

FCC TEST REPORT

FCC ID : I4S-PLL16D-R
Applicant : Peavey Electronics Corporation
Address : 5022 Hartley Peavey Drive Meridian, MS 39305
Manufacturer : Shenzhen Uniwisdom Technologies Co., Ltd.
Address : Bldg.91-94 3rd Industrial Zone, Lisonglang, Gongming Town, Bao'an District, Shenzhen, P.R.China

Equipment Under Test (EUT) :

Product Name : WIRELESS RECEIVER
Model No. : 16 CHANNEL UHF DIVERSITY WIRELESS RECEIVER (PLL-16D)
Rules : FCC CFR47 Part 15 Section 15.109:2012

Date of Test : September 17~18, 2013

Date of Issue : September 29, 2013

Test Result : **PASS***

Remarks:

* The sample described above has been tested to be in compliance with the requirements of the rules listed above.

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.

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

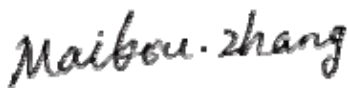
Testing location: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China

Tel :+86-755-83551033

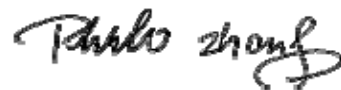
Fax:+86-755-83552400

Compiled by:

Approved by:



Maikou Zhang / Project Engineer



Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Test Method	Result
Radiated Emissions	Part 15.109	ANSI C63.4: 2003	PASS
Conducted Emissions	Part 15.107	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			

3 Contents

	Page
1 COVER PAGE.....	1
2 TEST SUMMARY.....	2
3 CONTENTS.....	3
4 GENERAL INFORMATION.....	4
4.1 GENERAL DESCRIPTION OF E.U.T.....	4
4.2 DETAILS OF E.U.T.....	4
4.3 TEST FACILITY	4
4.4 TEST LOCATION.....	4
5 EQUIPMENT USED DURING TEST.....	5
5.1 EQUIPMENTS LIST	5
5.2 MEASUREMENT UNCERTAINTY.....	5
5.3 TEST EQUIPMENT CALIBRATION.....	5
6 CONDUCTED EMISSIONS.....	6
6.1 E.U.T. OPERATION.....	6
6.2 EUT SETUP	6
6.3 CONDUCTED EMISSION TEST RESULT	7
7 RADIATED EMISSIONS.....	9
7.1 EUT OPERATION :	9
7.2 EUT SETUP	10
7.3 SPECTRUM ANALYZER SETUP.....	11
7.4 TEST PROCEDURE.....	11
7.5 TEST RESULT	12
8 PHOTOGRAPHS – TEST SETUP	16
8.1 PHOTOGRAPH –CONDUCTED EMISSIONS TEST SETUP.....	16
8.2 PHOTOGRAPH – RADIATION EMISSION TEST SETUP	16
9 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS	18
9.1 EUT –APPEARANCE VIEW	18
9.2 EUT – ADAPTER VIEW	20
9.3 EUT – OPEN VIEW	21
9.4 EUT –MODULE VIEW	24

4 General Information

4.1 General Description of E.U.T.

Product Name	: WIRELESS RECEIVER
Model No.	: 16 CHANNEL UHF DIVERSITY WIRELESS RECEIVER (PLL-16D)
Model Description	: N/A
Operation Frequency	: 672-679MHz (RECEIVER)

4.2 Details of E.U.T.

Technical Data	: DC 12-15V, 400mA
Adapter	: Output: DC 13.5V, 400mA Input: AC 120V, 60Hz Manufacturer: N/A

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 No.: 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

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	Spe.21,2012	Spe.20,2013
2.	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Spe.21,2012	Spe.20,2013
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Spe.21,2012	Spe.20,2013
4.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Spe.21,2012	Spe.20,2013
5.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	399	Spe.21,2012	Spe.20,2013
6.	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Spe.21,2012	Spe.20,2013
7.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Spe.21,2012	Spe.20,2013
8.	Cable	Top	EWO2014-7	-	Spe.21,2012	Spe.20,2013
9.	Cable	Top	TYPE16(13M)	-	Spe.21,2012	Spe.20,2013
10.	DC POWER SUPPLY	LWDQGS	PS-303D		Spe.21,2012	Spe.20,2013
11.	Humidity Chamber	GTH-225-40-1P	IAA061213		Spe.21,2012	Spe.20,2013
12.	Spectrum Analyzer	ROHDE & SCHWARZ	FSL6		Sep. 21, 2012	Sep. 20, 2013

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radiated Spurious	± 5.03 dB (Bilog antenna 30M~1000MHz)
Emissions test	± 4.74 dB (Horn antenna 1000M~25000MHz)

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 15.107
Test Method:	ANSI C63.4:2003
Frequency Range:	150kHz to 30MHz
Class:	Class B
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:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	1012 mbar

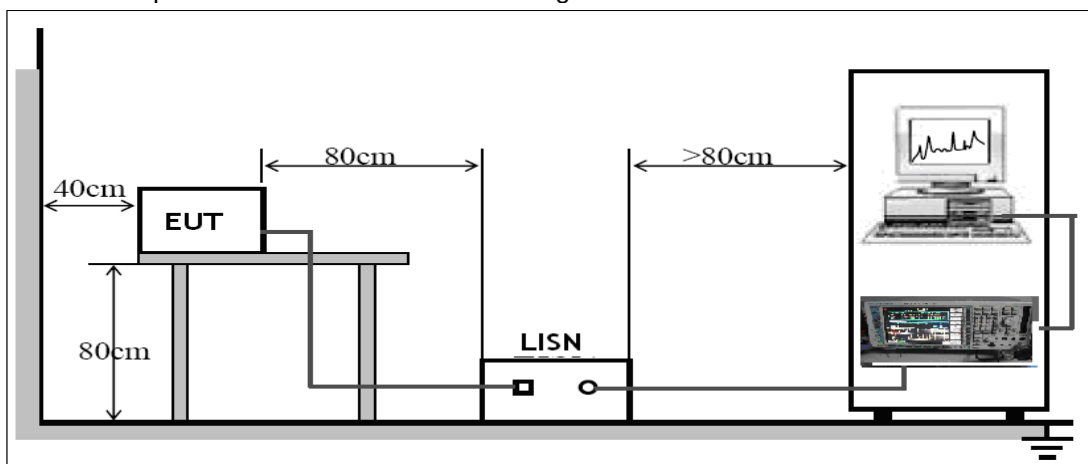
EUT Operation:

The pre-test was performed in receive mode, for this mode, the low, middle and high channel had been tested. The worst mode is the low channel, so the report show that mode's data only. The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.

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.

6.2 EUT Setup

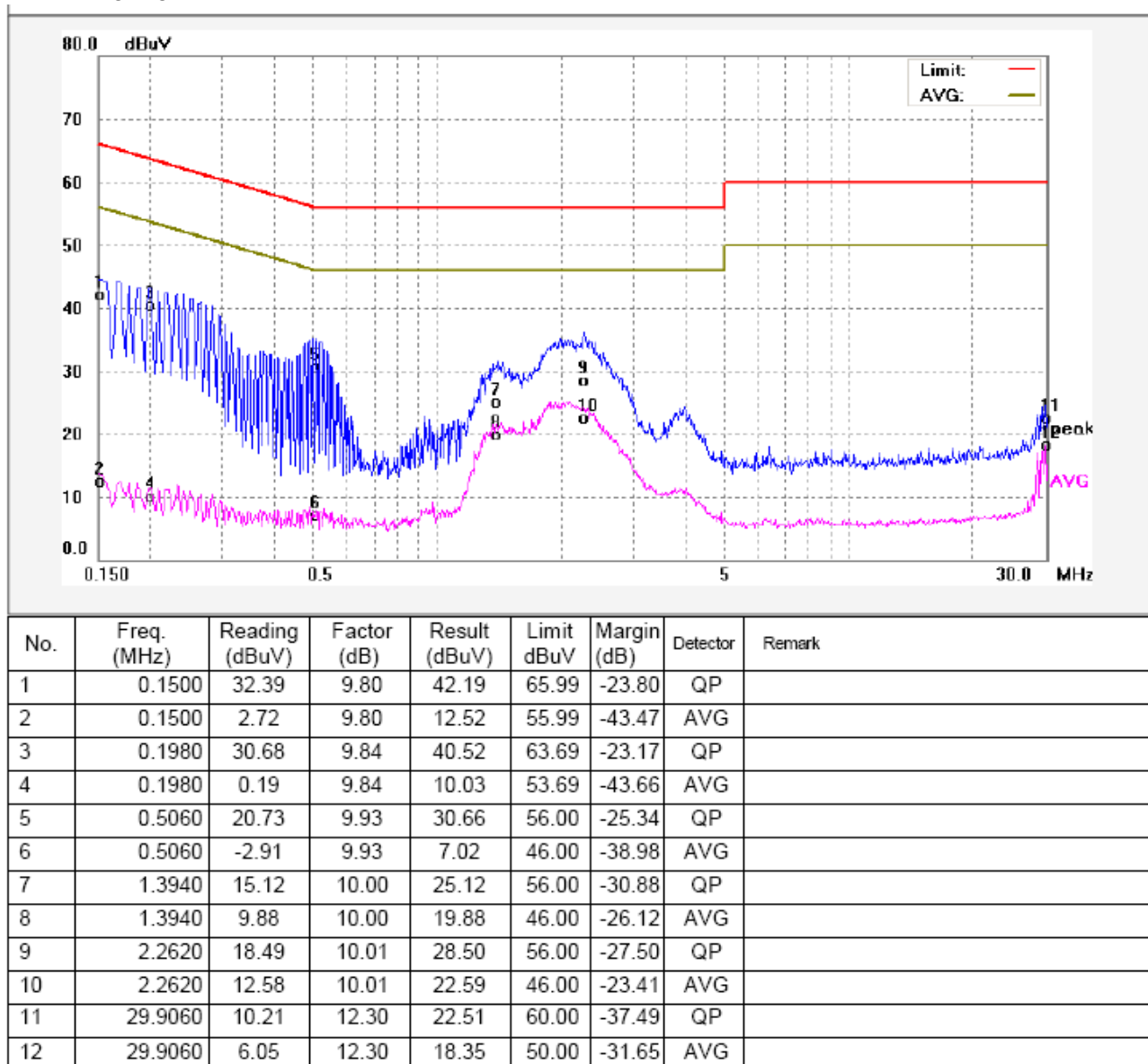
The EUT was placed on the test table in shielding room.



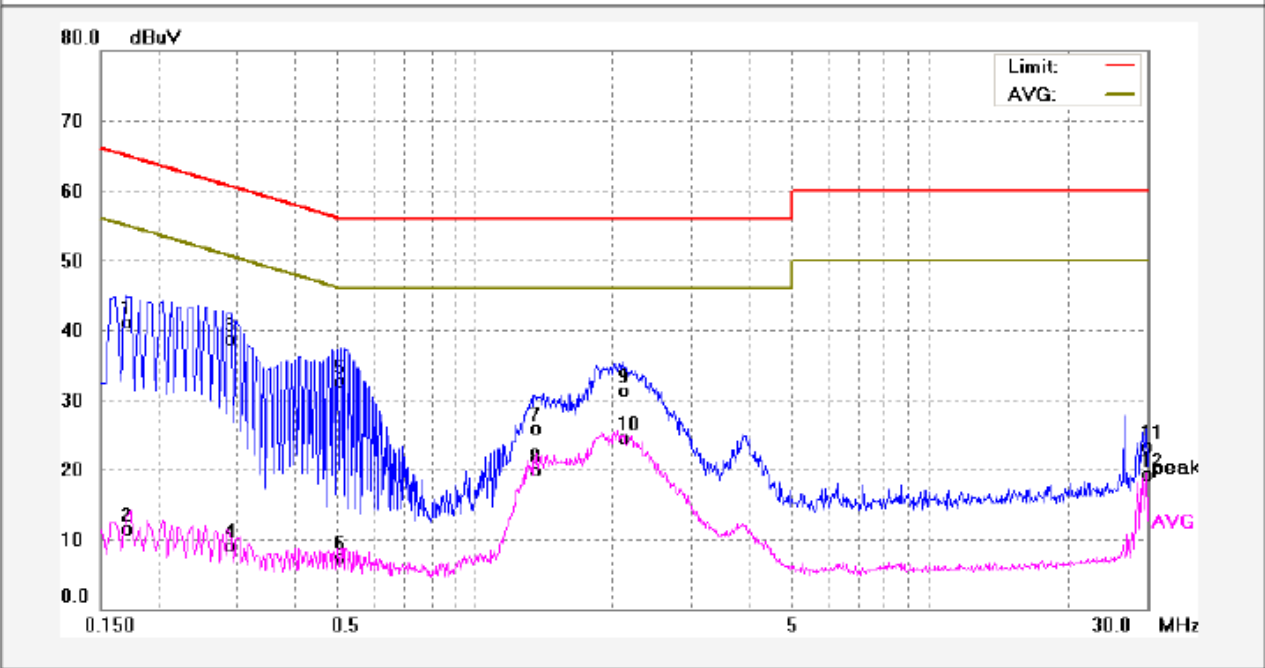
6.3 Conducted Emission Test Result

An initial pre-scan was performed on the live and neutral lines.

Live line:



Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1700	31.33	9.82	41.15	64.96	-23.81	QP	
2	0.1700	1.59	9.82	11.41	54.96	-43.55	AVG	
3	0.2900	28.78	9.87	38.65	60.52	-21.87	QP	
4	0.2900	-0.85	9.87	9.02	50.52	-41.50	AVG	
5	0.5100	22.83	9.93	32.76	56.00	-23.24	QP	
6	0.5100	-2.51	9.93	7.42	46.00	-38.58	AVG	
7	1.3540	15.96	10.00	25.96	56.00	-30.04	QP	
8	1.3540	9.83	10.00	19.83	46.00	-26.17	AVG	
9	2.1140	21.31	10.00	31.31	56.00	-24.69	QP	
10	2.1140	14.45	10.00	24.45	46.00	-21.55	AVG	
11	29.9060	11.09	12.30	23.39	60.00	-36.61	QP	
12	29.9060	6.91	12.30	19.21	50.00	-30.79	AVG	

7 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.109

Test Method: ANSI C63.4:2003

Test Result: PASS

Frequency Range: 30MHz to 4GHz

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:

- a) The tighter limit applies at the band edges.

For example: F.S limit at 88MHz is 100uV/m

- b) 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: 51 % RH

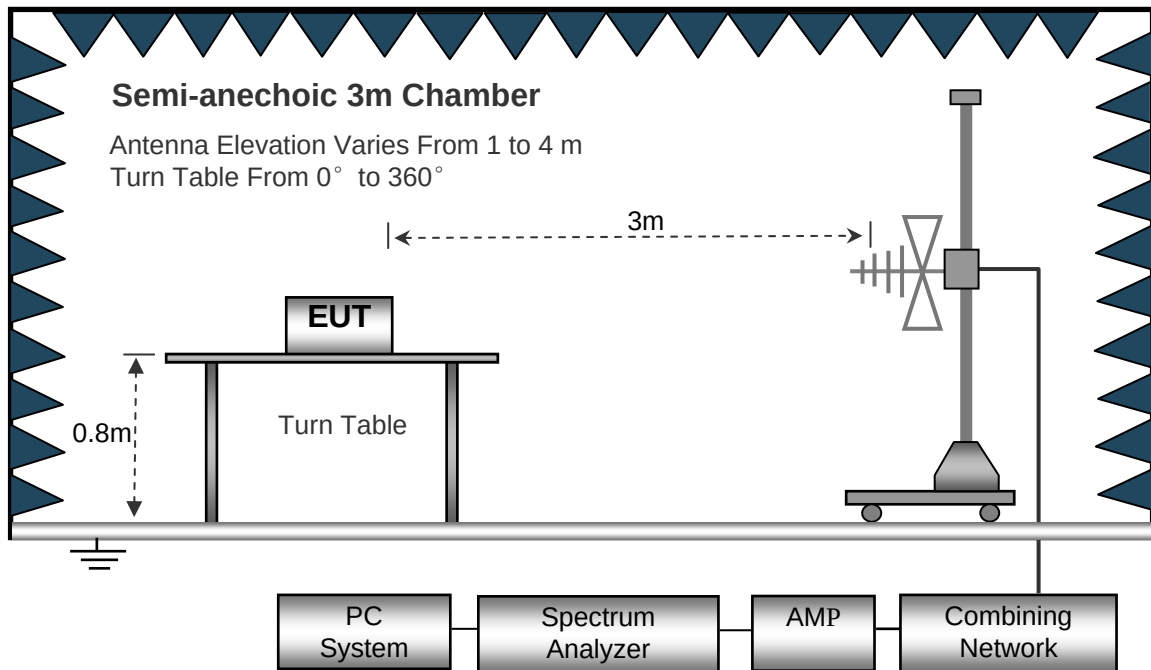
Atmospheric Pressure: 1012 mbar

EUT Operation:

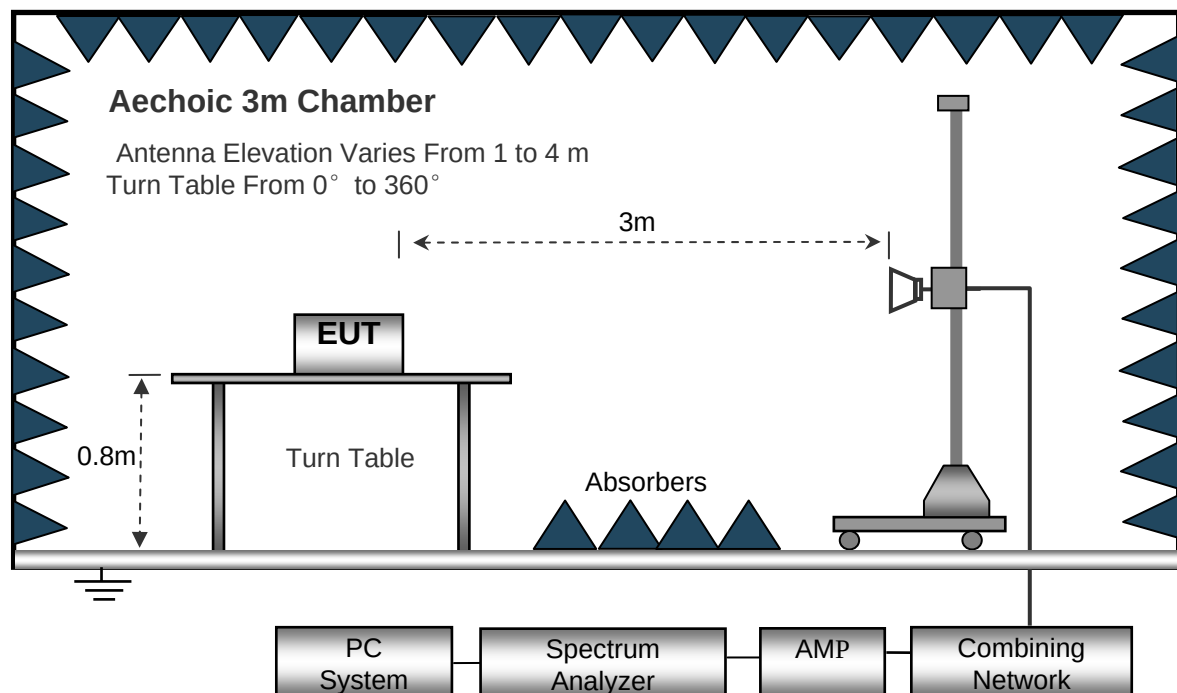
The pre-test was performed in receive mode, for this mode, the low, middle and high channel had been tested. The worst mode is the low channel, so the report show that mode's data only.

7.2 EUT Setup

The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested 30MHz to 4GHz.

30MHz ~ 1000MHz

Sweep SpeedAuto
 IF Bandwidth120KHz
 Video Bandwidth100KHz
 Quasi-Peak Adapter Bandwidth120 KHz
 Quasi-Peak Adapter ModeNormal
 Resolution Bandwidth.....120kHz

Above 1GHz

Sweep SpeedAuto
 IF Bandwidth120KHz
 Video Bandwidth1MHz
 Quasi-Peak Adapter Bandwidth120 KHz
 Quasi-Peak Adapter ModeNormal
 Resolution Bandwidth.....1MHz

7.4 Test Procedure

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. Only the worst case is shown in the report
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X(normal uses) axis positioning. And all the modes was tested in the report.
8. The EUT was tested in receive mode. According to ANSI STANDARD C63.4-2003 12.1.1.2
 OTHER TYPES OF RECEIVERS: In receive mode, a typical signal or an unmodulated CW signal at the operating frequency of the EUT shall be supplied to the EUT for all measurements. Such a signal may be supplied by either a signal generator and an antenna in close proximity to the EUT or directly conducted into the antenna terminals of the EUT. The signal level shall be sufficient to the local oscillator of the EUT. In this report, the antenna of the signal generator is under the turntable.

7.5 Test Result

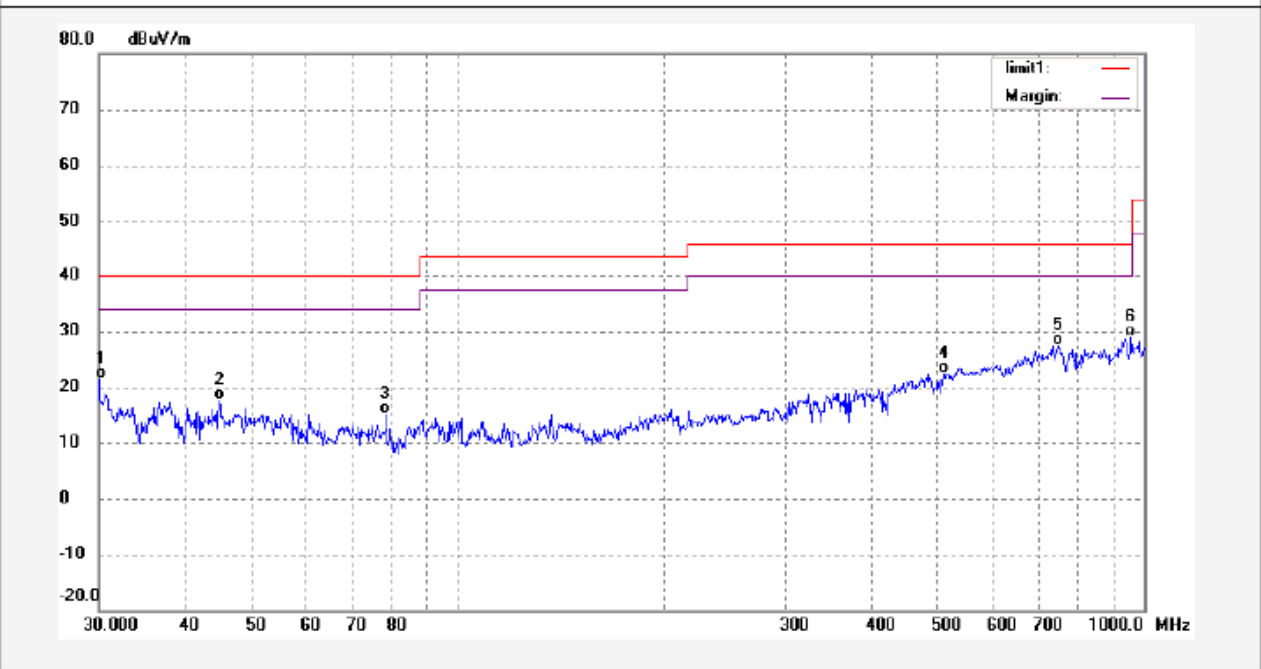
Formula of conversion factors:the field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV/m) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stored in terms of dB. The gain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

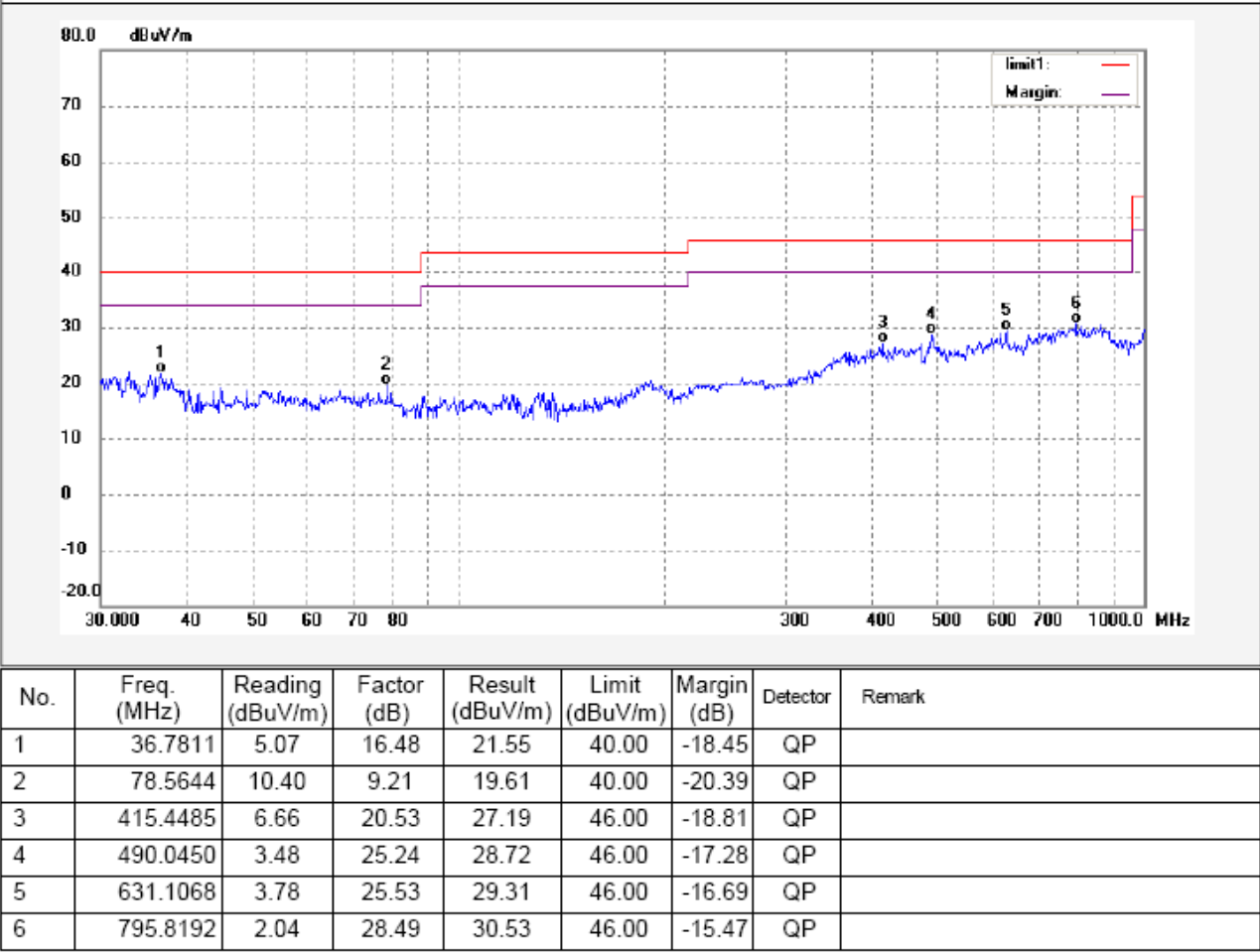
Test Data: 30MHz ~ 1000MHz

Antenna Porlarization: Vertical



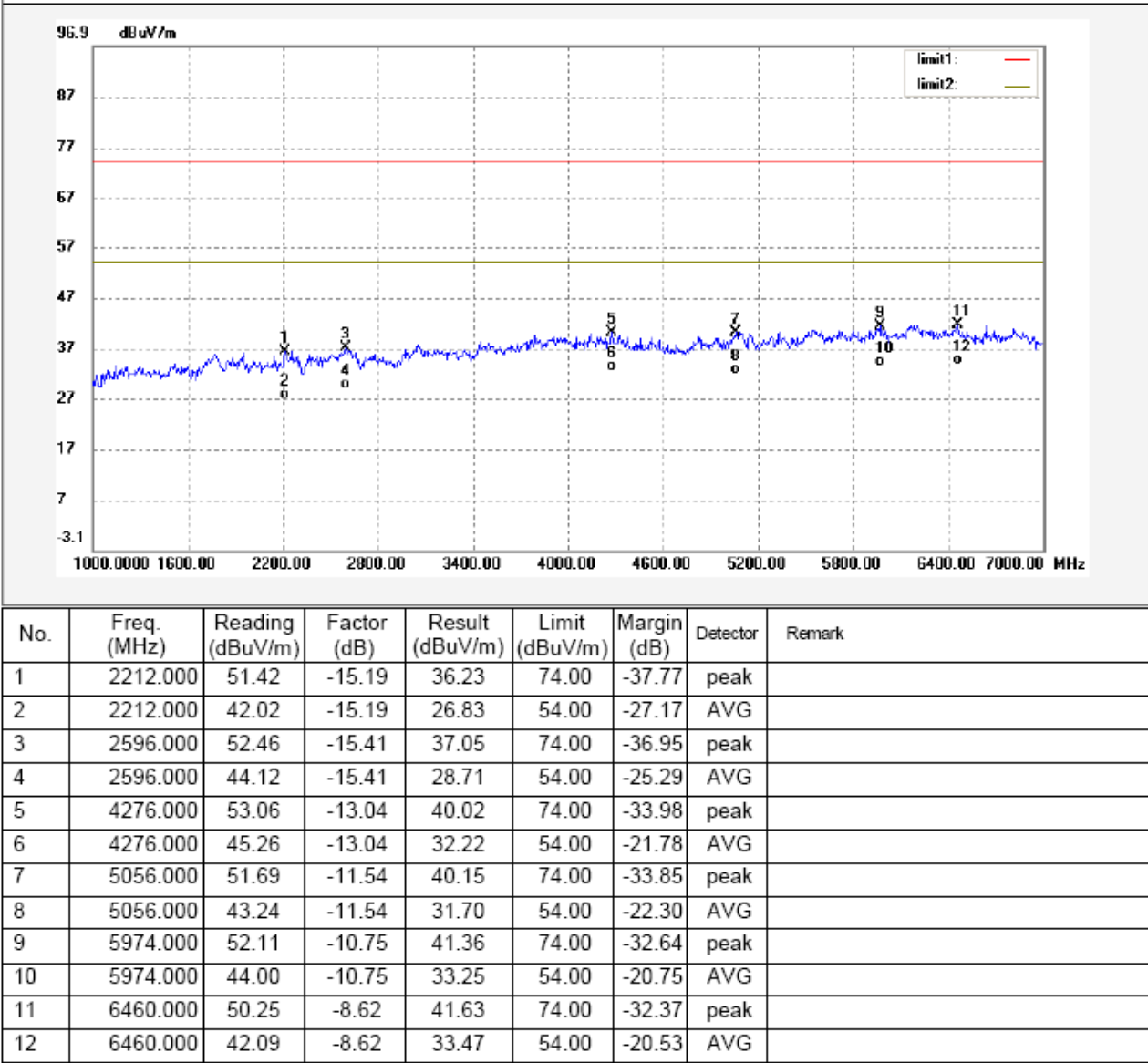
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.0000	5.17	16.20	21.37	40.00	-18.63	QP	
2	44.9369	2.89	14.84	17.73	40.00	-22.27	QP	
3	78.5644	5.90	9.21	15.11	40.00	-24.89	QP	
4	511.1485	-0.67	23.15	22.48	46.00	-23.52	QP	
5	749.6761	0.06	27.36	27.42	46.00	-18.58	QP	
6	958.7133	-0.32	29.13	28.81	46.00	-17.19	QP	

Antenna Porlarization: Horizontal

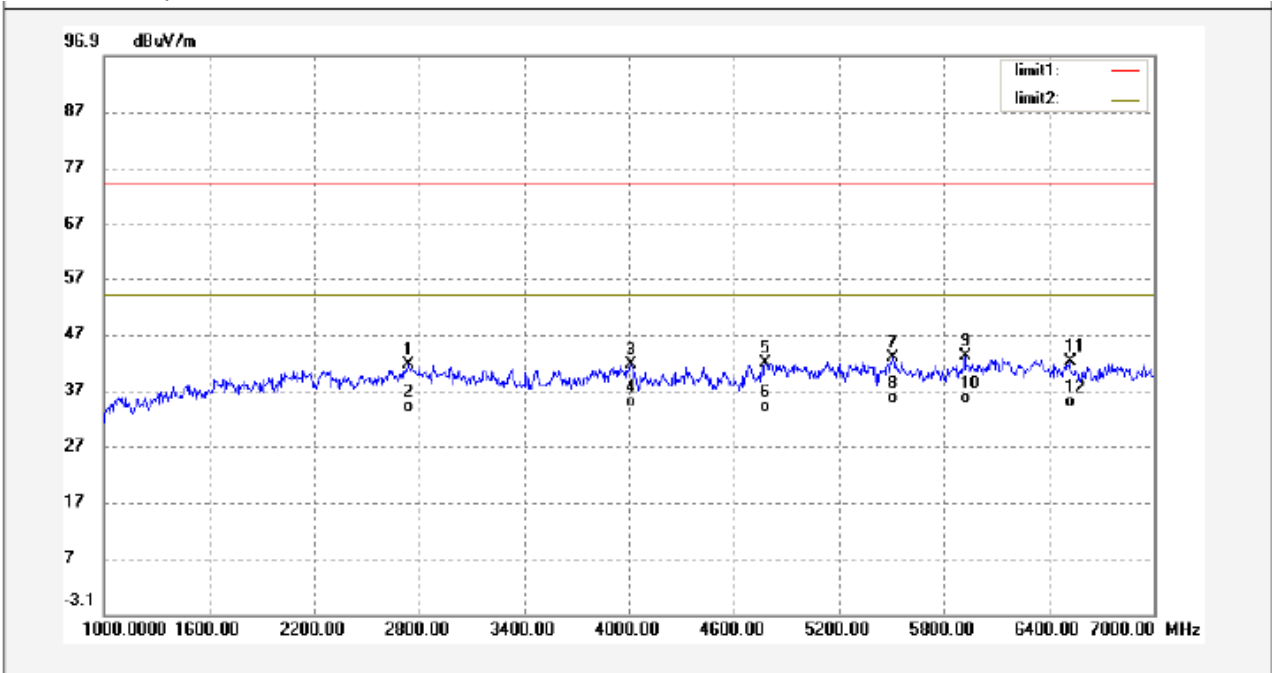


Test Data: 1GHz ~ 4GHz

Antenna polarization: Vertical



Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2740.000	56.45	-14.96	41.49	74.00	-32.51	peak	
2	2740.000	47.89	-14.96	32.93	54.00	-21.07	AVG	
3	4012.000	55.04	-13.42	41.62	74.00	-32.38	peak	
4	4012.000	47.12	-13.42	33.70	54.00	-20.30	AVG	
5	4780.000	53.86	-12.01	41.85	74.00	-32.15	peak	
6	4780.000	45.02	-12.01	33.01	54.00	-20.99	AVG	
7	5506.000	54.33	-11.65	42.68	74.00	-31.32	peak	
8	5506.000	46.27	-11.65	34.62	54.00	-19.38	AVG	
9	5920.000	53.69	-10.77	42.92	74.00	-31.08	peak	
10	5920.000	45.24	-10.77	34.47	54.00	-19.53	AVG	
11	6520.000	50.25	-8.33	41.92	74.00	-32.08	peak	
12	6520.000	42.05	-8.33	33.72	54.00	-20.28	AVG	

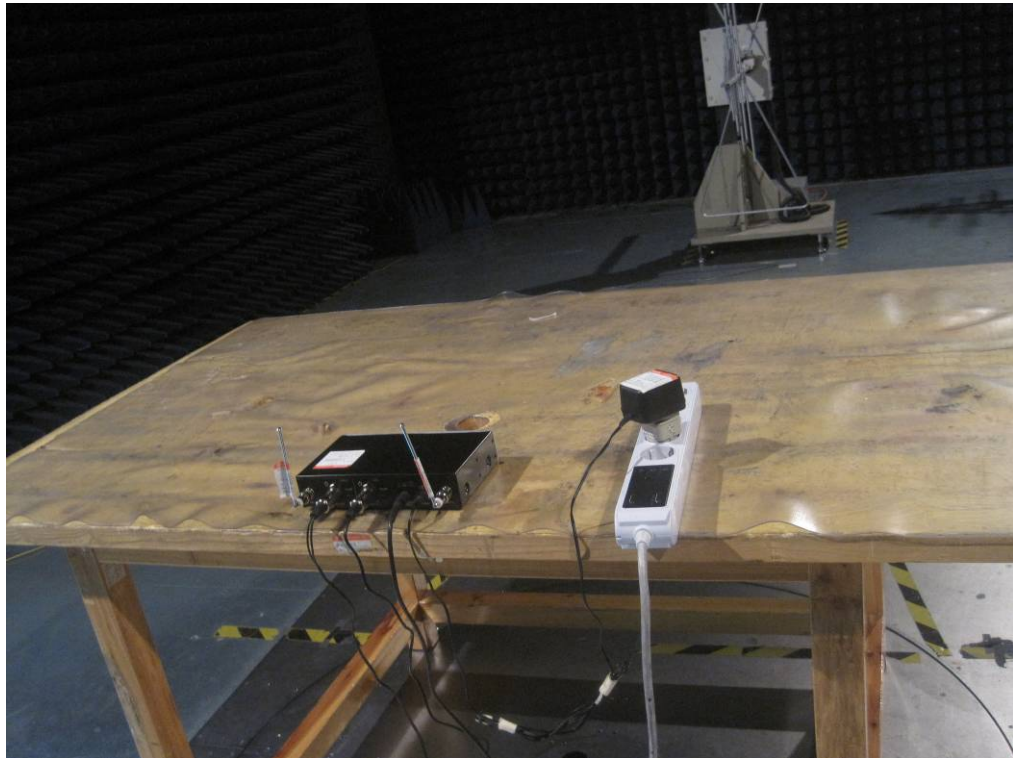
8 Photographs – Test Setup

8.1 Photograph –Conducted Emissions Test Setup

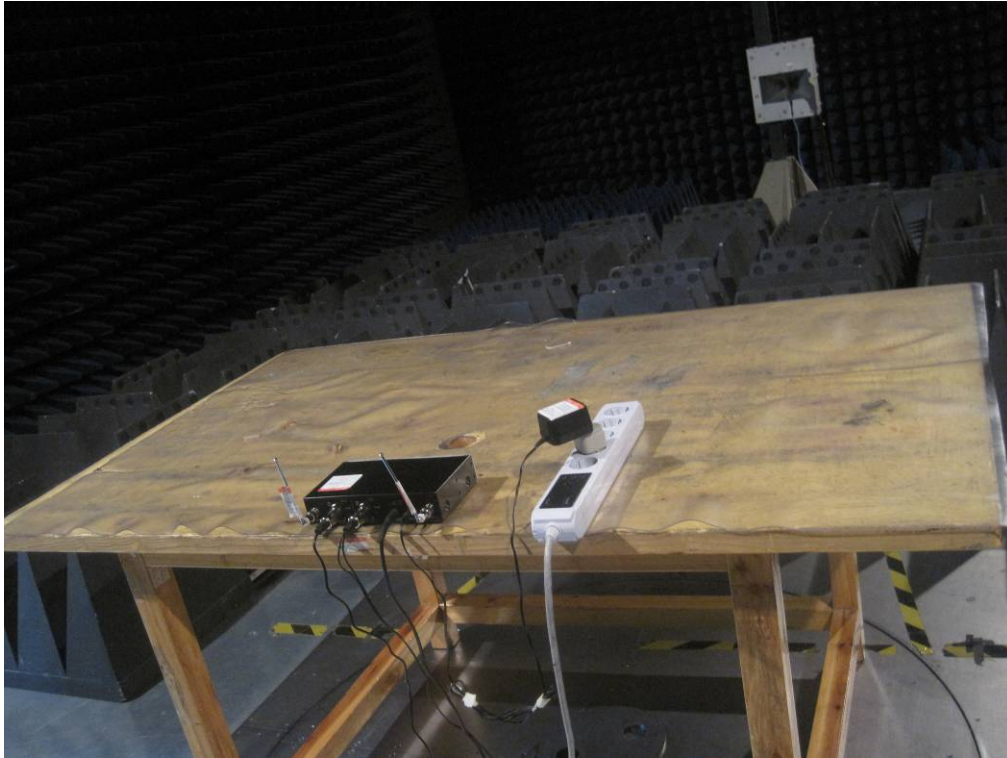


8.2 Photograph – Radiation Emission Test Setup

30MHz to 1GHz



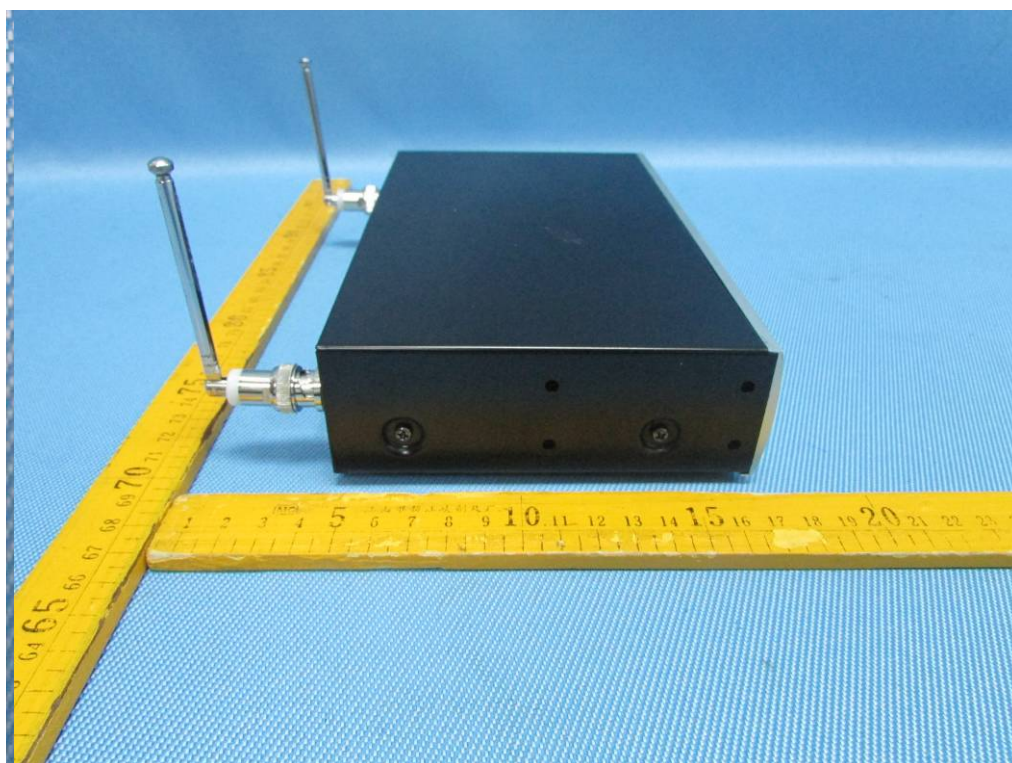
Above 1GHz



9 Photographs - Constructional Details

9.1 EUT –Appearance View





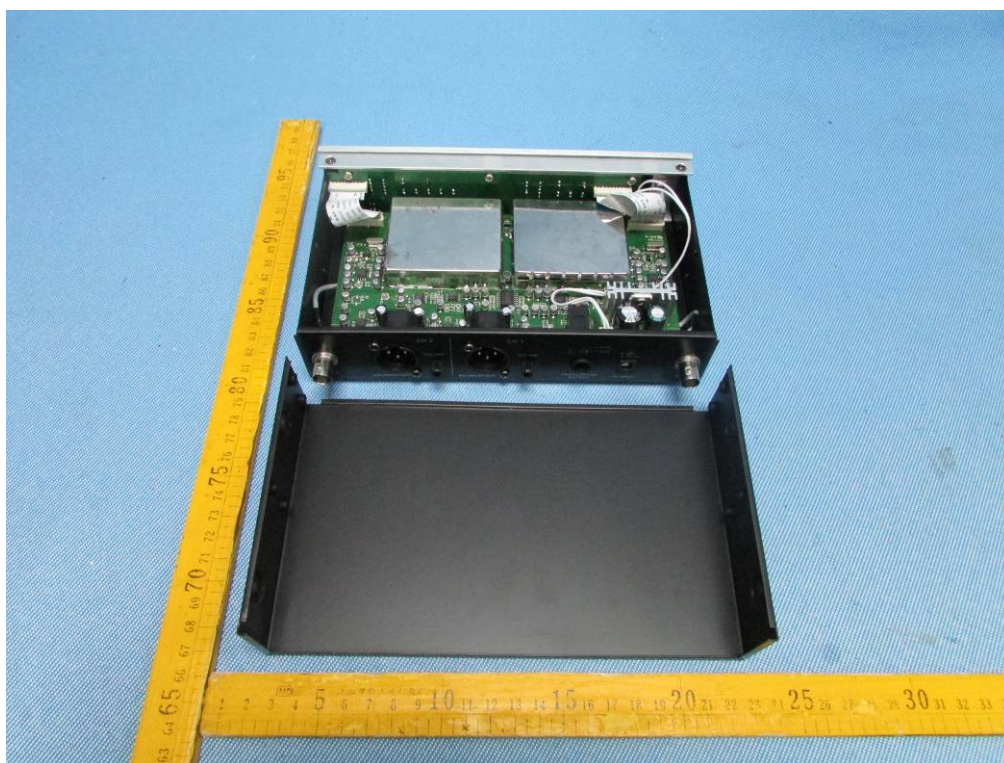


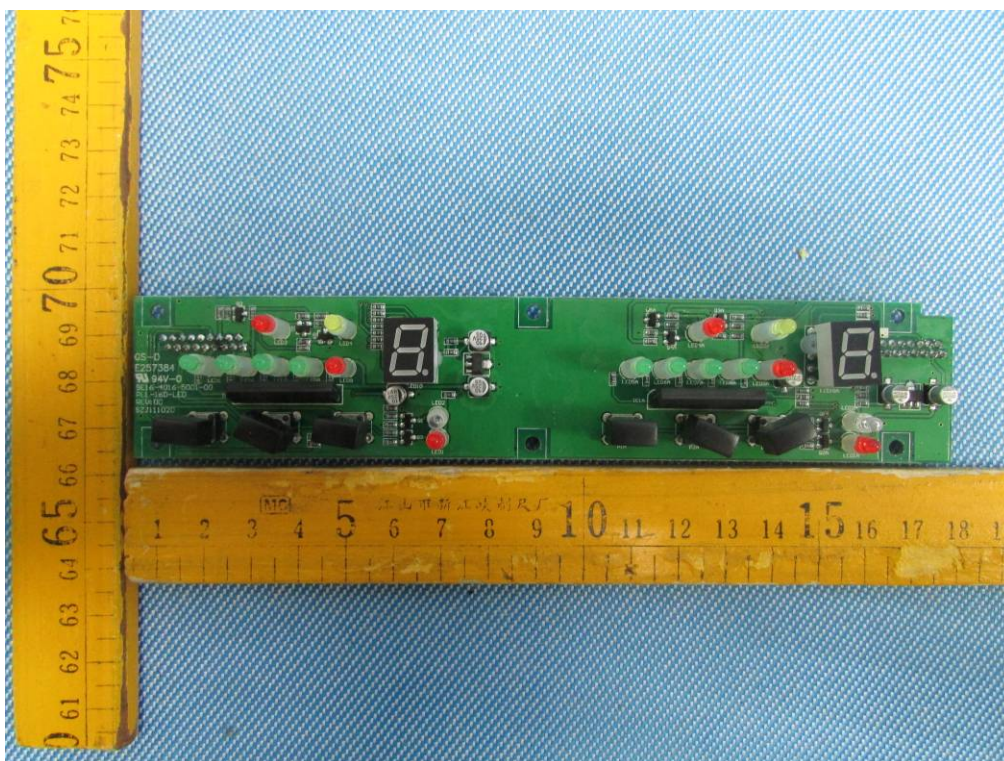
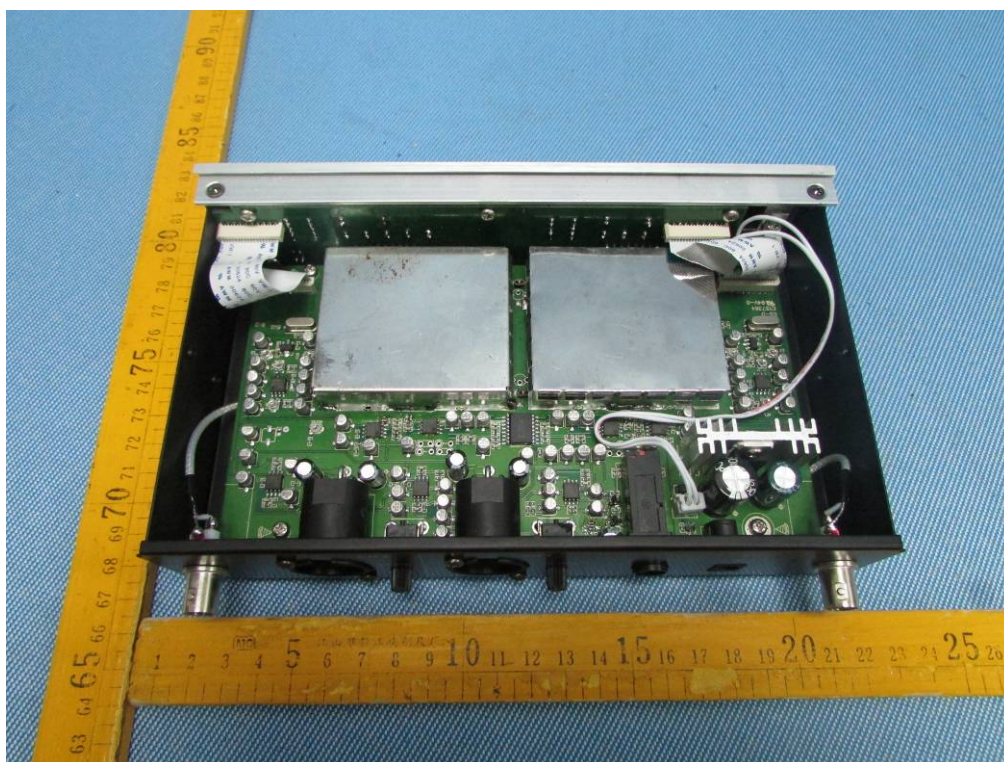
9.2 EUT – Adapter View

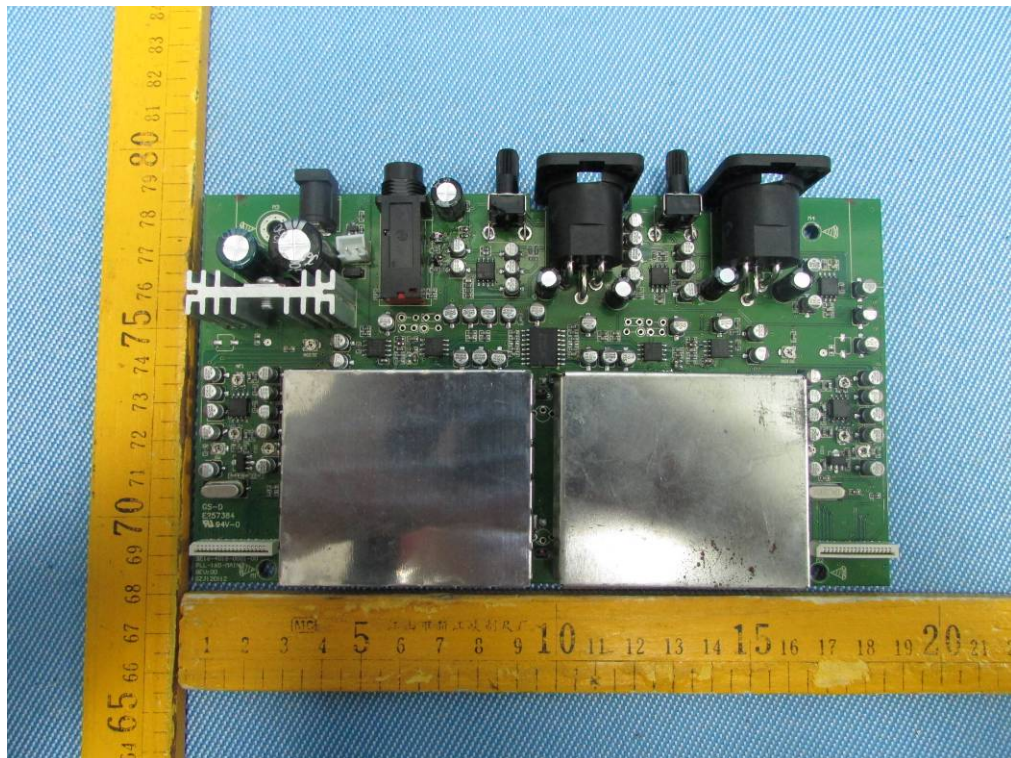
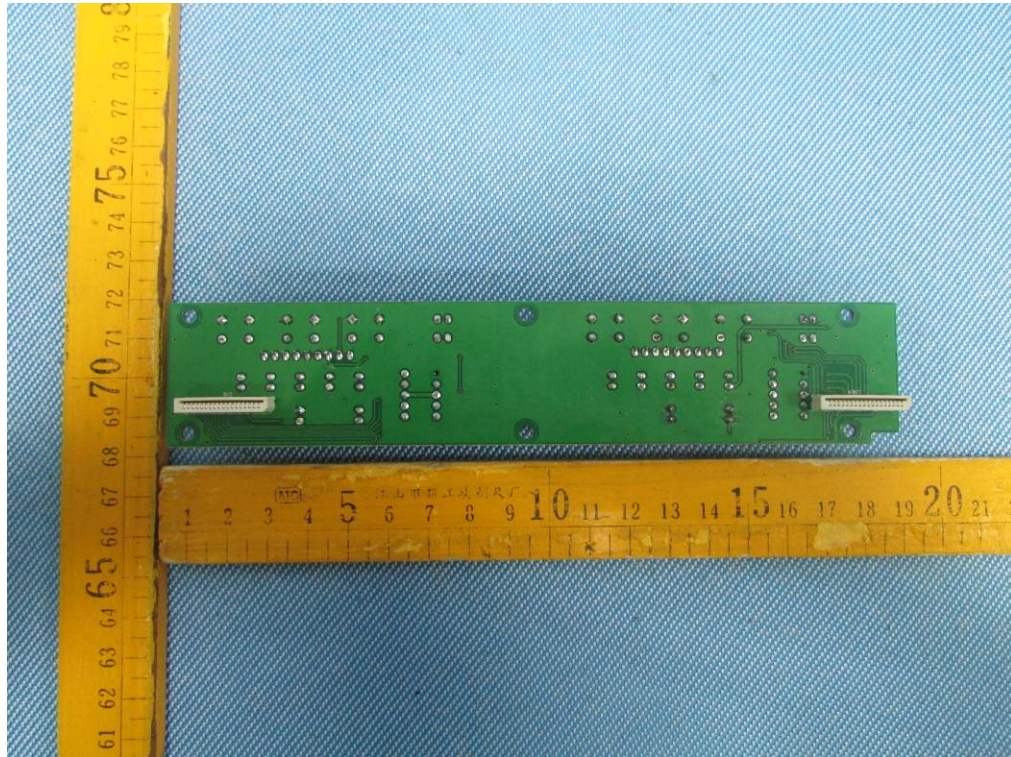


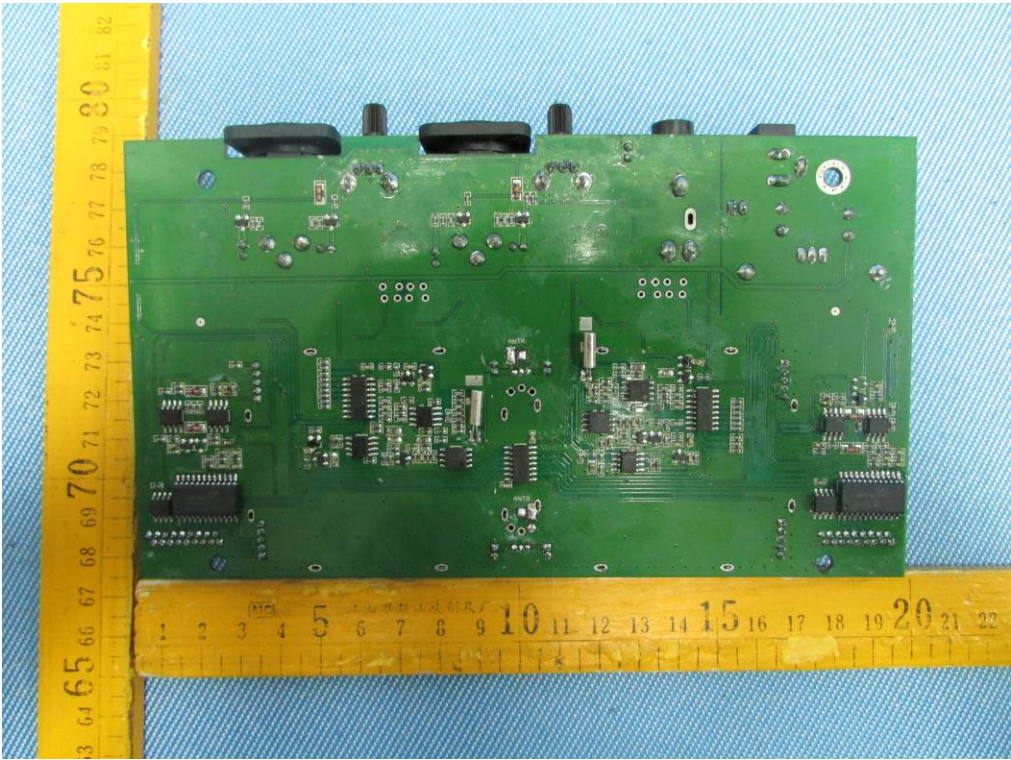


9.3 EUT – Open View

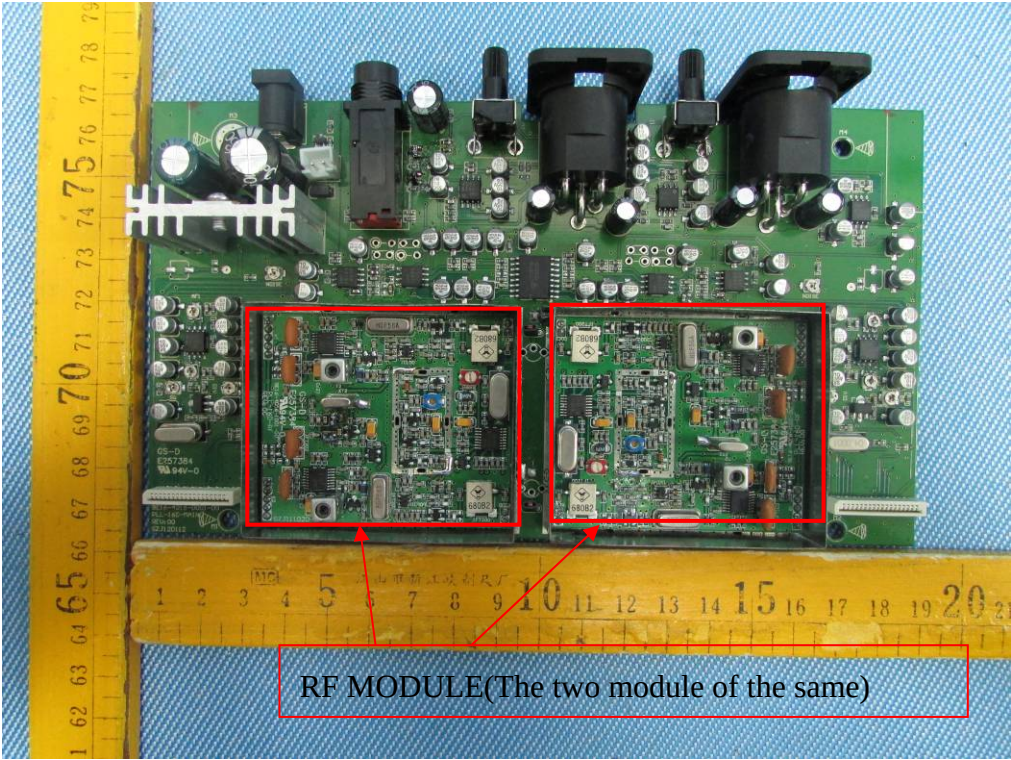








9.4 EUT –Module View



=End of report=