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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

FCC TEST REPORT

Application No. : 04.01.0020EF

Applicant : COMPEX INC.

FCC ID : MK8CPX-04-WPE54G

Fundamental Frequency : 2.412GHz to 2.472GHz

Equipment under Test (EUT):

Name : 2.4GHz Compex 54Mbps Wireless-G Access Point

Model : NetPassage WPE54G

Standards : FCC PART 15, SUBPART C : 2002

Date of Receipt : 26 February 2004

Date of Test : 28 February to 28 March 2004

Date of Issue : 05 April 2004

Test Result :	**PASS ***

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Kent Hsu
Laboratory Manager
SGS-CSTC Co.,Ltd.

2 Test Summary

Test	Test Requirement	Stanadard Paragraph	Result
Radiated Emission (30MHz to 25GHz)	FCC PART 15 :2002	Section 15.107	PASS
Conducted Emission (150KHz to 30MHz)	FCC PART 15 :2002	Section 15.109	PASS
Occupied Bandwidth	FCC PART 15 :2002	Section 15.247 (a2)	PASS
Maximum Peak Output Power	FCC PART 15 :2002	Section 15.247 (b)	PASS
Band Edges Measurement	FCC PART 15 :2002	Section 15.247 (c)	PASS
Power Spectral Density Measurement	FCC PART 15 :2002	Section 15.247 (d)	PASS

3 Contents

4 General Information

4.1 Client Information

Applicant: COMPEX INC.

Address of Applicant: 4051E, La Palma, Unit A, Anaham, CA92807, USA

4.2 Details of E.U.T.

Product Name: 2.4GHz Compex 54Mbps Wireless-G Access Point

Model: NetPassage WPE54G

Power Supply: 120 Vac / 60 Hz for AC/DC Adapter
(Adapter: Hon-Kwang I.T.E. Power Supply,
100 - 240Vac/ 50/60Hz 0.45A adaptor,
Model: HK-B210-A033, S/N: S361903)

Power Cord: 2wire x 1.8m unscreened dc power input cable.

4.3 Description of Support Units

Test the EUT as a 802.11b & 802.11g WLAN AP.
EUT operating at 2.4 to 2.4835GHz, which is stand alone device, test EUT with corresponding LAN card insert to a IBM ThinkPad (T40) to connect to LAN, with either DSSS & OFDM modulation.
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

1. Communicating with the ASUS SpaceLink Wireless Lan PC Card, (Model: WL-100).
   Product description: 2.4GHz DSSS 11 Mbps:

Verify the Frequency and Channel

Channel	Frequency (GHz)
1	2.412
2	2.417
3	2.422
4	2.427
5	2.432
6	2.437
7	2.442
8	2.447
9	2.452
10	2.457
11	2.462

2. Communicating with the Compex Wireless Lan PC Card,
(Model: ***iWavePort*** WL54G).
Product description: 54 Mbps Wireless Lan PCMCISA Card:

Verify the Frequency and Channel

Channel	Frequency (GHz)
1	2.412
2	2.417
3	2.422
4	2.427
5	2.432
6	2.437
7	2.442
8	2.447
9	2.452
10	2.457
11	2.462
12	2.467
13	2.472

Note:
1. This is for sure that all frequencies are in 2.412GHz to 2.462GHz for 11Mbps Wireless Lan PC card, 2.412GHz to 2.472GHz for 54Mbps Wireless Lan PC card.
2. Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz.
(The locations of these frequencies one near the top, one near the middle and one near the bottom.)
3. So all the items as
followed in testing report are need to test these three frequencies:
(1). For EUT communicating with 11Mbps Wireless Lan PC card.
Top: Channel – 1; Middle: Channel – 6; Bottom: Channel – 11.
(2). For EUT communicating with 54Mbps Wireless Lan PC card.
Top: Channel – 1; Middle: Channel – 7; Bottom: Channel – 13.

4.4 Test Location

All tests were performed at:-

SGS-CSTC Standards Technical Services Ltd., Guangzhou Safety & EMC Laboratory, 1/F, Building No. 1, Agriculture Machinery Materials Company Warehouse Ltd., Wushan Road Shipai, Tianhe District, Guangzhou, China. P.C. 510630.

Tel: +86 20 3848 1001

Fax: +86 20 3848 1006

4.5 Other Information Requested by the Customer

None.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**
  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 2000611-0. Effective through December 31, 2004.
- **ACA**
  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.
- **VCCI**
  The 3m Semi-anechoic chamber and Shielded Room (11.5m x 4m x 4m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1599 and C-1706 respectively.
  Date of Registration: February 28, 2003. Valid until May 30, 2005
- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FINKO**
  Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.
- **CNAL – LAB Code: L0141**
  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of Testing Laboratories.
- **FCC – Registration No.: 282399**
  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP, SGS-CSTC is an authorized test laboratory for the DoC process.

5 Test Results

5.1 Test Instruments

Test Equipment	Manufacturer	Model	Asset No.	Cal. Due Date
Temperature, Humidity & Barometer	Oregon Scientific	BA-888	EMC0003	25-07-2004
3m Semi- Anechoic Chamber	Frankonia	N/A	EMC0501	04-11-2004
EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	EMC0506	17-11-2004
Spectrum Analyzer	ROHDE & SCHWARZ	FSP 30	EMC0521	22-12-2004
Bilog Type Antenna	Schaffner Chase	CBL6143	EMC0519	01-12-2004
Horn Antenna	ROHDE & SCHWARZ	HF906	EMC0517	01-04-2004
Peramplifier	Agilent	8449B	EMC0520	30-06-2004
Coaxial cable	SGS	N/A	EMC0514	04-11-2004
Shielding Room	Frankonia	12 x 4 x 4 m^3	EMC0103	N/A
LISN	Schaffner Chase	MNZ050D11	1421	05-11-2004
EMI Test Receiver	Rohde& Schwarz	ESCS30	100086	17-11-2004
Coaxial Cable	SGS	2m	EMC0107	01-06-2004

5.2 E.U.T. Operation

Input voltage: 120Vac / 60Hz (for AC/DC Adapter supplied)

Operating Environment:

Temperature: 24.0 °C
Humidity: 52 % RH
Atmospheric Pressure: 1008 mbar

EUT Operation:

(1). For EUT communicating with 11Mbps Wireless Lan PC card.

Top: Channel – 1; Middle: Channel – 6; Bottom: Channel – 11.

(2). For EUT communicating with 54Mbps Wireless Lan PC card.

Top: Channel – 1; Middle: Channel – 7; Bottom: Channel – 13.

5.3 Test Procedure & Measurement Data

5.3.1 Conducted Emissions

Test Requirement: FCC Part15 B

Test Method: ANSI C63.4

Test Date: 26 March 2004

Frequency Range: 150KHz to 30MHz

Class / Severity: Class B

Detector: Peak for pre-scan (9kHz Resolution Bandwidth)

Operating Environment:

Temperature: 24.0 °C Humidity: 52% RH Atmospheric Pressure: 1012 Mbar

EUT Operation: Test in receiveing mode.For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

5.3.1.1 Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

The following Quasi-Peak and Average measurements were performed on the EUT.:

1. For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 1

Freq. MHz	Line	QP Level dBuV	Limit dBuV	Margin dB	AV Level dBuV	Limit dBuV	Margin dB
0.154	Live	54.9	64.9	10.0	52.0	54.9	2.9
0.339	Live	43.9	59.2	15.3	43.6	49.2	5.6
0.505	Live	42.5	56.0	13.5	41.9	46.0	4.1
0.621	Live	46.2	56.0	9.8	41.1	46.0	3.9
0.845	Live	42.4	56.0	13.6	41.4	46.0	4.6
1.520	Live	37.6	56.0	18.4	36.0	46.0	10.0
0.155	Neutral	54.7	65.1	10.4	52.6	55.1	2.5
0.336	Neutral	45.3	59.3	14.0	44.8	49.3	4.5
0.505	Neutral	43.0	56.0	13.0	42.5	46.0	3.5
0.611	Neutral	43.6	56.0	12.4	42.7	46.0	3.3
0.840	Neutral	42.9	56.0	13.1	42.0	46.0	4.0
1.515	Neutral	39.5	56.0	16.5	38.2	46.0	7.8

TEST RESULTS: The unit does meet the FCC requirements.

2. For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 6

Freq. MHz	Line	QP Level dBuV	Limit dBuV	Margin dB	AV Level dBuV	Limit dBuV	Margin dB
0.156	Live	54.9	64.8	9.9	51.2	54.9	3.7
0.338	Live	43.8	59.2	15.4	43.2	49.2	6.0
0.508	Live	42.5	56.0	13.5	41.3	46.0	4.7
0.622	Live	46.1	56.0	9.9	41.0	46.0	5.0
0.845	Live	42.3	56.0	13.7	42.0	46.0	4.0
1.520	Live	37.5	56.0	18.5	35.6	46.0	10.4
0.155	Neutral	54.8	65.1	10.3	52.1	55.1	3.0
0.336	Neutral	45.2	59.3	14.1	44.2	49.3	5.1
0.505	Neutral	43.5	56.0	12.5	42.5	46.0	3.5
0.611	Neutral	43.3	56.0	12.7	42.9	46.0	3.1
0.840	Neutral	43.1	56.0	12.9	42.4	46.0	3.6
1.515	Neutral	39.6	56.0	16.4	38.7	46.0	7.3

TEST RESULTS: The unit does meet the FCC requirements.

3. For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 11

Freq. MHz	Line	QP Level dBuV	Limit dBuV	Margin dB	AV Level dBuV	Limit dBuV	Margin dB
0.155	Live	54.2	64.9	10.7	51.2	54.9	3.7
0.335	Live	43.2	59.2	16.0	43.2	49.2	6.0
0.510	Live	42.6	56.0	13.4	41.2	46.0	4.8
0.625	Live	46.1	56.0	9.9	42.5	46.0	3.5
0.842	Live	42.8	56.0	13.2	42.0	46.0	4.0
1.510	Live	37.9	56.0	18.1	36.0	46.0	10.0
0.152	Neutral	54.5	65.1	10.6	51.5	55.1	3.6
0.337	Neutral	45.3	59.3	14.0	44.5	49.3	4.8
0.505	Neutral	43.6	56.0	12.4	43.0	46.0	3.0
0.611	Neutral	43.2	56.0	12.8	42.8	46.0	3.2
0.840	Neutral	43.0	56.0	13.0	42.2	46.0	3.8
1.515	Neutral	39.8	56.0	16.2	39.0	46.0	7.0

TEST RESULTS: The unit does meet the FCC requirements.

4. For EUT communicating with 54Mbps Wireless Lan PC card. Channel – 1

Freq. MHz	Line	QP Level dBuV	Limit dBuV	Margin dB	AV Level dBuV	Limit dBuV	Margin dB
0.156	Live	54.9	64.8	9.9	52.0	54.9	2.9
0.342	Live	43.9	59.1	15.2	43.4	49.2	5.8
0.505	Live	42.5	56.0	13.5	41.9	46.0	4.1
0.621	Live	46.2	56.0	9.8	41.5	46.0	4.5
0.845	Live	42.4	56.0	13.6	41.0	46.0	5.0
1.520	Live	37.8	56.0	18.2	36.5	46.0	9.5
0.158	Neutral	54.7	65.1	10.4	52.6	55.1	2.5
0.336	Neutral	45.6	59.3	13.7	44.8	49.3	4.5
0.505	Neutral	43.5	56.0	12.5	42.0	46.0	4.0
0.611	Neutral	43.0	56.0	13.0	42.7	46.0	3.3
0.840	Neutral	42.9	56.0	13.1	42.8	46.0	3.2
1.515	Neutral	39.8	56.0	16.2	38.8	46.0	7.2

TEST RESULTS: The unit does meet the FCC requirements.

5. For EUT communicating with 54Mbps Wireless Lan PC card. Channel -7

Freq. MHz	Line	QP Level dBuV	Limit dBuV	Margin dB	AV Level dBuV	Limit dBuV	Margin dB
0.155	Live	55.0	64.9	9.9	51.5	54.9	3.4
0.341	Live	44.0	59.2	15.2	43.8	49.2	5.4
0.510	Live	42.8	56.0	13.2	40.9	46.0	5.1
0.625	Live	46.5	56.0	9.5	41.0	46.0	5.0
0.848	Live	42.8	56.0	13.2	41.6	46.0	4.4
1.520	Live	37.9	56.0	18.1	36.5	46.0	9.5
0.155	Neutral	54.5	65.1	10.6	52.3	55.1	2.8
0.340	Neutral	45.8	59.3	13.5	44.0	49.3	5.3
0.512	Neutral	43.0	56.0	13.0	42.6	46.0	3.4
0.618	Neutral	43.6	56.0	12.4	42.0	46.0	4.0
0.842	Neutral	42.5	56.0	13.5	41.2	46.0	4.8
1.515	Neutral	40.0	56.0	16.0	38.6	46.0	7.4

TEST RESULTS: The unit does meet the FCC requirements.

6. For EUT communicating with 54Mbps Wireless Lan PC card. Channel – 13

Freq. MHz	Line	QP Level dBuV	Limit dBuV	Margin dB	AV Level dBuV	Limit dBuV	Margin dB
0.150	Live	54.6	64.9	10.3	52.0	54.9	2.9
0.336	Live	43.0	59.2	16.2	43.6	49.2	5.6
0.510	Live	43.6	56.0	12.4	41.9	46.0	4.1
0.620	Live	46.0	56.0	10.0	41.1	46.0	4.9
0.848	Live	42.5	56.0	13.5	41.4	46.0	4.6
1.520	Live	37.8	56.0	18.2	36.0	46.0	10.0
0.155	Neutral	54.5	65.1	10.6	52.6	55.1	2.5
0.338	Neutral	45.0	59.3	14.3	44.8	49.3	4.5
0.510	Neutral	43.2	56.0	12.8	42.5	46.0	3.5
0.611	Neutral	43.0	56.0	13.0	42.7	46.0	3.3
0.840	Neutral	42.5	56.0	13.5	42.0	46.0	4.0
1.518	Neutral	39.1	56.0	16.9	38.2	46.0	7.8

TEST RESULTS: The unit does meet the FCC requirements.

5.3.2 Radiated Emissions

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 Section 15.209
Test Date: 25 March 2004
Measurement Distance: 3m (Semi-Anechoic Chamber)
Frequency range 30 MHz – 25GHz for transmitting mode.
Test instrumentation resolution bandwidth 120 kHz (30 MHz - 1000 MHz)
1 MHz (1000 MHz – 25GHz)
Receive antenna scan height 1 m - 4 m, polarization Vertical / Horizontal

Limit:
40.0 dBμV/m between 30MHz & 88MHz
43.5 dBμV/m between 88MHz & 216MHz
46.0 dBμV/m between 216MHz & 960MHz
54.0 dBμV/m zbove 960MHz

Test Procedure: The procedure uesd was ANSI Standard C63.4-2000. The receive was scanned from 30MHz to 25GHz.When an emission was found,the table was roated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier . The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Peramlifer Factor

The following test results were performed on the EUT on 25 March 2004:

1. For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 1

Frequency (MHz)	Antenna Polarization	Emission Level Qusia-Peak (dBuV/m)	Limit (dBuV/m)	Margin (dB)
399.000	Vertical	38.5	46.0	7.5
665.000	Vertical	36.9	46.0	9.1
399.000	Horizontal	41.9	46.0	4.1
665.000	Horizontal	42.2	46.0	3.8

Above 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		Peak	Average	Peak	Average	Peak	Average
1456	Vertical	52.2	48.1	74.0	54.0	21.8	5.9
4830	Vertical	48.6	40.6	74.0	54.0	25.4	13.4
72315	Vertical	56.1	42.3	74.0	54.0	17.9	11.7
96495	Vertical	47.4	41.6	74.0	54.0	26.6	12.4
11463	Vertical	47.8	42.1	74.0	54.0	26.2	11.9
1456	Horizontal	43.8	39.5	74.0	54.0	30.2	14.5
4830	Horizontal	39.6	35.2	74.0	54.0	34.4	18.8

Remark:
According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.

2. For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 6
30MHz- 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level Qusia-Peak (dBuV/m)	Limit (dBuV/m)	Margin (dB)
399.000	Vertical	38.2	46.0	7.8
665.000	Vertical	37.8	46.0	8.2
399.000	Horizontal	41.0	46.0	5.0
665.000	Horizontal	42.5	46.0	3.5

Above 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		Peak	Average	Peak	Average	Peak	Average
1456	Vertical	42.9	38.8	74.0	54.0	31.1	15.2
4870	Vertical	37.5	34.0	74.0	54.0	36.5	20.0
7348	Vertical	56.4	45.8	74.0	54.0	17.6	8.2
9786	Vertical	44.6	38.5	74.0	54.0	29.4	15.5
1456	Horizontal	44.7	38.6	74.0	54.0	29.3	15.4
4870	Horizontal	39.8	35.2	74.0	54.0	34.2	18.8

Remark:
According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.

3. For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 11
30MHz- 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level Qusia-Peak (dBuV/m)	Limit (dBuV/m)	Margin (dB)
399.000	Vertical	38.0	46.0	8.0
665.000	Vertical	37.5	46.0	8.5
399.000	Horizontal	41.5	46.0	4.5
665.000	Horizontal	41.8	46.0	4.2

Above 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		Peak	Average	Peak	Average	Peak	Average
1456	Vertical	42.8	38.5	74.0	54.0	31.2	15.5
4932	Vertical	37.6	34.2	74.0	54.0	36.4	19.8
7.4265	Vertical	53.6	48.5	74.0	54.0	20.4	5.5
9.9030	Vertical	44.3	3.92	74.0	54.0	29.7	50.1
1456	Horizontal	44.8	39.8	74.0	54.0	29.2	14.2
4932	Horizontal	38.6	35.0	74.0	54.0	35.4	19.0

Remark:
According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.

4. For EUT communicating with 54Mbps Wireless Lan PC card. Channel – 1
30MHz- 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level Qusia-Peak (dBuV/m)	Limit (dBuV/m)	Margin (dB)
58.700	Vertical	30.2	40.0	9.8
200.020	Vertical	33.3	43.5	10.2
300.040	Vertical	39.6	46.0	6.4
399.000	Vertical	40.7	46.0	5.3
498.750	Vertical	36.2	46.0	9.8
300.040	Horizontal	35.6	46.0	10.4
399.000	Horizontal	38.7	46.0	7.3
665.000	Horizontal	39.8	46.0	6.2

Above 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		Peak	Average	Peak	Average	Peak	Average
1196	Vertical	40.2	38.5	74.0	54.0	33.8	15.5
1465	Vertical	38.6	35.0	74.0	54.0	35.4	19.0
4814	Vertical	46.6	43.2	74.0	54.0	27.4	10.8
7232	Vertical	51.2	47.5	74.0	54.0	22.8	6.5
9650	Vertical	43.9	38.9	74.0	54.0	30.1	15.1
1465	Horizontal	38.8	34.1	74.0	54.0	35.2	19.9
4820	Horizontal	36.5	33.8	74.0	54.0	37.5	20.2

Remark:
According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.

5. For EUT communicating with 54Mbps Wireless Lan PC card. Channel – 7
30MHz- 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level Qusia-Peak (dBuV/m)	Limit (dBuV/m)	Margin (dB)
58.700	Vertical	30.8	40.0	9.2
200.020	Vertical	33.4	43.5	10.1
300.040	Vertical	38.2	46.0	7.8
399.000	Vertical	40.1	46.0	5.9
498.750	Vertical	36.3	46.0	9.7
300.040	Horizontal	35.8	46.0	10.2
399.000	Horizontal	38.2	46.0	7.8
665.000	Horizontal	40.2	46.0	5.8

Above 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		Peak	Average	Peak	Average	Peak	Average
1198	Vertical	41.2	38.6	74.0	54.0	32.8	15.4
1472	Vertical	38.6	35.5	74.0	54.0	35.4	18.5
4872	Vertical	48.0	45.3	74.0	54.0	26.0	8.7
7309	Vertical	54.0	48.7	74.0	54.0	20.0	5.3
9747	Vertical	45.6	41.0	74.0	54.0	28.4	13.0
1472	Horizontal	38.8	34.2	74.0	54.0	35.2	19.8
4876	Horizontal	38.2	35.0	74.0	54.0	35.8	19.0

Remark:
According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.

6. For EUT communicating with 54Mbps Wireless Lan PC card. Channel – 13
30MHz- 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level Qusia-Peak (dBuV/m)	Limit (dBuV/m)	Margin (dB)
58.700	Vertical	30.1	40.0	9.9
200.020	Vertical	33.9	43.5	9.6
300.040	Vertical	39.5	46.0	6.5
399.000	Vertical	40.2	46.0	5.8
498.750	Vertical	36.7	46.0	9.3
300.040	Horizontal	36.5	46.0	9.5
399.000	Horizontal	38.0	46.0	8.0
665.000	Horizontal	40.1	46.0	5.9

Above 1000MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		Peak	Average	Peak	Average	Peak	Average
1214	Vertical	41.2	38.6	74.0	54.0	32.8	15.4
1478	Vertical	38.6	35.5	74.0	54.0	35.4	18.5
4910	Vertical	48.4	45.2	74.0	54.0	25.6	8.8
7388	Vertical	53.3	48.5	74.0	54.0	20.7	5.5
9845	Vertical	45.9	41.0	74.0	54.0	28.1	13.0
1478	Horizontal	38.8	34.2	74.0	54.0	35.2	19.8
4912	Horizontal	38.5	35.6	74.0	54.0	35.5	18.4

Remark:
According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements.

5.3.3 Occupied Bandwidth

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 C Section 15.247:
Test Date: 24 March 2004
Requirements: 15.247 (a2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

Method of measurement: The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB. Analyzer and the attached plot was taken.

Test results:

1. For EUT communicating with 11Mbps Wireless Lan PC card

Channel	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2.412	8.3	0.5	Pass
6	2.437	12.0	0.5	Pass
11	2.462	8.2	0.5	Pass

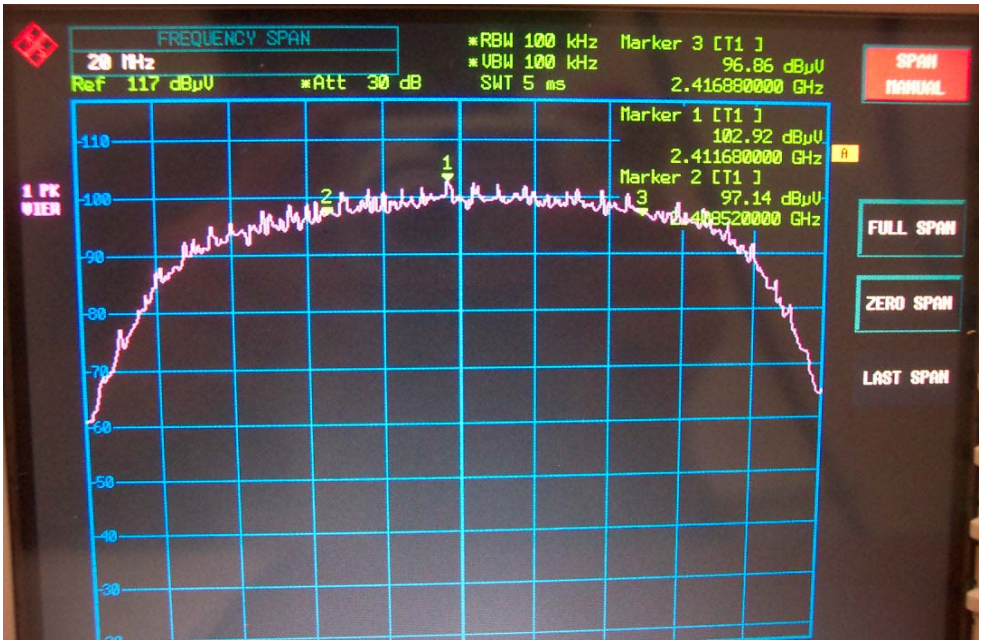
2. For EUT communicating with 54Mbps Wireless Lan PC card

Channel	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2.412	13.3	0.5	Pass
7	2.442	7.9	0.5	Pass
13	2.472	15.1	0.5	Pass

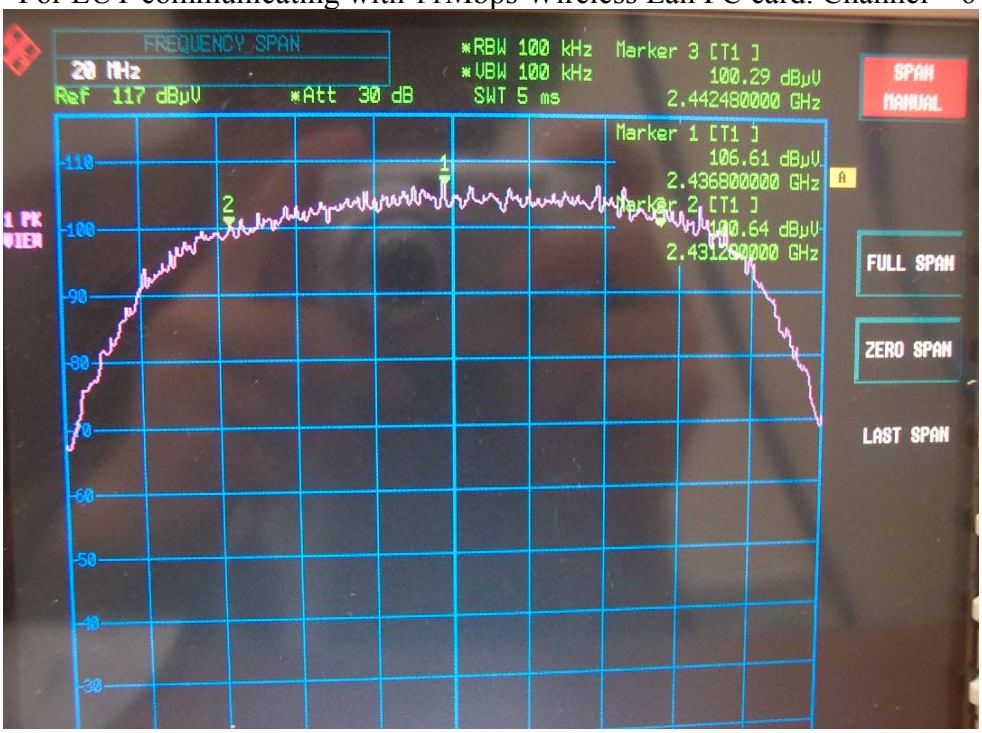
Conclusion:: The unit does meet the FCC requirements.

Please refer to the graph as below:

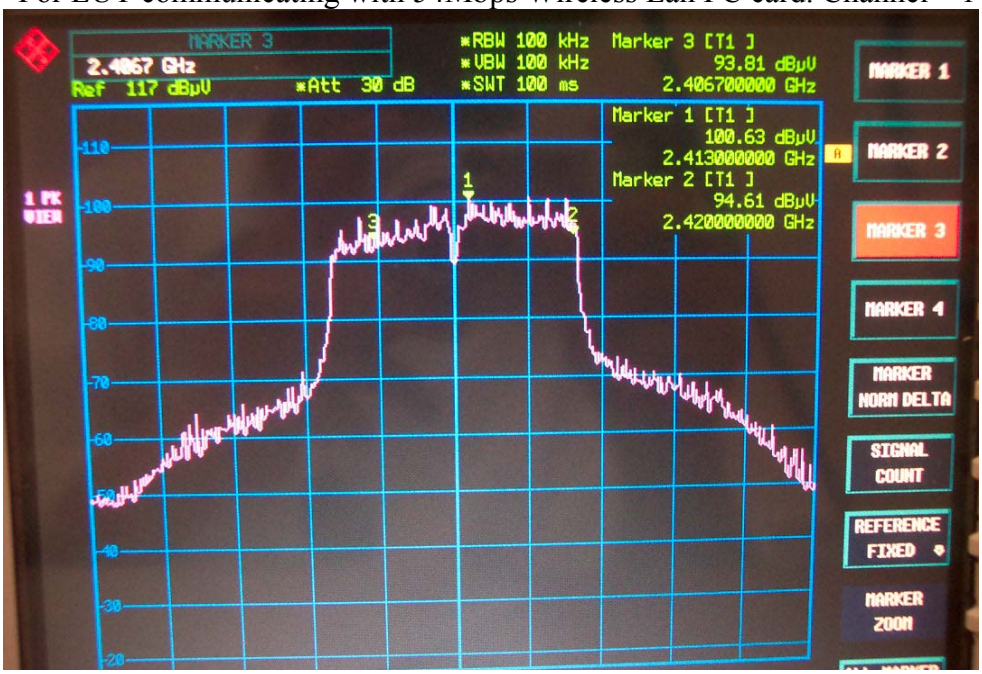
1. For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 1



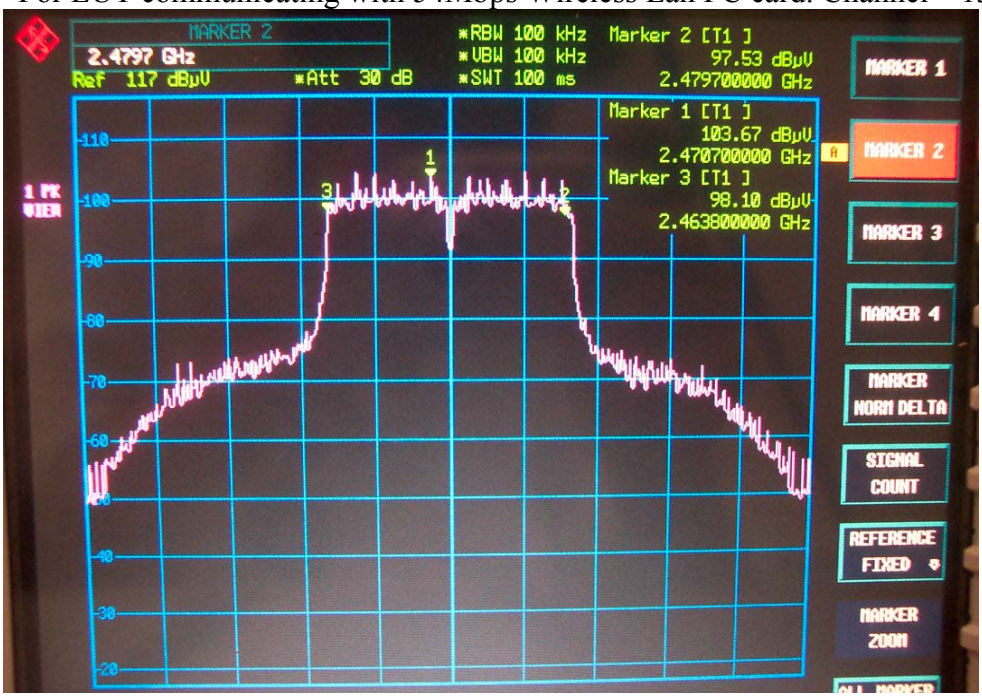
2. For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 6



3. For EUT communicating with 54Mbps Wireless Lan PC card. Channel – 1



4. For EUT communicating with 54Mbps Wireless Lan PC card. Channel – 13



5.3.4 Maximum Peak Output Power:

Test Requirement: FCC Part15 C

Test Method: Based on FCC Part15 C Section 15.247.

Test Date: 24 March 2004

Requirements:

Regulation 15.247 (b) The Limit of Maximum Peak Output Power Measurement is 30dBm.

Test results

1. For EUT communicating with 11Mbps Wireless Lan PC card

Channel	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER Limit (dBm)	PASS/FAIL
1	2.412	6.0	30.0	Pass
6	2.437	6.2	30.0	Pass
11	2.462	6.7	30.0	Pass

2. For EUT communicating with 54Mbps Wireless Lan PC card

Channel	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER Limit (dBm)	PASS/FAIL
1	2.412	8.5	30.0	Pass
7	2.442	9.5	30.0	Pass
13	2.472	10.5	30.0	Pass

Conclusion:
The EUT meets the requirements of this section.

5.3.5 Band Edges Measurement

Test Requirement: FCC Part15 C

Test Method: Based on FCC Part15 C Section 15.247.

Test Date: 24 March 2004

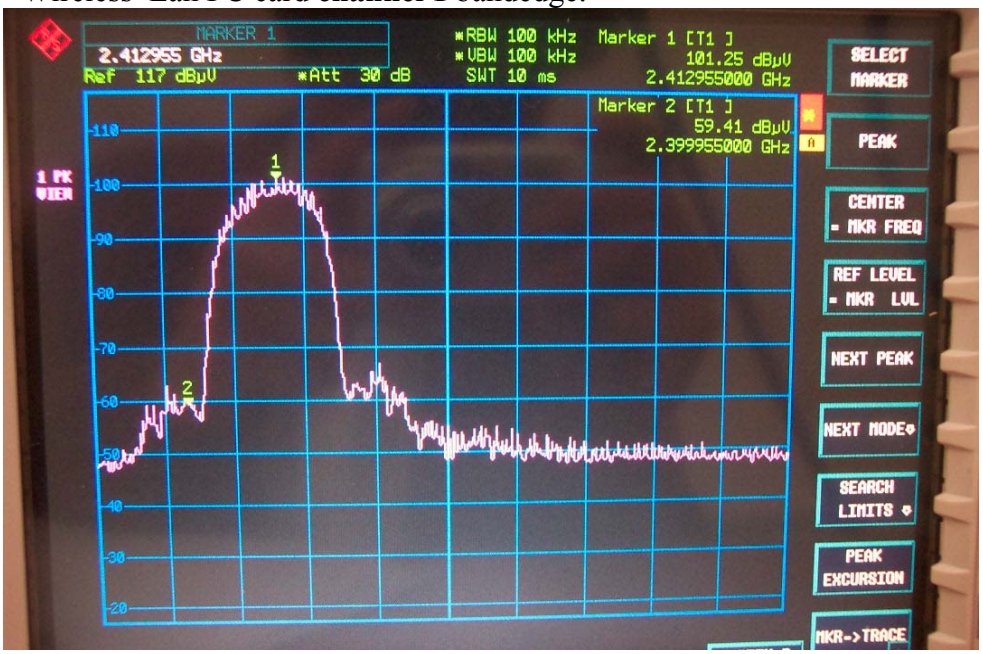
Requirements:

Regulation 15.247 (C) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

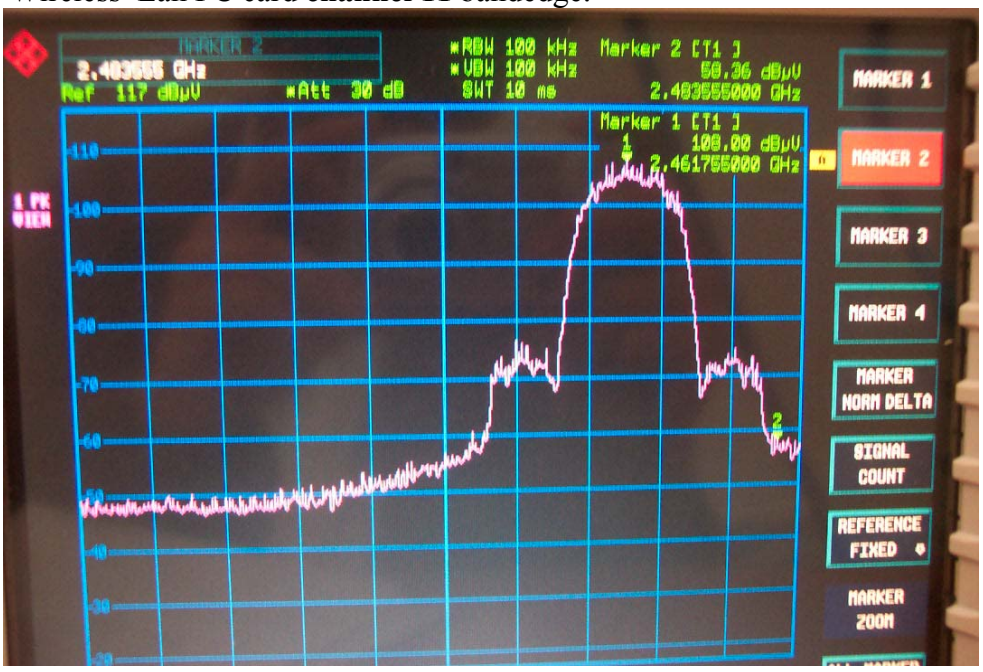
Test Procedures:
The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

Test Result:
Please refer to the measurement graph and data.

1. This is the hard copy of our measurement for EUT communicating with 11Mbps Wireless Lan PC card **channel 1** bandedge.



2.This is the hard copy of our measurement for EUT communicating with 11Mbps Wireless Lan PC card **channel 11** bandedge.



Conclusion:

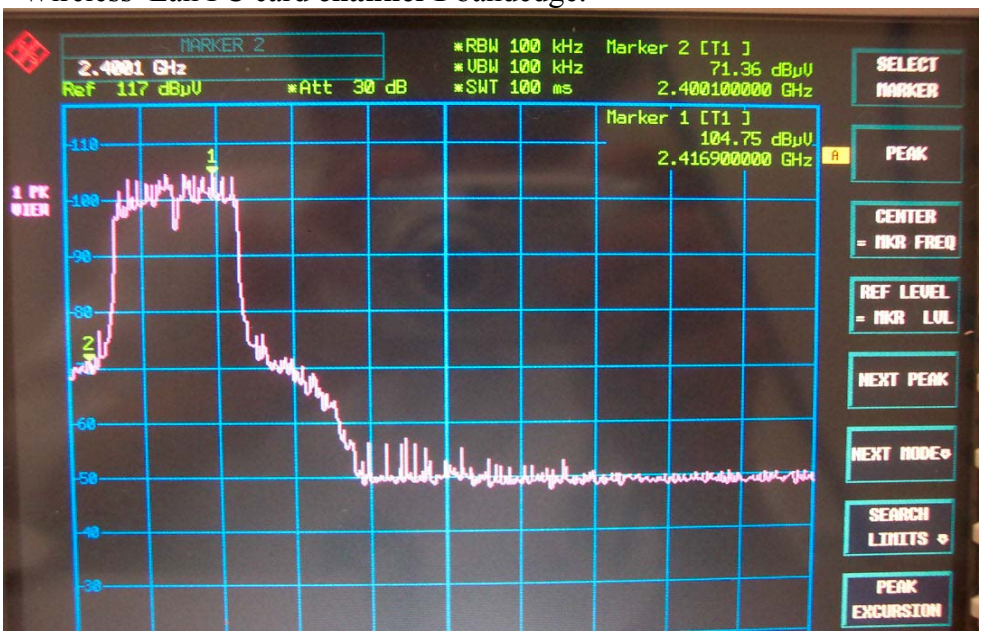
The spectrum plot extended to the start frequency : 2390MHz and the stop frequency 2485MHz (restriction bands are 2310 – 2390 MHz and 2483.5 – 2500MHz).
In any 100 kHz bandwidth outside the frequency band are at least than 20 dB below that in the 100 kHz bandwidth within the band.

For Wireless Lan PC card **channel 1** bandedge
The band edge emission plot on page 24 shows 53.2dB delta between carrier maximum power and local maximum emission in restrict band (2390MHz). The emission of carrier strength list in Radiated Emission test is 86.7dB μ V/m, so the maximum field strength in restrict band is 86.7 - 53.2 = 33.5 dB μ V/m which is under 54 dB μ V/m limit.

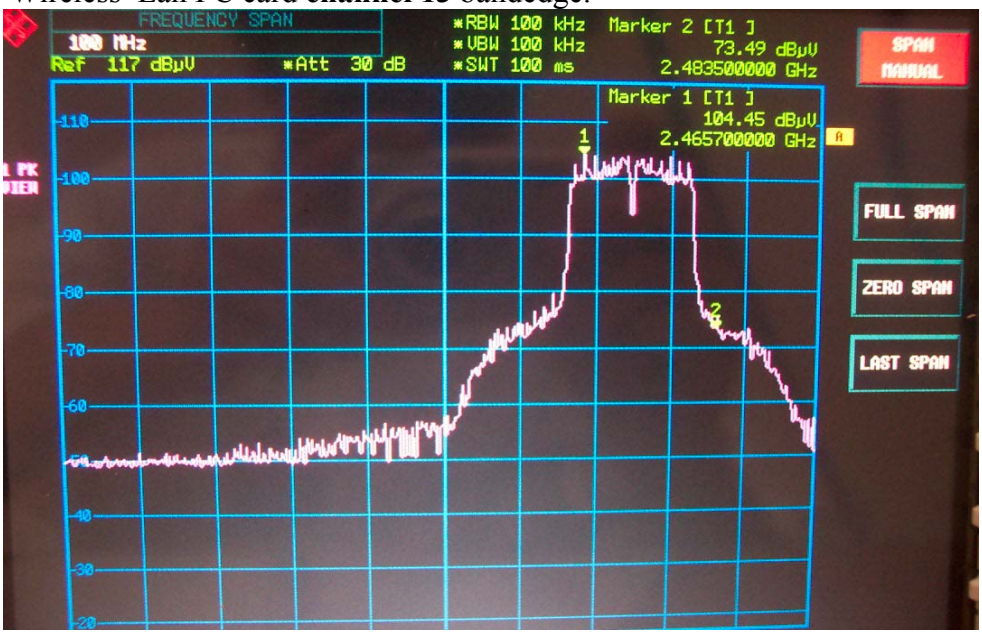
For Wireless Lan PC card **channel 11** bandedge
The band edge emission plot on page 24 shows 48.6dB delta between carrier maximum power and local maximum emission in restrict band (2483.5MHz). The emission of carrier strength list in Radiated Emission test is 87.2dB μ V/m, so the maximum field strength in restrict band is 87.2 - 48.6 = 38.7 dB μ V/m which is under 54 dB μ V/m limit.

The EUT meets the requirements of this section.

1. This is the hard copy of our measurement for EUT communicating with 54Mbps Wireless Lan PC card **channel 1** bandedge.



2.This is the hard copy of our measurement for EUT communicating with 54Mbps Wireless Lan PC card **channel 13** bandedge.



Conclusion:

The spectrum plot extended to the start frequency : 2390MHz and the stop frequency 2485MHz (restriction bands are 2310 – 2390 MHz and 2483.5 – 2500MHz).
In any 100 kHz bandwidth outside the frequency band are at least than 20 dB below that in the 100 kHz bandwidth within the band.

For Wireless Lan PC card **channel 1** bandedge
The band edge emission plot on page 26 shows 37.6dB delta between carrier maximum power and local maximum emission in restrict band (2390MHz). The emission of carrier strength list in Radiated Emission test is 89.2dB μ V/m, so the maximum field strength in restrict band is 89.2 - 37.6 = 51.6 dB μ V/m which is under 54 dB μ V/m limit.

For Wireless Lan PC card **channel 13** bandedge
The band edge emission plot on page 24 shows 48.7dB delta between carrier maximum power and local maximum emission in restrict band (2483.5MHz). The emission of carrier strength list in Radiated Emission test is 91.4dB μ V/m, so the maximum field strength in restrict band is 91.4 - 48.7 = 42.7 dB μ V/m which is under 54 dB μ V/m limit.

The EUT meets the requirements of this section.

5.3.6 Power Spectral Density Measurement

Test Requirement: FCC Part15 C

Test Method: Based on FCC Part15 C Section 15.247.

Test Date: 24 March 2004

Requirements:

Regulation 15.247 (d) For direct sequence systems, the peak 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

Test Procedures:
The tests below are running with the EUT transmitter set at high power mode .A PCMCIA port from a notebook computer to the EUT. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. A horn antenna was connected with the spectrum analyzer.

The EUT is tested in open field site. Put EUT on the middle of a wooden table. Set spectrum analyzer RBW = 3 KHz, VBW > RBW (e.g. VBW = 10 KHz), Span = 2 MHz. Turn around the table to find maximum emission. Then set the Span = 300 KHz and sweep time = 100 sec. Peak the maximum emission again. The peak level measured must be no greater than + 8dBm.

The EUT was set transmitting continuously and force selection of output power level and channel number. We'd observed that the peak levels aren't greater than +8dBm limit.

Test Result:

1. For EUT communicating with 11Mbps Wireless Lan PC card

Channel	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM Limit (dBm)	PASS/FAIL
1	2.412	-1.7	8.0	Pass
6	2.437	-0.5	8.0	Pass
11	2.462	-2.1	8.0	Pass

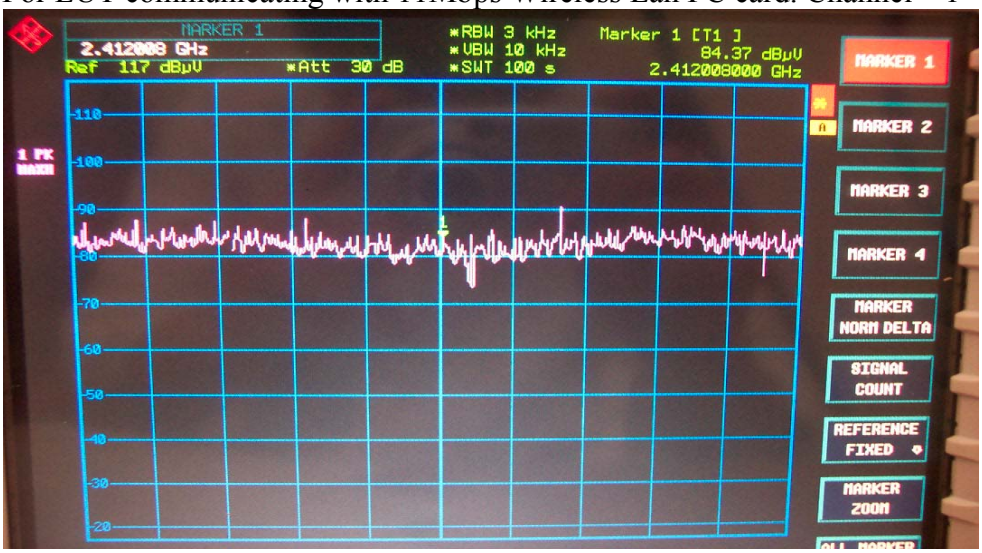
2. For EUT communicating with 54Mbps Wireless Lan PC card

Channel	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM Limit (dBm)	PASS/FAIL
1	2.412	-8.8	8.0	Pass
7	2.442	-2.0	8.0	Pass
13	2.472	-5.0	8.0	Pass

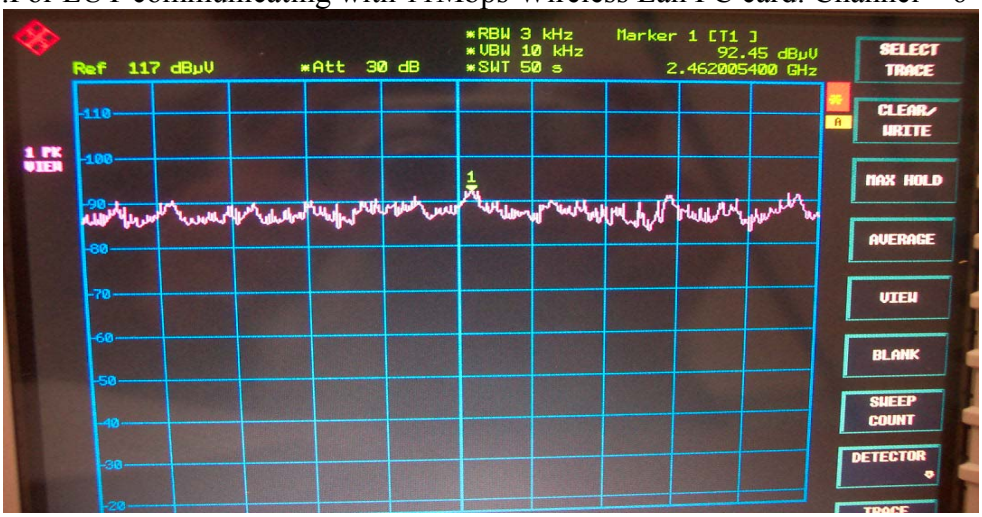
Conclusion:
The EUT meets the requirements of this section.

Please refer to the graph as below:

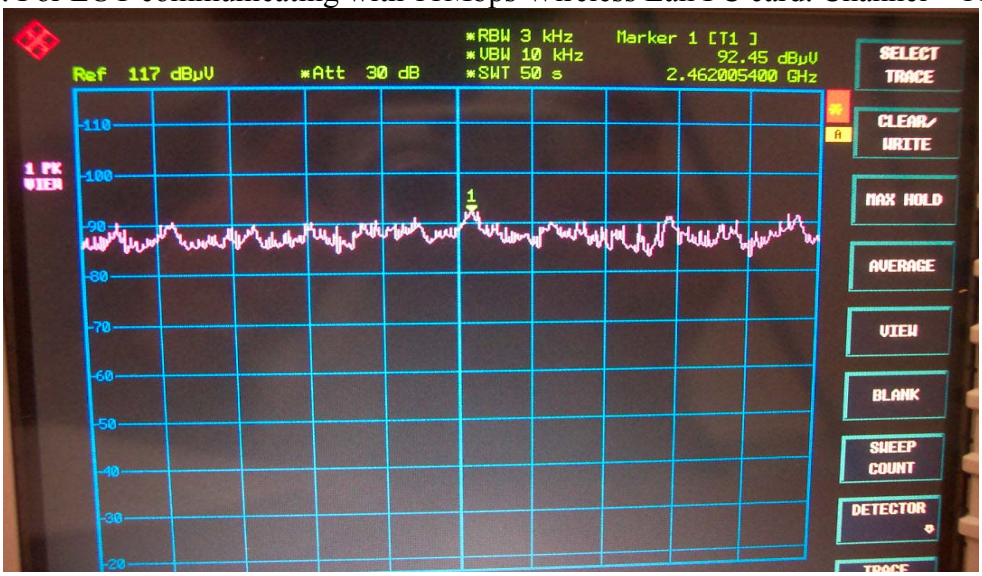
1. For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 1



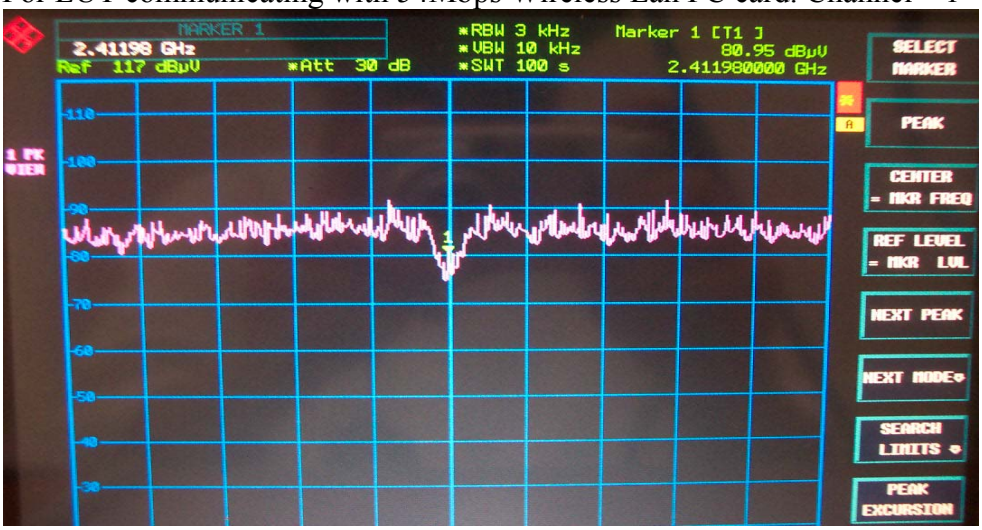
2.For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 6



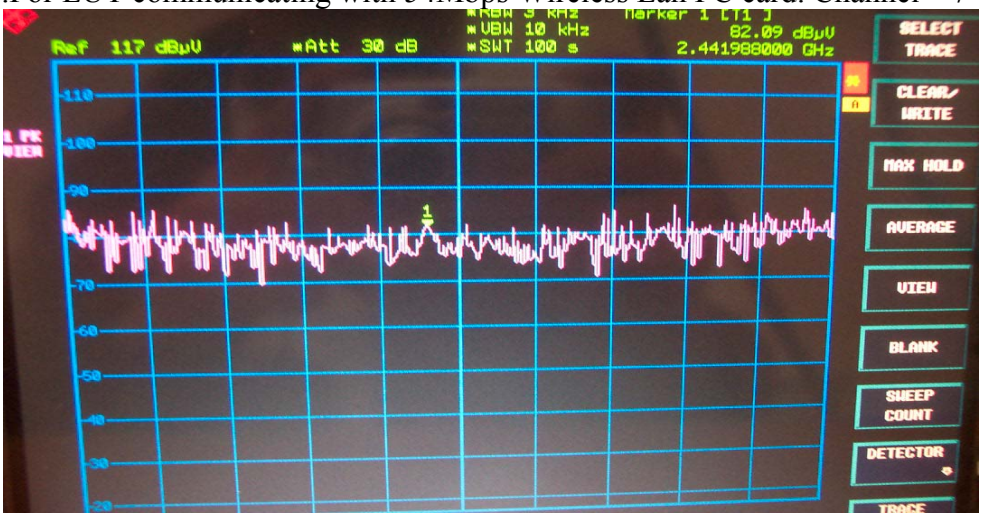
3. For EUT communicating with 11Mbps Wireless Lan PC card. Channel – 11



1. For EUT communicating with 54Mbps Wireless Lan PC card. Channel – 1



2.For EUT communicating with 54Mbps Wireless Lan PC card. Channel – 7



3. For EUT communicating with 54Mbps Wireless Lan PC card. Channel – 13