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Test Report: 82588-1TRFWL


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

Apparatus: MG-DCT10 433MHz Wireless Door Contact

FCC ID: KDYMGDCT1

In Accordance With: FCC Part 15 Subpart C, 15.231
Periodic operation in the band 40.66-40.70MHz and
above 70 MHz.

Tested By: Nemko Canada Inc.
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Authorized By: 
Jason Nixon, Telecom Specialist

Date: May 29, 2007

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:

| | |
|--------------------------------|---------------------------------------|
| Apparatus Assessed: | MG-DCT10 433MHz Wireless Door Contact |
| Specification: | FCC Part 15 Subpart C, 15.231 |
| Compliance Status: | Complies |
| Exclusions: | None |
| Non-compliances: | None |
| Report Release History: | 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.

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Section 1: Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows:

MG-DCT10 433MHz Wireless Door Contact

1.2 Samples Submitted for Assessment

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

| Sample No. | Description | Serial No. |
|-------------------|---------------------------------------|-------------------|
| 15 | MG-DCT10 433MHz Wireless Door Contact | None |
| | | |
| | | |

The first samples were received on: Mar. 5, 2007

1.3 Technical Specifications of the EUT

Manufacturer: Paradox Security Systems

Operating Frequency: 433.92MHz

Emission Designator: L1D

Modulation: Pulse Width Modulated,

Antenna Data: Integral

Power Source: 3x 'AAA' batteries

Section 2: Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.231

Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

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 | Jan 16/08 |
| Biconical (2) Antenna | EMCO | 3109 | FA000904 | Sept. 12/07 |
| Log Periodic Antenna #2 | EMCO | 3148 | FA001355 | May 16/07 |
| Horn Antenna #1 | EMCO | 3115 | FA000649 | Feb 26/08 |
| 1.0 – 2.0 GHz Amplifier | JCA | 12-400 | FA001498 | Aug. 02/07 |
| 2.0 – 4.0 GHz Amplifier | JCA | 24-600 | FA001496 | Aug. 02/07 |
| 4.0 – 8.0 GHz Amplifier | JCA | 48-600 | FA001497 | Aug. 02/07 |

Section 3: Observations

3.1 Modifications Performed During Assessment

22Kohm at R101 was added in order to pass FCC radiated emission requirement.

3.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

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.

3.5 Additional Observations

There were no additional observations made during this assessment.

Section 4: Results Summary

This section contains the following:

FCC Part 15 Subpart C: Test Results

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 in its final modified state.

4.1 FCC Part 15 Subpart C: Test Results

| Part 15 | Test Description | Required | Result |
|--------------|---|----------|--------|
| 15.31(e) | Variation of Power source | N | |
| 15.207(a) | Powerline Conducted Emissions | N | |
| 15.209(a) | Radiated Emissions within Restricted Bands | Y | PASS |
| 15.231(a)(1) | Manually operated transmitter | N | |
| 15.231(a)(2) | Automatically activated transmitter | Y | PASS |
| 15.231(a)(3) | Periodic transmissions at regular predetermined intervals | N | |
| 15.231(a)(4) | Radiators used in cases of emergency | Y | PASS |
| 15.231(a)(5) | Set-up information for security systems | N | |
| 15.231(b) | Radiated Emissions | Y | PASS |
| 15.231(c) | 20dB Bandwidth | Y | PASS |
| 15.231(d) | Devices operating within the frequency band 40.66-40.70 MHz | N | |
| 15.231(e) | Radiated emissions for Periodic radiators | N | |

Appendix A: Test Results

Clause 15.209(a) Radiated Emissions within Restricted Bands

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 (microvoltsmeter) (kHz) | Measurement Distance (meters) |
|-----------------|--|-------------------------------|
| 0.009-0.490 | 2400/F (kHz) | 300 |
| 0.490-1.705 | 24000/F (kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

Test Conditions:

| | | | |
|----------------------------|-------------|---------------------|--------|
| Sample Number: | 15 | Temperature: | 25°C |
| Date: | May 4, 2007 | Humidity: | 52% |
| Modification State: | 1 | Tester: | Xu Jin |
| | | Laboratory: | OATS |

Test Results:

See Attached Table for Results

Additional Observations:

The Spectrum was searched from 30MHz to 5GHz.

The EUT was measured on three orthogonal axis and with a fresh battery.

All measurements were performed using a Peak Detector with 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at a distance of 3 meters.

No emission within 20dB below the limit was noticed.

Clause 15.231(a) Conditions for intentional radiators to comply with periodic operation

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

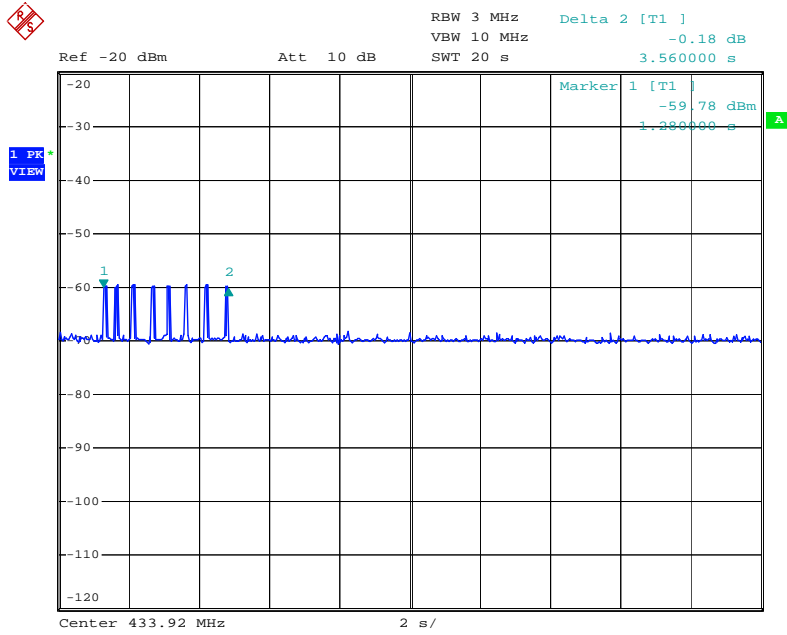
- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular 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.
- (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 condition.
- (5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

Test Conditions:

| | | | |
|----------------------------|-------------|---------------------|--------|
| Sample Number: | 15 | Temperature: | 25°C |
| Date: | May 7, 2007 | Humidity: | 52% |
| Modification State: | 1 | Tester: | Xu Jin |
| | | Laboratory: | OATS |

Test Results:

- (1) The apparatus is not manually triggered.
- (2) See attached plot for the time for transmission.
- (3) The apparatus is not a periodic transmitter.
- (4) The apparatus only transmits a single event for each alarm detected.
- (5) The setup information does not exceed the transmit duration.



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Clause 15.231(b) Radiated Emissions

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 (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 | 125 to 375 |
| 174-260 | 3,750 | 375 |
| 260-470 | 3,750 to 12,500 | 375 to 1,250 |
| Above 470 | 12,500 | 1,250 |

Test Conditions:

| | | | |
|----------------------------|-------------|---------------------|--------|
| Sample Number: | 15 | Temperature: | 25°C |
| Date: | May 4, 2007 | Humidity: | 52% |
| Modification State: | 1 | Tester: | Xu Jin |
| | | Laboratory: | OATS |

Test Results:

See Attached Table for Results

Additional Observations:

The Spectrum was searched from 30MHz to 5GHz.

The EUT was measured on three orthogonal axis and with a fresh battery

The measurements for spurious emissions were performed using a Peak Detector with 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at 3meter open area test site.

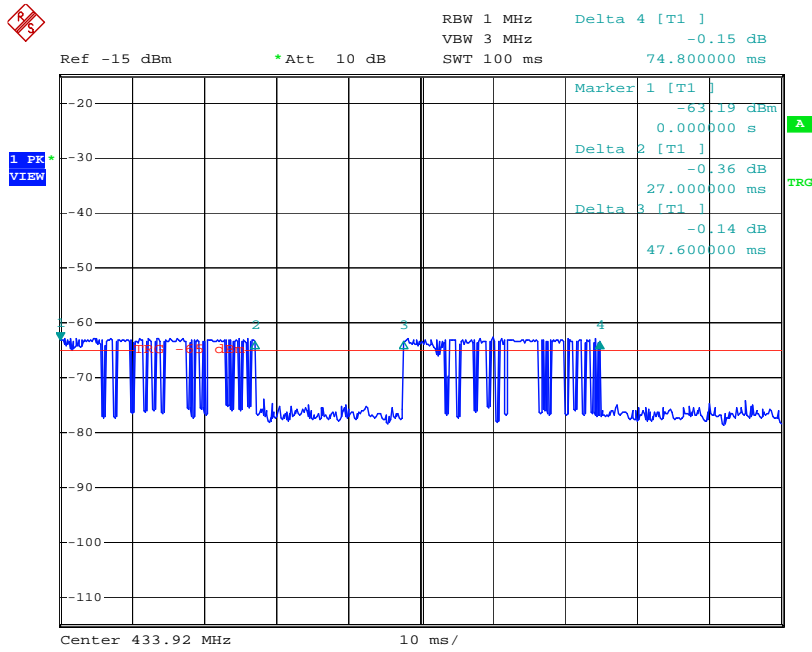
The measurement for fundamental emission was performed using a peak detector with 300KHz/1MHz RBW/VBW settings at 3meter open area test site.

Only worst case fundamental emission was reported. No spurious emission within 20dB below the limit was noticed.

| Freq. (MHz) | Ant | Pol. V/H | RCVD Signal (dBμV) | Ant. Factor (dB/m) | Amp. Gain (dB) | Duty Cycle Corr. (dB) | Cable Loss (dB) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-------------|-----|----------|--------------------|--------------------|----------------|-----------------------|-----------------|----------------|----------------|-------------|
| 433.9200 | LP | H | 63.0 | 17.2 | N/A | -5.3 | 2.1 | 77 | 80.8 | 3.8 |
| 433.9200 | LP | V | 51.7 | 16.6 | N/A | -5.3 | 2.1 | 65.1 | 80.8 | 15.7 |

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole

Duty cycle correction factor
 $=20 \cdot \log((27+27.2)/100) = -5.3\text{dB}$



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Clause 15.231(c) 20dB Bandwidth

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.

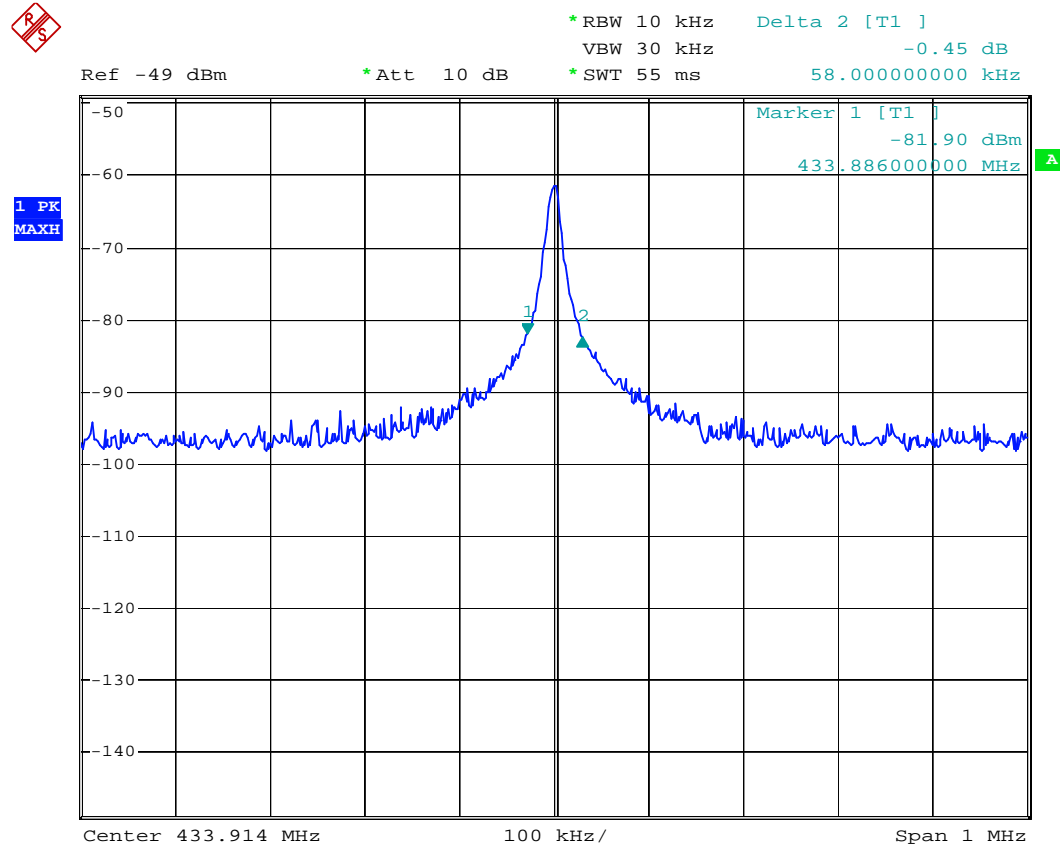
Test Conditions:

| | | | |
|----------------------------|-------------|---------------------|--------|
| Sample Number: | 15 | Temperature: | 25°C |
| Date: | May 7, 2007 | Humidity: | 52% |
| Modification State: | 1 | Tester: | Xu Jin |
| | | Laboratory: | OATS |

Limit: 0.25% of the center frequency = $0.0025 \times 433.92\text{MHz} = 1084.8\text{KHz}$

Test Results:

20dB Bandwidth=58KHz.



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Appendix B : Setup Photographs

Spurious Emissions Setup:





Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions

