

FCC TEST REPORT
for
ZHONGSHAN BOYING ELECTRONICS CO., Ltd.

Wireless doorbell

Model No.: A101, A102, A103, A106, A107, A108, A109, A201, A202, A203, A205, A206, A207, A208, A209, A301, A302, A303, A306, A307, A308, A309, A501, A502, A503, A505, A506, A507, A508, A509, A501, A502, A503, A506, A507, A508, A509, A601, A602, A603, A605, A606, A607, A608, A609, A701, A702, A703, A706, A707, A708, A709, A801, A802, A803, A805, A806, A807, A808, A809, A901, A902, A903, A905, A906, A907, A908, A909, 9809, 9803

Prepared for : ZHONGSHAN BOYING ELECTRONICS CO., Ltd.
Address : No.11, Yulian Street, Dongsheng Town, Zhongshan City,
Guangdong Province, China

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Report Number : R011508603I
Date of Test : Aug. 19~ Sept. 10, 2015
Date of Report : Sept. 11, 2015

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TEST REPORT VERIFICATION

Applicant : ZHONGSHAN BOYING ELECTRONICS CO., Ltd.
Manufacturer : ZHONGSHAN BOYING ELECTRONICS CO., Ltd.
EUT : Wireless doorbell
Model No. : A101, A102, A103, A106, A107, A108, A109, A201, A202, A203, A205, A206, A207, A208, A209, A301, A302, A303, A306, A307, A308, A309, A501, A502, A503, A505, A506, A507, A508, A509, A501, A502, A503, A506, A507, A508, A509, A601, A602, A603, A605, A606, A607, A608, A609, A701, A702, A703, A706, A707, A708, A709, A801, A802, A803, A805, A806, A807, A808, A809, A901, A902, A903, A905, A906, A907, A908, A909, 9809, 9803
Serial No. : N.A.
Trade Mark : N.A.
Rating : AC 110-240V, 50/60Hz, 9.1mA

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart B 15.107, 15.109 & FCC / ANSI C63.4-2014

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited Is assumed full responsibility for the accuracy and completeness of these measurements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited

Date of Test :

Aug. 19~ Sept. 10, 2015

Prepared by :



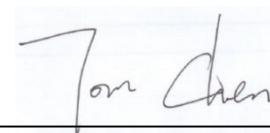
(Tested Engineer / Kebo Zhang)

Reviewer :



(Project Manager / Amy Ding)

Approved & Authorized Signer :



(Manager / Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description : Wireless doorbell

Model Number : A101, A102, A103, A106, A107, A108, A109, A201, A202, A203, A205, A206, A207, A208, A209, A301, A302, A303, A306, A307, A308, A309, A501, A502, A503, A505, A506, A507, A508, A509, A501, A502, A503, A506, A507, A508, A509, A601, A602, A603, A605, A606, A607, A608, A609, A701, A702, A703, A706, A707, A708, A709, A801, A802, A803, A805, A806, A807, A808, A809, A901, A902, A903, A905, A906, A907, A908, A909, 9809, 9803
(Note: All samples are the same except the model number and colour, so we prepare "A101" for test only.)

Test Power Supply : AC 120V, 60Hz/AC 240V, 60Hz

Applicant : ZHONGSHAN BOYING ELECTRONICS CO., Ltd.

Address : No.11, Yulian Street, Dongsheng Town, Zhongshan City, Guangdong Province, China

Manufacturer : ZHONGSHAN BOYING ELECTRONICS CO., Ltd.

Address : No.11, Yulian Street, Dongsheng Town, Zhongshan City, Guangdong Province, China

Factory : ZHONGSHAN BOYING ELECTRONICS CO., Ltd.

Address : No.11, Yulian Street, Dongsheng Town, Zhongshan City, Guangdong Province, China

Date of receipt : Aug. 19, 2015

Date of Test : Aug. 19~ Sept. 10, 2015

1.2. Auxiliary Equipment Used during Test

N/A

1.3. Description of Test Facility

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

CNAS - LAB Code: L3503

Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021

Shenzhen Anbotek Compliance Laboratory Limited, 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 752021, July 10, 2013

IC-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A-1, Feb. 22, 2013

Test Location

All Emissions tests were performed

Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.1dB (Horizontal)
Ur = 4.3dB (Vertical)

Conduction Uncertainty : Uc = 3.4dB

1.5. Test Summary

For the EUT described above. The standards used were FCC Part 15 Subpart B for Emissions.

Table 1 : Tests Carried Out Under FCC Part 15 Subpart B

Standard	Test Items	Status
FCC Part 15 Subpart B	Power Line Conducted Emission Test (150KHz To 30MHz)	✓
FCC Part 15 Subpart B	Radiated Emission Test (30MHz To 1000MHz)	✓

✓ Indicates that the test is applicable

x Indicates that the test is not applicable

2. POWER LINE CONDUCTED MEASUREMENT

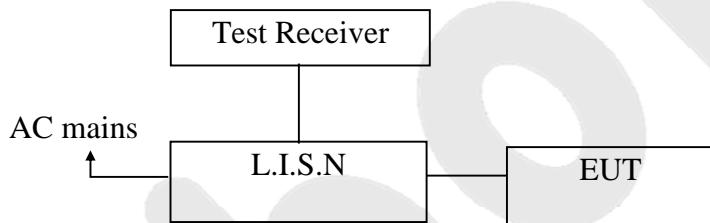
2.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	100055	Apr. 17, 2015	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 17, 2015	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 17, 2015	1 Year

2.2. Block Diagram of Test Setup

2.2.1. Block diagram of connection between the EUT and simulators



2.3. Power Line Conducted Emission Measurement Limits (FCC Part 15

Class B)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
 2. The lower limit shall apply at the transition frequencies.

2.4. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown as Section 2.2.

2.5.2. Turn on the power of all equipment.

2.5.3. Let the EUT work in test mode (On) and measure it.

2.6. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2014 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test result are reported on Section 2.7.

2.7. Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150KHz to 30 MHz is investigated.

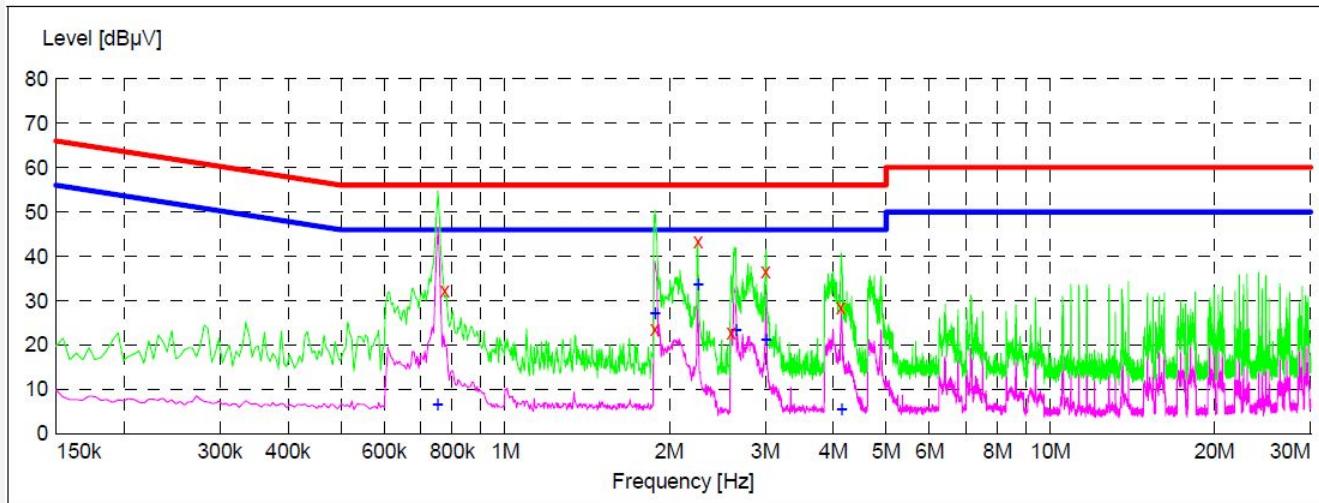
Please refer the following pages.

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: On
 Test Specification: AC 120V, 60Hz
 Comment: L
 Temp.:25°C Hum.:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.775500	32.40	20.1	56	23.6	QP	L1	GND
1.882000	23.70	20.3	56	32.3	QP	L1	GND
2.260000	43.30	20.3	56	12.7	QP	L1	GND
2.597500	22.70	20.4	56	33.3	QP	L1	GND
3.002500	36.60	20.4	56	19.4	QP	L1	GND
4.123000	28.50	20.5	56	27.5	QP	L1	GND

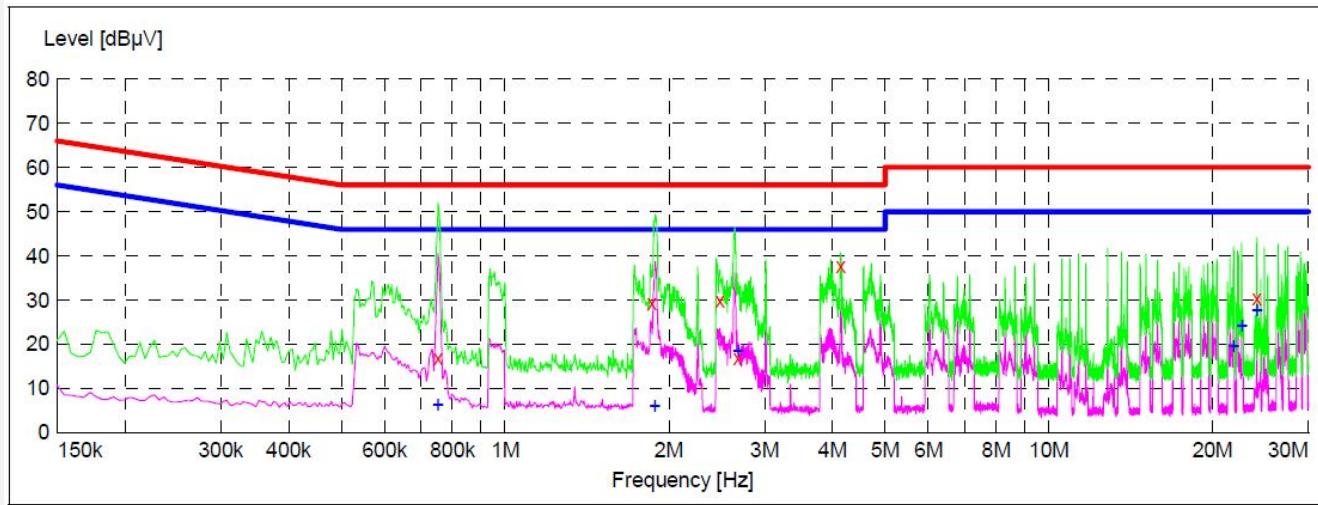
Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.753000	6.70	20.1	46	39.3	AV	L1	GND
1.882000	27.20	20.3	46	18.8	AV	L1	GND
2.260000	33.60	20.3	46	12.4	AV	L1	GND
2.656000	23.50	20.4	46	22.5	AV	L1	GND
3.011500	21.30	20.4	46	24.7	AV	L1	GND
4.136500	5.40	20.5	46	40.6	AV	L1	GND

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: On
 Test Specification: AC 120V, 60Hz
 Comment: N
 Temp.:25°C Hum.:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.753000	16.80	20.1	56	39.2	QP	N	GND
1.859500	29.30	20.3	56	26.7	QP	N	GND
2.480500	30.00	20.3	56	26.0	QP	N	GND
2.678500	17.00	20.4	56	39.0	QP	N	GND
4.145500	37.80	20.5	56	18.2	QP	N	GND
24.107500	30.30	20.8	60	29.7	QP	N	GND

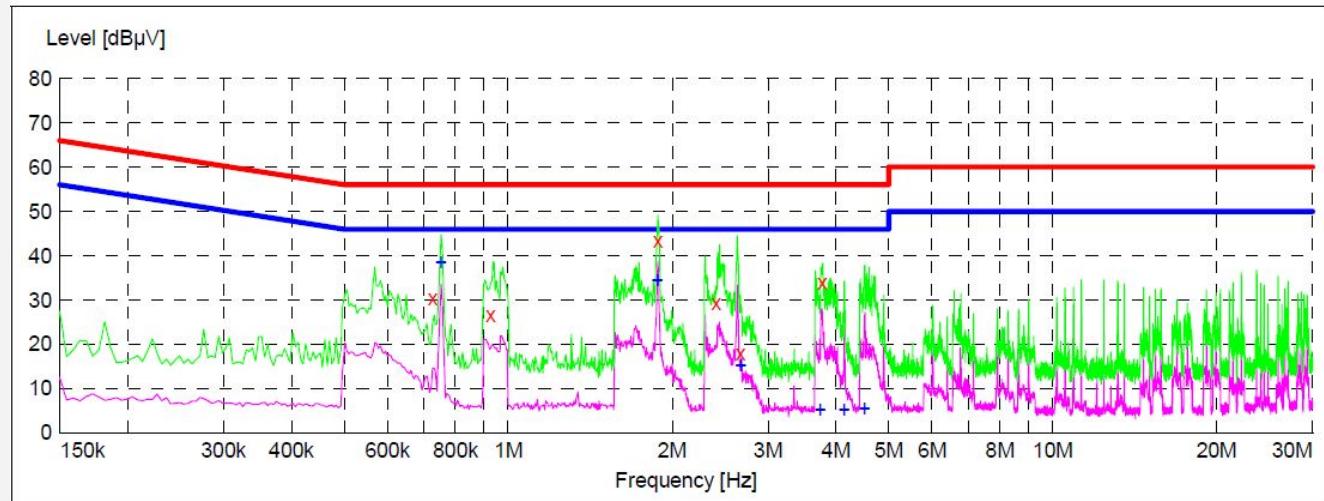
Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.753000	6.30	20.1	46	39.7	AV	N	GND
1.882000	6.00	20.3	46	40.0	AV	N	GND
2.678500	18.40	20.4	46	27.6	AV	N	GND
21.862000	19.60	20.8	50	30.4	AV	N	GND
22.640500	24.20	20.8	50	25.8	AV	N	GND
24.130000	27.60	20.8	50	22.4	AV	N	GND

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: On
 Test Specification: AC 240V, 60Hz
 Comment: L
 Temp.:25°C Hum.:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.726000	30.30	20.1	56	25.7	QP	L1	GND
0.928500	26.50	20.1	56	29.5	QP	L1	GND
1.882000	43.20	20.3	56	12.8	QP	L1	GND
2.408500	29.50	20.3	56	26.5	QP	L1	GND
2.669500	17.80	20.4	56	38.2	QP	L1	GND
3.767500	33.80	20.4	56	12.2	QP	L1	GND

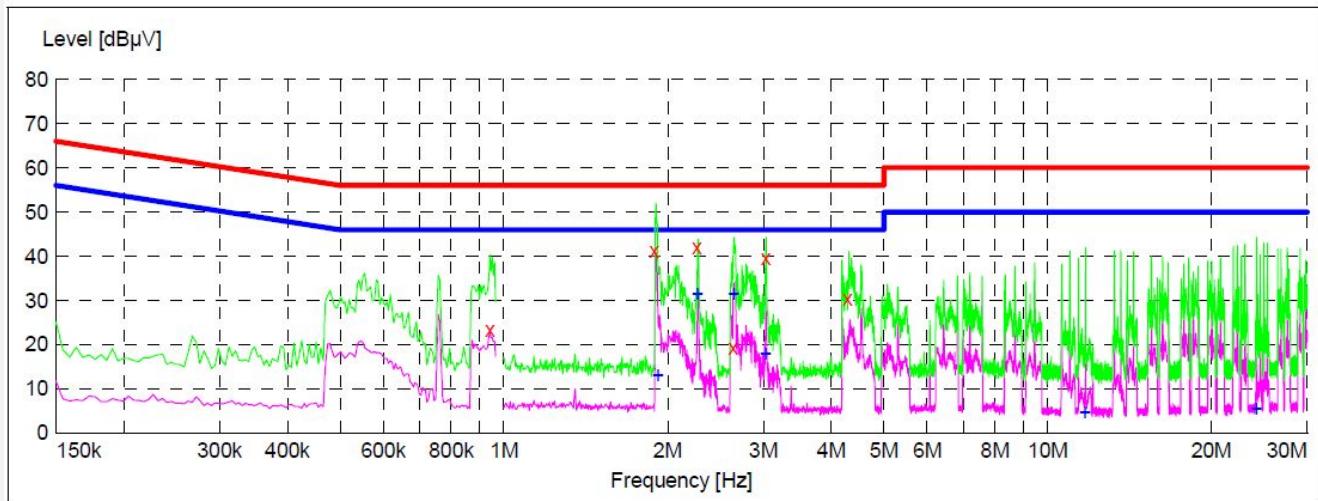
Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.753000	38.20	20.1	46	7.8	AV	L1	GND
1.877500	33.30	20.3	46	12.7	AV	L1	GND
2.674000	15.30	20.4	46	30.7	AV	L1	GND
3.740500	5.30	20.4	46	40.7	AV	L1	GND
4.132000	5.20	20.5	46	40.8	AV	L1	GND
4.510000	5.40	20.5	46	40.6	AV	L1	GND

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: On
 Test Specification: AC 240V, 60Hz
 Comment: N
 Temp.:25°C Hum.:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.942000	23.40	20.1	56	32.6	QP	N	GND
1.891000	41.30	20.3	56	14.7	QP	N	GND
2.264500	42.70	20.3	56	13.3	QP	N	GND
2.638000	19.40	20.4	56	36.6	QP	N	GND
3.029500	30.00	20.4	56	20.0	QP	N	GND
4.285000	28.40	20.5	56	27.6	QP	N	GND

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
1.918000	14.50	20.3	46	31.5	AV	N	GND
2.269000	31.70	20.3	46	14.3	AV	N	GND
2.642500	31.50	20.4	46	14.5	AV	N	GND
3.025000	18.10	20.4	46	27.9	AV	N	GND
11.701000	4.80	20.6	50	45.2	AV	N	GND
24.166000	5.60	20.8	50	44.4	AV	N	GND

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

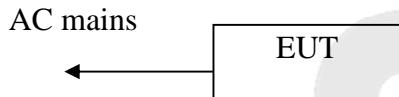
The following test equipments are used during the radiated emission measurement:

3.1.1. For Anechoic Chamber

Item	Equipment AC mains	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
2.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
3.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year

3.2. Block Diagram of Test Setup

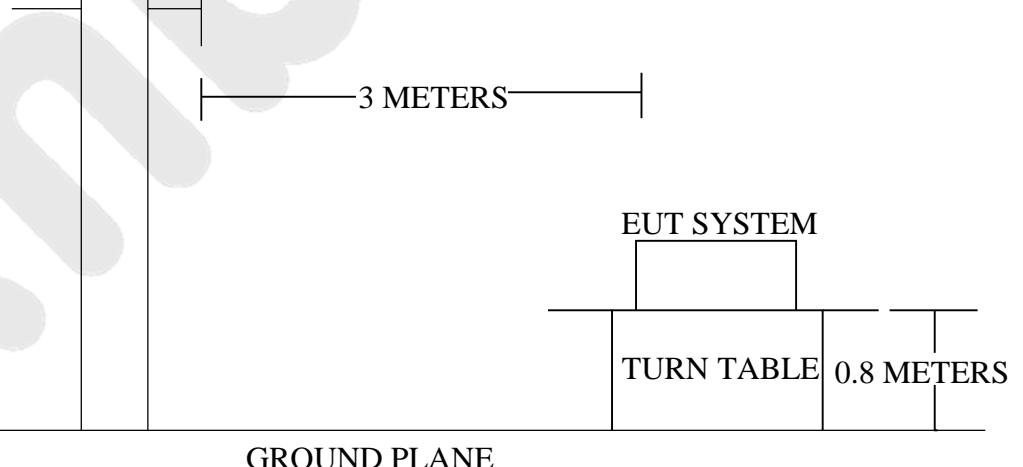
3.2.1. Block diagram of connection between the EUT and simulators



3.2.2. Anechoic Chamber Test Setup Diagram

ANTENNA TOWER

ANTENNA ELEVATION VARIES FROM 1 TO 4 METERS



3.3. Radiated Emission Limit (Subpart B Class B)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		µV/m	dB(µV)/m
30~88	3	100	40.0
88~216	3	150	43.5

216~960	3	200	46.0
960~1000	3	500	54.0

Remark :

- (1) Emission level (dB) μ V = 20 log Emission level μ V/m
- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

3.4. EUT Configuration on Measurement

The following equipments are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.5. Operating Condition of EUT

3.5.1. Setup the EUT as shown in Section 3.2.

3.5.2. Let the EUT work in test mode (On) and measure it.

3.6. Test Procedure

For below 1GHz, the EUT is placed on a turn table which is 0.8 meter high above the ground. For above 1GHz, the EUT is placed on a turn table which is 1.5 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (Trilog Broadband Antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.

The bandwidth of the EMI test receiver (ESCI) is set at 120kHz.

The frequency range from 30MHz to 6000MHz is checked.

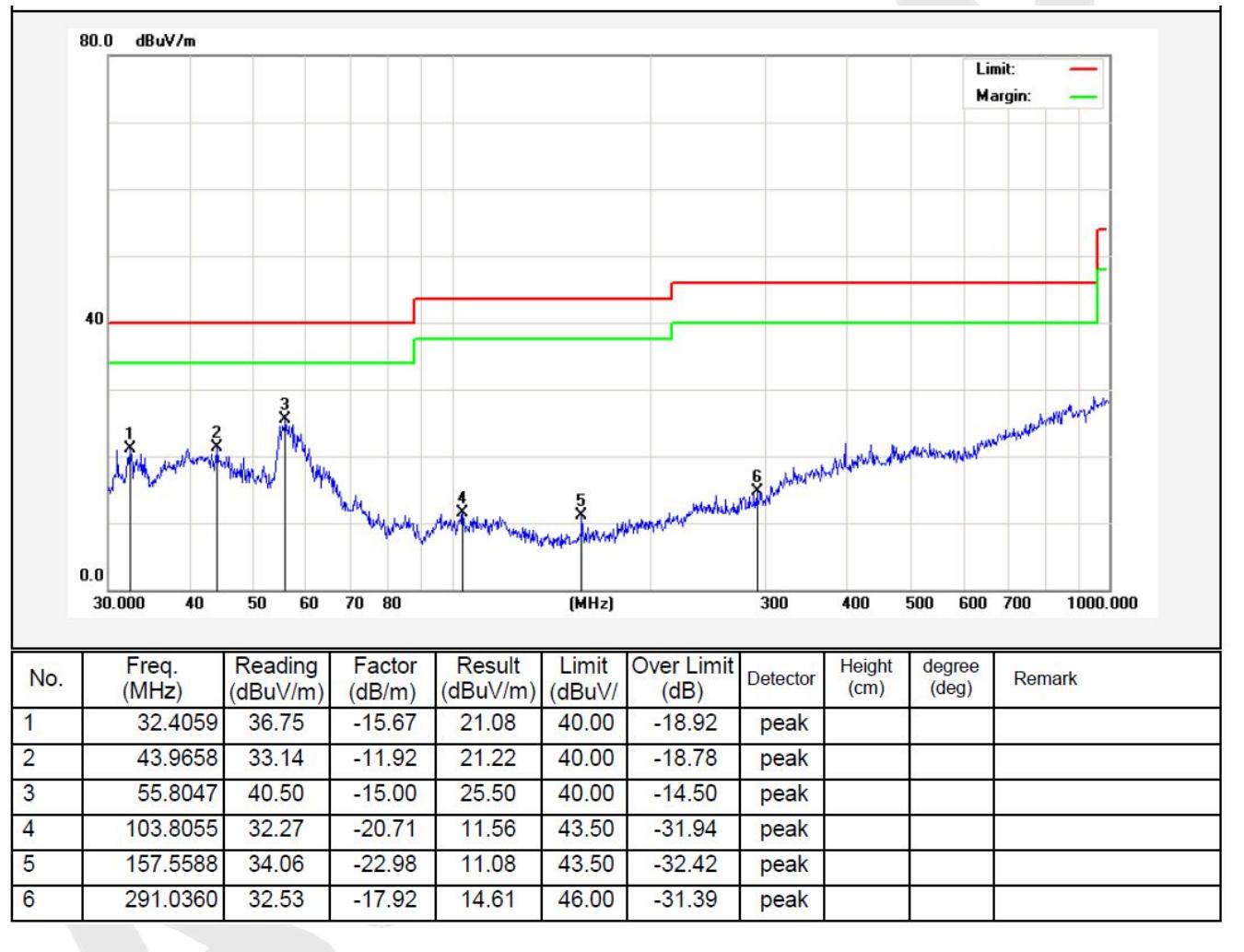
The test mode (On) is tested in chamber and all the test results are listed in Section 3.7.

3.7. Radiated Emission Measurement Results

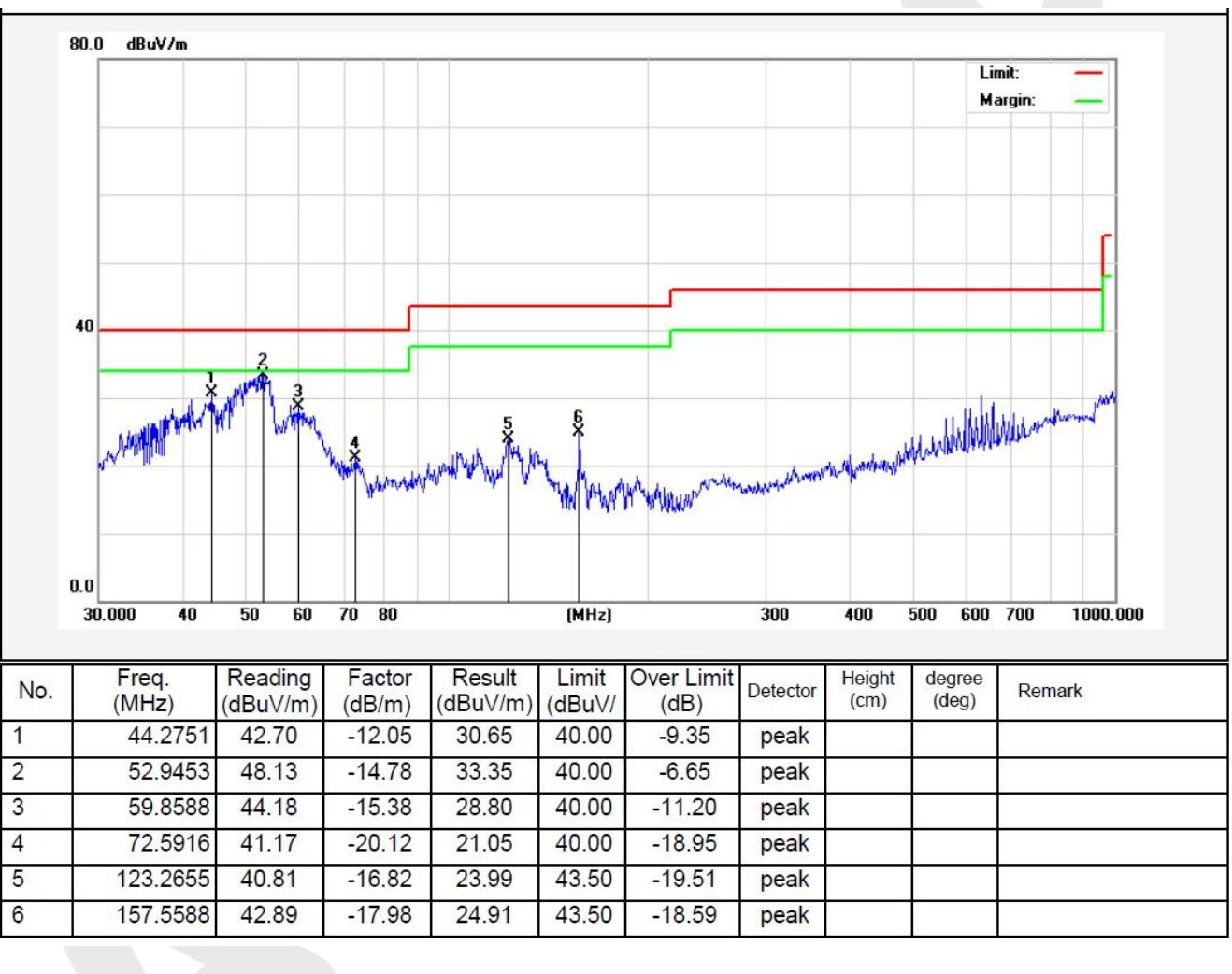
PASS.

Please refer the following pages.

Job No.:	011508603I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 B _3m	Power Source:	AC 120V, 60Hz
Test item:	Radiation Test	Temp.(°C)/Hum.(%RH):	24.3(°C)/55%RH
Mode:	On	Distance:	3m
Note:	30-1000MHz		



Job No.:	011508603I	Polarization:	Vertical
Standard:	(RE)FCC PART15 B _3m	Power Source:	AC 120V, 60Hz
Test item:	Radiation Test	Temp.(°C)/Hum.(%RH):	24.3(°C)/55%RH
Mode:	On	Distance:	3m
Note:	30-1000MHz		



Job No.:	011508603I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 B _3m	Power Source:	AC 120V, 60Hz
Test item:	Radiation Test	Temp.(°C)/Hum.(%RH):	24.3(°C)/55%RH
Mode:	On	Distance:	3m
Note:	1000-6000MHz		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	1087.500	48.85	-6.76	42.09	74.00	-31.91	peak			
2	1262.500	48.75	-6.55	42.20	74.00	-31.80	peak			
3	2162.500	47.82	-3.02	44.80	74.00	-29.20	peak			
4	2987.500	44.32	0.10	44.42	74.00	-29.58	peak			
5	3587.500	42.13	1.03	43.16	74.00	-30.84	peak			
6	3962.500	40.84	1.99	42.83	74.00	-31.17	peak			

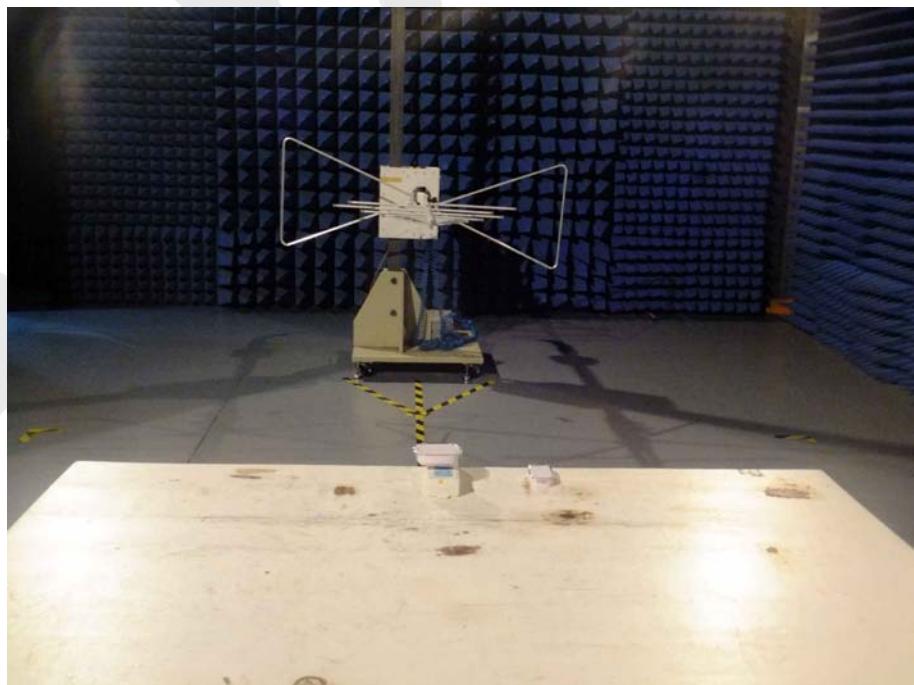
Job No.:	011508603I	Polarization:	Vertical							
Standard:	(RE)FCC PART15 B _3m	Power Source:	AC 120V, 60Hz							
Test item:	Radiation Test	Temp.(°C)/Hum.(%RH):	24.3(°C)/55%RH							
Mode:	On	Distance:	3m							
Note:	1000-6000MHz									
										
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	1164.509	38.64	-6.67	31.97	74.00	-42.03	peak			
2	1551.126	40.92	-5.97	34.95	74.00	-39.05	peak			
3	2075.000	42.12	-3.21	38.91	74.00	-35.09	peak			
4	2587.500	38.34	-1.84	36.50	74.00	-37.50	peak			
5	3537.500	37.57	0.90	38.47	74.00	-35.53	peak			
6	3850.000	36.24	1.70	37.94	74.00	-36.06	peak			

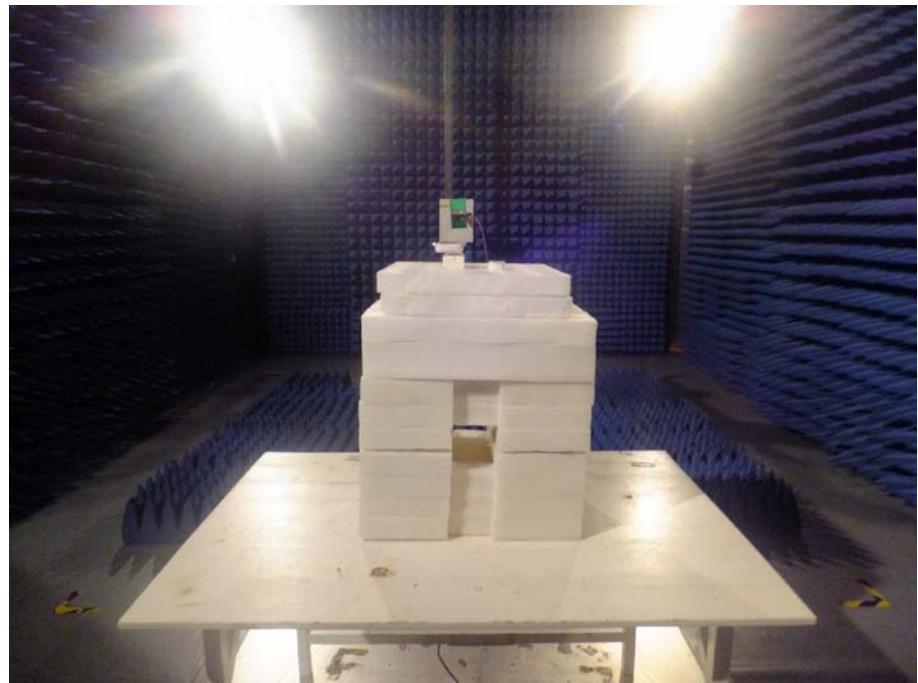
4. PHOTOGRAPH

4.1. Photo of Power Line Conducted Emission Test



4.2. Photo of Radiated Emission Test





Ambo'

APPENDIX I (EXTERNAL PHOTOS)

Figure 1
The EUT-Top View

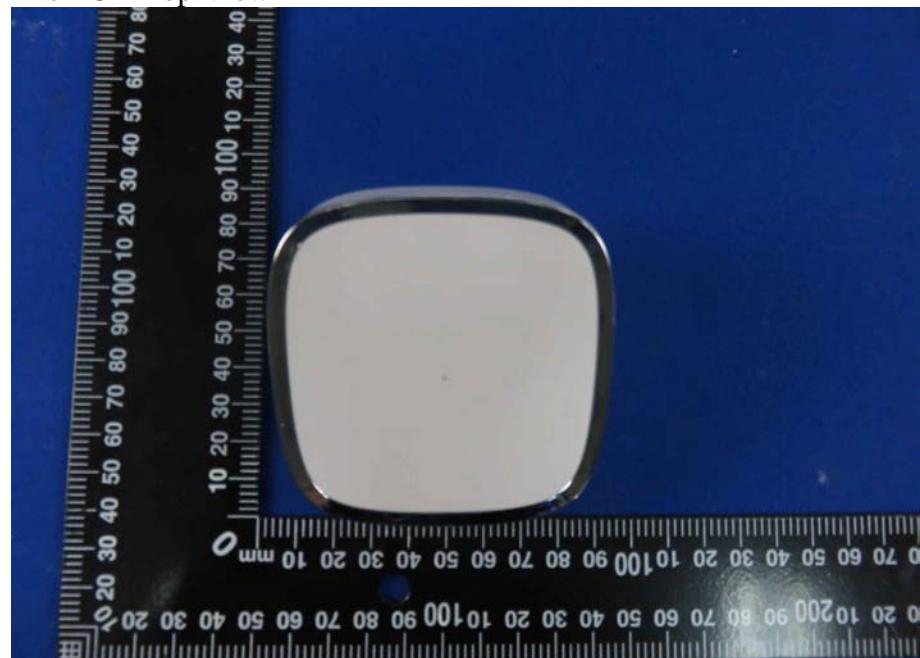


Figure 2
The EUT-Bottom View

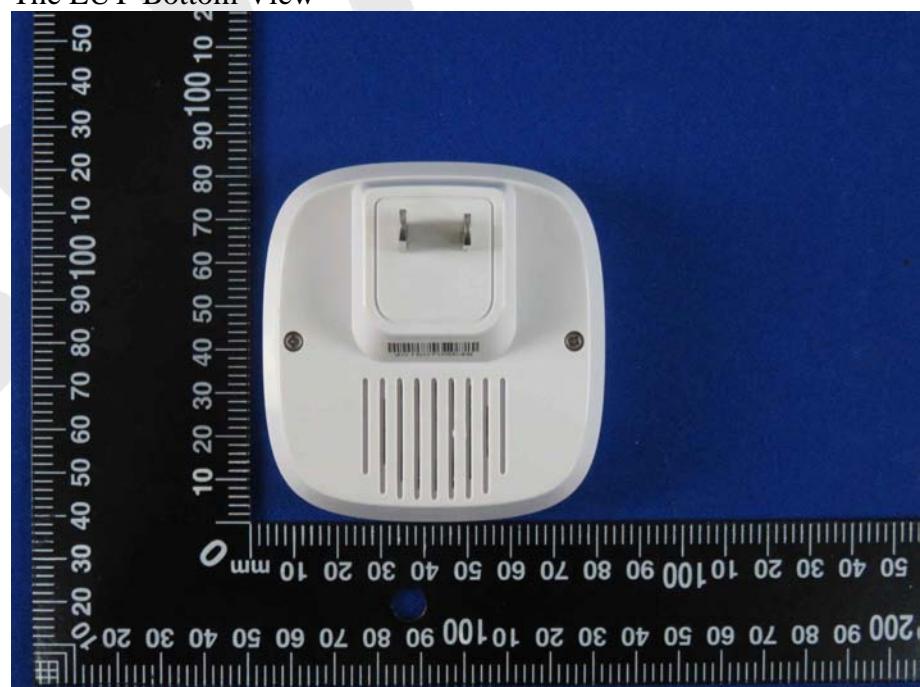


Figure 3
The EUT-Front View

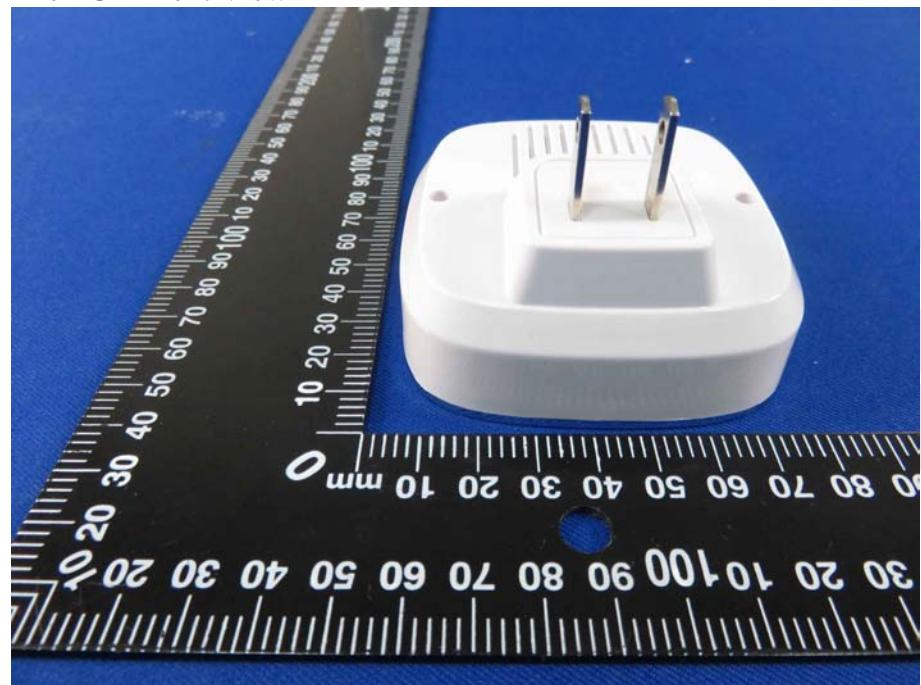


Figure 4
The EUT-Back View

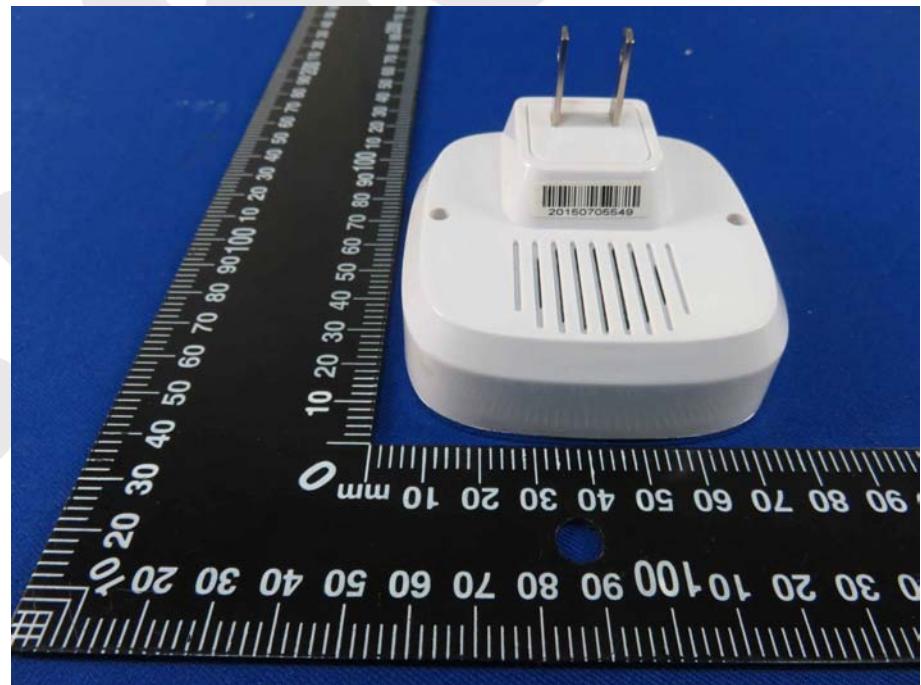


Figure 5
The EUT-Left View



Figure 6
The EUT-Right View



APPENDIX II (INTERNAL PHOTOS)

Figure 7
The EUT-Inside View

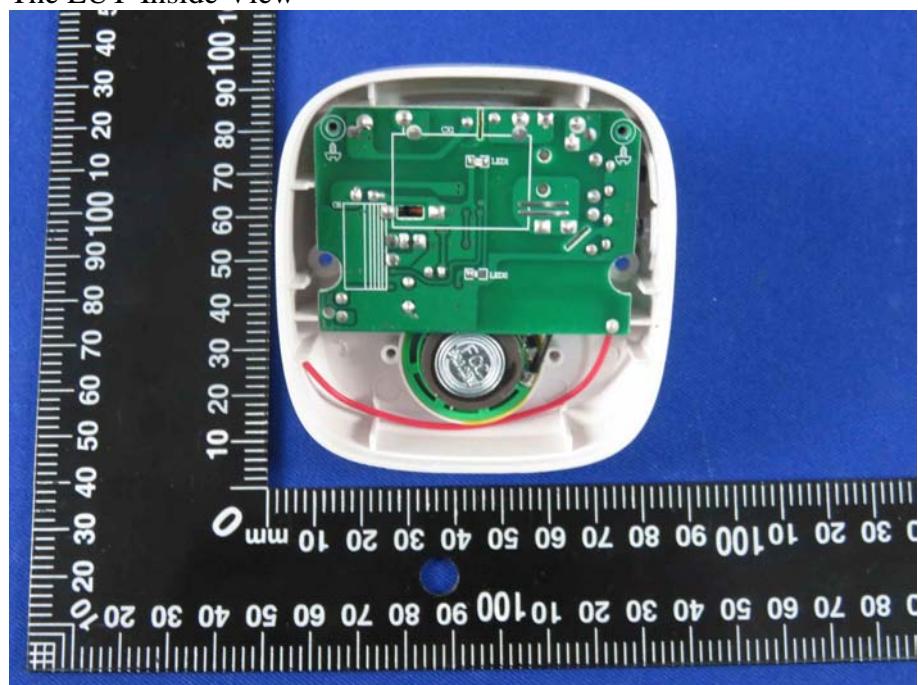


Figure 8
PCB of the EUT-Front View

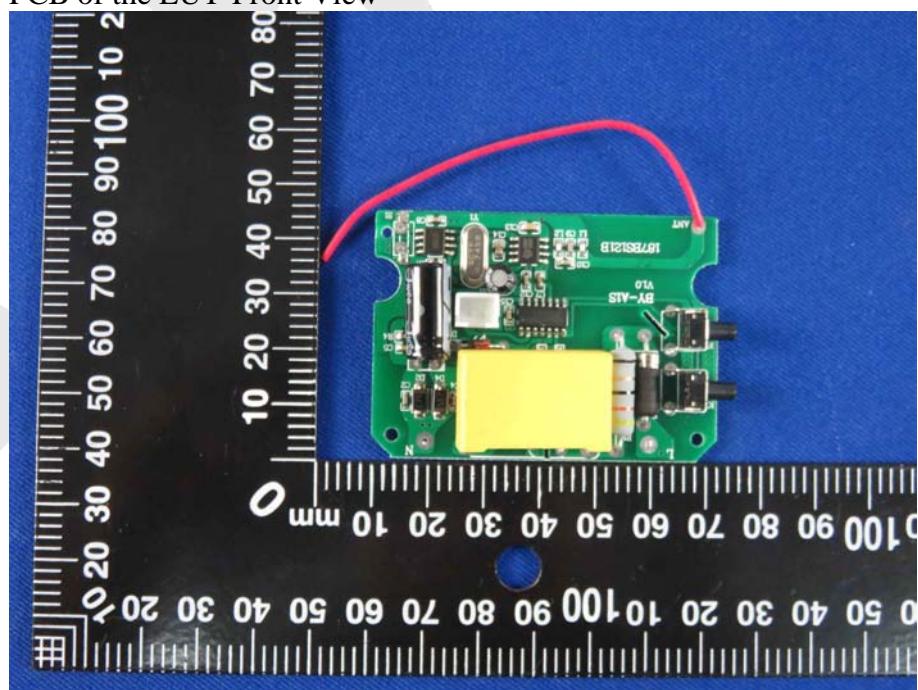


Figure 9
PCB of the EUT-Back View

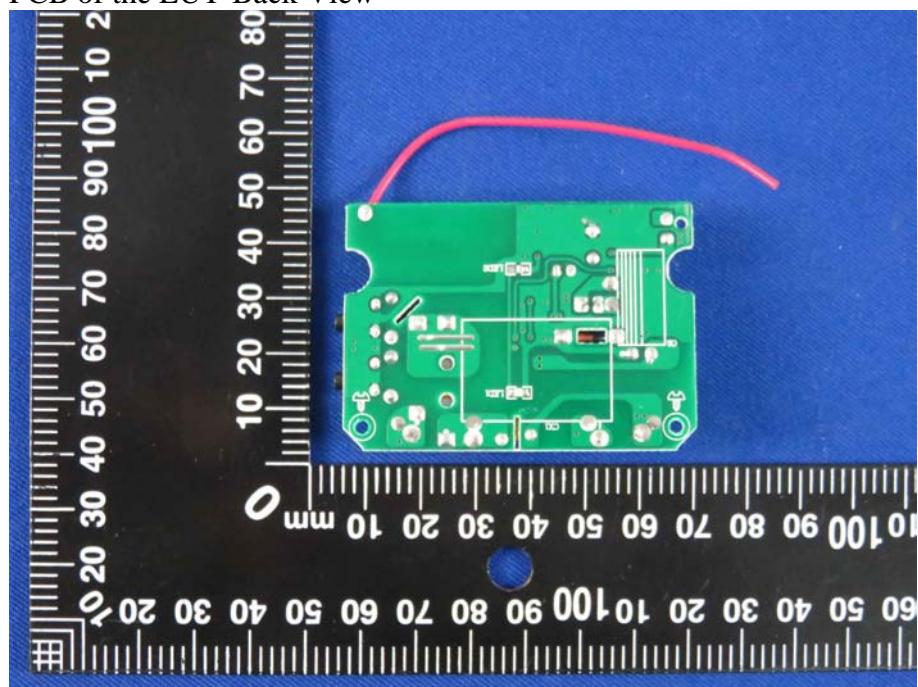


Figure 10
PCB of the EUT-Front View

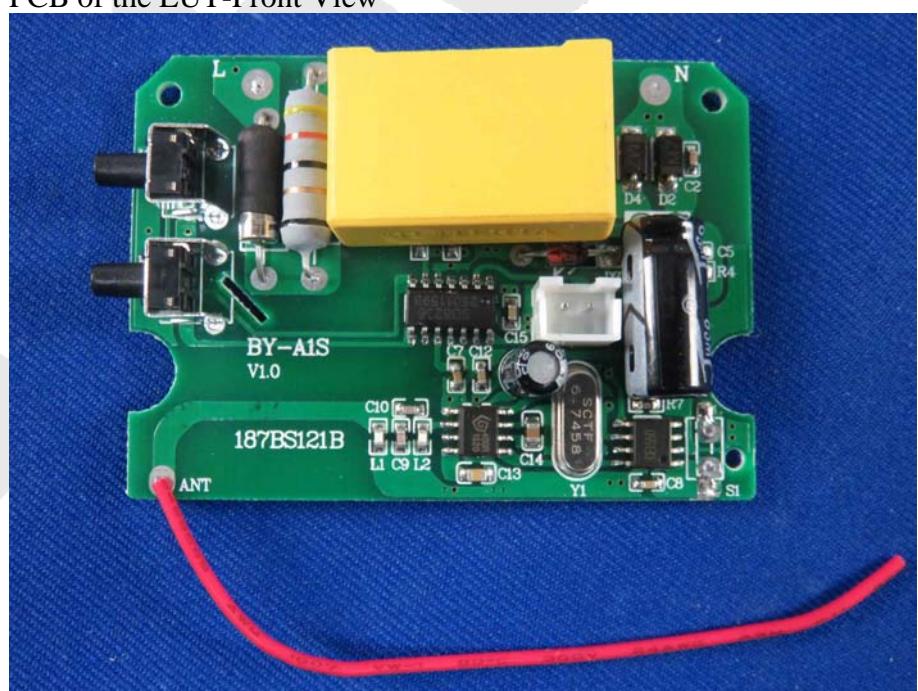
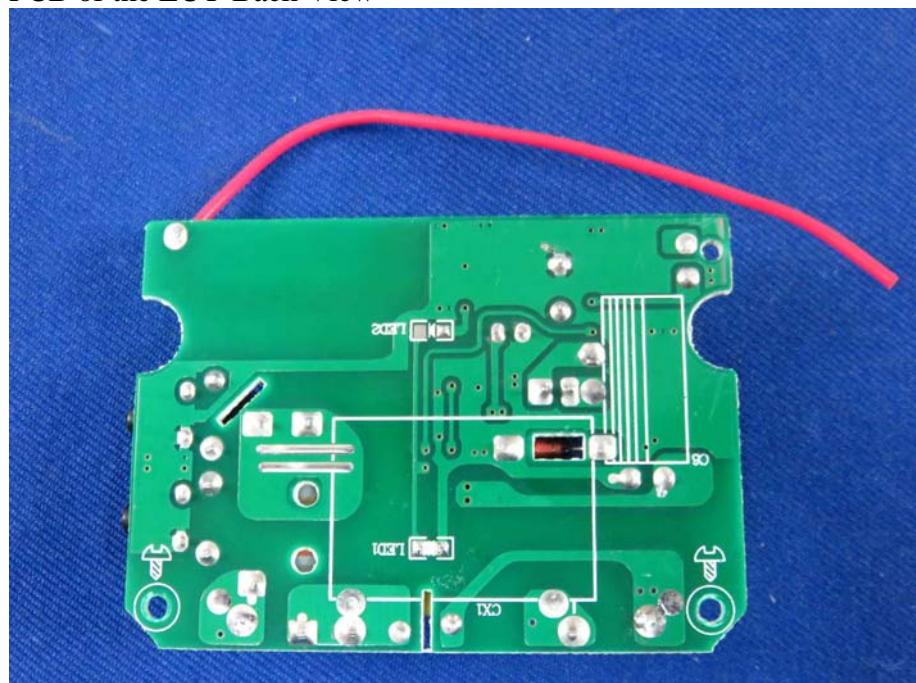


Figure 11
PCB of the EUT-Back View



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