EMC TEST REPORT



Report No.: 15070892-FCC-E Supersede Report No.:N/A

SENMAX INC.			
LTE Phone	LTE Phone		
Carbon			
N/A			
FCC Part	15 Subpart B Class B:2014, A	NSI C63.4: 2014	
October 10	to October 30, 2015		
October 30, 2015			
Pass Fail			
Equipment complied with the specification			
Equipment did not comply with the specification			
Winnie Zhang David Huang			
ang eer	David Huang Checked By		
	LTE Phone Carbon N/A FCC Part October 10 October 30 Pass ded with the state comply with Themy ang	Carbon N/A FCC Part 15 Subpart B Class B:2014, A October 10 to October 30, 2015 October 30, 2015 Pass Fail ed with the specification t comply with the specification Chang David Huang David Huang	

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



Test Report	15070892-FCC-E
Page	2 of 30

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	
- Country in togicin	Собра	
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	15070892-FCC-E
Page	3 of 30

This page has been left blank intentionally.



Test Report	15070892-FCC-E
Page	4 of 30

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
ANI	NEX A. TEST INSTRUMENT	19
ANI	NEX B. EUT AND TEST SETUP PHOTOGRAPHS	20
ANI	NEX C. TEST SETUP AND SUPPORTING EQUIPMENT	26
ANI	NEX D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PARTLIST	29
ANI	NEX E. DECLARATION OF SIMILARITY	30



Test Report	15070892-FCC-E
Page	5 of 30

1. Report Revision History

Report No.	Report Version	Description	Issue Date
15070892-FCC-E	NONE	Original	October 30, 2015

2. Customer information

Applicant Name	SENMAX INC.
Applicant Add	2300 GRAYSON DR # 1611 GRAPEVINE, TX 76051
Manufacturer	SENMAX INC.
Manufacturer Add	2300 GRAYSON DR # 1611 GRAPEVINE, TX 76051

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES	
	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park	
Lab Address	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	



Test Report	15070892-FCC-E
Page	6 of 30

4. Equipment under Test (EUT) Information

Description of EUT: LTE Phone

Main Model: Carbon

Serial Model: N/A

Date EUT received: October 09,2015

Test Date(s): October 10 to October 30, 2015

GSM850: -7.22 dBi PCS1900: -2.93 dBi

UMTS-FDD Band V: -7.22 dBi UMTS-FDD Band IV: -2.55 dBi UMTS-FDD Band II:-2.93 dBi Bluetooth/BLE:-2.94 dBi

Antenna Gain:

WIFI:-2.94 dBi

LTE Band 2: -3.96 dBi LTE Band 4: -2.33 dBi LTE Band 7: -2.54 dBi LTE Band 17: -8.25 dBi

GPS:-3.56 dBi

GSM / GPRS: GMSK EGPRS: GMSK, 8PSK

UMTS-FDD: QPSK, 16QAM 802.11b/g/n: DSSS, OFDM

Type of Modulation:

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

RF Operating Frequency (ies): 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;



Test Report	15070892-FCC-E
Page	7 of 30

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 WIFI:802.11n(40M): 2422-2452 MHz

Bluetooth& BLE: 2402-2480 MHz

LTE Band 2 TX: $1852.5 \sim 1907.5$ MHz; RX: $1932.5 \sim 1987.5$ MHz LTE Band 4 TX: $1712.5 \sim 1752.5$ MHz; RX: $2112.5 \sim 2152.5$ MHz LTE Band 7 TX: $2502.5 \sim 2567.5$ MHz; RX: $2622.5 \sim 2687.5$ MHz LTE Band 17 TX: $706.5 \sim 713.5$ MHz; RX: $736.5 \sim 743.5$ MHz

GPS RX:1575.42 MHz

Battery:

Spec:3.8V,2850mAh

Adapter:

Input Power: Model:TPA-955100UU

Input: 100-240V; 50/60Hz; 150mA

Output: DC 5.0V,1000mA

Port: Power Port, Earphone Port, USB Port

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

Trade Name :

Ojji

FCC ID: 2AF99CARBON



Test Report	15070892-FCC-E
Page	8 of 30

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		
-	-	-		



Test Report	15070892-FCC-E
Page	9 of 30

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

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

Requirement(s):

Spec	Item	Requirement Applicable				
47CFR§15.	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.				
107		Frequency ranges	Limit (
		(MHz)	QP	Average		
		0.15 ~ 0.5	66 – 56	56 – 46		
		0.5 ~ 5	56	46		
		5 ~ 30	60	50		
Test Setup	Vertical Ground Reference Plane EUT Horizontal Ground Reference Plane					
	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.					
Procedure	 The EUT and supporting equipment were set up in accordance with the requirement 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 					
filtered mains.						



Test Report	15070892-FCC-E
Page	10 of 30

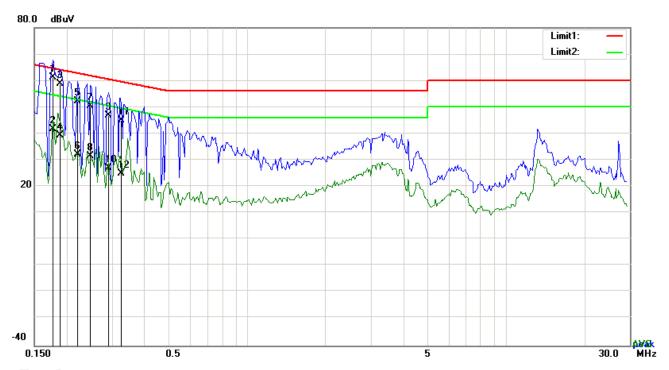
	3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss
	coaxial cable.
	4. All other supporting equipment were powered separately from another main supply.
	5. The EUT was switched on and allowed to warm up to its normal operating condition.
	6. A scan was made on the NEUTRAL 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 Report	15070892-FCC-E
Page	11 of 30

Test Mode 1 : USB Mode



Test Data

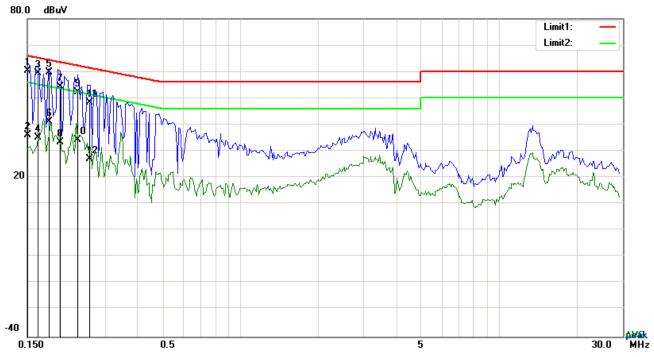
Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	L1	0.1773	51.25	QP	10.03	61.28	64.61	-3.33
2	L1	0.1773	31.84	AVG	10.03	41.87	54.61	-12.74
3	L1	0.1890	48.72	QP	10.03	58.75	64.08	-5.33
4	L1	0.1890	29.21	AVG	10.03	39.24	54.08	-14.84
5	L1	0.2202	42.21	QP	10.03	52.24	62.81	-10.57
6	L1	0.2202	22.13	AVG	10.03	32.16	52.81	-20.65
7	L1	0.2475	40.51	QP	10.03	50.54	61.84	-11.30
8	L1	0.2475	21.62	AVG	10.03	31.65	51.84	-20.19
9	L1	0.2904	36.93	QP	10.03	46.96	60.51	-13.55
10	L1	0.2904	17.06	AVG	10.03	27.09	50.51	-23.42
11	L1	0.3255	34.95	QP	10.03	44.98	59.57	-14.59
12	L1	0.3255	15.06	AVG	10.03	25.09	49.57	-24.48



Test Report	15070892-FCC-E
Page	12 of 30

Test Mode: USB Mode



Test Data

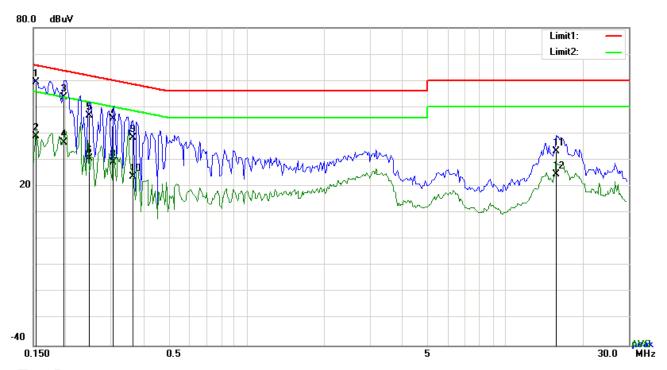
Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.1500	50.21	QP	10.02	60.23	66.00	-5.77
2	N	0.1500	25.93	AVG	10.02	35.95	56.00	-20.05
3	N	0.1656	49.45	QP	10.02	59.47	65.18	-5.71
4	N	0.1656	25.24	AVG	10.02	35.26	55.18	-19.92
5	N	0.1815	49.64	QP	10.02	59.66	64.42	-4.76
6	N	0.1815	31.18	AVG	10.02	41.20	54.42	-13.22
7	N	0.2007	44.29	QP	10.02	54.31	63.58	-9.27
8	N	0.2007	23.25	AVG	10.02	33.27	53.58	-20.31
9	N	0.2358	42.31	QP	10.02	52.33	62.24	-9.91
10	N	0.2358	24.27	AVG	10.02	34.29	52.24	-17.95
11	N	0.2616	38.33	QP	10.02	48.35	61.38	-13.03
12	N	0.2616	17.13	AVG	10.02	27.15	51.38	-24.23



Test Report	15070892-FCC-E
Page	13 of 30

Test Mode : USB Mode



Test Data

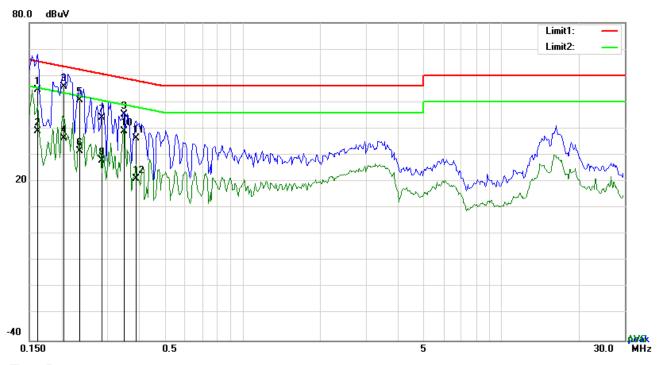
Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1539	49.38	QP	10.03	59.41	65.79	-6.38
2	L1	0.1539	28.89	AVG	10.03	38.92	55.79	-16.87
3	L1	0.1968	43.69	QP	10.03	53.72	63.74	-10.02
4	L1	0.1968	26.74	AVG	10.03	36.77	53.74	-16.97
5	L1	0.2475	36.93	QP	10.03	46.96	61.84	-14.88
6	L1	0.2475	20.70	AVG	10.03	30.73	51.84	-21.11
7	L1	0.3060	35.66	QP	10.03	45.69	60.08	-14.39
8	L1	0.3060	19.25	AVG	10.03	29.28	50.08	-20.80
9	L1	0.3645	28.47	QP	10.03	38.50	58.63	-20.13
10	L1	0.3645	13.80	AVG	10.03	23.83	48.63	-24.80
11	L1	15.7335	23.06	QP	10.24	33.30	60.00	-26.70
12	L1	15.7335	14.44	AVG	10.24	24.68	50.00	-25.32



Test Report	15070892-FCC-E
Page	14 of 30

Test Mode : USB Mode



Test Data

Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	N	0.1617	44.78	QP	10.02	54.80	65.38	-10.58
2	N	0.1617	28.90	AVG	10.02	38.92	55.38	-16.46
3	N	0.2046	45.96	QP	10.02	55.98	63.42	-7.44
4	N	0.2046	26.48	AVG	10.02	36.50	53.42	-16.92
5	N	0.2358	40.64	QP	10.02	50.66	62.24	-11.58
6	N	0.2358	21.63	AVG	10.02	31.65	52.24	-20.59
7	N	0.2865	34.16	QP	10.02	44.18	60.63	-16.45
8	N	0.2865	18.04	AVG	10.02	28.06	50.63	-22.57
9	N	0.3489	35.38	QP	10.02	45.40	58.99	-13.59
10	N	0.3489	29.06	AVG	10.02	39.08	48.99	-9.91
11	N	0.3879	26.44	QP	10.02	36.46	58.11	-21.65
12	N	0.3879	11.15	AVG	10.02	21.17	48.11	-26.94



Test Report	15070892-FCC-E
Page	15 of 30

6.2 Radiated Emissions

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

Requirement(s):

Spec	Item	Item Requirement Applicable				
47CFR§15. 109(d)	a)	Except higher limit as specified else emissions from the low-power radio exceed the field strength levels spe the level of any unwanted emission; the fundamental emission. The tight edges	>			
109(u)		Frequency range (MHz)	Field Strength (μV/m)			
		30 – 88	100			
		88 – 216	150			
		216 960	200			
		Above 960	500			
Test Setup	Ant. Tower 1-4m Variable Support Units Ground Plane Test Receiver					
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 			the EUT ating the EUT, the following		



Test Report	15070892-FCC-E
Page	16 of 30

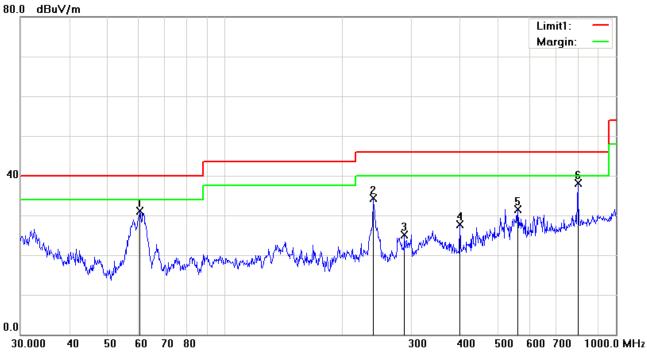
			over a full rotation of the EUT) was chosen.
		b.	The EUT was then rotated to the direction that gave the maximum
			emission.
		C.	Finally, the antenna height was adjusted to the height that gave the maximum
			emission.
	3.	The res	solution bandwidth and video bandwidth of test receiver/spectrum analyzer is
		120 kH	z for Quasiy Peak detection at frequency below 1GHz.
	4.	The reso	olution bandwidth of test receiver/spectrum analyzer is 1MHz and video
		bandwi	dth is 3MHz with Peak detection for Peak measurement at frequency above
		1GHz.	
		The re	solution bandwidth of test receiver/spectrum analyzer is 1MHz and the video
		bandw	vidth with Peak detection for Average Measurement as below at frequency
		above	1GHz.
		■ 1 kH	Hz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%)
	5.	Steps 2	2 and 3 were repeated for the next frequency point, until all selected frequency
		points \	were measured.
Remark			
Result	☑ Pa	ISS	☐ Fail
	7		
Test Data	Yes		N/A
Test Plot	Yes (S	See belo	w) N/A



Test Report	15070892-FCC-E
Page	17 of 30

Test Mode 1: US	SB Mode
-----------------	---------

Below 1GHz



Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Readin g	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/ m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()
1	Н	60.7044	45.46	peak	-14.30	31.16	40.00	-8.84	100	327
2	Н	239.1473	43.30	peak	-9.09	34.21	46.00	-11.79	100	345
3	Н	287.9904	32.61	peak	-7.45	25.16	46.00	-20.84	100	214
4	Н	399.0302	31.93	peak	-4.32	27.61	46.00	-18.39	100	1
5	Н	560.6928	32.15	peak	-0.64	31.51	46.00	-14.49	100	225
6	Н	798.9797	34.92	peak	3.20	38.12	46.00	-7.88	100	358

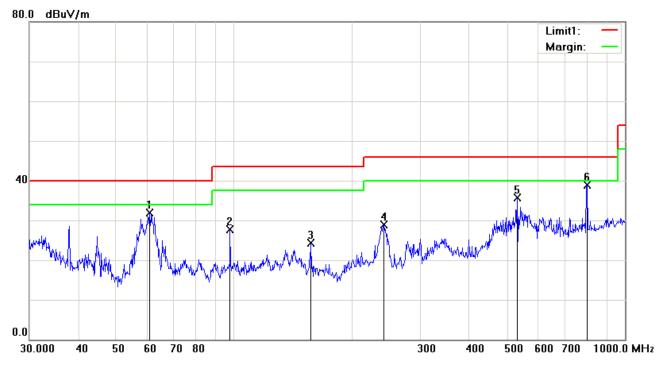
Above 1GHz

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



Test Report	15070892-FCC-E
Page	18 of 30

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Readin g	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/ m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()
1	V	60.9176	46.25	peak	-14.29	31.96	40.00	-8.04	100	272
2	>	97.7983	39.04	peak	-11.39	27.65	43.50	-15.85	100	227
3	V	157.5589	32.58	peak	-8.31	24.27	43.50	-19.23	100	92
4	V	241.6763	38.01	peak	-9.11	28.90	46.00	-17.10	100	145
5	٧	530.1014	36.93	peak	-1.16	35.77	46.00	-10.23	100	167
6	V	801.7863	35.75	peak	3.23	38.98	46.00	-7.02	100	347

Above 1GHz

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



Test Report	15070892-FCC-E
Page	19 of 30

Annex A. TEST INSTRUMENT

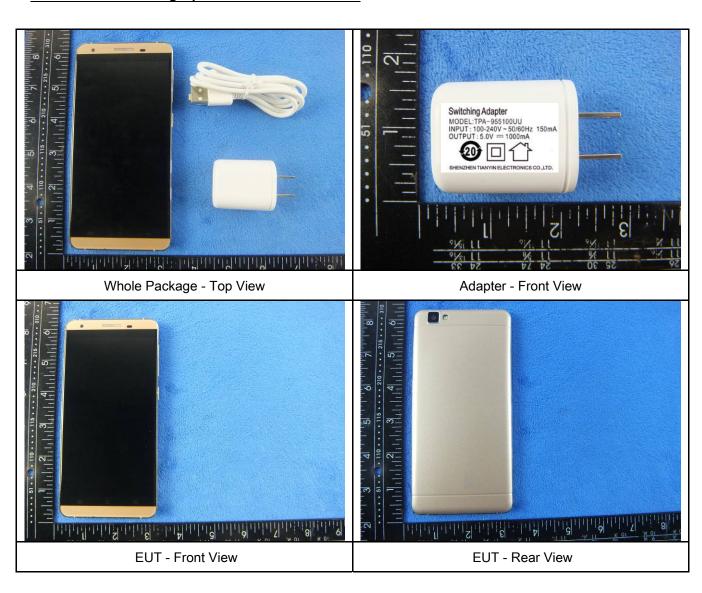
Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emis	AC Line Conducted Emissions				
EMI test receiver	ESCS30	8471241027	09/17/2015	09/16/2016	•
Line Impedance Stabilization Network	LI-125A	191106	09/25/2015	09/24/2016	>
Line Impedance Stabilization Network	LI-125A	191107	09/25/2015	09/24/2016	<u><</u>
LISN	ISN T800	34373	09/25/2015	09/24/2016	<
Transient Limiter	LIT-153	531118	09/01/2015	08/31/2016	<
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	>
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	\(\z\)
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	<u> </u>
Double Ridge Horn Antenna	AH-118	71259	09/24/2015	09/23/2016	\(\z\)



Test Report	15070892-FCC-E
Page	20 of 30

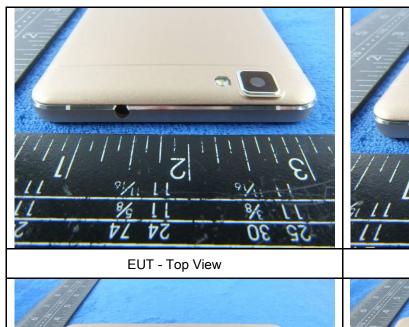
Annex B. EUT And Test Setup Photographs

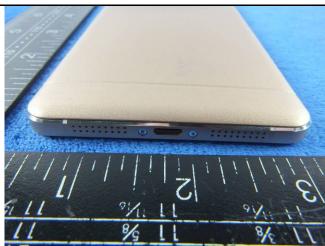
Annex B.i. Photograph: EUT External Photo



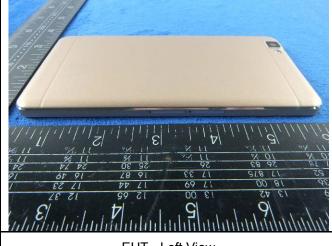


Test Report	15070892-FCC-E
Page	21 of 30

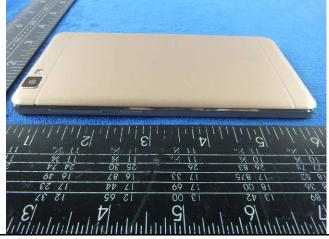




EUT - Bottom View



EUT - Left View

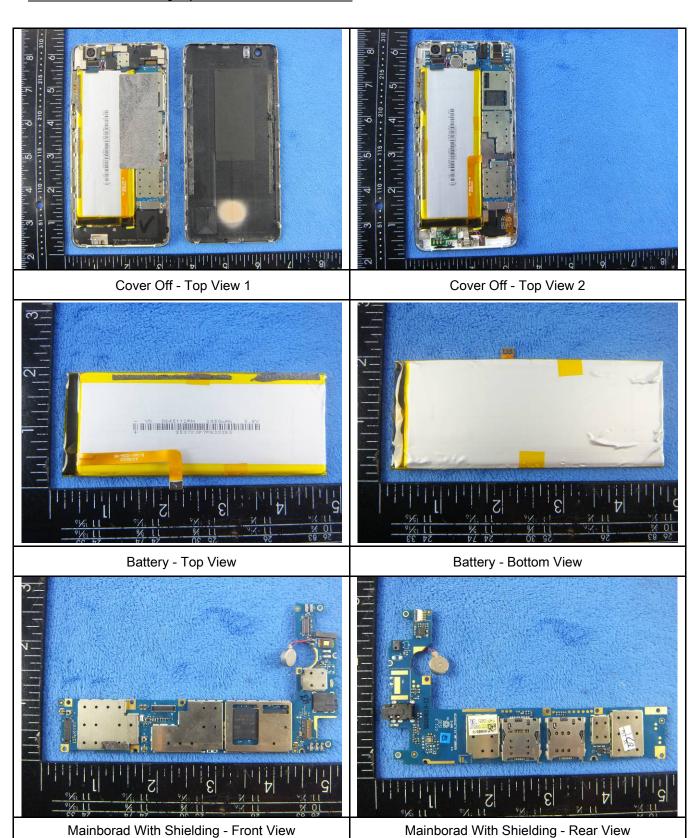


EUT - Right View



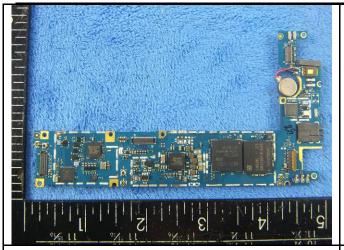
Test Report	15070892-FCC-E
Page	22 of 30

Annex B.ii. Photograph: EUT Internal Photo

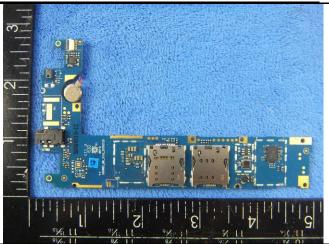




Test Report	15070892-FCC-E
Page	23 of 30



Mainborad Without Shielding - Front View



Mainborad Without Shielding - Rear View



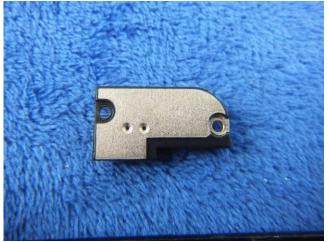
LCD - Front View



LCD - Rear View



GSM/PCS/UMTS-FDD Antenna View



WIFI/BT/BLE - Antenna View



Test Report	15070892-FCC-E
Page	24 of 30

SO21S_SY_GPS/LTE-2	
GPS/LTE - Antenna View	



Test Report	15070892-FCC-E
Page	25 of 30

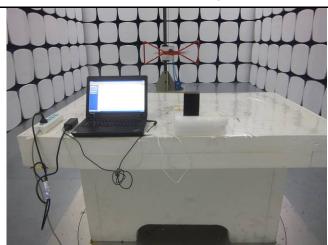
Annex B.iii. Photograph: Test Setup Photo



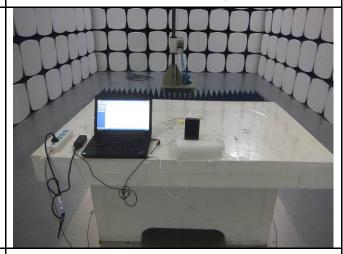
Conducted Emissions Test Setup - Front View



Conducted Emissions Test Setup - Side View



Radiated Spurious Emissions Test Setup Below 1GHz



Radiated Spurious Emissions Test Setup Above 1GHz

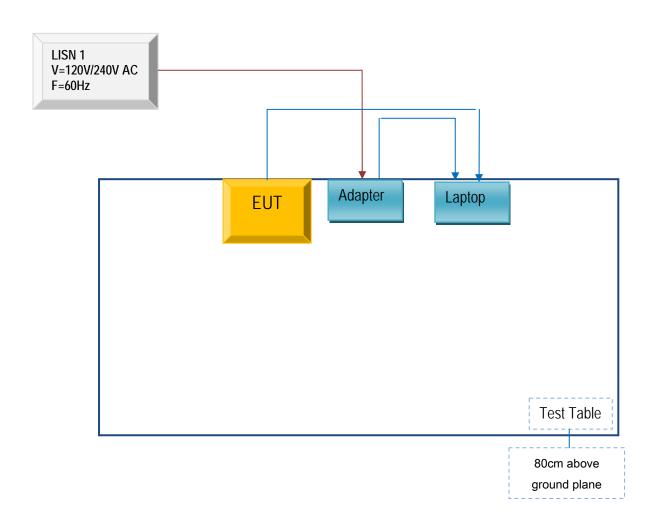


Test Report	15070892-FCC-E
Page	26 of 30

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

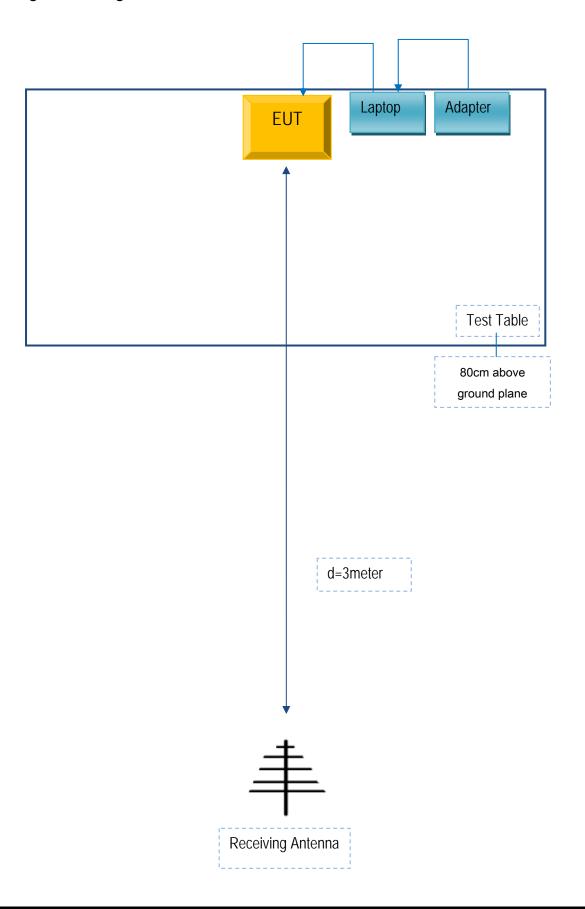
Block Configuration Diagram for Conducted Emissions





Test Report	15070892-FCC-E
Page	27 of 30

Block Configuration Diagram for Radiated Emissions





Test Report	15070892-FCC-E
Page	28 of 30

Annex C. il. 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



Test Report	15070892-FCC-E	
Page	29 of 30	

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

Please see Attachment



Test Report	15070892-FCC-E
Page	30 of 30

Annex E. DECLARATION OF SIMILARITY

N/A