COMPLIANCE WORLDWIDE INC.
TEST REPORT 423-09

In Accordance with the Requirements of

Industry Canada RSS 210, Issue 7, Annex II
Federal Communications Commission CFR Title 47 Part 15.231, Subpart C
Low Power License-Exempt Radio Communication Devices
Intentional Radiators
Issued to

NAPCO Security Systems
333 Bayview Avenue
Amityville, NY 11701

for the

GEMC-WL-SMK
Supervised Wireless Digital Smoke Detector

FCC ID: AD8-GEMCWLSMK

Report Issued on December 4, 2009

Prepared by

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Reviewed By

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Compliance Worldwide, Inc. - 357 Main Street - Sandown, NH 03873
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1. Scope

This test report certifies that the NAPCO Security Systems GEMC-WL-SMK Supervised Wireless Digital Smoke Detector 319.5 MHz transmitter, as tested, meets the FCC Part 15.231, Subpart C requirements and RSS 210 Annex II rules. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required

2. Product Details

2.1. Manufacturer: NAPCO Security Systems

2.2. Model Number: GEMC-WL-SMK

2.3. Serial Number: N/A

2.4. Description: Supervised Wireless Digital Smoke Detector 319.5 MHz

2.5. Hardware Revision: PC06970A

2.6. Software Revision: ICD373-1.01

2.7. Power Source: 3 Volts (One CR123A Battery)

2.8. EMC Modifications: 0.2 x 0.25 x 0.025 inch thick piece of Würth Elektronik part number 304025 Flexible ferrite absorber next to U2A on the back of the transmitter PCB.

3. Product Configuration

3.1. Cables

Cable Type	Length	Shield	From	To
No External Cables				

3.2. Support Equipment

Device	Manufacturer	Model	Serial No.
No Support Equipment			

3.3. Operational Characteristics

Unit was in a pre-programmed free running state once the battery was inserted.

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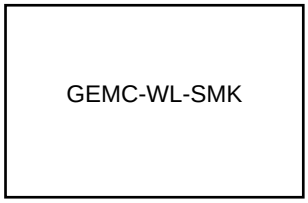
3. Product Configuration (continued)

3.4. Block Diagram



4. Measurements Parameters

4.1 Measurement Equipment Used to Perform Tests

Device	Manufacturer	Model No.	Serial No.	Cal Due
EMI Receiver	Hewlett Packard	8546A	3330A00115	10/28/2010
Biconilog Antenna	Com-Power	AC220	25509	8/6/2010
Horn Antenna	Electro-Metrics	EM-6961	6337	7/22/2010

4.2 Measurement & Equipment Setup

Test Dates:	11/19/2009 to 11/23/2009
Test Engineer:	Brian F Breault
Site Temperature (°C):	22.4
Relative Humidity (%RH):	31
Frequency Range:	30 MHz to 3.2 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	120 kHz (30 MHz – 1 GHz) 1 MHz (>1 GHz)
EMI Receiver Avg Bandwidth:	300 kHz (30 MHz – 1 GHz) 3 MHz (>1 GHz)
Detector Functions:	Peak, Quasi-Peak and Average
Antenna Height:	1 to 4 meters

4.3 Test Procedure

Test measurements were made in accordance FCC Part 15.231: Operation within the bands 40.66 – 40.70 MHz and above 70 MHz.

The test methods used to generate the data in this test report are in accordance 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.

The manufacturer declares that the device under test will always be operated in the same orientation. Therefore, exploratory radiated emission measurements while rotating the device through its three orthogonal axes to determine the worst case orientation was not necessary.

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5. Measurement Summary

Test Requirement	FCC Requirement	Test Report Section	Result	Comment
Antenna Requirement	15.203	N.A	Compliant	Unit has a permanently mounted internal antenna.
Operational Requirements	15.231 (a)(1)	N.A	N.A	This clause does not apply to the unit under test.
	15.231 (a)(2)	N.A	N.A	Section 15.231 (a)(4) applies to the unit under test.
	15.231 (a)(3)	6.1.1	Compliant	
	15.231 (a)(4)	6.1.2	Compliant	
	15.231 (a)(5)	N.A	N.A	The unit under test is not part of a security system.
Radiated Field Strength of Fundamental	15.231 (b)	6.2	Compliant	
Radiated Field Strength of Harmonics	15.231 (b)(3)	6.3	Compliant	
Emission Bandwidth	15.231 (c)	6.4	Compliant	
Bandwidth of Momentary Signals	IC RSS-210 A1.1.3	6.5	Compliant	
Spurious Radiated Emissions	15.231 (b)(3), 15.209	6.6	Compliant	
Conducted Emissions	15.207	N.A	N/A	Unit is battery operated
Determination of Duty Cycle Correction Factor	15.35	6.7	N/A	

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6. Measurement Data

6.1. Operational Requirements

6.1.1 (15.231, Section (a) (3))

Requirement: Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

Note: The manufacturer declares that for this device, the total polling duration within one hour is not more than one transmission of 4 bursts of 20 milliseconds each. Thus, the total duration is 4 x 20mS = 80 milliseconds or 0.08 seconds. This is less than the total of 2 seconds allowed.

6.1.2. (15.231, Section (a) (4))

Requirement: Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

Note: This device is employed for radio control purposes during emergencies involving fire.

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6. Measurement Data (continued)

6.2. Radiated Field Strength of Fundamental (15.231, Section (b))

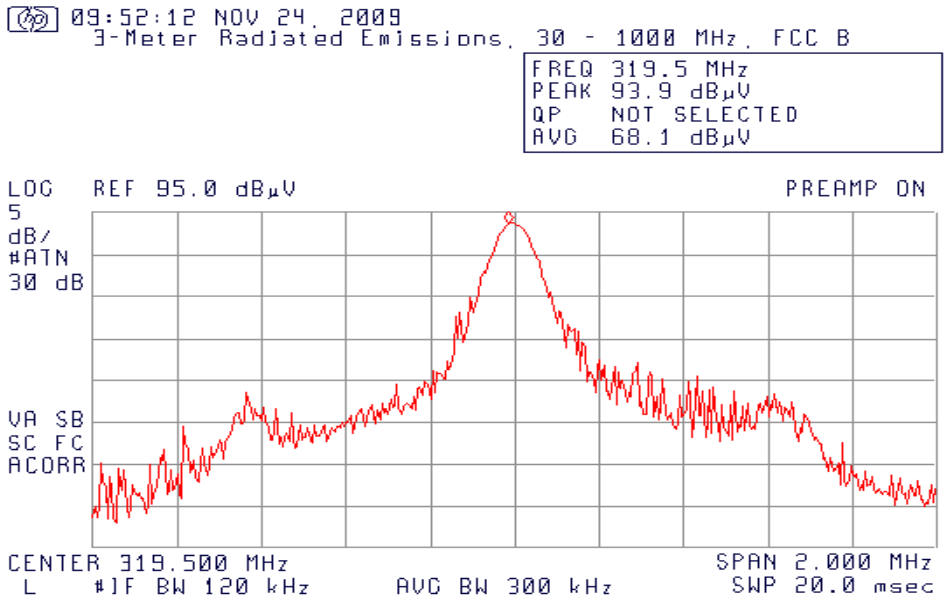
Requirement: The 3 meter field strength of the fundamental emissions from intentional radiators operated within the 260-470 MHz frequency bands shall comply with the limits specified in FCC Part 15.231, Section (b).

Temperature: 22.4ºC Humidity: 31% RH

Frequency (MHz)	Amplitude (dBµV/m)		Average Limit (dBµV/m)	Margin (dB)	Ant Pol	Ant Ht	TT Pos	Result
	Peak	Average[1]			H/V	cm	Deg	
319.5	93.90	69.46	75.89	-6.43	H	100	140	Compliant
319.5	78.73	54.29	75.89	-21.60	V	171	40	Compliant

[1] The average field strength was determined using the duty cycle correction factor calculated in section 6.7 of this test report. Reference FCC 47 CFR, Section 15.35 for additional information on pulsed transmitters.

6.2.1. Worst Case Fundamental Field Strength Measurement Screen Capture



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6. Measurement Data (continued)

6.3. Radiated Field Strength of Harmonics (15.231, Section (b) (3))

Requirement: The 3 meter field strength of the harmonic emissions from intentional radiators operated within the 260-470 MHz frequency band shall comply with the limits specified in FCC Part 15.231, Section (b). Peak field strength may not be greater than 20 dB above the average limit.

Site Temperature: 22.4ºC Site Humidity: 31% RH

6.3.1. Worst Case Harmonics Emissions < 1 GHz

Frequency (MHz)	Amplitude (dBµV/m)		QP Limit (dBµV/m)	Margin (dB)	Ant Pol[2]	Ant Ht	TT Pos	Result
	Peak	QP			H/V	cm	Deg	
639.0	54.5	32.3	55.9	-23.6	H	109	150	Compliant
958.5	65.5	39.2	55.9	-16.7	H	124	150	Compliant

6.3.2. Worst Case Harmonics Emissions > 1 GHz

Frequency (MHz)	Amplitude (dBµV/m)		Average Limit	Margin (dB)	Ant Pol[2]	Ant Ht	TT Pos	Result
	Peak	Avg[1]			H/V	cm	Deg	
1278.0	65.3	40.86	55.9	-15.0	H	124	150	Compliant
1597.5[1]	68.4	43.96	55.9	-11.9	H	100	174	Compliant
1917.0	64.0	39.56	55.9	-16.3	H	120	100	Compliant
2236.5[1]	61.9	37.46	55.9	-18.4	H	100	108	Compliant
2556.0	61.0	36.56	55.9	-19.3	H	119	44	Compliant
2875.5[1]	67.9	43.46	55.9	-12.4	H	100	74	Compliant
3195.0	66.9	42.46	55.9	-13.4	H	111	34	Compliant

[1] The average field strength was determined using the duty cycle correction factor calculated in section 6.7 of this test report. Reference FCC 47 CFR, Section 15.35 for additional information on pulsed transmitters.

[2] Both horizontal and vertical polarities were investigated. The data tabled in this test report represents the highest field strength for each harmonic emission.

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6. Measurement Data (continued)

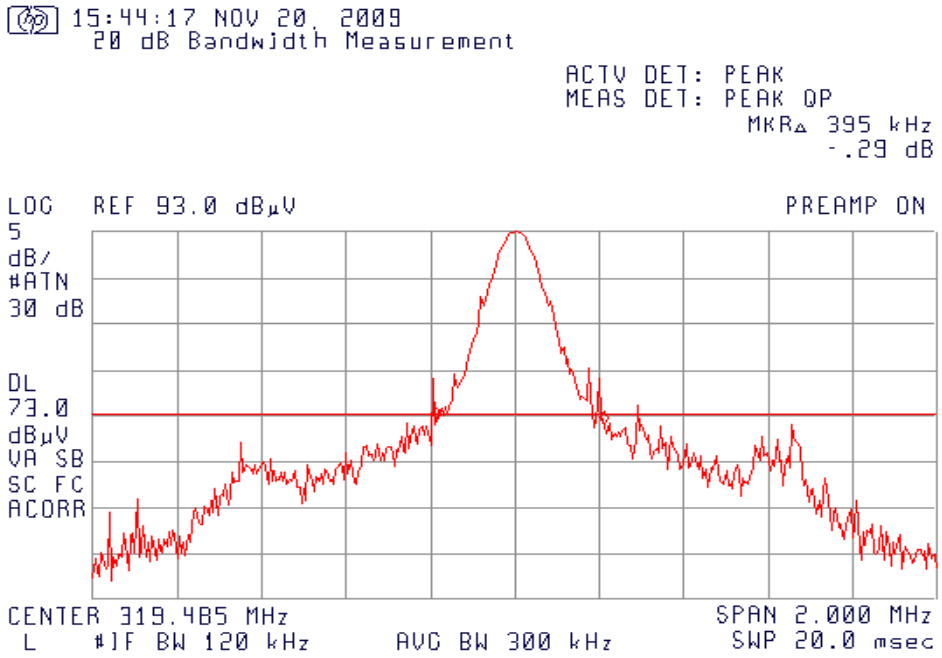
6.4. Emission Bandwidth (15.231, Section (c))

Requirement: 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. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Site Temperature: 22.4ºC Site Humidity: 31% RH

Fundamental Frequency	-20 dB Bandwidth	Limit	Result
(MHz)	(MHz)	(MHz)	
319.5	0.395	0.799	Compliant

6.4.1. 20 dB Emission Bandwidth Measurement Screen Capture



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6. Measurement Data (continued)

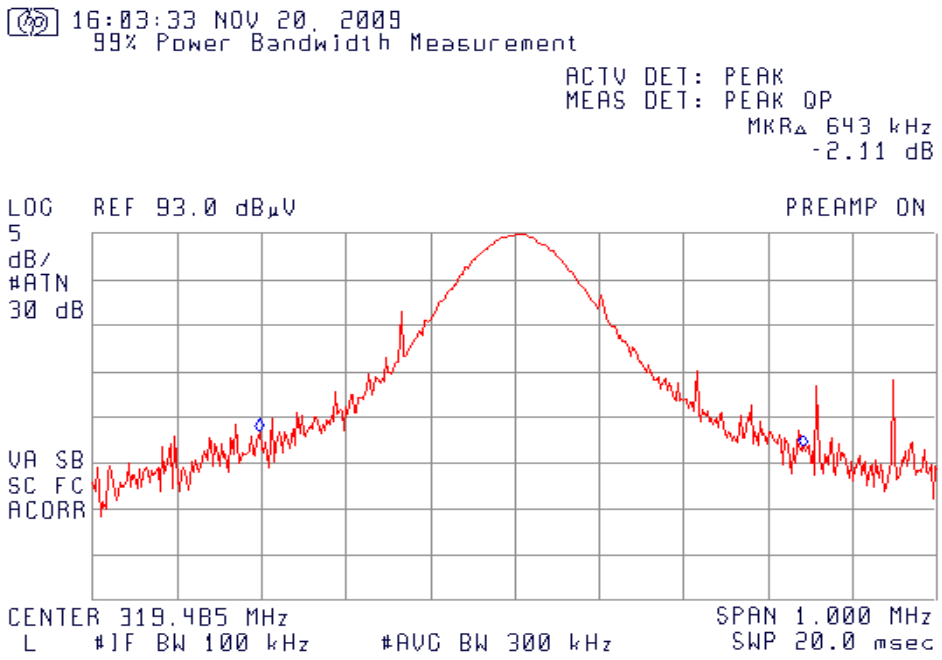
6.5. Bandwidth of Momentary Signals (IC RSS-210, Section A1.1.3)

Requirement: The 99% bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating between 70 MHz - 900 MHz.

Site Temperature: 22.4ºC Site Humidity: 31% RH

Fundamental Frequency	-20 dB Bandwidth	Limit	Result
(MHz)	(MHz)	(MHz)	
319.500	0.643	0.799	Compliant

6.5.1. 99% Emission Bandwidth Measurement Screen Capture



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6. Measurement Data (continued)

6.6. Spurious Radiated Emissions, 30 MHz to 4.4 GHz (15.231,(b))

Requirement: 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 Section 15.209, whichever is the lesser attenuation.

Site Temperature: 22.4ºC Site Humidity: 31% RH

6.6.1. Regulatory Limits: FCC Part 209, Quasi-Peak

Frequency Range (MHz)	Distance (Meters)	Limit (dBµV/m)
30 to 88	3	40.0
88 to 216	3	43.5
216 to 960	3	46.0
Above 960	3	54.0

6.6.2. Spurious Radiated Emissions, 30 MHz to 1 GHz Test Results

There were no measurable spurious emissions other than the harmonic emission detailed in section 6.3.1.

6.6.3. Spurious Radiated Emissions, >1 GHz Test Results

There were no measurable spurious emissions other than the harmonic emissions detailed in section 6.3.2.

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6. Measurement Data (continued)

6.7. Determination of Duty Cycle Correction Factor (FCC Part 15.35)

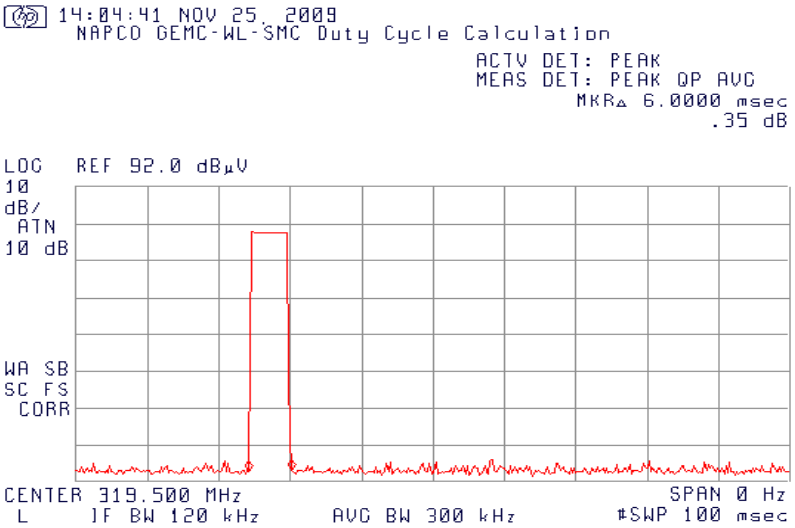
Number of Pulses per 100 mS: 1

Total On-Time in 1 period: (1 x 6 mS)

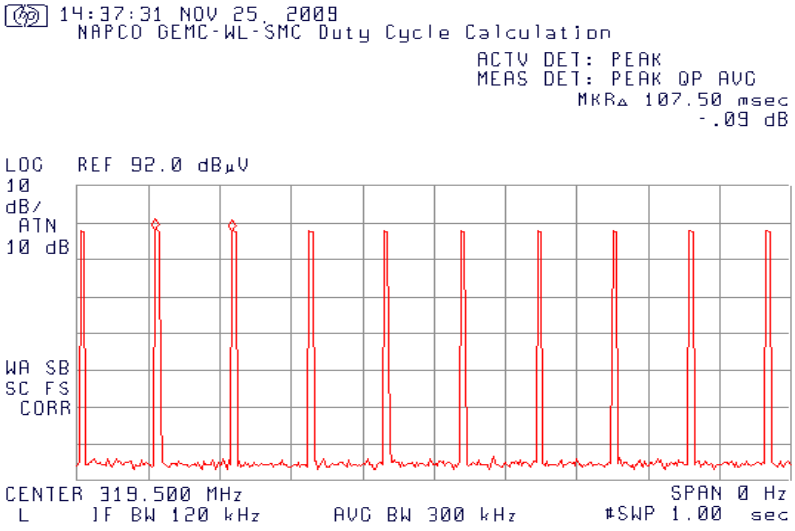
On-Time divided by cycle: 6 mS/100 mS = 0.06

Average Factor: 20 LOG_{10}(0. 06) = -24.44 dB

6.7.1. Number of Pulses per 100 mS Period



6.7.2. Pulse Separation



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7. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with Federal Communications Commission (FCC) and Industry Canada standards. A description of the test sites is on file with the FCC (registration number **96392**) and Industry Canada (file number **IC 3023A-1)**.

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022.

Both sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or table top.

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