



EMC TEST REPORT INTENTIONAL RADIATOR CERTIFICATION TO FCC AND IC REQUIREMENT (TX)

Product Name : Outdoor shields
Model Number : RAC00-12078
FCC ID : KE3-300978
IC ID : 2721A-300978
Report Number : SZEE090310119711-3
Date : Apr. 23, 2009

Standards	Results
<input checked="" type="checkbox"/> FCC Part 15:2008	PASS
<input checked="" type="checkbox"/> RSS-210:2007	PASS

Prepared for:
Radio Systems Corporation
Shenzhen Representative office of: Radio Systems Corporation
10427 Electric Ave. Knoxville, TN 37932 USA.
TEL: +1 865 218 1557
FAX: +1 865 671 6854

Prepared by:
CENTRE TESTING INTERNATIONAL (Shenzhen) Corporation
Building C, Hongwei Industrial Zone, Baoan 70 District,
Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

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1. VERIFICATION OF CONFORMITY

Applicant & Address: Radio Systems Corporation
Shenzhen Representative office of: Radio Systems Corporation
10427 Electric Ave. Knoxville, TN 37932 USA.

Manufacturer & Address: Whitways Enterprises Limited
Whitways Electronics Factory, San Zhong Management Zone,
Qing Xi, Dong Guan Shi, Guang Dong Province, China

Equipment Under Test: Outdoor shields

Trade Name: Invisible Fence

Model Number: RAC00-12078

Serial Number: N/A

Technical Data: 4 × 1.5Vdc

Date of test: Mar. 10, 2009 to Apr. 23, 2009

Condition of Test Sample: Normal

The above equipment was tested by Centre Testing International for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, Subpart B and the measurement procedure according to ANSI C63.4.

The test results of this report relate only to the tested sample identified in this report.

Prepared by :




Lily Yan

Reviewed by :



Christy Chen

Approved by :



Jim Zhang
Manager



Date :

Apr. 23, 2009

2. TEST SUMMARY

The EUT has been tested according to the following specifications:

EMISSION				
Standard	Test Type	Rule	Result	Remark
FCC Part 15	Conducted emission at AC power port	15.207	N/A	EUT is powered by battery.
	Radiated emission	15.209	PASS	See clause 7 in this report
RSS 210	Radiated emission	Table 2 Table 3	PASS	See clause 7 in this report

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement items	Value
Radiated emission	4.6 dB

4. PRODUCT INFORMATION

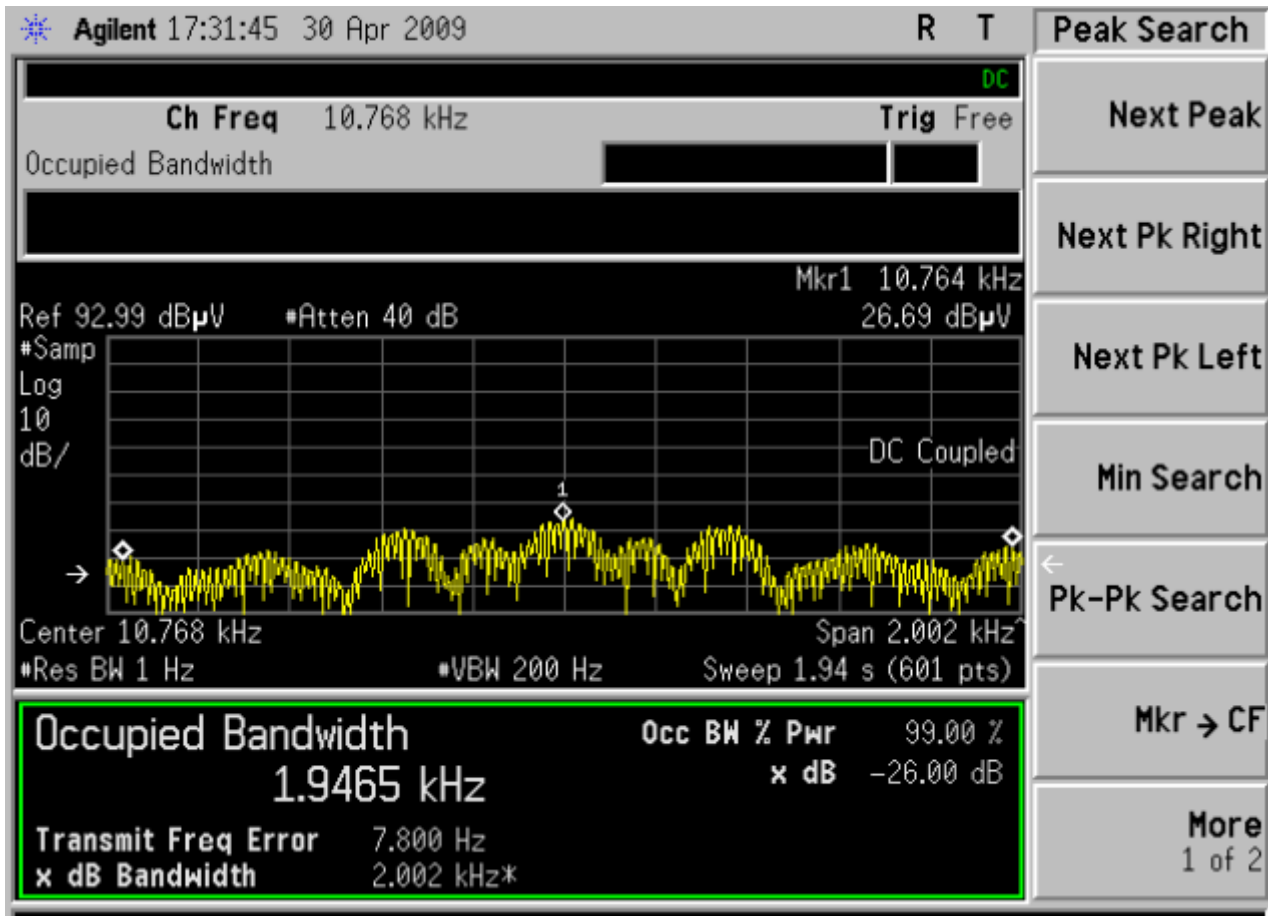
The Model: RAC00-12078

The EUT is an short range, low power, remote control designed as an “ Input Device”. It is designed by way of utilizing the FSK modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 7.5 kHz & 10.7 kHz, one channel per frequency.
- B). Modulation: FSK
- C). Antenna Designation: integral antenna (it can't be moved during the test)
- D). Power Supply: 4×1.5Vdc by battery.

Occupied Bandwidth: 1.95 kHz (transmit frequency: 10.764kHz)



5. FACILITIES AND ACCREDITATIONS

5.1 TEST FACILITY

All measurement facilities used to collect the measurement data are located at Building C, Hongwei Industrial Zone, Baoan 70 District, Shenzhen, Guangdong, China. The sites are constructed in conformance with the requirements of ANSI C63.4, and CISPR 16-1-1.

5.2 TEST EQUIPMENT LIST

Instrumentation: The following list contains equipments used at CTI for testing.

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

Equipment used during the tests:

3M Semi-anechoic Chamber — Radiation Test Site					
Equipment Type	Manufacturer	Model Number	CN	Serial Number	Calibration Date
Spectrum Analyzer	Agilent	E4443A	ASZTTEE E00001-6	MY45300910	09/07/2008
Biconilog Antenna	ETS-LINDGREN	3142C	ASZTTEE E00001-4	920250	01/18/2009
Horn Antenna	ETS-LINDGREN	3117	ASZTTEE E00001-5	00057407	06/27/2008
Loop Antenna	ETS-LINDGREN	6502	BSZTTEE E00005	00071730	09/22/2008
3M Chamber & Accessory Equipments	ETS-LINDGREN	FACT-3	ASZTTEE E00001-1	N/A	05/11/2008

5.3 LABORATORY ACCREDITATIONS AND LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by China National Accreditation Board for Laboratories (CNAS). Electromagnetic Interference tests according to ANSI C63.4 and CISPR 16 requirements.

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

1. See test photographs attached in Appendix 1.
 2. Make sure EUT work normally in max radiation condition during the whole test.
- Note: Set “+” button to max. to make EUT work in max radiation condition.

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	---	---	---	---	---	---
2.	---	---	---	---	---	---
3.	---	---	---	---	---	---

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

7. RADIATED EMISSION TEST

7.1 LIMITS OF RADIATED EMISSION TEST

7.1.1 Rule: FCC Part15.227(a)

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits as below.

Frequency (MHz)	Field strength ($\mu\text{V}/\text{m}$)	Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note: the tighter limit applies at the band edges.

7.1.2 Rule: RSS 210 Table 2 & 3

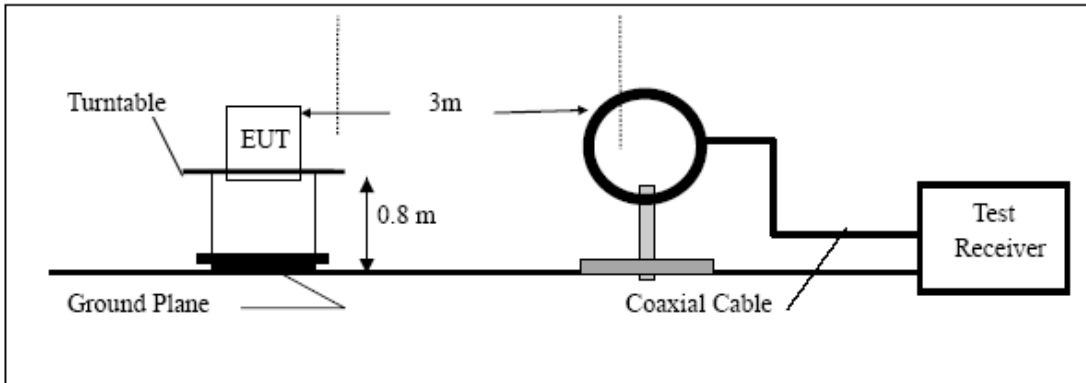
The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits as below.

Frequency (MHz)	Field strength ($\mu\text{V}/\text{m}$)	Field strength ($\mu\text{p}/\text{m}$)	Distance (m)
0.009-0.490	2400/F(kHz)	2400/377F(kHz)	300
0.490-1.705	24000/F(kHz)	24000/377F(kHz)	30
1.705-30	30	--	30
30-88	100	--	3
88-216	150	--	3
216-960	200	--	3
Above 960	500	--	3

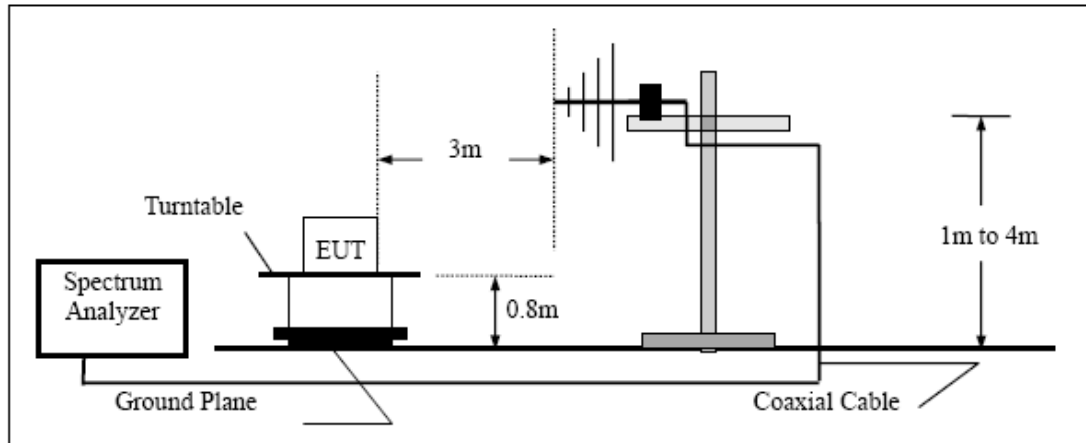
Note: the tighter limit applies at the band edges.

7.2 BLOCK DIAGRAM OF TEST SETUP

(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.3 PROCEDURE OF RADIATED EMISSION TEST

7.3.1 PROCEDURE OF RADIATED EMISSION TEST (above 30MHz)

- a. The EUT was placed on the top of a turntable 0.8 meters above the ground in the chamber, 3 meters away from the antenna (wideband antenna), which was mounted on the top of a variable-height antenna tower. The maximum values of the field strength are recorded by adjusting the polarizations of the test antenna and rotating the turntable.
- b. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- c. The test frequency analyzer system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

7.3.2 PROCEDURE OF RADIATED EMISSION TEST (below 30MHz)

- a. The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 1 meter away from the antenna (loop antenna). The maximum values of the field strength are recorded by adjusting the polarizations of the test antenna and rotating the turntable.
- b. For each suspected emission, the EUT was arranged to its worst case and then turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- c. The test frequency analyzer system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

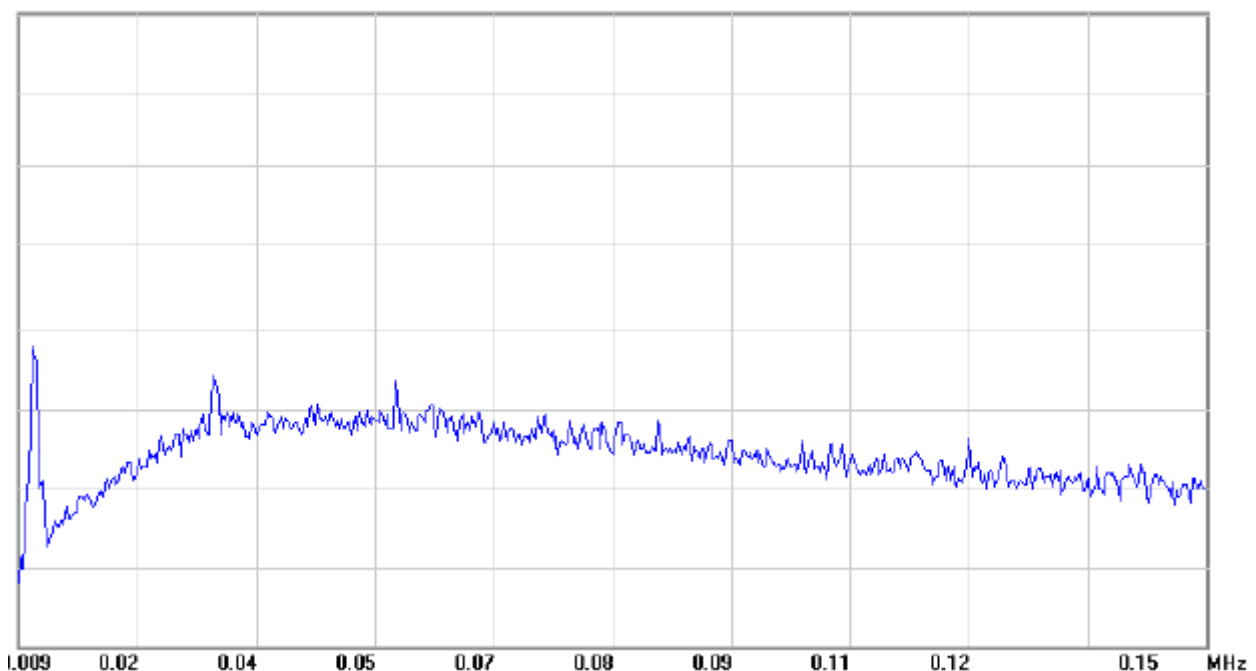
7.4 TEST RESULT OF RADIATED EMISSION TEST

7.4.1 Test Result below 30MHz

Frequency (kHz)	Reading Level @1m (dBµV/m)	Total Factor @1m (dB)	Corrected Level @1m (dBµV/m)	Result Power @300m (dBµV/m)	Limit @300m (dBµV/m)	Result
10.764	26.69	55.62	82.31	-7.69*	47	Pass
No suspicious signal found in other frequency.						

Note: Results dBµV/m @300m = 82.31-10-2×40=-7.69

Correction from 1m to 300m = -10(from 1m to 3m)-2×40(from 3m to 300m)



Data chart from 9kHz to 150kHz

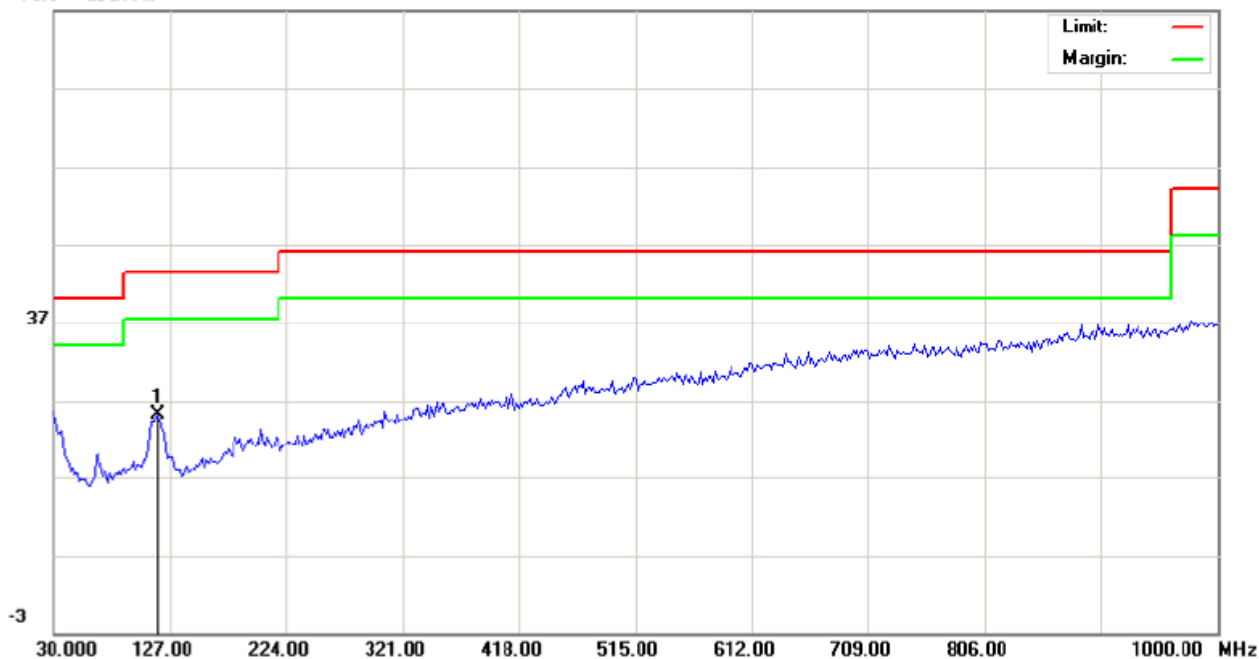
7.4.2 Test Result above 30MHz (test distance = 3m)

No suspicious signal found in other frequency.

Data chart from 30MHz to 1GHz

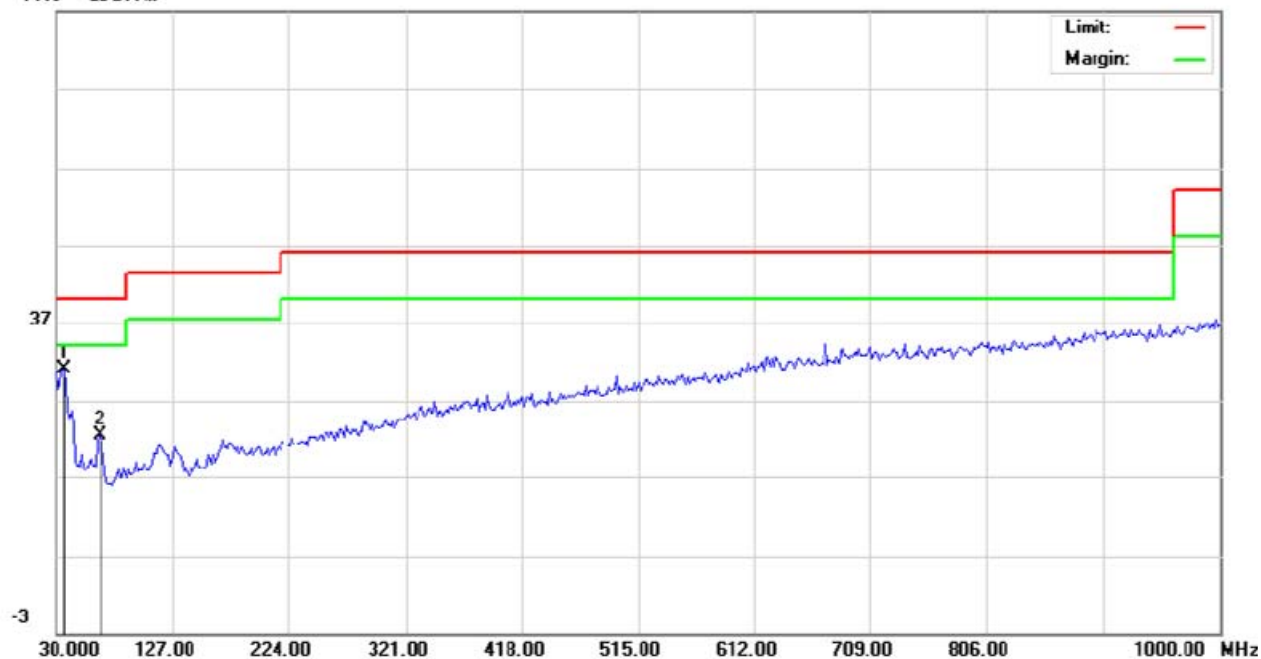
H:

76.9 dBuV/m

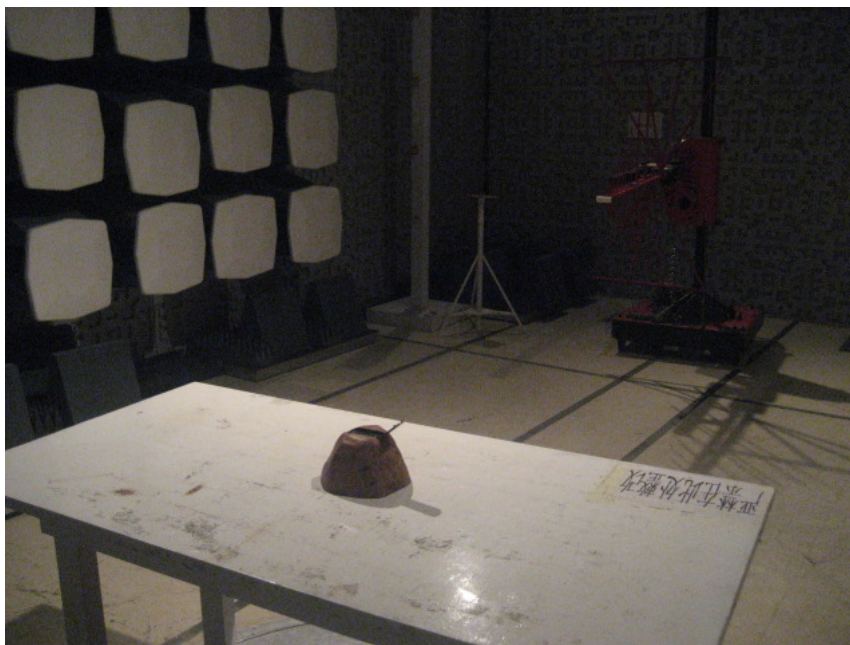


V:

77.0 dBuV/m



APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



TEST SETUP OF RADIATED EMISSION (≥ 30 MHz Wideband Antenna)



TEST SETUP OF RADIATED EMISSION (≤ 30 MHz Loop Antenna)

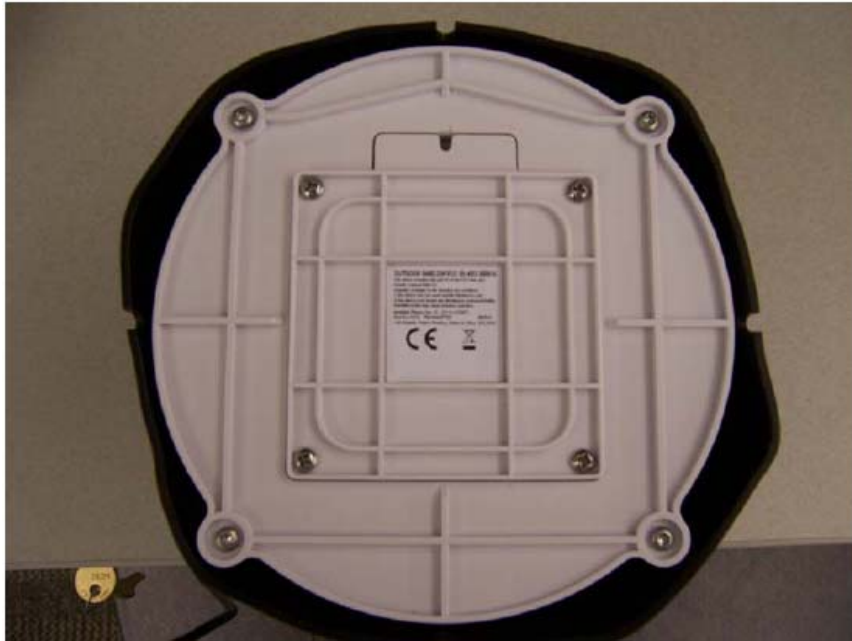
APPENDIX 2 EXTERNAL PHOTOGRAPHS OF EUT



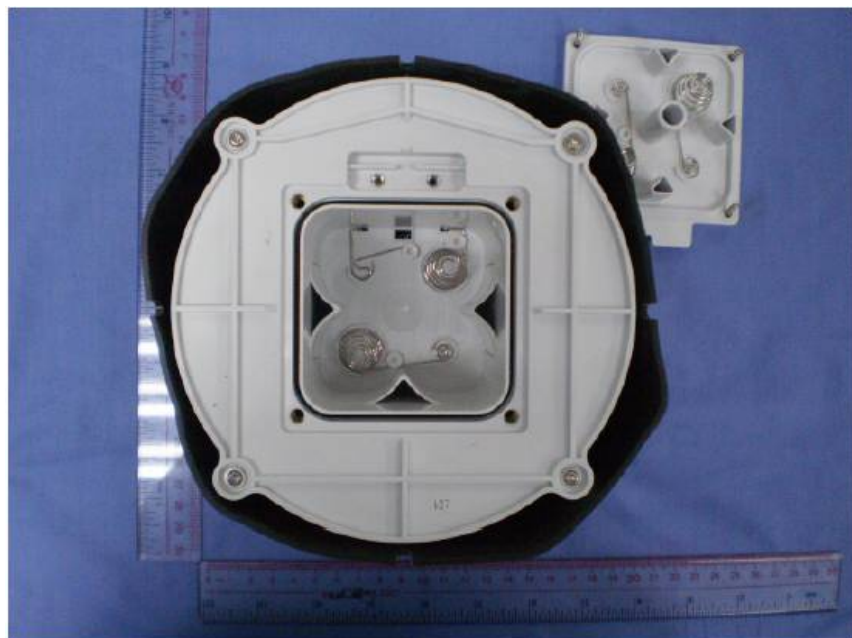
View of EUT-1



View of EUT-2

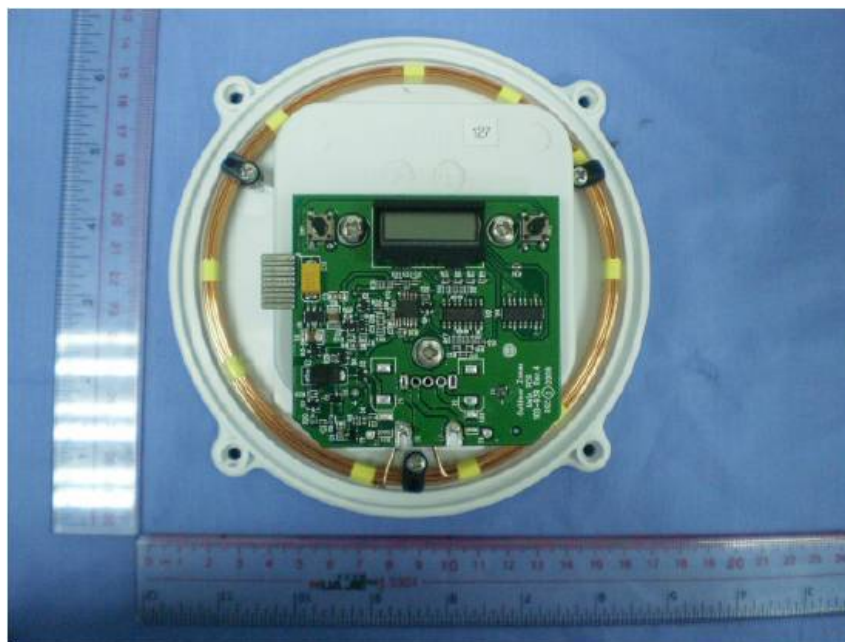


View of EUT-3

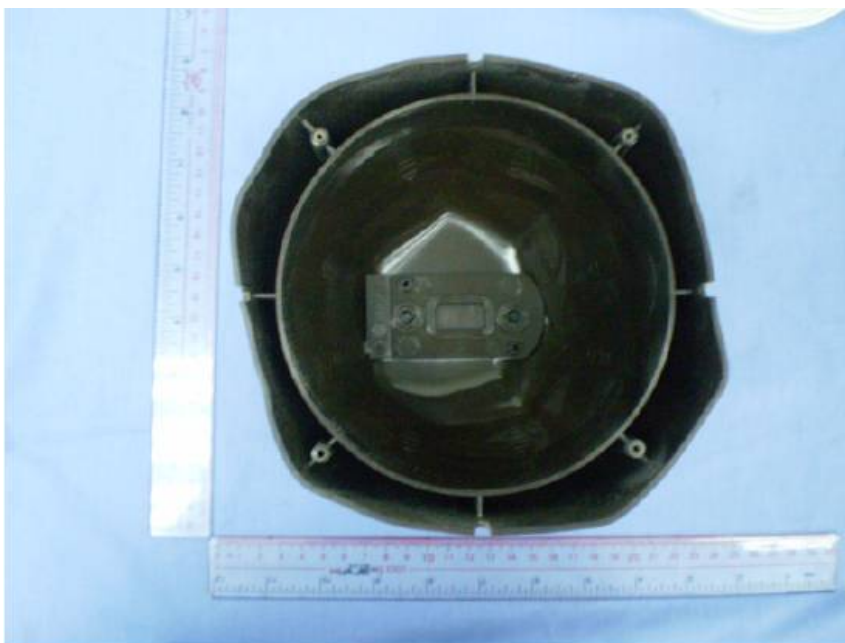


View of EUT-4

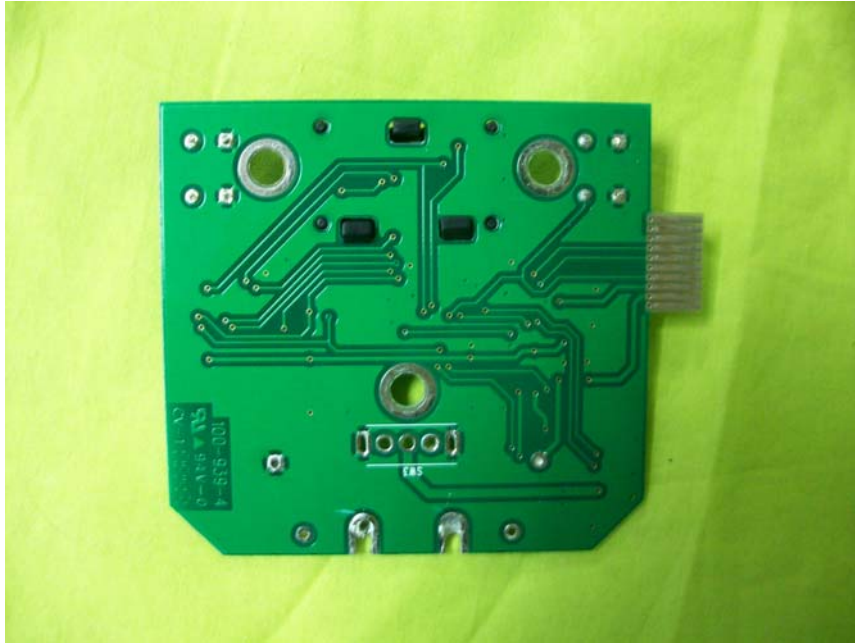
APPENDIX 3 INTERNAL PHOTOGRAPHS OF EUT



Inside-view with PCB



Inside-view with top-enclosure



PCB view-1



PCB view-2

----- End of report -----