

## FCC 47 CFR PART 15 SUBPART C

Product Type : Wireless Mobile Hotspot  
Applicant : Sierra Wireless, Inc.  
Address : 13811 Wireless Way, Richmond, BC, Canada, V6V 3A4  
Trade Name : AirCard  
Model Number : AirCard 770S  
Test Specification : FCC 47 CFR PART 15 SUBPART C: Oct., 2011  
ANSI C63.4-2009  
Application Purpose : Original  
Receive Date : Oct. 09, 2012  
Test Period : Oct. 09 ~ Nov. 19, 2012  
Issue Date : Nov. 22, 2012

### Issue by

A Test Lab Techno Corp.  
No. 140-1, Changan Street, Bade City,  
Taoyuan County 334, Taiwan R.O.C.  
Tel : +886-3-2710188 / Fax : +886-3-2710190



Taiwan Accreditation Eoundation accreditation number: 1330

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**Revision History**

Rev.	Issue Date	Revisions	Revised By
00	Nov. 21, 2012	Initial Issue	
01	Nov. 22, 2012	Revised report format.	Joyce Liao

## Verification of Compliance

Issued Date: 11/21/2011

Product Type : Wireless Mobile Hotspot  
Applicant : Sierra Wireless, Inc.  
Address : 13811 Wireless Way, Richmond, BC, Canada, V6V 3A4  
Trade Name : AirCard  
Model Number : AirCard 770S  
FCC ID : N7NAC770S  
Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2011  
ANSI C63.4-2009  
Test Result : Complied  
Application Purpose : Original  
Performing Lab. : A Test Lab Techno Corp.

No. 140-1, Changan Street, Bade City,  
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<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)

(Murphy Wang)

Reviewed By



(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	Wireless Mobile Hotspot
Trade Name	AirCard
Model No.	AirCard 770S
Applicant	Sierra Wireless, Inc. 13811 Wireless Way, Richmond, BC, Canada, V6V 3A4
Manufacturer	Sierra Wireless, Inc. 13811 Wireless Way, Richmond, BC, Canada, V6V 3A4
FCC ID	N7NAC770S
Frequency Range	2412 ~ 2462 MHz
Modulation Type	IEEE 802.11b:DSSS IEEE 802.11g:DSSS + OFDM IEEE 802.11n 2.4GHz 20MHz: OFDM
RF Output Power	IEEE 802.11b: 0.008 W / 8.76 dBm IEEE 802.11g: 0.008 W / 8.83 dBm IEEE 802.11n 2.4GHz 20MHz: 0.006 W / 7.46 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: IEEE 802.11n 2.4GHz 20MHz Link Mode
Mode 5: 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.

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.

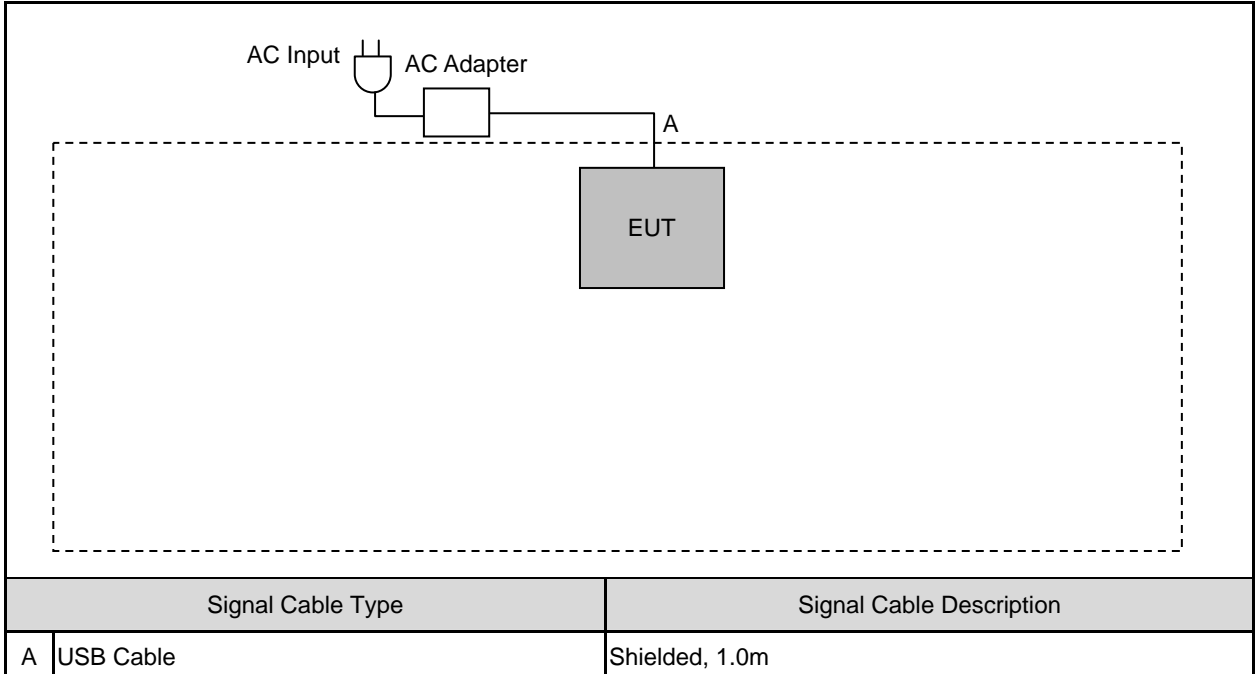
#### 3.2. EUT Exercise Software

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.

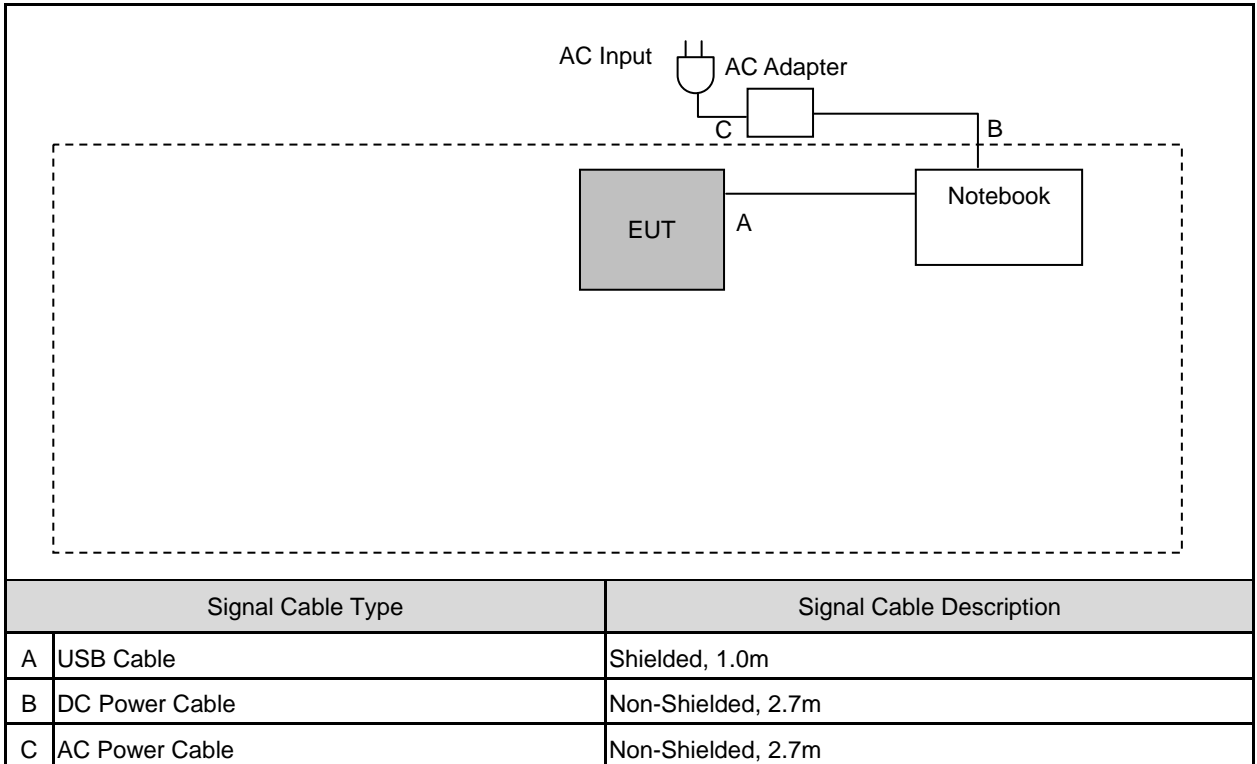


### 3.3. Configuration of Test System Details

#### Conducted Emission



#### Radiated Emission



**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

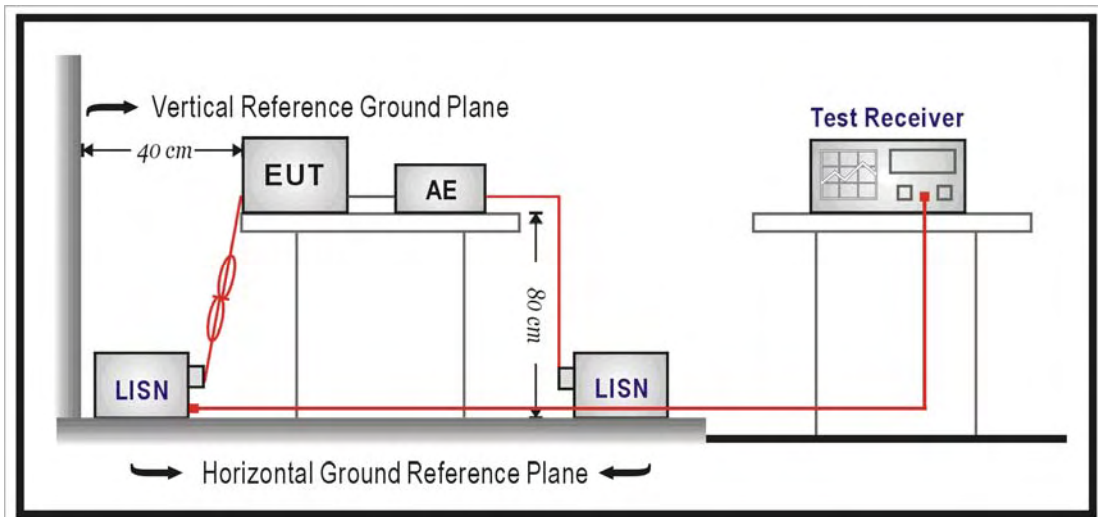
### 4.2. Test Instruments

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

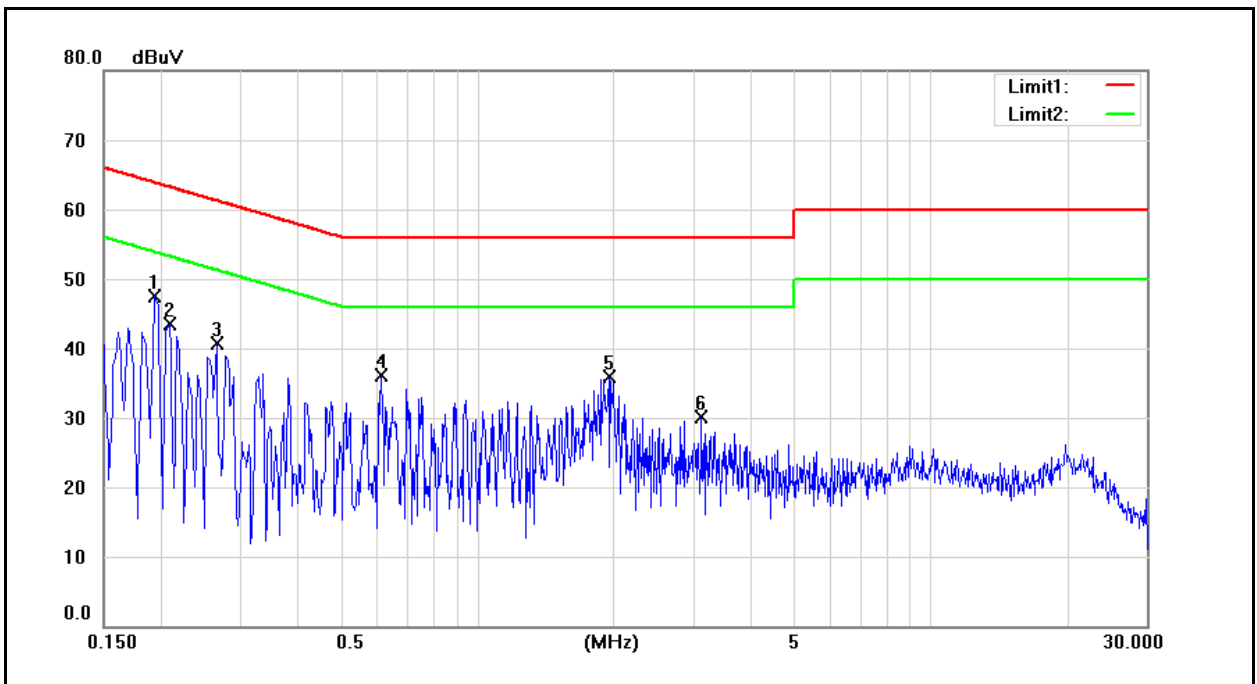
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

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.

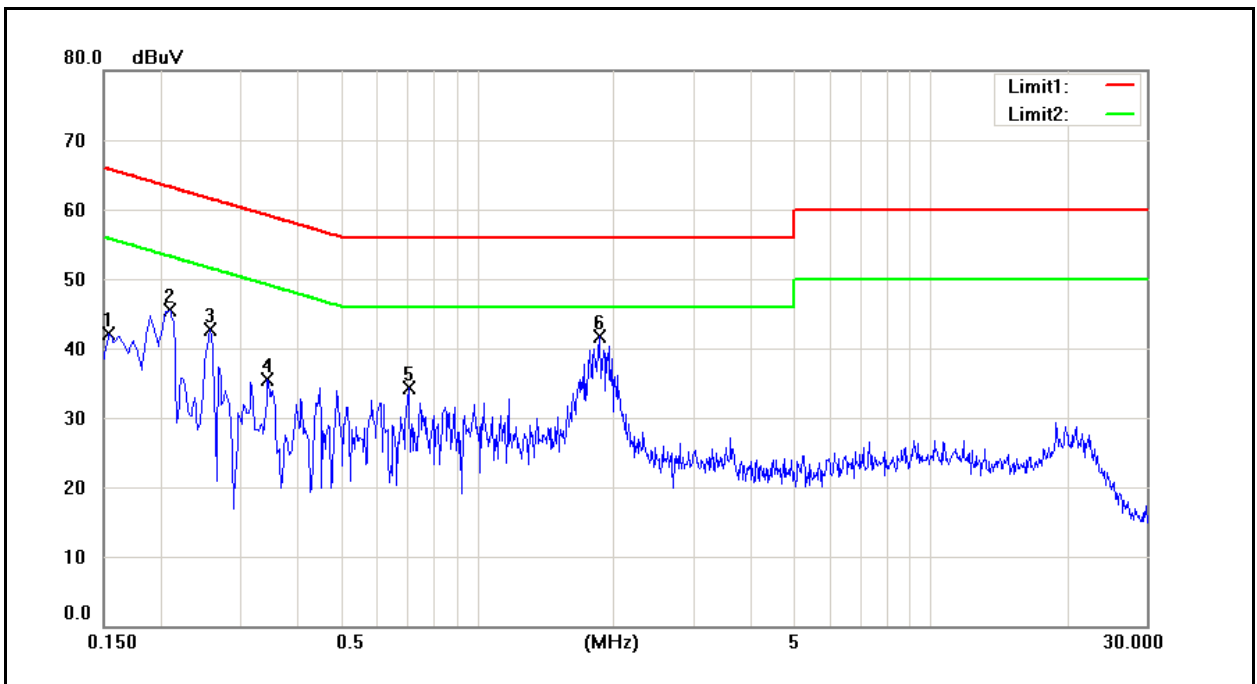
**4.5. Test Result**

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	10/09/2012
		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	0.1940	35.16	18.85	9.72	44.88	28.57	63.86	53.86	-18.98	-25.29	Pass
2	0.2100	34.93	18.37	9.72	44.65	28.09	63.21	53.21	-18.56	-25.12	Pass
3	0.2660	26.46	9.69	9.72	36.18	19.41	61.24	51.24	-25.06	-31.83	Pass
4	0.6140	22.75	6.25	9.72	32.47	15.97	56.00	46.00	-23.53	-30.03	Pass
5	1.9500	20.62	11.34	9.80	30.42	21.14	56.00	46.00	-25.58	-24.86	Pass
6	3.1300	11.25	2.53	9.83	21.08	12.36	56.00	46.00	-34.92	-33.64	Pass

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	10/09/2012
		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	0.1540	28.06	14.65	9.65	37.71	24.30	65.78	55.78	-28.07	-31.48	Pass
2	0.2100	30.11	15.23	9.64	39.75	24.87	63.21	53.21	-23.46	-28.34	Pass
3	0.2580	26.89	10.45	9.64	36.53	20.09	61.50	51.50	-24.97	-31.41	Pass
4	0.3460	17.04	4.40	9.64	26.68	14.04	59.06	49.06	-32.38	-35.02	Pass
5	0.7060	20.13	8.37	9.66	29.79	18.03	56.00	46.00	-26.21	-27.97	Pass
6	1.8660	24.12	15.62	9.71	33.83	25.33	56.00	46.00	-22.17	-20.67	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

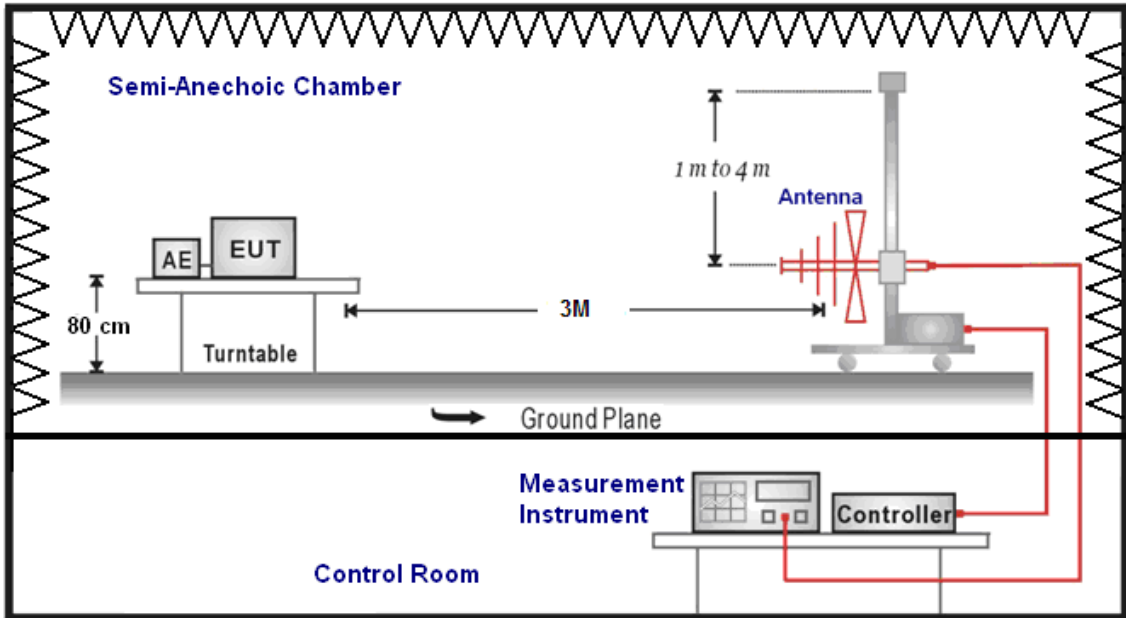
3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/16/2012	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/16/2012	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/22/2012	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/22/2012	(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	12/20/2011	(1)

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

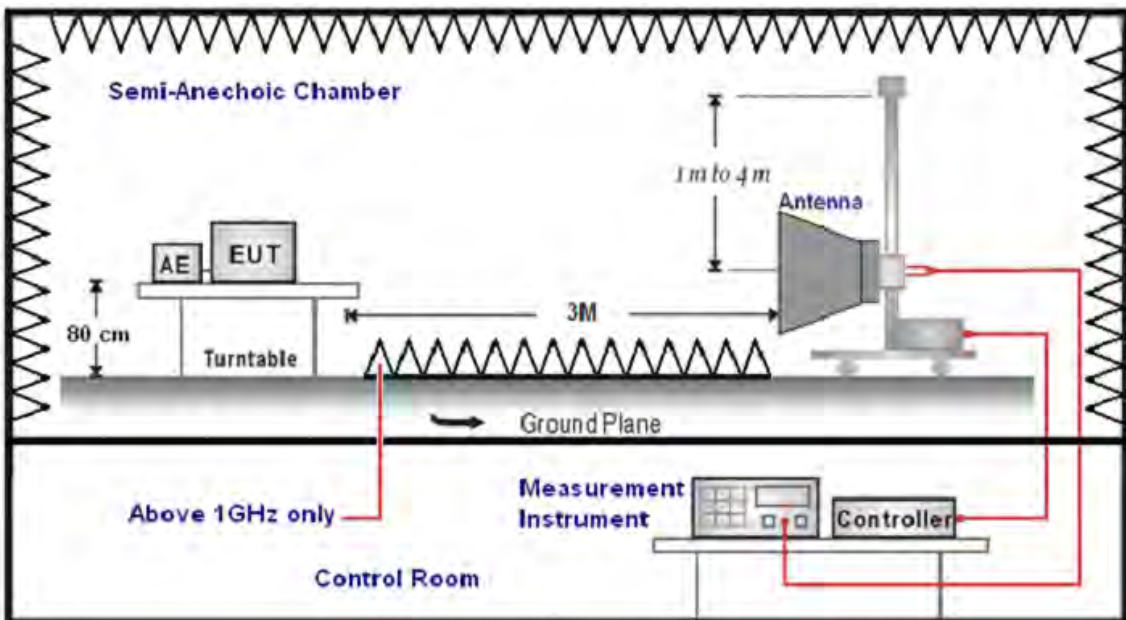
Note: N.C.R. = No Calibration Request.

### 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:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	11/19/2012
		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
147.5000	49.93	-17.27	32.66	43.50	-10.84	QP	H
286.5000	41.65	-10.95	30.70	46.00	-15.30	QP	H
498.0000	36.56	-6.84	29.72	46.00	-16.28	QP	H
615.5000	34.77	-4.72	30.05	46.00	-15.95	QP	H
766.5000	31.03	-2.17	28.86	46.00	-17.14	QP	H
909.5000	33.07	0.56	33.63	46.00	-12.37	QP	H
195.0000	42.38	-13.85	28.53	43.50	-14.97	QP	V
325.0000	38.22	-9.68	28.54	46.00	-17.46	QP	V
472.5000	35.76	-7.44	28.32	46.00	-17.68	QP	V
624.0000	34.98	-4.55	30.43	46.00	-15.57	QP	V
779.5000	30.62	-1.95	28.67	46.00	-17.33	QP	V
909.5000	35.28	0.56	35.84	46.00	-10.16	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:	AirCard 770S			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	11/19/2012		
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
2967.000	37.09	5.82	42.91	74.00	-31.09	peak	H
4824.000	41.90	11.71	53.61	74.00	-20.39	peak	H
4824.000	37.89	11.71	49.60	54.00	-4.40	AVG	H
6005.000	32.67	15.90	48.57	74.00	-25.43	peak	H
2939.000	38.16	5.75	43.91	74.00	-30.09	peak	V
4824.000	42.51	11.71	54.22	74.00	-19.78	peak	V
4824.000	41.17	11.71	52.88	54.00	-1.12	AVG	V
6075.000	33.61	16.11	49.72	74.00	-24.28	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	AirCard 770S			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	11/19/2012		
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
3177.000	36.82	6.30	43.12	74.00	-30.88	peak	H
4874.000	39.55	11.84	51.39	74.00	-22.61	peak	H
6061.000	33.68	16.07	49.75	74.00	-24.25	peak	H
3107.000	37.86	6.14	44.00	74.00	-30.00	peak	V
4874.000	40.45	11.84	52.29	74.00	-21.71	peak	V
4874.000	39.30	11.84	51.14	54.00	-2.86	AVG	V
5921.000	33.67	15.63	49.30	74.00	-24.70	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	AirCard 770S			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	11/19/2012		
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
2981.000	37.87	5.86	43.73	74.00	-30.27	peak	H
4924.000	38.45	11.97	50.42	74.00	-23.58	peak	H
5879.000	33.52	15.52	49.04	74.00	-24.96	peak	H
2967.000	37.50	5.82	43.32	74.00	-30.68	peak	V
4924.000	41.35	11.97	53.32	74.00	-20.68	peak	V
4924.000	38.41	11.97	50.38	54.00	-3.62	AVG	V
5858.000	33.41	15.44	48.85	74.00	-25.15	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	AirCard 770S			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	11/19/2012		
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
3142.000	37.57	6.22	43.79	74.00	-30.21	peak	H
4824.000	43.39	11.71	55.10	74.00	-18.90	peak	H
4824.000	34.08	11.71	45.79	54.00	-8.21	AVG	H
5970.000	33.16	15.78	48.94	74.00	-25.06	peak	H
3247.000	37.51	6.45	43.96	74.00	-30.04	peak	V
4824.000	47.01	11.71	58.72	74.00	-15.28	peak	V
4824.000	38.95	11.71	50.66	54.00	-3.34	AVG	V
7236.000	40.03	20.32	60.35	74.00	-13.65	peak	V
7236.000	31.13	20.32	51.45	54.00	-2.55	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	AirCard 770S			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	11/19/2012		
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
3170.000	37.80	6.28	44.08	74.00	-29.92	peak	H
4874.000	42.73	11.84	54.57	74.00	-19.43	peak	H
4874.000	34.24	11.84	46.08	54.00	-7.92	AVG	H
5991.000	33.45	15.85	49.30	74.00	-24.70	peak	H
3079.000	37.37	6.08	43.45	74.00	-30.55	peak	V
4874.000	46.37	11.84	58.21	74.00	-15.79	peak	V
4874.000	38.29	11.84	50.13	54.00	-3.87	AVG	V
7311.000	39.75	20.46	60.21	74.00	-13.79	peak	V
7311.000	29.95	20.46	50.41	54.00	-3.59	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	AirCard 770S			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	11/19/2012		
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
3310.000	37.78	6.58	44.36	74.00	-29.64	peak	H
4924.000	46.65	11.97	58.62	74.00	-15.38	peak	H
4924.000	35.15	11.97	47.12	54.00	-6.88	AVG	H
7386.000	35.57	20.59	56.16	74.00	-17.84	peak	H
7386.000	27.27	20.59	47.86	54.00	-6.14	AVG	H
3170.000	37.30	6.28	43.58	74.00	-30.42	peak	V
4924.000	45.24	11.97	57.21	74.00	-16.79	peak	V
4924.000	36.37	11.97	48.34	54.00	-5.66	AVG	V
7386.000	40.72	20.59	61.31	74.00	-12.69	peak	V
7386.000	30.66	20.59	51.25	54.00	-2.75	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	AirCard 770S			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	11/19/2012		
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
3205.000	37.81	6.36	44.17	74.00	-29.83	peak	H
4824.000	49.24	11.71	60.95	74.00	-13.05	peak	H
4824.000	34.59	11.71	46.30	54.00	-7.70	AVG	H
7236.000	36.02	20.32	56.34	74.00	-17.66	peak	H
7236.000	26.99	20.32	47.31	54.00	-6.69	AVG	H
3289.000	37.44	6.55	43.99	74.00	-30.01	peak	V
4824.000	48.16	11.71	59.87	74.00	-14.13	peak	V
4824.000	38.27	11.71	49.98	54.00	-4.02	AVG	V
7236.000	43.79	20.32	64.11	74.00	-9.89	peak	V
7236.000	31.07	20.32	51.39	54.00	-2.61	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	AirCard 770S			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	11/19/2012		
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
3366.000	37.01	6.72	43.73	74.00	-30.27	peak	H
4874.000	43.39	11.84	55.23	74.00	-18.77	peak	H
4874.000	33.45	11.84	45.29	54.00	-8.71	AVG	H
7311.000	35.89	20.46	56.35	74.00	-17.65	peak	H
7311.000	26.36	20.46	46.82	54.00	-7.18	AVG	H
3135.000	38.80	6.21	45.01	74.00	-28.99	peak	V
4874.000	47.01	11.84	58.85	74.00	-15.15	peak	V
4874.000	35.97	11.84	47.81	54.00	-6.19	AVG	V
7311.000	39.91	20.46	60.37	74.00	-13.63	peak	V
7311.000	30.07	20.46	50.53	54.00	-3.47	AVG	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	11/19/2012
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
3289.000	36.90	6.55	43.45	74.00	-30.55	peak	H
4924.000	45.30	11.97	57.27	74.00	-16.73	peak	H
4924.000	33.77	11.97	45.74	54.00	-8.26	AVG	H
7386.000	36.06	20.59	56.65	74.00	-17.35	peak	H
7386.000	25.96	20.59	46.55	54.00	-7.45	AVG	H
3303.000	37.29	6.57	43.86	74.00	-30.14	peak	V
4924.000	47.82	11.97	59.79	74.00	-14.21	peak	V
4924.000	36.26	11.97	48.23	54.00	-5.77	AVG	V
7386.000	41.35	20.59	61.94	74.00	-12.06	peak	V
7386.000	30.12	20.59	50.71	54.00	-3.29	AVG	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	5	Date:	11/19/2012
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
3023.000	36.09	5.96	42.05	74.00	54.00	-31.95	peak	H
4570.000	34.23	11.06	45.29	74.00	54.00	-28.71	peak	H
6383.000	32.41	17.06	49.47	74.00	54.00	-24.53	peak	H
2967.000	36.95	5.82	42.77	74.00	54.00	-31.23	peak	V
4570.000	33.83	11.06	44.89	74.00	54.00	-29.11	peak	V
6299.000	34.00	16.80	50.80	74.00	54.00	-23.20	peak	V

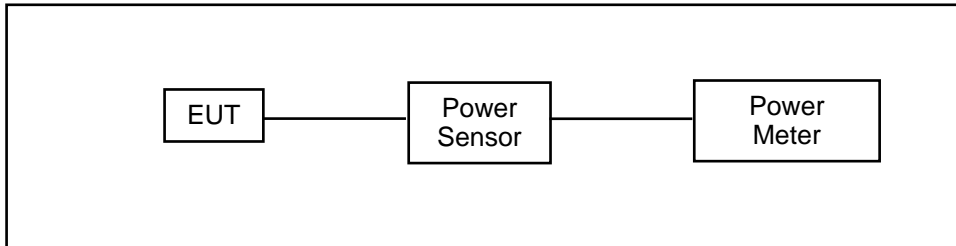


## 6 Maximum Conducted Output Power Measurement

### 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 (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		AirCard 770S				
Test Item		Maximum Conducted Output Power				
Test Mode		Mode 2: IEEE 802.11b Link Mode				
Date of Test		10/09/2012		Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	1 M	8.27	0.007	10.96	0.012	< 30
2437		8.76	0.008	<b>11.65</b>	<b>0.015</b>	< 30
2462		8.55	0.007	11.36	0.014	< 30
2412	11 M	8.05	0.006	11.11	0.013	< 30
2437		8.59	0.007	11.57	0.014	< 30
2462		8.43	0.007	11.52	0.014	< 30

Model Number		AirCard 770S				
Test Item		Maximum Conducted Output Power				
Test Mode		Mode 3: IEEE 802.11g Link Mode				
Date of Test		10/09/2012		Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	6 M	7.85	0.006	17.43	0.055	< 30
2437		8.32	0.007	17.78	0.060	< 30
2462		8.83	0.008	<b>18.19</b>	<b>0.066</b>	< 30
2412	54 M	7.63	0.006	17.35	0.054	< 30
2437		7.68	0.006	17.45	0.056	< 30
2462		7.35	0.005	17.68	0.059	< 30

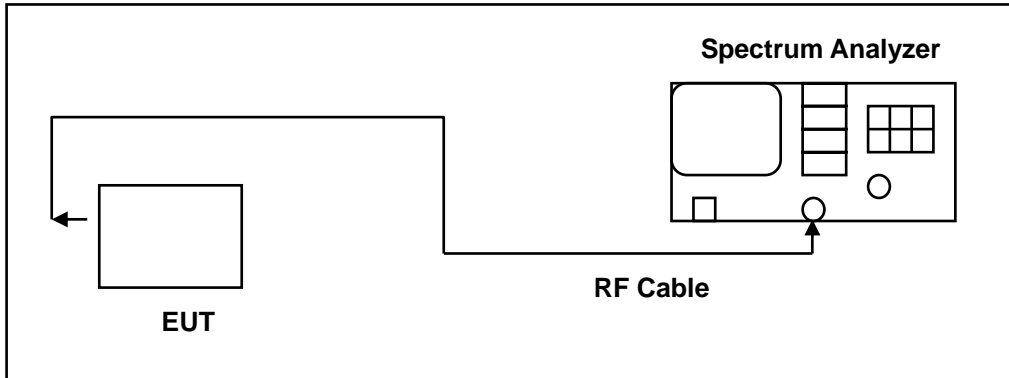
Model Number		AirCard 770S				
Test Item		Maximum Conducted Output Power				
Test Mode		Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode				
Date of Test		10/09/2012		Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	6.5 M	7.36	0.005	17.10	0.051	< 30
2437		7.34	0.005	16.50	0.045	< 30
2462		7.46	0.006	<b>17.15</b>	<b>0.052</b>	< 30
2412	65 M	6.28	0.004	16.71	0.047	< 30
2437		7.08	0.005	16.78	0.048	< 30
2462		6.01	0.004	16.01	0.040	< 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)

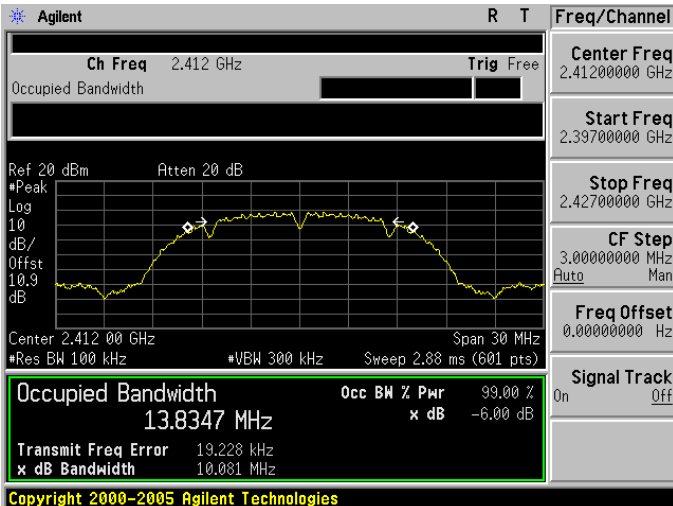
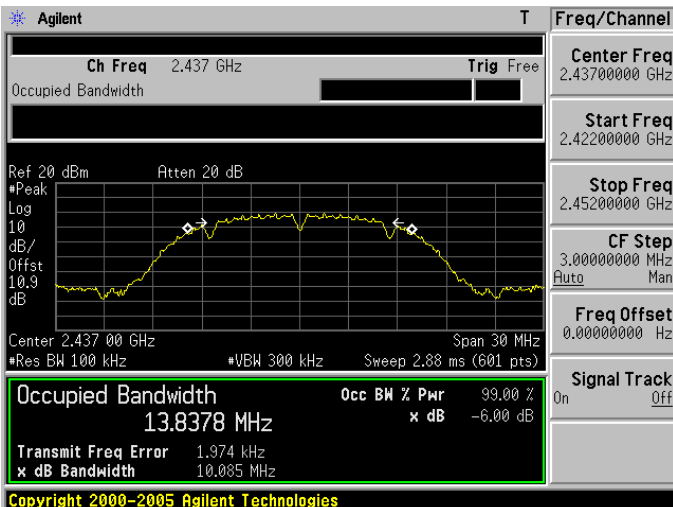
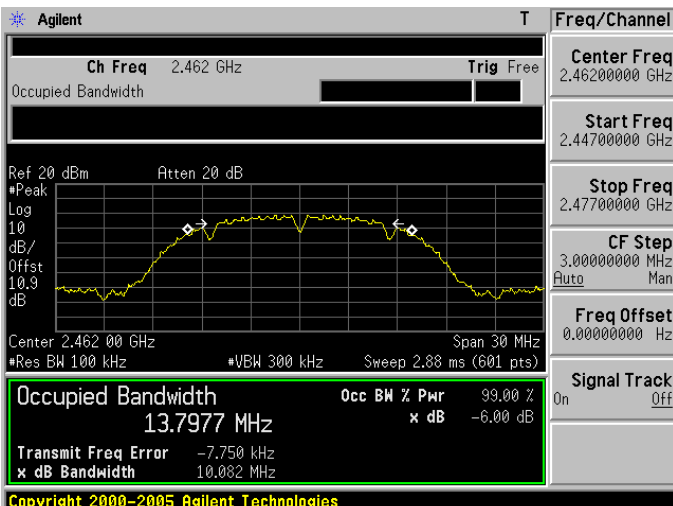
**7.5. Test Result**

Model Number	AirCard 770S		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	11/19/2012	Test Site	TE05
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	10081	> 500
	2437	10085	> 500
	2462	10082	> 500

Model Number	AirCard 770S		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	11/19/2012	Test Site	TE06
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	16349	> 500
	2437	16348	> 500
	2462	16355	> 500

Model Number	AirCard 770S		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode		
Date of Test	11/19/2012	Test Site	TE05
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	17117	> 500
	2437	17107	> 500
	2462	17330	> 500

**7.6. Test Graphs**

Mode 2: IEEE 802.11b Link Mode	
2412	
2437	
2462	

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 10.9</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><b>Occupied Bandwidth 16.4031 MHz</b></p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -6.00 dB</p> <p>Transmit Freq Error -9.070 kHz</p> <p>x dB Bandwidth 16.349 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 10.9</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><b>Occupied Bandwidth 16.4387 MHz</b></p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -6.00 dB</p> <p>Transmit Freq Error -16.935 kHz</p> <p>x dB Bandwidth 16.348 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 10.9</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><b>Occupied Bandwidth 16.4343 MHz</b></p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -6.00 dB</p> <p>Transmit Freq Error -15.752 kHz</p> <p>x dB Bandwidth 16.355 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>

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

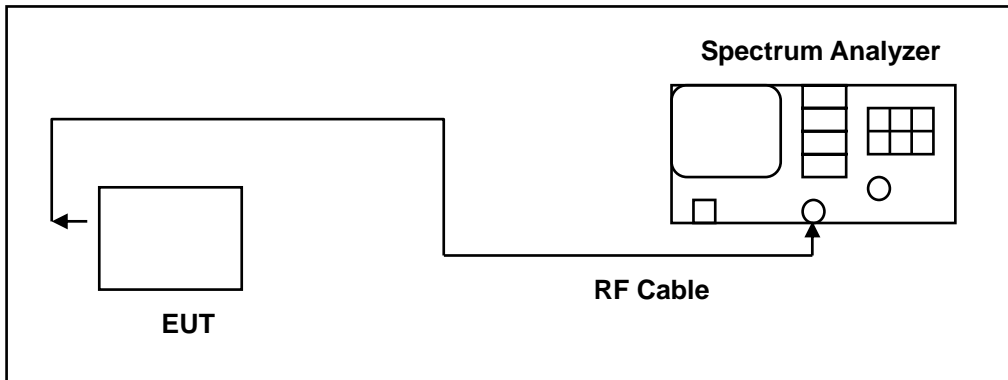
2412	<p>Agilent T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Atten 20 dB</p> <p>Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.9</p> <p>dB</p> <p>Center 2.412 00 GHz Span 30 MHz</p> <p>Res BW 100 kHz VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 %</p> <p><b>17.6235 MHz</b> x dB -6.00 dB</p> <p>Transmit Freq Error 1.511 kHz</p> <p>x dB Bandwidth 17.117 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</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>
2437	<p>Agilent R 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>10.9</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><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 %</p> <p><b>17.6215 MHz</b> x dB -6.00 dB</p> <p>Transmit Freq Error -2.853 kHz</p> <p>x dB Bandwidth 17.107 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</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>
2462	<p>Agilent T</p> <p>Ch Freq 2.462 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>10.9</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><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 %</p> <p><b>17.6161 MHz</b> x dB -6.00 dB</p> <p>Transmit Freq Error -6.557 kHz</p> <p>x dB Bandwidth 17.330 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</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>

## 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	AirCard 770S			
Test Item	Maximum Power Density			
Test Mode	Mode 2: IEEE 802.11b Link Mode			
Date of Test	11/19/2012		Test Site	TE05
Frequency (MHz)	Reading (dBm/100KHz)	BWCF (dB)	Results (dBm/3KHz)	Limit (dBm)
2412	-1.58	-15.30	-16.78	< 8
2437	-0.86	-15.30	-16.06	< 8
2462	-1.02	-15.30	-16.22	< 8

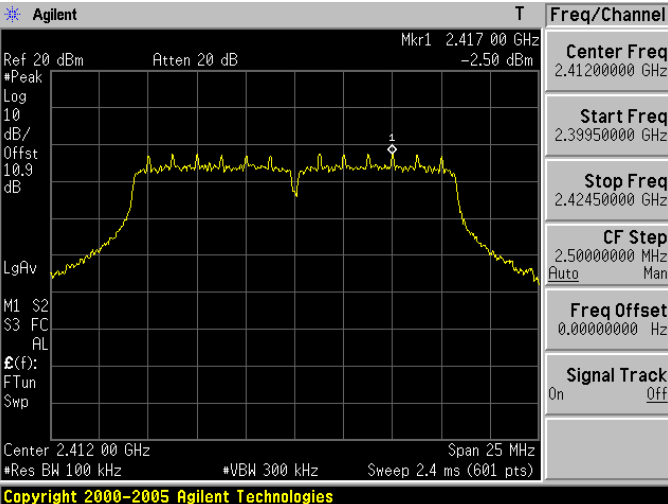
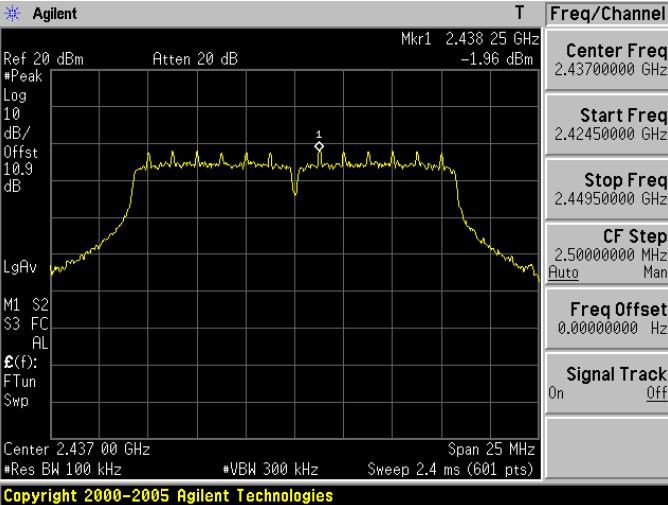
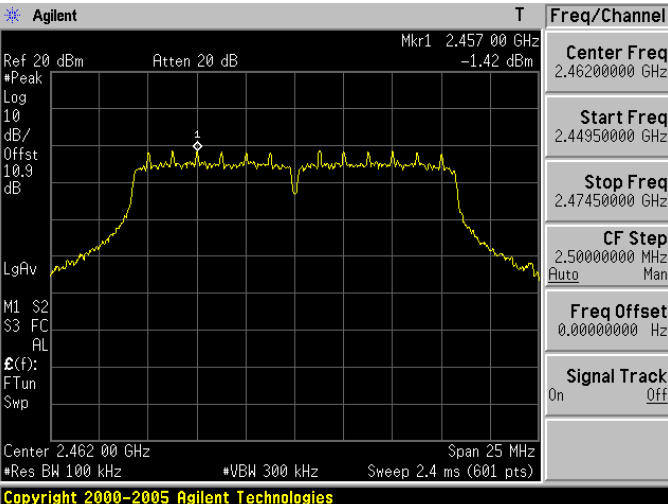
Model Number	AirCard 770S			
Test Item	Maximum Power Density			
Test Mode	Mode 3: IEEE 802.11g Link Mode			
Date of Test	11/19/2012		Test Site	TE05
Frequency (MHz)	Reading (dBm/100KHz)	BWCF (dB)	Results (dBm/3KHz)	Limit (dBm)
2412	-2.50	-15.30	-17.70	< 8
2437	-1.96	-15.30	-17.16	< 8
2462	-1.42	-15.30	-16.62	< 8

Model Number	AirCard 770S			
Test Item	Maximum Power Density			
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode			
Date of Test	11/19/2012		Test Site	TE05
Frequency (MHz)	Reading (dBm/100KHz)	BWCF (dB)	Results (dBm/3KHz)	Limit (dBm)
2412	-2.96	-15.30	-18.16	< 8
2437	-2.74	-15.30	-17.94	< 8
2462	-2.85	-15.30	-18.05	< 8

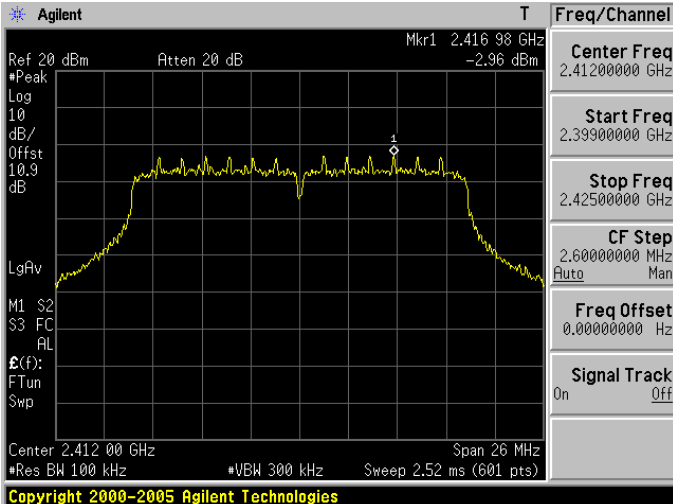
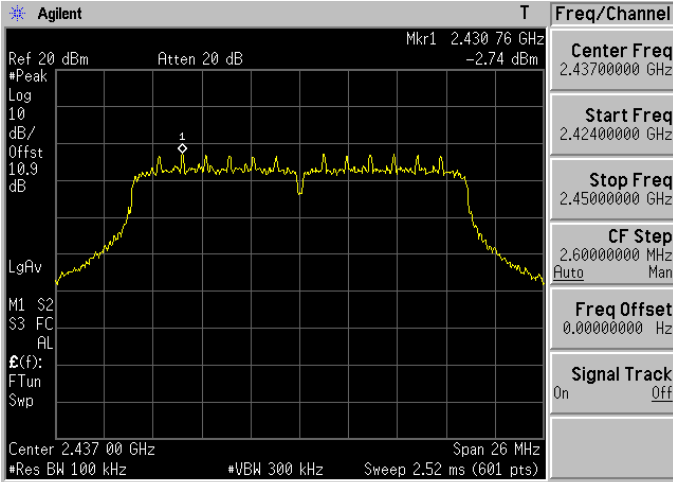
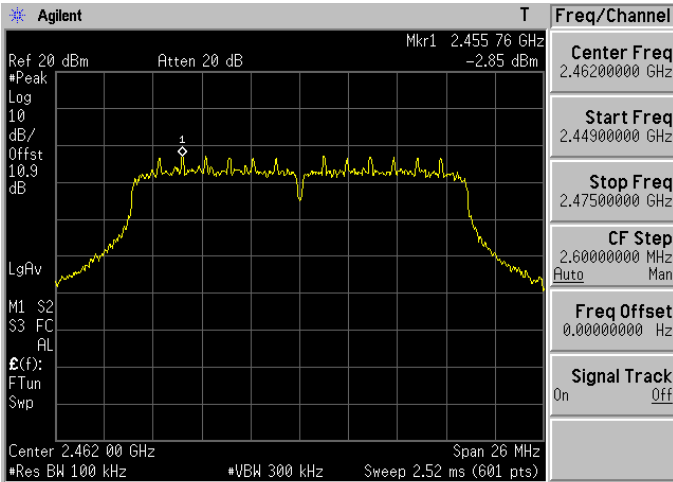
**8.6. Test Graphs**

Mode 2: IEEE 802.11b Link Mode															
2412	<table border="1" style="width: 100%; border-collapse: collapse;"> <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>2.40450000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.41950000 GHz</td> </tr> <tr> <td>CF Step</td> <td>1.50000000 MHz 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> <p style="font-size: small;">Copyright 2000-2005 Agilent Technologies</p>	Freq/Channel		Center Freq	2.41200000 GHz	Start Freq	2.40450000 GHz	Stop Freq	2.41950000 GHz	CF Step	1.50000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel															
Center Freq	2.41200000 GHz														
Start Freq	2.40450000 GHz														
Stop Freq	2.41950000 GHz														
CF Step	1.50000000 MHz Auto Man														
Freq Offset	0.00000000 Hz														
Signal Track	On Off														
2437	<table border="1" style="width: 100%; border-collapse: collapse;"> <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>2.42950000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.44450000 GHz</td> </tr> <tr> <td>CF Step</td> <td>1.50000000 MHz 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> <p style="font-size: small;">Copyright 2000-2005 Agilent Technologies</p>	Freq/Channel		Center Freq	2.43700000 GHz	Start Freq	2.42950000 GHz	Stop Freq	2.44450000 GHz	CF Step	1.50000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel															
Center Freq	2.43700000 GHz														
Start Freq	2.42950000 GHz														
Stop Freq	2.44450000 GHz														
CF Step	1.50000000 MHz Auto Man														
Freq Offset	0.00000000 Hz														
Signal Track	On Off														
2462	<table border="1" style="width: 100%; border-collapse: collapse;"> <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>2.45450000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.46950000 GHz</td> </tr> <tr> <td>CF Step</td> <td>1.50000000 MHz 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> <p style="font-size: small;">Copyright 2000-2005 Agilent Technologies</p>	Freq/Channel		Center Freq	2.46200000 GHz	Start Freq	2.45450000 GHz	Stop Freq	2.46950000 GHz	CF Step	1.50000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel															
Center Freq	2.46200000 GHz														
Start Freq	2.45450000 GHz														
Stop Freq	2.46950000 GHz														
CF Step	1.50000000 MHz Auto Man														
Freq Offset	0.00000000 Hz														
Signal Track	On Off														

Mode 3: IEEE 802.11g Link Mode

<p>2412</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.417 00 GHz -2.50 dBm</p> <p>*Peak Log 10 dB/ Offst 10.9 dB</p> <p>LgAv</p> <p>M1 S2 S3 FC AL</p> <p><math>\mathcal{E}(f)</math>: FTun Swp</p> <p>Center 2.412 00 GHz Span 25 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <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 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														
<p>2437</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.438 25 GHz -1.96 dBm</p> <p>*Peak Log 10 dB/ Offst 10.9 dB</p> <p>LgAv</p> <p>M1 S2 S3 FC AL</p> <p><math>\mathcal{E}(f)</math>: FTun Swp</p> <p>Center 2.437 00 GHz Span 25 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <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 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														
<p>2462</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.457 00 GHz -1.42 dBm</p> <p>*Peak Log 10 dB/ Offst 10.9 dB</p> <p>LgAv</p> <p>M1 S2 S3 FC AL</p> <p><math>\mathcal{E}(f)</math>: FTun Swp</p> <p>Center 2.462 00 GHz Span 25 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <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 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

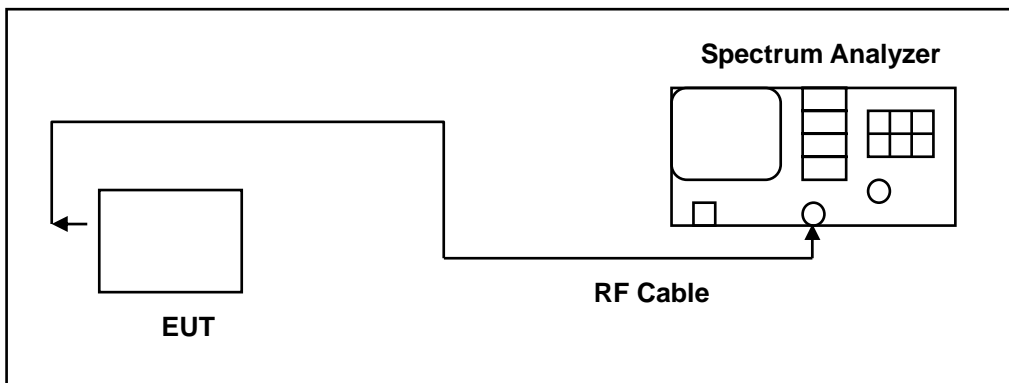
<p>2412</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.416 98 GHz -2.96 dBm</p> <p>*Peak Log 10 dB/ Offst 10.9 dB</p> <p>LgAv</p> <p>M1 S2 S3 FC AL</p> <p><math>\mathcal{E}(f)</math>: FTun Swp</p> <p>Center 2.412 00 GHz Span 26 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 2.52 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <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>2.39900000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.42500000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.60000000 MHz 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	2.39900000 GHz	Stop Freq	2.42500000 GHz	CF Step	2.60000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel															
Center Freq	2.41200000 GHz														
Start Freq	2.39900000 GHz														
Stop Freq	2.42500000 GHz														
CF Step	2.60000000 MHz Auto Man														
Freq Offset	0.00000000 Hz														
Signal Track	On Off														
<p>2437</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.430 76 GHz -2.74 dBm</p> <p>*Peak Log 10 dB/ Offst 10.9 dB</p> <p>LgAv</p> <p>M1 S2 S3 FC AL</p> <p><math>\mathcal{E}(f)</math>: FTun Swp</p> <p>Center 2.437 00 GHz Span 26 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 2.52 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <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>2.42400000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.45000000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.60000000 MHz 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	2.42400000 GHz	Stop Freq	2.45000000 GHz	CF Step	2.60000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel															
Center Freq	2.43700000 GHz														
Start Freq	2.42400000 GHz														
Stop Freq	2.45000000 GHz														
CF Step	2.60000000 MHz Auto Man														
Freq Offset	0.00000000 Hz														
Signal Track	On Off														
<p>2462</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.455 76 GHz -2.85 dBm</p> <p>*Peak Log 10 dB/ Offst 10.9 dB</p> <p>LgAv</p> <p>M1 S2 S3 FC AL</p> <p><math>\mathcal{E}(f)</math>: FTun Swp</p> <p>Center 2.462 00 GHz Span 26 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 2.52 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <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>2.44900000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.47500000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.60000000 MHz 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	2.44900000 GHz	Stop Freq	2.47500000 GHz	CF Step	2.60000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel															
Center Freq	2.46200000 GHz														
Start Freq	2.44900000 GHz														
Stop Freq	2.47500000 GHz														
CF Step	2.60000000 MHz Auto Man														
Freq Offset	0.00000000 Hz														
Signal Track	On Off														

## 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



2437

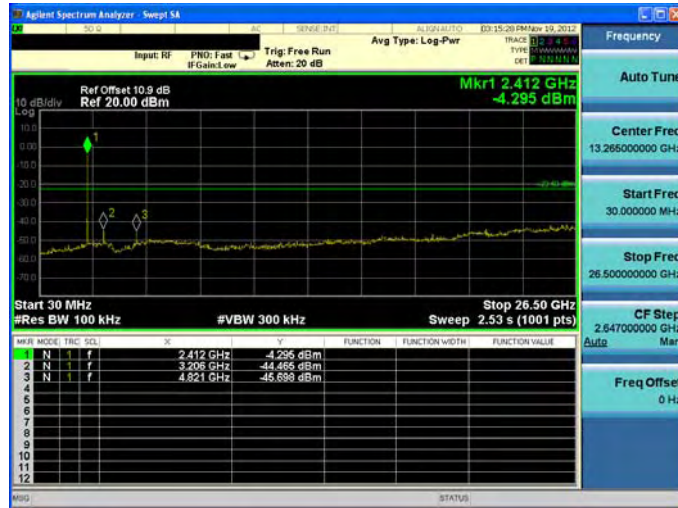


2462



Mode 3: IEEE 802.11g Link Mode

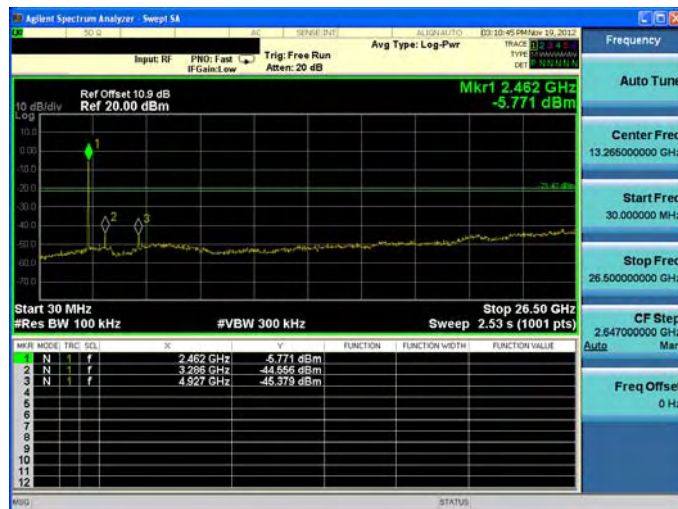
2412



2437



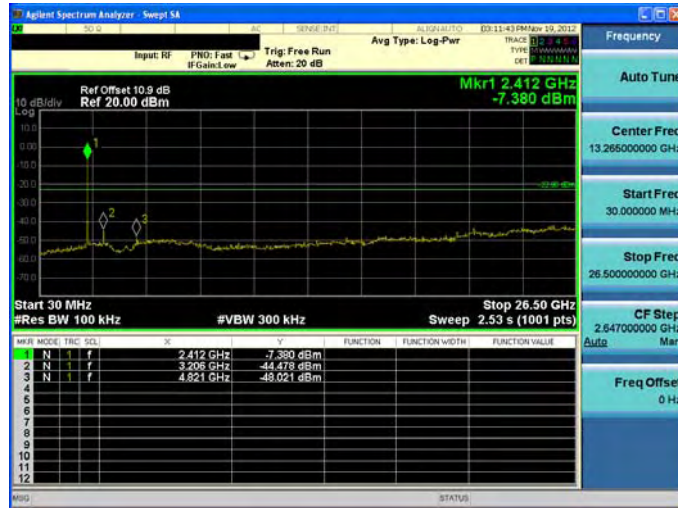
2462





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

2412



2437



2462



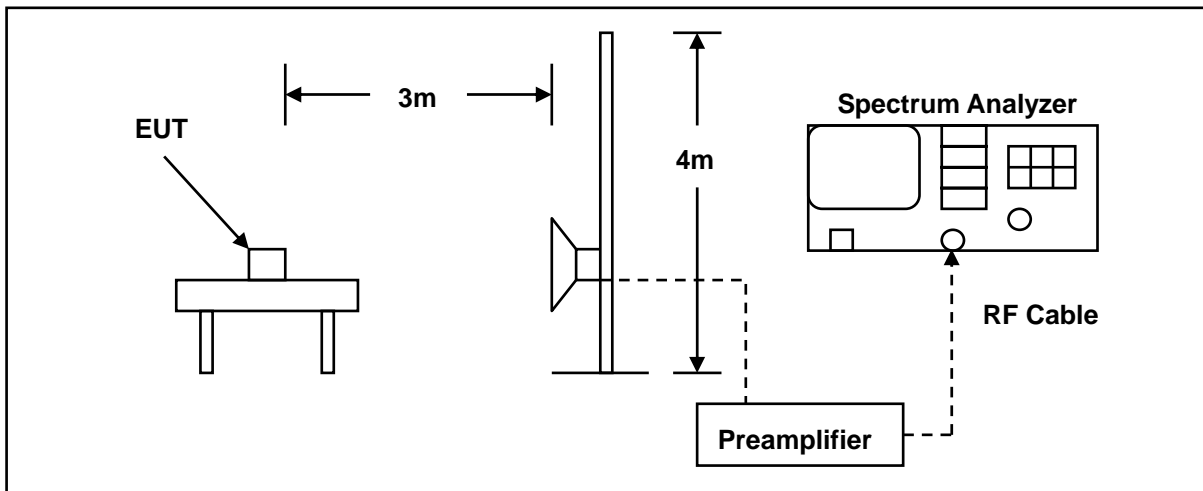


## 10 Band Edges Measurement

### 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)
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	12/20/2011	(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.

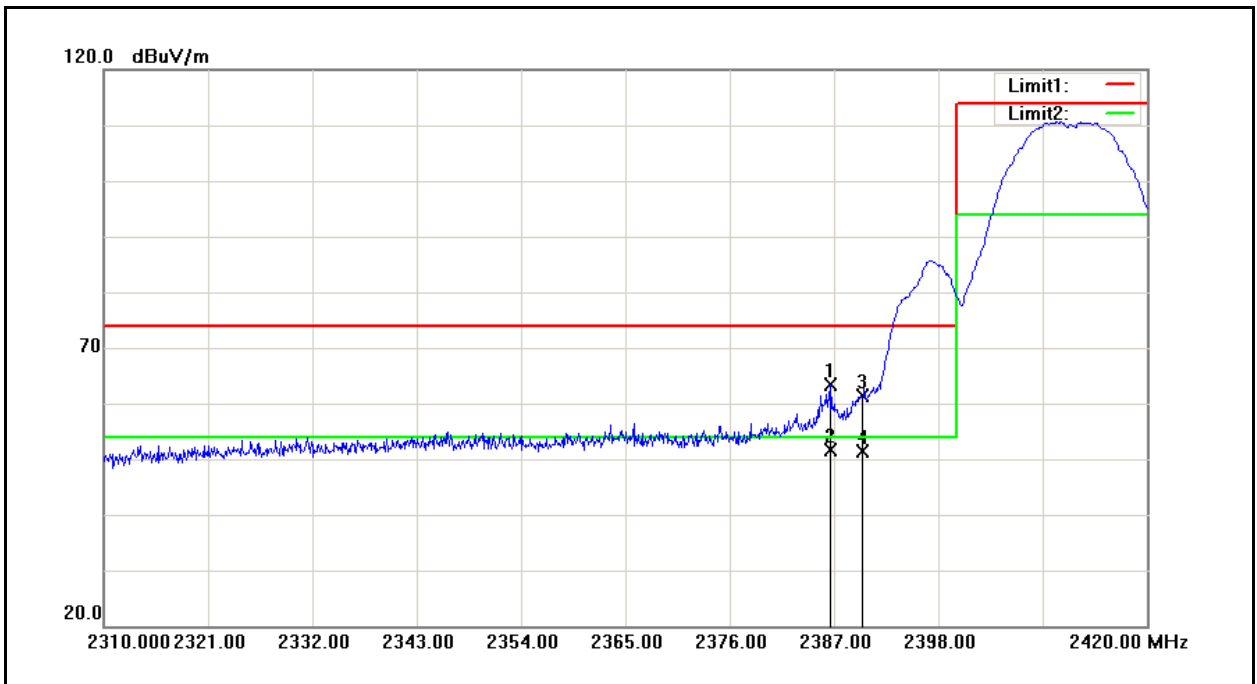
The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

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.

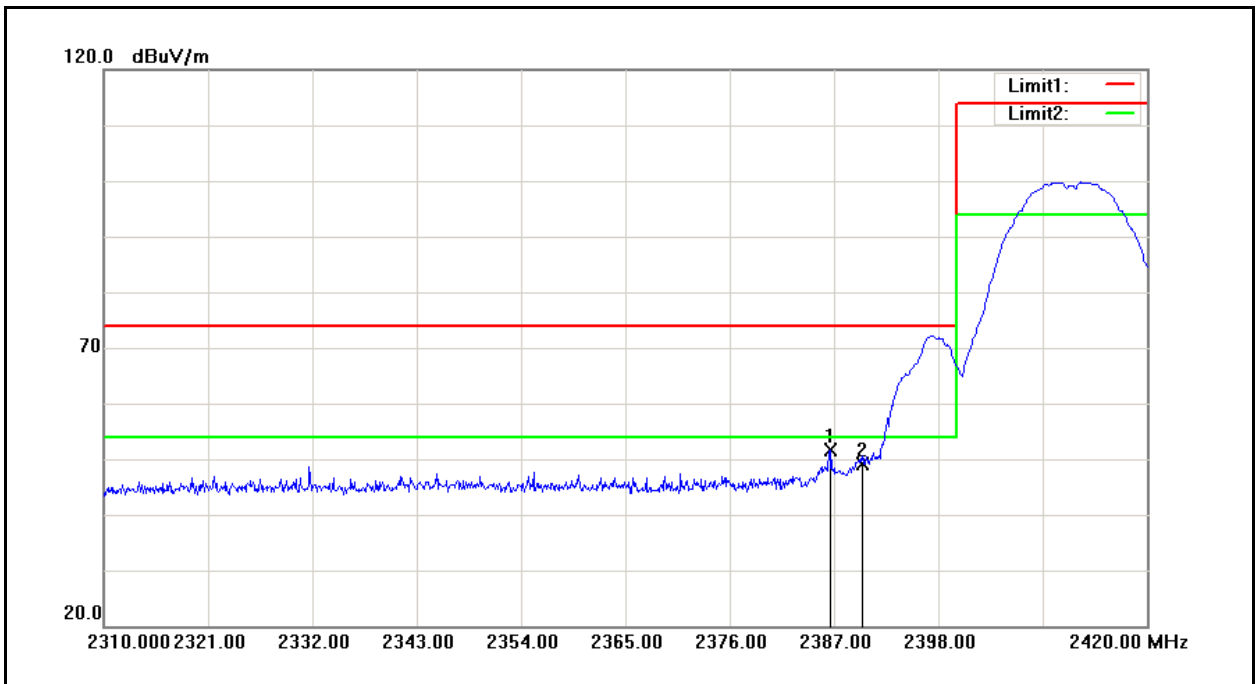
**10.5. Test Result**

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	11/16/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



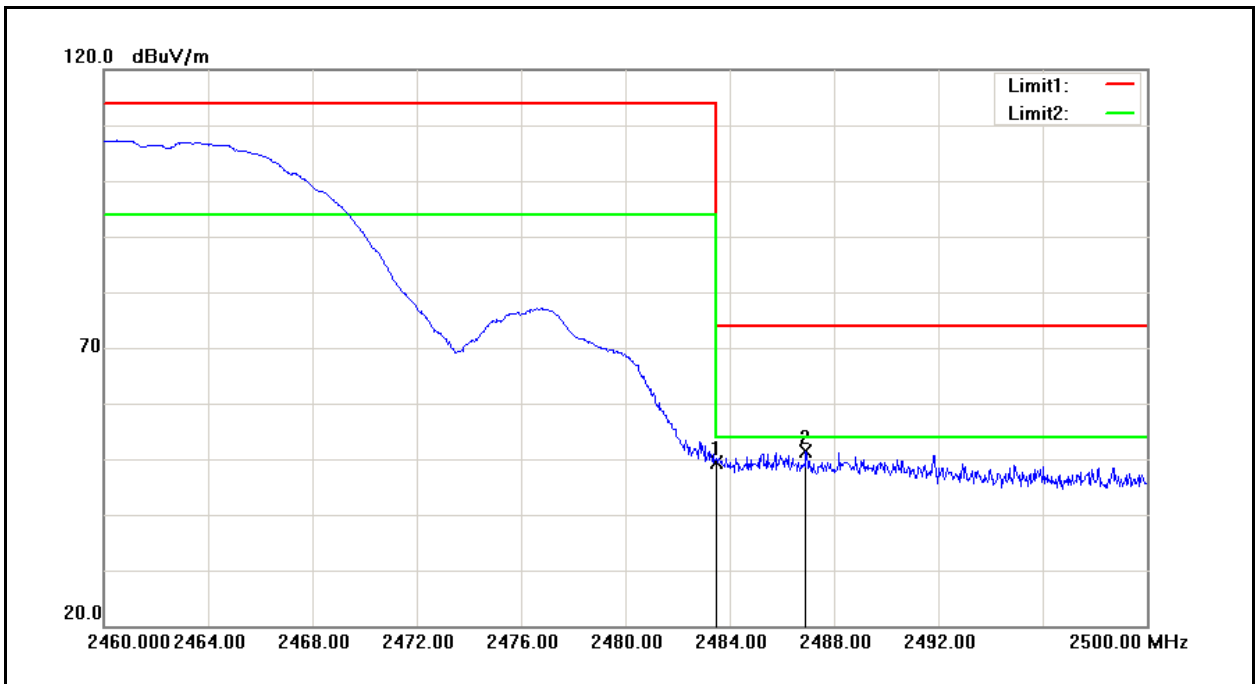
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2386.670	59.59	3.86	63.45	74.00	-10.55	peak
2	2386.670	47.79	3.86	51.65	54.00	-2.35	AVG
3	2390.000	57.58	3.88	61.46	74.00	-12.54	peak
4	2390.000	47.50	3.88	51.38	54.00	-2.62	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	11/16/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



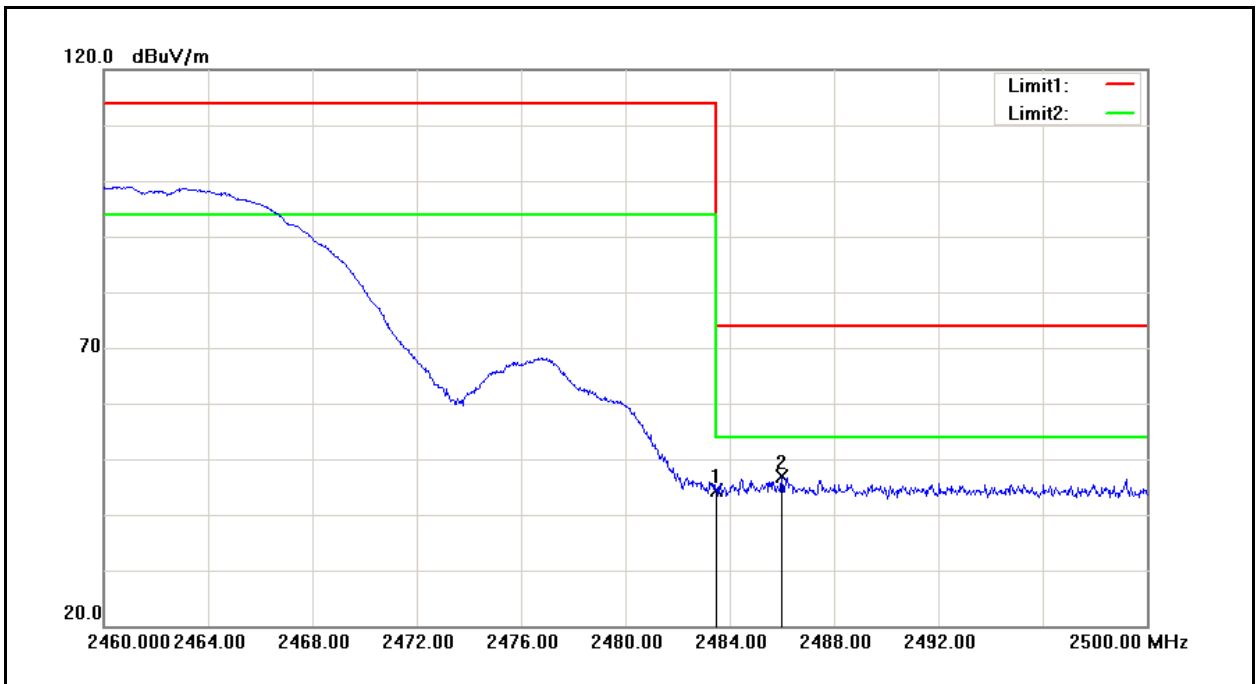
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2386.670	47.83	3.86	51.69	74.00	-22.31	peak
2	2390.000	45.29	3.88	49.17	74.00	-24.83	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	11/16/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



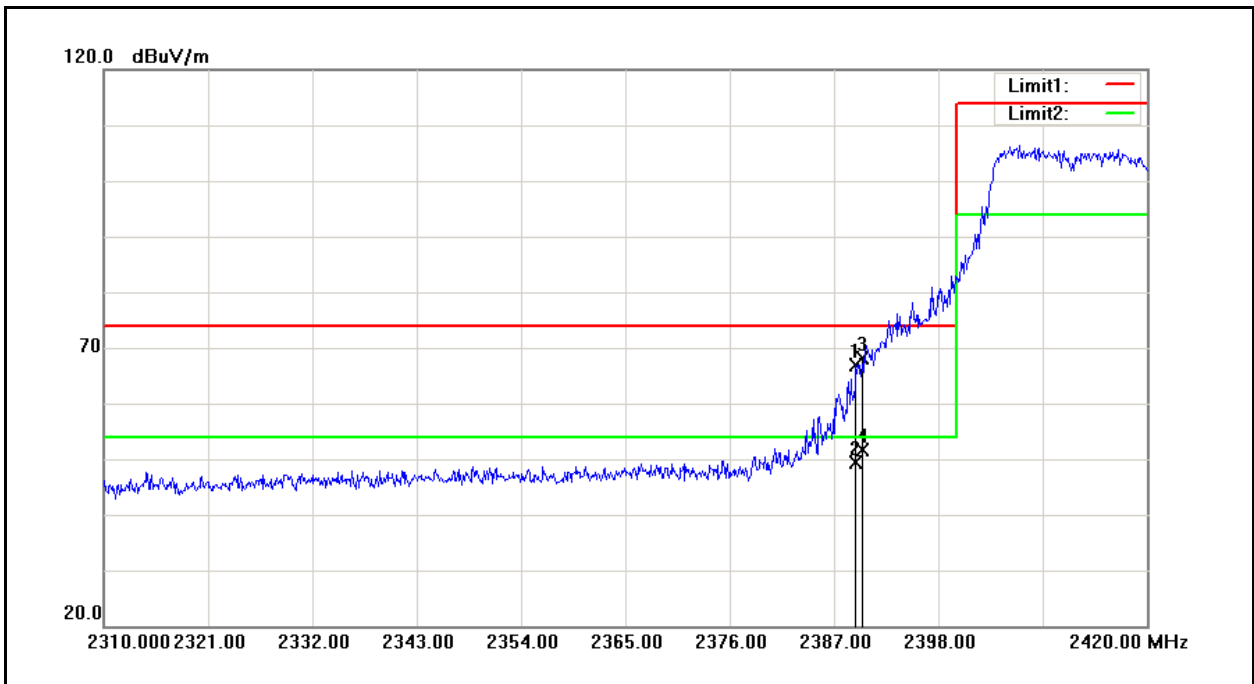
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	44.83	4.50	49.33	74.00	-24.67	peak
2	2486.920	46.77	4.53	51.30	74.00	-22.70	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	11/16/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



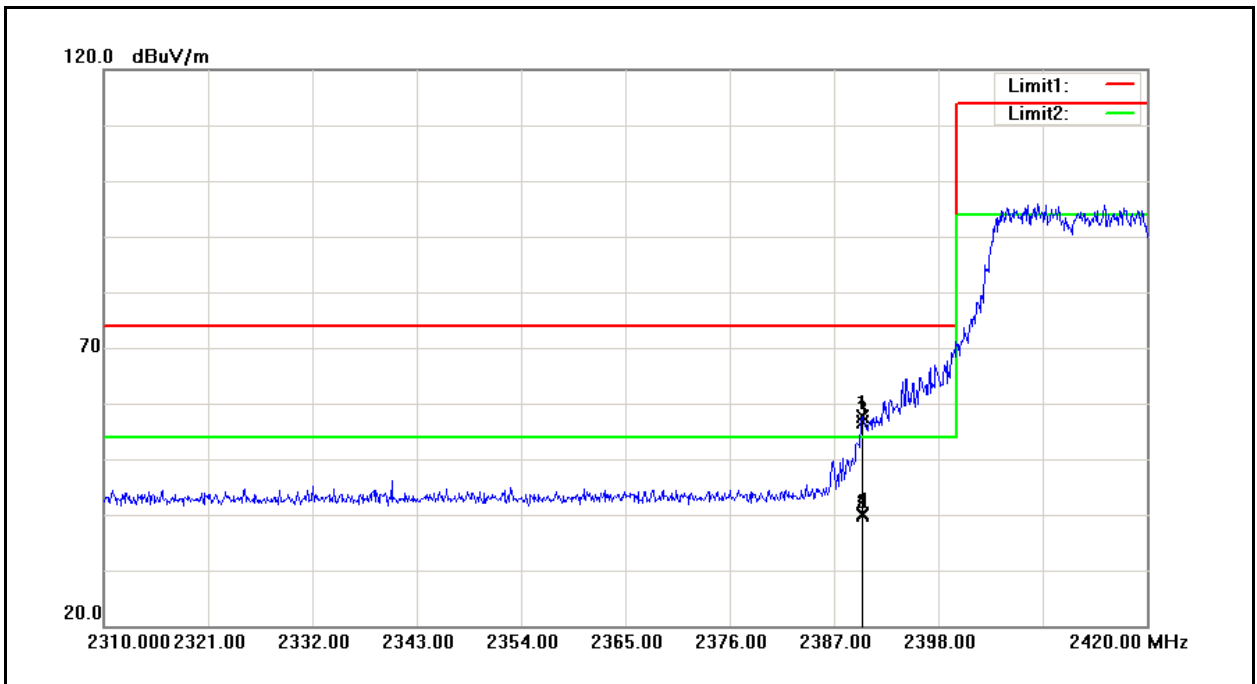
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	40.00	4.50	44.50	74.00	-29.50	peak
2	2486.000	42.29	4.52	46.81	74.00	-27.19	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	11/16/2012
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	63.10	3.88	66.98	74.00	-7.02	peak
2	2389.310	45.59	3.88	49.47	54.00	-4.53	AVG
3	2390.000	64.29	3.88	68.17	74.00	-5.83	peak
4	2390.000	47.71	3.88	51.59	54.00	-2.41	AVG

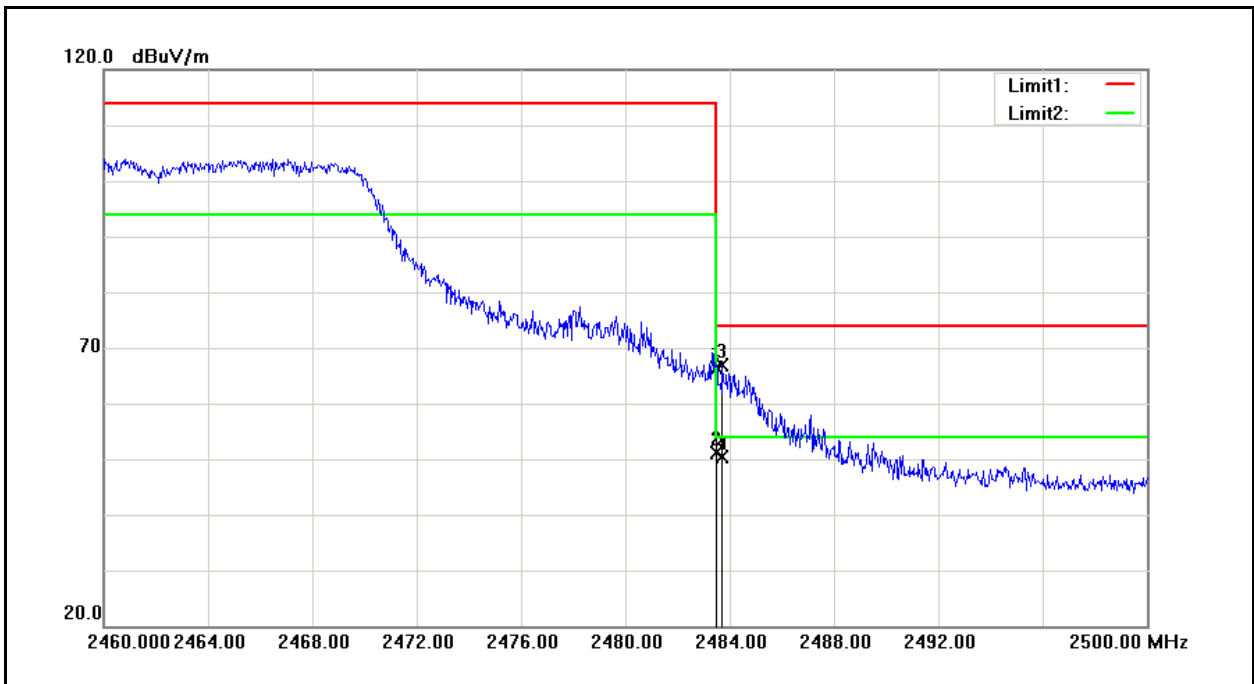
Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	11/16/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.970	53.86	3.88	57.74	74.00	-16.26	peak
2	2389.970	36.06	3.88	39.94	54.00	-14.06	AVG
3	2390.000	52.64	3.88	56.52	74.00	-17.48	peak
4	2390.000	36.14	3.88	40.02	54.00	-13.98	AVG

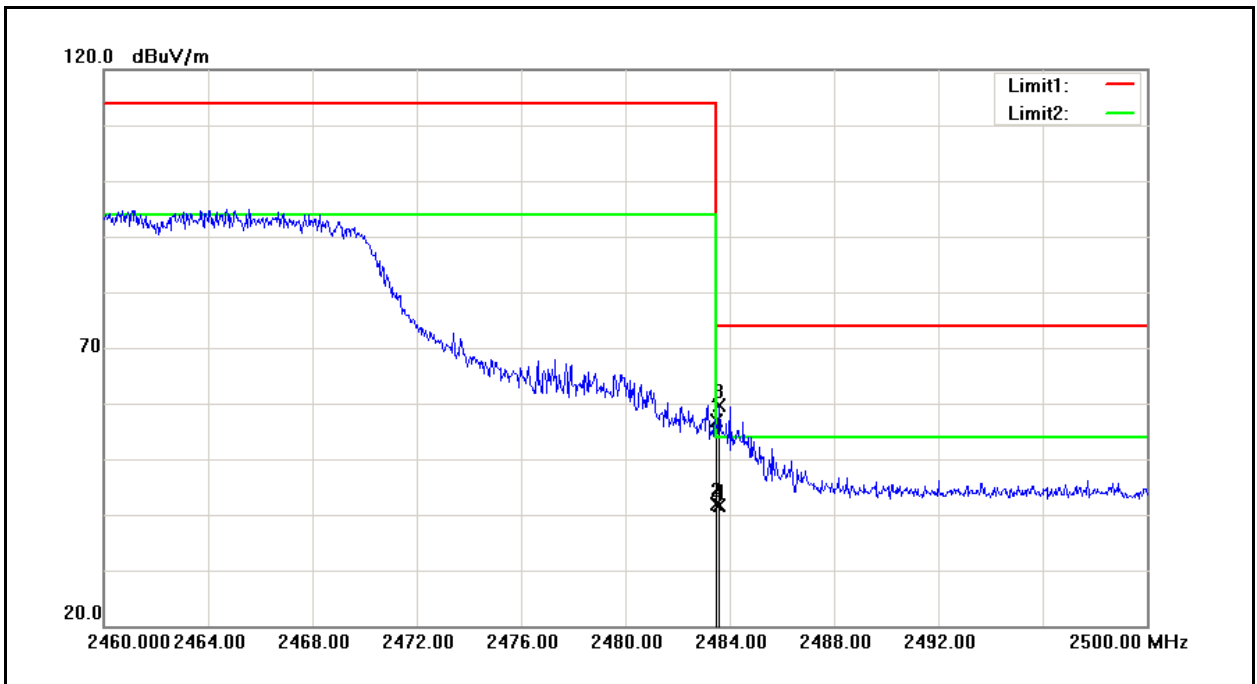


Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	11/16/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



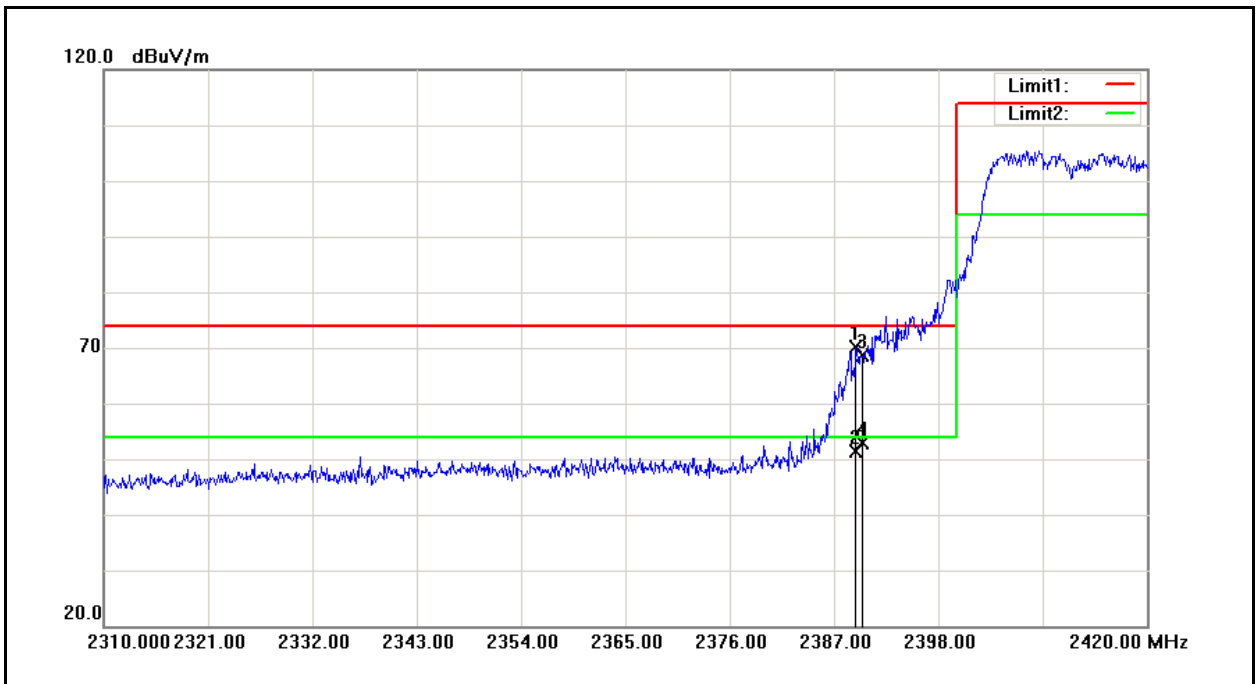
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	61.99	4.50	66.49	74.00	-7.51	peak
2	2483.500	46.53	4.50	51.03	54.00	-2.97	AVG
3	2483.720	62.33	4.50	66.83	74.00	-7.17	peak
4	2483.720	45.77	4.50	50.27	54.00	-3.73	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	3	Date:	11/16/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



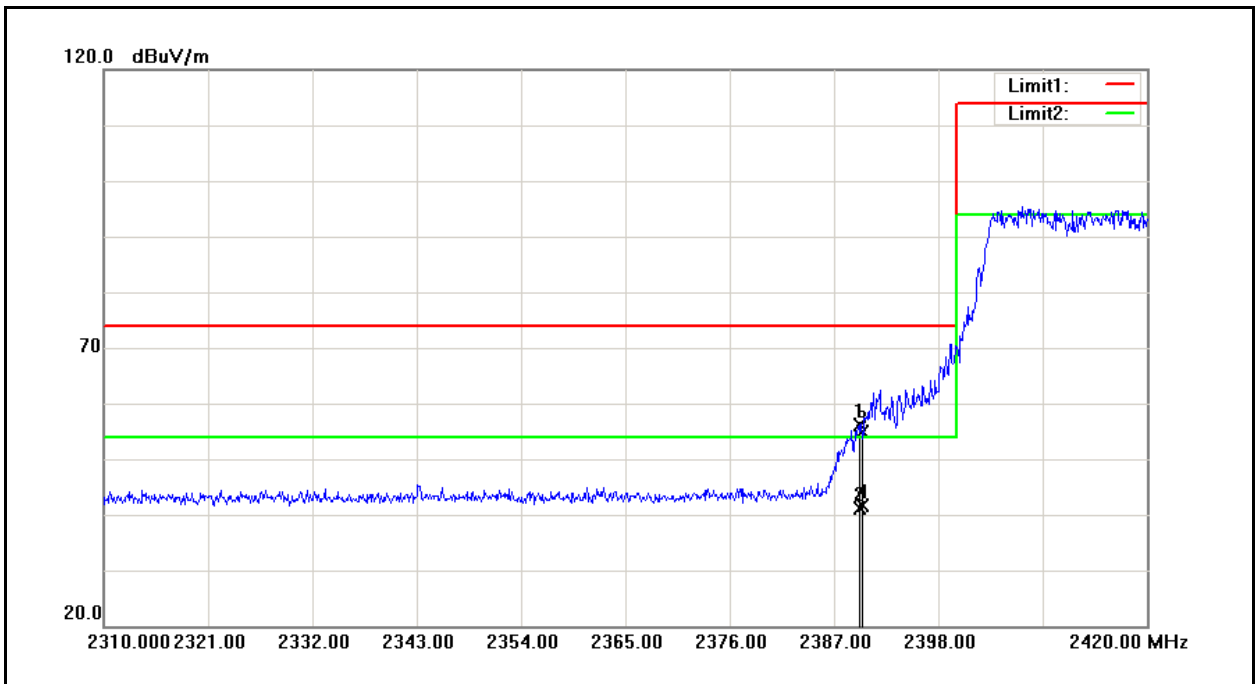
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	52.40	4.50	56.90	74.00	-17.10	peak
2	2483.500	37.37	4.50	41.87	54.00	-12.13	AVG
3	2483.600	55.17	4.50	59.67	74.00	-14.33	peak
4	2483.600	37.07	4.50	41.57	54.00	-12.43	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	11/16/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



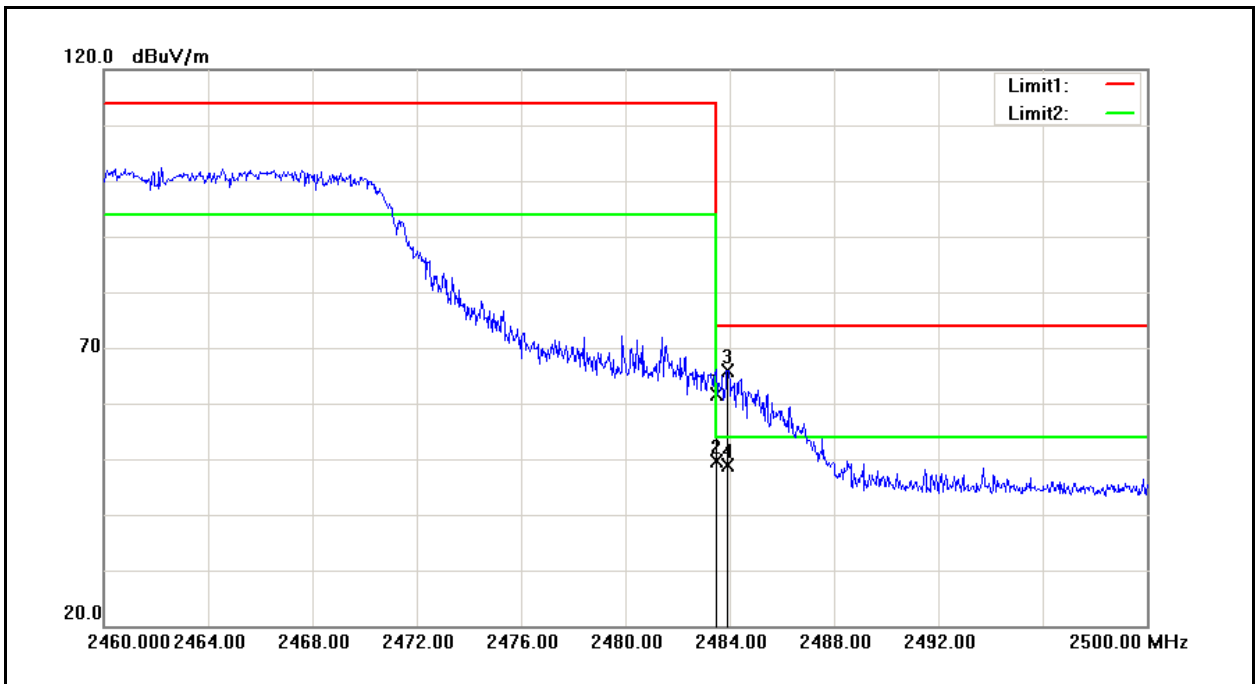
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.310	66.14	3.88	70.02	74.00	-3.98	peak
2	2389.310	47.46	3.88	51.34	54.00	-2.66	AVG
3	2390.000	64.73	3.88	68.61	74.00	-5.39	peak
4	2390.000	49.01	3.88	52.89	54.00	-1.11	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	11/16/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



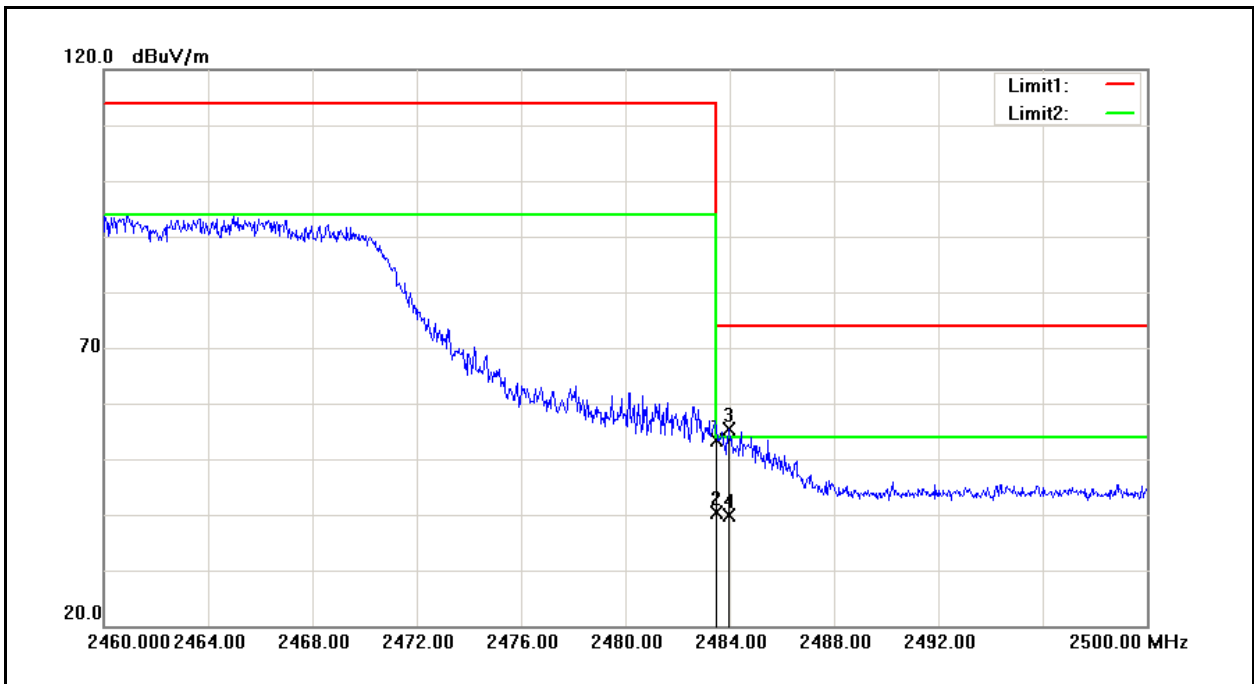
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.750	52.16	3.88	56.04	74.00	-17.96	peak
2	2389.750	37.23	3.88	41.11	54.00	-12.89	AVG
3	2390.000	51.04	3.88	54.92	74.00	-19.08	peak
4	2390.000	37.86	3.88	41.74	54.00	-12.26	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	11/16/2012
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	57.20	4.50	61.70	74.00	-12.30	peak
2	2483.500	45.10	4.50	49.60	54.00	-4.40	AVG
3	2483.920	61.43	4.51	65.94	74.00	-8.06	peak
4	2483.920	44.26	4.51	48.77	54.00	-5.23	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	AirCard 770S	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4	Date:	11/16/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



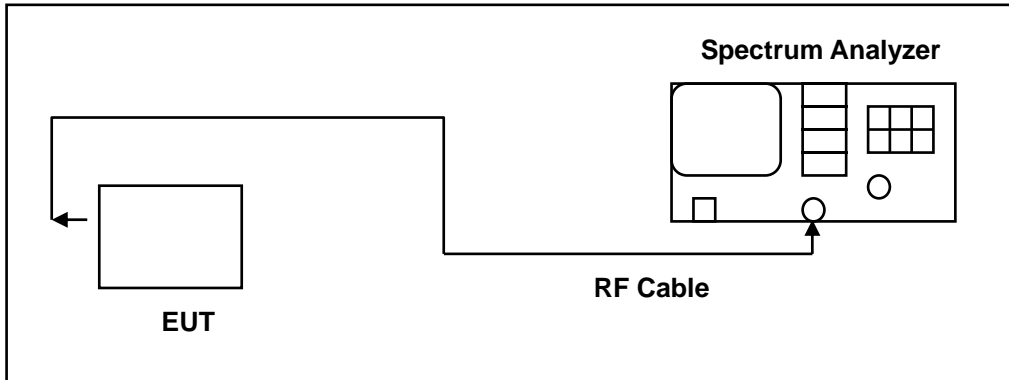
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	48.86	4.50	53.36	74.00	-20.64	peak
2	2483.500	35.91	4.50	40.41	54.00	-13.59	AVG
3	2483.960	50.82	4.51	55.33	74.00	-18.67	peak
4	2483.960	35.27	4.51	39.78	54.00	-14.22	AVG

## 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	AirCard 770S		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	11/19/2012	Test Site	TE05
	Frequency (MHz)	Measurement (MHz)	Limit (kHz)
	2412	13.8347	-----
	2437	13.8378	-----
	2462	13.7977	-----

Model Number	AirCard 770S		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	11/19/2012	Test Site	TE05
	Frequency (MHz)	Measurement (MHz)	Limit (kHz)
	2412	16.4031	-----
	2437	16.4387	-----
	2462	16.4343	-----

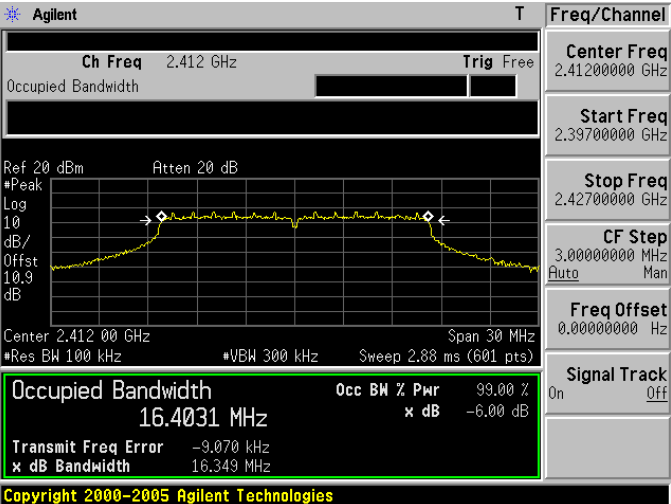
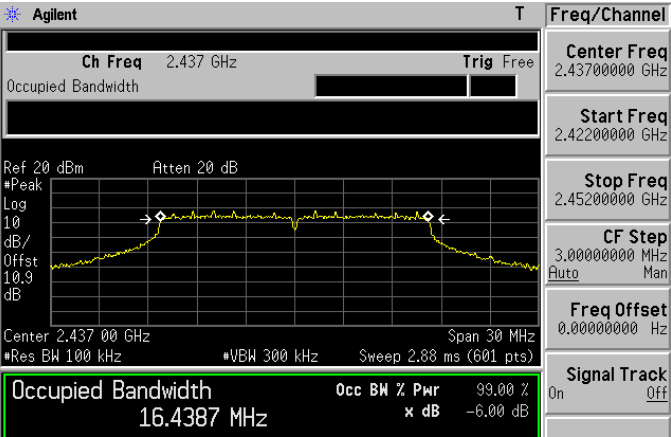
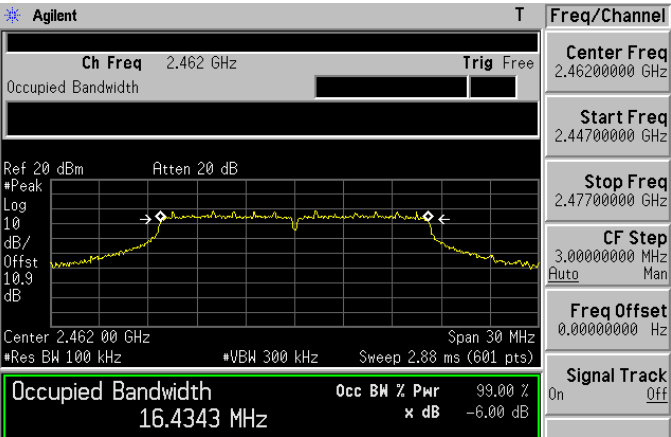
Model Number	AirCard 770S		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode		
Date of Test	11/19/2012	Test Site	TE05
	Frequency (MHz)	Measurement (MHz)	Limit (kHz)
	2412	17.6235	-----
	2437	17.6215	-----
	2462	17.6161	-----



**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 13.8347 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 19.228 kHz</p> <p>x dB Bandwidth 10.081 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 13.8378 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 1.974 kHz</p> <p>x dB Bandwidth 10.085 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 13.7977 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -7.750 kHz</p> <p>x dB Bandwidth 10.082 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 3: IEEE 802.11g 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>Occupied Bandwidth 16.4031 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -9.070 kHz</p> <p>x dB Bandwidth 16.349 MHz</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>Occupied Bandwidth 16.4387 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -16.935 kHz</p> <p>x dB Bandwidth 16.348 MHz</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>Occupied Bandwidth 16.4343 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error -15.752 kHz</p> <p>x dB Bandwidth 16.355 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 10.9</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><b>Occupied Bandwidth 17.6235 MHz</b></p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -6.00 dB</p> <p>Transmit Freq Error 1.511 kHz</p> <p>x dB Bandwidth 17.117 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	<p>Agilent R 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 10.9</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><b>Occupied Bandwidth 17.6215 MHz</b></p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -6.00 dB</p> <p>Transmit Freq Error -2.853 kHz</p> <p>x dB Bandwidth 17.107 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 10.9</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><b>Occupied Bandwidth 17.6161 MHz</b></p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -6.00 dB</p> <p>Transmit Freq Error -6.557 kHz</p> <p>x dB Bandwidth 17.330 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 internal antenna. And the maximum Gain of this antenna is 2.4 dBi.