

FCC TEST REPORT

FCC ID : KE3-PIF150
Applicant : Radio Systems Corporation
Address : 10427 Petsafe Way Knoxville,TN 37932 United States
Manufacturer : Radio Systems Corporation
Address : 10427 Petsafe Way Knoxville,TN 37932 United States
Equipment Under Test (EUT) :
Product Name : PetSafe Premium Wireless Fence Transmitter
Model No. : PIF-150

Rule : FCC CFR47 Part 15 Section 15.209:2010

Date of Test : March 29 ~ 30, 2013
Date of Issue : April 10, 2013
Test Result : **Pass** *

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

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Testing location: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China

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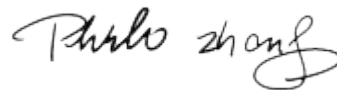
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Compiled by:



Zero Zhou / Project Engineer

Approved by:



Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Test Method	Result
Conducted Emissions	Part 15.207	ANSI C63.4:2003	PASS
Radiated Emissions	Part 15.209	ANSI C63.4: 2003	PASS

Remark:

PASS

Test item meets the requirement

FAIL

Test item does not meet the requirement

N/A

Test case does not apply to the test object

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4 General Information

4.1 General Description of E.U.T.

Product Name	: PetSafe Premium Wireless Fence Transmitter
Model No.	: PIF-150
Model Difference	: N/A
Operation Frequency	: 18.726kHz

4.2 Details of E.U.T.

Technical Data:	: DC 19V , 1.3A powered by adapter (input: 100-240V~ 50/60Hz 0.8A max.)
Adapter model:	: ITC-19V1.3C
Adapter manufacturer:	: Radio Systems Corporation

4.3 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, July 12, 2012.

- **FCC – Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. 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 880581, May 26, 2011.

4.4 Test Location

All the tests were performed at:
Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd., Songgang Street,
Baoan District, Shenzhen, China

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101178	Aug. 13,2012	Aug. 13,2013
2.	LISN	R&S	ENV216	101215	Aug. 13,2012	Aug. 13,2013
3.	Cable	HUBER+SUHNER	CBL2-NN-3M	2230300	Aug. 13,2012	Aug. 13,2013
4.	Switch	---	RSU/M2	---	Aug. 13,2012	Aug. 13,2013
3m Semi-anechoic Chamber for Radiation Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer	Agilent	E7405A	MY45114943	Aug. 13,2012	Aug. 13,2013
2.	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Aug. 13,2012	Aug. 13,2013
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Aug. 13,2012	Aug. 13,2013
4.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Aug. 13,2012	Aug. 13,2013
5.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	399	Aug. 13,2012	Aug. 13,2013
6.	Broadband Preamplifier	SCHWARZBECK	BBV 9719	9719-254	Aug. 13,2012	Aug. 13,2013
7.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Aug. 13,2012	Aug. 13,2013
8.	10m Coaxial Cable with N- plug	SCHWARZBECK	AK 9515 H	-	Aug. 13,2012	Aug. 13,2013
9.	10m 50 Ohm Coaxial Cable with N-plug	SCHWARZBECK	AK 9513	-	Aug. 13,2012	Aug. 13,2013
10.	Positioning Controller	C&C LAB	CC-C-IF	-	Aug. 13,2012	Aug. 13,2013
11.	Color Monitor	SUNSPO	SP-14C	-	Aug. 13,2012	Aug. 13,2013

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radiated Spurious Emissions test	± 5.03 dB (9KHz~1000MHz)
	± 4.74 dB (1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Conducted Emissions

Test Requirement	: FCC CFR47 Part 15 Section 15.207
Test Method	: ANSI C63.4:2003
Test Result	: PASS
Frequency Range	: 150kHz to 30MHz
Limit	: 66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz
Detector	: Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

6.1 E.U.T. Operation

Operating Environment:

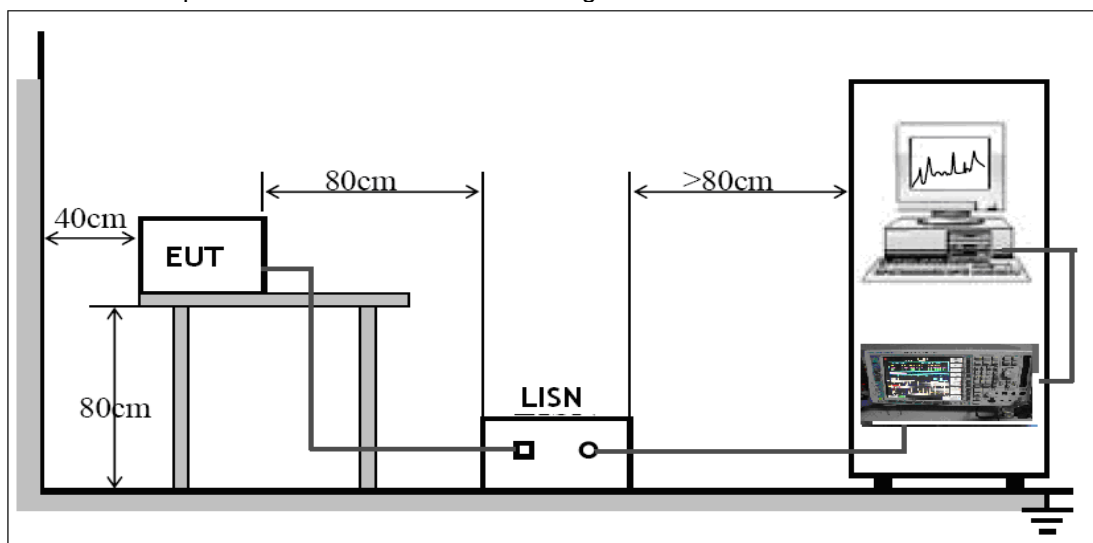
Temperature	: 26 °C
Humidity	: 54% RH
Atmospheric Pressure	: 1010 mbar

6.2 Test Procedure

- (1) The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.
- (2) The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.3 Test Setup

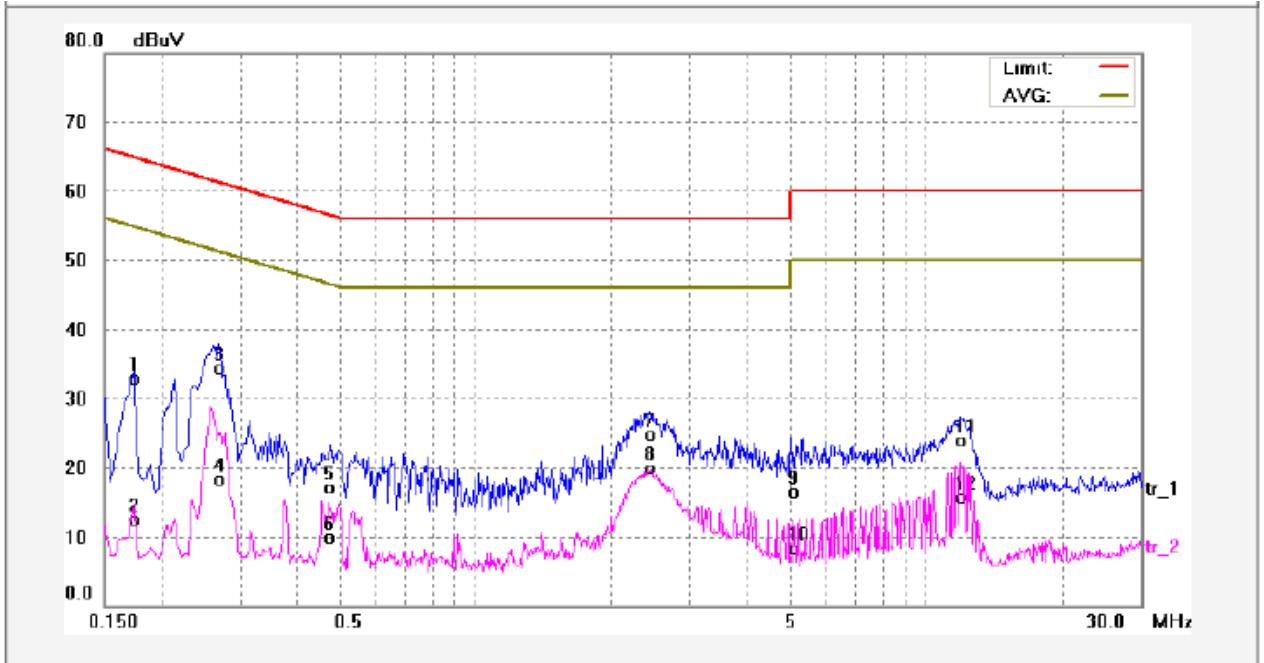
The EUT was placed on the test table in shielding room



6.4 Test Result

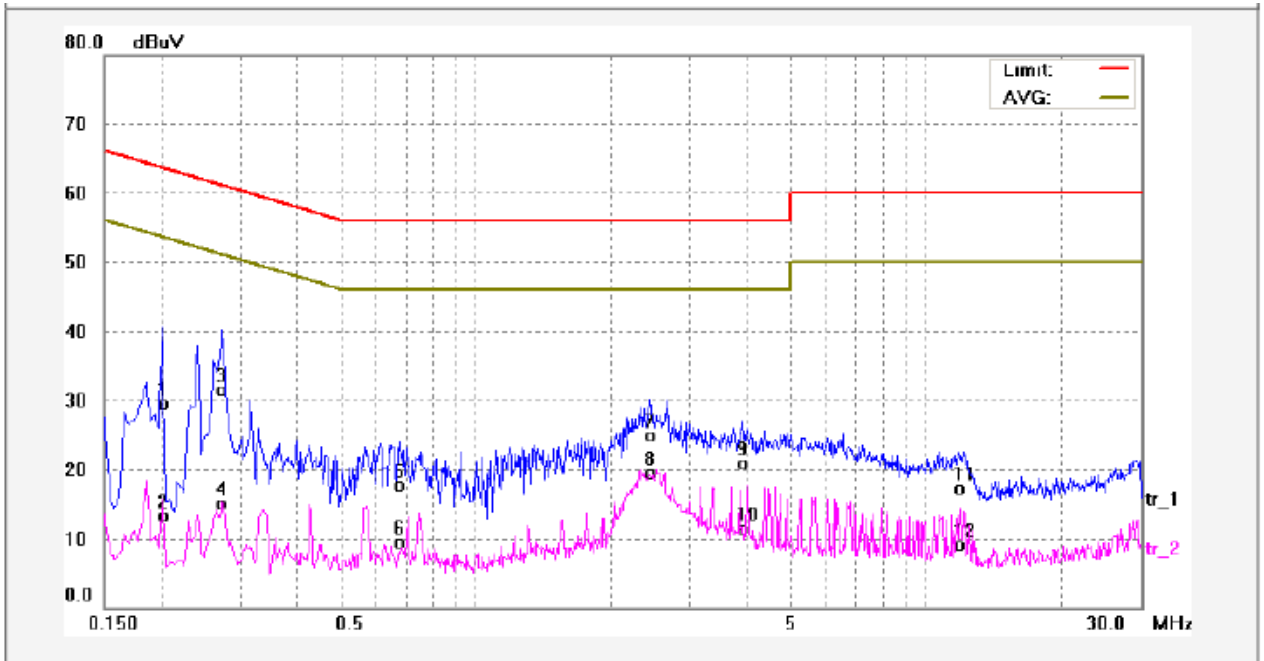
Test Mode: Working Mode

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1740	22.19	9.82	32.01	64.76	-32.75	QP	
2	0.1740	1.95	9.82	11.77	54.76	-42.99	AVG	
3	0.2700	23.68	9.86	33.54	61.12	-27.58	QP	
4	0.2700	7.60	9.86	17.46	51.12	-33.66	AVG	
5	0.4780	6.34	9.92	16.26	56.37	-40.11	QP	
6	0.4780	-0.86	9.92	9.06	46.37	-37.31	AVG	
7	2.4420	13.89	10.01	23.90	56.00	-32.10	QP	
8	2.4420	9.12	10.01	19.13	46.00	-26.87	AVG	
9	5.0140	5.63	10.10	15.73	60.00	-44.27	QP	
10	5.0140	-2.68	10.10	7.42	50.00	-42.58	AVG	
11	11.9420	12.37	10.66	23.03	60.00	-36.97	QP	
12	11.9420	4.24	10.66	14.90	50.00	-35.10	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2020	18.92	9.84	28.76	63.52	-34.76	QP	
2	0.2020	2.58	9.84	12.42	53.52	-41.10	AVG	
3	0.2740	20.87	9.86	30.73	60.99	-30.26	QP	
4	0.2740	4.49	9.86	14.35	50.99	-36.64	AVG	
5	0.6820	7.02	9.95	16.97	56.00	-39.03	QP	
6	0.6820	-1.31	9.95	8.64	46.00	-37.36	AVG	
7	2.4420	14.12	10.01	24.13	56.00	-31.87	QP	
8	2.4420	8.61	10.01	18.62	46.00	-27.38	AVG	
9	3.9180	10.00	10.06	20.06	56.00	-35.94	QP	
10	3.9180	0.69	10.06	10.75	46.00	-35.25	AVG	
11	12.0700	5.77	10.67	16.44	60.00	-43.56	QP	
12	12.0700	-2.43	10.67	8.24	50.00	-41.76	AVG	

7 Radiated Emissions

Test Requirement	: FCC CFR47 Part 15 Section 15.209
Test Method	: ANSI C63.4:2003
Test Result	: PASS
Frequency Range	: 9kHz to 1GHz
Measurement Distance	: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Note:

- The tighter limit applies at the band edges.
For example: F.S limit at 88MHz is 100uV/m
- If measurement is made at 3m distance, then F.S Limit at 3m distance is adjusted by using the formula of $L_{d1} = L_{d2} * (d2/d1)^2$.
For example:
F.S Limit at 30m(d2) distance is 30uV/m(L_{d2}), then F.S Limit at 3m(d1) distance is
 $L_{d1} = 30\text{uV/m} * (30/3)^2 = 100 * 30\text{uV/m}$

7.1 EUT Operation

Operating Environment:

Temperature	: 25.5 °C
Humidity	: 52% RH
Atmospheric Pressure	: 1016 mbar

7.2 Test Procedure

a) Test Procedure (below 30MHz)

- (1) The EUT is placed on a turntable, which is 0.8m above ground plane.
- (2) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- (3) EUT is set 3m away from the receiving antenna.
- (4) Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- (5) Repeat above procedures until the measurements for all frequencies are complete.
- (6) The radiation measurements are performed in X,Y,Z axes position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), the worst is X position.
- (7) AC source used during test.
- (8) A calculated substitution wire ring antenna used during test.

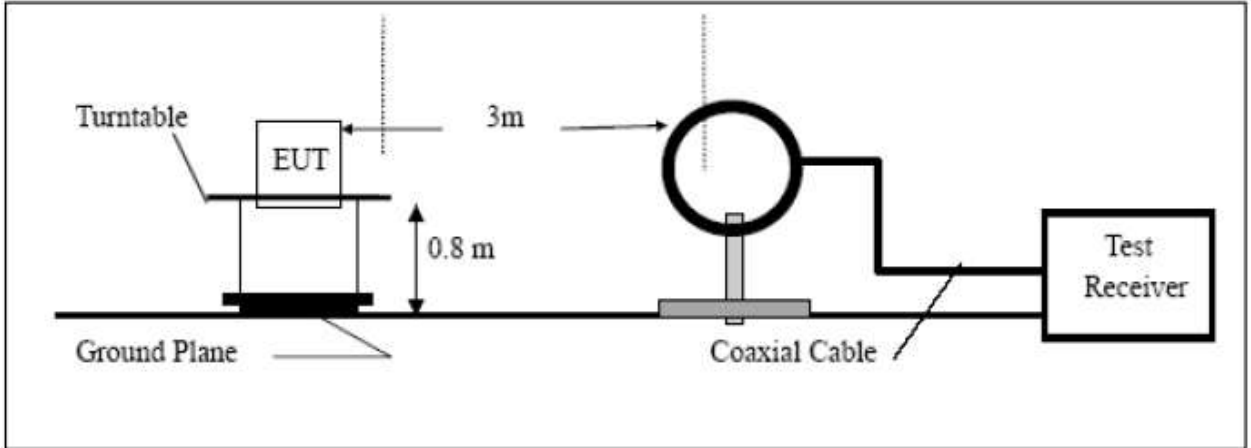
b) Test Procedure (above 30MHz)

- (1) The EUT is placed on a turntable, which is 0.8m above ground plane.
- (2) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- (3) EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
- (4) Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- (5) And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- (6) Repeat above procedures until the measurements for all frequencies are complete.
- (7) The radiation measurements are performed in X,Y,Z axes position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), the worst is X position.
- (8) AC source used during test.
- (9) A calculated substitution wire ring antenna used during test.

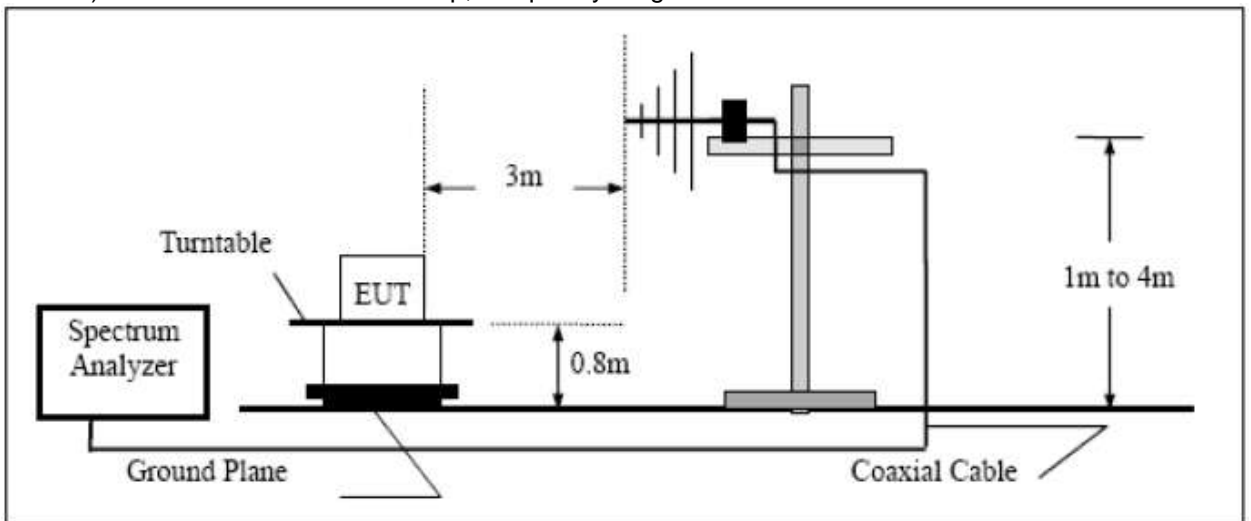
7.3 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site.

a) Radiated Emission Test Setup, Frequency Below 30MHz



b) Radiated Emission Test Setup, Frequency range 30MHz ~ 1000MHz



7.4 Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested 9kHz to 1000MHz.

Below 30MHz:

Sweep Speed Auto
 IF Bandwidth 10 KHz
 Video Bandwidth..... 10KHz
 Resolution Bandwidth..... 10KHz

Above 30MHz:

Sweep Speed Auto
 IF Bandwidth 120 KHz
 Video Bandwidth..... 100KHz
 Quasi-Peak Adapter Bandwidth 120 KHz
 Quasi-Peak Adapter Mode Normal
 Resolution Bandwidth..... 120kHz

7.5 Corrected Amplitude & Margin Calculation

Formula of conversion factors:the field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV/m) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the pressletor was accounted for in the spectrum analyser meter reading.

Example:

Freq(MHz) Meter Reading +ACF=FS

33 20dBuV+10.36dB=30.36dBuV/m @3m

7.6 Test Results

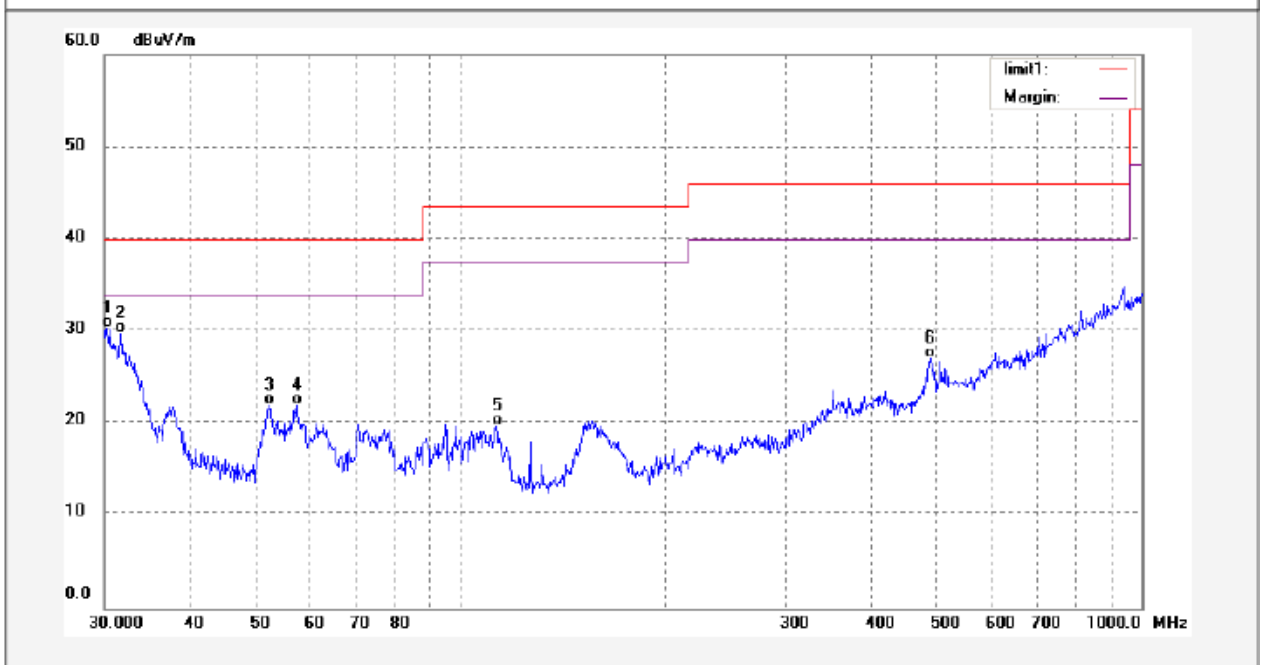
Test frequency below 30MHz:

Frequency (kHz)	Detector	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Measurement Distance (m)
18.726	peak	91.35	127	-35.65	3
No suspicious signal found in other frequency that other emissions are more than 20dB below the limit,the data do not report .					

Test frequency above 30MHz

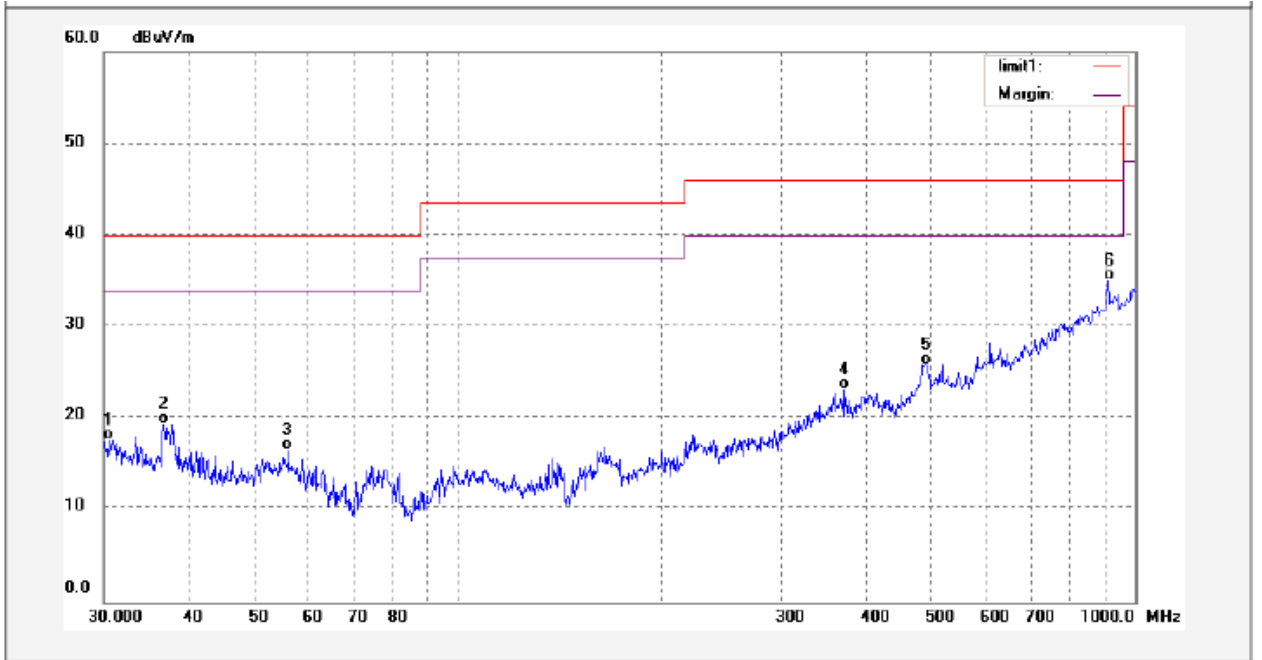
Test Mode: Working Mode

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.2116	14.12	16.19	30.31	40.00	-9.69	QP	
2	31.6235	13.30	16.51	29.81	40.00	-10.19	QP	
3	52.2659	7.48	14.43	21.91	40.00	-18.09	QP	
4	57.4670	8.85	13.13	21.98	40.00	-18.02	QP	
5	112.8229	6.57	13.10	19.67	43.50	-23.83	QP	
6	490.0451	1.30	25.75	27.05	46.00	-18.95	QP	

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.4246	1.43	16.24	17.67	40.00	-22.33	QP	
2	36.7811	3.04	16.45	19.49	40.00	-20.51	QP	
3	56.0708	2.98	13.53	16.51	40.00	-23.49	QP	
4	371.2679	2.64	20.47	23.11	46.00	-22.89	QP	
5	491.7700	0.64	25.29	25.93	46.00	-20.07	QP	
6	912.6953	3.57	31.47	35.04	46.00	-10.96	QP	

8 Photographs–Test Setup

8.1 Photograph –Conducted Emissions Test Setup

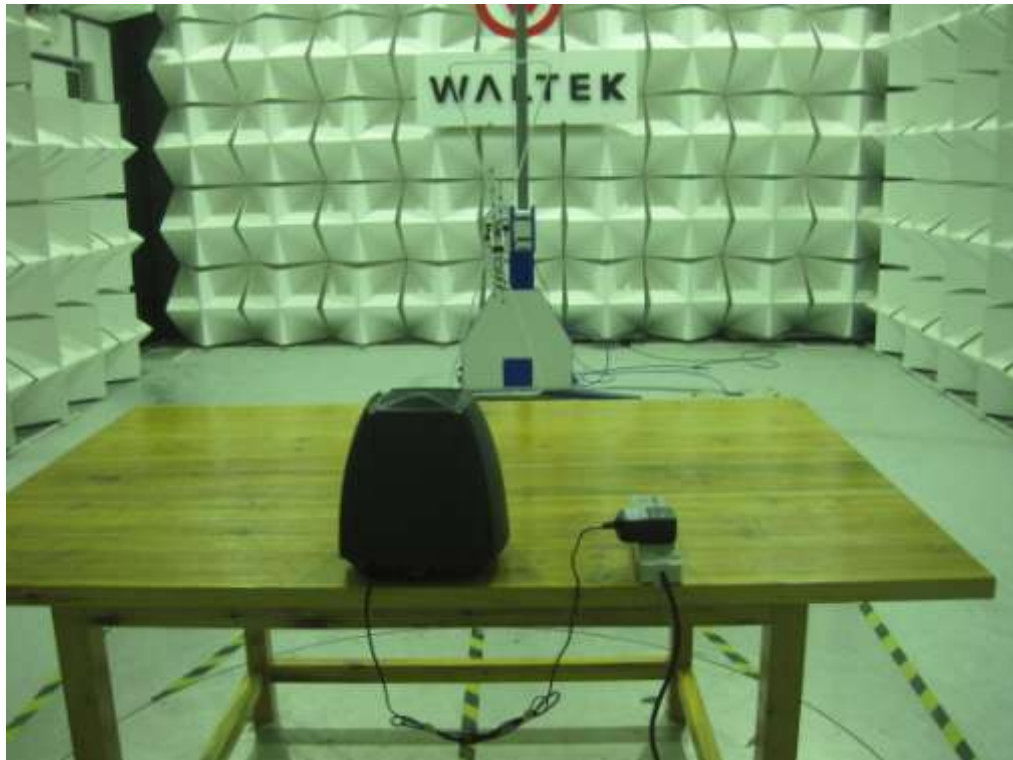


8.2 Photograph – Radiation Emissions Test Setup

Below 30MHz



Above 30MHz



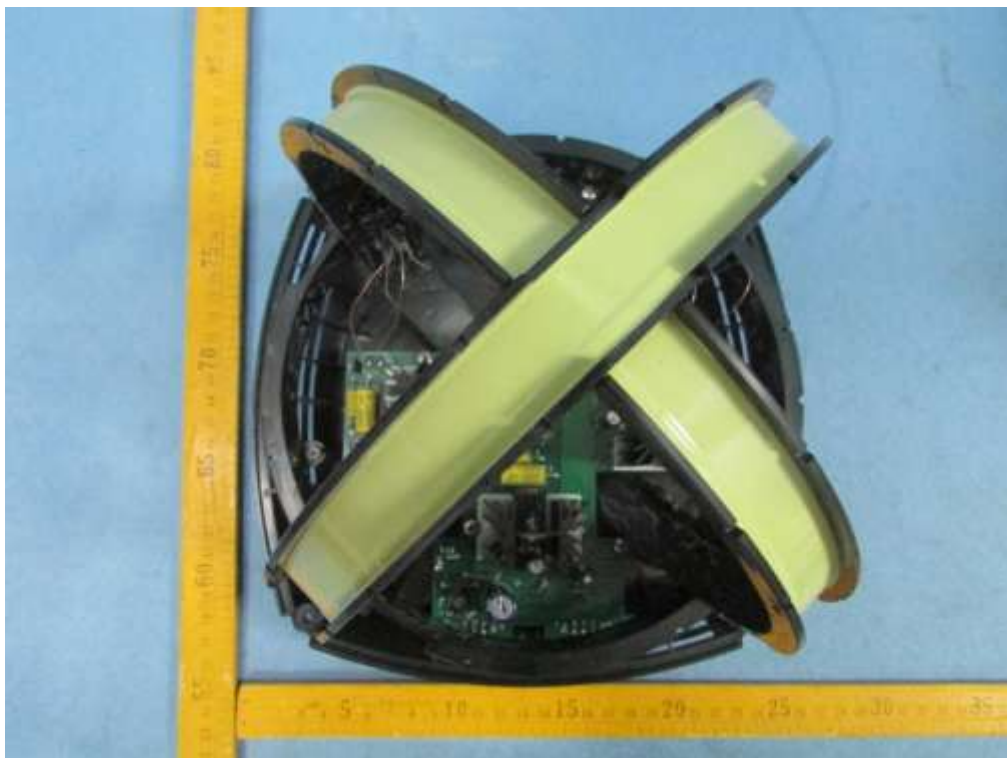
9 Photographs - Constructional Details

9.1 EUT – Appearance View

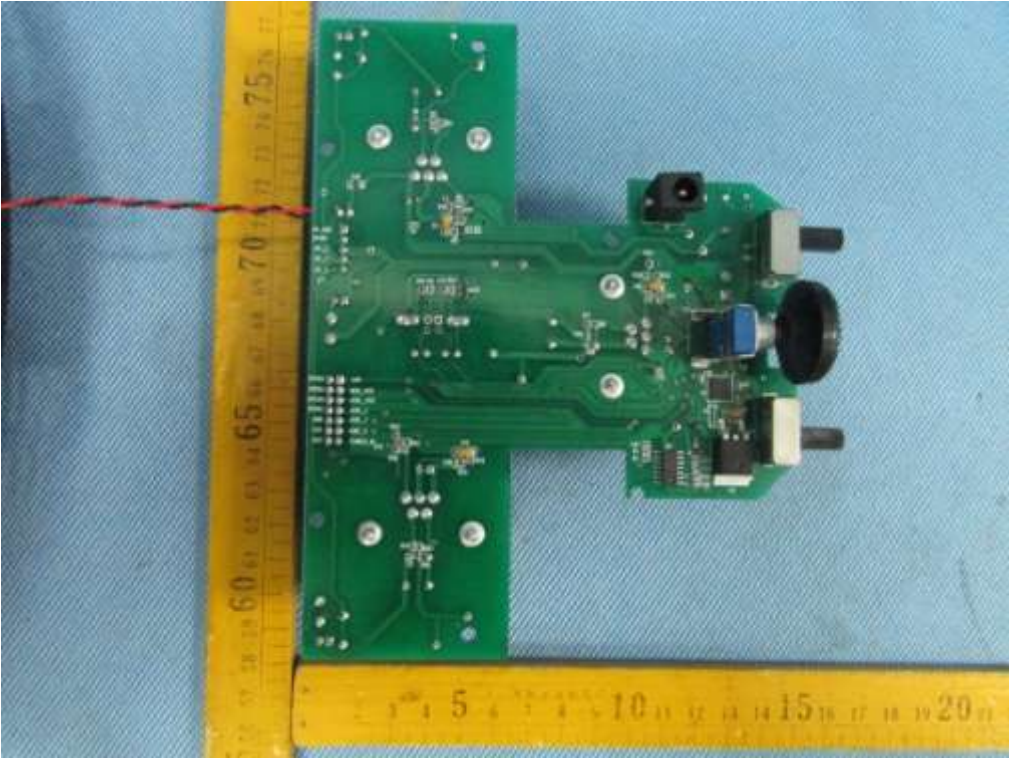
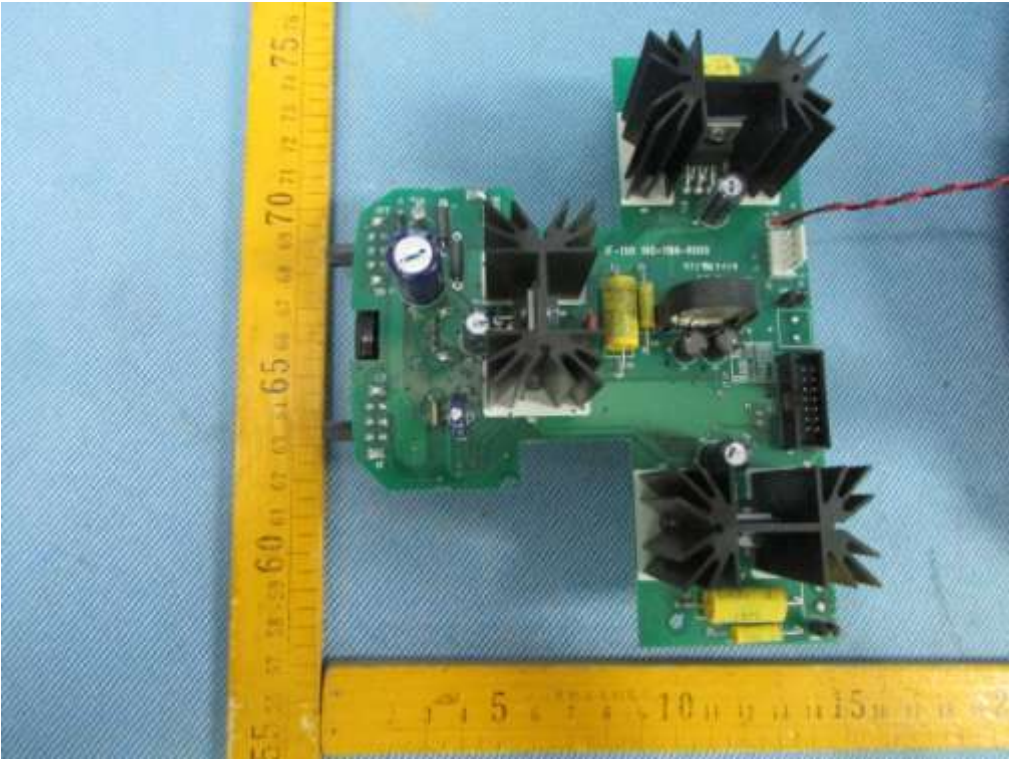




9.2 EUT – Open View



9.3 EUT – PCB View



9.4 Adapter – Appearance View





=End of test report=