



**FCC CFR47 PART 15 SUBPART C
IC RSS-210
CERTIFICATION
TEST REPORT**

FOR

**WIRELESS MOTION SENSOR
IN 433.92MHZ**

**MODEL NUMBER: EV-PIR433
FCC ID: QNP-EVPIR433
IC: 4674A-EVPIR433**

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	04/28/09	Initial Issue	T. Chan

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: GE SECURITY
1275 RED FOX ROAD
ARDEN HILLS, MN 55112, U.S.A.

EUT DESCRIPTION: WIRELESS MOTION SENSOR

MODEL: EV-PIR433

SERIAL NUMBER: 182-0554

DATE TESTED: APRIL 28, 2009

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	PASS
RSS-210 ISSUE 7	PASS

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15, IC RSS-210 and IC RSS-212.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Equipment Type	433.92MHz Transmitter
Fundamental Frequency	433.92 MHz
Power Source	3V Battery, Type CR123A
Transmitting Time	Periodic \leq 5 seconds
Manufacturer	Secure Wireless, Inc.

5.2. SOFTWARE AND FIRMWARE

EUT is modified to transmit continuously.

5.3. WORST-CASE CONFIGURATION AND MODE

EUT has been evaluated at stand-up and side position. The highest measured output power was at side position

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The transmitter utilizes an internal loop fixed antenna with a maximum gain of -15 dBi.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

N/A

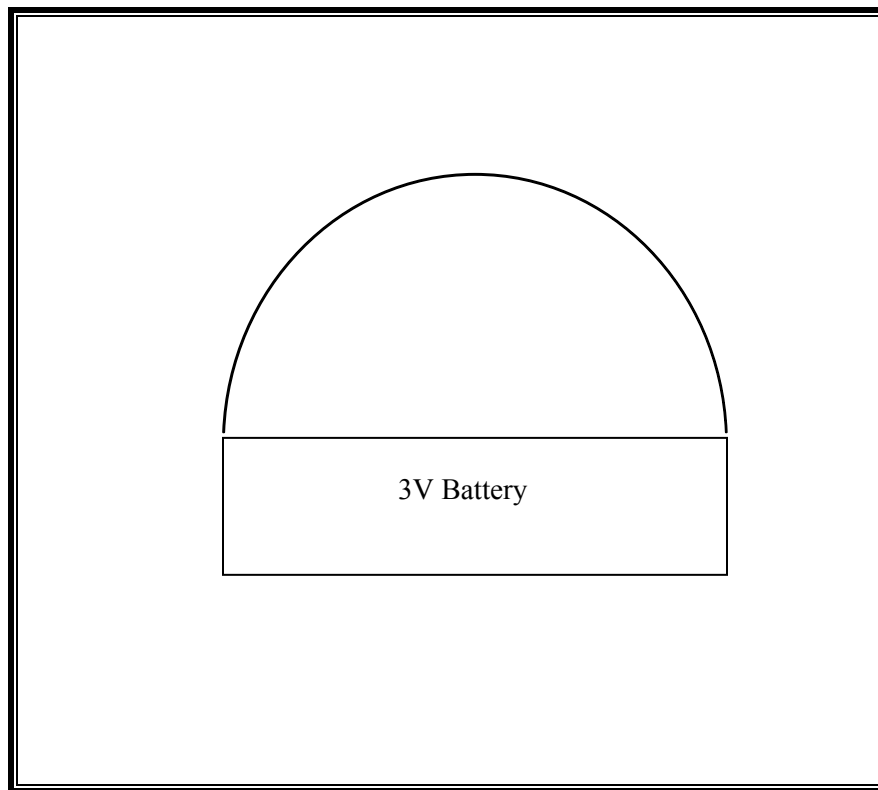
I/O CABLES

N/A

TEST SETUP

The EUT is stand-alone unit and is battery operated.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	12/16/09
Antenna, Horn, 18 GHz	EMCO	3115	C00945	01/29/10
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	02/04/10
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/10
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	03/16/10

7. LIMITS AND RESULTS

7.1. 20dB & 99% BANDWIDTHS

LIMIT

§15.231 (c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

IC RSS-210 Issue 6 A1.1.3 For the purpose of Section A1.1, the 99% bandwidth shall be no wider than 0.25% of the centre frequency for devices operating between 70-900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the centre frequency. The test report shall indicate the measured bandwidth of the emission.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer.

20dB Bandwidth: The RBW is set to 10 KHz. The VBW is set to 100 KHz. The sweep time is coupled. Bandwidth is determined at the points 20 dB down from the modulated carrier.

99% Bandwidth: The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

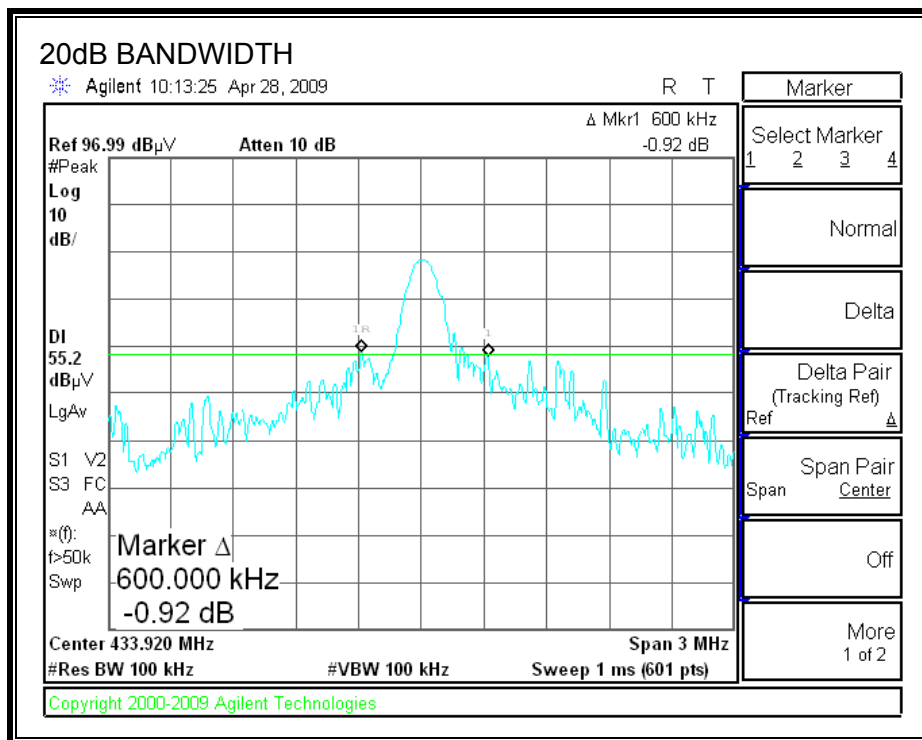
20dB Bandwidth

Frequency (MHz)	20dB Bandwidth (KHz)	Limit (KHz)	Margin (KHz)
433.92	600	1084.8	-484.8

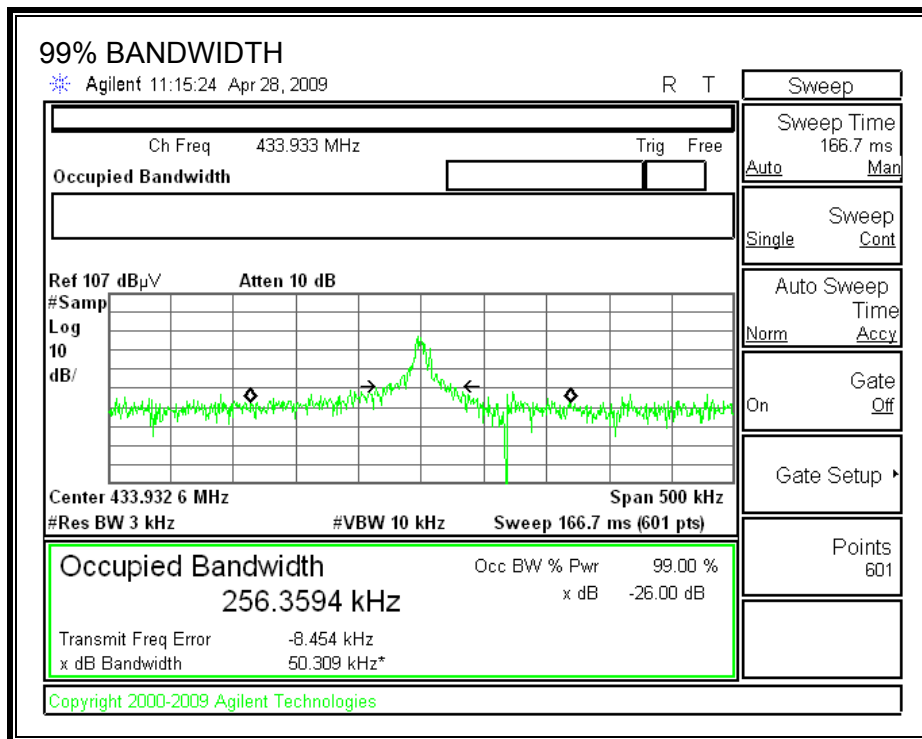
99% Bandwidth

Frequency (MHz)	99% Bandwidth (KHz)	Limit (KHz)	Margin (KHz)
433.92	256.3594	1084.8	-828.4406

20dB BANDWIDTH



99% BANDWIDTH



7.2. MAXIMUM MODULATION PERCENTAGE (M%)

LIMIT

§15.35 (c)

IC RSS-Gen Issue 1 §4.3 When the field strength (or envelope power) is not constant or when it is in pulses, and an averaging detector is specified to be used, the current or voltage over one complete pulse train, including blanking intervals, shall be averaged as long as the pulse train does not exceed 0.1 second. Where the pulse train exceeds 0.1 second, the average value (of field strength or output power) shall be determined over the 0.1-second interval during which the field strength is at its maximum.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled and the span is set to 0 Hz. The number of pulses is measured and calculated in a 100 ms scan.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

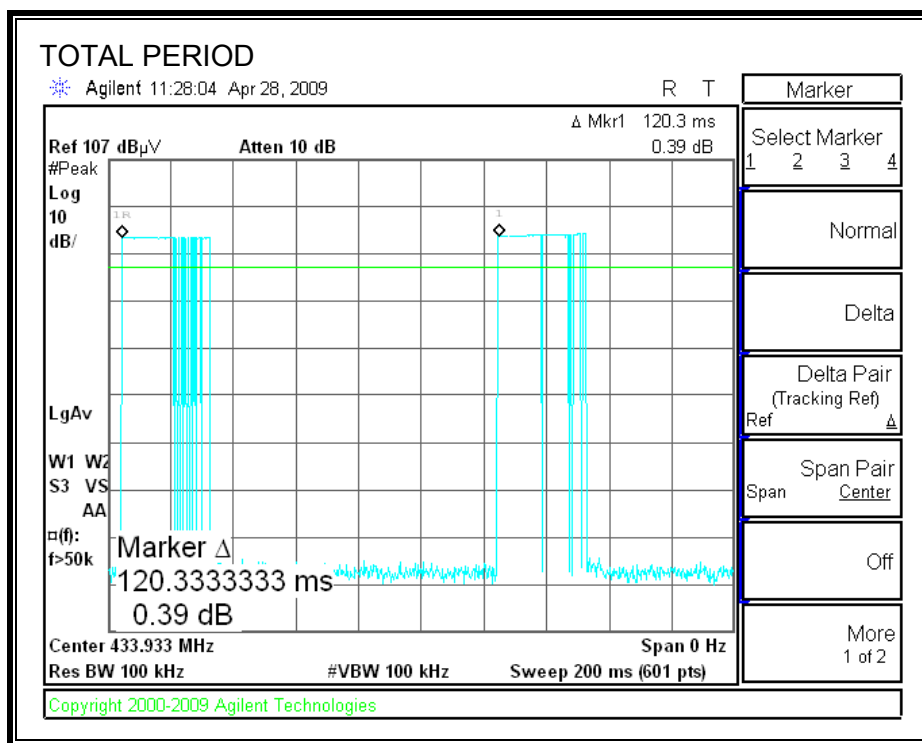
CALCULATION:

Average Reading = Peak Reading (dBuV/m) + $20 \log (\text{Duty Cycle})$, Where Duty Cycle is $(\# \text{ of long pulses} * \text{long pulse width}) + (\# \text{ of short pulses} * \text{short pulse width}) / 100$ or T

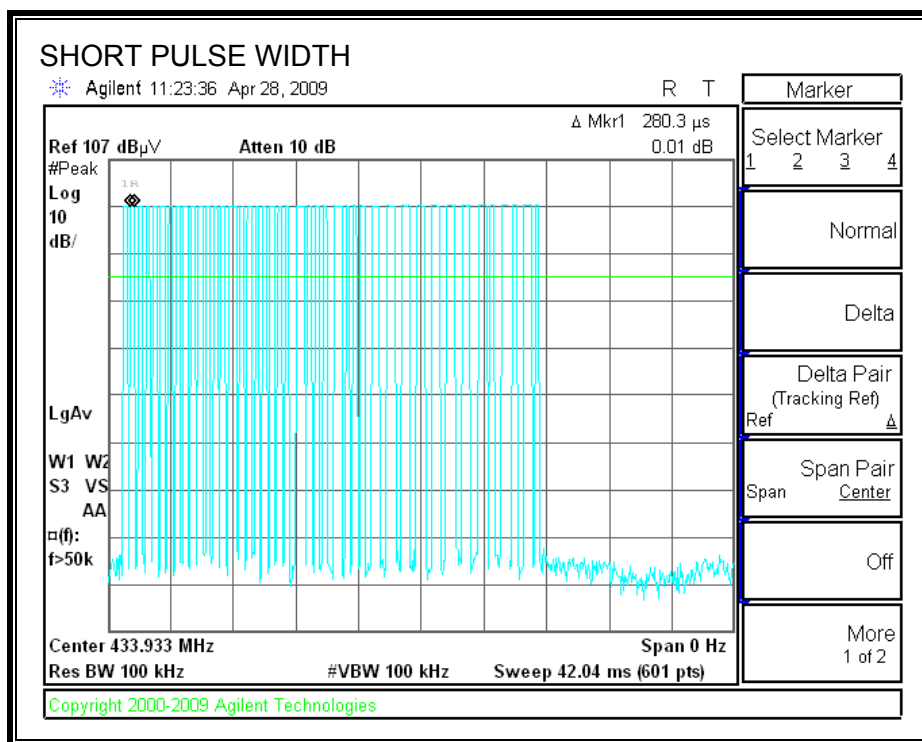
RESULTS

MAXIMUM MODULATION PERCENTAGE

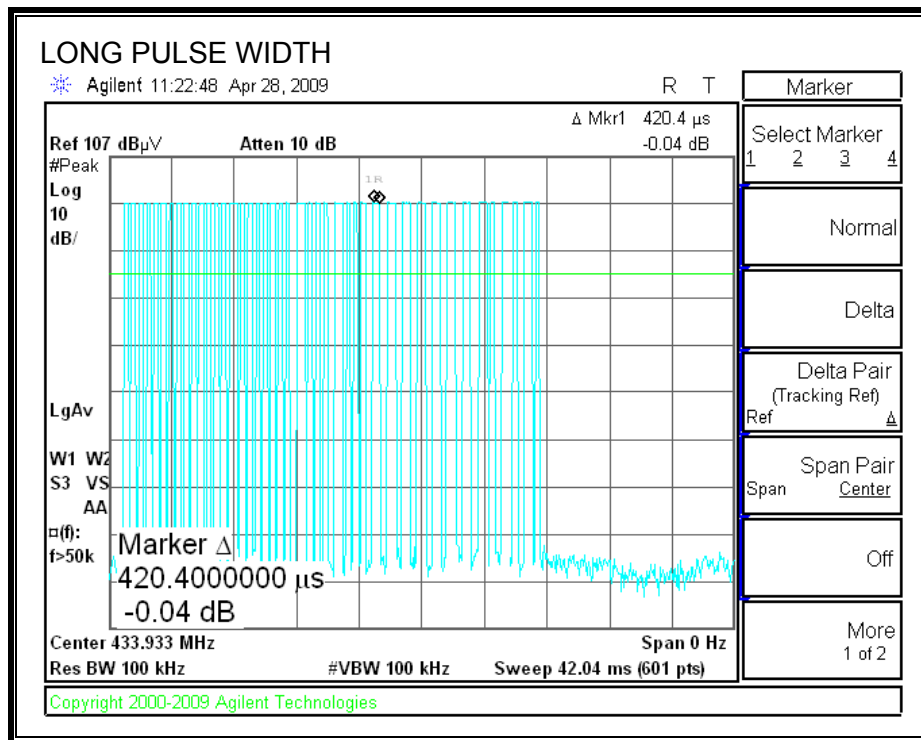
Total Period (ms)	Long Width (ms)	# of Long Pulses	Short Width (ms)	# of Short Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	0.42	13	0.2800	30	0.139	-17.14



SHORT PULSE WIDTH



LONG PULSE WIDTH



7.3. LESS THAN 5 SECONDS PLOT

LIMIT

§15.231 (a) (1); (a) (2)

RSS210 A1.1.1 (1) a manually operated transmitter shall employ a push-to-operate switch and be under manual control at all transmission times. When released, the transmitter shall cease transmission (holdover time of up to 5 seconds is permitted).

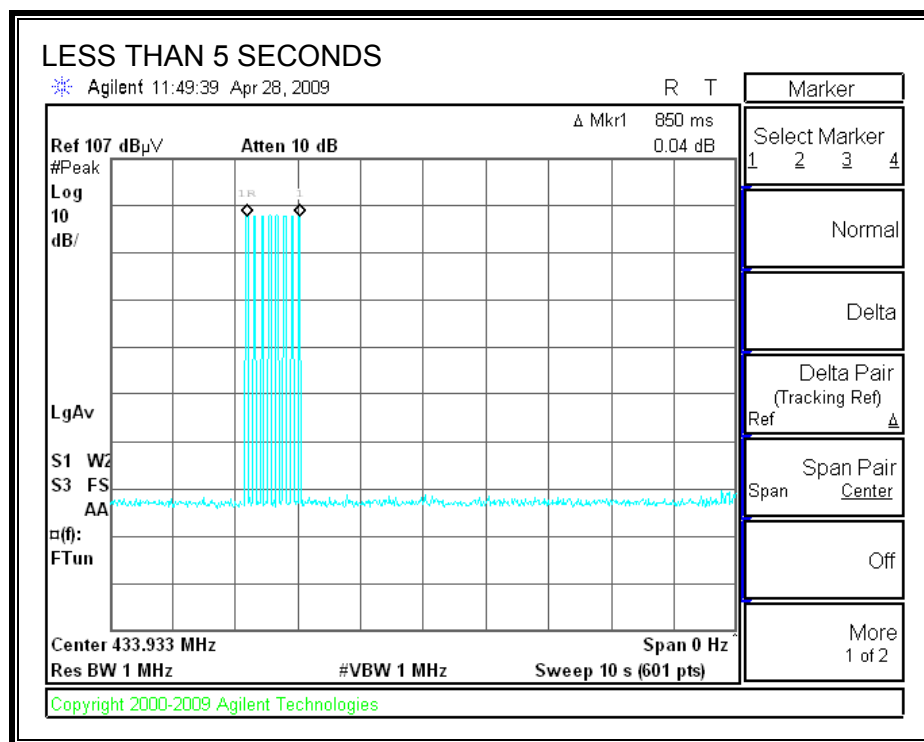
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is set to 10 seconds and the span is set to 0 Hz.

RESULTS

Transmission begins approximately 0.7 second after activation and transmission ceases approximately 2.18 seconds after activation.

LESS THAN 5 SECONDS



7.4. RADIATED EMISSIONS

7.4.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§15.231 (b) In addition to the provisions of § 15.205, the field strength of emissions from Intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental Frequency (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 - 40.70	2,250	225
70 - 130	1,250	125
130 - 174	1,250 to 3,750 ¹	125 to 375 ¹
174 - 260	3,750	375
260 - 470	3,750 to 12,500 ¹	375 to 1,250 ¹
Above 470	12,500	1,250

¹ Linear interpolation

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(2)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

RSS210 Table 4 same as limits FCC applied above.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

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, and duty cycle apply for average measurement.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurement, and duty cycle apply for average measurement.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

FUNDAMENTAL, HARMONICS AND SPURIOUS EMISSIONS 30 – 1000 MHz

30 - 1000MHz Substitution Measurement Compliance Certification Services, Fremont 5m A-Chamber										<i>Project #:</i> 09U12538 <i>Report #:</i> 09U12538 <i>Date & Time:</i> 04/28/09 <i>Test Engr:</i> Chin Pang				
<i>Company:</i> Secure Wireless, Inc. <i>EUT Description:</i> Wireless Motion Sensor <i>Test Configuration:</i> EUT stand alone <i>Type of Test:</i> FCC 15.231b <i>Mode of Operation:</i> Transmitting														
$M\% = ((t1+t2+t3+...)/T) * 66.83\% = 13.90\%$										$Av\ Reading = Pk\ Reading + 20*log(M\%)$ $20 * log (M\%) = -17.14$				
Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	AF (dB)	Closs 0	Pre-amp (dB)	Pk Level (dBuV/m)	Av Level (dBuV/m)	Pk Limit FCC_B	Av Limit FCC_B	Pk Margin (dB)	Avg Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)
EUT Standup Position														
433.92	63.30	46.16	15.50	1.90	0.00	80.70	63.56	100.83	80.83	-20.13	-17.26	V	0.00	1.00
433.92	73.80	56.66	15.50	1.90	0.00	91.20	74.06	100.83	80.83	-9.63	-6.76	H	0.00	1.50
EUT Side Position														
433.92	75.30	58.16	15.50	1.90	0.00	92.70	75.56	100.83	80.83	-8.13	-5.26	V	0.00	1.50
433.92	65.50	48.36	15.50	1.90	0.00	82.90	65.76	100.83	80.83	-17.93	-15.06	H	0.00	1.00
Worst Position: Side Position														
867.86	55.80	38.66	21.60	2.80	27.70	52.50	35.36	80.83	60.83	-28.33	-25.46	V	0.00	1.20
867.86	48.30	31.16	21.60	2.80	27.70	45.00	27.86	80.83	60.83	-35.83	-32.96	H	0.00	1.50

[illegible]

7.4.2. RECEIVER SPURIOUS EMISSIONS LIMIT

Not applicable, this EUT is transmitter only.

8. SETUP PHOTOS

RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION



RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION

SIDE POSITION PHOTO



END OF REPORT