FCC SAR TEST REPORT

Report No.:	SET2015-01431
Product:	LTE Mobile Phone
Model No.:	M4 SS4445T
FCC ID:	CLNSS4445T
Applicant:	MFOURTEL MEXICO S.A. DE C.V.
Address:	Av. Ejército Nacional 436 Piso 3 Chapultepec Morales Miguel Hidalgo Distrito Federal 11570.
Issued by:	CCIC-SET
Lab Location:	Electronic Testing Building, Shahe Road，Xili, Nanshan District, Shenzhen, 518055, P. R. China
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Test Report

Product. …….:	LTE Mobile Phone
Model No. ……..:	M4 SS4445T
Brand Name……..:	M4
FCC ID…….:	CLNSS4445T
Applicant……..:	MFOURTEL MEXICO S.A. DE C.V.
Applicant Address…….:	Av. Ejército Nacional 436 Piso 3 Chapultepec Morales Miguel Hidalgo Distrito Federal 11570.
Manufacturer……:	CK Telecom Limited
Manufacturer Address:	Technology Road.High-Tech Development Zone. Heyuan, Guangdong,P.R.China.
Test Standards…….:	**447CFR § 2.1093-** Radiofrequency Radiation Exposure Evaluation: Portable Devices; **ANSI C95.1–1992:** Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991) **IEEE 1528–2003:** IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques;
Test Result……:	Pass

Tested by ……..: Mei Chun 2015-01-30

Chun Mei, Test Engineer

Reviewed by……: Shuangwen Zhang 2015-01-30

Shuangwen Zhang,Senior Egineer

Approved by……: Wu Lian 2015-01-30

Wu Li'an , Manager

Contents

This Test Report consists of the following Annexes:

1. GENERAL CONDITIONS

1.1 This report only refers to the item that has undergone the test.

1.2 This report standalone does not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities.

1.3 This document is only valid if complete; no partial reproduction can be made without written approval of CCIC-SET

1.4 This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of CCIC-SET and the Accreditation Bodies, if it applies.

2. Administrative Date

2.1. Identification of the Responsible Testing Laboratory

Company Name:	CCIC-SET
Department:	EMC & RF Department
Address:	Electronic Testing Building, Shahe Road, Nanshan District, ShenZhen, P. R. China
Telephone:	+86-755-26629676
Fax:	+86-755-26627238
Responsible Test Lab Managers:	Mr. Wu Li'an

2.2. Identification of the Responsible Testing Location(s)

Company Name:	CCIC-SET
Address:	Electronic Testing Building, Shahe Road, Nanshan District, Shenzhen, P. R. China

2.3. Organization Item

CCIC-SET Report No.:	SET2015-01431
CCIC-SET Project Leader:	Mr. Li Sixiong
CCIC-SET Responsible for accreditation scope:	Mr. Wu Li'an
Start of Testing:	2014-11-19
End of Testing:	2015-01-27

2.4. Identification of Applicant

Company Name:	MFOURTEL MEXICO S.A. DE C.V.
Address:	Av. Ejército Nacional 436 Piso 3 Chapultepec Morales Miguel Hidalgo Distrito Federal 11570.

2.5. Identification of Manufacture

Company Name:	CK Telecom Limited
Address:	Technology Road.High-Tech Development Zone. Heyuan, Guangdong,P.R.China.

Notes: This data is based on the information by the applicant.

3. Equipment Under Test (EUT)

3.1. Identification of the Equipment under Test

Sample Name:	LTE Mobile Phone	
Type Name:	M4 SS4445T	
Brand Name:	M4	
General description:	Support Band	GSM850MHz/1900MHz/900MHz/1800MHz WCDMA 850MHz/1900MHz/2100MHz LTE Band 2,4,17 Wi-Fi802.11b,802.11g,802.11n-20, Bluetooth4.0
	Test Band	GSM 850MHz/ GSM 1900MHz, GPRS 850MHz/ GPRS 1900MHz, WCDMA 850MHz/ WCDMA 1900MHz LTE Band 2,4,17, Wi-Fi 802.11b
	Multislot Class	GPRS: Class 12,EDGE:Class 12
	Release Version	WCDMA:R99,HSDPA:R5 ,HSUPA:R6,HSPA+:R7 LTE:R8
	GPRS Class	Class B
	Development Stage	Identical Prototype
	Accessories	Power Supply
	Battery type	3.7V 2000mAh
	Antenna type	PIFI Antenna
	Operation mode	GSM / GPRS/EDGE/WCDMA/LTE / Bluetooth / WIFI
	Modulation mode	GMSK, QPSK,DSSS, OFDM, 16QAM, GFSK/π /4-DQPSK/8-DPSK
	IMEI	863147020002403
	Max. RF Power	33.63dBm
	Max. SAR Value	Head:0.433w/kg; Body:1.350w/kg

NOTE:

a. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

b. This device supports GPRS and EDGE operation up to class12(max.uplin:4, max.downlink:4, total timeslots:5)

c. The EUT does not support 16QAM uplink function in HSPA+ mode.

4 SAR SUMMARY

Highest Measured Standalone SAR Summary

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Head	GSM850	0.361	0.433
	GSM1900	0.257	
	WCDMA Band Ⅱ	0.377	
	WCDMA Band Ⅴ	0.346	
	LTE FDD2	0.271	
	LTE FDD4	0.409	
	LTE FDD17	0.433	
	WIFI	0.029	
	BT	0.053	
Body-worn Accessory & Hotspot (5mm Gap)	GSM850	1.199	1.350
	GSM1900	1.350	
	WCDMA Band Ⅱ	1.146	
	WCDMA Band Ⅴ	0.749	
	LTE FDD2	1.321	
	LTE FDD4	0.792	
	LTE FDD17	0.791	
	WIFI	0.046	
	BT	0.053	

5 Specific Absorption Rate (SAR)

5.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

5.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (). The equation description is as below:

$$\mathrm{SAR} = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dv}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

$$\mathrm{SAR} = C\frac{\delta T}{\delta t}$$

where C is the specific head capacity, δT is the temperature rise and δt the exposure duration, or related to the electrical field in the tissue by

$$\mathrm{SAR} = \frac{\sigma |E|^2}{\rho}$$

where σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the rms electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

5.3 Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SATIMO. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).

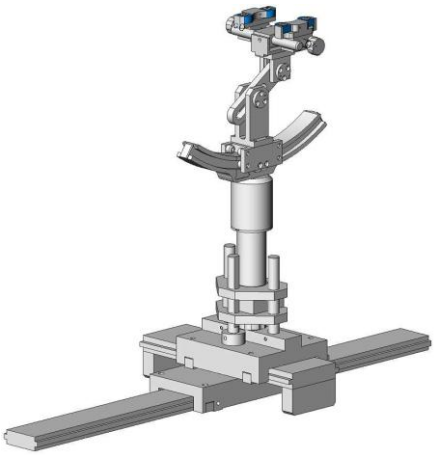
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

SAM Twin Phantom

5.4 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SATIMO as an integral part of the COMOSAR test system.

The device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.



Device holder

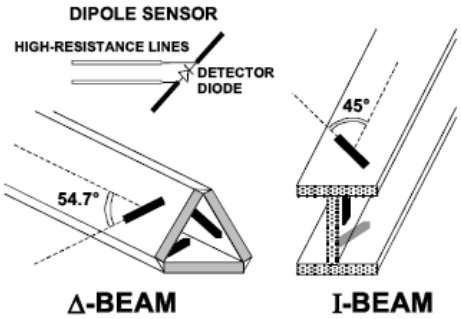
5.5 Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	700 MHz to 3 GHz; Linearity: ± 0.5 dB (700 MHz to 3 GHz)
Directivity	± 0.25 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	1.5 µW/g to 100 mW/g; Linearity: ± 0.5 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 5 mm (Body: 8 mm) Distance from probe tip to dipole centers: <2.7 mm
Application	General dosimetry up to 3 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones
Frequency	450 MHz to 6 GHz; Linearity: ± 0.5 dB (450 MHz to 6 GHz)
Dimensions	Overall length: 330 mm Tip diameter: 2.5 mm Distance from probe tip to dipole centers: 1 mm
Compatibility	COMOSAR

Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



6 OPERATIONAL CONDITIONS DURING TEST

6.1 Schematic Test Configuration

During SAR test, EUT was operating in Traffic Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with a System Simulator (SS) by air link, and a call is established.

The Absolute Radio Frequency Channel Number (ARFCN) was allocated to 128, 189 and 251 respectively in the case of GSM 850MHz, or to 512, 661 and 810 respectively in the case of PCS 1900MHz, or to 4132, 4182 and 4233 respectively in the case of WCDMA 850MHz, or to 9262, 9400 and 9538 respectively in the case of WCDMA 1900MHz, or to High, Middle, and Low Channel respectively in the case of LTE Band 4 and Band 17, and WIFI 802.11b. The EUT was commanded to operate at maximum transmitting power.

The EUT should use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link was used, the antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the handset.

The signal transmitted by the simulator to the antenna feeding point should be lower than the output power level of the handset by at least 35 dB

6.2 SAR Measurement System

The SAR measurement system being used is the SATIMO system, the system is controlled remotely from a PC, which contains the software to control the robot and data acquisition equipment. The software also displays the data obtained from test scans.

In operation, the system first does an area (2D) scan at a fixed depth within the liquid from the inside wall of the phantom. When the maximum SAR point has been found, the system will then carry out a 3D scan centred at that point to determine volume averaged SAR level.

6.2.1 Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness Power drifts in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Table 1: Recommended Dielectric Performance of Tissue

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.46	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (Nacl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton x-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (s/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Table 2 Recommended Tissue Dielectric Parameters

Frequency (MHz)	Head Tissue		Body Tissue	
	ε_r	σ(S/m)	ε_r	σ(S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

6.2.2 Simulant liquids

For measurements against the phantom head, the “cheek” and “tilt” position on both the left hand and the right hand sides of the phantom. For body-worn measurements, the EUT was tested against flat phantom representing the user body. The EUT was put on in the belt holder. Simulant liquids that are used for testing at frequencies of GSM 850MHz/1900MHz, WCDMA850MHz/1900MHz, LTE Band 4 and Band 17and Wi-Fi 2.4GHz, which are made mainly of sugar, salt and water solutions may be left in the phantoms.

Table 3: Dielectric Performance of Head Tissue Simulating Liquid

Temperature: 23.2°C; Humidity: 64%;			
/	Frequency	Permittivity ε	Conductivity σ (S/m)
Target value	835MHz	41.5	0.90
Validation value (Nov. 19th, 2014)	835MHz	41.45	0.91
Target value	1750 MHz	40.0	1.40
Validation value (Nov. 20h, 2014)	1750 MHz	39.98	1.41
Target value	1900MHz	40.0	1.40
Validation value (Nov. 21th, 2014)	1900MHz	39.98	1.41
Target value	2450MHz	39.2	1.80
Validation value (Nov. 24th, 2014)	2450MHz	38.99	1.81
Target value	835MHz	41.5	0.90
Validation value (Nov. 25th, 2014)	835MHz	41.46	0.91
Target value	1900MHz	40.0	1.40
Validation value (Jan. 27th, 2015)	1900MHz	39.98	1.40

Table 4: Dielectric Performance of Body Tissue Simulating Liquid

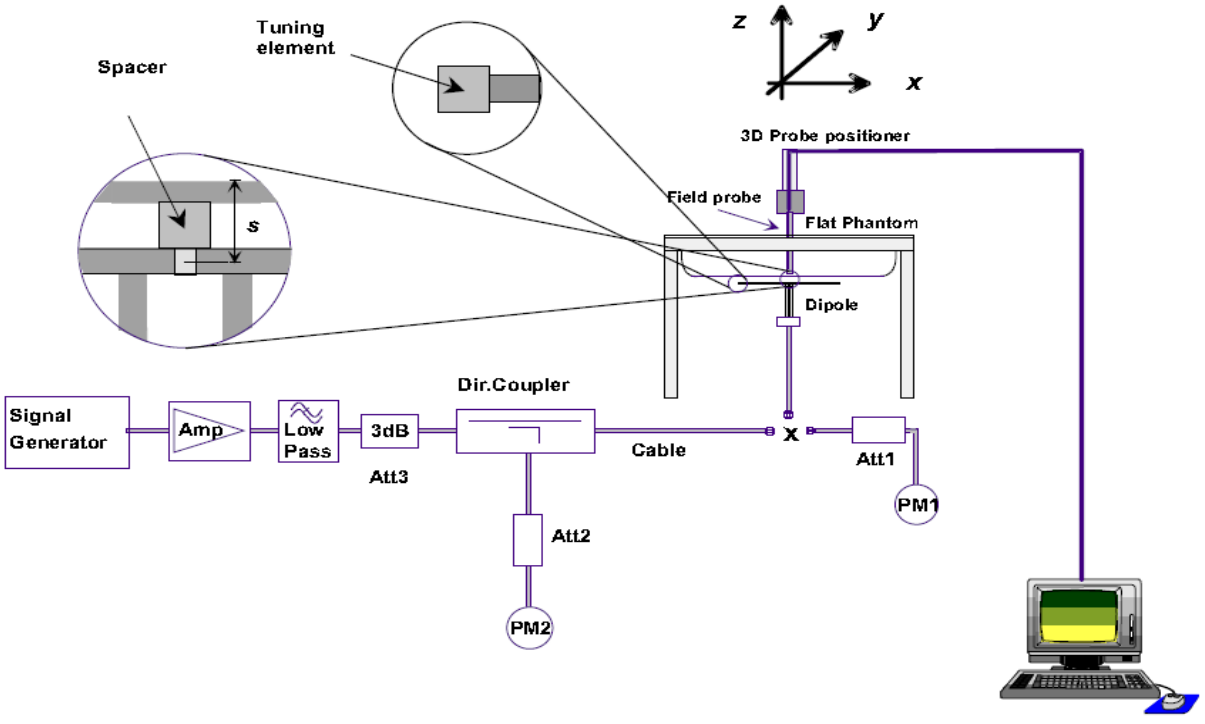
Temperature: 23.2°C; Humidity: 64%;			
/	Frequency	Permittivity ε	Conductivity σ (S/m)
Target value	835MHz	55.2	0.97
Validation value (Nov. 19th, 2014)	835MHz	55.26	0.98
Target value	1750 MHz	53.3	1.52
Validation value (Nov. 20h, 2014)	1750 MHz	53.89	1.53
Target value	1900MHz	53.3	1.52
Validation value (Nov. 21th, 2014)	1900MHz	53.28	1.53
Target value	2450MHz	52.7	1.95
Validation value (Nov. 24th, 2014)	2450MHz	52.65	1.96

Target value	835MHz	55.2	0.97
Validation value (Nov. 25th, 2014)	835MHz	55.53	1.02
Target value	1900MHz	53.3	1.52
Validation value (Jan. 27th, 2015)	1900MHz	53.27	1.53

6.3 Equipments and results of validation testing

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ±10%. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

The following procedure, recommended for performing validation tests using box phantoms is based on the procedures described in the IEEE standard P1528 2003. Setup according to the setup diagram below :



With the SG and Amp and with directional coupler in place, set up the source signal at the relevant frequency and use a power meter to measure the power at the end of the SMA cable that you intend to connect to the balanced dipole. Adjust the SG to make this, say, 0.25W (24 dBm). If this level is too high to read directly with the power meter sensor, insert a calibrated attenuator (e.g. 10 or 20 dB) and make a suitable correction to the power meter reading.

Note 1: In this method, the directional coupler is used for monitoring rather than setting the exact feed power level. If, however, the directional coupler is used for power measurement, you should check the frequency range and power rating of the coupler and measure the coupling factor (referred to output) at the test frequency using a VNA.

Note 2: Remember that the use of a 3dB attenuator (as shown in Figure 8.1 of P1528) means that you need an RF amplifier of 2 times greater power for the same feed power. The other issue is the cable length. You might get up to 1dB of loss per meter of cable, so the cable length after the coupler needs to be quite short.

Note 3: For the validation testing done using CW signals, most power meters are suitable. However, if you are measuring the output of a modulated signal from either a signal generator or a handset, you must ensure that the power meter correctly reads the modulated signals.

The measured 1-gram averaged SAR values of the device against the phantom are provided in Tables 7 and Table 8. The humidity and ambient temperature of test facility were 64% and 23.2°C respectively. The body phantom were full of the body tissue simulating liquid. The EUT was supplied with full-charged battery for each measurement.

The distance between the back of the EUT and the bottom of the flat phantom is 5 mm (taking into account of the IEEE 1528 and the place of the antenna).

Table 7: Head SAR system validation (1g)

Frequency	Duty cycle	Target value （W/kg）	Test value (W/kg)	
			250 mW	1W
835MHz(Nov. 19th, 2014)	1:1	9.77	2.45	9.80
1750MHz(Nov. 20th, 2014)	1:1	38.67	9.82	39.28
1900MHz(Nov. 21th, 2014)	1:1	40.37	9.79	39.16
2450MHz(Nov. 24th, 2014)	1:1	53.60	13.17	52.68
750MHz(Nov. 25th, 2014)	1:1	8.19	1.98	7.92
1900MHz(Jan. 27th, 2015)	1:1	40.37	9.81	39.24

Table 8: Body SAR system validation (1g)

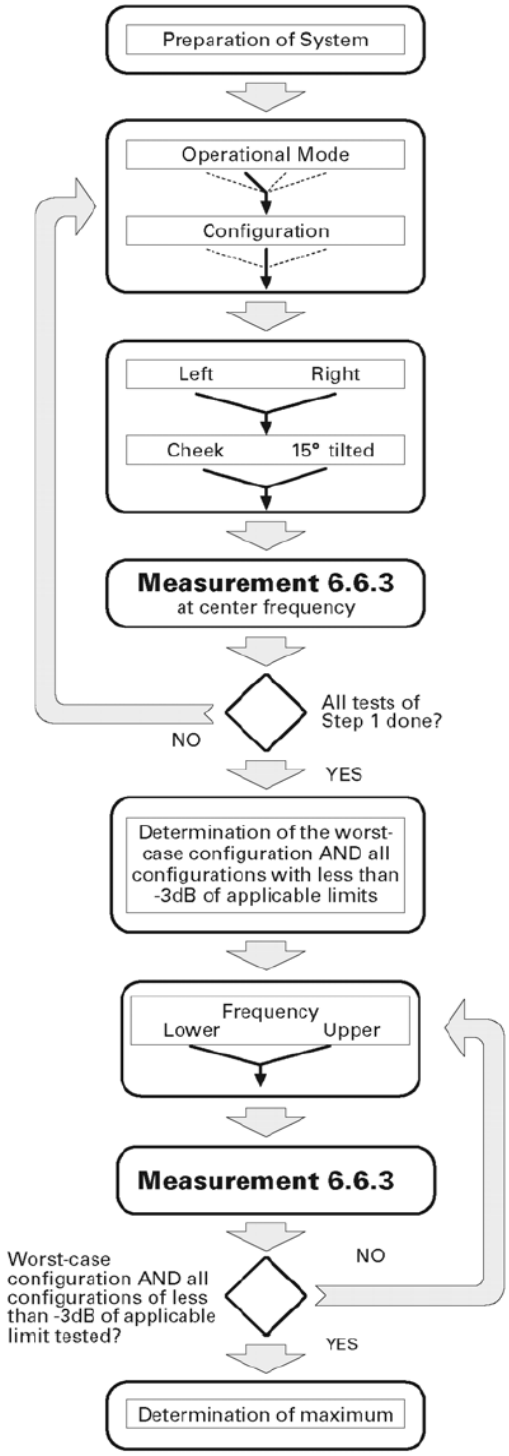
Frequency	Duty cycle	Target value （W/kg）	Test value (W/kg)	
			250 mW	1W
835MHz(Nov. 19th, 2014)	1:1	10.31	2.46	9.84
1750MHz(Nov. 20th, 2014)	1:1	40.07	9.81	39.24
1900MHz(Nov. 21th, 2014)	1:1	40.81	9.98	39.92
2450MHz(Nov. 24th, 2014)	1:1	52.66	13.08	52.32
750MHz(Nov. 25th, 2014)	1:1	8.21	1.99	7.96
1900MHz(Jan. 27th, 2015)	1:1	40.81	9.99	39.96

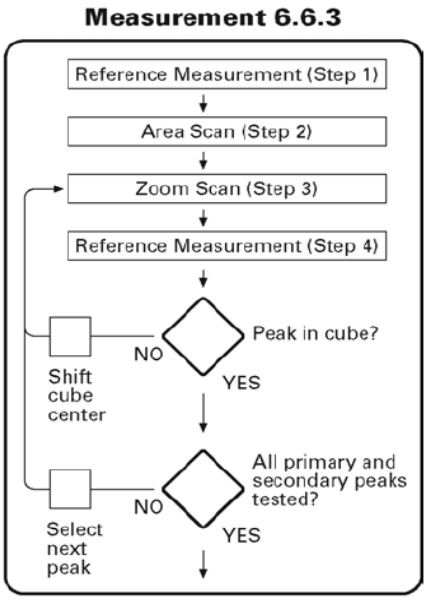
* Note: Target value was referring to the measured value in the calibration certificate of reference dipole.

Note: All SAR values are normalized to 1W forward power.

6.4 SAR measurement procedure

The SAR test against the head phantom was carried out as follow:





Establish a call with the maximum output power with a base station simulator, the connection between the EUT and the base station simulator is established via air interface.

After an area scan has been done at a fixed distance of 2mm from the surface of the phantom on the source side, a 3D scan is set up around the location of the maximum spot SAR. First, a point within the scan area is visited by the probe and a SAR reading taken at the start of testing. At the end of testing, the probe is returned to the same point and a

second reading is taken. Comparison between these start and end readings enables the power drift during measurement to be assessed.

Above is the scanning procedure flow chart and table from the IEEEp1528 standard. This is the procedure for which all compliant testing should be carried out to ensure that all variations of the device position and transmission behaviour are tested.

For body-worn measurement, the EUT was tested under two position: face upward and back upward.

6.5 Transmitting antenna information

There are GSM &WCDMA&LTE antenna(s), WIFI&BT antenna inside the EUT

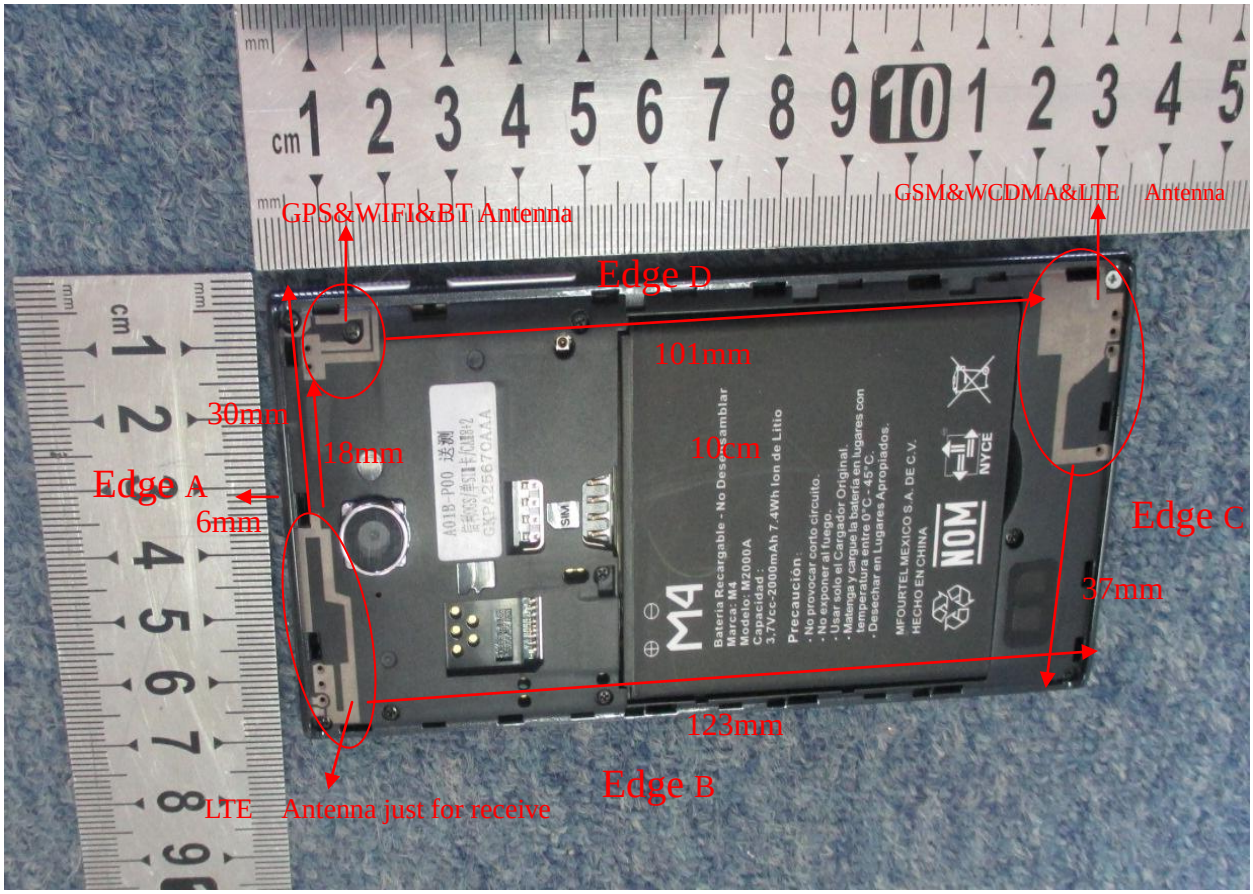


Fig. 3 Position of the antennas

7 Applicable Measurement Standards

47CFR § 2.1093- Radiofrequency Radiation Exposure Evaluation: Portable Devices;

ANSI C95.1–1992: Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991)

IEEE 1528–2003: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques;

IEEE Std 1528a-2005: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques

FCC KDB 865664 D01 v01r03 SAR Measurement 100MHz to 6GHz

FCC KDB 865664 D02 v01r01 RF Exposure Reporting

FCC KDB 447498 D01 v05r02 General RF Exposure Guidance v05r02

FCC KDB 648474 D04 v01r02 SAR Evaluation Considerations for Wireless Handsets

FCC KDB 941225 D01 v03 SAR test for 3G devices

FCC KDB 941225 D05 v02r03 SAR for LTE Devices

FCC KDB 941225 D06 v02 Hotspot Mode

FCC KDB 248227 D01 v01r02 SAR Measurement Procedures-802.11a/b/g Transmitters

8 LABORATORY ENVIRONMENT

8.1 The Ambient Conditions during SAR Test

Temperature	Min. = 18 ° C, Max. = 25 ° C
Atmospheric pressure	Min.=86 kPa, Max.=106 kPa
Relative humidity	Min. = 45%, Max. = 75%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards.Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

9.Conducted RF Output Power

9.1 GSM Conducted Power

Band		Burst Average Power (dBm)			Frame-Average Power (dBm)		
GSM850	TX Channel	128	190	251	128	190	251
	Frequency(MHz)	824.2	836.4	848.8	824.2	836.4	848.8
	GSM	33.28	**33.63**	33.61	24.25	24.6	24.58
	GPRS (Slot 1)	33.13	33.24	33.45	24.10	24.21	24.42
	GPRS (Slot 2)	30.04	30.14	30.11	24.02	24.12	24.09
	GPRS (Slot 3)	28.28	28.27	28.29	24.02	24.01	24.03
	GPRS (Slot 4)	26.62	26.64	26.63	23.61	23.63	23.62
	EDGE (Slot 1)	30.3	30.29	30.31	21.27	21.26	21.28
	EDGE (Slot 2)	27.18	27.24	27.2	21.16	21.22	21.18
	EDGE (Slot 3)	25.21	25.23	25.22	20.95	20.97	20.96
	EDGE (Slot 4)	23.96	23.76	23.84	20.95	20.75	20.83
GSM1900	TX Channel	512	661	810	512	661	810
	Frequency(MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8
	GSM	30.70	**30.76**	30.58	21.73	21.67	21.55
	GPRS (Slot 1)	30.62	30.57	30.53	21.59	21.54	21.5
	GPRS (Slot 2)	27.34	27.37	27.36	21.32	21.35	21.34
	GPRS (Slot 3)	25.75	25.77	25.75	21.49	21.51	21.49
	GPRS (Slot 4)	23.87	23.89	23.88	20.86	20.88	20.87

GSM1900	EDGE (Slot 1)	30.23	30.34	30.26	21.2	21.31	21.23
	EDGE (Slot 2)	27.12	27.18	27.21	21.10	21.16	21.19
	EDGE (Slot 3)	25.24	25.21	25.19	20.98	20.95	20.93
	EDGE (Slot 4)	23.47	23.45	23.48	20.46	20.44	20.47

Note: Per KDB 447498 D01 v05r02, the maximum output power channel is used for SAR testing and for further SAR test reduction.

For Head SAR testing, GSM should be evaluated, therefore the EUT was set in GSM Voice for GSM850 and GSM1900 due to its highest frame-average power.

For Body worn SAR testing, GSM should be evaluated, therefore the EUT was set in GSM Voice for GSM850 and GSM 1900 due to its highest frame-average power.

For hotspot mode SAR testing, GPRS and EDGE should be evaluated, therefore the EUT was set in GPRS （4Tx slots）due to its highest frame-average power.

Timeslot consignations:

No. Of Slots	Slot 1	Slot 2	Slot 3	Slot 4
Slot Consignation	1Up4Down	2Up3Down	3Up2Down	4Up1Down
Duty Cycle	1:8	1:4	1:267	1:2
Crest Factor	-9.03dB	-6.02dB	-4.26dB	-3.01dB

9.2 WCDMA Conducted peak output Power

Item	band	WCDMA 850			WCDMA 1900		
	ARFCN	4132	4182	4233	9262	9400	9538
	subtest	dBm			dBm		
RMC 12.2kbps	non	23.17	**23.36**	23.21	23.23	**23.25**	23.09
AMR	non	23.07	23.21	23.18	23.15	23.21	23.07
HSDPA	1	22.71	22.51	22.84	22.67	22.79	22.58
	2	22.29	22.71	22.29	22.47	22.05	22.54
	3	21.68	21.91	21.78	21.85	21.89	21.95
	4	21.79	21.54	21.61	21.77	21.94	21.83
HSUPA	1	22.24	22.37	22.77	22.54	22.37	22.77
	2	22.29	22.14	22.21	22.03	21.89	21.74

	3	21.86	22.09	22.08	22.17	22.01	22.08
	4	22.05	22.04	22.33	21.99	21.51	21.74
	5	22.23	22.16	22.11	22.05	22.25	22.08
HSPA+	1	22.23	22.48	22.25	22.39	22.45	22.57
Note:	The Conducted RF Output Power test of WCDMA /HSDPA /HSUPA /HSPA+ was tested by power meter.						

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and Δ_{CQI} = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Note:

1. Per KDB941225 D01v03, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
2. It is expected by the manufacturer that MPR for some HSPA subtests may be up to 2dB more than specified by 3GPP,but also as low as 0dB according to the chipset implementation in this model.

9.3 LTE Conducted peak output Power

LTE Test Configurations

The CMW500 WideBand Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR test were performed with the same number of RB and RB offsets transmitting on all frames.

1)Spectrum Plots for RB configurations

A properly configured base station simulator was used for LTE output power measurements and SAR testing. Therefore, spectrum plots for RB configurations were not required to be included in this report.

2)MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel banwidth and modulation conbinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.

The allowed Maximum Power Reduction(MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101:

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

3)A-MPR LTE procedures for SAR testing

A-MPR(Additional MPR) has been disabled for all SAR tests by using Network Signalling Value of “NS_01” on the base station simulator.

4)LTE procedures for SAR testing

A) Largest channel bandwidth standalone SAR test

requirements i) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

ii) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in i) are applied to measure the SAR for QPSK with 50% RB allocation.

iii) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in i) and ii) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

iv) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

B) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

1. LTE Band 2 Conducted Power Test Verdict:

BW (MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				18700	18900	19100
Frequency(MHz)				1860	1880	1900
20	QPSK	1	0	23.50	23.51	23.55
20	QPSK	1	49	23.52	**23.59**	23.48
20	QPSK	1	99	23.42	23.54	23.42
20	QPSK	50	0	22.96	22.97	22.93
20	QPSK	50	24	22.87	22.85	22.84
20	QPSK	50	49	22.78	22.76	22.82
20	QPSK	100	0	22.75	22.77	22.77
20	16QAM	1	0	22.20	22.31	22.31
20	16QAM	1	49	22.14	22.25	22.23
20	16QAM	1	99	22.14	22.10	22.14
20	16QAM	50	0	21.87	21.89	21.86
20	16QAM	50	24	21.85	21.87	21.88
20	16QAM	50	49	21.87	21.88	21.81
20	16QAM	100	0	21.79	21.85	21.83

Channel				18675	18900	19125
Frequency(MHz)				1857.5	1880	1902.5
15	QPSK	1	0	23.45	23.50	23.51
15	QPSK	1	37	23.47	23.51	23.45
15	QPSK	1	74	23.41	23.44	23.40
15	QPSK	36	0	22.71	22.70	22.74
15	QPSK	36	18	22.64	22.64	22.62
15	QPSK	36	37	22.61	22.65	22.63
15	QPSK	75	0	22.63	22.64	22.64
15	16QAM	1	0	22.71	22.63	22.67
15	16QAM	1	37	22.46	22.37	22.69
15	16QAM	1	74	22.57	22.62	22.65
15	16QAM	36	0	21.95	21.91	21.95
15	16QAM	36	18	21.84	21.86	21.89
15	16QAM	36	37	21.81	21.84	21.85
15	16QAM	75	0	21.79	21.75	21.77

BW (MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				18650	18900	19150
Frequency(MHz)				1855	1880	1905
10	QPSK	1	0	23.41	23.44	23.43
10	QPSK	1	24	23.32	23.41	23.46
10	QPSK	1	49	23.32	23.39	23.41
10	QPSK	25	0	22.64	22.66	22.75
10	QPSK	25	12	22.88	22.86	22.88
10	QPSK	25	24	22.64	22.70	22.65
10	QPSK	50	0	22.66	22.72	22.71
10	16QAM	1	0	22.61	22.61	22.62
10	16QAM	1	24	22.59	22.64	22.71
10	16QAM	1	49	22.35	22.51	22.28
10	16QAM	25	0	22.54	22.10	22.31
10	16QAM	25	12	21.86	21.94	21.81
10	16QAM	25	24	21.77	21.75	21.81
10	16QAM	50	0	21.74	21.81	21.75

Channel				18625	18900	19175
Frequency(MHz)				1852.5	1880	1907.5
5	QPSK	1	0	23.39	23.42	23.40
5	QPSK	1	12	23.32	23.33	23.35
5	QPSK	1	24	23.28	23.23	23.27
5	QPSK	12	0	22.64	22.63	22.62
5	QPSK	12	6	22.44	22.44	22.45
5	QPSK	12	11	22.51	22.64	22.57
5	QPSK	25	0	22.61	22.71	22.62
5	16QAM	1	0	22.17	22.15	22.14
5	16QAM	1	12	22.14	22.12	22.11
5	16QAM	1	24	22.15	22.19	22.16
5	16QAM	12	0	21.60	21.70	21.74
5	16QAM	12	6	21.59	21.63	21.55
5	16QAM	12	11	21.54	21.57	21.64
5	16QAM	25	0	21.56	21.51	21.51

BW (MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				18615	18900	19185
Frequency(MHz)				1851.5	1880	1908.5
3	QPSK	1	0	23.43	23.52	23.47
3	QPSK	1	7	23.47	23.51	23.38
3	QPSK	1	14	23.44	23.51	23.52
3	QPSK	8	0	22.65	22.67	22.69
3	QPSK	8	4	22.68	22.85	22.78
3	QPSK	8	7	22.64	22.68	22.75
3	QPSK	15	0	22.71	22.59	22.83
3	16QAM	1	0	22.87	22.79	22.88
3	16QAM	1	7	22.82	22.8	22.85
3	16QAM	1	14	22.67	22.96	22.74
3	16QAM	8	0	22.65	22.71	22.67
3	16QAM	8	4	22.54	22.53	22.45
3	16QAM	8	7	22.50	22.57	22.53
3	16QAM	15	0	22.49	22.51	22.44

Channel				18607	18900	19193
Frequency(MHz)				1850.7	1880	1909.3
1.4	QPSK	1	0	23.40	23.44	23.47
1.4	QPSK	1	2	23.40	23.42	23.37
1.4	QPSK	1	5	23.41	23.46	23.49
1.4	QPSK	3	0	22.80	22.51	22.19
1.4	QPSK	3	1	22.74	22.72	22.73
1.4	QPSK	3	2	22.74	22.70	22.71
1.4	QPSK	6	0	22.60	22.56	22.53
1.4	16QAM	1	0	22.31	22.31	22.32
1.4	16QAM	1	2	22.24	22.28	22.23
1.4	16QAM	1	5	22.24	22.25	22.22
1.4	16QAM	3	0	21.97	21.89	21.87
1.4	16QAM	3	1	21.85	21.77	21.92
1.4	16QAM	3	2	21.84	21.79	21.89
1.4	16QAM	6	0	21.67	21.72	21.70

LTE Band 4 Conducted Power Test Verdict:

BW (MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				20050	20175	20300
Frequency(MHz)				1720	1732.5	1745
20	QPSK	1	0	23.47	23.60	23.59
20	QPSK	1	49	23.54	23.55	23.57
20	QPSK	1	99	23.51	23.57	23.35
20	QPSK	50	0	22.82	22.87	22.84
20	QPSK	50	24	22.77	22.75	22.81
20	QPSK	50	49	22.74	22.72	22.82
20	QPSK	100	0	22.71	22.75	22.75
20	16QAM	1	0	22.20	22.31	22.31
20	16QAM	1	49	22.34	22.35	22.33
20	16QAM	1	99	22.24	22.30	22.24
20	16QAM	50	0	21.57	21.75	21.78
20	16QAM	50	24	21.59	21.67	21.80
20	16QAM	50	49	21.61	21.71	21.86
20	16QAM	100	0	21.54	21.65	21.81

Channel				20025	20175	20325
Frequency(MHz)				1717.5	1732.5	1747.5
15	QPSK	1	0	23.57	23.60	23.52
15	QPSK	1	37	23.43	23.51	23.44
15	QPSK	1	74	23.49	23.47	23.51
15	QPSK	36	0	22.92	22.97	22.94
15	QPSK	36	18	22.88	22.86	22.81
15	QPSK	36	37	22.86	22.84	22.80
15	QPSK	75	0	22.79	22.76	22.82
15	16QAM	1	0	22.36	22.37	22.33
15	16QAM	1	37	22.10	22.26	22.29
15	16QAM	1	74	22.07	22.22	22.28
15	16QAM	36	0	21.46	21.73	21.84
15	16QAM	36	18	21.49	21.73	21.77
15	16QAM	36	37	21.49	21.70	21.83
15	16QAM	75	0	21.58	21.71	21.81

BW (MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				20000	20175	20350
Frequency(MHz)				1715	1732.5	1750
10	QPSK	1	0	23.47	23.50	23.52
10	QPSK	1	24	23.41	23.42	23.45
10	QPSK	1	49	23.32	23.39	23.40
10	QPSK	25	0	22.54	22.76	22.85
10	QPSK	25	12	22.82	22.69	22.80
10	QPSK	25	24	22.81	22.80	22.85
10	QPSK	50	0	22.76	22.82	22.91
10	16QAM	1	0	22.47	22.45	22.44
10	16QAM	1	24	22.31	22.32	22.35
10	16QAM	1	49	22.28	22.29	22.26
10	16QAM	25	0	21.90	21.93	21.96
10	16QAM	25	12	21.84	21.85	21.82
10	16QAM	25	24	21.82	21.85	21.84
10	16QAM	50	0	21.82	21.84	21.79

Channel				19975	20175	20375
Frequency(MHz)				1712.5	1732.5	1752.5
5	QPSK	1	0	23.47	23.51	23.52
5	QPSK	1	12	23.45	23.48	23.42
5	QPSK	1	24	23.41	23.43	23.38
5	QPSK	12	0	22.71	22.77	22.82
5	QPSK	12	6	22.71	22.80	22.78
5	QPSK	12	11	22.71	22.73	22.77
5	QPSK	25	0	22.75	22.72	22.65
5	16QAM	1	0	22.37	22.36	22.30
5	16QAM	1	12	22.31	22.27	22.29
5	16QAM	1	24	22.19	22.21	22.25
5	16QAM	12	0	21.81	21.81	21.86
5	16QAM	12	6	21.76	21.72	21.69
5	16QAM	12	11	21.74	21.75	21.72
5	16QAM	25	0	21.73	21.72	21.70

BW (MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				19965	20175	20385
Frequency(MHz)				1711.5	1732.5	1753.5
3	QPSK	1	0	23.56	23.59	23.58
3	QPSK	1	7	23.53	23.60	23.50
3	QPSK	1	14	23.52	23.52	23.58
3	QPSK	8	0	22.77	22.71	22.76
3	QPSK	8	4	22.75	22.75	22.78
3	QPSK	8	7	22.69	22.70	22.70
3	QPSK	15	0	22.67	22.67	22.68
3	16QAM	1	0	22.31	22.45	22.49
3	16QAM	1	7	22.47	22.45	22.43
3	16QAM	1	14	22.38	22.30	22.36
3	16QAM	8	0	21.63	21.80	21.82
3	16QAM	8	4	21.64	21.68	21.68
3	16QAM	8	7	21.63	21.62	21.65
3	16QAM	15	0	21.52	21.56	21.58

Channel				19957	20175	20393
Frequency(MHz)				1710.7	1732.5	1754.3
1.4	QPSK	1	0	23.55	23.60	23.49
1.4	QPSK	1	2	23.59	23.52	23.58
1.4	QPSK	1	5	23.49	23.49	23.45
1.4	QPSK	3	0	23.53	23.58	23.42
1.4	QPSK	3	1	23.57	23.47	23.52
1.4	QPSK	3	2	23.56	23.37	23.41
1.4	QPSK	6	0	23.57	23.46	23.53
1.4	16QAM	1	0	22.72	22.97	22.61
1.4	16QAM	1	2	22.63	22.84	23.01
1.4	16QAM	1	5	22.41	22.91	22.94
1.4	16QAM	3	0	22.55	22.74	22.85
1.4	16QAM	3	1	22.52	22.73	22.67
1.4	16QAM	3	2	22.50	22.55	22.67
1.4	16QAM	6	0	22.49	22.55	22.66

LTE Band 17 Conducted Power Test Verdict:

BW (MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				23780	23790	23800
Frequency(MHz)				709	710	711
10	QPSK	1	0	23.25	23.38	23.33
10	QPSK	1	24	23.49	23.40	23.39
10	QPSK	1	49	23.40	23.57	23.39
10	QPSK	25	0	22.71	22.76	22.72
10	QPSK	25	12	22.67	22.66	22.64
10	QPSK	25	24	22.61	22.61	22.66
10	QPSK	50	0	22.66	22.69	22.67
10	16QAM	1	0	22.14	22.14	22.27
10	16QAM	1	24	22.06	22.11	22.03
10	16QAM	1	49	22.00	22.01	22.02
10	16QAM	25	0	21.41	21.46	21.45
10	16QAM	25	12	21.64	21.75	21.41
10	16QAM	25	24	21.51	21.74	21.46
10	16QAM	50	0	21.53	21.46	21.51

Channel				23755	23790	23825
Frequency(MHz)				706.5	710	713.5
5	QPSK	1	0	23.22	23.34	23.27
5	QPSK	1	12	23.29	23.13	23.16
5	QPSK	1	24	23.28	23.20	23.11
5	QPSK	12	0	22.60	22.63	22.67
5	QPSK	12	6	22.56	22.52	22.52
5	QPSK	12	11	22.56	22.56	22.59
5	QPSK	25	0	22.56	22.53	22.52
5	16QAM	1	0	22.24	22.29	22.19
5	16QAM	1	12	22.25	22.18	22.26
5	16QAM	1	24	22.13	22.17	22.17
5	16QAM	12	0	21.40	21.45	21.45
5	16QAM	12	6	21.42	21.45	21.49
5	16QAM	12	11	21.51	21.54	21.44
5	16QAM	25	0	21.41	21.44	21.44

9.4 WLAN 2.4GHz Band Conducted Power

For the 802.11b/g SAR tests, a communication link is set up with the test mode software for WiFi mode test. The Absolute Radio Frequency Channel Number(ARFCN) is allocated to 1 ,6 and 11 respectively in the case of 2450 MHz.During the test,at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate.

802.11b/g operating modes are tested independently according to the service requirements in each frquency band. 802.11b/g modes are tested on channel 1, 6, 11; however,if output power reduction is necessary for channels 1 and/or 11 to meet restricted band requirements the highest output channel closest to each of these channels must be tested instead.

SAR is not required for 802.11g/n channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels.

Mode	Band	GHz	Channel	"Default Test Channels"	
				802.11b	802.11g
802.11b/g	2.4 GHz	2.412	1#	√	△
		2.437	6	√	△
		2.462	11#	√	△

Notes:
√ = "default test channels"
△= possible 802.11g channels with maximum average output ¼ dB the "default test channels"
= when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

802.11 Test Channels per FCC KDB 248227

Channel	Frequency (MHz)	WIFI Output Power(dBm)		
		802.11b	802.11g	802.11n-20
CH 01	2412	17.55	15.28	15.50
CH 06	2437	17.69	15.41	15.39
CH 11	2462	17.42	15.87	15.81

Channel	Frequency (MHz)	WIFI Output Power(dBm)
		802.11n-40
CH 03	2422	14.02
CH 06	2437	14.54
CH 09	2452	14.95

Note:

1. Per KDB 248227 D01 v01r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4dB higher than those measured at lowest data rate
3. Per KDB 248227 D01 v01r02, 802.11g /11n-HT20/11n-HT40 is not required, for the maximum average output power is less than 1/4dB higher than measured on the corresponding 802.11b mode. Thus the SAR can be excluded.

Bluetooth Conducted Power

Channel	Frequency(MHz)	BT 4.0
CH 0	2402	-0.09
CH 20	2442	0.27
CH 39	2480	0.22

Note:

1. Per KDB 447498 D01v05r02, the 1-g and 10-g SAR test exclusion thrssholds for 100MHz to 6GHz at test separation distances ≤ 50mm are determined by:[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [$\sqrt{f}$ (GHz)] ≤3.0 for 1-g SAR and ≤7.5 for 10-g extremity SAR
   (1) f(GHz) is the RF channel transmit frequency in GHz
   (2) Power and distance are round to the nearest mW and mm before calculation
   (3) The result is rounded to one decimal place for comparison
   (4) If the test separation diatance(antenna-user) is < 5mm, 5mm is used for excluded SAR calculation

Bluetooth Max Power (dBm)	mW	Test Distance (mm)	Frequency(Ghz)	Exclusion Thresholds
1	1.259	5	2.48	0.397

2. Per KDB 447498 D01v05r02 exclusion thresholds is 0.397<3, RF exposure evaluation is not required.

   BT estimated SAR value=Exclusion Thresholds/7.5=0.397/7.5=0.053W/Kg

General Note:

1. Per KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
2. Per KDB447498 D01v05r02, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is: ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is≤ 100 MHz. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.
3. The maximum reported SAR of each test band is shown in **bold** letters.
4. Per KDB941225 D06v02, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. As the manufacture required, the separation distance use 5mm for Hotspot mode.
5. Per KDB 865664 D01v01r03,for each frequency band,repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤20%,and the measured SAR <1.45W/Kg,only one repeated measurement is required.
6. Per KDB865664 D02v01r01, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing(Refer to appendix D for details).
7. Per KDB941225 D01, when multiple slots can be used, the GPRS/EDGE slot configuration with the highest frame–averaged output power was selected for SAR testing.
8. Per KDB941225 D01v03, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
9. The LTE test configurations are determined according to KDB941225 D05 SAR for LTE Devices v02r03.The general test procedures used for SAR testing can be found in Section 6.3.
10. Per KDB 248227 D01 v01r02, 802.11g /11n-HT20/11n-HT40 is not required, for the maximum average output power is less than 1/4dB higher than measured on the corresponding 802.11b mode. Thus the SAR can be excluded.

. Scaling Factor calculation

Operation Mode	Channel	Output Power(dBm)	Tune up Power in tolerance(dBm)	Scaling Factor
GSM 850	128	33.28	33.15 ±0.5	1.089
	190	33.63	33.15 ±0.5	1.005
	251	33.61	33.15 ±0.5	1.009
GPRS 850(1Tx)	128	33.13	33.00 ±0.5	1.089
	190	33.24	33.00±0.5	1.062
	251	33.45	33.00 ±0.5	1.012
GSM1900	512	30.70	30.30 ±0.5	1.023
	661	30.76	30.30 ±0.5	1.009
	810	30.58	30.30 ±0.5	1.052
GPRS1900(1Tx)	512	30.62	30.15 ±0.5	1.007
	661	30.57	30.15 ±0.5	1.019
	810	30.53	30.15 ±0.5	1.028
WCDMA850	4132	23.17	22.40 ±1	1.054
	4183	23.36	22.40 ±1	1.009
	4233	23.21	22.40 ±1	1.045
WCDMA1900	9262	23.23	22.30 ±1	1.016
	9400	23.25	22.30 ±1	1.012
	9538	23.09	22.30 ±1	1.050
LTE Band 2 1RB	18700	23.52	22.60 ±1	1.019
	18900	23.59	22.60 ±1	1.002
	19100	23.48	22.60 ±1	1.028
LTE Band 2 50%RB	18700	22.96	22.60 ±1	1.159
	18900	22.97	22.60 ±1	1.156
	19100	22.93	22.60 ±1	1.167
LTE Band 2 100%RB	18700	22.75	22.60 ±1	1.216
	18900	22.77	22.60 ±1	1.211
	19100	22.77	22.60 ±1	1.211
LTE Band 4 1RB	1720	23.47	22.70 ±1	1.054
	1732.5	23.60	22.70 ±1	1.023
	1745	23.59	22.70 ±1	1.026
LTE Band 4 50%RB	1720	22.82	22.70 ±1	1.225
	1732.5	22.87	22.70 ±1	1.211
	1745	22.84	22.70 ±1	1.219
LTE Band 4 100%RB	1720	22.71	22.70 ±1	1.256
	1732.5	22.75	22.70 ±1	1.245
	1745	22.75	22.70 ±1	1.245

LTE Band 17 1RB	709	23.40	23.10 ±0.5	1.047
	710	23.57	23.10 ±0.5	1.007
	711	23.39	23.10 ±0.5	1.050
LTE Band 17 50%RB	709	22.76	23.10 ±0.5	1.213
	710	22.71	23.10 ±0.5	1.227
	711	22.72	23.10 ±0.5	1.225
LTE Band 17 100%RB	709	22.69	23.10 ±0.5	1.233
	710	22.66	23.10 ±0.5	1.242
	711	22.67	23.10 ±0.5	1.239
802.11b	2437	17.69	17.25 ±0.5	1.014
BT 3.0 GFSK	2441	0.27	0 ±1	1.183

10 TEST RESULTS

10.1 Summary of Power Measurement Results

According the description above, the measurements against the head phantom were executed on the operation mode: GSM850 /1900MHz, WCDMA850/1900MHz and WIFI 802.11b, while the tests against the body-worn were carried out on the operation mode : GSM850/1900MHz, GPRS 850 /1900MHz, WCDMA850/1900MHz,WIFI 802.11b.

Table 1: SAR Values of GSM 850MHz Band

Temperature: 22.0~23.5°C, humidity: 62~64%.					
Test Positions			Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)	
				SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek		190/836.6	0.314	0.315
	Tilt 15 degrees		190/836.6	0.267	0.268
Left Side of Head	Cheek		190/836.6	**0.359**	0.361
	Tilt 15 degrees		190/836.6	0.282	0.283
Body (5mm Separation)	GSM	Face Upward	190/836.6	0.684	0.687
		Back Upward	128/824.2	0.821	0.894
			190/836.6	**0.829**	0.833
			190/836.6	0.824	0.828
			251/848.8	0.817	0.825
		Edge A	190/836.6	0.113	0.114
		Edge B	190/836.6	0.152	0.153
		Edge C	190/836.6	0.211	0.212
		Edge D	128/824.2	1.101	1.199
			190/836.6	**1.183**	1.188
			190/836.6	1.181	1.186
			251/848.8	1.163	1.174
	GPRS (1Tx)	Face Upward	251/848.8	0.746	0.755
		Back Upward	128/824.2	1.020	1.111
			190/836.6	**1.127**	1.199
			190/836.6	**1.071**	1.137
			251/848.8	0.987	0.999
		Edge A	251/848.8	0.105	0.106

		Edge B	251/848.8	0.137	0.139
		Edge C	251/848.8	0.174	0.176
		Edge D	128/824.2	0.809	0.881
			190/836.6	0.824	0.875
			190/836.6	0.816	0.866
			251/848.8	0.812	0.822

Table 2: SAR Values of GSM1900 MHz Band

Temperature: 22.0~23.5°C, humidity: 62~64%.					
Test Positions			Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)	
				SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek		661/1880.0	**0.255**	0.257
	Tilt 15 degrees		661/1880.0	0.048	0.048
Left Side of Head	Cheek		661/1880.0	0.178	0.180
	Tilt 15 degrees		661/1880.0	0.037	0.037
Body (5mm Separation)	GSM	Face Upward	512/1850.2	1.169	1.180
			661/1880.0	1.208	1.236
			661/1880.0	1.176	1.203
			661/1880.0	1.176	1.203
			810/1909.8	1.167	1.228
		Back Upward	512/1850.2	1.268	1.297
			661/1880.0	**1.296**	1.308
			661/1880.0	**1.282**	1.294
			661/1880.0	**1.287**	1.299
			810/1909.8	1.283	1.350
		Edge A	661/1880.0	0.212	0.214
		Edge B	661/1880.0	0.318	0.321
		Edge C	661/1880.0	0.541	0.546
		Edge D	661/1880.0	0.405	0.409
	GPRS (1Tx)	Face Upward	512/1850.2	0.963	0.970
			512/1850.2	0.957	0.964
			661/1880.0	0.961	0.979
			810/1909.8	0.961	0.988
		Back Upward	512/1850.2	0.999	1.006
			661/1880.0	**1.014**	1.033
			661/1880.0	**1.003**	1.022
			810/1909.8	0.972	0.999

		Edge A	661/1880.0	0.162	0.163
		Edge B	661/1880.0	0.247	0.249
		Edge C	661/1880.0	0.392	0.398
		Edge D	661/1880.0	0.325	0.327

Table 3: SAR Values of WCDMA850

Temperature: 22.0~23.5°C, humidity: 62~64%.				
Test Positions		Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)	
			SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek	4183/836.6	0.278	0.281
	Tilt 15 degrees	4183/836.6	0.220	0.222
Left Side of Head	Cheek	4183/836.6	**0.343**	0.346
	Tilt 15 degrees	4183/836.6	0.247	0.249
Body (5mm Separation)	Face Upward	4183/836.6	0.399	0.403
	Back Upward	4183/836.6	0.492	0.497
	Edge A	4183/836.6	0.268	0.270
	Edge B	4183/836.6	0.342	0.345
	Edge C	4183/836.6	0.482	0.486
	Edge D	4183/836.6	**0.742**	0.749

Table 4: SAR Values of WCDMA1900

Temperature: 22.0~23.5°C, humidity: 62~64%.				
Test Positions		Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)	
			SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek	9400/1880.0	0.348	0.352
	Tilt 15 degrees	9400/1880.0	0.108	0.109
Left Side of Head	Cheek	9400/1880.0	**0.373**	0.377
	Tilt 15 degrees	9400/1880.0	0.111	0.112
Body (5mm Separation)	Face Upward	9262/1852.4	1.087	1.105
		9400/1880.0	**1.131**	1.144
		9400/1880.0	1.124	1.137
		9538/1907.6	1.092	1.146
	Back Upward	9262/1852.4	1.092	1.110
		9400/1880.0	**1.098**	1.111
		9400/1880.0	1.094	1.107
		9538/1907.6	1.079	1.132
	Edge A	9400/1880.0	0.342	0.346
	Edge B	9400/1880.0	0.557	0.564
	Edge C	9400/1880.0	0.712	0.720
	Edge D	9400/1880.0	0.684	0.692

Table 5:SAR Values of LTE Band 2, Bandwidth 20MHz, QPSK

Temperature: 22.0~23.5°C, humidity: 62~64%.

Test Positions		Channel /Frequency (MHz)	RB Size	RB Offest	SAR(W/Kg), 1.6 (1g average)	
					SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek	Middle	1	49	0.226	0.227
		Middle	50	0	0.224	0.259
	Tilt 15 degrees	Middle	1	49	0.057	0.057
		Middle	50	0	0.046	0.053
Left Side of Head	Cheek	Middle	1	49	**0.247**	0.248
		Middle	50	0	0.234	0.271
	Tilt 15 degrees	Middle	1	49	0.075	0.075
		Middle	50	0	0.058	0.067
Body (5mm Separation)	Edge A	Middle	1	49	0.403	0.404
		Middle	50	0	0.398	0.460
	Edge B	Middle	1	49	0.662	0.663
		Middle	50	0	0.658	0.761
	Edge C	Low	1	49	1.167	1.189
		Middle	1	49	**1.318**	1.321
		Middle	1	49	**1.254**	1.257
		Middle	1	49	**1.252**	1.255
		High	1	49	1.154	1.186
		Low	50	0	1.050	1.217
		Middle	50	0	1.104	1.276
		Middle	50	0	1.102	1.274
		High	50	0	1.043	1.217
		Low	100	0	0.947	1.152
		Middle	100	0	0.948	1.148
		Middle	100	0	0.945	1.144
		High	100	0	0.942	1.141
	Edge D	Middle	1	49	0.738	0.739
		Middle	50	24	0.684	0.791
	Face Upward	Middle	1	49	0.591	0.592
		Middle	50	0	0.587	0.679
	Back Upward	Middle	1	49	0.724	0.725
		Middle	50	0	0.691	0.799

Table 6:SAR Values of LTE Band 4, Bandwidth 20MHz, QPSK

Temperature: 22.0~23.5°C, humidity: 62~64%.						
Test Positions		Channel /Frequency (MHz)	RB Size	RB Offest	SAR(W/Kg), 1.6 (1g average)	
					SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek	Middle	1	0	**0.347**	0.355
		Middle	50	0	0.335	0.406
	Tilt 15 degrees	Middle	1	0	0.214	0.219
		Middle	50	0	0.210	0.254
Left Side of Head	Cheek	Middle	1	0	0.342	0.350
		Middle	50	0	0.338	0.409
	Tilt 15 degrees	Middle	1	0	0.197	0.202
		Middle	50	0	0.195	0.236
Body (5mm Separation)	Edge A	Middle	1	0	0.083	0.085
		Middle	50	0	0.081	0.098
	Edge B	Middle	1	0	0.119	0.122
		Middle	50	0	0.115	0.139
	Edge C	Middle	1	0	0.154	0.158
		Middle	50	0	0.147	0.178
	Edge D	Middle	1	0	0.386	0.395
		Middle	50	0	0.367	0.444
	Face Upward	Middle	1	0	0.621	0.635
		Middle	50	0	0.599	0.725
	Back Upward	Middle	1	0	**0.684**	0.700
		Middle	50	0	0.654	0.792

Table 7:SAR Values of LTE Band 17, Bandwidth 10MHz,QPSK

Temperature: 22.0~23.5°C, humidity: 62~64%.						
Test Positions		Channel /Frequency (MHz)	RB Size	RB Offest	SAR(W/Kg), 1.6 (1g average)	
					SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek	Middle	1	49	**0.430**	0.433
		Middle	25	0	0.329	0.399
	Tilt 15 degrees	Middle	1	49	0.207	0.208
		Middle	25	0	0.217	0.263
Left Side of Head	Cheek	Middle	1	49	0.395	0.398
		Middle	25	0	0.330	0.400
	Tilt 15 degrees	Middle	1	49	0.240	0.242
		Middle	25	0	0.192	0.233
Body (5mm Separation)	Edge A	Middle	1	49	0.055	0.055
		Middle	25	0	0.052	0.063
	Edge B	Middle	1	49	0.073	0.074
		Middle	25	0	0.069	0.084
	Edge C	Middle	1	49	0.090	0.091
		Middle	25	0	0.089	0.108
	Edge D	Middle	1	49	0.394	0.397
		Middle	25	0	0.359	0.435
	Face Upward	Middle	1	49	0.617	0.621
		Middle	25	0	0.597	0.724
	Back Upward	Middle	1	49	**0.720**	0.725
		Middle	25	0	0.652	0.791

Table 8:SAR Values of Wi-Fi 802.11b

Temperature: 22.0~23.5°C, humidity: 62~64%.				
Test Positions		Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)	
			SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek	6/2437	**0.029**	0.029
	Tilt 15 degrees	6/2437	0.017	0.017
Left Side of Head	Cheek	6/2437	0.025	0.025
	Tilt 15 degrees	6/2437	0.014	0.014
802.11b(5mm Separation)	Edge A	6/2437	0.012	0.012
	Edge B	6/2437	0.014	0.014
	Edge C	6/2437	0.006	0.006
	Edge D	6/2437	0.009	0.009
	Face Upward	6/2437	0.026	0.026
	Back Upward	6/2437	**0.045**	0.046

Note:

When the 1-g SAR for the mid-band channel or the channel with the Highest output power satisfy the following conditions, testing of the other channels in the band is not required.(Per KDB 447498 D01 General RF Exposure Guidance v05r02)

• ≤ 0.8 W/kg, when the transmission band is ≤ 100 MHz

• ≤ 0.6 W/kg, when the transmission band is between 100 MHz and 200 MHz

• ≤ 0.4 W/kg, when the transmission band is ≥ 200 MHz

SIMULTANEOUS TRANSMISSION ANALYSIS

Test Position		Right Cheek	Right Title	Left Cheek	Left Tilt
Head MAX 1-g SAR(W/Kg)	GSM850	0.315	0.268	0.361	0.283
	GSM1900	0.257	0.048	0.180	0.037
	WCDMA1900	0.352	0.109	0.377	0.112
	WCDMA 850	0.281	0.222	0.346	0.249
	LTE Band 2	0.259	0.057	0.271	0.075
	LTE Band 4	0.406	0.254	0.409	0.236
	LTE Band 17	0.433	0.263	0.400	0.242
	2.4G WiFi	0.029	0.017	0.025	0.014
	BT	0.053	0.053	0.053	0.053
∑1-g SAR(W/Kg)		**0.488**	0.321	0.462	0.336

Simultaneous Tx Combination of GSM/WCDMA/LTE and BT/WIFI (Head).

Test Position		Face	Back	Edge A	Edge B	Edge C	Edge D
Body 10mm separation MAX 1-g SAR(W/Kg)	GSMS850	0.775	1.199	0.144	0.153	0.212	1.199
	GSM1900	1.236	1.350	0.214	0.321	0.546	0.409
	WCDMA1900	1.146	1.132	0.346	0.564	0.720	0.692
	WCDMA 850	0.403	0.497	0.270	0.345	0.486	0.749
	LTE Band 2	0.679	0.799	0.460	0.761	1.321	0.791
	LTE Band 4	0.725	0.792	0.098	0.139	0.178	0.444
	LTE Band 17	0.724	0.791	0.063	0.084	0.108	0.435
	2.4G WiFi	0.026	0.046	0.012	0.014	0.006	0.009
	BT	0.053	0.053	0.053	0.053	0.053	0.053
∑1-g SAR(W/Kg)		1.289	**1.403**	0.513	0.814	1.374	0.844

Simultaneous Tx Combination of GSM/WCDMA/LTE and BT/WIFI (Body).

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required

11 Measurement Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) ui(%)	Degree of freedom Veff or vi
	Measurement System							
1	－Probe Calibration	B	5.8	N	1	1	5.8	∞
2	－Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	∞
3	－Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	∞
4	－Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	∞
5	－Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	∞
6	－System Detection Limits	B	1.0	R	$\sqrt{3}$	1	0.58	∞
7	Modulation response	B	3	N	1	1	3.00	
8	－Readout Electronics	B	0.5	N	1	1	0.50	∞
9	－Response Time	B	1.4	R	$\sqrt{3}$	1	0.81	∞
10	－Integration Time	B	3.0	R	$\sqrt{3}$	1	1.73	∞
11	－RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	－Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	∞
13	－Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	∞
14	－Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	∞
	Uncertainties of the DUT							
15	－Position of the DUT	A	2.6	N	$\sqrt{3}$	1	2.6	5
16	－Holder of the DUT	A	3	N	$\sqrt{3}$	1	3.0	5

17	－Output Power Variation –SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.89	∞
Phantom and Tissue Parameters								
18	－Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	∞
19	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	B	2	N	1	1	2.00	
20	－Liquid Conductivity Target –tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
21	－Liquid Conductivity –measurement Uncertainty)	B	4	N	$\sqrt{3}$	1	0.92	9
22	－Liquid Permittivity Target tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
23	－Liquid Permittivity –measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	∞
Combined Standard Uncertainty				RSS			10.63	
Expanded uncertainty (Confidence interval of 95 %)				K=2			21.26	

System Check Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) ui(%)	Degree of freedom Veff or vi
	Measurement System							
1	－Probe Calibration	B	5.8	N	1	1	5.8	∞
2	－Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	∞
3	－Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	∞
4	－Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	∞
5	－Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	∞
6	－System Detection Limits	B	1	R	$\sqrt{3}$	1	0.58	∞
7	Modulation response	B	0	N	1	1	0.00	

8	－Readout Electronics	B	0.5	N	1	1	0.50	∞
9	－Response Time	B	0.00	R	$\sqrt{3}$	1	0.00	∞
10	－Integration Time	B	1.4	R	$\sqrt{3}$	1	0.81	∞
11	－RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	－Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	∞
13	－Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	∞
14	－Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	∞
	Uncertainties of the DUT							
15	Deviation of experimental source from numberical source	A	4	N	1	1	4.00	5
16	Input Power and SAR drift measurement	A	5	R	$\sqrt{3}$	1	2.89	5
17	Dipole Axis to Liquid Distance	B	2	R	$\sqrt{3}$	1	1.2	∞
Phantom and Tissue Parameters								
18	－Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	∞
19	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	B	2	N	1	1	2.00	
20	－Liquid Conductivity Target –tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
21	－Liquid Conductivity –measurement Uncertainty)	B	4	N	$\sqrt{3}$	1	0.92	9
22	－Liquid Permittivity Target tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
23	－Liquid Permittivity –measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	∞
Combined Standard Uncertainty				RSS			10.15	
Expanded uncertainty (Confidence interval of 95 %)				K=2			20.29	

12 MAIN TEST INSTRUMENTS

No.	EQUIPMENT	TYPE	Series No.	Last Calibration	Due Date
1	System Simulator	E5515C	GB 47200710	2014/02/23	1 Year
2	System Simulator	CMW500	130805	2014/06/10	1 Year
3	SAR Probe	SATIMO	SN 09/13 EP169	2014/04/05	1 Year
4	SAR Probe	SATIMO	SN 27/14 EPG210	2014/05/16	1 Year
5	Dipole	SID750	SN25/13 DIP0G750-253	2014/08/17	1 Year
6	Dipole	SID835	SN09/13 DIP0G835-217	2014/08/28	1 Year
7	Dipole	SID1800	SN09/13 DIP1G800-216	2014/08/28	1 Year
8	Dipole	SID1900	SN09/13 DIP1G900-218	2014/08/28	1 Year
9	Dipole	SID2450	SN09/13 DIP2G450-220	2014/08/28	1 Year
10	Network Analyzer	ZVB8	A0802530	2014/06/13	1 Year
11	Signal Generator	SMR27	A0304219	2014/06/10	1 Year
12	Amplifier	Nucletudes	143060	2014/04/05	1 Year
13	Directional Coupler	DC6180A	305827	2014/06/10	1 Year
14	Power Meter	NRVS	1020.1809.02	2014/06/13	1 Year
15	Power Sensor	NRV-Z4	100069	2014/06/10	1 Year
16	Power Meter	NRP2	A140401673	2014/04/04	1 Year
17	Power Sensor	NPR-Z11	1138.3004.02-114072-nq	2014/04/04	1 Year
18	Multimeter	Keithley2000	4014020	2014/04/16	1 Year
19	Device Holder	SATIMO	SN 09/13 MSH80	2014/04/05	1 Year
	SAM Phantom	SAM97	SN 09/13 SAM97	2014/04/05	1 Year

ANNEX A

of

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.

CONFORMANCE TEST REPORT FOR

HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

SET2015-01431

CK Telecom Limited

LTE Mobile Phone

Type Name: M4 SS4445T

Hardware Version: A-V1.0

Software Version: M4_SS4445_S10_VER200

Accreditation Certificate

This Annex consists of 2 pages

Date of Report: 2015-01-30

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(Registration No. CNAS L1659)

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.

Building 28/29, Shigudong, Xili Industrial Area, Xili Street,

Nanshan District, Shenzhen, Guangdong, China

is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) *for the competence of testing and calibration.*

The scope of accreditation is detailed in the attached appendices bearing the same registration number as above. The appendices form an integral part of this certificate.

Date of Issue: 2012-09-29

Date of Expiry: 2015-09-28

Date of Initial Accreditation: 1999-08-03

Date of Update: 2012-09-29

Signed on behalf of China National Accreditation Service for Conformity Assessment

China National Accreditation Service for Conformity Assessment (CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC MRA) and Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC MRA).

No.CNAS AL 2

0005210

ANNEX B

of

CCIC-SET

CONFORMANCE TEST REPORT FOR

HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

SET2015-01431

CK Telecom Limited

LTE Mobile Phone

Type Name: M4 SS4445T

Hardware Version： A-V1.0

Software Version： M4_SS4445_S10_VER200

TEST LAYOUT

This Annex consists of 7 pages

Date of Report: 2015-01-30

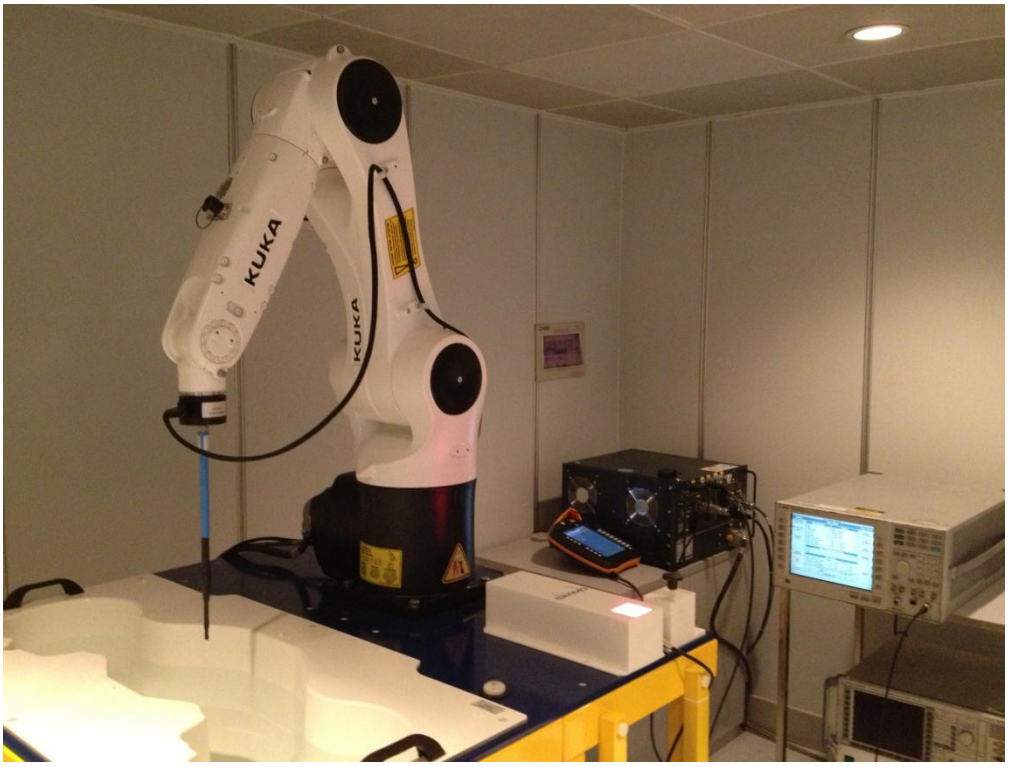


Fig.1 COMO SAR Test System

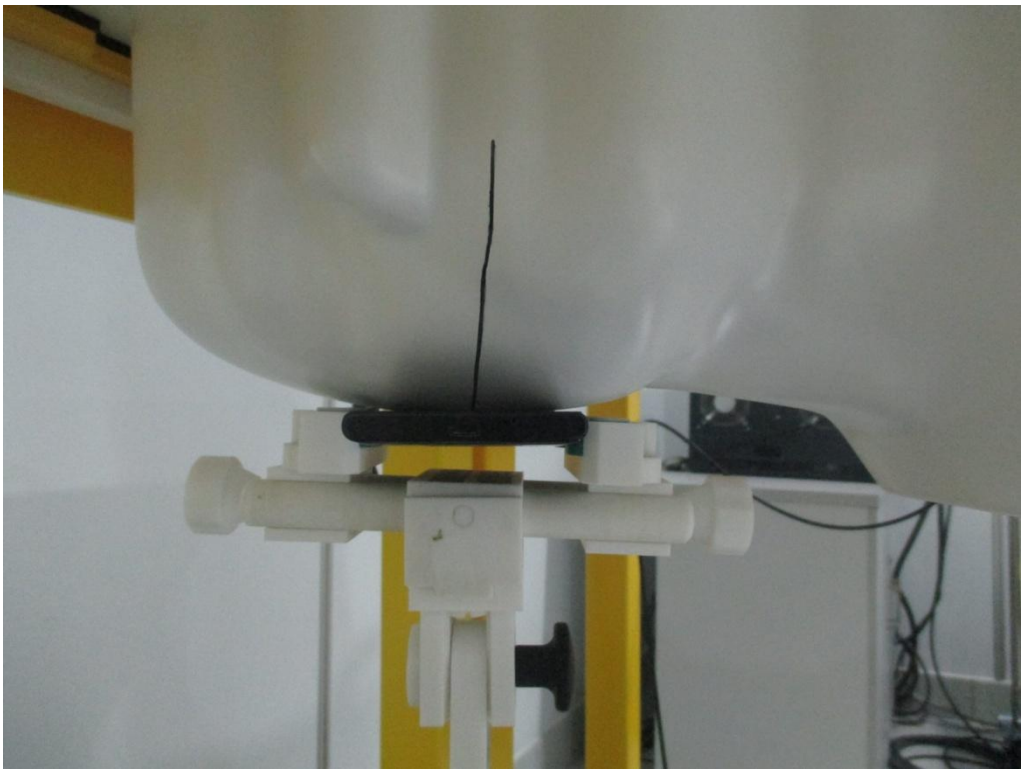


Fig.2 Right_Cheek

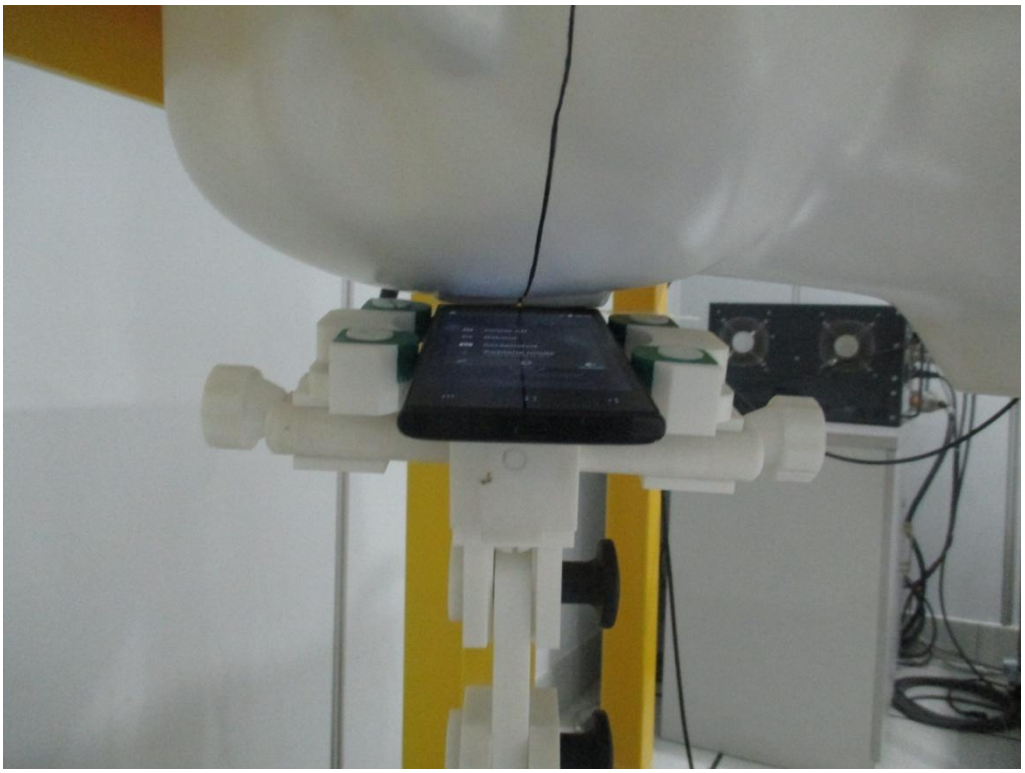


Fig.3 Right_Tilt

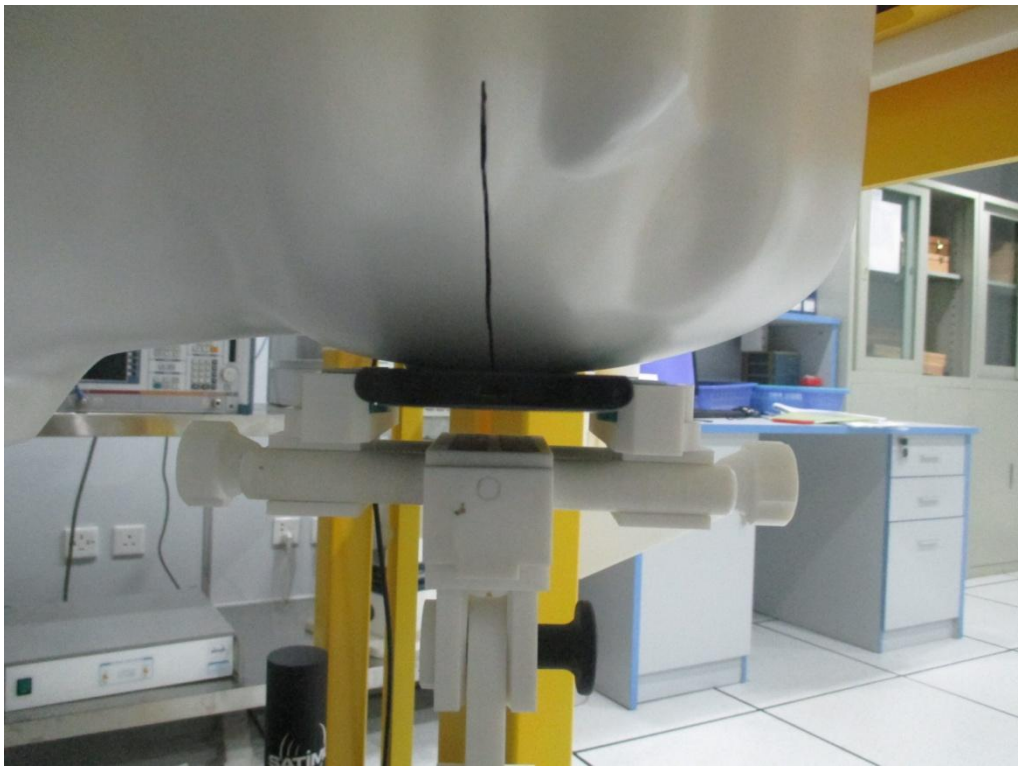


Fig.4 Left Cheek

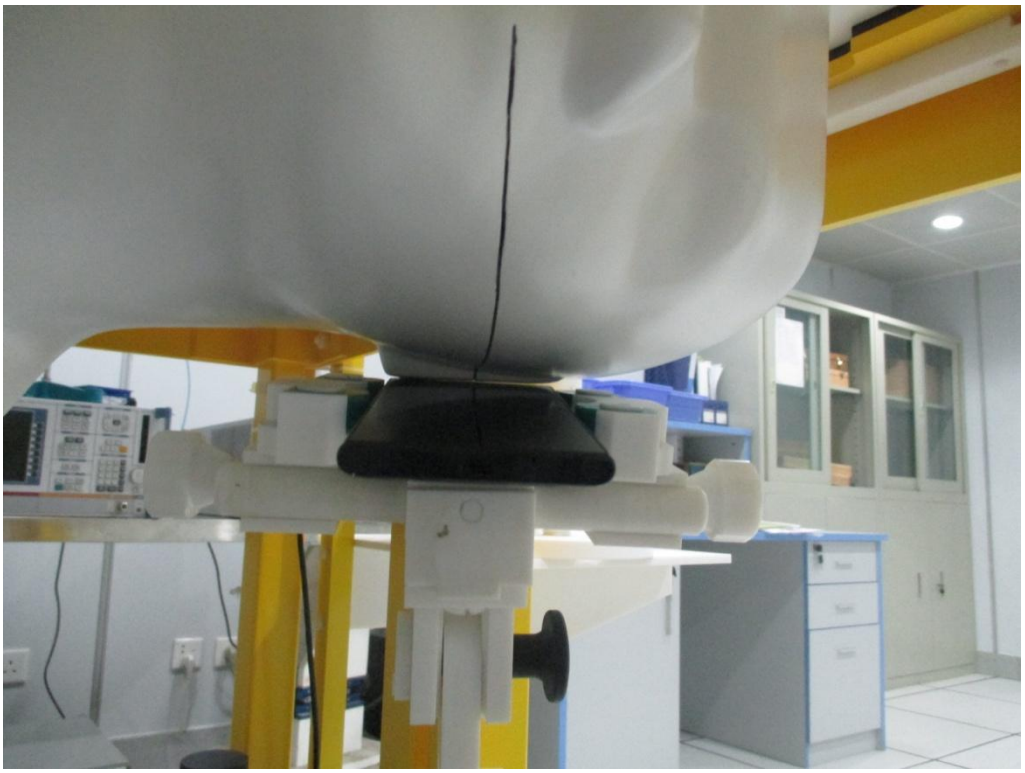


Fig.5 Left_Tilt

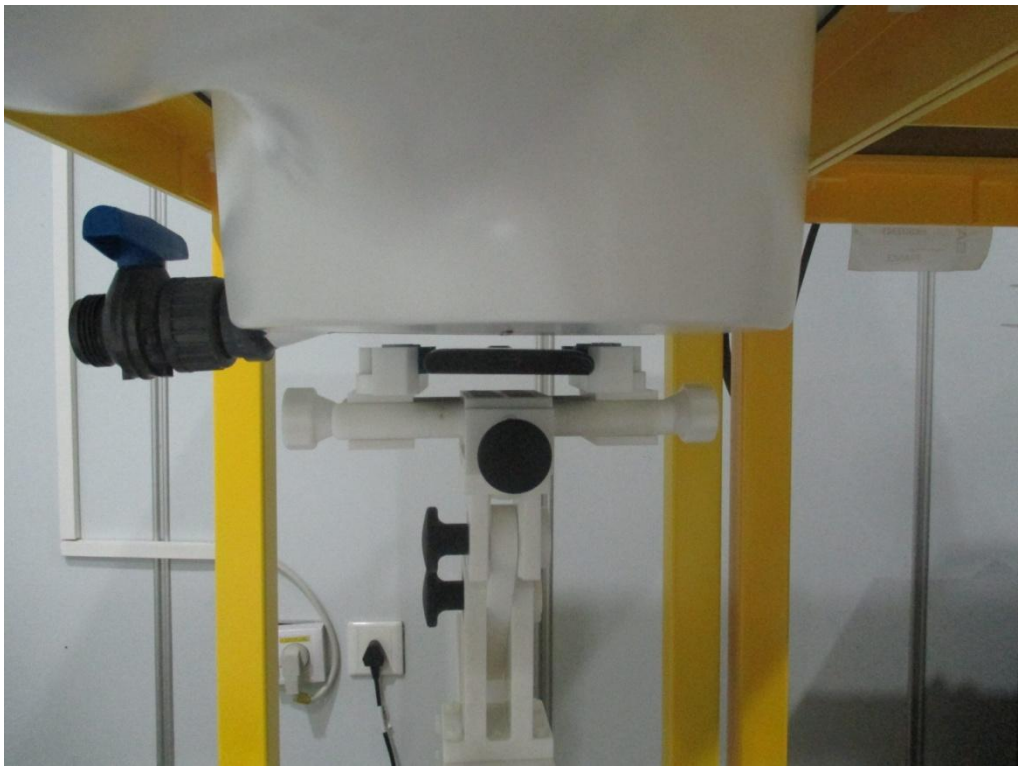


Fig.6 Body(Back upside,5mm seperation)

Fig.7 Body(Face upside,5mm seperation)

Fig.8 Body Edge A(UP,5mm seperation)

Fig.9 Body Edge B(Right upside,5mm separation)

Fig.10 Body Edge C(Down,5mm seperation)

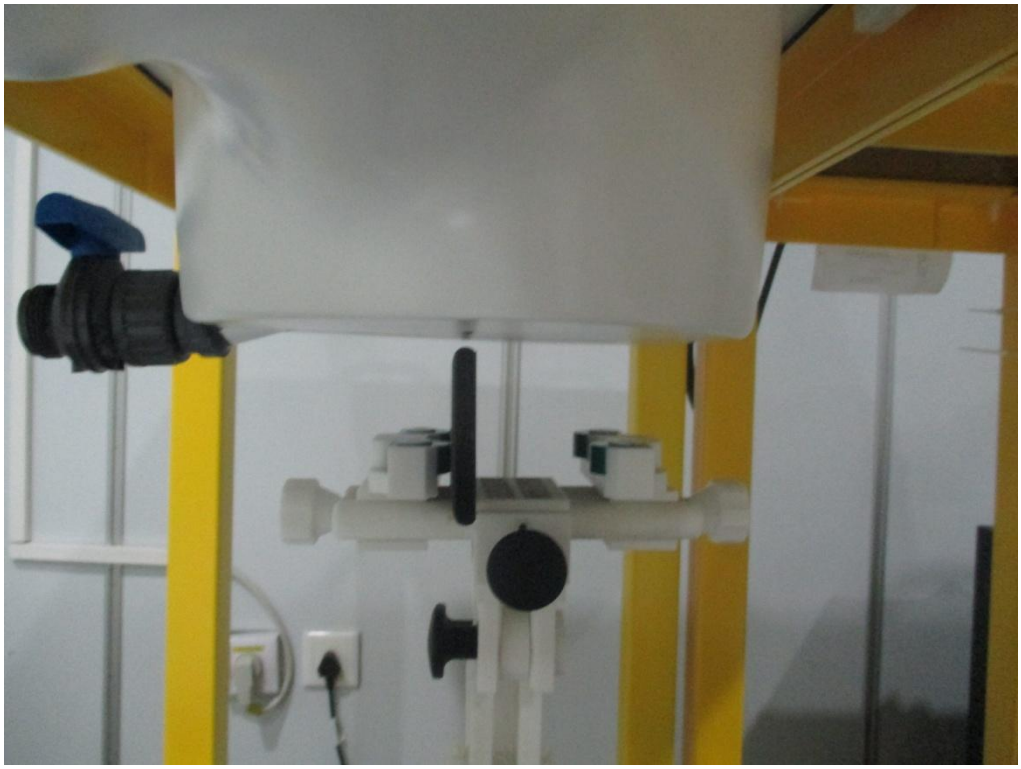


Fig.11 Body Edge D(Left upside,5mm separation)

Fig.13 Head Liquid of 835MHz(15cm)

Fig.14 Body Liquid of 835MHz(15cm)

Fig.15 Head Liquid of 1750MHz(15cm)

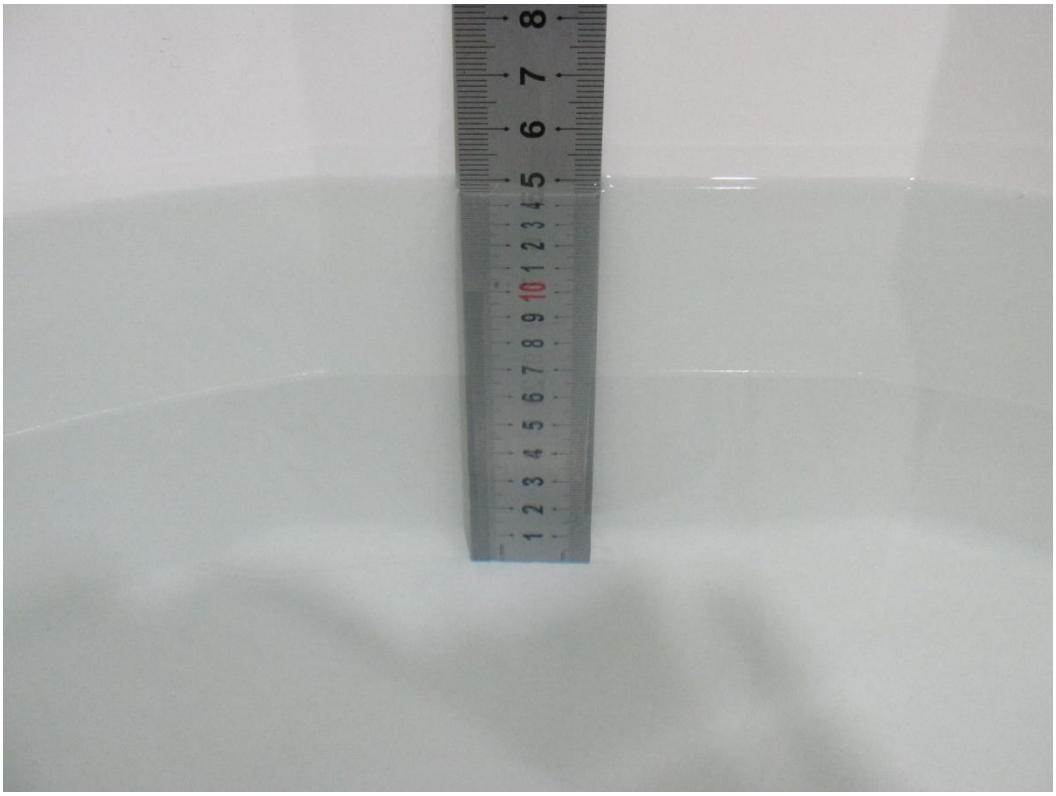


Fig.16 Body Liquid of 1750MHz(15cm)

Fig.17 Head Liquid of 1900MHz(15cm)

Fig.18 Body Liquid of 1900MHz(15cm)

Fig.19 Head Liquid of 2450MHz(15cm)

Fig.20 Body Liquid of 2450MHz(15cm)

ANNEX C

of

CCIC-SET

CONFORMANCE TEST REPORT FOR

HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

SET2015-01431

LTE Mobile Phone

Type Name: M4 SS4445T

Hardware Version: A-V1.0

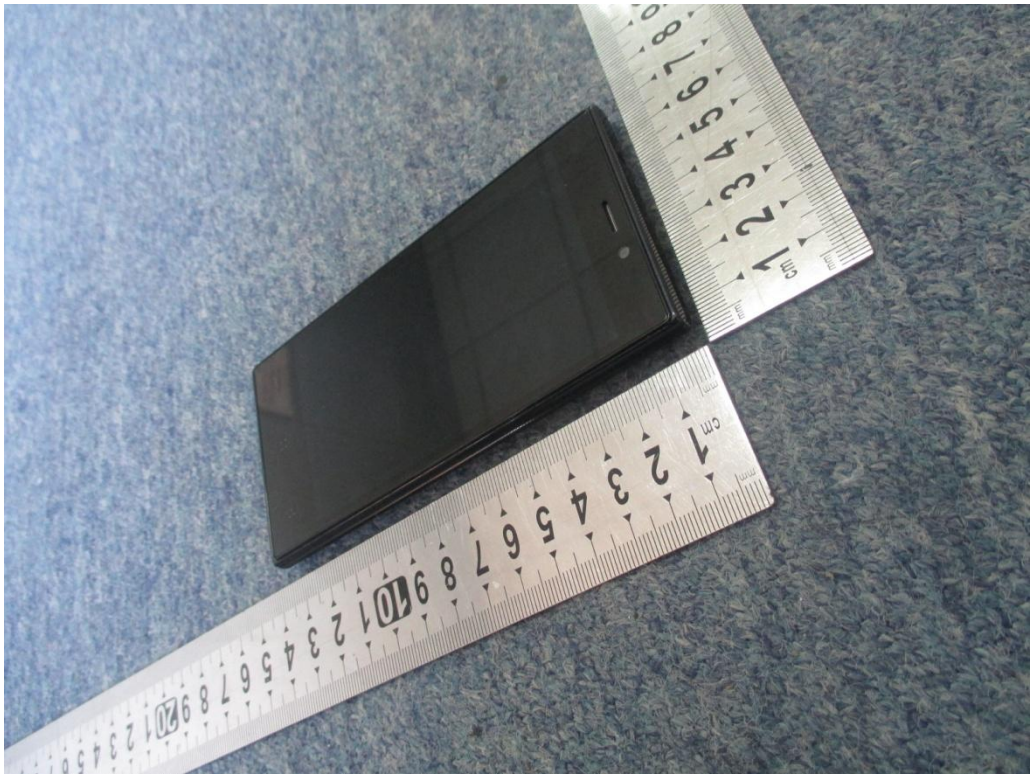
Software Version: M4_SS4445_S10_VER200

Sample Photographs

This Annex consists of 2 pages

Date of Report: 2015-01-30

1. Appearance



Appearance and size (obverse)

Appearance and size (reverse)

ANNEX D

of

CCIC-SET

CONFORMANCE TEST REPORT FOR

HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

SET2015-01431

LTE Mobile Phone

Type Name: M4 SS4445T

Hardware Version: A-V1.0

Software Version: M4_SS4445_S10_VER200

System Performance Check Data and Highest SAR Plots

This Annex consists of 50 pages

Date of Report: 2015-01-30

GRAPH TEST RESULTS

BAND	PAPAMETERS
GSM 850	Left Head with Cheek device position on Middle Channel in GSM mode Flat Plane with Back Body device position on Middle Channel in GSM mode Flat Plane with Edge D Body device position on Middle Channel in GSM mode Flat Plane with Edge D Body device position on Middle Channel in GSM mode (repeated measurement) Flat Plane with Back Body device position on Middle Channel in GPRS mode Flat Plane with Back Body device position on Middle Channel in GPRS mode (repeated measurement)
GSM 1900	Right Head with Cheek device position on Middle Channel in GSM mode Flat Plane with Back Body device position on Middle Channel in GSM mode Flat Plane with Back Body device position on Middle Channel in GSM mode (repeated measurement1) Flat Plane with Back Body device position on Middle Channel in GSM mode (repeated measurement2) Flat Plane with Back Body device position on Middle Channel in GPRS mode Flat Plane with Back Body device position on Middle Channel in GPRS mode (repeated measurement)
WCDMA 850	Left Head with Cheek device position on Middle Channel in WCDMA mode Flat Plane with Edge D Body device position on Middle Channel in WCDMA mode
WCDMA 1900	Left Head with Cheek device position on Middle Channel in WCDMA mode Flat Plane with Face Body device position on Middle Channel in WCDMA mode Flat Plane with Face Body device position on Middle Channel in WCDMA mode(repeated measurement)
WIFI 802.11b	Right Head with Cheek device position on Low Channel in DSSS mode Flat Plane with Back Body device position on Low Channel in DSSS mode
LTE Band2	Left Head with Cheek device position on Middle Channel in QPSK mode Flat Plane with Edge C Body device position on Middle Channel in QPSK mode Flat Plane with Edge C Body device position on Middle Channel in QPSK mode Flat Plane with Edge C Body device position on Middle Channel in QPSK mode
LTE Band4	Right Head with Cheek device position on High Channel in QPSK mode Flat Plane with Back Body device position on High Channel in QPSK mode
LTE Band17	Right Head with Cheek device position on Low Channel in QPSK mode Flat Plane with Back Body device position on Low Channel in QPSK mode

System Performance Check (Head, 835MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement:19/11/2014

Measurement duration: 12 minutes 57 seconds

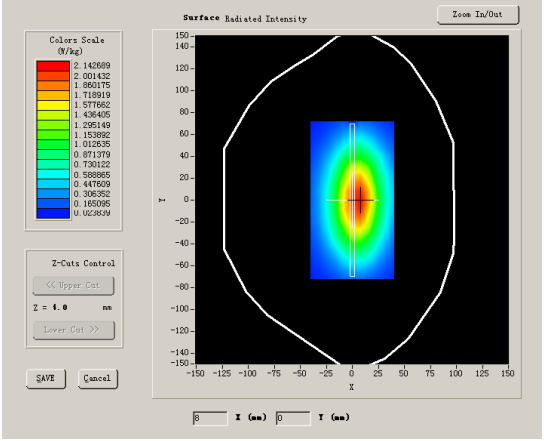
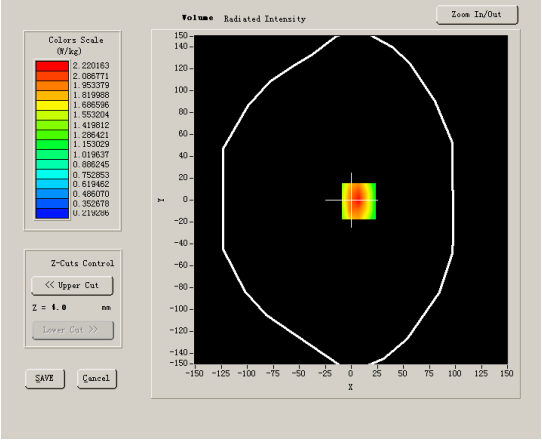
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	835MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	835.000000
Relative permittivity (real part)	41.45
Relative permittivity	15.07
Conductivity (S/m)	0.91
Power drift (%)	-0.230000
Ambient Temperature:	23.2 ℃
Liquid Temperature:	23.5 ℃
ConvF:	5.51
Duty factor:	1:1

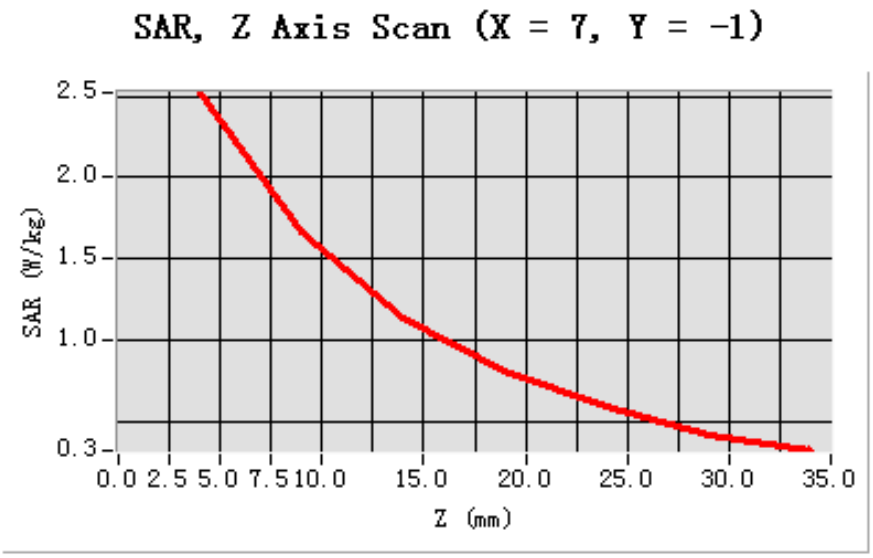
SURFACE SAR	VOLUME SAR
	

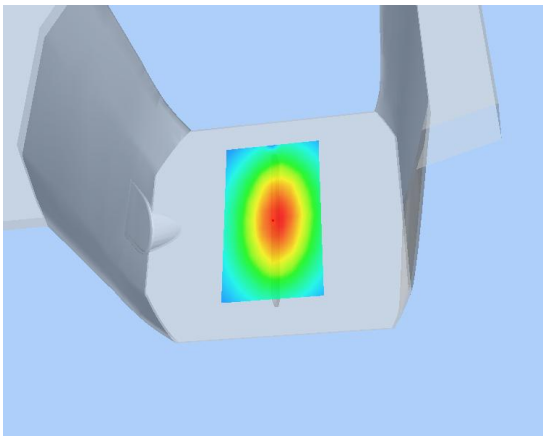
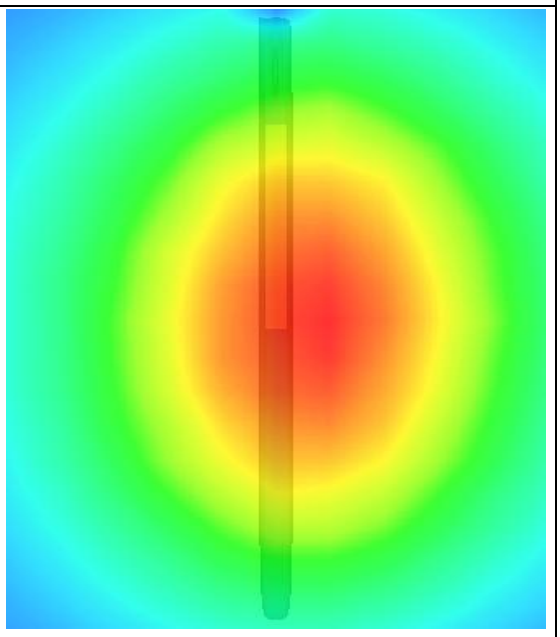
Maximum location: X=7.00, Y=-1.00

SAR 10g (W/Kg)	1.824256
SAR 1g (W/Kg)	2.454673

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.5214	1.6624	1.1451	0.8065	0.5875	0.4153



3D sceen shot	Hot spot position
	

System Performance Check (Head, 1750MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 20/11/2014

Measurement duration: 12 minutes 52 seconds

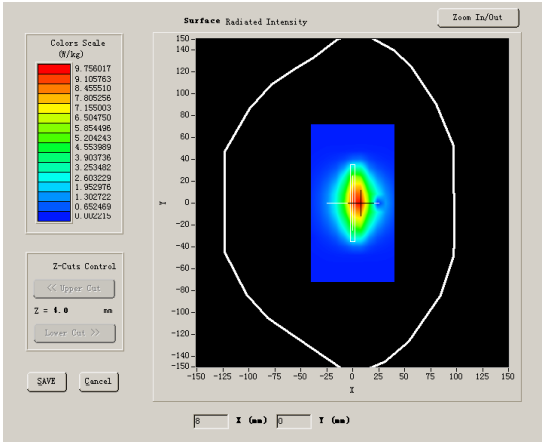
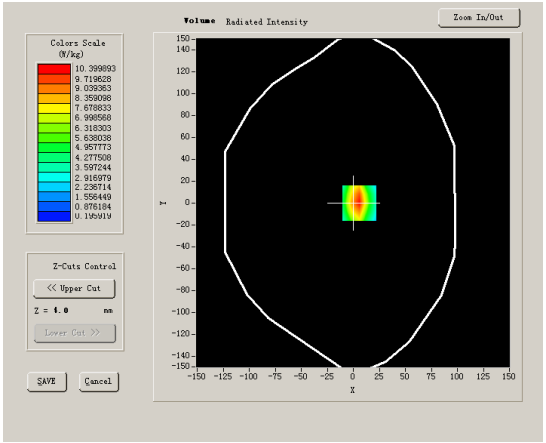
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	1750MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1750.000000
Relative permittivity (real part)	39.979347
Relative permittivity	15.067700
Conductivity (S/m)	1.413587
Power drift (%)	-0.140000
Ambient Temperature:	23.3℃
Liquid Temperature:	23.6℃
ConvF:	4.80
Crest factor:	1:1

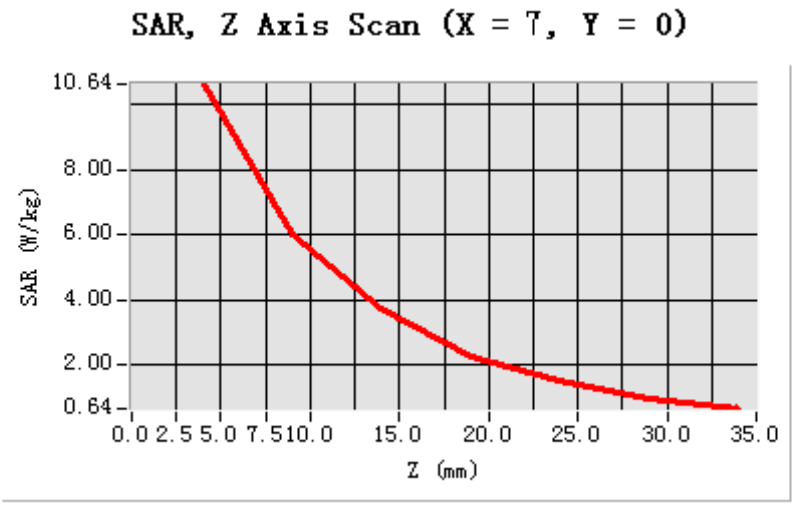
SURFACE SAR	VOLUME SAR
	

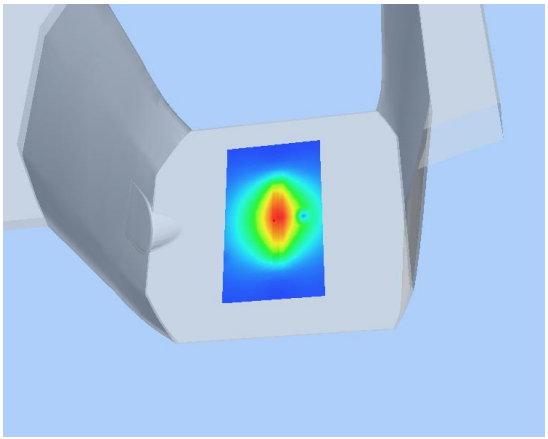
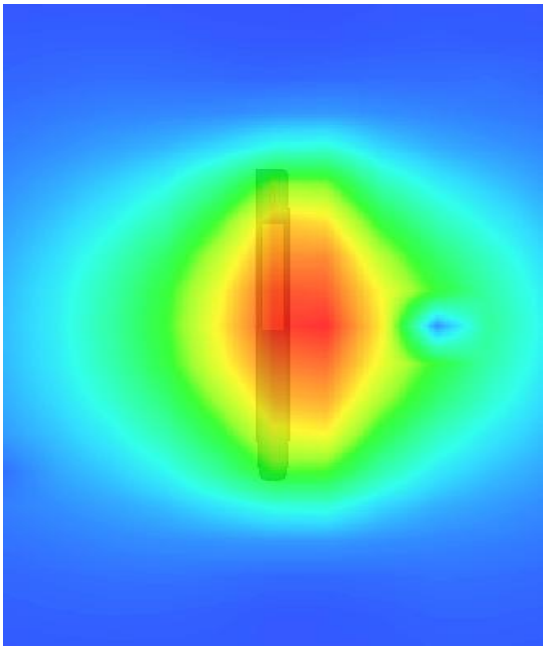
Maximum location: X=7.00, Y=0.00

SAR 10g (W/Kg)	5.035784
SAR 1g (W/Kg)	9.824367

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	10.2574	6.0013	3.7134	2.2345	1.4352	0.9653



3D sceen shot	Hot spot position
	

System Performance Check (Head, 1900MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 21/11/2014

Measurement duration: 12 minutes 57 seconds

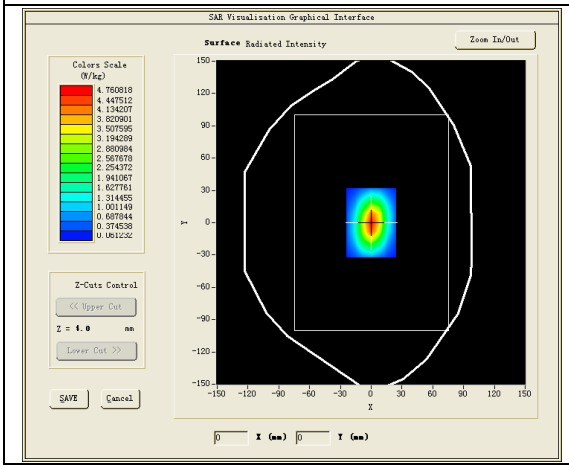
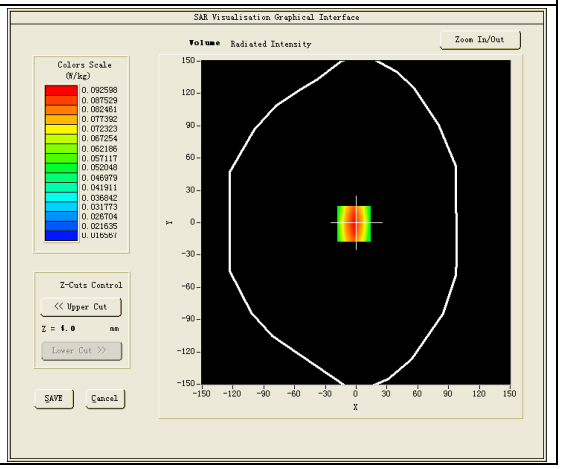
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	1900MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1900.000000
Relative permittivity (real part)	39.98
Relative permittivity	15.07
Conductivity (S/m)	1.41
Power drift (%)	-0.150000
Ambient Temperature:	22.3 ℃
Liquid Temperature:	22.6 ℃
ConvF:	5.49
Duty factor:	1:1

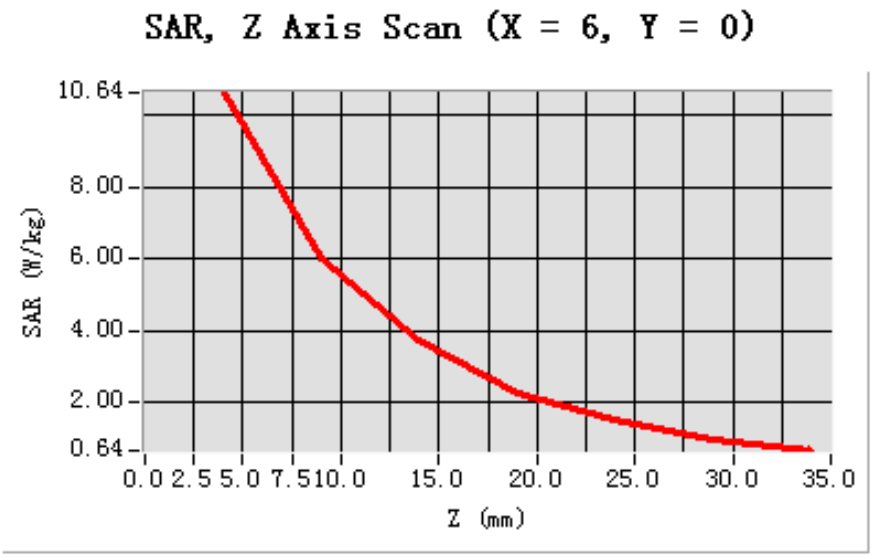
SURFACE SAR	VOLUME SAR
	

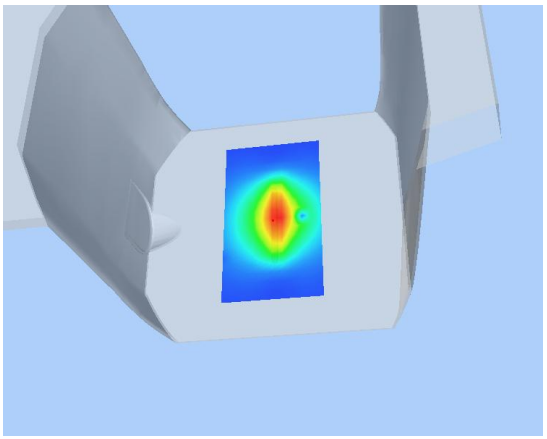
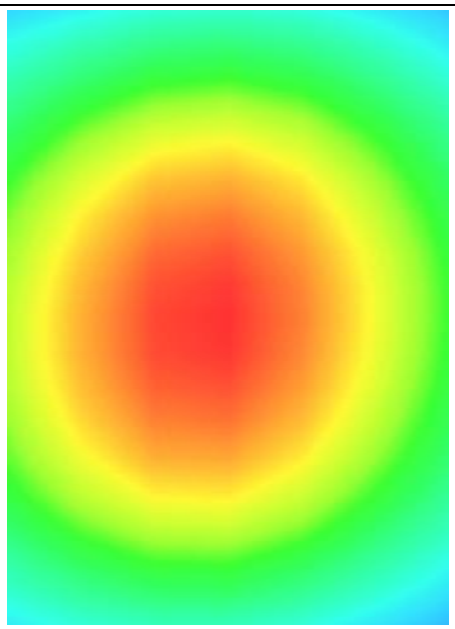
Maximum location: X=6.00, Y=0.00

SAR 10g (W/Kg)	5.142873
SAR 1g (W/Kg)	9.794237

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	10.6418	6.0044	3.7296	2.2605	1.5117	0.9790



3D sceen shot	Hot spot position
	

System Performance Check (Head, 2450MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement:24/11/2014

Measurement duration: 15 minutes 24 seconds

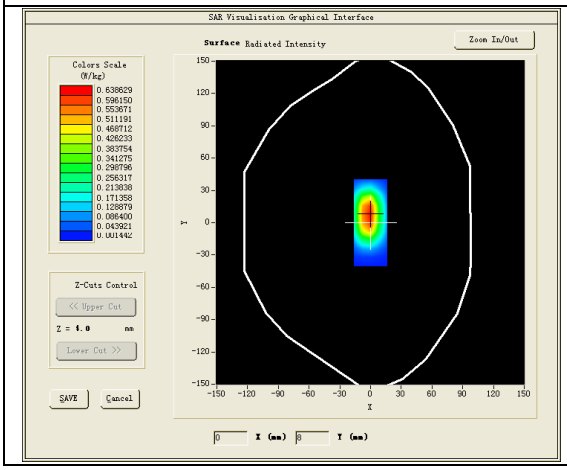
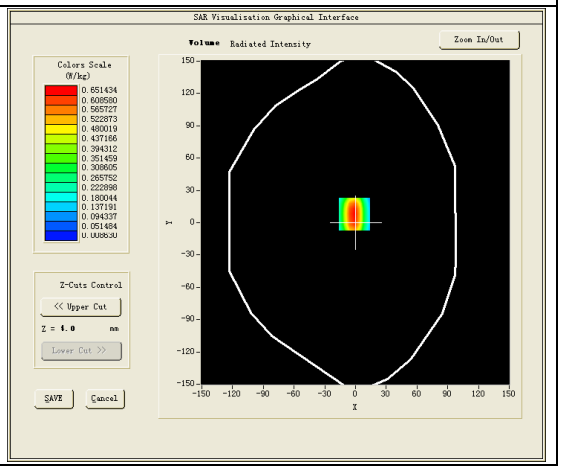
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Dipole
Band	2450MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	2450.000000
Relative permittivity (real part)	38.99
Relative permittivity	13.19
Conductivity (S/m)	1.81
Power Drift (%)	0.420000
ConvF:	4.81
Duty factor:	1:1

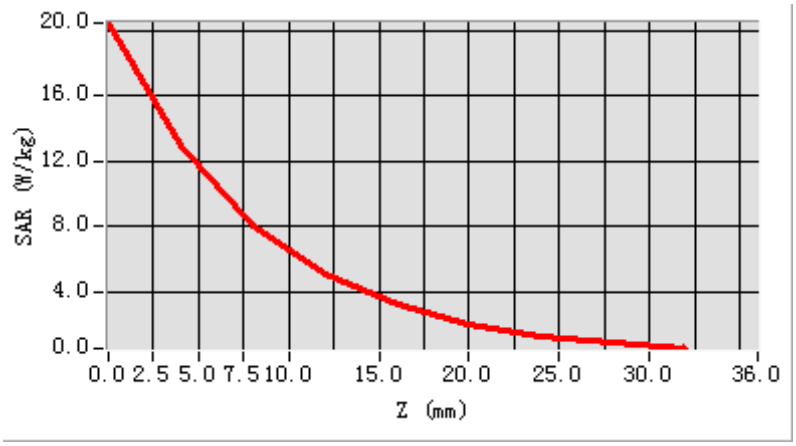
SURFACE SAR	**VOLUME SAR**
	

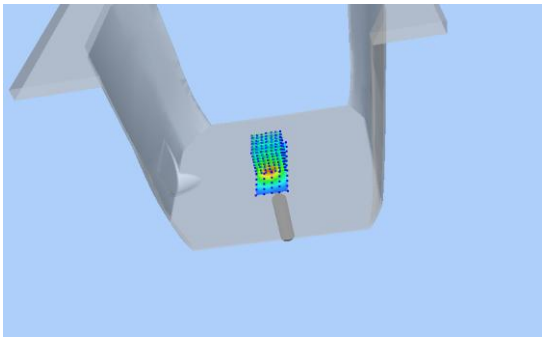
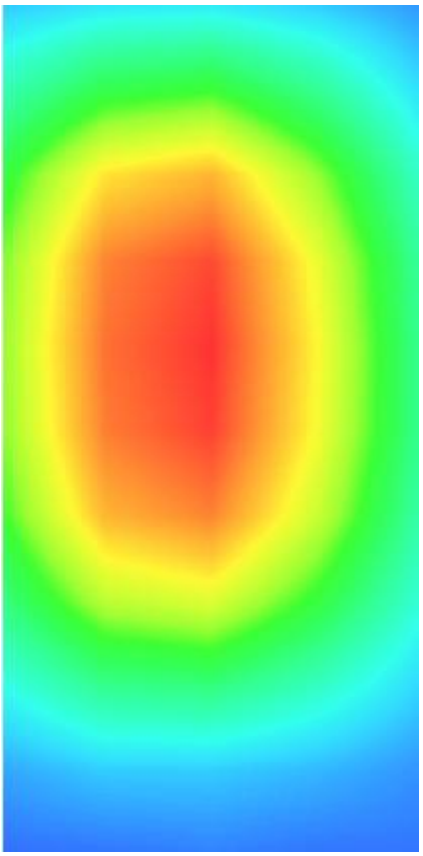
Maximum location: X=0.00, Y=8.00

SAR 10g (W/Kg)	5.900543
SAR 1g (W/Kg)	13.174632

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	20.3890	13.160218	3.8625	0. 8019	0.2333



3D sceen shot	Hot spot position
	

System Performance Check (Head, 750MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement:25/11/2014

Measurement duration: 12 minutes 57 seconds

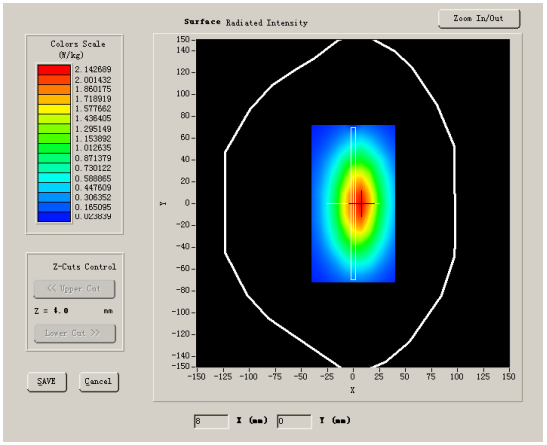
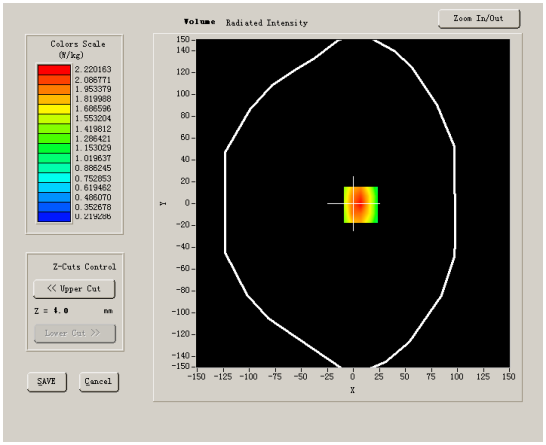
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	750MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	750.000000
Relative permittivity (real part)	41.46
Relative permittivity	15.07
Conductivity (S/m)	0.91
Power drift (%)	-0.430000
Ambient Temperature:	23.2 ℃
Liquid Temperature:	23.5 ℃
ConvF:	22.51
Duty factor:	1:1

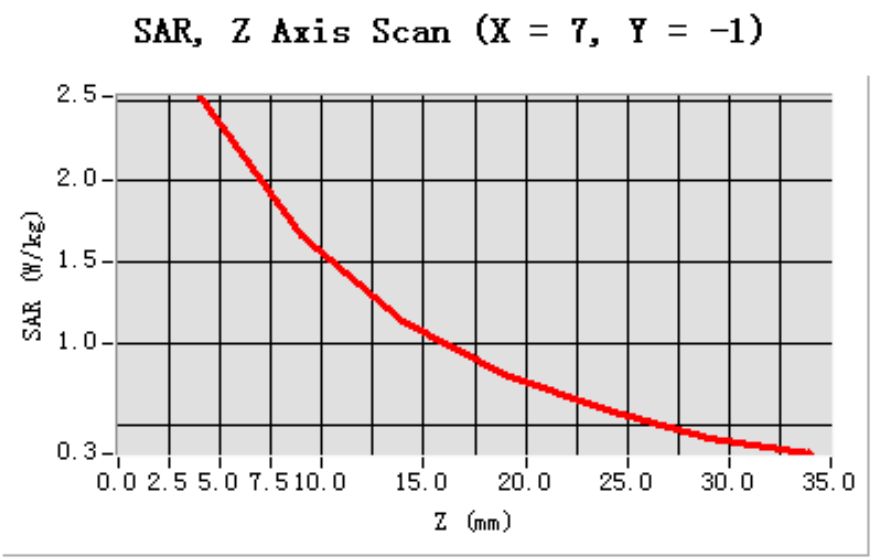
SURFACE SAR	VOLUME SAR
	

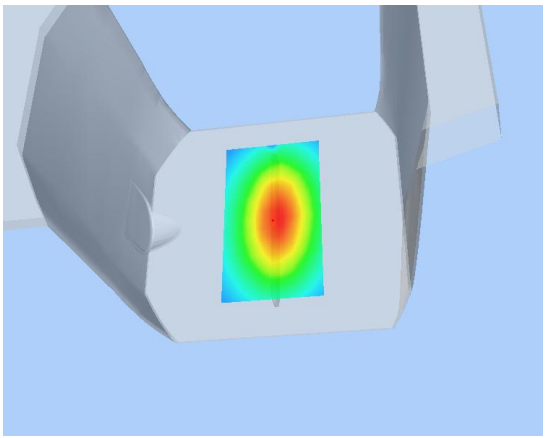
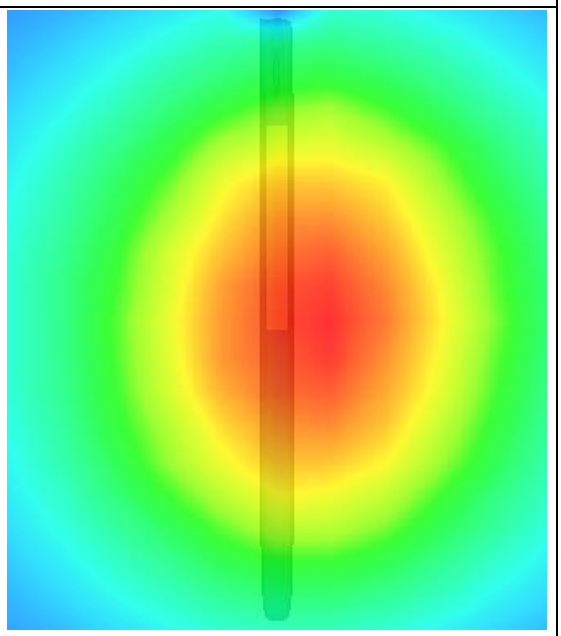
Maximum location: X=7.00, Y=-1.00

SAR 10g (W/Kg)	0.995872
SAR 1g (W/Kg)	1.983241

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.2147	1.5231	1.1215	0.8010	0.5625	0.4024



3D sceen shot	Hot spot position
	

System Performance Check (Head, 1900MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 27/01/2015

Measurement duration: 12 minutes 57 seconds

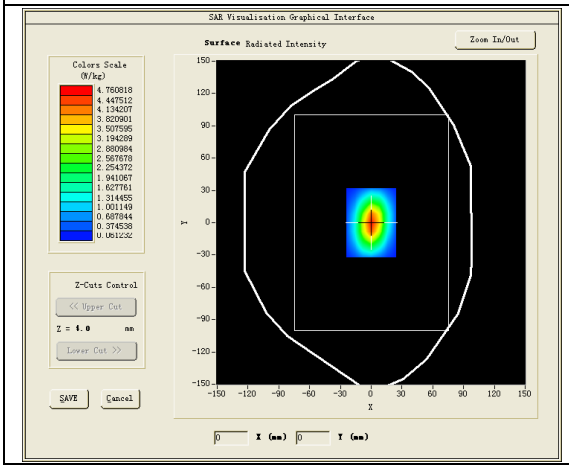
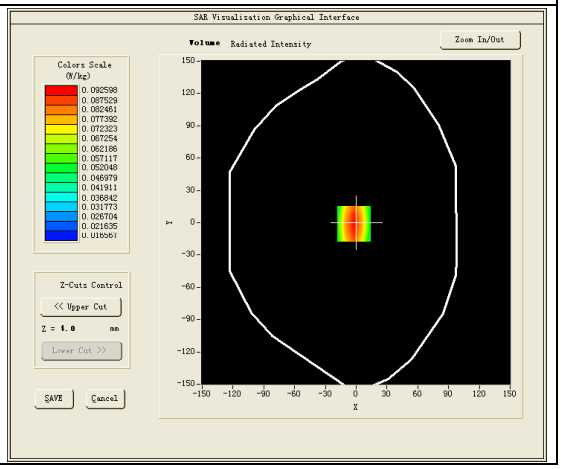
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	1900MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1900.000000
Relative permittivity (real part)	39.98
Relative permittivity	15.07
Conductivity (S/m)	1.40
Power drift (%)	-0.230000
Ambient Temperature:	22.3℃
Liquid Temperature:	22.6℃
ConvF:	5.49
Duty factor:	1:1

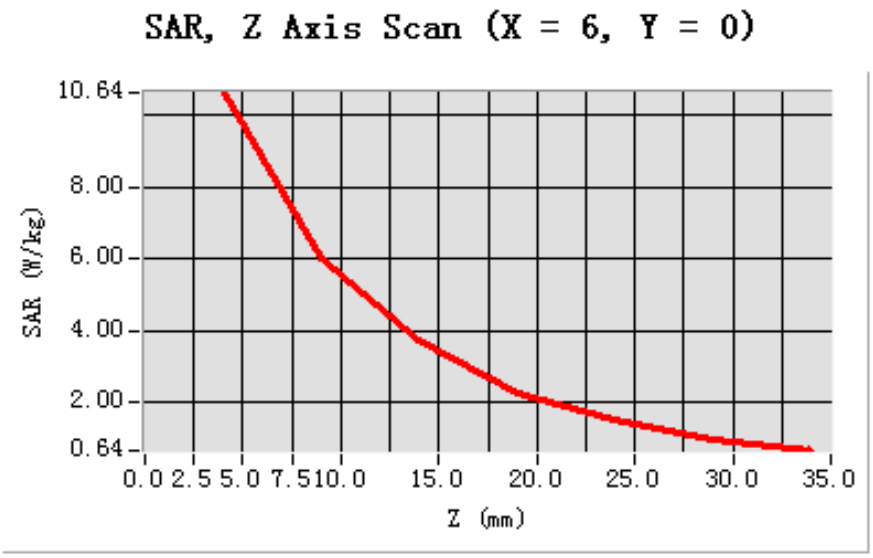
SURFACE SAR	VOLUME SAR
	

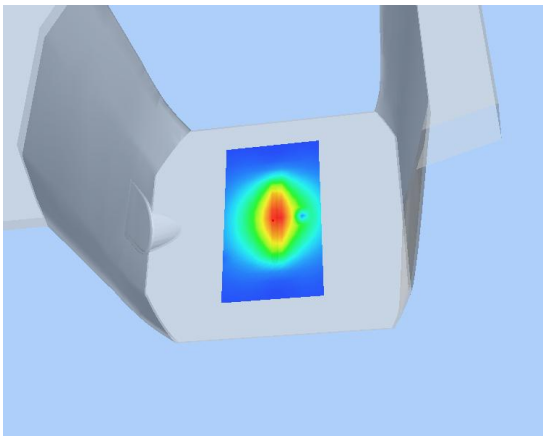
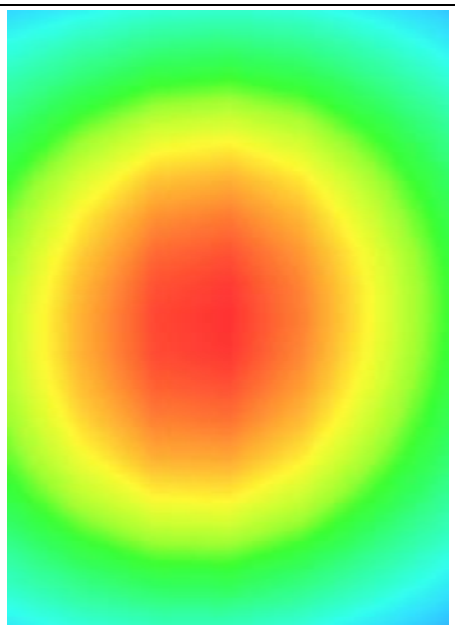
Maximum location: X=6.00, Y=0.00

SAR 10g (W/Kg)	5.143264
SAR 1g (W/Kg)	9.812421

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	10.6431	6.0047	3.7299	2.2612	1.5123	0.9794



3D sceen shot	Hot spot position
	

System Performance Check (Body, 835MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 19/11/2014

Measurement duration: 13 minutes 12 seconds

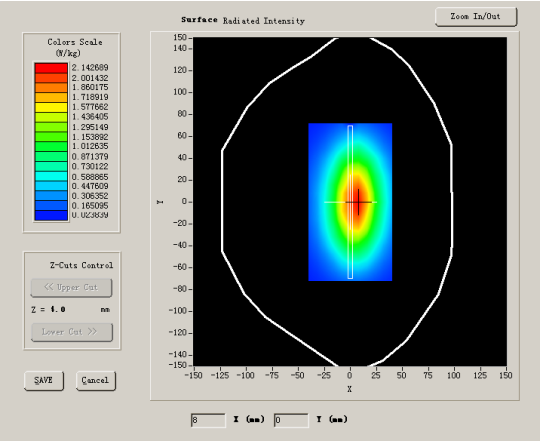
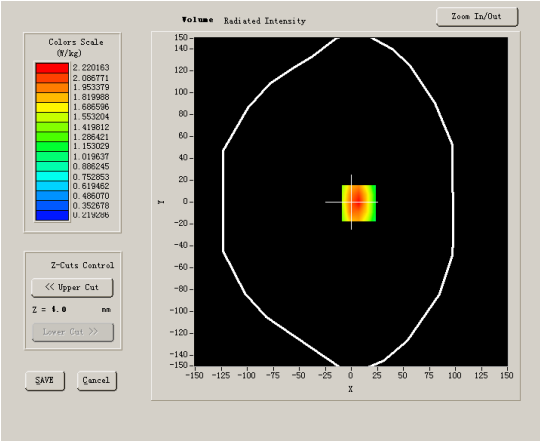
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	835MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	835.000000
Relative permittivity (real part)	55.26
Relative permittivity	21.71
Conductivity (S/m)	0.98
Power drift (%)	-0.270000
Ambient Temperature:	23.2 ℃
Liquid Temperature:	23.5 ℃
ConvF:	5.68
Duty factor:	1:1

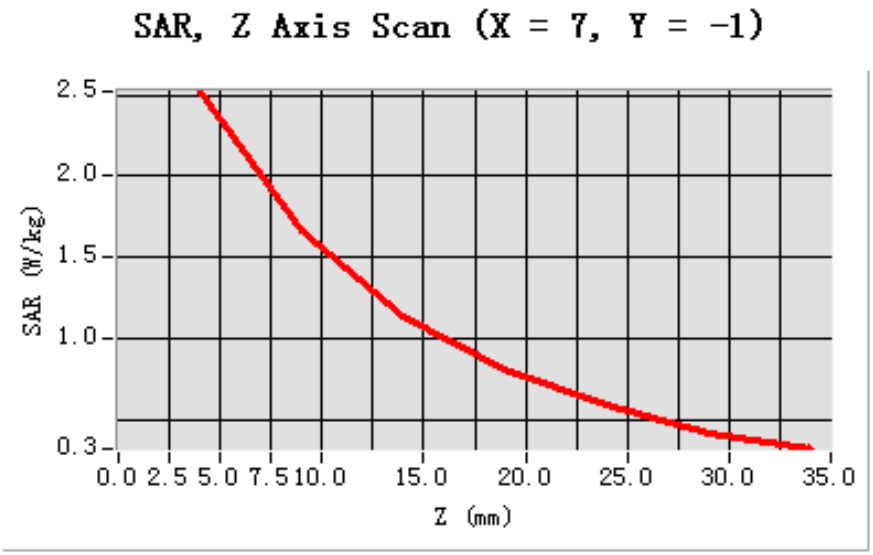
SURFACE SAR	VOLUME SAR
	

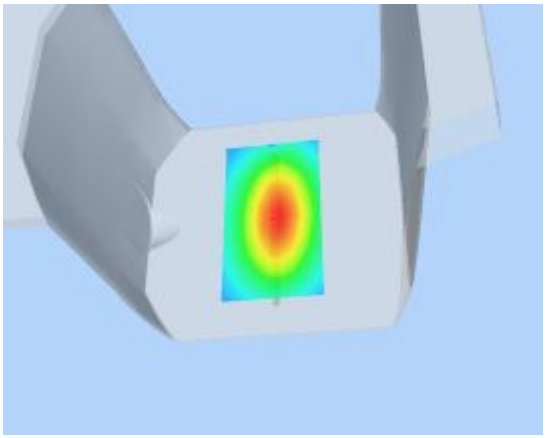
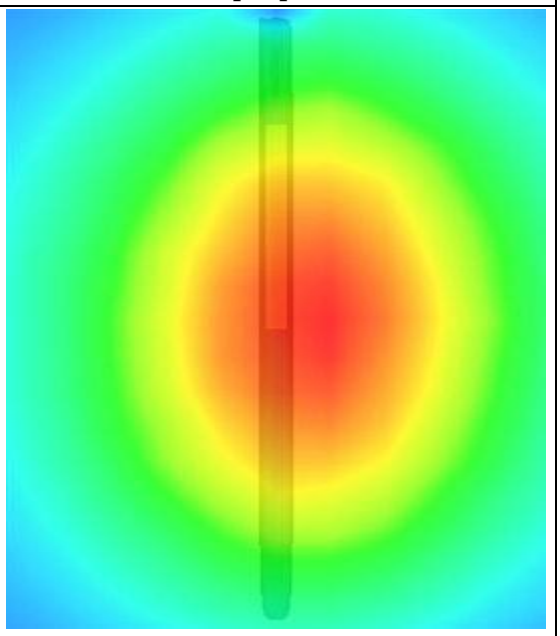
Maximum location: X=7.00, Y=-1.00

SAR 10g (W/Kg)	1.735712
SAR 1g (W/Kg)	2.463547

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.5212	1.6645	1.1443	0.8082	0.5893	0.4148



3D sceen shot	Hot spot position
	

System Performance Check (Body, 1750MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 20/11/2014

Measurement duration: 13 minutes 06 seconds

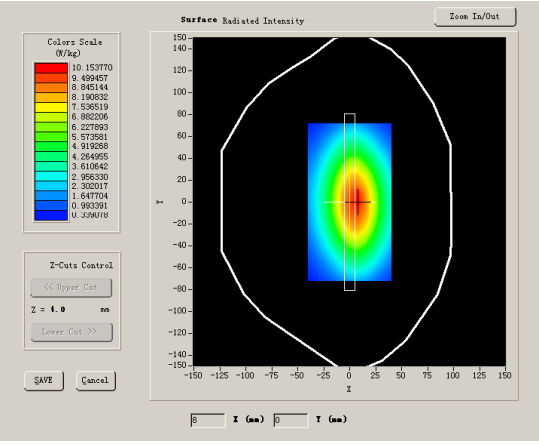
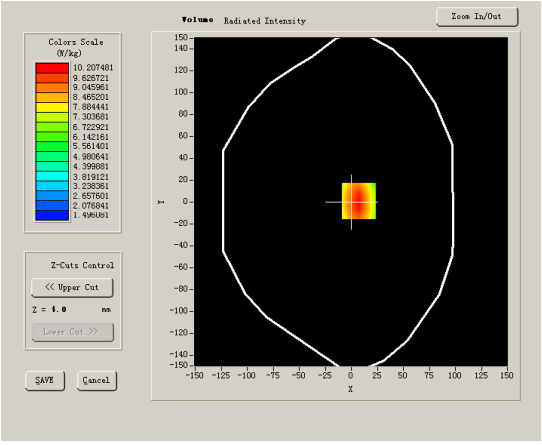
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	1750MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1750.000000
Relative permittivity (real part)	53.890442
Relative permittivity	14.070000
Conductivity (S/m)	1.529512
Power drift (%)	-0.330000
Ambient Temperature:	23.2 ℃
Liquid Temperature:	23.6 ℃
ConvF:	4.94
Crest factor:	1:1

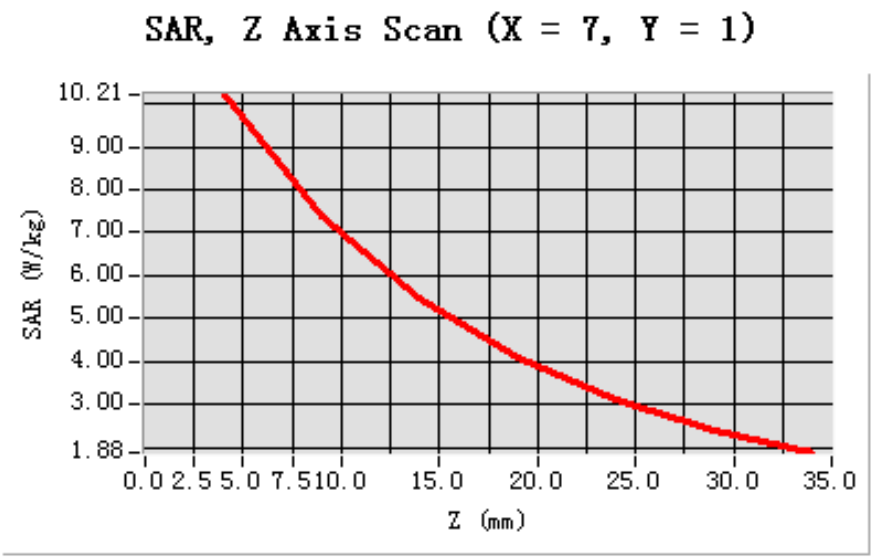
SURFACE SAR	VOLUME SAR
	

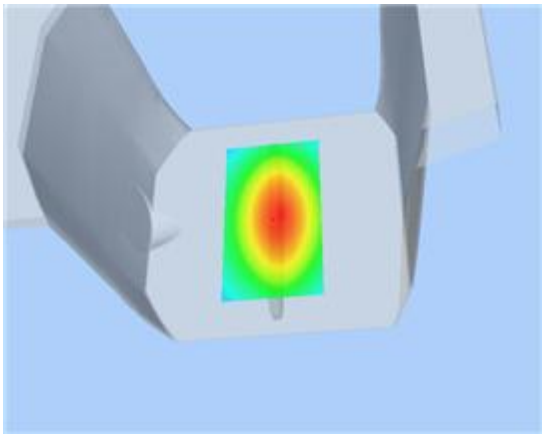
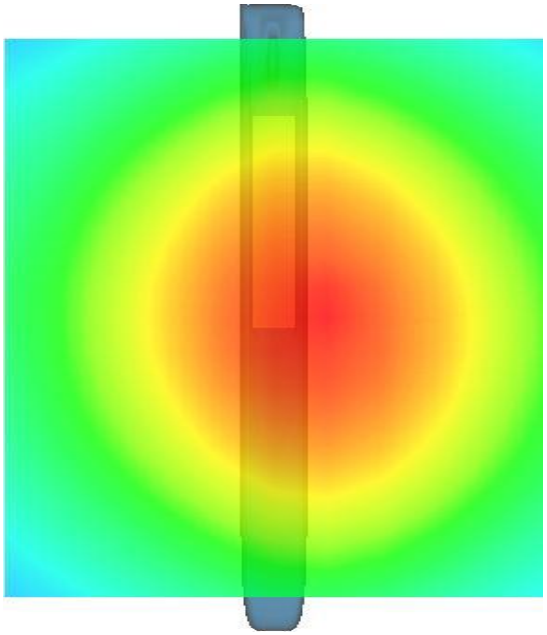
Maximum location: X=7.00, Y=1.00

SAR 10g (W/Kg)	5.102475
SAR 1g (W/Kg)	9.814257

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	10.2075	7.3996	5.4654	4.1101	3.1286	2.4128



3D sceen shot	Hot spot position
	

System Performance Check (Body, 1900MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 21/11/2014

Measurement duration: 13 minutes 12 seconds

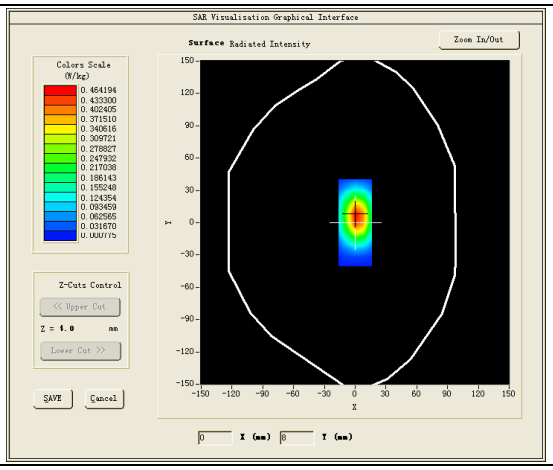
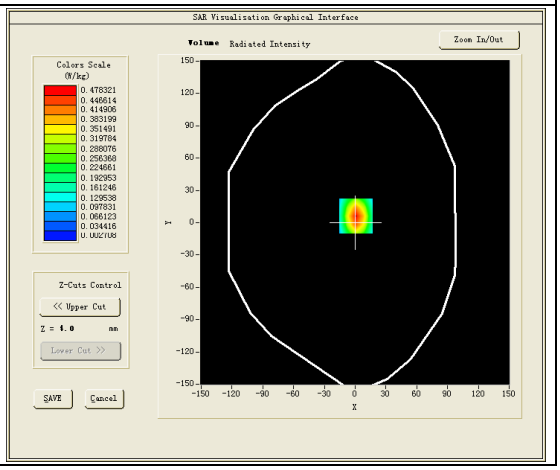
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	1900MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1900.000000
Relative permittivity (real part)	53.28
Relative permittivity	12.99
Conductivity (S/m)	1.53
Power Drift (%)	0.410000
Ambient Temperature:	22.0 ℃
Liquid Temperature:	21.8 ℃
ConvF:	5.65
Duty factor:	1:1

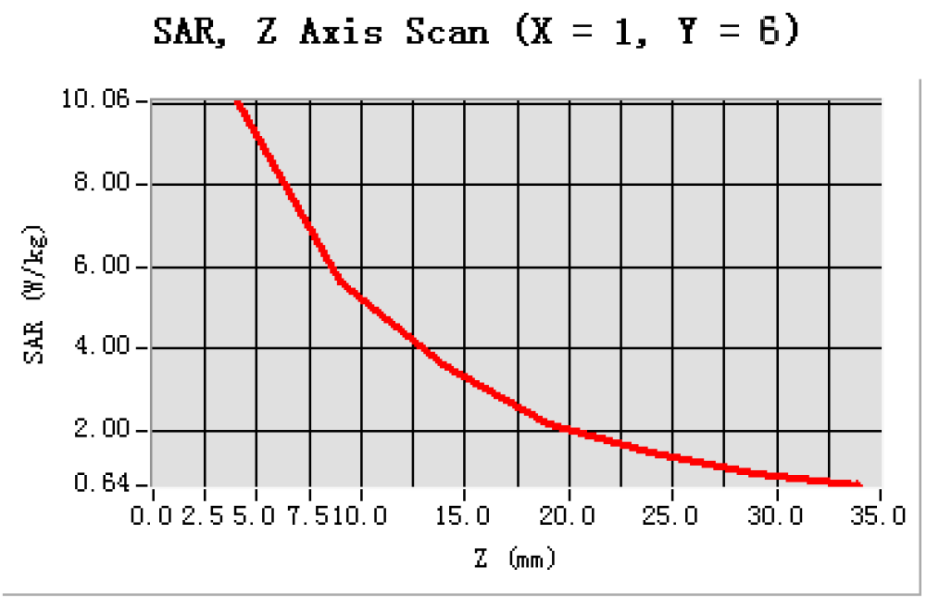
SURFACE SAR	VOLUME SAR
	

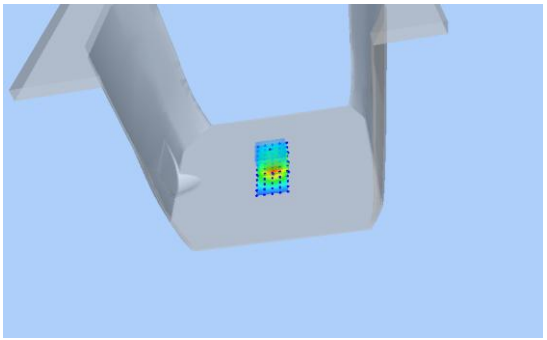
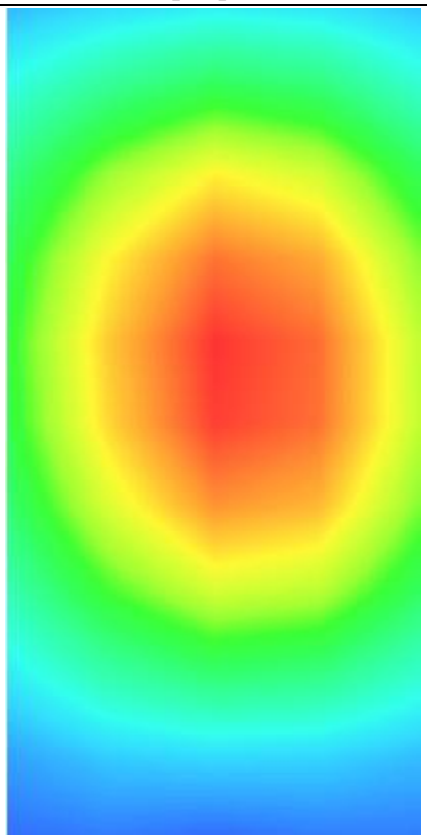
Maximum location: X=1.00, Y=6.00

SAR 10g (W/Kg)	5.215326
SAR 1g (W/Kg)	9.982523

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	10.0613	5.7282	3. 6529	2.0314



3D sceen shot	Hot spot position
	

System Performance Check (Body, 2450MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=5mm, dy=5mm, dz=5mm

Date of measurement: 24/11/2014

Measurement duration: 13 minutes 21 seconds

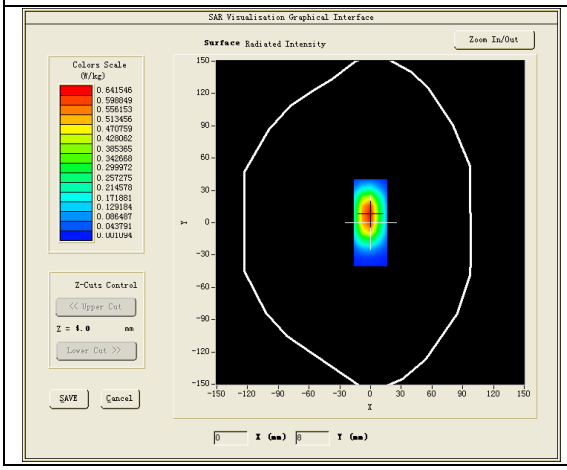
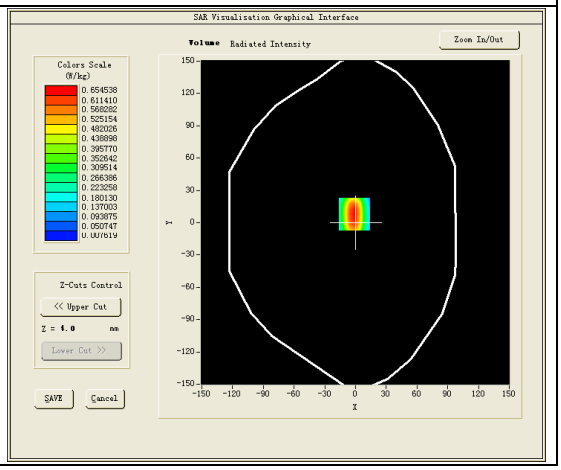
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Dipole
Band	2450MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	2450.000000
Relative permittivity (real part)	52.65
Relative permittivity	13.02
Conductivity (S/m)	1.96
Power Drift (%)	-0.310000
Duty factor:	1:1
ConvF:	4.91

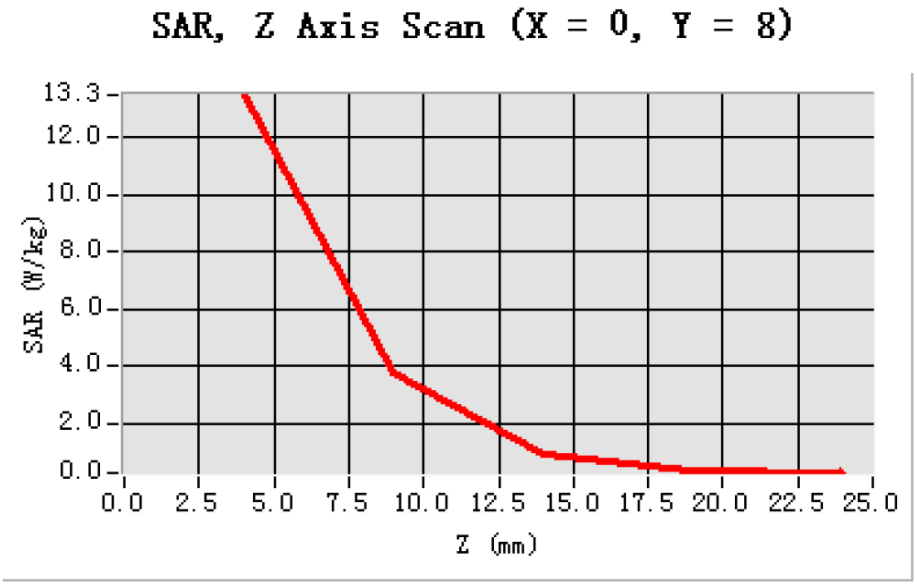
SURFACE SAR	**VOLUME SAR**
	

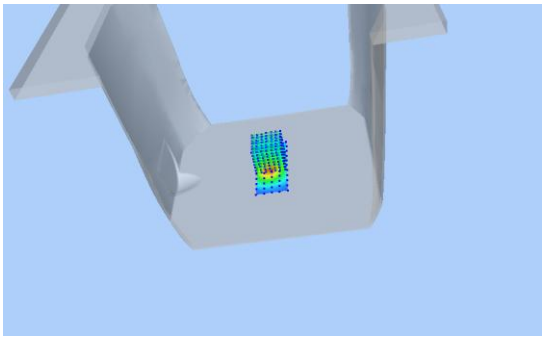
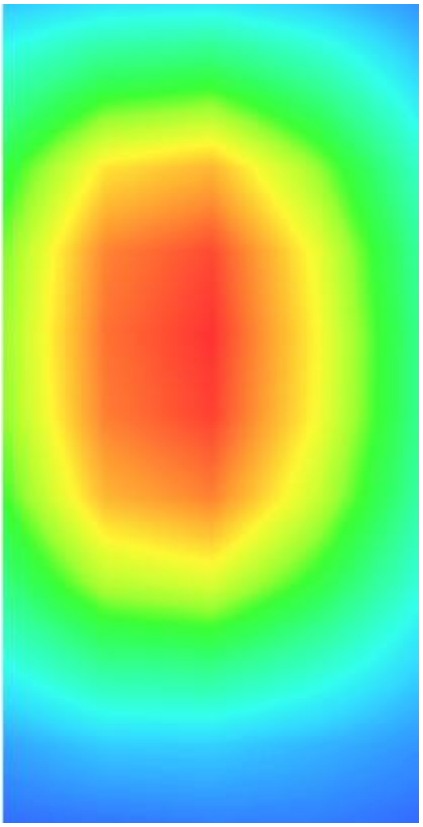
Maximum location: X=0.00, Y=8.00

SAR 10g (W/Kg)	6.032464
SAR 1g (W/Kg)	13.087432

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	13.3124	3.8627	0. 8023	0.2335



3D sceen shot	Hot spot position
	

System Performance Check (Body, 750MHz)

Type: Validation measurement (Complete)

Date of measurement: 25/11/2014

Measurement duration: 13 minutes 52 seconds

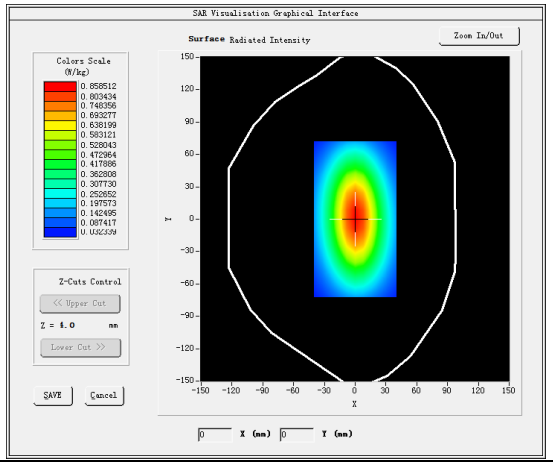
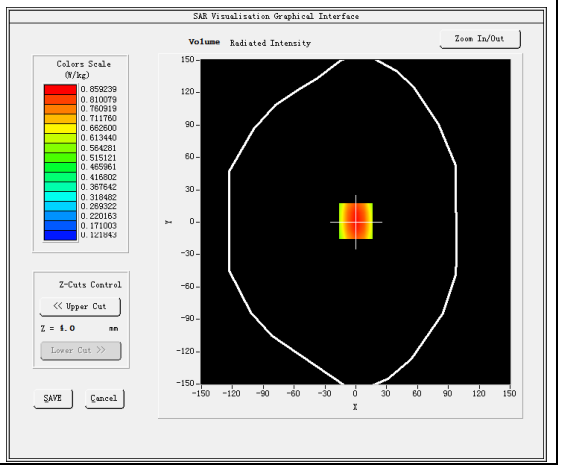
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	surf_sam_plan.txt, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm,Complete/nsurf_sam_plan.txt, h= 5.00 mm
Phantom	Validation plane
Device Position	Body
Band	CW750
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

Frequency (MHz)	750.000000
Relative permittivity (real part)	55.531170
Relative permittivity (imaginary part)	24.594805
Conductivity (S/m)	1.024784
Variation (%)	-0.170000
ConvF	23.36

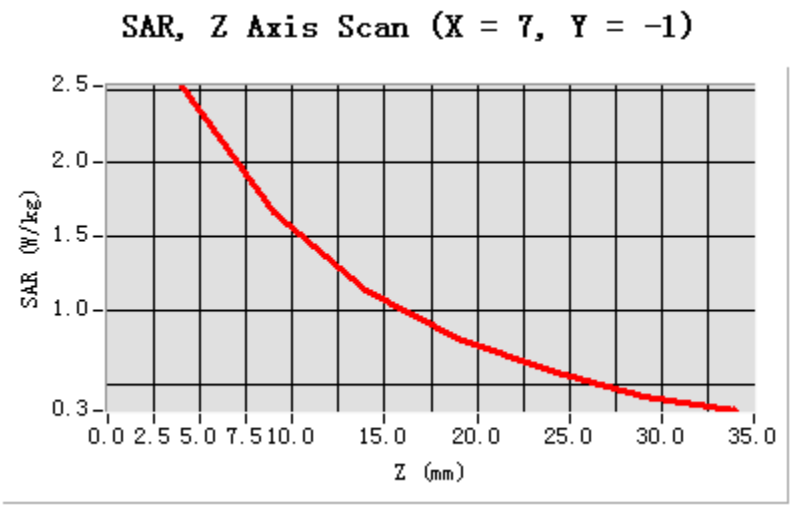
SURFACE SAR	VOLUME SAR
	

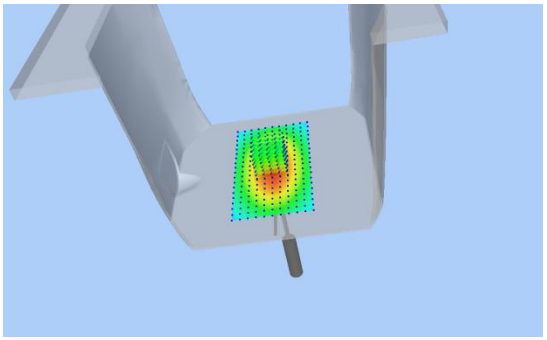
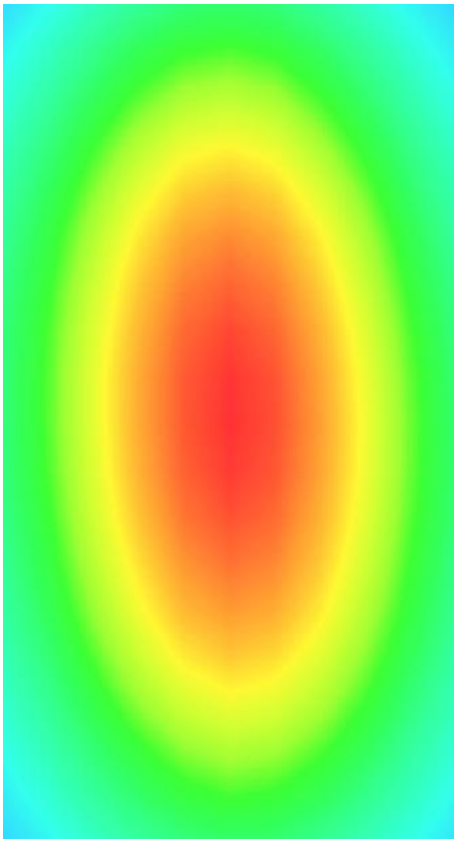
Maximum location: X=0.00, Y=1.00

SAR 10g (W/Kg)	0.965604
SAR 1g (W/Kg)	1.988657

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.3214	1.6241	1.1402	0.8001	0.5821	0.4104



3D screen shot	Hot spot position
	

System Performance Check (Body, 1900MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 27/01/2015

Measurement duration: 13 minutes 12 seconds

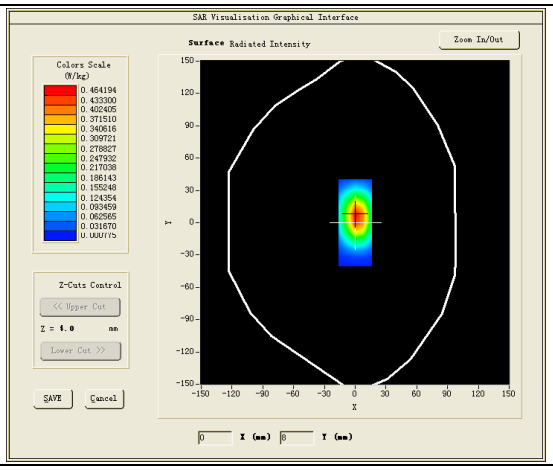
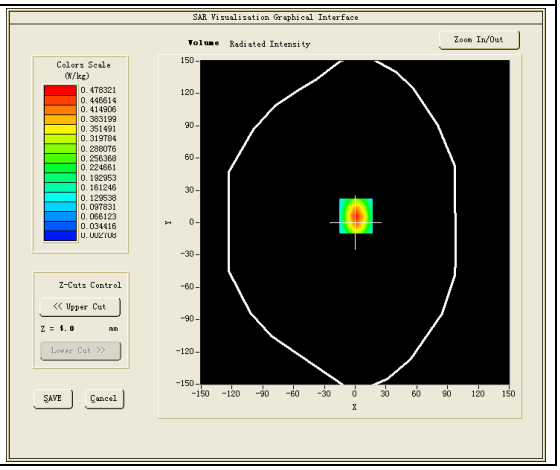
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	1900MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1900.000000
Relative permittivity (real part)	53.27
Relative permittivity	12.99
Conductivity (S/m)	1.53
Power Drift (%)	0.470000
Ambient Temperature:	22.0℃
Liquid Temperature:	21.8℃
ConvF:	5.65
Duty factor:	1:1

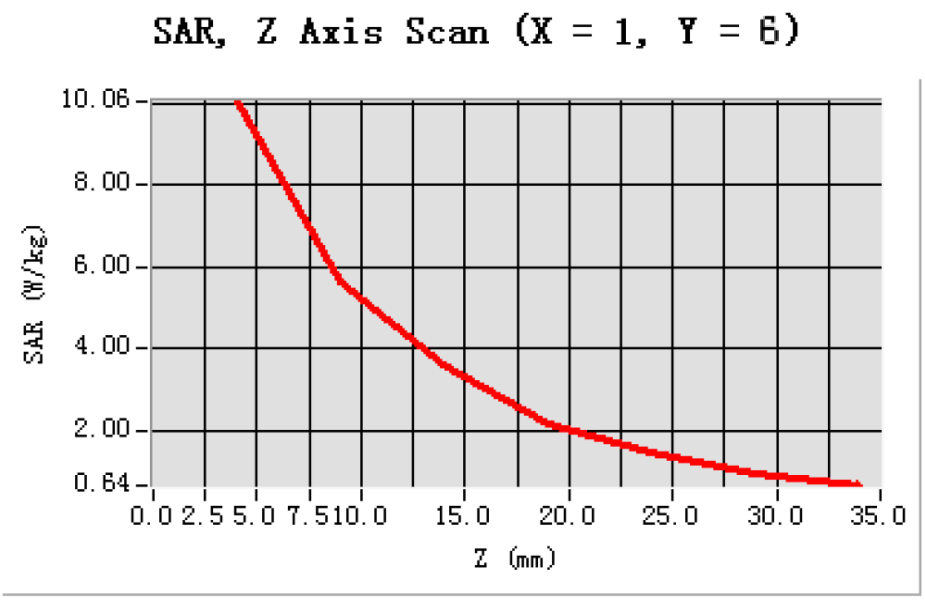
SURFACE SAR	VOLUME SAR
	

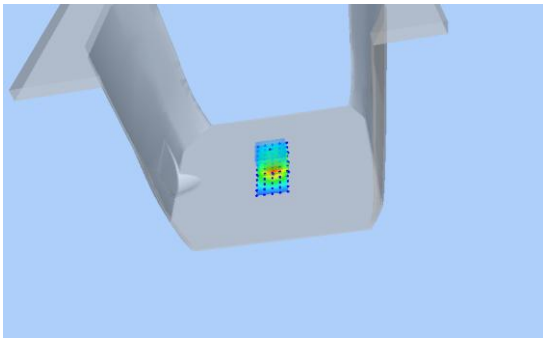
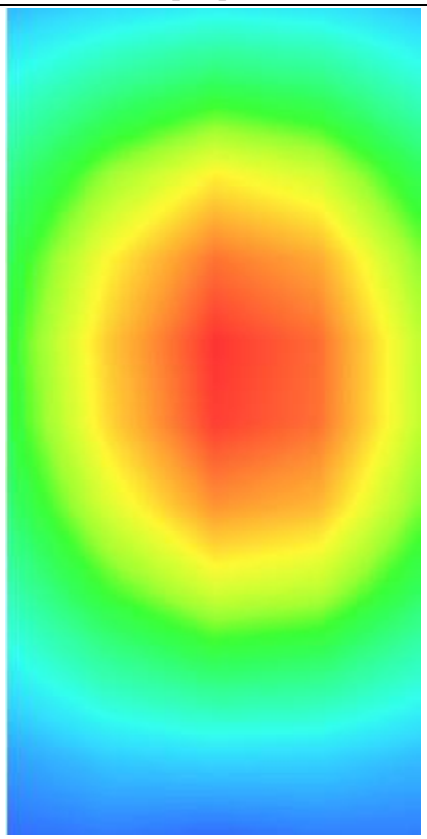
Maximum location: X=1.00, Y=6.00

SAR 10g (W/Kg)	5.215473
SAR 1g (W/Kg)	9.993720

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	10.0617	5.7285	3. 6534	2.0316



3D sceen shot	Hot spot position
	

GSM850, Left Cheek, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 19/11/2014

Measurement duration: 6 minutes 35 seconds

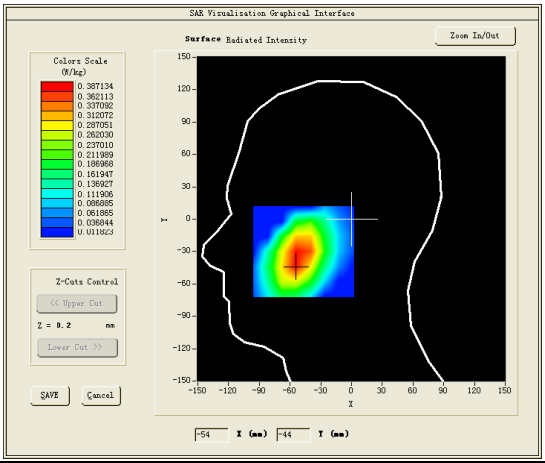
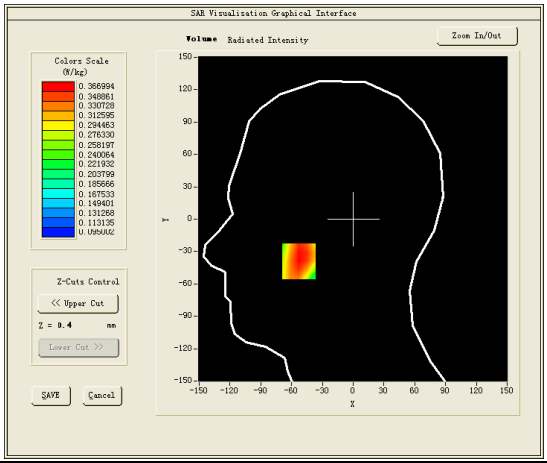
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	sam_direct_droit2_surf8mm.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	GSM850
Channels	190
Signal	GSM (Duty cycle: 1:8)

B. SAR Measurement Results

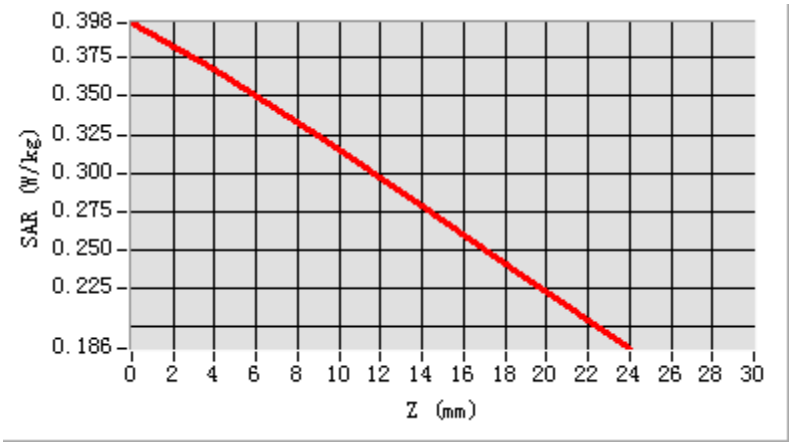
Frequency (MHz)	836.6
Relative permittivity (real part)	41.45
Relative permittivity (imaginary part)	15.07
Conductivity (S/m)	0.91
Variation (%)	-0.900000
ConvF:	5.51

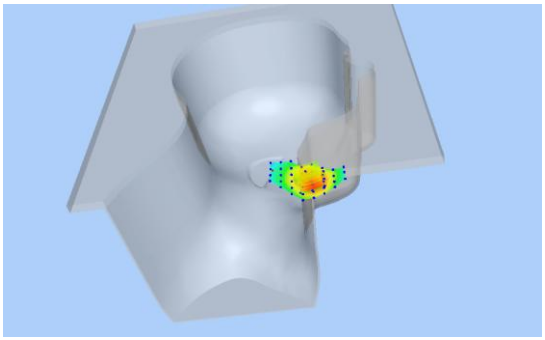
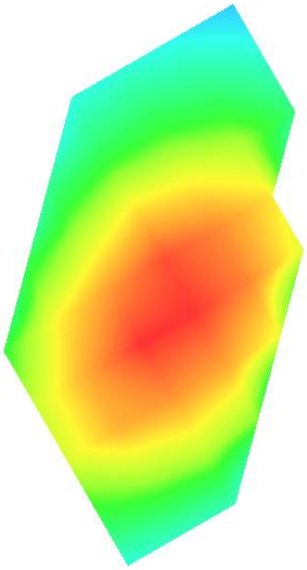
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-53.00, Y=-39.00

SAR 10g (W/Kg)	0.290021
SAR 1g (W/Kg)	0.359269

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.3976	0.3670	0.3246	0.2785	0.2311



3D screen shot	Hot spot position
	

GSM850, Back, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 19/11/2014

Measurement duration: 7 minutes 32 seconds

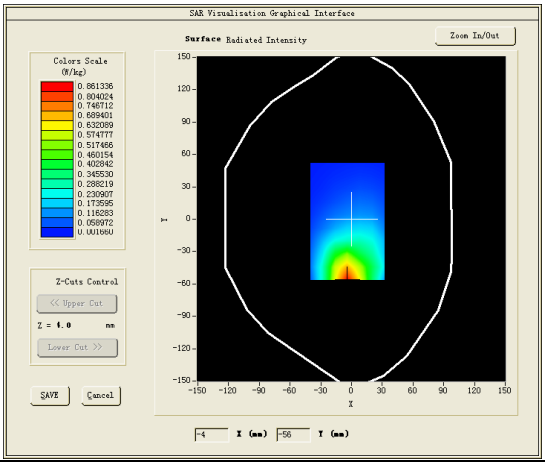
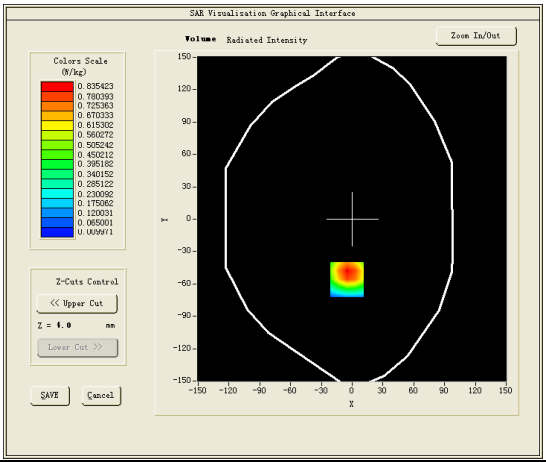
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	surf_sam_plan.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Back
Band	GSM850
Channels	190
Signal	GSM(Duty cycle: 1:8)

B. SAR Measurement Results

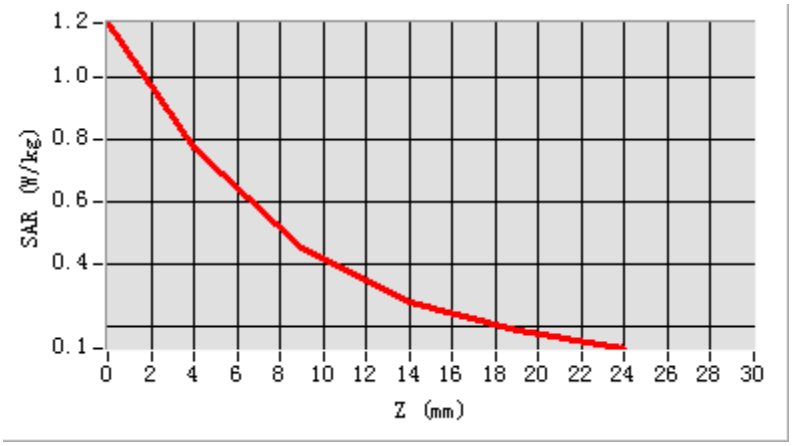
Frequency (MHz)	836.6
Relative permittivity (real part)	55.26
Relative permittivity (imaginary part)	21.71
Conductivity (S/m)	0.98
Variation (%)	1.420000
ConvF:	5.68

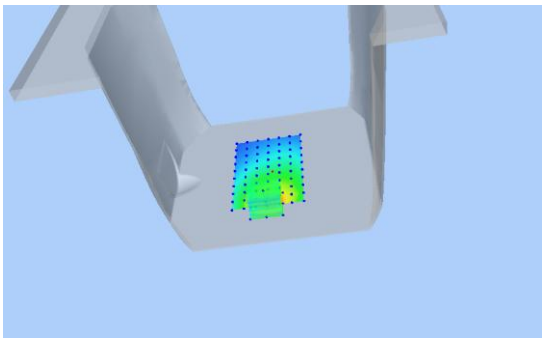
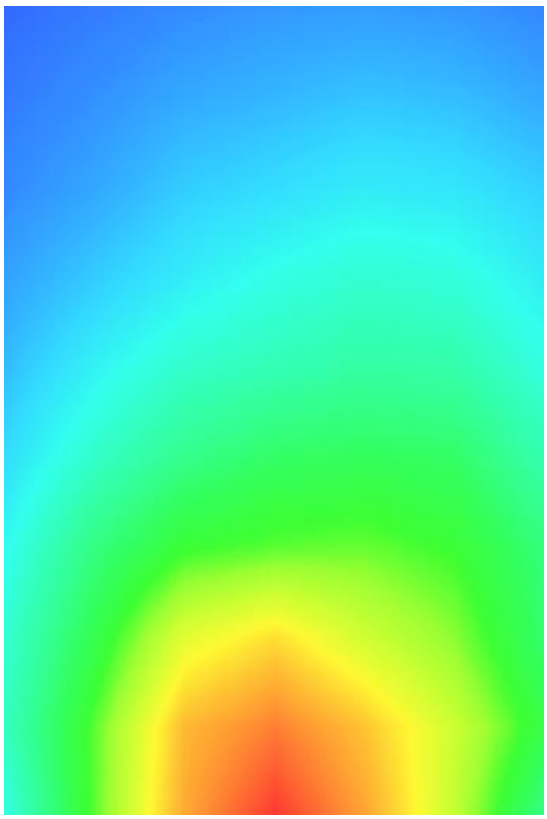
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-5.00, Y=-56.00

SAR 10g (W/Kg)	0.476586
SAR 1g (W/Kg)	0.829417

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.1744	0.7720	0.4540	0.2776	0.1847



3D screen shot	Hot spot position
	

GSM850, Edge D, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 19/11/2014

Measurement duration: 7 minutes 32 seconds

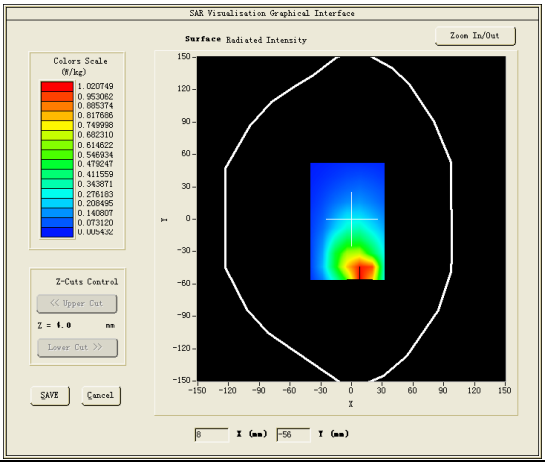
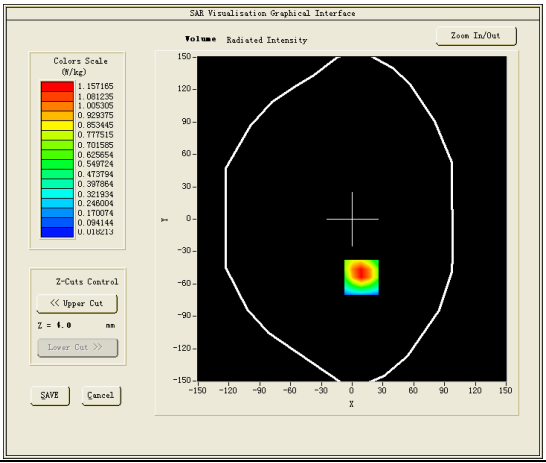
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	surf_sam_plan.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Back
Band	GSM850
Channels	190
Signal	GSM(Duty cycle: 1:8)

B. SAR Measurement Results

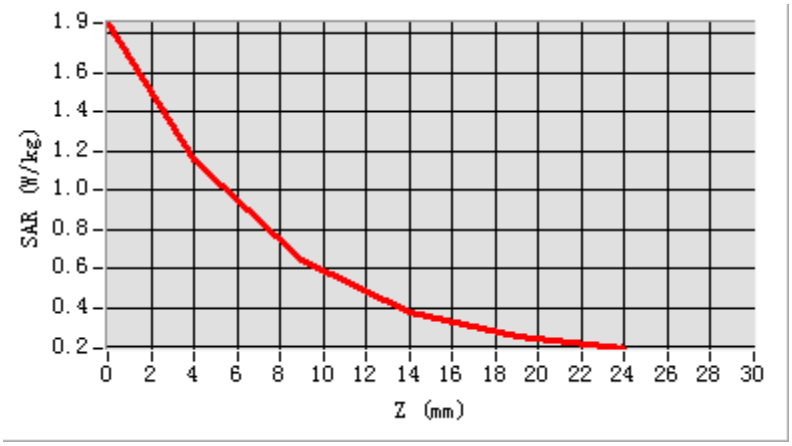
Frequency (MHz)	836.6
Relative permittivity (real part)	55.26
Relative permittivity (imaginary part)	21.71
Conductivity (S/m)	0.98
Variation (%)	0.250000
ConvF:	5.68

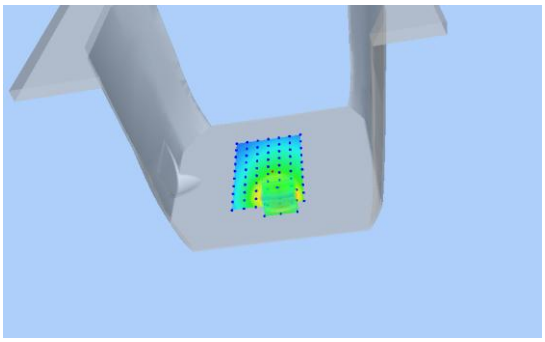
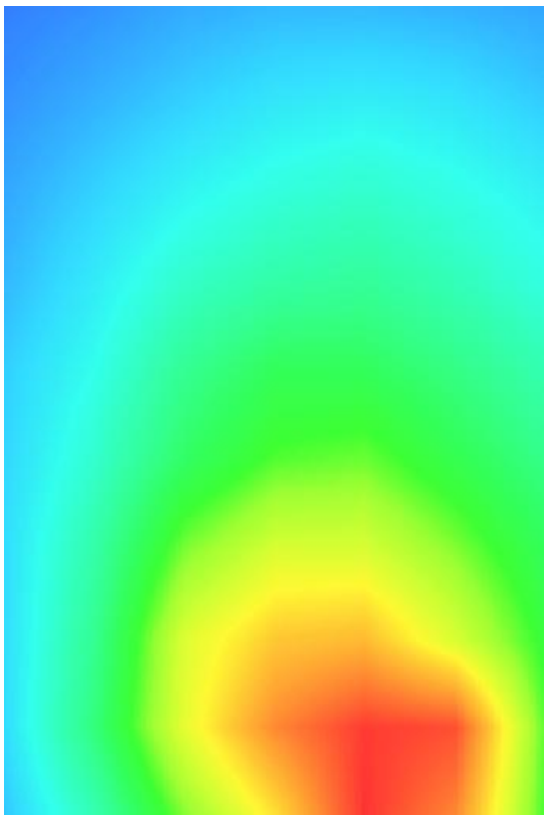
SURFACE SAR	VOLUME SAR
	

Maximum location: X=9.00, Y=-54.00

SAR 10g (W/Kg)	0.641398
SAR 1g (W/Kg)	1.182803

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.8520	1.1572	0.6387	0.3767	0.2565



3D screen shot	Hot spot position
	

GSM850, Edge D, Middle, Repeated testing

Type: Phone measurement (11 points in the volume)

Date of measurement: 19/11/2014

Measurement duration: 7 minutes 32 seconds

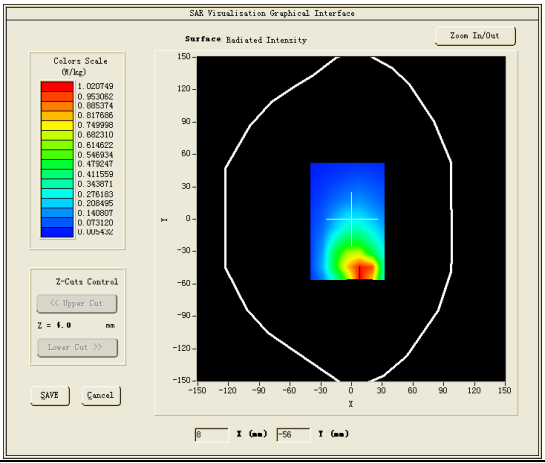
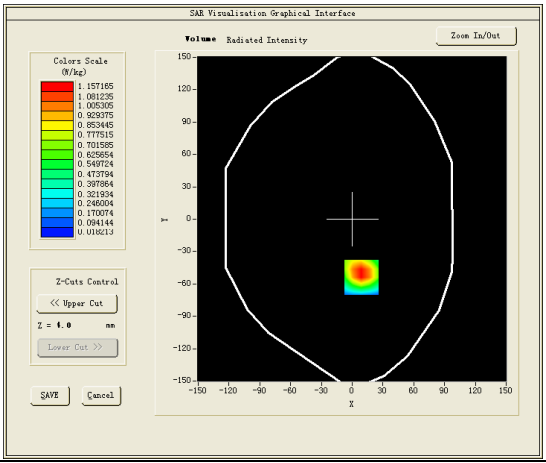
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	surf_sam_plan.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Back
Band	GSM850
Channels	190
Signal	GSM(Duty cycle: 1:8)

B. SAR Measurement Results

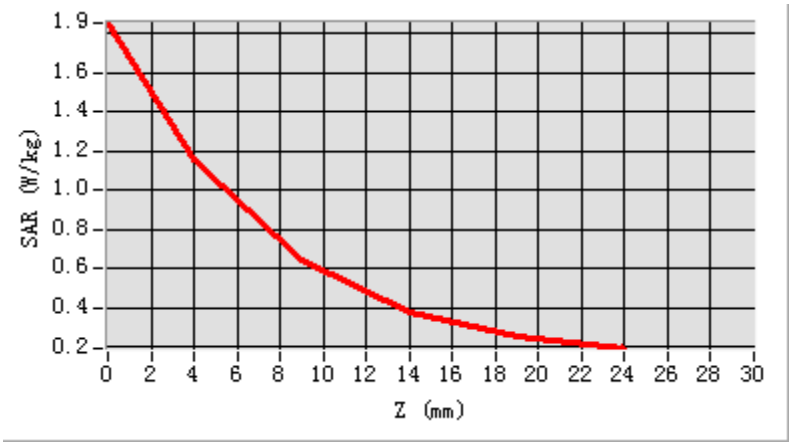
Frequency (MHz)	836.6
Relative permittivity (real part)	55.26
Relative permittivity (imaginary part)	21.71
Conductivity (S/m)	0.98
Variation (%)	1.010000
ConvF:	5.68

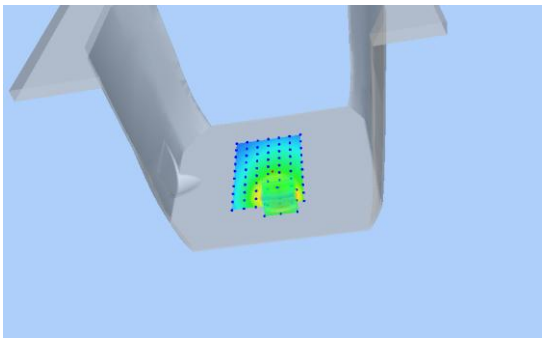
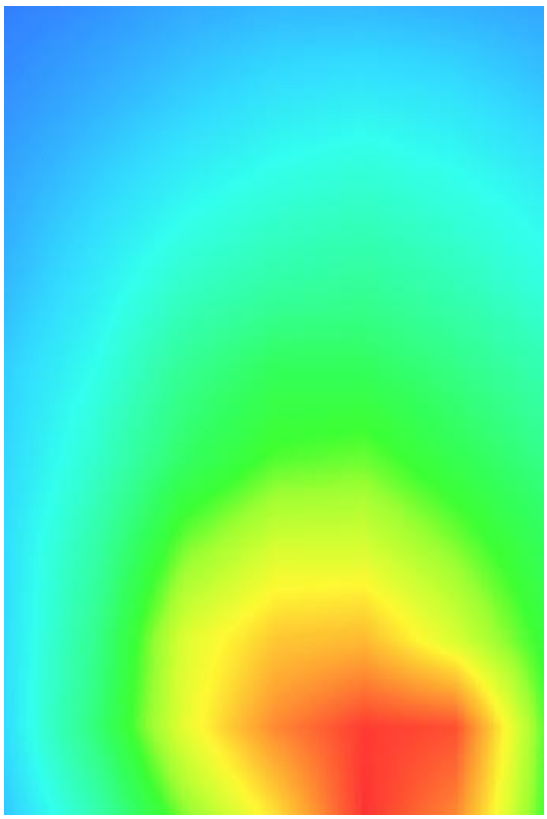
SURFACE SAR	VOLUME SAR
	

Maximum location: X=9.00, Y=-54.00

SAR 10g (W/Kg)	0.640243
SAR 1g (W/Kg)	1.181345

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.8520	1.1571	0.6385	0.3764	0.2563



3D screen shot	Hot spot position
	

GPRS 850, Back, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 19/11/2014

Measurement duration: 7 minutes 33 seconds

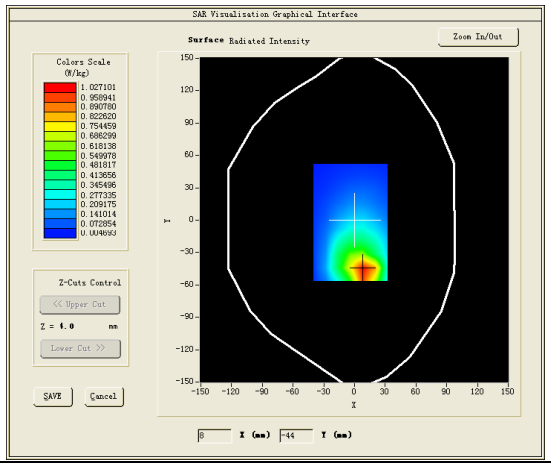
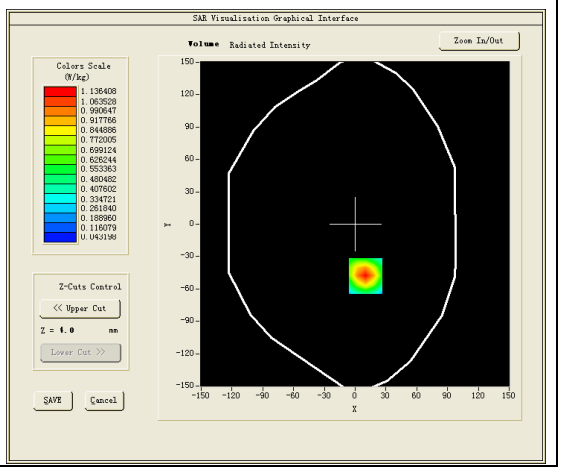
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	surf_sam_plan.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Back
Band	CUSTOM (GPRS850_1Tx)
Channels	190
Signal	GPRS(Duty cycle: 1:8)

B.SAR Measurement Results

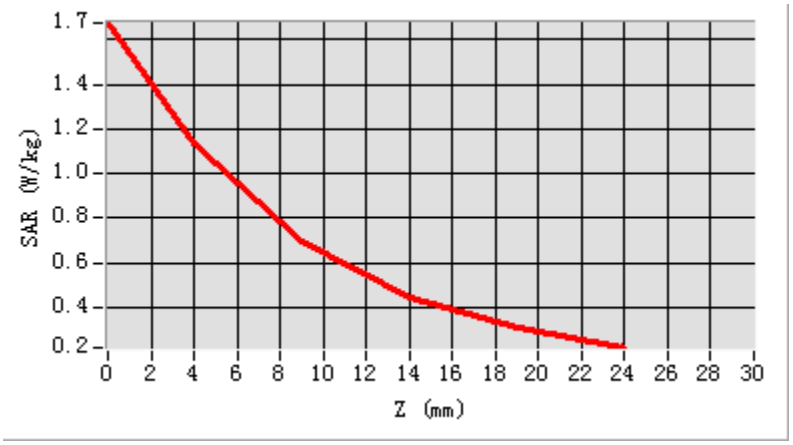
Frequency (MHz)	836.6
Relative permittivity (real part)	55.26
Relative permittivity (imaginary part)	21.71
Conductivity (S/m)	0.98
Variation (%)	-0.300000
ConvF:	5.68

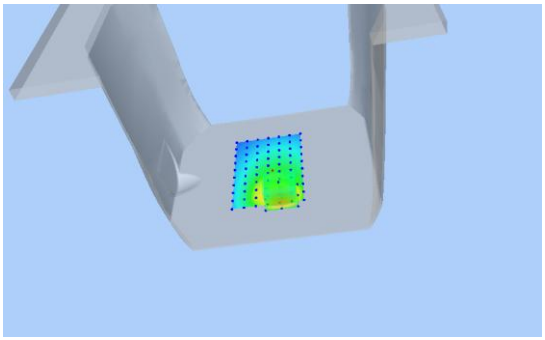
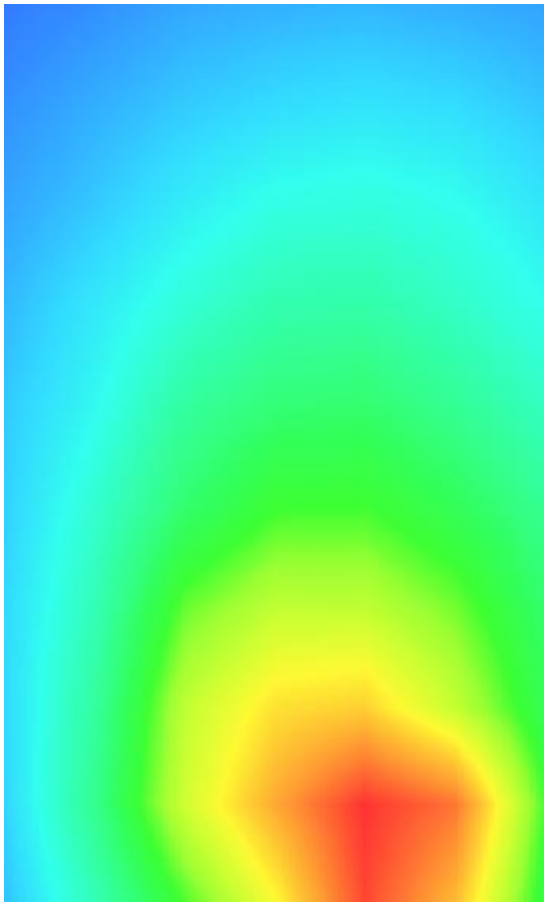
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=10.00, Y=-48.00

SAR 10g (W/Kg)	0.652154
SAR 1g (W/Kg)	1.127243

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.6637	1.1324	0.6968	0.4454	0.3063



3D screen shot	Hot spot position
	

GPRS 850, Back, Middle, Repeated testing

Type: Phone measurement (11 points in the volume)

Date of measurement: 19/11/2014

Measurement duration: 7 minutes 33 seconds

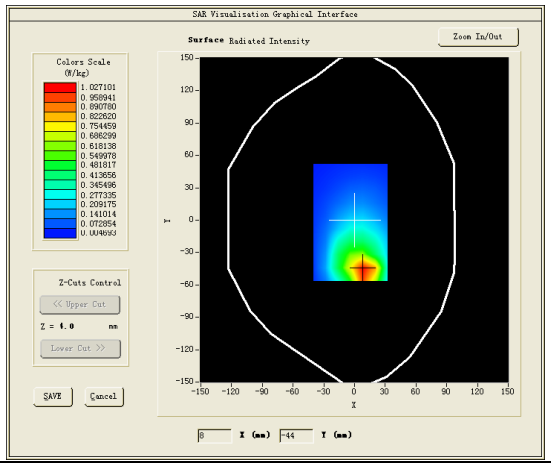
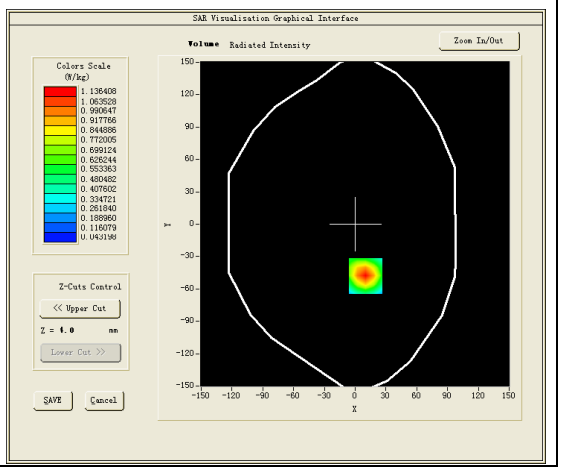
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	surf_sam_plan.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Back
Band	CUSTOM (GPRS850_1Tx)
Channels	190
Signal	GPRS(Duty cycle: 1:8)

B.SAR Measurement Results

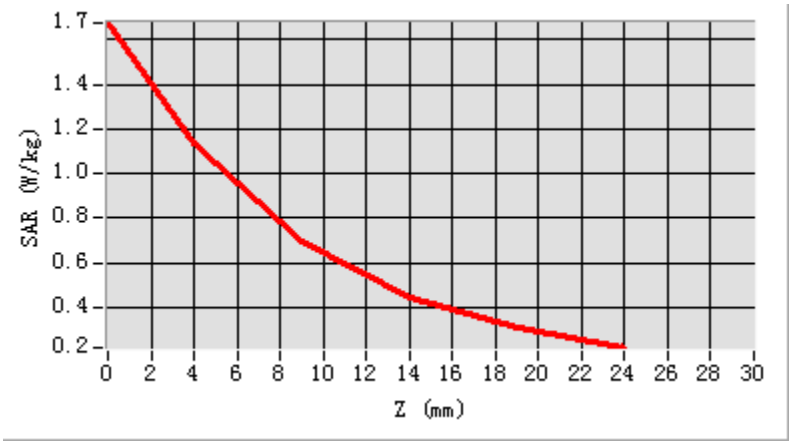
Frequency (MHz)	836.6
Relative permittivity (real part)	55.26
Relative permittivity (imaginary part)	21.71
Conductivity (S/m)	0.98
Variation (%)	-0.700000
ConvF:	5.68

SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=10.00, Y=-48.00

SAR 10g (W/Kg)	0.599261
SAR 1g (W/Kg)	1.070822

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.6712	1.1345	0.6957	0.4434	0.3058



3D screen shot	Hot spot position