

FCC CERTIFICATION RADIO MEASUREMENT TECHNICAL REPORT

On Model Name : Wireless Garage Security Kit- PIR

Model Number : AC51532A

Trademark : WINPLUS

FCC ID Number : XMEFWINPLUSA

Prepared for
Shenzhen SAINT Technology Electronic Co.,Ltd

According to FCC Part 15(2008), Subpart C

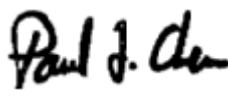
Test Report #: SHE-0907-10229-FCCID

Prepared by: May Wang

Reviewed by: Jawen Yin

QC Manager: Paul Chen

Test Report Released by:



Paul Chen

2009, September 18

Date

List of Attached Files

| Exhibit Type | File Description | File Name |
|--------------------------------|----------------------------------------|-----------------------------------------------|
| <i>Test Report</i> | <i>Test Report</i> | <i>XMEFWINPLUSA_ Test report.pdf</i> |
| <i>Operational Description</i> | <i>Technical Description</i> | <i>XMEFWINPLUSA_operation description.pdf</i> |
| <i>External Photos</i> | <i>External Photos</i> | <i>XMEFWINPLUSA_External Photos</i> |
| <i>Internal Photos</i> | <i>Internal Photos</i> | <i>XMEFWINPLUSA_Internal Photos</i> |
| <i>Block Diagram</i> | <i>Block Diagram</i> | <i>XMEFWINPLUSA_Block Diagram.pdf</i> |
| <i>Schematics</i> | <i>Circuit Diagram for transmitter</i> | <i>XMEFWINPLUSA_Schematics.pdf</i> |
| <i>Label&Location</i> | <i>Label Artwork and Location</i> | <i>XMEFWINPLUSA_Label & Location.pdf</i> |
| <i>User Manual</i> | <i>User Manual</i> | <i>XMEFWINPLUSA_User Manual.pdf</i> |
| <i>Test set up photos</i> | <i>Test set up photos</i> | <i>XMEFWINPLUSA_Test Setup Photos.pdf</i> |

Test Location

Tests performed in a Certified ANSI Semi-Anechoic Chamber and Shielded Room.

Test Site Location : Guangdong Galanz Enterprise Co. Ltd

*25 South Ronggui Rd., Shunde, Foshan,
Guangdong, China*

Tel : 86-757-23612785

Fax : 86-757-23612537

FCC Registration Number : 580210

CNAS Registration Number : L2244

List of Test Instruments

| <i>Equipment</i> | <i>Manufacturer</i> | <i>Model No.</i> | <i>Serial No.</i> | <i>Calibrated Untill</i> |
|------------------------------------------|----------------------------|-------------------------|--------------------------|-------------------------------------|
| <i>Spectrum Analyzer</i> | <i>R&S</i> | <i>FSP30</i> | <i>100755</i> | <i>2010-11-30</i> |
| <i>EMI Receiver</i> | <i>SCHAFFNER</i> | <i>SMR4503</i> | <i>11725</i> | <i>2010-07-08</i> |
| <i>Double-ridged Wave guide horn</i> | <i>ETS</i> | <i>3115</i> | <i>6587</i> | <i>2010-08-02</i> |
| <i>Amplifier</i> | <i>Agilent</i> | <i>83017A</i> | <i>MY3950043 8</i> | <i>2010-07-11</i> |
| <i>Biconilog Antenna</i> | <i>ETS</i> | <i>3142C</i> | <i>00042672</i> | <i>2010-09-28</i> |
| <i>Semi-anechoic Chamber</i> | <i>ETS</i> | <i>N/A</i> | <i>N/A</i> | <i>2010-05-24</i> |

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Opinions and Interpretations

This test report relates to the abovementioned equipment under test (EUT). Without the permission of ECMG Worldwide Certification Solution, Inc. this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark on this or similar products. The manufacturer has sole responsibility of continued compliance of the device.

Statement of Measurement Uncertainty

The data and results referenced in the document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error. Furthermore, component and process variability of devices similar to that tested may result in additional deviation.

Administrative Data

Test Sample : *Wireless Garage Security Kit- PIR*

Model Number : *AC51532A*

Model Tested : *AC51532A*

Trade Mark : *WINPLUS*

Date Tested : *2009, July 10 to August 28*

Applicant : *Shenzhen SAINT Technology Electronic Co.,Ltd*
804 Room,4th buliding, Qingnian Chengbang
Yuan,Longhua st, Baoan Dist,
Shenzhen,Guangdong,China.(518000)

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Description of EUT

SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD. Model number AC51532A is a Wireless Garage Security Kit- PIR.

The EUT's technical specification are as below:

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Product | <i>Wireless Garage Security Kit- PIR</i> |
| Model No. | <i>AC51532A</i> |
| Power type | <i>DC 9V,Alkaline battery</i> |
| Modulation Type | <i>FSK</i> |
| Carrier Frequency | <i>433.92MHz</i> |
| Number of Channel | <i>1</i> |
| Antenna Type | <i>Pull out antenna</i> |
| Data Cable | <i>N/A</i> |
| I/O Ports | <i>N/A</i> |
| <i>Note : The above EUT informations was declared by manufacturer and for more detailed features descriptions, please refer to the manufacturer's specifications or user's Manual.</i> | |

Test Mode Applicability And Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, and X.Y.Z. axis.

Following channel(s) was (were) selected for the final test as listed below.

| <i>Available channel</i> | <i>Tested channel</i> | <i>Modulation type</i> | <i>Axis</i> |
|---------------------------------|------------------------------|-------------------------------|--------------------|
| <i>1</i> | <i>1</i> | <i>FSK</i> | <i>X</i> |

Note :

- 1) The worst-case X axis was selected for final test.*
- 2) All test was conducted with fresh battery.*

General Description of Applied Standards

The EUT is a operated automatically transmitter. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (Section 15.231) & ANSI C63.4- 2003.

All test items have been performed and recorded as per the above standards.

Test Summary

The Electromagnetic Compatibility requirements on EUT for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment Under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

| EMC Test Items (Reference FCC Part 15.231) | | | |
|--------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------|--------------|
| Specification | Description | Test Results | Remark |
| FCC Part 15.203 | Antenna Requirement | Compliance | Attachment 1 |
| FCC Part 15.207 | Conducted Emission Test | Test is not applicable, because EUT only employ battery power for operation. | |
| FCC Part 15.231(a) | Transmitting Time Test | Compliance | Attachment 2 |
| FCC Part 15.209 | Radiated Emission | Compliance | Attachment 3 |
| FCC Part 15.205 | Restricted Bands of operation | Compliance | |
| FCC Part 15.231(b) | Field Strength of Fundamental and Spurious Emissions | Compliance | |
| FCC Part 15.231(c) | Bandwidth | Compliance | Attachment 4 |

Test Mode Justification

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

EUT Exercise Software

The device is not programmable and does not use software.

Equipment Modification

Any modifications installed previous to testing by SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD will be incorporated in each production model sold or leased in United States.

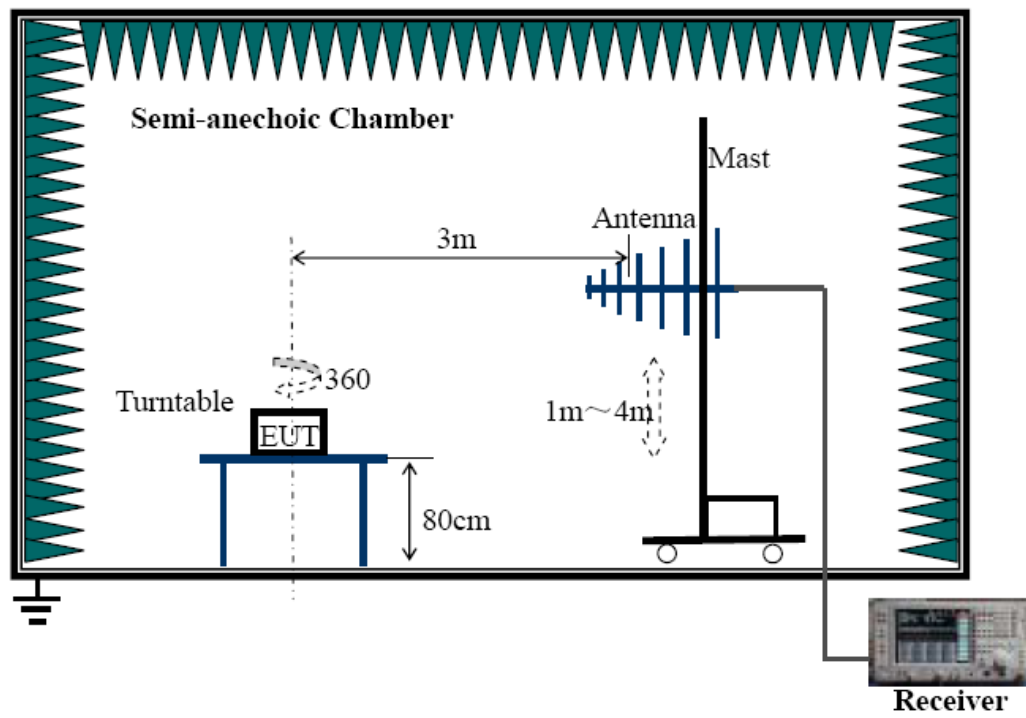
There were no modifications installed by EMC Compliance Management Group (China) test personnel.

Test System Details

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| EUT | | | | |
|-------------------|------------------------------------------------|---------------|--------------|----------------------------------|
| Model Number: | AC51532A | | | |
| Model Tested: | AC51532A | | | |
| Trademark: | WINPLUS | | | |
| Serial Number: | Engineering Sample | | | |
| Input Voltage: | DC 9V | | | |
| Description: | Wireless Garage Security Kit- PIR | | | |
| Manufacturer: | SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD . | | | |
| Support Equipment | | | | |
| Description | Model Number | Serial Number | Manufacturer | Power Cable Description (Meters) |
| None | | | | |
| Cable Description | | | | |
| None | | | | |

Configuration of Tested System



EUT Sample Photos



Front View of EUT



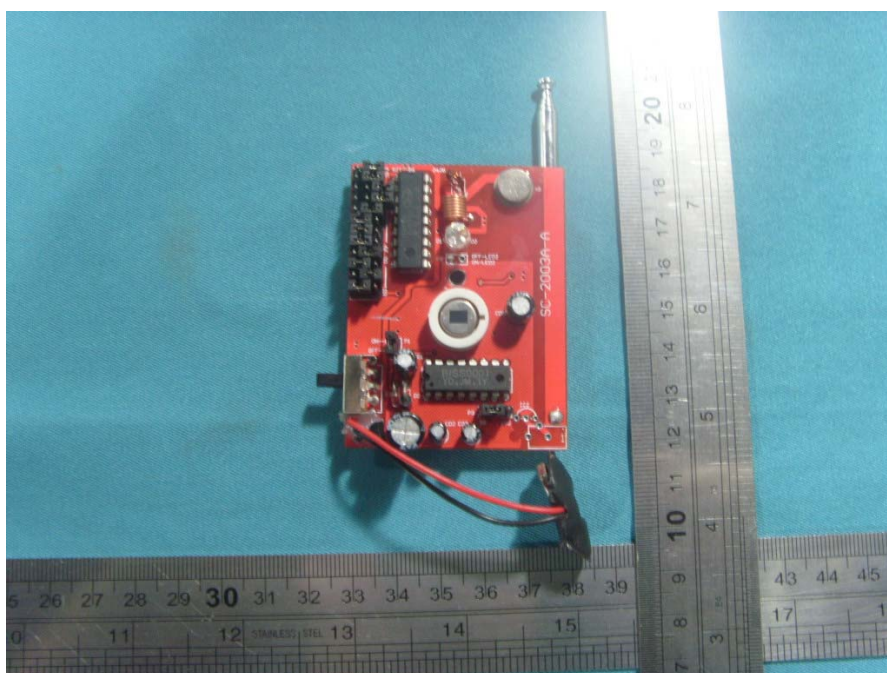
Back View of EUT



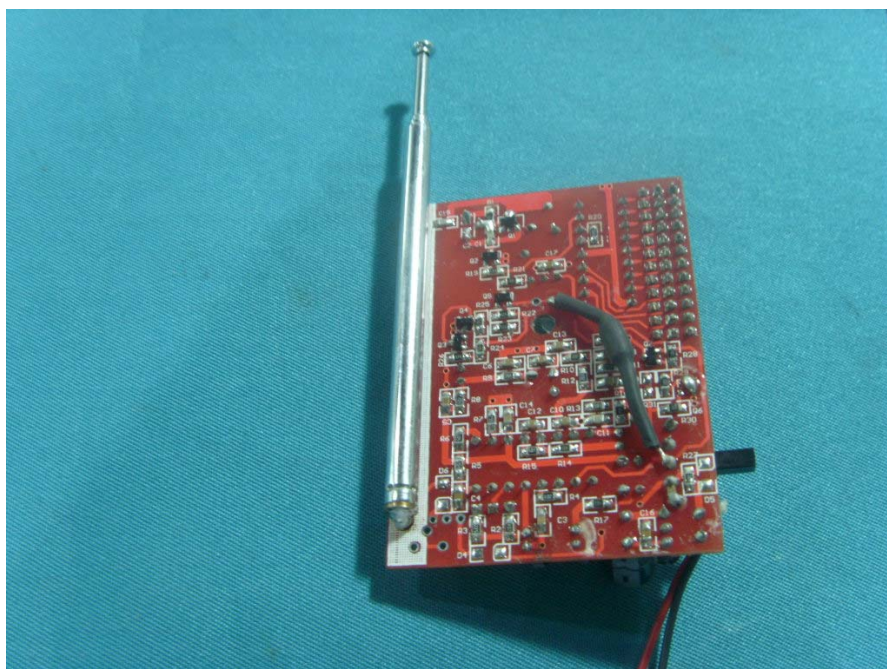
Side View of EUT



Uncovered View



Main Board View #1



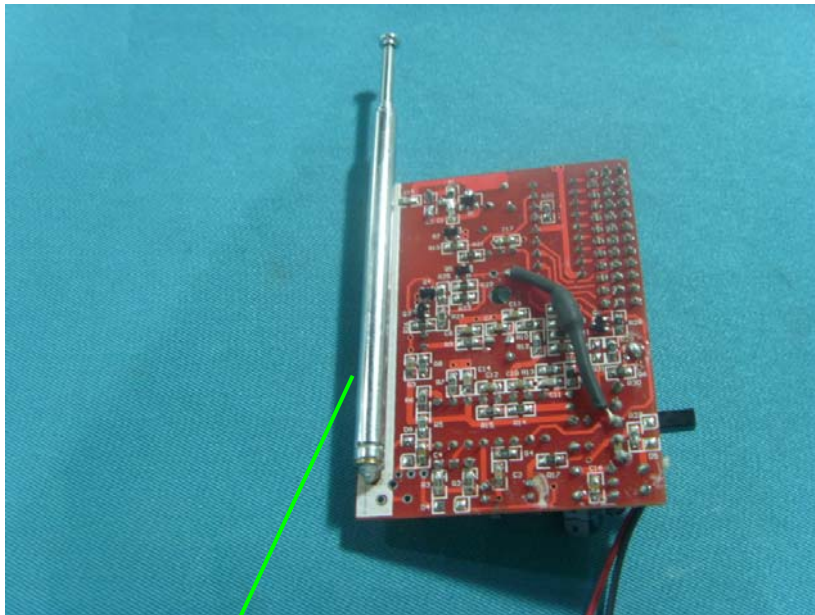
Main Board View #2

Attachment 1 – Antenna Requirement

| | | | |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------|
| CLIENT: | SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD . | TEST STANDARD: | FCC Part 15.203 |
| MODEL TESTED: | AC51532A | PRODUCT: | Wireless Garage Security Kit- PIR |
| SERIAL NO.: | Engineering Sample | EUT DESIGNATION: | RF Equipment |
| TEMPERATURE: | 21°C | HUMIDITY: | 55%RH |
| ATM PRESSURE: | 101.8 kPa | GROUNDING: | No Grounding |
| TESTED BY: | Jawen Yin | DATE OF TEST: | 2009, August 28 |
| SETUP METHOD: | N/A | | |
| ANTENNA REQUIREMENT: | <p>An intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.</p> | | |
| TEST VOLTAGE: | 9V DC(alkaline Battery) | | |
| TEST STATUS: | Normal Operation As Usual | | |
| RESULTS: | The EUT meets the Antenna requirement of FCC 15.203. The test results relate only to the equipment under test provided by client. | | |
| CHANGES OR MODIFICATIONS: | There were no modifications installed by ECMG Worldwide Certification Solution, Inc. (China) test personnel. | | |
| M. UNCERTAINTY: | N/A | | |

| FCC Section | FCC Rules | Conclusion |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 15.203 | <p><i>Described how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.</i></p> <p><i>The exception is in those cases where EUT must be professionally installed. In order to demonstrate that professional installation is required, the following 3 points must be addressed:</i></p> <ul style="list-style-type: none"> • <i>The application (or intended use) of the EUT</i> • <i>The installation requirements of the EUT</i> • <i>The method by which the EUT will be marketed</i> | <p><i>The Wireless Garage Security Kit- PIR uses an integrate antenna without connector.</i></p> <p><i>Please refer to the following photo.</i></p> |

Integrate Antenna without Connector View:



Integrate
Antenna

Attachment 2 – Transmitting Time Test

| | | | |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------|
| CLIENT: | SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD . | TEST STANDARD: | FCC Part 15.231 (a) |
| MODEL TESTED: | AC51532A | PRODUCT: | Wireless Garage Security Kit- PIR |
| SERIAL NO.: | Engineering Sample | EUT DESIGNATION: | RF Equipment |
| TEMPERATURE: | 21°C | HUMIDITY: | 55%RH |
| ATM PRESSURE: | 101.8 kPa | GROUNDING: | No Grounding |
| TESTED BY: | Jawen Yin | DATE OF TEST: | 2009, September 04 |
| SETUP METHOD: | N/A | | |
| OPERATION MODE REQUIREMENT: | A transmitter activated automatically shall cease transmission within 5 seconds after activation. | | |
| TEST PROCEDURES | (1) The EUT was placed on the turning table. (2) The signal was coupled to the spectrum analyzer through an antenna. (3) Set the resolution bandwidth to 1MHz and video bandwidth to 1MkHz. The spectrum analyzer was turned to the centre frequency of the transmitter's and the analyzer's marker function was used to determine the duration of transmission. (4) The transmission duration was measured and recorded. | | |
| TEST VOLTAGE: | 9V DC(alkaline Battery) | | |
| TEST STATUS: | Normal Operation As Usual | | |
| RESULTS: | The EUT meets the operation mode requirement. The test results relate only to the equipment under test provided by client. | | |
| CHANGES OR MODIFICATIONS: | There were no modifications installed by EMC Compliance Management Group (China) test personnel. | | |
| M. UNCERTAINTY: | N/A | | |

Limits :

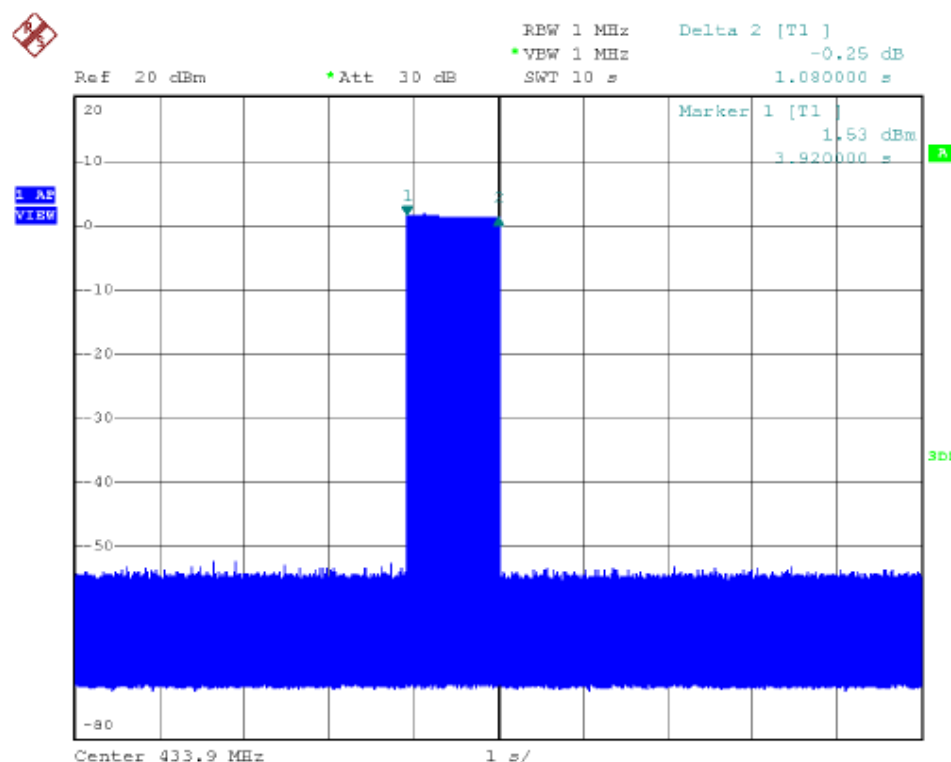
| FCC Section | FCC Rules | Conclusion |
|---------------|---------------------------------------------------------------------------------------------------|------------|
| 15.231 (a)(2) | A transmitter activated automatically shall cease transmission within 5 seconds after activation. | Pass |

Note: The EUT is a activated automatically transmitter which does not employ a switch, only when infrared signal is detected Only sending control signal to host (i.e. receiver) and Once sending time not more than 5 seconds, so it does not belongs to periodic operational device and meets the requirements of 15.231(a)(2) & RSS-210 A1.1.1(b), Please refer to the following data.

Test Data:

| Operated Frequency | Transmission Duration (sec) | Maximum Limits (sec) | Pass/Fail |
|--------------------|-----------------------------|----------------------|-----------|
| 433.944MHz | 1.080 | 5.0 | Pass |

The plot of test result is as below:



Attachment 3 – Radiated Emission Measurement

| | | | |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------|
| CLIENT: | SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD . | TEST STANDARD: | FCC Part 15.231 |
| MODEL TESTED: | AC51532A | PRODUCT: | Wireless Garage Security Kit- PIR |
| SERIAL NO.: | Engineering Sample | EUT DESIGNATION: | RF Equipment |
| TEMPERATURE: | 21°C | HUMIDITY: | 55%RH |
| ATM PRESSURE: | 101.8 kPa | GROUNDING: | No Grounding |
| TESTED BY: | Jawen Yin | DATE OF TEST: | 2009, September 04 |
| TEST REFERENCE: | FCC Part 15.209, FCC Part 15.205, FCC Part 15.231(b) , ANSI C63.4: 2003. | | |
| TEST PROCEDURE: | <p>a. The EUT was placed on a rotatable table with 0.8 meters above ground.</p> <p>b. The EUT was set 3 meters from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower.</p> <p>c. The antenna was varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna were set to make measurement.</p> <p>d. For each suspected emission the EUT was arranged to its worst case and then change the antenna tower height (from 1m to 4m) and turn table (from 0 degree to 360 degree) to find the maximum reading.</p> <p>e. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported.</p> <p>f. Broadband antenna (Calibrated antenna) was used as receiving antenna below 1000MHz. Horn antenna were used as receiving antenna above 1000MHz.</p> <p>g. The bandwidth is 120 kHz below 1000 MHz, and 1 MHz above 1000 MHz</p> <p>Explanation of the Correction Factor are given as follows:</p> <p>FS= RA + AF + CF - AG Where: FS = Field Strength</p> <p>RA = Receiver Amplitude AF = Antenna Factor</p> <p>CF = Cable Attenuation Factor AG = Amplifier Gain</p> | | |
| TESTED RANGE: | 30MHz to 5000MHz | | |
| TEST VOLTAGE: | 9V DC(alkaline Battery) | | |
| TEST STATUS: | Keep Tx in continuous transmission mode, modulated | | |
| RESULTS: | The EUT meets the requirements of test reference for Radiated Emissions .The test results relate only to the equipment under test provided by client. | | |
| CHANGES OR MODIFICATIONS: | There were no modifications installed by ECMG Worldwide Certification Solution, Inc. (China) test personnel. | | |
| M. UNCERTAINTY: | Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB | | |

Section 15.205 Restricted bands of operation:

| MHz | MHz | MHz | GHz |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 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 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | (²) |
| 13.36 - 13.41 | | | |

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

² Above 38.6

The fundamental is not in a restricted band, and the spurious emission in the restricted bands comply with the general emission limits of 15.209.

Field strength limits of 15.209:

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field strength | |
|--------------------|----------------|-------------|
| | (uV/meter) | dB uV/meter |
| 30-88 | 100 | 40.0 |
| 88-216 | 150 | 43.5 |
| 216-960 | 200 | 46.0 |
| Above 960 | 500 | 54.0 |

Note:

1. Field Strength (dBuV/m)=20log Field Strength (uV/m).
2. In the emission tables above, the tighter limit applies at the band edge.

15.231 (b) Fundamental and Harmonics emission limits:

In addition to the provisions of section 15.205, According to 15.231 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

| Fundamental Frequency(MHz) | Field Strength of Fundamental | | Field Strength of Spurious Emission | |
|----------------------------|-------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | $\mu\text{V}/\text{Meter}$ | $\text{dB}\mu\text{V}/\text{Meter}$ | $\mu\text{V}/\text{Meter}$ | $\text{dB}\mu\text{V}/\text{Meter}$ |
| 40.66-40.70 | 2250 | 67.04 | 225 | 48.04 |
| 70-130 | 1250 | 61.94 | 125 | 41.94 |
| 130-174 | 1250 to 3750 | 61.94 to 71.48 | 125 to 375 | 41.94 to 51.48 |
| 174-260 | 3750 | 71.48 | 75 | 37.50 |
| 260-470 | 3750 to 12500 | 71.48 to 81.94 | 375 to 1250 | 51.48 to 61.94 |
| Above 470 | 12500 | 81.94 | 1250 | 61.94 |

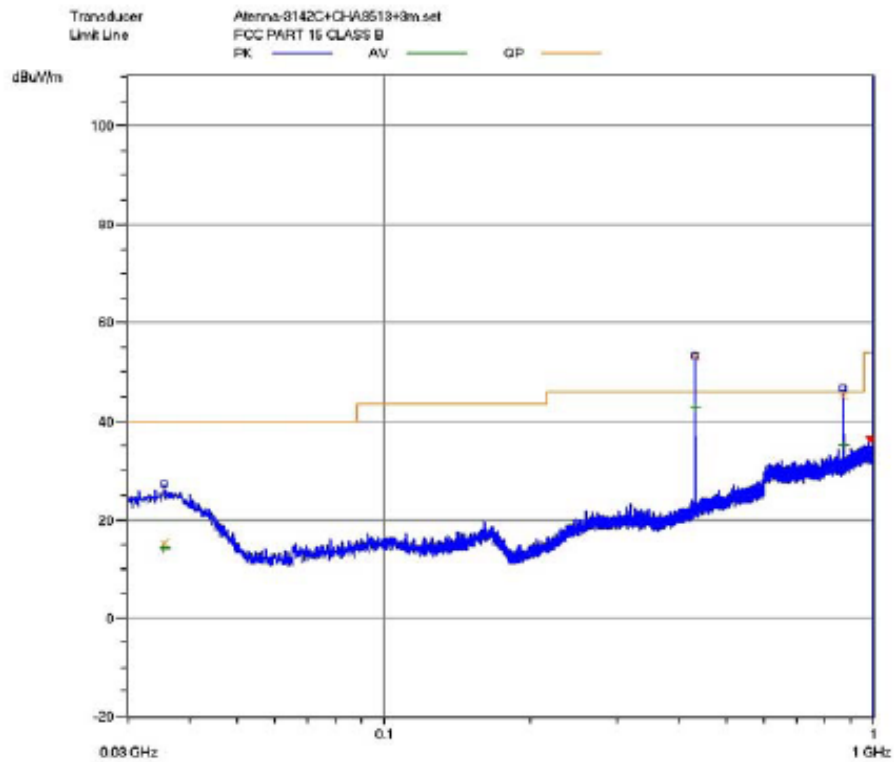
Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows:

for the band 130-174MHz, $\mu\text{V}/\text{m}$ at 3 meters = $56.81818(F)-6136.3636$;
for the band 260-470 MHz, $\mu\text{V}/\text{m}$ at 3 meters = $41.6667(F)-7083.3333$.
the maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

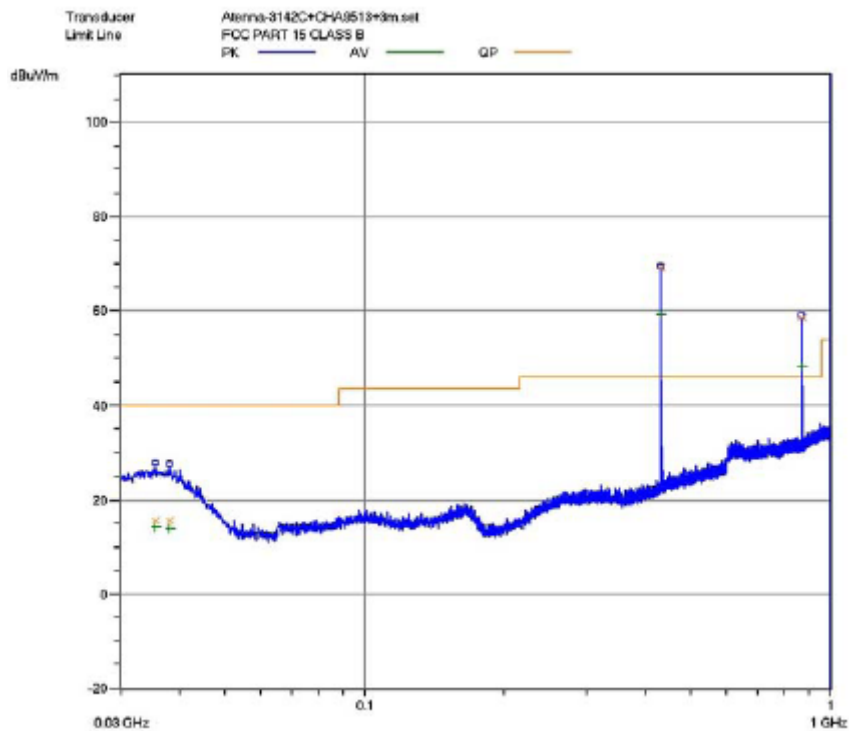
The above field strength limits are specified at a distance of 3 meter,
The tighter limits apply at the band edges.

In the above table , based on the average value of the measure emissions
According to the operation frequency of EUT ,the limits should be :

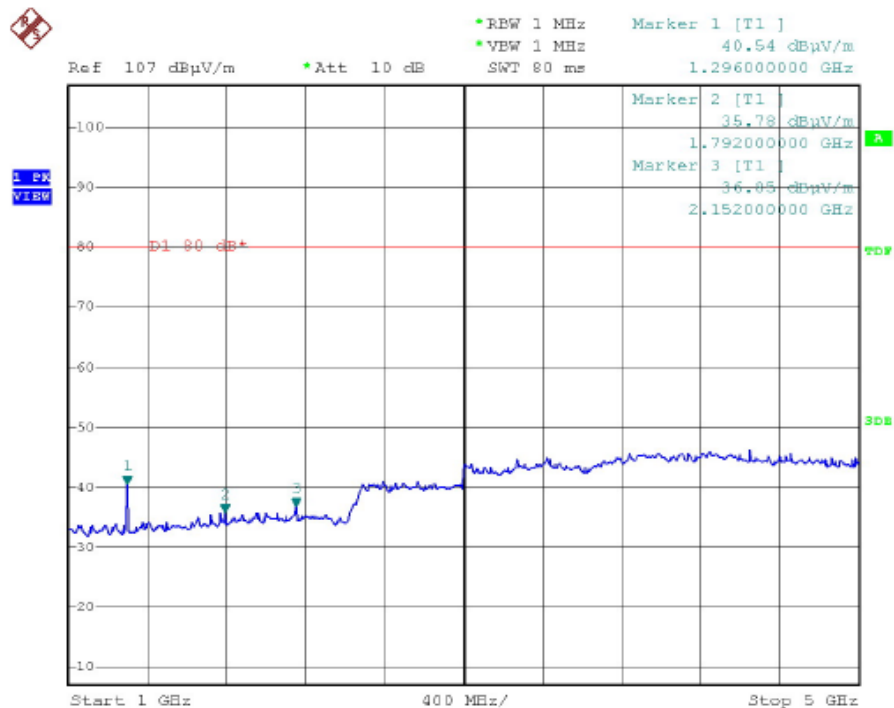
| Fundamental Frequency(MHz) | Field Strength of Fundamental | | Field Strength of Spurious |
|----------------------------|-------------------------------|---------------------------------------|---------------------------------------|
| | $\mu\text{V}/\text{m}$ at 3m | $\text{dB}\mu\text{V}/\text{m}$ at 3m | $\text{dB}\mu\text{V}/\text{m}$ at 3m |
| 433.746 MHz | 10997.68 | 80.82 | 60.82 |



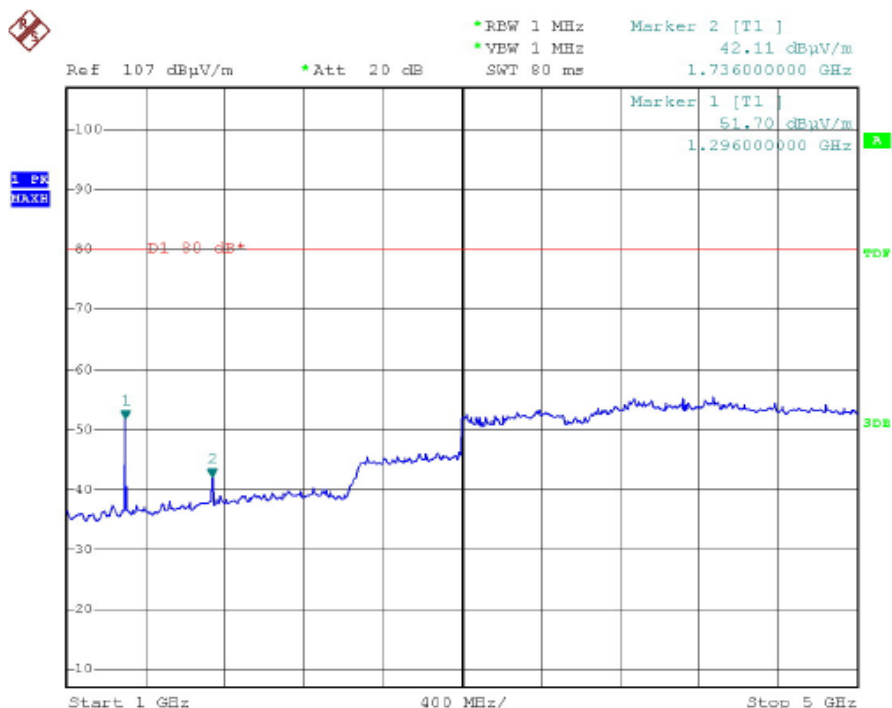
Test Polt of Below 1GHz (Horizontal Polarzation)



Test Polt of Below 1GHz (Vertical Polarzation)



Test Polt of Above 1GHz (Horizontal Polarzation)



Test Polt of Above 1GHz (Vertical Polarzation)

Fundamental And Spurious Emission Data :

Peak value(All reading are peak detector)

| Polarization | Frequency (MHz) | Read Level dB(μV) | Factor (dB) | Field Strength dB(μV/m) | Limit dB(μV/m) | Over Limit dB(μV/m) |
|--------------|-----------------|-------------------|-------------|-------------------------|----------------|---------------------|
| Horizontal | 433.76 | 36.97 | 16.33 | 53.30 | 100.82 | -47.52 |
| Horizontal | 867.52 | 23.48 | 23.22 | 46.70 | 80.82 | -34.12 |
| Horizontal | 1296.00 | 16.04 | 24.50 | 40.54 | 80.82 | -40.28 |
| Horizontal | *1302.03 | 15.28 | 25.30 | 40.58 | 74.00 | -33.42 |
| Horizontal | 1736.00 | 8.72 | 27.10 | 35.82 | 80.82 | -45.00 |
| Horizontal | 2152.00 | 7.71 | 28.34 | 36.05 | 80.82 | -44.77 |
| Vertical | 433.76 | 53.17 | 16.33 | 69.50 | 100.82 | -31.32 |
| Vertical | 867.52 | 35.78 | 23.22 | 59.00 | 80.82 | -21.82 |
| Vertical | *1302.03 | 7.90 | 25.30 | 33.20 | 74.00 | -40.80 |
| Vertical | 1296.00 | 27.20 | 24.50 | 51.70 | 80.82 | -29.12 |
| Vertical | 1736.00 | 15.01 | 27.10 | 42.11 | 80.82 | -38.71 |
| Vertical | 2600.00 | 11.88 | 28.70 | 40.58 | 80.82 | -40.24 |

Average value (All reading are peak detector)

| Polarization | Frequency (MHz) | Read Level dB(μV) | Factor (dB) | Duty cycle Correction Factor (dB) | Field Strength dB(μV/m) | Limit dB(μV/m) | Over Limit dB(μV/m) |
|--------------|-----------------|-------------------|-------------|-----------------------------------|-------------------------|----------------|---------------------|
| Horizontal | 433.76 | 36.97 | 16.33 | -11.00 | 42.30 | 80.82 | -38.52 |
| Horizontal | 867.52 | 23.48 | 23.22 | -11.00 | 35.70 | 60.82 | -25.12 |
| Horizontal | 1296.00 | 16.04 | 24.50 | -11.00 | 29.54 | 60.82 | -31.28 |
| Horizontal | *1302.03 | 15.28 | 25.30 | -11.00 | 29.58 | 54.00 | -24.42 |
| Horizontal | 1736.00 | 8.72 | 27.10 | -11.00 | 24.82 | 60.82 | -36.00 |
| Horizontal | 2152.00 | 7.71 | 28.34 | -11.00 | 25.05 | 60.82 | -35.77 |
| Vertical | 433.76 | 53.17 | 16.33 | -11.00 | 58.50 | 80.82 | -22.32 |
| Vertical | 867.52 | 35.78 | 23.22 | -11.00 | 48.00 | 60.82 | -12.82 |
| Vertical | *1302.03 | 7.90 | 25.30 | -11.00 | 22.20 | 54.00 | -31.80 |
| Vertical | 1296.00 | 27.20 | 24.50 | -11.00 | 40.70 | 60.82 | -20.12 |
| Vertical | 1736.00 | 15.01 | 27.10 | -11.00 | 31.11 | 60.82 | -29.71 |
| Vertical | 2600.00 | 11.88 | 28.70 | -11.00 | 29.58 | 60.82 | -31.24 |

The Other Emission Data :

All reading bellow 1GHz are Quasi-peak, above 1GHz are average value.

| Polarization | Frequency (MHz) | Read Level dB(μV) | Factor (dB) | Field Strength dB(μV/m) | Limit dB(μV/m) | Over Limit dB(μV/m) |
|--------------|-----------------|-------------------|-------------|-------------------------|----------------|---------------------|
| Vertical | 35.60 | 12.46 | 15.34 | 27.8 | 40.0 | -12.20 |
| Vertical | 38.24 | 15.27 | 12.43 | 27.7 | 40.0 | -12.30 |
| Vertical | 438.37 | 5.36 | 16.97 | 22.33 | 46.0 | -23.67 |
| Horizontal | 35.44 | 11.86 | 15.34 | 27.2 | 40.0 | -12.80 |
| Horizontal | 72.68 | 5.68 | 8.69 | 14.37 | 40.0 | -25.63 |
| Horizontal | 105.66 | 4.31 | 7.75 | 12.06 | 43.5 | -31.44 |

Remark :

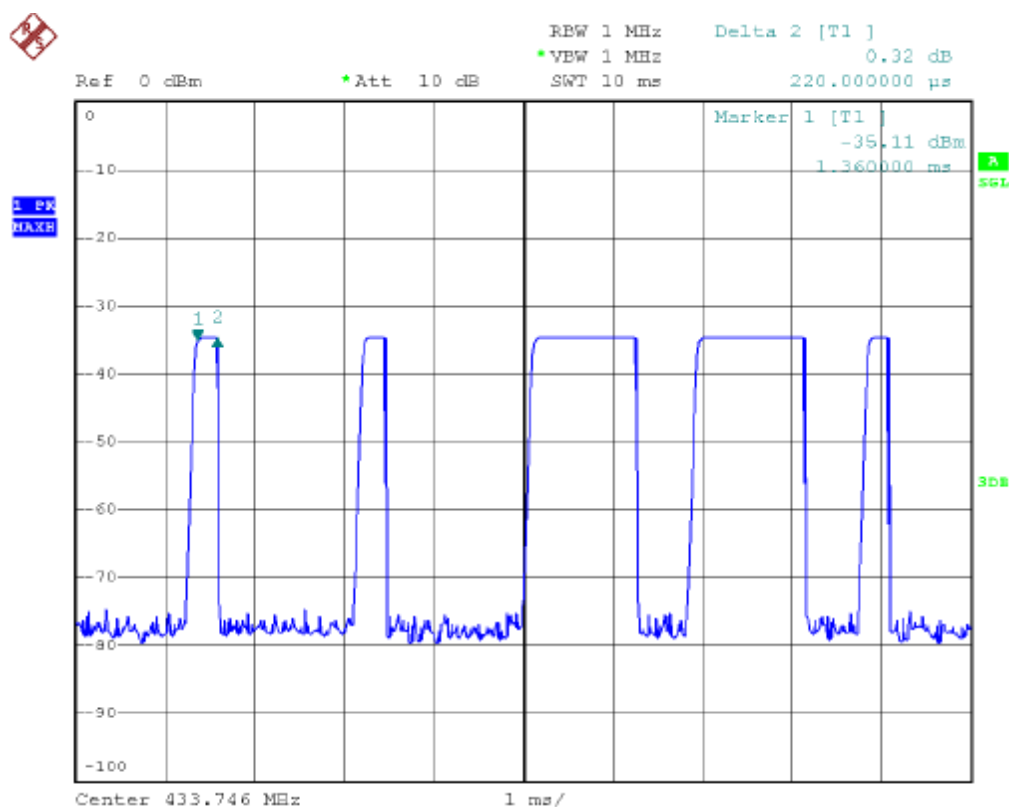
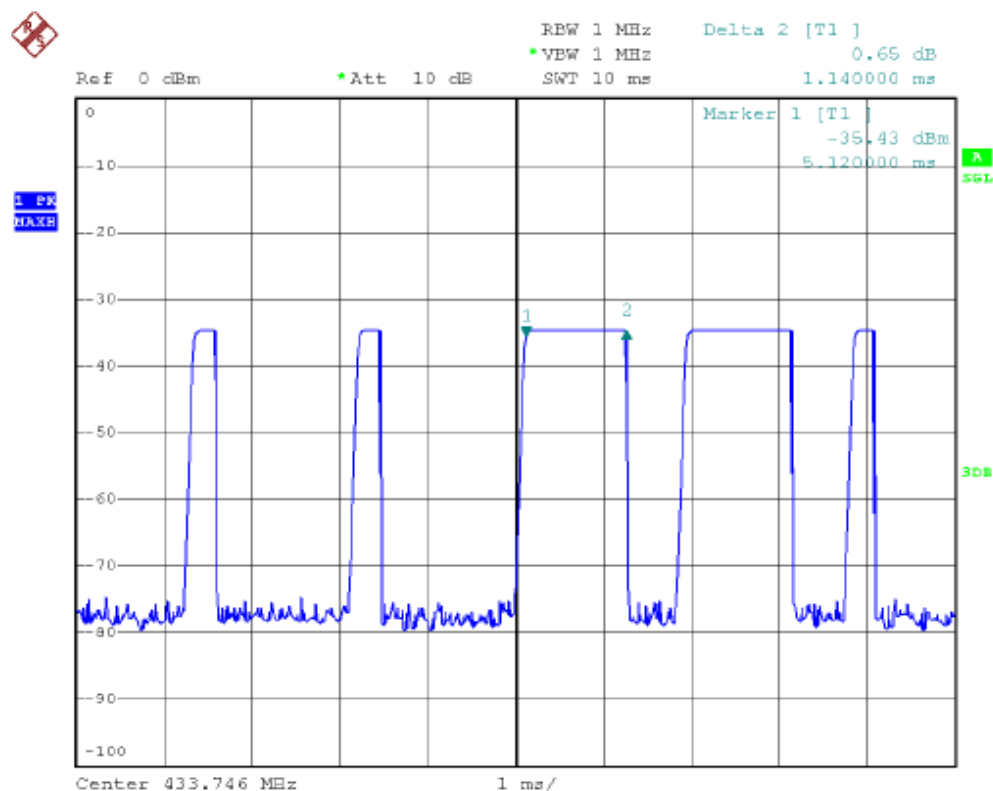
1. The frequency range was scanned from 30MHz to 4.5GHz, all emissions not recorded were very low against the limit.
2. According to FCC 15.35(b), maximum permitted peak field strength is 20dB above the maximum permitted average emission limit.
3. Field Strength = Read Level + Factor + Duty Cycle Correction Factor,
Factor = Antenna Factor + Cable Loss - Preamp Factor
4. "*" means emission within the restricted band of part 15.205, the corresponding limit as per 15.209
5. Duty Cycle Correction Factor is calculated by averaging the sum of the pulse train. Correction factor is measured as follows:

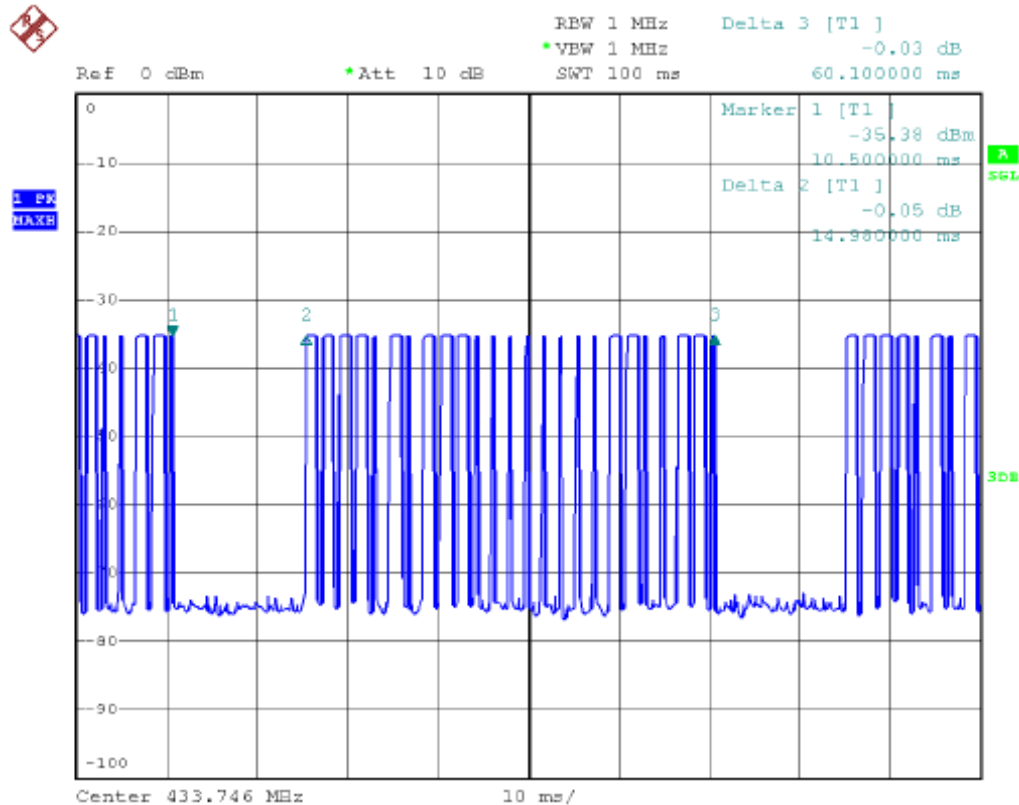
Keep the EUT in continuous transmission mode (modulated), and set the spectrum to the fundamental frequency and set the span width to 0 Hz. Then connect a storage oscilloscope to the video output of the spectrum that is used to detect the pulse train. Adjust the oscilloscope settings to observe the pulse train and determine the number and width of the pulses, as well as the period of the train.

Duty Cycle Correction Factor in 0.1s at its maximum value

$$\begin{aligned} &= 20\log(\text{duty cycle}) \\ &= 20\log(\text{Ton time} / T_{\text{period}} \text{ or } 100\text{ms}) \\ &= 20\log[(21 \times 1.14\text{ms}) + (19 \times 0.22\text{ms}) / 100\text{ms}] \\ &= 20\log(28.12 / 100) \\ &= -11.00 \end{aligned}$$

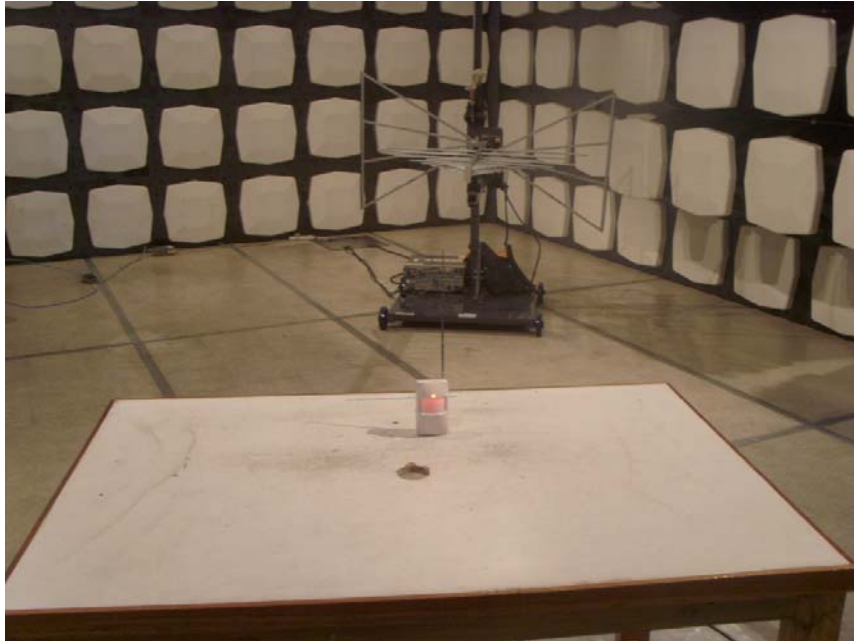
please refer to the following test graph:





Radiated Emissions Test Set-up:

Below 1GHz:



Above 1GHz:



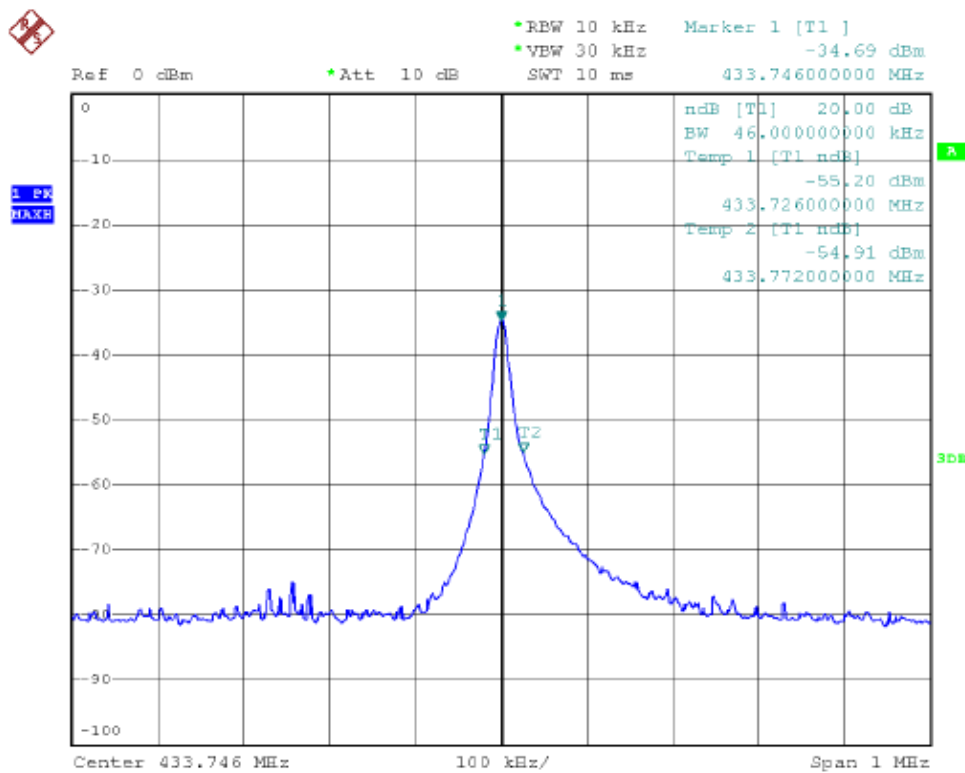
ATTACHMENT 4 – BANDWIDTH MEASUREMENT

| | | | |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------|
| CLIENT: | SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD | TEST STANDARD: | FCC Part 15.231 (c) |
| MODEL TESTED: | AC51532A | PRODUCT: | Wireless Garage Security Kit- PIR |
| SERIAL NO.: | Engineering Sample | EUT DESIGNATION: | RF Equipment |
| TEMPERATURE: | 21°C | HUMIDITY: | 55%RH |
| ATM PRESSURE: | 101.8 kPa | GROUNDING: | No Grounding |
| TESTED BY: | Jawen Yin | DATE OF TEST: | 2009, August 30 |
| SETUP METHOD: | ANSI C63.4 - 2003 | | |
| BANDWIDTH 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. 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 PROCEDURE: | <p>The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.</p> <p>The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.</p> <p>The span between the two recorded frequencies is the occupied bandwidth.</p> <p>Bandwidth Limits = 0.25% X 433.746MHz= 1084.87KHz.</p> | | |
| TEST VOLTAGE: | 9V DC(alkaline Battery) | | |
| TEST STATUS: | Keep Tx in continuous transmission mode, modulated | | |
| RESULTS: | The EUT meets the bandwidth requirement. The test results relate only to the equipment under test provided by client. | | |
| CHANGES OR MODIFICATIONS: | There were no modifications installed by ECMG Worldwide Certification Solution, Inc. (China) test personnel. | | |
| UNCERTAINTY: | Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB | | |

Test Data :

| Frequency (MHz) | 20 dB Bandwidth Limit (KHz) (Fcenter x 0.25%) | Test Result (KHz) | Pass/Fail |
|-----------------|-----------------------------------------------|-------------------|-----------|
| 433.746 | 1084.87 | 46.0 | Pass |

The plot of test result is as below:



Bandwidth Test Set-up:

