

FCC EMC TEST REPORT

No. 150934-EMC

For

OBI Connect FZE

Product Name: Mobile Phone

Model Name: Obi Worldphone SJ1.5

Trade Name: OBI

Issued Date: 2015-12-14

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of GCCT.

To verify test report authenticity, send full test report to Email: gaoxiaoqing0310@126.com

Test Laboratory:

GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
Technology Road, High-tech Zone, He Yuan, Guang Dong, PR China 517001

Tel: +86(0)762-3607221, Fax: +86(0)762-3603336 Email: ncctmail@126.com. www.ncct.org.cn

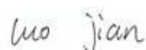
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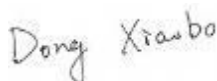
GENERAL SUMMARY

Product Name	Mobile Phone
Model Name	Obi Worldphone SJ1.5
Trade Name	OBI
Applicant	OBI Connect FZE
Manufacturer	CK Telecom Limited
Test Laboratory	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
Reference Standards	FCC Part 15, Subpart B "Radio frequency devices". ANSI C63.4-2014: "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"
Test Conclusion	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in annex B of this test report are below limits specified in the relevant standards. General Judgment: Pass Date of issue:2015.12.14
Comment	The test results in this report apply only to the tested sample of the stated device/equipment.

Approved by:

Luo Jian
Manager

Reviewed by:

Dong Xiaobo
Deputy Manager

Tested by:

Li Longliang
Test Engineer

1. Test Laboratory

1.1 Testing Location

Company Name	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
Address	Technology Road, High-tech Zone, Heyuan, Guangdong Province, PR.China
CNAS Registration No.	L4992
Postal Code	517001
Telephone	+86-762-3607221
Fax	+86-762-3603336

1.2 Testing Environment

Control room and Power Amplifier room did not exceed following limits along the EMC testing:

Project	Control room	Power Amplifier room
Temperature	15°C~35°C	15°C~35°C
Relative humidity	20% ~80%	20% ~80%
Shielding effectiveness	> 110dB	> 110dB
Electrical insulation	> 2MΩ	> 2MΩ
Ground system resistance	< 1Ω	< 1Ω

Semi-anechoic chamber (9.73 meters×6.70meters×6.12meters) did not exceed following limits along the EMC testing:

Temperature	15°C~30°C
Relative humidity	35% ~60%
Shielding effectiveness	> 110dB
Electrical insulation	> 10kΩ
Ground system resistance	< 1Ω
Normalised site attenuation (NSA)	< ±3.5dB, 3m distance, from 30 to 1000 MHz
voltage standing-wave ratio (VSWR)	< ±6dB, 3m distance, above 1 GHz
Uniformity of field strength(FU)	80MHz ~6000MHz, 0 ~6dB

EMC(1) room did not exceed following limits along the EMC testing:

Temperature	15℃～35℃
Relative humidity	30%～60%

1.3 Project Data

Project Leader:	Dong Xiaobo
Testing Start Date:	2015-11-23
Testing End Date:	2015-12-14

2. Client Information

2.1 Applicant Information

Company Name	OBI Connect FZE
Address	B-21,Dubai Airport Free zone, PO BOX 371475, United Arab Emirates
City	Dubai
Postal Code	/
Country	United Arab Emirates

2.2 Manufacturer Information

Company Name	CK Telecom Limited
Address	Technology Road.High-Tech Development Zone. Heyuan, Guangdong,P.R.China.
City	Heyuan
Postal Code	/
Country	China

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1 About EUT

Model Name	Obi Worldphone SJ1.5
FCC ID	2AGBLSJ15
Tx Frequency	GSM850:824 ~ 848 MHz PCS1900 : 1850 ~ 1909MHz WCDMA Band V: 826 ~ 846MHz Bluetooth& BLE: 2402 ~ 2480MHz WIFI(802.11b/g/n-20): 2412 ~ 2462MHz WIFI(802.11n-40): 2422 ~ 2462MHz
Rx Frequency	GSM850: 869 ~ 893MHz GSM1900: 1930 ~ 1989MHz WCDMA Band V: 871 ~ 891MHz Bluetooth& BLE: 2402 ~ 2480MHz WIFI(802.11b/g/n-20): 2412 ~ 2462MHz WIFI(802.11n-40): 2422 ~ 2462MHz
Number of Channels	GSM850 :25 GSM1900 : 60 WCDMA Band V: 25 Bluetooth:79 BLE:40 WIFI(802.11b/g/n-20):11 WIFI(802.11n-40):7
Modulation	GSM:GMSK WCDMA:BPSK/QPSK BLE:GFSK Bluetooth: GFSK& $\pi/4$ -DQPSK&8DPSK WIFI:CCK/OFDM
Antenna Gain	GSM850&1900:-0.5dBi WCDMA Band V: -1dBi Bluetooth&BLE&WIFI: -1dBi
Normal Voltage	3.8V
Extreme Low Voltage	3.7V
Extreme High Voltage	4.2V
Extreme Low Temperature	0°C
Extreme High Temperature	40°C

Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2 Internal Identification of EUT

EUT ID *	IMEI	HW Version	SW Version
150934-M03	/	V1.0	OBI-SJ1.5-000-Ver1.5

*EUT ID: is used to identify the test sample in the lab internally.

3.3 Internal Identification of AE

AE ID *	Description	Type	SN
150934-B03	Battery	OB3000CKA	DONG GUAN DRN NEW ENERGY CO.,LTD.
150934-C03	Adapter	A0D2A5V	DONG GUAN AOHA1 POWER TECHNOLOGY CO.,LTD.

*AE ID: is used to identify the test sample in the lab internally.

4. Test Mode and Performance Criteria

4.1 Test Mode

Frequency range was investigated: Conducted emission test: from 150 kHz to 30MHz; Radiated emission test: 30MHz to the 5th harmonic of the highest fundamental frequency or to 40GHz, whichever is lower. All test modes were pre-scanned and only shown the worst in bold.

Test Item
Radiated Emission < 1GHz
Mode 1: GSM850 Idle + WIFI+USB Cable (Charging from PC)
Mode 2: GSM1900 Idle + WIFI+USB Cable (Charging from Adapter)
Mode 3: WCDMA Band II Idle + WIFI+USB Cable (Charging from Adapter)
Mode 4: WCDMA Band V Idle + WIFI+ Bluetooth Idle + USB Cable (Data Link with PC)
Radiated Emission ≥ 1GHz
Mode 1: GSM850 Idle + BT+USB Cable (Charging from Adapter)
Mode 2: GSM1900 Idle + WIFI+ USB Cable (Charging from Adapter)
Mode 3: WCDMA Band II Idle + WIFI+ Bluetooth Idle + USB Cable (Data Link with PC)
Mode 4: WCDMA Band V Idle + WIFI+ USB Cable (Charging from PC)
AC Conducted Emission
Mode 1: WIFI + USB Cable (Charging from Adapter)
Mode 2: GSM1900 Idle + WIFI+ USB Cable (Charging from Adapter)
Mode 3: Bluetooth + USB Cable (Charging from Adapter)
Mode 4: BLE + USB Cable (Data Link with PC)

Remark:

1. The worst case of AC Conducted Emission is mode 2; only the test data of this mode was reported.
2. The worst case of RE < 1G is mode 3; only the test data of this mode was reported.
3. Data Link with PC means data application transferred mode between EUT and PC.

5. Test Results

5.1 Summary of Test Results

Clause (FCC Part 15B)	Test Case	Verdict
15.109(a)	Radiated Emission	Pass
15.107(a)	AC Conducted Emission	Pass

Note: Please refer to Annex B in this test report for the detailed test results.

5.2 Statements

GCCT has evaluated the test cases requested by the applicant/manufacture as listed in section 5.1 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in general summary.

6. Test Equipments Utilized

6.1 List of Measuring Equipment

Table 1. Measurement Equipments

Hardware						
No.	Name	Model	SN	Manufacturer	CAL. DATE	CAL. Due DATE
1	Spectrum Analyzer	E4440A	MY48250641	Agilent	2015-8-21	2016-8-20
2	RF Filter Section	N9039A	MY48260024	Agilent	2015-8-21	2016-8-20
3	BiCoNilog Antenna	3142D	00110050	ETS-Lindgren	2015-9-15	2017-9-14
4	Horn Antenna	3117	00129169	ETS-Lindgren	2015-9-15	2017-9-14
5	RF Notch filter	/	/	ETS-Lindgren	/	/
6	Signal Generator	N5183A-532	MY49060563	Agilent	2015-8-21	2016-8-20
7	Signal Generator	N5181A-506	MY49061300	Agilent	2015-8-21	2016-8-20
8	Power Amplifier	AR75A250	0333065	AR	/	/
9	Power Amplifier	250W1000A	0332703	AR	/	/
10	Power Amplifier	AS0860-40/4	AS0860-40/45	Milmega	/	/
11	EMS antenna	ATL80M1G	0332624	AR	/	/
12	EMS antenna	High Gain HornAntenna	BBHA 9120 E 456	SCHWARZBE CK	/	/
13	Power Meter	N1913A	MY50000213	Agilent	2015-8-21	2016-8-20
14	Power Meter	N1913A	MY50000214	Agilent	2015-8-21	2016-8-20
15	CDN	FCC-801-M2 -16A	100230	FCC	2015-8-21	2016-8-20
16	BCI	F-120-9A	100334	FCC	2015-8-21	2016-8-20
17	LISN	LI-125	191012 191013	Com-power	2015-8-21	2016-8-20
18	Electrostatic Discharge	Dito	V0946105513	EMTEST	2015-8-21	2016-8-20
19	The ultra-compact simulator and its	UCS 500 N5	V0946105514	EMTEST	2015-8-21	2016-8-20

20	Motor driven AC source	MV2616	V0946105516	EMTEST	2015-8-21	2016-8-20
21	Universal Radio Communication Tester	CMU200	118627	R&S	2015-8-21	2016-8-20
22	Universal Radio Communication Tester	E5515C	MY48367105	Agilent	2015-8-21	2016-8-20
23	Bluetooth Tester	MT8852B	1307002	Anristu	2015-8-21	2016-8-20
24	Software	MEAS	/	ETS-Lindgren	/	/
25	PC	G450	/	LENEVO	/	/
Software						
1	Software	TILE4.5	/	ETS-Lindgren	/	/

Table 3. List of Accessories

No.	Name	Model	SN	Manufacturer	Length	Shielding
1	PC	Pavilion dv2	CNC9112F68	HP	/	/
2	Printer	BOISB-0604-00	VNF3L52398	HP	/	/
3	Mouse	M-UAV-DE L8	/	DELL	/	/
4	Power line for printer	I-SHENG	/	/	1.3m	unshielding
5	Power line for PC	A003145	/	/	2.8m	unshielding
6	USB cable	SHIELDED	E174089	/	/	unshielding
7	Adapter	Series PPP009D	HP	/	/	/

6.2 Uncertainty

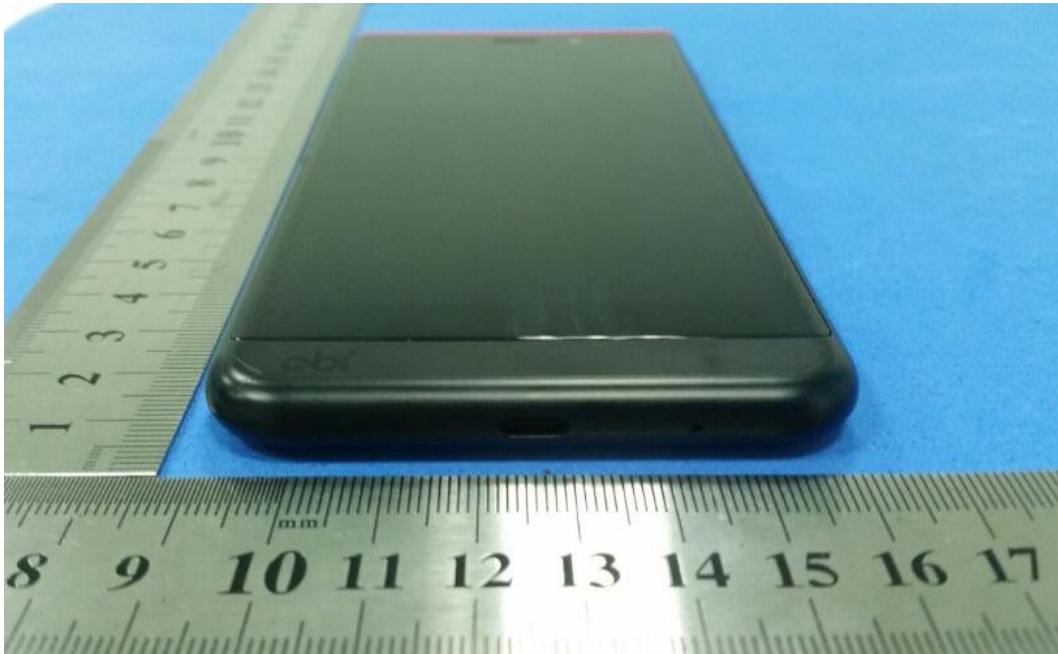
RE Uncertainty Evaluation (30MHz~1000MHz)	
Uncertainty for 95% Confidence	5.2dB
RE Uncertainty Evaluation (Above 1GHz)	
Uncertainty for 95% Confidence	5.4dB
CE Uncertainty Evaluation (150kHz~30MHz)	
Uncertainty for 95% Confidence	3.8dB

ANNEX A: EUT Photograph

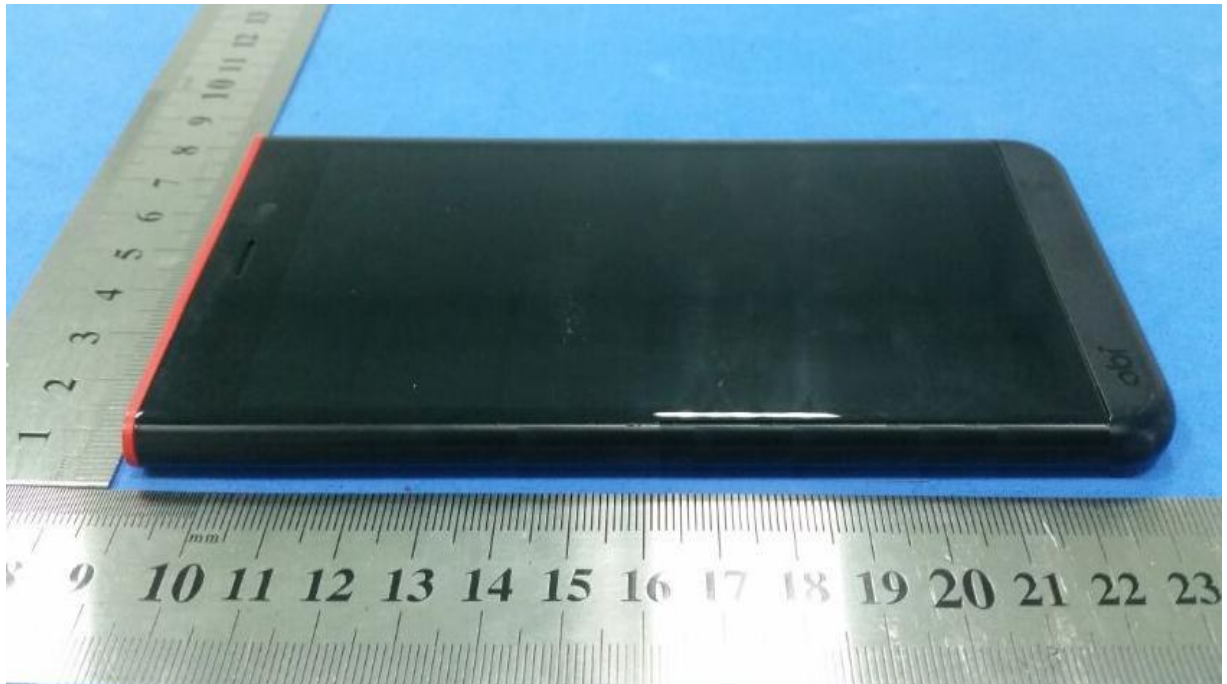
EUT Front View



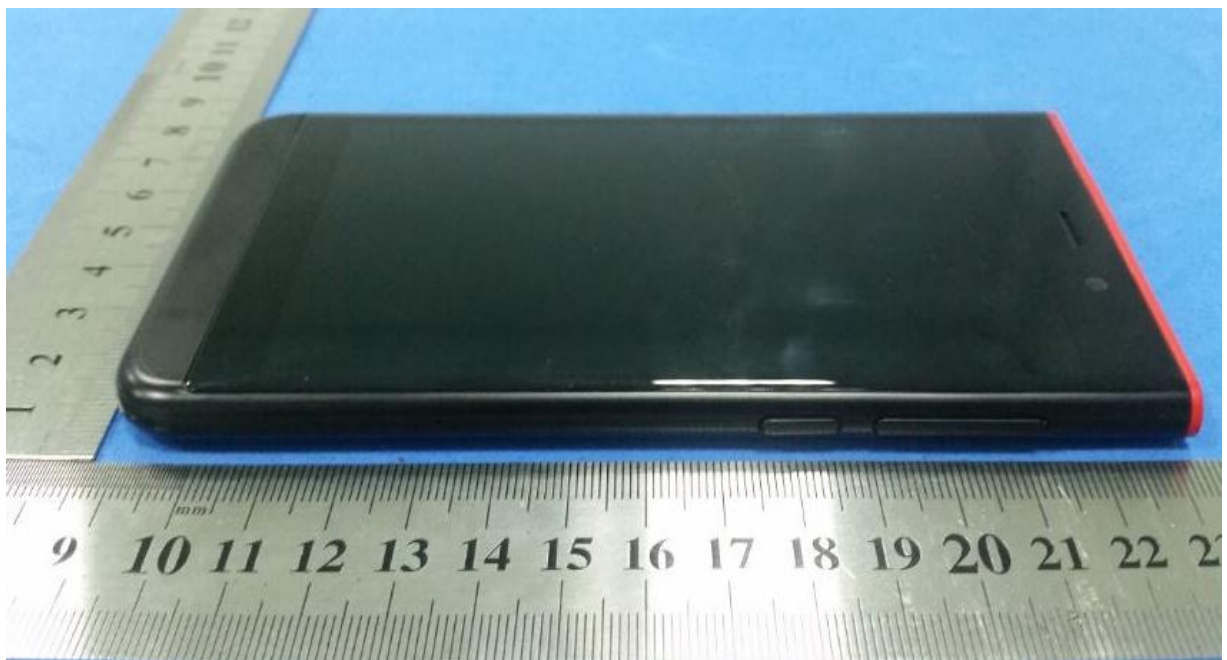
EUT behind View



EUT Left View



EUT Right View



EUT Top View



EUT Rear View



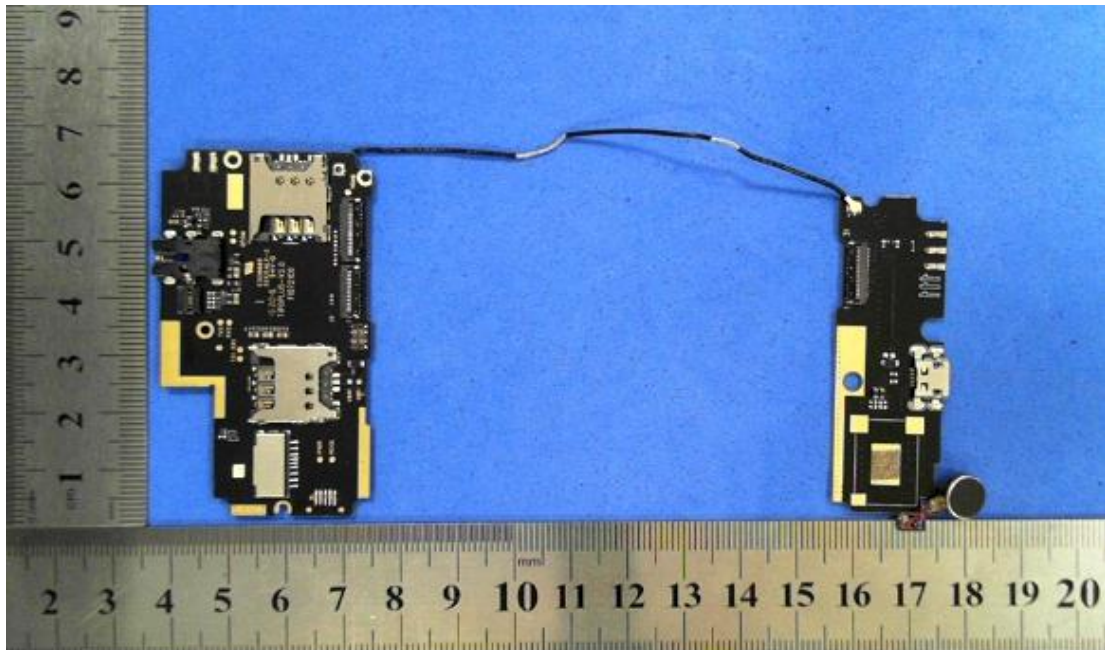
All



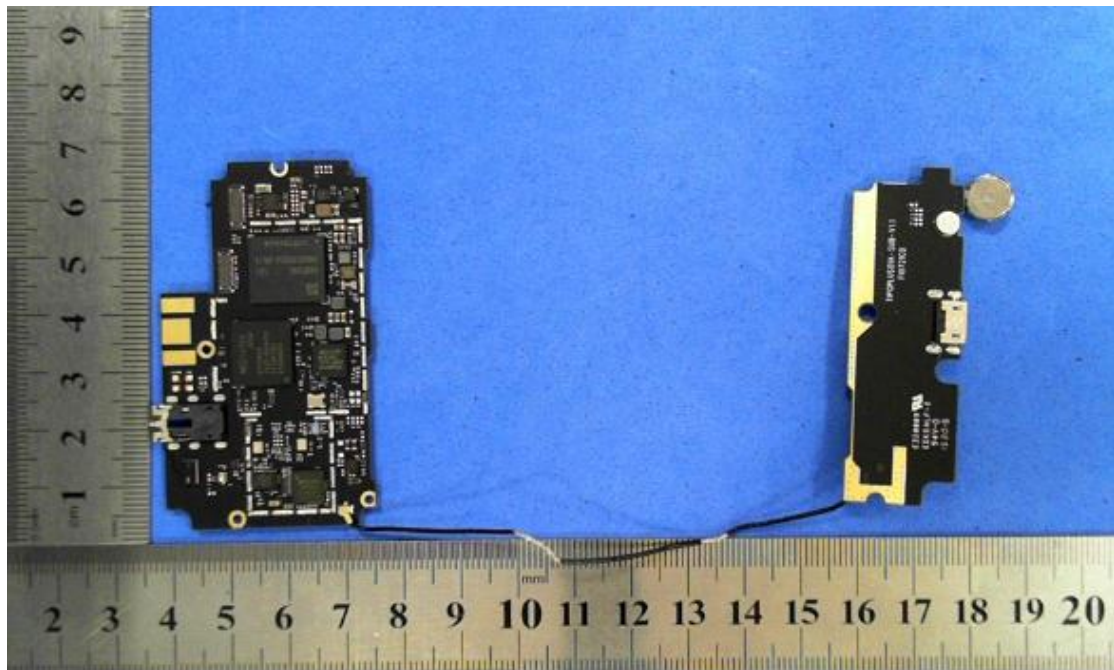
Cover off



Main board Front View



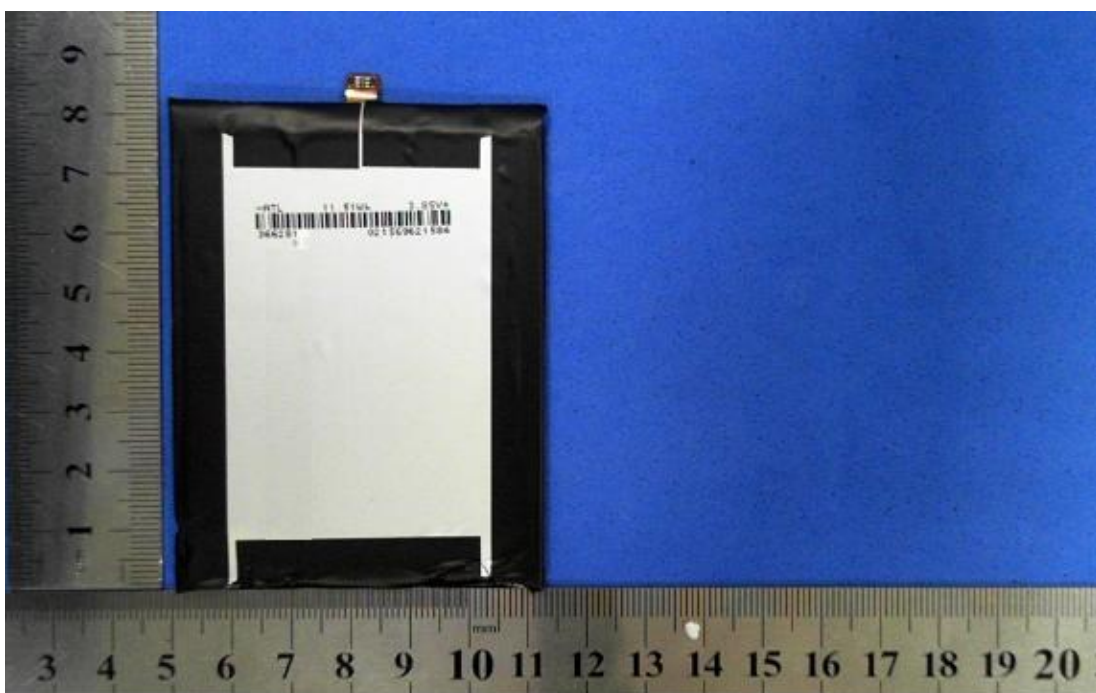
Main board Rear View



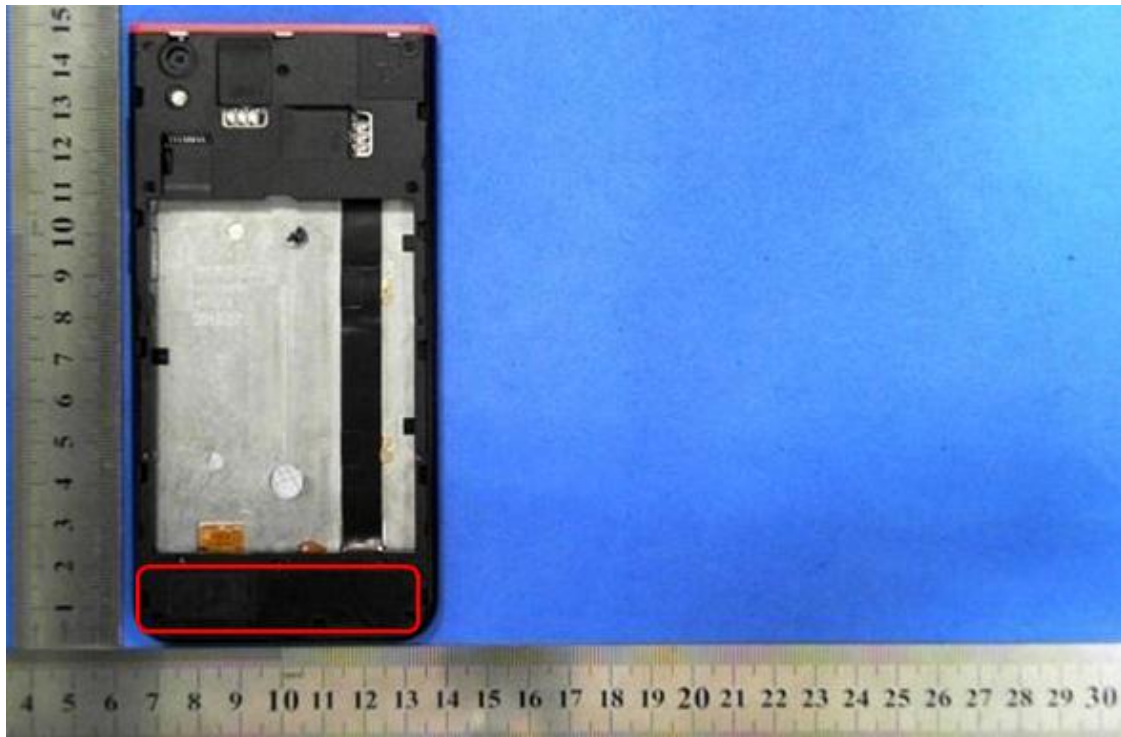
Battery Front View



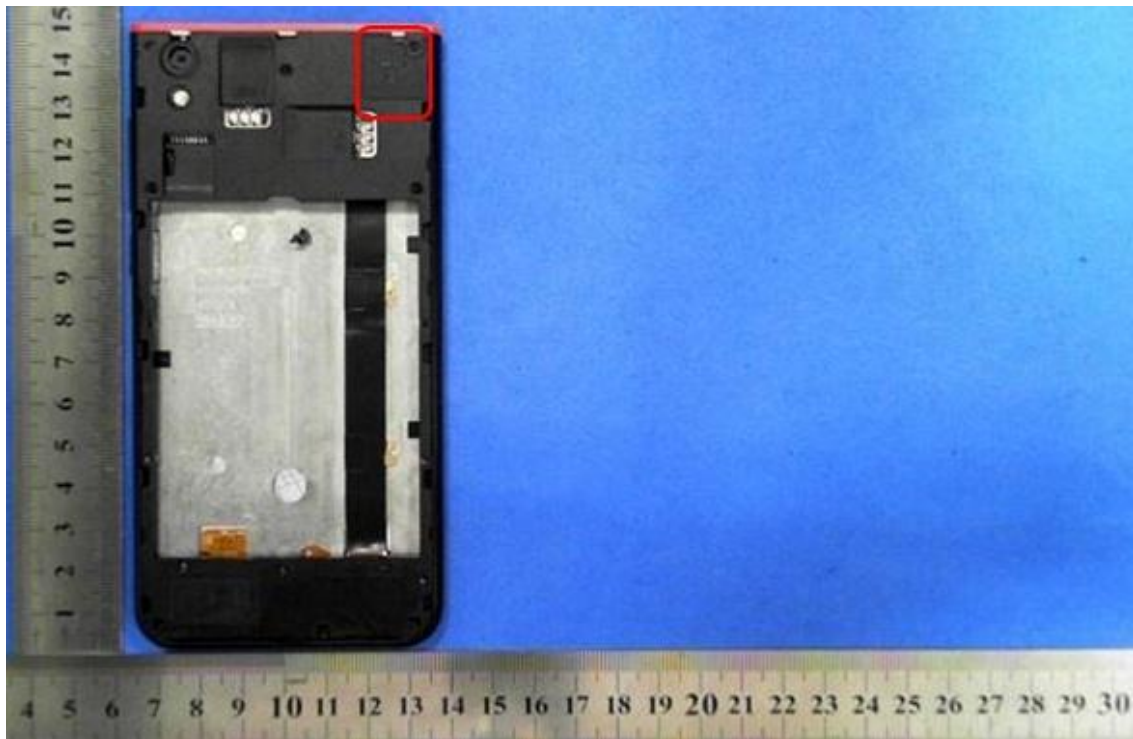
Battery Back View



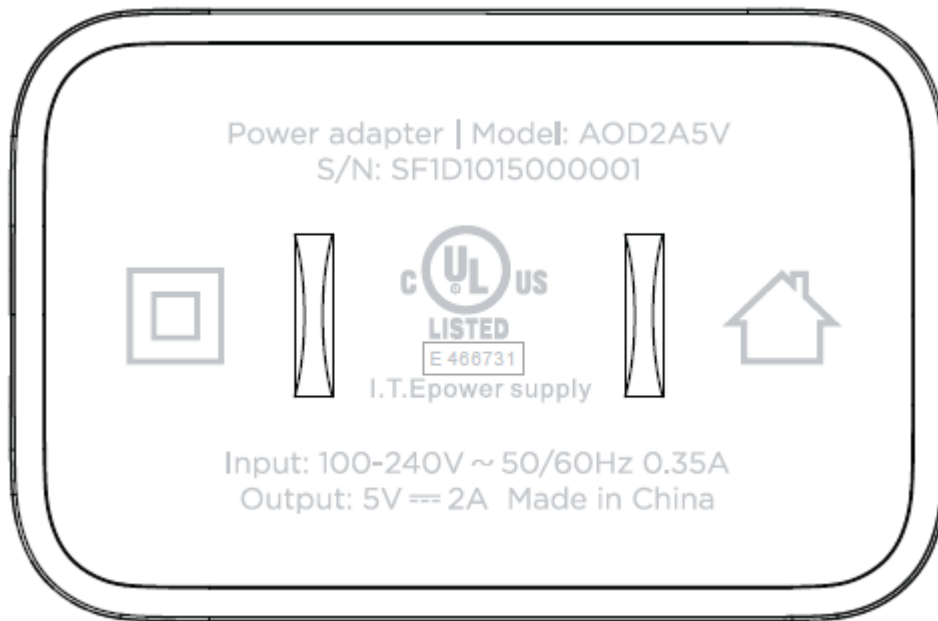
GSM/WCDMA Antenna View



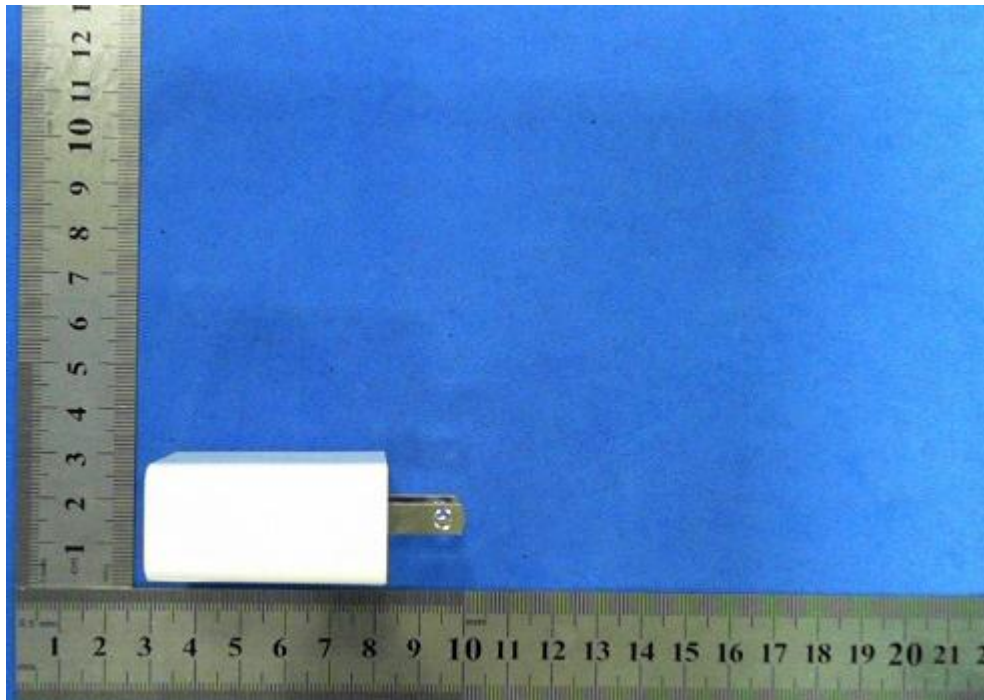
BT/WIFI Antenna View



Adapter label view



Adapter view



USB Cable



ANNEX B: EMC Emission Measurements Test Results**B.1 Test of Radiated Emissions****B.1.1 Limit of Radiated Emissions (At a measuring distance of 3 m)**

Frequency range (MHz)	Field Strength (microvolts/m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

B.1.2 Test Procedure

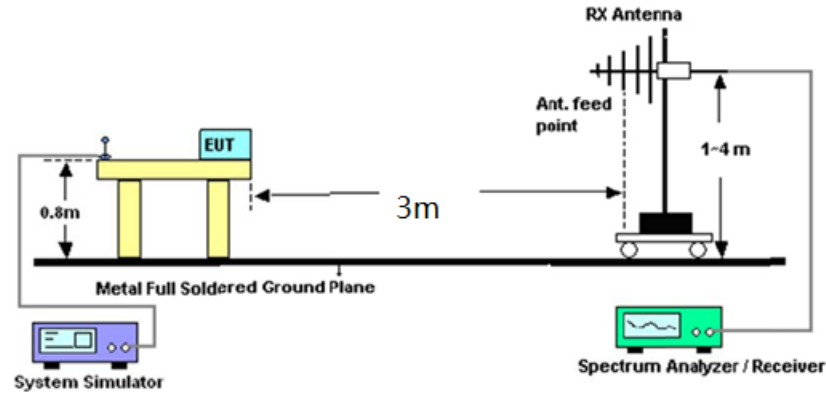
- a. The EUT was placed on a turntable with 1.5 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The height of the antenna is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
- e. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower(from 1 m to 4 m)and turntable(from 0 degree to 360 degrees)to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 20dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
- h. Emission level (dBμV/m) = 20 log Emission level (μV/m).

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

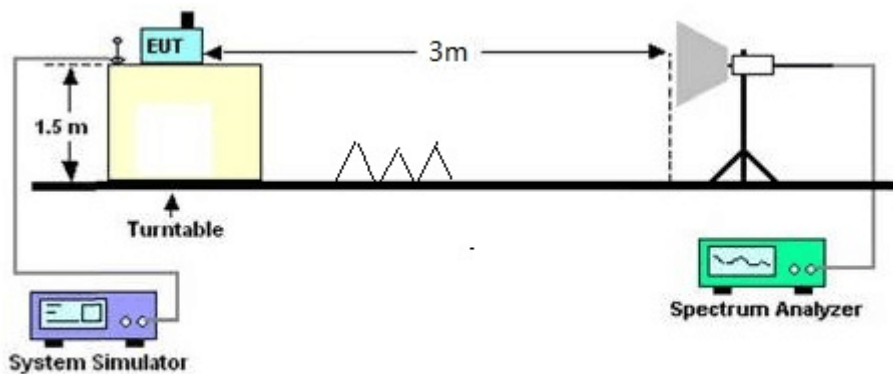
Frequency Band(MHz)	Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	Peak	100kHz	100kHz
Above 1000	Peak	1MHz	1MHz
	Average	1MHz	10Hz

B.1.3 Test Setup

B.1.3.1 Radiated Emissions Frequency: 30MHz to 1000MHz

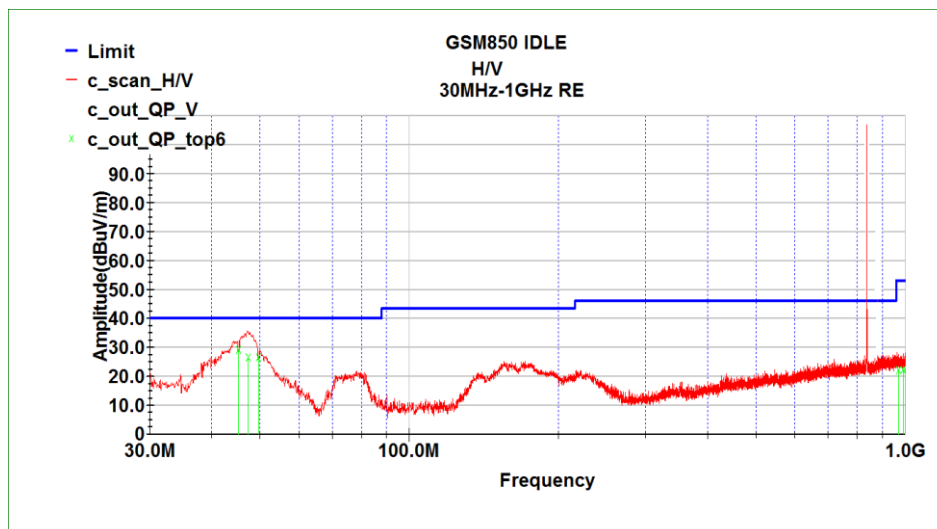


B.1.3.2 Radiated Emissions Frequency: Above 1000 MHz



B.1.4 Test Results

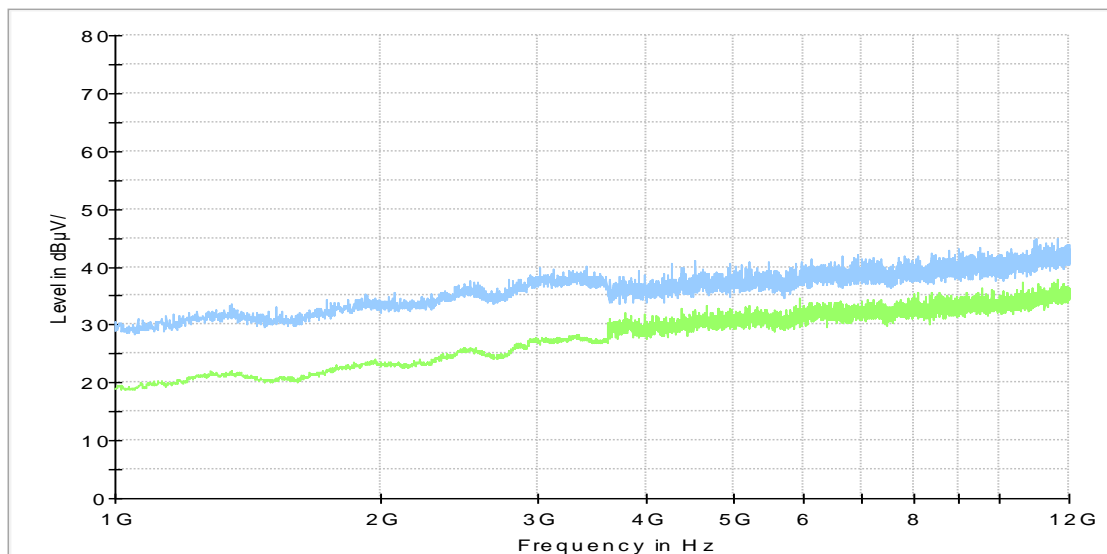
Mode 1: GSM850 Idle + WIFI+USB Cable (Charging from PC)



Frequency (MHz)	Polarization (H/ V)	Tower (cm)	Table (°)	QP	
				Limit dB(μV/m)	QP dB(μV/m)
45.2597	V	100	288	40	29.14
47.3497	V	110	279	40	26.46
49.6415	V	104	287	40	26.49
970.045	H	100	253	54	22.01
990.522	H	100	253	54	22.22
999.86	H	100	253	54	22.21

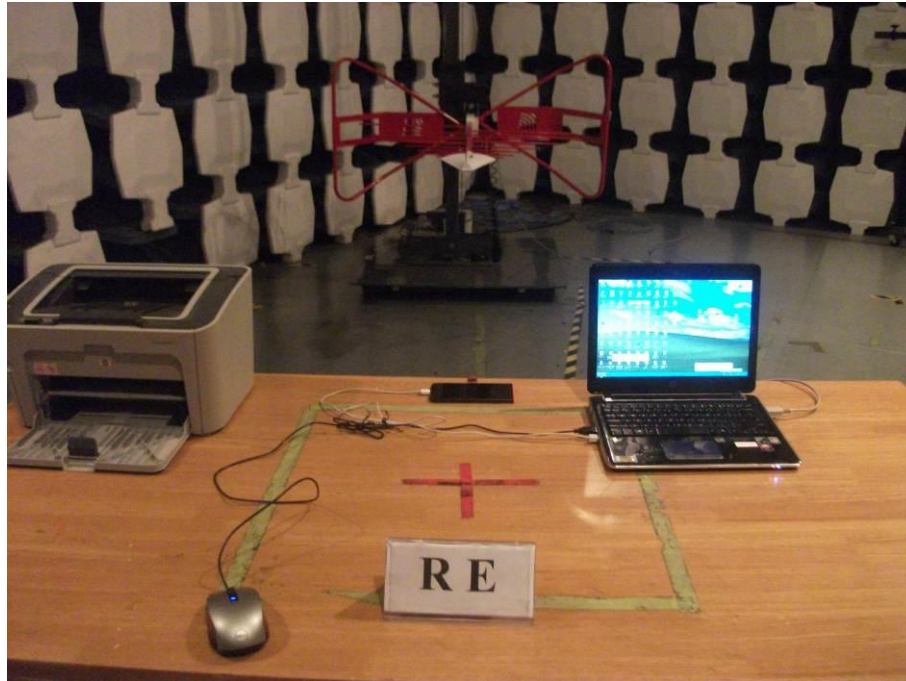
Note: only record low 6dB or measuring higher than the limit value than the limit value.

Mode 4: WCDMA Band V Idle + USB Cable (Charging from PC) (Above 1000 MHz)



Frequency (MHz)	Polarization (H/ V)	Tower (cm)	Table (°)	PK		AV	
				Limit dB(μV/m)	PK dB(μV/m)	Limit dB(μV/m)	AV dB(μV/m)
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/

Note: only record low 6dB or measuring higher than the limit value than the limit value.

B.1.5 Test Setup**B.1.5.1 Radiated Emissions Frequency: 30MHz to 1000MHz****B.1.5.2 Radiated Emissions Frequency: Above 1000 MHz**



B.1.6 Measurement Uncertainty

RE Uncertainty Evaluation (30MHz~1000MHz)	
Uncertainty for 95% Confidence	5.2dB
RE Uncertainty Evaluation (1GHz~6GHz)	
Uncertainty for 95% Confidence	5.4dB

B.2 Test of AC Conducted Emission

B.2.1 Limit of AC Conducted Emission

Frequency (MHz)	QP Limit (dBμV)	AV Limit (dBμV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

*Decreases with the logarithm of the frequency.

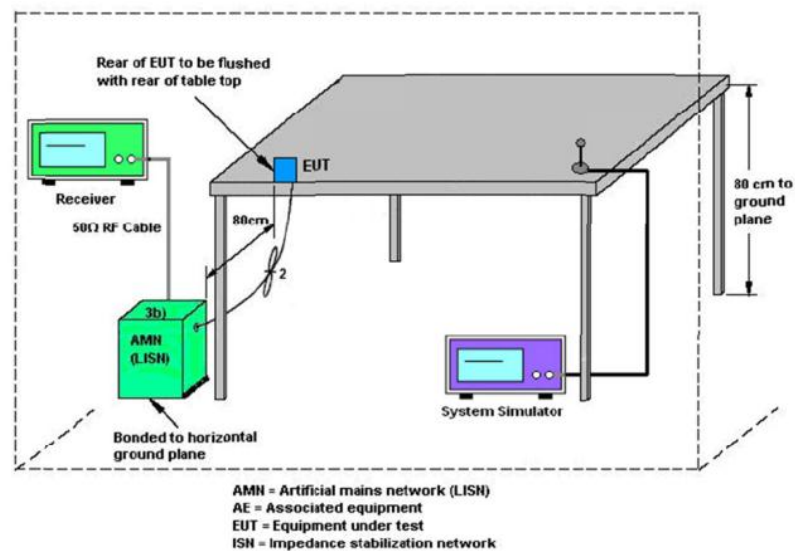
B.2.2 Test Procedures

- a. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meters

from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.

- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was scanned.
- h. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- i. The EMI test receiver was then turned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10kHz .For FCC test, only Quasi-peak measurements were made.

B.2.3 Test Setup





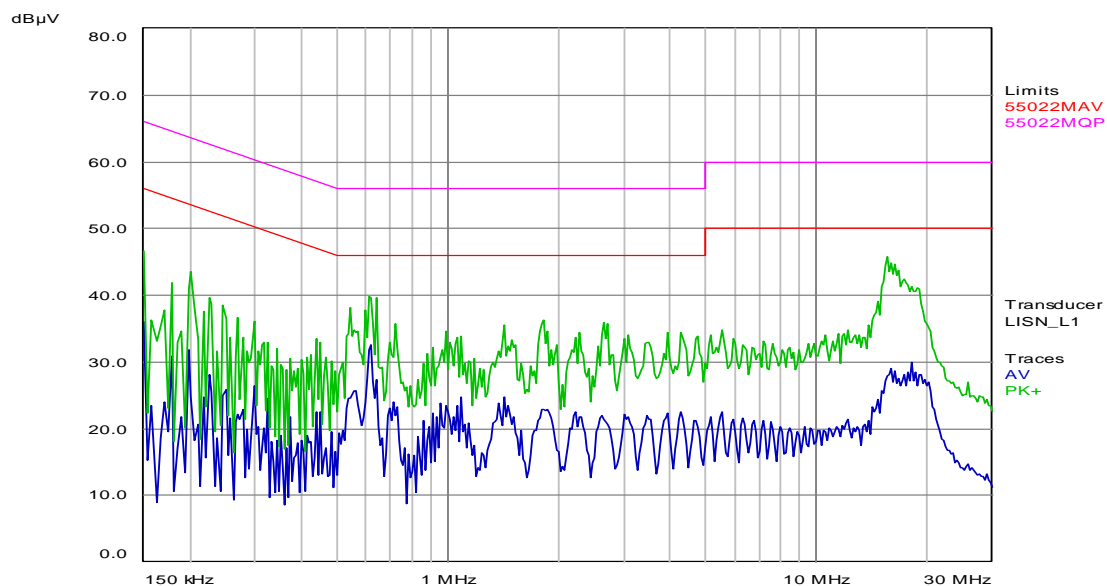
B.2.4 Measurement Uncertainty

CE Uncertainty Evaluation (150kHz~30MHz)	
Uncertainty for 95% Confidence	3.8dB

B.2.5 Test Results

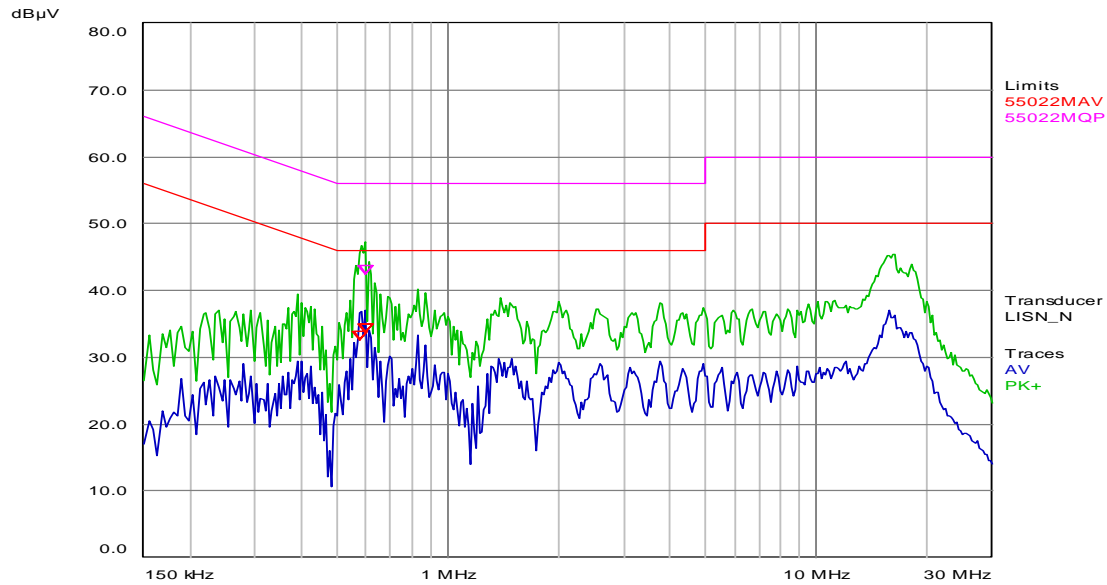
Mode 2: GSM1900 Idle + USB Cable (Charging from Adapter)

LINE L:



Trace	Frequency	Level	Limit	Delta Limit	Comment
	(MHz)	(dB μ V)	(dB μ V)	(dB)	
/	/	/	/	/	/
/	/	/	/	/	/

LINE N:



Trace	Frequency	Level	Limit	Delta Limit	Comment
	(MHz)	(dB μ V)	(dB μ V)	(dB)	
1 AV	0.5775	32.61	46.00	-13.39	N / on
1 AV	0.6	33.62	46.00	-12.38	N / on
2 QP	0.6	42.37	56.00	-13.63	N / on

Note: only record low 10dB or measuring higher than the limit value than the limit value.

ANNEX C: Report Revision History

Report NO.	Report version	Description	Issue Date
150934-EMC	NONE	Original	2015.11.27

***** END OF REPORT*****