

FCC PART 15.249
EMI MEASUREMENT AND TEST REPORT
For
Wireless eSystems, Inc.

65 Hill Ave.
Fort Walton Beach, Florida 32548

FCC ID: OYILITEREMOTE

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: Lite Remote
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Wireless eSystems, Inc.* product, FCC ID: *OYILITEREMOTE*, or the "EUT" as referred to in this report is a Lite Remote, operating frequency 2432.8317 – 2435.4317 MHz. The EUT is measured approximately 152.4mmL x 50.8mmW x 25.4mmH.

** The test data gathered are from production sample, serial number: 002, provided by the manufacturer.*

Objective

This document is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209, and 15.249.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4 - 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp.

Test Facility

The Open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA with registration number: 90464.

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to ANSI C63.4-2003.

Schematics and Block Diagram

Please refer to Appendix A.

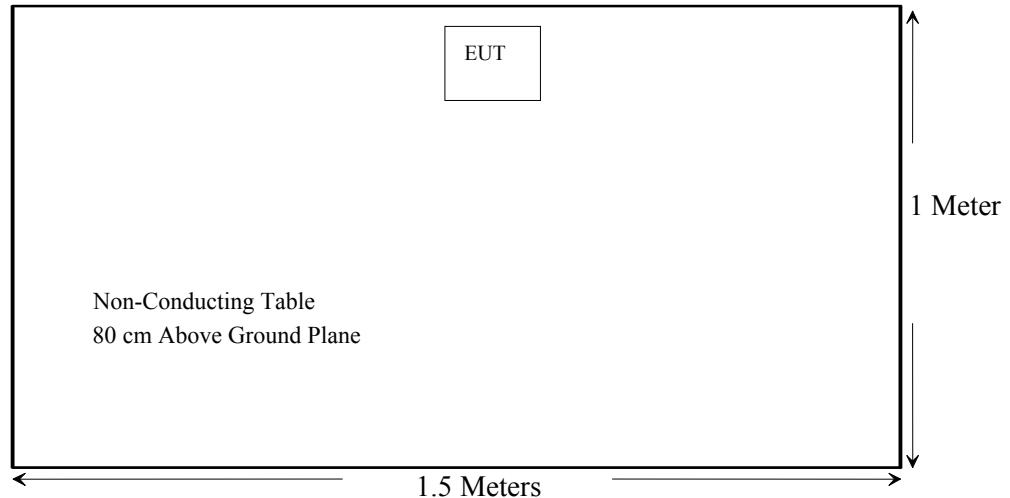
Equipment Modifications

No modifications were made to the EUT.

Test Setup Configuration



Test Setup Block Diagram



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band	Compliant
§15.207(a)	Conducted Emission	N/A
§15.209 (a), §15.249 (a)	Radiated Emission	Compliant
15.249 (d)	Band Edge Testing	Compliant

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

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.

Antenna Connected Construction

The antenna connector is designed with permanent attachment and no consideration of replacement.

§ 15.207 (a) - CONDUCTED EMISSIONS TEST DATA

Not applicable. The EUT is battery operated.

§15.205, §15.209 (a), §15.249 (a) - RADIATED EMISSION DATA

Applicable Standard

According to §15.249 (a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/ meter)	Field strength of harmonics (microvolts/ meter)
902-928 MHz.....	50	500
2400-2483.5 MHz.....	50	500
5725-5875 MHz.....	50	500
24.0-24.25 GHz.....	250	2500

According to §15.249 (d), emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ± 4.0 dB.

EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15 Subpart C limits.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The EUT was connected to an adapter, which connected to 120Vac/60Hz power source.

Receiver Setup

According to FCC Rules, 47 CFR 15.33 (a) (1), the system was tested to 25GHz.

During the radiated emission test, the receiver was set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>
Below 30MHz	10kHz	10kHz
30 – 1000MHz	100kHz	100kHz
Above 1000MHz	1MHz	1MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Pre, Amplifier (1-26.5 GHz)	8449B	3147A00400	2005-10-05
A. H. Systems	Antenna, Horn, DRG	SAS-200/271	261	2005-04-20
Rohde & Schewarz	EMI Test Receiver	ESCI 1166.595 0K03	100044	2004-09-29

* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	40%
ATM Pressure:	1021mbar

*Testing was performed by James Ma on 2005-11-22.

Test Procedure

For the radiated emissions test, the power cord of the EUT was connected to the AC floor outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limits), and are distinguished with a "Qp" in the data table.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for applicable limits. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Applicable Limit}$$

Summary of Test Results

According to the recorded data in following table, the EUT measured test data within the measurement uncertainty of ± 4.0 , and had the worst margin of:

- 15.2 dB at 4865.66 MHz in the **Horizontal** polarization at **Low** Channel
- 13.7 dB at 4868.06 MHz in the **Horizontal** polarization at **Mid** Channel
- 17.2 dB at 4870.86 MHz in the **Horizontal** polarization at **High** Channel

Radiated Emissions Test Result Data - 3Meter

Low Channel (0)

Frequency MHz	Reading dBuV/m	Direction Degree	Height Meter	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Factor dBuV/m	15.249		Comments
									Limit (dBuV/m)	Margin dB	
4865.6634	38.0	230	1.5	h	32.5	3.1	34.8	38.8	54	-15.2	Ave
4865.6634	35.0	200	1.0	v	32.5	3.1	34.8	35.8	54	-18.2	Ave
2432.8317	100.6	90	2.0	h	28.7	2.0	35.8	95.4	114	-18.6	Fund/Peak
2432.8317	97.8	20	1.0	v	28.7	2.0	35.8	92.6	114	-21.4	Fund/Peak
2400.0000	36.0	260	2.0	v	28.7	2.0	35.8	30.8	54	-23.2	Band Edge/ Ave
2400.0000	35.0	200	1.5	h	28.7	2.0	35.8	29.8	54	-24.2	Band Edge/ Ave
4865.6634	41.0	200	1.0	v	32.5	3.1	34.8	41.8	74	-32.2	Peak
4865.6634	40.7	230	1.5	h	32.5	3.1	34.8	41.5	74	-32.5	Peak
2400.0000	40.0	260	2.0	v	28.7	2.0	35.8	34.8	74	-39.2	Band Edge/ Peak
2400.0000	38.0	200	1.5	h	28.7	2.0	35.8	32.8	74	-41.2	Band Edge/ Peak
2432.8317	56.0	90	2.0	h	28.7	2.0	35.8	50.8	94	-43.2	Fund/Ave
2432.8317	55.7	20	1.0	v	28.7	2.0	35.8	50.5	94	-43.5	Fund/Ave

Radiated Emissions Test Result Data - 3Meter

Mid Channel (6)

Frequency MHz	Reading dBuV/m	Direction Degree	Height Meter	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Factor dBuV/m	15.249		Comments
									Limit (dBuV/m)	Margin dB	
4868.0634	39.5	200	1.5	h	32.5	3.1	34.8	40.3	54	-13.7	Ave
4868.0634	38.0	200	1.5	v	32.5	3.1	34.8	38.8	54	-15.2	Ave
2434.0317	97.8	0	2.5	v	28.7	2.0	35.8	92.6	114	-21.4	Fund/Peak
2434.0317	97.5	20	2.0	h	28.7	2.0	35.8	92.3	114	-21.7	Fund/Peak
4868.0634	42.0	200	1.5	h	32.5	3.1	34.8	42.8	74	-31.2	Peak
4868.0634	41.5	200	1.5	v	32.5	3.1	34.8	42.3	74	-31.7	Peak
2434.0317	52.6	0	2.0	h	28.7	2.0	35.8	47.4	94	-46.6	Fund/Ave
2434.0317	52.2	10	2.5	v	28.7	2.0	35.8	47.0	94	-47.0	Fund/Ave

High Channel (13)

Frequency MHz	Reading dBuV/m	Direction Degree	Height Meter	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Factor dBuV/m	15.249		Comments
									Limit (dBuV/m)	Margin dB	
4870.8634	36.0	90	2.5	h	32.5	3.1	34.8	36.8	54	-17.2	Ave
4870.8634	35.0	180	1.5	v	32.5	3.1	34.8	35.8	54	-18.2	Ave
2435.4317	100.7	250	2.5	h	28.7	2.0	35.8	95.5	114	-18.5	Fund/Peak
2435.4317	96.0	270	3.0	v	28.7	2.0	35.8	90.8	114	-23.2	Fund/Peak
2483.5000	36.0	200	1.5	v	28.7	2.0	35.8	30.8	54	-23.2	Band Edge/ Ave
2483.5000	35.0	200	1.5	h	28.7	2.0	35.8	29.8	54	-24.2	Band Edge/ Ave
4870.8634	41.0	90	2.5	h	32.5	3.1	34.8	41.8	74	-32.2	Peak
4870.8634	40.0	180	1.5	v	32.5	3.1	34.8	40.8	74	-33.2	Peak
2483.5000	40.0	200	1.5	v	28.7	2.0	35.8	34.8	74	-39.2	Band Edge/ Peak
2483.5000	38.0	200	1.5	h	28.7	2.0	35.8	32.8	74	-41.2	Band Edge/ Peak
2435.4317	56.7	250	2.5	h	28.7	2.0	35.8	51.5	94	-42.5	Fund/Ave
2435.4317	51.6	270	3.0	v	28.7	2.0	35.8	46.4	94	-47.6	Fund/Ave