

FCC TEST REPORT
For
HEFEI LONG RIVER ELECTRICAL CO., LTD.
Infrared Motion wireless alarm chime
Test Model No.: 622-108

Prepared for : HEFEI LONG RIVER ELECTRICAL CO., LTD.
Address : RM4-602, LONGXING GARDEN, NO.418 MENGCHENG
ROAD, HEFEI, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : June 30, 2015
Number of tested samples : 1
Serial number : 1020100903
Date of Test : June 30, 2015 – July 07, 2015
Date of Report : July 07, 2015

FCC TEST REPORT**FCC CFR 47 PART 15C(15.231): 2014****Report Reference No. : LCS1506301705E**

Date of Issue : July 07, 2015

Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.Address : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,
Bao'an District, Shenzhen, Guangdong, ChinaTesting Location/ Procedure..... : Full application of Harmonised standards ☒
Partial application of Harmonised standards ☐
Other standard testing method ☐**Applicant's Name..... : HEFEI LONG RIVER ELECTRICAL CO., LTD.**Address : RM4-602, LONGXING GARDEN, NO.418 MENGCHENG
ROAD, HEFEI, China**Test Specification**

Standard : FCC CFR 47 PART 15 Subpart C: 2014; ANSI C63.10: 2013

Test Report Form No..... : LCSEMC-1.0

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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Test Item Description. : Infrared Motion wireless alarm chime

Trade Mark : N/A

Test Model : 622-108

Ratings : DC 9V by volt heavy duty battery

Result : **Positive****Compiled by:**

Leo Lee/ File administrators

Supervised by:

Glin Lu/ Technique principal

Approved by:

Gavin Liang/ Manager

FCC/IC TEST REPORT

Test Report No. : LCS1506301705E	<u>July 07, 2015</u> Date of issue
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Test Mode.....	: 622-108
EUT.....	: Infrared Motion wireless alarm chime
Applicant.....	: HEFEI LONG RIVER ELECTRICAL CO., LTD.
Address.....	: RM4-602, LONGXING GARDEN, NO.418 MENGCHENG ROAD, HEFEI, China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: HEFEI LONG RIVER ELECTRICAL CO., LTD.
Address.....	: RM4-602, LONGXING GARDEN, NO.418 MENGCHENG ROAD, HEFEI, China
Telephone.....	: /
Fax.....	: /
Factory.....	: HEFEI LONG RIVER ELECTRICAL CO., LTD.
Address.....	: RM4-602, LONGXING GARDEN, NO.418 MENGCHENG ROAD, HEFEI, China
Telephone.....	: /
Fax.....	: /

Test Result	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: Infrared Motion wireless alarm chime
Test Model	: 622-108
Hardware Version	: V10
Software Version	: LR V15
Power Supply	: DC 9V by volt heavy duty battery
Transmit Frequency	: 315.00MHz
Number of Channels	: 1
Modulation Type	: ASK
Antenna Description	: PCB Antenna, 4.0dBi(Max.)

1.2. Objective

The primary objective of the manufacturer is compliance with Subpart C of Part 15 of FCC Rules for the radiated and conducted emissions of intentional radiators and Industry Canada RSS-210 for Low Power, License-Exempt Radio Communication Devices. Certification of these devices is required as a prerequisite to marketing as defined in Part 2 the FCC Rules and Industry Canada Radio Standards Procedure RSP-100.

Certification is a procedure where the manufacturer or a contracted laboratory makes measurements and submits the test data and technical information to the FCC. The FCC issues a grant of equipment authorization upon successful completion of their review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

1.3. Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35 °C
- Humidity: 30-60 %
- Atmospheric pressure: 86-106kPa

1.4. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
--	--	--	--	--

1.5. External I/O Port

I/O Port Description	Quantity	Cable
--	--	--

1.6. Description of Test Facility

CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

Industry Canada Registration Number. is 9642A-1.

VCCI Registration Number. is C-4260 and R-3804.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

1.7. Statement of The Measurement Uncertainty

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with NAMAS document NIS 81.

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	3.10dB	(1)
		30MHz~200MHz	2.96dB	(1)
		200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10: 2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the normal operating mode. The TX frequency that was fixed which was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.231 under the FCC Rules Part 15 Subpart C.

2.3. General Test Procedures

2.3.1 Conducted Emissions(N/A)

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013.

2.4. Instrument Calibration

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

2.5. Test Mode

The EUT has been tested under engineering mode. As normal use, the EUT is only operating in detector mode (automatically operation).

The field strength of radiation emission was measured in the following position: EUT stand-up position (Y axis), lie-down position (X, Z axis).

The worst case of Y axis was reported.

A new battery supplied DC 9V power to the EUT for testing.

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmit condition.

3.2. EUT Exercise Software

N/A

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart C		
FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Bands Of Operation	Compliant
§15.209	Radiated Emission Limits, General Requirements.	Compliant
§15.231 (e)	Field Strength Of Fundamental And Harmonics	Compliant
§15.231 (c)	20dB Bandwidth	Compliant
§15.231 (e)	Transmission Cease Time	Compliant
§15.207	Conducted Emissions	N/A

5. TEST ITEMS AND RESULTS

5.1. Transmission Cease Time

FCC 15.231 (e)

5.1.1. Limit

Devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

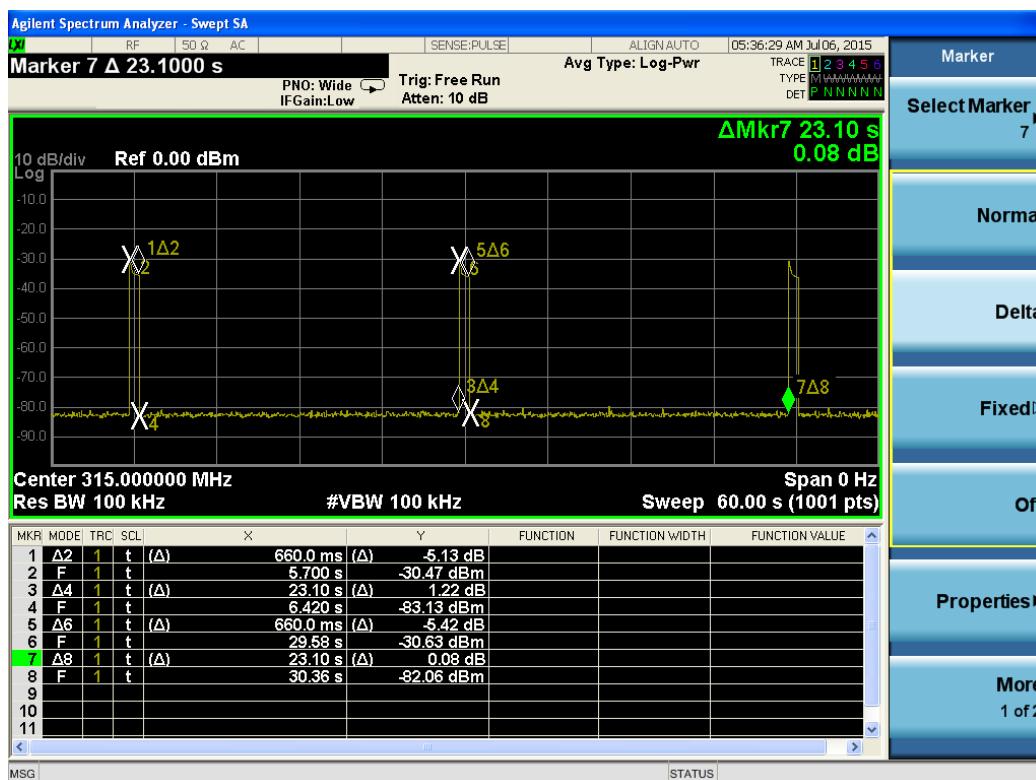
5.1.2. Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations. The antenna was all opened.

5.1.3. Test Results

Frequency (MHz)	Duration Time (s)	Silent Period (s)	Conclusion
315.00	0.66	23.10	PASS

***Note: Silent Period(23.10s) > 30 * Duration Time(0.66s); Duration Time(0.66s)<1s



5.2. Transmitter Field Strength of Emissions

5.2.1. Limit

FCC §15.231 (e)

The field strength of emissions from Intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field Strength of Fundamental (microvolt/meter)	Field Strength of spurious emissions (microvolt/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500	50 to 150
174-260	1,500	150
260-470	1,500 to 50,000	150 to 500
Above 470	5,000	500

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, $\mu\text{V/m}$ at 3 meters = $22.72727(F) - 2454.545$; for the band 260-470 MHz, $\mu\text{V/m}$ at 3 meters = $16.6667(F) - 2833.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

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

2 Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) 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 (microvolts/meter)	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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 72 MHz, 76 88 MHz, 174 216 MHz or 470 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

5.2.2. Instruments Setting

The following table is the setting of spectrum analyzer and receiver.

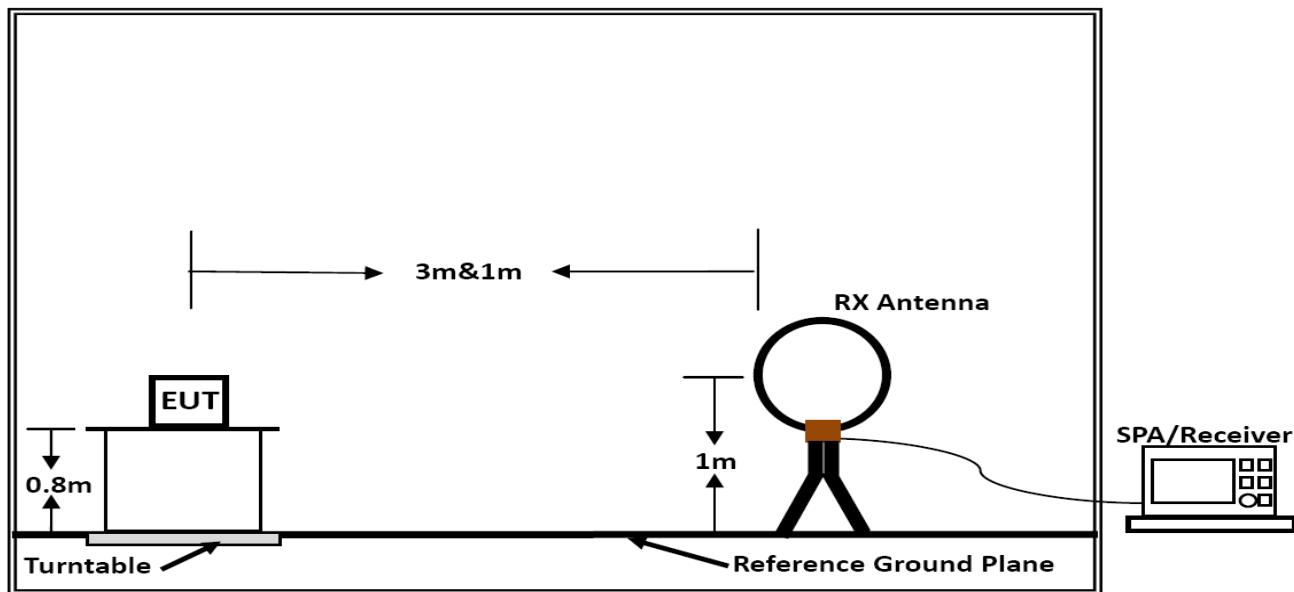
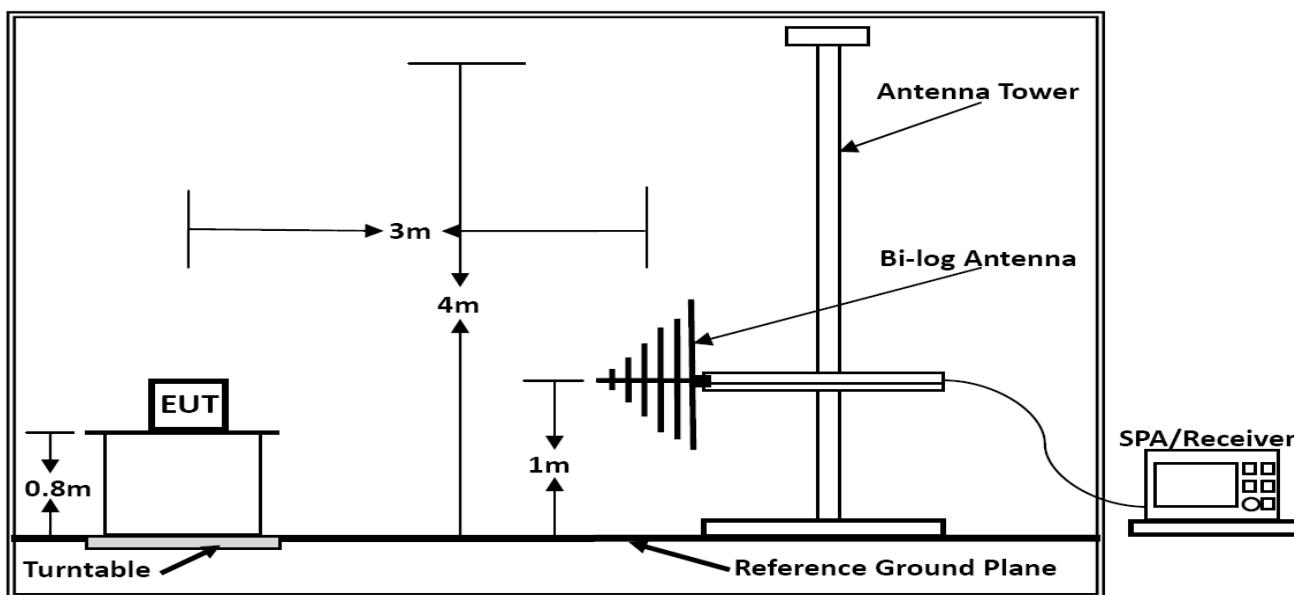
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

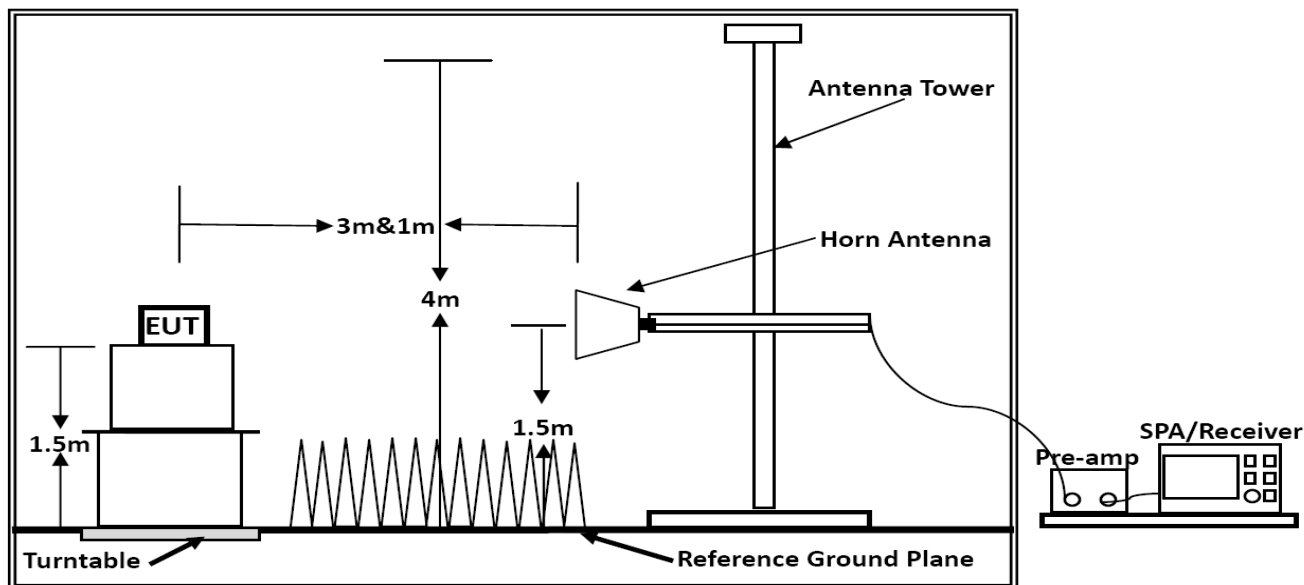
Spectrum Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.2.3. Test Procedures

- 1) Configure the EUT according to ANSI C63.10: 2013. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2) Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3) The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4) For each suspected emissions, the antenna tower was scan (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading
- 5) Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6) For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- 7) When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
- 8) If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9) For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emission sat the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. The emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10) In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

5.2.4. Test Setup Layout

**Below 30MHz****Below 1GHz**



Above 1GHz

All the x/y/z orientation has been investigated, and only worst case is presented in this report.

5.2.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.6. Results of Radiated Emissions (9kHz~30MHz)

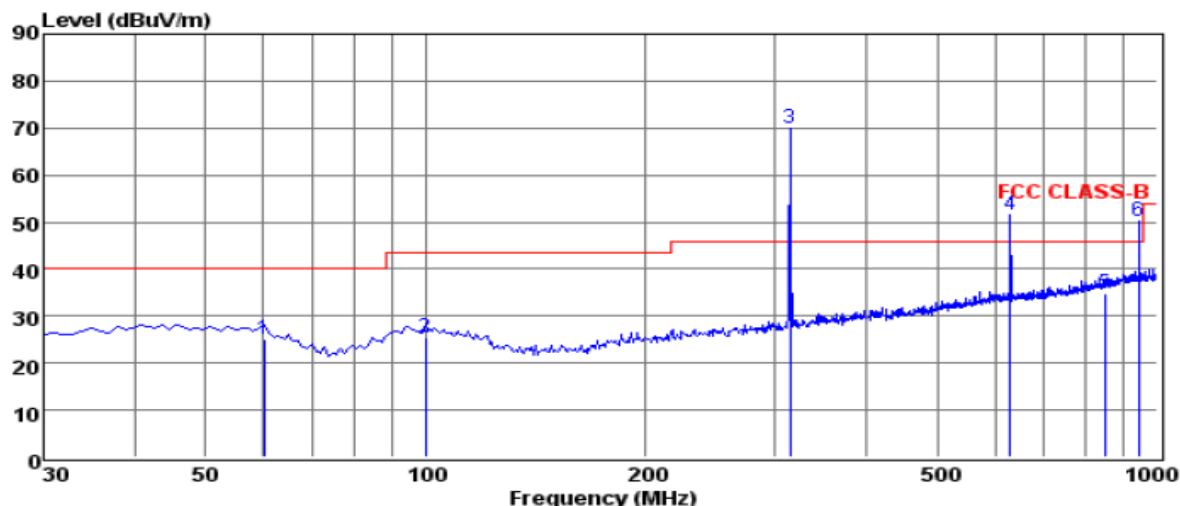
The low frequency, which started from 9KHz to 30MHz, was pre-scan and the result was 20dB lower than the limit line per 15.31(o) was not reported.

Note: Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

5.2.7. Results of Radiated Emissions (30MHz~1GHz)

Temperature	25°C	Humidity	60%
Test Engineer	Leo	Configurations	Radiated Emissions



Env./Ins: 24°C/56%
 EUT: Infrared Motion wireless alarm chime
 M/N: 622-108
 Power Rating: DC 9V
 Test Mode: TX
 Operator: Leo
 Memo:
 pol: HORIZONTAL

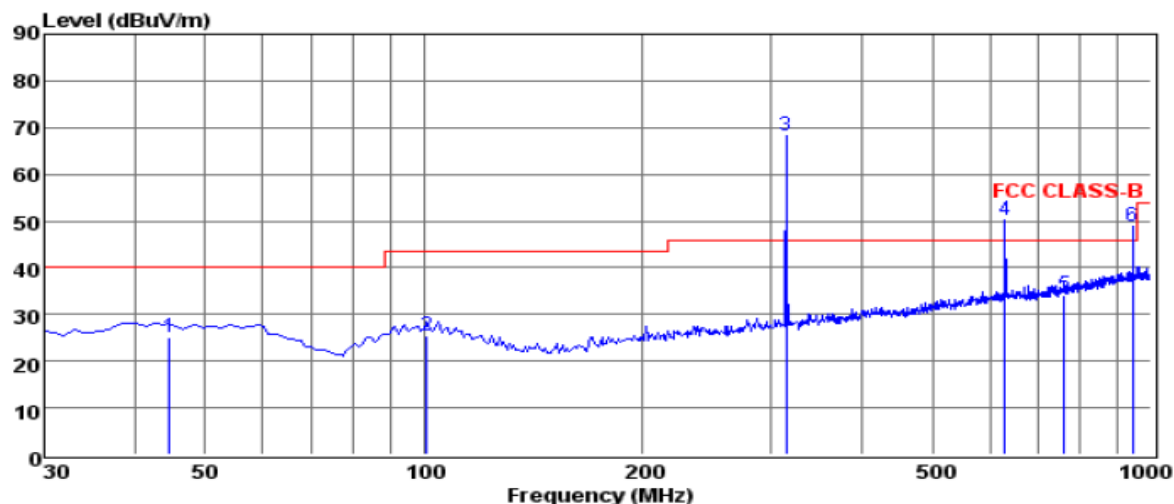
	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	60.07	12.04	0.49	12.66	25.19	40.00	-14.81	QP
2	99.84	11.60	0.60	13.15	25.35	43.50	-18.15	QP
3	315.00	55.67	1.09	13.26	70.02	87.66		Peak
4	630.00	31.22	1.60	18.56	51.38	67.66		Peak
5	847.71	12.62	1.76	20.55	34.93	46.00	-11.07	QP
6	945.00	27.01	1.95	21.38	50.34	67.66		Peak

Note: 1. All readings are Quasi-peak values.

2. Measured= Reading + Antenna Factor + Cable Loss

3. The emission that are 20db below the official limit are not reported

Fundamental and Harmonics Average Result					
Frequency (MHz)	Peak Level (dBμV/m)	AV Factor(dBμV/m) (see Section 5.4)	Average Level (dBμV/m)	Limit(dBμV/m) (average)	Conclusion
315.00	70.02	-6.82	63.20	67.66	PASS
630.00	51.38	-6.82	44.56	47.66	PASS
945.00	50.34	-6.82	43.52	47.66	PASS



Env./Ins: 24°C/56%
 EUT: Infrared Motion wireless alarm chime
 M/N: 622-108
 Power Rating: DC 9V
 Test Mode: TX
 Operator: Leo
 Memo:
 pol: VERTICAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	44.55	11.25	0.41	13.55	25.21	40.00	-14.79	QP
2	100.81	11.89	0.60	13.09	25.58	43.50	-17.92	QP
3	315.00	54.06	1.09	13.26	68.41	87.66		Peak
4	630.00	29.94	1.60	18.56	50.10	67.66		Peak
5	760.41	12.68	1.77	19.57	34.02	46.00	-11.98	QP
6	945.00	25.59	1.95	21.38	48.92	67.66		Peak

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20dB below the official limit are not reported

Fundamental and Harmonics Average Result					
Frequency (MHz)	Peak Level (dBμV/m)	AV Factor(dBμV/m) (see Section 5.4)	Average Level (dBμV/m)	Limit(dBμV/m) (average)	Conclusion
315.00	68.41	-6.82	61.59	67.66	PASS
630.00	50.10	-6.82	43.28	47.66	PASS
945.00	48.92	-6.82	42.10	47.66	PASS

5.2.8. Results of Radiated Emissions (Above1GHz)

Temperature	25℃	Humidity	55%
Test Engineer	Leo	Configurations	Harmonics Emissions/ Spurious Emission

Peak Value:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over limit (dB)	Polarization
1260.17	41.59	74	-32.41	Horizontal
1575.34	43.87	74	-30.13	Horizontal
1890.21	45.66	74	-28.34	Horizontal
1260.17	42.17	74	-31.83	Vertical
1575.34	44.53	74	-29.47	Vertical
1890.21	46.71	74	-27.29	Vertical

Average Value:

Frequency (MHz)	Level (dBuV/m)	Duty cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over limit (dB)	Polarization
1260.17	41.59	-6.82	29.22	54	-44.78	Horizontal
1575.34	43.87	-6.82	31.50	54	-42.50	Horizontal
1890.21	45.66	-6.82	33.29	54	-40.71	Horizontal
1260.17	42.17	-6.82	29.80	54	-44.20	Vertical
1575.34	44.53	-6.82	32.16	54	-41.84	Vertical
1890.21	46.71	-6.82	34.34	54	-39.66	Vertical

1. Measuring frequencies from 9k~10th harmonic (ex. 4GHz), No emission found between lowest internal used/generated frequency to 30MHz.
2. Radiated emissions measured in frequency range from 9k~10th harmonic (ex. 4GHz) were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5.3. 20dB Bandwidth Emissions

FCC 15.231 (c)

5.3.1. Limit

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. Bandwidth is determined at the points 20 dB down from the modulated carrier.

5.3.2. Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

5.3.3. Test Data

Transmit Frequency (MHz)	Limit (kHz)	20dB Bandwidth (kHz)	Result
315.00	787.5	47.05	PASS
Maximum allowed bandwidth:	☒ 0.25% of the centre operating frequency ☐ 0.5% of the centre operating frequency		
RBW:	☒ 10kHz ☐ 100kHz ☐ other kHz		
VBW:	☒ 30kHz ☐ 300kHz ☐ other kHz		



5.4. Duty cycle

5.4.1. Limit

No dedicated limit specified in the Rules.

5.4.2. Test Procedure

5.4.2.1. Place the EUT on the table and set it in transmitting mode.

5.4.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

5.4.2.3. Set centre frequency of spectrum analyzer=operating frequency.

5.4.2.4. Set the spectrum analyzer as RBW=100kHz, VBW=100KHz, Span=0Hz, Adjust Sweep=100ms.

5.4.2.5. Repeat above procedures until all frequency measured was complete.

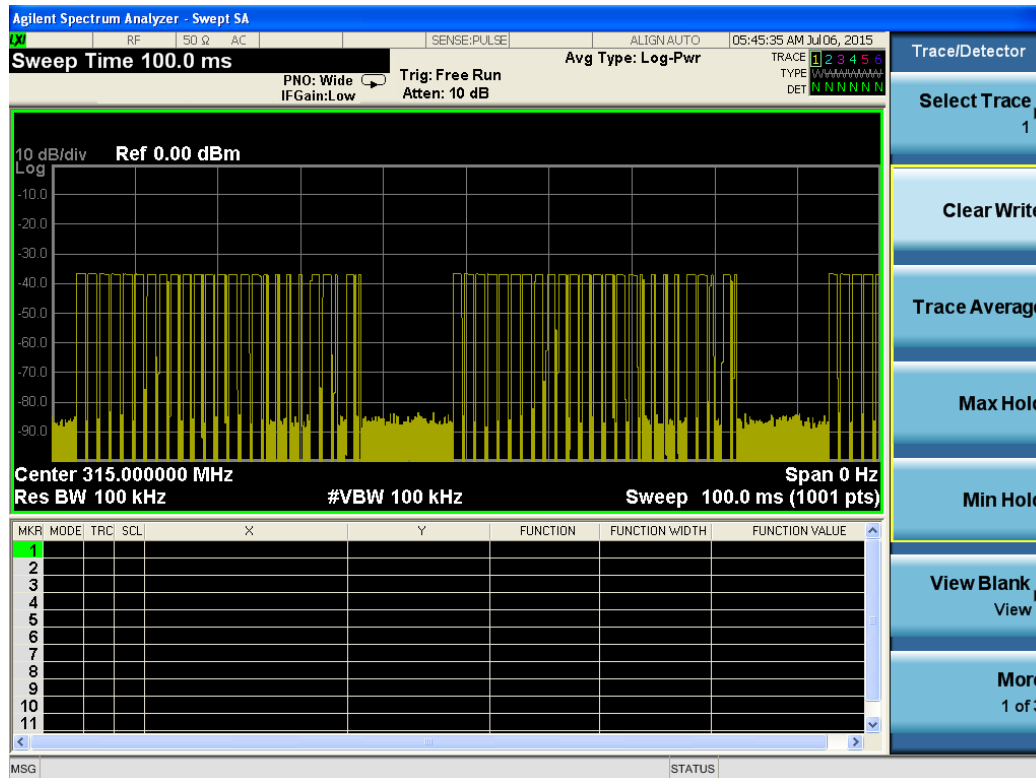
5.4.3. Test Data

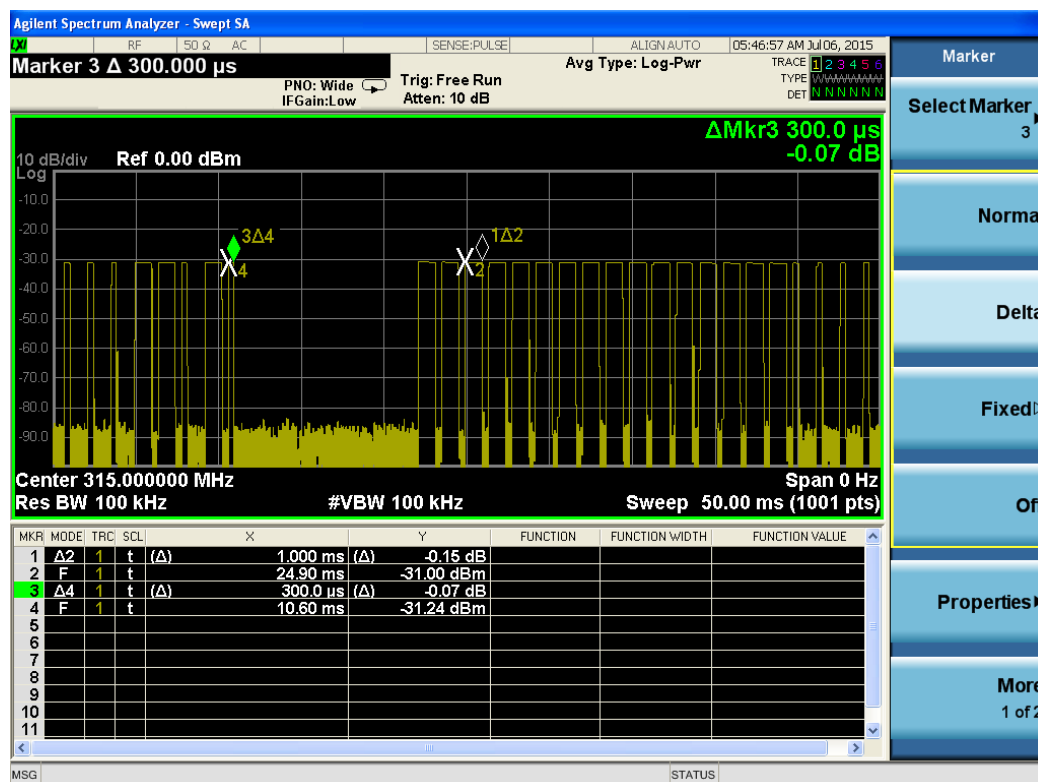
Since the duration time is 660ms(according to Section 5.1.3.), the T_p was set to 100.00ms.

$T_{on} = (0.30 \times 12 + 1.00 \times 42) \text{ms} = 45.60 \text{ms}$

Average Correction Factory = $20 \log (T_{on}/T_p) = 20 \log (45.60/100.00) = -6.82 \text{dB}$

Note: The shortest Pulse Width(PW)=0.30ms; $2/PW = 2/0.30 \text{ms} = 6.67 \text{kHz} < 100 \text{kHz} \text{ (RBW)}$, So the PDCF is not needed.





5.5. Antenna Requirement

FCC 15.203

5.5.1. Standard Applicable

According to § 15.203, An intentional radiator shall be designed to ensure that no antenna other than that 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.

5.5.2. Result

Compliant.

The antenna used for transmitting is permanently attached and no consideration of replacement. Please see EUT photo for details.

6. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal. Date	Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-1GHz 3m	June 18, 2015	June 17, 2016
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHz	July 15, 2014	July 14, 2015
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 15, 2014	July 14, 2015
Spectrum Analyzer	Agilent	E4407B	MY41440292	9k-26.5GHz	June 18, 2015	June 17, 2016
MAX Signal analyzer	Agilent	N9020A	MY50510140	20Hz-26.5GHz	October 27, 2014	October 26, 2015
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18, 2015	June 17, 2016
By-log Antenna	SCHAFFNER	CBL 6112D	22237	30MHz-1GHz	June 18, 2015	June 17, 2016
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 18, 2015	June 17, 2016
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18, 2015	June 17, 2016
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18, 2015	June 17, 2016
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18, 2015	June 17, 2016
RF CABLE-2m	JYE Bao	RG142	CB)35-2m	20MHz-1GHz	June 18, 2015	June 17, 2016

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