FCC CERTIFICATION RADIO MEASUREMENT TECHNICAL REPORT

On Model Name : Wireless Garage Security Kit- Door Sensor

Model Number : AC51532B

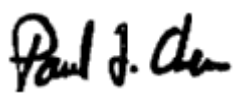
Trademark : WINPLUS

FCC ID Number : XMEFWINPLUSB

Prepared for
Shenzhen SAINT Technology Electronic Co.,Ltd

According to FCC Part 15(2008), Subpart C

Test Report #:	SHE-0907-10230-FCCID
Prepared by:	May Wang
Reviewed by:	Jawen Yin
QC Manager:	Paul Chen

Test Report Released by:  2009, September 18

Paul Chen Date

List of Attached Files

Exhibit Type	*File Description*	*File Name*
Test Report	*Test Report*	*XMEFWINPLUSB_ Test report.pdf*
Operational Description	*Technical Description*	*XMEFWINPLUSB_operation description.pdf*
External Photos	*External Photos*	*XMEFWINPLUSB_External Photos*
Internal Photos	*Internal Photos*	*XMEFWINPLUSB_Internal Photos*
Block Diagram	*Block Diagram*	*XMEFWINPLUSB_Block Diagram.pdf*
Schematics	*Circuit Diagram for transmitter*	*XMEFWINPLUSB_Shematics.pdf*
Label&Location	*Label Artwork and Location*	*XMEFWINPLUSB_Label & Location.pdf*
User Manual	*User Manual*	*XMEFWINPLUSB_User Manual.pdf*
Test set up photos	*Test set up photos*	*XMEFWINPLUSB_Test Setup Photos.pdf*

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

IC Registration Number : 7949A

List of Test Instruments

Equipment	***Manufacturer***	***Model No.***	***Serial No.***	***Calibrated Untill***
Spectrum Analyzer	*R&S*	*FSP30*	*100755*	*2010-11-30*
EMI Receiver	*SCHAFFNER*	*SMR4503*	*11725*	*2010-07-08*
Double-ridged Wave guide horn	*ETS*	*3115*	*6587*	*2010-08-02*
Amplifier	*Agilent*	*83017A*	*MY39500438*	*2010-07-11*
Biconilog Antenna	*ETS*	*3142C*	*00042672*	*2010-09-28*
Semi-anechoic Chamber	*ETS*	*N/A*	*N/A*	*2010-05-24*

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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- Door Sensor

Model Number : AC51532B

Model Tested : AC51532B

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)

Telephone : +86-769-8685 5951

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Description of EUT

SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD.Model number AC51532B is a Wireless Garage Security Kit- Door Sensor.

The EUT's technical specification are as below:

Product	*Wireless Garage Security Kit- Door Sensor*
Model No.	*AC51532B*
Power type	*Alkaline battery,DC 12V*
Modulation Type	*FSK*
Carrier Frequency	*433.92MHz*
Number of Channel	*1*
Antenna Type	*Pull out antenna*
Data Cable	*N/A*
I/O Ports	*N/A*
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.*	

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.

Available channel	*Tested channel*	*Modulation type*	*Axis*
1	*1*	*FSK*	*X*

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

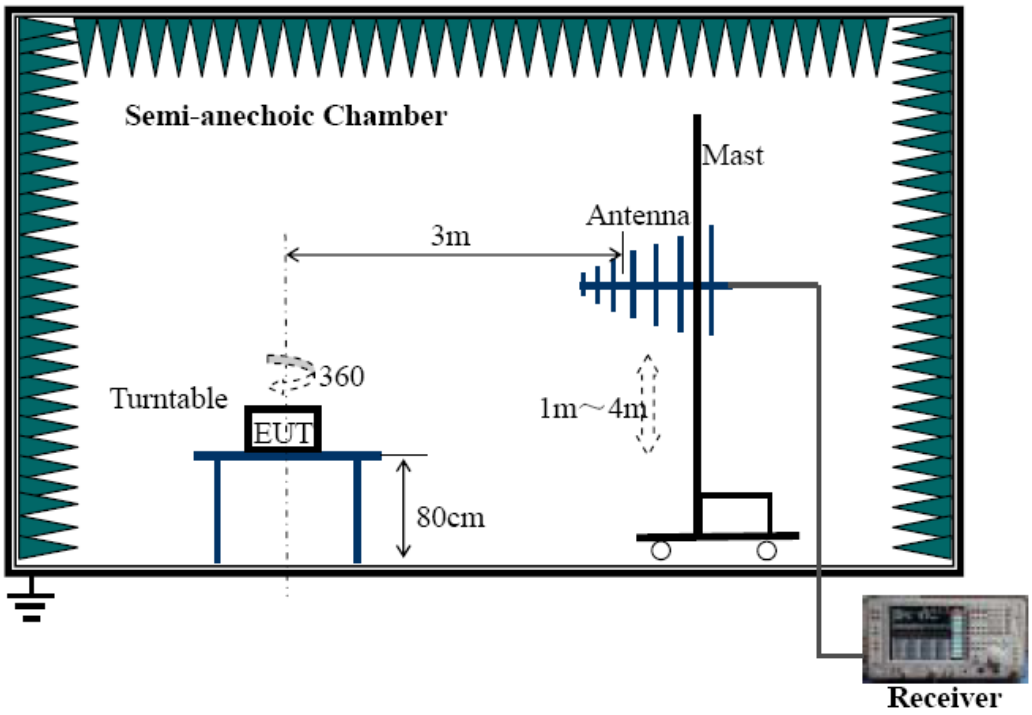
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

EUT	
Model Number:	*AC51532B*
Model Tested:	*AC51532B*
Trademark:	*WINPLUS*
Serial Number:	*Engineering Sample*
Input Voltage:	*Alkaline DC 12V*
Description:	*Wireless Garage Security Kit- Door Sensor*
Manufacturer:	*SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD .*

Support Equipment				
Description	***Model Number***	***Serial Number***	***Manufacturer***	***Power Cable Description (Meters)***
None				

Cable Description
None

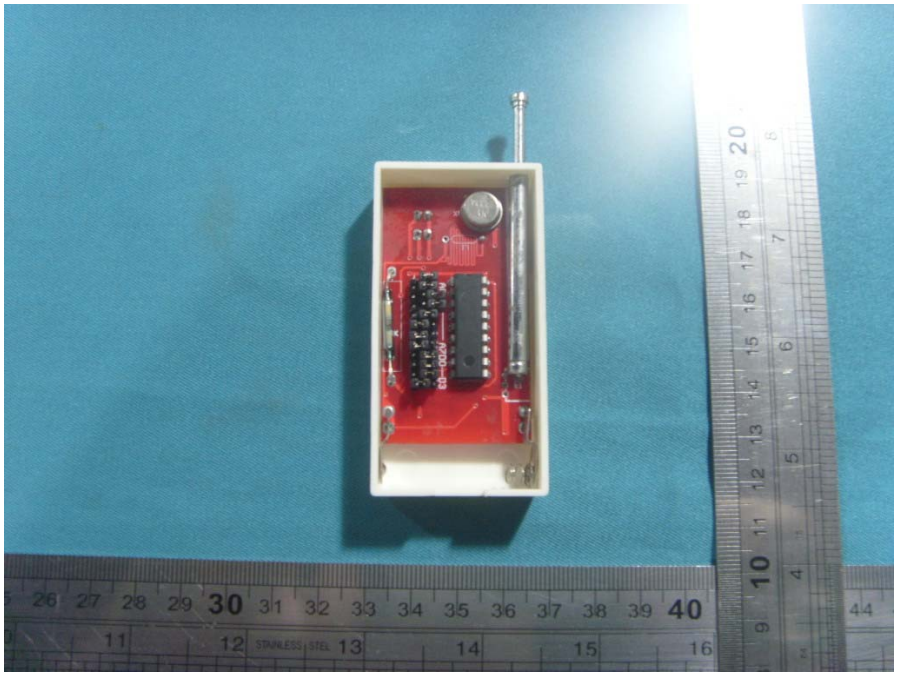
Configuration of Tested System



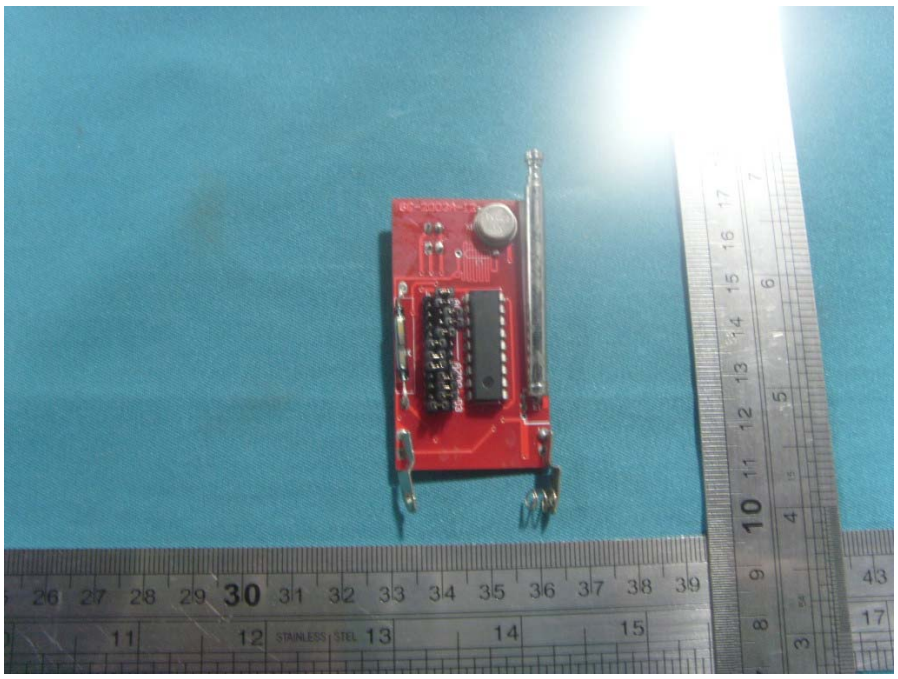
EUT Sample Photos

Front View of EUT

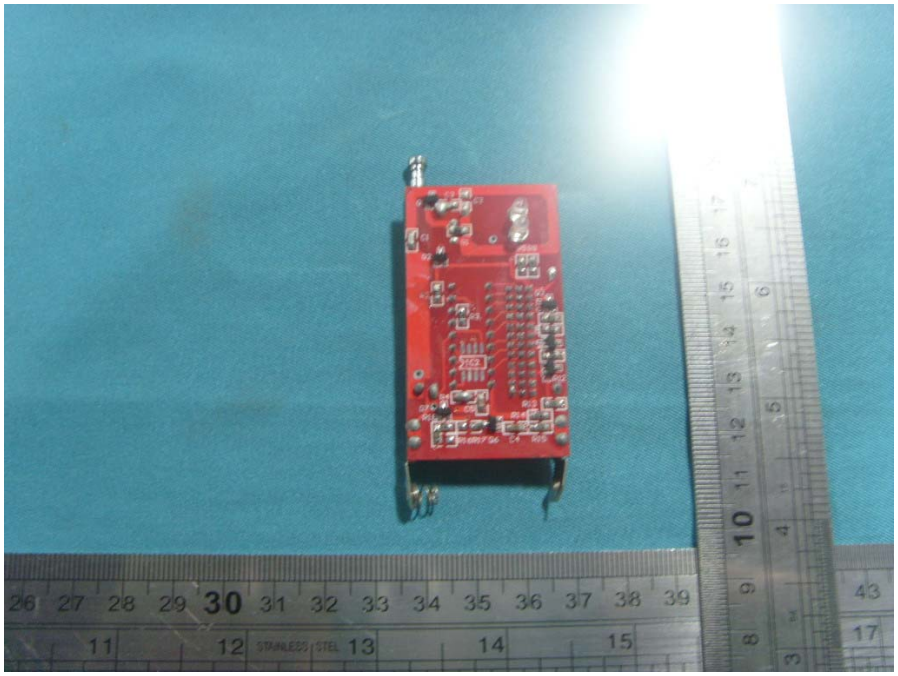
Back View of EUT



Uncovered View



Main Board View #1



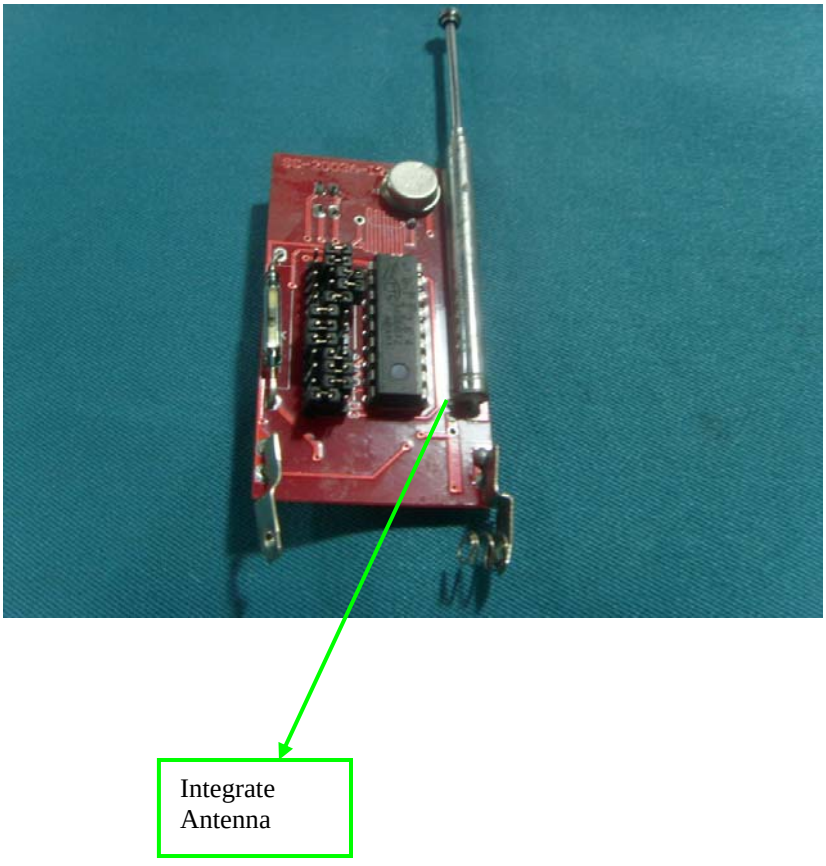
Main Board View #2

Attachment 1 – Antenna Requirement

CLIENT:	SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD .	**TEST STANDARD:**	FCC Part 15.203
MODEL TESTED:	AC51532B	**PRODUCT:**	Wireless Garage Security Kit- Door Sensor
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:	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.		
TEST VOLTAGE:	12V 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	*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.* *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:* ● *The application (or intended use) of the EUT* ● *The installation requirements of the EUT* ● *The method by which the EUT will be marketed*	*The Wireless Garage Security Kit- Door Sensor uses an integrate antenna without connector.* *Please refer to the following photo.*

Integrate Antenna without Connector View:



Attachment 2 – Transmiting Time Test

CLIENT:	SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD .	**TEST STANDARD:**	FCC Part 15.231 (a)
MODEL TESTED:	AC51532B	**PRODUCT:**	Wireless Garage Security Kit- Door Sensor
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:	12V 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 :

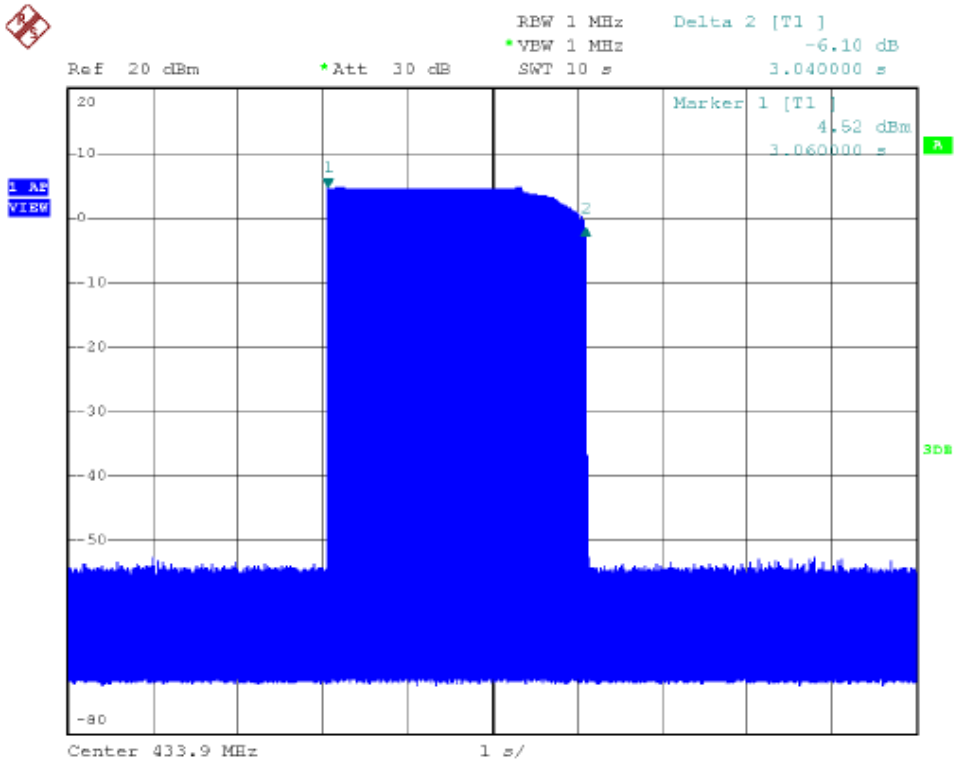
FCC Section	*FCC Rules*	*Conclusion*
15.231 (a)(2)	*A transmitter activated automatically shall cease transmission within 5 seconds after activation.*	*Pass*

Note: The EUT is a activated automatically transmitter which does not employ a switch, only when magnet and transmitter separate are 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	*3.040*	*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:	AC51532B	**PRODUCT:**	Wireless Garage Security Kit- Door Sensor
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:	a. The EUT was placed on a rotatable table with 0.8 meters above ground. b. The EUT was set 3 meters from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower. 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. 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. 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. f. Broadband antenna (Calibrated antenna) was used as receiving antenna below 1000MHz. Horn antenna were used as receiving antenna above 1000MHz. g. The bandwidth is 120 kHz below 1000 MHz, and 1 MHZ above 1000 MHz Explanation of the Correction Factor are given as follows: FS= RA + AF + CF - AG Where: FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Attenuation Factor AG = Amplifier Gain		
TESTED RANGE:	30MHz to 5000MHz		
TEST VOLTAGE:	12V 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. ± 2x10-7 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	
	uV/Meter	dBuV/Meter	uV/Meter	dBuV/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

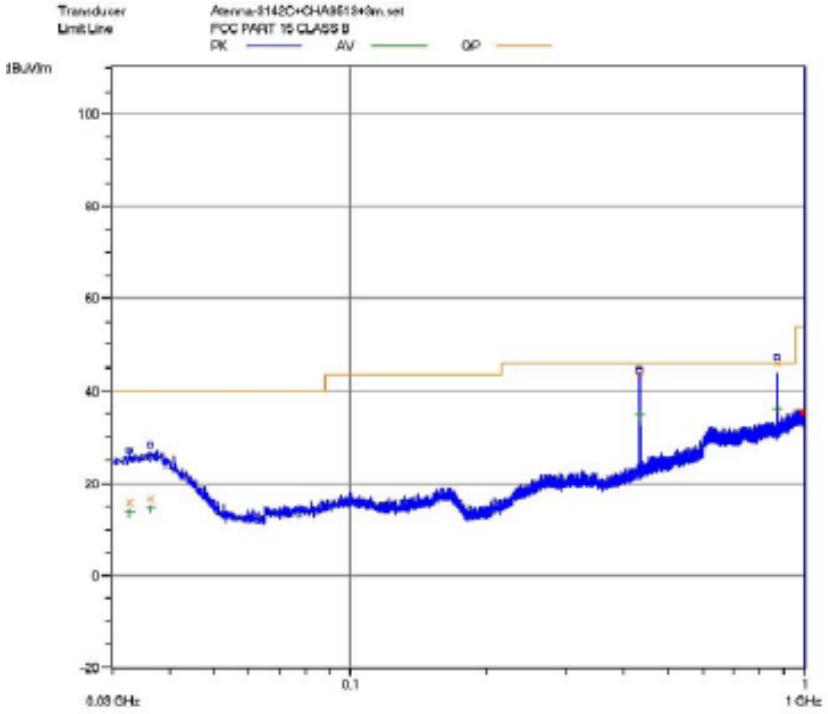
Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows:

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

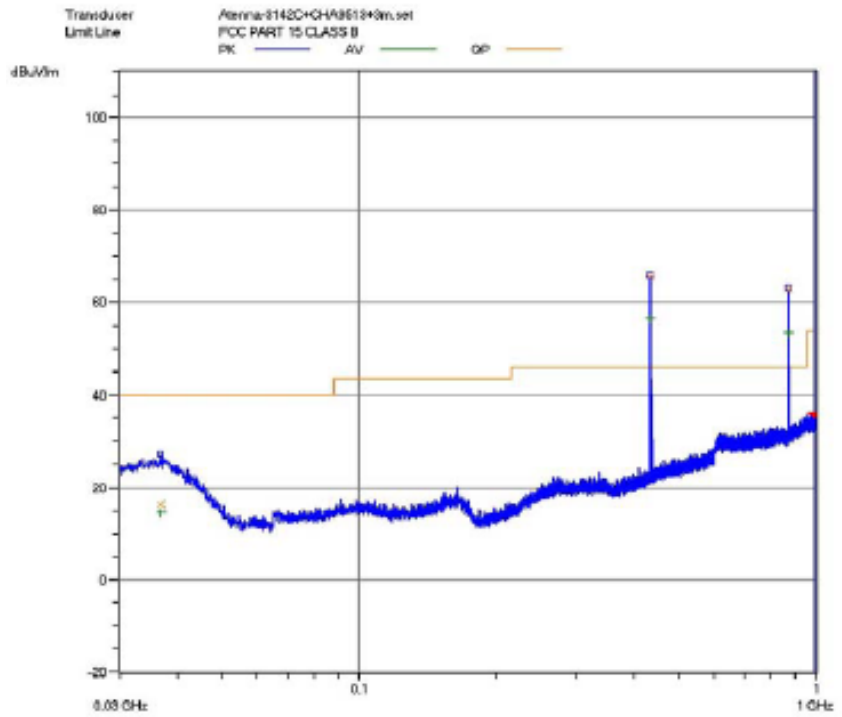
The above field strength limis are specified at a distance of 3 meter, The tighter limits apply at the band edges.

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

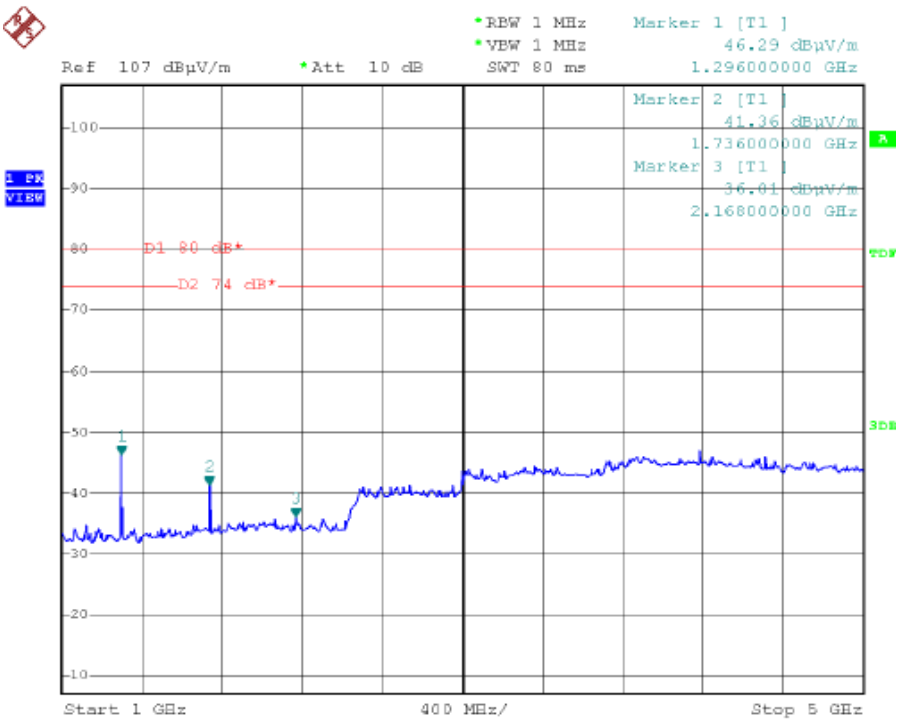
Fundamental Frequency(MHz)	Field Strength of Fundamental		Field Strength of Spurious
	uV/m at 3m	dBuV/m at 3m	dBuV/m at 3m
433.920MHz	10997.68	80.82	60.82



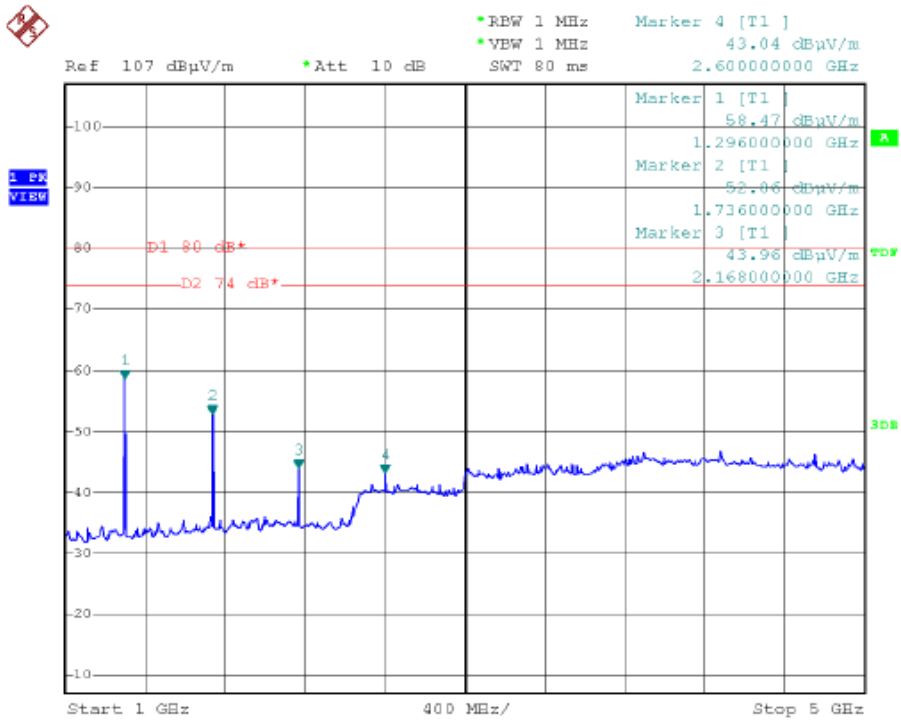
Test Polt of Below 1GHz (Horizontal Polarzation)



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	433.92	28.25	16.35	44.6	100.82	-56.22
Horizontal	867.92	24.18	23.22	47.4	80.82	-33.42
Horizontal	1296.00	21.79	24.50	46.29	80.82	-34.53
Horizontal	*1302.03	15.28	25.30	40.58	74.00	-33.42
Horizontal	1736.00	14.26	27.10	41.36	80.82	-39.46
Horizontal	2168.00	7.66	28.35	36.01	80.82	-44.81
Vertical	433.92	49.55	16.35	65.90	100.82	-34.92
Vertical	867.92	35.78	23.22	63.3	80.82	-17.52
Vertical	*1302.03	7.90	25.30	33.20	74.00	-40.80
Vertical	1296.00	33.97	24.50	58.47	80.82	-22.35
Vertical	1736.00	24.96	27.10	52.06	80.82	-28.76
Vertical	2600.00	14.34	28.70	43.04	80.82	-37.78

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	433.92	28.25	16.35	-9.80	34.80	80.82	-46.02
Horizontal	867.92	24.18	23.22	-9.80	37.60	60.82	-23.22
Horizontal	1296.00	21.79	24.50	-9.80	36.49	60.82	-24.33
Horizontal	*1302.03	15.28	25.30	-9.80	30.78	54.00	-23.22
Horizontal	1736.00	14.26	27.10	-9.80	31.56	60.82	-29.26
Horizontal	2168.00	7.66	28.35	-9.80	26.21	60.82	-34.61
Vertical	433.92	49.55	16.35	-9.80	56.10	80.82	-24.72
Vertical	867.92	35.78	23.22	-9.80	53.50	60.82	-7.32
Vertical	*1302.03	7.90	25.30	-9.80	23.40	54.00	-30.60
Vertical	1296.00	33.97	24.50	-9.80	48.67	60.82	-12.15
Vertical	1736.00	24.96	27.10	-9.80	42.26	60.82	-18.56
Vertical	2600.00	14.34	28.70	-9.80	33.24	60.82	-27.58

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	32.64	11.70	15.30	27.0	40.0	-13.0
Vertical	38.24	15.27	12.43	27.7	40.0	-12.30
Vertical	438.37	9.82	16.97	25.16	46.0	-20.84
Horizontal	36.88	11.99	15.31	27.3	40.0	-12.7
Horizontal	72.68	5.68	8.69	14.37	40.0	-25.63
Horizontal	105.66	16.56	7.75	24.31	43.5	-19.19

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*

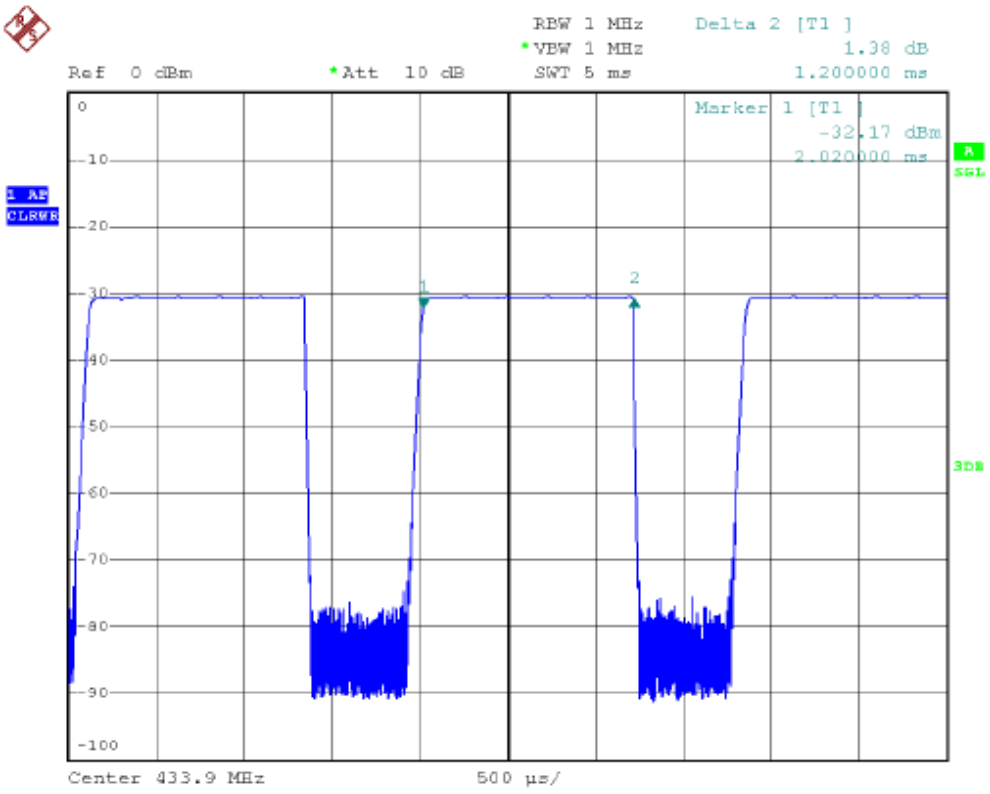
5. *Duty Cycle Correction Factor is calculated by averaging the sum of the pulse train. Correction factor is measured as follows:*

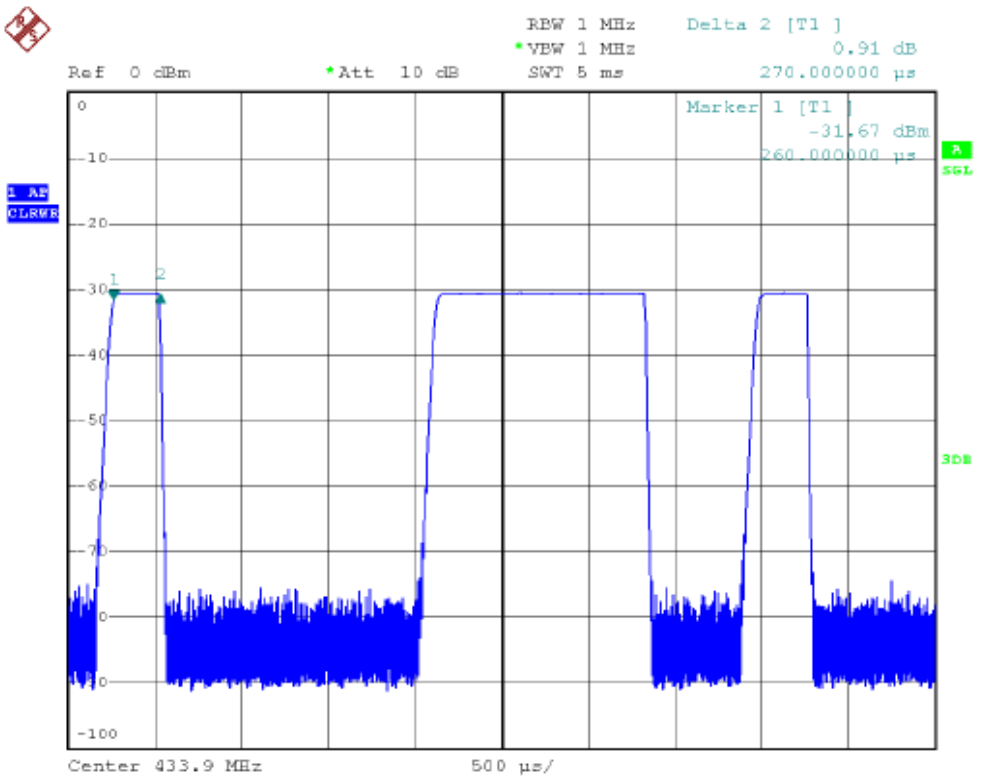
   Keep the EUT in continuous transmission mode (modulated), and set the spectrum to the fundamental frequency and set the span width to 0 Hz. Then connect a storage oscilloscope to the video output of the spectrum that is used to detect the pulse train. Adjust the oscilloscope settings to observe the pulse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

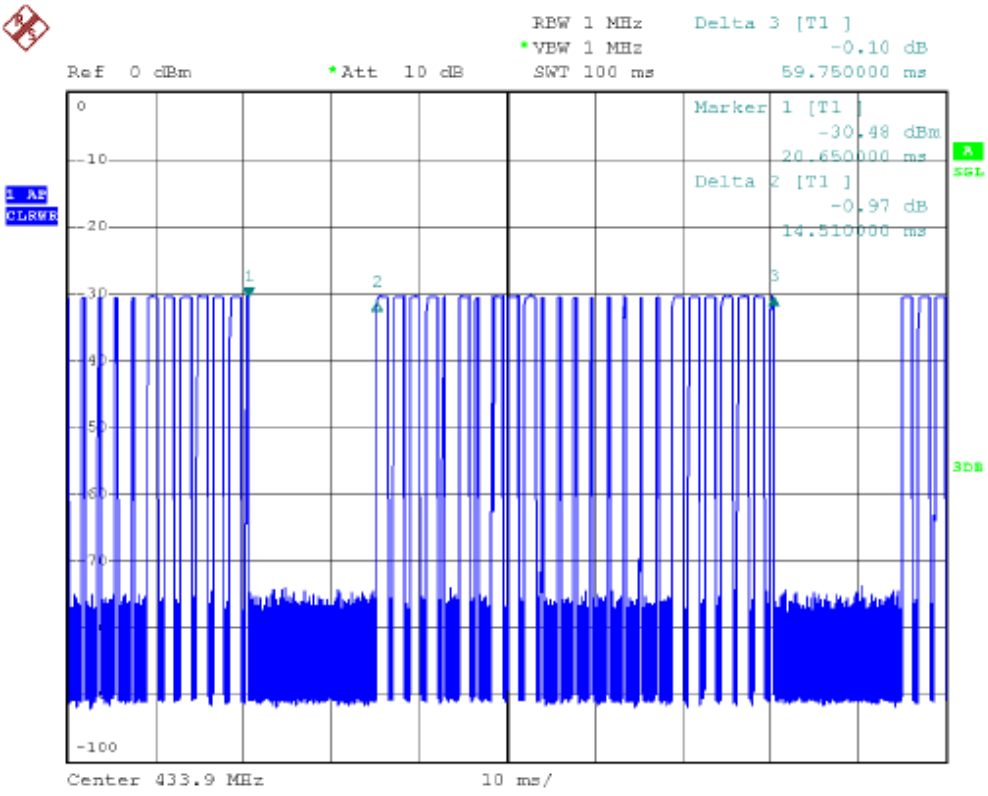
   Duty Cycle Correction Factor in 0.1s at its maximum value

   = 20log(duty cycle)
   = 20log(Ton time/ Tperiod or100ms)
   *= 20log[(23*1.20ms)+(17*0.27ms)]/100ms*
   = 20log(32.19/100)
   = -9.8

   please refer to the following test graph:

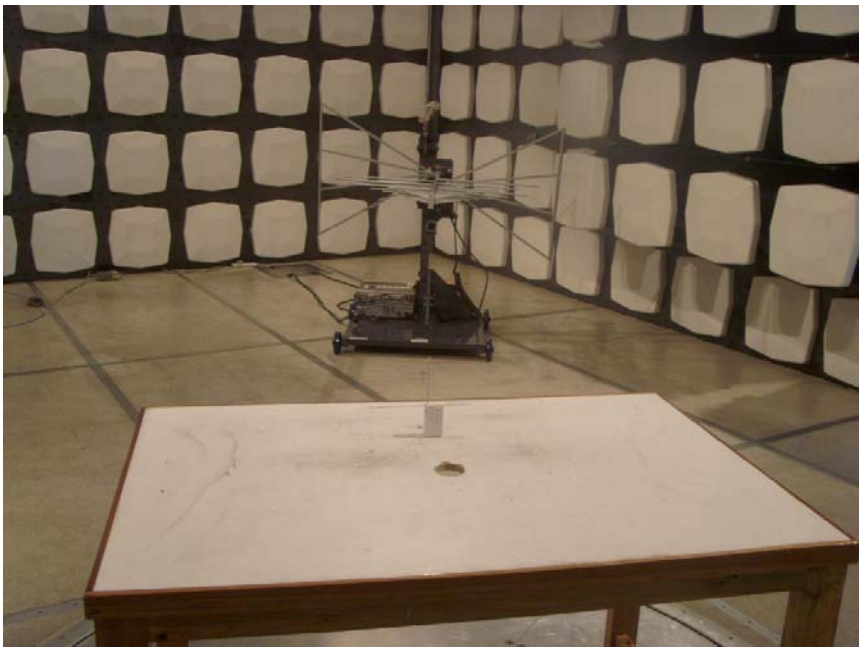

RBW 1 MHz
*VBW 1 MHz
SWT 5 ms
Delta 2 [T1]
1.38 dB
1.200000 ms
Ref 0 dBm
*Att 10 dB
Marker 1 [T1]
-32.17 dBm
2.020000 ms
1 AP
CLRWR
A
SGL
3DB
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 433.9 MHz
500 µs/


RBW 1 MHz
*VBW 1 MHz
SWT 5 ms
Delta 2 [T1]
0.91 dB
270.000000 µs
Ref 0 dBm
*Att 10 dB
Marker 1 [T1]
-31.67 dBm
260.000000 µs
1 AP
CLRWR
A
SGL
3DB
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 433.9 MHz
500 µs/

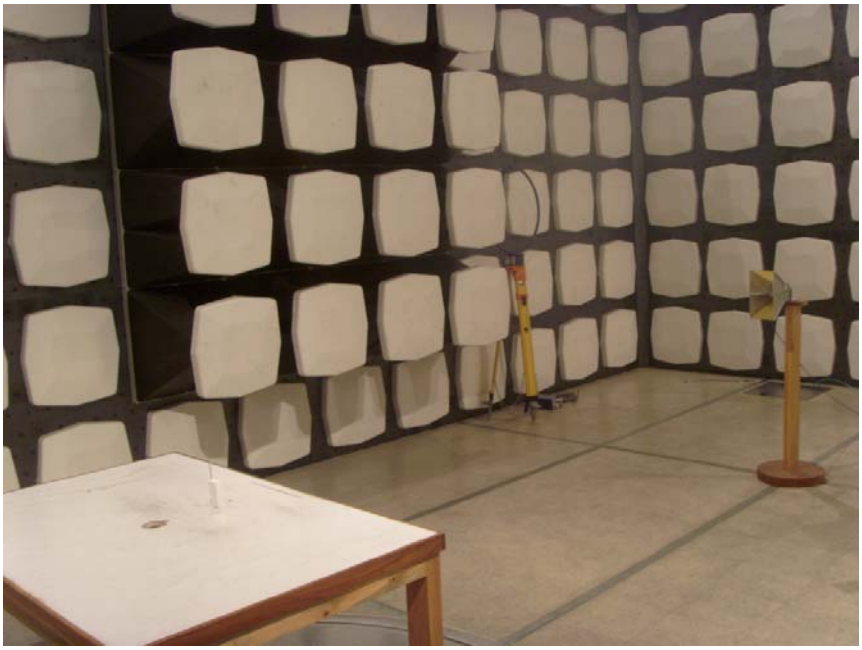

RBW 1 MHz
*VBW 1 MHz
SWT 100 ms
Delta 3 [T1]
-0.10 dB
59.750000 ms
Ref 0 dBm
*Att 10 dB
Marker 1 [T1]
-30.48 dBm
20.650000 ms
Delta 2 [T1]
-0.97 dB
14.510000 ms
1 AP
CLRWR
A
SGL
3DB
0
-10
-20
-30
-40
-50
-60
-70
-100
Center 433.9 MHz
10 ms/

Radiated Emissions Test Set-up：

Below 1GHz:



Above 1GHz:



ATTACHMENT 4 – BANDWIDTH MEASUREMENT

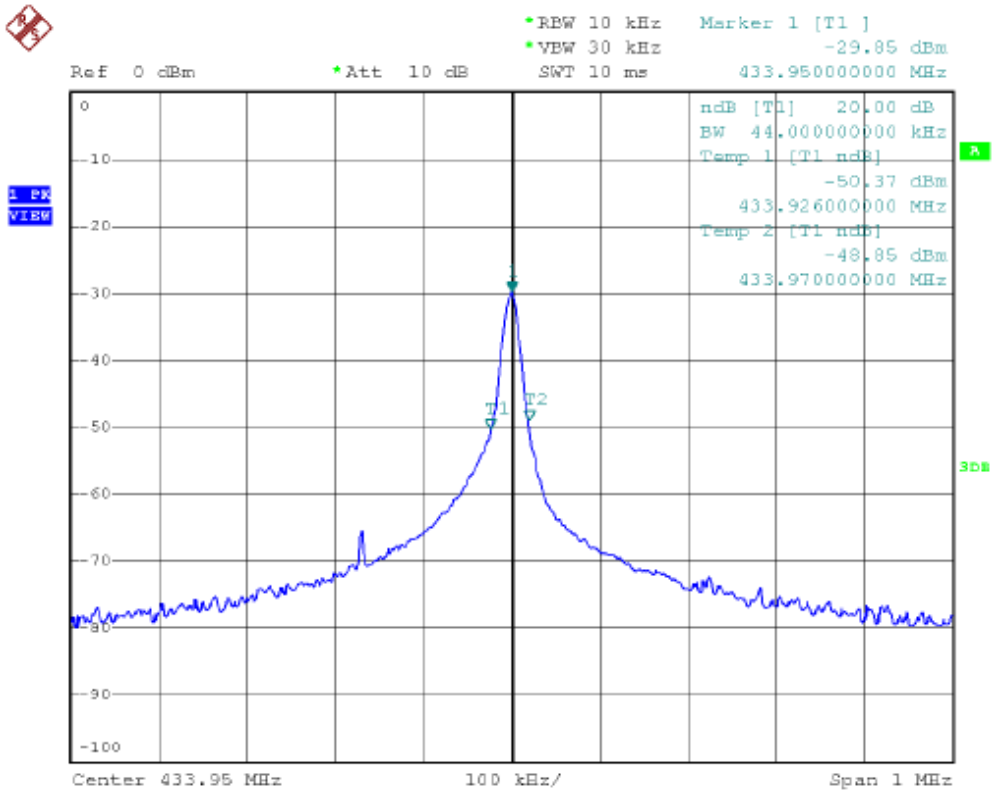
CLIENT:	SHENZHEN SAINT TECHNOLOGY ELECTRONIC CO.,LTD	**TEST STANDARD:**	FCC Part 15.231 (c)
MODEL TESTED:	AC51532B	**PRODUCT:**	Wireless Garage Security Kit- Door Sensor
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	21°C	**HUMIDITY:**	55%RH
ATM PRESSURE:	101.8 kPa	**GROUNDING:**	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:	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. 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. The span between the two recorded frequencies is the occupied bandwidth. Bandwidth Limits = 0.25% X 433.746MHz= 1084.87KHz.
TEST VOLTAGE:	12V 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. $\pm$ $2x10^{-7}$ x Center Freq., Amp $\pm$ 2.6 dB

Test Data :

Frequency (MHz)	*20 dB Bandwidth Limit (KHz) (Fcenter x 0.25%)*	*Test Result (KHz)*	*Pass/Fail*
433.920	*1084.87*	*44.0*	*Pass*

The plot of test result is as below:



Bandwidth Test Set-up: