FCC Test Report

Report No.: AGC01904140902FE02

FCC ID	:	2ABYLSP6020
APPLICATION PURPOSE	:	Class II Permissive Change
PRODUCT DESIGNATION	:	WCDMA mobile phone
BRAND NAME	:	WOO
MODEL NAME	:	SP6022
CLIENT	:	Uwin Innovation (HongKong) Limited
DATE OF ISSUE	:	Oct.15, 2014
STANDARD(S)	:	FCC Part 22H & 24E Rules
REPORT VERSION	:	V1.0

Attestation of ***G***lobal ***C***ompliance (Shenzhen) Co., Ltd.

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct.15, 2014	Valid	Class II Permissive Change
DESCRIPTION				
In this report, only changed the accessories, model name, battery capacity, internal storage, frame color and appearance of the GSM/WCDMA antenna. The information of test results is almost identical to the report number - AGC01575140201FE02, which was named SP6020; All the test cases can be referred to the original test report. Based on the report, only the ERP/EIRP and the worst cases of Radiated Spurious Emission were verified for the differences.				

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1.VERIFICATION OF COMPLIANCE

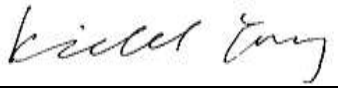
Applicant	Uwin Innovation (HongKong) Limited
Address	Room 206, Block 30, Nantou Checking Point 2nd Road, Wisdomland Business Park, Nanshan District, Shenzhen, China
Manufacturer	Shenzhen Eternity Technology Limited
Address	Block A2, Yingzhan Industrial Park, Longtian Community, Kengzi Street, Pingshan District, Shenzhen, CHINA
Product Designation	WCDMA mobile phone
Brand Name	WOO
Test Model	SP6022
Date of test	Oct.10, 2014 to Oct.13, 2014
Deviation	None
Condition of Test Sample	Normal

We hereby certify that:

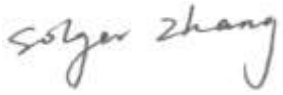
The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.4:2003 and TIA/EIA 603. The sample tested as described in this report is in compliance with the FCC Rules Part 22H and 24E.
The test results of this report relate only to the tested sample identified in this report.

Tested By : 

Bart Xie Oct.15, 2014

Reviewed By : 

Kidd Yang Oct.15, 2014

Approved By: 

Solger Zhang Oct.15, 2014

2. GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	WCDMA mobile phone
Hardware version:	Elink-MR601-V2 20131203
Software version:	N/A
Frequency Bands:	☒GSM 850 ☒PCS 1900 (U.S. Bands) ☒GSM 900 ☒DCS 1800 (Non-U.S. Bands) ☒UMTS FDD Band II ☒UMTS FDD Band V (U.S. Bands) ☐UMTS FDD Band I ☐UMTS FDD Band VIII (Non-U.S. Bands)
Antenna:	PIFA Antenna
Antenna gain:	-1.0dBi(GSM/WCDMA 850), -0.8dBi (GSM/WCDMA 1900)
Power Supply:	DC 3.7V by Battery
Battery parameter:	DC3.7V/2500 mAh
Adapter Input:	AC100-240V, 50-60Hz
Adapter Output:	DC5.0V, 1.5A
Dual Card:	WCDMA / GSM Card Slot GSM Card Slot
GPRS Class	12
Extreme Vol. Limits:	DC3.4 V to 4.2 V (Normal: DC3.7 V)
Extreme Temp. Tolerance	-10℃ to +50℃
*** Note: The High Voltage DC4.2V and Low Voltage DC3.4V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage. Other functions have been performed according to verification procedure except for Bluetooth and MS function. Card 1 can't transmit with Card 2 simultaneously.	

***** Note:** The maximum power levels are GSM for MCS-4: GMSK link, EDGE for MCS-9:8PSK link, and RMC 12.2kbps mode for WCDMA band II, WCDMA band V, only these modes were used for all tests.
We found out the test mode with the highest power level after we analyze all the data rates. So we chose worst case as a representative.

2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2ABYLSP6020** , filing to comply with the FCC Part 22H&24E requirements.

KDB 971168 D01 Power Meas License Digital Systems v02r01

2.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI C 63.4: 2003; TIA/EIA 603 and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

KDB 971168 D01 Power Meas License Digital Systems v02r01

2.4 TEST FACILITY

The test site used to collect the radiated data is located at:

Attestation of Global Compliance (Shenzhen) Co., Ltd.

2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China

FCC register No.: 259865

2.5 MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	Calibration Date	Calibration Due.
SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	July 25, 2014	July 24, 2015
TEST RECEIVER	R&S	ESCI	100694	July 25, 2014	July 24, 2015
COMMUNICATION TESTER	AGILENT	8960	122500087	Oct.21, 2013	Oct.20, 2014
COMMUNICATION TESTER	R&S	CMU200	122500166	Feb.27,2014	Feb.26,2015
SIGNAL GENERATOR	AGILENT	E4438C	MY44260051	Feb.23,2014	Feb. 22,2015
LISN	R&S	ESH3-Z5	8389791009	July 25, 2014	July 24, 2015
CLIMATE CHAMBER	ALBATROSS	--	--	July 25, 2014	July 24, 2015
Loop Antenna	A.H.	SAS-562B	SEL0097	July 25, 2014	July 24, 2015
Bilogical Antenna	A.H. Systems Inc.	SAS-521-4	26	June 6, 2014	June 5, 2015
Horn Antenna	EM	EM-AH-10180	67	June 6, 2014	June 5, 2015
Horn Antenna	A.H. Systems Inc.	SAS-574	--	Apr.19, 2014	Apr.18, 2015

2.6 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

2.7 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. SYSTEM TEST CONFIGURATION

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

3.3 GENERAL TECHNICAL REQUIREMENTS

Item Number	Item Description		FCC Rules
1	Output Power	Conducted output power	2.1046/22.913(a) (2) / 24.232 (c)
		Radiated output power	
2	Peak-to-Average Ratio	Peak-to-Average Ratio	24.232(d)
3	Spurious Emission	Conducted spurious emission	2.1051 / 22.917 / 24.238
		Radiated spurious emission	
4	Mains Conducted Emission		15.107 / 15.207
5	Frequency Stability		2.1055/22.355 /24.235
6	Occupied Bandwidth		2.1049 (h)(i)
7	Emission Bandwidth		22.917(a)/24.238(a)
8	Band Edge		22.917(a)/24.238(a)

3.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

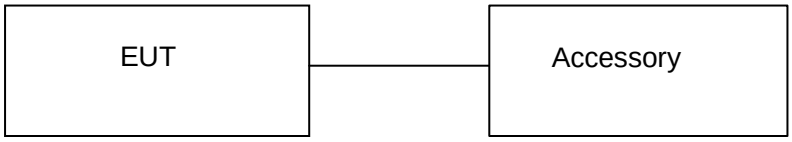


Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	WCDMA mobile phone	SP6022	FCC ID:2ABYLSP6020	EUT
2	Adapter	SP6022	DC5.0V / 1.5A	Accessory
3	Battery	SP6022	DC3.7V/ 2500 mAh	Accessory
4	Earphone	SP6022	N/A	Accessory
5	USB Cable	SP6022	N/A	Accessory

****Note: All the accessories have been used during the test. The following "EUT" in setup diagram means EUT system.*

4. SUMMARY OF TEST RESULTS

Item Number	Item Description		FCC Rules	Result
1	Output Power	Conducted Output Power	2.1046/22.913(a) (2) / 24.232 (c)	Pass
		Radiated Output Power		
2	Peak-to-Average Ratio	Peak-to-Average Ratio	24.232(d)	Pass
3	Spurious Emission	Conducted Spurious Emission	2.1051 / 22.917 / 24.238	Pass
		Radiated Spurious Emission		
4	Mains Conducted Emission		15.107 / 15.207	Pass
5	Frequency Stability		2.1055/22.355 /24.235	Pass
6	Occupied Bandwidth		2.1049 (h)(i)	Pass
7	Emission Bandwidth		22.917(a)/24.238(a)	Pass
8	Band Edge		22.917(a)/24.238(a)	Pass

5. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both GSM and PCS frequency band.

*****Note:** GSM/GPRS/EGPRS 850, GSM/GPRS/EGPRS 1900, WCDMA/HSPA band II, WCDMA/HSPA band V, mode have been tested during the test.

The worst condition was recorded in the test report if no other modes test data.

6. OUTPUT POWER

6.1RADIATED OUTPUT POWER

6.1.1 MEASUREMENT METHOD

The measurements procedures specified in TIA-603C-2004 were applied.

1 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.

2 The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. The ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

3 The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

4 From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

5 The EUT is then put into continuously transmitting mode at its maximum power level.

6 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.

7 This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

8 ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi..

6.1.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 24.232(b) specifies, “Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power” and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.” Rule Part 22.913(a) specifies “Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

Mode	Nominal Peak Power
GSM 850/EDGE	<=38.45 dBm (7W)
PCS 1900/EDGE	<=33 dBm (2W)
UMTS BAND II	<=33 dBm (2W)
UMTS BANDV	<=38.45 dBm (7W)

6.1.3 MEASUREMENT RESULT

Radiated Power (ERP) for GSM 850/EDGE 8				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. ERP	
GSM850	824.2	**30.28**	Horizontal	Pass
	836.6	30.20	Horizontal	Pass
	848.8	30.15	Horizontal	Pass
	824.2	28.45	Vertical	Pass
	836.6	28.53	Vertical	Pass
	848.8	29.06	Vertical	Pass
EDGE	824.2	25.21	Horizontal	Pass
	836.6	25.42	Horizontal	Pass
	848.8	25.47	Horizontal	Pass
	824.2	24.01	Vertical	Pass
	836.6	25.34	Vertical	Pass
	848.8	25.22	Vertical	Pass

Radiated Power (E.I.R.P) for PCS 1900/EDGE 8				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P.(dBm)	Polarization Of Max. E.I.R.P.	
GSM 1900	1850.2	**27.38**	Horizontal	Pass
	1880.0	27.31	Horizontal	Pass
	1909.8	27.27	Horizontal	Pass
	1850.2	26.49	Vertical	Pass
	1880.0	26.30	Vertical	Pass
	1909.8	25.22	Vertical	Pass
EDGE	1850.2	24.44	Horizontal	Pass
	1880.0	24.26	Horizontal	Pass
	1909.8	24.33	Horizontal	Pass
	1850.2	23.28	Vertical	Pass
	1880.0	23.26	Vertical	Pass
	1909.8	23.13	Vertical	Pass

Radiated Power (E.I.R.P) for UMTS band II				
Mode	Frequency	Result		
		Max. Peak E.I.R.P (dBm)	Polarization Of Max. E.I.R.P	
RMC 12.2kbps	1852.4	**21.71**	Horizontal	Pass
	1880	21.63	Horizontal	Pass
	1907.6	21.32	Horizontal	Pass
	1852.4	21.08	Vertical	Pass
	1880	20.49	Vertical	Pass
	1907.6	21.00	Vertical	Pass

Radiated Power (ERP) for UMTS band V				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. E.I.R.P.	
RMC 12.2kbps	826.4	**21.42**	Horizontal	Pass
	835.0	21.23	Horizontal	Pass
	846.6	21.04	Horizontal	Pass
	826.4	20.42	Vertical	Pass
	835.0	20.59	Vertical	Pass
	846.6	20.46	Vertical	Pass

Note: Above is worst mode data.

7. SPURIOUS EMISSION

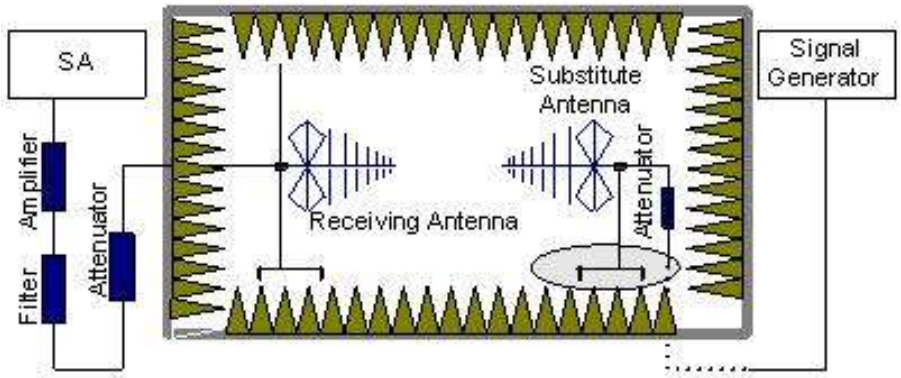
7.1 Radiated Spurious Emission

7.1.1 MEASUREMENT METHOD

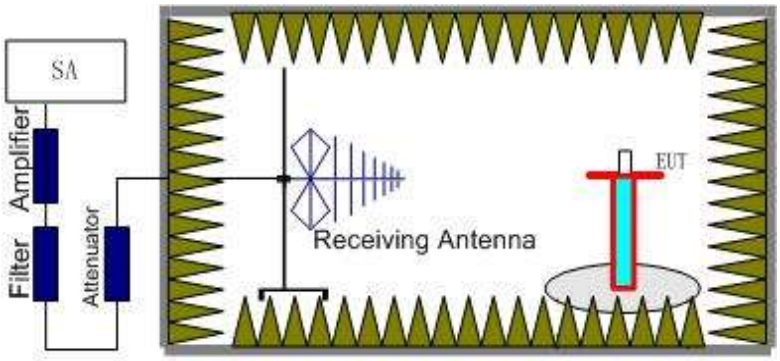
The measurements procedures specified in TIA-603C-2004 were used for testing. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set 1MHz as outlined in Part 24.238. The measurements were performed on all modes(GPRS/EGPRS 850, GPRS/EGPRS 1900, HSPA band II, HSPA band V) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx（dBuV）+CL（dB）+SA（dB）+Gain（dBi）-107（dBuV to dBm）The SA is calibrated using following setup.



b) EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.



Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS 1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) ,GSM850 band (824.2MHz, 836.6MHz, 848.8MHz), UMTS band II(1852.4MHz, 1880MHz, 1907.6MHz), UMTS band V(826.4MHz, 835.0MHz, 846.6MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: $Power=P_{Mea}+A_{Rpl}$

7.1.2 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee’s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Note: only result the worst condition of each test mode:

7.1.3 MEASUREMENT RESULT

GSM 850:

The Worst Test Results for Channel 251/848.8 MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
1685.23	-43.22	-5.01	-48.23	-13.00	Horizontal
2456.12	-45.67	-2.18	-47.85	-13.00	Vertical
3645.78	-46.31	3.46	-42.85	-13.00	Vertical
4536.58	-44.29	2.79	-41.50	-13.00	Horizontal

GSM 850(EDGE 8):

The Worst Test Results for Channel 251/848.8 MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
1696.28	-46.56	-2.26	-48.82	-13.00	Horizontal
2162.19	-47.38	-3.12	-50.50	-13.00	Vertical
3645.78	-48.24	-1.74	-49.98	-13.00	Vertical
9257.65	-45.29	8.46	-36.83	-13.00	Horizontal

PCS 1900:

The Worst Test Results for Channel 810/1909.8MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
1429.36	-45.36	-3.22	-48.58	-13.00	Vertical
2563.47	-46.24	-0.24	-46.48	-13.00	Vertical
3645.26	-47.38	3.98	-43.40	-13.00	Horizontal
4563.56	-47.52	11.56	-35.96	-13.00	Vertical
5689.25	-45.51	17.89	-27.62	-13.00	Horizontal

PCS 1900(EDGE 8):

The Worst Test Results for Channel 810/1909.8MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
1430.15	-53.26	2.7	-50.56	-13.00	Vertical
9367.91	-53.37	11.6	-41.77	-13.00	Vertical
13356.68	-54.26	14.89	-39.37	-13.00	Horizontal
15249.71	-54.21	13.87	-40.34	-13.00	Vertical
17913.63	-55.75	19.76	-35.99	-13.00	Horizontal

UMTS band II:

The Worst Test Results for Channel 9938/1907.6MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
2000.00	-38.77	-2.25	-41.02	-13.00	Vertical
9548.50	-41.35	-3.03	-44.38	-13.00	Horizontal
13367.40	-44.39	-1.87	-46.26	-13.00	Horizontal
15277.80	-42.21	8.52	-33.69	-13.00	Vertical
17931.60	-49.27	18.7	-30.57	-13.00	Horizontal

UMTS band V:

The Worst Test Results for Channel 4458/846.6MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
1598.26	-41.62	-2.26	-43.88	-13.00	Vertical
2365.78	-39.37	-3.12	-42.49	-13.00	Horizontal
4967.65	-42.28	-1.74	-44.02	-13.00	Horizontal
6457.86	-39.44	8.74	-30.7	-13.00	Vertical
7896.56	-42.62	17.89	-24.73	-13.00	Horizontal

Note: ARpl= Factor=Antenna Factor+ Cable loss-Amplifier gain.

The “Factor” value can be calculated automatically by software of measurement system.

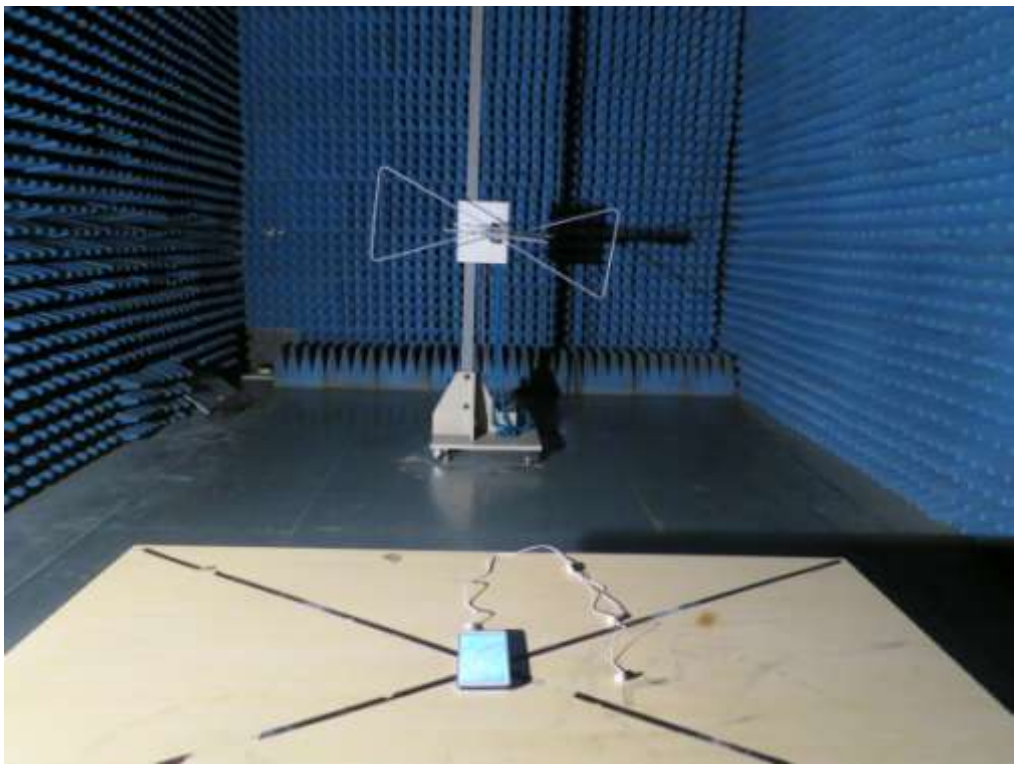
Below 30MHZ no Spurious found and The GSM modes is the worst condition.

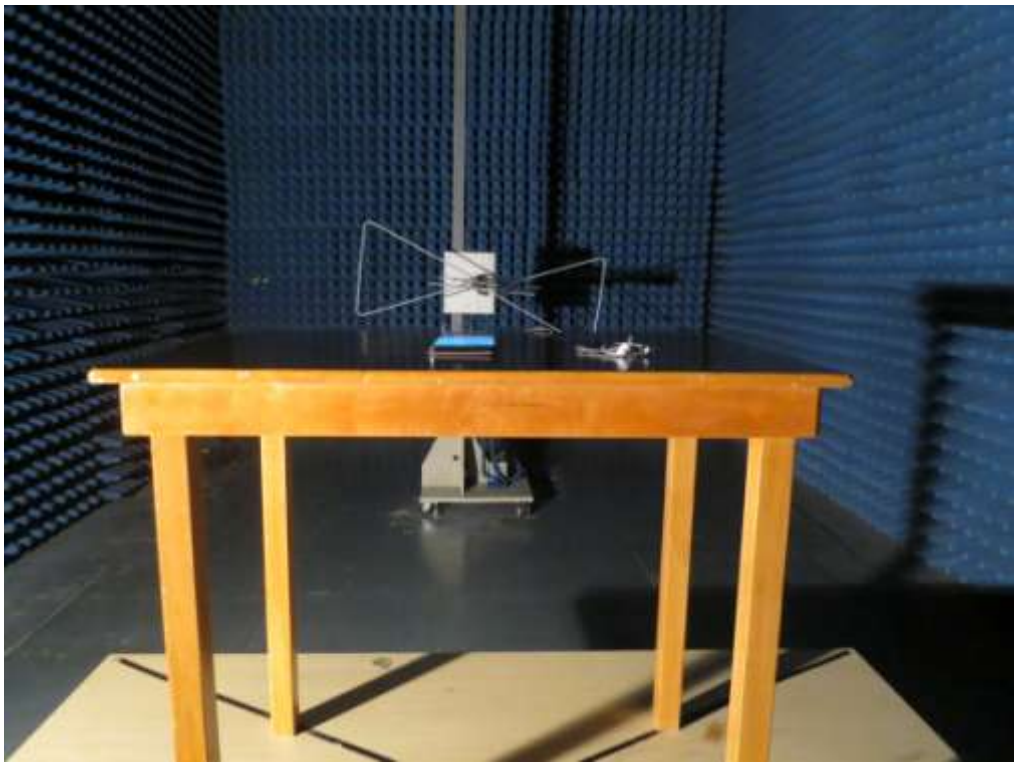
PPENDIX D

PHOTOGRAPHS OF TEST SETUP

CONDUCTED EMISSION

RADIATED SPURIOUS EMISSION





APPENDIX E

PHOTOGRAPHS OF EUT

All VIEW OF EUT

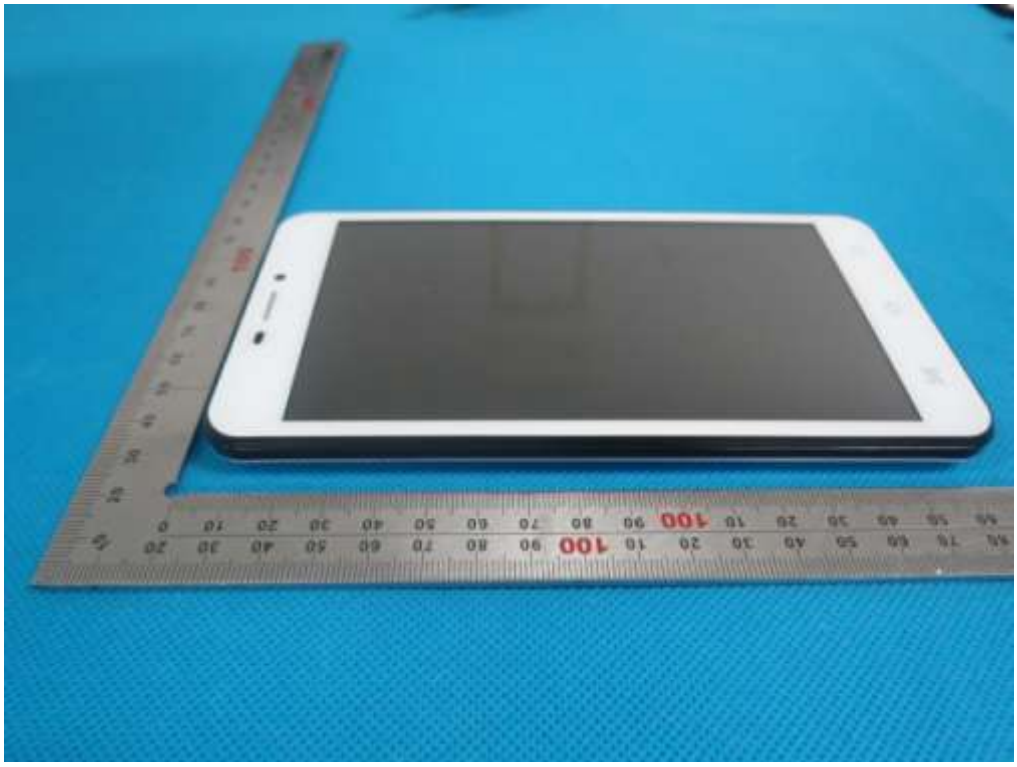
TOP VIEW OF EUT

BOTTOM VIEW OF EUT

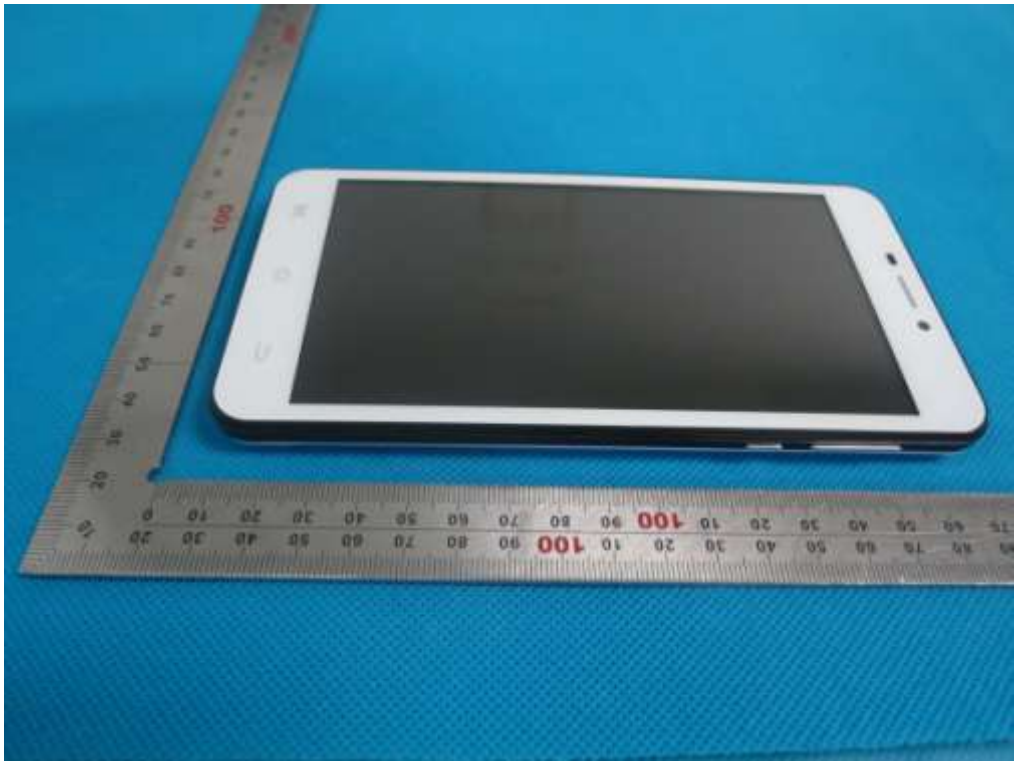
FRONT VIEW OF EUT

BACK VIEW OF EUT

LEFT VIEW OF EUT



RIGHT VIEW OF EUT

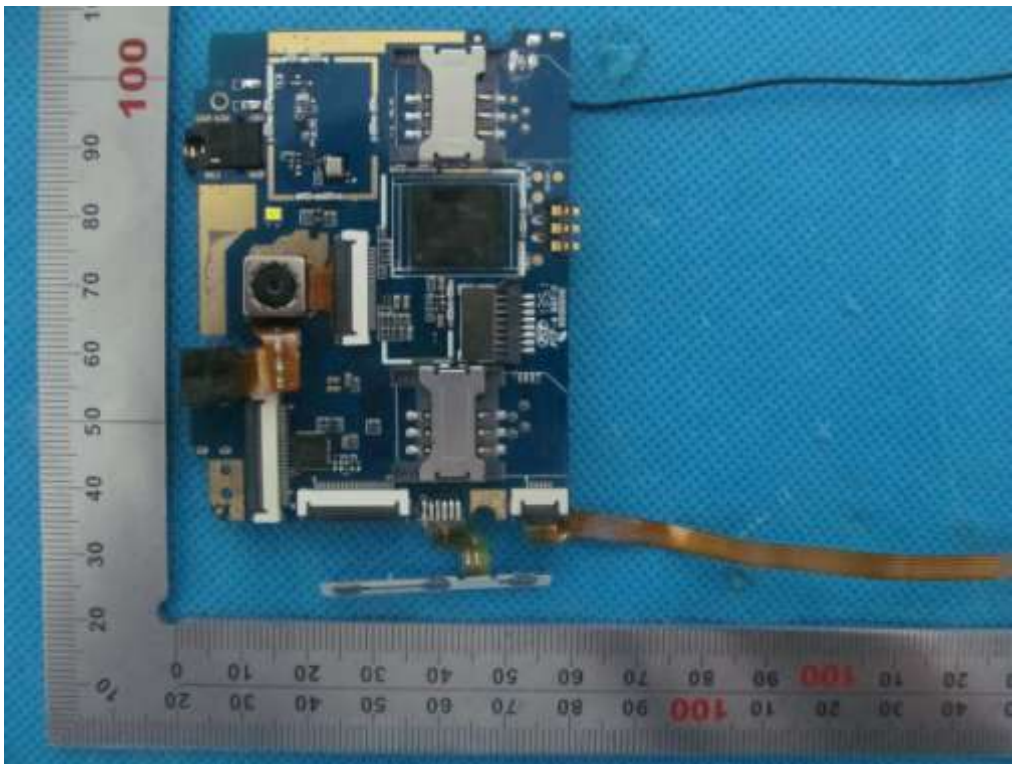


OPEN VIEW OF EUT-1

OPEN VIEW OF EUT-2

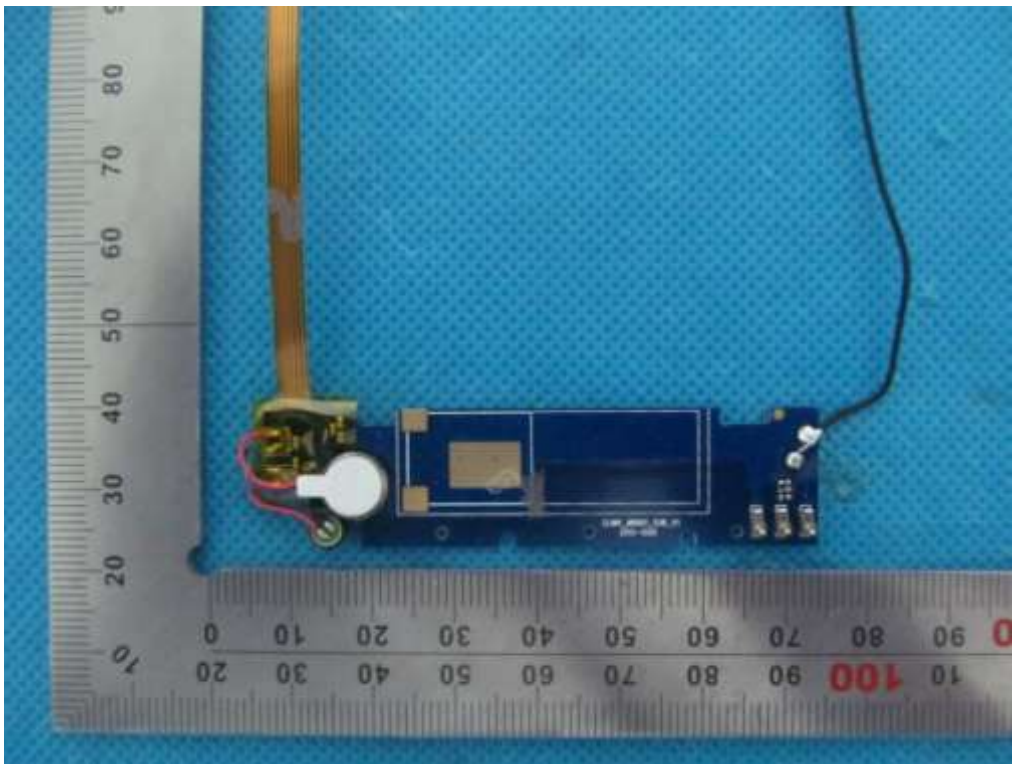
OPEN VIEW OF EUT-3

INTERNAL VIEW OF EUT-1

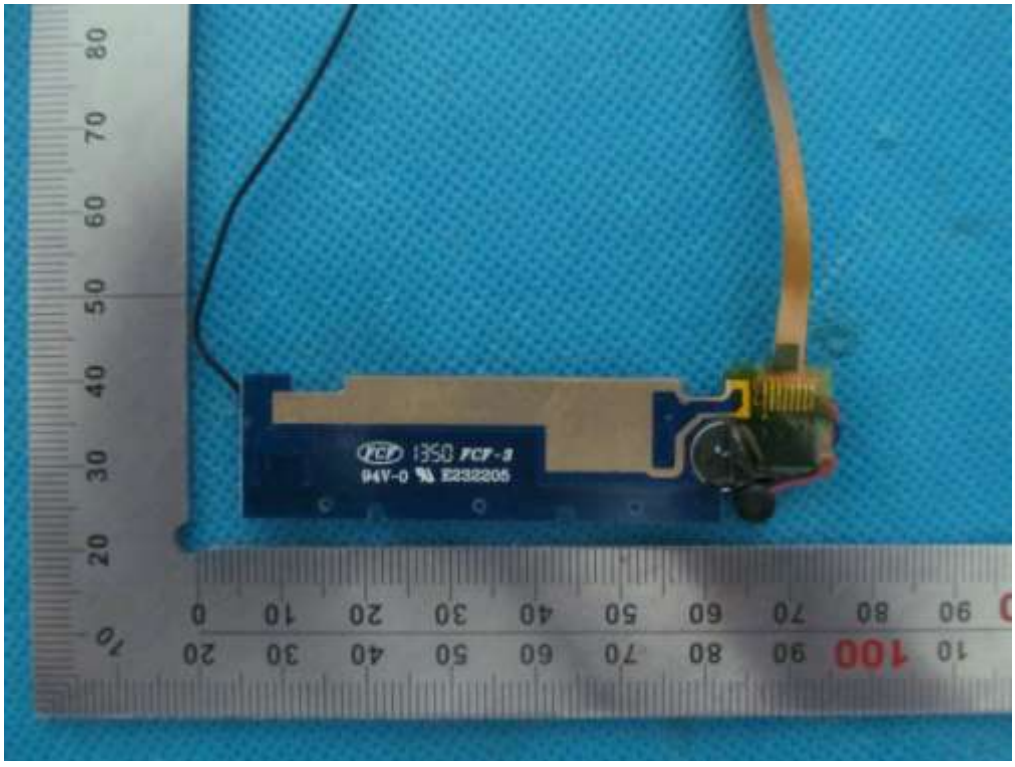


INTERNAL VIEW OF EUT-2

INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4



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