

# EMC TEST REPORT



Report No.: 15070876-FCC-E

Supersede Report No.:N/A

Applicant	NEG TECHNOLOGY CO., LIMITED	
Product Name	Mobile Phone	
Model No.	S3020D	
Serial No.	N/A	
Test Standard	FCC Part 15 Subpart B Class B:2014, ANSI C63.4: 2014	
Test Date	September 23 to October 09 , 2015	
Issue Date	October 14, 2015	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification		<input checked="" type="checkbox"/>
Equipment did not comply with the specification		<input type="checkbox"/>
Winnie Zhang	David Huang	
Winnie Zhang Test Engineer	David Huang Checked By	
This test report may be reproduced in full only		
Test result presented in this test report is applicable to the tested sample only		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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## Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

### Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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## 1. Report Revision History

Report No.	Report Version	Description	Issue Date
15070876-FCC-E	NONE	Original	October 14, 2015

## 2. Customer information

Applicant Name	NEG TECHNOLOGY CO., LIMITED
Applicant Add	Rm 1406, Block B, Jinsejiali, Jingtian south road, Futian district, Shenzhen, China
Manufacturer	NEG TECHNOLOGY CO., LIMITED
Manufacturer Add	Rm 1406, Block B, Jinsejiali, Jingtian south road, Futian district, Shenzhen, China

## 3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

#### 4. Equipment under Test (EUT) Information

Description of EUT:	Mobile Phone
Main Model:	S3020D
Serial Model:	N/A
Antenna Gain:	GSM850: 0.8dBi PCS1900: 1dBi UMTS-FDD Band V: 1dBi UMTS-FDD Band II: 1dBi Bluetooth: 1dBi WIFI: 1dBi GPS: 1dBi
Input Power:	Battery: Model: S3020D Spec: 3.7V,1350mAh Limited Charging Voltage: 4.2V Adapter: Model: S3020D Input: 100-240V; 50/60Hz; 150mA Output: DC 5.0V,500mA
Trade Name :	OWN
FCC ID:	2AAZ8-S3020D
Date EUT received:	September 22, 2015
Equipment Category :	JBP
Type of Modulation:	GSM / GPRS: GMSK EGPRS: GMSK UMTS-FDD: QPSK, 16QAM 802.11b/g/n: DSSS, OFDM Bluetooth: GFSK, π /4DQPSK, 8DPSK

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GPS:BPSK

GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz

PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz

UMTS-FDD Band V TX: 826.4 ~ 846.6 MHz; RX: 871.4 ~ 891.6 MHz

UMTS-FDD Band II TX: 1852.4 ~ 1907.6 MHz;  
RX: 1932.4 ~ 1987.6 MHz

WIFI:802.11b/g/n(20M): 2412-2462 MHz

Bluetooth: 2402-2480 MHz

GPS RX:1575.42 MHz

GSM 850: 124CH

PCS1900: 299CH

UMTS-FDD Band V : 102CH

Number of Channels:

UMTS-FDD Band II : 277CH

WIFI :802.11b/g/n(20M): 11CH

Bluetooth: 79CH

GPS:1CH

Port: Power Port, Earphone Port, USB Port

GPRS/EGPRS Multi-slot class 8/10/12

## 5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.107; ANSI C63.4: 2014	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2014	Radiated Emissions	Compliance

### Measurement Uncertainty

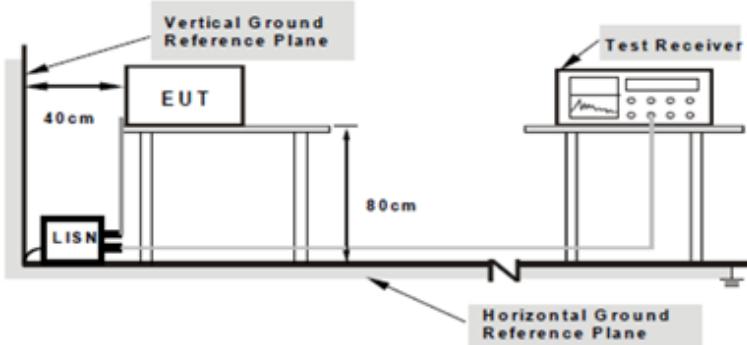
Emissions		
Test Item	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
-	-	-

## 6. Measurements, Examination And Derived Results

### 6.1 AC Power Line Conducted Emissions

Temperature	24°C
Relative Humidity	56%
Atmospheric Pressure	1023mbar
Test date :	September 23, 2015
Tested By :	Winnie Zhang

#### Requirement(s):

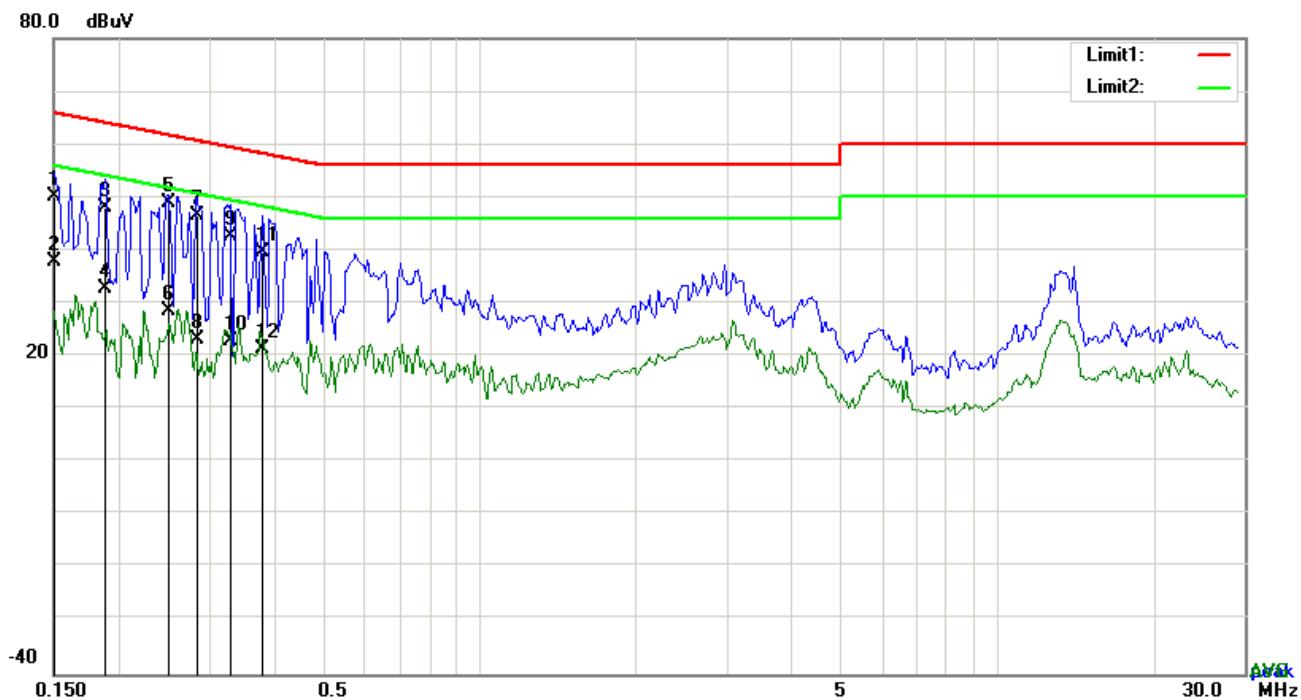
Spec	Item	Requirement	Applicable														
47CFR§15. 107	a)	<p>For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.</p> <table border="1"> <thead> <tr> <th rowspan="2">Frequency ranges (MHz)</th> <th colspan="2">Limit (dB<math>\mu</math>V)</th> </tr> <tr> <th>QP</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15 ~ 0.5</td> <td>66 – 56</td> <td>56 – 46</td> </tr> <tr> <td>0.5 ~ 5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5 ~ 30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency ranges (MHz)	Limit (dB $\mu$ V)		QP	Average	0.15 ~ 0.5	66 – 56	56 – 46	0.5 ~ 5	56	46	5 ~ 30	60	50	<input checked="" type="checkbox"/>
Frequency ranges (MHz)	Limit (dB $\mu$ V)																
	QP	Average															
0.15 ~ 0.5	66 – 56	56 – 46															
0.5 ~ 5	56	46															
5 ~ 30	60	50															
Test Setup	 <p>The diagram illustrates the test setup. An EUT (Equipment Under Test) is placed on a table. A LISN (Line Impedance Stabilization Network) is connected between the EUT and the power source. A Test Receiver is connected to the LISN. The setup is positioned on a horizontal ground reference plane. The distance between the LISN and the EUT is 40 cm, and the distance between the LISN and the Test Receiver is 80 cm. A vertical ground reference plane is also indicated.</p> <p><b>Note:</b>    1. Support units were connected to second LISN.    2. Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</p>																
Procedure	<ol style="list-style-type: none"> <li>The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.</li> <li>The power supply for the EUT was fed through a 50Ω /50mH EUT LISN, connected to filtered mains.</li> </ol>																

	<ol style="list-style-type: none"> <li>3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.</li> <li>4. All other supporting equipment were powered separately from another main supply.</li> <li>5. The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.</li> <li>7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz.</li> <li>8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).</li> </ol>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data  Yes  N/A

Test Plot  Yes (See below)  N/A

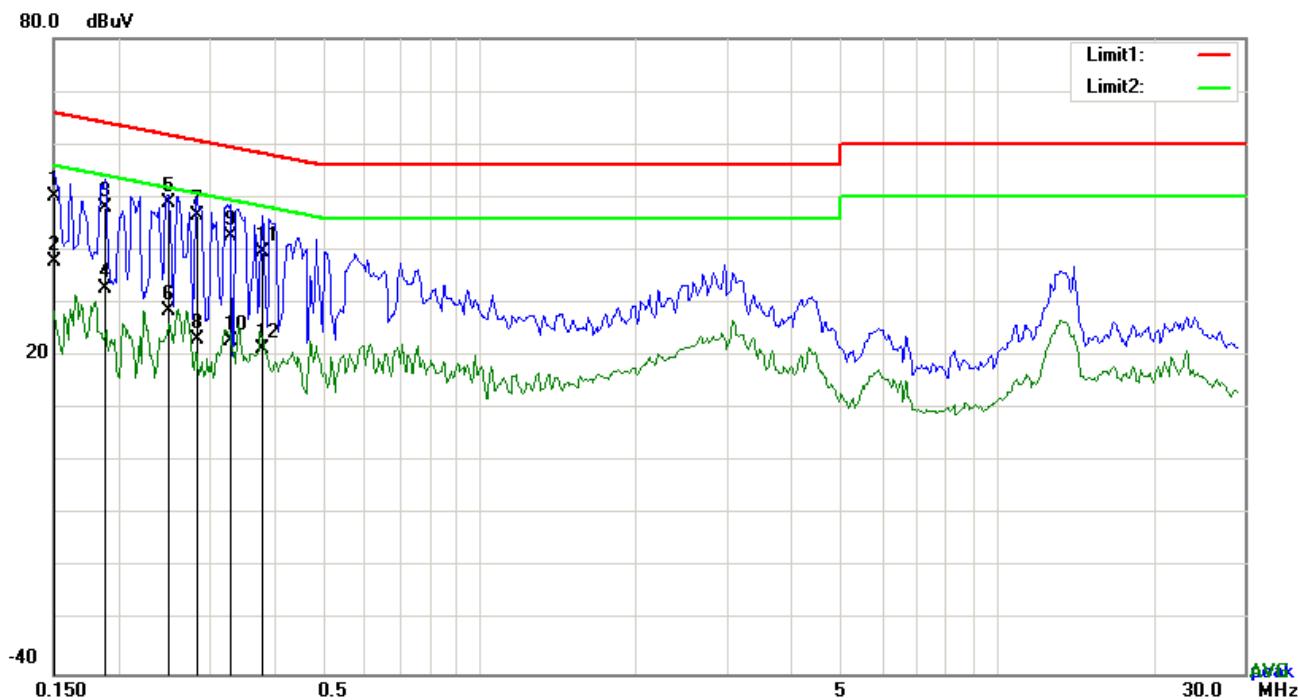
**Test Mode :** USB Mode



### Test Data

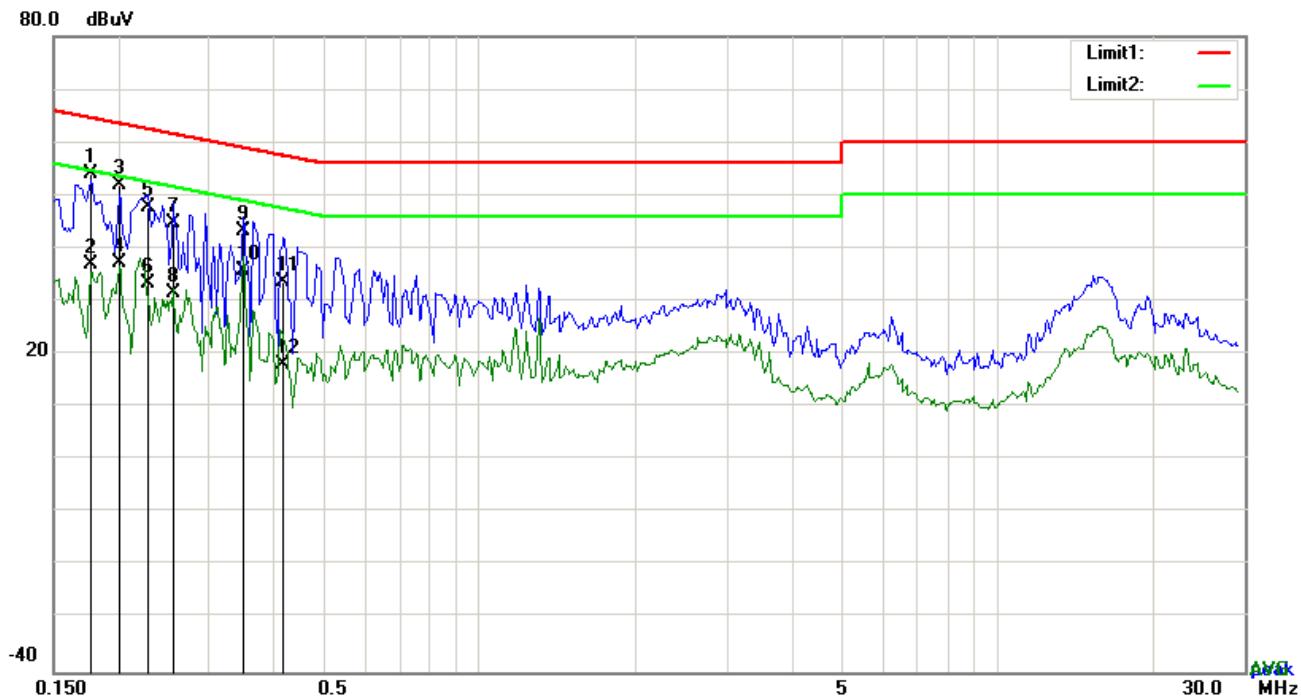
Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	L1	0.1508	40.15	QP	10.03	50.18	65.96	-15.78
2	L1	0.1508	27.73	AVG	10.03	37.76	55.96	-18.20
3	L1	0.1890	37.92	QP	10.03	47.95	64.08	-16.13
4	L1	0.1890	22.65	AVG	10.03	32.68	54.08	-21.40
5	L1	0.2495	38.85	QP	10.03	48.88	61.77	-12.89
6	L1	0.2495	18.49	AVG	10.03	28.52	51.77	-23.25
7	L1	0.2833	36.67	QP	10.03	46.70	60.72	-14.02
8	L1	0.2833	13.26	AVG	10.03	23.29	50.72	-27.43
9	L1	0.3294	32.70	QP	10.03	42.73	59.47	-16.74
10	L1	0.3294	12.92	AVG	10.03	22.95	49.47	-26.52
11	L1	0.3801	29.72	QP	10.03	39.75	58.28	-18.53
12	L1	0.3801	11.34	AVG	10.03	21.37	48.28	-26.91

**Test Mode : USB Mode**

**Test Data**
**Phase Neutral Plot at 120Vac, 60Hz**

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	N	0.1508	40.15	QP	10.03	50.18	65.96	-15.78
2	N	0.1508	27.73	AVG	10.03	37.76	55.96	-18.20
3	N	0.1890	37.92	QP	10.03	47.95	64.08	-16.13
4	N	0.1890	22.65	AVG	10.03	32.68	54.08	-21.40
5	N	0.2495	38.85	QP	10.03	48.88	61.77	-12.89
6	N	0.2495	18.49	AVG	10.03	28.52	51.77	-23.25
7	N	0.2833	36.67	QP	10.03	46.70	60.72	-14.02
8	N	0.2833	13.26	AVG	10.03	23.29	50.72	-27.43
9	N	0.3294	32.70	QP	10.03	42.73	59.47	-16.74
10	N	0.3294	12.92	AVG	10.03	22.95	49.47	-26.52
11	N	0.3801	29.72	QP	10.03	39.75	58.28	-18.53
12	N	0.3801	11.34	AVG	10.03	21.37	48.28	-26.91

Test Mode : **USB Mode**

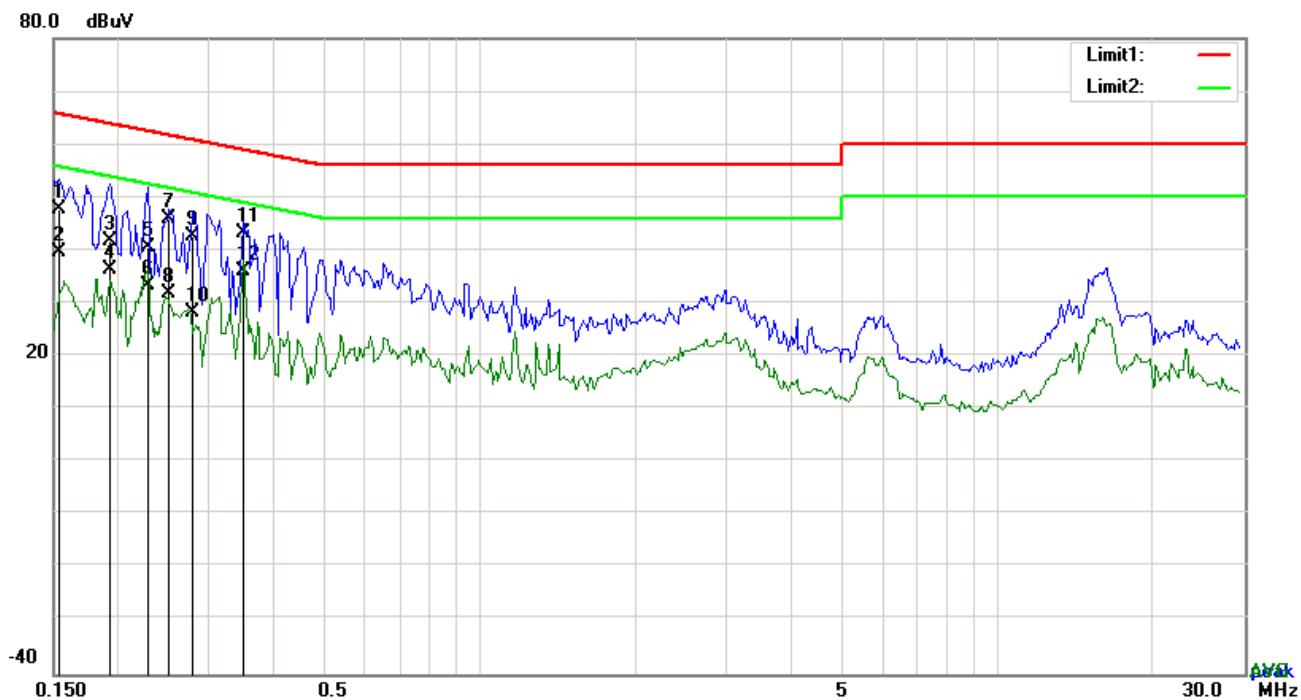


**Test Data**

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	L1	0.1773	43.92	QP	10.03	53.95	64.61	-10.66
2	L1	0.1773	26.80	AVG	10.03	36.83	54.61	-17.78
3	L1	0.2007	41.82	QP	10.03	51.85	63.58	-11.73
4	L1	0.2007	27.20	AVG	10.03	37.23	53.58	-16.35
5	L1	0.2280	37.60	QP	10.03	47.63	62.52	-14.89
6	L1	0.2280	23.42	AVG	10.03	33.45	52.52	-19.07
7	L1	0.2553	34.86	QP	10.03	44.89	61.58	-16.69
8	L1	0.2553	21.51	AVG	10.03	31.54	51.58	-20.04
9	L1	0.3489	33.21	QP	10.03	43.24	58.99	-15.75
10	L1	0.3489	25.87	AVG	10.03	35.90	48.99	-13.09
11	L1	0.4191	23.64	QP	10.03	33.67	57.47	-23.80
12	L1	0.4191	8.08	AVG	10.03	18.11	47.47	-29.36

Test Mode : **USB Mode**



**Test Data**

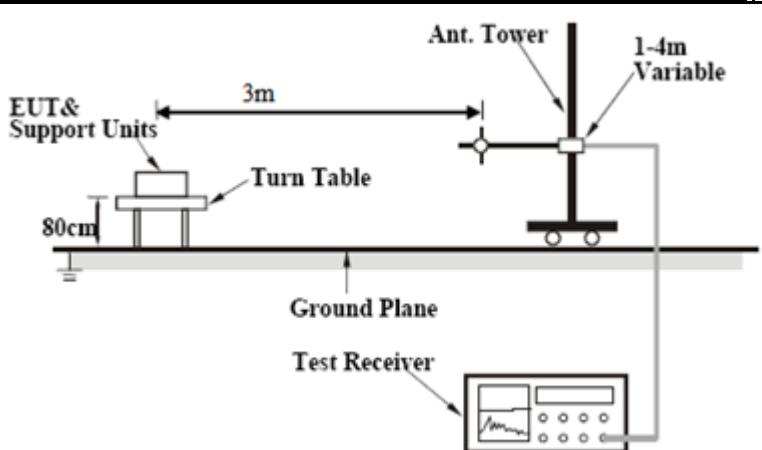
Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	N	0.1539	37.62	QP	10.03	47.65	65.79	-18.14
2	N	0.1539	29.66	AVG	10.03	39.69	55.79	-16.10
3	N	0.1929	31.74	QP	10.03	41.77	63.91	-22.14
4	N	0.1929	26.30	AVG	10.03	36.33	53.91	-17.58
5	N	0.2280	30.44	QP	10.03	40.47	62.52	-22.05
6	N	0.2280	23.26	AVG	10.03	33.29	52.52	-19.23
7	N	0.2514	36.05	QP	10.03	46.08	61.71	-15.63
8	N	0.2514	21.93	AVG	10.03	31.96	51.71	-19.75
9	N	0.2788	32.71	QP	10.03	42.74	60.85	-18.11
10	N	0.2788	18.29	AVG	10.03	28.32	50.85	-22.53
11	N	0.3489	33.29	QP	10.03	43.32	58.99	-15.67
12	N	0.3489	25.99	AVG	10.03	36.02	48.99	-12.97

## 6.2 Radiated Emissions

Temperature	24°C
Relative Humidity	56%
Atmospheric Pressure	1023mbar
Test date :	September 23, 2015
Tested By :	Winnie Zhang

### Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15.109(d)	a)	<p>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (<math>\mu</math>V/m)</th> </tr> </thead> <tbody> <tr> <td>30 – 88</td> <td>100</td> </tr> <tr> <td>88 – 216</td> <td>150</td> </tr> <tr> <td>216 – 960</td> <td>200</td> </tr> <tr> <td>Above 960</td> <td>500</td> </tr> </tbody> </table>	Frequency range (MHz)	Field Strength ( $\mu$ V/m)	30 – 88	100	88 – 216	150	216 – 960	200	Above 960	500	<input checked="" type="checkbox"/>
Frequency range (MHz)	Field Strength ( $\mu$ V/m)												
30 – 88	100												
88 – 216	150												
216 – 960	200												
Above 960	500												
Test Setup		 <p>The diagram illustrates the test setup for radiated emissions. A 'Turn Table' is positioned on a 'Ground Plane'. An 'EUT &amp; Support Units' assembly is mounted on the turn table, with a vertical height of 80cm indicated. A '3m' horizontal distance separates the EUT from an 'Ant. Tower'. The 'Ant. Tower' is mounted on a vertical post and is connected to a 'Test Receiver' unit. The antenna height is adjustable, with a range of '1-4m Variable' indicated.</p>											
Procedure		<ol style="list-style-type: none"> <li>The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:           <ol style="list-style-type: none"> <li>Vertical or horizontal polarization (whichever gave the higher emission level)</li> </ol> </li> </ol>											

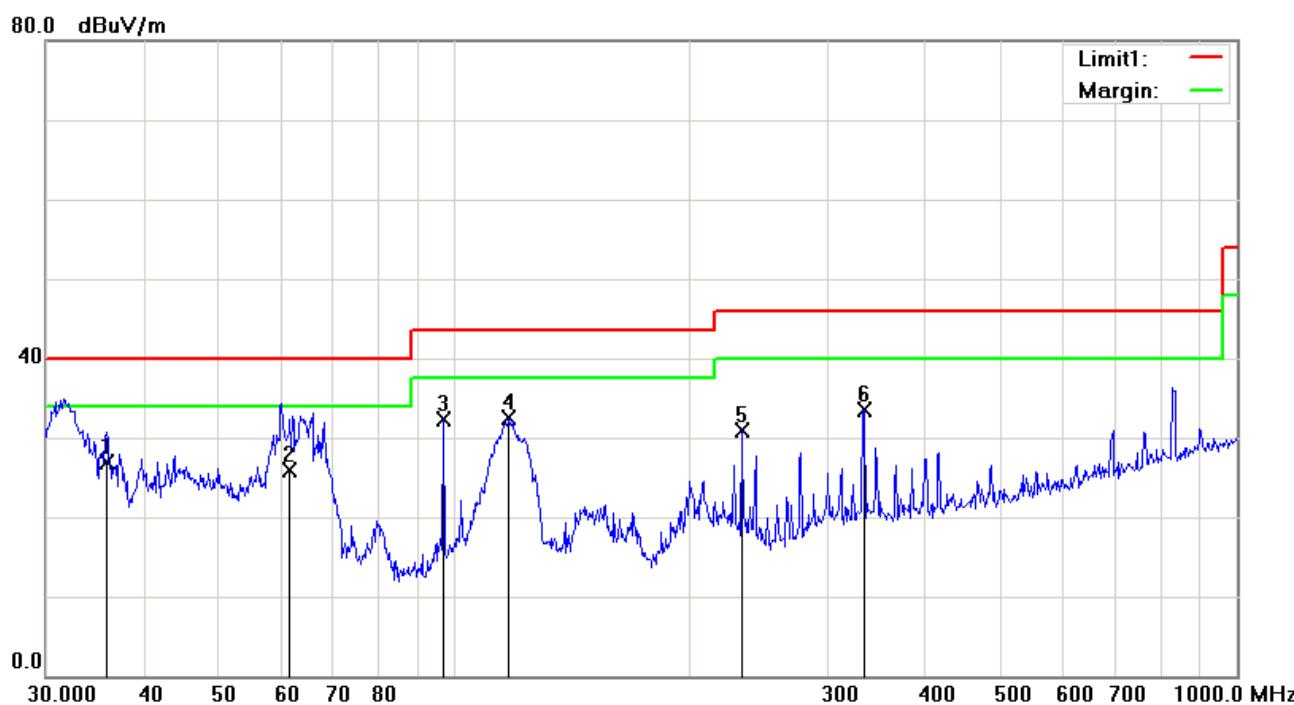
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz.</p> <p>4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz.</p> <p>The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth with Peak detection for Average Measurement as below at frequency above 1GHz.</p> <ul style="list-style-type: none"> <li>■ 1 kHz (Duty cycle &lt; 98%) <input type="checkbox"/> 10 Hz (Duty cycle &gt; 98%)</li> </ul> <p>5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</p>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

**Test Data**  Yes  N/A

**Test Plot**  Yes (See below)  N/A

Test Mode : **USB Mode**

**Below 1GHz**



**Test Data**

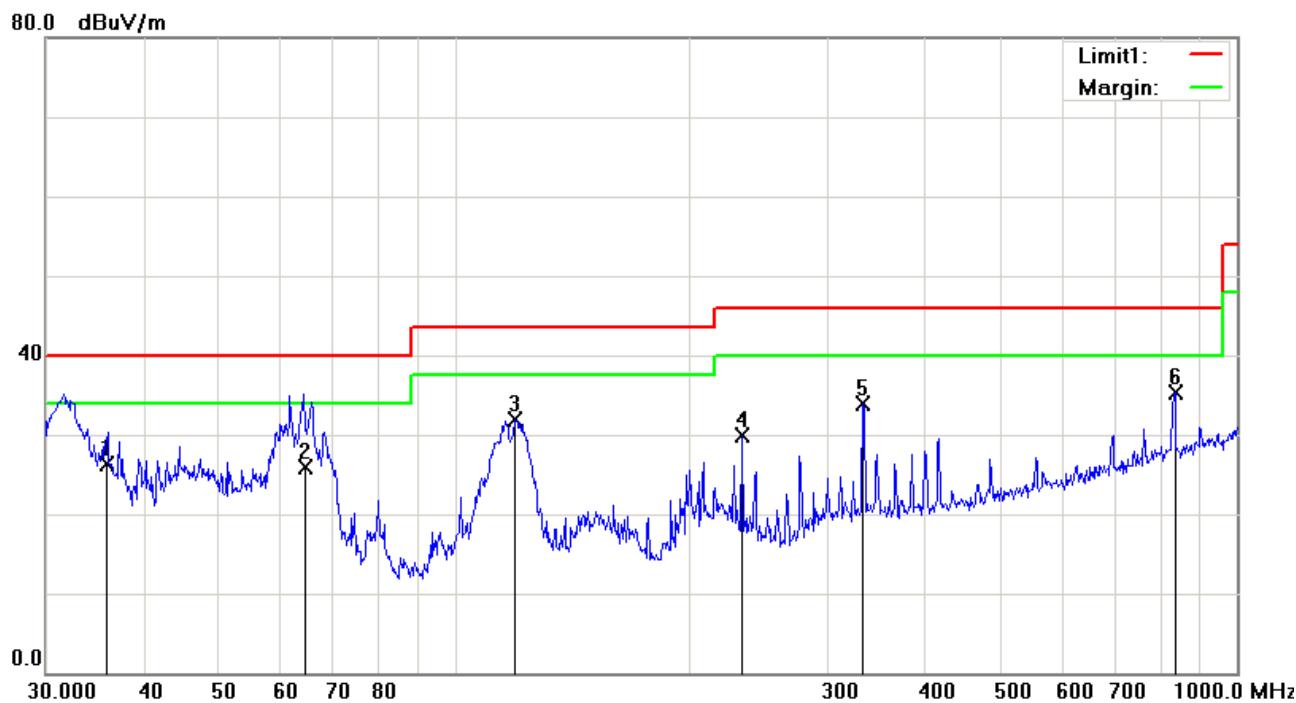
Horizontal Polarity Plot @3m

No.	P/L	Frequency (MHz)	Readin g (dBuV/ m)	Detector	Corrected (dB/m)	Result (dBuV/m )	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree
1	H	35.9659	31.49	QP	-4.65	26.84	40.00	-13.16	100	149
2	H	61.6970	40.05	QP	-14.23	25.82	40.00	-14.18	100	0
3	H	96.7749	43.95	peak	-11.65	32.30	43.50	-11.20	100	317
4	H	117.3603	40.20	peak	-7.75	32.45	43.50	-11.05	100	59
5	H	232.5318	39.98	peak	-9.04	30.94	46.00	-15.06	100	190
6	H	333.6867	39.43	peak	-5.93	33.50	46.00	-12.50	100	329

**Above 1GHz**

*Note: The frequency that above 1GHz is mainly from the environment noise.*

### Below 1GHz



### Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency (MHz)	Readin g (dBuV/ m)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree
1	V	35.8221	30.85	QP	-4.54	26.31	40.00	-13.69	100	211
2	V	64.5352	39.84	QP	-14.00	25.84	40.00	-14.16	100	124
3	V	119.4361	39.27	peak	-7.40	31.87	43.50	-11.63	100	42
4	V	233.3487	38.92	peak	-9.04	29.88	46.00	-16.12	100	139
5	V	332.5187	39.88	peak	-5.97	33.91	46.00	-12.09	100	331
6	V	833.3171	31.68	peak	3.61	35.29	46.00	-10.71	100	297

### Above 1GHz

Note: The frequency that above 1GHz is mainly from the environment noise.

## Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
<b>AC Line Conducted Emissions</b>					
EMI test receiver	ESCS30	8471241027	09/17/2015	09/16/2016	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191106	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191107	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
LISN	ISN T800	34373	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
Transient Limiter	LIT-153	531118	09/01/2015	08/31/2016	<input checked="" type="checkbox"/>
<b>Radiated Emissions</b>					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	<input checked="" type="checkbox"/>
Microwave Preamplifier (1~26.5GHz)	8449B	3008A02402	03/25/2015	03/24/2016	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna	AH-118	71259	09/25/2014	09/24/2015	<input checked="" type="checkbox"/>

## Annex B. EUT And Test Setup Photographs

### Annex B.i. Photograph: EUT External Photo





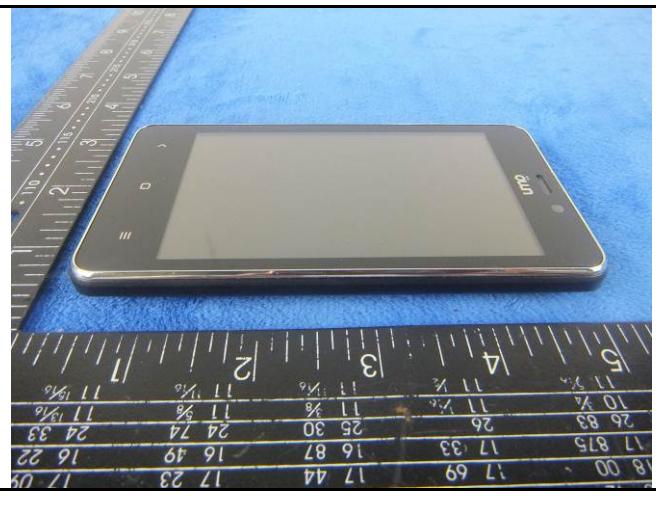
EUT - Top View



EUT - Bottom View

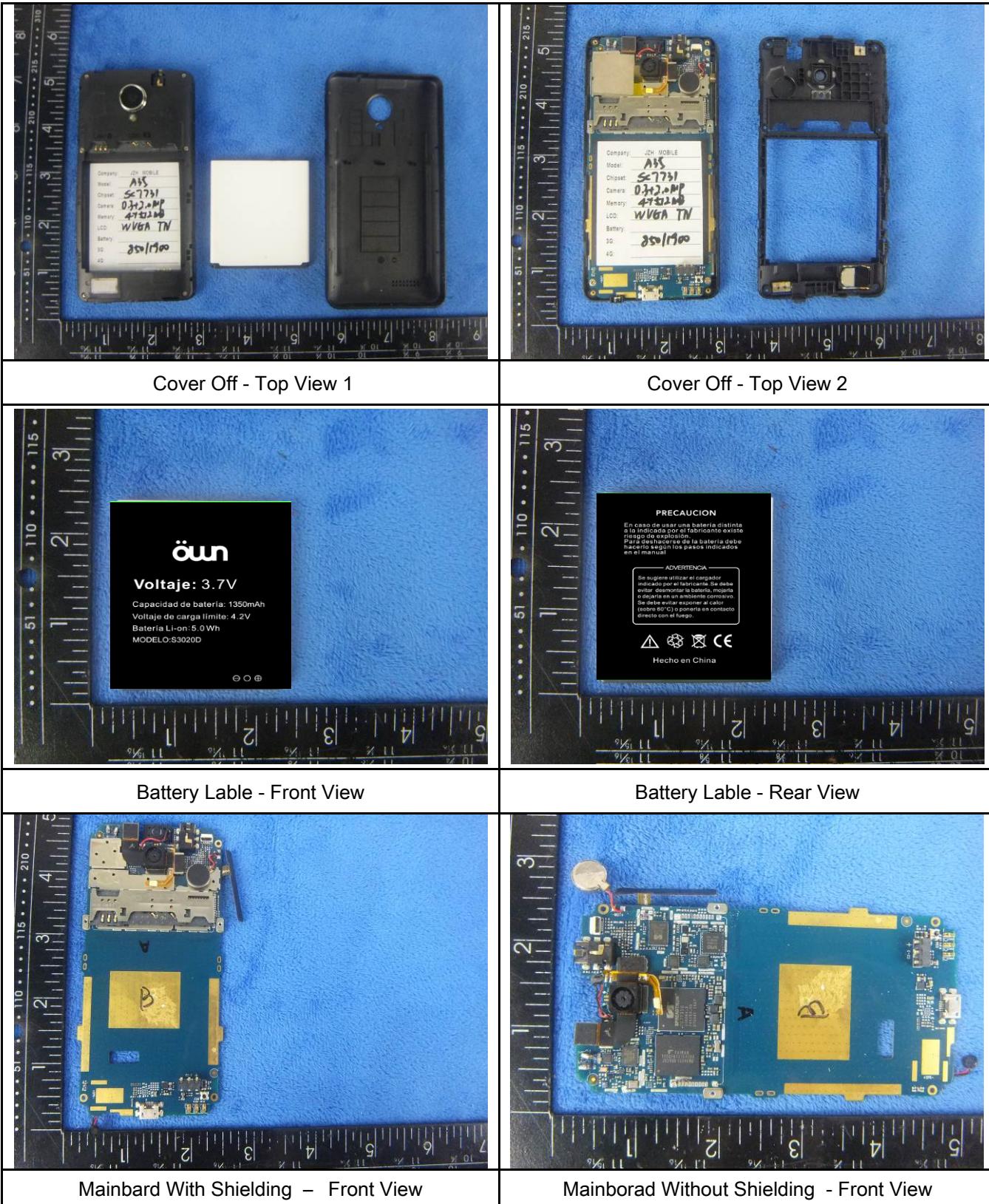


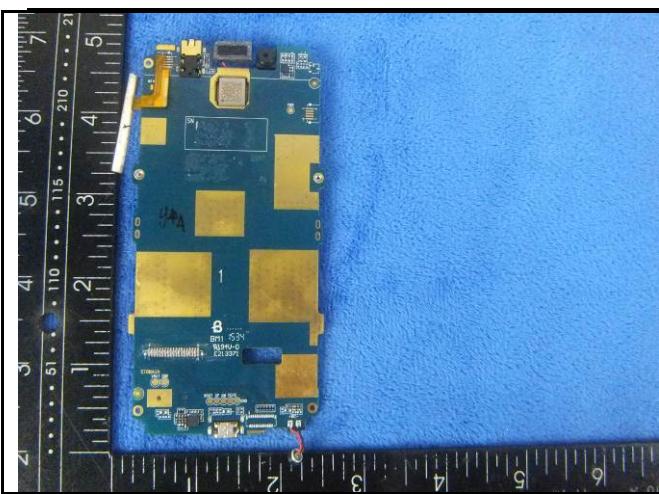
EUT - Left View



EUT - Right View

**Annex B.ii. Photograph: EUT Internal Photo**

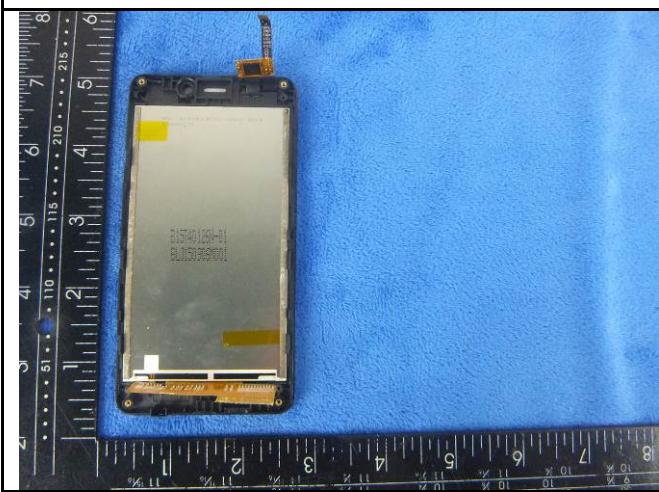




Mainborad – Rear View



LCD – Front View



LCD – Rear View

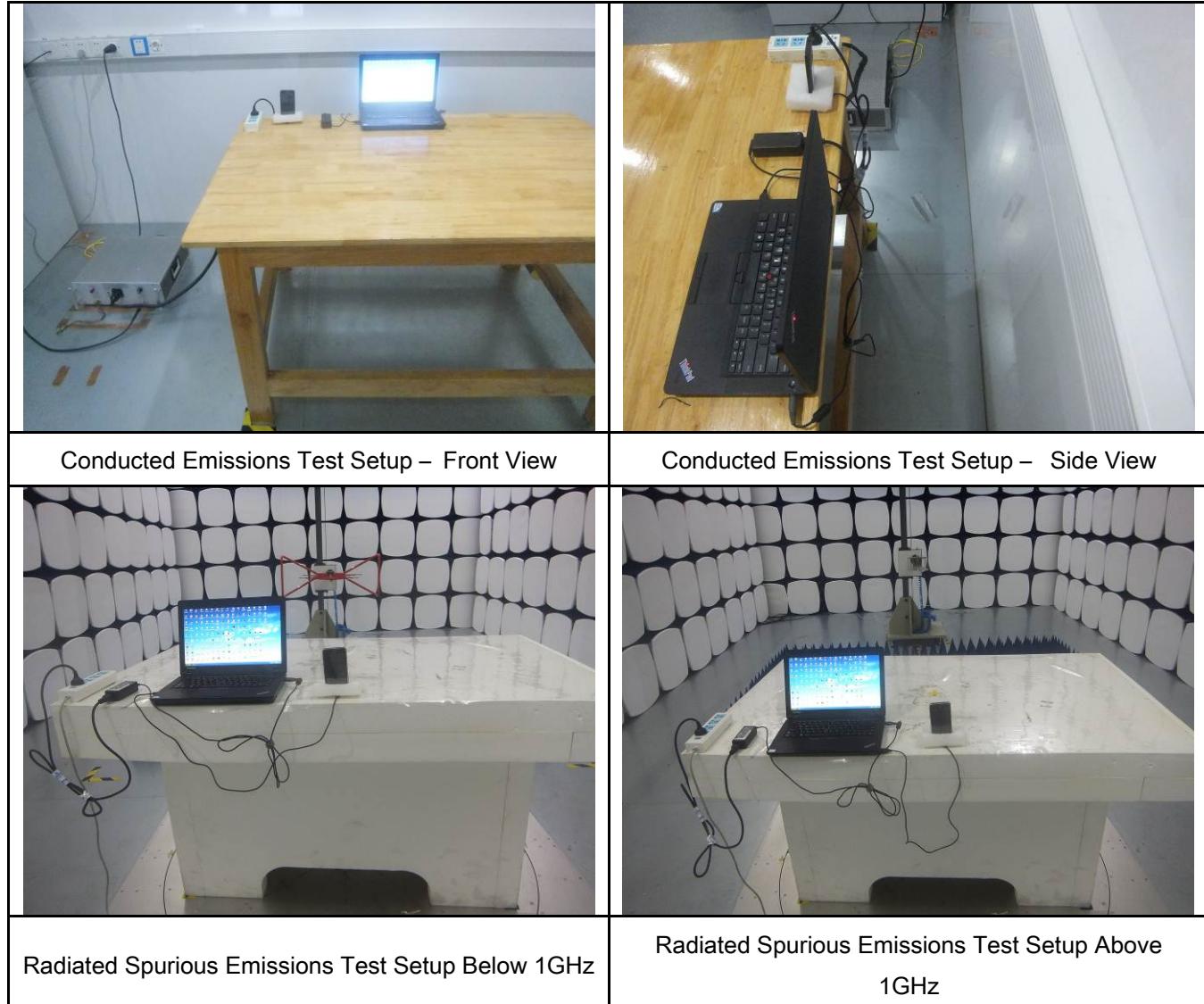


GSM/PCS/UMTS-FDD Antenna View



WIFI/BT/GPS - Antenna View

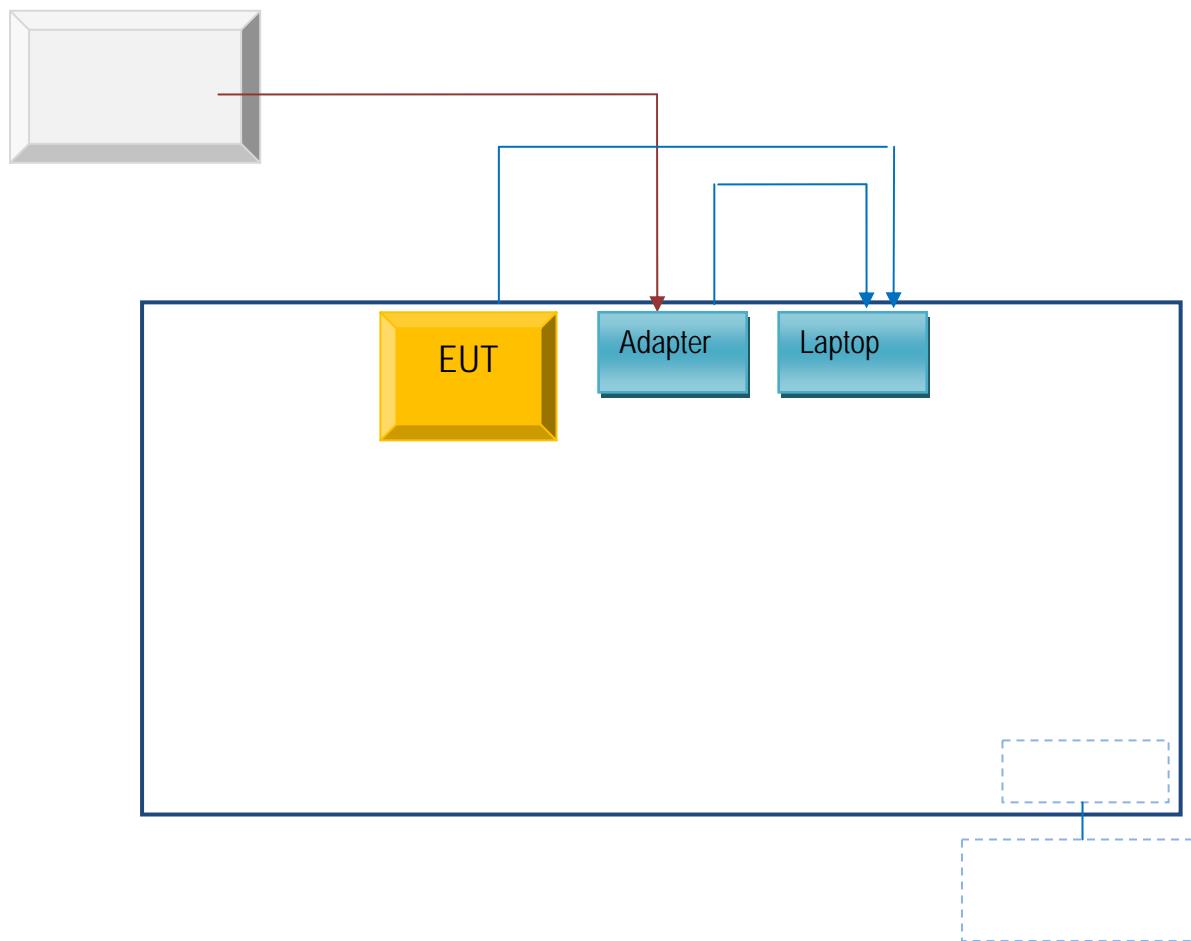
**Annex B.iii. Photograph: Test Setup Photo**



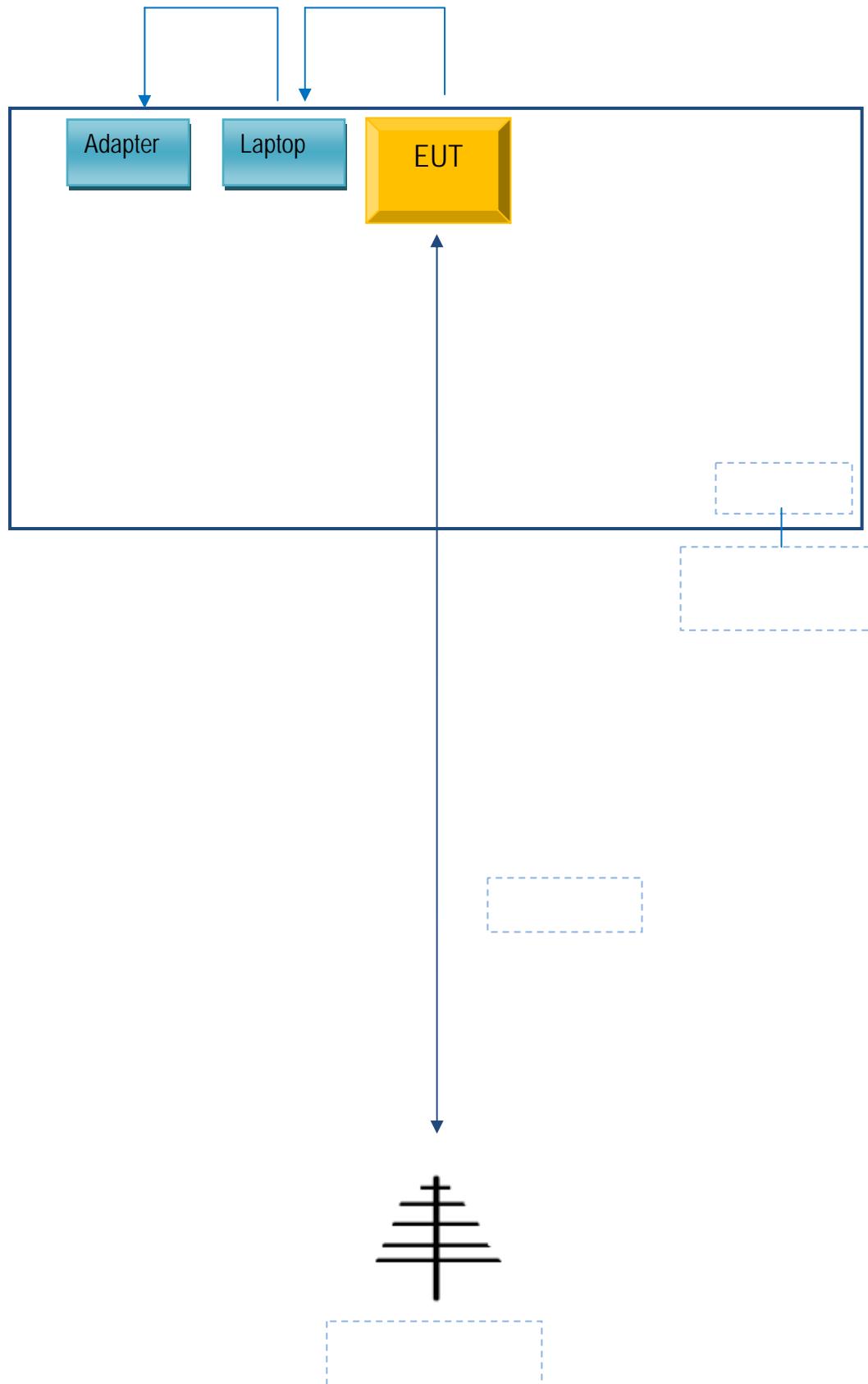
## Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

### Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



### Block Configuration Diagram for Radiated Emissions



### Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Manufacturer	Equipment Description	Model	Calibration Date	Calibration Due Date
Lenovo	Lenovo Laptop	E40& 0579A52	N/A	N/A

## Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see Attachment

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## Annex E. DECLARATION OF SIMILARITY

N/A