

TEST REPORT

Reference No..... : WTS17S0475948E
FCC ID : GAO-2LK300
Applicant..... : Collage Investments LLC
Address..... : 11437 NW 34 STREET,DORAL, FL 33178,United States
Manufacturer : Collage Investments LLC
Address..... : 11437 NW 34 STREET,DORAL, FL 33178,United States
Product Name..... : MOBILE PHONE
Model No..... : LK300
Brand..... : LIKUID
Standards : FCC PART15 SUBPART B: 2016
Date of Receipt sample : Apr. 10, 2017
Date of Test : Apr. 11 ~ 18, 2017
Date of Issue..... : Apr. 19, 2017
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.

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

Tel :+86-755-83551033

Fax:+86-755-83552400

Compiled by:

Ford Wang

Ford Wang / Project Engineer

Approved by:



Philio Zhong

Philio Zhong / Manager

2 Laboratories Introduction

Waltek Services Test Group Ltd is a professional third-party testing and certification organization with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by CNAS (China National Accreditation Service for Conformity Assessment) AQSIIQ, CMA and IECEE for CBTL. Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CPSC(Consumer Product Safety Commission), CEC(California energy efficiency), IC(Industry Canada) and ELI(Efficient Lighting Initiative). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as UL, Intertek(ETL-SEMKO), CSA, TÜV Rheinland, TÜV SÜD, etc.



Waltek Services Test Group Ltd. is one of the largest and the most comprehensive third party testing organizations in China, our headquarter located in Shenzhen and have branches in Foshan, Dongguan, Zhongshan, Suzhou, Ningbo and Hong Kong. Our test capability covered four large fields: safety test. ElectroMagnetic Compatibility(EMC), reliability and energy performance, Chemical test. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

3 Contents

	Page
1 COVER PAGE	1
2 LABORATORIES INTRODUCTION.....	2
3 CONTENTS	3
4 REVISION HISTORY	4
5 GENERAL INFORMATION.....	5
5.1 GENERAL DESCRIPTION OF E.U.T.....	5
5.2 DETAILS OF E.U.T.....	5
5.3 STANDARDS APPLICABLE FOR TESTING	5
5.4 TEST FACILITY	6
5.5 SUBCONTRACTED	6
5.6 ABNORMALITIES FROM STANDARD CONDITIONS	6
6 TEST SUMMARY	7
7 EQUIPMENT USED DURING TEST	8
7.1 EQUIPMENT LIST.....	8
7.2 DESCRIPTION OF SUPPORT UNITS.....	9
7.3 MEASUREMENT UNCERTAINTY.....	9
8 EMISSION TEST RESULTS.....	10
8.1 POWER LINE CONDUCTED EMISSION, 150kHz TO 30MHz	10
8.2 RADIATION EMISSION, 30MHz TO 1000MHz.....	13
8.3 RADIATION EMISSION, ABOVE 1000MHz.....	16
9 PHOTOGRAPHS – TEST SETUP FCC ID GAO-2LK300	19
9.1 PHOTOGRAPH –POWER LINE CONDUCTED EMISSION TEST SETUP AT TEST SITE 1#.....	19
9.2 PHOTOGRAPH – RADIATED EMISSION TEST SETUP FOR 30~1000MHz AT TEST SITE 2#.....	19
9.3 PHOTOGRAPH – RADIATED EMISSION TEST SETUP FOR ABOVE 1GHz AT TEST SITE 1#.....	20

4 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS17S0475948 E	Apr. 10, 2017	Apr. 11 ~ 18, 2017	Apr. 19, 2017	original	-	Valid

5 General Information

5.1 General Description of E.U.T.

Product Name:	MOBILE PHONE
Model No.:	LK300
Model Description:	N/A
GSM Band(s):	GSM 850/900/1800/1900MHz
GPRS Class:	12
WCDMA Band(s):	N/A
Wi-Fi Specification:	N/A
Bluetooth Version:	Bluetooth v2.1+EDR
GPS:	N/A
Hardware Version:	SC6531_BAR
Software Version:	TIANCHI_X02-S_V01_01-11-2017 11:19:12_Release
Highest frequency (Exclude Radio):	312MHz
Storage Location:	Internal Storage

Note: This EUT has two SIM card slots, and use same one RF module. We found that RF parameters are the same, when we insert the card 1 and card 2. So we usually performed the test under main card slot 1.

5.2 Details of E.U.T.

Technical Data:	Battery DC 3.7V, 650mAh DC 5V, 0.2A, charging from adapter (Adapter Input: 100-240V~50/60Hz)
Adapter:	Manufacture: SHENZHEN HELIANSHENG ELECTRONICS TECHNOLOGY CO.,LTD Model No.: HLS-001A

5.3 Standards Applicable for Testing

The tests were performed according to following standards:

FCC PART 15, SUBPART B Electronic Code of Federal Regulations- Unintentional Radiators

5.4 Test Facility

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

- **IC – Registration No.: 7760A-1**

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 7760A-1, October 15, 2015.

- **FCC Test Site 1#– 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, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

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 328995, December 3, 2014.

5.5 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

5.6 Abnormalities from Standard Conditions

None.

6 Test Summary

Test Item	Test Requirement	Class	Test Method	Test Result
Power Line Conducted Emission (150kHz to 30MHz)	FCC PART 15, SUBPART B	Class B	ANSI C63.4: 2014	Pass
Radiated Emission 30MHz to 1GHz)	FCC PART 15, SUBPART B	Class B	ANSI C63.4: 2014	Pass
Radiated Emission (Above 1GHz)	FCC PART 15, SUBPART B	Class B	ANSI C63.4: 2014	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

7 Equipment Used during Test

7.1 Equipment List

Conducted Emissions Test Site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.12,2016	Sep.11,2017
2.	LISN	R&S	ENV216	101215	Sep.12,2016	Sep.11,2017
3.	Cable	Top	TYPE16(3.5M)	-	Sep.12,2016	Sep.11,2017
Conducted Emissions Test Site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.12,2016	Sep.11,2017
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.12,2016	Sep.11,2017
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.12,2016	Sep.11,2017
4.	Cable	LARGE	RF300	-	Sep.12,2016	Sep.11,2017
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP	100091	Apr.29, 2016	Apr.28, 2017
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Apr.09,2017	Apr.08,2018
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.09,2017	Apr.08,2018
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.12,2016	Sep.11,2017
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.09,2017	Apr.08,2018
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.09,2017	Apr.08,2018
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Apr.13,2017	Apr.12,2018
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.13,2017	Apr.12,2018
9	Universal Radio Communication Tester	R&S	CMU 200	112461	Apr.13,2017	Apr.12,2018
10	Smart Antenna	SCHWARZBECK	HA08	-	Apr.09,2017	Apr.08,2018
11	Signal Generator	R&S	SMR20	100046	Sep.12,2016	Sep.11,2017
12.	Universal Radio Communication Tester	R&S	CMW 500	127818	Apr.13,2017	Apr.12,2018
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						

Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	Apr.13,2017	Apr.12,2018
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Apr.09,2017	Apr.08,2018
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Apr.13,2017	Apr.12,2018
4	Cable	HUBER+SUHNER	CBL2	525178	Apr.13,2017	Apr.12,2018

7.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
MacBook Air	APPLE	A1465	C17KTQDNF5N7
Power Supply	LPS DELTA ELECTRONICS UIANG CO.,LTD	ADP-45GD	-

7.3 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction Emission	150kHz~30MHz	$\pm 3.64\text{dB}$	(1)
Radiation Emission	30MHz~1000MHz	$\pm 5.03\text{dB}$	(1)
	1GHz~18GHz	$\pm 5.47\text{dB}$	(1)
Confidence interval: 95%. Confidence factor:k=2			

8 Emission Test Results

8.1 Power Line Conducted Emission, 150kHz to 30MHz

Test Requirement : FCC PART 15, SUBPART B
 Test Method : ANSI C63.4: 2014
 Test Result : Pass
 Frequency Range : 150kHz to 30MHz
 Class : Class B
 Limit :

Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	60
5 to 30	60	50

8.1.1 E.U.T. Operation

Operating Environment:

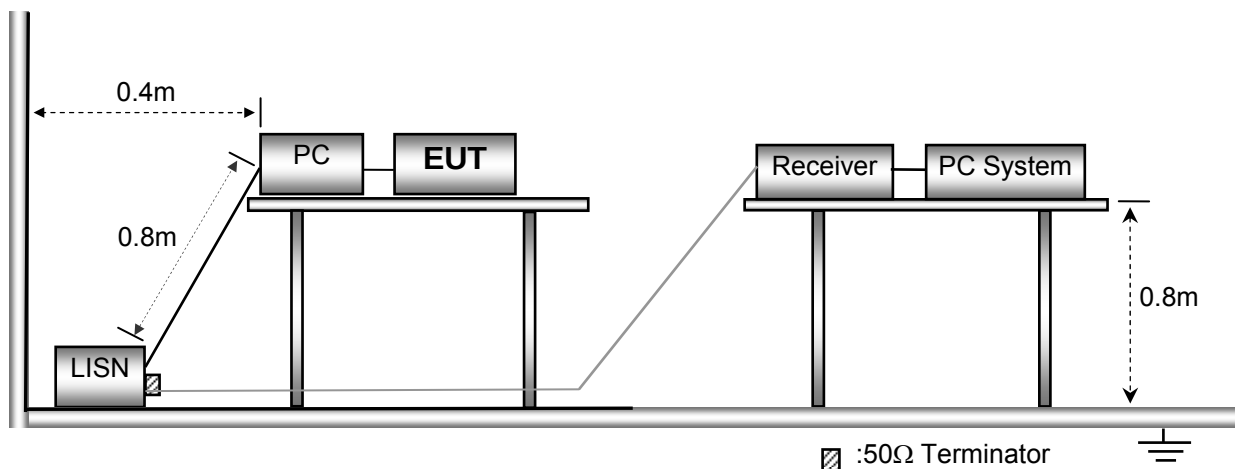
Temperature : 23°C
 Humidity : 53.6%RH
 Atmospheric Pressure : 101kPa

EUT Operation:

Input Voltage : DC 5V by PC
 Operating Mode : Data transmitting mode, Earphone mode, Adapter mode
 Remark : The worse case Data transmitting mode is under the condition of AC 120V/60Hz adapter input and the data is shown as follow.

8.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with ANSI C63.4:2014.

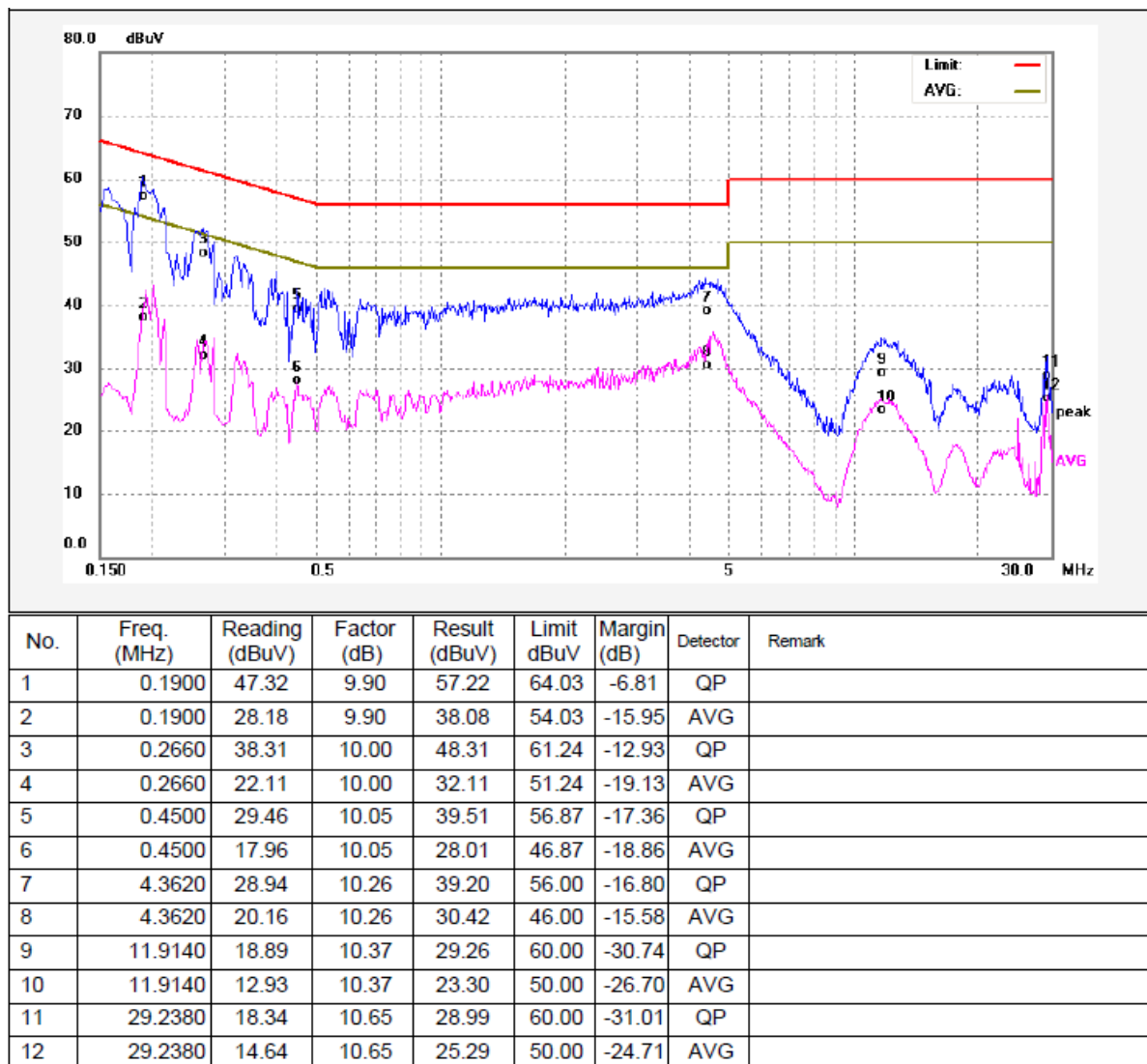


8.1.3 Measurement Data

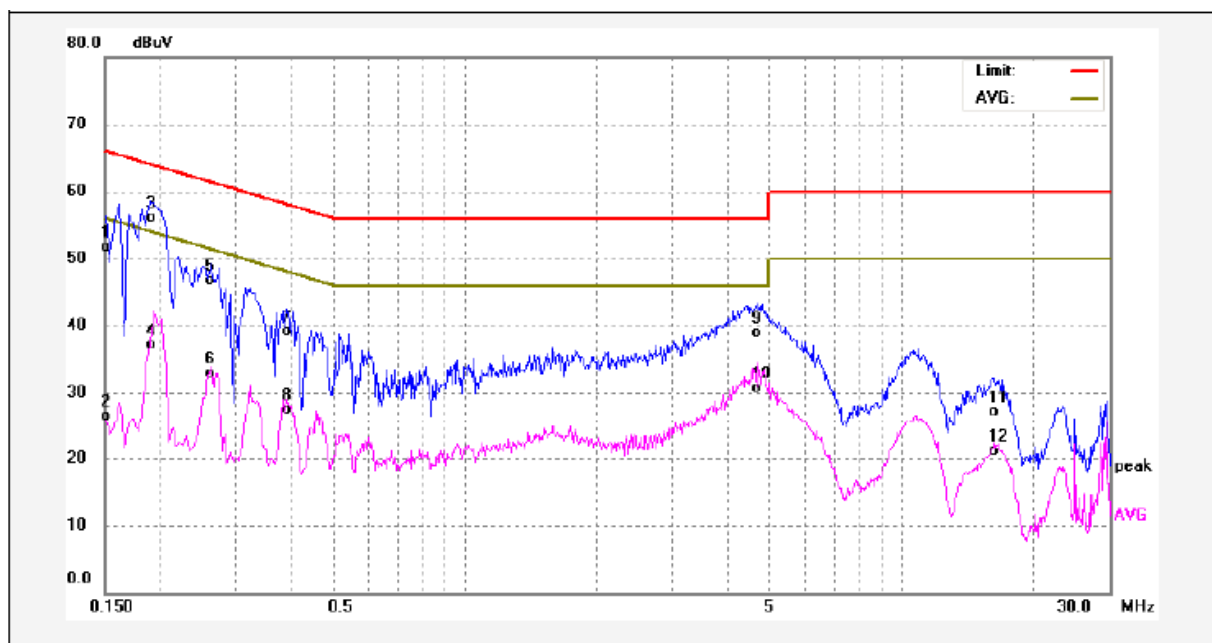
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line. According to the data in below section, the EUT complied with the FCC PART 15, SUBPART B standards.

8.1.4 Power Line Conducted Emission Test Data

Live Line:



Neutral Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	41.63	10.06	51.69	65.99	-14.30	QP	
2	0.1500	16.52	10.06	26.58	55.99	-29.41	AVG	
3	0.1900	46.17	9.90	56.07	64.03	-7.96	QP	
4	0.1900	27.11	9.90	37.01	54.03	-17.02	AVG	
5	0.2620	36.75	10.00	46.75	61.36	-14.61	QP	
6	0.2620	22.99	10.00	32.99	51.36	-18.37	AVG	
7	0.3899	29.13	10.04	39.17	58.06	-18.89	QP	
8	0.3899	17.40	10.04	27.44	48.06	-20.62	AVG	
9	4.6500	28.72	10.26	38.98	56.00	-17.02	QP	
10	4.6500	20.45	10.26	30.71	46.00	-15.29	AVG	
11	16.3340	16.67	10.40	27.07	60.00	-32.93	QP	
12	16.3340	10.70	10.40	21.10	50.00	-28.90	AVG	

8.2 Radiation Emission, 30MHz to 1000MHz

Test Requirement : FCC PART 15, SUBPART B
 Test Method : ANSI C63.4: 2014
 Test Result : Pass
 Frequency Range : 30MHz to 1000MHz
 Class. : Class B
 Limit..... :

Frequency (MHz)	Distance (Meter)	Limit (dB μ V/m)
		Quas -p ak
30 to 88	3	4
88 to 216	3	43.5
216 to 960	3	46
960 to 1000	3	54

8.2.1 E.U.T. Operation

Operating Environment:

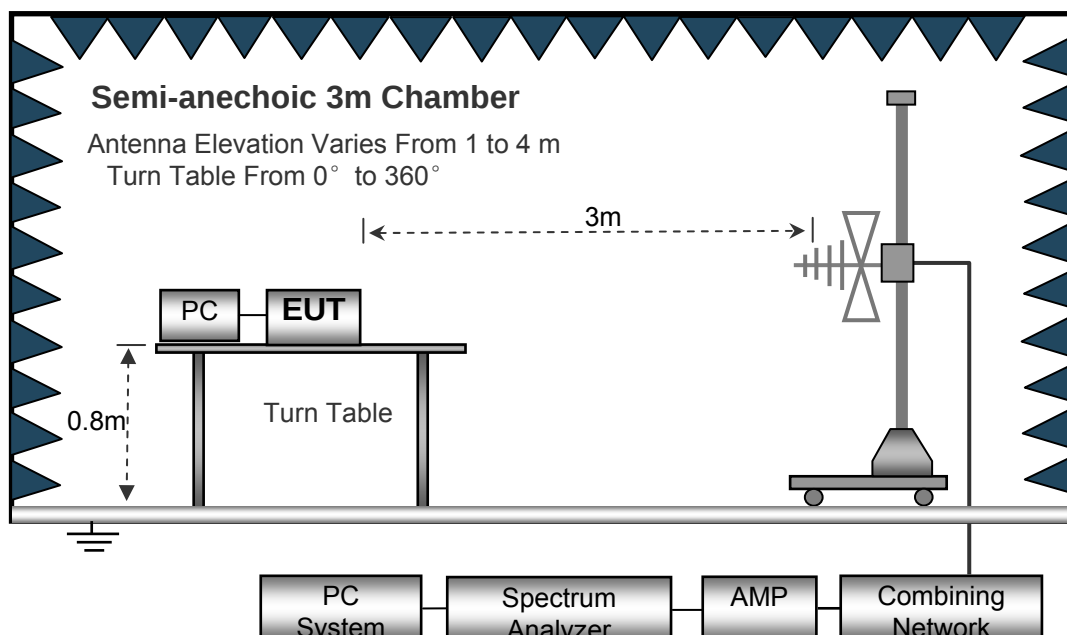
Temperature : 22.5°C
 Humidity : 52.6%RH
 Atmospheric Pressure : 101.2kPa

EUT Operation:

Input Voltage : DC 5V by PC
 Operating Mode : Data transmitting with PC mode, Earphone mode, Adapter mode
 Remark : The worse case Data transmitting with PC mode is under the condition of AC 120V/60Hz adapter input and the data is shown as follow.

8.2.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2014.

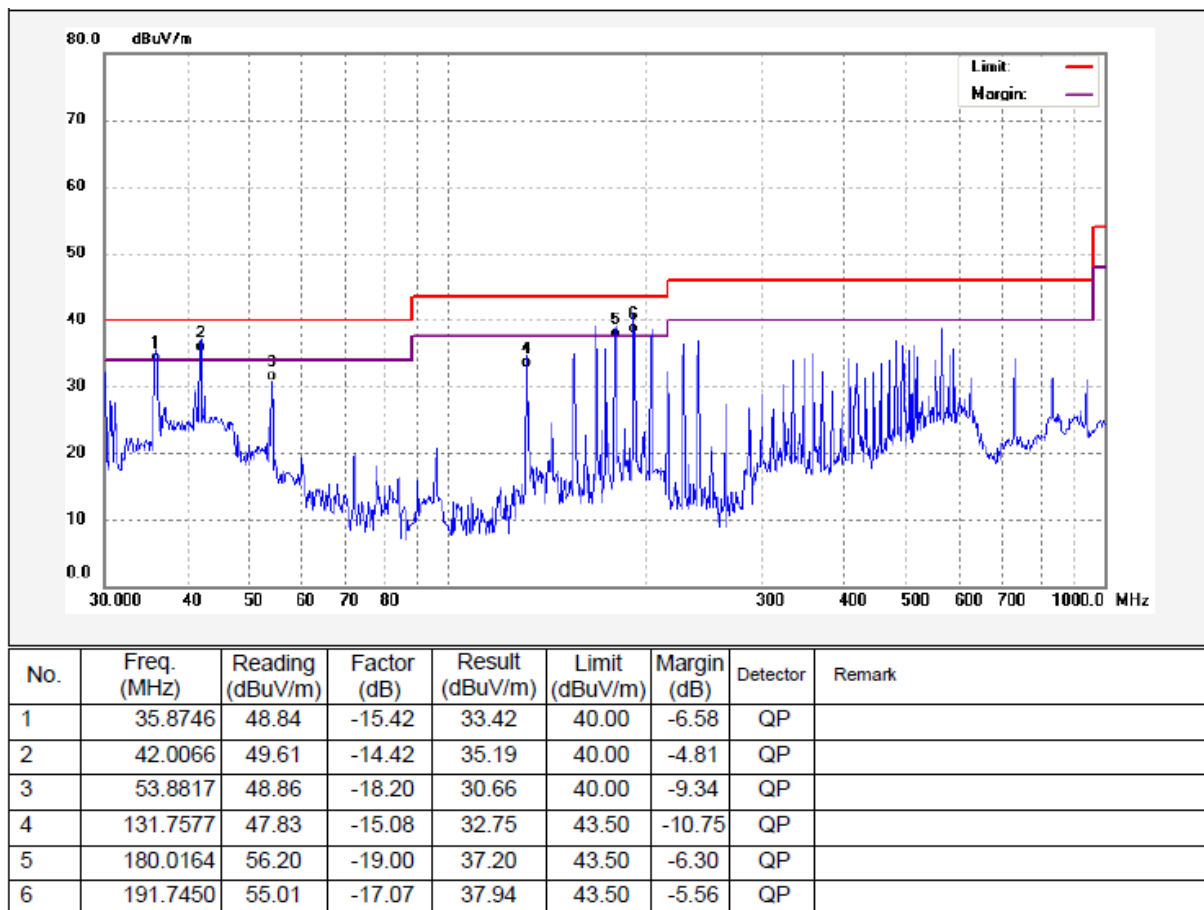


8.2.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Quasi-peak measurements were performed if peak emissions were within 6dB of the Quasi-peak limit line.

8.2.4 Radiated Emission Test Data, 30MHz to 1000MHz

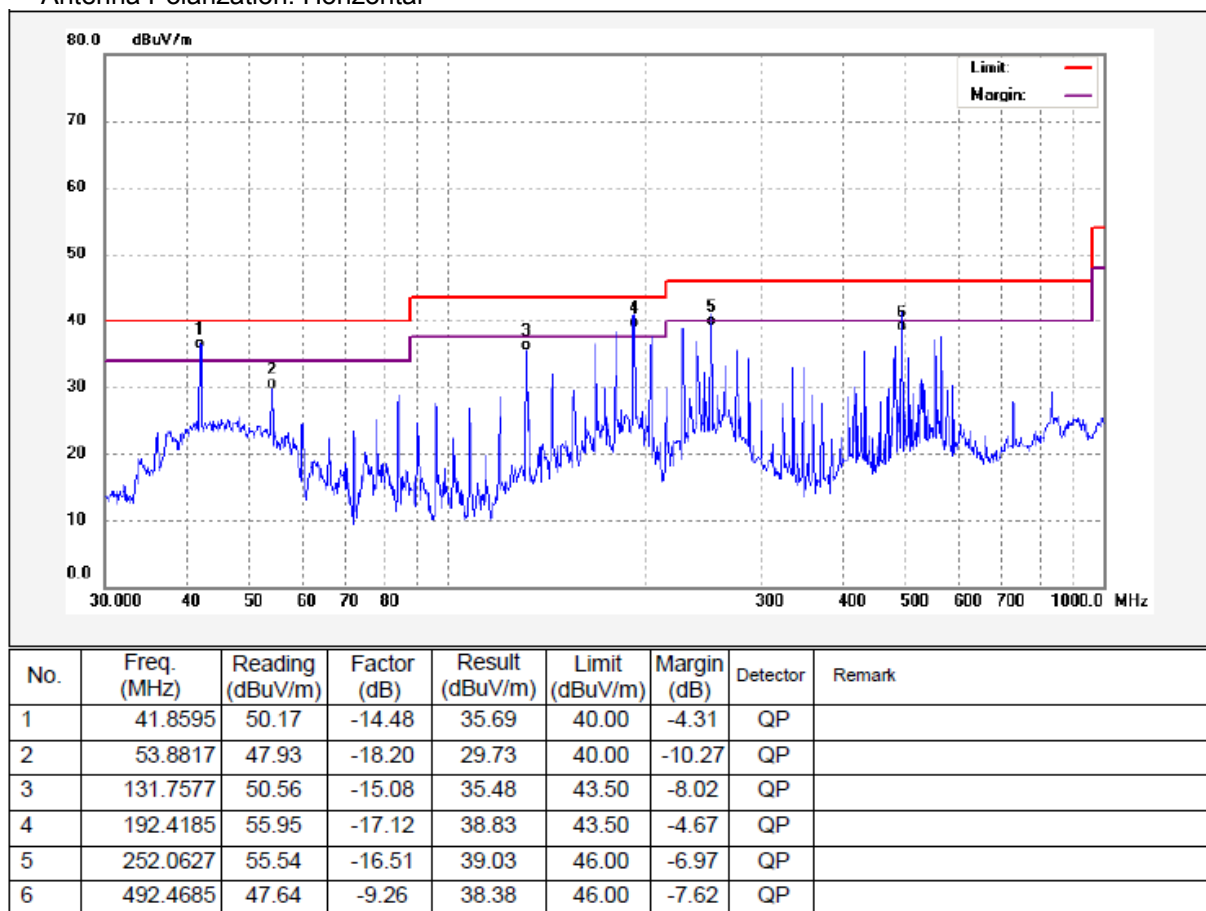
Antenna Polarization: Vertical



Factor= antenna factor + cable loss - preamplifier factor

Result = Reading + Factor

Antenna Polarization: Horizontal



Factor= antenna factor + cable loss - preamplifier factor

Result = Reading + Factor

8.3 Radiation Emission, Above 1000MHz

Test Requirement : FCC PART 15, SUBPART B
 Test Method : ANSI C63.4: 2014
 Test Result..... : Pass
 Frequency Range : 1GHz~18GHz
 Class. : Class B
 Limit. :

Frequency Range (MHz)	Distance (Meter)	Average Limit dB(uV/m)	Peak Limit (dBUV/m)
Above 1GHz	3	54	74

8.3.1 E.U.T. Operation

Operating Environment:

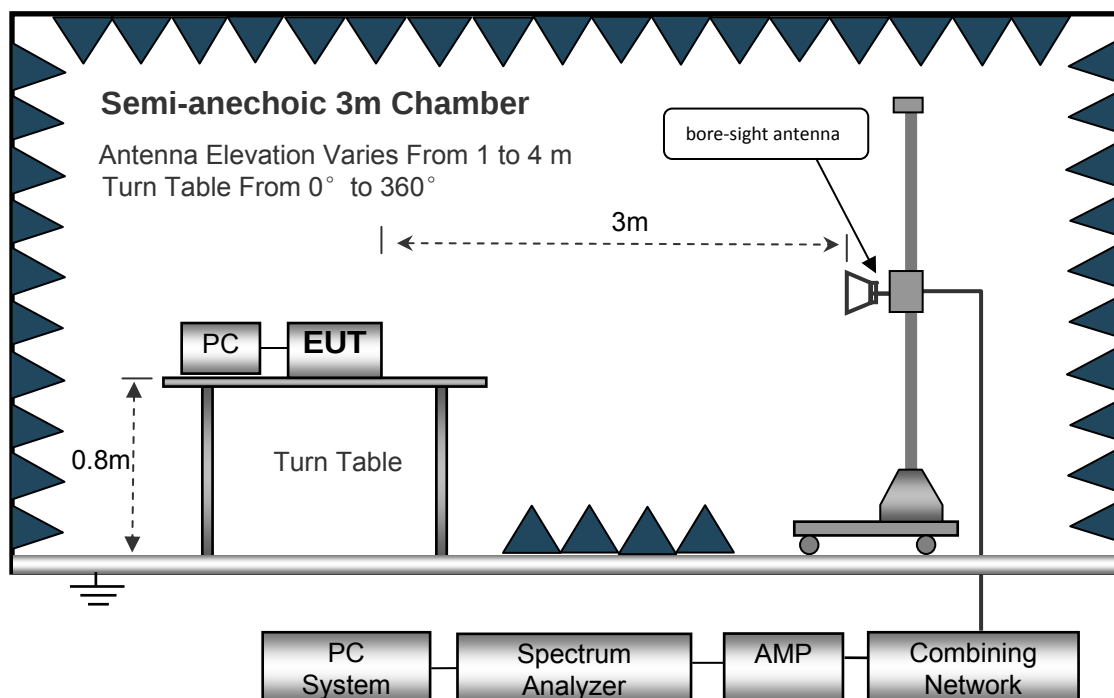
Temperature..... : 22.4°C
 Humidity : 52.3%RH
 Atmospheric Pressure..... : 101.3kPa

EUT Operation:

Input Voltage : DC 5V by PC
 Operating Mode : Data transmitting with PC mode, Earphone mode, Adapter mode
 Remark..... : The worse case Data transmitting mode is under the condition of AC 120V/60Hz adapter input and the data is shown as follow.

8.3.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2014.

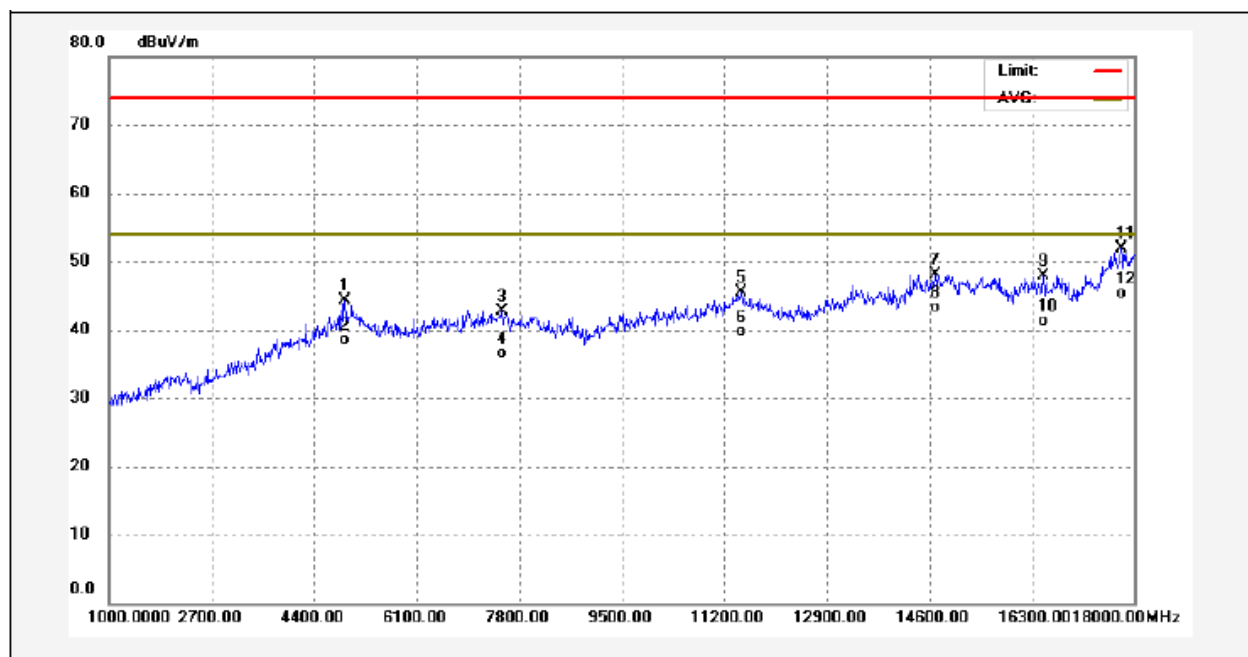


8.3.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Average measurements were performed if peak emissions were within 6dB of the average limit line

8.3.4 Radiated Emission Test Data, Above 1000MHz

Antenna Polarization: Vertical

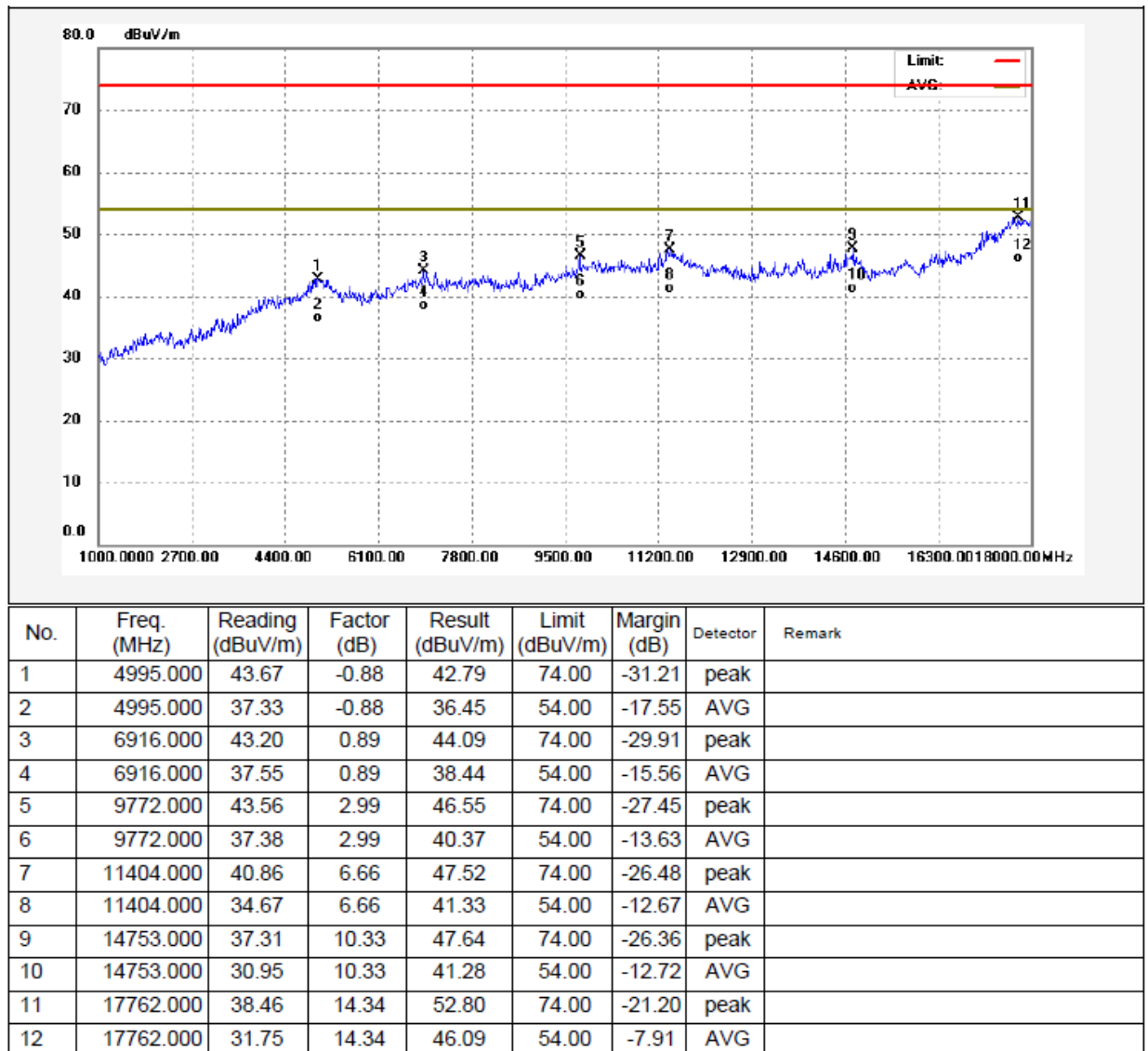


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4910.000	45.95	-1.56	44.39	74.00	-29.61	peak	
2	4910.000	39.97	-1.56	38.41	54.00	-15.59	AVG	
3	7511.000	41.31	1.30	42.61	74.00	-31.39	peak	
4	7511.000	35.22	1.30	36.52	54.00	-17.48	AVG	
5	11489.000	38.49	7.05	45.54	74.00	-28.46	peak	
6	11489.000	32.57	7.05	39.62	54.00	-14.38	AVG	
7	14702.000	37.86	10.33	48.19	74.00	-25.81	peak	
8	14702.000	32.89	10.33	43.22	54.00	-10.78	AVG	
9	16487.000	38.02	9.93	47.95	74.00	-26.05	peak	
10	16487.000	31.28	9.93	41.21	54.00	-12.79	AVG	
11	17779.000	37.44	14.40	51.84	74.00	-22.16	peak	
12	17779.000	30.96	14.40	45.36	54.00	-8.64	AVG	

Factor= antenna factor + cable loss - preamplifier factor

Result = Reading + Factor

Antenna Polarization: Horizontal



Factor= antenna factor + cable loss - preamplifier factor

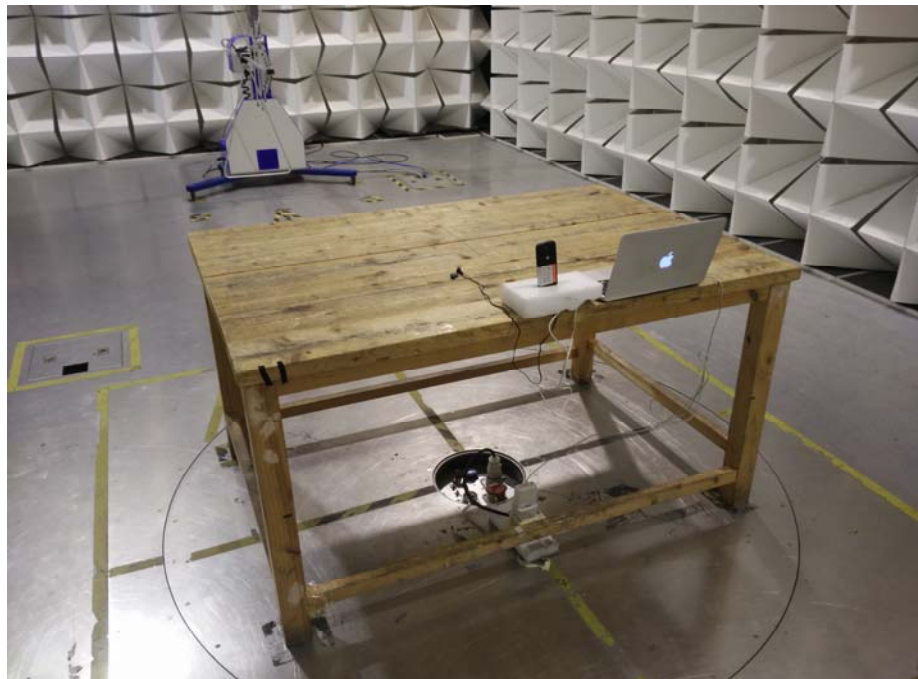
Result = Reading + Factor

9 Photographs – Test Setup FCC ID GAO-2LK300

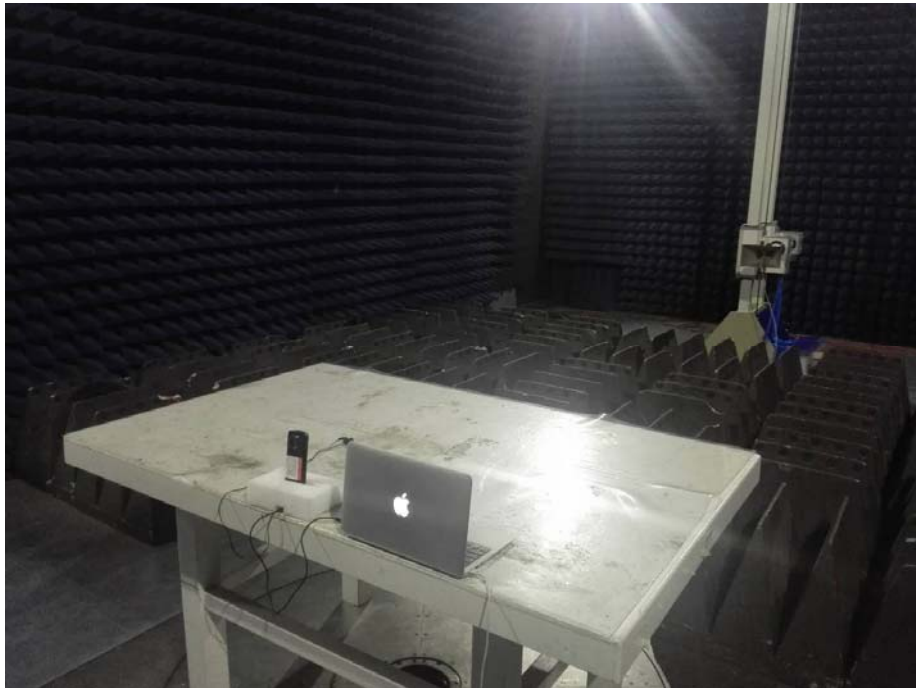
9.1 Photograph –Power Line Conducted Emission Test Setup at Test Site 1#



9.2 Photograph – Radiated Emission Test Setup for 30~1000MHz at Test Site 2#



9.3 Photograph – Radiated Emission Test Setup for Above 1GHz at Test Site 1#



=====End of Report=====