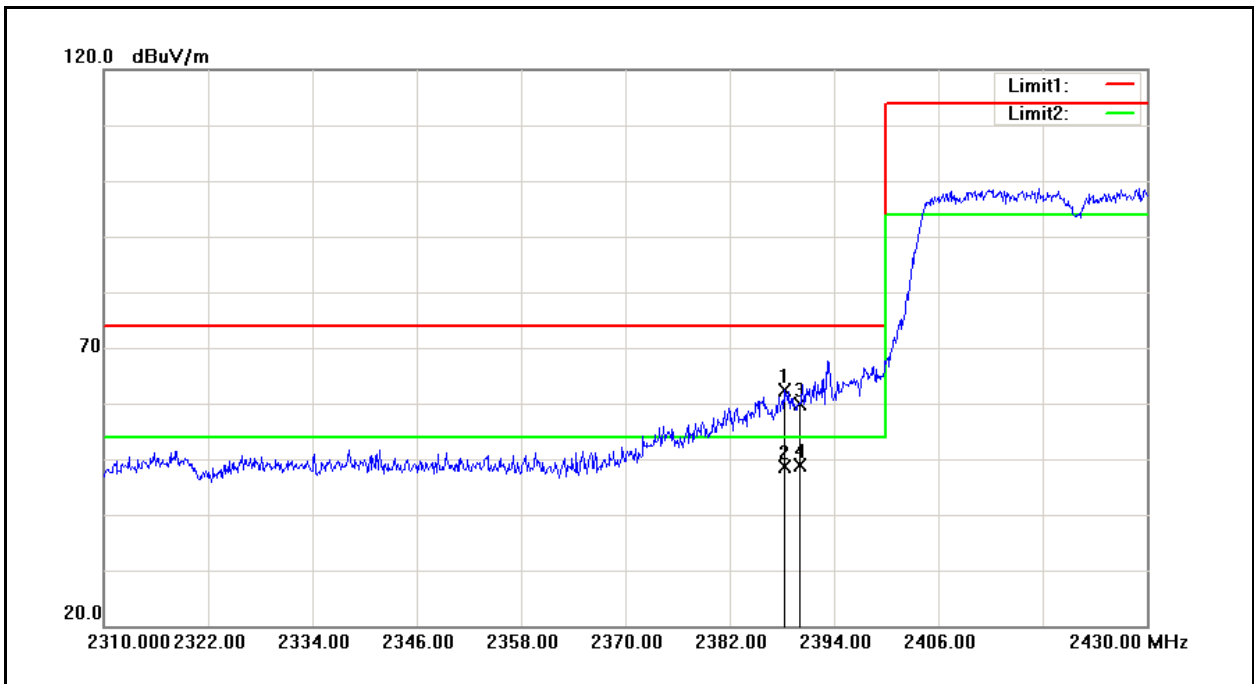
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	58.40	4.50	62.90	74.00	-11.10	peak
2	2483.500	40.36	4.50	44.86	54.00	-9.14	AVG
3	2483.920	57.27	4.51	61.78	74.00	-12.22	peak
4	2483.920	39.74	4.51	44.25	54.00	-9.75	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	5	Date:	12/04/2012
Frequency:	2422 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



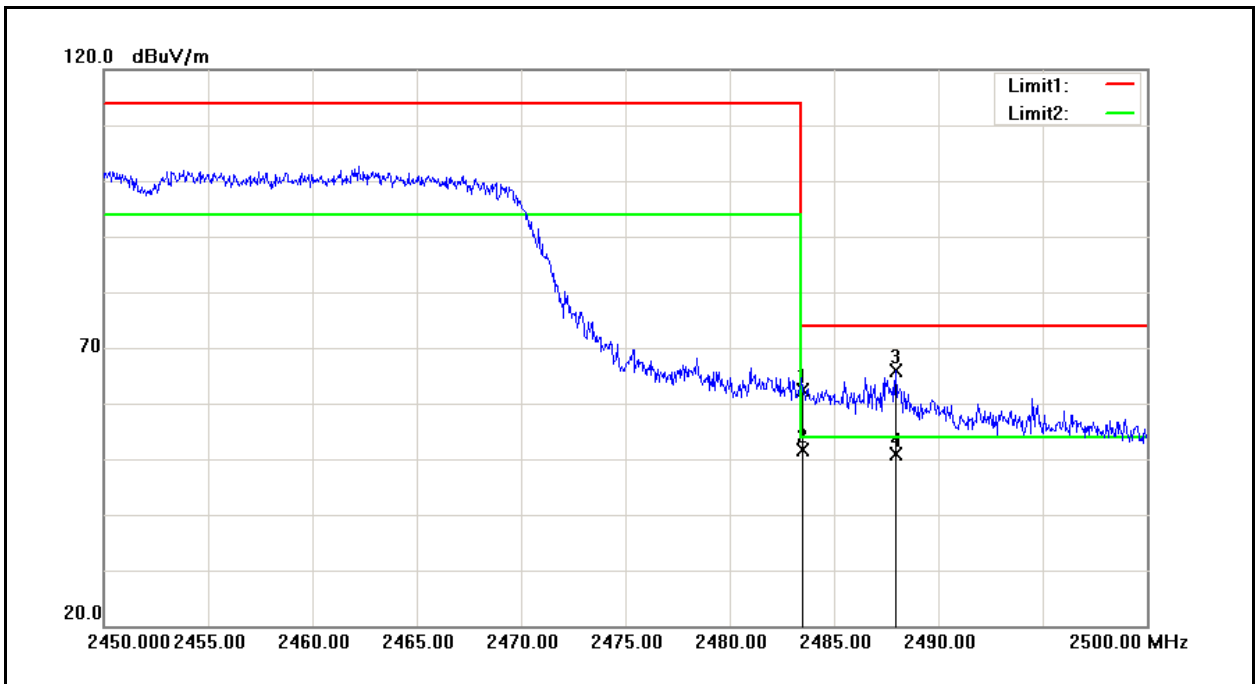
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.000	66.48	3.86	70.34	74.00	-3.66	peak
2	2388.000	47.03	3.86	50.89	54.00	-3.11	AVG
3	2390.000	63.85	3.88	67.73	74.00	-6.27	peak
4	2390.000	47.98	3.88	51.86	54.00	-2.14	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	5	Date:	12/04/2012
Frequency:	2422 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



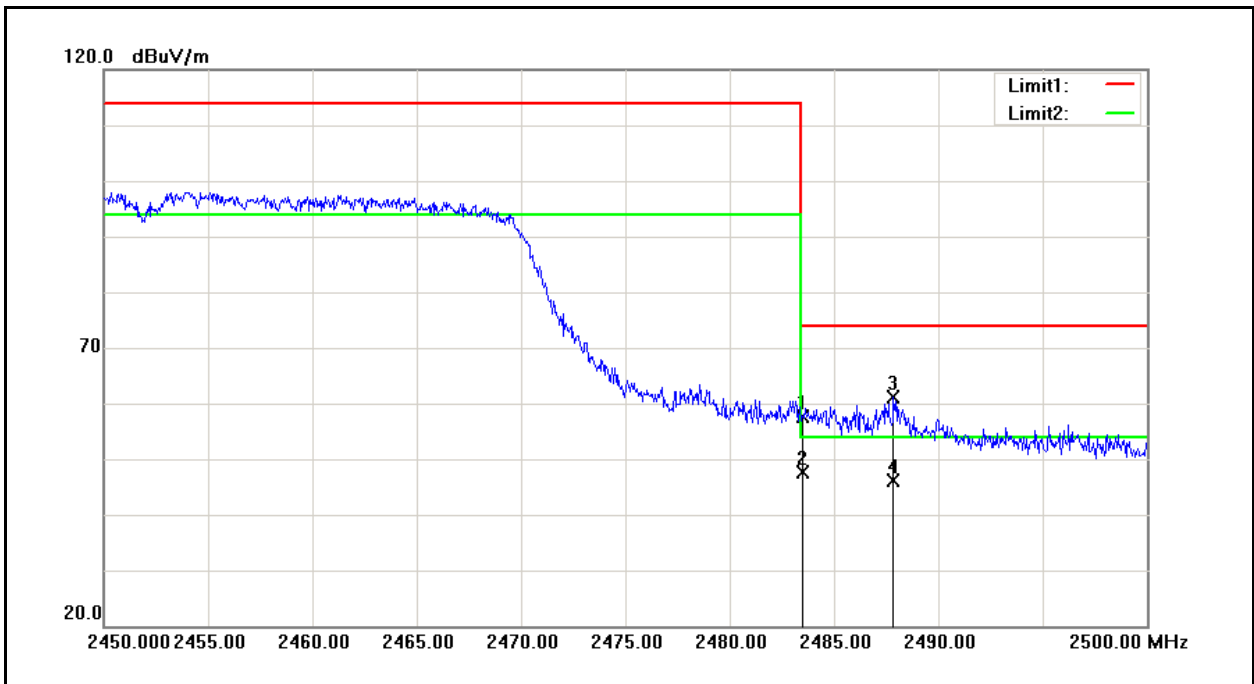
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.240	58.51	3.86	62.37	74.00	-11.63	peak
2	2388.240	44.75	3.86	48.61	54.00	-5.39	AVG
3	2390.000	55.91	3.88	59.79	74.00	-14.21	peak
4	2390.000	45.03	3.88	48.91	54.00	-5.09	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	5	Date:	12/04/2012
Frequency:	2452 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	57.80	4.50	62.30	74.00	-11.70	peak
2	2483.500	47.19	4.50	51.69	54.00	-2.31	AVG
3	2487.950	61.37	4.53	65.90	74.00	-8.10	peak
4	2487.950	46.25	4.53	50.78	54.00	-3.22	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	WN4622R	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	5	Date:	12/04/2012
Frequency:	2452 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



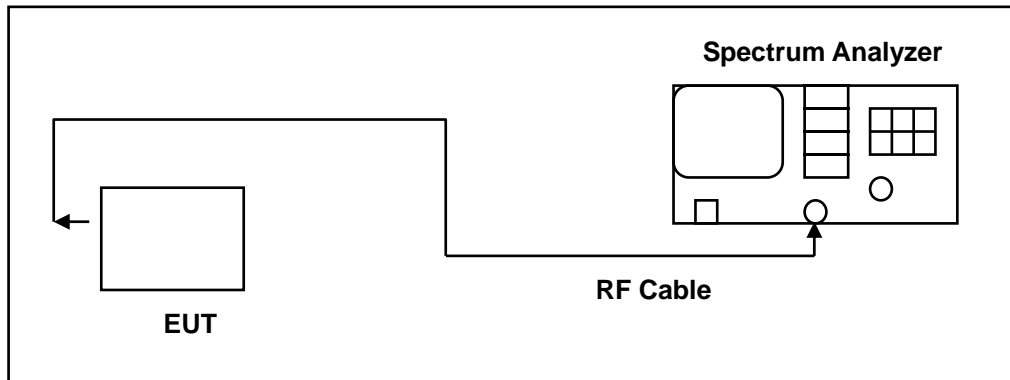
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	53.18	4.50	57.68	74.00	-16.32	peak
2	2483.500	43.08	4.50	47.58	54.00	-6.42	AVG
3	2487.850	56.58	4.53	61.11	74.00	-12.89	peak
4	2487.850	41.54	4.53	46.07	54.00	-7.93	AVG

## 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	12/21/2011	(2)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 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	WN4622R		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	12/05/2012	Test Site	TE05
	Frequency (MHz)	Measurement (MHz)	Limit (kHz)
	2412	15.0008	----
	2437	14.9524	----
	2462	14.9368	----

Model Number	WN4622R		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	12/05/2012	Test Site	TE05
	Frequency (MHz)	Measurement (MHz)	Limit (kHz)
	2412	16.3833	----
	2437	16.3598	----
	2462	16.4113	----

Model Number	WN4622R		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode		
Date of Test	12/05/2012	Test Site	TE05
	Frequency (MHz)	Measurement (MHz)	Limit (kHz)
	2412	17.4960	----
	2437	17.5011	----
	2462	17.4972	----

Model Number	WN4622R		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode		
Date of Test	12/05/2012	Test Site	TE05
	Frequency (MHz)	Measurement (MHz)	Limit (kHz)
	2422	35.8655	----
	2437	35.8661	----
	2452	35.8681	----

**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>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.42700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 15.0008 MHz Occ BW % PWR 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -36.334 kHz x dB Bandwidth 12.137 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	<p>Agilent T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 14.9524 MHz Occ BW % PWR 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -52.736 kHz x dB Bandwidth 12.125 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	<p>Agilent T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44700000 GHz</p> <p>Stop Freq 2.47700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 14.9368 MHz Occ BW % PWR 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -53.435 kHz x dB Bandwidth 12.140 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 3: IEEE 802.11g Link Mode

2412	 <p>Agilent T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.42700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 16.3833 MHz Occ BW % PMR 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -15.736 kHz x dB Bandwidth 16.505 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	 <p>Agilent T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 16.3598 MHz Occ BW % PMR 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -17.015 kHz x dB Bandwidth 16.550 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	 <p>Agilent T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44700000 GHz</p> <p>Stop Freq 2.47700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 16.4113 MHz Occ BW % PMR 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -29.370 kHz x dB Bandwidth 16.547 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

2412	<p><b>Agilent</b> T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.42700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>Peak Log 10 dB/Offst 10.8 dB</p> <p>Center 2.412 00 GHz Span 30 MHz</p> <p>Res BW 100 kHz VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> 17.4960 MHz</p> <p>Transmit Freq Error -6.166 kHz</p> <p>x dB Bandwidth 17.648 MHz</p> <p>Occ BW % PMR x dB 99.00 % -6.00 dB</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	<p><b>Agilent</b> T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>Peak Log 10 dB/Offst 10.8 dB</p> <p>Center 2.437 00 GHz Span 30 MHz</p> <p>Res BW 100 kHz VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> 17.5011 MHz</p> <p>Transmit Freq Error -12.942 kHz</p> <p>x dB Bandwidth 17.642 MHz</p> <p>Occ BW % PMR x dB 99.00 % -6.00 dB</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	<p><b>Agilent</b> T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44700000 GHz</p> <p>Stop Freq 2.47700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>Peak Log 10 dB/Offst 10.8 dB</p> <p>Center 2.462 00 GHz Span 30 MHz</p> <p>Res BW 100 kHz VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> 17.4972 MHz</p> <p>Transmit Freq Error -17.125 kHz</p> <p>x dB Bandwidth 17.620 MHz</p> <p>Occ BW % PMR x dB 99.00 % -6.00 dB</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode

2412	<p>Agilent T</p> <p>Ch Freq 2.422 GHz Trig Free</p> <p>Center Freq 2.42200000 GHz</p> <p>Start Freq 2.39200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 6.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 35.8655 MHz Occ BW % PMR 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -25.922 kHz</p> <p>x dB Bandwidth 36.468 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	<p>Agilent T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.40700000 GHz</p> <p>Stop Freq 2.46700000 GHz</p> <p>CF Step 6.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 35.8661 MHz Occ BW % PMR 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -35.881 kHz</p> <p>x dB Bandwidth 36.471 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	<p>Agilent T</p> <p>Ch Freq 2.452 GHz Trig Free</p> <p>Center Freq 2.45200000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.48200000 GHz</p> <p>CF Step 6.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 35.8681 MHz Occ BW % PMR 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -42.905 kHz</p> <p>x dB Bandwidth 36.442 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</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 METAL STAMPING ANTENNA. And the maximum Gain of this antenna is 3.51 dBi.