
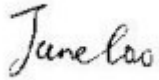
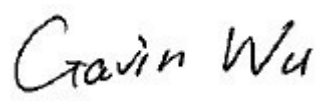


TEST REPORT

Report No.:	EM201100293-2	Application No.:	ZJ00009531
Client:	Harman Consumer, Inc		
Address:	8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES		
Sample Description:	Remote		
Model:	RB85A00		
Test Location:	Guangzhou GRG Metrology and Test Co., Ltd.		
Test Specification:	FCC 15.249:2010		
Test procedure	ANSI C63.10:2009		
Test Date:	2013-03-07 to 2013-03-12		
Issue Date:	2013-03-13		
Test Result:	<i>Pass.</i>		
Tested By:	Reviewed By:	Approved By:	
Eddy Zong / Test Engineer	Jane Cao / Technical Support	Gavin Wu / Manager	
			
Date:2013-03-13	Date:2013-03-13	Date:2013-03-13	
Other Aspects:			
<i>None</i>			
Abbreviations: <i>ok / P = passed; fail / F = failed; n.a. / N = not applicable</i>			
The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT.			

Revision Description

The Intentional Radiators Field Strength of production sample was significantly higher than the engineering sample. We retest the production sample and draw up the new test report.

The test results for clause 5.1.4, clause 5.2.4, and clause 5.3.4 of EM201100293-2 states on page 12, 15, 18 have been revised Compared with EM201100293-1.

Page Number		Remark
EM201100293-1	EM201100293-2	
Page 1	Page 1	Report NO. has been altered
Page11,14,16	Page 12, 15, 18	The test result has been revised

DIRECTIONS OF TEST

1. This station carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.
2. 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.
3. If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.

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1. TEST RESULT SUMMARY

FCC 15.249:2010			
Standard	Item	Limit / Severity	Result
FCC 15.249:2010	Antenna Requirement	FCC Part 15.203	PASS
	Intentional radiators Field Strength	FCC Part 15.249(a)	PASS
	Radiated Electromagnetic Disturbance	FCC Part 15.249 (e)	PASS
	Conduction Emissions	/	N/A(Note)
	Out of Band Emissions	FCC Part 15.249(d)	PASS

Note: The EUT is own DC 3V battery supply

2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name: Harman Consumer, Inc
Address: 8500 Balboa Blvd , Northridge , CA 91329 , UNITED STATES

2.2 MANUFACTURER

Name: Harman Consumer, Inc
Address: 8500 Balboa Blvd , Northridge , CA 91329 , UNITED STATES

2.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Remote
Model No.: RB85A00
Adding Model: /
Trade Name: Harman/Kardon
Power Supply: DC 3V(Battery)
Frequency Range: 2402
Antenna gain -4.26dBi
Channel number Single channel
Note: /

2.4 TEST OPERATION MODES

Emission mode: Transmitting

3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests and measurements refer to this report were performed by EMC Laboratory of Guangzhou GRG Metrology and Test Technology Co., Ltd.

Add. : 163 Pingyun Rd, West of Huangpu Ave, Guangzhou, 510656, P. R. China

Telephone: +86-20-38699959, 38699960, 38699961

Fax : +86-20-38695185

3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC Listed Lab No. 688188
China	CNAS NO.L0446
China	DILAC No.DL175
Canada	Registration No.:8355A-1

3.3 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:

Measurement		Frequency	Uncertainty
Radiated Emission	Horizontal	30MHz~1000MHz	4.2dB
	Horizontal	1GHz~18GHz	4.2dB
	Vertical	30MHz~1000MHz	4.4dB
	Vertical	1GHz~18GHz	4.4dB

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

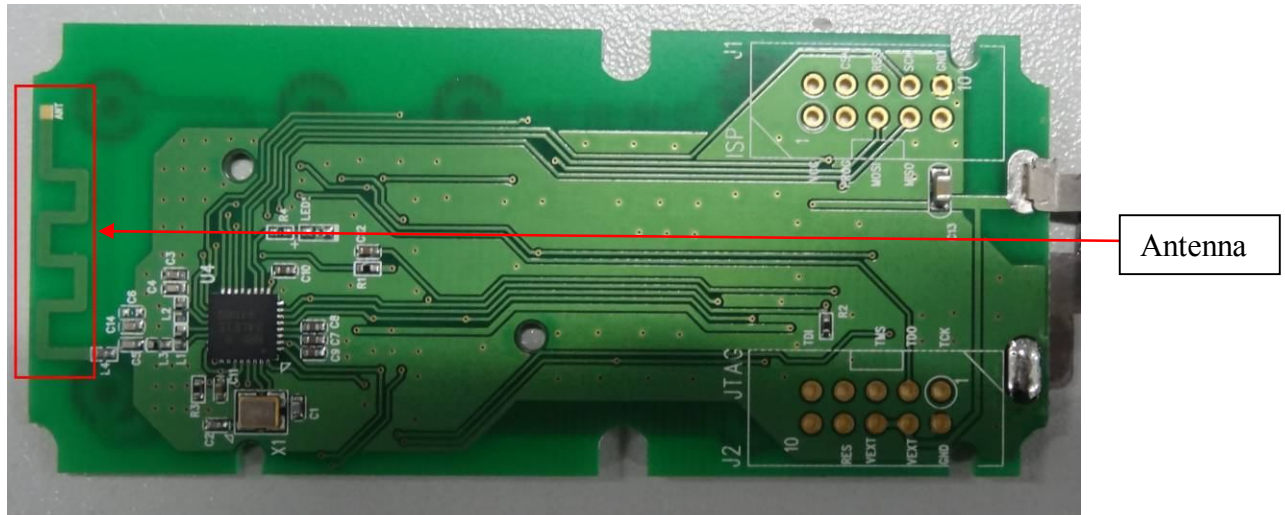
3.4 LIST OF USED TEST EQUIPMENT AT GRG

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Radiated Emission				
Receiver	R&S	ESU40	100106	2014-01-24
Biconical Log-periodic Antenna	ETS.LINDGREN	3142C	00075971	2013-05-26
Horn antenna	SCHWARZBECK	BBHA9120D	D752	2013-10-14
Intentional radiators Field Strength				
Receiver	R&S	ESU40	100106	2014-01-24
Horn antenna	SCHWARZBECK	BBHA9120D	D752	2013-10-14
Out of Band Emissions				
EMI Receiver	R&S	ESCI	100529	2013-07-30

NOTE: The calibration interval of the above test instruments is 12 months.

4. ANTENNA REQUIREMENT

The EUT antenna is PCB Printed antenna. Antenna gain is -4.26dBi .which accordance 15.203.is considered sufficient to comply with the provisions of this section



5. EMISSION TEST

5.1 INTENTIONAL RADIATORS FIELD STRENGTH

5.1.1 LIMITS

Frequency (MHz)	Field Strength
2400~2483.5	50(millivolts/meter)
Field Strength of Harmonics	500(microvolts/meter)

5.1.2 TEST PROCEDURE

The test procedures is followed the ANSI C63.10-2009.

Procedure of Test

Radiated emission tests shall be made with the receive or transmit antenna located at a horizontal distance of 3 m plus half of the maximum width of the EUT being tested, measured from the centre of the EUT. The tests shall be performed with the equipment configured as closely as possible to its typical, practical operation. Unless stated otherwise, cables and wiring shall be as specified by the manufacturer and the equipment shall be in its housing (or cabinet) with all covers and access panels in place. Any deviation from normal EUT operating conditions shall be included in the test report.

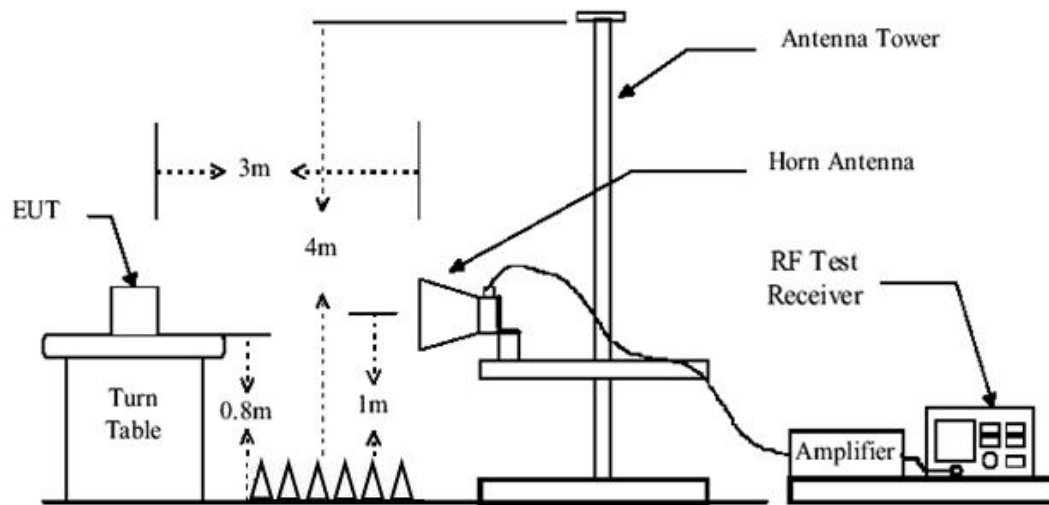
The EUT (on a non-conductive support structure, where applicable) shall be placed on a remotely operated turntable, to allow the EUT to be rotated. The height of the EUT above the ground plane shall be according to the following requirements.

- Table-top equipment is placed on a non-conductive set-up table with height $0.8\text{ m} \pm 0.01\text{ m}$; ANSI C63.10 specifies the method to determine the impact of the non-conductive set-up table on test results.
- Floor-standing equipment is placed on a non-conductive support, as specified in the applicable product standard. If there are no EUT height placement requirements in the product standard, the EUT shall be placed on a non-conductive support at a height of 5 cm to 15 cm above the ground plane.

Interface cables, loads, and devices should be connected to at least one of each type of the interface ports of the EUT and, where practical, each cable shall be terminated in a device typical for its actual use. Where there are multiple interface ports of the same type, a typical number of these devices shall be connected to devices or loads. It is sufficient to connect only one of the loads, provided that it can be shown, for example by preliminary testing, that the connection of further ports would not significantly increase the level of disturbance (that is, more than 2 dB) or significantly degrade the immunity level.

The test mode(s) described in Item 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 producing the highest emission level. The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the test.

5.1.3 TEST SETUP



5.1.4 TEST RESULTS

Test Result:	Pass	Polarization:	Horizontal
Standard:	(RE)FCC PART 15 3m	Power Source:	DC 3V
Test item:	Radiation Test	Date:	2013-3-8
Temp./Hum. (%RH):	23/51% RH	Time:	9:23:36
EUT:	Remote	Model:	RB85A00
Note:			

Polarization	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Vertical	2402	66.68	19.59	86.27	114.00	-27.73	peak
Vertical	2402	59.71	19.59	79.30	94.00	-14.70	AVG
Horizontal	2402	68.58	19.59	88.17	114.00	-25.93	peak
Horizontal	2402	60.61	19.59	80.20	94.00	-13.80	AVG

5.2 RADIATED ELECTROMAGNETIC DISTURBANCE

5.2.1 LIMITS

Frequency (MHz)	Quasi-peak(dB μ V/m)
30 ~ 88	40
88~216	43.5
216 ~ 960	46
Above 960	54

NOTE: (1) The lower limit shall apply at the transition frequencies.

Frequency (GHz)	Quasi-peak(dB μ V/m)
1 ~ 18	74
1 ~ 18	54

5.2.2 TEST PROCEDURES

The test procedures is followed the ANSI C63.10-2009.

Procedure of Preliminary Test

Radiated emission tests shall be made with the receive or transmit antenna located at a horizontal distance of 3 m plus half of the maximum width of the EUT being tested, measured from the centre of the EUT. The tests shall be performed with the equipment configured as closely as possible to its typical, practical operation. Unless stated otherwise, cables and wiring shall be as specified by the manufacturer and the equipment shall be in its housing (or cabinet) with all covers and access panels in place. Any deviation from normal EUT operating conditions shall be included in the test report.

The EUT (on a non-conductive support structure, where applicable) shall be placed on a remotely operated turntable, to allow the EUT to be rotated. The height of the EUT above the ground plane shall be according to the following requirements.

- Table-top equipment is placed on a non-conductive set-up table with height $0.8\text{ m} \pm 0.01\text{ m}$; ANSI C63.10 specifies the method to determine the impact of the non-conductive set-up table on test results.
- Floor-standing equipment is placed on a non-conductive support, as specified in the applicable product standard. If there are no EUT height placement requirements in the product standard, the EUT shall be placed on a non-conductive support at a height of 5 cm to 15 cm above the ground plane.

Interface cables, loads, and devices should be connected to at least one of each type of the interface ports of the EUT and, where practical, each cable shall be terminated in a device typical for its actual use. Where there are multiple interface ports of the same type, a typical number of these devices shall be connected to devices or loads. It is sufficient to connect only one of the loads, provided that it can be shown, for example by preliminary testing, that the connection of further ports would not significantly increase the level of disturbance (that is, more than 2 dB) or significantly degrade the immunity level.

The test mode(s) described in Item 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 producing the highest emission level. The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

Procedure of Final Test

EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test. The Analyzer / Receiver scanned from 30MHz to 1000MHz and 1GHz~18GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level. Record at least six highest emissions.

Below 1GHz Set the spectrum analyzer: RBW =100 KHz VBW \geq RBW, Span = enough to catch the trace. Sweep = auto; Detector Function = QP. Trace = Max-hold.

Above 1GHz Set the spectrum analyzer: RBW =1MHz VBW \geq RBW, Span = enough to catch the trace. Sweep = auto; Detector Function = Peak and AVG. Trace = Max-hold.

Pre-test for normal mode and EDR mode, to find the EDR is the worst case.

The worst case emissions were reported.

5.2.3 TEST SETUP

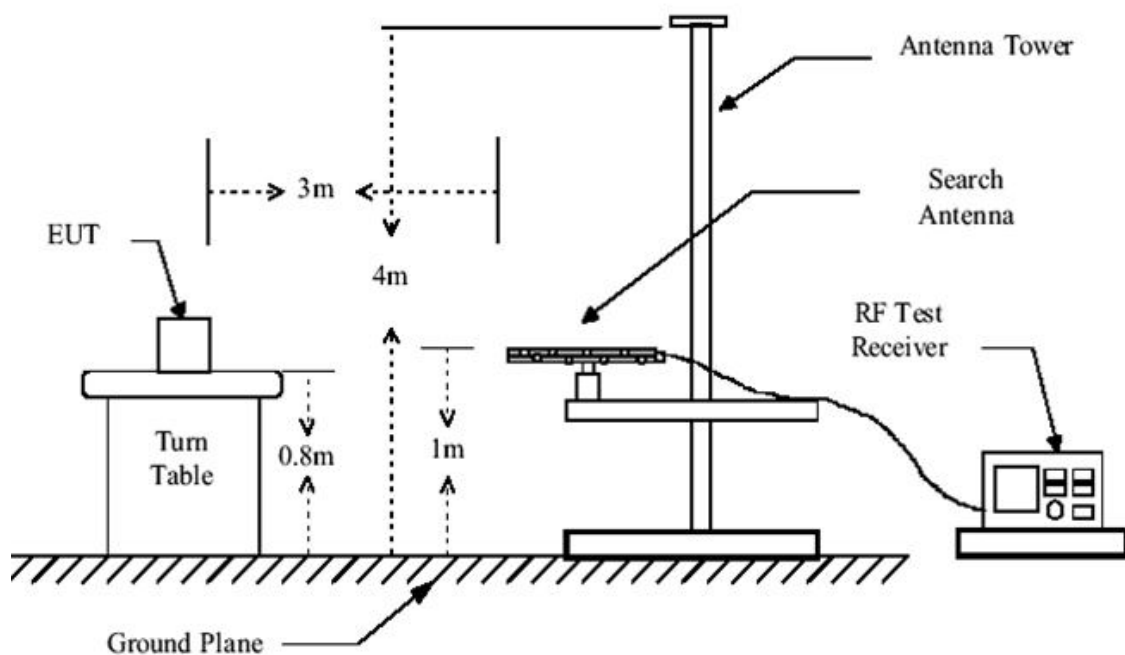


Figure 2. 30MHz to 1GHz radiated emissions test configuration

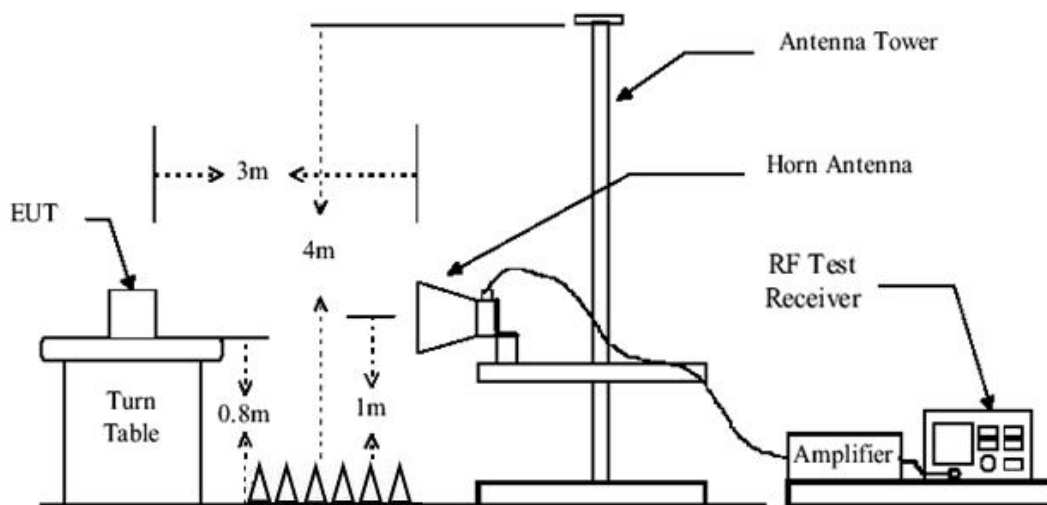
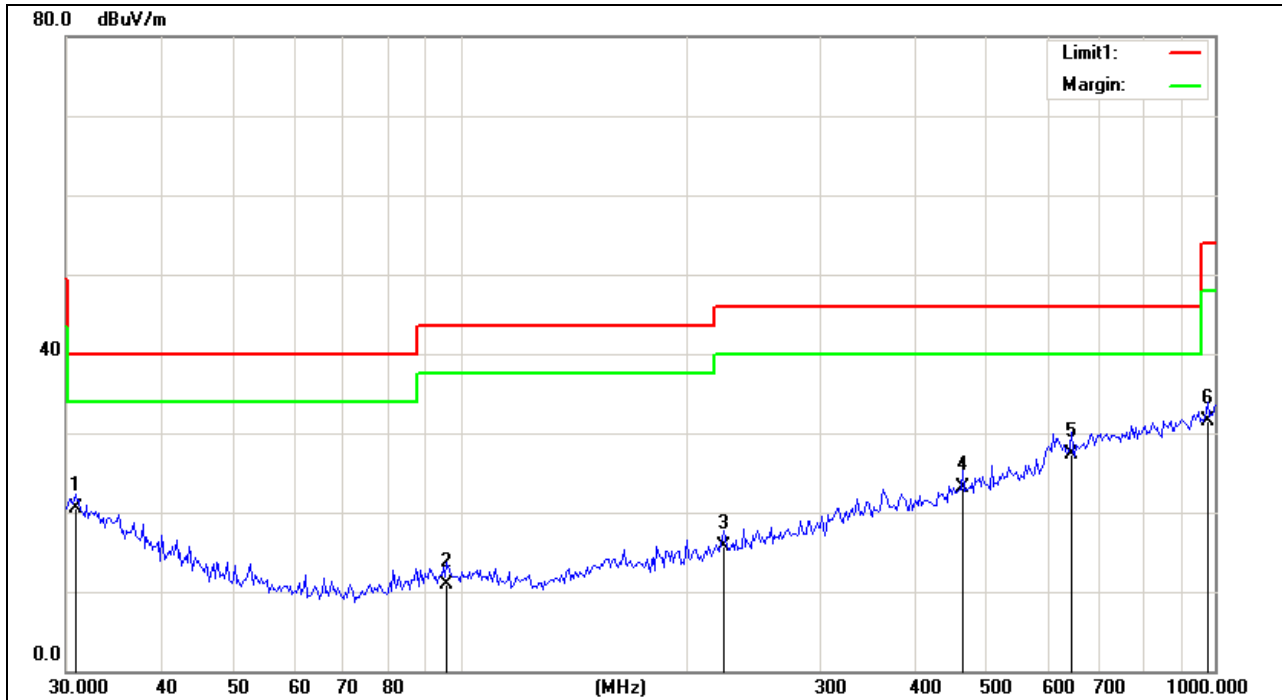


Figure 3. Above 1GHz radiated emissions test configuration

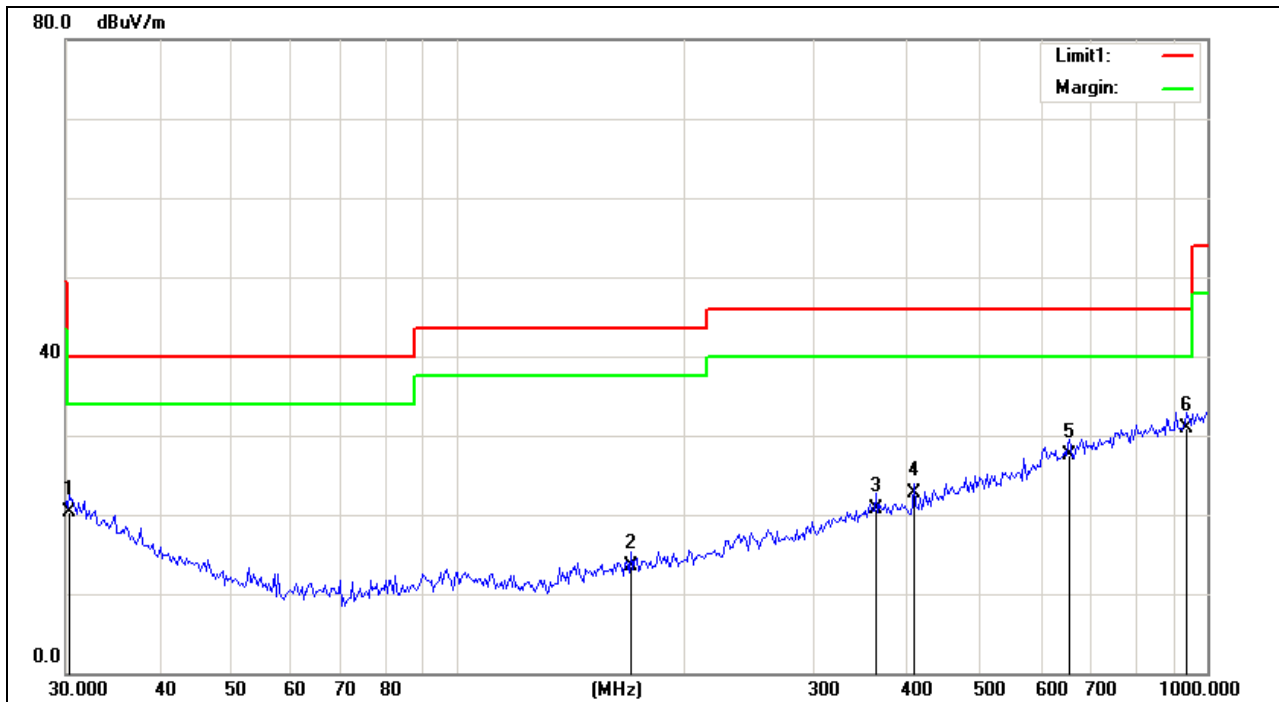
5.2.4 TEST RESULTS

Test Result:	Pass	Probe:	Vertical
Standard:	(RE)FCC PART 15 3m	Power Source:	DC 3V
Test item:	Radiation Test	Date:	2013-3-8
Temp./Hum.(%RH):	23/51%RH	Time:	10:03:34
EUT:	Remote	Model:	RB85A00
Note:			



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.8549	1.61	18.89	20.50	40.00	-19.50	QP
2	96.0079	1.04	9.86	10.90	43.50	-32.60	QP
3	223.0404	3.15	12.65	15.80	46.00	-30.20	QP
4	463.0735	3.59	19.51	23.10	46.00	-22.90	QP
5	645.1195	4.51	22.79	27.30	46.00	-18.70	QP
6	977.7727	4.79	26.71	31.50	54.00	-22.50	QP

Test Result:	Pass	Probe:	Horizontal
Standard:	(RE)FCC PART 15 3m	Power Source:	DC 3V
Test item:	Radiation Test	Date:	2013-3-8
Temp./Hum.(%RH):	23/51%RH	Time:	10:09:14
EUT:	Remote	Model:	RB85A00
Note:			



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.3390	1.18	19.22	20.40	40.00	-19.60	QP
2	170.3095	2.96	10.54	13.50	43.50	-30.00	QP
3	361.6326	3.33	17.47	20.80	46.00	-25.20	QP
4	406.9286	4.56	18.24	22.80	46.00	-23.20	QP
5	656.0874	4.53	22.97	27.50	46.00	-18.50	QP
6	940.0574	4.71	26.19	30.90	46.00	-15.10	QP

Emission above 1GHz: Peak & Average Measurement

Peak Measurement:

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Antenna polarization
1	10135.083	35.01	17.69	52.70	74.00	-21.30	Horizontal
2	14411.629	34.57	19.43	54.00	74.00	-20.00	Horizontal
3	10276.904	35.80	17.42	53.22	74.00	-20.78	Vertical
4	13444.302	35.49	17.89	53.38	74.00	-20.62	Vertical

AV Measurement:

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Antenna polarization
1	10135.083	22.11	17.69	39.80	54.00	-14.20	Horizontal
2	14411.629	21.97	19.43	41.40	54.00	-12.60	Horizontal
3	10276.904	23.28	17.42	40.70	54.00	-13.30	Vertical
4	13444.302	20.61	17.89	38.50	54.00	-15.50	Vertical

The field strength is calculated by adding the Antenna Factor. Correct Factor.

The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Correct Factor

Note: This device was tested in the X, Y and Z planes (as the test photo), we found the maximum radiation emission is X planes, so the record is X planes test data

5.3 OUT OF BAND EMISSIONS

5.3.1 LIMITS

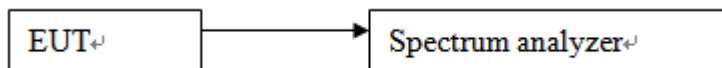
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

5.3.2 TEST PROCEDURES

Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.

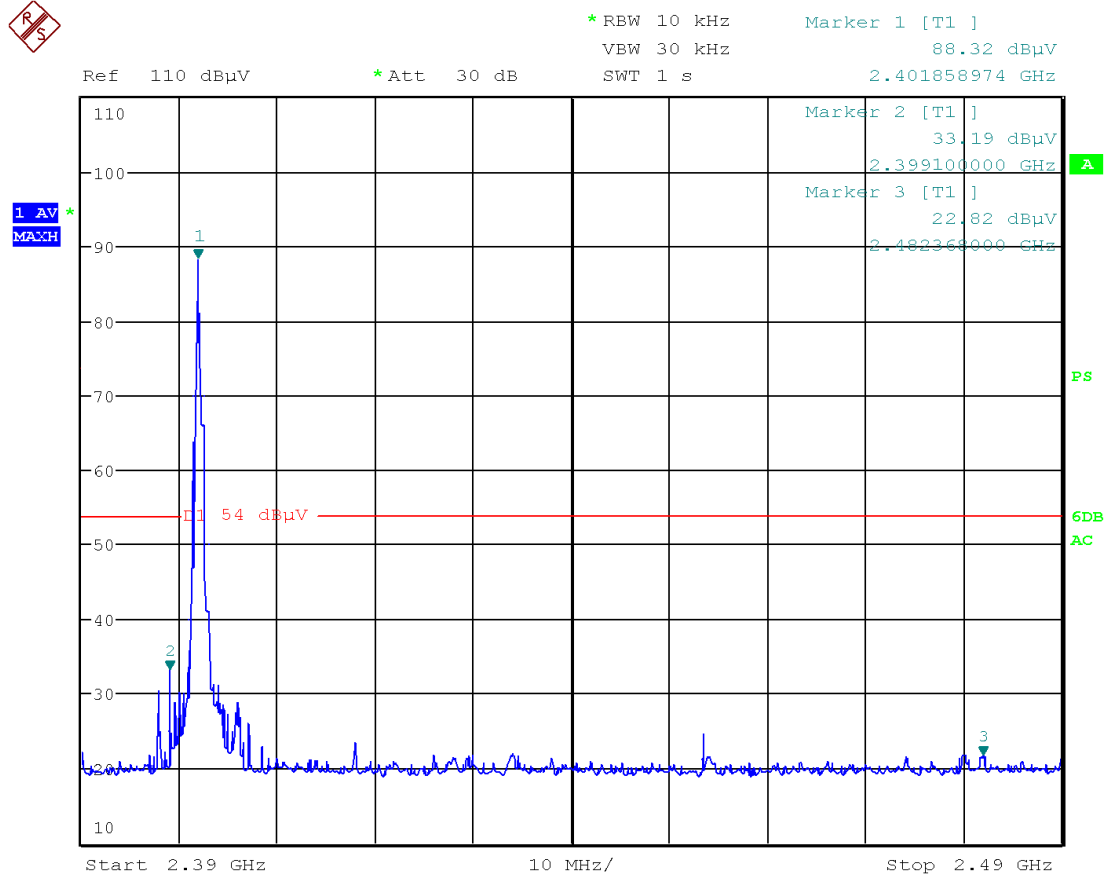
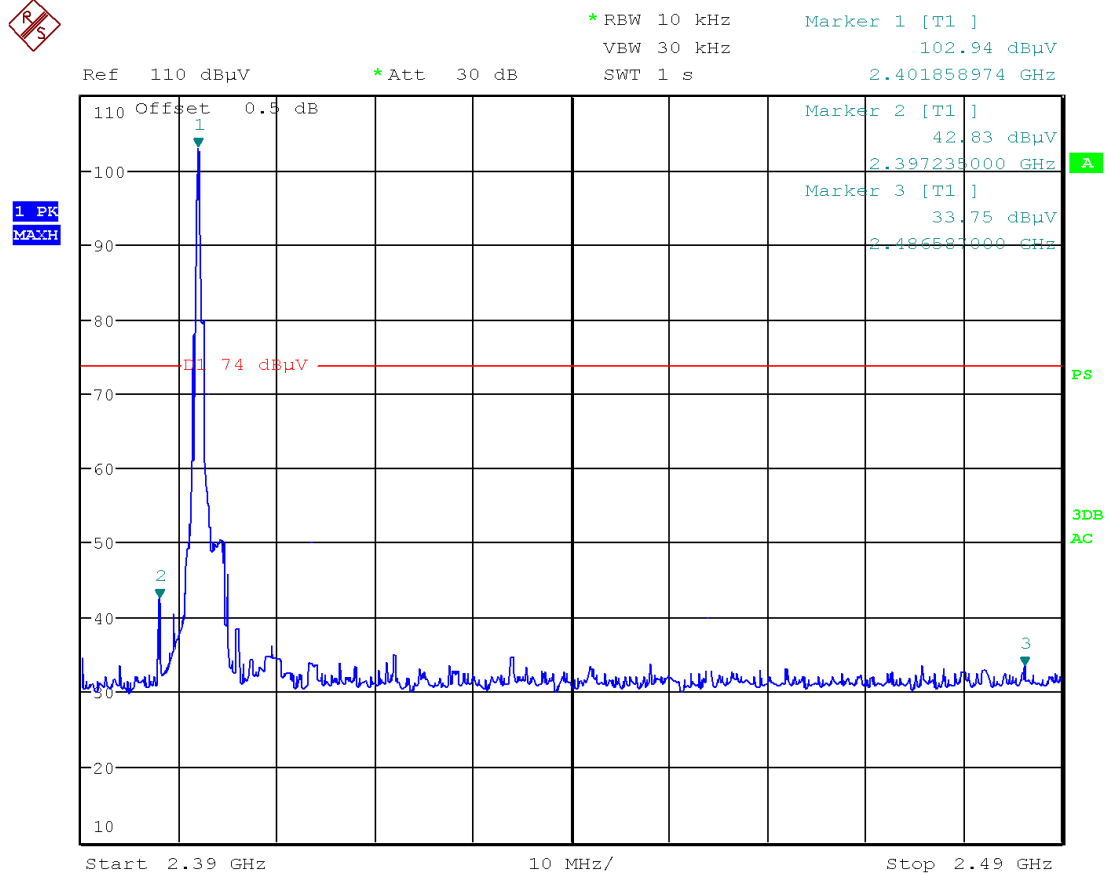
Set the spectrum analyzer: RBW \geq 1% of the span (set 10 kHz). VBW \geq RBW, Span = enough to catch the trace. Sweep = auto; Detector Function = Peak. Trace = Maxhold.

5.3.3 TEST SETUP



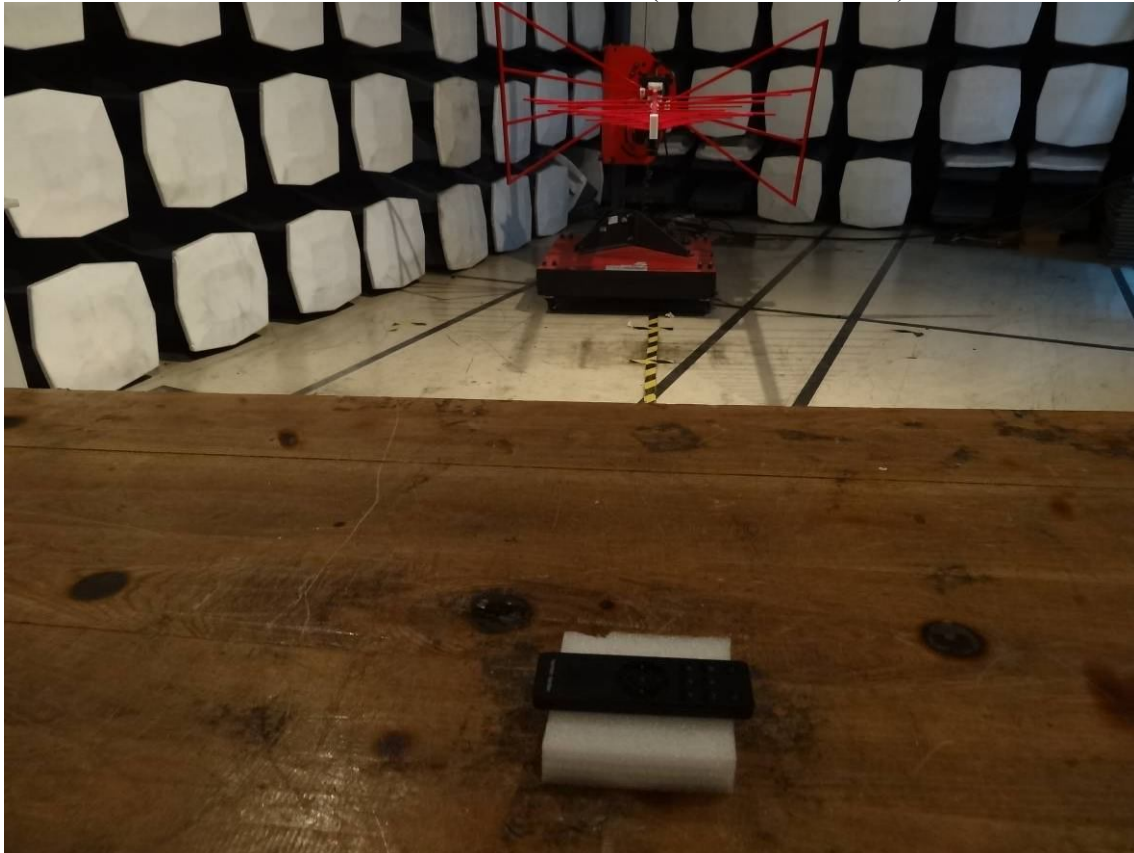
5.3.4 TEST RESULTS

Frequency (MHz)	Reading dBuV	Limit	Result
2397.2MHz	42.83	PK below 74 or below fundamental 50dB	Pass
2486.6 MHz	33.75	PK below 74 or below fundamental 50dB	Pass
2399.1MHz	33.19	AV below 54 or below fundamental 50dB	Pass
2482.4 MHz	22.82	AV below 54 or below fundamental 50dB	Pass

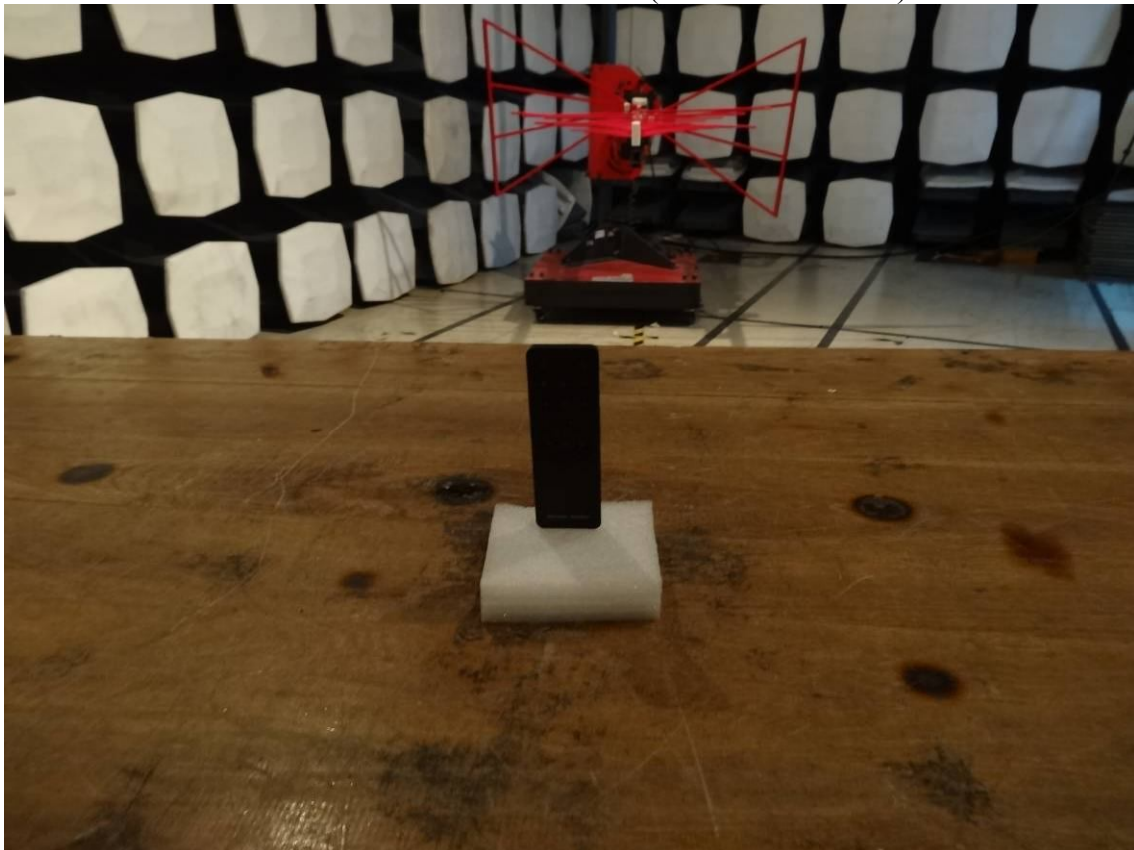


APPENDIX A: PHOTOGRAPH OF THE TEST ARRANGEMENT

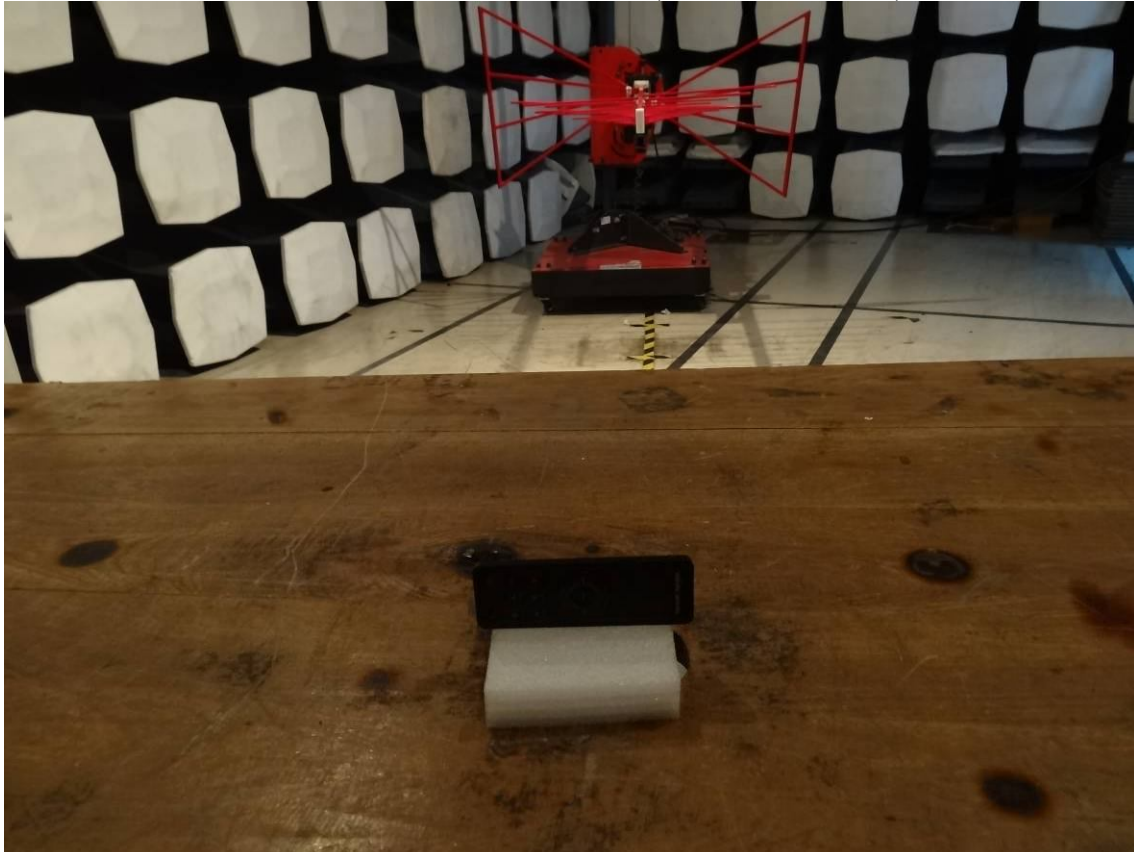
Radiated Emission below 1GHz (Tested in X Planes)



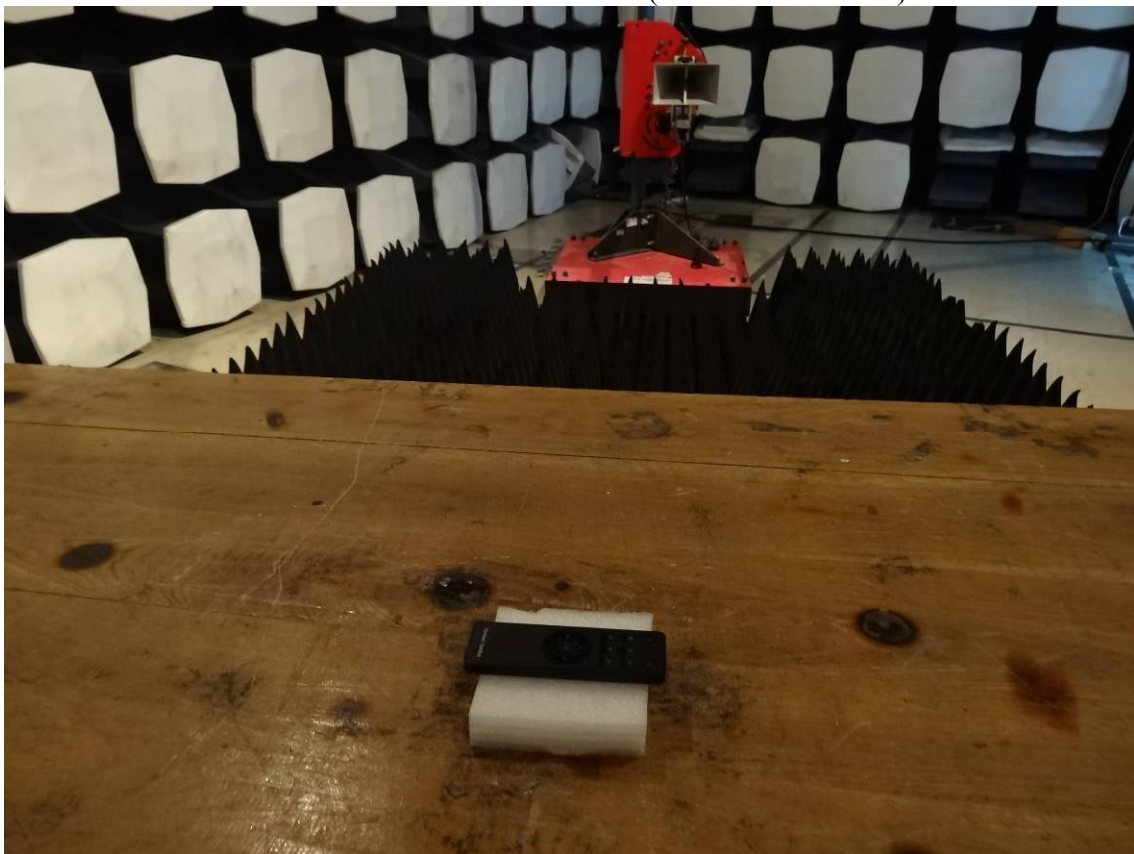
Radiated Emission below 1GHz (Tested in Y Planes)



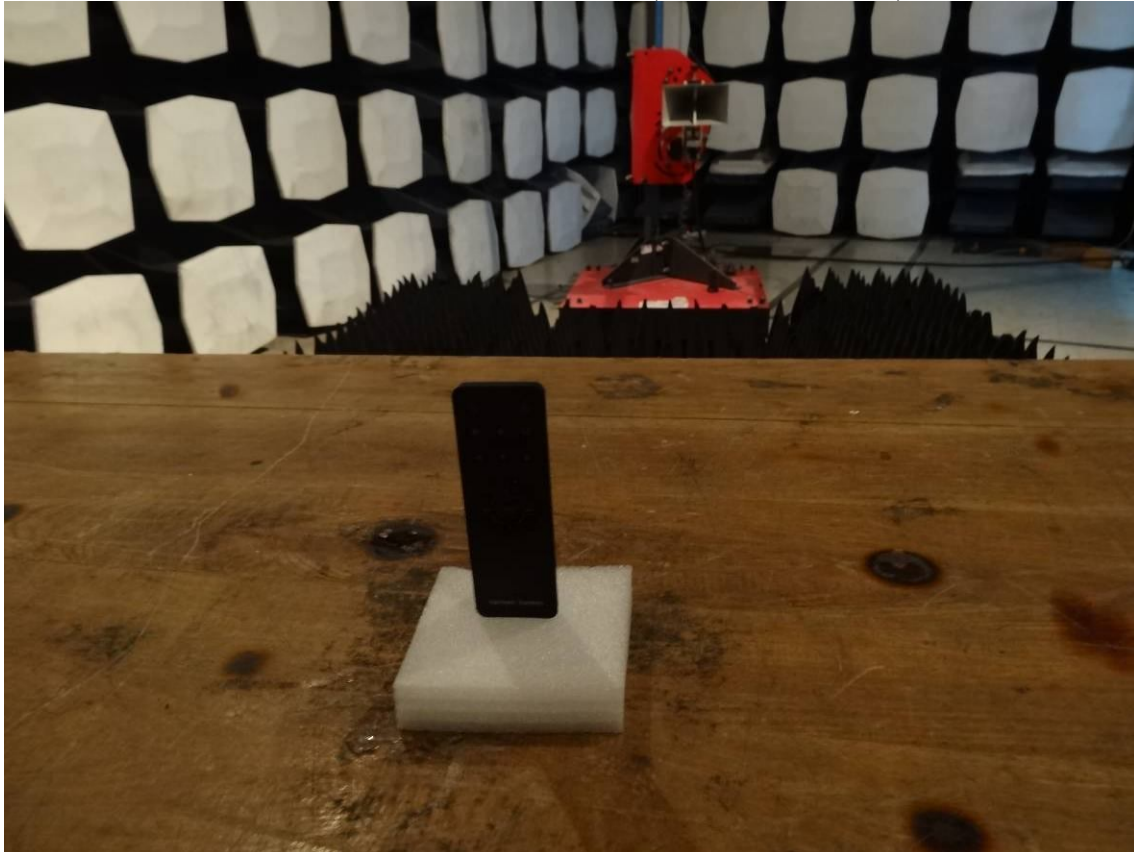
Radiated Emission below 1GHz (Tested in Z Planes)



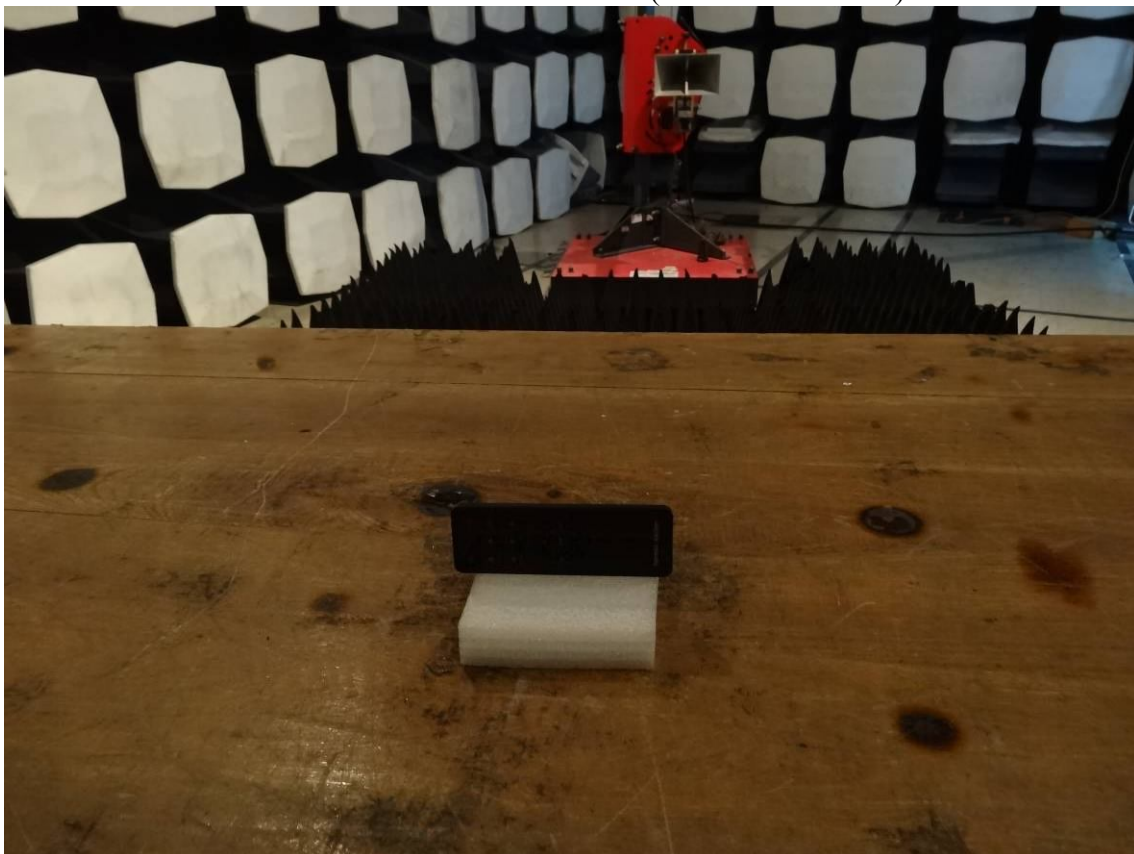
Radiated Emission above 1GHz (Tested in X Planes)



Radiated Emission above 1GHz (Tested in Y Planes)

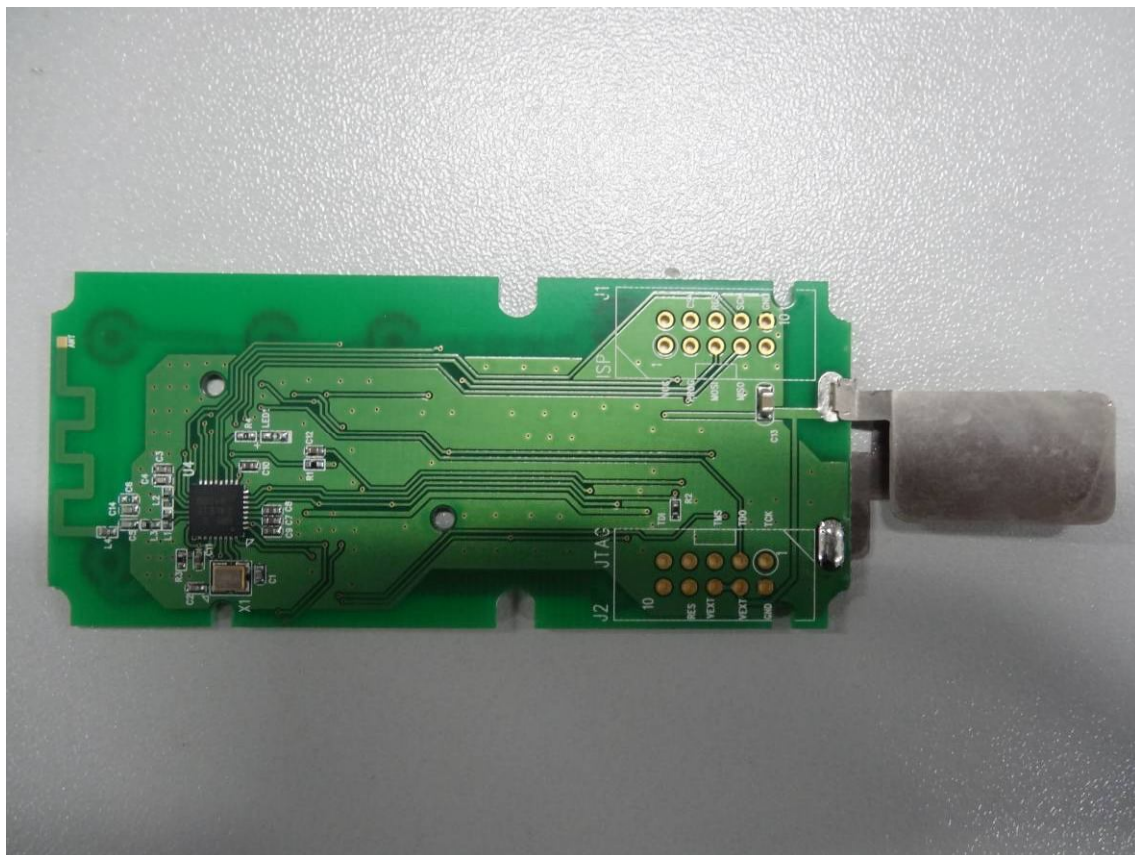
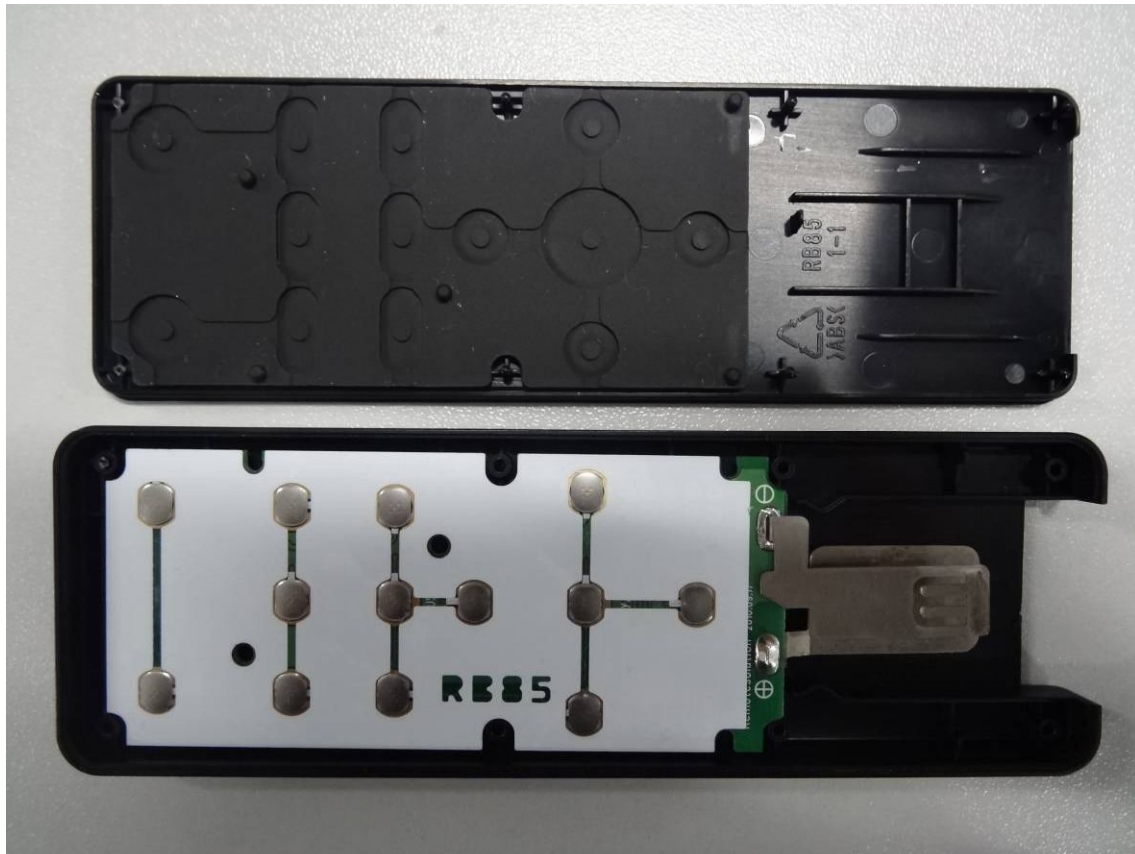


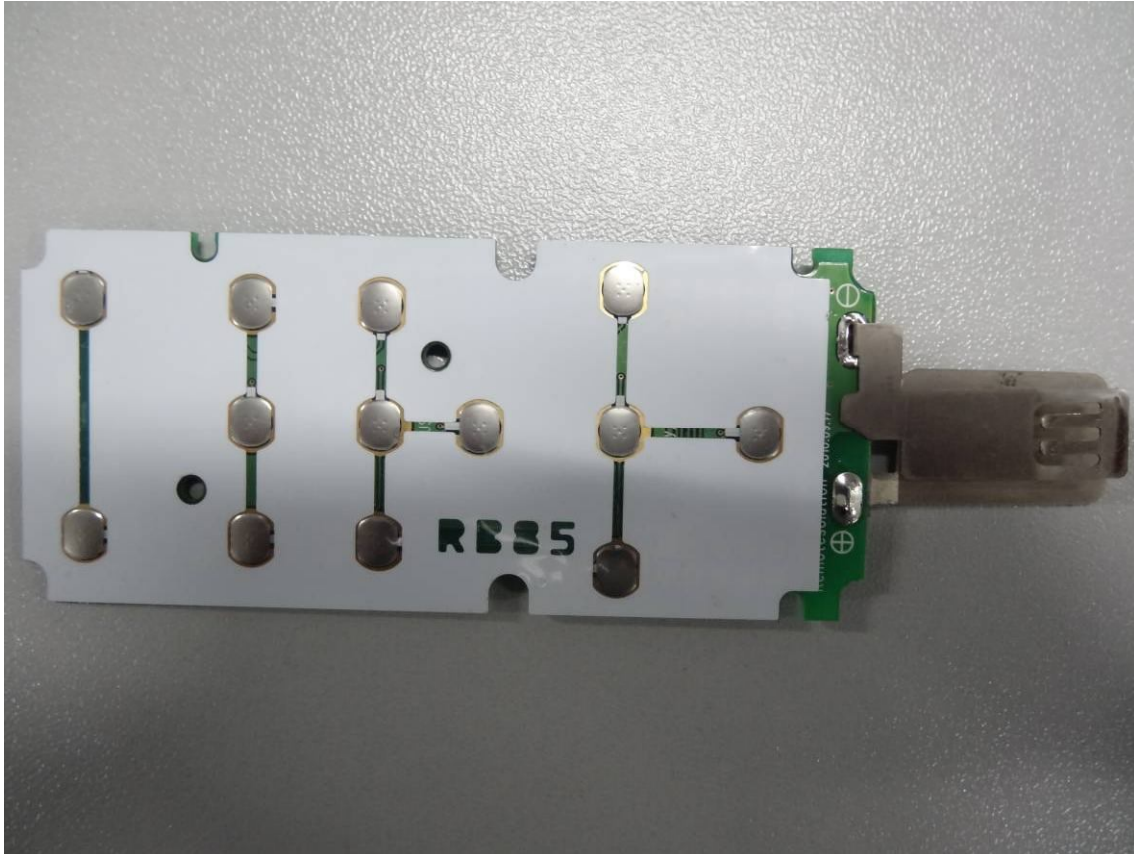
Radiated Emission above 1GHz (Tested in Z Planes)



APPENDIX B: PHOTOGRAPH OF THE EUT







-----This is the last page of the report. -----