



SGS-CSTC Standards Technical Services Ltd.

No. 1 Workshop, M-10, Middle Section, Science & Technology Park,
District Shenzhen, China 518057
Telephone: +86 (0) 755 2601 2053
Fax: +86 (0) 755 2671 0594
Email: sgs_internet_operations@sgs.com
FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: SZEMO09010009201
Page: 1 of 16
FCC ID: W4KLPL999

TEST REPORT

Application No.: SZEMO090100092RF
Applicant: Kai yue Electronics Factory
Address of Applicant: A59 building fuchengao industrial area, pinghu town shenzhen guang dong province
FCC ID: W4KLPL999
Fundamental Frequency : 433.92MHz
Equipment Under Test (EUT):
Name: Remote Control Light Switch
Model No.: LPL999 in 433MHz
Standards: FCC PART 15, SUBPART C : 2008 (Section 15.231)
Date of Receipt: 09 January 2009
Date of Test: 16 January to 16 March 2009
Date of Issue: 18 March 2009

| | |
|----------------------|---------------|
| Test Result : | PASS * |
|----------------------|---------------|

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Test Summary

| Test | Test Requirement | Standard Paragraph | Result |
|---|--------------------|---------------------------------|--------|
| Radiated Emission (30MHz to 5000MHz) | FCC PART 15 : 2008 | Section 15.231/15.209/15.205 | PASS |
| Dwell time | FCC PART 15 : 2008 | Section 15.231 | PASS |
| Occupied Bandwidth | FCC PART 15 : 2008 | Section 15.215 | PASS |

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

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4 General Information

4.1 Details of E.U.T

Name: Remote Control Light Switch
Model No.: LPL999 in 433MHz
Power Supply: DC4.5V(3*1.5V"AAA"Size Batteries)
Power Cord: N/A-

4.2 Description of Support Units

The EUT was tested as an independent unit: a 433 MHz Remote Control Light Switch

4.3 Test Location

All tests were performed at:

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, District Shenzhen, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.4 Other Information Requested by the Customer

None.

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4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0. Effective through December 31, 2006.
- **ACA**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.
- **VCCI**
The 3m Semi-anechoic chamber and Shielded Room (11.5m x 4m x 4m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1599 and C-1706 respectively.
Date of Registration: June 01, 2005. Valid until February 22, 2008
- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**
Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.
- **CNAL – LAB Code: L0141**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of Testing Laboratories.
- **FCC – Registration No.: 282399**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorised test laboratory for the DoC process.
- **Industry Canada (IC)**
The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5169.

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5 Test Results

5.1 Test Instruments

| R&TTE RE in Chamber | | | | | | |
|---------------------|--------------------------------|-----------------|-----------|---------------|---------------------|-------------------------|
| Item | Test Equipment | Manufacturer | Model No. | Inventory No. | Cal.Date (dd-mm-yy) | Cal.Due date (dd-mm-yy) |
| 1 | 3m Semi-Anechoic Chamber | ETS-LINDGREN | N/A | SEL0017 | 16-06-2007 | 15-06-2009 |
| 2 | EMI Test Receiver | Rohde & Schwarz | ESIB26 | SEL0023 | 12-12-2008 | 11-12-2009 |
| 3 | EMI Test software | AUDIX | E3 | SEL0050 | N/A | N/A |
| 4 | Coaxial cable | SGS | N/A | SEL0028 | 18-06-2008 | 17-06-2009 |
| 5 | Coaxial cable | SGS | N/A | SEL0027 | 18-06-2008 | 17-06-2009 |
| 6 | BiConiLog Antenna (26-3000MHz) | ETS-LINDGREN | 3142C | SEL0014 | 12-08-2008 | 11-08-2009 |
| 7 | EMI Test Receiver | Rohde & Schwarz | ESCI | SEL0022 | 18-06-2008 | 17-06-2009 |
| 8 | Active Loop Antenna | Beijing Daze | ZN30900A | SEL0097 | 15-06-2008 | 14-06-2009 |

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5.2 E.U.T. Operation

Operating Environment:

Temperature: 24.0 °C

Humidity: 52 % RH

Atmospheric Pressure: 1010 mbar

5.3 Test Procedure & Measurement Data

5.3.1 Radiated Emissions

Test Requirement: FCC Part15 C Section 15.231**Test Method:** ANSI C63.4**Measurement Distance:** 3m (Semi-Anechoic Chamber and OATS)**Test mode:** Keep the EUT in transmitting mode.**Frequency range:** 30 MHz – 5.0GHz**Receiver setup:** RBW=120kHz VBW=300KHz (30MHz to 1000MHz)
RBW=1MHz VBW=3MHz (Above 1GHz)**Limit:**

According to FCC 15.231(b) requirement:

In addition to the provisions of 15.205, the field strength of emissions from intentional radiator operated under this section shall not exceed the following:

Fundamental and harmonics emission limits

| Fundamental Frequency MHz | Field Strength of Fundamental (dBμV/m @ 3m) | Field Strength of Harmonics and Spurious Emissions (dBμV/m @ 3m) |
|---------------------------|---|--|
| 433.95 | 80.83 | 60.83 |

General Radiated emission limit

| Frequency(MHz) | Emission (dBμV/m @ 3m) |
|----------------|------------------------|
| 30-88 | 40.0 |
| 88-216 | 43.5 |
| 216-960 | 46.0 |
| Above 960 | 54.0 |

Remark: The table above tighter limit applies at the band edges.

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Test Procedure:

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

An initial pre-scan was performed in the 3m chamber using the spectrum analyzer in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bilog antenna with 2 orthogonal polarities.

The following test results were performed on the EUT:

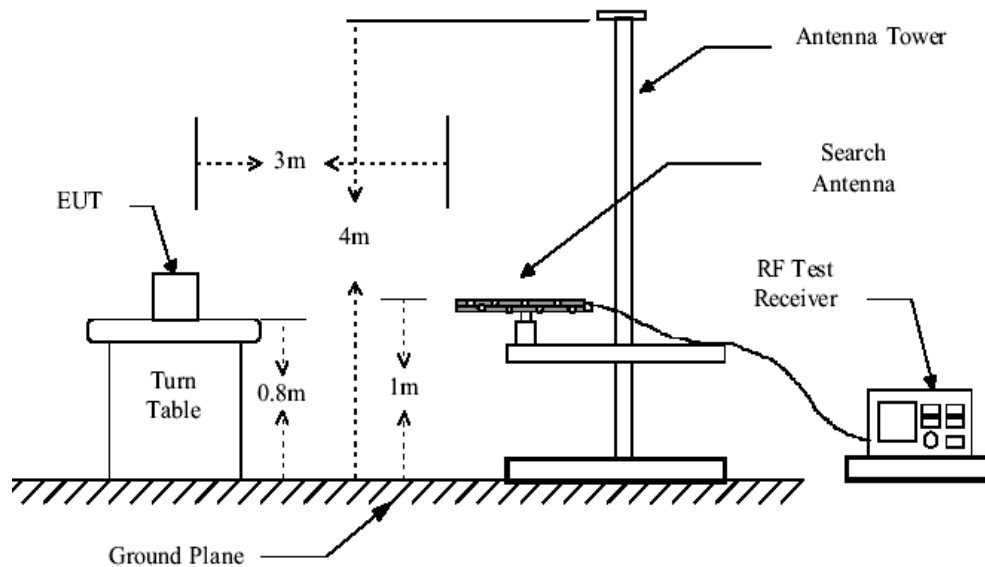
1. Fundamental emission

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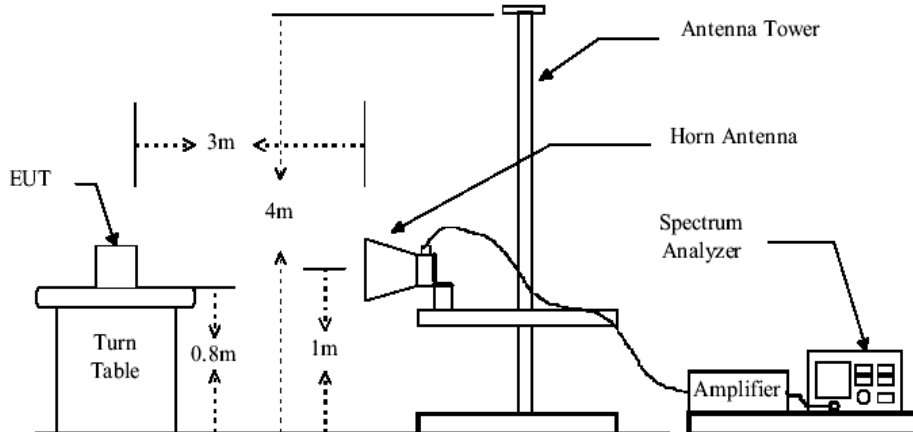
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Configuration of Measurement:

Blow 1GHz



Above 1GHz



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Field Strength of Fundamental

Peak value:

| Test Frequency (MHz) | Peak (dB μ V/m) | | Limits (dB μ V/m) | Margin (dB) | |
|-------------------------|---------------------|------------|--------------------------|-------------|------------|
| | Vertical | Horizontal | | Vertical | Horizontal |
| 433.95MHz | 76.53 | 78.97 | 100.83 | 24.30 | 24.86 |

Average value:

Average value = Peak value + PDCF

Ton time = $23 \times 0.62\text{ms} + 15 \times 1.82\text{ms} = 41.92\text{ms}$

Duty cycle = Ton time / T period = $41.92\text{ms} / 100\text{ms} = 0.4192$

PDCF = $20 \log(\text{Duty cycle}) = 20 \times (-0.378) = -7.56$

Average value = $78.97 - 7.56 = 71.47\text{dB}\mu\text{V/m}$

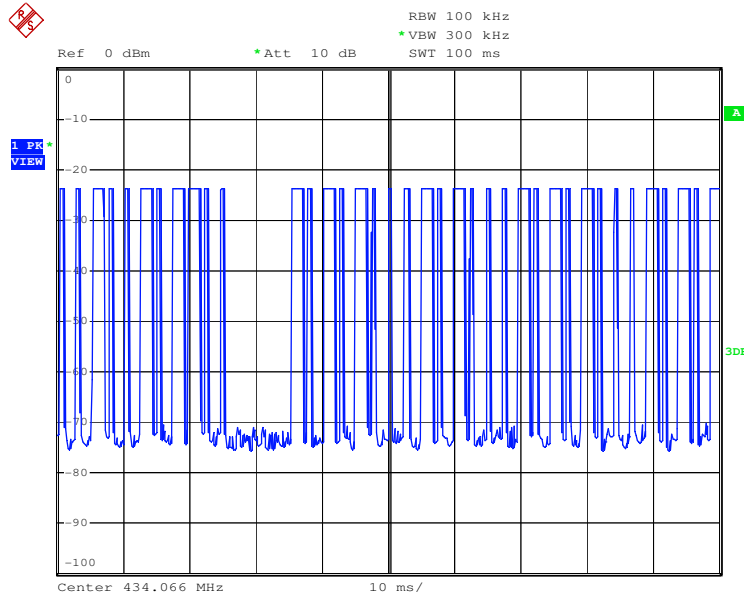
Please see the diagrams below:

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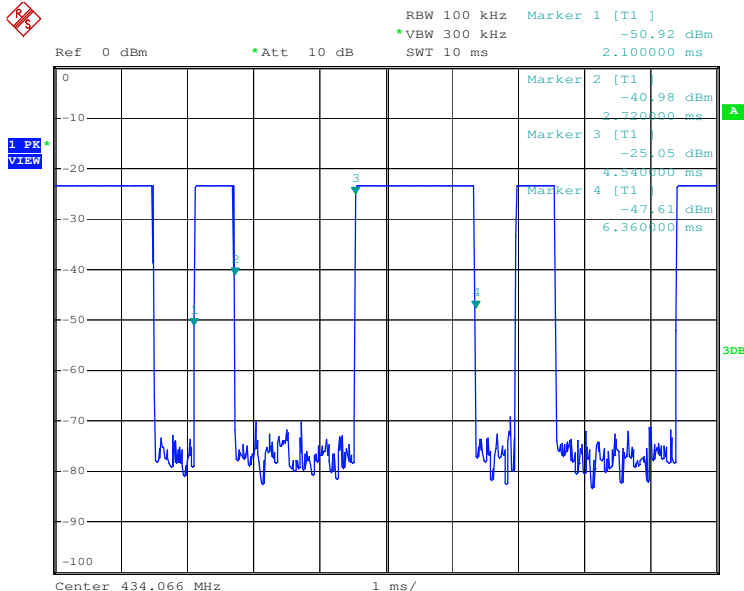


Duty cycle numbers



Date: 16.MAR.2009 08:42:07

Time slot:



Date: 16.MAR.2009 08:43:58

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**Test Frequency 30MHz- 1GHz**

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamp Factor (dB) | Read Level (dBuV) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) |
|-----------------|-----------------|-----------------------|--------------------|-------------------|----------------|---------------------|-----------------|
| 51.34 | 0.80 | 8.31 | 28.10 | 37.46 | 18.47 | 40.00 | -21.53 |
| 109.54 | 1.23 | 8.62 | 27.78 | 38.47 | 20.54 | 43.50 | -22.96 |
| 253.10 | 1.69 | 12.38 | 26.90 | 39.24 | 26.41 | 46.00 | -19.59 |
| 615.54 | 2.73 | 20.18 | 27.56 | 48.56 | 43.91 | 46.00 | -2.09 |
| 868.15 | 3.48 | 22.85 | 26.58 | 55.79 | 55.54 | 60.83 | -5.92 |

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamp Factor (dB) | Read Level (dBuV) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) |
|-----------------|-----------------|-----------------------|--------------------|-------------------|----------------|---------------------|-----------------|
| 55.22 | 0.80 | 7.56 | 28.08 | 47.09 | 27.37 | 40.00 | -12.63 |
| 78.50 | 1.05 | 7.59 | 28.00 | 41.56 | 22.20 | 40.00 | -17.80 |
| 253.10 | 1.69 | 12.38 | 26.90 | 37.20 | 24.37 | 46.00 | -21.63 |
| 615.56 | 2.73 | 20.18 | 27.56 | 48.07 | 43.42 | 46.00 | -2.58 |
| 868.15 | 3.48 | 22.85 | 26.58 | 47.49 | 47.24 | 60.83 | -13.59 |

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Test frequency above 1GHz

Peak measurement

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamplifier Factor (dB) | Read Level (dBuV) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|-----------------|-----------------|-----------------------|--------------------------|-------------------|----------------|---------------------|-----------------|--------------|
| 1296.00 | 3.45 | 27.66 | 44.76 | 66.49 | 52.84 | 74.00 | -21.16 | H |
| 1732.00 | 4.08 | 29.90 | 44.70 | 63.94 | 53.22 | 74.00 | -20.78 | H |
| 2432.00 | 5.01 | 32.26 | 44.76 | 61.57 | 54.08 | 74.00 | -19.92 | H |
| 3028.00 | 5.11 | 33.39 | 44.91 | 60.59 | 54.18 | 74.00 | -19.82 | H |
| 3860.00 | 5.94 | 33.34 | 45.11 | 61.28 | 55.45 | 74.00 | -18.55 | H |
| 1296.00 | 3.45 | 27.66 | 44.76 | 68.95 | 55.30 | 74.00 | -18.70 | V |
| 1732.00 | 4.08 | 29.90 | 44.70 | 65.91 | 55.19 | 75.00 | -19.81 | V |
| 2432.00 | 5.01 | 32.26 | 44.76 | 63.29 | 55.80 | 76.00 | -20.20 | V |
| 3060.00 | 5.15 | 33.37 | 44.91 | 63.84 | 57.45 | 77.00 | -19.55 | V |
| 3988.00 | 6.05 | 33.40 | 45.14 | 62.77 | 57.08 | 78.00 | -20.92 | V |

Average measurement

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamplifier Factor (dB) | Read Level (dBuV) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|-----------------|-----------------|-----------------------|--------------------------|-------------------|----------------|---------------------|-----------------|--------------|
| 1296.00 | 3.45 | 27.66 | 44.76 | 50.98 | 37.33 | 54.00 | -16.67 | H |
| 1732.00 | 4.08 | 29.90 | 44.70 | 42.03 | 31.31 | 54.00 | -22.69 | H |
| 2432.00 | 5.01 | 32.26 | 44.76 | 43.02 | 35.53 | 54.00 | -18.47 | H |
| 3028.00 | 5.11 | 33.39 | 44.91 | 40.59 | 34.18 | 54.00 | -19.82 | H |
| 3860.00 | 5.94 | 33.34 | 45.11 | 41.08 | 35.25 | 54.00 | -18.75 | H |
| 1296.00 | 3.45 | 27.66 | 44.76 | 46.91 | 33.26 | 54.00 | -20.74 | V |
| 1732.00 | 4.08 | 29.90 | 44.70 | 42.59 | 31.87 | 54.00 | -22.13 | V |
| 2432.00 | 5.01 | 32.26 | 44.76 | 46.89 | 39.40 | 54.00 | -14.60 | V |
| 3060.00 | 5.15 | 33.37 | 44.91 | 40.42 | 34.03 | 54.00 | -19.97 | V |
| 3988.00 | 6.05 | 33.40 | 45.14 | 42.24 | 36.55 | 54.00 | -17.45 | V |

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According to the standards used, where limits are specified by agencies for both average and peak (or quasi-peak) detection, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC Part 15 C Section 15.231 requirements.

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5.3.2 Occupy Bandwidth

Test Requirement: FCC Part15 C

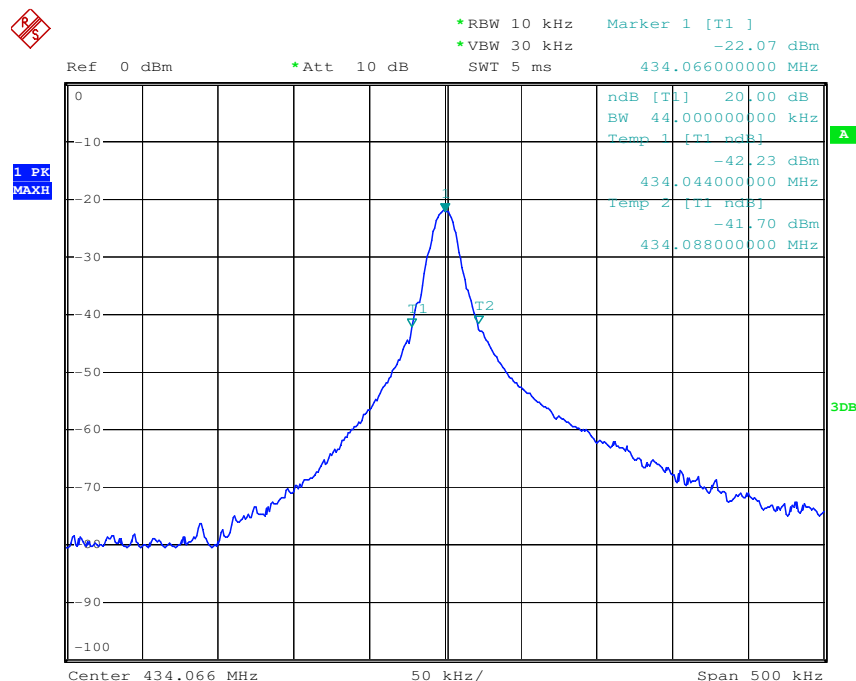
Test Method: ANSI C63.4 section 13 & FCC Part 2.1049

Requirements: 15.231 (c3) 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.

Limit: BW(20dBc)<1084.87kHz

Method of measurement: A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken. The vertical is set to 10dB per division. The horizontal scale is set to 50KHz per division.

The graph as below: represents the emissions take for this device.



Date: 16.MAR.2009 08:30:37

The results: The unit does meet the FCC Part 15C Section 15.231 requirements.

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5.3.3 Dwell Time:

Test Requirement: FCC Part15 C

Test Method: FCC Part15 C Section 15.231.

Requirements:

1. Regulation 15.231 (a) 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. Radio control of toys is not permitted. Continuous transmissions, such as voice or video, and data transmissions are not permitted. The prohibition against data transmissions does not preclude the use of recognition codes. Those codes are used to identify the sensor that is activated or to identify the particular component as being part of the system.

Result:

The EUT is similar as a remote switch.

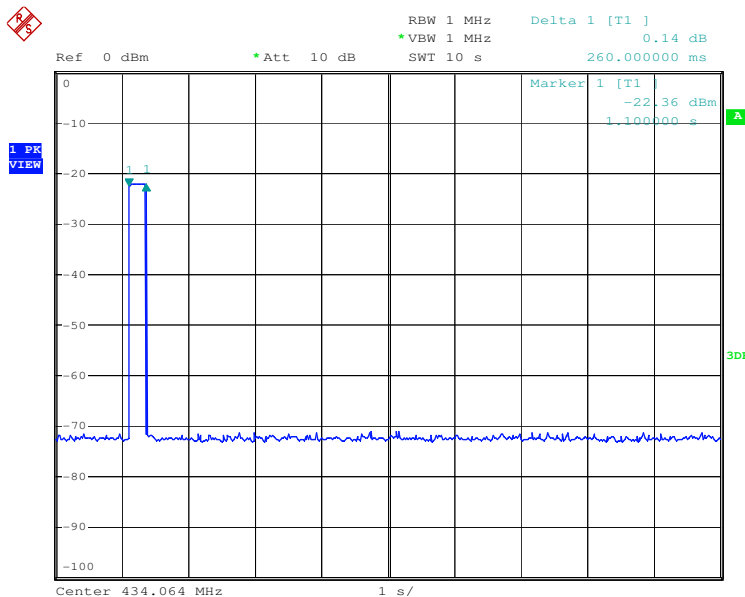
The EUT meets the requirements of this section.

2. Regulation 15.231 (a1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Result:

Transmitter ceases immediately after being released.

Please refer to the duration of the each transmission as below:



Date: 16.MAR.2009 08:17:12

The results: The unit does meet the FCC Part 15C Section 15.231 requirements.

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