

TEST REPORT

Reference No...... : WTS15S0425914E
FCC ID : 2AEE8LAVAGRAN
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...... : Grand
Brand..... : LAVA
Standards : FCC PART15 SUBPART B: 2014
Date of Receipt sample : Apr,30, 2015
Date of Test : May. 04 - 07, 2015
Date of Issue..... : Jun. 03, 2015
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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Compiled by:



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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: 2014	Class B	ANSI C63.4: 2003	Pass
Radiated Emission 30MHz to 1GHz)	FCC PART 15, SUBPART B: 2014	Class B	ANSI C63.4: 2003	Pass
Radiated Emission (Above 1GHz)	FCC PART 15, SUBPART B: 2014	Class B	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

2 Contents

	Page
COVER PAGE	1
1 TEST SUMMARY	2
2 CONTENTS	3
3 GENERAL INFORMATION	4
3.1 GENERAL DESCRIPTION OF E.U.T.....	4
3.2 DETAILS OF E.U.T.....	4
3.3 STANDARDS APPLICABLE FOR TESTING	4
3.4 TEST FACILITY	4
3.5 SUBCONTRACTED	5
3.6 ABNORMALITIES FROM STANDARD CONDITIONS	5
4 EQUIPMENT USED DURING TEST	6
4.1 EQUIPMENT LIST.....	6
4.2 DESCRIPTION OF SUPPORT UNITS.....	7
4.3 MEASUREMENT UNCERTAINTY.....	7
5 EMISSION TEST RESULTS	8
5.1 POWER LINE CONDUCTED EMISSION, 150KHZ TO 30MHZ	8
5.2 RADIATION EMISSION, 30MHZ TO 1000MHZ.....	11
5.3 RADIATION EMISSION, ABOVE 1000MHZ.....	14
6 PHOTOGRAPHS – TEST SETUP	17
6.1 PHOTOGRAPH –POWER LINE CONDUCTED EMISSION TEST SETUP AT TEST SITE 2#.....	17
6.2 PHOTOGRAPH – RADIATED EMISSION TEST SETUP FOR 30~1000MHZ AT TEST SITE 2#.....	17
6.3 PHOTOGRAPH – RADIATED EMISSION TEST SETUP FOR ABOVE 1GHZ AT TEST SITE 1#.....	18
7 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS	19
7.1 EXTERNAL VIEW	19
7.2 INTERNAL PHOTOS	24

3 General Information

3.1 General Description of E.U.T.

Product Name	:mobile phone
Model No.	:Grand
Model Description	: N/A
GSM Band(s)	: GSM 850/900/1800/1900MHz
GPRS Class	: 12
EDGE	: Support
WCDMA Band(s)	: FDD Band I/II/V
Wi-Fi Specification	: 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_Grand_MEX_S101_20150421

3.2 Details of E.U.T.

Technical Data	: Battery DC 3.8V 2650mAh DC 5V, 1.0A, charging from adapter (Adapter Input: 100-300V~50/60Hz, 0.15A)
Adapter	:: Manufacture: LAVA INTERNATIONAL (H.K) LIMITED 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 2014

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, July 12, 2012.

- **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.

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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

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.15,2014	Sep.14,2015
2.	LISN	R&S	ENV216	101215	Sep.15,2014	Sep.14,2015
3.	Cable	Top	TYPE16(3.5M)	-	Sep.15,2014	Sep.14,2015
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.15,2014	Sep.14,2015
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.15,2014	Sep.14,2015
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.15,2014	Sep.14,2015
4.	Cable	LARGE	RF300	-	Sep.15,2014	Sep.14,2015
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2014	Sep.14,2015
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.15,2014	Sep.14,2015
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.19,2015	Apr.18,2016
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.15,2014	Sep.14,2015
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.19,2015	Apr.18,2016
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.19,2015	Apr.18,2016
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Mar.17,2015	Mar.16,2016
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.10,2015	Apr.09,2016
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	Sep.15,2014	Sep.14,2015
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Sep.15,2014	Sep.14,2015
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.15,2014	Sep.14,2015

4	Cable	HUBER+SUHNER	CBL2	525178	Sep.15,2014	Sep.14,2015
RF Conducted Testing						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.15,2014	Sep.14,2015
2.	Spectrum Analyzer (9k~6GHz)	R&S	FSL6	100959	Sep.15,2014	Sep.14,2015
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.15,2014	Sep.14,2015

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~6GHz	±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
 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 t 5	56	46
5 to 30	60	50

5.1.1 E.U.T. Operation

Operating Environment:

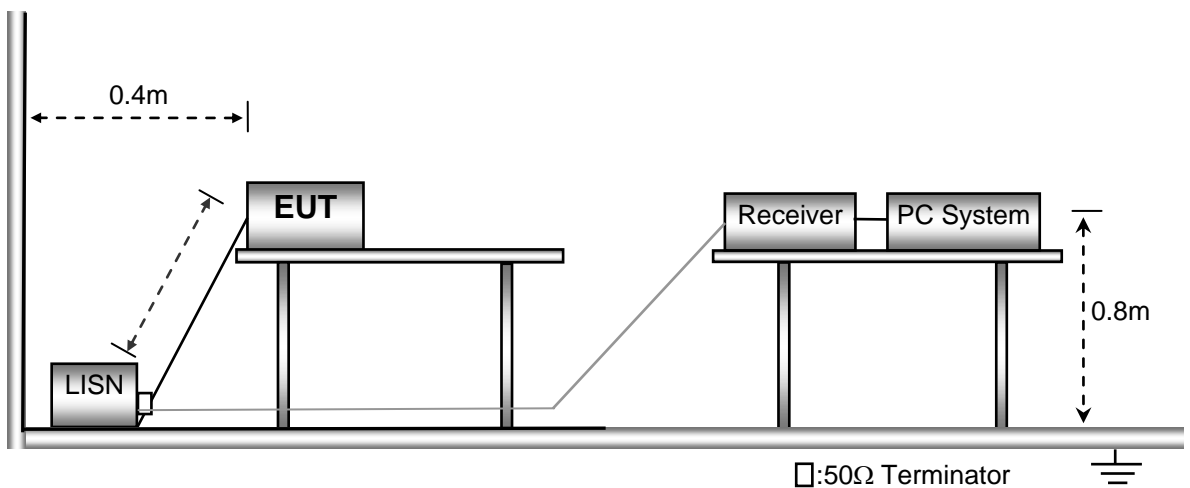
Temperature : 23°C
 Humidity : 53.6%RH
 Atmospheric Pressure..... : 101kPa

EUT Operation:

Input Voltage..... : DC 5V by Adapter Input AC 120V/60Hz
 Operating Mode : Data transmitting
 Remark : The worse case(Data transmitting mode) is under the condition of AC 120V/50Hz 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 .

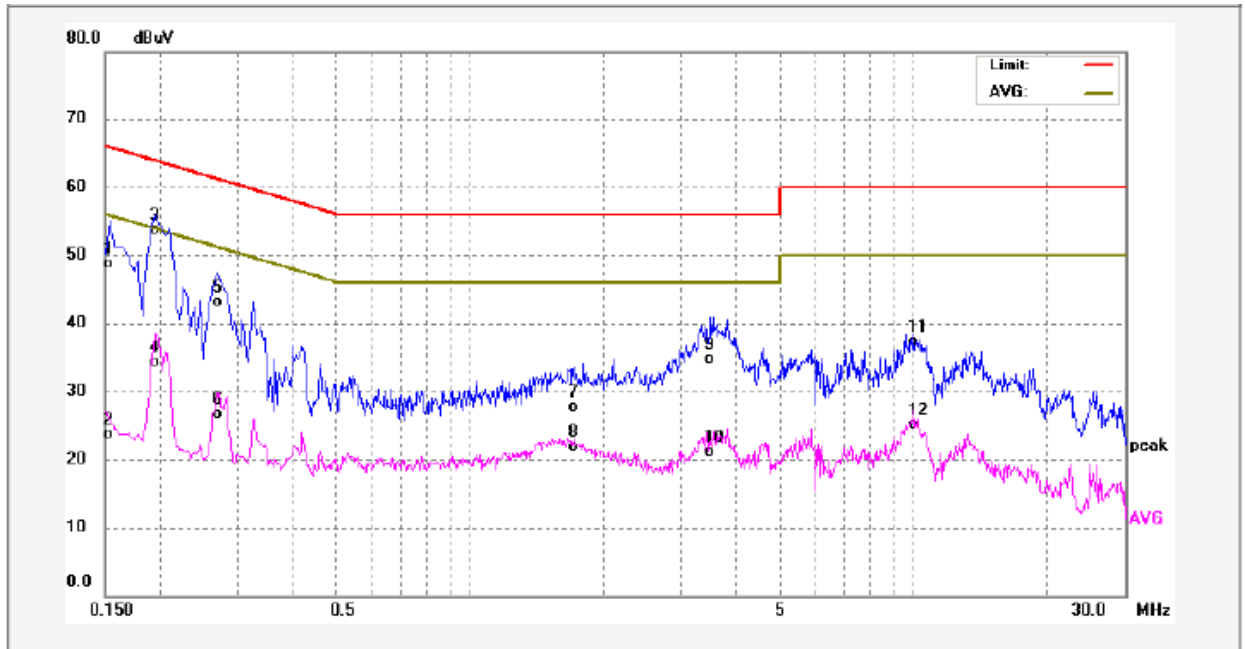


5.1.3 Measurement Data

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.

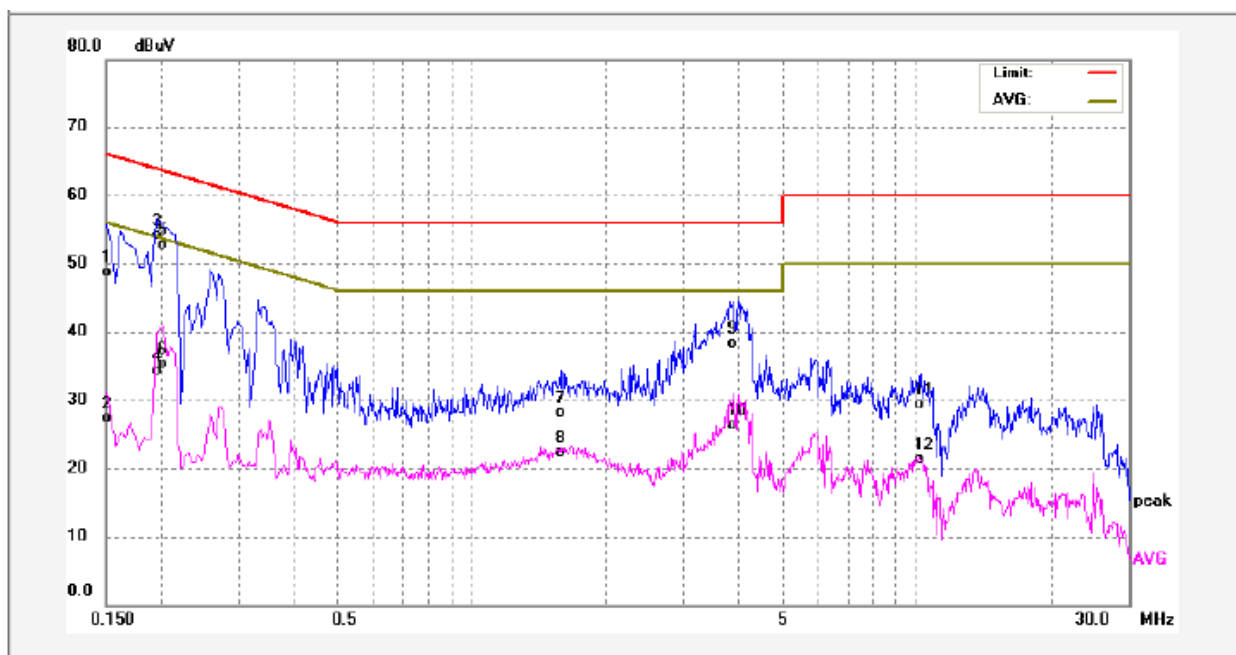
5.1.4 Power Line Conducted Emission Test Data

Live Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1539	38.70	10.10	48.80	65.78	-16.98	QP	
2	0.1539	13.67	10.10	23.77	55.78	-32.01	AVG	
3	0.1945	43.54	10.10	53.64	63.84	-10.20	QP	
4	0.1945	24.20	10.10	34.30	53.84	-19.54	AVG	
5	0.2700	33.03	10.10	43.13	61.12	-17.99	QP	
6	0.2700	16.57	10.10	26.67	51.12	-24.45	AVG	
7	1.7140	17.57	10.20	27.77	56.00	-28.23	QP	
8	1.7140	11.62	10.20	21.82	46.00	-24.18	AVG	
9	3.4860	24.41	10.22	34.63	56.00	-21.37	QP	
10	3.4860	10.92	10.22	21.14	46.00	-24.86	AVG	
11	9.9780	26.98	10.35	37.33	60.00	-22.67	QP	
12	9.9780	14.77	10.35	25.12	50.00	-24.88	AVG	

Neutral Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	38.54	10.10	48.64	65.99	-17.35	QP	
2	0.1500	17.29	10.10	27.39	55.99	-28.60	AVG	
3	0.1940	43.95	10.10	54.05	63.86	-9.81	QP	
4	0.1940	24.23	10.10	34.33	53.86	-19.53	AVG	
5	0.2020	42.67	10.10	52.77	63.52	-10.75	QP	
6	0.2020	25.29	10.10	35.39	53.52	-18.13	AVG	
7	1.5820	17.83	10.20	28.03	56.00	-27.97	QP	
8	1.5820	12.20	10.20	22.40	46.00	-23.60	AVG	
9	3.8740	28.08	10.23	38.31	56.00	-17.69	QP	
10	3.8740	16.17	10.23	26.40	46.00	-19.60	AVG	
11	10.1980	18.93	10.36	29.29	60.00	-30.71	QP	
12	10.1980	10.98	10.36	21.34	50.00	-28.66	AVG	

5.2 Radiation Emission, 30MHz to 1000MHz

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

Frequency (MHz)	Distance (Meter)	Limit (dB μ V/m
		Qu si-peak
30 to 88	3	40
88 to 216	3	43.5
216 to 960	3	46
960 to 1000	3	54

5.2.1 E.U.T. Operation

Operating Environment:

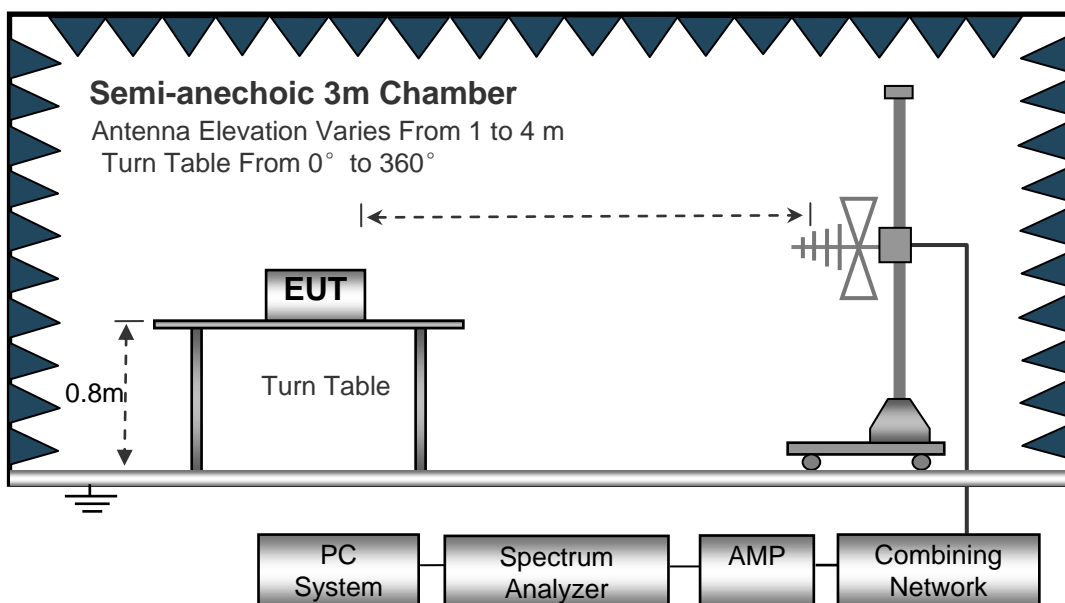
Temperature : 22.5°C
 Humidity : 52.6%RH
 Atmospheric Pressure..... : 101.2kPa

EUT Operation:

Input Voltage..... : DC 5V by Adapter Input AC 120V/60Hz
 Operating Mode : Data transmitting
 Remark : The worse case(Data transmitting mode) 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.

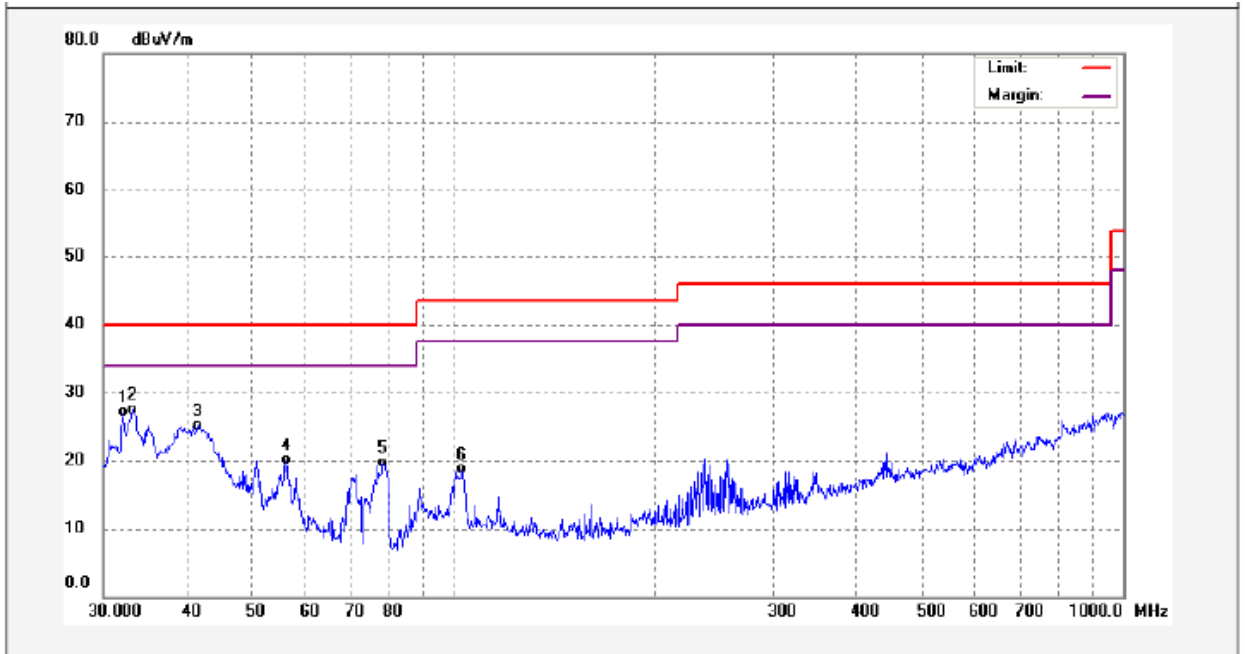


5.2.3 Measurement Data

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.

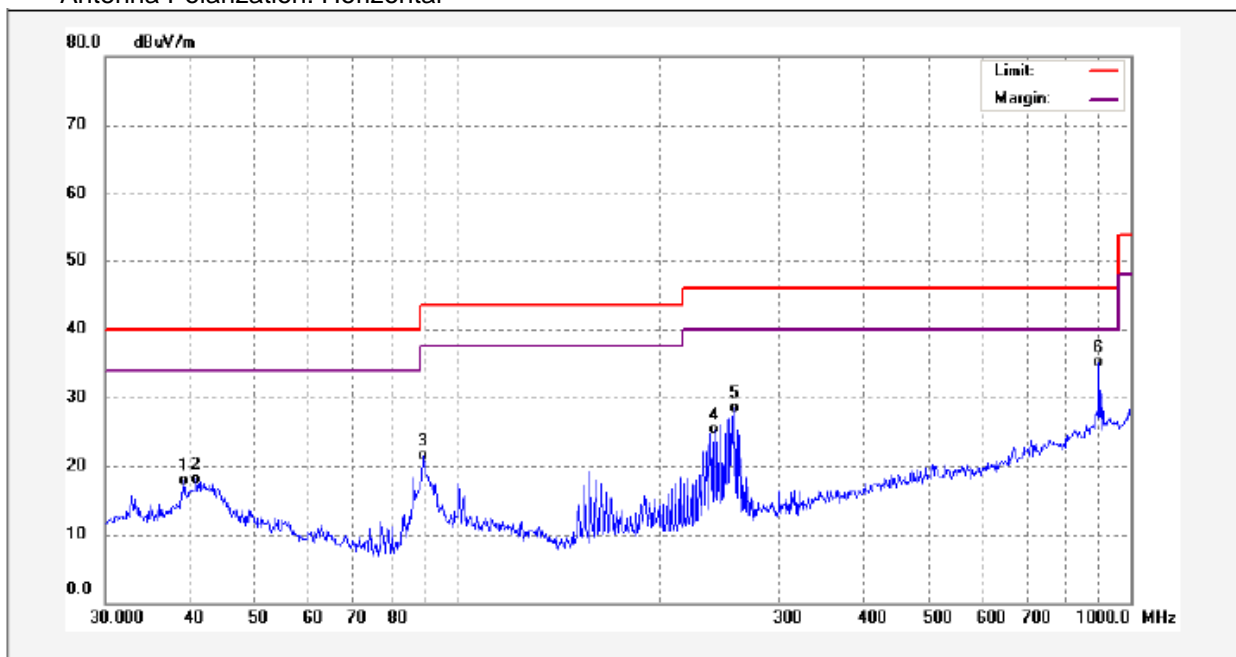
5.2.4 Radiated Emission Test Data, 30MHz to 1000MHz

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	32.0667	42.11	-14.96	27.15	40.00	-12.85	QP	
2	33.0950	42.22	-14.70	27.52	40.00	-12.48	QP	
3	41.5670	38.42	-13.33	25.09	40.00	-14.91	QP	
4	56.1974	36.13	-16.10	20.03	40.00	-19.97	QP	
5	78.4133	39.12	-19.36	19.76	40.00	-20.24	QP	
6	102.7192	34.08	-15.46	18.62	43.50	-24.88	QP	

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	39.2991	31.11	-13.23	17.88	40.00	-22.12	QP	
2	40.9881	31.37	-13.22	18.15	40.00	-21.85	QP	
3	88.9639	38.50	-17.05	21.45	43.50	-22.05	QP	
4	240.8304	38.86	-13.52	25.34	46.00	-20.66	QP	
5	258.3264	42.13	-13.56	28.57	46.00	-17.43	QP	
6	896.9965	36.96	-1.81	35.15	46.00	-10.85	QP	

5.3 Radiation Emission, Above 1000MHz

Test Requirement : FCC PART 15, SUBPART B
 Test Method : ANSI C63.4
 Test Result : Pass
 Frequency Range : 1GHz~6GHz
 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:

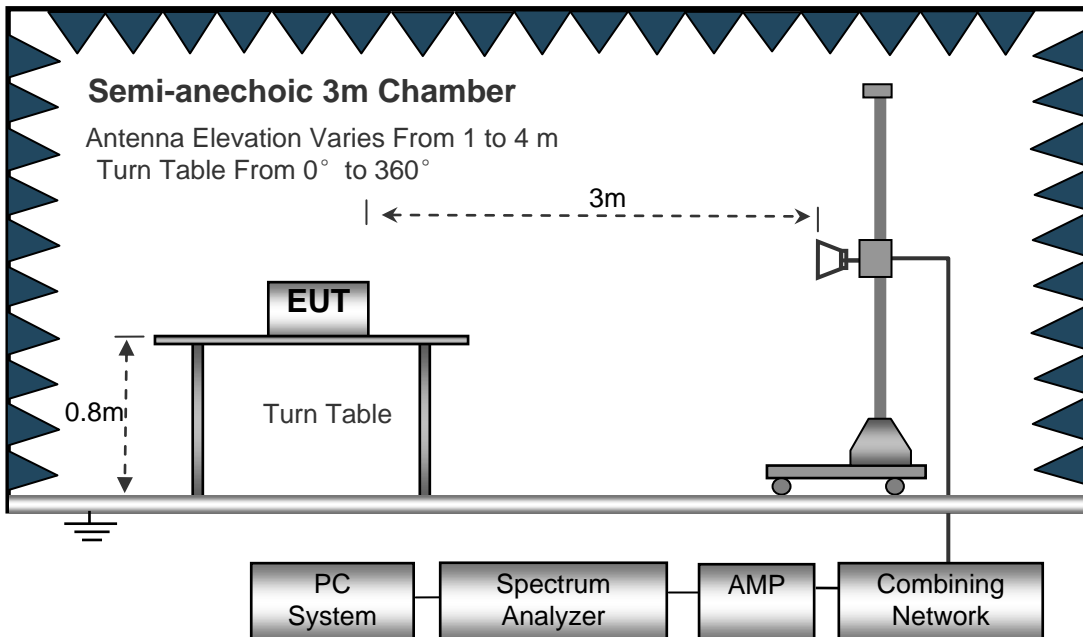
Temperature..... : 22.4°C
 Humidity : 52.3%RH
 Atmospheric Pressure..... : 101.3kPa

EUT Operation:

Input Voltage : DC 5V by Adapter Input AC 120V/60Hz
 Operating Mode : Data transmitting 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.

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.

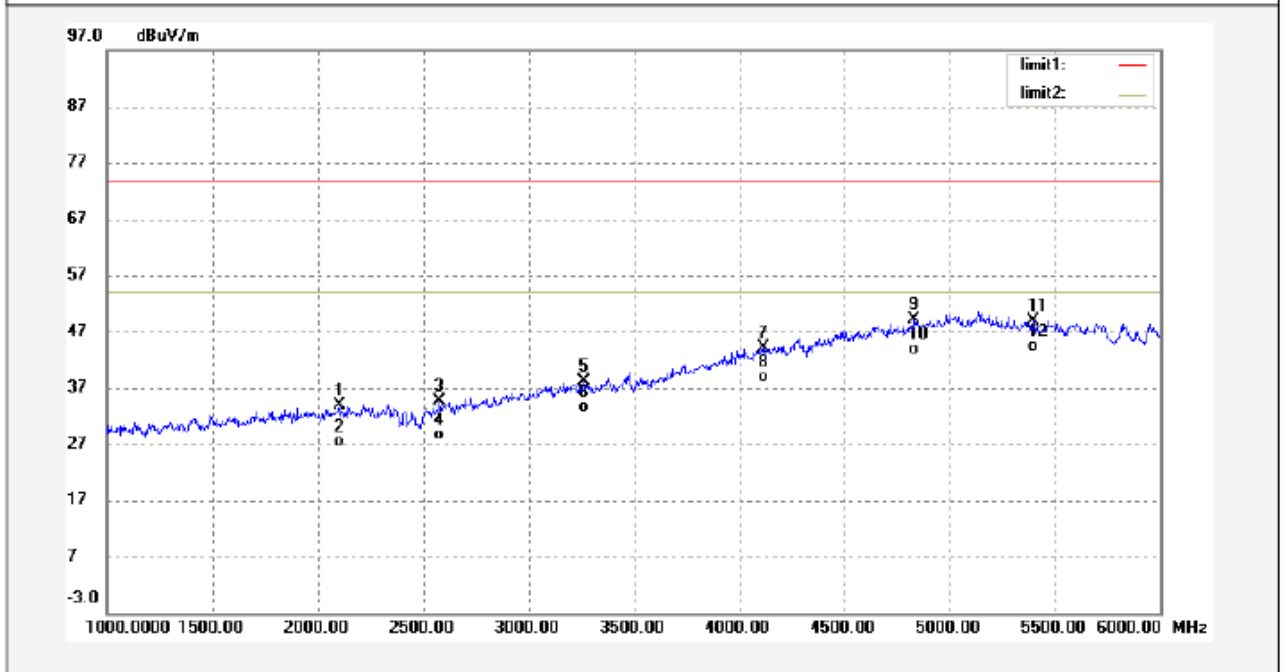


5.3.3 Measurement Data

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

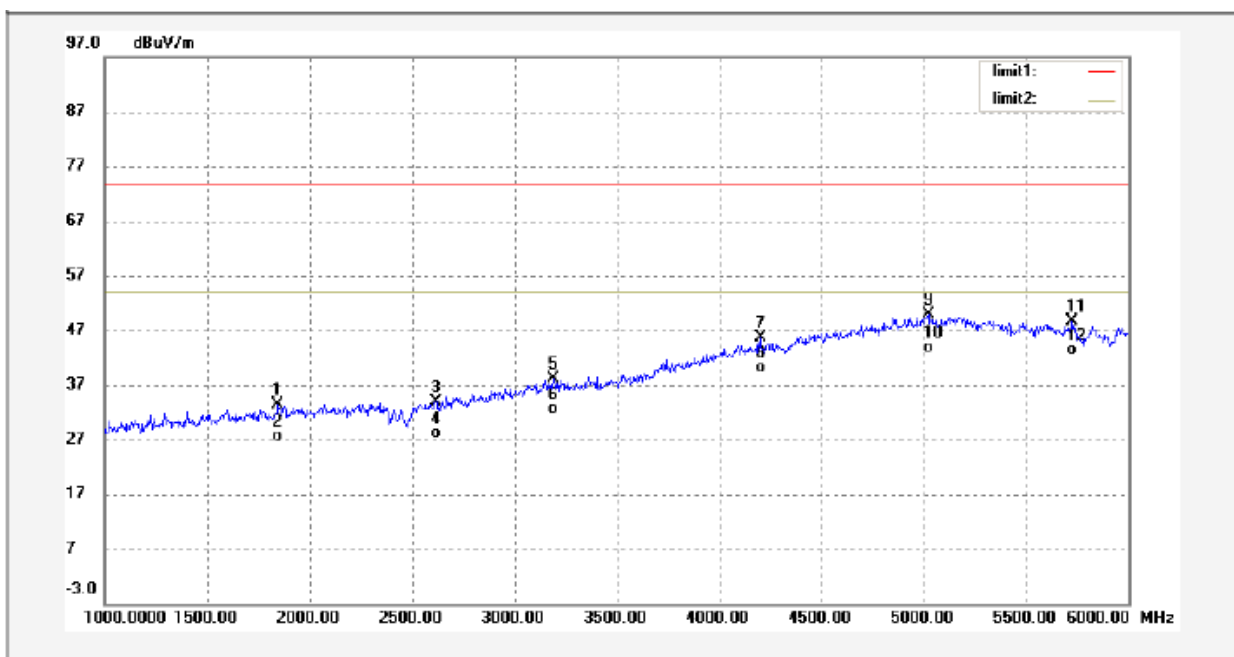
5.3.4 Radiated Emission Test Data, Above 1000MHz

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2100.000	50.25	-16.41	33.84	74.00	-40.16	peak	
2	2100.000	42.76	-16.41	26.35	54.00	-27.65	AVG	
3	2575.000	50.21	-15.62	34.59	74.00	-39.41	peak	
4	2575.000	43.30	-15.62	27.68	54.00	-26.32	AVG	
5	3260.000	50.39	-12.38	38.01	74.00	-35.99	peak	
6	3260.000	45.03	-12.38	32.65	54.00	-21.35	AVG	
7	4115.000	50.10	-6.09	44.01	74.00	-29.99	peak	
8	4115.000	43.97	-6.09	37.88	54.00	-16.12	AVG	
9	4830.000	50.68	-1.62	49.06	74.00	-24.94	peak	
10	4830.000	44.41	-1.62	42.79	54.00	-11.21	AVG	
11	5395.000	50.53	-1.57	48.96	74.00	-25.04	peak	
12	5395.000	44.88	-1.57	43.31	54.00	-10.69	AVG	

Antenna Polarization: Horizontal



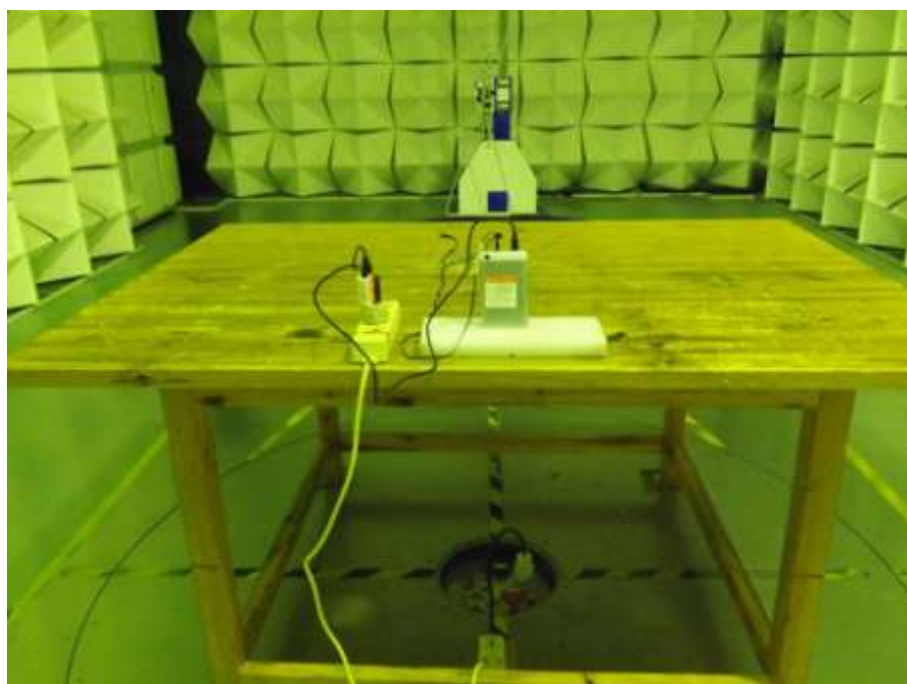
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1845.000	50.31	-17.04	33.27	74.00	-40.73	peak	
2	1845.000	43.59	-17.04	26.55	54.00	-27.45	AVG	
3	2615.000	49.37	-15.39	33.98	74.00	-40.02	peak	
4	2615.000	42.60	-15.39	27.21	54.00	-26.79	AVG	
5	3190.000	50.65	-12.63	38.02	74.00	-35.98	peak	
6	3190.000	44.31	-12.63	31.68	54.00	-22.32	AVG	
7	4200.000	51.10	-5.57	45.53	74.00	-28.47	peak	
8	4200.000	44.72	-5.57	39.15	54.00	-14.85	AVG	
9	5020.000	50.52	-0.58	49.94	74.00	-24.06	peak	
10	5020.000	43.54	-0.58	42.96	54.00	-11.04	AVG	
11	5725.000	50.57	-1.91	48.66	74.00	-25.34	peak	
12	5725.000	44.25	-1.91	42.34	54.00	-11.66	AVG	

6 Photographs – Test Setup

6.1 Photograph – Power Line Conducted Emission Test Setup at Test Site 2#



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



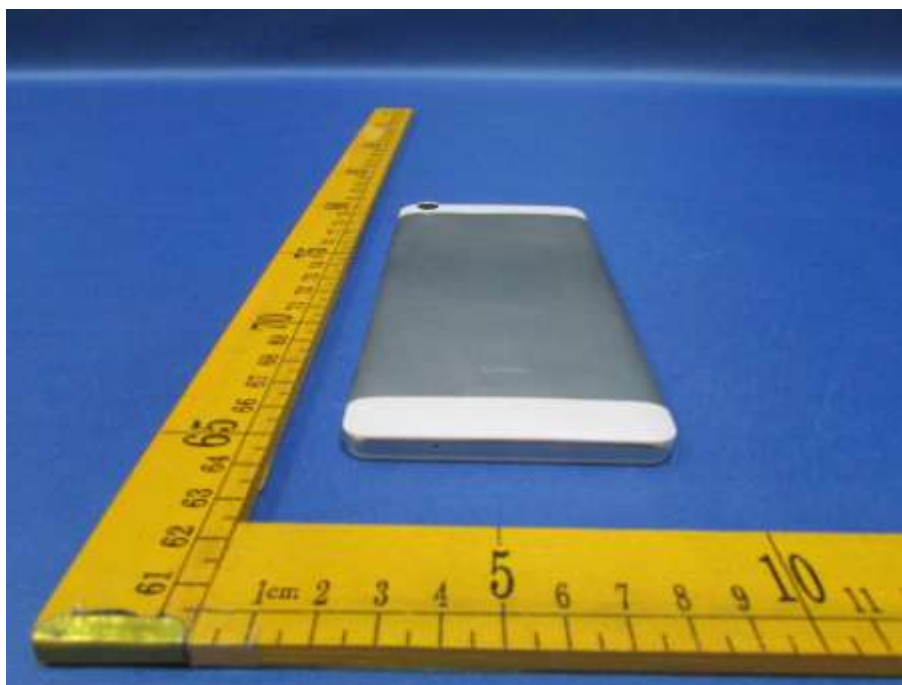
6.3 Photograph – Radiated Emission Test Setup for Above 1GHz at Test Site 1#



7 Photographs - Constructional Details

7.1 External View





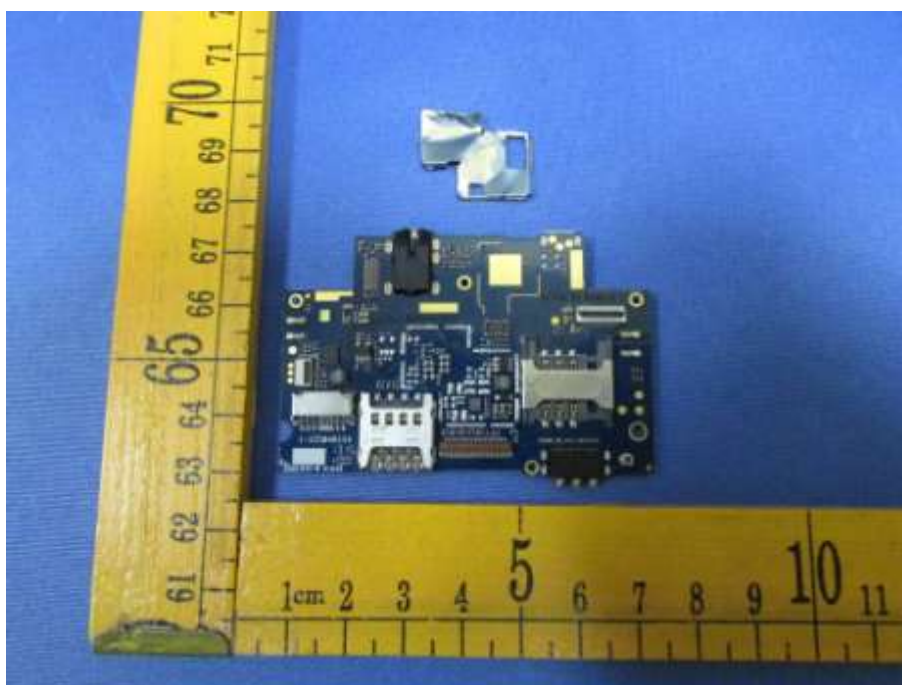
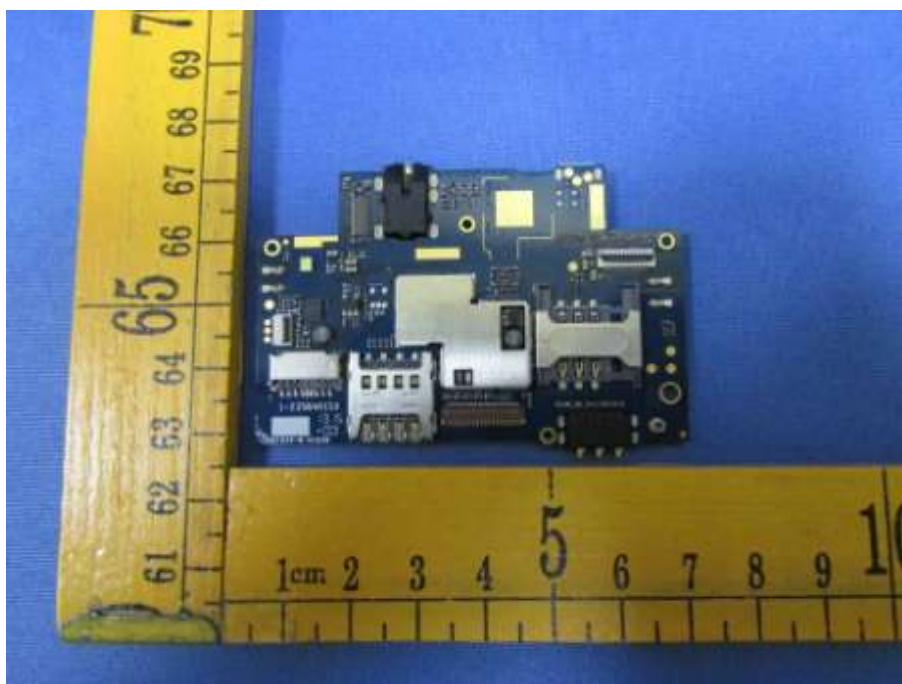


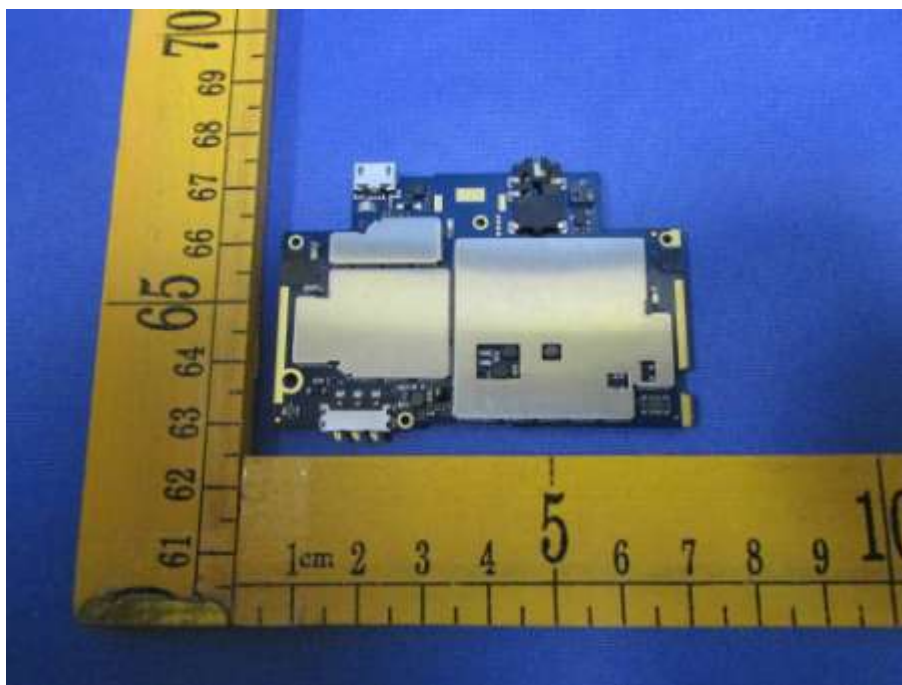
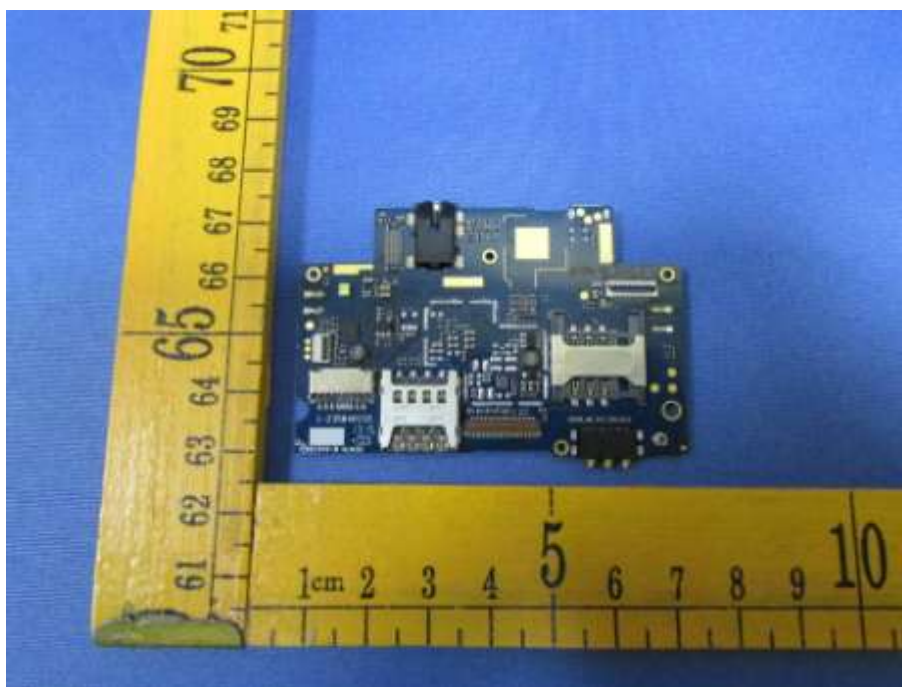


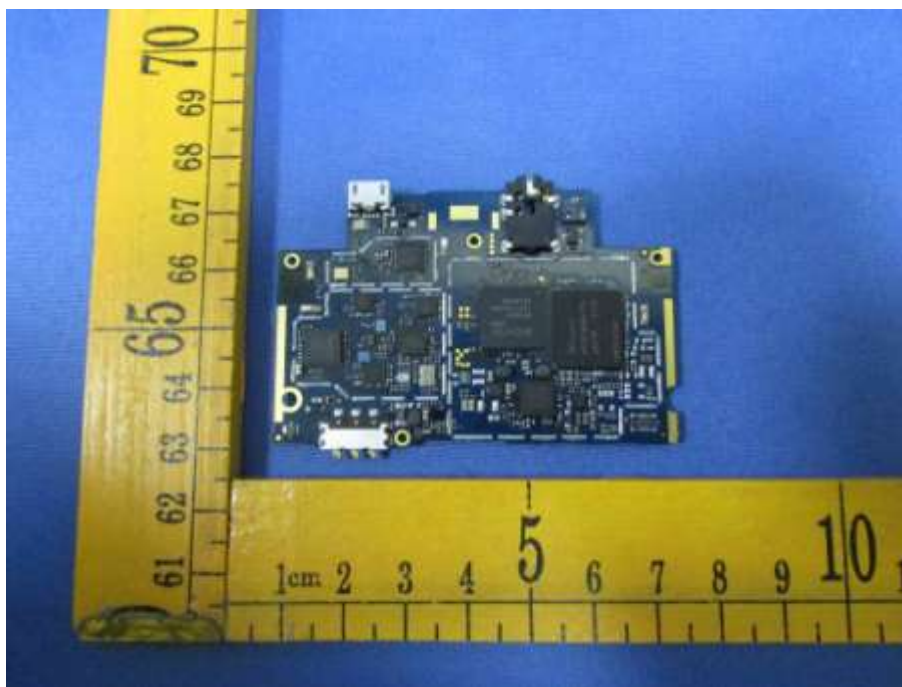
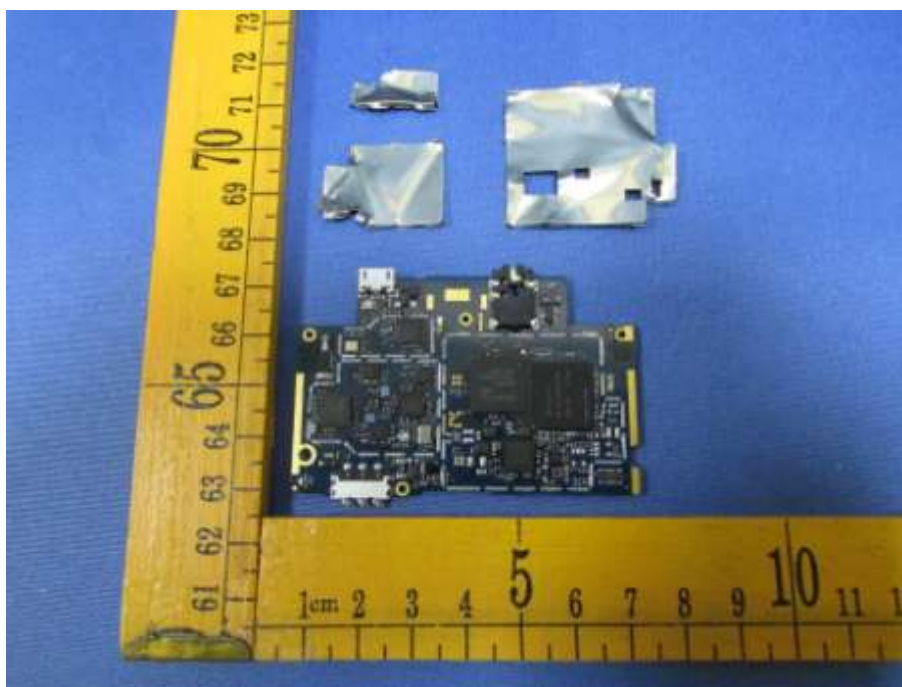


7.2 Internal Photos











====End of Report====