

## FCC 47 CFR PART 15 SUBPART C

Product Type : Smartphone  
Applicant : HTC Corporation  
Address : No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330,  
Taiwan  
Trade Name : HTC  
Model Number : PJ03100  
Test Specification : FCC 47 CFR PART 15 SUBPART C: Oct., 2010  
ANSI C63.4-2009  
Issue Date : Sep. 30, 2011

### Issue by

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

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**Revision History**

<b>Rev.</b>	<b>Issue Date</b>	<b>Revisions</b>	<b>Revised By</b>
00	Sep. 01, 2011	Initial Issue	
01	Sep. 30, 2011	Revised 99 % Occupied Bandwidth results.	Joyce Liao

## Verification of Compliance

Issued Date: 09/30/2011

Product Type : Smartphone  
Applicant : HTC Corporation  
Address : No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330,  
Taiwan  
Trade Name : HTC  
Model Number : PJ03100  
FCC ID : NM8PJ03100  
EUT Rated Voltage : DC 5.0V, 1.0A  
Test Voltage : 120 Vac / 60 Hz  
Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2010  
ANSI C63.4-2009  
Test Result : Complied  
Performing Lab. : A Test Lab Techno Corp.

No. 140-1, Changan Street, Bade City,  
Taoyuan County 334, Taiwan R.O.C.

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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.

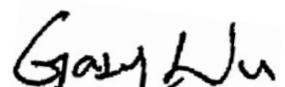
Approved By :



(Manager)

(Miller Lee )

Reviewed By :



(Testing Engineer)

(Gary Wu)

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## 1 General Information

### 1.1 Summary of Test Result

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

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

### 1.2 Measurement Uncertainty

#### Conducted Emission

The measurement uncertainty is evaluated as  $\pm 2.24$  dB.

#### Radiated Emission

The measurement uncertainty of 30 MHz - 1GHz is evaluated as  $\pm 3.072$ dB.

## 2 EUT Description

Product	:	Smartphone
Trade Name	:	HTC
Model No.	:	PJ03100
Applicant	:	HTC Corporation No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan
Manufacturer	:	HTC Corporation No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan
FCC ID	:	NM8PJ03100
Frequency Range	:	2412 ~ 2462 MHz
Modulation Type	:	IEEE 802.11b:DSSS IEEE 802.11g:DSSS+ OFDM draft 802.11n Standard-20MHz channel mode: OFDM
Antenna Type	:	PIFA Type
Antenna Gain	:	0.46 dBi
RF Output Power	:	IEEE 802.11b: 0.076 W / 18.82 dBm IEEE 802.11g: 0.116 W / 20.65 dBm draft 802.11n Standard-20MHz: 0.116 W / 20.66 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: IDLE Mode
Mode 2: Normal Operation Mode
Mode 3: IEEE 802.11b Link Mode
Mode 4: IEEE 802.11g Link Mode
Mode 5: draft 802.11n Standard-20MHz 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 11Mbps data rate were chosen for full testing.

IEEE 802.11g mode:

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

draft 802.11n Standard-20 MHz Channel mode:

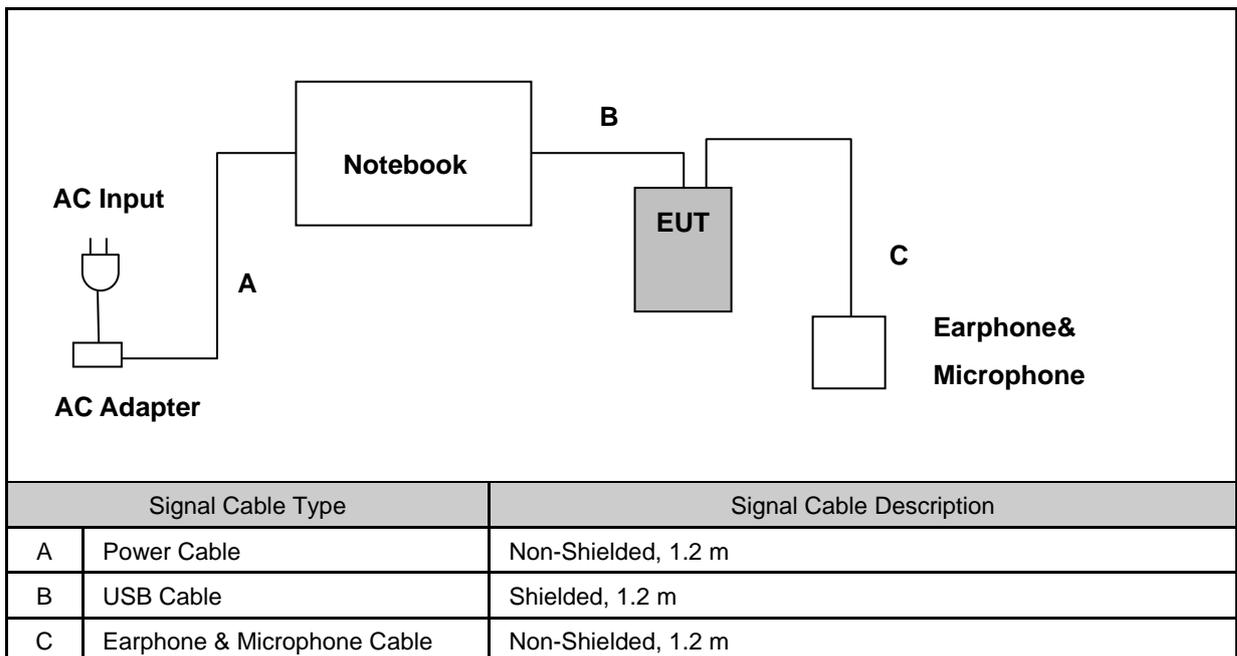
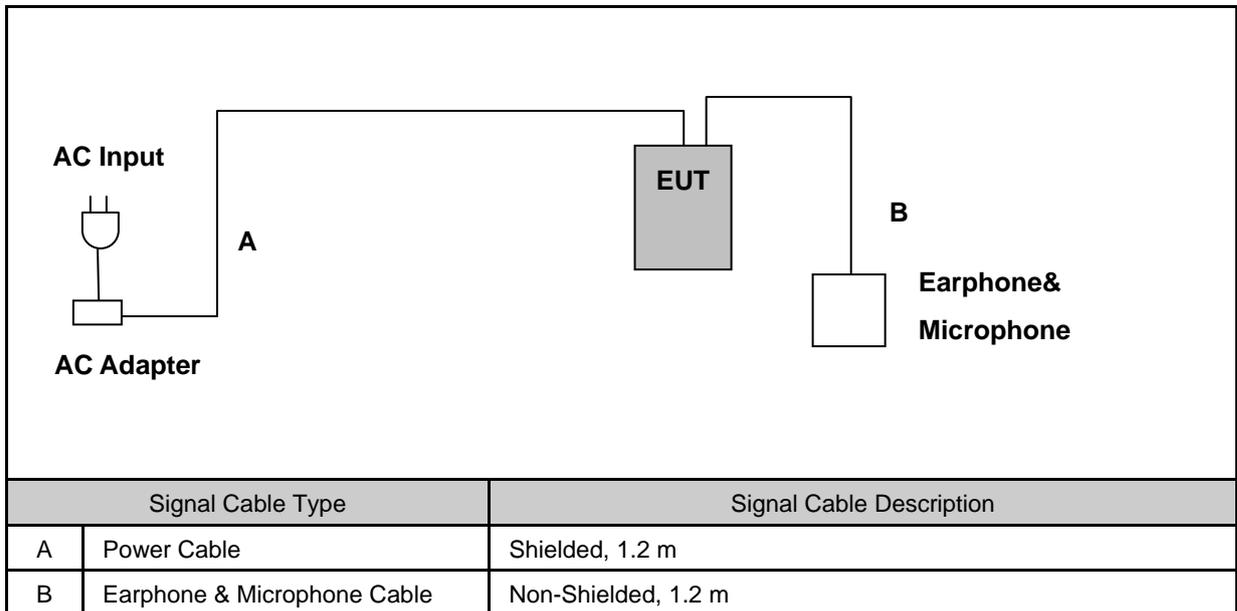
Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with MCS7 data rate were chosen for full testing.

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



### 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

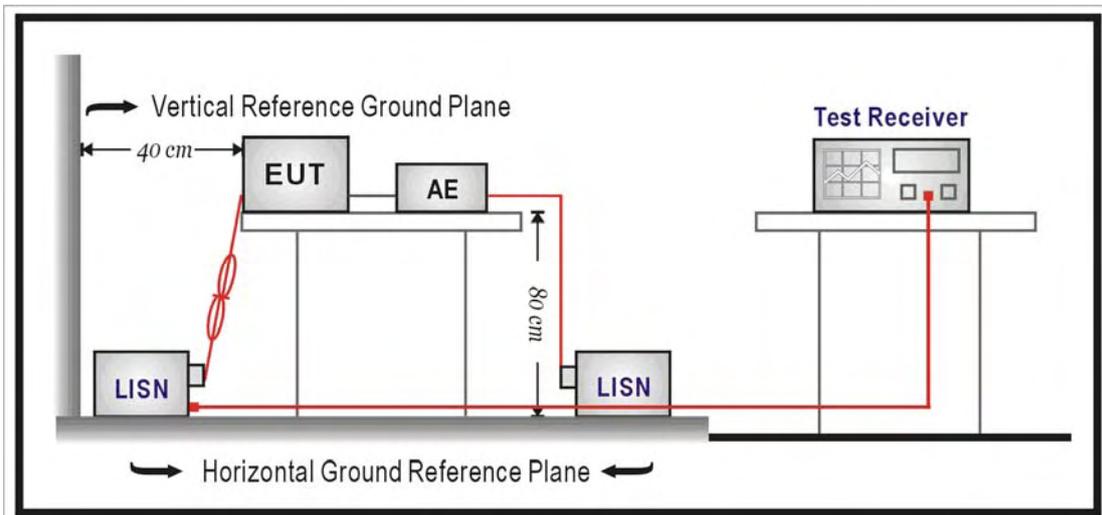
### 4.2. Test Instruments

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

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

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

### 4.3. Test Setup



#### **4.4. Test Procedure**

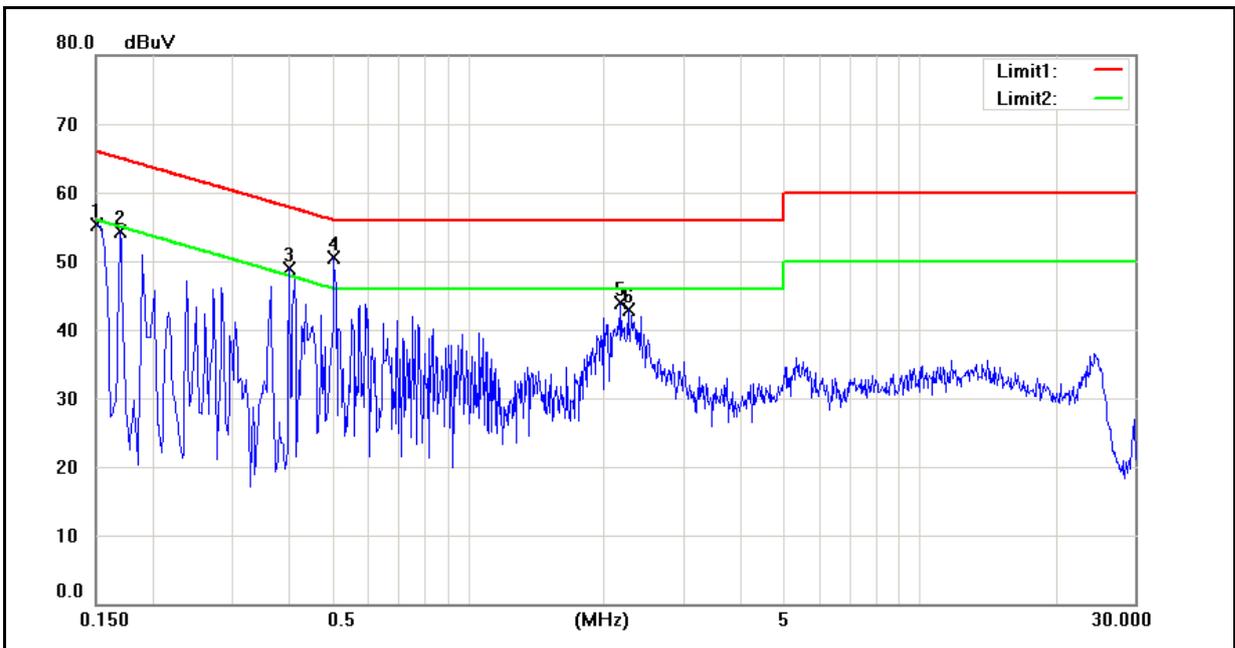
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

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

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

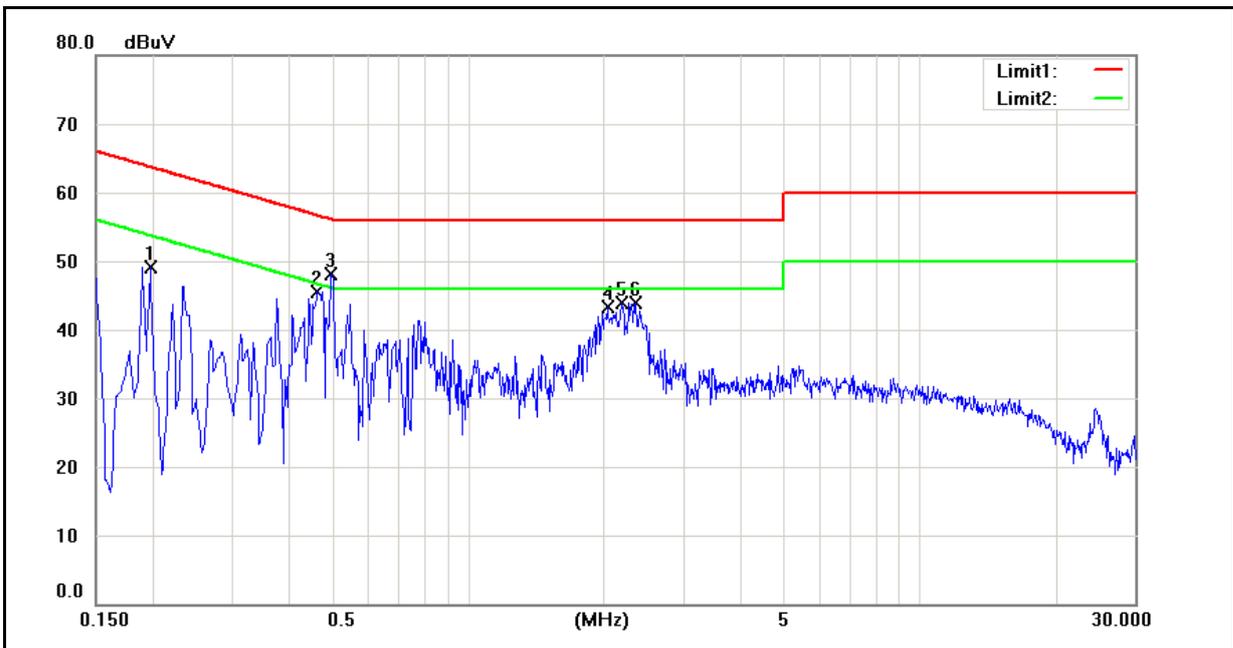
#### 4.5. Test Result

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 1	Date:	08/15/2011
		Test By:	Gary Wu
Description:			



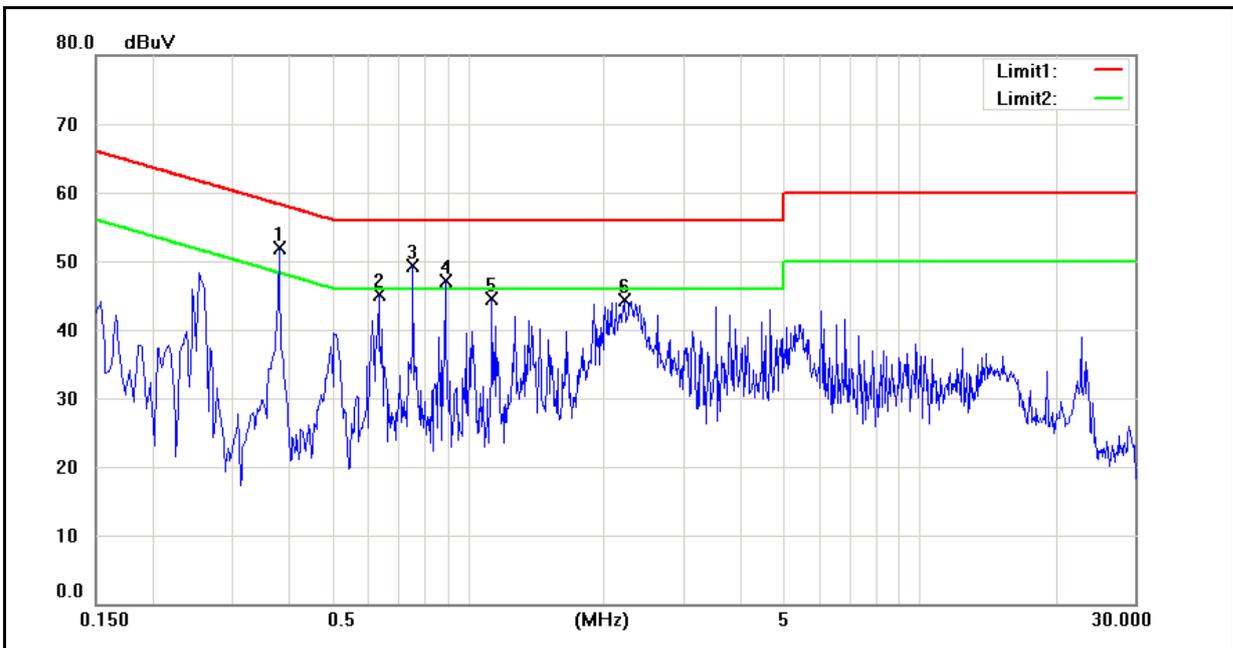
No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1500	40.65	19.88	10.07	50.72	29.95	66.00	56.00	-15.28	-26.05	Pass
2	0.1700	27.16	7.98	10.06	37.22	18.04	64.96	54.96	-27.74	-36.92	Pass
3	0.4020	29.73	9.09	9.97	39.70	19.06	57.81	47.81	-18.11	-28.75	Pass
4	0.5060	35.33	16.70	9.93	45.26	26.63	56.00	46.00	-10.74	-19.37	Pass
5	2.1820	24.46	18.38	9.70	34.16	28.08	56.00	46.00	-21.84	-17.92	Pass
6	2.2660	30.59	21.98	9.71	40.30	31.69	56.00	46.00	-15.70	-14.31	Pass

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 1	Date:	08/15/2011
		Test By:	Gary Wu
Description:			



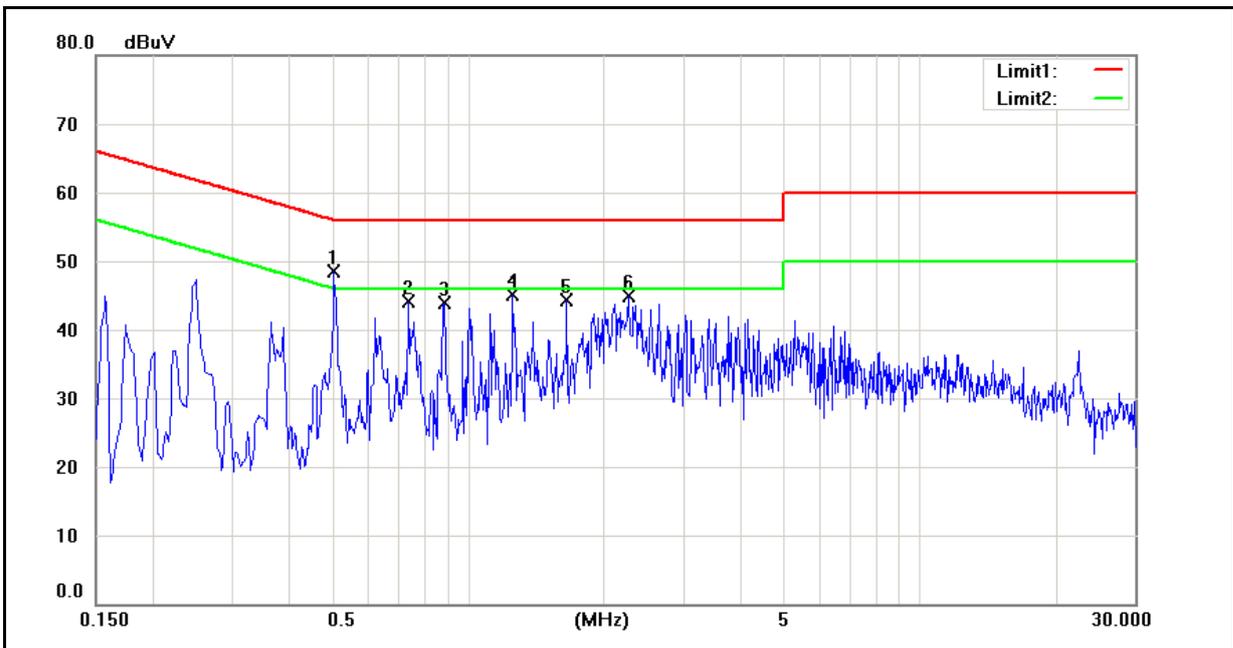
No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1980	36.36	16.93	10.13	46.49	27.06	63.69	53.69	-17.20	-26.63	Pass
2	0.4660	33.58	23.36	10.02	43.60	33.38	56.58	46.58	-12.98	-13.20	Pass
3	0.4980	34.66	24.03	10.01	44.67	34.04	56.03	46.03	-11.36	-11.99	Pass
4	2.0340	29.89	21.16	9.74	39.63	30.90	56.00	46.00	-16.37	-15.10	Pass
5	2.1900	26.20	19.47	9.76	35.96	29.23	56.00	46.00	-20.04	-16.77	Pass
6	2.3580	28.77	20.94	9.78	38.55	30.72	56.00	46.00	-17.45	-15.28	Pass

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	08/15/2011
		Test By:	Gary Wu
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.3820	28.91	20.24	9.98	38.89	30.22	58.24	48.24	-19.35	-18.02	Pass
2	0.6340	25.16	15.32	9.87	35.03	25.19	56.00	46.00	-20.97	-20.81	Pass
3	0.7580	23.20	13.78	9.83	33.03	23.61	56.00	46.00	-22.97	-22.39	Pass
4	0.8940	25.45	14.82	9.77	35.22	24.59	56.00	46.00	-20.78	-21.41	Pass
5	1.1300	15.89	6.25	9.72	25.61	15.97	56.00	46.00	-30.39	-30.03	Pass
6	2.2340	30.74	22.86	9.71	40.45	32.57	56.00	46.00	-15.55	-13.43	Pass

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	08/15/2011
		Test By:	Gary Wu
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.5060	35.09	25.93	10.01	45.10	35.94	56.00	46.00	-10.90	-10.06	Pass
2	0.7420	23.25	13.66	9.91	33.16	23.57	56.00	46.00	-22.84	-22.43	Pass
3	0.8860	31.19	23.41	9.85	41.04	33.26	56.00	46.00	-14.96	-12.74	Pass
4	1.2620	29.50	20.10	9.77	39.27	29.87	56.00	46.00	-16.73	-16.13	Pass
5	1.6540	27.02	17.60	9.75	36.77	27.35	56.00	46.00	-19.23	-18.65	Pass
6	2.2660	29.49	22.01	9.77	39.26	31.78	56.00	46.00	-16.74	-14.22	Pass

## 5 Radiated Interference Measurement

### 5.1. Limit

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

### 5.2. Test Instruments

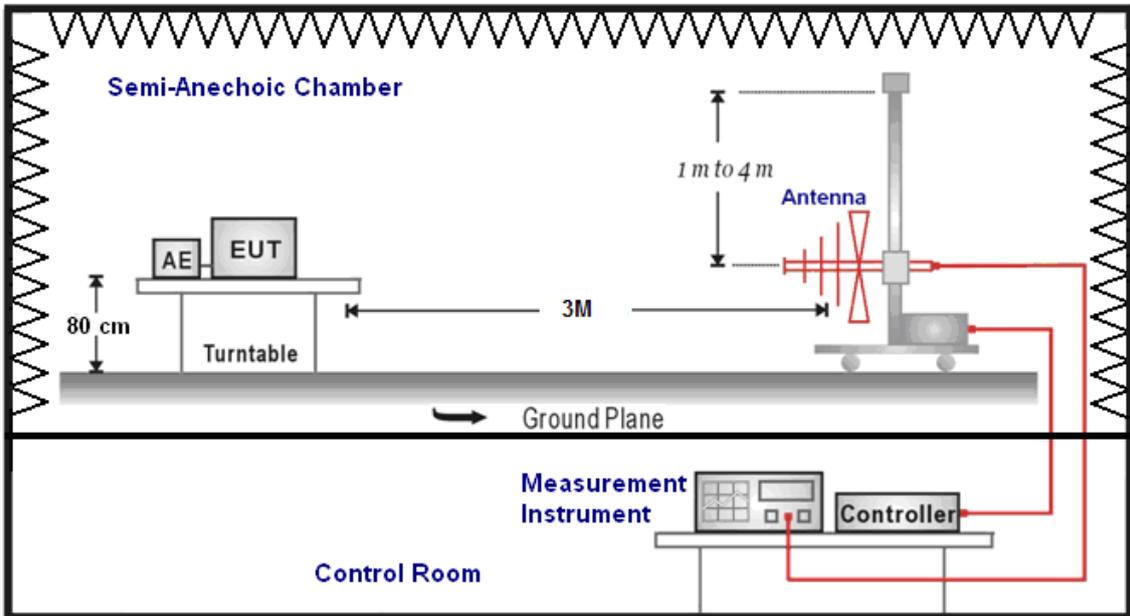
3 Meter Chamber (966-A)					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/18/2011	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/18/2011	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/23/2011	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/23/2011	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/29/2011	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/29/2011	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/28/2011	(1)
Test Site	ATL	TE01	888001	12/24/2010	(1)

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

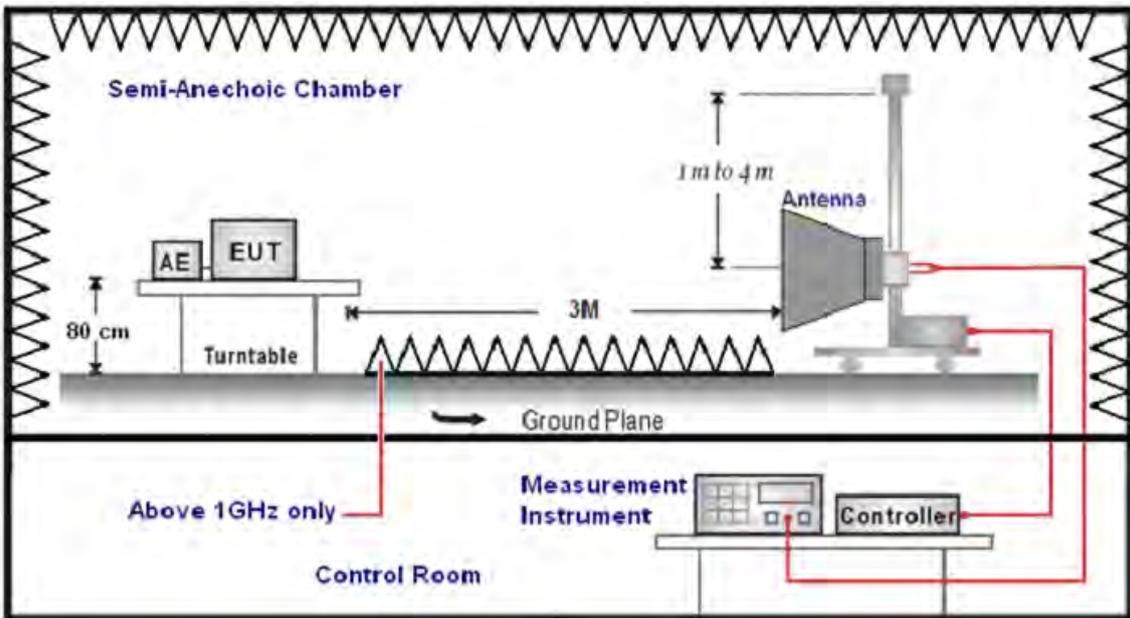
NOTE: N.C.R. = No Calibration Request.

### 5.3. Setup

Below 1GHz



Above 1GHz



## 5.4. Test Procedure

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

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

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

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

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (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) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

(2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)

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

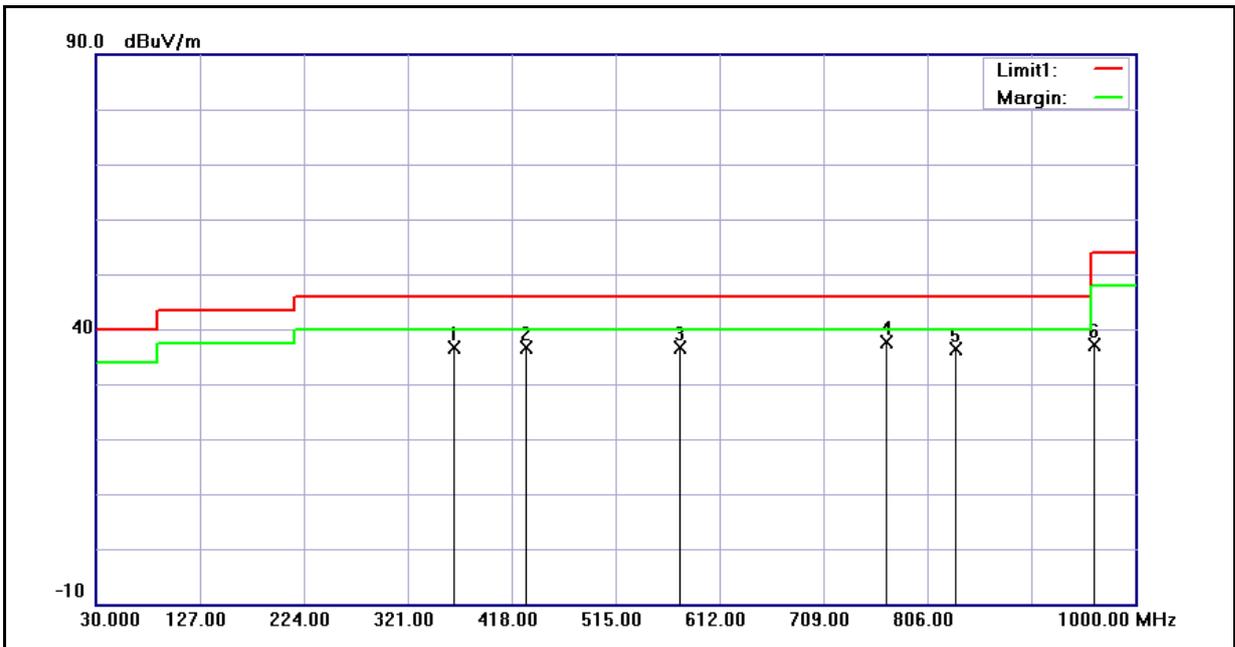
(a) For fundamental frequency : Transmitter Output < +30dBm

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

## 5.5. Test Result

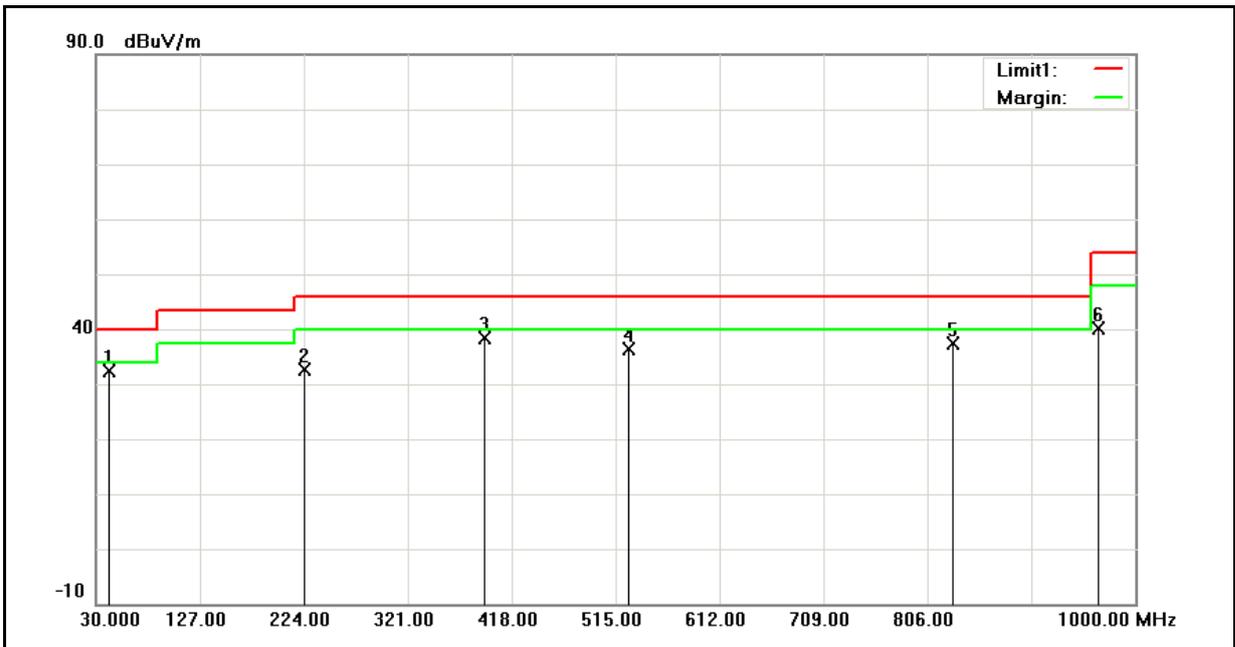
### Below 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	08/15/2011
Ant.Polar.:	Horizontal	Test By:	Gary Wu



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	365.0000	45.45	-8.74	36.71	46.00	-9.29	QP
2	432.0000	45.04	-8.30	36.74	46.00	-9.26	QP
3	576.0000	42.17	-5.63	36.54	46.00	-9.46	QP
4	768.0000	39.60	-2.02	37.58	46.00	-8.42	QP
5	833.0000	37.57	-1.11	36.46	46.00	-9.54	QP
6	962.0000	36.03	1.09	37.12	54.00	-16.88	QP

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	08/15/2011
Ant.Polar.:	Vertical	Test By:	Gary Wu



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	42.5000	44.34	-12.05	32.29	40.00	-7.71	QP
2	225.0000	45.75	-13.06	32.69	46.00	-13.31	QP
3	393.0000	47.19	-8.70	38.49	46.00	-7.51	QP
4	528.0000	42.95	-6.59	36.36	46.00	-9.64	QP
5	829.5000	38.64	-1.16	37.48	46.00	-8.52	QP
6	966.5000	39.08	1.17	40.25	54.00	-13.75	QP

**Above 1GHz**

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	PJ03100			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 3			Date:	08/15/2011		
Frequency:	2412MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1658.000	47.31	-3.00	44.31	74.00	-29.69	peak	H
3786.000	38.74	4.50	43.24	74.00	-30.76	peak	H
6348.000	37.02	12.24	49.26	74.00	-24.74	peak	H
3002.000	43.87	2.30	46.17	74.00	-27.83	peak	V
4824.000	41.66	7.92	49.58	74.00	-24.42	peak	V
6369.000	36.32	12.33	48.65	74.00	-25.35	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	PJ03100			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 3			Date:	08/15/2011		
Frequency:	2437MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1994.000	46.13	-1.81	44.32	74.00	-29.68	peak	H
5319.000	36.98	9.46	46.44	74.00	-27.56	peak	H
7311.000	39.60	15.23	54.83	74.00	-19.17	peak	H
7311.000	28.19	15.23	43.42	54.00	-10.58	AVG	H
3989.000	37.57	5.29	42.86	74.00	-31.14	peak	V
4874.000	40.04	8.09	48.13	74.00	-25.87	peak	V
6754.000	37.00	13.66	50.66	74.00	-23.34	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	PJ03100			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 3			Date:	08/15/2011		
Frequency:	2462MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2995.000	41.86	2.28	44.14	74.00	-29.86	peak	H
4682.000	38.15	7.45	45.60	74.00	-28.40	peak	H
7386.000	39.51	15.42	54.93	74.00	-19.07	peak	H
7386.000	29.94	15.42	45.36	54.00	-8.64	AVG	H
2995.000	43.22	2.28	45.50	74.00	-28.50	peak	V
4924.000	42.20	8.25	50.45	74.00	-23.55	peak	V
7386.000	38.60	15.42	54.02	74.00	-19.98	peak	V
7386.000	28.84	15.42	44.26	54.00	-9.74	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	PJ03100			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	08/21/2011		
Frequency:	2412MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4143.000	38.65	5.77	44.42	74.00	-29.58	peak	H
6474.000	35.68	12.78	48.46	74.00	-25.54	peak	H
7426.000	36.29	15.54	51.83	74.00	-22.17	peak	H
2995.000	43.59	2.28	45.87	74.00	-28.13	peak	V
4612.000	36.60	7.22	43.82	74.00	-30.18	peak	V
6047.000	36.70	10.96	47.66	74.00	-26.34	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	PJ03100			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	08/21/2011		
Frequency:	2437MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1098.000	49.62	-5.81	43.81	74.00	-30.19	peak	H
1665.000	46.64	-2.97	43.67	74.00	-30.33	peak	H
4325.000	38.93	6.32	45.25	74.00	-28.75	peak	H
1994.000	51.20	-1.81	49.39	74.00	-24.61	peak	V
2995.000	41.90	2.28	44.18	74.00	-29.82	peak	V
4388.000	37.57	6.51	44.08	74.00	-29.92	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	PJ03100			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	08/21/2011		
Frequency:	2462MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2505.000	41.30	0.25	41.55	74.00	-32.45	peak	H
4143.000	38.34	5.77	44.11	74.00	-29.89	peak	H
5347.000	36.46	9.54	46.00	74.00	-28.00	peak	H
2988.000	43.43	2.25	45.68	74.00	-28.32	peak	V
4983.000	38.88	8.45	47.33	74.00	-26.67	peak	V
5501.000	37.30	9.99	47.29	74.00	-26.71	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	PJ03100			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 5			Date:	08/21/2011		
Frequency:	2412MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2785.000	40.35	1.41	41.76	74.00	-32.24	peak	H
4458.000	37.15	6.72	43.87	74.00	-30.13	peak	H
6061.000	37.09	11.01	48.10	74.00	-25.90	peak	H
1994.000	50.40	-1.81	48.59	74.00	-25.41	peak	V
2995.000	44.75	2.28	47.03	74.00	-26.97	peak	V
4276.000	38.12	6.17	44.29	74.00	-29.71	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	PJ03100			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 5			Date:	08/21/2011		
Frequency:	2437MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1665.000	47.46	-2.97	44.49	74.00	-29.51	peak	H
3310.000	39.99	2.99	42.98	74.00	-31.02	peak	H
4913.000	36.40	8.22	44.62	74.00	-29.38	peak	H
1665.000	49.23	-2.97	46.26	74.00	-27.74	peak	V
1994.000	47.43	-1.81	45.62	74.00	-28.38	peak	V
3002.000	44.17	2.30	46.47	74.00	-27.53	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	PJ03100			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 5			Date:	08/21/2011		
Frequency:	2462MHz			Test By:	Gary Wu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1994.000	43.60	-1.81	41.79	74.00	-32.21	peak	H
2988.000	40.32	2.25	42.57	74.00	-31.43	peak	H
4563.000	38.22	7.06	45.28	74.00	-28.72	peak	H
2995.000	44.33	2.28	46.61	74.00	-27.39	peak	V
3324.000	42.33	3.02	45.35	74.00	-28.65	peak	V
3660.000	40.63	4.02	44.65	74.00	-29.35	peak	V

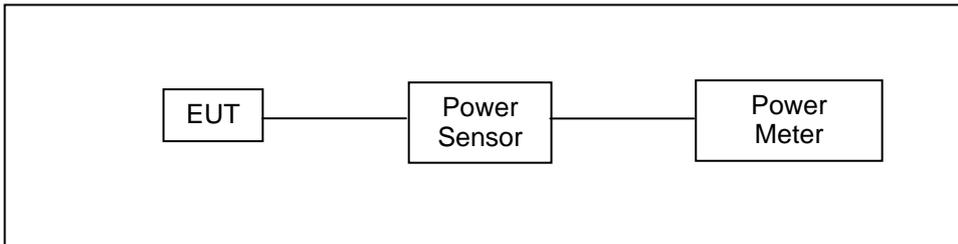
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Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	PJ03100			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 6			Date:	08/21/2011		
Modulation:	IEEE 802.11b			Test By:	Gary Wu		
Frequency:	2437MHz						
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1665.000	46.17	-2.97	43.20	74.00	-30.80	peak	H
2785.000	39.47	1.41	40.88	74.00	-33.12	peak	H
3548.000	40.03	3.60	43.63	74.00	-30.37	peak	H
2001.000	51.28	-1.79	49.49	74.00	-24.51	peak	V
2995.000	42.58	2.28	44.86	74.00	-29.14	peak	V
4213.000	37.91	5.97	43.88	74.00	-30.12	peak	V

## 6 Maximum Conducted Output Power Measurement

### 6.1. Limit

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

### 6.2. Test Setup



### 6.3. Test Instruments

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

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

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

### 6.4. Test Procedure

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

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

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

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

**6.5. Test Result**

Model Number	PJ03100					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 3: IEEE 802.11b Link Mode					
Date of Test	08/13/2011			Test Site	TE02	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	1M	15.67	0.037	18.58	0.072	< 30
2437		15.52	0.036	18.56	0.072	< 30
2462		15.69	0.037	18.53	0.071	< 30
2412	11M	15.39	0.035	18.55	0.072	< 30
2437		15.28	0.034	18.63	0.073	< 30
2462		15.55	0.036	<b>18.82</b>	<b>0.076</b>	< 30

Model Number	PJ03100					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 4: IEEE 802.11g Link Mode					
Date of Test	08/13/2011			Test Site	TE02	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	6M	9.36	0.009	20.09	0.102	< 30
2437		9.19	0.008	20.43	0.110	< 30
2462		9.27	0.008	<b>20.65</b>	<b>0.116</b>	< 30
2412	54M	7.89	0.006	19.57	0.091	< 30
2437		7.91	0.006	20.08	0.102	< 30
2462		8.21	0.007	20.45	0.111	< 30

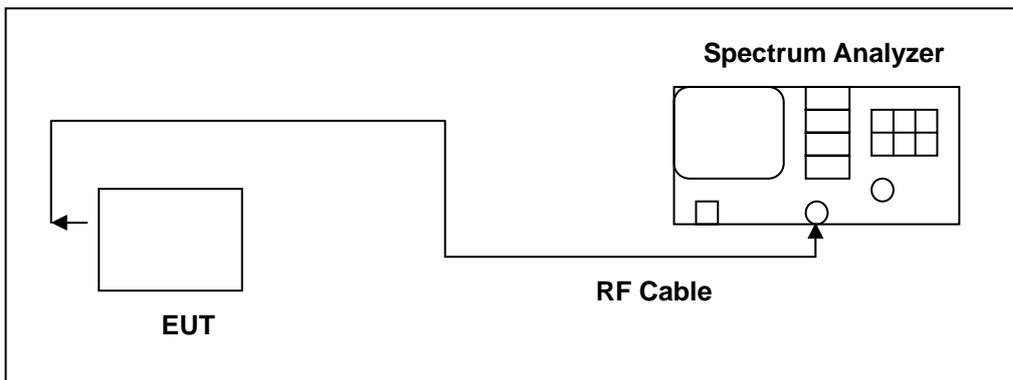
Model Number	PJ03100					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 5: draft 802.11n Standard-20MHz Link Mode					
Date of Test	08/13/2011			Test Site	TE02	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	MCS0	9.26	0.008	19.71	0.094	< 30
2437		9.15	0.008	20.19	0.104	< 30
2462		9.21	0.008	20.30	0.107	< 30
2412	MCS7	8.08	0.006	20.01	0.100	< 30
2437		7.74	0.006	20.21	0.105	< 30
2462		7.95	0.006	<b>20.66</b>	<b>0.116</b>	< 30

## 7 6dB RF Bandwidth Measurement

### 7.1. Limit

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

### 7.2. Test Setup



### 7.3. Test Instruments

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

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

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

### 7.4. Test Procedure

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

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

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

**7.5. Test Result**

Model Number	PJ03100		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 3: IEEE 802.11b Link Mode		
Date of Test	08/13/2011	Test Site	TE02
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	10170	> 500
	2437	9080	> 500
	2462	9420	> 500

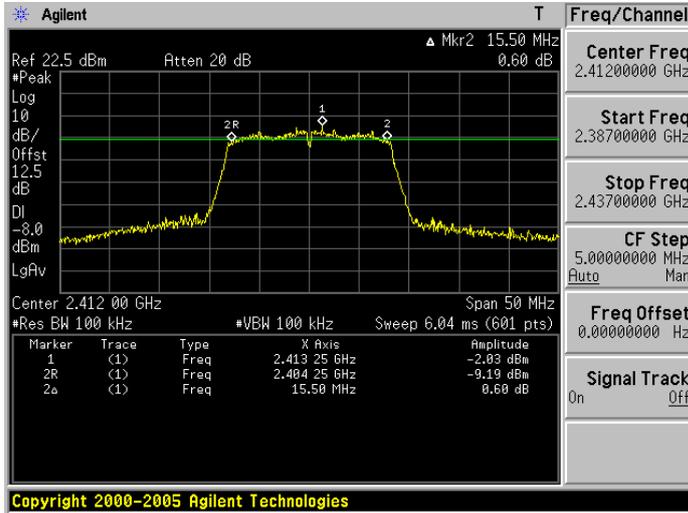
Model Number	PJ03100		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 4: IEEE 802.11g Link Mode		
Date of Test	08/13/2011	Test Site	TE06
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	15500	> 500
	2437	15920	> 500
	2462	16420	> 500

Model Number	PJ03100		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 5: draft 802.11n Standard-20MHz Link Mode		
Date of Test	08/13/2011	Test Site	TE02
	Frequency (MHz)	Measurement (kHz)	Limit (kHz)
	2412	16750	> 500
	2437	16330	> 500
	2462	17250	> 500

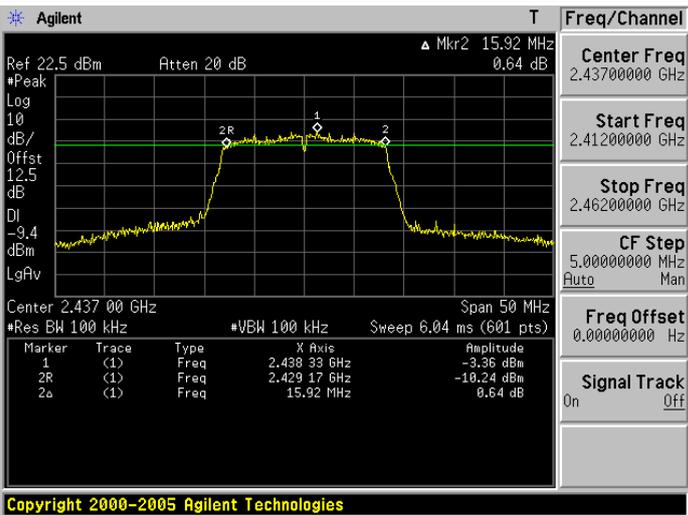


Mode 4: IEEE 802.11g Link Mode

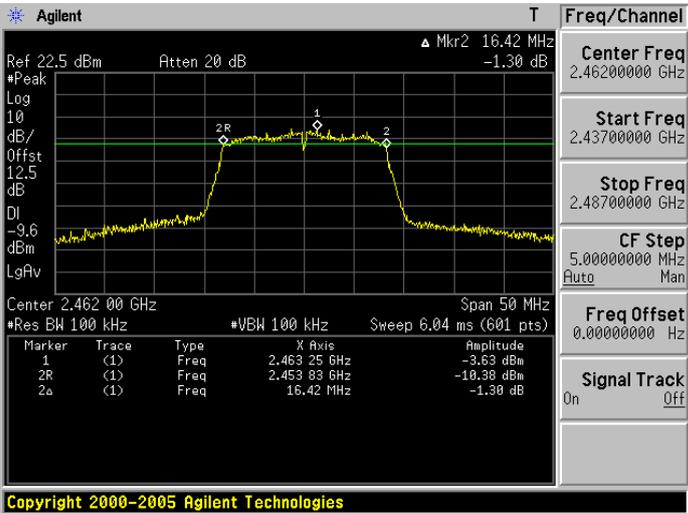
2412



2437

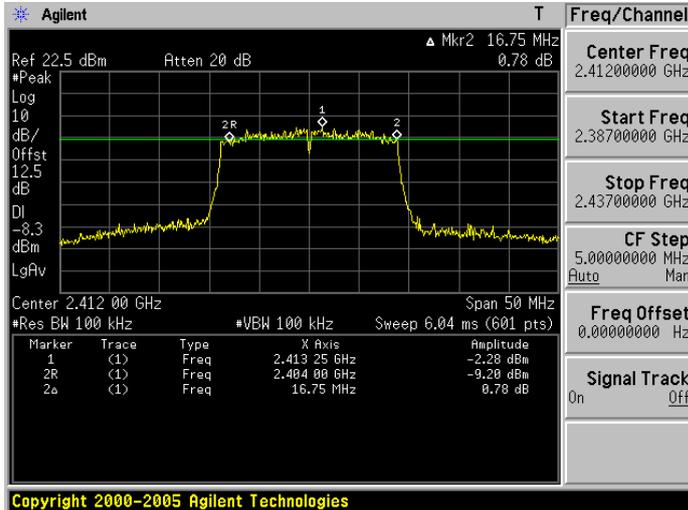


2462

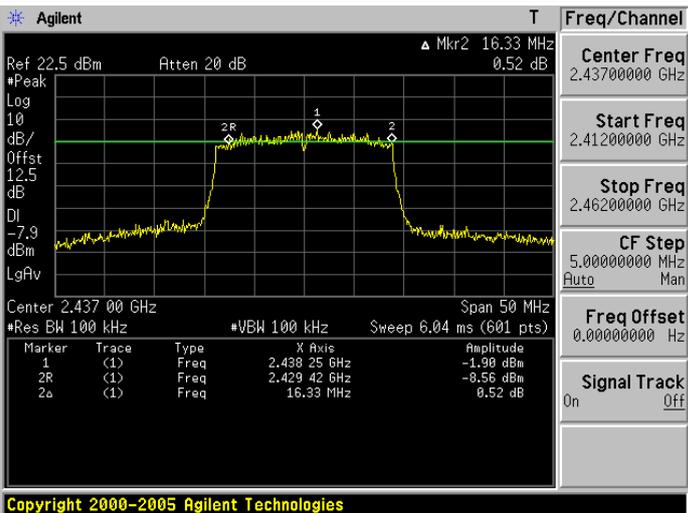


Mode 5: draft 802.11n Standard-20MHz Link Mode

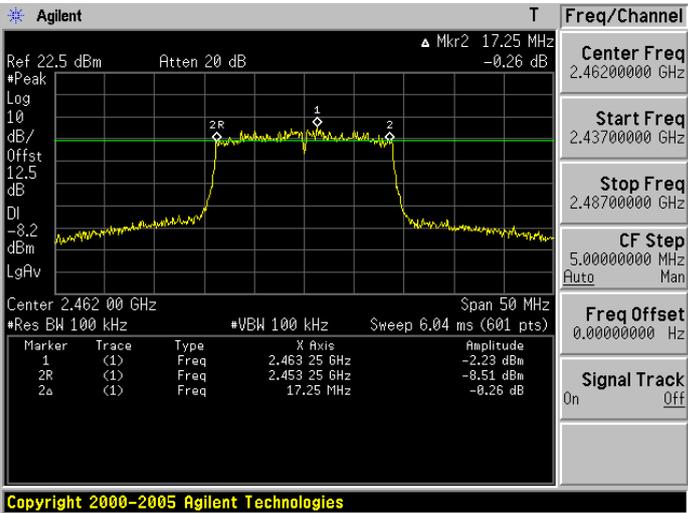
2412



2437



2462

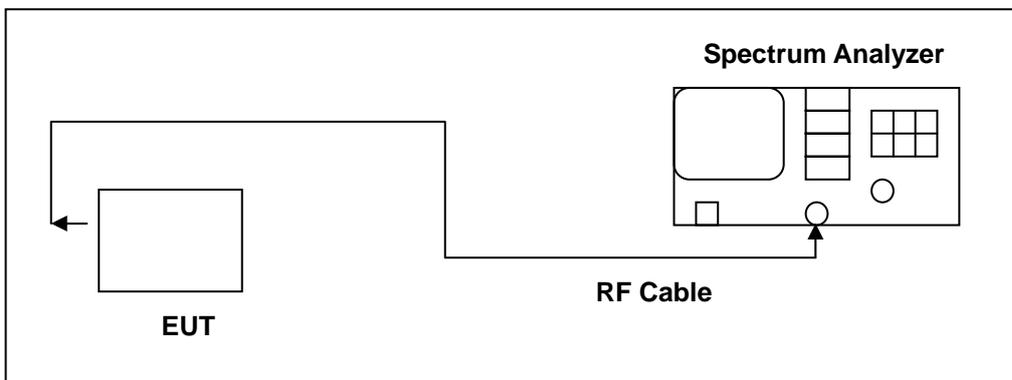


## 8 Maximum Power Density Measurement

### 8.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 8.2. Test Setup



### 8.3. Test Instruments

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

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

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

### 8.4. Test Procedure

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

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

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

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

**8.5. Test Result**

Model Number	PJ03100		
Test Item	Maximum Power Density		
Test Mode	Mode 3: IEEE 802.11b Link Mode		
Date of Test	08/13/2011	Test Site	TE02
	Frequency (MHz)	Measurement (dBm)	Limit (dBm)
	2412	-6.400	< 8
	2437	-6.850	< 8
	2462	-7.360	< 8

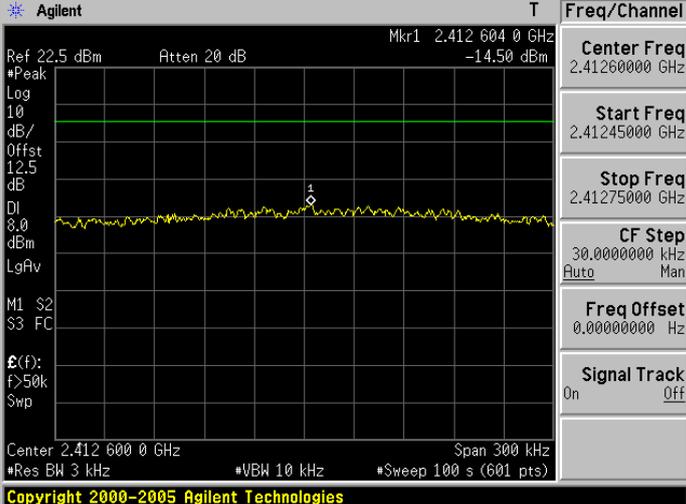
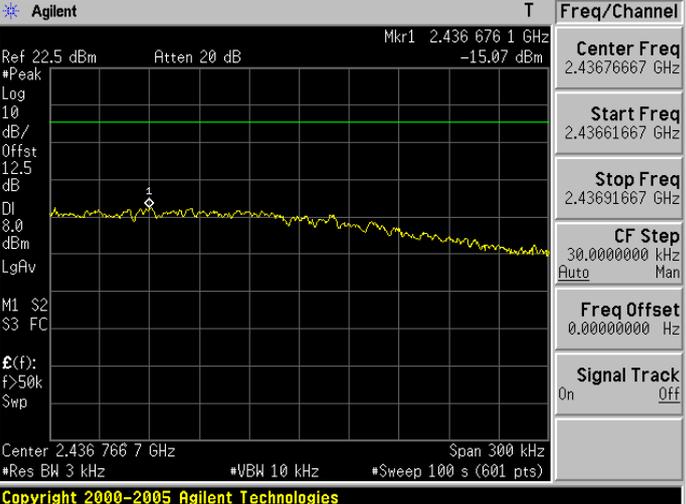
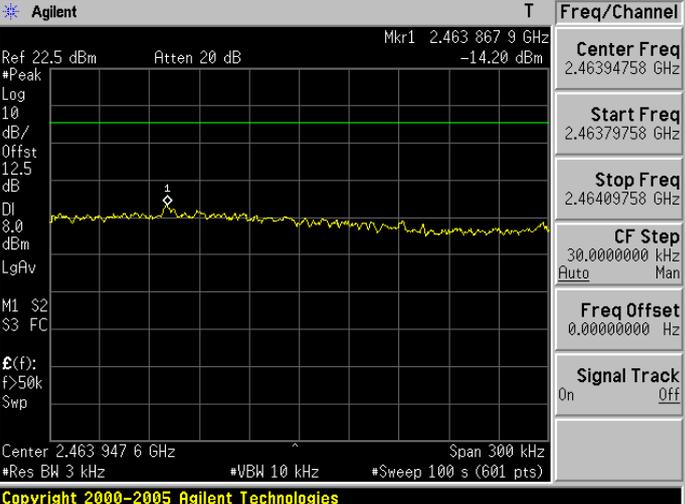
Model Number	PJ03100		
Test Item	Maximum Power Density		
Test Mode	Mode 4: IEEE 802.11g Link Mode		
Date of Test	08/13/2011	Test Site	TE02
	Frequency (MHz)	Measurement (dBm)	Limit (dBm)
	2412	-14.50	< 8
	2437	-15.07	< 8
	2462	-14.20	< 8

Model Number	PJ03100		
Test Item	Maximum Power Density		
Test Mode	Mode 5: draft 802.11n Standard-20MHz Link Mode		
Date of Test	08/13/2011	Test Site	TE02
	Frequency (MHz)	Measurement (dBm)	Limit (dBm)
	2412	-15.95	< 8
	2437	-16.02	< 8
	2462	-14.90	< 8

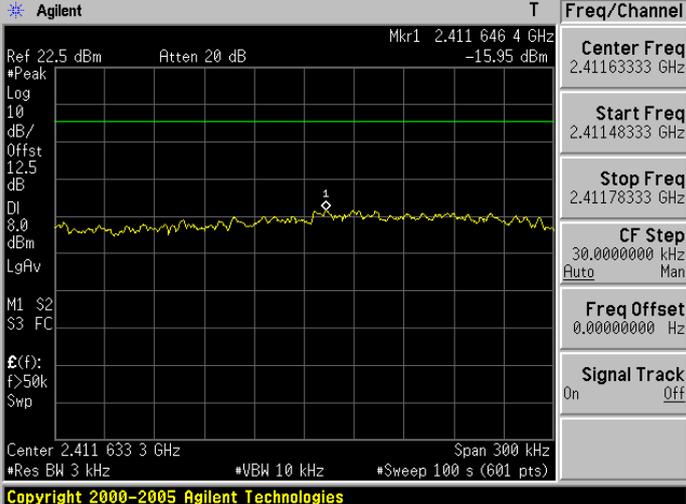
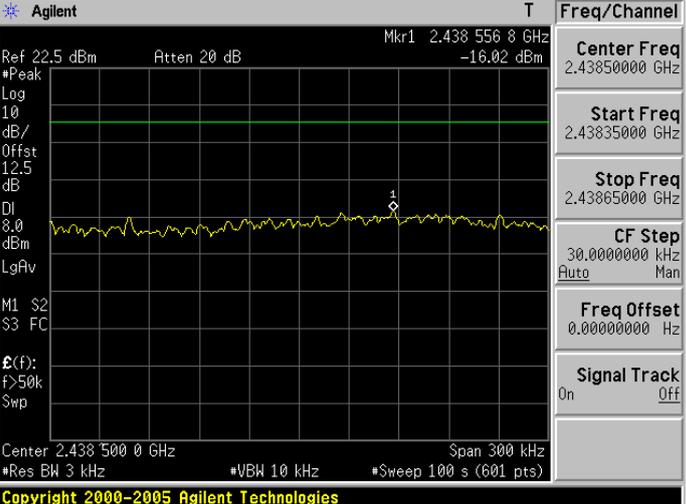
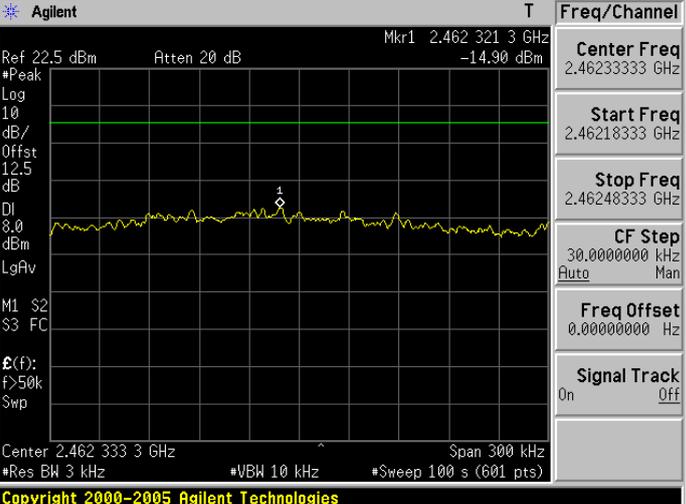
**8.6. Test Graphs**

Mode 3: IEEE 802.11b Link Mode	
2412	<p>Agilent T Freq/Channel</p> <p>Ref 22.5 dBm Atten 20 dB Mkr1 2.410 888 5 GHz -6.40 dBm</p> <p>#Peak Log 10 dB/ Offst 12.5 dB DI 8.0 dBm LgAv</p> <p>M1 S2 S3 FC</p> <p>Ⓔ(f): f&gt;50k Swp</p> <p>Center 2.410 833 3 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</p> <p>Center Freq 2.41083333 GHz</p> <p>Start Freq 2.41068333 GHz</p> <p>Stop Freq 2.41098333 GHz</p> <p>CF Step 30.0000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2437	<p>Agilent R T Freq/Channel</p> <p>Ref 22.5 dBm Atten 20 dB Mkr1 2.437 209 6 GHz -6.85 dBm</p> <p>#Peak Log 10 dB/ Offst 12.5 dB DI 8.0 dBm LgAv</p> <p>M1 S2 S3 FC</p> <p>Ⓔ(f): f&gt;50k Swp</p> <p>Center 2.437 100 0 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</p> <p>Center Freq 2.43710000 GHz</p> <p>Start Freq 2.43695000 GHz</p> <p>Stop Freq 2.43725000 GHz</p> <p>CF Step 30.0000000 kHz 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 22.5 dBm Atten 20 dB Mkr1 2.463 273 4 GHz -7.36 dBm</p> <p>#Peak Log 10 dB/ Offst 12.5 dB DI 8.0 dBm LgAv</p> <p>M1 S2 S3 FC</p> <p>Ⓔ(f): f&gt;50k Swp</p> <p>Center 2.463 200 0 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <p>Freq/Channel</p> <p>Center Freq 2.46320000 GHz</p> <p>Start Freq 2.46305000 GHz</p> <p>Stop Freq 2.46335000 GHz</p> <p>CF Step 30.0000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

Mode 4: IEEE 802.11g Link Mode

2412	 <p>Agilent T Freq/Channel</p> <p>Ref 22.5 dBm Atten 20 dB Mkr1 2.412 604 0 GHz -14.50 dBm</p> <p>Center Freq 2.41260000 GHz</p> <p>Start Freq 2.41245000 GHz</p> <p>Stop Freq 2.41275000 GHz</p> <p>CF Step 30.0000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.412 600 0 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	 <p>Agilent T Freq/Channel</p> <p>Ref 22.5 dBm Atten 20 dB Mkr1 2.436 676 1 GHz -15.07 dBm</p> <p>Center Freq 2.4366667 GHz</p> <p>Start Freq 2.43661667 GHz</p> <p>Stop Freq 2.43691667 GHz</p> <p>CF Step 30.0000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.436 766 7 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	 <p>Agilent T Freq/Channel</p> <p>Ref 22.5 dBm Atten 20 dB Mkr1 2.463 867 9 GHz -14.20 dBm</p> <p>Center Freq 2.46394758 GHz</p> <p>Start Freq 2.46379758 GHz</p> <p>Stop Freq 2.46409758 GHz</p> <p>CF Step 30.0000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.463 947 6 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 5: draft 802.11n Standard-20MHz Link Mode

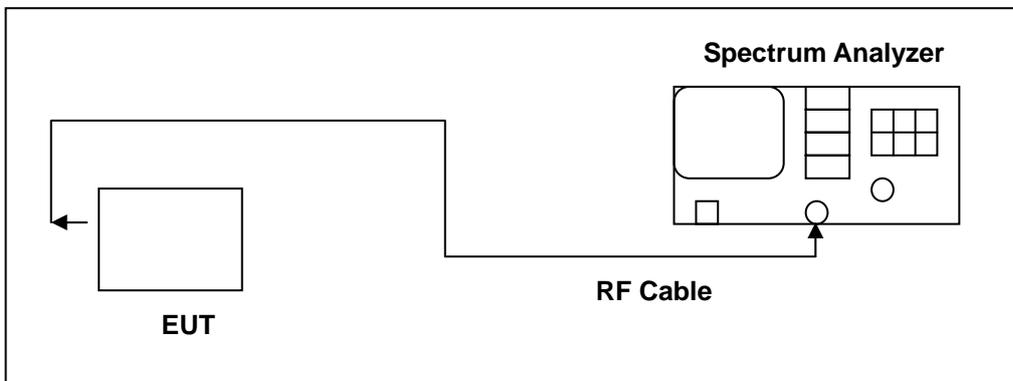
2412	 <p>Agilent T Freq/Channel</p> <p>Ref 22.5 dBm Atten 20 dB Mkr1 2.411 646 4 GHz #Peak -15.95 dBm Center Freq 2.41163333 GHz</p> <p>Start Freq 2.41148333 GHz</p> <p>Stop Freq 2.41178333 GHz</p> <p>CF Step 30.0000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.411 633 3 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	 <p>Agilent T Freq/Channel</p> <p>Ref 22.5 dBm Atten 20 dB Mkr1 2.438 556 8 GHz #Peak -16.02 dBm Center Freq 2.43850000 GHz</p> <p>Start Freq 2.43835000 GHz</p> <p>Stop Freq 2.43865000 GHz</p> <p>CF Step 30.0000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.438 500 0 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	 <p>Agilent T Freq/Channel</p> <p>Ref 22.5 dBm Atten 20 dB Mkr1 2.462 321 3 GHz #Peak -14.90 dBm Center Freq 2.46233333 GHz</p> <p>Start Freq 2.46218333 GHz</p> <p>Stop Freq 2.46248333 GHz</p> <p>CF Step 30.0000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.462 333 3 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>

## 9 Out of Band Conducted Emissions Measurement

### 9.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

### 9.2. Test Setup



### 9.3. Test Instruments

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

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

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

### 9.4. Test Procedure

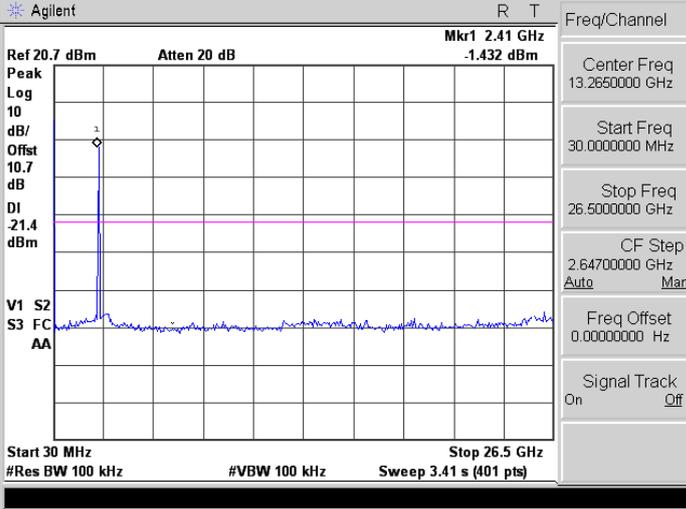
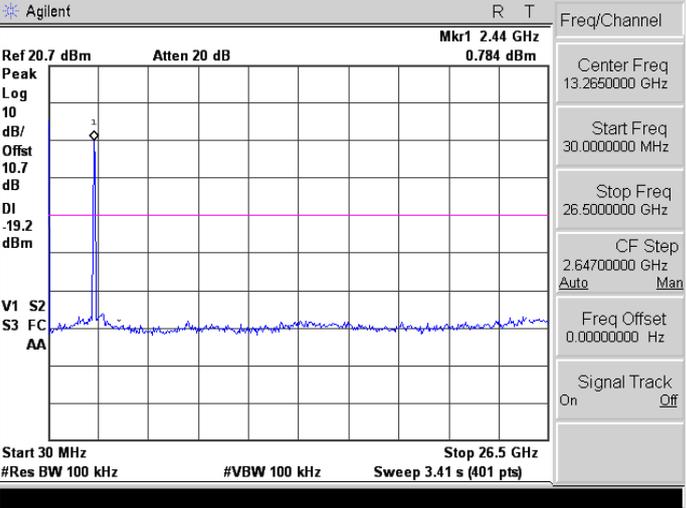
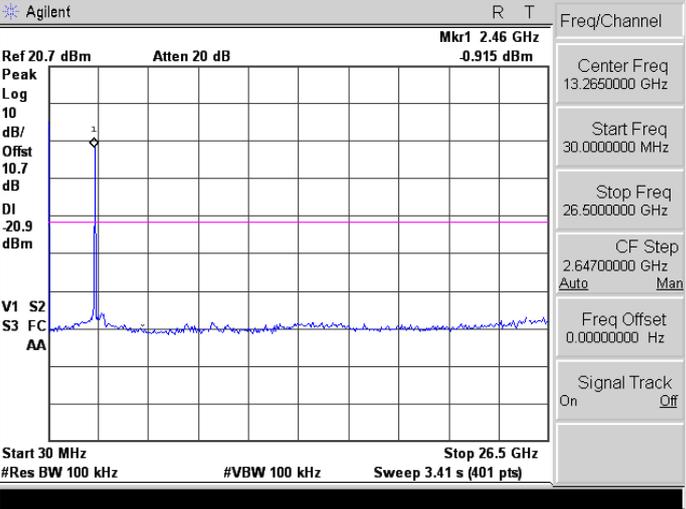
In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly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

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

**9.5. Test Graphs**

Mode 3: IEEE 802.11b Link Mode	
2412	
2437	
2462	

Mode 4: IEEE 802.11g Link Mode

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

Mode 5: draft 802.11n Standard-20MHz Link Mode

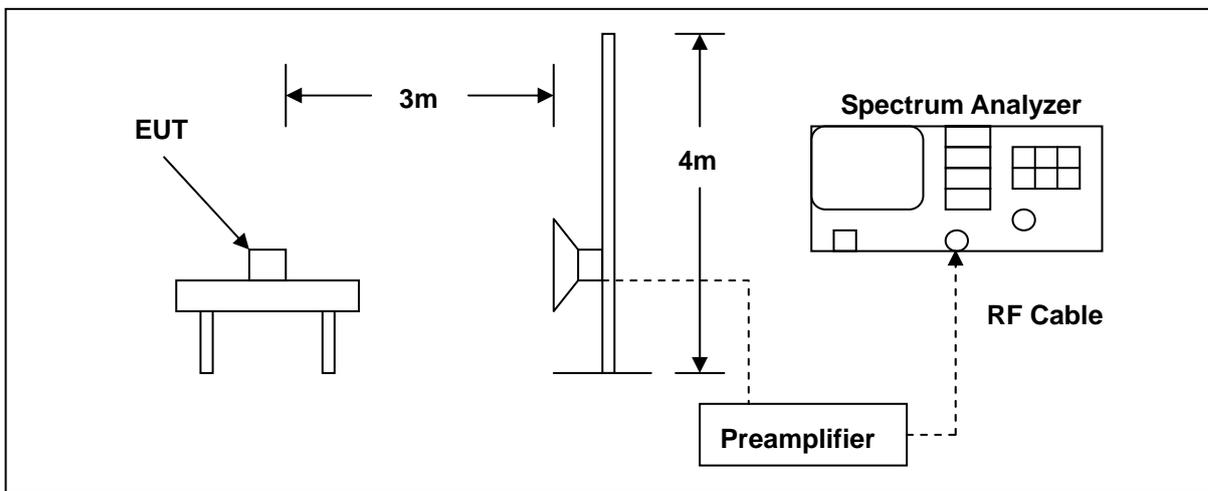
<p>2412</p>	
<p>2437</p>	
<p>2462</p>	

## 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

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

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

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

#### **10.4. Test Procedure**

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

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

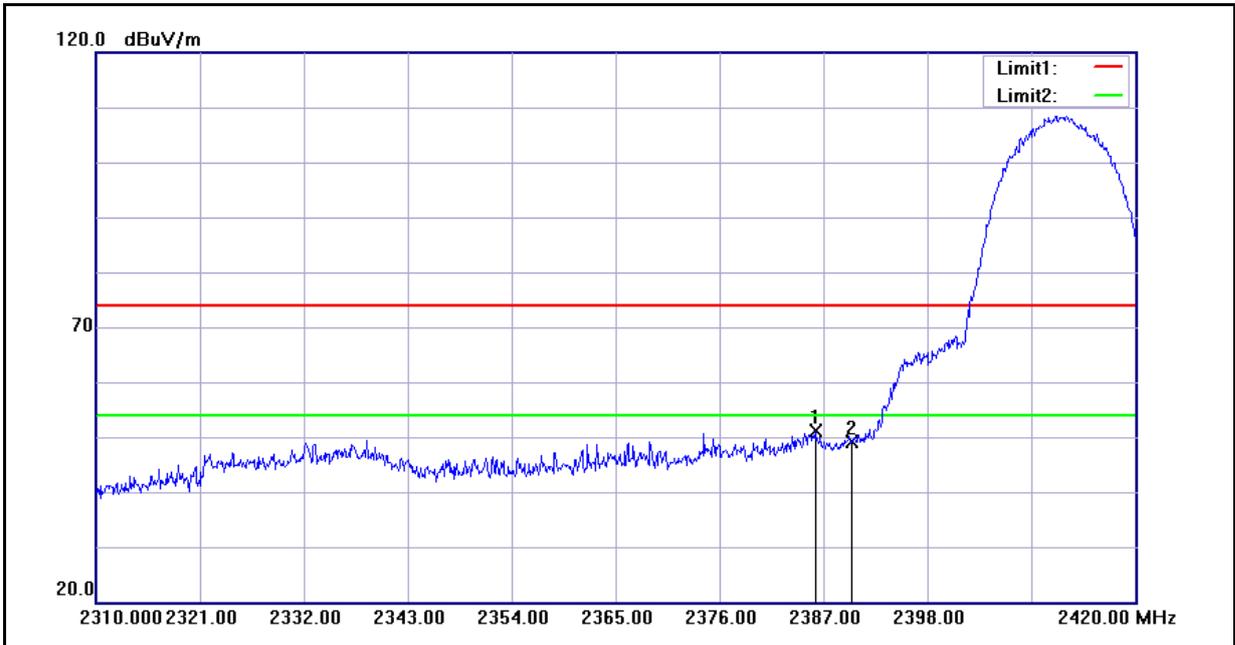
The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

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

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

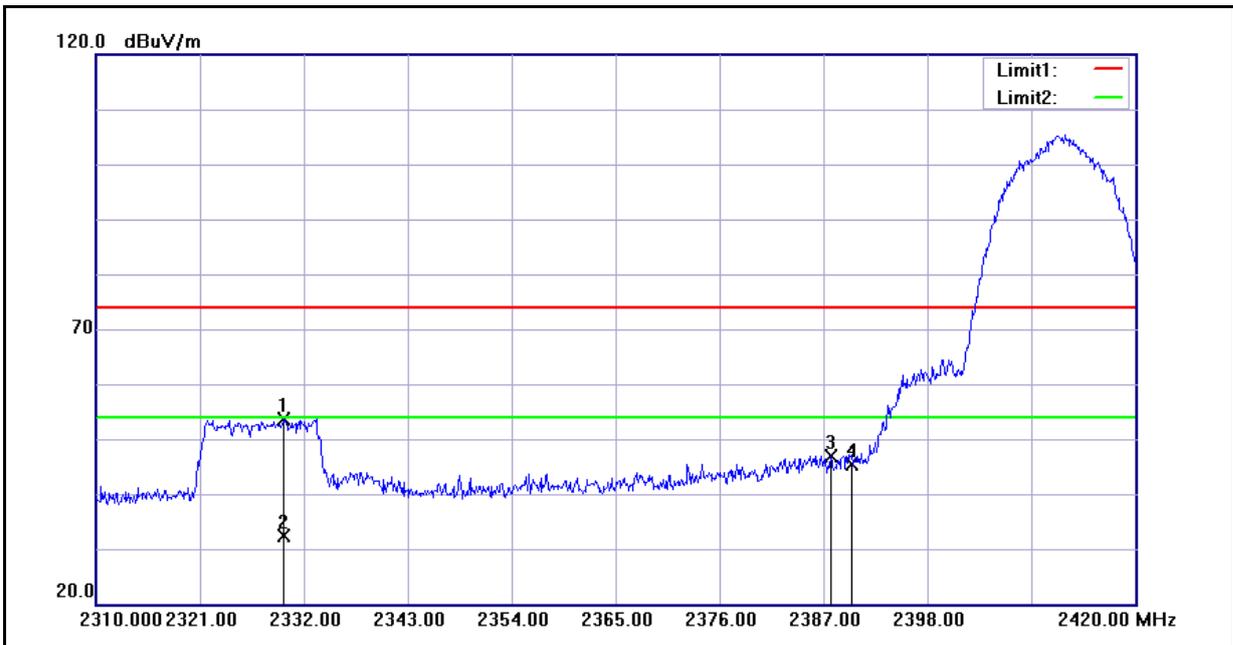
**10.5.Test Result**

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	08/21/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



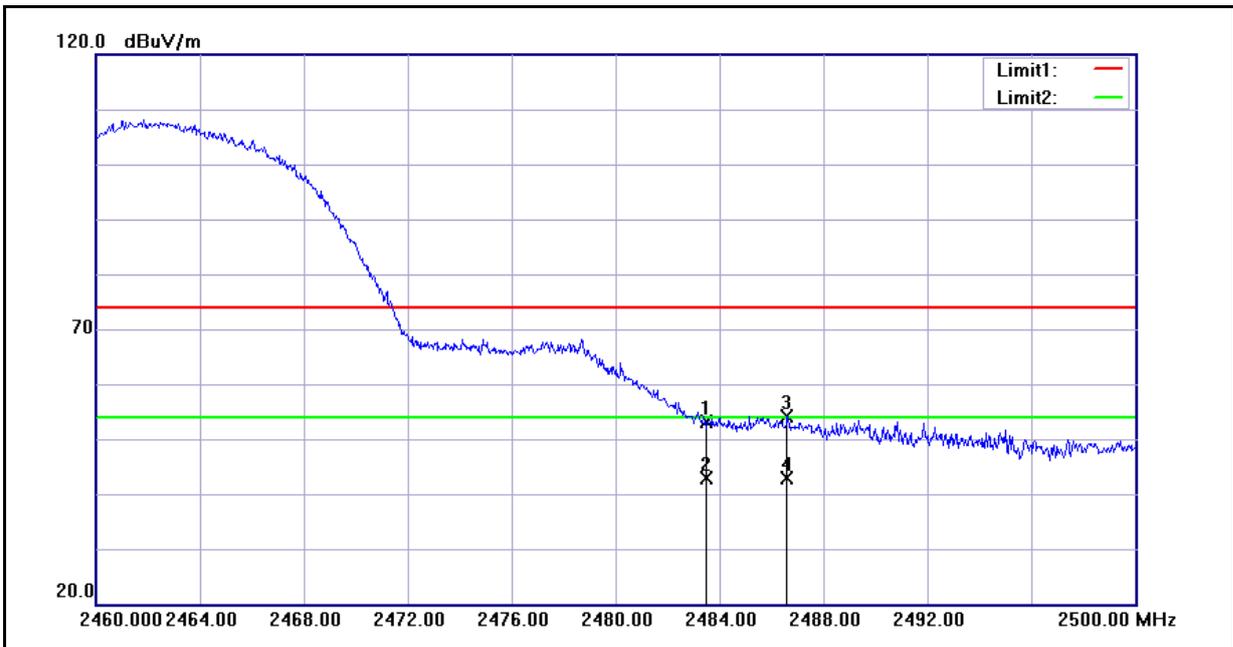
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2386.120	51.47	-0.24	51.23	74.00	-22.77	peak
2	2390.000	49.39	-0.22	49.17	74.00	-24.83	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	08/21/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



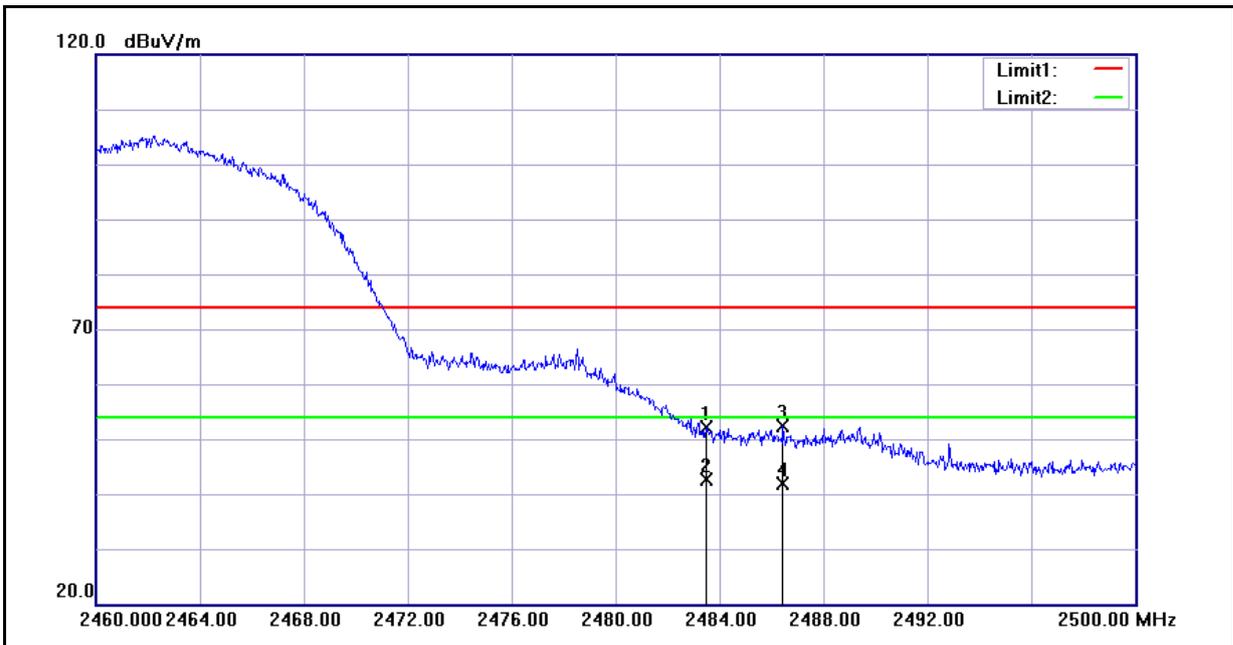
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2329.910	54.06	-0.45	53.61	74.00	-20.39	peak
2	2329.910	32.71	-0.45	32.26	54.00	-21.74	AVG
3	2387.770	47.22	-0.22	47.00	74.00	-27.00	peak
4	2390.000	45.50	-0.22	45.28	74.00	-28.72	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	08/21/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



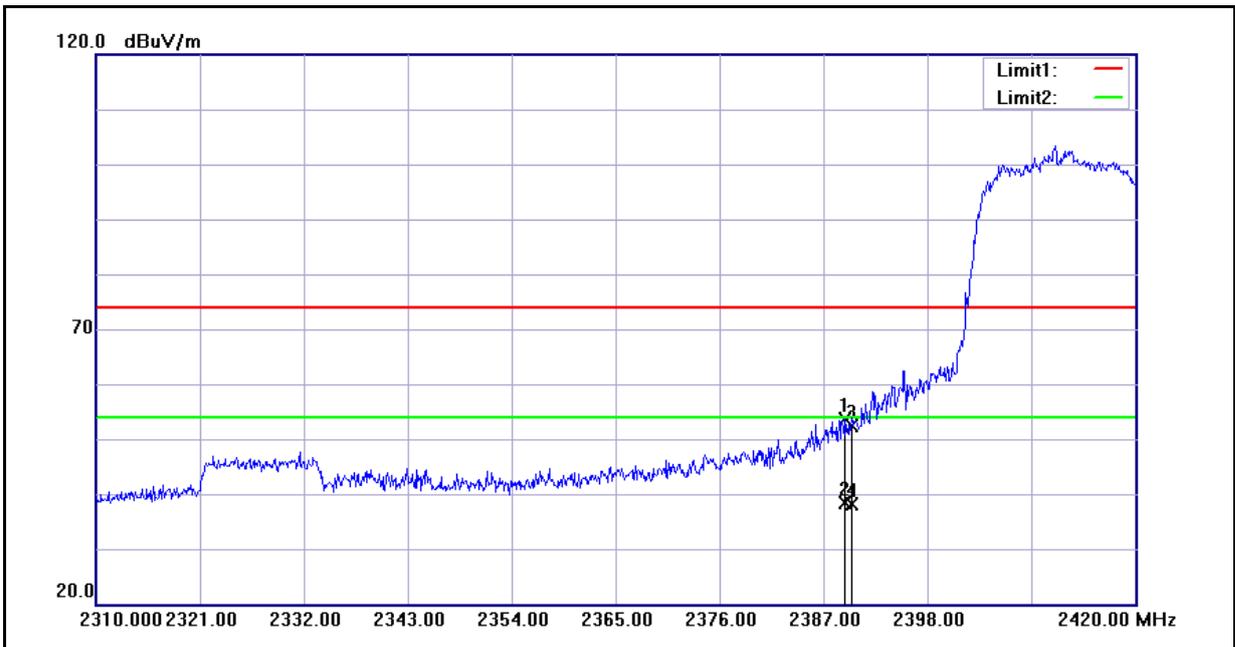
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	52.97	0.16	53.13	74.00	-20.87	peak
2	2483.500	42.75	0.16	42.91	54.00	-11.09	AVG
3	2486.600	53.94	0.18	54.12	74.00	-19.88	peak
4	2486.600	42.71	0.18	42.89	54.00	-11.11	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	08/21/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



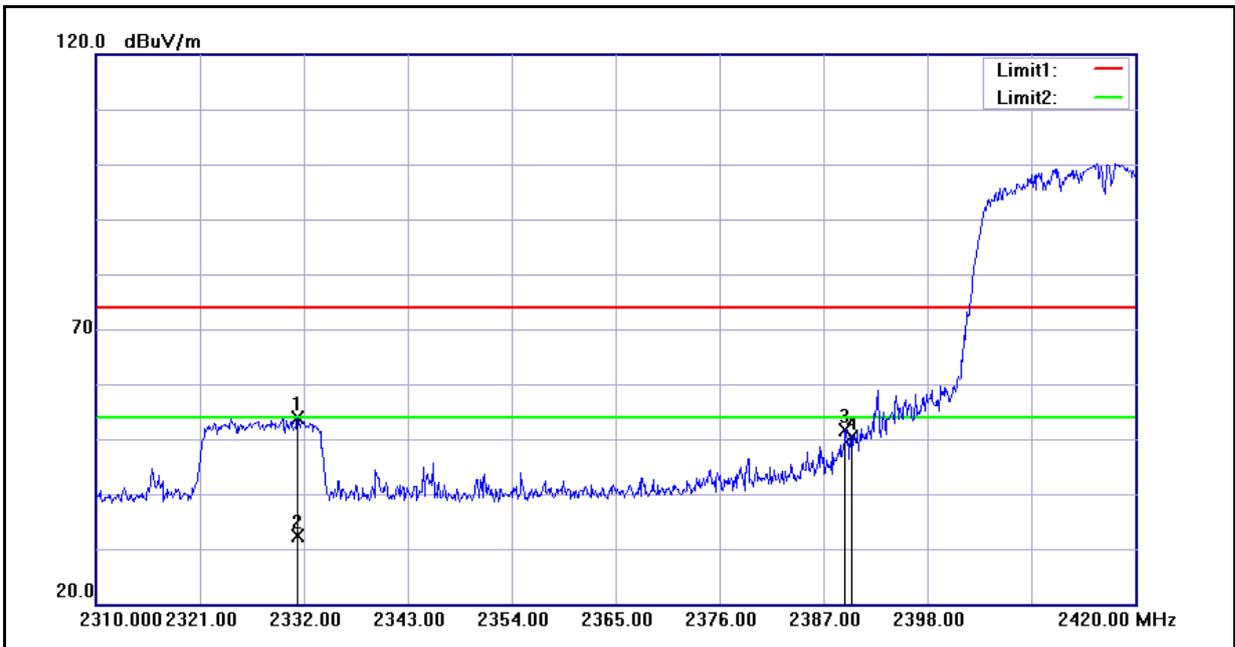
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	52.06	0.16	52.22	74.00	-21.78	peak
2	2483.500	42.43	0.16	42.59	54.00	-11.41	AVG
3	2486.440	52.23	0.17	52.40	74.00	-21.60	peak
4	2486.440	41.82	0.17	41.99	54.00	-12.01	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	08/21/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



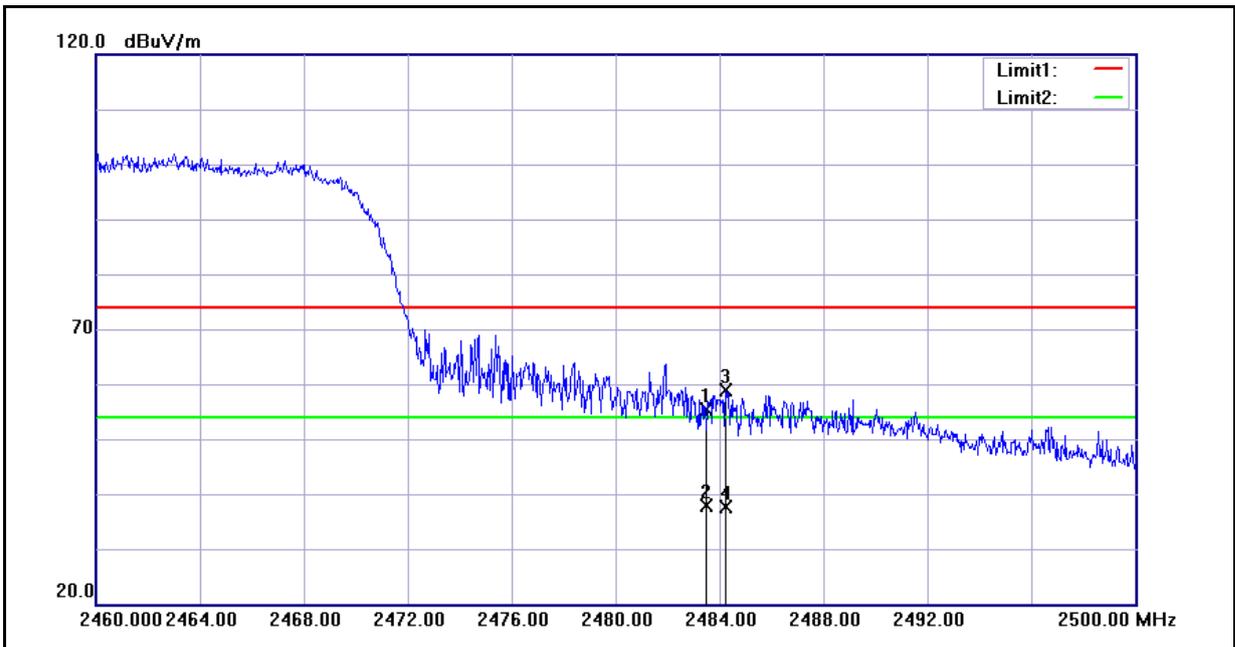
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.310	53.91	-0.22	53.69	74.00	-20.31	peak
2	2389.310	38.67	-0.22	38.45	54.00	-15.55	AVG
3	2390.000	52.68	-0.22	52.46	74.00	-21.54	peak
4	2390.000	38.46	-0.22	38.24	54.00	-15.76	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	08/21/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



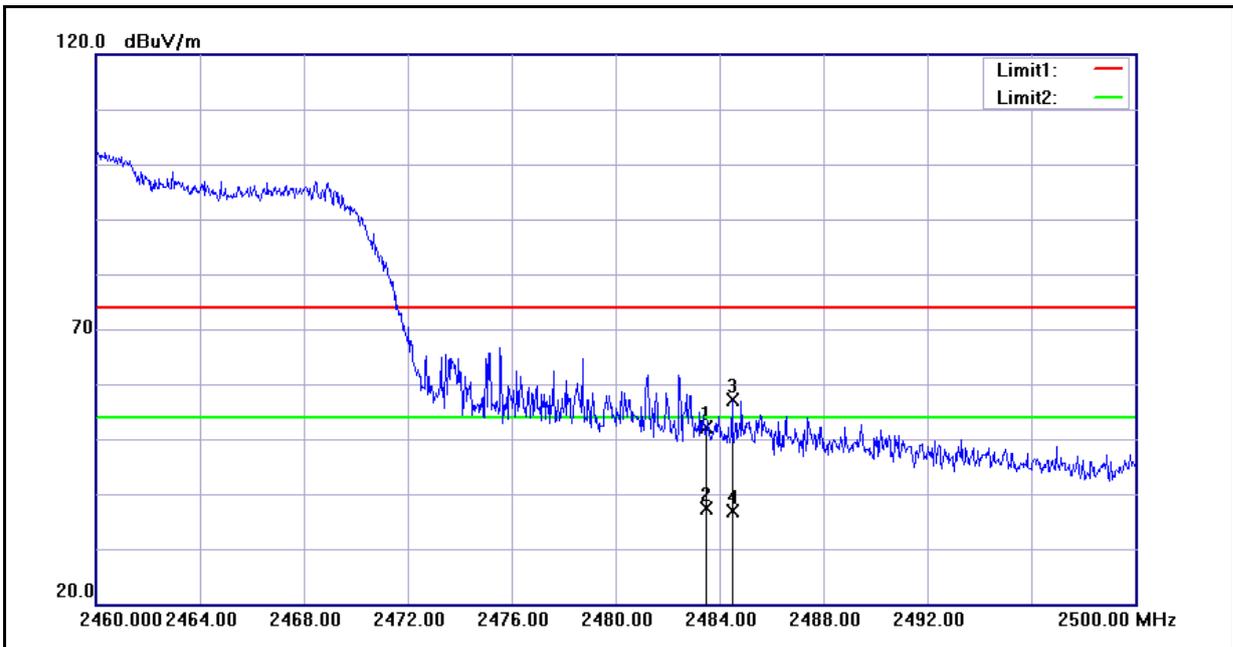
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2331.340	54.32	-0.45	53.87	74.00	-20.13	peak
2	2331.340	32.71	-0.45	32.26	54.00	-21.74	AVG
3	2389.310	51.84	-0.22	51.62	74.00	-22.38	peak
4	2390.000	50.65	-0.22	50.43	74.00	-23.57	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	08/21/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



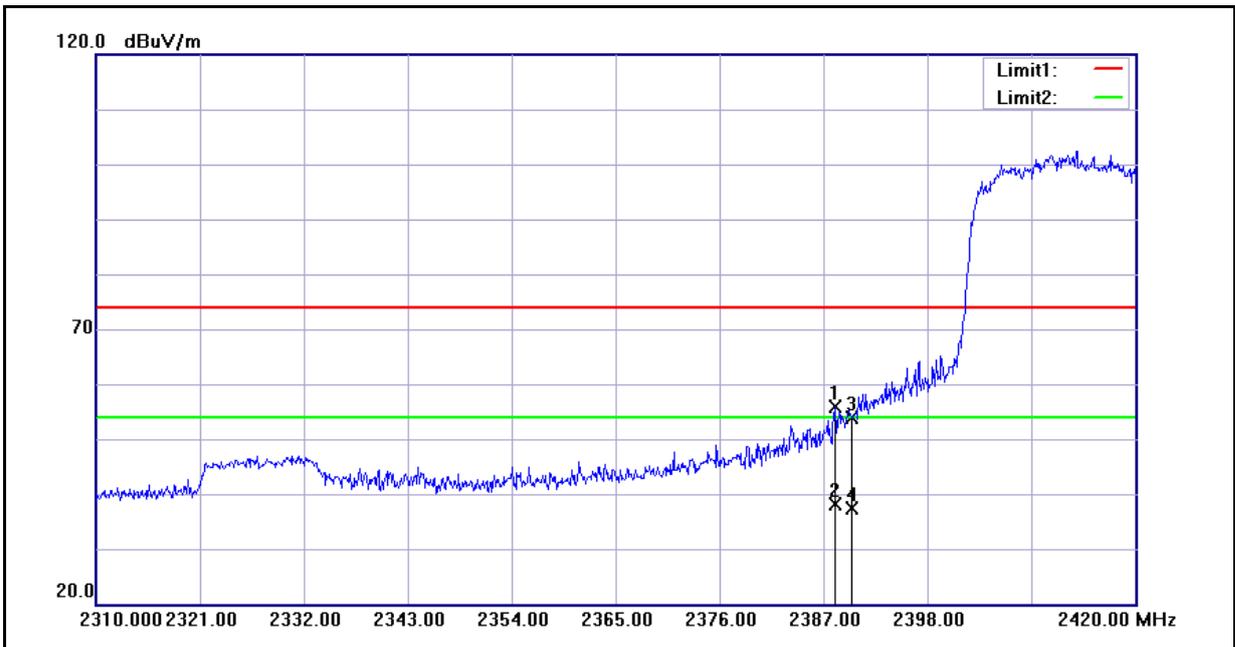
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	55.31	0.16	55.47	74.00	-18.53	peak
2	2483.500	37.84	0.16	38.00	54.00	-16.00	AVG
3	2484.240	58.65	0.16	58.81	74.00	-15.19	peak
4	2484.240	37.43	0.16	37.59	54.00	-16.41	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	08/21/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



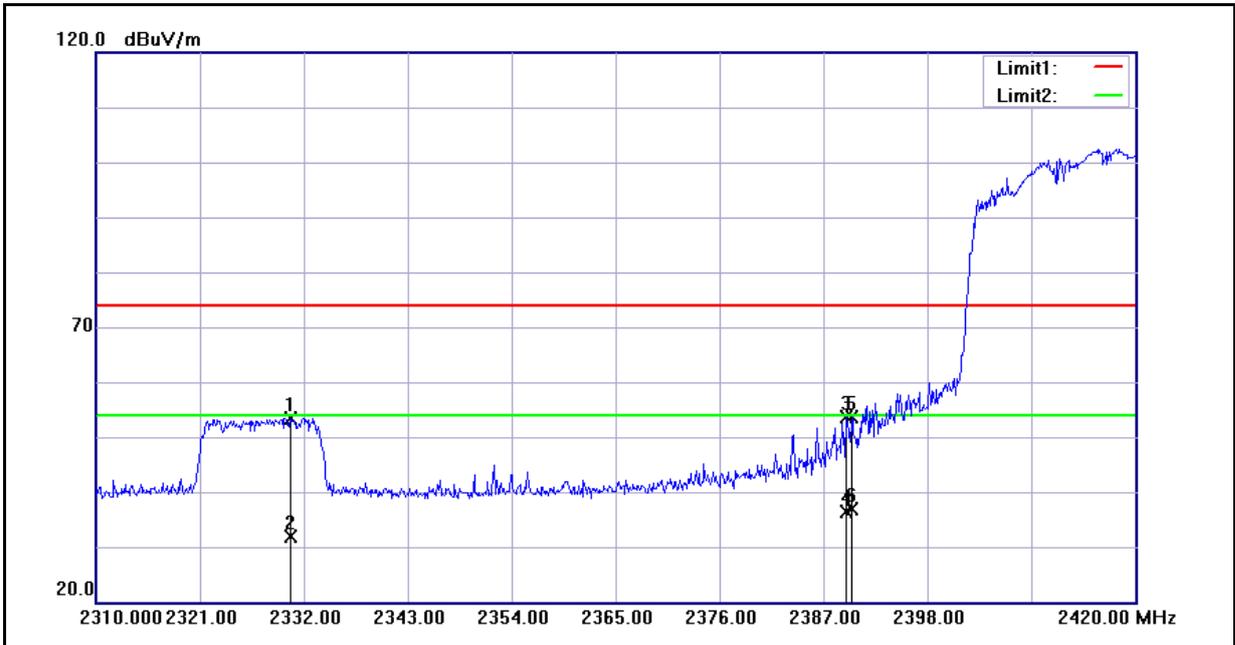
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	52.04	0.16	52.20	74.00	-21.80	peak
2	2483.500	37.10	0.16	37.26	54.00	-16.74	AVG
3	2484.480	56.98	0.16	57.14	74.00	-16.86	peak
4	2484.480	36.72	0.16	36.88	54.00	-17.12	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	08/21/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



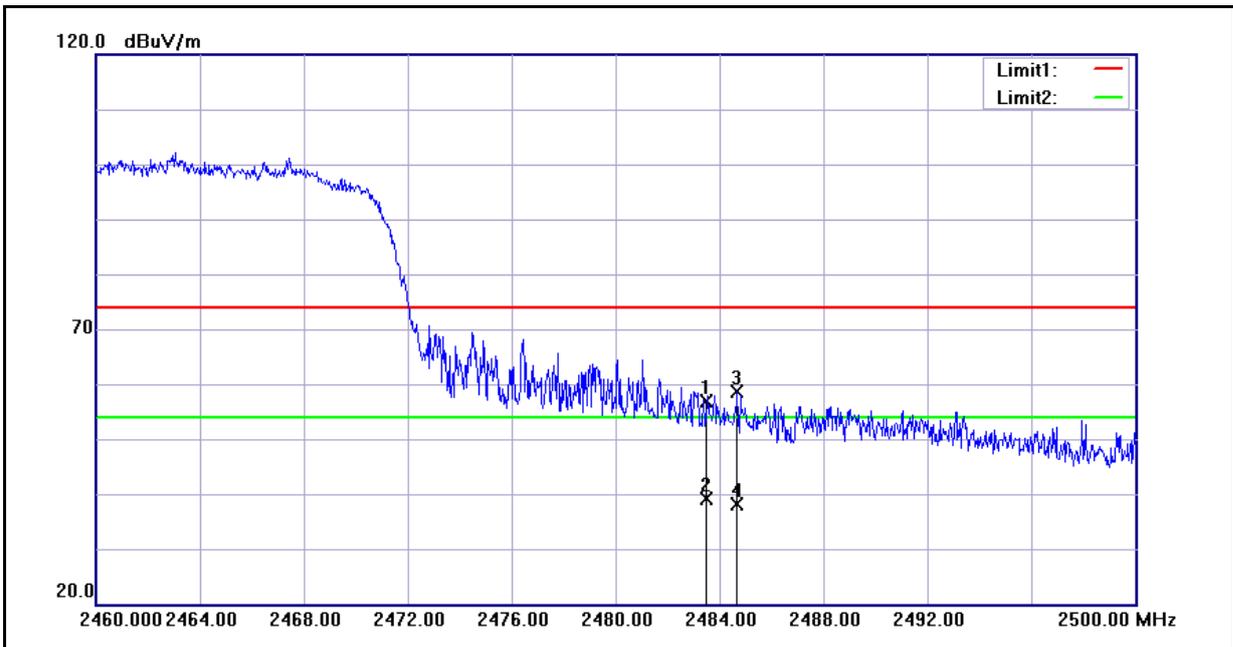
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.210	56.11	-0.22	55.89	74.00	-18.11	peak
2	2388.210	38.37	-0.22	38.15	54.00	-15.85	AVG
3	2390.000	54.07	-0.22	53.85	74.00	-20.15	peak
4	2390.000	37.51	-0.22	37.29	54.00	-16.71	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	08/21/2011
Frequency:	2412 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



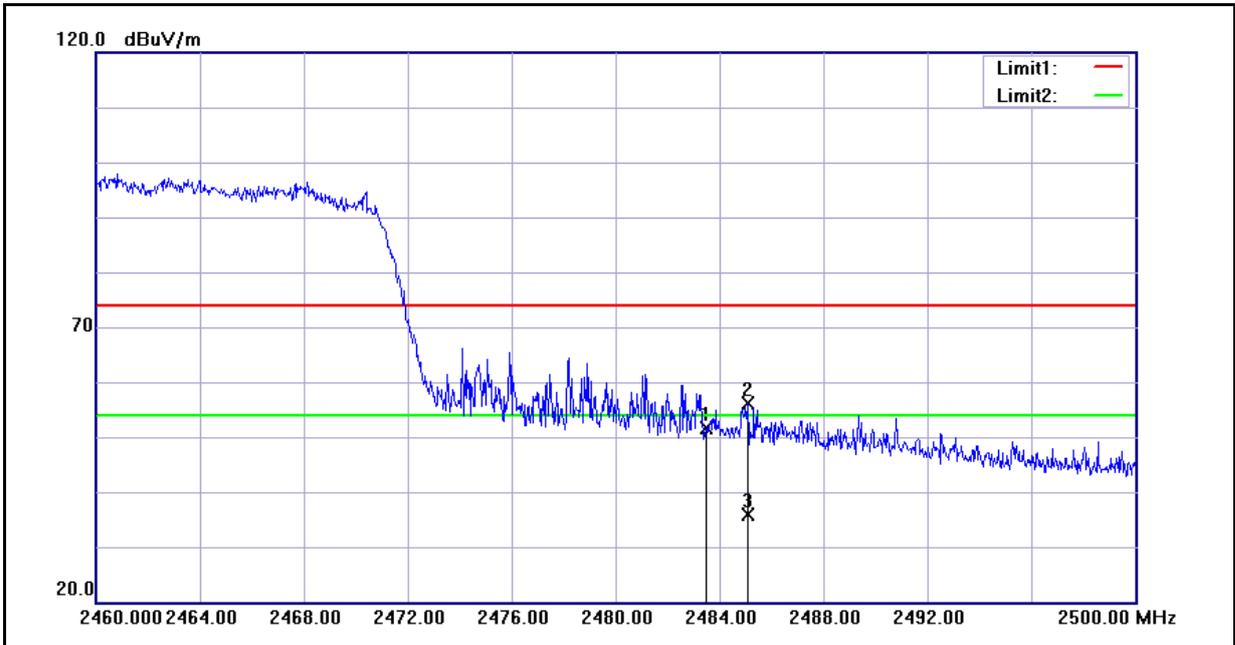
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2330.570	53.95	-0.45	53.50	74.00	-20.50	peak
2	2330.570	32.33	-0.45	31.88	54.00	-22.12	AVG
3	2389.420	53.83	-0.22	53.61	74.00	-20.39	peak
4	2389.420	36.70	-0.22	36.48	54.00	-17.52	AVG
5	2390.000	53.80	-0.22	53.58	74.00	-20.42	peak
6	2390.000	36.98	-0.22	36.76	54.00	-17.24	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	08/21/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	56.60	0.16	56.76	74.00	-17.24	peak
2	2483.500	39.08	0.16	39.24	54.00	-14.76	AVG
3	2484.680	58.42	0.16	58.58	74.00	-15.42	peak
4	2484.680	37.94	0.16	38.10	54.00	-15.90	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PJ03100	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	08/21/2011
Frequency:	2462 MHz	Test By:	Gary Wu
Ant.Polar.:	Vertical		



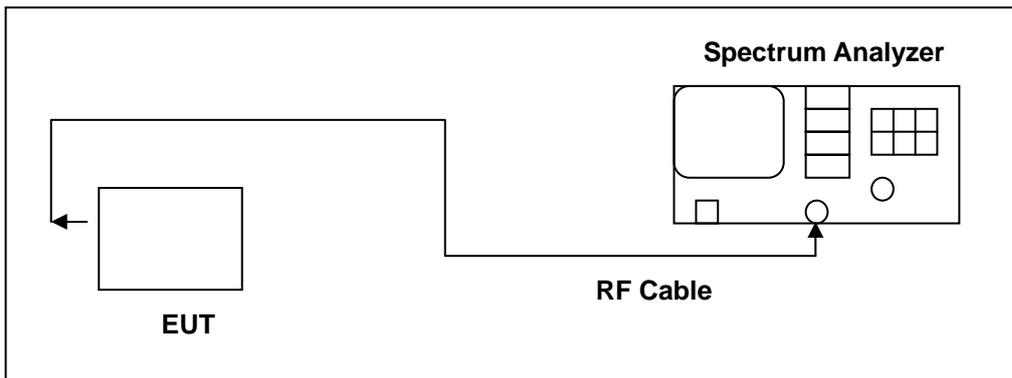
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	51.38	0.16	51.54	74.00	-22.46	peak
2	2485.080	55.99	0.16	56.15	74.00	-17.85	peak
3	2485.080	35.84	0.16	36.00	54.00	-18.00	AVG

## 11 99 % Occupied Bandwidth Measurement

### 11.1.Limit

N/A

### 11.2.Test Setup



### 11.3.Test Instruments

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

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

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

### 11.4.Test Procedure

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

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

**11.5.Test Result**

Model Number	PJ03100		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 3: IEEE 802.11b Link Mode		
Date of Test	09/21/2011	Test Site	TE02
	Frequency (MHz)	Measurement (MHz)	Limit (kHz)
	2412	13.8576	-----
	2437	13.5814	-----
	2462	13.5371	-----

Model Number	PJ03100		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 4: IEEE 802.11g Link Mode		
Date of Test	09/21/2011	Test Site	TE02
	Frequency (MHz)	Measurement (MHz)	Limit (kHz)
	2412	16.8683	-----
	2437	16.8987	-----
	2462	17.0442	-----

Model Number	PJ03100		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 5: draft 802.11n Standard-20MHz Link Mode		
Date of Test	09/21/2011	Test Site	TE02
	Frequency (MHz)	Measurement (MHz)	Limit (kHz)
	2412	17.9650	-----
	2437	17.9548	-----
	2462	18.0009	-----

**11.6. Test Graphs**

Mode 3: IEEE 802.11b Link Mode	
2412	<p>Agilent R T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20.8 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.8 dB</p> <p>Center 2.412 GHz Span 50 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p><b>Occupied Bandwidth</b> 13.8576 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 116.698 kHz x dB Bandwidth 17.756 MHz*</p> <p>Freq/Channel</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.38700000 GHz</p> <p>Stop Freq 2.43700000 GHz</p> <p>CF Step 5.00000000 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 20.8 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.8 dB</p> <p>Center 2.437 GHz Span 50 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p><b>Occupied Bandwidth</b> 13.5814 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 44.566 kHz x dB Bandwidth 17.458 MHz*</p> <p>Freq/Channel</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.41200000 GHz</p> <p>Stop Freq 2.46200000 GHz</p> <p>CF Step 5.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
2462	<p>Agilent R T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20.8 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.8 dB</p> <p>Center 2.462 GHz Span 50 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p><b>Occupied Bandwidth</b> 13.5371 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 14.900 kHz x dB Bandwidth 17.369 MHz*</p> <p>Freq/Channel</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.43700000 GHz</p> <p>Stop Freq 2.48700000 GHz</p> <p>CF Step 5.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

Mode 4: IEEE 802.11g Link Mode

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

Mode 5: draft 802.11n Standard-20MHz Link Mode

<p>2412</p>	<p>Agilent R T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20.8 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.8 dB</p> <p>Center 2.412 GHz Span 50 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 % <b>17.9650 MHz</b> x dB -26.00 dB</p> <p>Transmit Freq Error 5.462 kHz x dB Bandwidth 20.575 MHz*</p> <p>Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.38700000 GHz Stop Freq 2.43700000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
<p>2437</p>	<p>Agilent R T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20.8 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.8 dB</p> <p>Center 2.437 GHz Span 50 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 % <b>17.9548 MHz</b> x dB -26.00 dB</p> <p>Transmit Freq Error 17.516 kHz x dB Bandwidth 20.543 MHz*</p> <p>Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.41200000 GHz Stop Freq 2.46200000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>
<p>2462</p>	<p>Agilent R T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20.8 dBm #Atten 20 dB</p> <p>#Samp Log 10 dB/Offset 10.8 dB</p> <p>Center 2.462 GHz Span 50 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 4 ms (401 pts)</p> <p><b>Occupied Bandwidth</b> Occ BW % Pwr 99.00 % <b>18.0009 MHz</b> x dB -26.00 dB</p> <p>Transmit Freq Error 8.395 kHz x dB Bandwidth 20.561 MHz*</p> <p>Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.43700000 GHz Stop Freq 2.48700000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off</p>

## **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 **PIFA Antenna**. And the maximum Gain of this antenna is only **0.46 dBi**.