



**Test Report:** 6W70247

**Applicant:** Wave Wireless Corp  
Suite 4,  
6110-1A St, SW,  
Calgary, Alta,  
Canada, T2H 0G4

**Apparatus:** EUM3006A PCBA

**FCC ID:** KIN-915B

**In Accordance With:** FCC Part 15 Subpart C, 15.247  
FHSS System and Digitally Modulated Radiators  
902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz

**Tested By:** Nemko Canada Inc.  
303 River Road  
Ottawa, Ontario  
K1V 1H2

A handwritten signature in blue ink, appearing to read 'Jason Nixon', with a stylized flourish at the end.

**Authorized By:**

Jason Nixon, Telecom Specialist

**Date:** September 5, 2006

**Total Number of Pages:** 18

## Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

<b>Apparatus Assessed:</b>	EUM3006A PCBA
<b>Specification:</b>	FCC Part 15.247, Subpart C
<b>Compliance Status:</b>	Complies
<b>Exclusions:</b>	None
<b>Non-compliances:</b>	None
<b>Report Release History:</b>	Original Release

Author: Xu Jin, Wireless Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

Nemko Canada Inc. authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

## TABLE OF CONTENTS

<b>Report Summary .....</b>	<b>2</b>
<b>Section 1 : Equipment Under Test.....</b>	<b>4</b>
1.1 Product Identification .....	4
1.2 Samples Submitted for Assessment.....	4
1.3 Technical Specifications of the EUT .....	5
<b>Section 2: Test Conditions.....</b>	<b>6</b>
2.1 Specifications .....	6
2.2 Deviations From Laboratory Test Procedures .....	6
2.3 Test Environment .....	6
2.4 Test Equipment.....	6
<b>Section 3: Observations .....</b>	<b>7</b>
3.1 Modifications Performed During Assessment .....	7
3.2 Record Of Technical Judgements .....	7
3.3 EUT Parameters Affecting Compliance .....	7
3.4 Test Deleted.....	7
<b>Section 4: Results Summary .....</b>	<b>8</b>
4.1 FCC Part 15 Subpart C: Test Results .....	9
<b>Appendix A: Test Results .....</b>	<b>10</b>
<b>Appendix B : Setup Photographs .....</b>	<b>17</b>
Radiated Emission Setup Photos.....	17
<b>Appendix C : Block Diagram of Test Setups .....</b>	<b>18</b>

## **Section 1 : Equipment Under Test**

### **1.1 Product Identification**

The Equipment Under Test was identified as follows:  
EUM3006A PCBA

### **1.2 Samples Submitted for Assessment**

The following samples of the apparatus have been submitted for type assessment:

<b>Sample No.</b>	<b>Description</b>	<b>Serial No.</b>
1	Antenna M/N # SC 9014-DIN	00000005995
3	Internet wireless modem (board) EUM3006A	623E23

The first samples were received on: July 11, 2006

### **1.3 Technical Specifications of the EUT**

<b>Manufacturer:</b>	Wave Wireless Corp
<b>Frequency Band</b>	902-928MHz
<b>Operation Frequency</b>	905-925MHz
<b>Rated Output Power:</b>	27.3dBm
<b>Emission Designator</b>	G1W
<b>Modulation:</b>	CCK
<b>Antenna Data:</b>	SWEDCOM, SC9014-D1N Antenna gain=14dBd=16.1dBi
<b>Antenna Connector:</b>	SMA, Waverider custom design antenna connector

## Section 2: Test Conditions

### 2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.247

FHSS System and Digitally Modulated Radiators

902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz

### 2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

### 2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 °C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

### 2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next Cal.
Spectrum Analyzer	Rohde & Schwarz	FSU	FA001877	May 10/07
Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 16/07
Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 16/07
Biconical (1) Antenna	EMCO	3109	FA000805	May 03/07
Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Aug. 29/06
Horn Antenna #2	EMCO	3115	FA000825	Dec. 16/06
Horn Antenna #1	EMCO	3115	FA000649	Jan. 12/07
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	Aug 2/07
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	Aug 2/07
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	Aug 2/07
5.0 - 18GHz Amplifier	Narda	DWT-186N23U40	FA001409	COU
Power Meter	HP	4418B	FA001678	May 16/07
Power Probe	HP	8487A	FA001741	May 22/07

\* COU (Calibrate on Use)

## **Section 3: Observations**

### **3.1 Modifications Performed During Assessment**

No modifications were performed during assessment.

### **3.2 Record Of Technical Judgements**

The test only covered the spurious emission test requirement. For other test data, please refer to CCU 310 test report (MPBT w08e3557-1) for the detail.

### **3.3 EUT Parameters Affecting Compliance**

The user of the apparatus could not alter parameters that would affect compliance.

### **3.4 Test Deleted**

No Tests were deleted from this assessment.

## **Section 4: Results Summary**

This section contains the following:

FCC Part 15.247, Subpart C: Spurious Emissions Test Result

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

- N      No : not applicable / not relevant.
- Y      Yes : Mandatory i.e. the apparatus shall conform to these tests.
- N/T    Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.



**4.1 FCC Part 15 Subpart C: Test Results**

Section	Clause	Test Description	Required	Result
1	15.247(b)(3)	Output Power	Y	PASS
2	15.247(c)	Spurious Emissions	Y	PASS
3	15.109	Digital Emissions	Y	PASS

## Appendix A: Test Results

### Section 1. Output Power

**Criteria: Clause 15.247(b)(3)**

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(c) Operation with directional antenna gains greater than 6 dBi.

(i) Fixed point-to-point operation:

(ii) Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

**Test Conditions:**

<b>Sample Number:</b>	3	<b>Temperature:</b>	22 °C
<b>Date:</b>	July 19, 2006	<b>Humidity:</b>	50 %
<b>Modification State:</b>	0	<b>Tester:</b>	Xu Jin
		<b>Laboratory:</b>	Ottawa

**Test Method:** Output power was measured Peak detector on the spectrum analyzer with RBW/VBW setting as 5MHz/10MHz.

**Test Results:** Complies

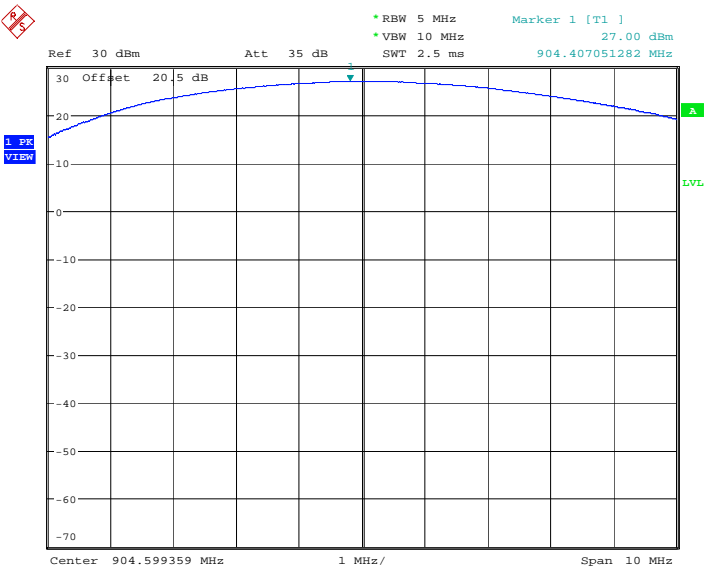
**Test Data:** See attached table and graphics

SWEDCOM Antenna gain=14dBd, 16.1dBi

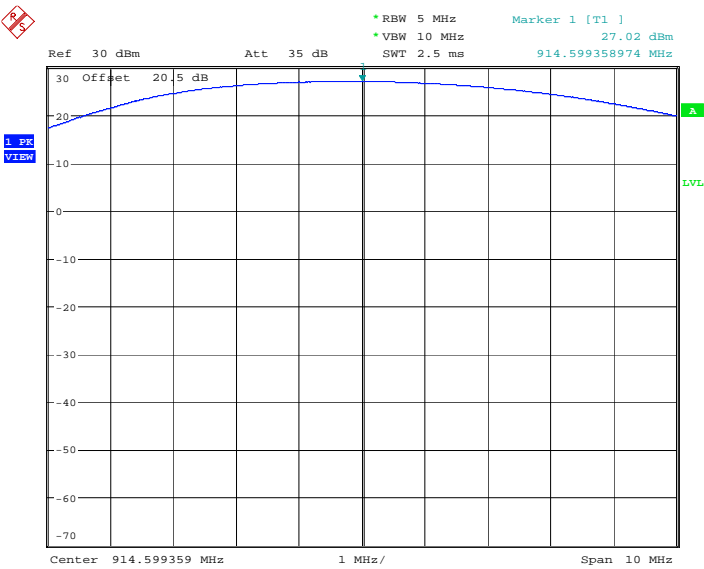
Frequency (MHz)	Peak Power (dBm)	Antenna gain	Attenuator (dB)	Cable loss(dB)	E.I.R.P
905	27.00	16.1	7	1	35.1
915	27.02	16.1	7	1	35.12
925	27.19	16.1	7	1	35.29

Manufacturer has declared there would be 7dB attenuator, and also 1dB loss cable between the radio module and antenna connector.

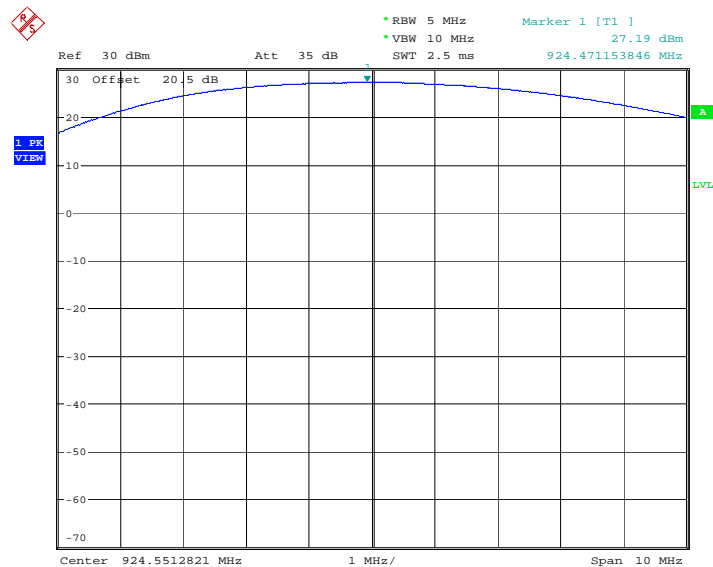
Limit: 30dBm +6dBi (E.I.R.P)



Date: 19.JUL.2006 10:21:32



Date: 19.JUL.2006 10:19:32



Date: 19.JUL.2006 10:23:39

## Section 2 Spurious Emissions

### Criteria: Clause 15.247(d)

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, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### Test Conditions:

Sample Number:	1, 3	Temperature:	22 °C
Date:	July 19, 2006	Humidity:	50 %
Modification State:	0	Tester:	Xu Jin
		Laboratory:	Ottawa

**Test Results:** Complies

**Test Data:** See attached table and graphics

The DUT was searched to from 30MHz to 10<sup>th</sup> harmonic of the EUT, and for low, medium and high frequencies. The spectrum analyser was set to peak detector mode with RBW/VBW as 100KHz/100KHz below 1GHz and RBW/VBW as 1MHz/1MHz above 1GHz.

It was noticed no spurious emission was within 20dB of the limit. Also it was further noticed that no spurious emission was falling into the restricted band.

**Section 3. Digital Spurious Emissions****Criteria: 15.109**

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Spurious Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

<b>Sample Number:</b>	1	<b>Temperature:</b>	22 °C
<b>Date:</b>	July 19, 2006	<b>Humidity:</b>	50%
<b>Modification State:</b>	0	<b>Tester:</b>	Xu Jin
		<b>Laboratory:</b>	Ottawa

**Test Results:**

See attached tables

**Additional Observations:**

The Spectrum was searched from 30MHz to the 10<sup>th</sup> Harmonic.

All measurements were performed using a Peak Detector with RBW/VBW as 100KHz/300KHz below 1GHz and a RBW/VBW as 1MHz/3MHz above 1GHz.

Only worst-case data was presented.

**Radiated Emissions Test Data**

Test Date: July. 19, 2006										
Engineer's Name: Xu Jin										
Tested as per: Table Top										
Mains Input Voltage: 120VAC							Mains Input Frequency: 60Hz			
Test Distance (meters): 3							Dome: 1			
Freq. (MHz)	Ant.	Po l. V/ H	RCVD Signal (dBμV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
52.3000	BC2	H	13.4	10.2	N/A	1.5	25.1	40.0	14.9	Peak
52.3000	BC2	V	15.1	9.4	N/A	1.5	26.0	40.0	14.0	Peak
100.0000	BC2	H	13.8	9.7	N/A	1.6	25.0	43.5	18.5	Peak
100.0000	BC2	V	14.7	10.6	N/A	1.6	26.9	43.5	16.6	Peak
132.0000	BC2	H	14.8	12.7	N/A	1.8	29.3	43.5	14.2	Peak
132.0000	BC2	V	18.4	13.8	N/A	1.8	34.0	43.5	9.5	Peak
Legend:										
Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole										



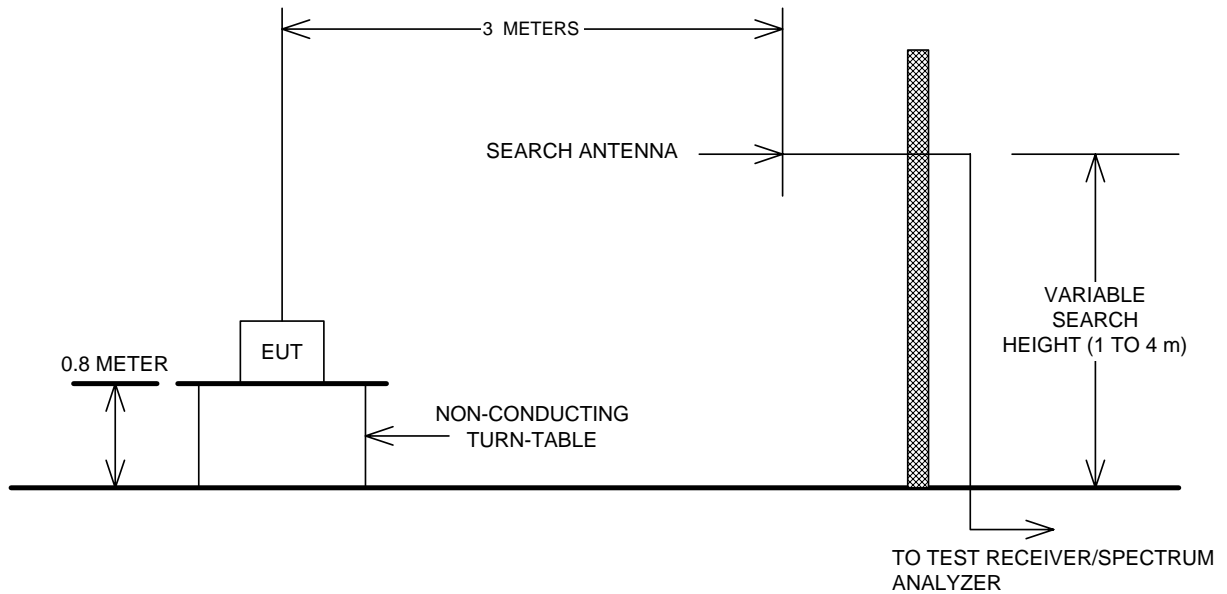
## **Appendix B : Setup Photographs**

### **Radiated Emission Setup Photos**



## Appendix C : Block Diagram of Test Setups

### Test Site For Radiated Emissions



### Conducted Measurements

