



Nemko

Test Report: 3W06962


Applicant: Paradox Security Systems
780 Industrial Blvd.
Ste-Eustache, Quebec
J7R 5V3, Canada

**Equipment Under Test:
(EUT)** OMN-SMK1 Smoke Detector
433MHz Transmitter

FCC ID: KDYOMNSMK1

In Accordance With: **FCC Part 15, Subpart C, 15.231**

Tested By: Nemko Canada Inc.
303 River Road, R.R. 5
Ottawa, Ontario K1V 1H2



Authorized By: Kevin Carr, EMC Specialist

Date: 22 April 2003

Total Number of Pages: 16

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EQUIPMENT: OMN-SMK1 Smoke Detector

Section 1. Summary of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. All tests were conducted using measurement procedure ANSI C63.4-2001. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



TESTED BY: _____
Glen Westwell, Wireless Technologist

DATE: 20 April 2003

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This report applies only to the items tested.

EQUIPMENT: OMN-SMK1 Smoke Detector

Summary Of Test Data

Name of Test	Para. Number	Results
Transmission Requirements	15.231(a)	Complies
Radiated Emissions	15.231(b)	Complies
Occupied Bandwidth	15.231(c)	Complies
Frequency Tolerance	15.231(d)	NA
Periodic Alternate Field Strength Requirements	15.231(e)	NA
Powerline Conducted Emissions	15.207	NA

Note: This device is powered by one 9Vdc cell.

Test Conditions:

Indoor Temperature: 22°C
 Humidity: 30%

Outdoor Temperature: 10°C
 Humidity: 35%

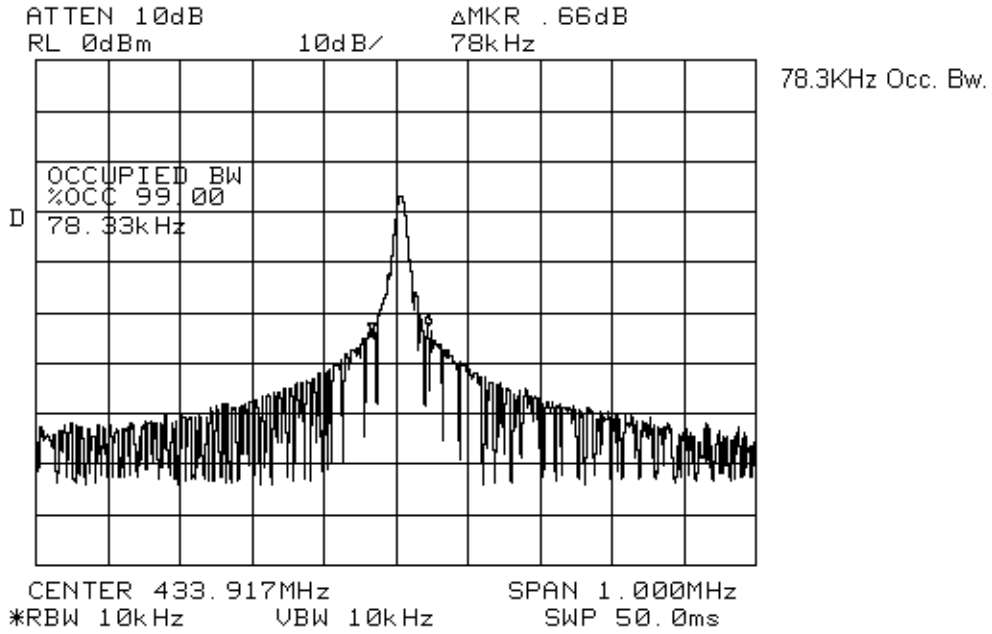
EQUIPMENT: OMN-SMK1 Smoke Detector

Section 2. Equipment Under Test

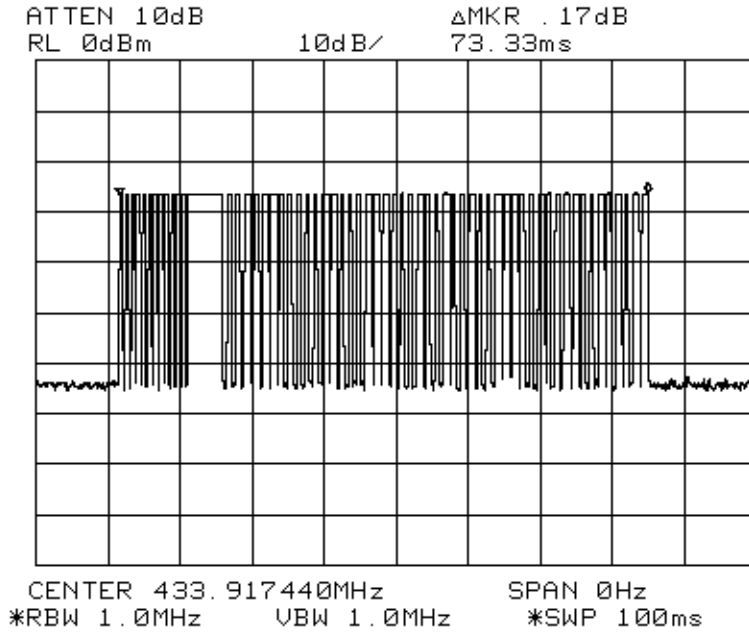
General Equipment Information

Manufacturer:	Paradox Security Systems
Equipment	433MHz Transmitter
Model No.:	OMN-SMK1
Serial No.:	None
Date Received In Laboratory:	Mar. 28, 2003
Nemko Identification No.:	1
Transmit Frequency:	433.9MHz Fixed
Modulation:	ASK, 100% (Pulse Carrier On Off)
Emission Designator:	78K3L1D

EQUIPMENT: OMN-SMK1 Smoke Detector



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Duty Cycle

Packet Pulse Length = 73.3mS
 $20 \times \text{Log} (73.3 / 100) = -2.7 \text{ dB}$

EQUIPMENT: OMN-SMK1 Smoke Detector

Section 3. Transmission Requirements

Para. No.: 15.231(a)

Test Performed By: Glen Westwell	Date of Test: 20 April 2003
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Minimum Standard: 15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.

15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds after being released.

15.231(a)(2) A transmitter activated automatically shall cease transmission within 5 seconds of activation.

15.231(a)(3) Periodic transmissions at regular pre-determined intervals are not permitted. However polling or supervisory transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

15.231(a)(4) 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.

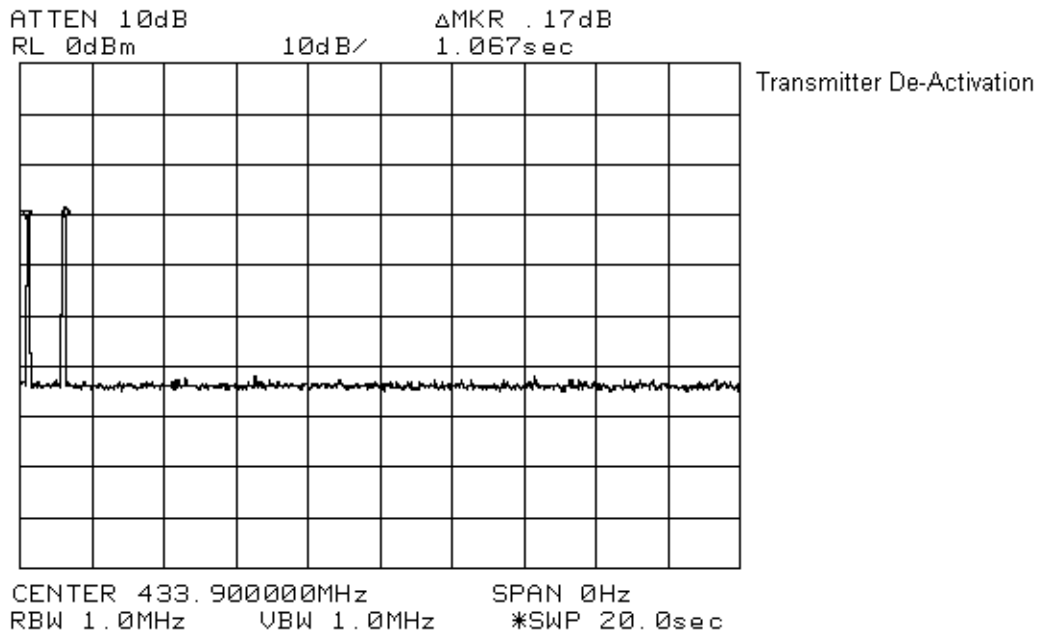
Test Results: Complies

Test Data: Compliance was determined by verification of technical specifications and a functional test on the equipment.

EQUIPMENT: OMN-SMK1 Smoke Detector

Rationale for Compliance with Transmission Requirements

- 15.231(a)(1) : The transmitter is deactivated 1.1 seconds upon releasing the push button switch.
- 15.231(a)(2) : The transmitter deactivates 1.1 seconds after automatic activation.
- 15.231(a)(3) : No periodic, polling, or supervision transmissions.
- 15.231(a)(4) : NA



EQUIPMENT: OMN-SMK1 Smoke Detector

Section 4. Radiated Emissions

Para. No.: 15.231(b)

Test Performed By: Glen Westwell	Date of Test: 20 April 2003
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Minimum Standard:

Fundamental Frequency (MHz)	Field Strength of Fundamental ($\mu\text{V/m @ 3m}$)	Field Strength of Spurious Emissions ($\mu\text{V/m @ 3m}$)
40.66 - 40.70	2,250	225
70-130	1, 250	125
130-174	1,250 to 3,750*	125 to 375
174-260 (note 1)	3,750	375
260-470 (note 1)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

Restricted Band Limits		
Frequency (MHz)	Field Strength ($\mu\text{V/m @ 3m}$)	Field Strength ($\text{dB}\mu\text{V/m @ 3m}$)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

Test Results: Complies

Test Data: As per attached tabulated data.

- All spurious and harmonic emissions were search to the 10th harmonic.
- The EUT was searched on 3 orthogonal axis for maximum emission detection.
- The EUT was powered with fresh 9Vdc cells.

EQUIPMENT: OMN-SMK1 Smoke Detector

Test Data – Radiated Emissions

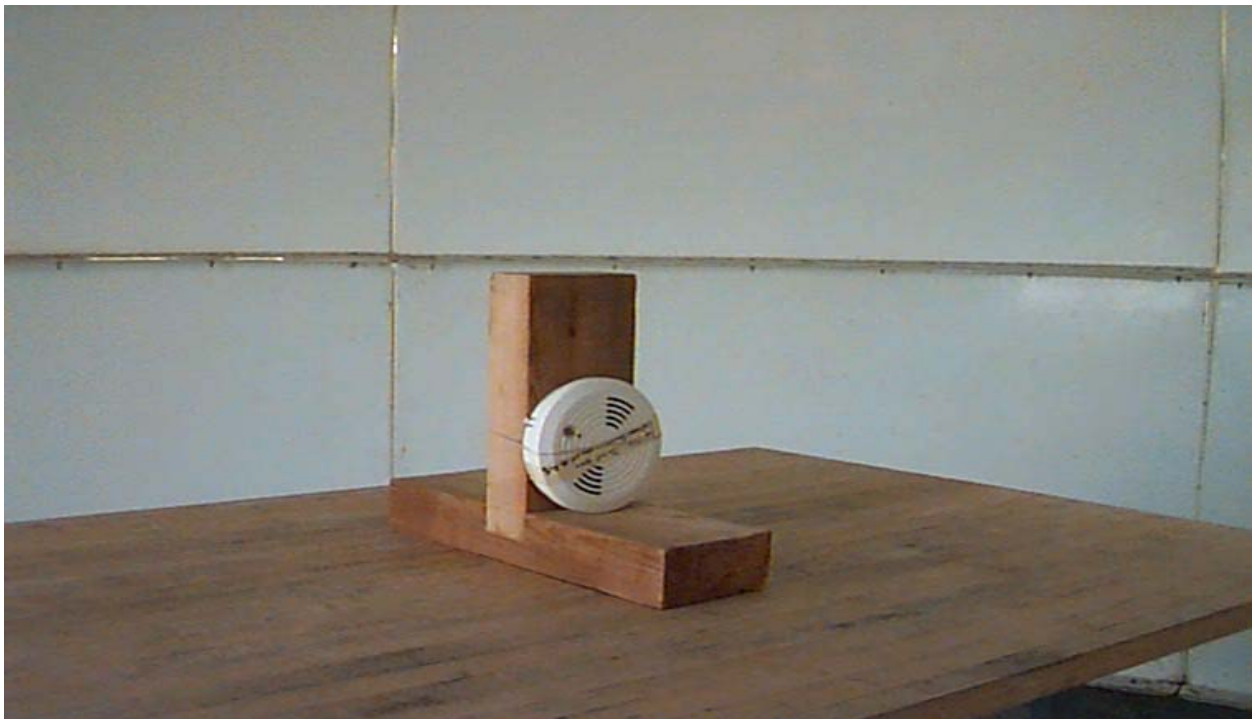
Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Duty Cycle Corr. (-dB)	Cable Loss (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Amp.
433.9000	LP1	V	58.7	16.4		2.7	2.7	75.1	81.0	5.9	
433.9000	LP1	H	50.3	17.0		2.7	2.7	67.3	81.0	13.7	
867.8000	LP1	V	N.D.	22.6		2.7	3.9	N.D.	61.0	N.D.	
867.8000	LP1	H	N.D.	23.7		2.7	3.9	N.D.	61.0	N.D.	
1301.7000	Horn1	V	55.2	26.4	51.8	2.7	3.3	30.4	54.0	23.6	1-2GHz
1301.7000	Horn1	H	46.0	26.3	51.8	2.7	3.3	21.7	54.0	32.3	1-2GHz
1735.6500	Horn1	V	64.8	28.2	51.8	2.7	3.9	42.4	61.0	18.6	1-2GHz
1735.6500	Horn1	H	54.0	28.0	51.8	2.7	3.9	31.4	61.0	29.6	1-2GHz
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW, N.D. = Not Detected											
Notes:		All emissions to the 10 th harmonic were searched. Only those within 20dB of the limit were reported. Receiver bandwidth of 100KHz was used below 1GHz, & 1MHz bandwidth was used on emissions above 1GHz. Emissions were measured at the Ottawa Facility, Range A, at 3 meters									

EQUIPMENT: OMN-SMK1 Smoke Detector

Radiated Pre-Scan Photo



OATS Set Up Photo



EQUIPMENT: OMN-SMK1 Smoke Detector

Section 5. Occupied Bandwidth

Para. No.: 15.231(c)

Test Performed By: Glen Westwell	Date of Test: 20 April 2003
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Minimum Standard: 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.

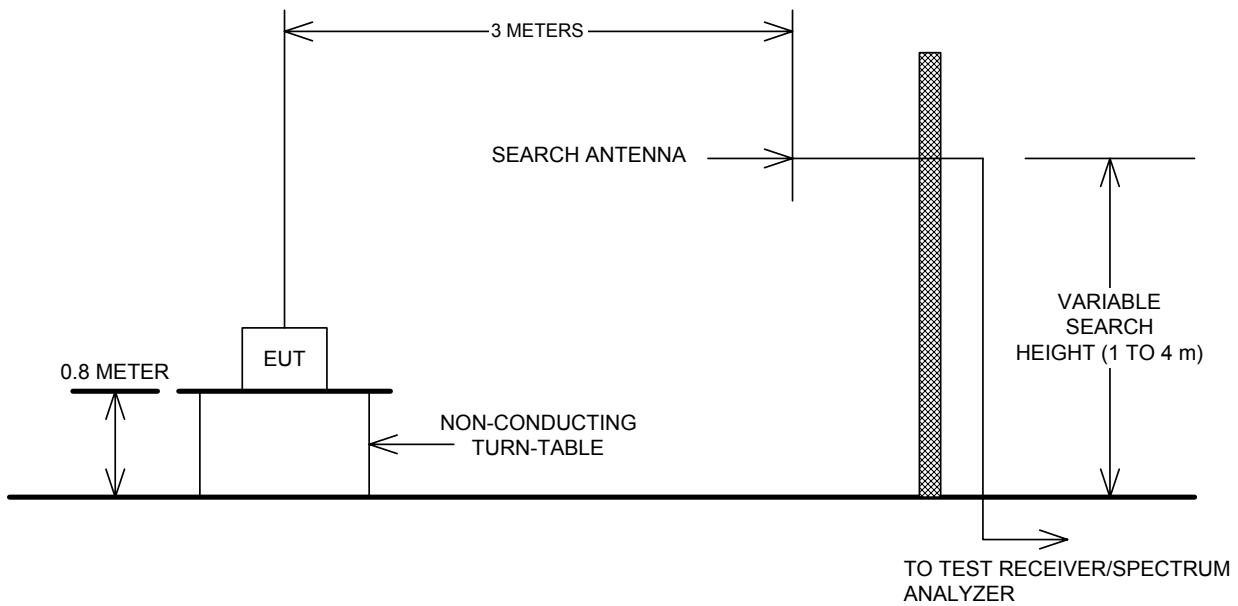
Test Results: Complies

Test Data: See attached graph.

EQUIPMENT: OMN-SMK1 Smoke Detector

Section 6. Block Diagrams

Outdoor Test Site For Radiated Emissions



The spectrum was searched up to the 10th harmonic of the fundamental frequency of operation.

EQUIPMENT: OMN-SMK1 Smoke Detector

Section 7. Test Equipment List

CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	15 Jul 02	15 Jul 03
1 Year	RF AMP	MITEQ AM-5A-1020	1-2 GHz	FA001493	20 Apr 03	COU
1 Year	Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Aug. 23/02	Aug. 23/03
1 Year	Horn Antenna	EMCO #1	3115	FA000649	23 Dec 02	23 Dec 03
1 Year	Signal Generator	Rohde & Schwarz	SMIQ03E	FA001269	Dec. 06/02	Dec. 06/03
Extended	Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	Nov. 27/01	May. 27/03
Extended	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	Nov. 27/01	May. 27/03
NCR	Bilog	Schaffner	CBL6112B	FA001504	NCR	NCR