

# TEST REPORT

**Reference No.**..... : WTS16S0448412E  
**FCC ID** ..... : 2AEE8LAVAGRAN2C  
**Applicant**..... : LAVA INTERNATIONAL (H.K) LIMITED  
**Address**..... : UNIT L 1/F MAU LAM COMM BLDG 16-18 MAU LAM ST,  
JORDAN KL, HK.  
**Manufacturer** ..... : LAVA INTERNATIONAL (H.K) LIMITED  
**Address**..... : UNIT L 1/F MAU LAM COMM BLDG 16-18 MAU LAM ST,  
JORDAN KL, HK.  
**Product Name**..... : Mobile Phone  
**Model No.**..... : Grand2c  
**Brand**..... : LAVA  
**Standards** ..... : FCC PART15 SUBPART B: 2015  
**Date of Receipt sample** .... : Apr. 21, 2016  
**Date of Test** ..... : Apr. 22, 2016 – Apr. 29, 2016  
**Date of Issue**..... : May, 03, 2016  
**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:**

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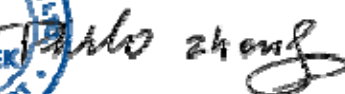
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Compiled by:



Zero Zhou / Test Engineer

Approved by:



Philo Zhong / Manager

## 1 Test Summary

Test Item	Test Requirement	Class	Test Method	Test Result
Power Line Conducted Emission (150kHz to 30MHz)	FCC PART 15, SUBPART B: 2015	Class B	ANSI C63.4: 2009	Pass
Radiated Emission 30MHz to 1GHz)	FCC PART 15, SUBPART B: 2015	Class B	ANSI C63.4: 2009	Pass
Radiated Emission (Above 1GHz)	FCC PART 15, SUBPART B: 2015	Class B	ANSI C63.4: 2009	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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### 3 General Information

#### 3.1 General Description of E.U.T.

Product Name	: Mobile Phone
Model No.	: Grand2c
Model Description	: N/A
GSM Band(s)	: GSM 850/900/1900MHz
GPRS/EGPRS Class	: 12
WCDMA Band(s)	: FDD Band I/II/V
LTE Bnad(s)	: LTE Band 2/4/7
Wi-Fi Specification	: 2.4G: 802.11b/g/n HT20/n HT40
Bluetooth Version	: Bluetooth v4.0 with BLE
GPS	: Support
NFC	: N/A
Hardware Version	: V2.0
Software Version	: LAVA_Grand2c_MX_S101_20160408
Highest Operate Frequency	: 1.3GHz

#### 3.2 Details of E.U.T.

Technical Data:	: Battery DC 3.8V 3000mAh DC 5V, 1A, charging from adapter (Adapter Input: 100-300V~50/60Hz 0.15A)
Adapter:	: Manufacture: Shenzhen Tianyin Electronics Co.,LTD. Model No.: CLV-14

#### 3.3 Standards Applicable for Testing

The tests were performed according to following standards:

FCC PART 15, SUBPART B: Electronic Code of Federal Regulations- Unintentional Radiators 2015

### 3.4 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.

### 3.5 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

### 3.6 Abnormalities from Standard Conditions

None.

## 4 Equipment Used during Test

### 4.1 Equipment List

<b>Conducted Emissions Test Site 1#</b>						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.15,2015	Sep.14,2016
2.	LISN	R&S	ENV216	101215	Sep.15,2015	Sep.14,2016
3.	Cable	Top	TYPE16(3.5M)	-	Sep.15,2015	Sep.14,2016
<b>Conducted Emissions Test Site 2#</b>						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.15,2015	Sep.14,2016
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.15,2015	Sep.14,2016
3.	Limitter	York	MTS-IMP-136	261115-001-0024	Sep.15,2015	Sep.14,2016
4.	Cable	LARGE	RF300	-	Sep.15,2015	Sep.14,2016
<b>3m Semi-anechoic Chamber for Radiation Emissions Test site 1#</b>						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2015	Sep.14,2016
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.15,2015	Sep.14,2016
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.19,2016	Apr.18,2017
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.15,2015	Sep.14,2016
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.19,2016	Apr.18,2017
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.19,2016	Apr.18,2017
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Mar.17,2016	Mar.16,2017
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.10,2016	Apr.09,2017
<b>3m Semi-anechoic Chamber for Radiation Emissions Test site 2#</b>						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	Sep.15,2015	Sep.14,2016
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Sep.15,2015	Sep.14,2016
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.15,2015	Sep.14,2016

4	Cable	HUBER+SUHNER	CBL2	525178	Sep.15,2015	Sep.14,2016
<b>RF Conducted Testing</b>						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.15,2015	Sep.14,2016
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.15,2015	Sep.14,2016
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.15,2015	Sep.14,2016

#### 4.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
MacBook Air	APPLE	A1465	C17KTQDNF5N7

#### 4.3 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	±3.64dB	(1)
Radiation Emission	30MHz~1000MHz	±5.03dB	(1)
	1GHz~18GHz	±5.47dB	(1)

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

## 5 Emission Test Results

### 5.1 Power Line Conducted Emission, 150kHz to 30MHz

Test Requirement ..... : FCC PART 15, SUBPART B  
 Test Method ..... : ANSI C63.4 2009  
 Test Result ..... : Pass  
 Frequency Range ..... : 150kHz to 30MHz  
 Class ..... : Class B  
 Limit ..... :

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

#### 5.1.1 E.U.T. Operation

Operating Environment:

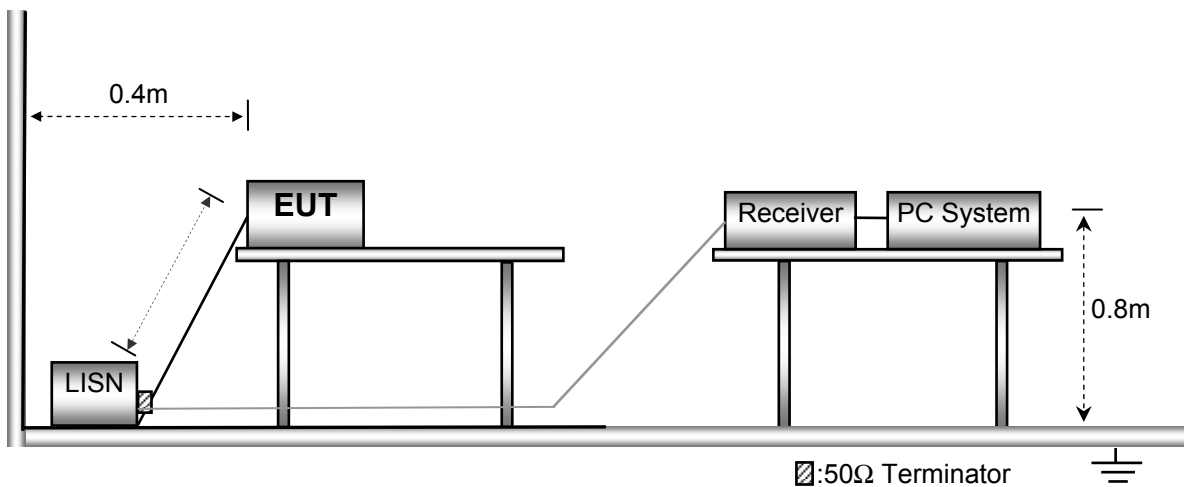
Temperature ..... : 23°C  
 Humidity ..... : 53.6%RH  
 Atmospheric Pressure..... : 101kPa

EUT Operation:

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

#### 5.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with the ANSI C63.4 2009.



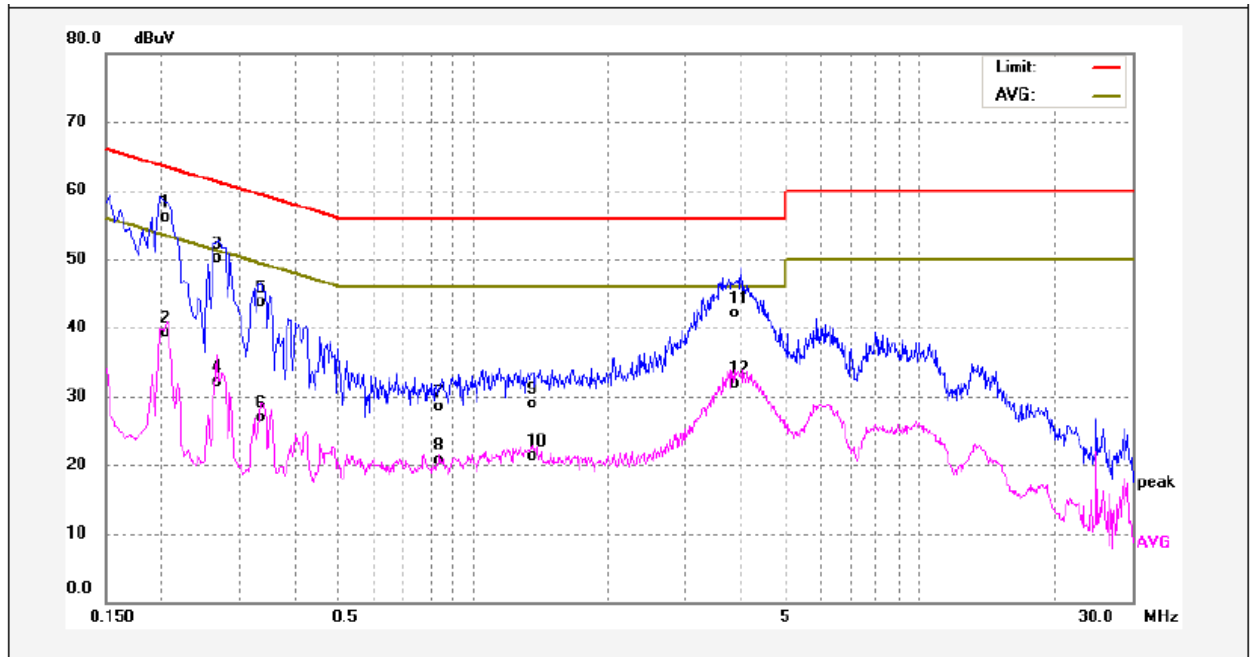


### 5.1.3 Measurement Data

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 section 5.1.4, the EUT complied with the FCC PART 15, SUBPART B standards.

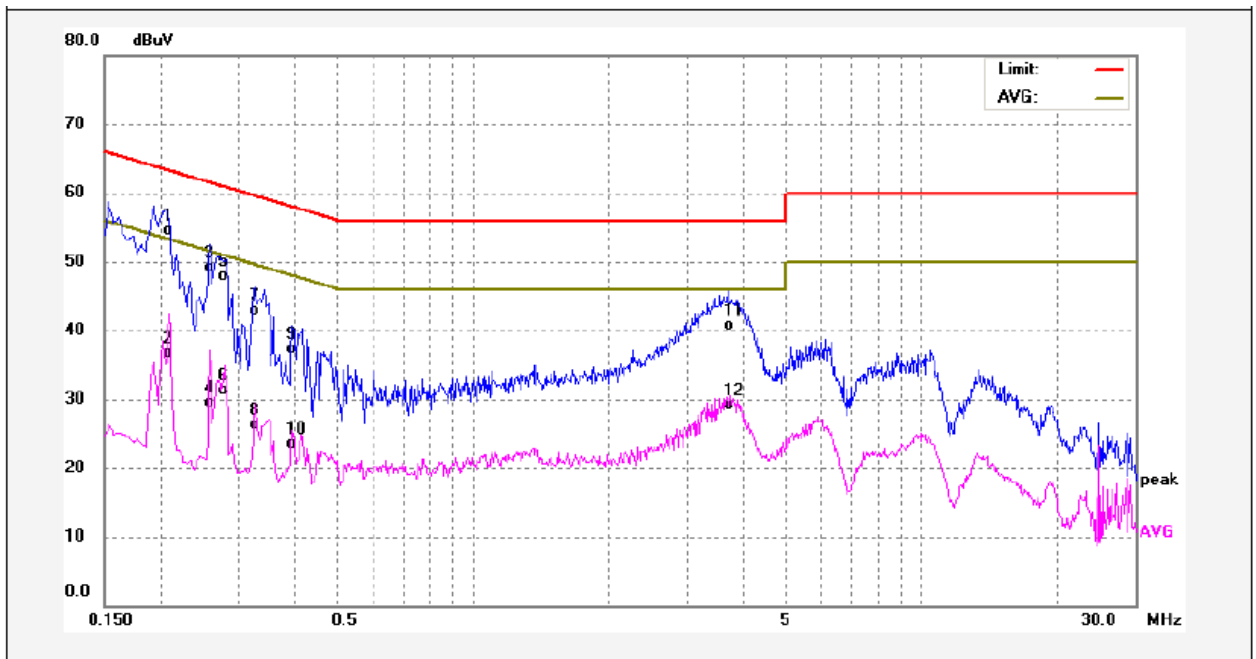
### 5.1.4 Power Line Conducted Emission Test Data

Live Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2060	45.91	10.26	56.17	63.36	-7.19	QP	
2	0.2060	29.10	10.26	39.36	53.36	-14.00	AVG	
3	0.2660	39.88	10.27	50.15	61.24	-11.09	QP	
4	0.2660	21.89	10.27	32.16	51.24	-19.08	AVG	
5	0.3339	33.37	10.29	43.66	59.35	-15.69	QP	
6	0.3339	16.65	10.29	26.94	49.35	-22.41	AVG	
7	0.8420	18.23	10.37	28.60	56.00	-27.40	QP	
8	0.8420	10.39	10.37	20.76	46.00	-25.24	AVG	
9	1.3540	18.53	10.42	28.95	56.00	-27.05	QP	
10	1.3540	10.83	10.42	21.25	46.00	-24.75	AVG	
11	3.8500	31.65	10.51	42.16	56.00	-13.84	QP	
12	3.8500	21.44	10.51	31.95	46.00	-14.05	AVG	

Neutral Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2100	44.21	10.26	54.47	63.20	-8.73	QP	
2	0.2100	26.39	10.26	36.65	53.20	-16.55	AVG	
3	0.2580	38.77	10.26	49.03	61.49	-12.46	QP	
4	0.2580	19.21	10.26	29.47	51.49	-22.02	AVG	
5	0.2779	37.58	10.27	47.85	60.88	-13.03	QP	
6	0.2779	20.96	10.27	31.23	50.88	-19.65	AVG	
7	0.3260	32.62	10.28	42.90	59.55	-16.65	QP	
8	0.3260	15.93	10.28	26.21	49.55	-23.34	AVG	
9	0.3940	27.10	10.27	37.37	57.98	-20.61	QP	
10	0.3940	13.29	10.27	23.56	47.98	-24.42	AVG	
11	3.7500	30.27	10.51	40.78	56.00	-15.22	QP	
12	3.7500	18.57	10.51	29.08	46.00	-16.92	AVG	

### 5.2 Radiation Emission, 30MHz to 1000MHz

Test Requirement ..... : FCC PART 15, SUBPART B  
 Test Method ..... : ANSI C63.4 2009  
 Test Result ..... : Pass  
 Frequency Range ..... : 30MHz to 1000MHz  
 Class. : Class B  
 Limit..... :

Frequency (MHz)	Distance (Meter)	Limit (dB $\mu$ V/m
		Quasi-peak
30 to 88	3	40
88 to 211	3	43.5
216 to 960	3	46
960 to 1000	3	54

#### 5.2.1 E.U.T. Operation

Operating Environment:

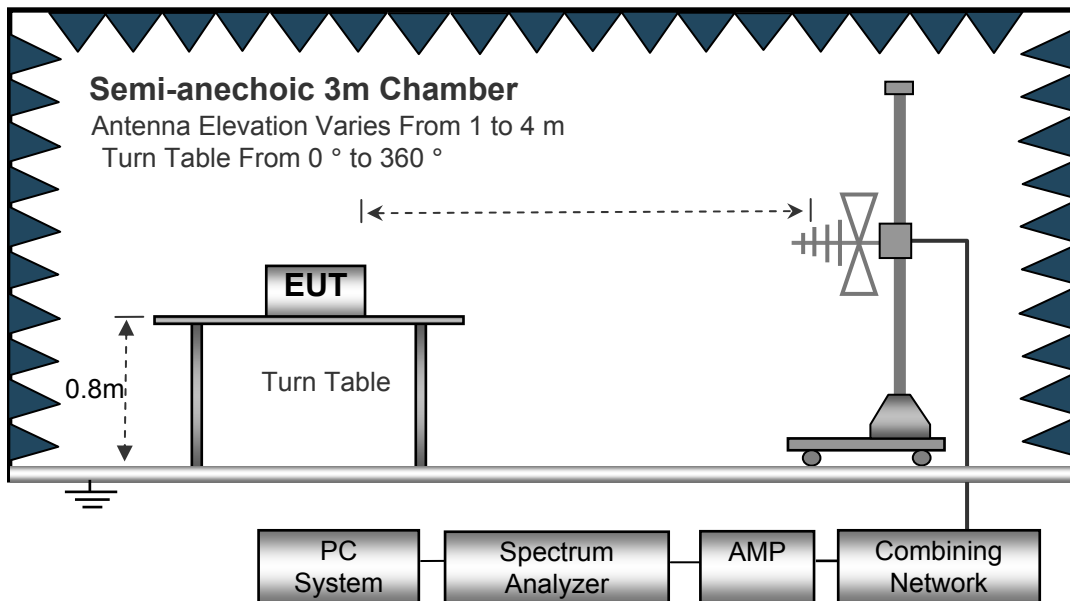
Temperature ..... : 22.5°C  
 Humidity ..... : 52.6%RH  
 Atmospheric Pressure..... : 101.2kPa

EUT Operation:

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

#### 5.2.2 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.

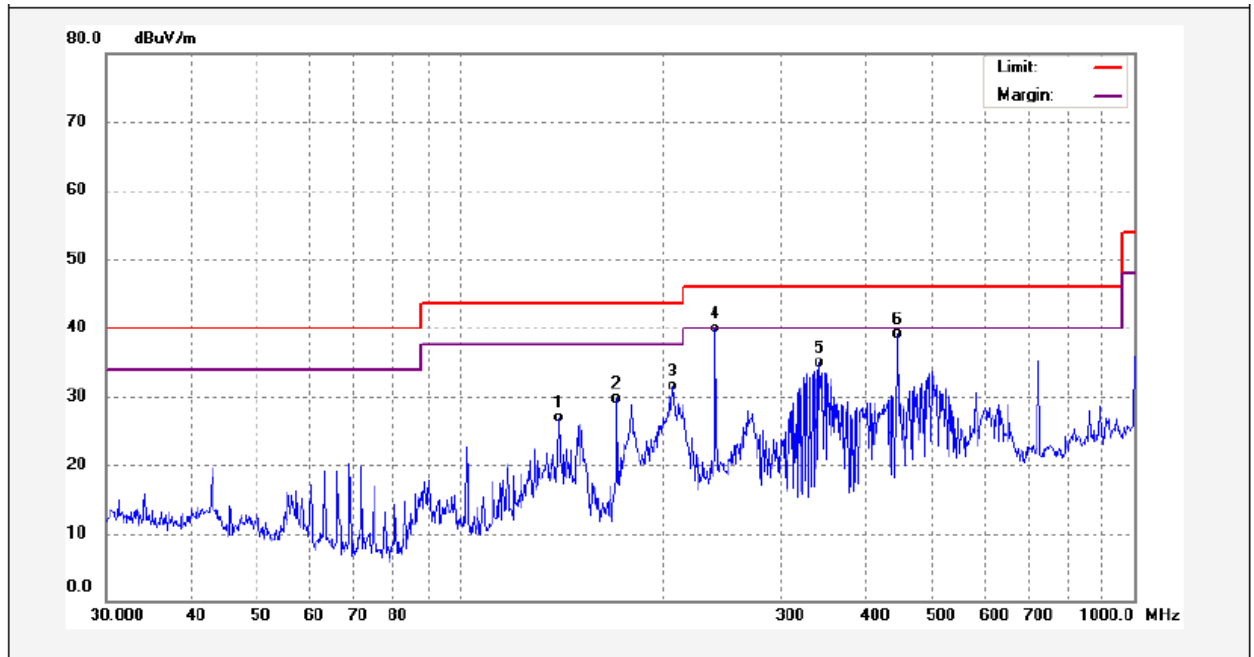


### 5.2.3 Measurement Data

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.

### 5.2.4 Radiated Emission Test Data, 30MHz to 1000MHz

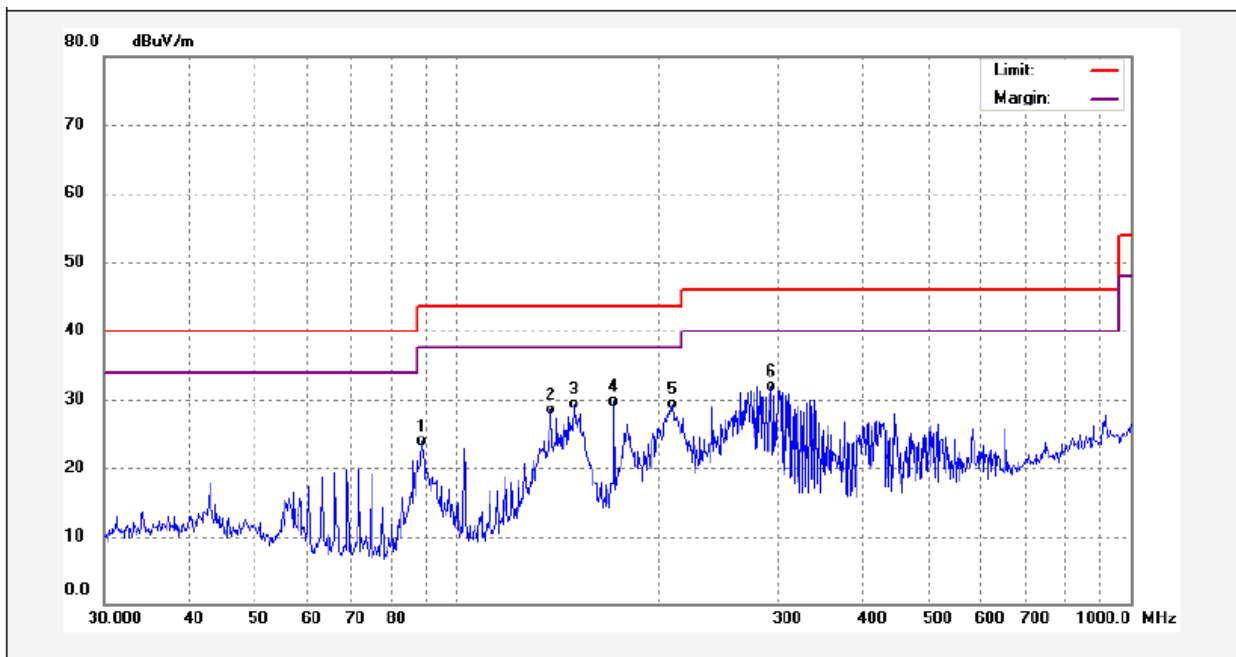
Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	140.8350	46.56	-19.59	26.97	43.50	-16.53	QP	
2	171.3925	48.22	-18.53	29.69	43.50	-13.81	QP	
3	207.1225	48.83	-17.31	31.52	43.50	-11.98	QP	
4	239.9873	55.99	-16.10	39.89	46.00	-6.11	QP	
5	341.9786	48.29	-13.41	34.88	46.00	-11.12	QP	
6	446.4139	50.39	-11.23	39.16	46.00	-6.84	QP	

Factor= antenna factor + cable loss - preamplifier factor

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	88.9639	42.99	-19.05	23.94	43.50	-19.56	QP	
2	137.9028	47.66	-19.24	28.42	43.50	-15.08	QP	
3	149.4857	48.74	-19.53	29.21	43.50	-14.29	QP	
4	171.3926	48.21	-18.53	29.68	43.50	-13.82	QP	
5	209.3129	46.57	-17.25	29.32	43.50	-14.18	QP	
6	293.0842	47.14	-15.28	31.86	46.00	-14.14	QP	

Factor= antenna factor + cable loss - preamplifier factor

### 5.3 Radiation Emission, Above 1000MHz

Test Requirement ..... : FCC PART 15, SUBPART B  
 Test Method ..... : ANSI C63.4 2009  
 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

#### 5.3.1 E.U.T. Operation

Operating Environment:

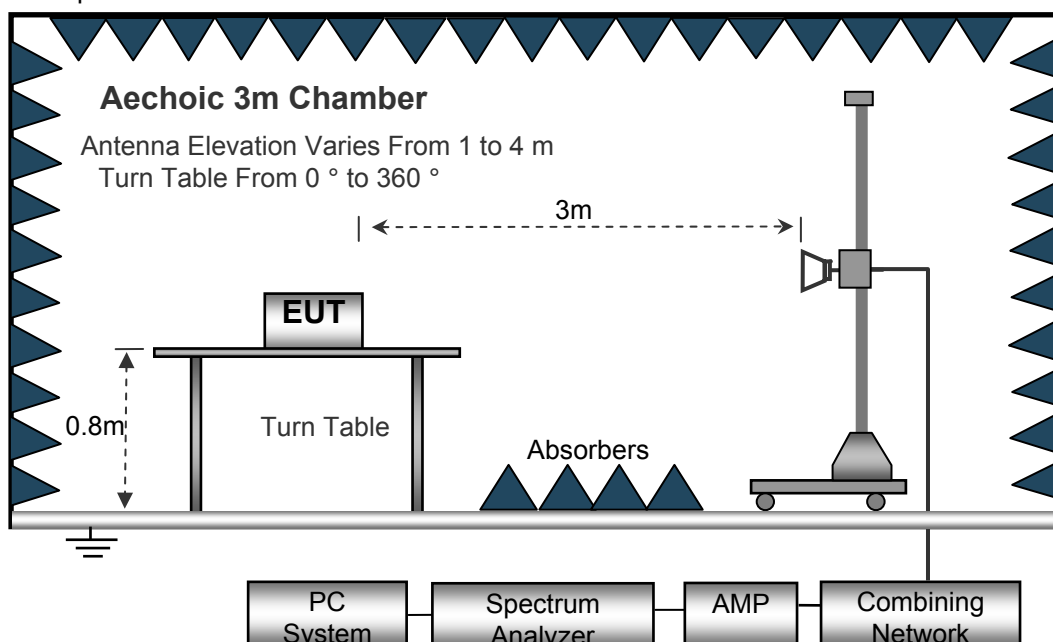
Temperature..... : 22.4°C  
 Humidity ..... : 52.3%RH  
 Atmospheric Pressure..... : 101.3kPa

EUT Operation:

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

#### 5.3.2 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.

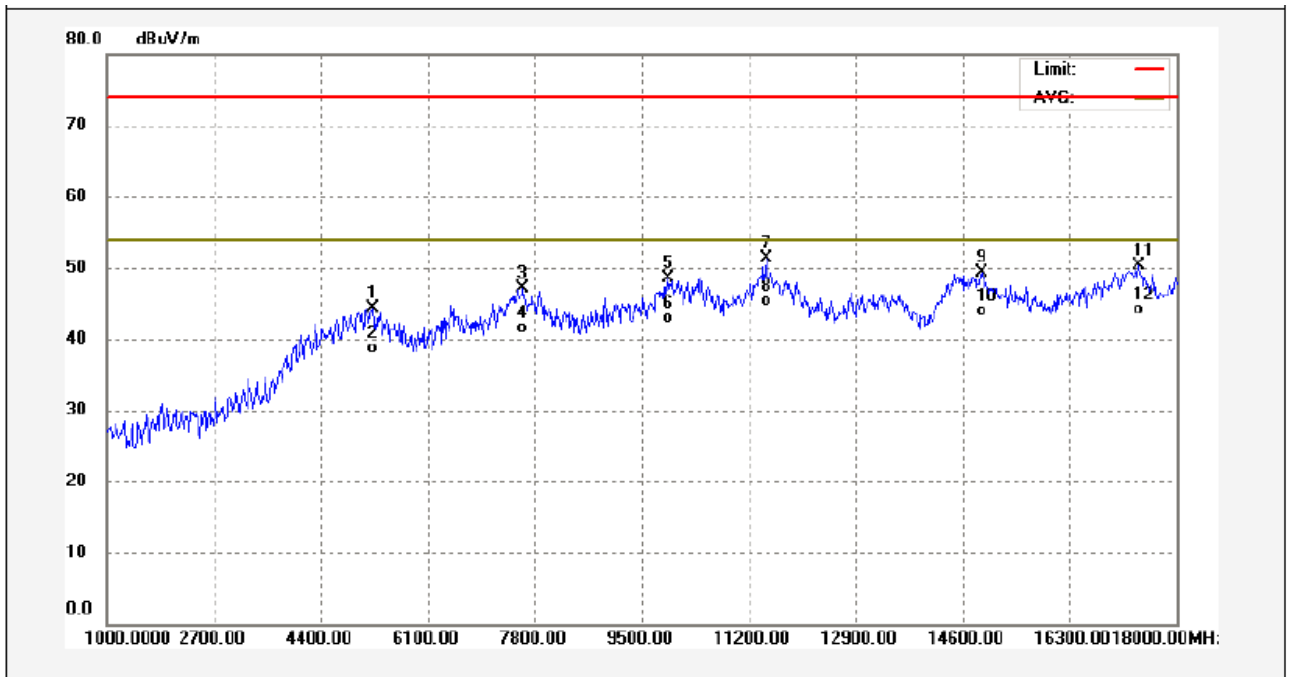


### 5.3.3 Measurement Data

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

### 5.3.4 Radiated Emission Test Data, Above 1000MHz

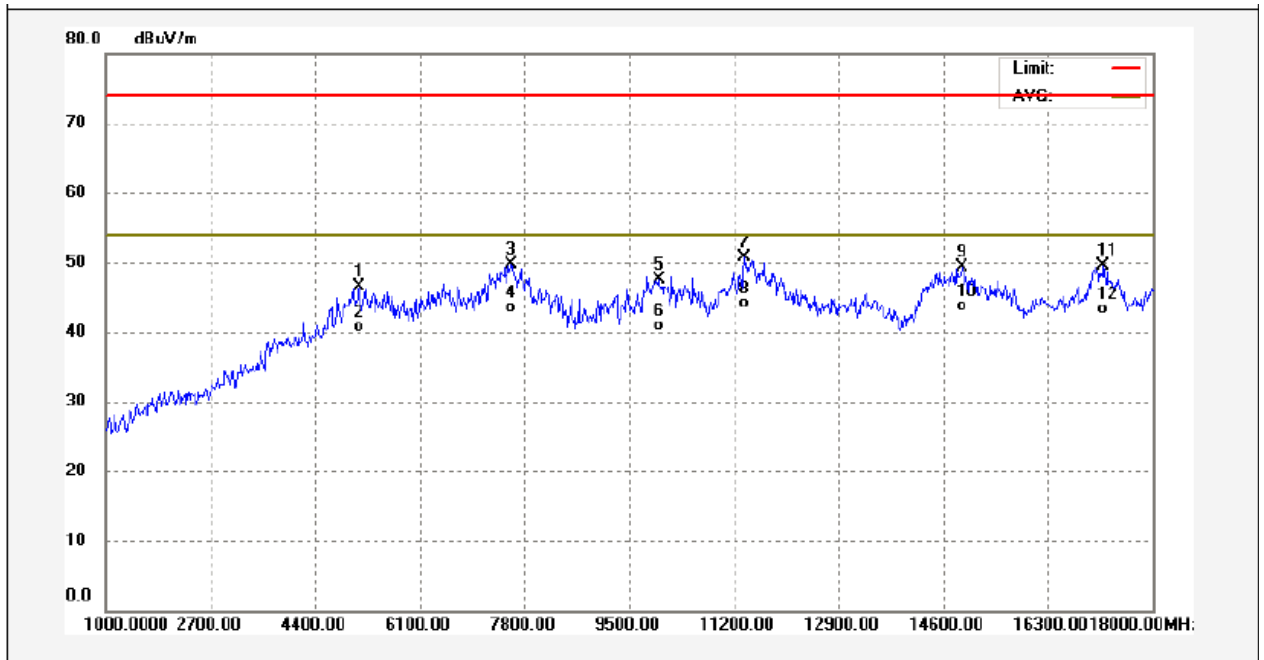
Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	5233.000	45.30	-0.94	44.36	74.00	-29.64	peak	
2	5233.000	39.56	-0.94	38.62	54.00	-15.38	AVG	
3	7613.000	43.70	3.37	47.07	74.00	-26.93	peak	
4	7613.000	38.15	3.37	41.52	54.00	-12.48	AVG	
5	9925.000	42.28	6.31	48.59	74.00	-25.41	peak	
6	9925.000	36.60	6.31	42.91	54.00	-11.09	AVG	
7	11472.000	42.18	9.11	51.29	74.00	-22.71	peak	
8	11472.000	36.20	9.11	45.31	54.00	-8.69	AVG	
9	14906.000	39.92	9.43	49.35	74.00	-24.65	peak	
10	14906.000	34.54	9.43	43.97	54.00	-10.03	AVG	
11	17388.000	36.50	13.87	50.37	74.00	-23.63	peak	
12	17388.000	30.29	13.87	44.16	54.00	-9.84	AVG	

Factor= antenna factor + cable loss - preamplifier factor

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	5114.000	47.08	-0.59	46.49	74.00	-27.51	peak	
2	5114.000	41.20	-0.59	40.61	54.00	-13.39	AVG	
3	7579.000	46.28	3.47	49.75	74.00	-24.25	peak	
4	7579.000	40.05	3.47	43.52	54.00	-10.48	AVG	
5	9976.000	40.83	6.62	47.45	74.00	-26.55	peak	
6	9976.000	34.38	6.62	41.00	54.00	-13.00	AVG	
7	11370.000	42.20	8.47	50.67	74.00	-23.33	peak	
8	11370.000	35.71	8.47	44.18	54.00	-9.82	AVG	
9	14906.000	39.94	9.43	49.37	74.00	-24.63	peak	
10	14906.000	34.25	9.43	43.68	54.00	-10.32	AVG	
11	17201.000	37.31	12.26	49.57	74.00	-24.43	peak	
12	17201.000	31.03	12.26	43.29	54.00	-10.71	AVG	

Factor= antenna factor + cable loss - preamplifier factor

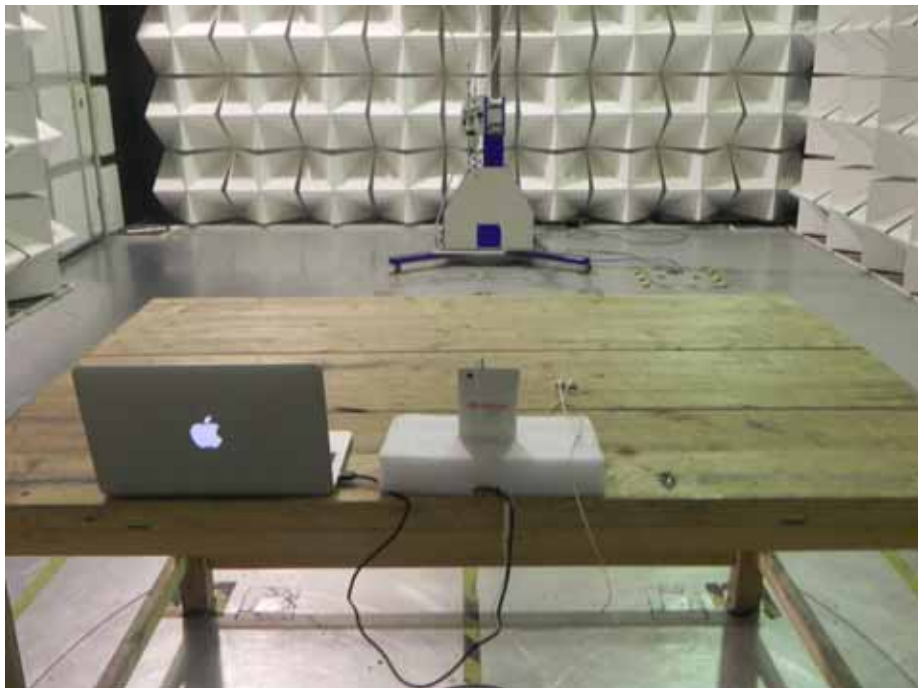


## 6 Photographs – Test Setup

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



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



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



====End of Report====