

EMC TEST REPORT



Report No.: 15050034-FCC-E

Supersede Report No.:N/A

Applicant	b mobile HK Limited	
Product Name	Mobile Phone	
Model No.	AX1050	
Serial No.	L50	
Test Standard	FCC Part 15 Subpart B Class B:2014, ANSI C63.4: 2014	
Test Date	August 13 to September 08 , 2015	
Issue Date	September 28, 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
15050034-FCC-E	NONE	Original	September 28, 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:	AX1050
Serial Model:	L50
Antenna Gain:	GSM850: -1.28dBi PCS1900: -0.93dBi UMTS-FDD Band V: -1.28dBi UMTS-FDD Band IV: -0.88dBi UMTS-FDD Band II: -0.93dBi Bluetooth/BLE: 0.977dBi WIFI: 0.977dB LTE Band 2:-0.93Bi LTE Band 4:-0.88dBi LTE Band 12:-1.35dBi
Input Power:	Adapter: Model: A98A-050100U-US1 Input: 100-240V; 50/60Hz;0.2A Output: DC 5V,1000mA Battery: Model: AX1050 Spec:2000mAh, 7.6Wh Voltage:3.8Vdc
Trade Name :	Bmobile
FCC ID:	ZSW-30-017
Date EUT received:	August 12, 2015
GPRS/EGPRS Multi-slot class	8/10/12

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

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
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
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 12 TX: 699.7 ~ 715.3 MHz; RX : 729.7 ~ 745.3 MHz
GPS RX: 1575.42 MHz

Number of Channels:

GSM 850: 124CH
PCS1900: 299CH
UMTS-FDD Band V : 102CH
UMTS-FDD Band IV: 202CH
UMTS-FDD Band II : 277CH
WIFI : 802.11b/g/n(20M): 13CH
WIFI : 802.11n(40M): 9CH
Bluetooth: 79CH
BLE: 40CH
GPS: 1CH

Port:

Power Port, Earphone Port, USB Port

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
-	-	-

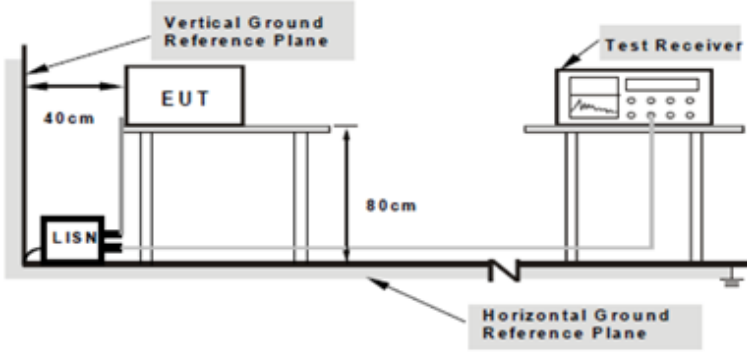
6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	25°C
Relative Humidity	52%
Atmospheric Pressure	1028mbar
Test date :	September 03, 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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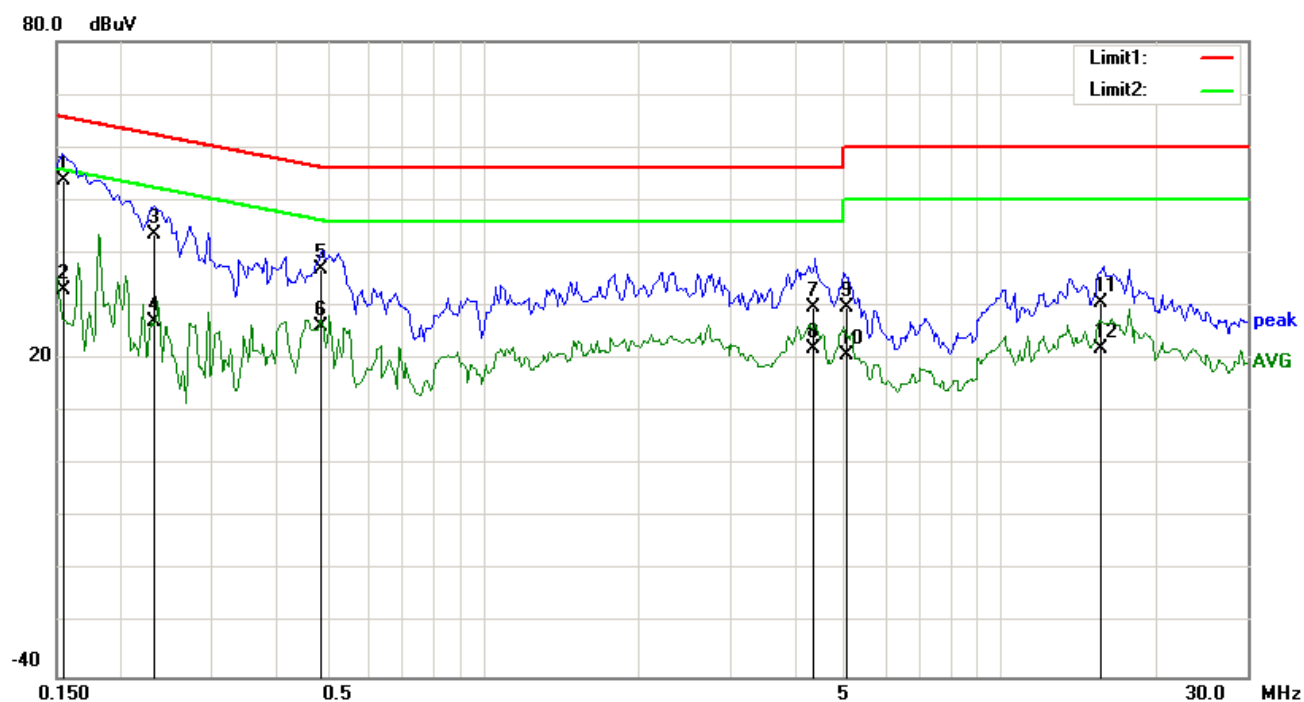
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	3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal 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

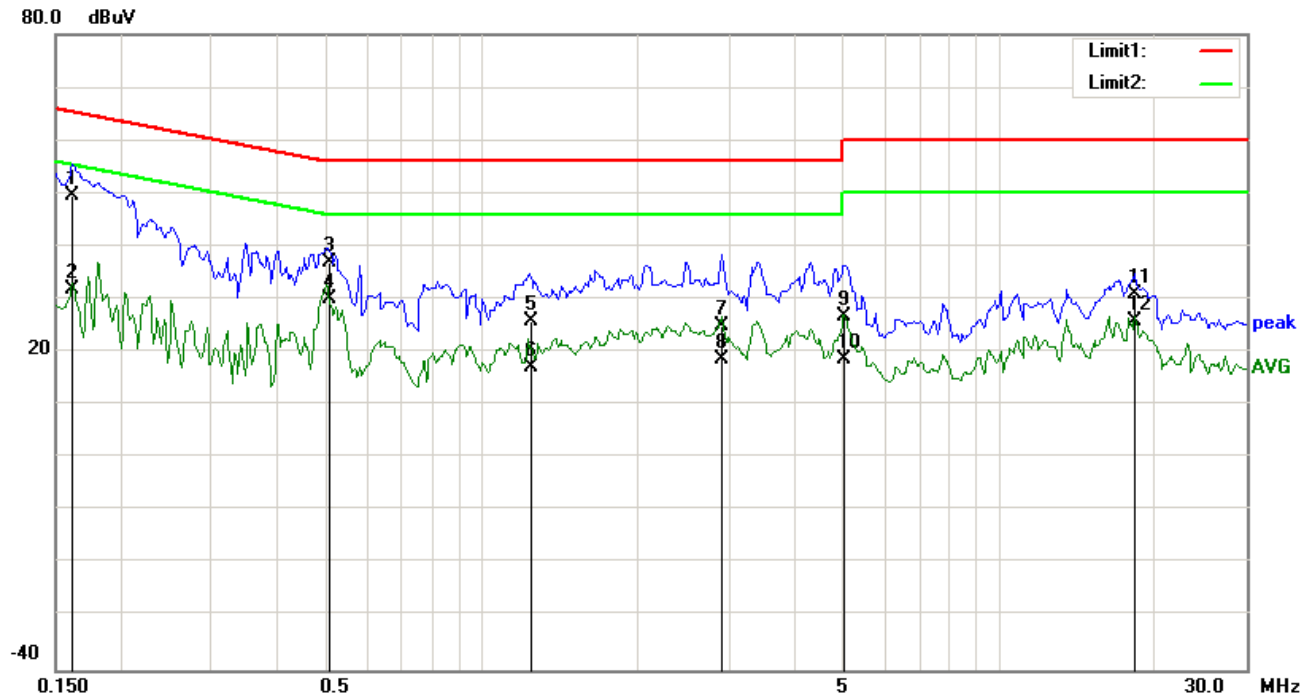


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1548	43.70	QP	10.03	53.73	65.74	-12.01
2	L1	0.1548	23.03	AVG	10.03	33.06	55.74	-22.68
3	L1	0.2320	33.52	QP	10.03	43.55	62.38	-18.83
4	L1	0.2320	17.16	AVG	10.03	27.19	52.38	-25.19
5	L1	0.4863	26.91	QP	10.03	36.94	56.23	-19.29
6	L1	0.4863	16.25	AVG	10.03	26.28	46.23	-19.95
7	L1	4.3376	19.77	QP	10.07	29.84	56.00	-26.16
8	L1	4.3376	11.83	AVG	10.07	21.90	46.00	-24.10
9	L1	5.0547	19.66	QP	10.08	29.74	60.00	-30.26
10	L1	5.0547	10.70	AVG	10.08	20.78	50.00	-29.22
11	L1	15.6349	20.55	QP	10.23	30.78	60.00	-29.22
12	L1	15.6349	11.67	AVG	10.23	21.90	50.00	-28.10

Test Mode : USB Mode

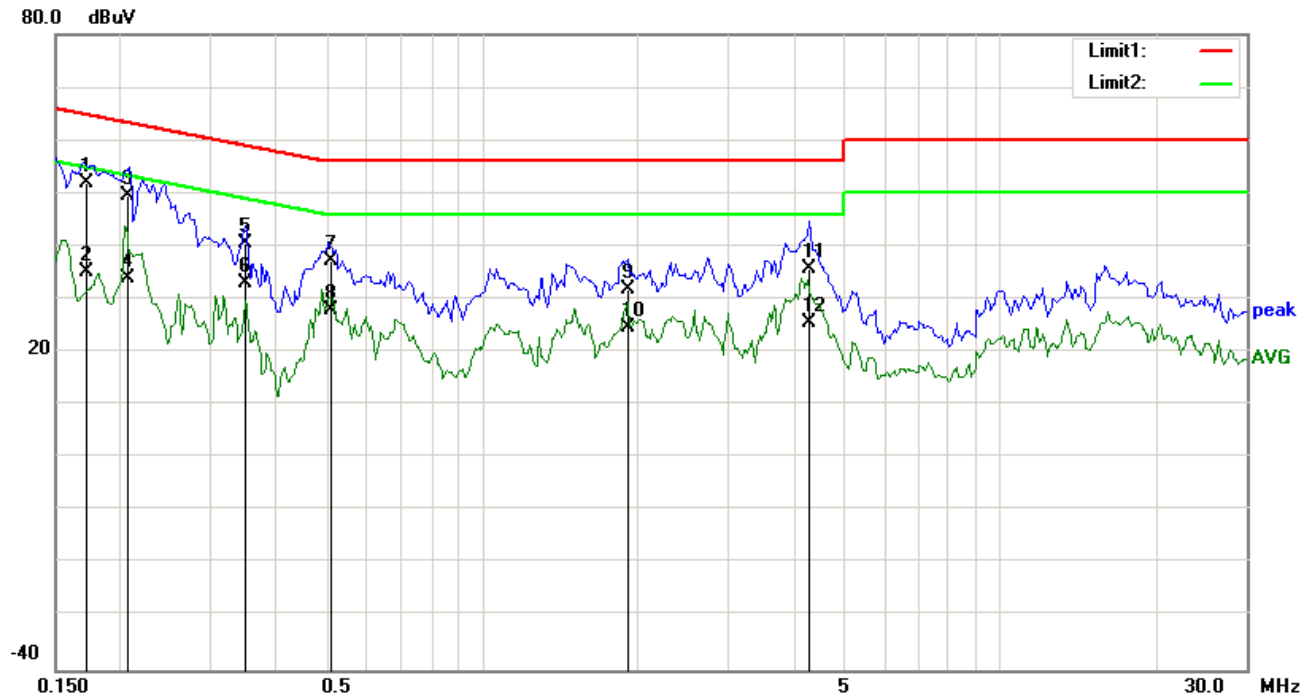


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.1617	39.50	QP	10.02	49.52	65.38	-15.86
2	N	0.1617	21.76	AVG	10.02	31.78	55.38	-23.60
3	N	0.5094	26.96	QP	10.02	36.98	56.00	-19.02
4	N	0.5094	19.90	AVG	10.02	29.92	46.00	-16.08
5	N	1.2422	15.71	QP	10.03	25.74	56.00	-30.26
6	N	1.2422	7.21	AVG	10.03	17.24	46.00	-28.76
7	N	2.9078	15.02	QP	10.05	25.07	56.00	-30.93
8	N	2.9078	8.60	AVG	10.05	18.65	46.00	-27.35
9	N	5.0046	16.81	QP	10.07	26.88	60.00	-33.12
10	N	5.0046	8.53	AVG	10.07	18.60	50.00	-31.40
11	N	18.2422	20.60	QP	10.24	30.84	60.00	-29.16
12	N	18.2422	15.72	AVG	10.24	25.96	50.00	-24.04

Test Mode : USB Mode

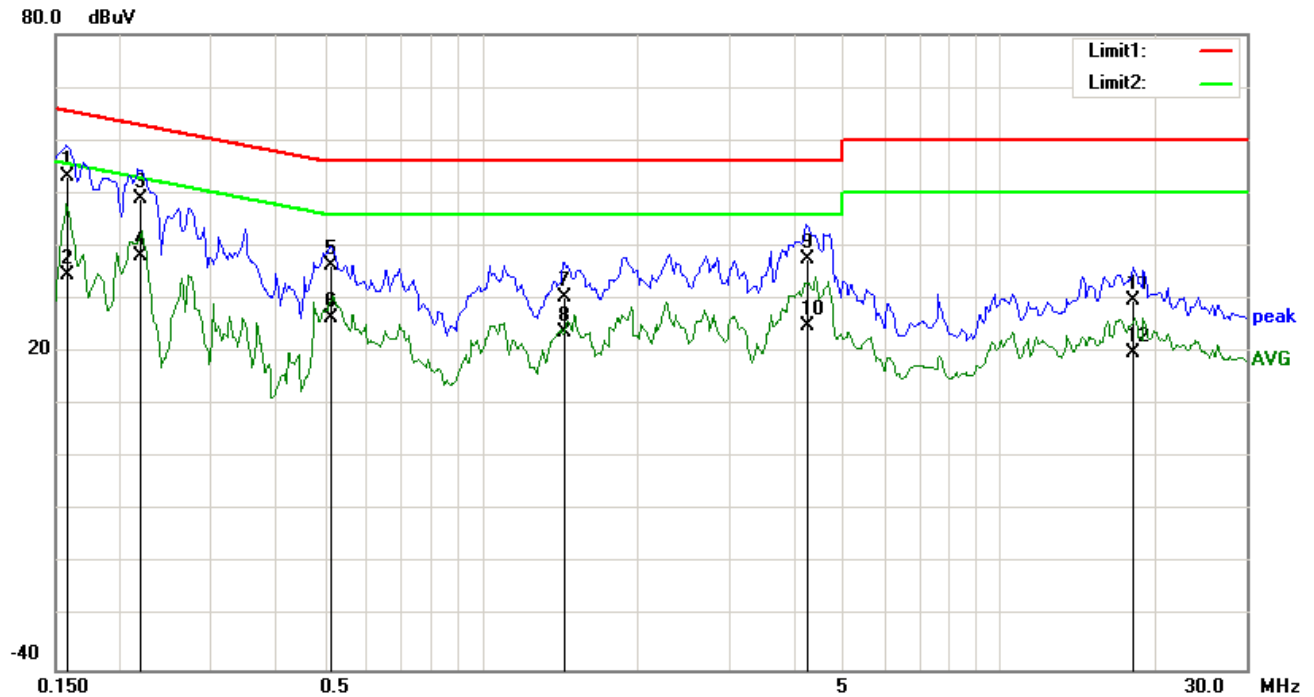


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1734	41.86	QP	10.03	51.89	64.80	-12.91
2	L1	0.1734	25.04	AVG	10.03	35.07	54.80	-19.73
3	L1	0.2072	39.43	QP	10.03	49.46	63.32	-13.86
4	L1	0.2072	24.06	AVG	10.03	34.09	53.32	-19.23
5	L1	0.3492	30.48	QP	10.03	40.51	58.98	-18.47
6	L1	0.3492	22.96	AVG	10.03	32.99	48.98	-15.99
7	L1	0.5101	27.10	QP	10.03	37.13	56.00	-18.87
8	L1	0.5101	18.00	AVG	10.03	28.03	46.00	-17.97
9	L1	1.9182	21.86	QP	10.04	31.90	56.00	-24.10
10	L1	1.9182	14.57	AVG	10.04	24.61	46.00	-21.39
11	L1	4.2918	25.53	QP	10.07	35.60	56.00	-20.40
12	L1	4.2918	15.40	AVG	10.07	25.47	46.00	-20.53

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	0.1582	43.23	QP	10.02	53.25	65.56	-12.31	
2	N	0.1582	24.53	AVG	10.02	34.55	55.56	-21.01	
3	N	0.2185	39.02	QP	10.02	49.04	62.88	-13.84	
4	N	0.2185	28.22	AVG	10.02	38.24	52.88	-14.64	
5	N	0.5101	26.46	QP	10.02	36.48	56.00	-19.52	
6	N	0.5101	16.41	AVG	10.02	26.43	46.00	-19.57	
7	N	1.4409	20.44	QP	10.03	30.47	56.00	-25.53	
8	N	1.4409	13.71	AVG	10.03	23.74	46.00	-22.26	
9	N	4.2466	27.35	QP	10.06	37.41	56.00	-18.59	
10	N	4.2466	14.88	AVG	10.06	24.94	46.00	-21.06	
11	N	18.1352	19.52	QP	10.24	29.76	60.00	-30.24	
12	N	18.1352	9.64	AVG	10.24	19.88	50.00	-30.12	

6.2 Radiated Emissions

Temperature	24°C
Relative Humidity	53%
Atmospheric Pressure	1001mbar
Test date :	September 01, 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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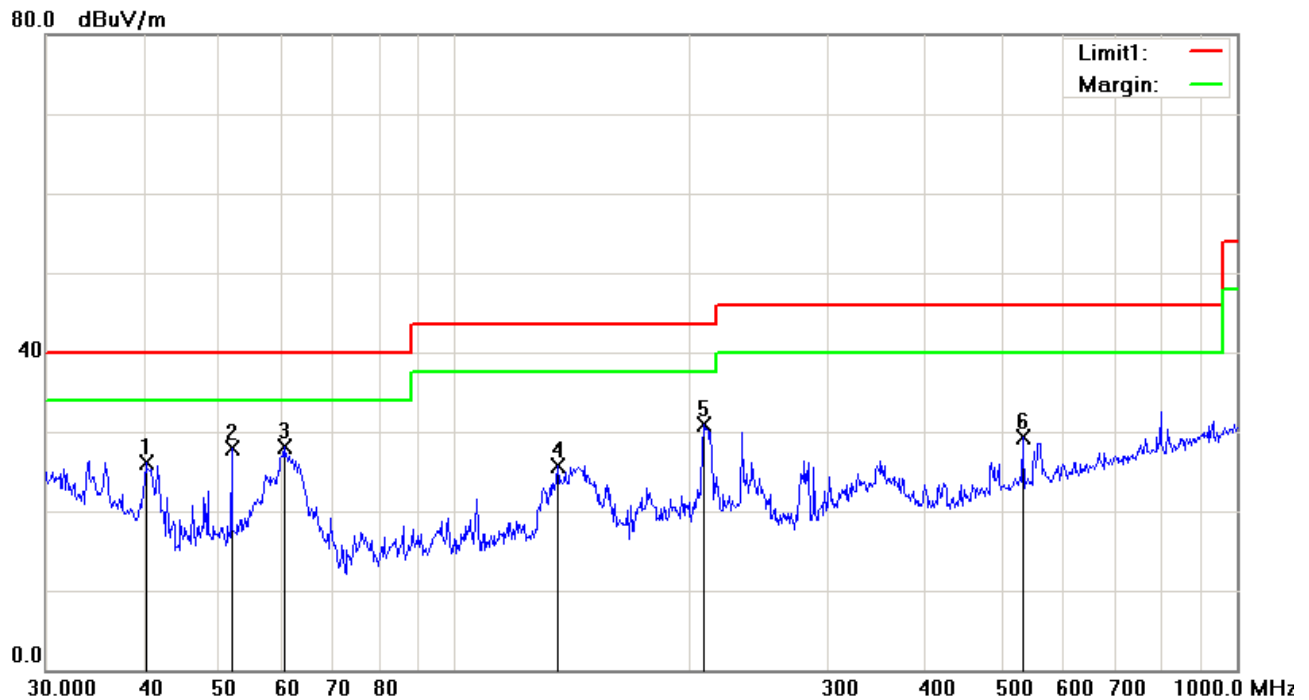
	over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 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

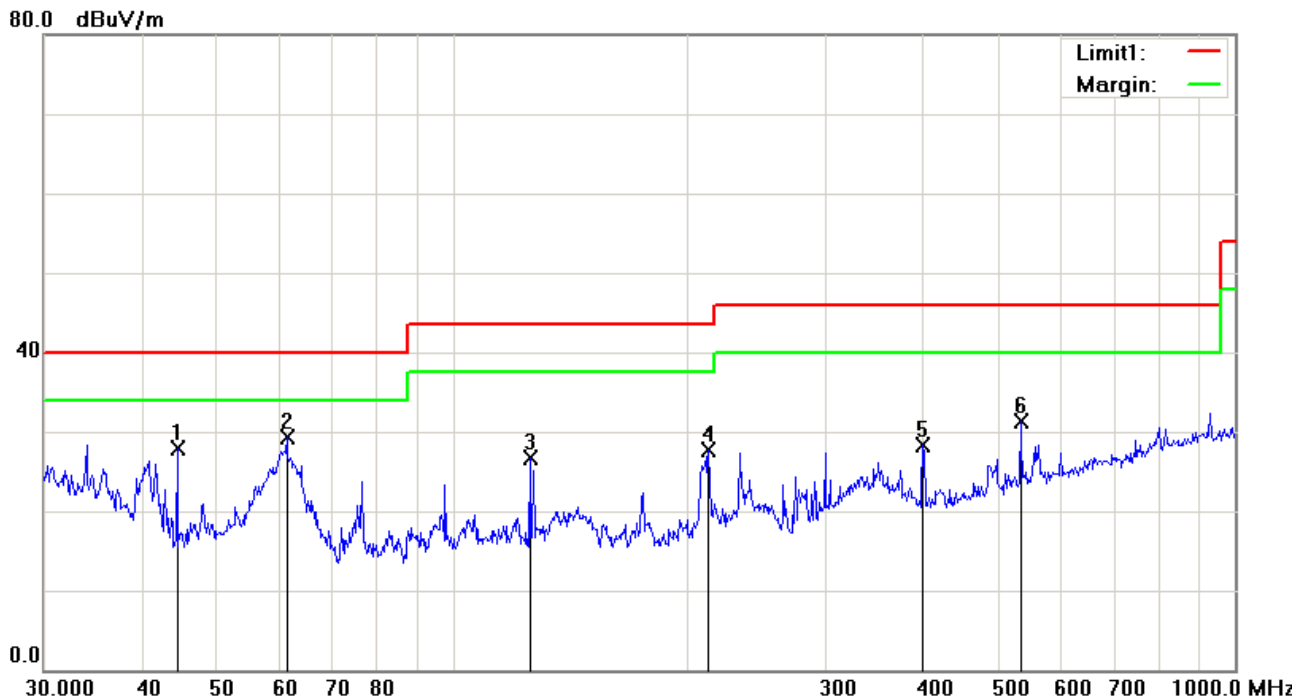
Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()
1	H	40.2757	33.90	peak	-7.77	26.13	40.00	-13.87	100	0
2	H	51.8430	41.22	peak	-13.40	27.82	40.00	-12.18	100	137
3	H	60.4919	42.42	peak	-14.33	28.09	40.00	-11.91	100	133
4	H	135.5062	34.04	peak	-8.27	25.77	43.50	-17.73	100	51
5	H	208.5803	39.73	peak	-8.81	30.92	43.50	-12.58	200	90
6	H	531.9635	30.39	peak	-1.13	29.26	46.00	-16.74	100	1

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
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()
1	V	44.4308	38.51	peak	-10.56	27.95	40.00	-12.05	100	229
2	V	61.3463	43.62	peak	-14.25	29.37	40.00	-10.63	200	276
3	V	125.4457	34.40	peak	-7.64	26.76	43.50	-16.74	100	233
4	V	212.2695	36.61	peak	-8.85	27.76	43.50	-15.74	200	198
5	V	399.0302	32.61	peak	-4.32	28.29	46.00	-17.71	200	336
6	V	531.9635	32.38	peak	-1.13	31.25	46.00	-14.75	100	165

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	09/01/2015	08/31/2016	☒
Radiated Emissions					
EMI test receiver	ESL6	100262	09/18/2014	09/17/2015	☒
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	☒
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	☒

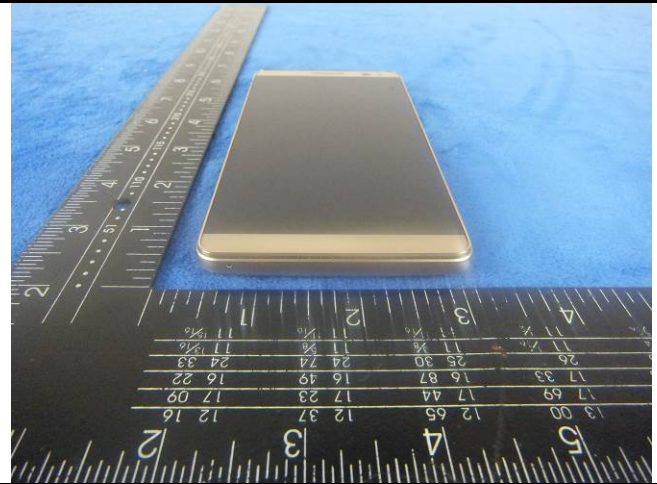
Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

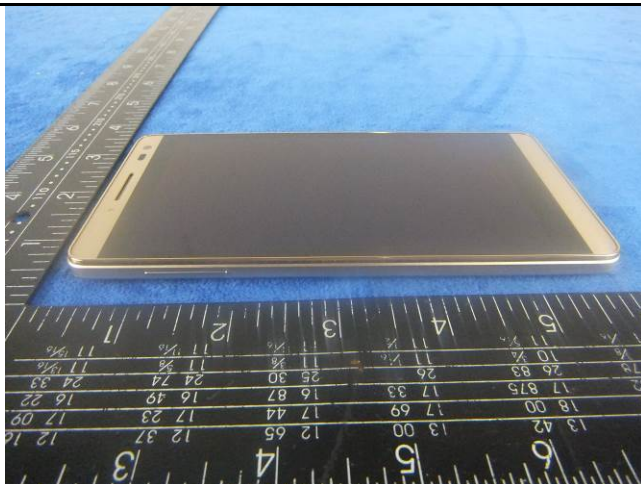




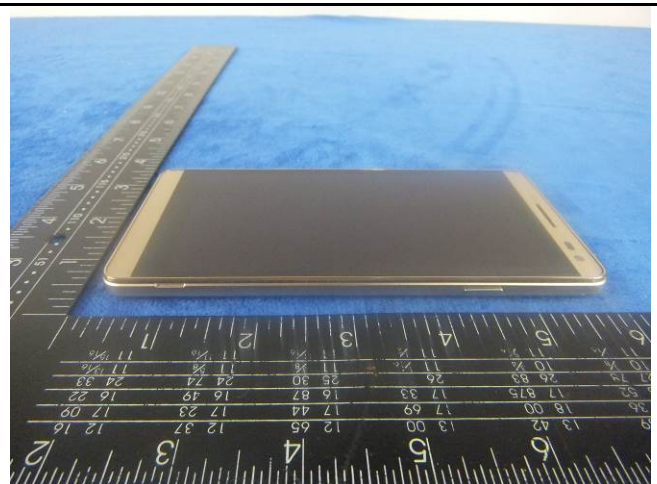
EUT - Top View



EUT - Bottom View



EUT - Left View

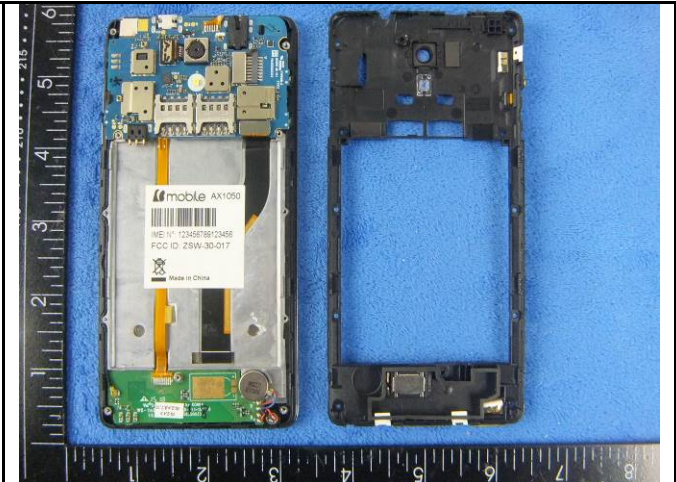


EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo



Cover Off - Top View 1



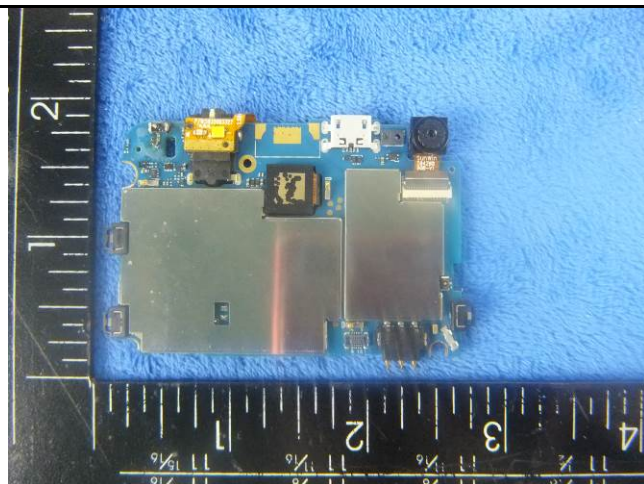
Cover Off - Top View 2



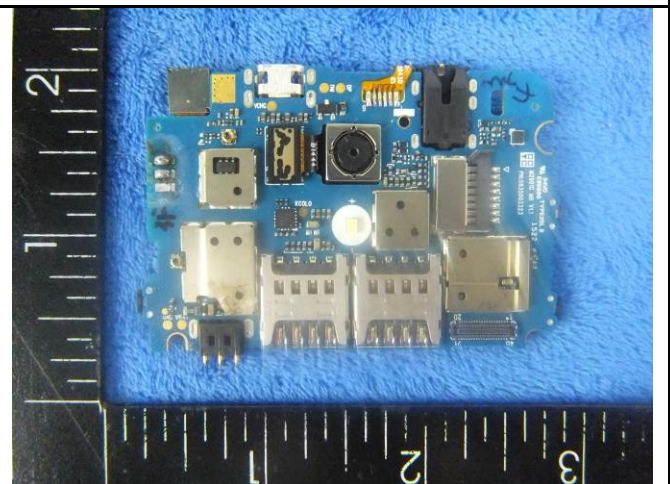
Battery - Top View



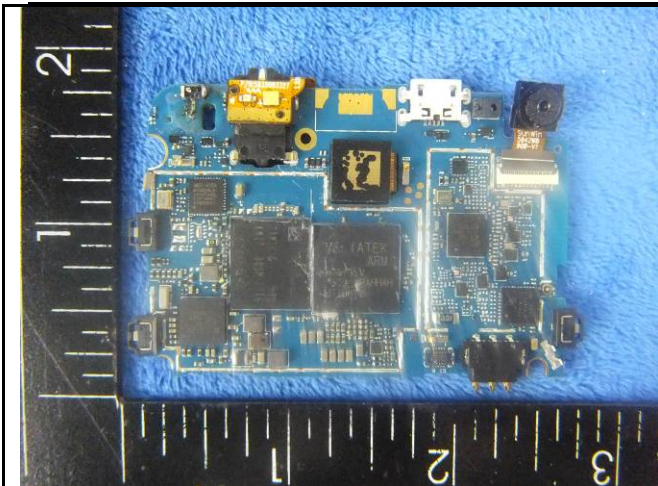
Battery - Bottom View



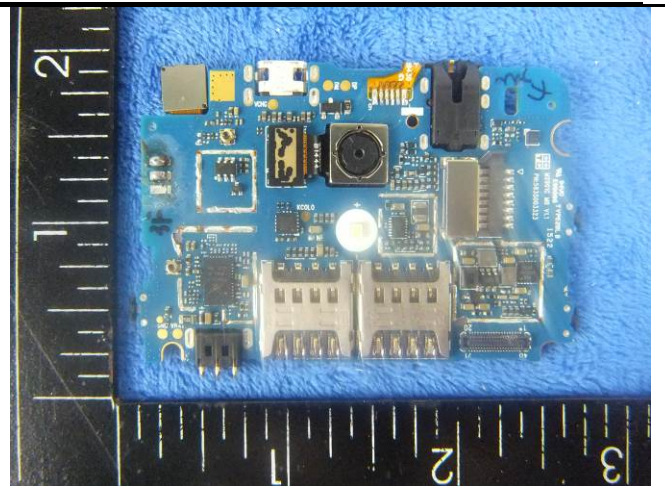
Mainboard With Shielding - Front View



Mainboard With Shielding - Rear View



Mainboard Without Shielding - Front View



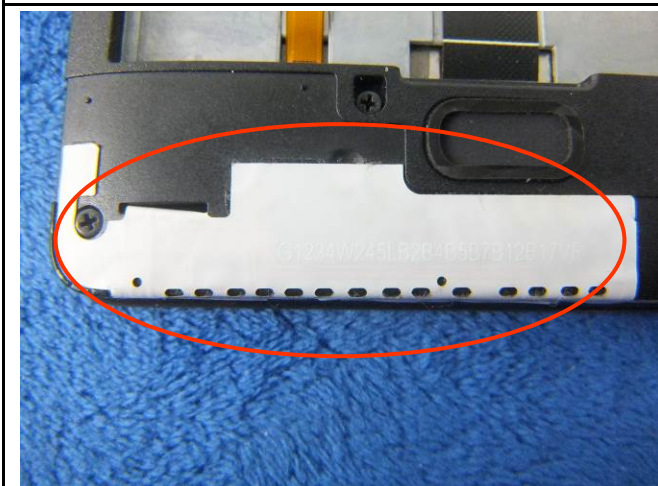
Mainboard Without Shielding - Rear View



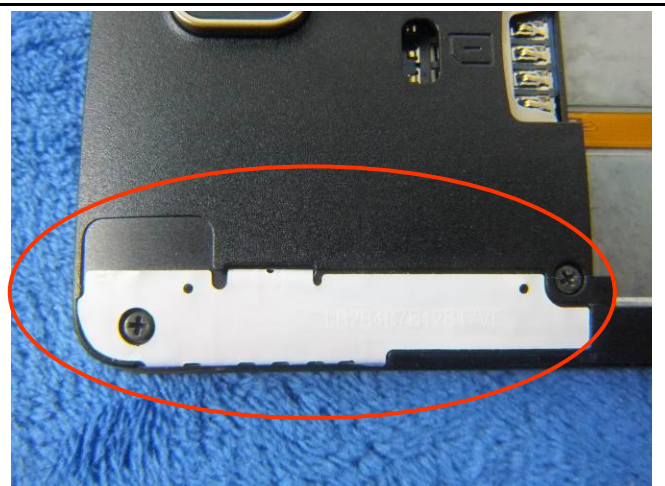
LCD - Front View



LCD - Rear View



GSM/PCS/UMTS-FDD/LTE Antenna View



WIFI/BT/BLE - 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

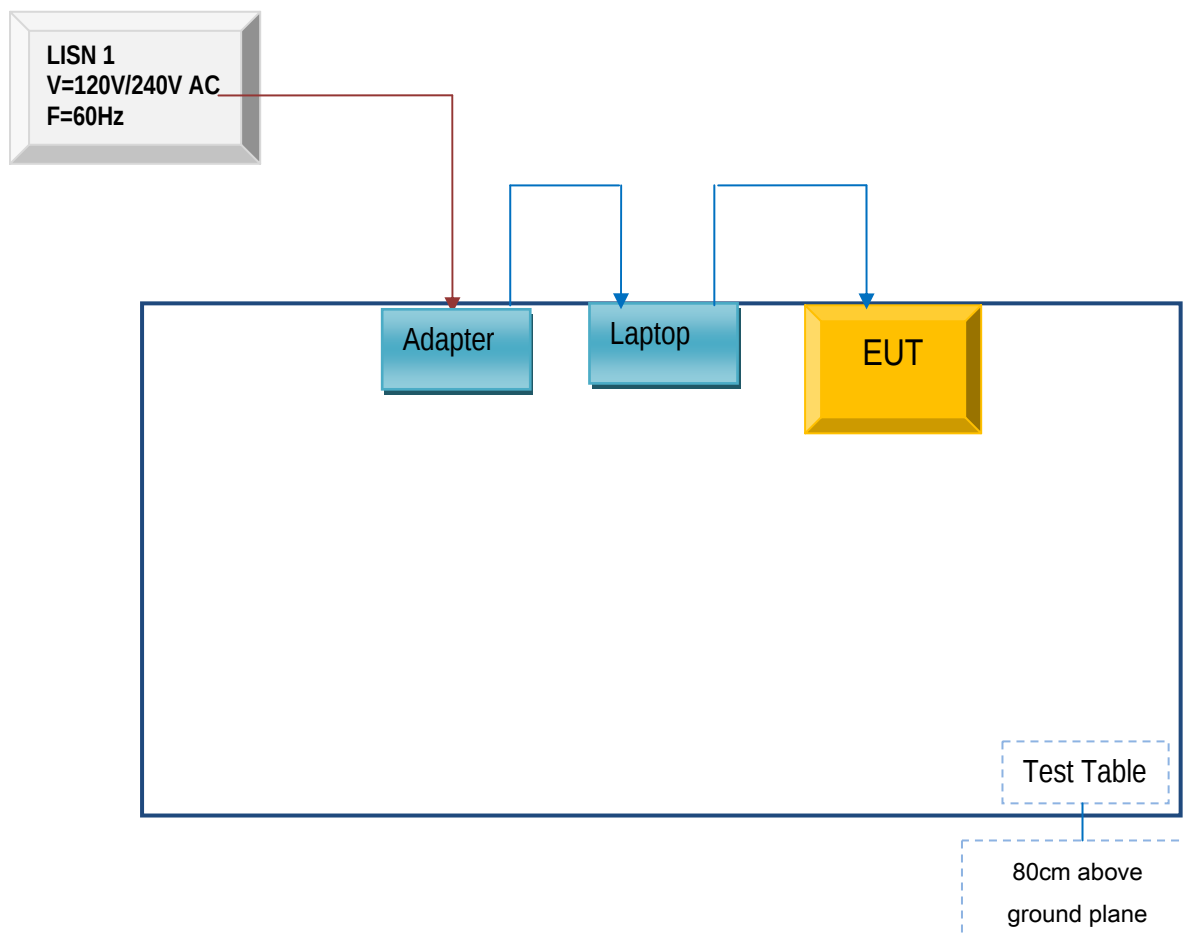


Radiated Spurious Emissions Test Setup Above
1GHz

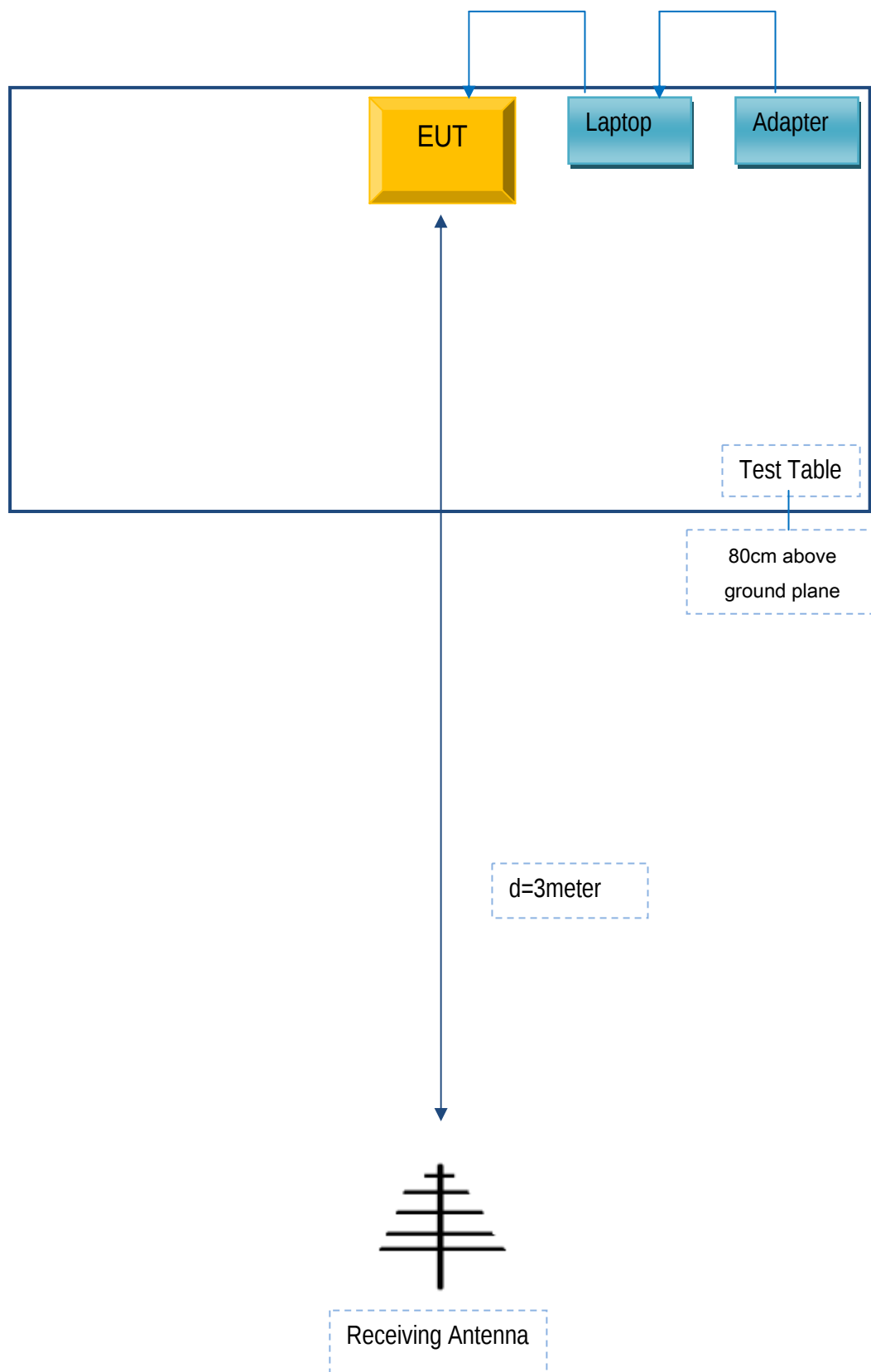
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

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

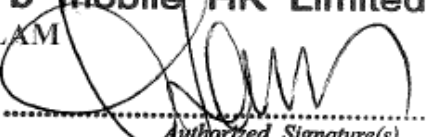
Model number: AX1050/L50

FCC ID: ZSW-30-017

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)