

EMC TEST REPORT



Report No.: 16071216-FCC-E_V2

Supersede Report No: N/A

Applicant	ESG group SA	
Product Name	Mobile Phone	
Model No.	Bravo	
Serial No.	N/A	
Test Standard	FCC Part 15 Subpart B Class B:2015, ANSI C63.4: 2014	
Test Date	October 10 to November 02, 2016	
Issue Date	November 15, 2016	
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"/>		
Loren Luo	David Huang	
Loren Luo 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

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

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

Test Report	16071216-FCC-E_V2
Page	3 of 30

This page has been left blank intentionally.

CONTENTS

1. REPORT REVISION HISTORY	5
2. CUSTOMER INFORMATION	5
3. TEST SITE INFORMATION.....	5
4. EQUIPMENT UNDER TEST (EUT) INFORMATION	6
5. TEST SUMMARY	8
6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS	9
6.1 AC POWER LINE CONDUCTED EMISSIONS.....	9
6.2 RADIATED EMISSIONS.....	15
ANNEX A. TEST INSTRUMENT.....	20
ANNEX B. EUT AND TEST SETUP PHOTOGRAPHS.....	21
ANNEX C. TEST SETUP AND SUPPORTING EQUIPMENT.....	26
ANNEX D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PARTLIST	29
ANNEX E. DECLARATION OF SIMILARITY	30

1. Report Revision History

Report No.	Report Version	Description	Issue Date
16071216-FCC-E	NONE	Original (Obsolete)	November 03, 2016
16071216-FCC-E_V1	V1	Modifying the data of note 1 on Page 19;And marking BT antenna position again ; And replacing the photo of GSM/PCS antenna (Obsolete)	November 11, 2016
16071216-FCC-E_V2	V2	Replacing the photo of BT antenna And marking BT antenna position	November 15, 2016

2. Customer information

Applicant Name	ESG group SA
Applicant Add	14 Rue Capois, Port-au-Prince Haiti
Manufacturer	ESG group SA
Manufacturer Add	30 Rue des Nimes, route de l'aeoport Port-au-Prince, Haiti

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:	Bravo
Serial Model:	N/A
Antenna Gain:	GSM850: -2.4dBi PCS1900: -2.4dBi Bluetooth:-5.4dBi
Antenna Type:	GSM:PIFA antenna BT: Monopole antenna
Input Power:	Adapter: Model: GCH-001 Input: AC100-240V~50/60Hz,0.15A Output: DC 5.0V-500mA Battery: Model: BT012300 Spec: 3.7V, 1500mAh Charging limit voltage: 4.2V
Equipment Category :	JBP
Type of Modulation:	GSM / GPRS: GMSK Bluetooth: GFSK, π /4DQPSK, 8DPSK
RF Operating Frequency (ies):	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 Bluetooth: 2402-2480 MHz
Number of Channels:	GSM 850: 124CH PCS1900: 299CH Bluetooth: 79CH
Port:	Power Port, Earphone Port, USB Port

Test Report	16071216-FCC-E_V2
Page	7 of 30

Trade Name : Gravity

FCC ID: 2AGO0BRAVOHT

Date EUT received: October 09, 2016

Test Date(s): October 10 to November 02, 2016

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

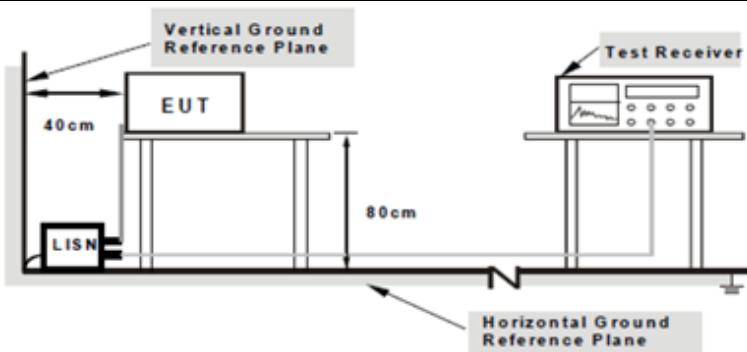
Emissions		
Test Item	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
-	-	-

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	24°C
Relative Humidity	53%
Atmospheric Pressure	1011mbar
Test date :	October 11, 2016
Tested By :	Loren Luo

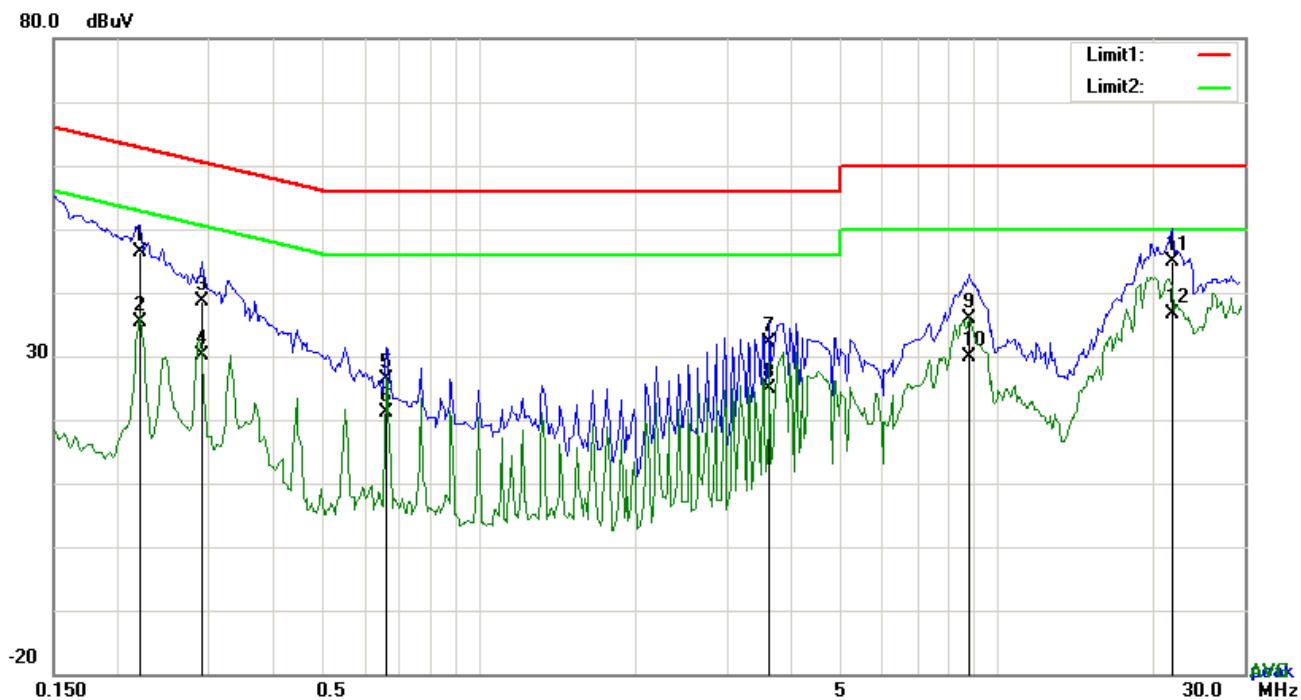
Requirement(s):

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 (dBμV)</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 μ 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 μ 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>Note: 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"> 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. The power supply for the EUT was fed through a 50Ω /50mH EUT LISN, connected to filtered mains. 																

	<ol style="list-style-type: none"> 3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal operating condition. 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. 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. 8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

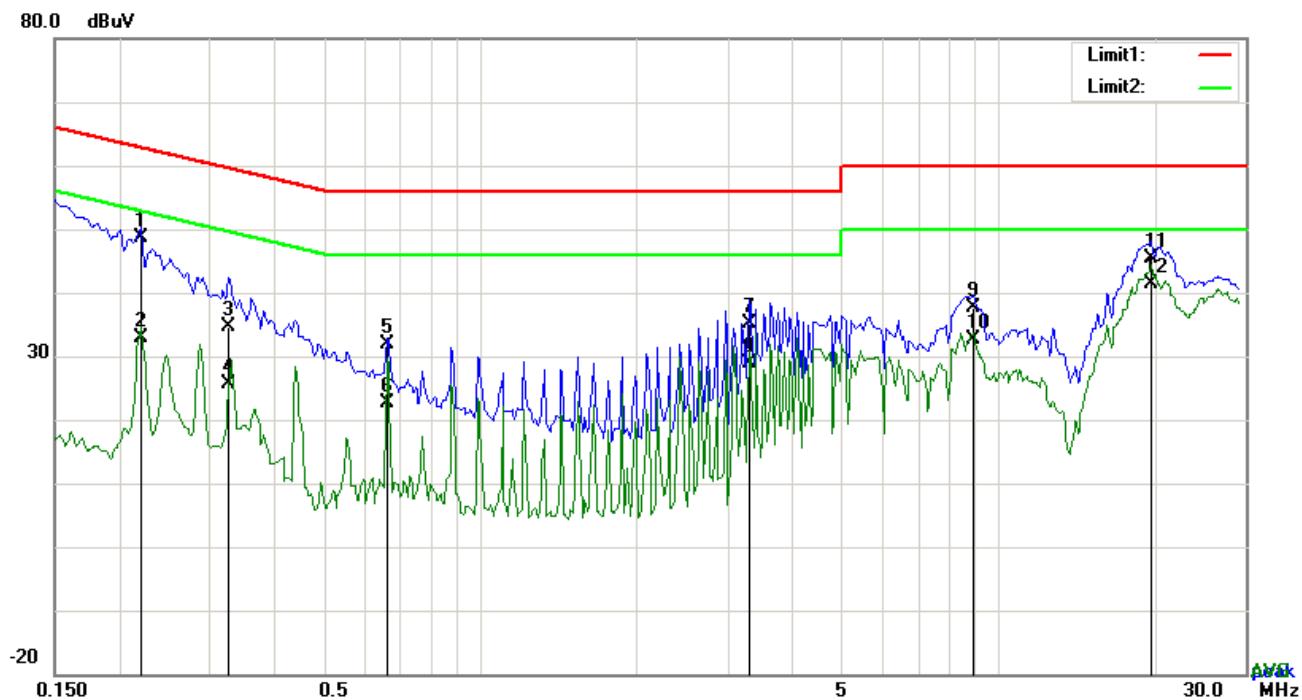
Test Data Yes N/A

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	0.2202	36.25	QP	10.03	46.28	62.81	-16.53
2	L1	0.2202	25.41	AVG	10.03	35.44	52.81	-17.37
3	L1	0.2904	28.65	QP	10.03	38.68	60.51	-21.83
4	L1	0.2904	20.06	AVG	10.03	30.09	50.51	-20.42
5	L1	0.6609	16.39	QP	10.03	26.42	56.00	-29.58
6	L1	0.6609	11.09	AVG	10.03	21.12	46.00	-24.88
7	L1	3.6357	22.17	QP	10.06	32.23	56.00	-23.77
8	L1	3.6357	14.86	AVG	10.06	24.92	46.00	-21.08
9	L1	8.8149	25.81	QP	10.13	35.94	60.00	-24.06
10	L1	8.8149	19.72	AVG	10.13	29.85	50.00	-20.15
11	L1	21.8097	34.51	QP	10.33	44.84	60.00	-15.16
12	L1	21.8097	26.34	AVG	10.33	36.67	50.00	-13.33

Test Mode : **USB Mode**

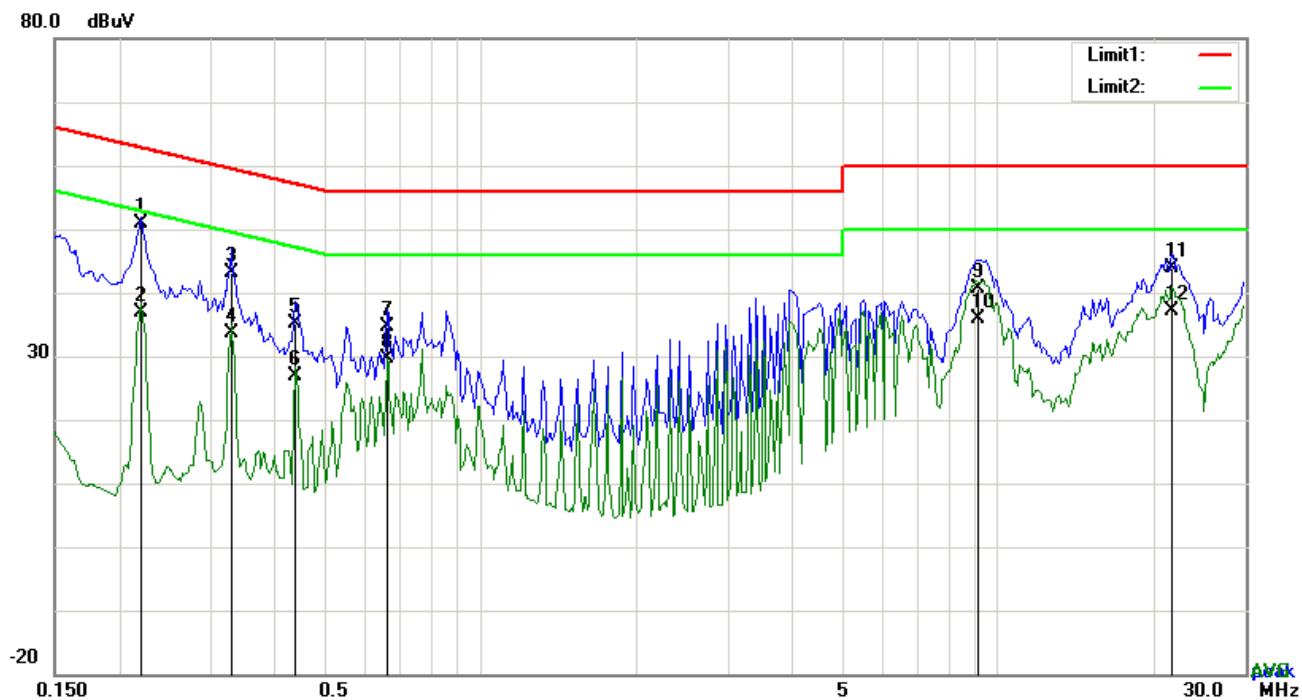


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	N	0.2202	38.58	QP	10.02	48.60	62.81	-14.21
2	N	0.2202	22.98	AVG	10.02	33.00	52.81	-19.81
3	N	0.3255	24.63	QP	10.02	34.65	59.57	-24.92
4	N	0.3255	15.71	AVG	10.02	25.73	49.57	-23.84
5	N	0.6609	21.83	QP	10.02	31.85	56.00	-24.15
6	N	0.6609	12.61	AVG	10.02	22.63	46.00	-23.37
7	N	3.3042	25.06	QP	10.05	35.11	56.00	-20.89
8	N	3.3042	18.75	AVG	10.05	28.80	46.00	-17.20
9	N	8.9202	27.49	QP	10.12	37.61	60.00	-22.39
10	N	8.9202	22.58	AVG	10.12	32.70	50.00	-17.30
11	N	19.8207	35.12	QP	10.26	45.38	60.00	-14.62
12	N	19.8207	31.08	AVG	10.26	41.34	50.00	-8.66

Test Mode : **USB Mode**

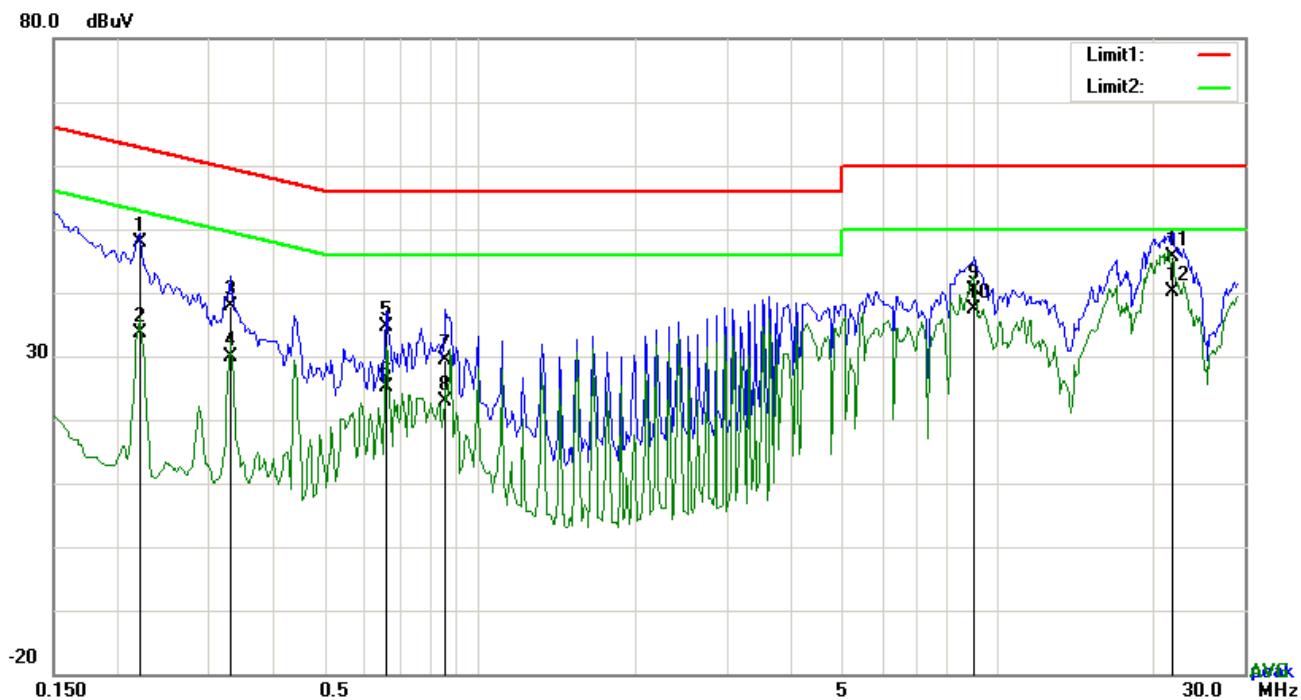


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	L1	0.2202	40.75	QP	10.03	50.78	62.81	-12.03
2	L1	0.2202	26.86	AVG	10.03	36.89	52.81	-15.92
3	L1	0.3294	33.01	QP	10.03	43.04	59.47	-16.43
4	L1	0.3294	23.63	AVG	10.03	33.66	49.47	-15.81
5	L1	0.4386	25.21	QP	10.03	35.24	57.09	-21.85
6	L1	0.4386	16.95	AVG	10.03	26.98	47.09	-20.11
7	L1	0.6609	24.58	QP	10.03	34.61	56.00	-21.39
8	L1	0.6609	19.69	AVG	10.03	29.72	46.00	-16.28
9	L1	9.1269	30.46	QP	10.14	40.60	60.00	-19.40
10	L1	9.1269	25.86	AVG	10.14	36.00	50.00	-14.00
11	L1	21.6732	33.48	QP	10.33	43.81	60.00	-16.19
12	L1	21.6732	26.79	AVG	10.33	37.12	50.00	-12.88

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	0.2202	37.86	QP	10.02	47.88	62.81	-14.93
2	N	0.2202	23.64	AVG	10.02	33.66	52.81	-19.15
3	N	0.3294	27.85	QP	10.02	37.87	59.47	-21.60
4	N	0.3294	19.88	AVG	10.02	29.90	49.47	-19.57
5	N	0.6609	24.61	QP	10.02	34.63	56.00	-21.37
6	N	0.6609	15.03	AVG	10.02	25.05	46.00	-20.95
7	N	0.8598	19.24	QP	10.03	29.27	56.00	-26.73
8	N	0.8598	12.73	AVG	10.03	22.76	46.00	-23.24
9	N	9.0255	30.31	QP	10.13	40.44	60.00	-19.56
10	N	9.0255	27.31	AVG	10.13	37.44	50.00	-12.56
11	N	21.7941	35.32	QP	10.29	45.61	60.00	-14.39
12	N	21.7941	29.87	AVG	10.29	40.16	50.00	-9.84

6.2 Radiated Emissions

Temperature	25°C
Relative Humidity	54%
Atmospheric Pressure	1012mbar
Test date :	October 12, 2016
Tested By :	Loren Luo

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 (μV/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 (μ V/m)	30 – 88	100	88 – 216	150	216 – 960	200	Above 960	500	<input checked="" type="checkbox"/>
Frequency range (MHz)	Field Strength (μ V/m)												
30 – 88	100												
88 – 216	150												
216 – 960	200												
Above 960	500												
Test Setup		 <p>The diagram illustrates the test setup. A 'Turn Table' is positioned on a 'Ground Plane'. An 'EUT & Support Units' is mounted on the turn table, with a vertical distance of '80cm' indicated. A '3m' horizontal distance is shown between the EUT and a 'Ant. Tower'. The 'Ant. Tower' is mounted on a vertical post and is labeled '1-4m Variable' to indicate its height adjustment range. A 'Test Receiver' is connected to the turn table, likely for signal processing or measurement.</p>											
Procedure		<ol style="list-style-type: none"> 1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. 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"> a. Vertical or horizontal polarization (whichever gave the higher emission level) 											

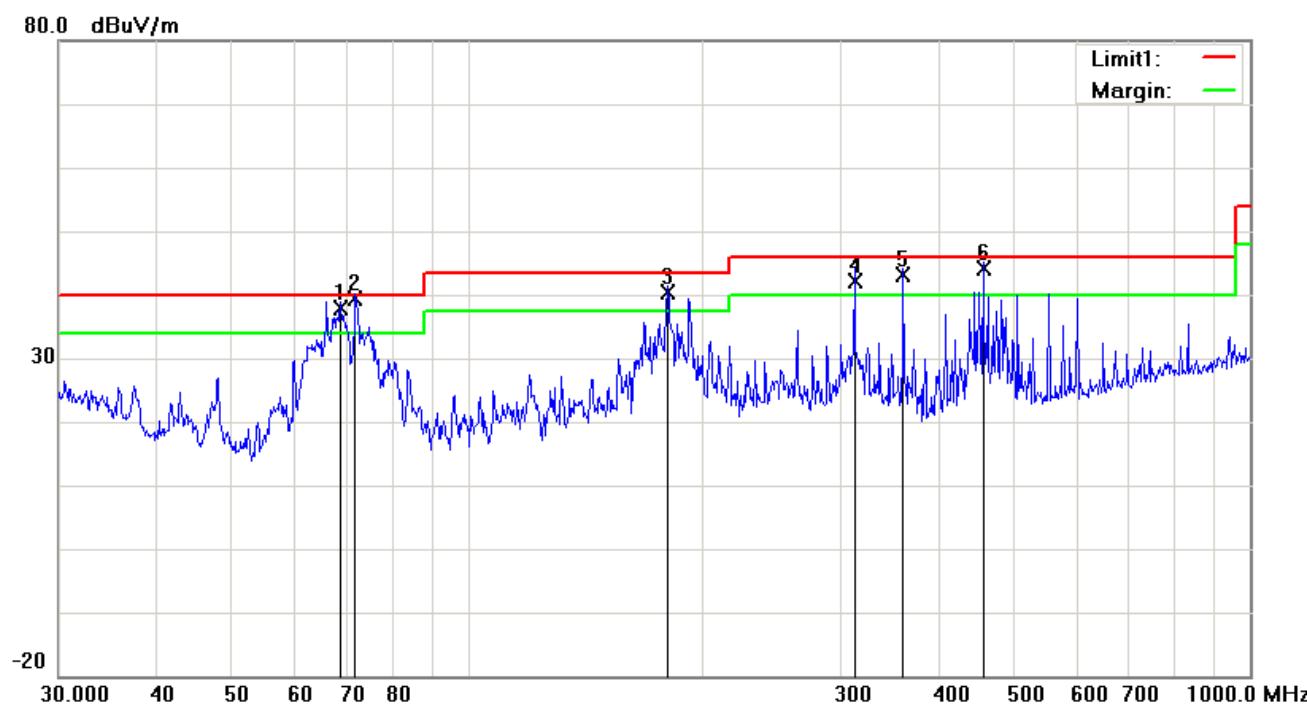
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum 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"> ■ 1 kHz (Duty cycle < 98%) <input type="checkbox"/> 10 Hz (Duty cycle > 98%) <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

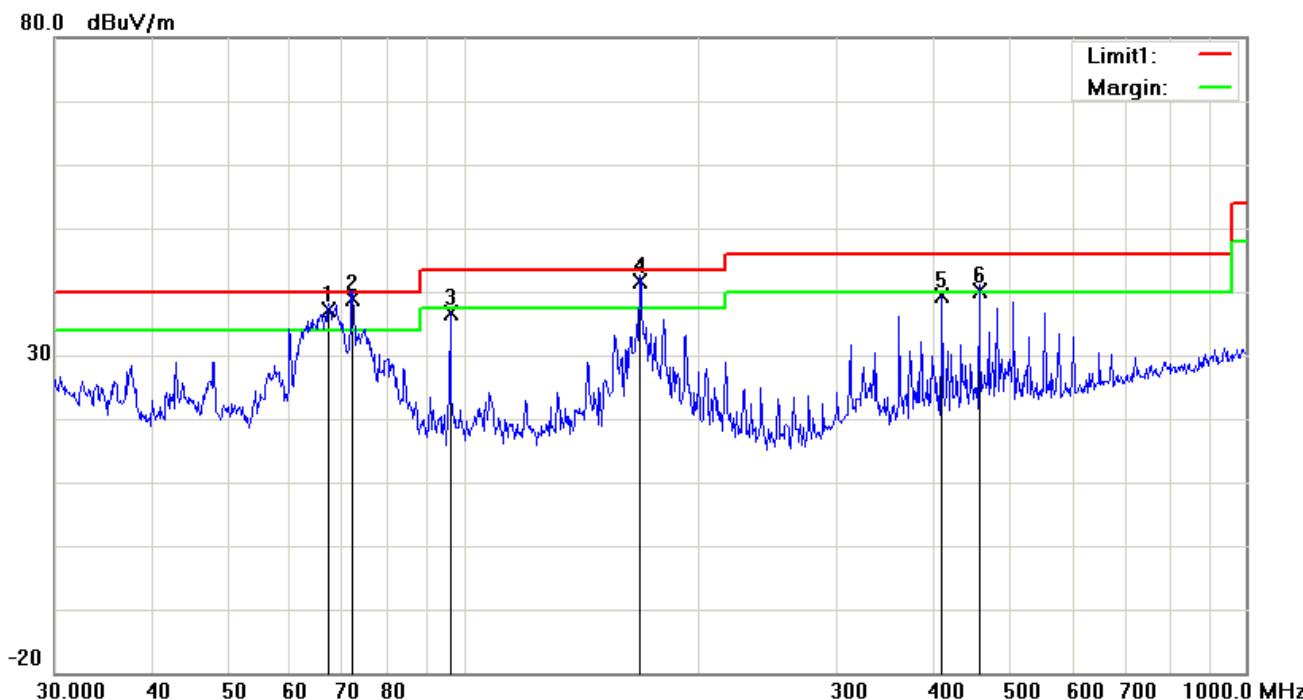


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency (MHz)	Reading (dBuV/ m)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	H	68.6310	51.52	QP	-13.70	37.82	40.00	-2.18	100	307
2	H	71.8320	52.96	QP	-13.66	39.30	40.00	-0.70	100	157
3	H	180.0165	50.22	QP	-9.89	40.33	43.50	-3.17	100	24
4	H	312.1794	48.71	QP	-6.55	42.16	46.00	-3.84	100	79
5	H	360.4477	48.45	QP	-5.22	43.23	46.00	-2.77	100	236
6	H	455.9058	47.07	QP	-2.92	44.15	46.00	-1.85	100	228

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	67.2022	51.04	QP	-13.81	37.23	40.00	-2.77	100	91
2	V	72.0843	52.46	QP	-13.66	38.80	40.00	-1.20	100	304
3	V	96.0986	48.44	peak	-11.84	36.60	43.50	-6.90	100	46
4	V	167.8243	50.44	QP	-8.92	41.52	43.50	-1.98	100	156
5	V	408.9460	43.50	peak	-4.08	39.42	46.00	-6.58	100	85
6	V	455.9058	42.98	QP	-2.92	40.06	46.00	-5.94	100	27

Above 1GHz

Frequency (MHz)	Amplitude (dB μ V/m)	Azimuth	Height (cm)	Polarity (H/V)	Factors (dB)	Limit (dB μ V/m)	Margin (dB)	Detector (PK/AV)
1288.63	54.16	52	144	V	-22.57	74	-19.84	PK
1475.33	53.27	126	158	V	-23.06	74	-20.73	PK
2056.82	55.66	91	137	V	-22.11	74	-18.34	PK
1763.41	56.31	83	255	H	-21.23	74	-17.69	PK
1512.35	51.72	107	232	H	-21.69	74	-22.28	PK
2216.67	52.08	134	169	H	-22.45	74	-21.92	PK

*Note1: The highest frequency of the EUT is 2480 MHz, so the testing has been conformed to 5*2480MHz=12,400MHz.*

Note2: The frequency that above 3GHz is mainly from the environment noise.

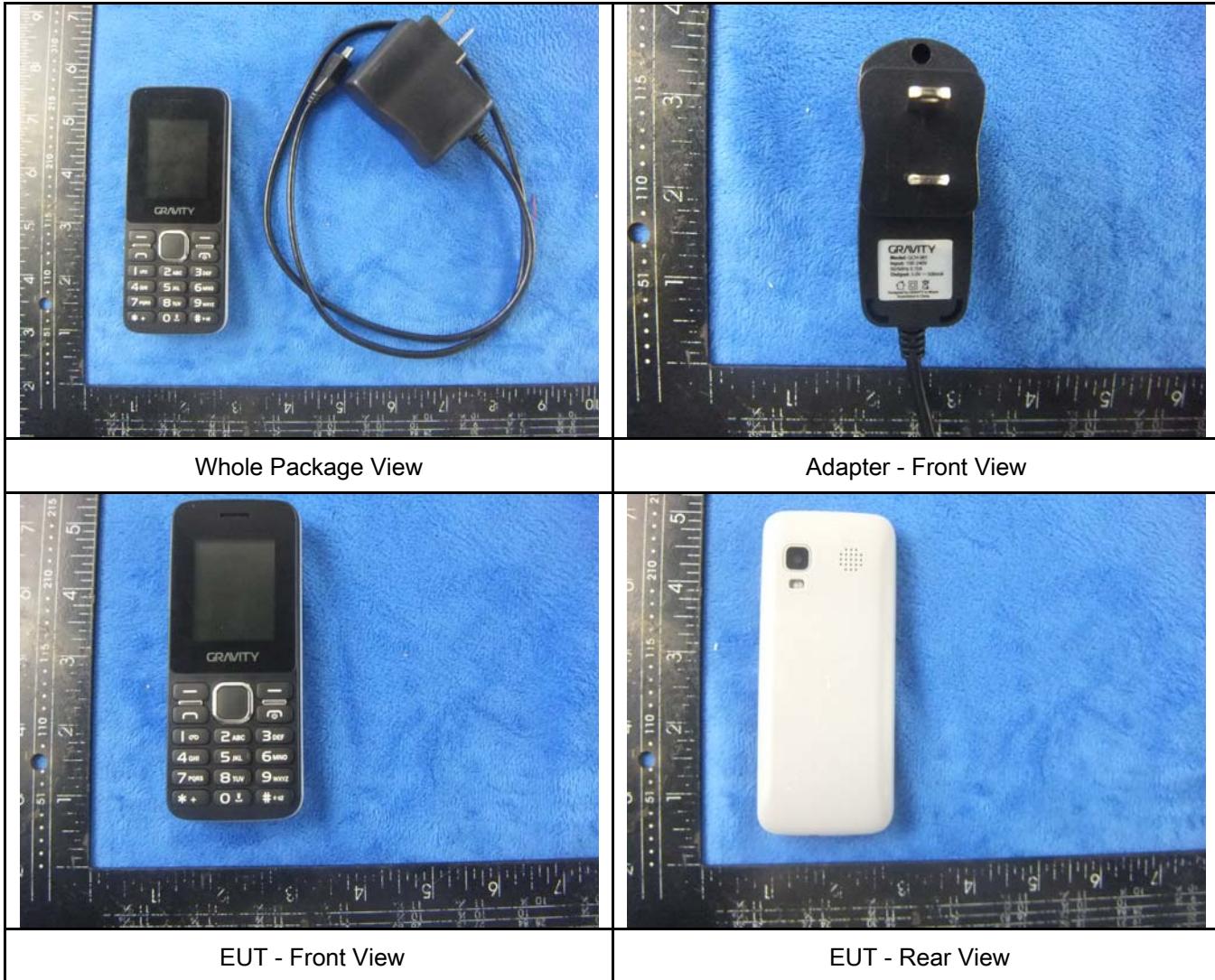
Note3: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
EMI test receiver	ESCS30	8471241027	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191106	09/24/2016	09/23/2017	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191107	09/24/2016	09/23/2017	<input checked="" type="checkbox"/>
LISN	ISN T800	34373	09/24/2016	09/23/2017	<input checked="" type="checkbox"/>
Transient Limiter	LIT-153	531118	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Radiated Emissions					
EMI test receiver	ESL6	100262	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/24/2016	03/23/2017	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/20/2016	09/19/2017	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna	AH-118	71259	09/23/2016	09/22/2017	<input checked="" type="checkbox"/>

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo





EUT - Top View



EUT - Bottom View

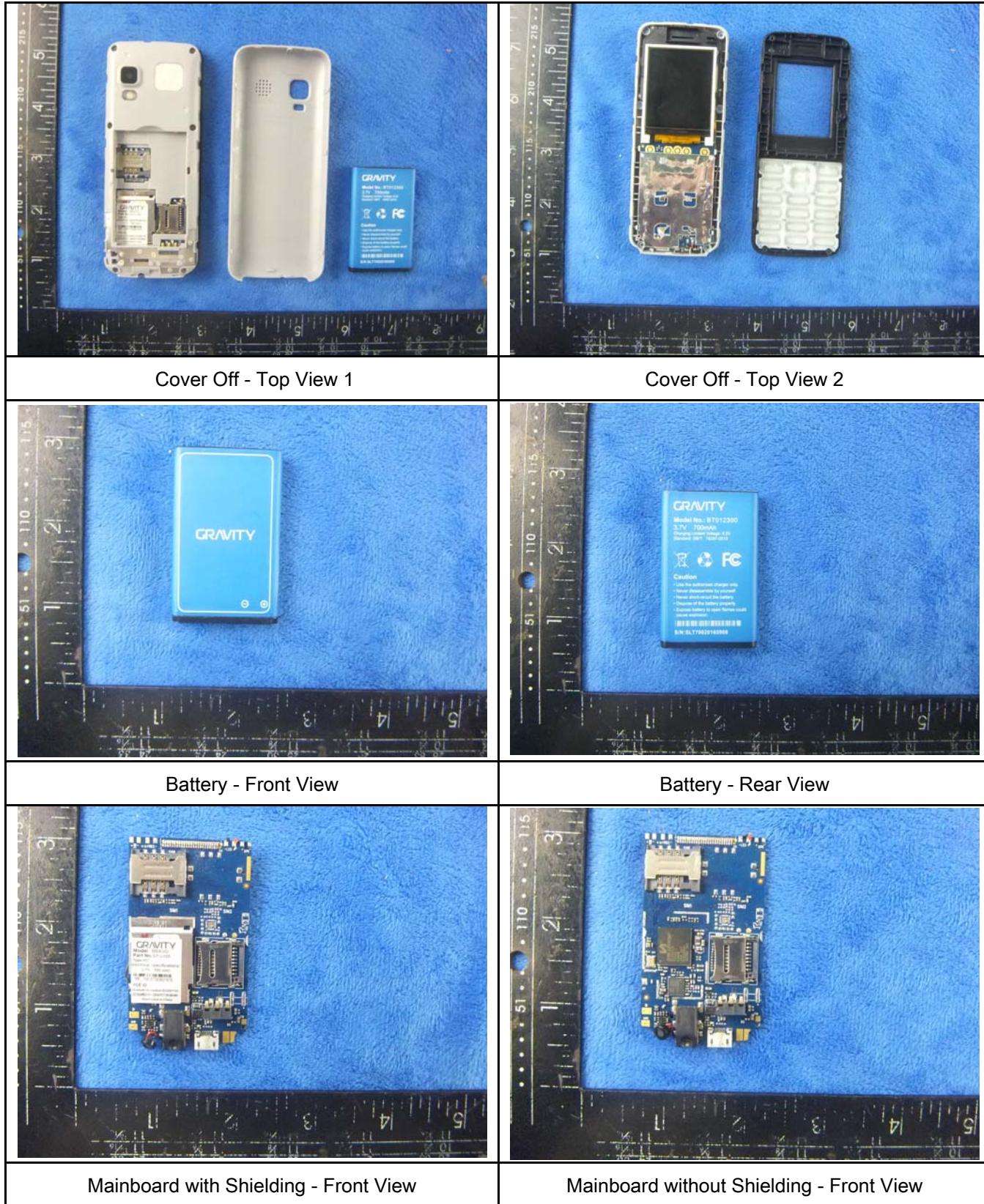


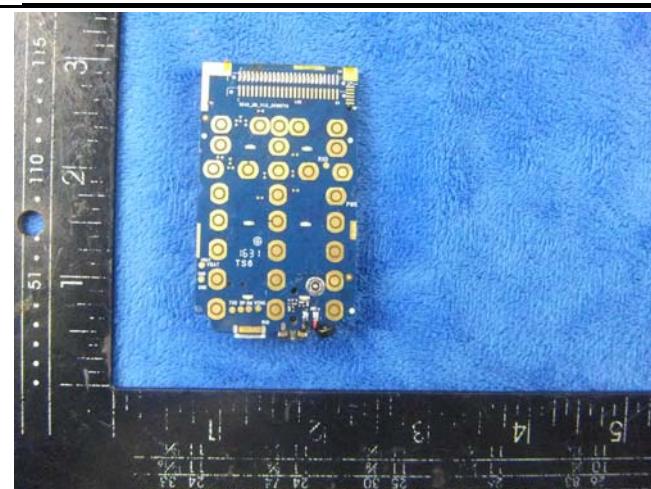
EUT - Left View



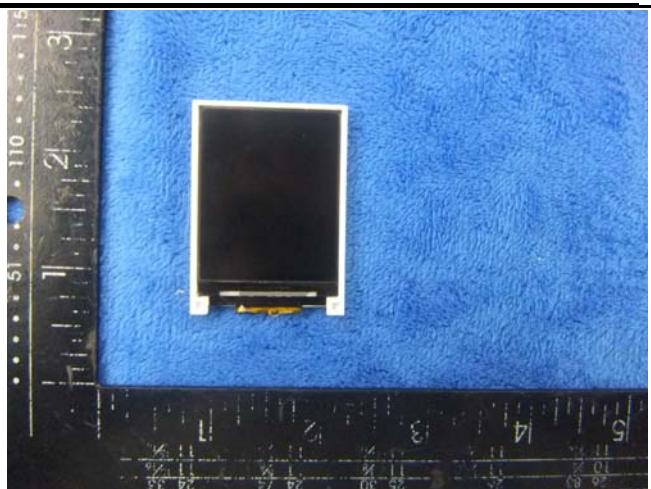
EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo

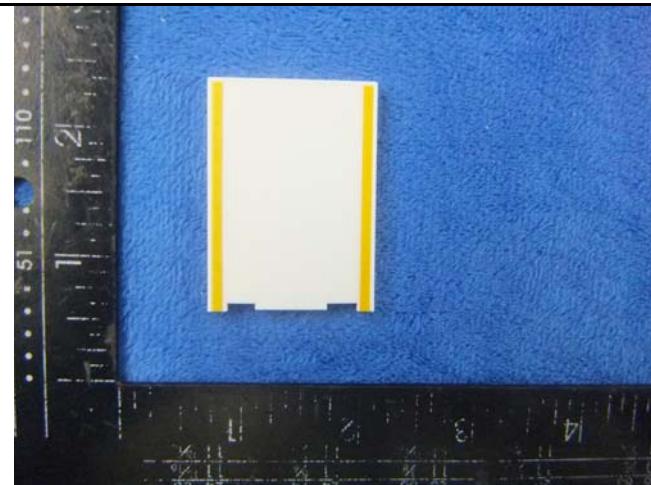




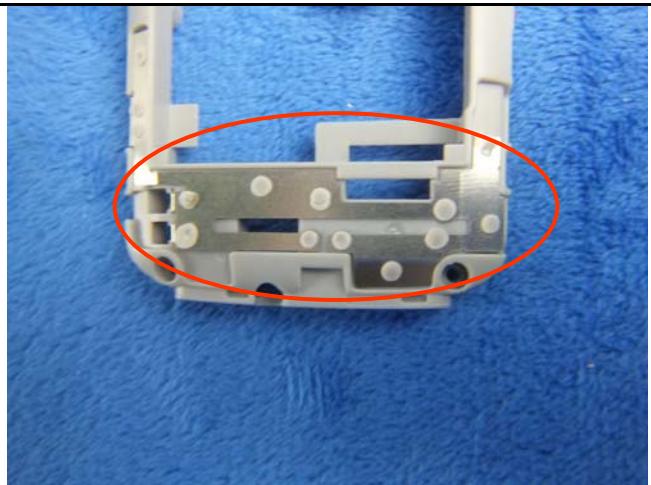
Mainboard - Rear View



LCD – Front View



LCD – Rear View

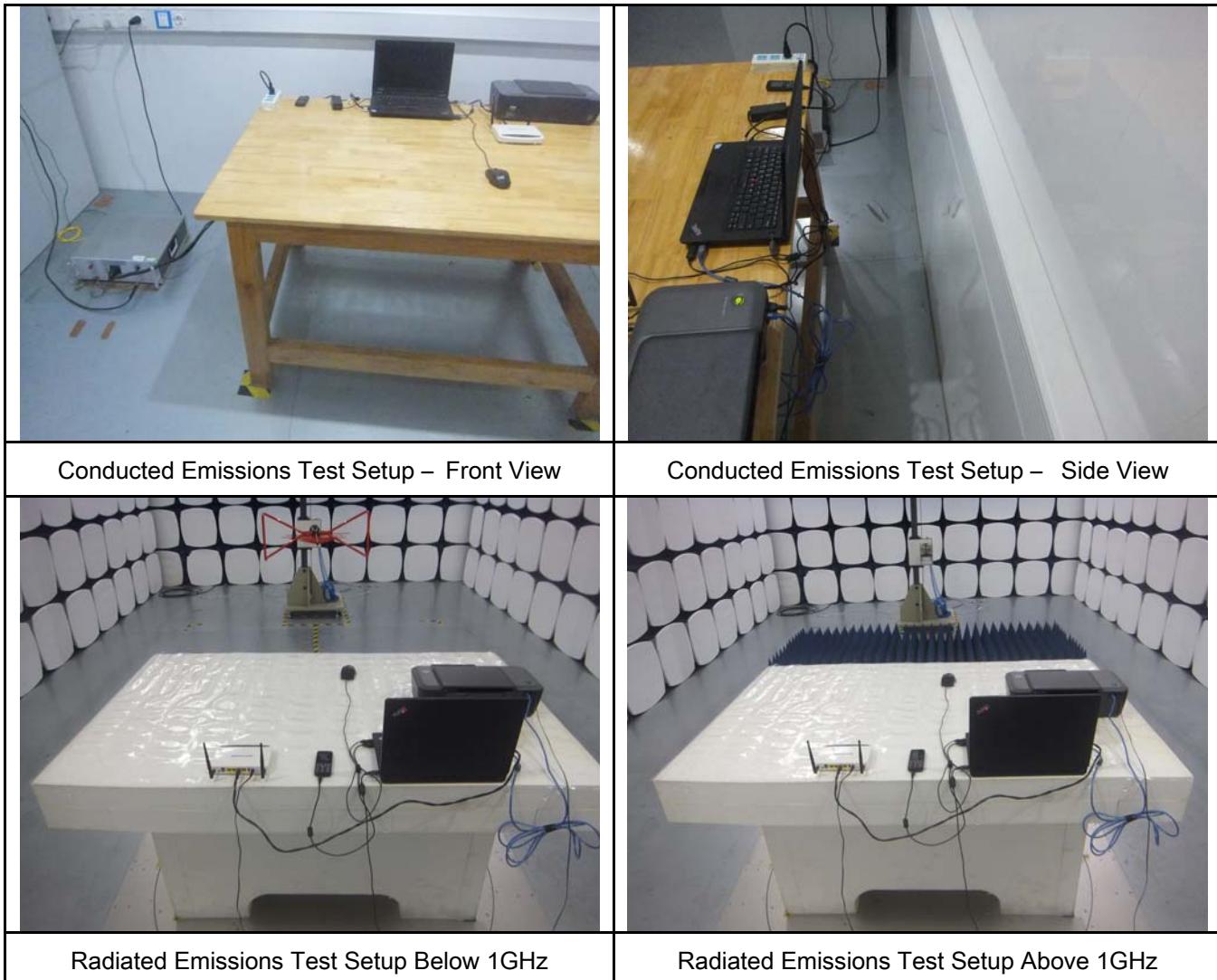


GSM/PCS Antenna View



BT - Antenna View

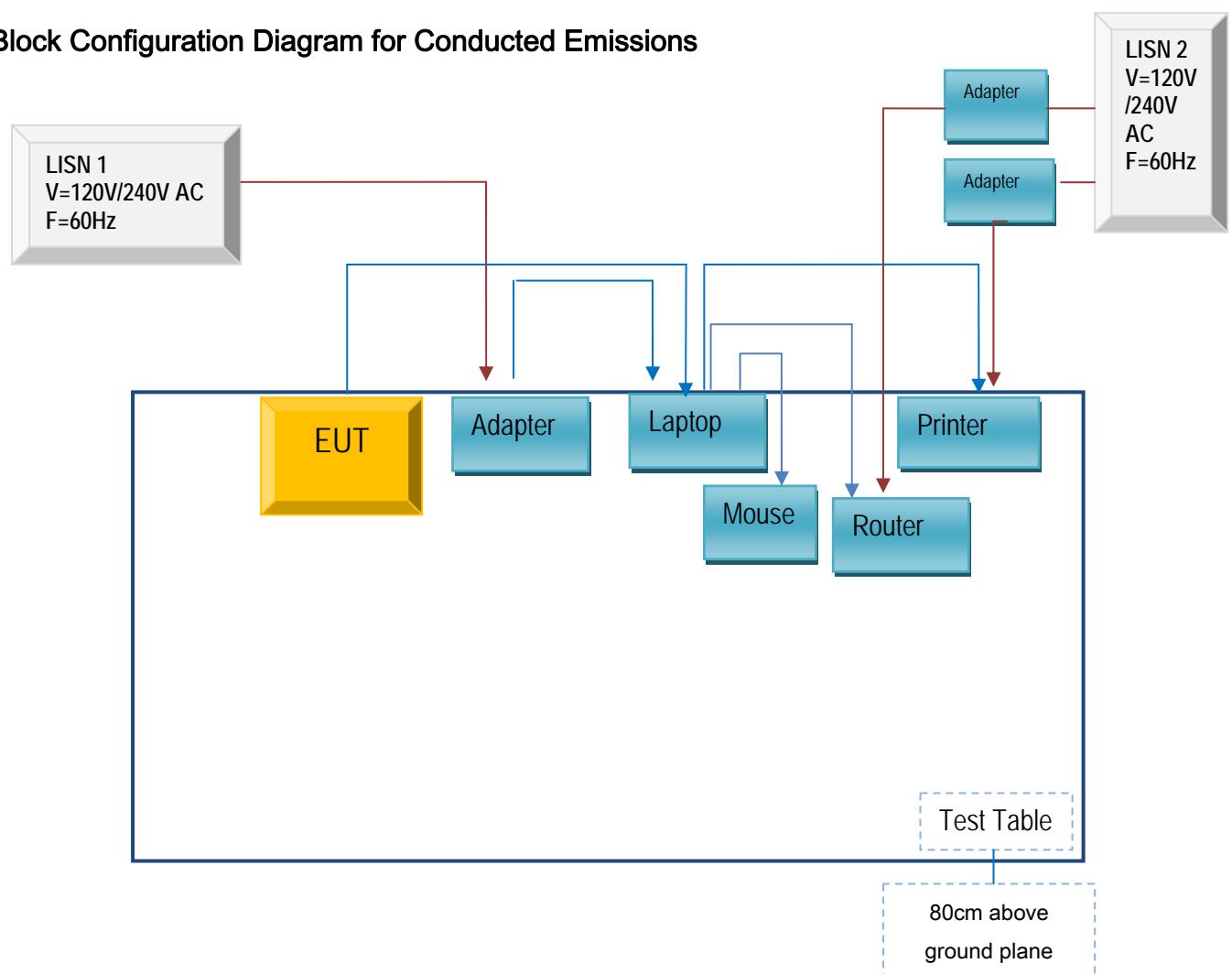
Annex B.iii. Photograph: Test Setup Photo



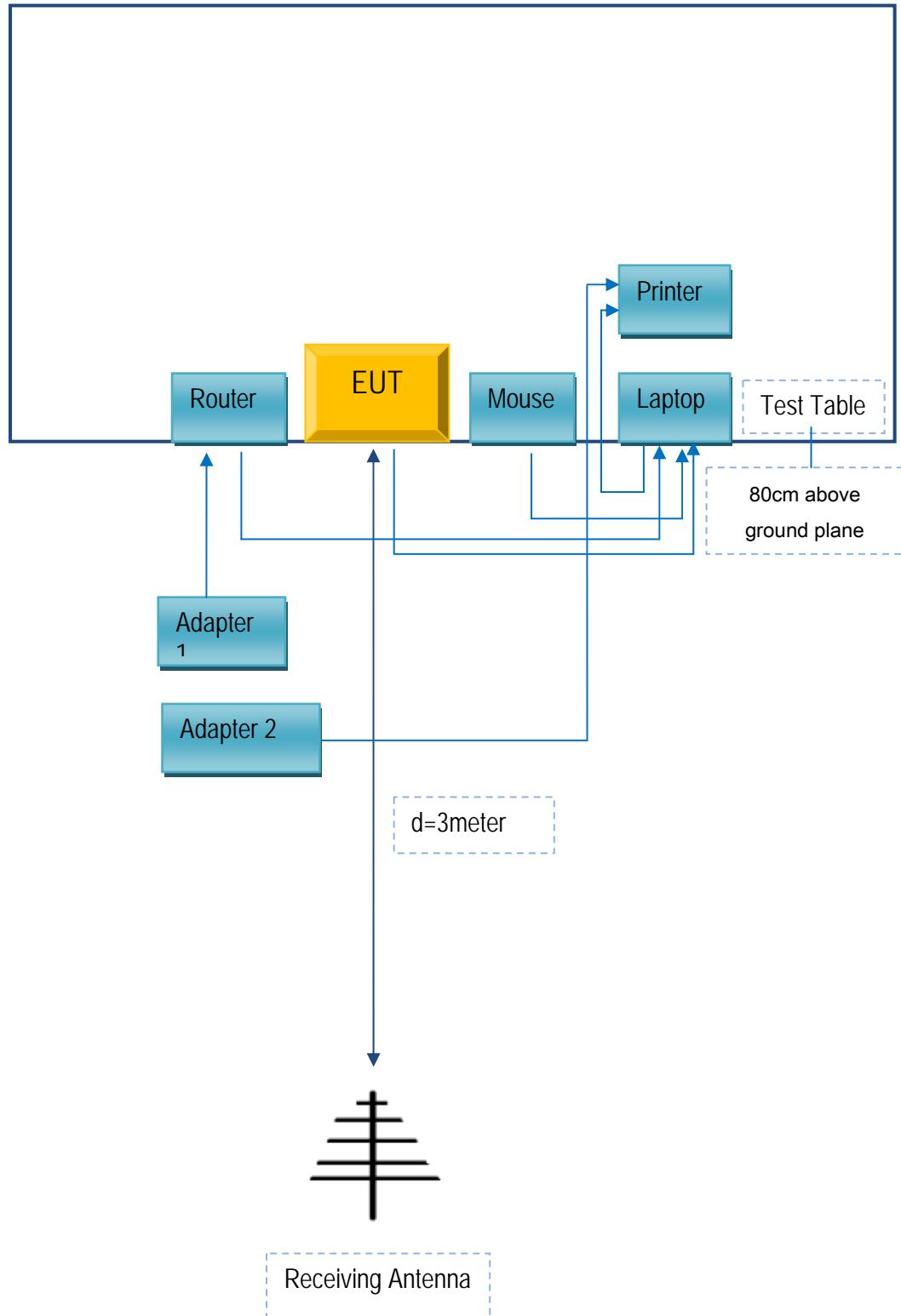
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

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.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
Lenovo	Laptop	E40	LR-1EHRX
GOLDWEB	Router	R102	1202032094
Lenovo	AC Adapter	42T4416	21D9JU
HP	Printer	VCVRA-1003	CN36M19JWX
DELL	Mouse	E100	912NMTUT41481
BULL	Socket	GN-403	GN201203

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	2m	JX120051274
USB Cable	Un-shielding	No	2m	CBA3000AH0C1
RJ45 Cable	Un-shielding	No	2m	KX156327541
Router Power cable	Un-shielding	No	2m	13274630Z
Printer Power cable	Un-shielding	No	2m	127581031
Power Cable	Un-shielding	No	0.8m	GT211032

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

Please see the attachment

Test Report	16071216-FCC-E_V2
Page	30 of 30

Annex E. DECLARATION OF SIMILARITY

N/A