



TEST REPORT

No. 2013TAR763

for

Sony Mobile Communications AB

GSM/WCDMA/LTE mobile phone

Type: PM-0640-BV

FCC ID: PY7PM-0640

with

Hardware Version: A

Software Version: 14.2.A.0.78

Issued Date: Nov. 15th, 2013

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 TMC Beijing.

Test Laboratory:

DAkks accreditation (DIN EN ISO/IEC 17025): No. D-PL-12123-01-01

FCC 2.948 Listed: No.733176

IC O.A.T.S listed: No.6629A-1

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China 100191.

Tel: +86(0) 10-62304633-2561, Fax:+86(0)10-62304633-2504 Email:welcome@emcite.com. www.emcite.com

CONTENTS

1. TEST LABORATORY.....	3
1.1. TESTING LOCATION.....	3
1.2. TESTING ENVIRONMENT.....	3
1.3. PROJECT DATA.....	3
1.4. SIGNATURE.....	3
2. CLIENT INFORMATION.....	4
2.1. APPLICANT INFORMATION.....	4
2.2. MANUFACTURER INFORMATION.....	4
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE).....	5
3.1. ABOUT EUT.....	5
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST.....	5
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	5
3.4. GENERAL DESCRIPTION.....	6
4. REFERENCE DOCUMENTS.....	7
4.1. REFERENCE DOCUMENTS FOR TESTING.....	7
5. LABORATORY ENVIRONMENT.....	8
6. SUMMARY OF TEST RESULTS.....	9
6.1. SUMMARY OF TEST RESULTS.....	9
6.2. STATEMENTS.....	9
7. TEST EQUIPMENTS UTILIZED.....	10
ANNEX A: MEASUREMENT RESULTS.....	11
ANNEX B: TEST LAYOUT.....	14
ANNEX C: EUT PHOTOGRAPH.....	15

1. Test Laboratory

1.1. Testing Location

Location A

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
Address: No 52, Huayuan Bei Road, Haidian District, Beijing, P.R. China
Postal Code: 100191

1.2. Testing Environment

Normal Temperature: 15-35°C
Relative Humidity: 20-75%
Air pressure: 980 - 1040 hPa

The climatic requirements above are general exclude the special requirements for dedicated test environments listed in section 5 and some specific test cases in other parts of this report.

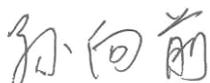
1.3. Project data

Receipt of Sample: Oct. 29th, 2013
Testing Start Date: Oct. 31st, 2013
Testing End Date: Nov. 12th, 2013

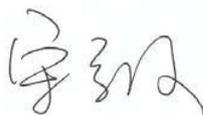
1.4. Signature



Qu Pengfei
(Prepared this test report)



Sun Xiangqian
(Reviewed this test report)



Song Chongwen
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: Sony Mobile Communications (China) Co. Ltd
Address /Post: Sony Mobile R&D Center, No. 16, Guangshun South Street,
Chaoyang District
City: Beijing
Postal Code: 100102
Country: China
Contact Person: Ma, Gang
Telephone: +86-10-58656312
Fax: +86-10-58659049

2.2. Manufacturer Information

Company Name: Sony Mobile Communications AB
Address /Post: Mobilvägen, 22188 Lund, Sweden
City: Lund
Postal Code: 22188
Country: Sweden
Contact Person: Nilsson, Mikael
Telephone: +46 703 227503
Fax: +46 706 127385

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

3.1. About EUT

Description	GSM 850/900/1800/1900 quad bands, GPRS, EDGE, WCDMA FDD bands 1/2/4/5/8, HSDPA, HSUPA, LTE FDD bands 1/2/3/4/5/7/8/20, Bluetooth (EDR and 4.0), ANT+, WLAN (802.11 a/ac/b/g/n), NFC, FM, GPS mobile phone
Type	PM-0640-BV
FCC ID	PY7PM-0640
GSM Frequency Band	GSM 850/900/1800/1900
UMTS Frequency Band	FDD Band 1 / FDD Band 2/ FDD Band 4/ FDD Band 5 / FDD Band 8
LTE Frequency Band	FDD Band 1/ FDD Band 2/ FDD Band 3 / FDD Band 4 / FDD Band 5/ FDD Band 7/ FDD Band 8/ FDD Band 20
Antenna	Internal
Power supply	Battery (charged by travel adapter or vehicle charger)
Extreme vol. Limits	3.6VDC to 4.2VDC (nominal: 4.2VDC)
Extreme temp. Tolerance	-30°C to +50°C

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN	IMEI	HW Version	SW Version
EUT4	CB5A1VG620	004402451604411	A	14.2.A.0.78

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

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN	Revision
#24009	USB Cable	123307DD003654E	1
#23899	Vehicle Charger	123714060270742	1

#24009

Commercial name	EC801
Type	AI-0401
Manufacturer	Sony Mobile
Length of cable	98.5 cm

#23899

Type	CAA-0003013
Manufacturer	Sony Mobile
Length of cable	98.5 cm (the length of USB cable)

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

3.4. General Description

The Equipment Under Test (EUT) is a model of GSM/WCDMA/LTE mobile phone with integrated antenna and inbuilt battery.

The EUT supports GSM 850/900/1800/1900MHz bands, WCDMA FDD band 1/2/4/5/8 and LTE FDD bands 1/2/3/4/5/7/8/20. It supports GPRS service with multi-slots class 33 and EGPRS service with multi-slots class 33. The HSDPA and HSUPA features are also supported.

It has MP3, camera, USB memory, Mobile High-Definition Link (MHL), FM radio, GPS receiver, NFC, Bluetooth (EDR and Bluetooth 4.0), ANT+, WLAN (802.11 a/ac/b/g/n) and Wi-Fi hotspot functions. For WLAN 802.11n, it supports 20MHz bandwidth on 2.4GHz band and 20MHz/40MHz bandwidths on 5GHz/5.8GHz band. For WLAN 802.11 ac, it supports 20MHz/40MHz/80MHz bandwidths.

It includes normal options: vehicle charger and USB cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices	10-1-12 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2009

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber SAC-1 (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3m/10m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Shielded room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

6. SUMMARY OF TEST RESULTS

6.1. Summary of test results

Abbreviations used in this clause:		
Verdict Column	P	Pass
	F	Fail
	NA	Not applicable
	NM	Not measured
Location Column	A/B/C/D	The test is performed in test location A, B, C or D which are described in section 1.1 of this report

Items	Test Name	Clause in FCC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	B.1	P	A

6.2. Statements

The test cases listed in section 6.1 of this report for the EUT specified in section 3 were performed by TMC according to the standards or reference documents in section 4.1

The EUT met all applicable requirements of the standards or reference documents in section 4.1.

This report only deals with the GPS receiver function among the features described in section 3.

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE
1.	Test Receiver	ESCI 7	100948	R&S	2014-07-18
2.	Spectrum Analyzer	FSV	100376	R&S	2014-06-30
3.	EMI Antenna	VULB 9163	9163-483	Schwarzbeck	2014-02-17
4.	EMI Antenna	3115	6914	ETS-Lindgren	2014-12-16
5.	Universal Radio Communication Tester	CMU200	102228	R&S	2014-06-23
6.	Vector Signal Generator	SMU200A	102082	R&S	2013-11-14

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission

Reference

FCC: CFR Part 15.109(a)

A.1.1 Method of measurement

The field strength of radiated emissions from the GPS receiver of MS at a distance of 10m (30MHz-1GHz) and 3 m (>1GHz) is tested. Tested in accordance with the procedures of ANSI C63.4 - 2009, section 8.3.

A.1.2 EUT Operating Mode:

EUT Setup: EUT4 + #24009 + #23899

A vector signal generator is used to provide the simulated GPS signal, and the frequency is set to 1575.42 MHz. Before the test starts, the integrated GPS application in MS is started up and locked to the simulated GPS signal.

Meanwhile, the EUT is synchronized to universal radio communication tester, and able to respond to paging messages and incoming call. An established call has been released.

A.1.3 Test layout: see Pic.1 in ANNEX B.

A.1.4 Measurement Limit

Limit from CFR Part 15.109(a)

Frequency range (MHz)	Field strength limit ($\mu\text{V}/\text{m}$)		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

A.1.5 Test Condition

Frequency range (MHz)	RBW/VBW	Sweep Time (s)	Detector
30-1000	120kHz (IF Bandwidth)	5	Peak/Quasi-peak
Above 1000	1MHz/1MHz	15	Peak, Average

A.1.6 Measurement Results

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss". It includes the antenna factor of receive antenna and the path loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}} = P_{\text{Mea}} + G_A + G_{\text{PL}}$$

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

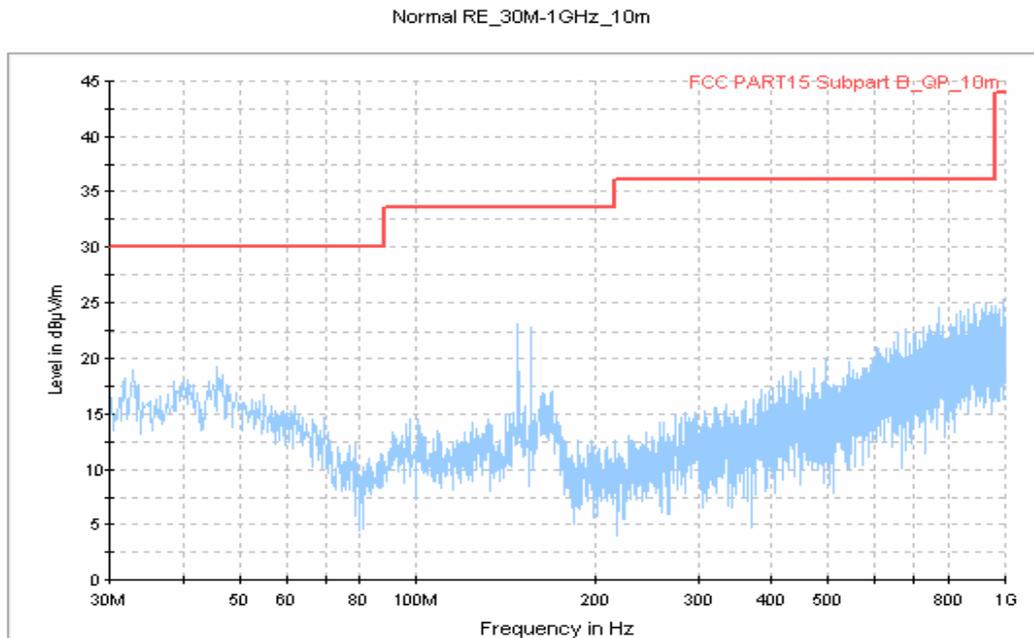
Measurement result for GPS mode:

Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17820.438	65.0	-18.5	45.6	37.9	HORIZONTAL
17894.813	64.6	-18.5	45.6	37.5	VERTICAL
17898.000	64.1	-18.5	45.6	37.0	VERTICAL
17875.688	63.8	-18.5	45.6	36.7	HORIZONTAL
17825.750	63.8	-18.5	45.6	36.7	VERTICAL
17924.563	63.7	-17.7	45.6	35.8	VERTICAL

Average detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17866.125	52.3	-18.5	45.6	25.2	HORIZONTAL
17868.250	52.2	-18.5	45.6	25.1	VERTICAL
17861.875	52.2	-18.5	45.6	25.1	VERTICAL
17867.188	52.2	-18.5	45.6	25.1	VERTICAL
17870.375	52.2	-18.5	45.6	25.1	HORIZONTAL
17885.250	52.1	-18.5	45.6	25.0	HORIZONTAL



Note: The test distance for 30MHz-1GHz is 10 m, so the limit line used is 10 dB below the limit in A.1.4.

Figure A.1 Radiated Emission from 30MHz to 1GHz

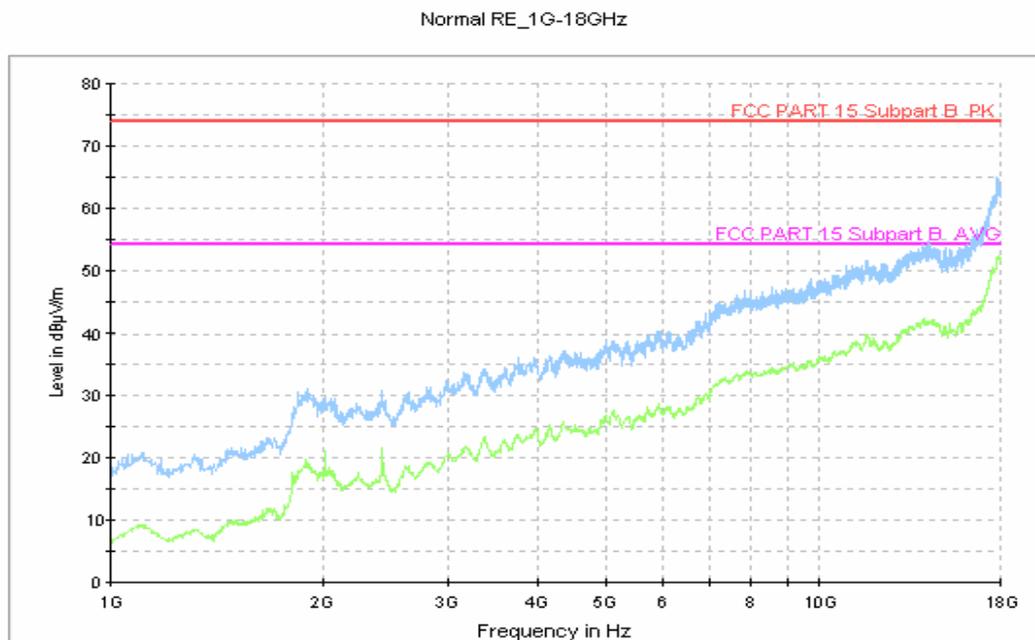


Figure A.2 Radiated Emission from 1GHz to 18GHz

Maximum expanded measurement uncertainty (30MHz - 1GHz): $U = 3.9$ dB, $k = 2$.

Maximum expanded measurement uncertainty (>1GHz): $U = 4.2$ dB, $k = 2$