# FCC SAR TEST REPORT

| | |
|---|---|
| **Report No.:** | SET2014-13183 |
| **Product:** | WCDMA digital mobile phone |
| **Model No.:** | W861 |
| **FCC ID:** | SG71111HW-W861 |
| **Applicant:** | Haier Telecom (Qingdao) Co., Ltd |
| **Address:** | No.1 Haier Road, Hi-tech Zone, Qingdao, China |
| **Issued by:** | CCIC-SET |
| **Lab Location:** | Electronic Testing Building, Shahe Road，Xili, Nanshan District, Shenzhen, 518055, P. R. China |
| **Tel:** | 86 755 26627338 Fax：86 755 26627238 |
| **Mail:** | manager@ccic-set.com Website：http://www.ccic-set.com |

This test report consists of **126** pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CCIC-SET. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CCIC-SET within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.

# Test Report

| | |
|---|---|
| **Product. …….:** | WCDMA digital mobile phone |
| **Model No. ……..:** | W861 |
| **Brand Name……..:** | Haier |
| **FCC ID…….:** | SG71111HW-W861 |
| **Applicant……..:** | Haier Telecom (Qingdao) Co., Ltd |
| **Applicant Address…….:** | No.1 Haier Road, Hi-tech Zone, Qingdao, China |
| **Manufacturer……:** | Haier Telecom (Qingdao) Co., Ltd |
| **Manufacturer Address:** | No.1 Haier Road, Hi-tech Zone, Qingdao, China |
| **Test Standards…….:** | **47CFR § 2.1093-** Radiofrequency Radiation Exposure Evaluation: Portable Devices;<br>**FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01):** Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields;<br>**ANSI C95.1–1999:** IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz;<br>**IEEE 1528–2013:** 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 2014-12-03

Chun Mei, Test Engineer

**Reviewed by……:** Shuangwen Zhang 2014-12-03

Shuangwen Zhang,Senior Egineer

**Approved by……:** Wu Lian 2014-12-03

Wu Li'an , Manager

# Contents

1. **GENERAL CONDITIONS**----4
2. **ADMINISTRATIVE DATA**----5
   2.1. Identification of the Responsible Testing Laboratory----5
   2.2. Identification of the Responsible Testing Location(s)----5
   2.3. Organization Item----5
   2.4. Identification of Applicant----5
   2.5. Identification of Manufacture----5
3. **EQUIPMENT UNDER TEST (EUT)**----6
4. **OPERATIONAL CONDITIONS DURING TEST**----7
   4.1. Introduction----7
   4.2. SAR Definition----7
   4.3. Phantoms----8
   4.4. Device Holder----8
   4.5. Probe Specification----9
5. **OPERATIONAL CONDITIONS DURING TEST**----10
   5.1. Schematic Test Configuration----10
   5.2. SAR Measurement System----10
   5.3. Equipments and results of validation testing----14
   5.4. SAR measurement procedure----17
   5.5. Antennas position and test position----18
6. **CHARACTERISTICS OF THE TEST**----19
   6.1. Applicable Limit Regulations----19
   6.2. Applicable Measurement Standards----19
7. **LABORATORY ENVIRONMENT**----20
8. **CONDUCTED RF OUTPUT POWER**----21
9. **TEST RESULTS**----28
10. **MEASUREMENT UNCERTAINTY**----35
11. **MAIN TEST INSTRUMENTS**----36

**This Test Report consists of the following Annexes:**

**Annex A: Accreditation Certificate** ----37

**Annex B: Test Layout** ----39

**Annex C: Sample Photographs**----46

**Annex D: System Performance Check Data and Highest SAR Plots**----48

**Annex E: Calibration Certificate of Probe and Dipoles**----102

# 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.:** | SET2014-13183 |
| **CCIC-SET Project Leader:** | Mr. Li Sixiong |
| **CCIC-SET Responsible for accreditation scope:** | Mr. Wu Li'an |
| **Start of Testing:** | 2014-11-27 |
| **End of Testing:** | 2014-11-28 |

### 2.4. Identification of Applicant

| | |
|---|---|
| **Company Name:** | Haier Telecom (Qingdao) Co., Ltd |
| **Address:** | No.1 Haier Road, Hi-tech Zone, Qingdao, China |

### 2.5. Identification of Manufacture

| | |
|---|---|
| **Company Name:** | Haier Telecom (Qingdao) Co., Ltd |
| **Address:** | No.1 Haier Road, Hi-tech Zone, Qingdao, 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:** | WCDMA digital mobile phone | |
| **Type Name:** | W861 | |
| **Brand Name:** | Haier | |
| **General description:** | Support Band | GSM850MHz/1900MHz/900MHz/1800MHz<br>WCDMA 850MHz/1900MHzMHz<br>Wi-Fi802.11b,802.11g,802.11n-20, Bluetooth |
| | Test Band | GSM 850MHz/ GSM 1900MHz<br>WCDMA 850MHz/ WCDMA 1900MHz<br>Wi-Fi 802.11b |
| | Multislot Class | GPRS: Class 33, EDGE: Class 33 |
| | GPRS Class | Class B |
| | Development Stage | Identical Prototype |
| | Accessories | Power Supply |
| | Battery type | 3.8V 2200mAh |
| | Antenna type | IFA Antenna |
| | Operation mode | GSM / GPRS/WCDMA / Bluetooth / WIFI |
| | Modulation mode | GMSK, QPSK,DSSS, OFDM, GFSK/π /4-DQPSK/8-DPSK |
| | Max. RF Power | 31.87dBm |
| | IMEI | 862549028066706 |
| | Max. SAR Value | Head:0.494w/kg; Body:0.930w/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 operation up to class33(max.uplin:5, max.downlink:4, total timeslots:6)

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

# 4 Specific Absorption Rate (SAR)

## 4.1 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.

## 4.2 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, $\delta$T is the temperature rise and $\delta$t 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.

### 4.3 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).

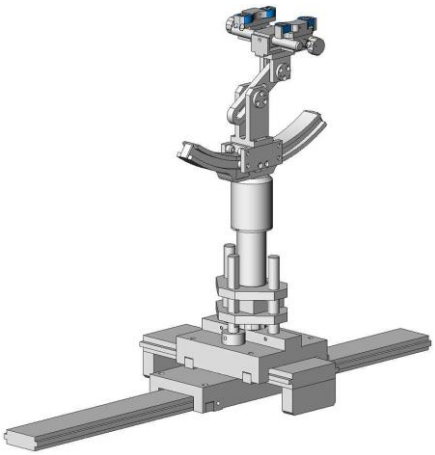
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

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

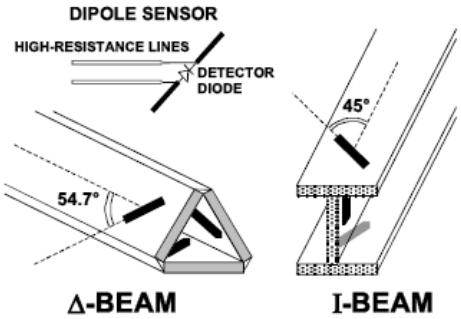
## 4.5 Probe Specification

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




# **5** OPERATIONAL CONDITIONS DURING TEST

## 5.1 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, 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

## 5.2 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.

### 5.2.1 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 | |
|---|---|---|---|---|
| | $\varepsilon_r$ | $\sigma$(S/m) | $\varepsilon_r$ | $\sigma$(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 |

### 5.2.2 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, and 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. 27th, 2014) | 835MHz | 41.45 | 0.91 |
| Target value | 1900MHz | 40.0 | 1.40 |
| Validation value (Nov. 27th, 2014) | 1900MHz | 39.98 | 1.41 |
| Target value | 2450MHz | 39.2 | 1.80 |
| Validation value (Nov. 27th, 2014) | 2450MHz | 38.99 | 1.81 |

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. 28th, 2014) | 835MHz | 55.26 | 0.98 |
| Target value | 1900MHz | 53.3 | 1.52 |
| Validation value (Nov. 28th, 2014) | 1900MHz | 53.28 | 1.53 |
| Target value | 2450MHz | 52.7 | 1.95 |
| Validation value (Nov. 28th, 2014) | 2450MHz | 52.65 | 1.96 |

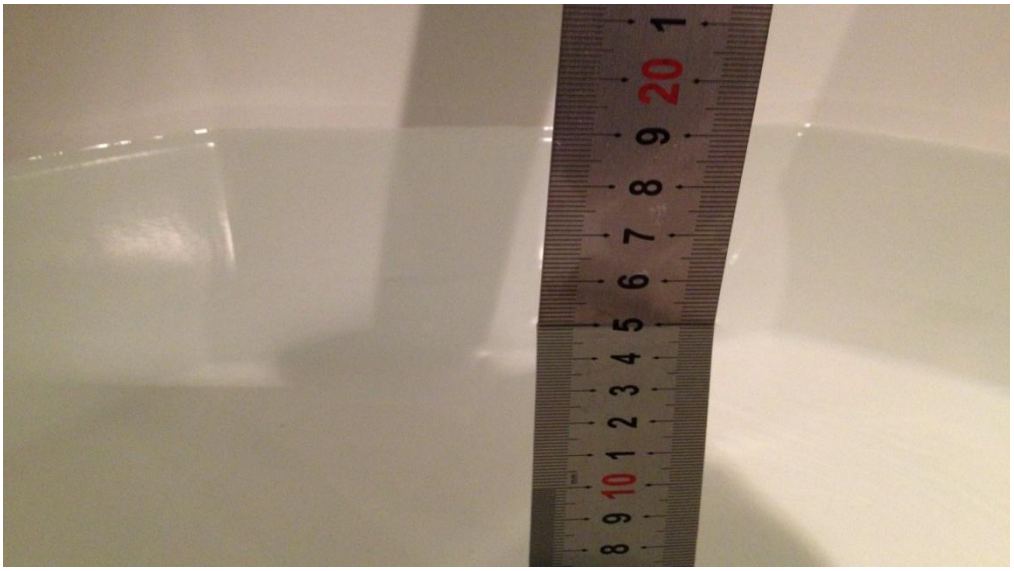


Fig. 1 Configuration of body tissue

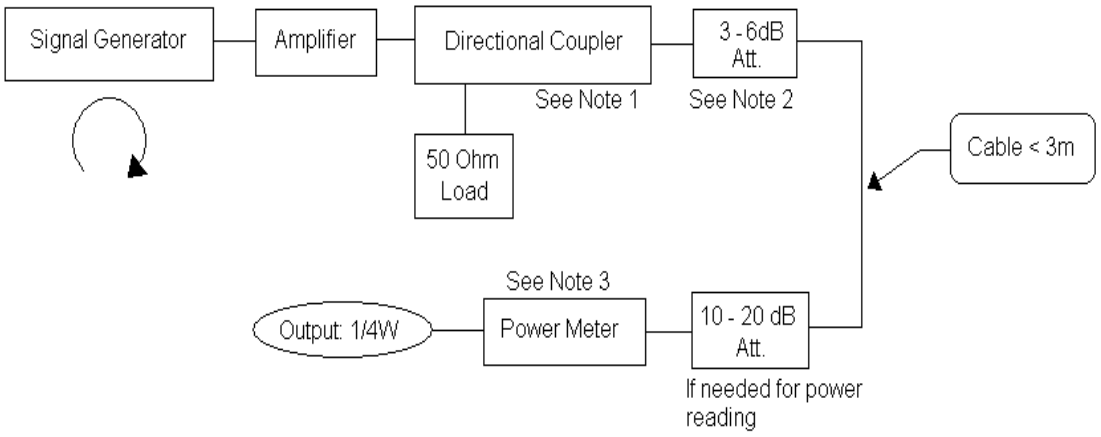
**5.3 Equipments and results of validation testing**

Table 6 Important equipments :

| Equipment description | Manufacturer/Model | Identification No. |
|---|---|---|
| System Simulator | E5515C | GB 47200710 |
| SAR Probe | SATIMO | SN 09/13 EP169 |
| Dipole | SID835 | SN 09/13 DIP 0G835-217 |
| Dipole | SID1900 | SN 09/13 DIP 1G900-218 |
| Dipole | SID2450 | SN 09/13 DIP 2G450-220 |
| Vector Network Analyzer | ZVB8 | A0802530 |
| Signal Generator | SMR27 | A0304219 |
| Amplifier | Nucletudes | 143060 |
| Power Meter | NRVS | 1020.1809.02 |
| Power Sensor | NRV-Z4 | 100069 |
| Multimeter | Keithley-2000 | 4014020 |
| Device Holder | SATIMO | SN 09/13 MSH80 |
| SAM Phantom | SAM97 | SN 09/13 SAM97 |

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 draft IEEE standard P1528. 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 10 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. 27th, 2014) | 1:1 | 9.77 | 2.45 | 9.80 |
| 1900MHz(Nov. 27th, 2014) | 1:1 | 40.37 | 9.79 | 39.16 |
| 2450MHz(Nov. 27th, 2014) | 1:1 | 53.60 | 13.17 | 52.68 |

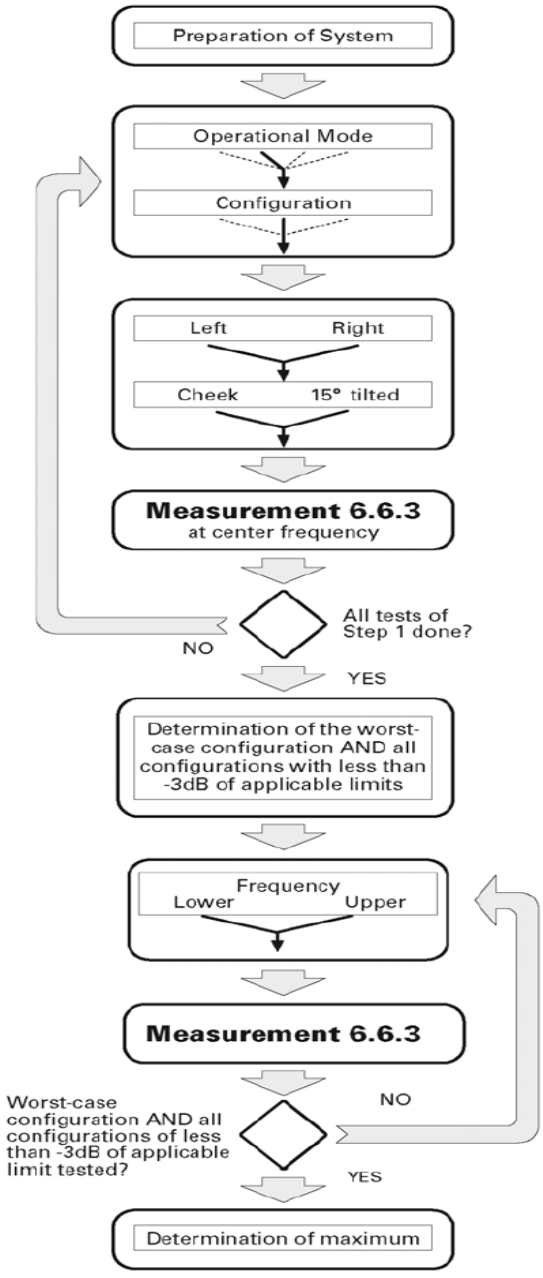
Table 8: Body SAR system validation (1g)

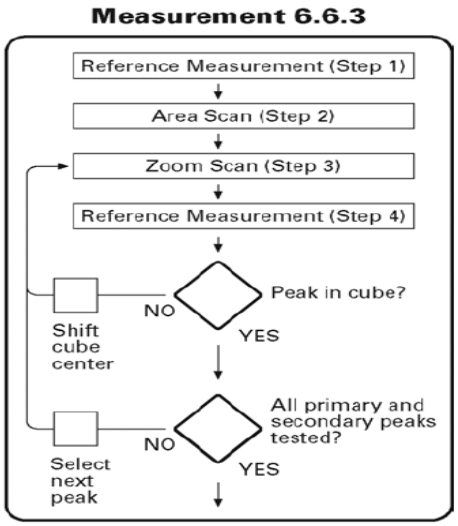
| Frequency | Duty cycle | Target value （W/kg） | Test value (W/kg) | |
|---|---|---|---|---|
| | | | 250 mW | 1W |
| 835MHz(Nov. 28h, 2014) | 1:1 | 10.31 | 2.46 | 9.84 |
| 1900MHz(Nov. 28th, 2014) | 1:1 | 40.81 | 9.98 | 39.92 |
| 2450MHz(Nov. 28th, 2014) | 1:1 | 52.66 | 13.08 | 52.32 |

* 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.

## 5.4 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 8mm 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.

### 5.5 Transmitting antenna information

There are three antennas (GSM &WCDMA antenna, WIFI&BT antenna) inside the EUT, the former two antennas are the transmitting source, and they are a type of IFA antenna.

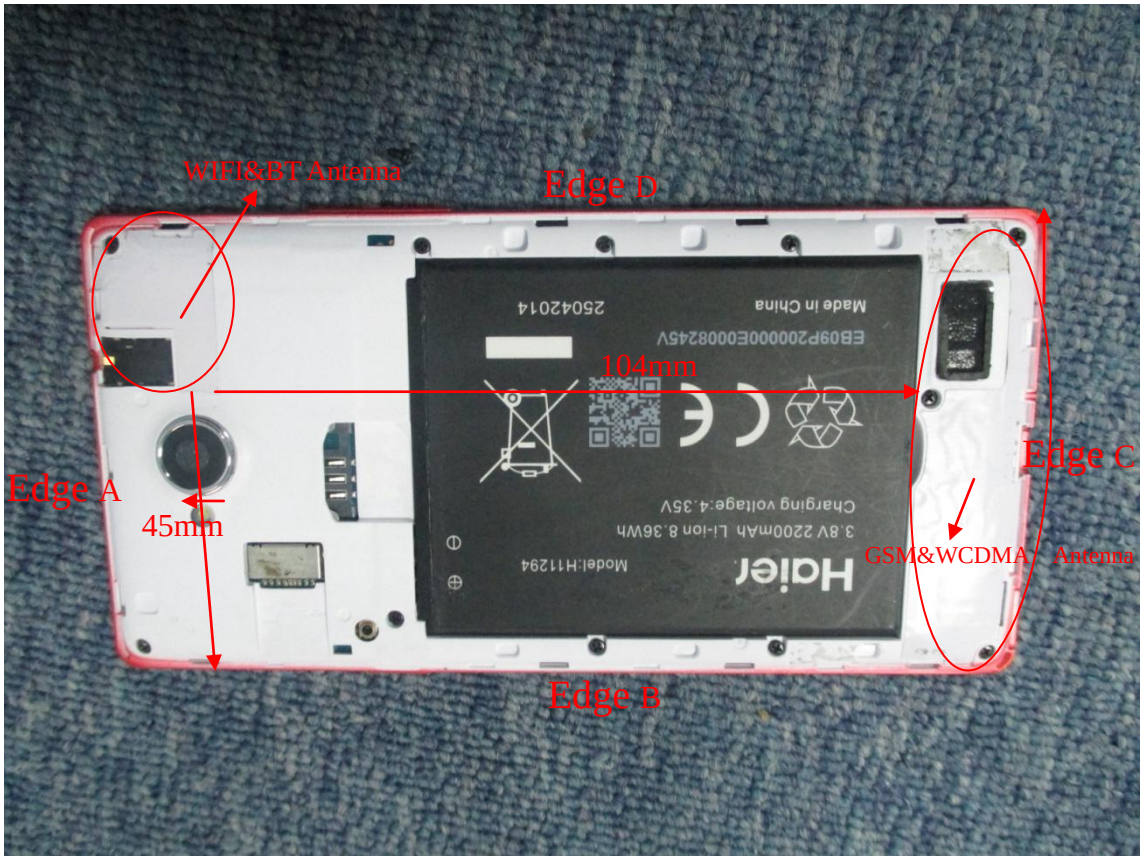



Fig. 3 Position of the antennas

## HOTSPOT MODE EVALUATION PROCEDURE

The SAR evaluation procedures for Portable Devices with Wireless Router function is according to KDB 941225 D06 Hot Spot SAR v01.

SAR must be tested for all surfaces and edges(side) with a transmitting antenna with in 2.5cm from that surface or edge, at a test separation distance of 5mm, in the wireless modes that support wireless routing.

| Assessment | Hotspot side for SAR | | | | | |
|---|---|---|---|---|---|---|
| | | | | | Test distance:5mm | |
| Antennas | Back | Front | Edge A | Edge B | Edge C | Edge D |
| GSM/WCDMA | Yes | Yes | No | Yes | Yes | Yes |
| WLAN/BT | Yes | Yes | Yes | NO | No | Yes |

# 6 CHARACTERISTICS OF THE TEST

## 6.1 Applicable Limit Regulations

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

**FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01):** Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields;

**ANSI C95.1–1999:** IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz;

**IEEE 1528–2013:** Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques;

It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

## 6.2 Applicable Measurement Standards

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this is in accordance with the following standards:

FCC 47 CFR Part2 (2.1093)
FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)
ANSI/IEEE C95.1-1992
IEEE 1528-2003
IC RSS 102 Issue 4
FCC KDB 447498 D02 v01r01 Dipole Requirements for SAR System Validation and Verification
FCC KDB 447498 D01 v05r02 General RF Exposure Guidance v05r01
FCC KDB 616217 D04 SAR for laptop and tablets v01r01
FCC KDB 648474 D04 v01r02 SAR Evaluation Considerations for Wireless Handsets
FCC KDB 248227 D01 v01r02 SAR Measurement Procedures-802.11a/b/g Transmitters
FCC KDB 865664 D01 v01r03 SAR Measurement 100MHz to 6GHz
FCC KDB 865664 D02 v01r01 SAR Reporting
FCC KDB 941225 D01 v02 SAR test for 3G devices
FCC KDB 941225 D04 v01 Evaluating SAR for GSM/(E)GPRS Dual Transfer Mode
FCC KDB 941225 D06 v01r01 Hot Spot SAR

# 7 LABORATORY ENVIRONMENT

## 7.1 The Ambient Conditions during SAR Test

| | |
|---|---|
| Temperature | Min. = 15 ° C, Max. = 30 ° 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.<br>Reflection of surrounding objects is minimized and in compliance with requirement of standards. | |

# 8.Conducted RF Output Power

8.1 GSM Conducted Power

| Band | | Burst Average Power (dBm) | | | Frame-Average Power (dBm) | | |
|---|---|---|---|---|---|---|---|
| GSM850 | TX Channel | 128 | 189 | 251 | 128 | 189 | 251 |
| | Frequency(MHz) | 824.2 | 836.4 | 848.8 | 824.2 | 836.4 | 848.8 |
| | GSM | **31.87** | 31.75 | 31.79 | 22.84 | 22.72 | 22.76 |
| | GPRS (Slot 1) | 29.21 | 29.18 | 29.17 | 23.19 | 23.16 | 23.15 |
| | GPRS (Slot 2) | 29.98 | 29.88 | 29.93 | 25.72 | 25.62 | 25.67 |
| | GPRS (Slot 3) | 30.87 | 30.76 | 30.82 | 27.86 | 27.75 | 27.81 |
| | GPRS (Slot 4) | 31.62 | 31.48 | 31.53 | 28.61 | 28.47 | 28.52 |
| | EDGE (Slot 1) | 29.12 | 29.08 | 29.13 | 23.1 | 23.06 | 23.11 |
| | EDGE (Slot 2) | 29.95 | 29.89 | 29.97 | 25.69 | 25.63 | 25.71 |
| | EDGE (Slot 3) | 30.87 | 30.75 | 30.88 | 27.86 | 27.74 | 27.87 |
| | EDGE (Slot 4) | 31.45 | 31.38 | 31.47 | 28.44 | 28.37 | 28.46 |
| GSM1900 | TX Channel | 512 | 661 | 810 | 512 | 661 | 810 |
| | Frequency(MHz) | 1850.2 | 1880 | 1909.8 | 1850.2 | 1880 | 1909.8 |
| | GSM | 29.46 | **29.61** | 29.53 | 20.43 | 20.58 | 20.5 |
| | GPRS (Slot 1) | 27.15 | 27.09 | 27.17 | 21.13 | 21.07 | 21.15 |
| | GPRS (Slot 2) | 27.84 | 27.76 | 27.85 | 23.58 | 23.5 | 23.59 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | GPRS (Slot 3) | 28.52 | 28.45 | 28.56 | 25.51 | 25.44 | 25.55 |
| | GPRS (Slot 4) | 29.24 | 29.18 | 29.35 | 26.23 | 26.17 | 26.34 |
| | EDGE (Slot 1) | 27.05 | 27.11 | 27.14 | 21.03 | 21.09 | 21.12 |
| | EDGE (Slot 2) | 27.84 | 27.92 | 27.95 | 23.58 | 23.66 | 23.69 |
| | EDGE (Slot 3) | 28.43 | 28.52 | 28.57 | 25.42 | 25.51 | 25.56 |
| | EDGE (Slot 4) | 29.05 | 29.16 | 29.23 | 26.04 | 26.15 | 26.22 |

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

## 8.2 WCDMA Conducted peak output Power

| Item | band | WCDMA 850 | | | WCDMA 1900 | | |
|---|---|---|---|---|---|---|---|
| | ARFCN | 4132/ 826.4 | 4182/ 836.4 | 4233/ 846.6 | 9262/ 1852.4 | 9400/ 1880.0 | 9538/ 1907.6 |
| | subtest | dBm | | | dBm | | |
| WCDMA | non | **22.87** | 22.76 | 22.82 | 22.73 | **22.85** | 22.69 |
| HSDPA | 1 | 22.41 | 22.51 | 22.54 | 22.67 | 22.79 | 22.58 |
| | 2 | 22.29 | 22.71 | 22.29 | 22.47 | 22.25 | 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 | 22.57 |
| | 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 | 22.41 | 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 ($\beta_c$ and $\beta_d$) 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 | $\beta_c$ | $\beta_d$ | $\beta_d$ (SF) | $\beta_c/\beta_d$ | $\beta_{HS}$ (Note1) | $\beta_{ec}$ | $\beta_{ed}$ (Note 5) (Note 6) | $\beta_{ed}$ (SF) | $\beta_{ed}$ (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<br>$\beta_{ed}2$: 47/15 | 4<br>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: $\Delta_{ACK}$, $\Delta_{NACK}$ and $\Delta_{CQI}$ = 30/15 with $\beta_{hs}$ = 30/15 * $\beta_c$.
Note 2: CM = 1 for $\beta_c/\beta_d$ =12/15, $\beta_{hs}/\beta_c$=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 $\beta_c/\beta_d$ 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 $\beta_c$ = 10/15 and $\beta_d$ = 15/15.
Note 4: For subtest 5 the $\beta_c/\beta_d$ 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 $\beta_c$ = 14/15 and $\beta_d$ = 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: $\beta_{ed}$ 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 ($\beta_c$ and $\beta_d$) 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 | $\beta_c$ | $\beta_d$ | $\beta_d$ (SF) | $\beta_c/\beta_d$ | $\beta_{HS}$ (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: $\Delta_{ACK}$, $\Delta_{NACK}$ and $\Delta_{CQI}$ = 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, $\Delta_{ACK}$ and $\Delta_{NACK}$ = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI}$ = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d$ =12/15, $\beta_{hs}/\beta_c$=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 $\beta_c/\beta_d$ 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 $\beta_c$ = 11/15 and $\beta_d$ = 15/15.

## Note:

1. WCDMA SAR was tested under PMC 12.2kbps with HSPA Inactive per KDB Publication 941225 D01.HSPA SAR was not requires since the average output power of the HSPA subtests was not more than 0.25dB higher than the RMC level and SAR was less than 1.2W/kg.

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.

## 8.3 WLAN 2.4GHz Band Conducted Power

| Channel | Frequency (MHz) | WIFI Output Power(dBm) | | |
|---|---|---|---|---|
| | | 802.11b | 802.11g | 802.11n-20 |
| CH 01 | 2412 | 14.47 | 12.17 | 12.03 |
| CH 06 | 2437 | 14.28 | 12.19 | 12.12 |
| CH 11 | 2462 | 14.89 | 12.99 | 12.24 |

## 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) | BT3.0 Output Power(dBm) | | |
|---|---|---|---|---|
| | | GFSK | Π /4-DQPSK | 8-DPSK |
| CH 0 | 2402 | 4.95 | 4.67 | 4.35 |
| CH 39 | 2441 | 5.62 | 5.12 | 4.95 |
| CH 78 | 2480 | 5.70 | 5.17 | 4.72 |

| Channel | Frequency(MHz) | BT 4.0 |
|---|---|---|
| CH 0 | 2402 | -1.87 |
| CH 20 | 2442 | -1.21 |
| CH 39 | 2480 | -1.14 |

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 |
|---|---|---|---|---|
| 6.0 | 3.981 | 5 | 2.48 | 1.254 |

2. Per KDB 447498 D01v05r02 exclusion thresholds is 1.254<3, RF exposure evaluation is not required.

General Note:

1. Per KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power(mW)/EUT RF power(mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle , the measured SAR is scaled-up by the duty cycle scaling factor which is equal to “1/(duty cycle)”
   c. For WWAN: Reported SAR(W/kg)=Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN: Reported SAR(W/kg)=Measured SAR(W/kg)*Duty Cycle scaling factor * Tune-up scaling factor

2. Per KDB 447498 D01v05r02, for each exposure position, if the highest output channel reported SAR≤0.8W/kg, other channels SAR testing is not necessary.
3. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to “1/(duty cycle)”
4. Body-worn SAR testing was performed at 5mm separation, and this distance is determined by the handset manufacturer that there will be body-worn accessories with the required minimum separation.
5. Per KDB 648474 D04v01r02,when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤1.2W/kg, SAR testing with a headset connected to the handset is not required.

6. Scaling Factor calculation

| Operation Mode | Channel | Output Power(dBm) | Tune up Power in tolerance(dBm) | Scaling Factor |
|---|---|---|---|---|
| GSM 850 | 128 | 31.87 | 31.45 ± 0.5 | 1.019 |
| | 190 | 31.75 | 31.45 ± 0.5 | 1.047 |
| | 251 | 31.79 | 31.45 ± 0.5 | 1.038 |
| GPRS 850(5Tx) | 128 | 31.62 | 31.20 ±0.5 | 1.019 |
| | 190 | 31.48 | 31.20 ±0.5 | 1.052 |
| | 251 | 31.53 | 31.20 ±0.5 | 1.040 |
| GSM1900 | 512 | 29.46 | 29.20 ±0.5 | 1.057 |
| | 661 | 29.61 | 29.20 ±0.5 | 1.021 |
| | 810 | 29.53 | 29.20 ±0.5 | 1.040 |
| GPRS1900(5Tx) | 512 | 29.24 | 28.90 ±0.5 | 1.038 |
| | 661 | 29.18 | 28.90 ±0.5 | 1.052 |
| | 810 | 29.35 | 28.90 ±0.5 | 1.012 |
| WCDMA850 | 4132 | 22.87 | 22.40 ±0.5 | 1.007 |
| | 4182 | 22.76 | 22.40 ±0.5 | 1.033 |
| | 4233 | 22.82 | 22.40 ±0.5 | 1.019 |
| WCDMA1900 | 9262 | 22.73 | 22.40 ±0.5 | 1.040 |
| | 9400 | 22.85 | 22.40 ±0.5 | 1.012 |
| | 9538 | 22.69 | 22.40 ±0.5 | 1.050 |
| 802.11b | 2462 | 14.89 | 14.50 ±0.5 | 1.026 |
| BT 3.0 GFSK | 2480 | 5.70 | 5.50 ±0.5 | 1.072 |

# Simultaneous SAR

| Description of Simultaneous Transmit Capabilities | | | | |
|---|---|---|---|---|
| No. | Transmitter Combinations | Scenario Supported or not | Supported for Mobile Hotspot or not | Explanation |
| 1 | GSM(Voice)+GSM(Data) | No | No | Note1 |
| 2 | WCDMA(Voice)+WCDMA(Data) | Yes | No | |
| 3 | GSM(Voice)+ WCDMA(Data) | No | No | |
| 4 | WCDMA(Voice)+GSM(Data) | No | No | |
| 5 | GSM(Voice)+ WCDMA(Voice) | No | No | |
| 6 | GSM(Voice)+Wifi(/BT) | Yes | Yes | Note 2 |
| 7 | WCDMA(Voice) +Wifi(/BT) | Yes | Yes | |
| 8 | WCDMA(Voice)+WCDMA(Data)+Wifi(/BT) | Yes | Yes | |
| 9 | GSM(Data)+wifi | Yes | Yes | |
| 10 | WCDMA(Data) +wifi | Yes | Yes | |

| Not applicable | Applicable | Head | Body-worn | Hotspot |
|---|---|---|---|---|
| 1,3,4,5 | 2,6,7,8,9.10 | 2,6,7,8 | 2,6,7,8,9.10 | 6,7,8,9,10 |

Note :

1. EUT system architecture support simultaneous voice and data(except on WCDMA), multiple voice channels, or multiple data channels during a single session on the cellular net work.

2. Support for mobile hotspot operation.

3. When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WiFi transmitter and another licensed transmitter. Both transmitter often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. The “Portable Hotspot” feature on the handset was not activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

4. The hotspot SAR result may overlap with the body-worn accessory SAR requirements, per KDB 941225 D06, the more conservative configurations can be considered, thus excluding some unnecessary body-worn accessory SAR tests.

5. WCDMA supports voice and data transmission simultaneously.

6. Simultaneous Transmission SAR evaluation is not required for BT and WiFi, because the software mechanism have been incorporated to guarantee that the WLAN and Bluetooth transmitters would not simultaneously operate.

7. For Scenario No.2,7.8,10 , WCDMA and WiFi is tested separately, the WCDMA mode is test with 12.2kbps RMC and TPC set to all “1”, if maximum SAR for 12.2kbps RMC is≤75% of the SAR limit(i.e. 1.2W/kg 1g) and maximum average output of each RF channel with HSDPA/HSUPA active is less than 1/4 dB Middle than that measured without HSDPA/HSUPA using 12.2kbps RMC, according to KDB 941224 D01v02, SAR is not required for this handset with HSPA capabilities.

8. For Scenario No.6 to 10, GSM, WCDMA, BT and WiFi is tested separately, the GSM mode do not supports voice and data transmission simultaneously, voic (GSM) and data(GPRS) is tested separately.

## Applicable Multiple Scenario Evaluation

| Test Position | WCDMA&GSM SAR Max.(W/Kg) | Wifi SAR Max.(W/Kg) | Bluetooth Max.(W/Kg) | ∑1-gSARMAX.(W/Kg) | |
|---|---|---|---|---|---|
| | | | | BT&Main Ant | Wifi&Main Ant |
| Head SAR | 0.494 | 0.033 | 0.167 | 0.587 | 0.661 |
| Body SAR | 0.930 | 0.025 | 0.083 | 0.955 | 1.013 |

Simultaneous Transmission SAR evaluation is not required for Wifi and WCDMA&GSM, because the sum of 1g SAR Max is 0.955W/Kg<1.6 W/Kg for Wifi and WCDMA&GSM.
Simultaneous Transmission SAR evaluation is not required for BT and WCDMA&GSM, because the sum of 1g SAR Max is 1.013W/Kg<1.6 W/Kg for BT and WCDMA&GSM.
(According to KDB 447498D01v05r02,the sum of the Highest reported SAR of each antenna does not exceed the limit, simultaneous transmission SAR evaluation is not required.)

# 9 TEST RESULTS

## 9.1 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: 23.0~23.5°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 | | 128/824.2 | **0.271** | 0.276 |
| | Tilt 15 degrees | | 128/824.2 | 0.216 | 0.220 |
| Left Side of Head | Cheek | | 128/824.2 | 0.227 | 0.231 |
| | Tilt 15 degrees | | 128/824.2 | 0.225 | 0.229 |
| Body (5mm Separation) | GSM | Face Upward | 128/824.2 | 0.348 | 0.354 |
| | | Back Upward | 128/824.2 | **0.699** | 0.712 |
| | | Edge B | 128/824.2 | 0.493 | 0.502 |
| | | Edge C | 128/824.2 | 0.326 | 0.332 |
| | | Edge D | 128/824.2 | 0.438 | 0.446 |
| | GPRS | Face Upward | 128/824.2 | 0.322 | 0.328 |
| | | Back Upward | 128/824.2 | **0.743** | 0.757 |
| | | Edge B | 128/824.2 | 0.433 | 0.441 |
| | | Edge C | 128/824.2 | 0.345 | 0.351 |
| | | Edge D | 128/824.2 | 0.352 | 0.359 |

Table 2: SAR Values of GSM1900 MHz Band

| Temperature: 23.0~23.5°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 | **0.301** | 0.307 |
| | Tilt 15 degrees | | 661/1880.0 | 0.172 | 0.176 |
| Left Side of Head | Cheek | | 661/1880.0 | 0.165 | 0.168 |
| | Tilt 15 degrees | | 661/1880.0 | 0.123 | 0.126 |
| Body (5mm Separation) | GSM | Face Upward | 661/1880.0 | 0.395 | 0.403 |
| | | Back Upward | 661/1880.0 | 0.452 | 0.461 |
| | | Edge B | 661/1880.0 | **0.742** | 0.758 |
| | | Edge C | 661/1880.0 | 0.665 | 0.679 |
| | | Edge D | 661/1880.0 | 0.311 | 0.318 |
| | GPRS | Face Upward | 661/1880.0 | 0.279 | 0.293 |
| | | Back Upward | 661/1880.0 | 0.452 | 0.475 |
| | | Edge B | 661/1880.0 | **0.710** | 0.747 |
| | | Edge C | 661/1880.0 | 0.419 | 0.441 |
| | | Edge D | 661/1880.0 | 0.258 | 0.271 |

Table 3: SAR Values of WCDMA850

| Temperature: 23.0~23.5°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 | 4132/826.4 | 0.155 | 0.156 |
| | Tilt 15 degrees | 4132/826.4 | 0.116 | 0.117 |
| Left Side of Head | Cheek | 4132/826.4 | **0.161** | 0.162 |
| | Tilt 15 degrees | 4132/826.4 | 0.100 | 0.101 |
| Body (5mm Separation) | Face Upward | 4132/826.4 | 0.216 | 0.217 |
| | Back Upward | 4132/826.4 | **0.558** | 0.562 |
| | Edge B | 4132/826.4 | 0.181 | 0.182 |
| | Edge C | 4132/826.4 | 0.079 | 0.080 |
| | Edge D | 4132/826.4 | 0.238 | 0.240 |

Table 4: SAR Values of WCDMA1900

| Temperature: 23.0~23.5°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 | **0.488** | 0.494 |
| | Tilt 15 degrees | 9400/1880.0 | 0.258 | 0.261 |
| Left Side of Head | Cheek | 9400/1880.0 | 0.332 | 0.336 |
| | Tilt 15 degrees | 9400/1880.0 | 0.216 | 0.219 |
| Body (5mm Separation) | Face Upward | 9400/1880.0 | 0.659 | 0.667 |
| | Back Upward | 9262/1852.4 | 0.876 | 0.911 |
| | | 9400/1880.0 | **0.919** | 0.930 |
| | | 9400/1880.0 | 0.887 | 0.897 |
| | | 9538/1907.6 | 0.845 | 0.887 |
| | Edge B | 9400/1880.0 | 0.472 | 0.477 |
| | Edge C | 9400/1880.0 | 0.449 | 0.454 |
| | Edge D | 9400/1880.0 | 0.206 | 0.208 |

Table 7:SAR Values of Wi-Fi 802.11b

| Temperature: 23.0~23.5°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 | 11/2462 | **0.032** | 0.033 |
| | Tilt 15 degrees | 11/2462 | 0.021 | 0.022 |
| Left Side of Head | Cheek | 11/2462 | 0.031 | 0.032 |
| | Tilt 15 degrees | 11/2462 | 0.018 | 0.018 |
| 802.11b(5mm Separation) | Edge A | 11/2462 | 0.016 | 0.016 |
| | Edge D | 11/2462 | 0.018 | 0.018 |
| | Face Upward | 11/2462 | 0.010 | 0.010 |
| | Back Upward | 11/2462 | **0.024** | 0.025 |

Note:

a) According to KDB 941225 D01, since the maximum average output of each RF channel with HSDPA/HSUPA active is less than that measured without HSDPA/HSUPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is less 1.2 W/kg, the measurement against HSDPA and HSUPA were ignored in this report.

b) 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

## 10.2 Conclusion

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 6 of this report. Maximum localized SAR is **below** exposure limits specified in the relevant standards.

# 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 | 7 | N | 3 | 1 | 3.5 | ∞ |
| 2 | —Axial isotropy | B | 4.7 | R | $\sqrt{3}$ | 0.5 | 4.3 | ∞ |
| 3 | —Hemispherical Isotropy | B | 9.4 | R | $\sqrt{3}$ | 0.5 | 4.3 | ∞ |
| 4 | —Boundary Effect | B | 11.0 | R | $\sqrt{3}$ | 1 | 6.4 | ∞ |
| 5 | —Linearity | B | 4.7 | R | $\sqrt{3}$ | 1 | 2.7 | ∞ |
| 6 | —System Detection Limits | B | 1.0 | R | $\sqrt{3}$ | 1 | 0.6 | ∞ |
| 7 | —Readout Electronics | B | 1.0 | N | 3 | 1 | 1.00 | ∞ |
| 8 | —Response Time | B | 0.00 | R | $\sqrt{3}$ | 1 | 0.00 | ∞ |
| 9 | —Integration Time | B | 0.00 | R | $\sqrt{3}$ | 1 | 0.00 | ∞ |
| 10 | —RF Ambient Conditions | B | 3.0 | R | $\sqrt{3}$ | 1 | 1.73 | ∞ |
| 11 | —Probe Position Mechanical tolerance | B | 0.4 | R | $\sqrt{3}$ | 1 | 0.2 | ∞ |
| 12 | —Probe Position with respect to Phantom Shell | B | 2.9 | R | $\sqrt{3}$ | 1 | 1.7 | ∞ |
| 13 | —Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation | B | 3.9 | R | $\sqrt{3}$ | 1 | 2.3 | ∞ |
| | Uncertainties of the DUT | | | | | | | |
| 14 | —Position of the DUT | A | 4.8 | N | 3 | 1 | 4.8 | 5 |
| 15 | —Holder of the DUT | A | 7.1 | N | 3 | 1 | 7.1 | 5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 16 | —Output Power Variation –SAR drift measurement | B | 5.0 | R | $\sqrt{3}$ | 1 | 2.9 | ∞ |
| | **Phantom and Tissue Parameters** | | | | | | | |
| 17 | —Phantom Uncertainty(shape and thickness tolerances) | B | 1.0 | R | $\sqrt{3}$ | 1 | 0.6 | ∞ |
| 18 | —Liquid Conductivity Target –tolerance | B | 5.0 | R | $\sqrt{3}$ | 0.6 | 1.7 | ∞ |
| 19 | —Liquid Conductivity –measurement Uncertainty) | B | 0.23 | N | 3 | 1 | 0.23 | 9 |
| 20 | —Liquid Permittivity Target tolerance | B | 5.0 | R | $\sqrt{3}$ | 0.6 | 1.7 | ∞ |
| 21 | —Liquid Permittivity –measurement uncertainty | B | 0.46 | N | 3 | 1 | 0.46 | ∞ |
| **Combined Standard Uncertainty** | | | | RSS | | | 12.92 | 44.15 |
| **Expanded uncertainty** (Confidence interval of 95 %) | | | | K=2 | | | 25.84 | |

## 12 MAIN TEST INSTRUMENTS

| No. | EQUIPMENT | TYPE | Series No. | Last Calibratio | Due Date |
|---|---|---|---|---|---|
| 1 | System Simulator | E5515C | GB 47200710 | 2014/02/23 | 1 Year |
| 2 | SAR Probe | SATIMO | SN 09/13 EP169 | 2014/04/05 | 1 Year |
| 3 | Dipole | SID835 | SN09/13 DIP0G835-217 | 2014/08/28 | 1 Year |
| 4 | Dipole | SID1800 | SN09/13 DIP1G800-216 | 2014/08/28 | 1 Year |
| 5 | Dipole | SID1900 | SN09/13 DIP1G900-218 | 2014/08/28 | 1 Year |
| 6 | Dipole | SID2450 | SN09/13 DIP2G450-220 | 2014/08/28 | 1 Year |
| 7 | Network Analyzer | ZVB8 | A0802530 | 2014/06/13 | 1 Year |
| 8 | Signal Generator | SMR27 | A0304219 | 2014/06/10 | 1 Year |
| 9 | Amplifier | Nucletudes | 143060 | 2014/04/05 | 1 Year |
| 10 | Power Meter | NRVS | 1020.1809.02 | 2014/06/13 | 1 Year |
| 11 | Power Sensor | NRV-Z4 | 100069 | 2014/06/10 | 1 Year |
| 12 | Multimeter | Keithley-2000 | 4014020 | 2013/01/29 | 2 Year |
| 13 | Device Holder | SATIMO | SN 09/13 MSH80 | 2014/04/05 | 1 Year |
| 14 | 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

## SET2014-13183

**Haier Telecom (Qingdao) Co., Ltd**

**WCDMA digital mobile phone**

**Type Name: W861**

**Hardware Version： UALD07 VER.A**

**Software Version： HW-W861-H01-S004-VE**

**Accreditation Certificate**

**This Annex consists of 2 pages**

**Date of Report: 2014-12-03**

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

## SET2014-13183

**Haier Telecom (Qingdao) Co., Ltd**

**WCDMA digital mobile phone**

**Type Name: W861**

**Hardware Version： UALD07 VER.A**

**Software Version： HW-W861-H01-S004-VE**

## TEST LAYOUT

**This Annex consists of 7 pages**

**Date of Report: 2014-12-03**

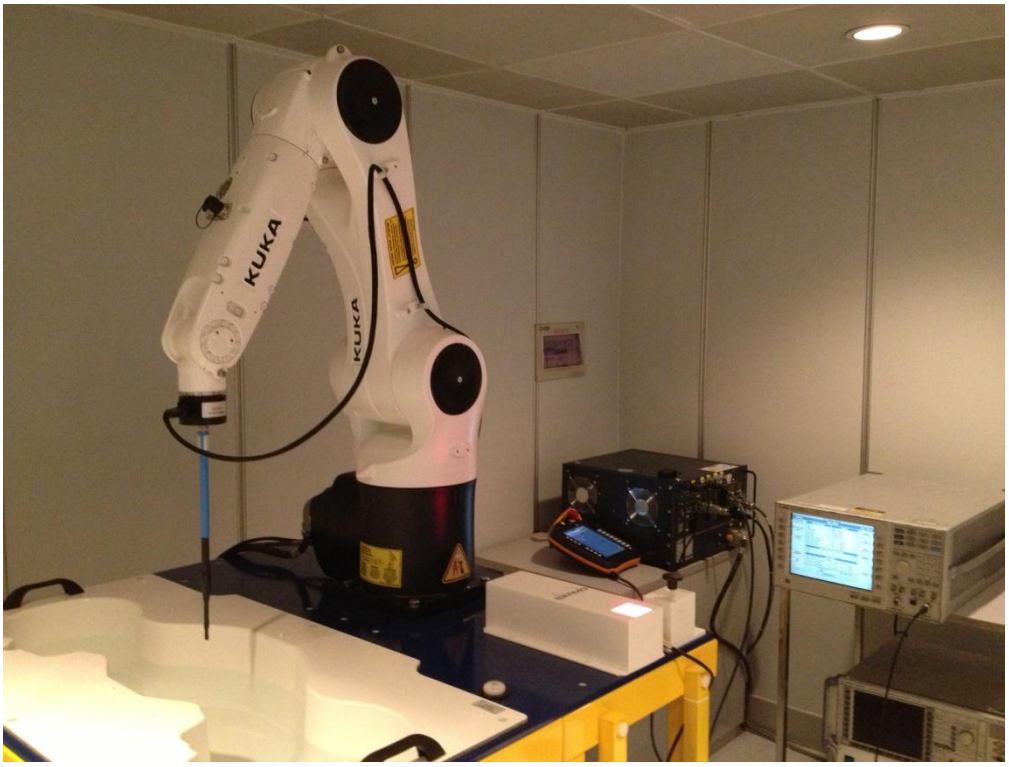



**Fig.1 COMO SAR Test System**

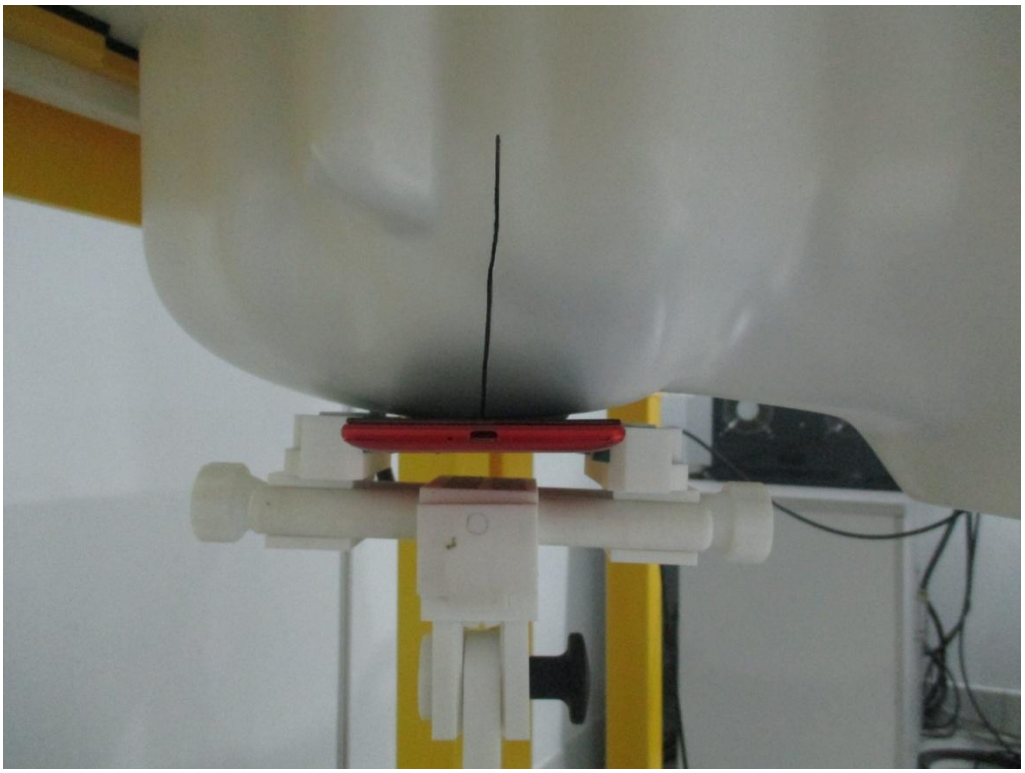


**Fig.2 Right_Cheek**

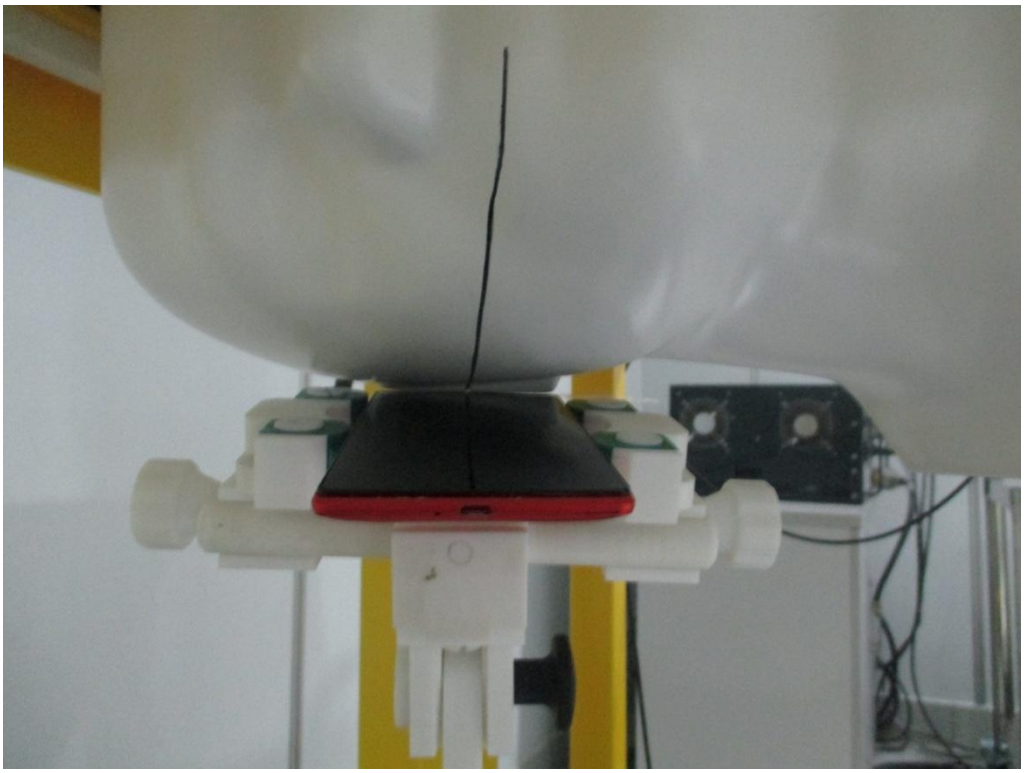


**Fig.3 Right_Tilt**

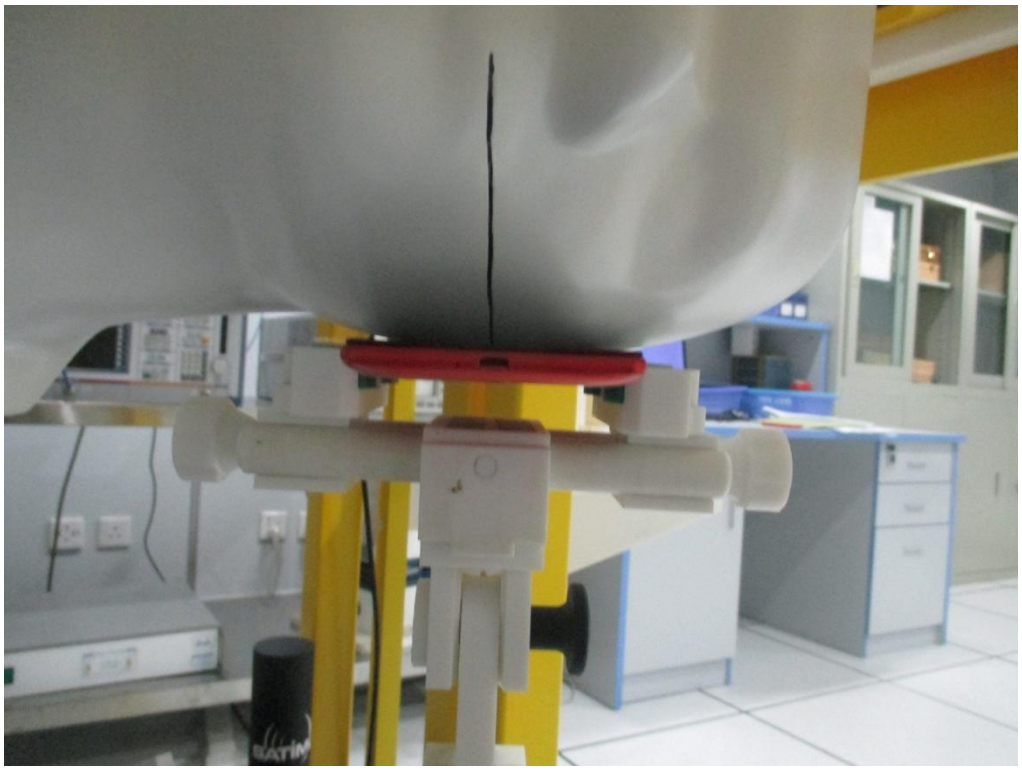


**Fig.4 Left Cheek**

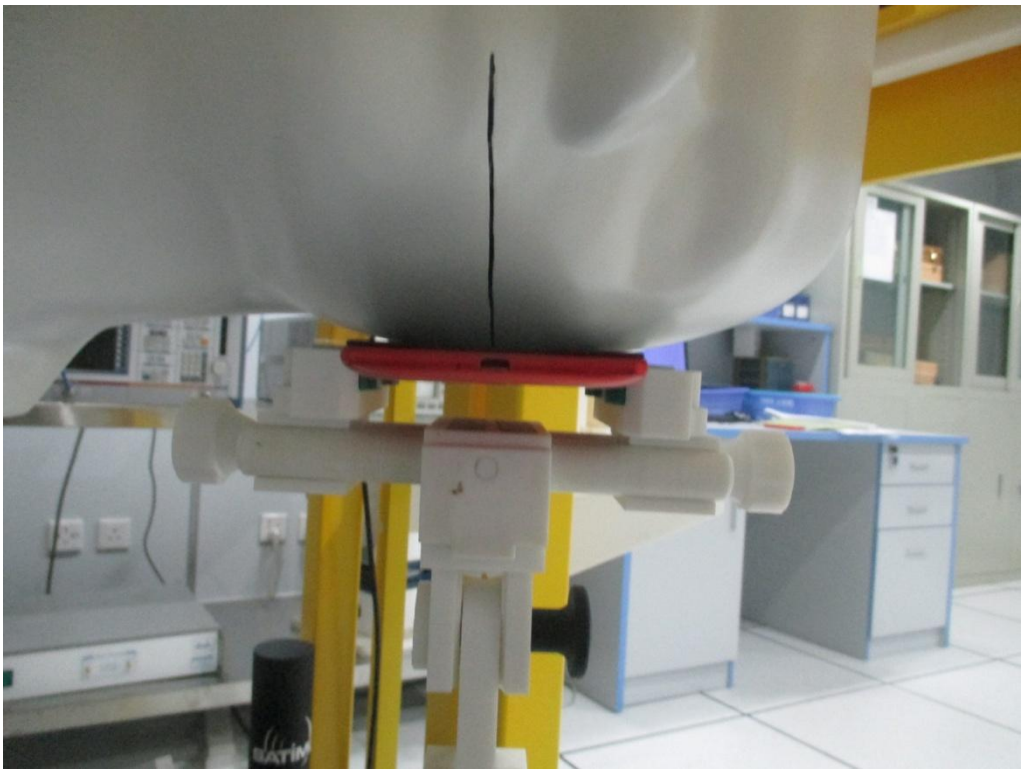


**Fig.5 Left_Tilt**

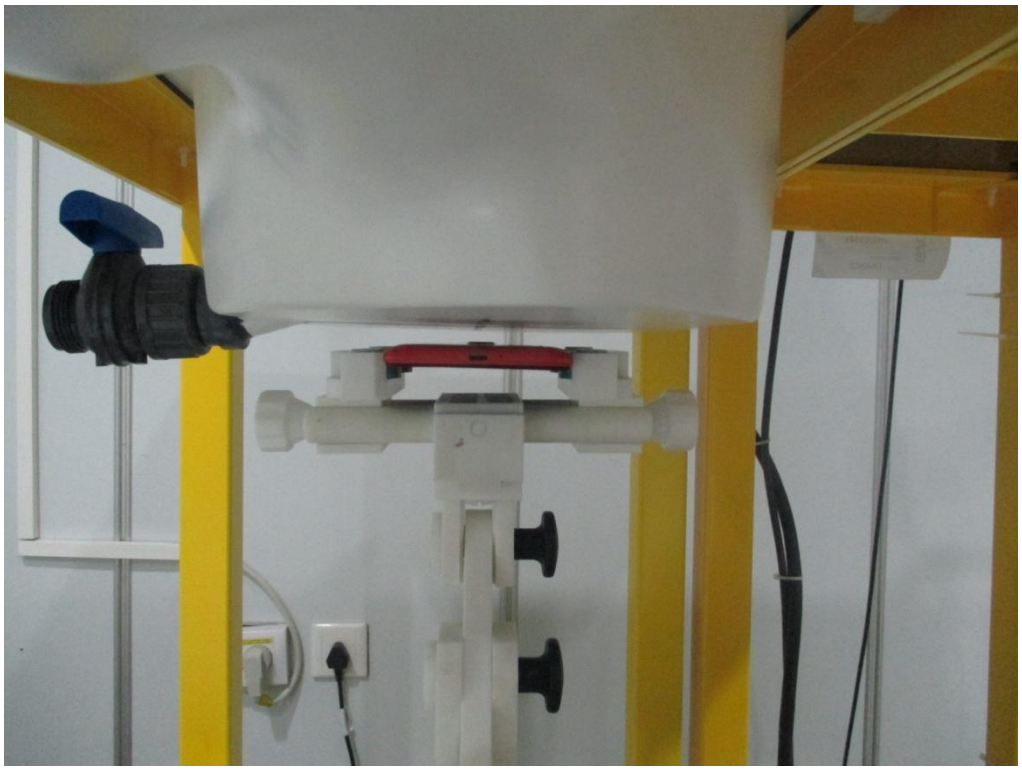


**Fig.6 Body(Back upside,5mm seperation)**

**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)**

# ANNEX C

# of

# CCIC-SET

## CONFORMANCE TEST REPORT FOR

## HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

## SET2014-13183

**WCDMA digital mobile phone**

**Type Name: W861**

**Hardware Version: UALD07 VER.A**

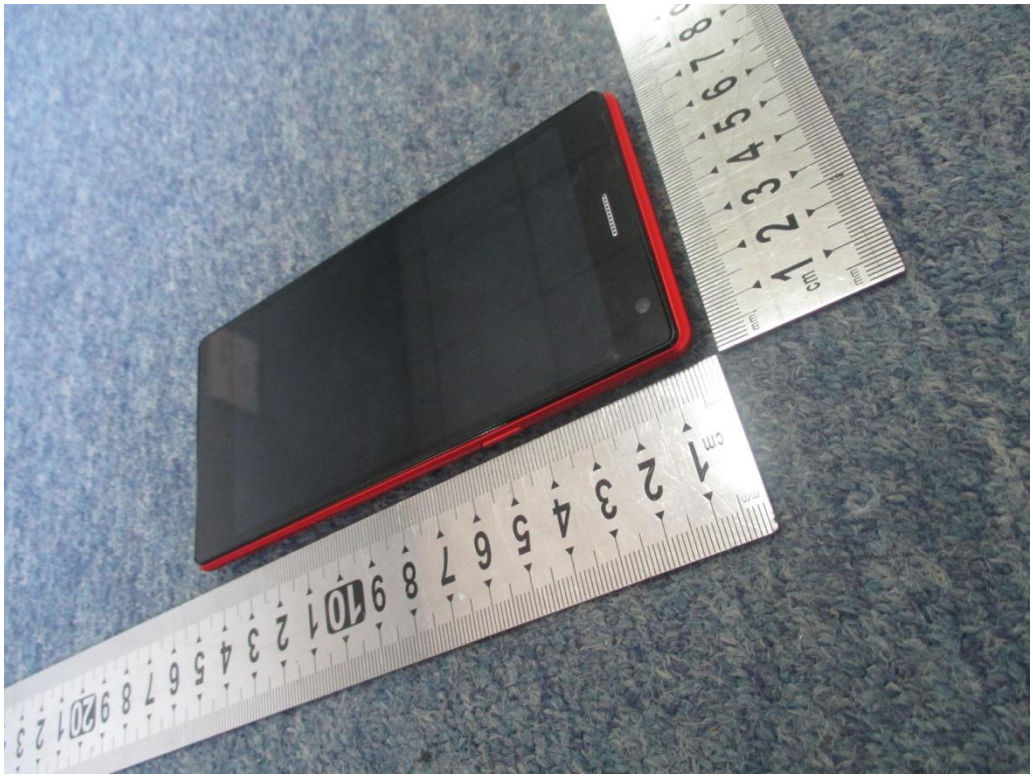
**Software Version: HW-W861-H01-S004-VE**

**Sample Photographs**

**This Annex consists of 2 pages**

**Date of Report: 2014-12-03**

## 1. Appearance



**Appearance and size (obverse)**


**Appearance and size (reverse)**

# ANNEX D

# of

# CCIC-SET

## CONFORMANCE TEST REPORT FOR

## HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

## SET2014-13183

**WCDMA digital mobile phone**

**Type Name: W861**

**Hardware Version: UALD07 VER.A**

**Software Version: HW-W861-H01-S004-VE**

**System Performance Check Data and Highest SAR Plots**

**This Annex consists of 50 pages**

**Date of Report: 2014-12-03**

## GRAPH TEST RESULTS

| BAND | PAPAMETERS |
|---|---|
| **GSM 850** | Right Head with Cheek device position on Low Channel in GSM mode<br>Flat Plane with Edge B Body device position on Low Channel in GSM mode<br>Flat Plane with Back Body device position on Low Channel in GPRS mode |
| **GSM 1900** | Right Head with Cheek device position on Middle Channel in GSM mode<br>Flat Plane with Edge B Body device position on Middle Channel in GSM mode<br>Flat Plane with Edge B Body device position on Middle Channel in GPRS mode |
| **WCDMA 850** | Left Head with Cheek device position on Low Channel in WCDMA mode<br>Flat Plane with Edge B Body device position on Low Channel in WCDMA mode |
| **WCDMA 1900** | Right Head with Cheek device position on Middle Channel in WCDMA mode<br>Flat Plane with Edge B Body device position on Middle Channel in WCDMA mode<br>Flat Plane with Edge B Body device position on Middle Channel in WCDMA mode(repeated measurement) |
| **WIFI 802.11b** | Right Head with Cheek device position on High Channel in DSSS mode<br>Flat Plane with Back Body device position on High Channel in DSSS 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:27/11/2014

Measurement duration: 12 minutes 57 seconds

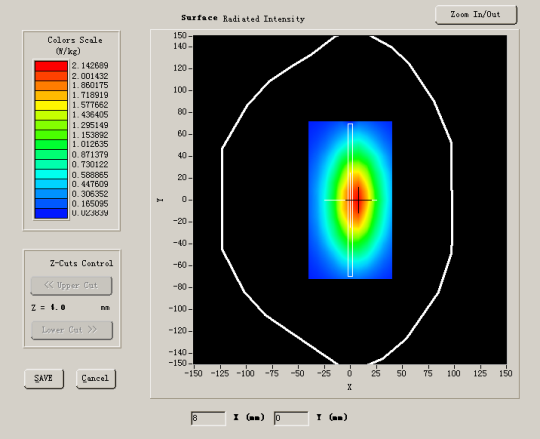
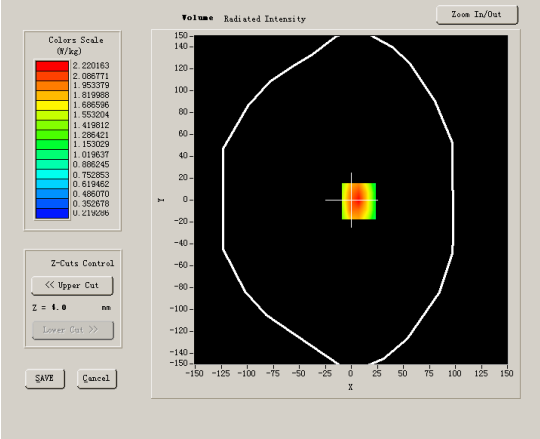
## A. Experimental conditions.

| | |
|---|---|
| **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 |

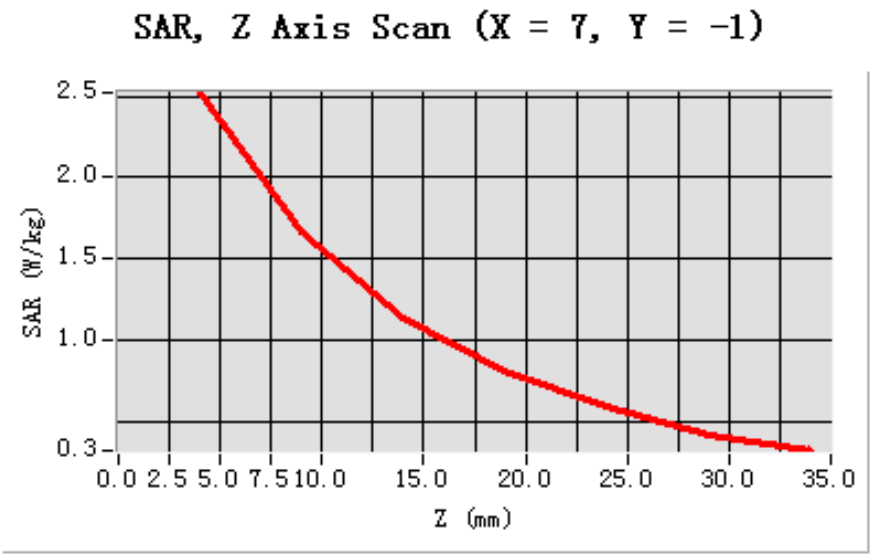
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

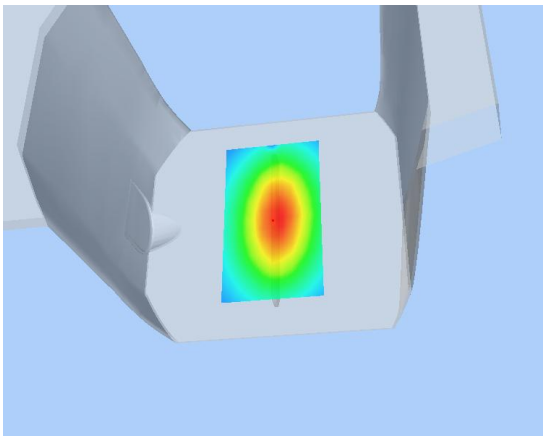
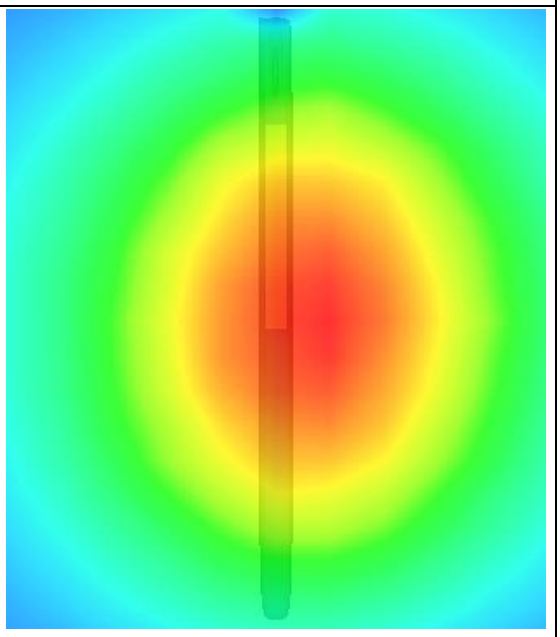
**Maximum location: X=7.00, Y=-1.00**

| | |
|---|---|
| **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, 1900MHz)

Type: Phone measurement (Complete)

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

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

Date of measurement: 27/11/2014

Measurement duration: 12 minutes 57 seconds

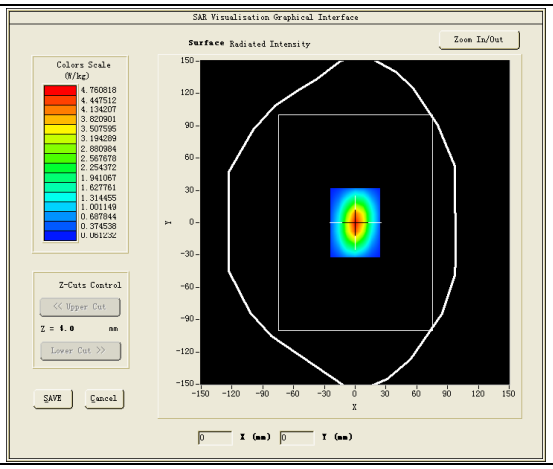
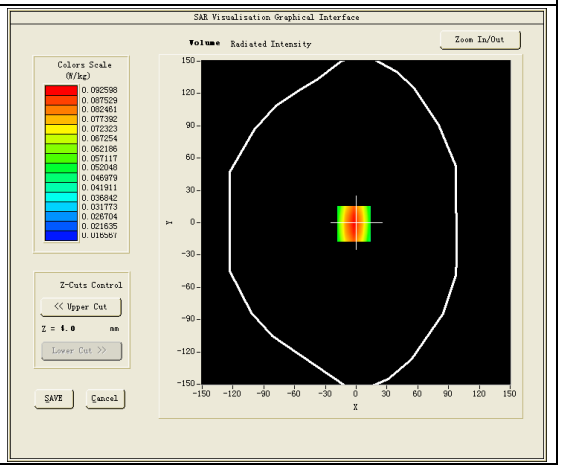
**A. Experimental conditions.**

| | |
|---|---|
| **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 |

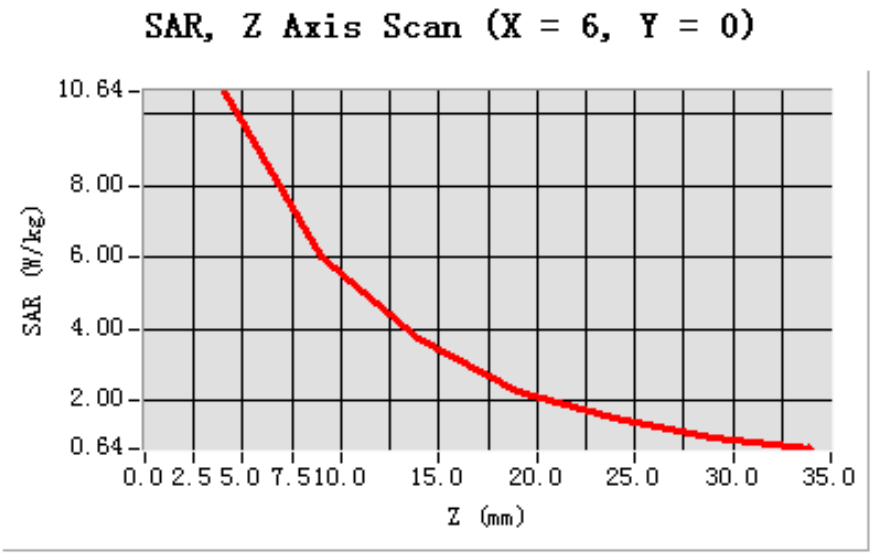
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

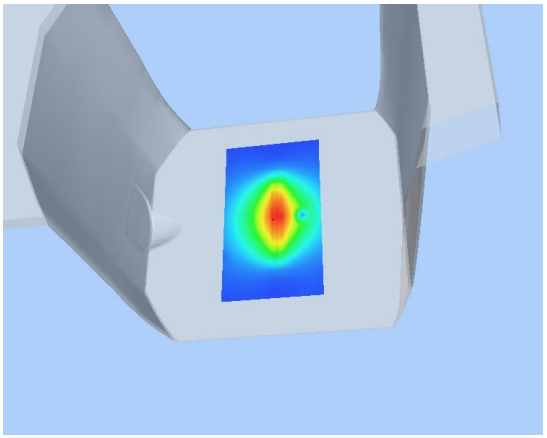
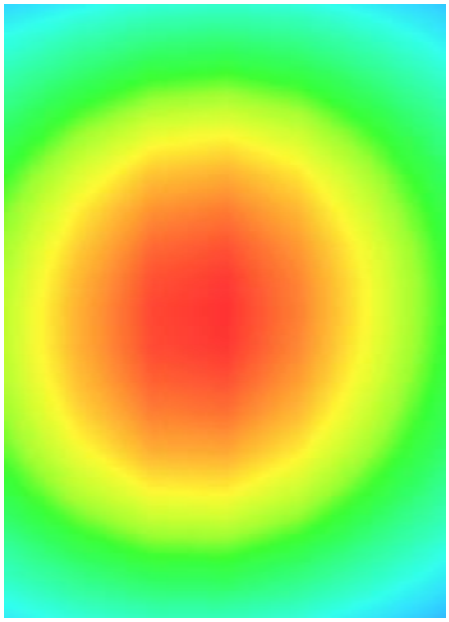
**Maximum location: X=6.00, Y=0.00**

| | |
|---|---|
| **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:27/11/2014

Measurement duration: 15 minutes 24 seconds

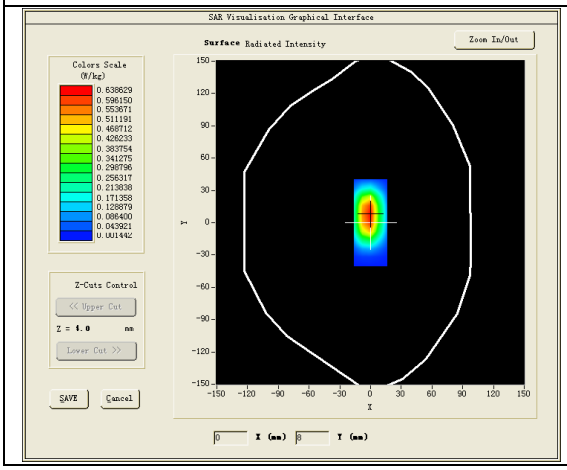
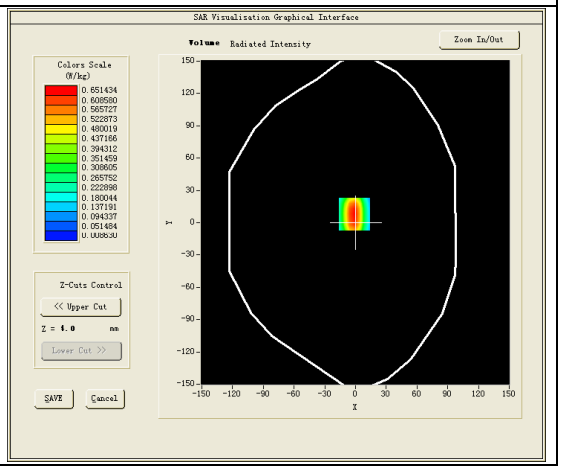
**A. Experimental conditions.**

| | |
|---|---|
| **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** |
|---|---|
|  |  |



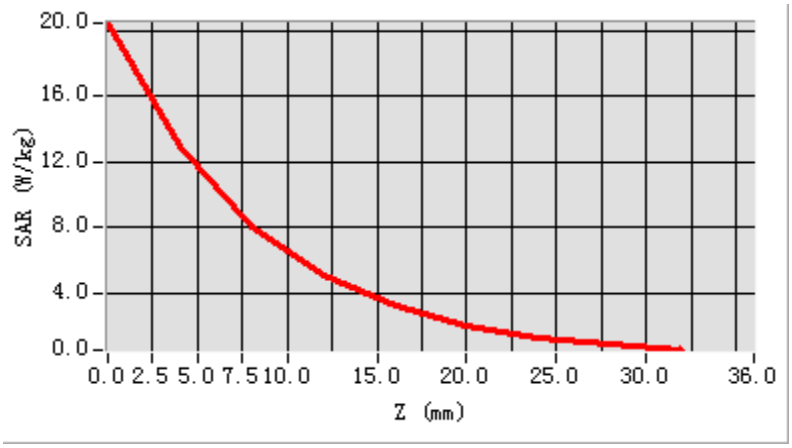


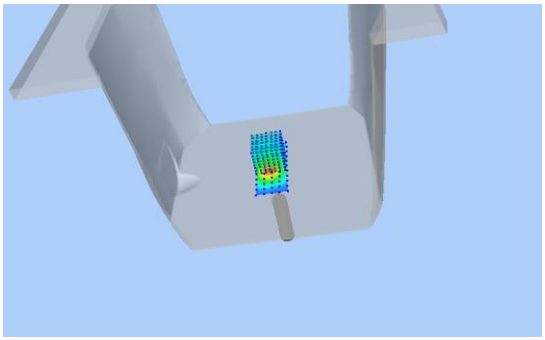
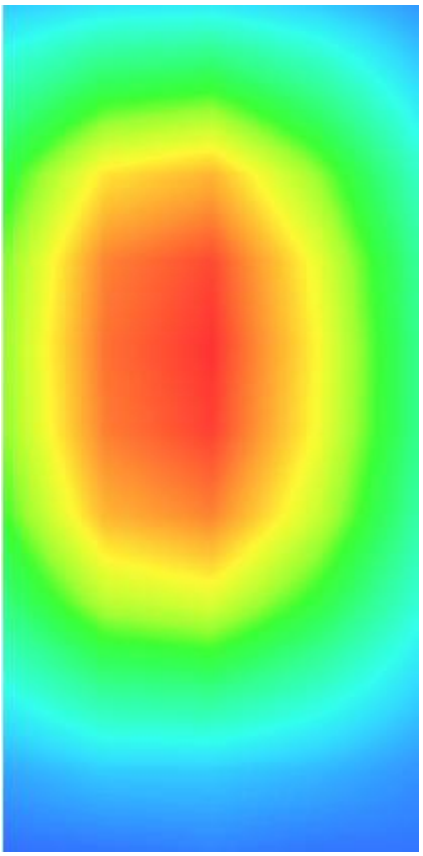
**Maximum location: X=0.00, Y=8.00**

| | |
|---|---|
| **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 (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: 28/11/2014

Measurement duration: 13 minutes 12 seconds

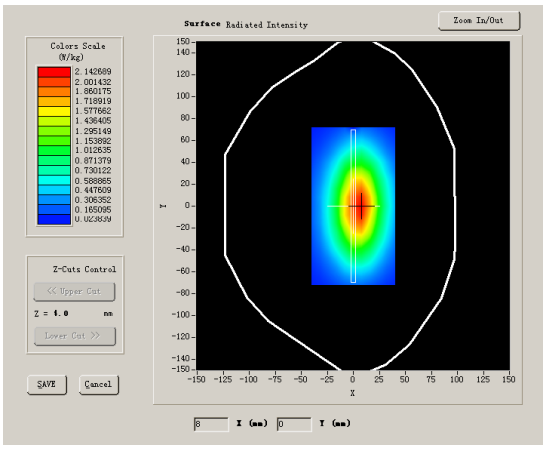
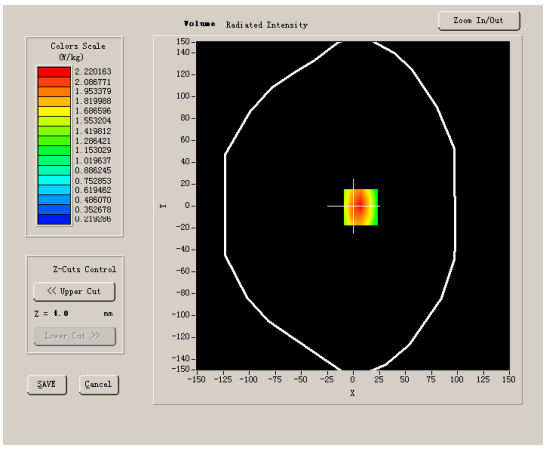
## A. Experimental conditions.

| | |
|---|---|
| **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 |

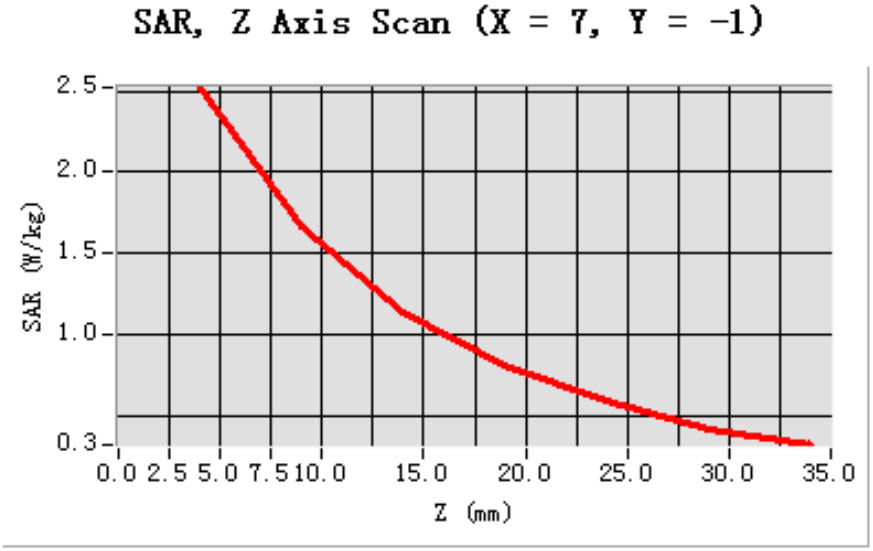
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

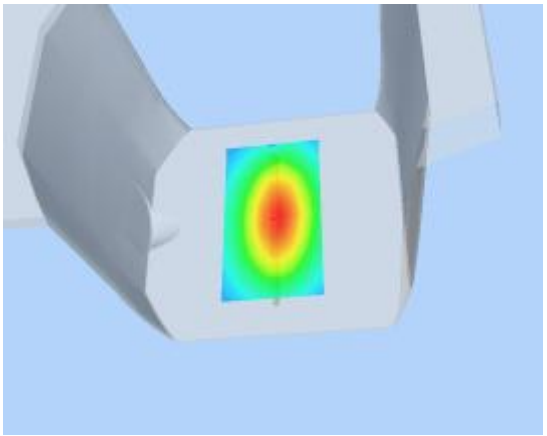
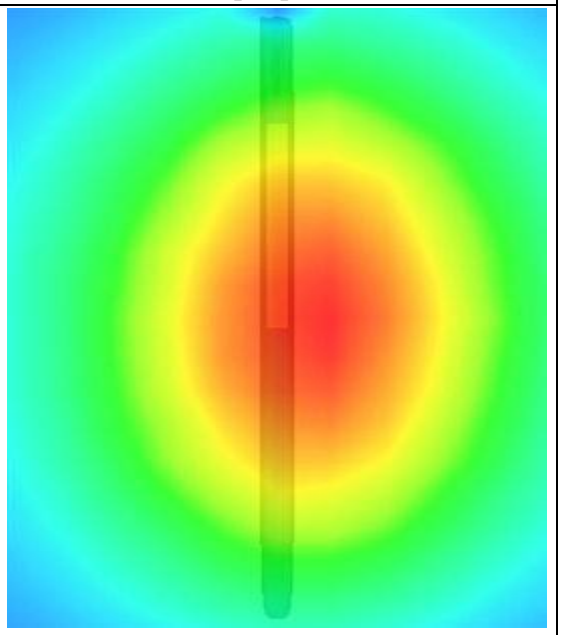
**Maximum location: X=7.00, Y=-1.00**

| | |
|---|---|
| **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, 1900MHz)

Type: Phone measurement (Complete)

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

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

Date of measurement: 28/11/2014

Measurement duration: 13 minutes 12 seconds

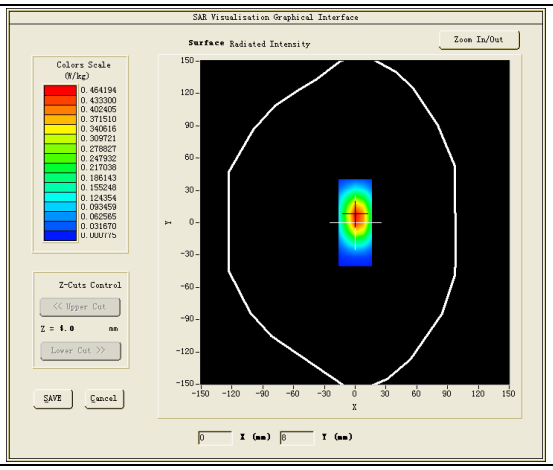
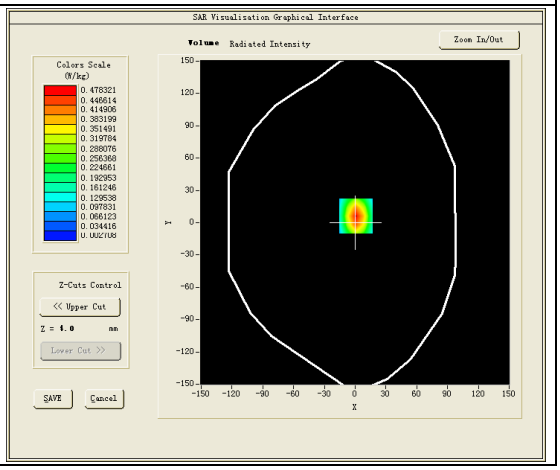
## A. Experimental conditions.

| | |
|---|---|
| **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 |
|---|---|
|  |  |



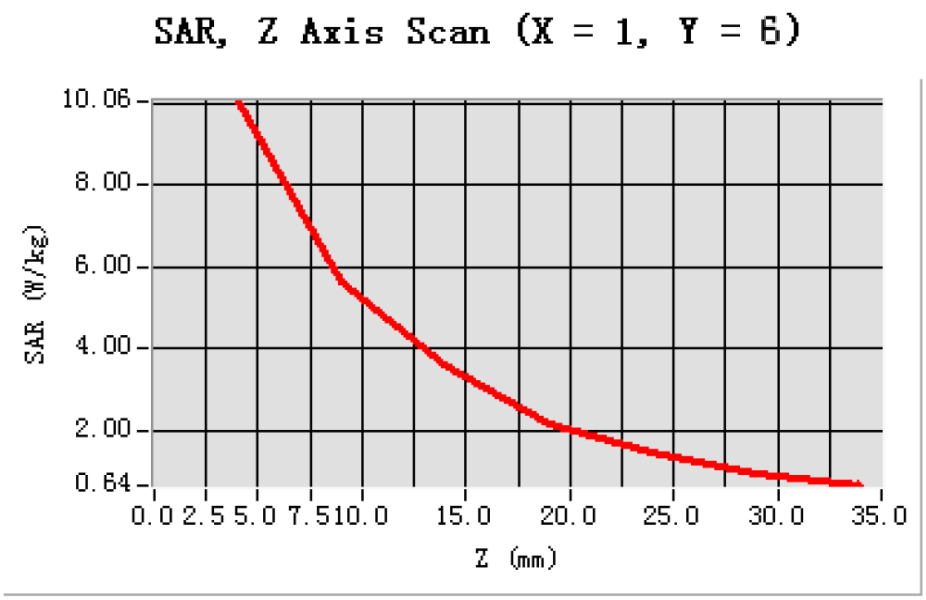


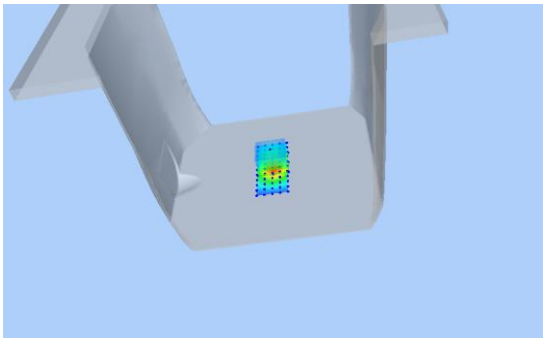
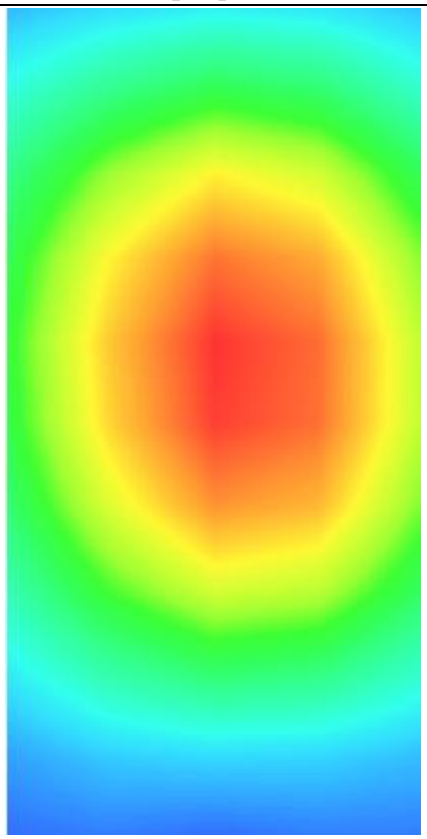
**Maximum location: X=1.00, Y=6.00**

| | |
|---|---|
| **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=8mm, dy=8mm, dz=5mm

Date of measurement: 28/11/2014

Measurement duration: 13 minutes 21 seconds

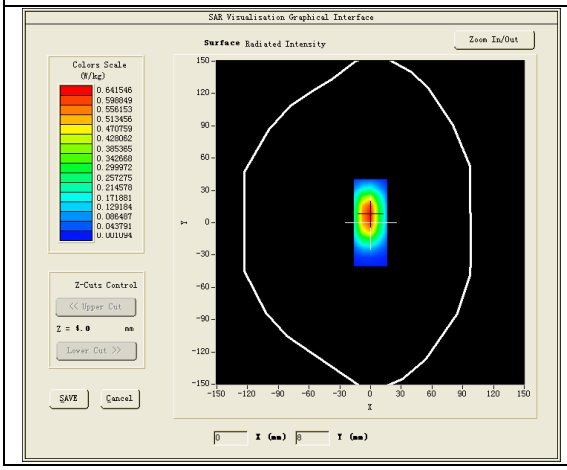
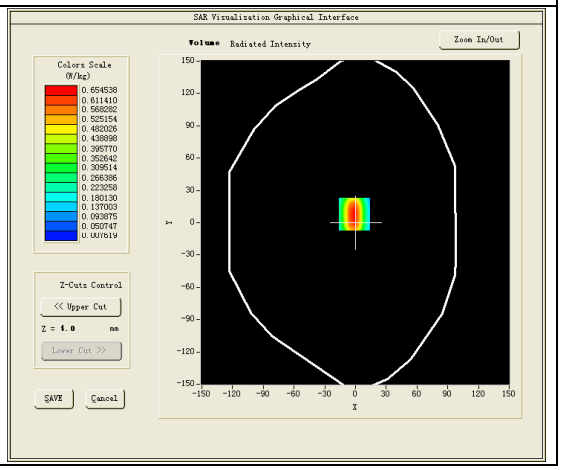
**A. Experimental conditions.**

| | |
|---|---|
| **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** |
|---|---|
|  |  |



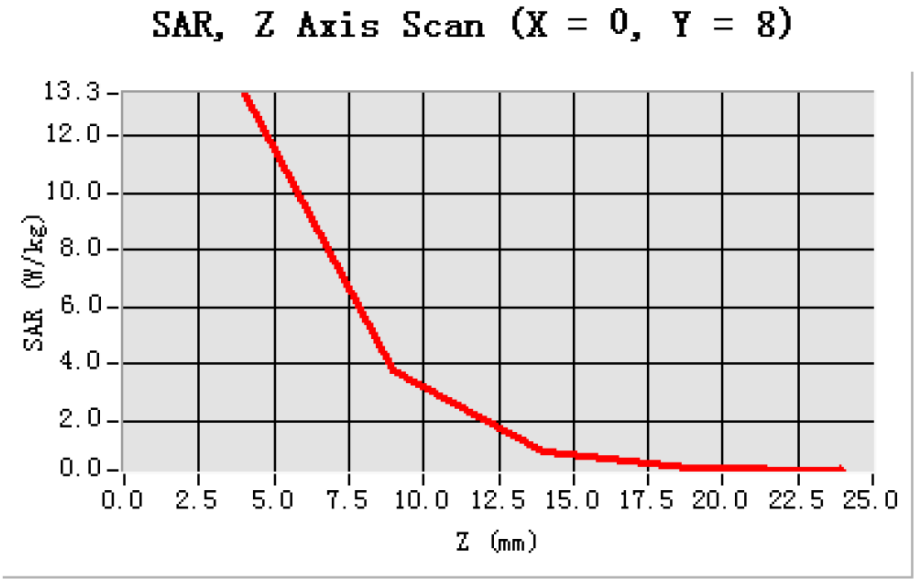


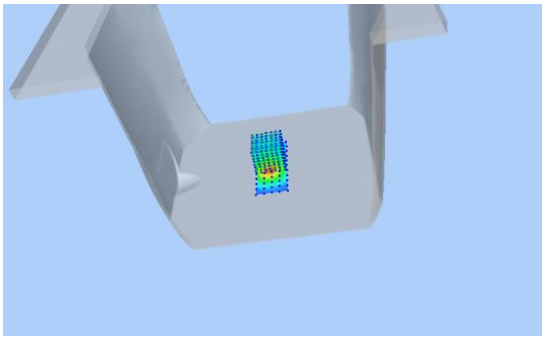
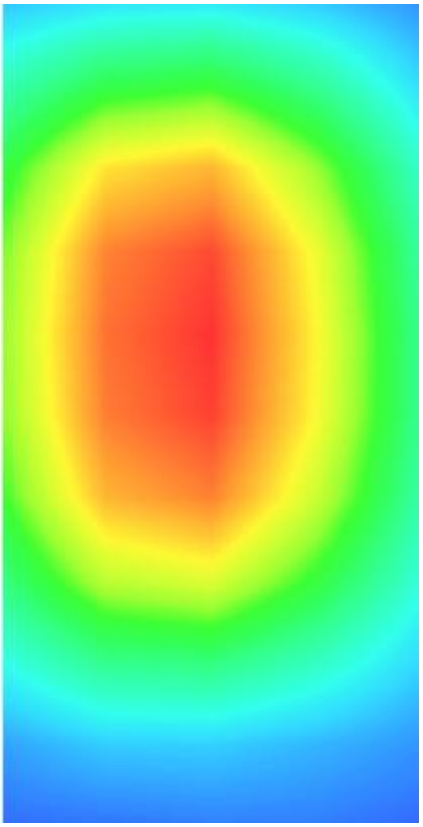
**Maximum location: X=0.00, Y=8.00**

| | |
|---|---|
| **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 |
|---|---|
|  |  |

# GSM850, Right Cheek, Low

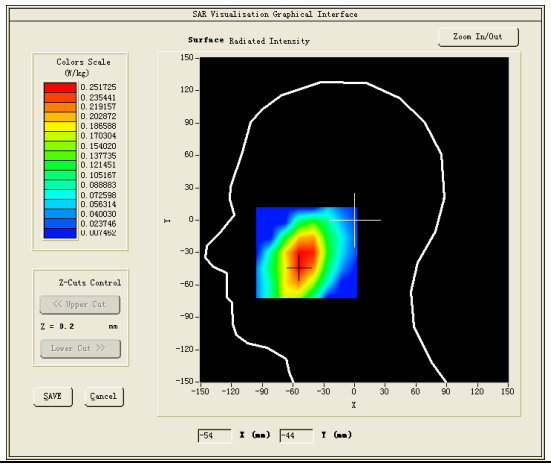
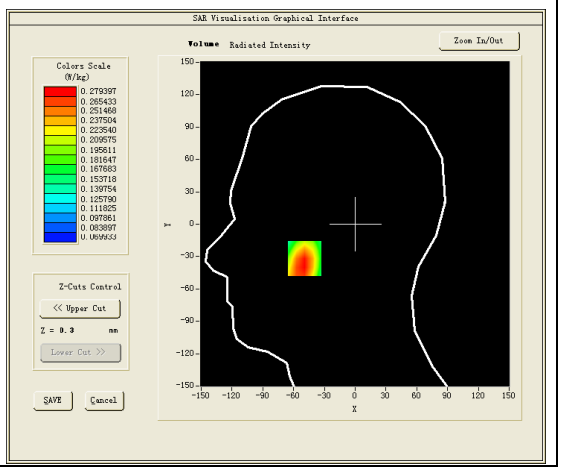
Type: Phone measurement (Very fast, 11 points in the volume)
Date of measurement: 27/11/2014
Measurement duration: 6 minutes 35 seconds
Mobile Phone IMEI number: --

**A. Experimental conditions.**

| | |
|---|---|
| **Area Scan** | sam_direct_droit2_surf8mm.txt |
| **ZoomScan** | 5x5x7,dx=8mm dy=8mm dz=5mm,Very fast |
| **Phantom** | Right head |
| **Device Position** | Cheek |
| **Band** | GSM850 |
| **Channels** | 128 |
| **Signal** | GSM (Duty cycle: 1:8) |

**B. SAR Measurement Results**

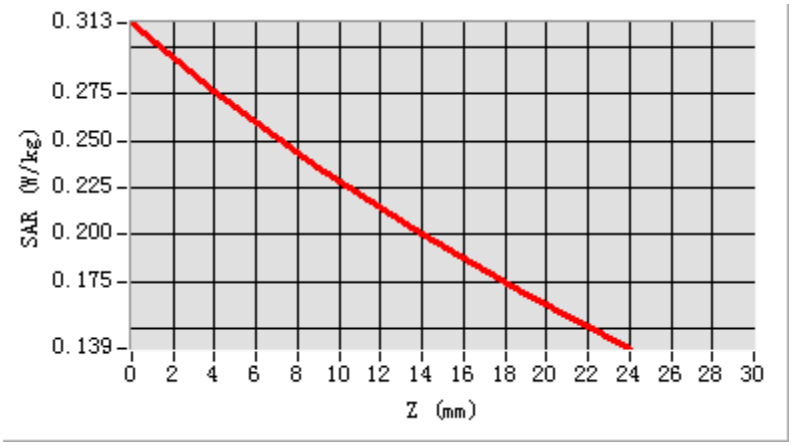
| | |
|---|---|
| **Frequency (MHz)** | 824.2 |
| **Relative permittivity (real part)** | 41.45 |
| **Relative permittivity (imaginary part)** | 15.07 |
| **Conductivity (S/m)** | 0.91 |
| **Variation (%)** | -1.730000 |
| **ConvF:** | 5.51 |

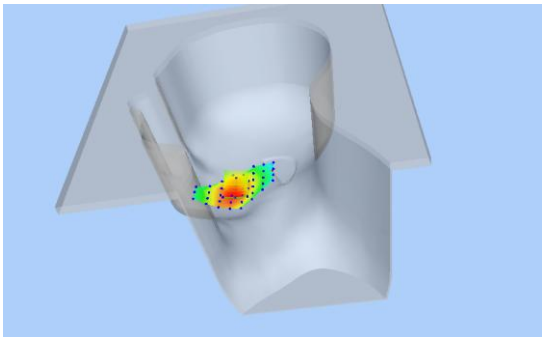
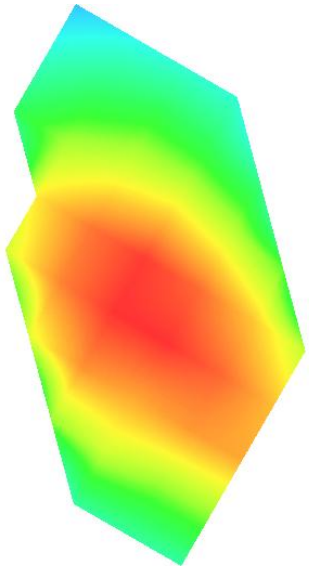
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=-49.00, Y=-32.00**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.212156 |
| **SAR 1g (W/Kg)** | 0.271412 |

| Z (mm) | 0.00 | 4.00 | 9.00 | 14.00 | 19.00 |
|---|---|---|---|---|---|
| SAR (W/Kg) | 0.3128 | 0.2767 | 0.2361 | 0.2001 | 0.1681 |




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# GSM850, Back, Low

Type: Phone measurement (Very fast, 11 points in the volume)

Date of measurement: 28/11/2014

Measurement duration: 7 minutes 32 seconds

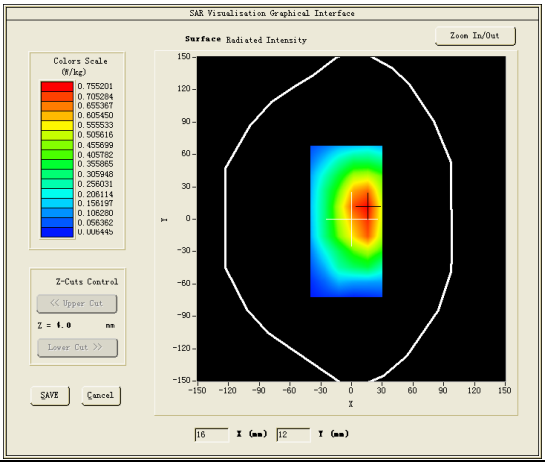
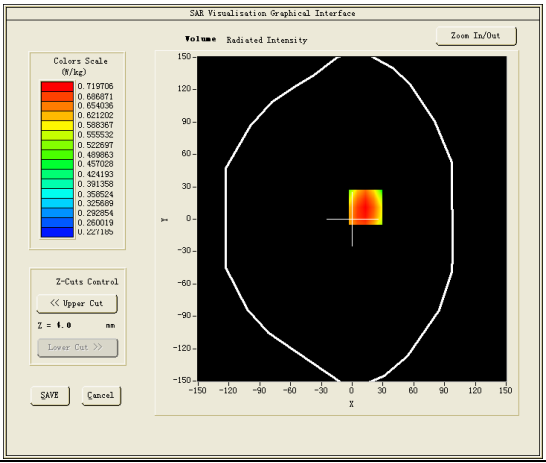
Mobile Phone IMEI number: --

**A. Experimental conditions.**

| | |
|---|---|
| **Area Scan** | surf_sam_plan.txt |
| **ZoomScan** | 5x5x7,dx=8mm dy=8mm dz=5mm,Very fast |
| **Phantom** | Validation plane |
| **Device Position** | Back |
| **Band** | GSM850 |
| **Channels** | 128 |
| **Signal** | GSM(Duty cycle: 1:8) |

**B. SAR Measurement Results**

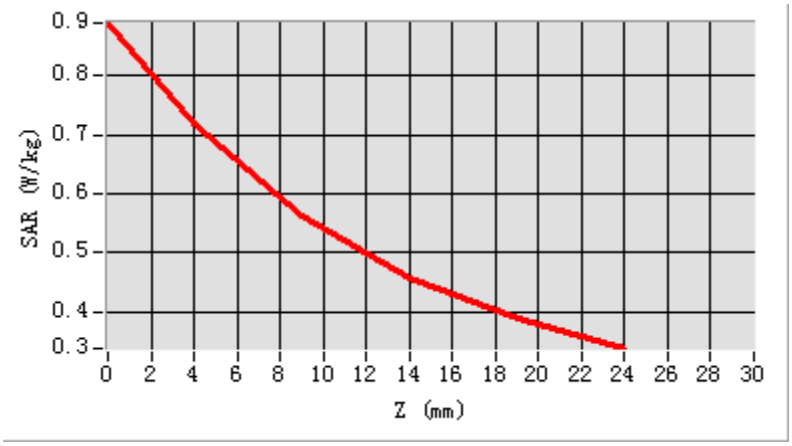
| | |
|---|---|
| **Frequency (MHz)** | 824.2 |
| **Relative permittivity (real part)** | 55.26 |
| **Relative permittivity (imaginary part)** | 21.71 |
| **Conductivity (S/m)** | 0.98 |
| **Variation (%)** | 2.000000 |
| **ConvF:** | 5.68 |

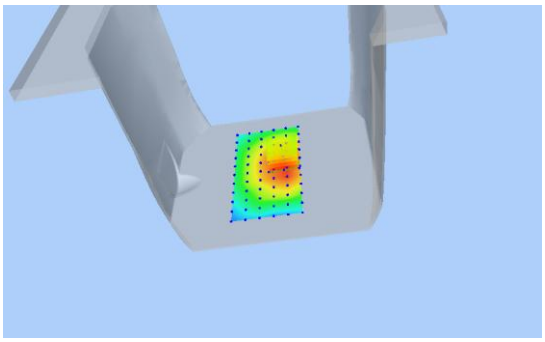
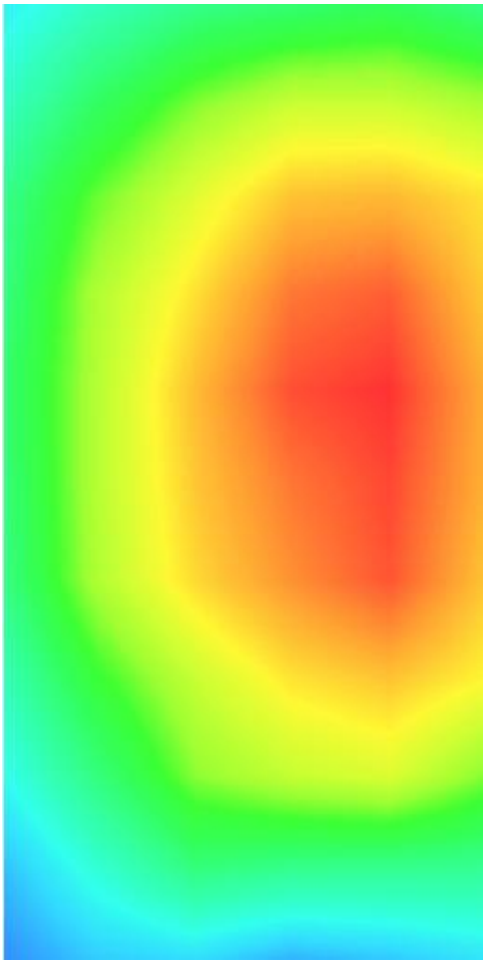
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=13.00, Y=11.00**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.542386 |
| **SAR 1g (W/Kg)** | 0.698662 |

| Z (mm) | 0.00 | 4.00 | 9.00 | 14.00 | 19.00 |
|---|---|---|---|---|---|
| SAR (W/Kg) | 0.8897 | 0.7197 | 0.5631 | 0.4577 | 0.3886 |




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# GPRS 850, Back, Low

Type: Phone measurement (Very fast, 11 points in the volume)

Date of measurement: 28/11/2014

Measurement duration: 7 minutes 33 seconds

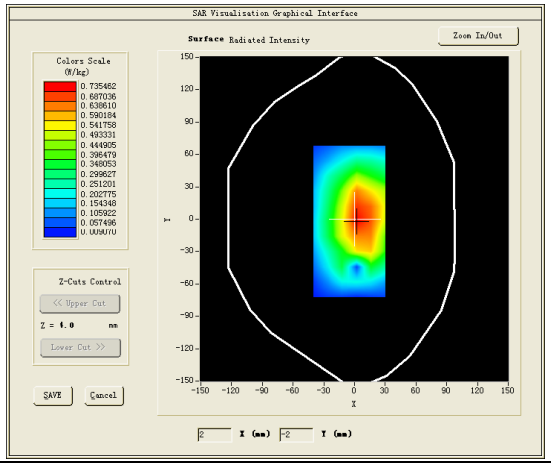
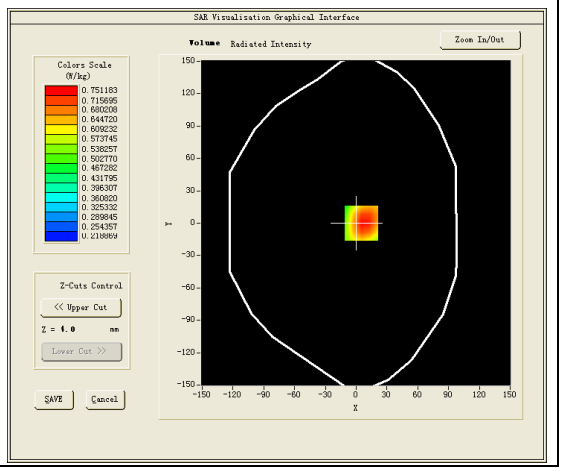
Mobile Phone IMEI number: --

**A. Experimental conditions.**

| | |
|---|---|
| **Area Scan** | surf_sam_plan.txt |
| **ZoomScan** | 5x5x7,dx=8mm dy=8mm dz=5mm,Very fast |
| **Phantom** | Validation plane |
| **Device Position** | Back |
| **Band** | CUSTOM (GPRS850 ) |
| **Channels** | 128 |
| **Signal** | GPRS slot 4 mode (Duty cycle: 1:2) |

**B.SAR Measurement Results**

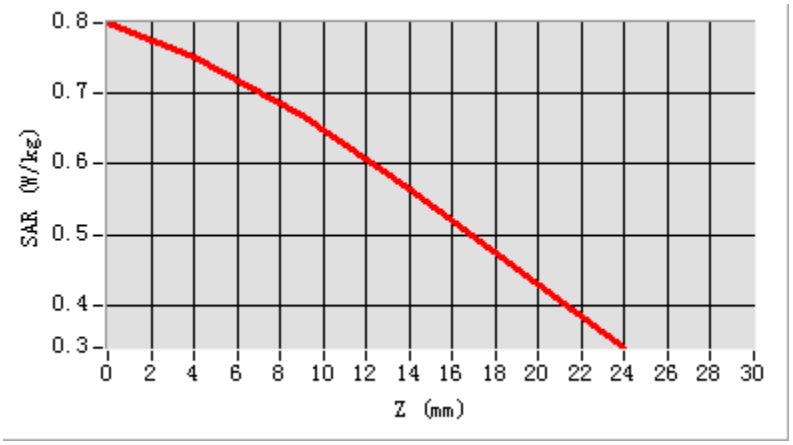
| | |
|---|---|
| **Frequency (MHz)** | 824.2 |
| **Relative permittivity (real part)** | 55.26 |
| **Relative permittivity (imaginary part)** | 21.71 |
| **Conductivity (S/m)** | 0.98 |
| **Variation (%)** | 1.410000 |
| **ConvF:** | 5.68 |

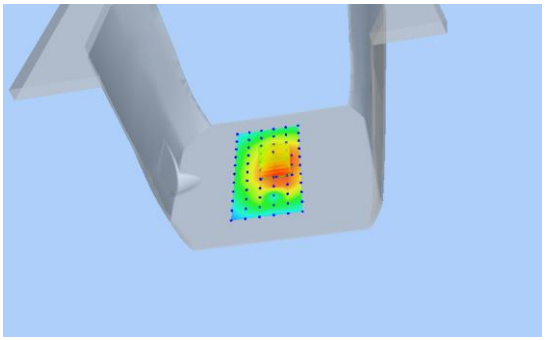
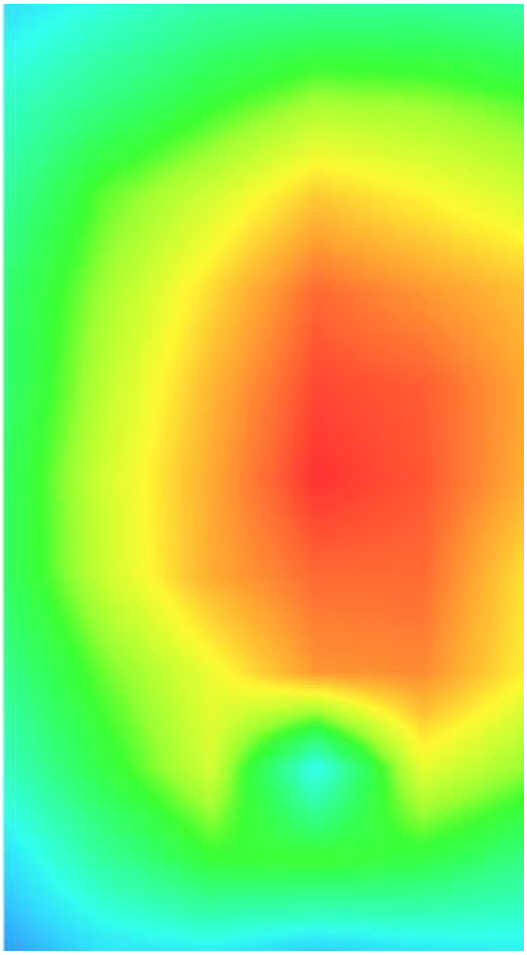
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=5.00, Y=0.00**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.577624 |
| **SAR 1g (W/Kg)** | 0.742791 |

| Z (mm) | 0.00 | 4.00 | 9.00 | 14.00 | 19.00 |
|---|---|---|---|---|---|
| SAR (W/Kg) | 0.7998 | 0.7512 | 0.6681 | 0.5645 | 0.4503 |




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# GSM1900, Right Cheek, Middle

Type: Phone measurement (Very fast, 11 points in the volume)

Date of measurement: 27/11/2014

Measurement duration: 5 minutes 37 seconds

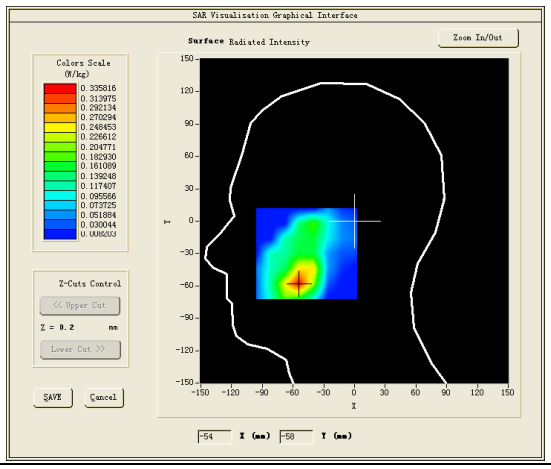
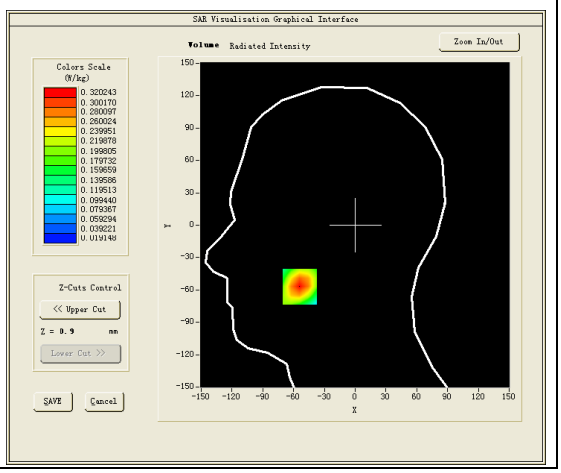
Mobile Phone IMEI number: --

**A. Experimental conditions.**

| | |
|---|---|
| **Area Scan** | sam_direct_droit2_surf8mm.txt |
| **ZoomScan** | 5x5x7,dx=8mm dy=8mm dz=5mm,Very fast |
| **Phantom** | Right head |
| **Device Position** | Cheek |
| **Band** | GSM1900 |
| **Channels** | 661 |
| **Signal** | GSM (Duty cycle: 1:8) |

**B.SAR Measurement Results**

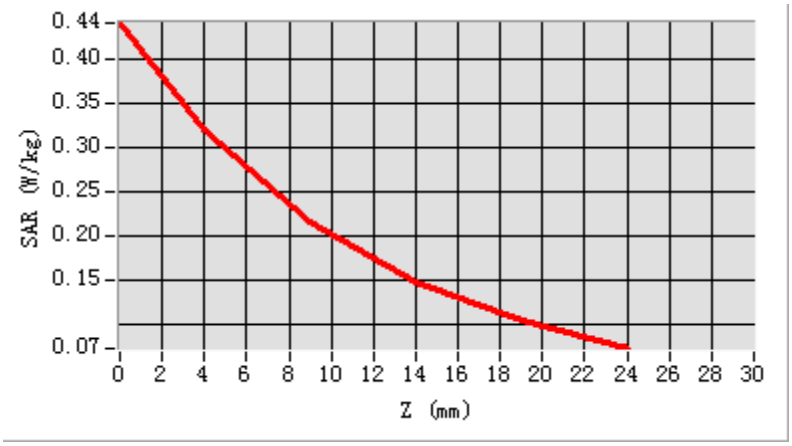
| | |
|---|---|
| **Frequency (MHz)** | 1880.0 |
| **Relative permittivity (real part)** | 39.98 |
| **Relative permittivity (imaginary part)** | 15.07 |
| **Conductivity (S/m)** | 1.41 |
| **Variation (%)** | 2.090000 |
| **ConvF:** | 5.49 |

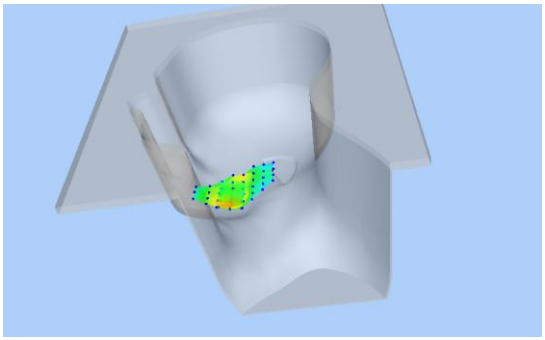
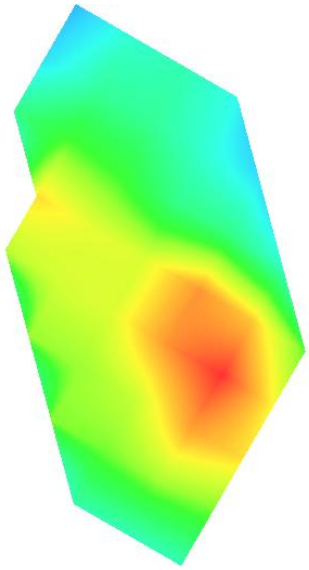
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=-54.00, Y=-57.00**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.186088 |
| **SAR 1g (W/Kg)** | 0.301247 |

| Z (mm) | 0.00 | 4.00 | 9.00 | 14.00 | 19.00 |
|---|---|---|---|---|---|
| SAR (W/Kg) | 0.4402 | 0.3202 | 0.2150 | 0.1471 | 0.1040 |




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# GSM1900, Edge B, Middle

Type: Phone measurement (Very fast, 11 points in the volume)

Date of measurement: 28/11/2014

Measurement duration: 6 minutes 52 seconds

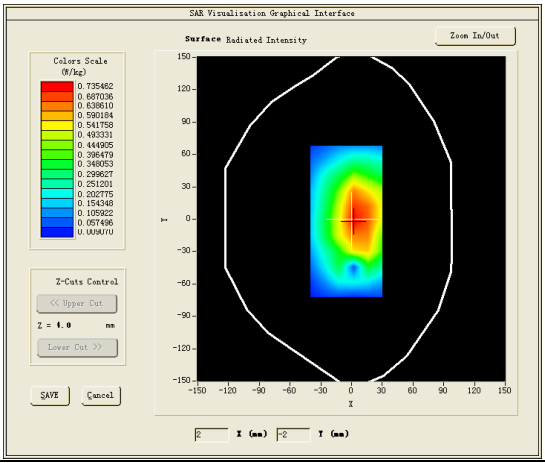
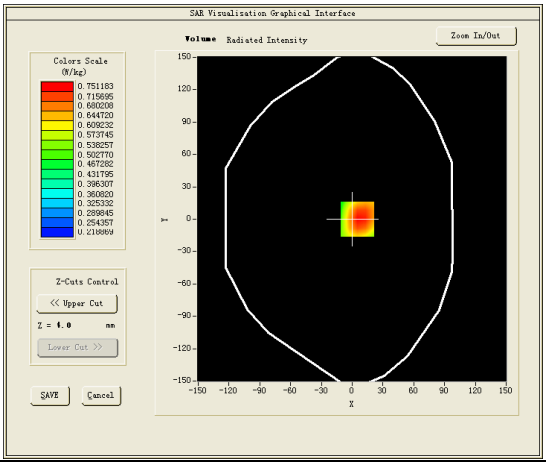
Mobile Phone IMEI number: --

## A. Experimental conditions.

| | |
|---|---|
| **Area Scan** | dx=8mm dy=8mm |
| **ZoomScan** | 5x5x7,dx=8mm dy=8mm dz=5mm,Very fast |
| **Phantom** | Validation plane |
| **Device Position** | Back |
| **Band** | GSM1900 |
| **Channels** | 661 |
| **Signal** | GSM (Duty cycle: 1:8) |

## B. SAR Measurement Results

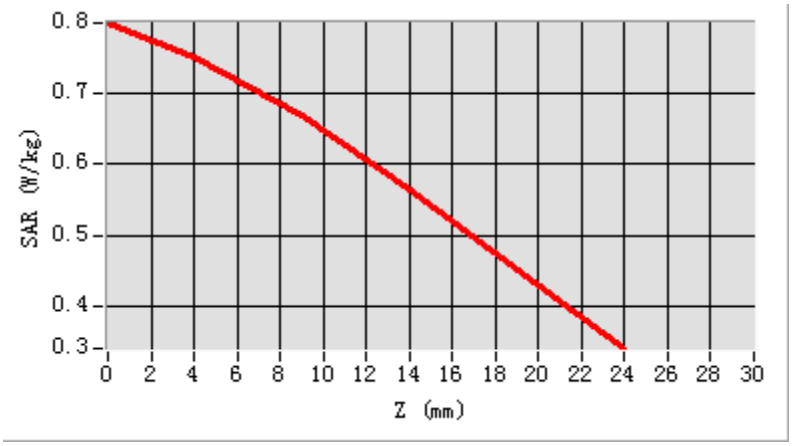
| | |
|---|---|
| **Frequency (MHz)** | 1880.0 |
| **Relative permittivity (real part)** | 53.28 |
| **Relative permittivity (imaginary part)** | 12.99 |
| **Conductivity (S/m)** | 1.53 |
| **Variation (%)** | -3.010000 |
| **ConvF:** | 5.65 |

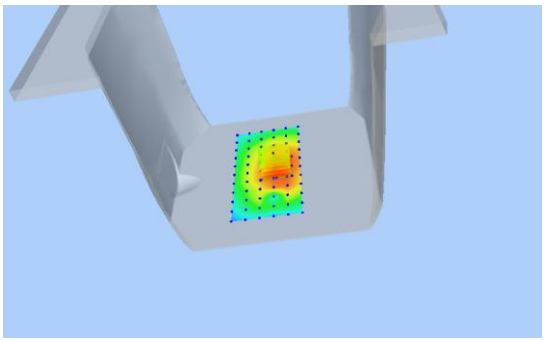
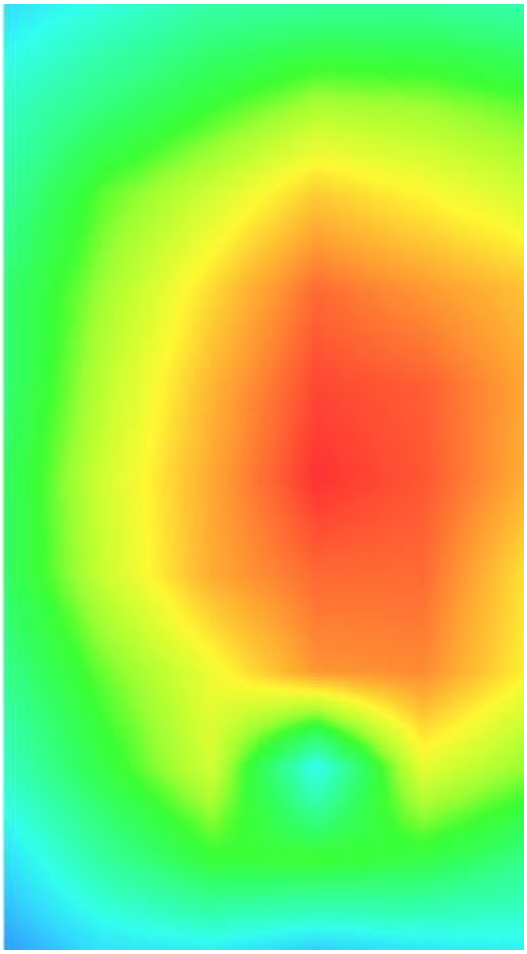
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=5.00, Y=0.00**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.576574 |
| **SAR 1g (W/Kg)** | 0.742057 |

| Z (mm) | 0.00 | 4.00 | 9.00 | 14.00 | 19.00 |
|---|---|---|---|---|---|
| SAR (W/Kg) | 0.7984 | 0.7501 | 0.6632 | 0.5634 | 0.4501 |




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# GPRS1900, Edge B, Middle

Type: Phone measurement (Very fast, 11 points in the volume)

Date of measurement: 28/11/2014

Measurement duration: 7 minutes 31 seconds

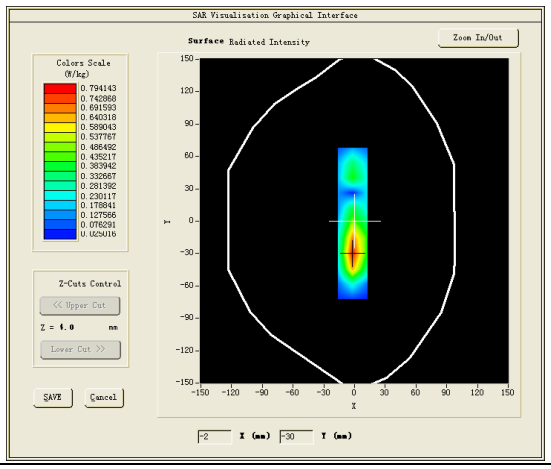
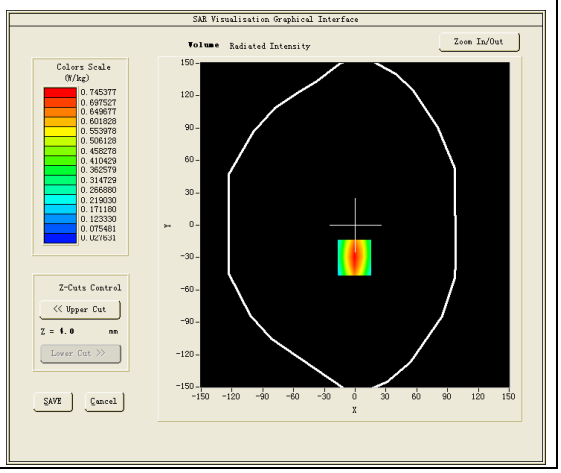
Mobile Phone IMEI number: --

**A. Experimental conditions.**

| | |
|---|---|
| **Area Scan** | surf_sam_plan.txt |
| **ZoomScan** | 5x5x7,dx=8mm dy=8mm dz=5mm,Very fast |
| **Phantom** | Validation plane |
| **Device Position** | Body |
| **Band** | CUSTOM (GPRS1900 ) |
| **Channels** | 661 |
| **Signal** | GPRS slot 4 mode (Duty cycle: 1:2) |

**B. SAR Measurement Results**

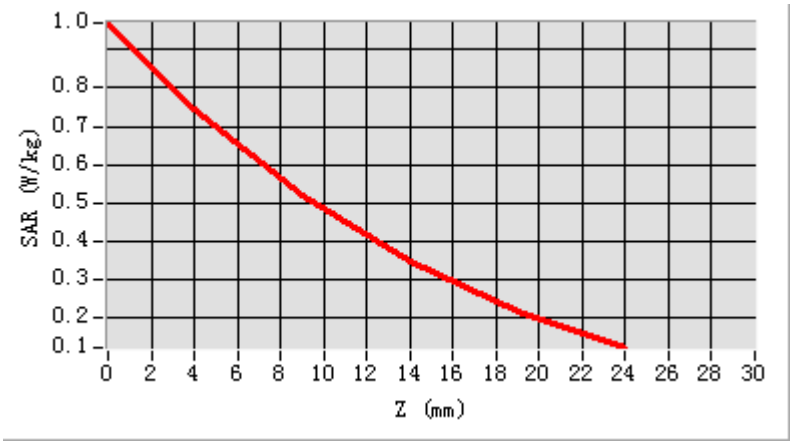
| | |
|---|---|
| **Frequency (MHz)** | 1880.0 |
| **Relative permittivity (real part)** | 53.28 |
| **Relative permittivity (imaginary part)** | 12.99 |
| **Conductivity (S/m)** | 1.53 |
| **Variation (%)** | 2.510000 |
| **ConvF:** | 5.65 |

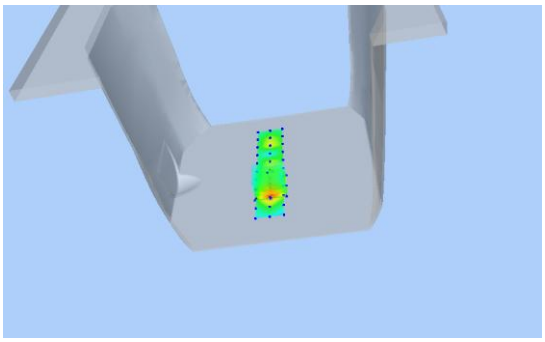
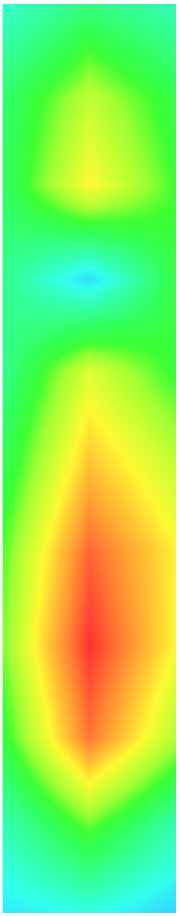
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=-1.00, Y=-30.00**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.422336 |
| **SAR 1g (W/Kg)** | 0.709666 |

| Z (mm) | 0.00 | 4.00 | 9.00 | 14.00 | 19.00 |
|---|---|---|---|---|---|
| SAR (W/Kg) | 0.9694 | 0.7454 | 0.5209 | 0.3490 | 0.2199 |




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# WCDMA850, Left Cheek, Low

Type: Phone measurement (Very fast, 11 points in the volume)

Date of measurement: 27/11/2014

Measurement duration: 5 minutes 19 seconds

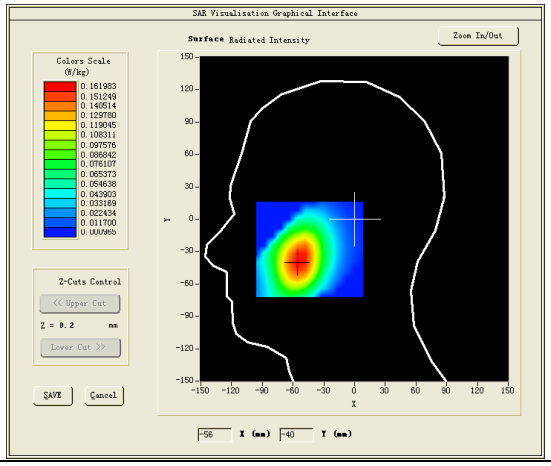
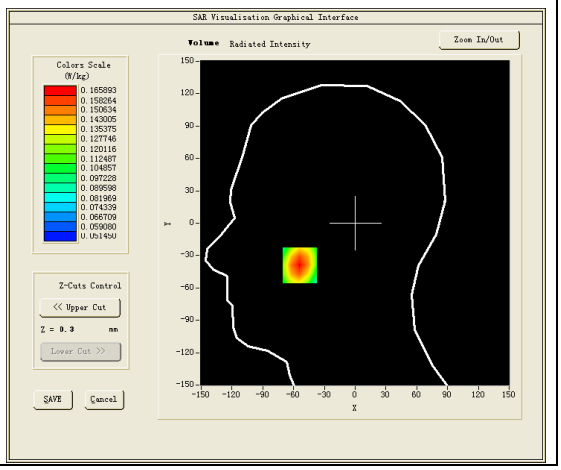
Mobile Phone IMEI number: --

**A. Experimental conditions.**

| | |
|---|---|
| **Area Scan** | sam_direct_droit2_surf8mm.txt |
| **ZoomScan** | 5x5x7,dx=8mm dy=8mm dz=5mm,Very fast |
| **Phantom** | Left head |
| **Device Position** | Cheek |
| **Band** | Band5_WCDMA850 |
| **Channels** | 4132 |
| **Signal** | WCDMA (Duty cycle: 1:1) |

**B. SAR Measurement Results**

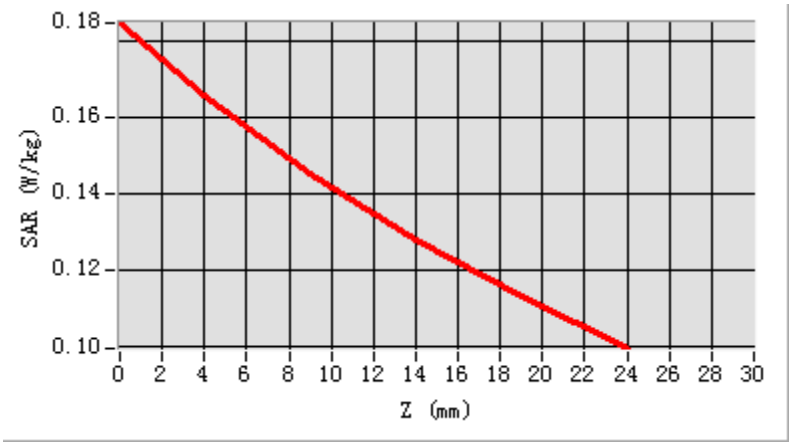
| | |
|---|---|
| **Frequency (MHz)** | 826.4 |
| **Relative permittivity (real part)** | 41.45 |
| **Relative permittivity (imaginary part)** | 15.07 |
| **Conductivity (S/m)** | 0.91 |
| **Variation (%)** | -1.910000 |
| **ConvF:** | 5.51 |

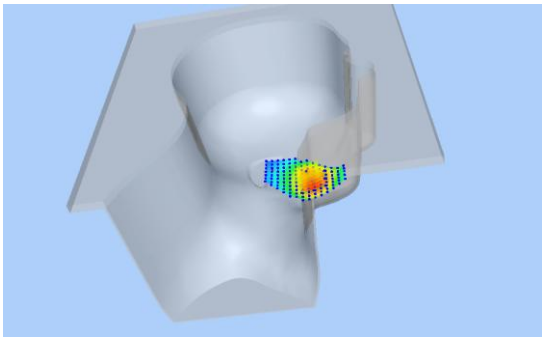
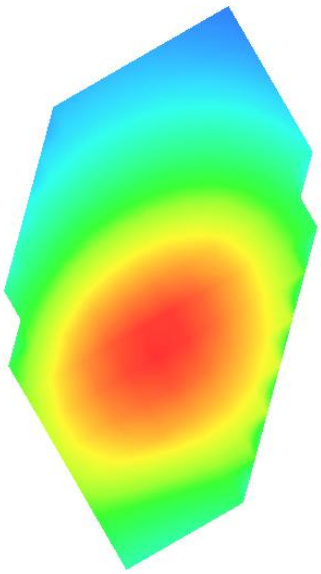
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=-54.00, Y=-39.00**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.129691 |
| **SAR 1g (W/Kg)** | 0.160506 |

| Z (mm) | 0.00 | 4.00 | 9.00 | 14.00 | 19.00 |
|---|---|---|---|---|---|
| SAR (W/Kg) | 0.1846 | 0.1659 | 0.1454 | 0.1279 | 0.1128 |




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# WCDMA850, Edge B, Low

Type: Phone measurement (Very fast, 11 points in the volume)

Date of measurement: 28/11/2014

Measurement duration: 7 minutes 26 seconds

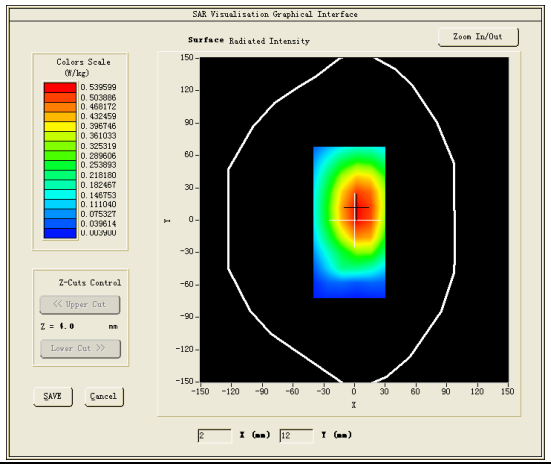
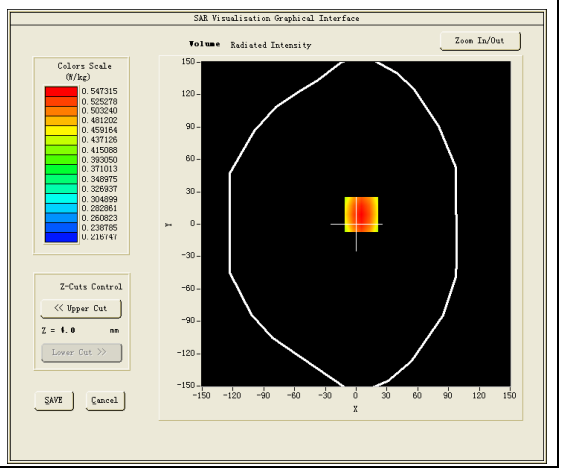
Mobile Phone IMEI number: --

**A. Experimental conditions.**

| | |
|---|---|
| **Area Scan** | surf_sam_plan.txt |
| **ZoomScan** | 5x5x7,dx=8mm dy=8mm dz=5mm,Very fast |
| **Phantom** | Validation plane |
| **Device Position** | Edge B |
| **Band** | Band5_WCDMA850 |
| **Channels** | 4132 |
| **Signal** | WCDMA (Crest factor: 1:1) |

**B. SAR Measurement Results**

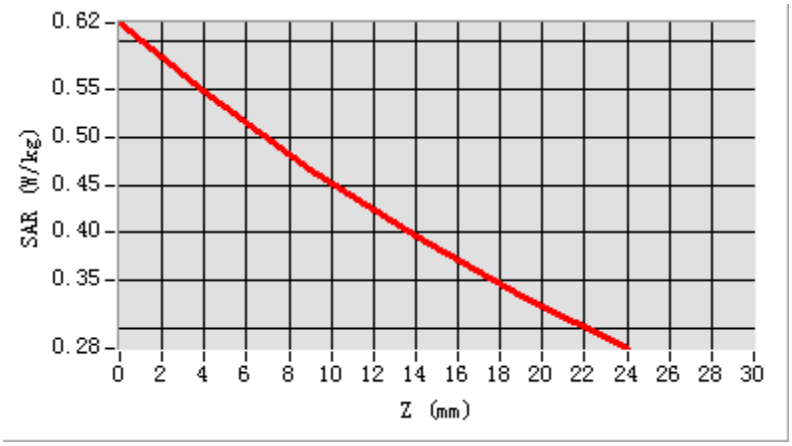
| | |
|---|---|
| **Frequency (MHz)** | 826.4 |
| **Relative permittivity (real part)** | 55.26 |
| **Relative permittivity (imaginary part)** | 21.71 |
| **Conductivity (S/m)** | 0.98 |
| **Variation (%)** | -1.290000 |
| **ConvF:** | 5.68 |

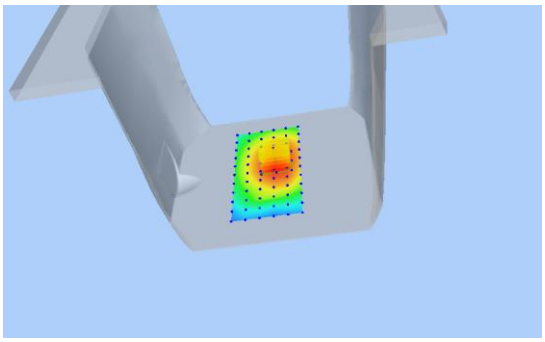
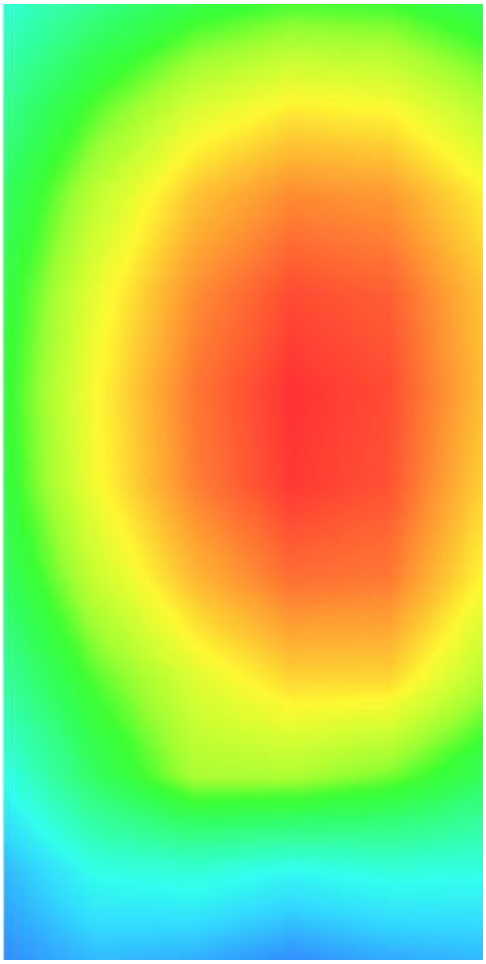
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=5.00, Y=9.00**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.450736 |
| **SAR 1g (W/Kg)** | 0.557510 |

| Z (mm) | 0.00 | 4.00 | 9.00 | 14.00 | 19.00 |
|---|---|---|---|---|---|
| SAR (W/Kg) | 0.6200 | 0.5473 | 0.4664 | 0.3956 | 0.3337 |




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# WCDMA1900, Right Cheek, Middle

Type: Phone measurement (Very fast, 11 points in the volume)

Date of measurement: 27/11/2014

Measurement duration: 6 minutes 6 seconds

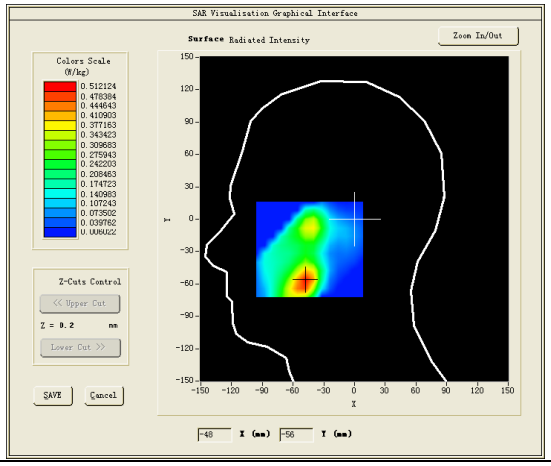
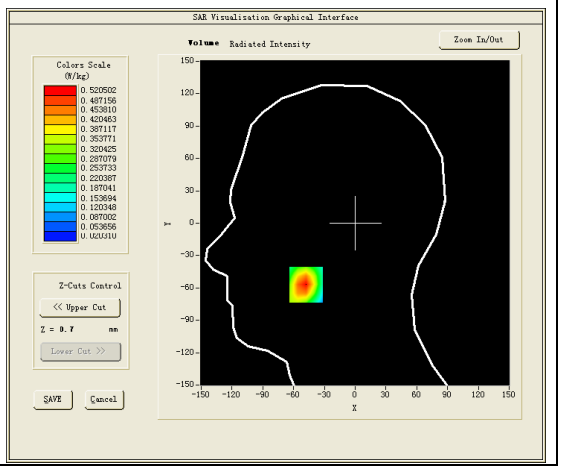
Mobile Phone IMEI number: --

**A. Experimental conditions.**

| | |
|---|---|
| **Area Scan** | sam_direct_droit2_surf8mm.txt |
| **ZoomScan** | 5x5x7,dx=8mm dy=8mm dz=5mm,Very fast |
| **Phantom** | Right head |
| **Device Position** | Cheek |
| **Band** | Band2_WCDMA1900 |
| **Channels** | 9400 |
| **Signal** | WCDMA (Duty cycle: 1:1) |

**B. SAR Measurement Results**

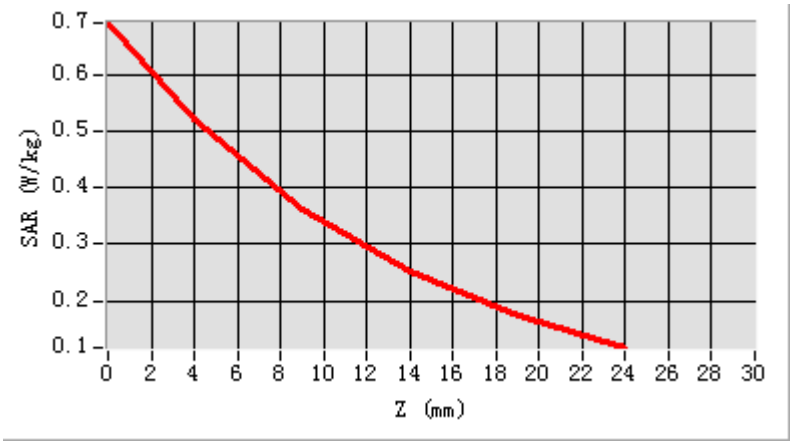
| | |
|---|---|
| **Frequency (MHz)** | 1880.0 |
| **Relative permittivity (real part)** | 39.98 |
| **Relative permittivity (imaginary** | 15.07 |
| **Conductivity (S/m)** | 1.41 |
| **Variation (%)** | -0.240000 |
| **ConvF:** | 5.49 |

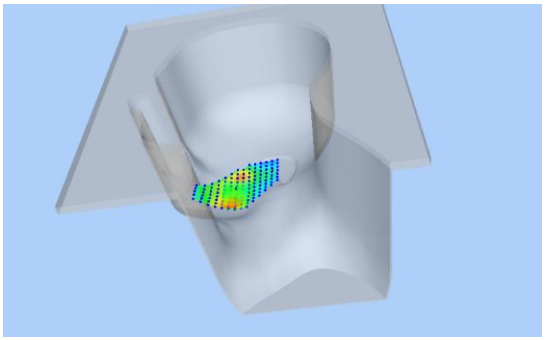
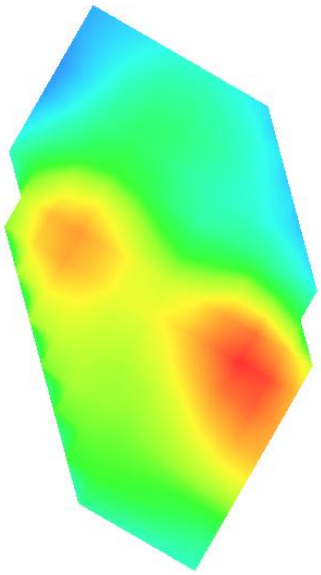
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=-48.00, Y=-57.00**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.297404 |
| **SAR 1g (W/Kg)** | 0.488263 |

| Z (mm) | 0.00 | 4.00 | 9.00 | 14.00 | 19.00 |
|---|---|---|---|---|---|
| SAR (W/Kg) | 0.6923 | 0.5205 | 0.3612 | 0.2504 | 0.1736 |




| 3D screen shot | Hot spot position |
|---|---|
|  |  |