

# TEST REPORT

Reference No..... : WTS15S0323897E  
FCC ID ..... : 2AEE8LAVASTAR  
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..... : Star  
Brand..... : LAVA  
Standards ..... : FCC PART15 SUBPART B: 2014  
Date of Receipt sample .... : Mar. 05, 2015  
Date of Test ..... : Mar. 06-07, 2015  
Date of Issue..... : Apr.23, 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:



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## 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

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### 3 General Information

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

Product Name	: Mobile Phone
Model No.	: Star
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	: STAR_MB_V2.0
Software Version	: V1.0.1

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

Operation Frequency	: GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 900: 925-960MHz DCS/GPRS/EDGE 1800: 1805-1880MHz PCS/GPRS/EDGE 1900: 1850~1910MHz WCDMA Band I: 1920-1980MHz WCDMA Band II: 1850-1910MHz WCDMA Band V: 824~849MHz WiFi: 802.11b/g/n HT20: 2412-2462MHz 802.11n HT40: 2422-2452MHz Bluetooth: 2402-2480MHz GPS: 1.57GHz
Max. RF output power	: GSM 850: 32.71dBm PCS1900:29.58dBm WCDMA Band II: 22.16dBm WCDMA Band V: 22.50dBm WiFi: 9.35dBm Bluetooth:1.02dBm

Type of Modulation	: GSM,GPRS: GMSK EDGE: 8PSK WCDMA: BPSK WiFi: CCK, OFDM Bluetooth: GFSK, Pi/4 DQPSK,8DPSK
Antenna installation	: GSM/WCDMA: Wire antenna WiFi/Bluetooth: Metal Dome
Antenna Gain	: GSM 850: -1.5dBi PCS1900: -1.0dBi WCDMA Band II: -1.0dBi WCDMA Band V: -1.5dBi WiFi: 0dBi Bluetooth: 0dBi
Technical Data	: Battery DC 3.8V 9.5Wh DC 5V, 1A, charging from adapter (Adapter Input: 100-300V~50/60Hz, 0.15A)
Adapter	:: Manufacture: LAVA Model No.: CLV-15
Type of Emission	: GSM850: 246KGXW,PCS1900: 247KGXW EDGE850:250KG7W,EDGE1900:266KG7W WCDMA850: 4M16F9W, WCDMA1900: 4M18F9W

### 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.19,2014	Apr.18,2015
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.19,2014	Apr.18,2015
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.19,2014	Apr.18,2015
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.10,2014	Apr.09,2015
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
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No</b>	<b>Last Calibration Date</b>	<b>Calibration Due Date</b>
<b>RF Conducted Testing</b>						
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Last Calibration Date</b>	<b>Calibration Due Date</b>
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 $\mu$ 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:

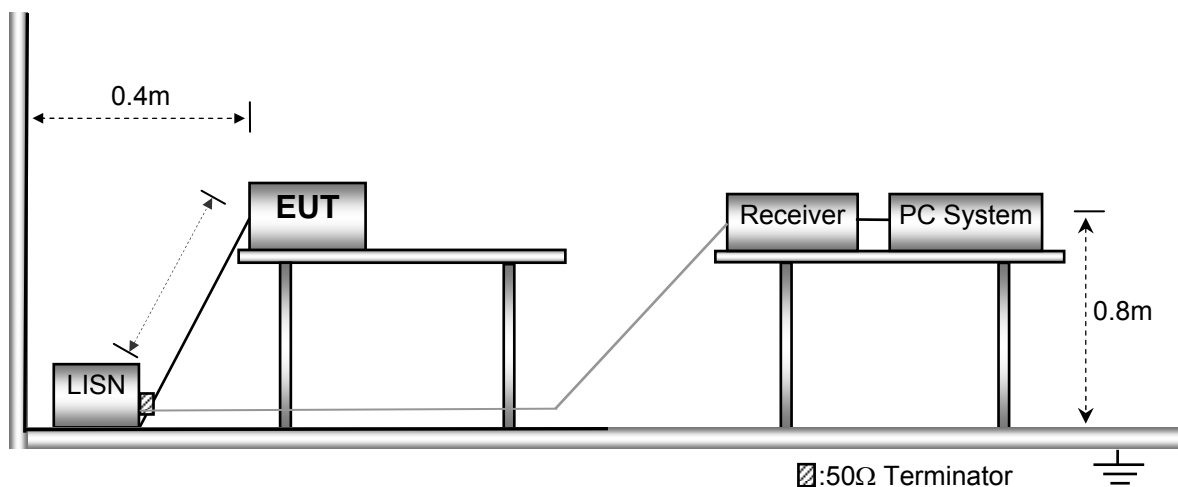
Temperature ..... : 23°C  
 Humidity ..... : 53.6%RH  
 Atmospheric Pressure..... : 101kPa

EUT Operation:

Input Voltage..... : AC 120V/60Hz  
 Operating Mode ..... : Data transmitting mode, Bluetooth WIFI connection mode,GSM connection mode and WCDMA connection 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.

#### 5.1.2 Block Diagram of Test Setup

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

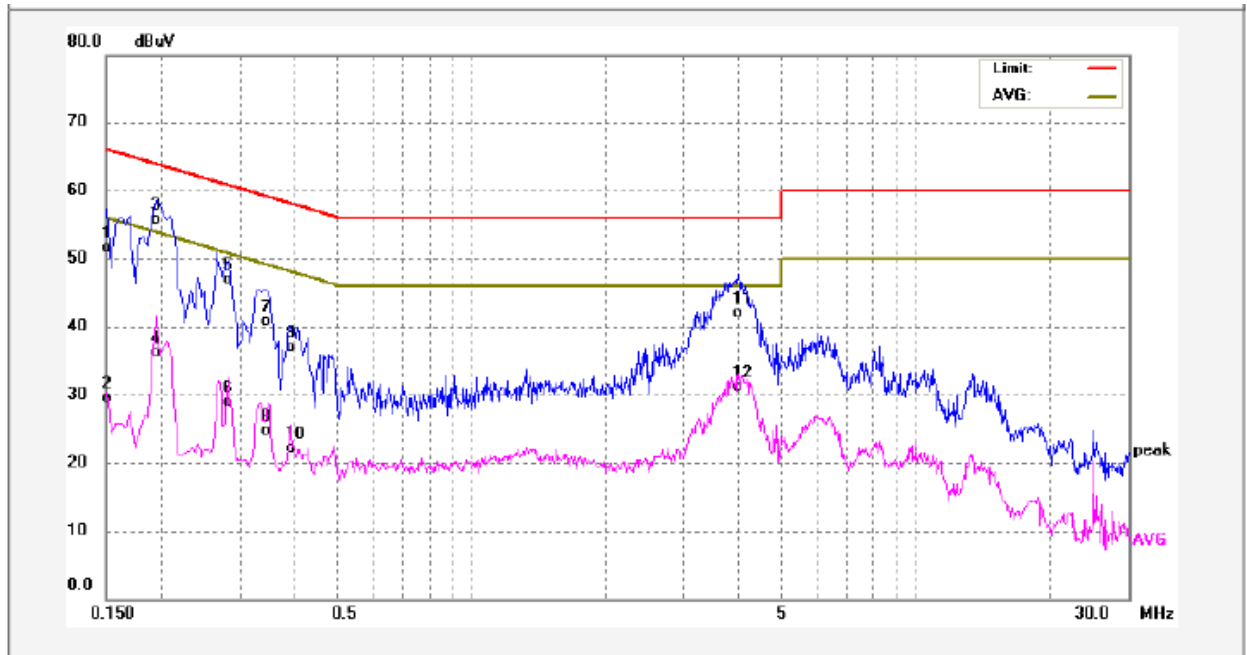


### 5.1.3 Measurement Data

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.

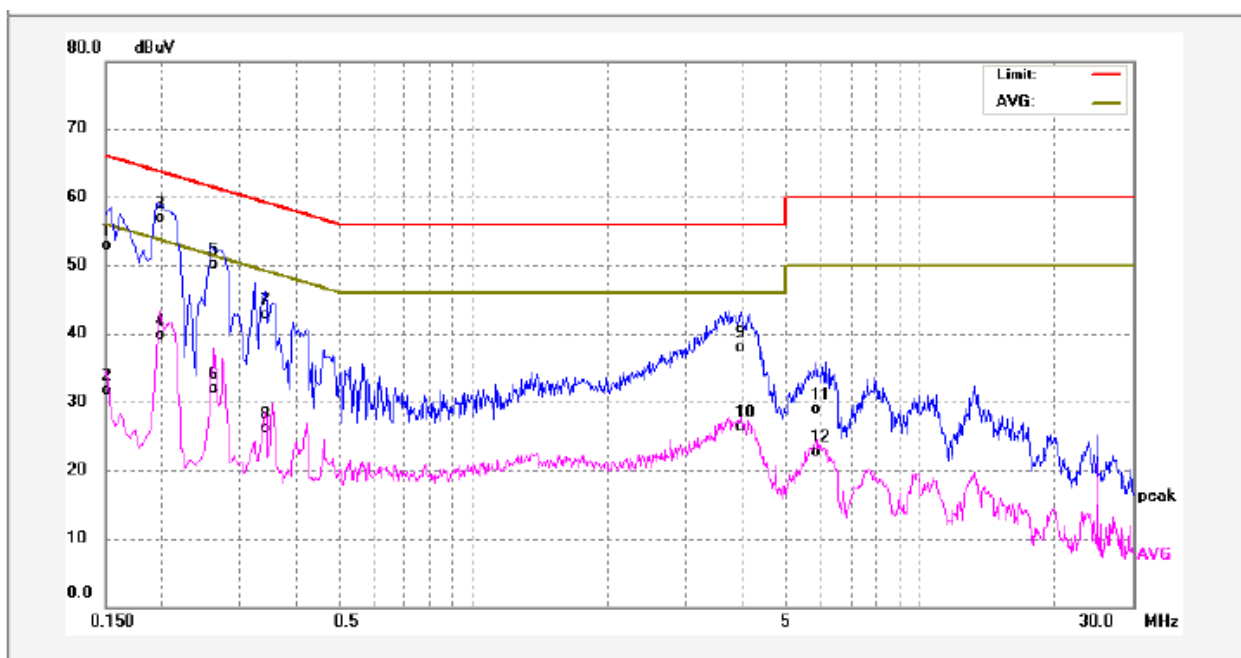
### 5.1.4 Power Line Conducted Emission Test Data

Live Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	40.27	11.17	51.44	65.99	-14.55	QP	
2	0.1500	18.33	11.17	29.50	55.99	-26.49	AVG	
3	0.1940	44.33	11.28	55.61	63.86	-8.25	QP	
4	0.1940	24.79	11.28	36.07	53.86	-17.79	AVG	
5	0.2819	35.66	11.30	46.96	60.76	-13.80	QP	
6	0.2819	17.54	11.30	28.84	50.76	-21.92	AVG	
7	0.3420	29.50	11.30	40.80	59.15	-18.35	QP	
8	0.3420	13.33	11.30	24.63	49.15	-24.52	AVG	
9	0.3899	25.55	11.31	36.86	58.06	-21.20	QP	
10	0.3899	10.81	11.31	22.12	48.06	-25.94	AVG	
11	3.9820	30.70	11.23	41.93	56.00	-14.07	QP	
12	3.9820	19.85	11.23	31.08	46.00	-14.92	AVG	

Neutral Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	41.64	11.17	52.81	65.99	-13.18	QP	
2	0.1500	20.44	11.17	31.61	55.99	-24.38	AVG	
3	0.2007	45.54	11.30	56.84	63.58	-6.74	QP	
4	0.2007	28.35	11.30	39.65	53.58	-13.93	AVG	
5	0.2620	38.71	11.30	50.01	61.36	-11.35	QP	
6	0.2620	20.55	11.30	31.85	51.36	-19.51	AVG	
7	0.3420	31.50	11.30	42.80	59.15	-16.35	QP	
8	0.3420	14.75	11.30	26.05	49.15	-23.10	AVG	
9	3.9740	26.62	11.23	37.85	56.00	-18.15	QP	
10	3.9740	15.06	11.23	26.29	46.00	-19.71	AVG	
11	5.8820	17.61	11.25	28.86	60.00	-31.14	QP	
12	5.8820	11.45	11.25	22.70	50.00	-27.30	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 $\mu$ V/m)
		Quasi-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:

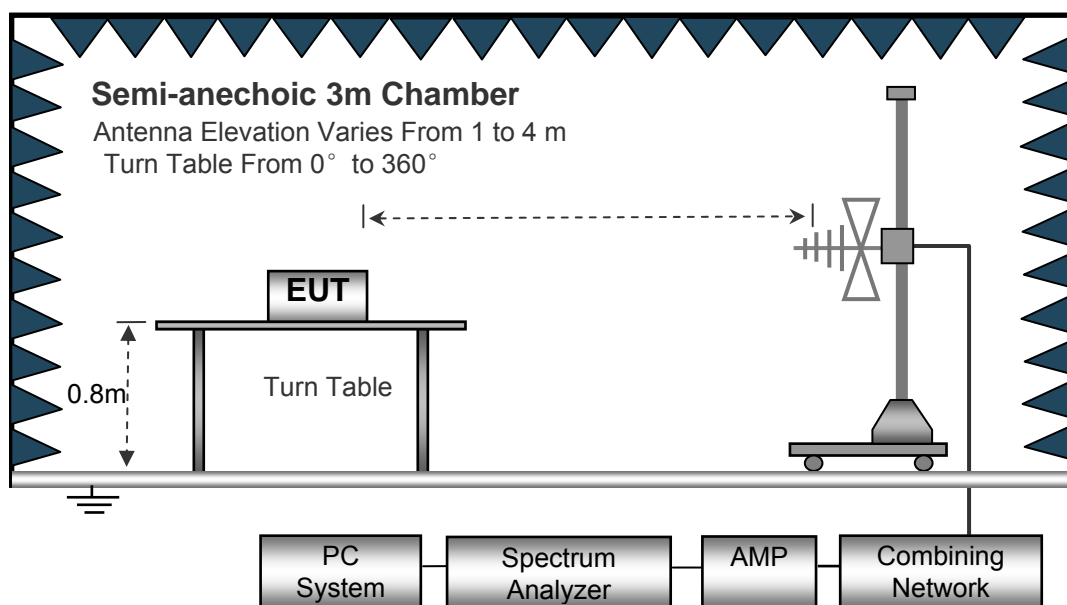
Temperature ..... : 22.5°C  
 Humidity ..... : 52.6%RH  
 Atmospheric Pressure..... : 101.2kPa

EUT Operation:

Input Voltage ..... : AC 120V/60Hz  
 Operating Mode ..... : Data transmitting mode, Bluetooth WIFI connection mode, GSM connection mode and WCDMA connection 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.

#### 5.2.2 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.

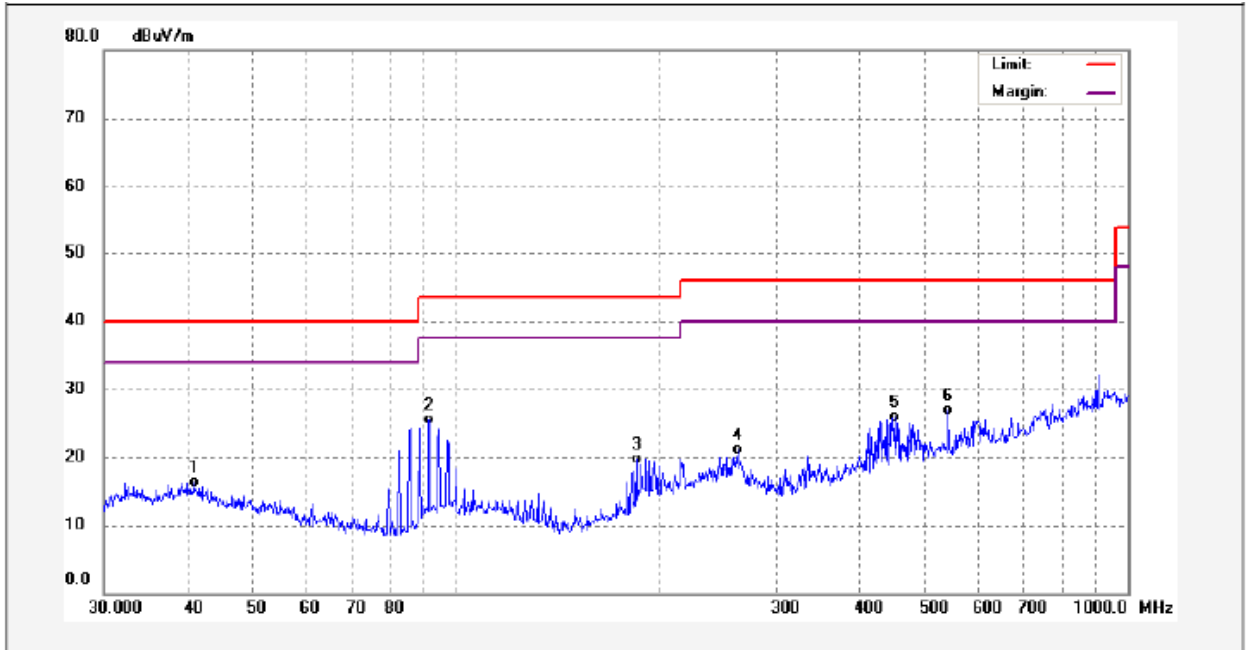


### 5.2.3 Measurement Data

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.

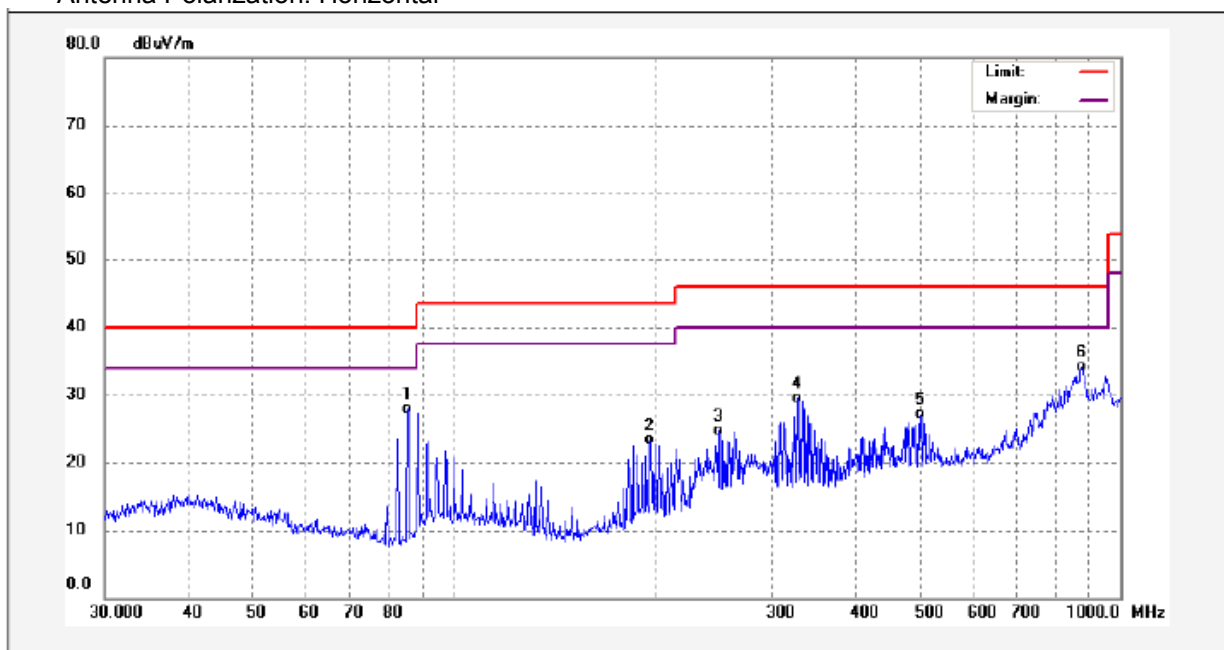
### 5.2.4 Radiated Emission Test Data, 30MHz to 1000MHz

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	40.8446	29.50	-13.19	16.31	40.00	-23.69	QP	
2	91.4949	41.61	-16.17	25.44	43.50	-18.06	QP	
3	185.7882	35.10	-15.43	19.67	43.50	-23.83	QP	
4	262.8955	34.61	-13.55	21.06	46.00	-24.94	QP	
5	451.1350	35.06	-9.19	25.87	46.00	-20.13	QP	
6	541.3725	35.67	-8.72	26.95	46.00	-19.05	QP	

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	85.2980	47.37	-19.48	27.89	40.00	-12.11	QP	
2	197.2001	38.18	-14.89	23.29	43.50	-20.21	QP	
3	250.3012	38.42	-13.62	24.80	46.00	-21.20	QP	
4	327.8873	41.54	-11.99	29.55	46.00	-16.45	QP	
5	501.1790	36.26	-9.20	27.06	46.00	-18.94	QP	
6	875.2470	36.21	-2.20	34.01	46.00	-11.99	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:

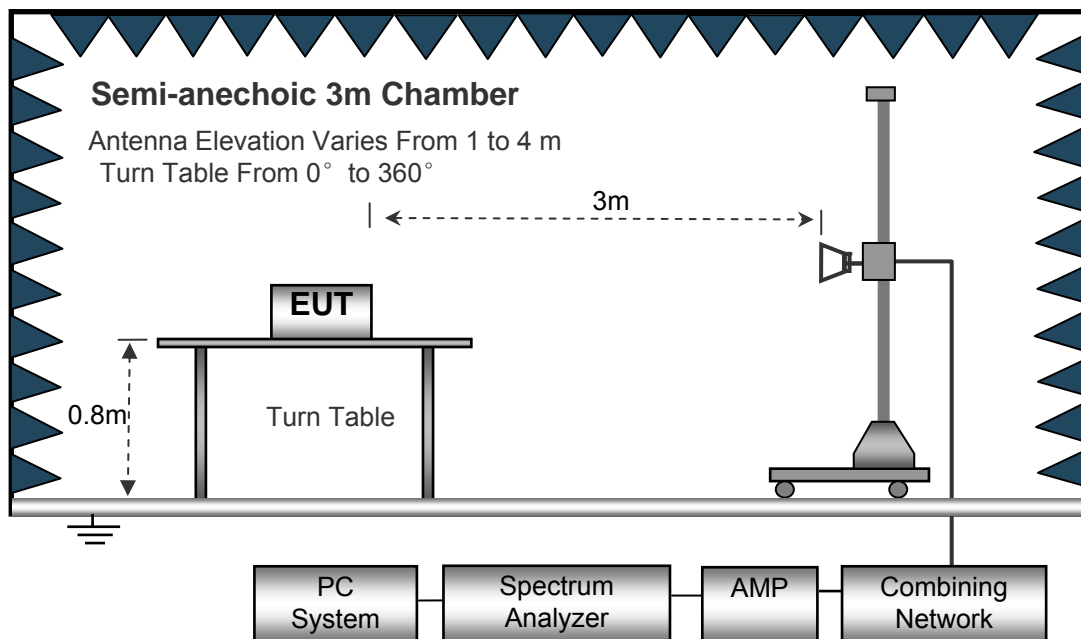
Temperature ..... : 22.4°C  
 Humidity ..... : 52.3%RH  
 Atmospheric Pressure ..... : 101.3kPa

EUT Operation:

Input Voltage ..... : AC 120V/60Hz  
 Operating Mode ..... : Data transmitting mode, Bluetooth WIFI connection mode, GSM connection mode and WCDMA connection 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.

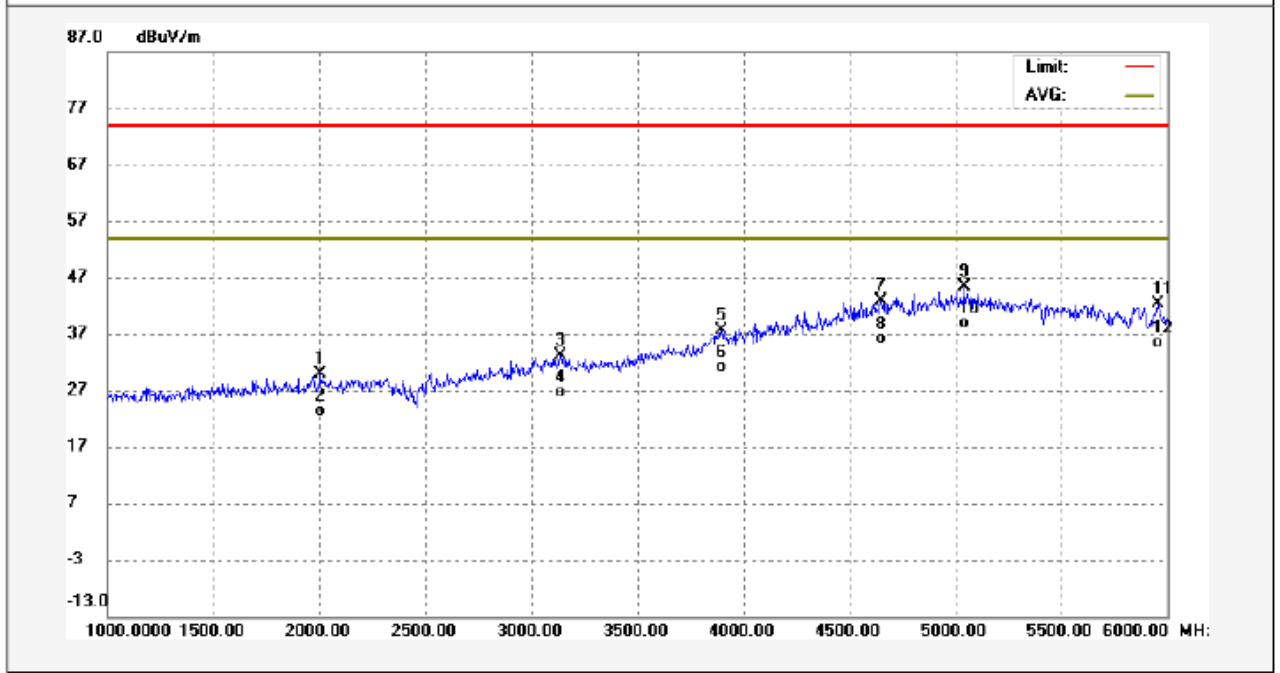


### 5.3.3 Measurement Data

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

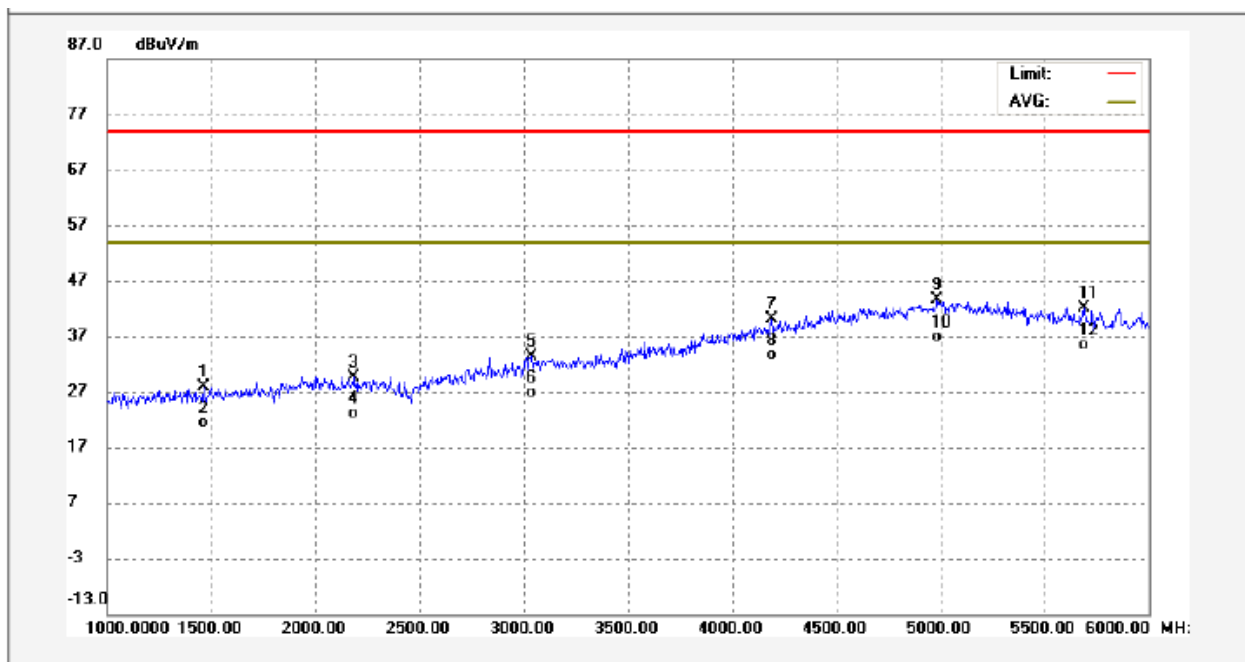
Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2005.000	46.49	-16.51	29.98	74.00	-44.02	peak	
2	2005.000	39.85	-16.51	23.34	54.00	-30.66	AVG	
3	3135.000	46.03	-12.84	33.19	74.00	-40.81	peak	
4	3135.000	39.46	-12.84	26.62	54.00	-27.38	AVG	
5	3895.000	45.38	-7.79	37.59	74.00	-36.41	peak	
6	3895.000	38.82	-7.79	31.03	54.00	-22.97	AVG	
7	4650.000	45.52	-2.76	42.76	74.00	-31.24	peak	
8	4650.000	38.98	-2.76	36.22	54.00	-17.78	AVG	
9	5040.000	45.91	-0.64	45.27	74.00	-28.73	peak	
10	5040.000	39.43	-0.64	38.79	54.00	-15.21	AVG	
11	5955.000	44.23	-1.96	42.27	74.00	-31.73	peak	
12	5955.000	37.37	-1.96	35.41	54.00	-18.59	AVG	



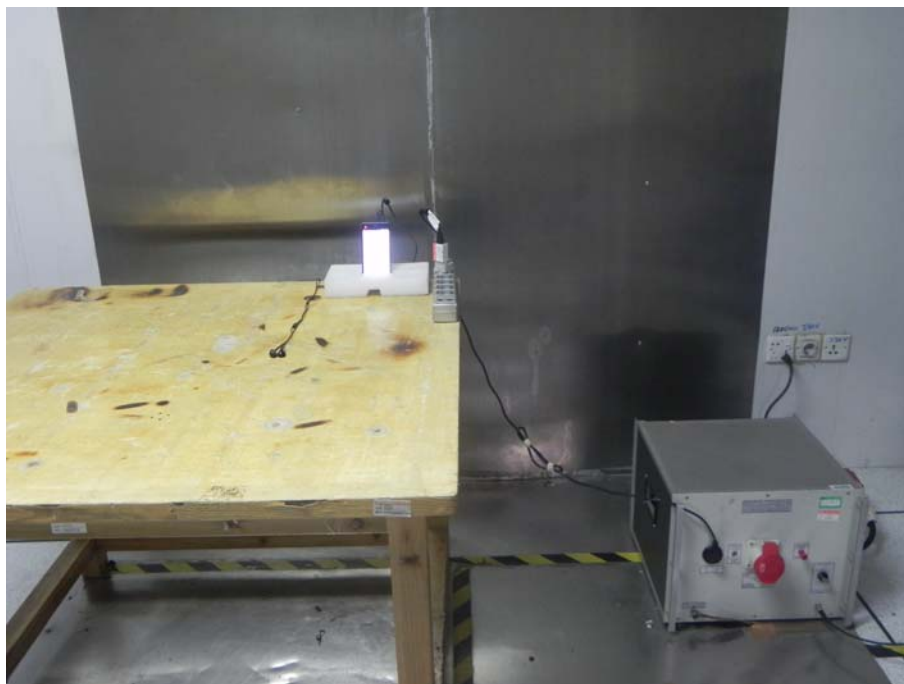
Antenna Polarization: Horizontal



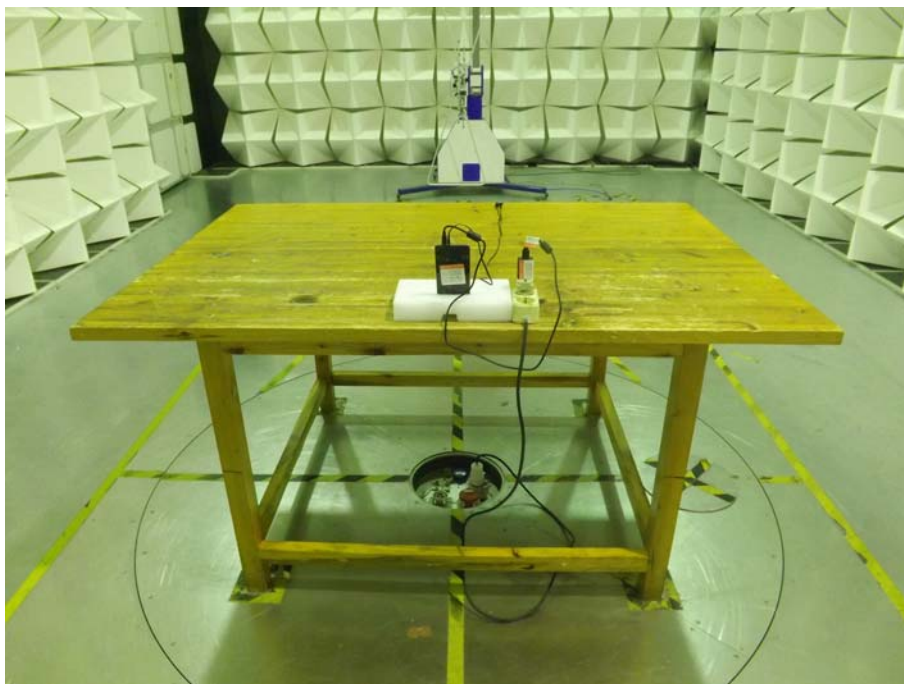
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1460.000	46.15	-18.31	27.84	74.00	-46.16	peak	
2	1460.000	39.61	-18.31	21.30	54.00	-32.70	AVG	
3	2180.000	46.05	-16.33	29.72	74.00	-44.28	peak	
4	2180.000	39.45	-16.33	23.12	54.00	-30.88	AVG	
5	3035.000	46.61	-13.20	33.41	74.00	-40.59	peak	
6	3035.000	40.04	-13.20	26.84	54.00	-27.16	AVG	
7	4190.000	45.81	-5.63	40.18	74.00	-33.82	peak	
8	4190.000	39.14	-5.63	33.51	54.00	-20.49	AVG	
9	4985.000	44.19	-0.62	43.57	74.00	-30.43	peak	
10	4985.000	37.44	-0.62	36.82	54.00	-17.18	AVG	
11	5690.000	43.91	-1.89	42.02	74.00	-31.98	peak	
12	5690.000	37.15	-1.89	35.26	54.00	-18.74	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#



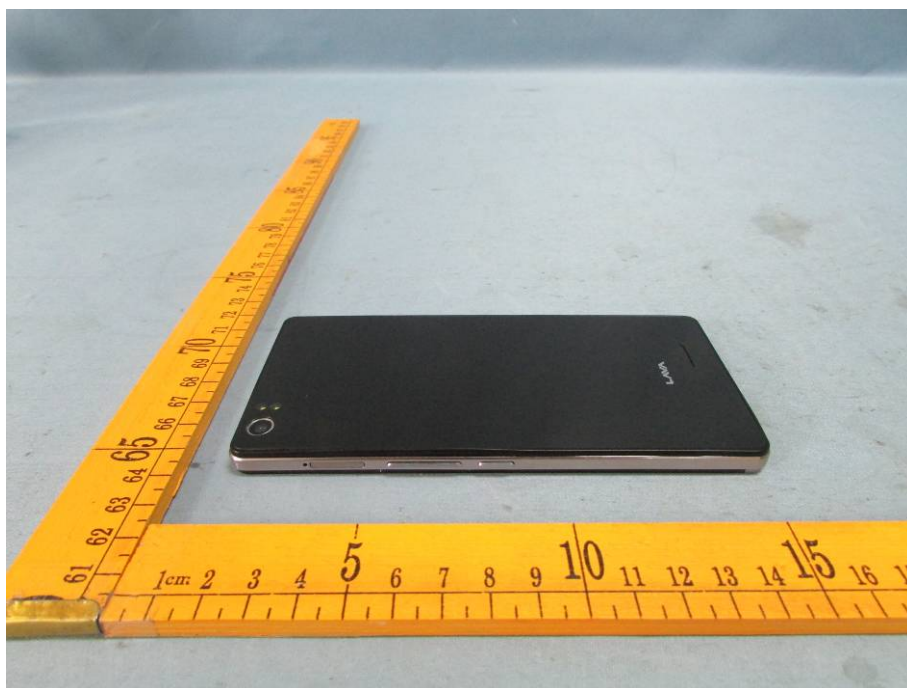
## 7 Photographs - Constructional Details

### 7.1 Model Star- External View













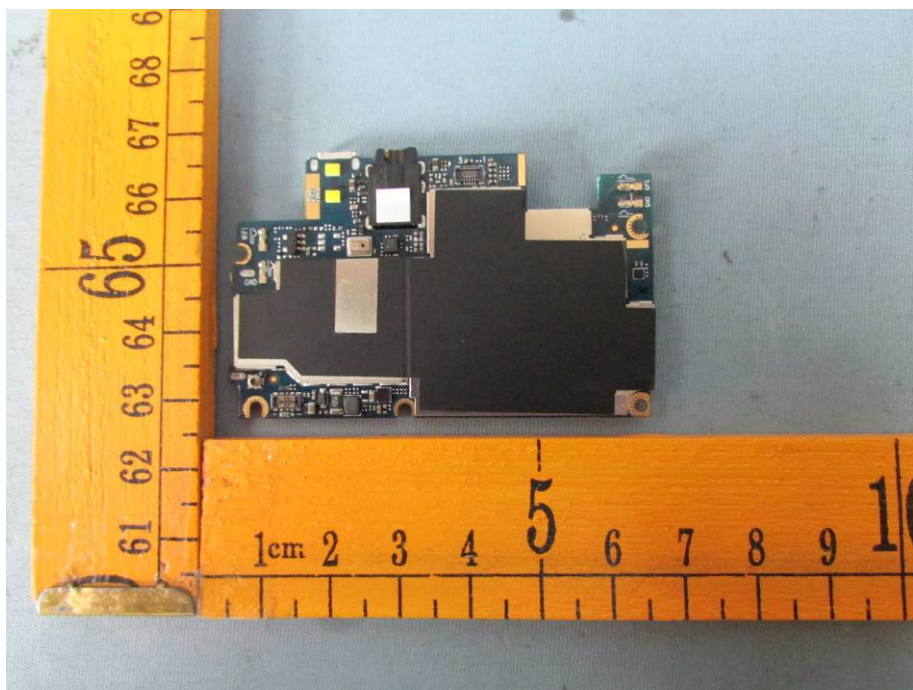
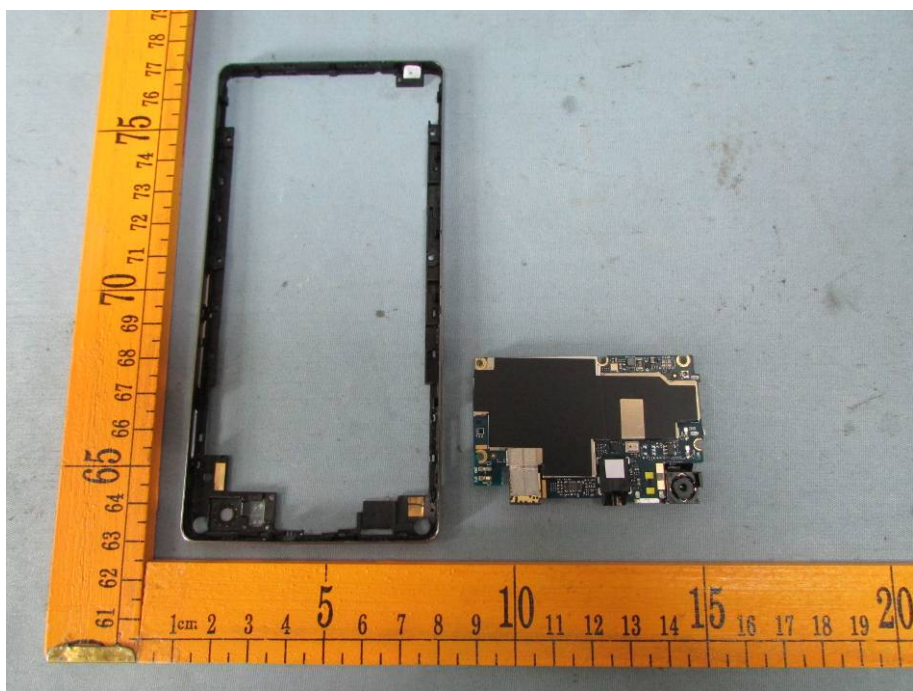


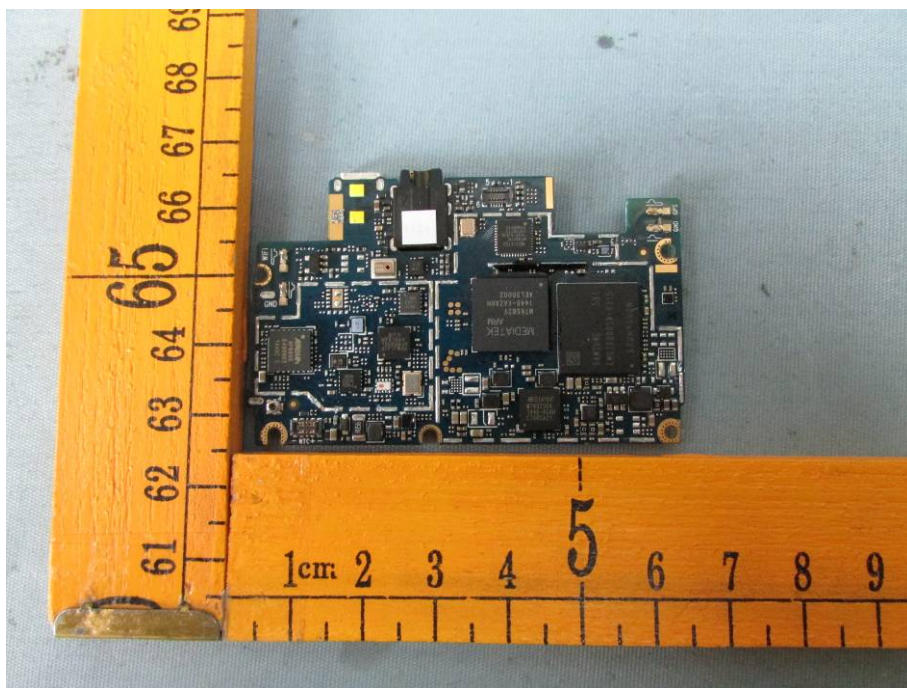
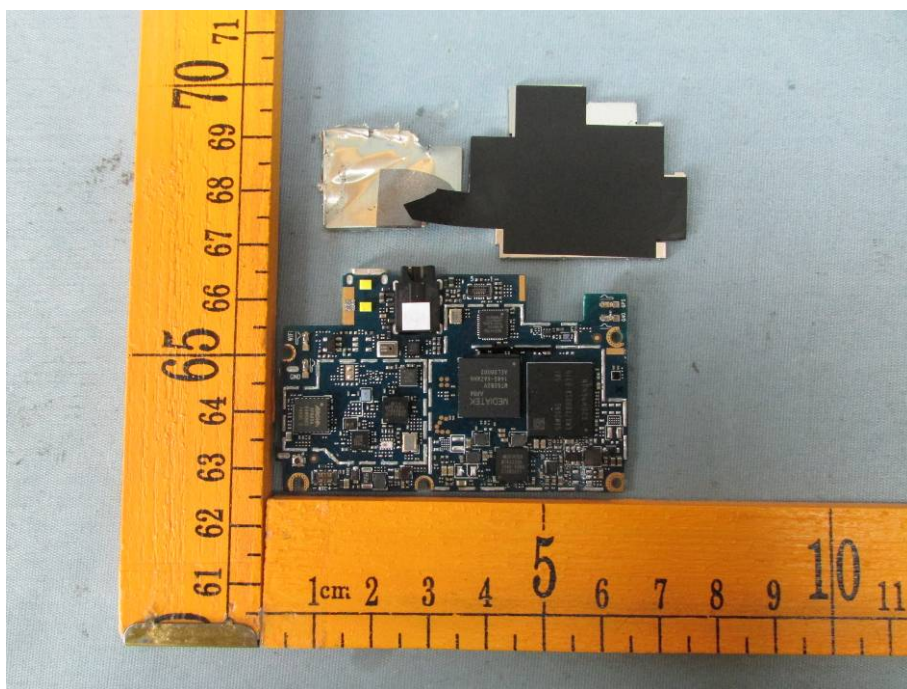
## 7.2 Model Star - Internal View



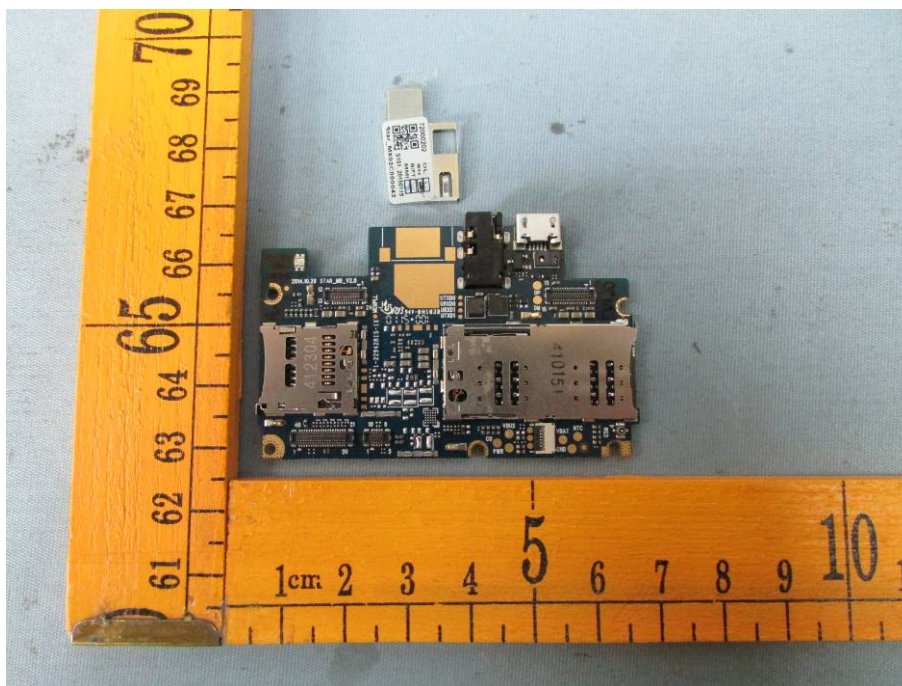
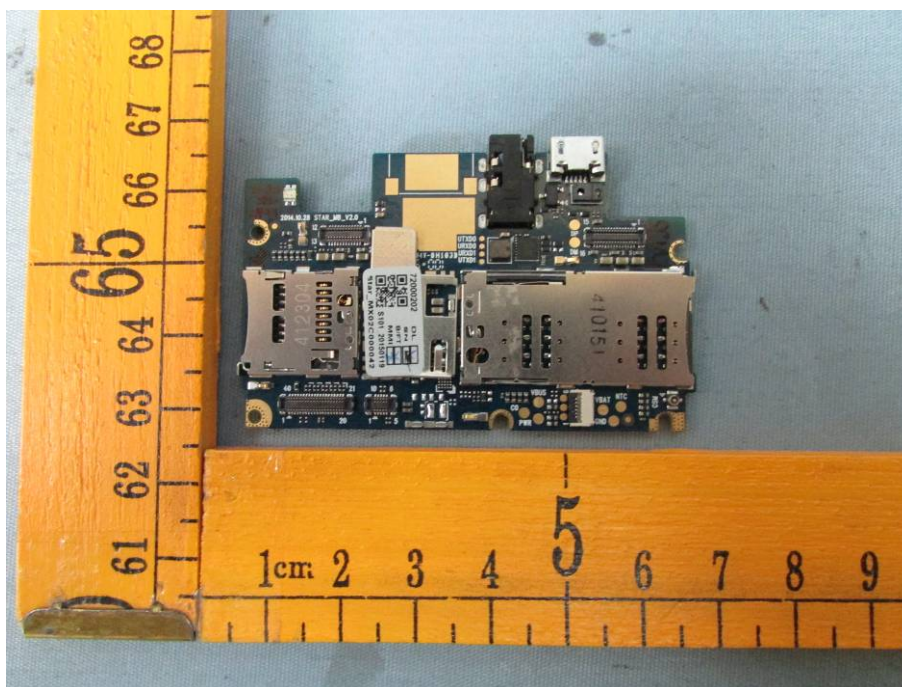


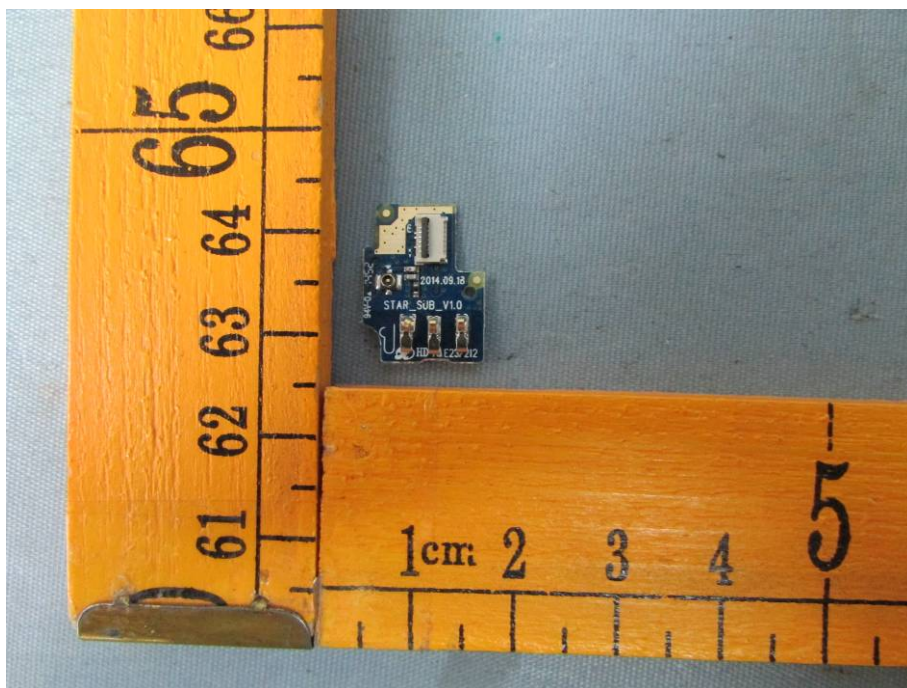
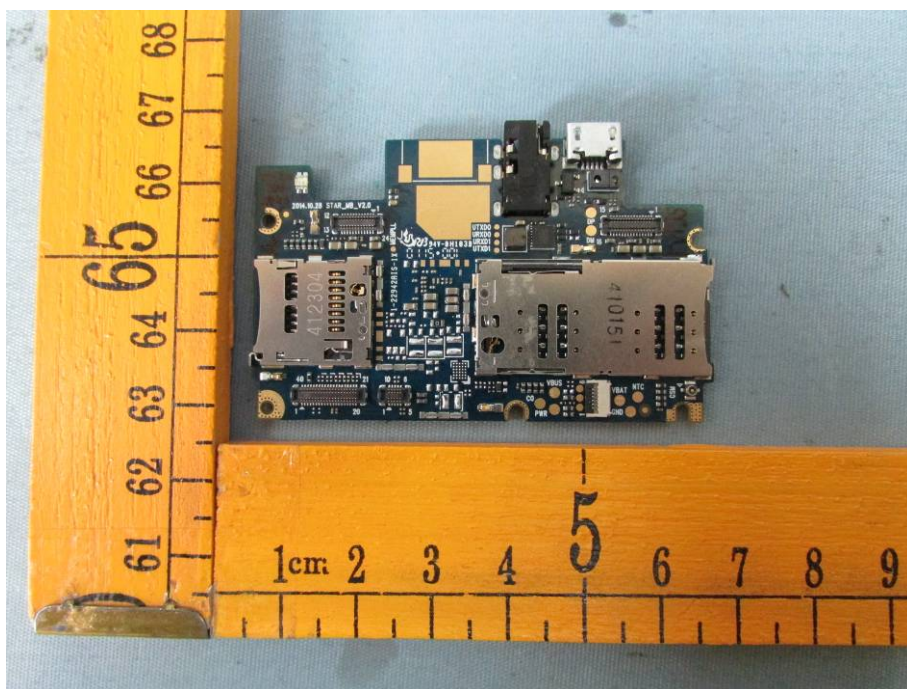




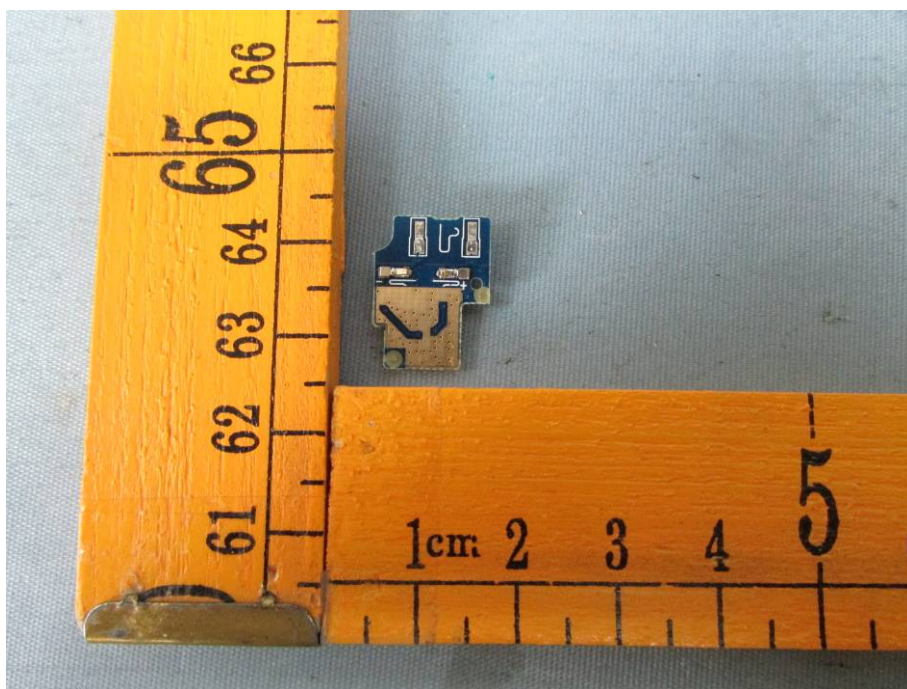


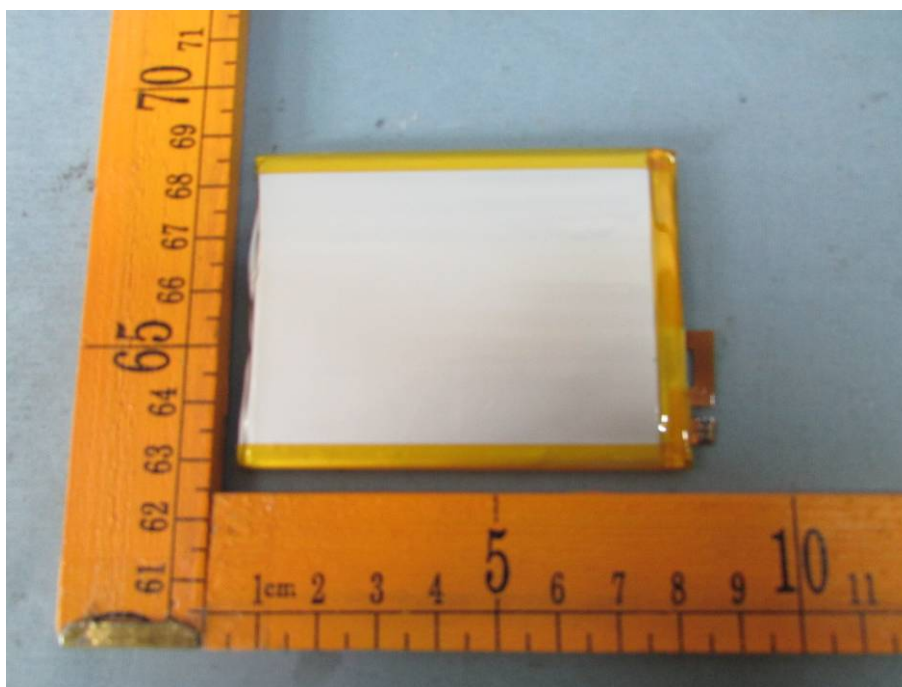












=====**End of Report**=====