

EMC TEST REPORT



Report No.: 15050027-FCC-E

Supersede Report No.:N/A

Applicant	b mobile HK Limited	
Product Name	Mobile phone	
Model No.	AX1030	
Serial No.	AX1020	
Test Standard	FCC Part 15 Subpart B Class B:2014, ANSI C63.4: 2014	
Test Date	July 10 to July 27 , 2015	
Issue Date	August 10, 2015	
Test Result	☒ Pass ☐ Fail	
Equipment complied with the specification ☒		
Equipment did not comply with the specification ☐		
<i>Winnie Zhang</i>	<i>David Huang</i>	
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
15050027-FCC-E	NONE	Original	August 10, 2015

2. Customer information

Applicant Name	b mobile HK Limited
Applicant Add	Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung;New Territories; Hong Kong
Manufacturer	b mobile HK Limited
Manufacturer Add	Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung;New Territories; Hong Kong

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:	AX1030
Serial Model:	AX1020
Antenna Gain:	GSM850: 1.4 dBi PCS1900: 1.7 dBi UMTS-FDD Band IV: 1.7 dBi UMTS-FDD Band V: 1.7 dBi UMTS-FDD Band II: 1.7 dBi Bluetooth/BLE: 1.9 dBi WIFI: 1.8 dBi LTE Band 2: 1.7 dBi LTE Band 4: 1.6 dBi LTE Band 7: 1.9 dBi LTE Band 17: 1.5 dBi GPS:2 dBi
Input Power:	Battery: Model: A4505 Spec:1950mAh,7.215Wh Voltage:3.7Vdc Charging Voltage: 4.35Vdc Adapter: Model:N/A Input: 100-240V; 50/60Hz;0.15A Output: 5.0V; 1A
Trade Name :	Bmobile
FCC ID:	ZSW-30-012
Date EUT received:	July 09, 2015

Equipment Category :

JBP

Type of Modulation:

GSM / GPRS: GMSK

EGPRS: GMSK, 8PSK

UMTS-FDD: QPSK, 16QAM

802.11b/g/n: DSSS, OFDM

Bluetooth: GFSK, π /4DQPSK, 8DPSK

BLE: GFSK

LTE Band: QPSK, 16QAM

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 IV TX:1712.4 ~ 1752.6 MHz;

RX : 2112.4 ~ 2152.6 MHz

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

RX: 1932.4 ~ 1987.6 MHz

RF Operating Frequency (ies):

WIFI:802.11b/g/n(20M): 2412-2472 MHz

WIFI:802.11n(40M): 2422-2462 MHz

Bluetooth& BLE: 2402-2480 MHz

LTE Band 2 TX: 1852.5 ~ 1907.5 MHz; RX : 1932.5 ~ 1987.5 MHz

LTE Band 4 TX: 1712.5 ~ 1752.5 MHz; RX : 2112.5 ~ 2152.5 MHz

LTE Band 7 TX: 2502.5 ~ 2567.5 MHz; RX : 2622.5 ~ 2687.5 MHz

LTE Band 17 TX: 706.5 ~ 713.5 MHz; RX : 736.5 ~ 743.5 MHz

GPS RX:1575.42 MHz

GSM 850: 124CH

PCS1900: 299CH

UMTS-FDD Band V : 102CH

UMTS-FDD Band IV: 202CH

UMTS-FDD Band II : 277CH

Number of Channels:

WIFI :802.11b/g/n(20M): 13CH

WIFI :802.11n(40M): 9CH

Bluetooth: 79CH

BLE: 40CH

GPS:1CH

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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
-	-	-

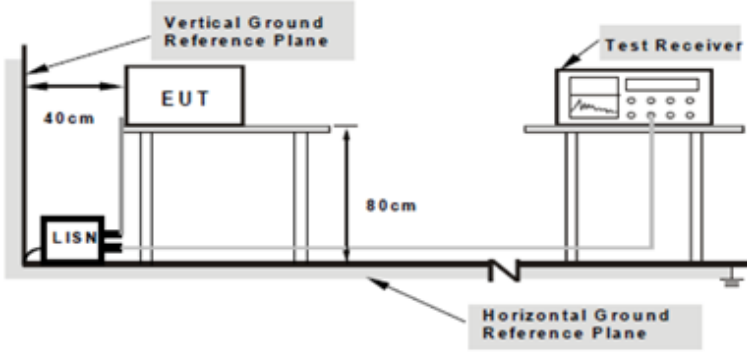
6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	22°C
Relative Humidity	59%
Atmospheric Pressure	1017mbar
Test date :	July 17, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable														
47CFR§15.107	a)	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.															
		<table><tr><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBµV)</th></tr><tr><th>QP</th><th>Average</th></tr><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></table>	Frequency ranges (MHz)	Limit (dBµV)		QP	Average	0.15 ~ 0.5	66 – 56	56 – 46	0.5 ~ 5	56	46	5 ~ 30	60	50	
Frequency ranges (MHz)	Limit (dBµV)																
	QP	Average															
0.15 ~ 0.5	66 – 56	56 – 46															
0.5 ~ 5	56	46															
5 ~ 30	60	50															

Test Setup	 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.
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Procedure	- 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.
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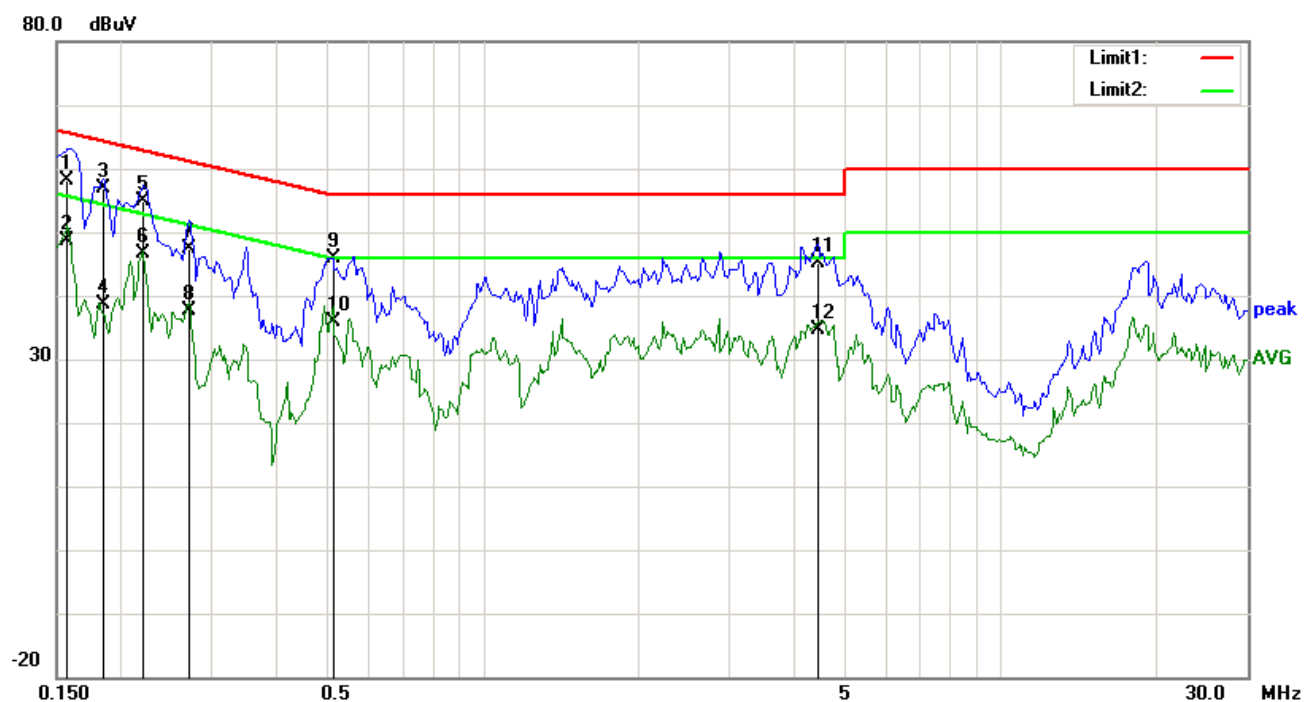
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	3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal 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	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test Mode 1 : USB Mode

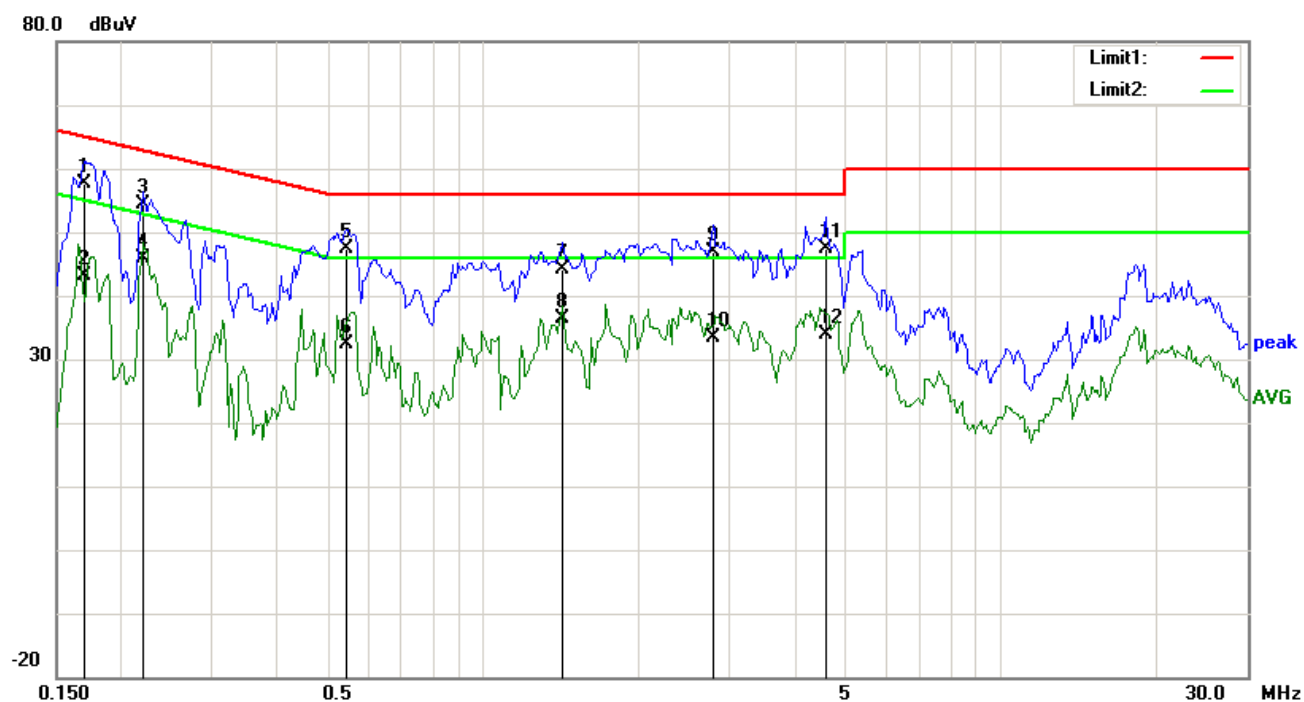


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Comment
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)	
1	L1	0.1578	45.08	QP	13.17	58.25	65.58	-7.33	
2	L1	0.1578	35.40	AVG	13.17	48.57	55.58	-7.01	
3	L1	0.1852	43.77	QP	13.07	56.84	64.25	-7.41	
4	L1	0.1852	25.44	AVG	13.07	38.51	54.25	-15.74	
5	L1	0.2203	41.95	QP	12.94	54.89	62.81	-7.92	
6	L1	0.2203	33.62	AVG	12.94	46.56	52.81	-6.25	
7	L1	0.2711	34.57	QP	12.75	47.32	61.08	-13.76	
8	L1	0.2711	24.90	AVG	12.75	37.65	51.08	-13.43	
9	L1	0.5133	33.94	QP	11.89	45.83	56.00	-10.17	
10	L1	0.5133	23.93	AVG	11.89	35.82	46.00	-10.18	
11	L1	4.4336	33.65	QP	11.40	45.05	56.00	-10.95	
12	L1	4.4336	23.13	AVG	11.40	34.53	46.00	-11.47	

Test Mode : USB Mode

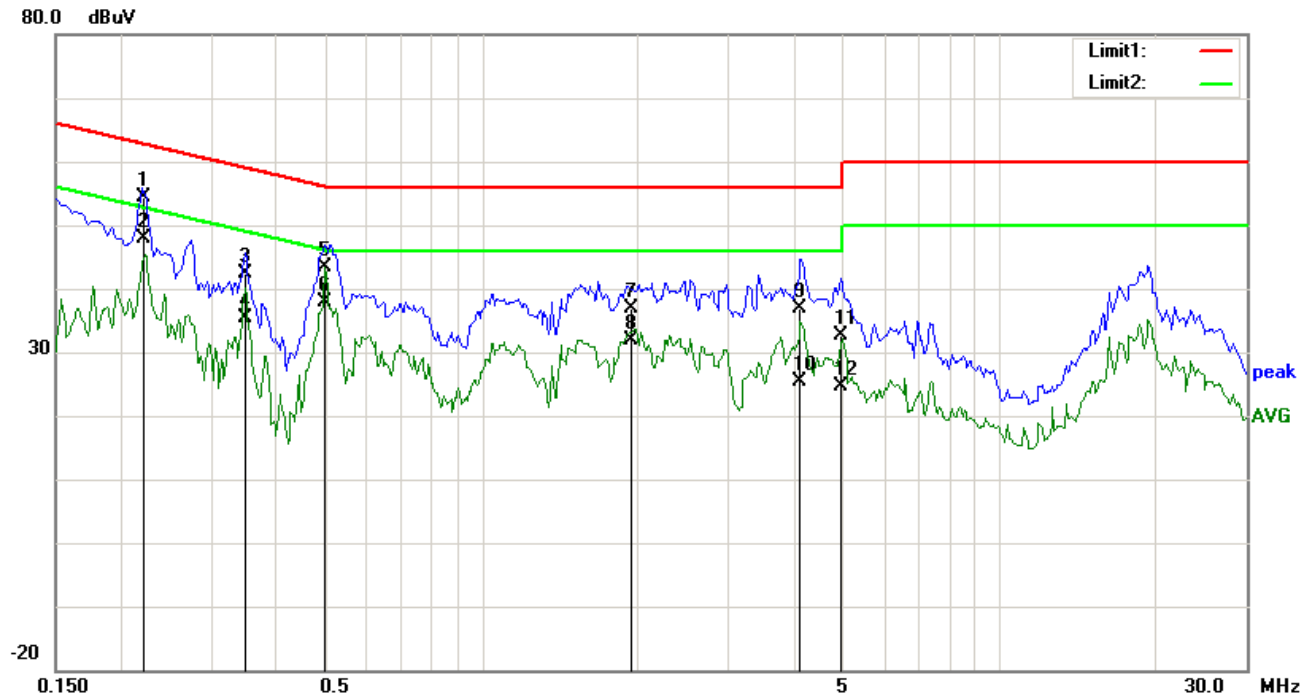


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Comment
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)	
1	N	0.1695	44.59	QP	13.13	57.72	64.98	-7.26	
2	N	0.1695	29.95	AVG	13.13	43.08	54.98	-11.90	
3	N	0.2203	41.47	QP	12.94	54.41	62.81	-8.40	
4	N	0.2203	32.89	AVG	12.94	45.83	52.81	-6.98	
5	N	0.5445	35.50	QP	11.86	47.36	56.00	-8.64	
6	N	0.5445	20.55	AVG	11.86	32.41	46.00	-13.59	
7	N	1.4234	32.57	QP	11.45	44.02	56.00	-11.98	
8	N	1.4234	24.91	AVG	11.45	36.36	46.00	-9.64	
9	N	2.7867	35.33	QP	11.62	46.95	56.00	-9.05	
10	N	2.7867	21.79	AVG	11.62	33.41	46.00	-12.59	
11	N	4.6055	35.42	QP	11.85	47.27	56.00	-8.73	
12	N	4.6055	21.98	AVG	11.85	33.83	46.00	-12.17	

Test Mode : USB Mode

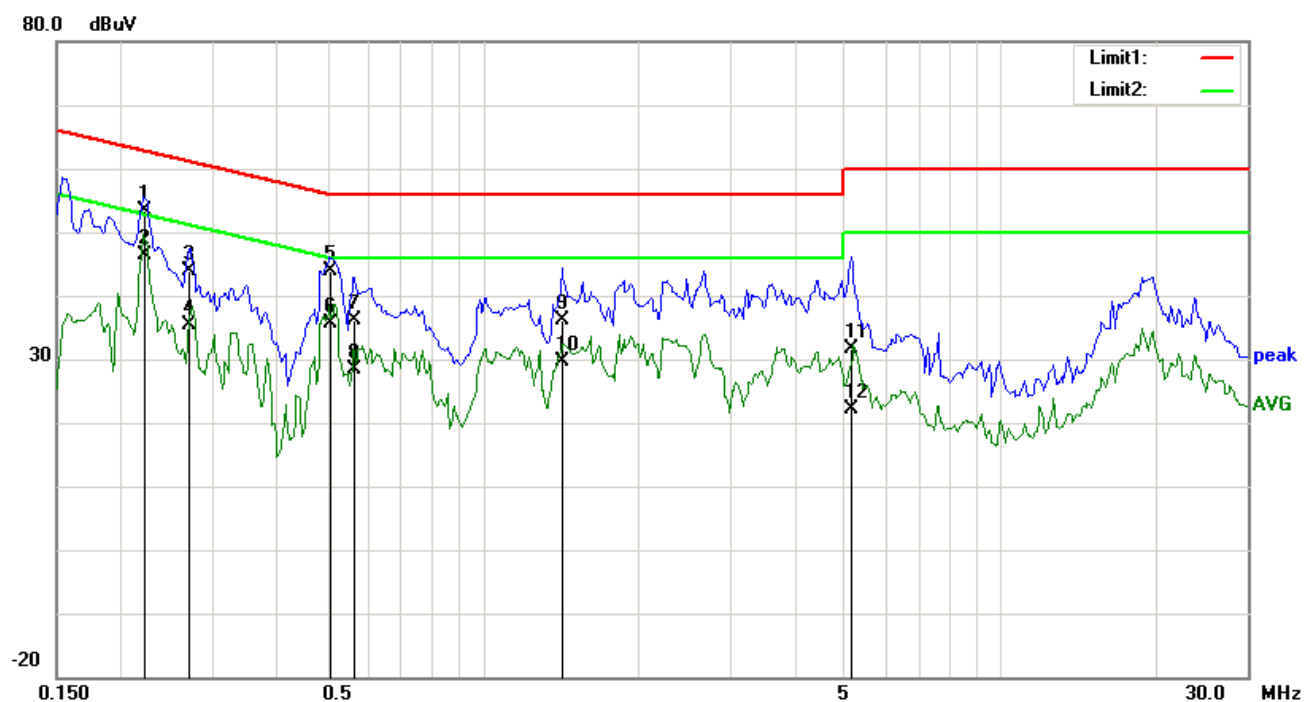


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Comment
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)	
1	L1	0.2220	41.51	QP	12.93	54.44	62.74	-8.30	
2	L1	0.2220	34.91	AVG	12.93	47.84	52.74	-4.90	
3	L1	0.3492	29.97	QP	12.46	42.43	58.98	-16.55	
4	L1	0.3492	22.88	AVG	12.46	35.34	48.98	-13.64	
5	L1	0.4977	31.40	QP	11.91	43.31	56.04	-12.73	
6	L1	0.4977	25.94	AVG	11.91	37.85	46.04	-8.19	
7	L1	1.9430	25.40	QP	11.40	36.80	56.00	-19.20	
8	L1	1.9430	20.53	AVG	11.40	31.93	46.00	-14.07	
9	L1	4.1289	25.53	QP	11.40	36.93	56.00	-19.07	
10	L1	4.1289	14.05	AVG	11.40	25.45	46.00	-20.55	
11	L1	4.9492	21.30	QP	11.40	32.70	56.00	-23.30	
12	L1	4.9492	13.29	AVG	11.40	24.69	46.00	-21.31	

Test Mode : USB Mode



Test Data

Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Comment
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)	
1	N	0.2220	40.38	QP	12.93	53.31	62.74	-9.43	
2	N	0.2220	33.57	AVG	12.93	46.50	52.74	-6.24	
3	N	0.2711	31.24	QP	12.75	43.99	61.08	-17.09	
4	N	0.2711	22.73	AVG	12.75	35.48	51.08	-15.60	
5	N	0.5094	32.10	QP	11.89	43.99	56.00	-12.01	
6	N	0.5094	23.85	AVG	11.89	35.74	46.00	-10.26	
7	N	0.5641	24.41	QP	11.84	36.25	56.00	-19.75	
8	N	0.5641	16.66	AVG	11.84	28.50	46.00	-17.50	
9	N	1.4273	24.61	QP	11.45	36.06	56.00	-19.94	
10	N	1.4273	18.18	AVG	11.45	29.63	46.00	-16.37	
11	N	5.1406	19.79	QP	11.94	31.73	60.00	-28.27	
12	N	5.1406	10.11	AVG	11.94	22.05	50.00	-27.95	

6.2 Radiated Emissions

Temperature	25°C
Relative Humidity	58%
Atmospheric Pressure	1016mbar
Test date :	July 16, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable	
47CFR§15.109(d)	a)	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		
		Frequency range (MHz)		Field Strength (µV/m)
		30 – 88		100
		88 – 216		150
		216 960		200
		Above 960		500

Test Setup	
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Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - 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: - Vertical or horizontal polarization (whichever gave the higher emission level
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	over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi Peak detection at frequency below 1GHz. 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. 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. ■ 1 kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%) 5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	
Result	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test Mode 1: USB Mode

Below 1GHz



Test Data

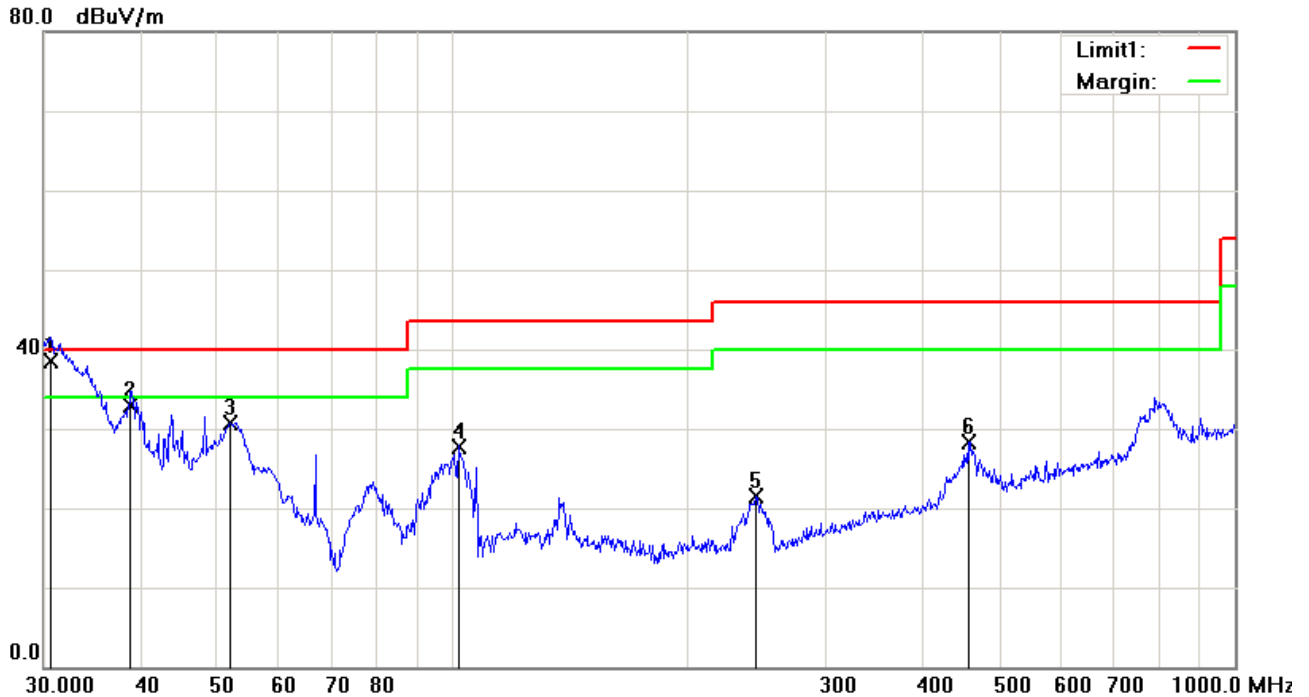
Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree	Comment
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()	
1	H	37.2855	38.63	QP	-5.61	33.02	40.00	-6.98	200	208	
2	H	100.2286	29.40	peak	-10.76	18.64	43.50	-24.86	154	0	
3	H	210.7860	29.81	peak	-8.84	20.97	43.50	-22.53	200	38	
4	H	333.6867	32.13	peak	-5.93	26.20	46.00	-19.80	100	19	
5	H	451.1350	27.26	peak	-3.05	24.21	46.00	-21.79	100	124	
6	H	719.1995	32.84	peak	1.78	34.62	46.00	-11.38	200	360	

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	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree	Comment
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()	
1	V	30.6379	39.20	QP	-0.73	38.47	40.00	-1.53	100	259	
2	V	38.7518	39.66	QP	-6.68	32.98	40.00	-7.02	100	1	
3	V	51.8430	44.09	peak	-13.40	30.69	40.00	-9.31	100	0	
4	V	102.0014	38.12	peak	-10.44	27.68	43.50	-15.82	200	34	
5	V	244.2321	30.72	peak	-9.14	21.58	46.00	-24.42	200	173	
6	V	455.9058	31.27	peak	-2.92	28.35	46.00	-17.65	100	199	

Above 1GHz

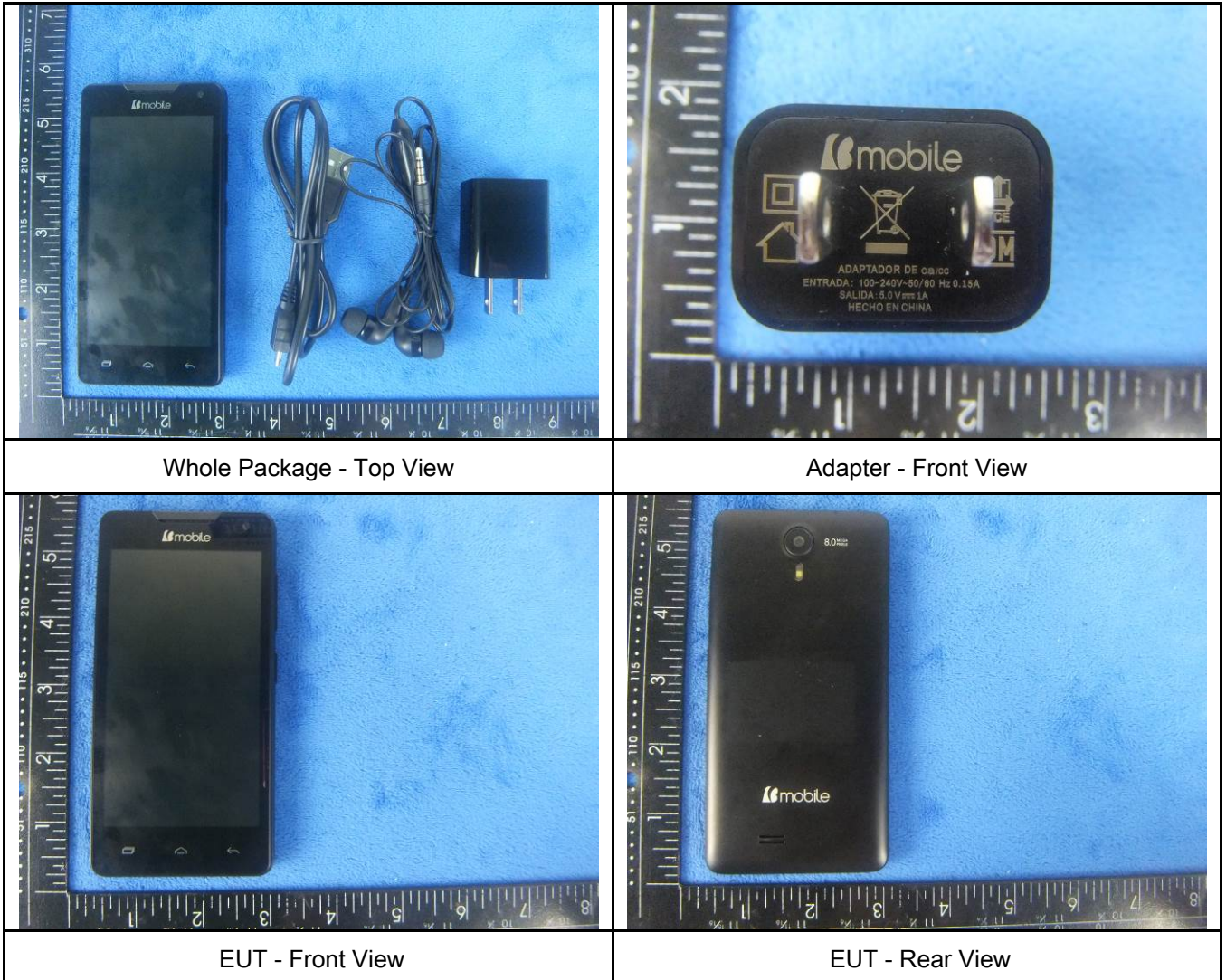
Note: The frequency that above 1GHz is mainly from the environment noise.

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
EMI test receiver	ESCS30	8471241027	09/18/2014	09/17/2015	☒
Line Impedance Stabilization Network	LI-125A	191106	09/26/2014	09/25/2015	☒
Line Impedance Stabilization Network	LI-125A	191107	09/26/2014	09/25/2015	☒
LISN	ISN T800	34373	09/26/2014	09/25/2015	☒
Transient Limiter	LIT-153	531118	09/02/2014	09/01/2015	☒
Radiated Emissions					
EMI test receiver	ESL6	100262	09/18/2014	09/17/2015	☒
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/02/2014	09/01/2015	☒
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/25/2015	03/24/2016	☒
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/22/2014	09/21/2015	☒
Double Ridge Horn Antenna	AH-118	71259	09/25/2014	09/24/2015	☒

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo



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EUT - Top View



EUT - Bottom View



EUT - Left View



EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo



Cover Off - Top View 1



Cover Off - Top View 2



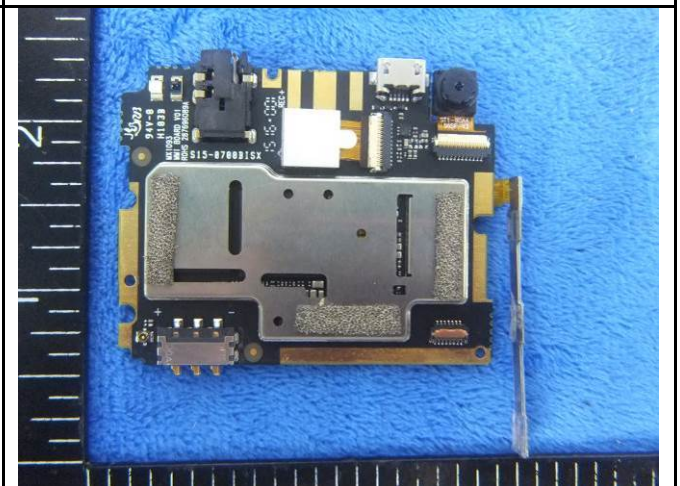
Battery - Top View



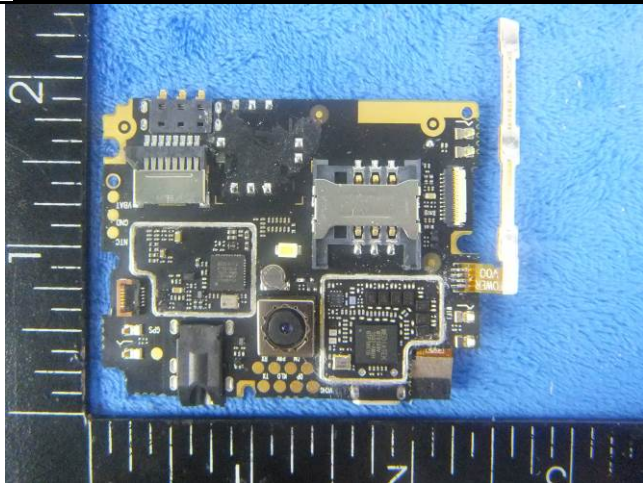
Battery - Bottom View



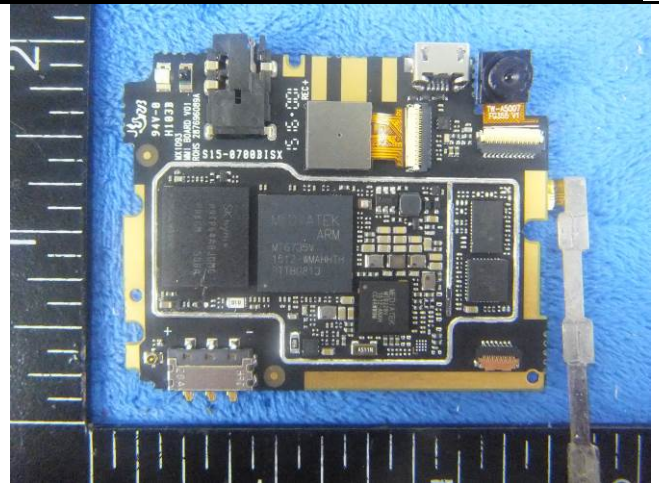
Mainboard With Shielding - Front View



Mainboard With Shielding - Rear View



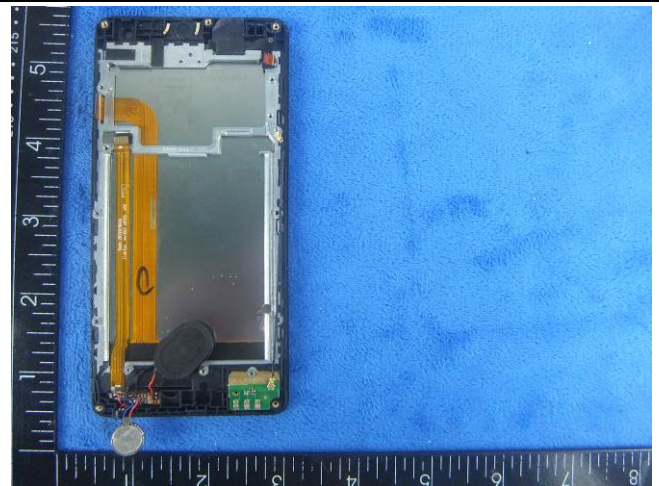
Mainboard Without Shielding - Front View



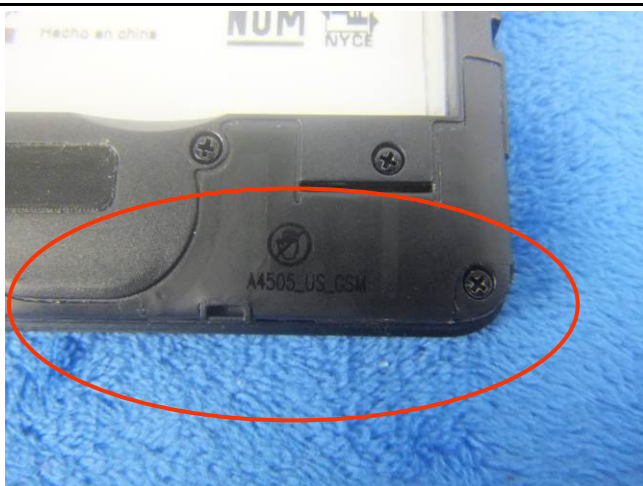
Mainboard Without Shielding - Rear View



LCD - Front View



LCD - Rear View



GSM/PCS/UMTS-FDD Antenna View



WIFI/BT/BLE - Antenna View

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LTE- Antenna View

Annex B.iii. Photograph: Test Setup Photo



Conducted Emissions Test Setup – Front View



Conducted Emissions Test Setup – Side View



Radiated Spurious Emissions Test Setup Below 1GHz

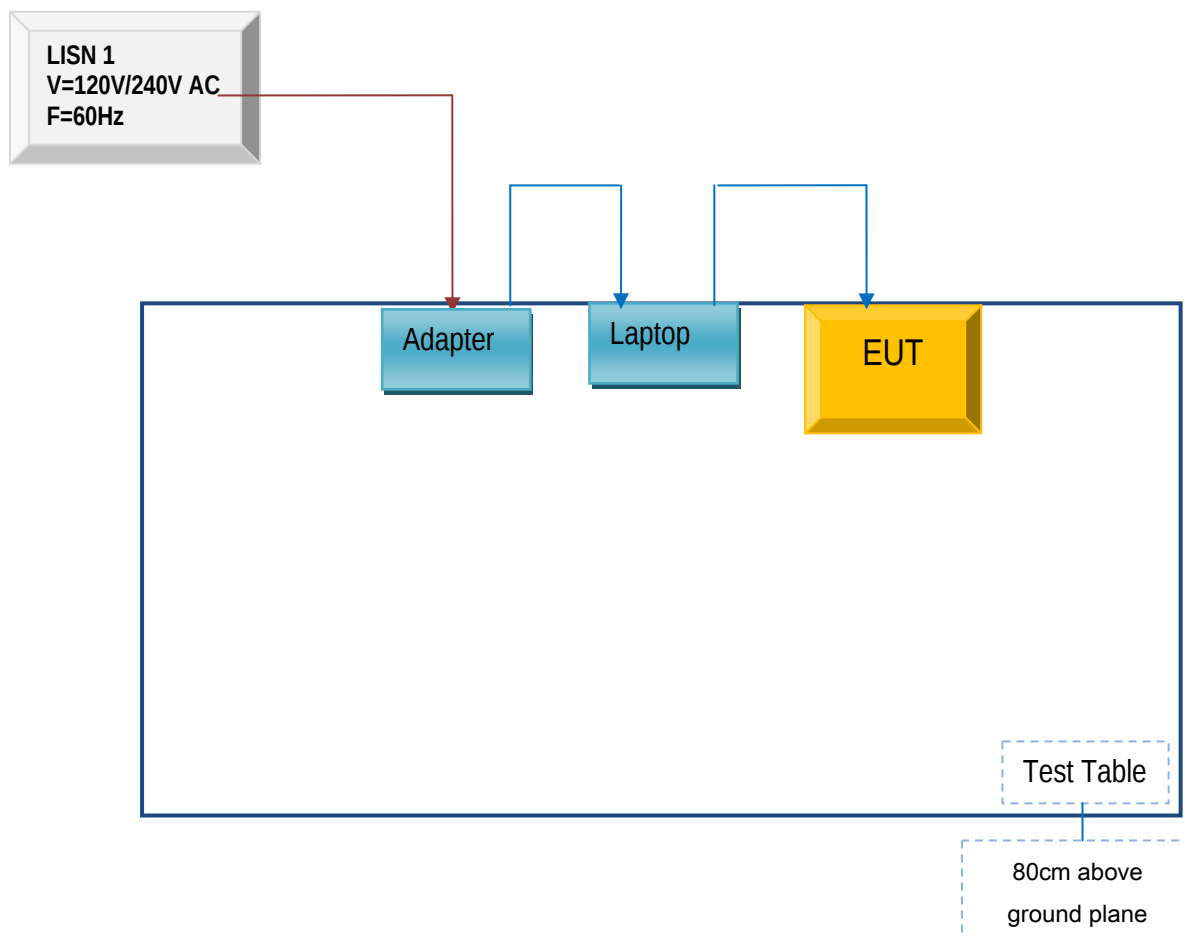


Radiated Spurious Emissions Test Setup Above
1GHz

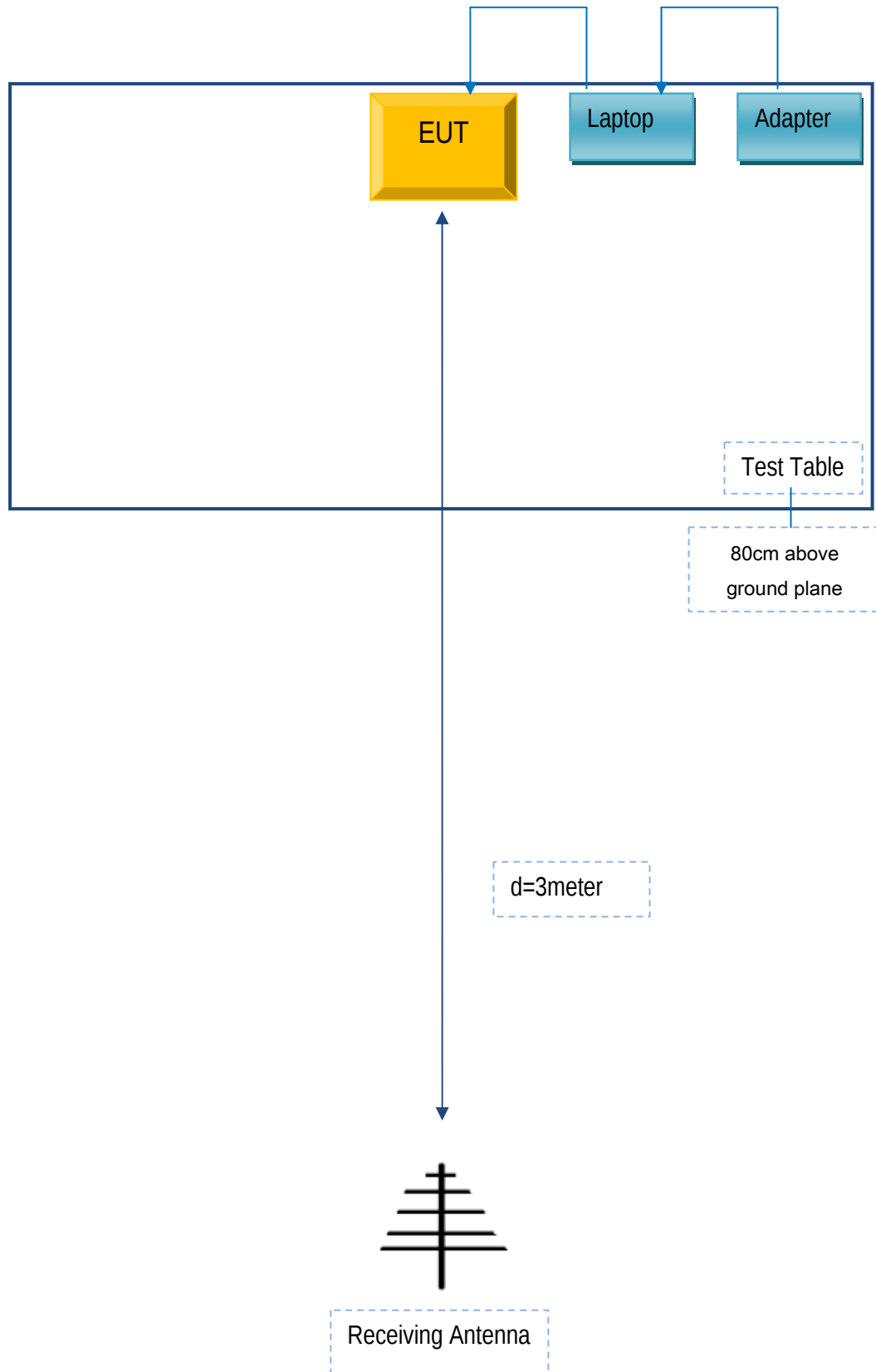
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



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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

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

Please see Attachment

Annex E. DECLARATION OF SIMILARITY

b Mobile HK Limited

To SIEMIC Inc
775 Montague Expressway
Milpitas, CA 95035.

Statement

We, **b Mobile HK Limited** apply a multiple-listing certification for the below models.

Product Name: Mobile phone

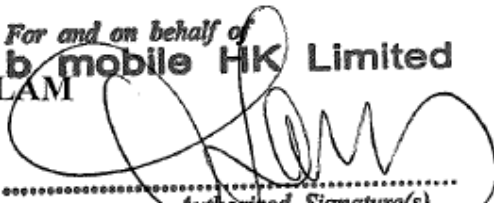
Model number: AX1020/ AX1030

FCC ID: ZSW-30-012

We hereby state that these models are identical in interior structure, electrical circuits and components, and just model name is different for the marketing requirement.

Your assistance on this matter is highly appreciated.

Sincerely,
Name: KA SHING LAM
Title: Director
Signature:

For and on behalf of
b mobile HK Limited

.....
Authorized Signature(s)