



Accredited testing laboratory

CNAS Registration number: L0310

**Report On SAR Test of HUAWEI
CDMA Handset Phone
M/N: F261**

Test report no. : SYBH (Z-SAR)008042011-2
Type identification : F261
FCC ID : QISF261
Test specification : IEEE 1528-2003
: ANSI C95.1-1999
: RSS-102 issue 4 (2010)
: OET Bulletin 65 Supplement C



Table of Contents

1 General Information 3

1.1 Notes 3

1.1.1 Statement of Compliance 3

1.2 Testing laboratory 4

1.3 Applicant and Manufacturer 4

1.4 Application details 4

1.5 Test item 5

1.5.1 EUT Description 5

1.6 Test specification(s) 6

1.6.1 RF exposure limits 6

1.7 Operating conditions during test 7

1.7.1 General description of test procedures 7

1.7.2 Information for the Measurement of CDMA 1x Devices 7

2 Technical test 8

2.1 Summary of test results 8

2.2 Test environment 8

2.3 Measurement and test set-up 8

2.4 Measurement system 9

2.4.1 System Description 9

2.4.2 Test environment 10

2.4.3 Probe description 10

2.4.4 Phantom description 11

2.4.5 Device holder description 11

2.4.6 Scanning procedure 12

2.4.7 Spatial Peak SAR Evaluation 13

2.4.8 Data Storage and Evaluation 14

2.4.9 Test equipment utilized 16

2.4.10 Tissue simulating liquids: dielectric properties 17

2.4.11 Tissue simulating liquids: parameters 17

2.4.12 Measurement uncertainty evaluation for SAR test 18

2.4.13 Measurement uncertainty evaluation for system validation 19

2.4.14 System check 20

2.4.15 Validation procedure 20

2.5 Test Results 21

2.5.1 Conducted power measurements 21

2.5.2 Conducted power results 21

2.5.3 Test results (Head and Body SAR) 22

Annex 1 Test Plots 23

Annex 1.1 System performance verification 23

Annex 1.2 CDMA800 MHz Head 25

Annex 1.3 CDMA800 MHz Body 31

Annex 2 Photo documentation 35

Annex 2.1 Test Facility 35

Annex 2.2 Test Positions 36

Annex 3 Calibration parameters 38

Annex 3.1 Calibration report “Probe EX3DV4” 38

Annex 3.2 Calibration report “Data Acquisition Unit (DAE)” 47

Annex 3.3 Calibration report “835 MHz System validation dipole” 52



1 General Information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The HUAWEI does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of HUAWEI.

The test results of this test report relate exclusively to the test item specified in 1.5. The HUAWEI does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of HUAWEI.

1.1.1 Statement of Compliance

The SAR values found for the F261 are below the maximum recommended levels of 1.6 W/Kg as averaged over any 1 g tissue according to the FCC rule §2.1093, the ANSI/IEEE C 95.1:1999, the NCRP Report Number 86 for uncontrolled environment, according to the Health Canada's Safety Code 6 and the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure.

The measurement together with the test system set-up is described in chapter 2.3 of this test report. A detailed description of the equipment under test can be found in chapter 1.5.

Test engineer:

2011-04-18

Lu Chaogan

Date

Name

Signature

Reviewed by:

2011-04-18

Alvin Way

Date

Name

Signature

Approved by:

2011-04-18

Liu Chunlin

Date

Name

Signature



1.2 Testing laboratory

Lab Name: Global Compliance & Testing Center (GCTC) of Huawei Technologies Co., Ltd.
Sub-lab Name: SAR Lab of Terminal Reliability Lab
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State of accreditation: The Test laboratory (area of testing) is accredited according to
ISO/IEC 17025.
CNAS Registration number: L0310

1.3 Applicant and Manufacturer

Name: HUAWEI TECHNOLOGIES CO., LTD

Street: Huawei Base, Bantian, Longgang District
Town: Shenzhen
Country: P.R.China

Contact: Li Peng
Telephone: 0755-28780808

1.4 Application details

Date of receipt of application:	2011-03-31
Date of receipt of test item:	2011-04-02
Start/Date of test:	2011-04-06
End of test:	2011-04-07

1.5 Test item

Device Information:			
DUT Name:	CDMA Handset Phone		
Type Identification:	F261		
Serial Number:	B9R9KB1132900186		
IMEI No:	A000002DBD8BCEB		
Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Test device Production Information	production unit		
Device Operating Configurations:			
Operating Mode(s)	CDMA 800		
Test Modulation	QPSK		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	CDMA 800	824-849	869-894
Power Class :	Tested with power control all up bits (CDMA 800)		
Test Channels (low-mid-high) :	1013-384-777 (CDMA 800)		
Hardware Version :	WL1F261I		
Software Version :	V100R001		
Antenna Type :	Integrated antenna		
Accessories/Body-worn Configurations:	N/A		
Battery Options :	Huawei Technologies Co., Ltd. Rechargeable Li-ion Battery Model: HB6A2L; Rated capacity: 1000mAh Nominal Voltage: --- +3.7V; Charging Voltage: --- +4.2V S/N: GAGAA17XC4144247		
Charger Options:	Manufacturer: Huawei Technologies Co., Ltd. AC/DC Adapter Model: HS-050040E1 Input Voltage: 100-240V ~50/60Hz, 0.2A Output Voltage: 5V --- 400mA; S/N: 732800178		

1.5.1 EUT Description

F261 are CDMA Handset Phones. It's operated in Band Class 0 (800MHz). The Handset Phone implements such functions as RF signal receiving / Transmitting, CDMA protocol processing, voice, etc. The TX is 824MHz-849MHz and the RX 869MHz-894MHz.

Externally it provides Mini-USB interface to computers and power supply.

1.6 Test specification(s)

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

IEEE 1528-2003 (April 21, 2003): Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques

Supplement C, Edition 01-01 to OET Bulletin 65, Edition 97-01 June 2001: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions.

Canada's Safety Code 6: Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz (99-EHD-237)

RSS-102: Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands (Issue 4 of March 2010).

FCC KDB 941225 D01 SAR test for 3G devices v02, Published on Nov 13 2009.

1.6.1 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain)	1.60 mW/g	8.00 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g	0.40 mW/g
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

Table 1: RF exposure limits

The limit applied in this test report is shown in **bold** letters

Notes:

- * The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time
- ** The Spatial Average value of the SAR averaged over the whole body.
- *** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

1.7 Operating conditions during test

1.7.1 General description of test procedures

Connection to the EUT is established via air interface with CMU200, and the EUT is set to maximum output power by CMU200. The antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30 dB.

1.7.2 Information for the Measurement of CDMA 1x Devices

For SAR test, the maximum power output is very important and essential; it is identical under the measurement uncertainty. It is proper to use typical Test Mode 3(FW RC3, RVS RC3, SO55) as the worst case for SAR test.

Test Parameter setup for maximum RF output power according to section 4.4.5 of 3GPP2;

Parameter	Units	Value
I or	dBm/1.23MHz	-104
PilotE c/I or	dB	-7
TrafficE c /I or	dB	-7.4

SAR for head exposure configurations is measured in RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55. SAR for RC1 is not required when the maximum average output of each channel is less than ¼ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1 using the exposure configuration that results in the highest SAR for that channel in RC3.

SAR for body exposure configurations is measured in RC3 with the DUT configured using TDSO / SO32, to transmit at full rate on FCH with all other code channels disabled. SAR for multiple code channels (FCH + SCHn) is not required when the maximum average output of each RF channel is less than ¼ dB higher than that measured with FCH only. Otherwise, SAR is measured on the maximum output channel (FCH + SCHn) with FCH at full rate and SCH0 enabled at 9600 bps, using the exposure configuration that results in the highest SAR for that channel with FCH only. When multiple code channels are enabled, the DUT output may shift by more than 0.5 dB and lead to higher SAR drifts and SCH dropouts.

Body SAR in RC1 is not required when the maximum average output of each channel is less than ¼ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1; with Loopback Service Option SO55, at full rate, using the body exposure configuration that results in the highest SAR for that channel in RC3.

Test communication setup meet as followings:

Communication standard between mobile station and base station simulator	3GPP2 C.S0011-B
Radio configuration	RC3(Supporting CDMA 1X)
Spreading Rate	SR1
Data Rate	9600bps
Service Options	SO55(Loopback service)
Service Options	SO32(Test Data service)
Multiplex Options	The mobile station does not support this service

2 Technical test

2.1 Summary of test results

Band	Test channel /Frequency	Test Position	1g-MAX SAR (W/kg)	Limit (W/kg)	MAX Conducted Power (dBm)	Turn-up Power (dBm)	Extrapolated Result (W/kg)	Test Result
CDMA800 RC3	1013/824.7	Right hand touch cheek	0.628	1.60	24.18	24.70	0.708	PASS
CDMA800 RC3	1013/824.7	Towards phantom 15mm	0.497	1.60	24.18	24.70	0.560	PASS

Table 2: The Maximum SAR1g Values for Head and Body position

2.2 Test environment

General Environment conditions in the test area are as follows:

Ambient temperature: 20°C – 24°C
 Tissue simulating liquid: 20°C – 24°C
 Humidity: 30% – 70%

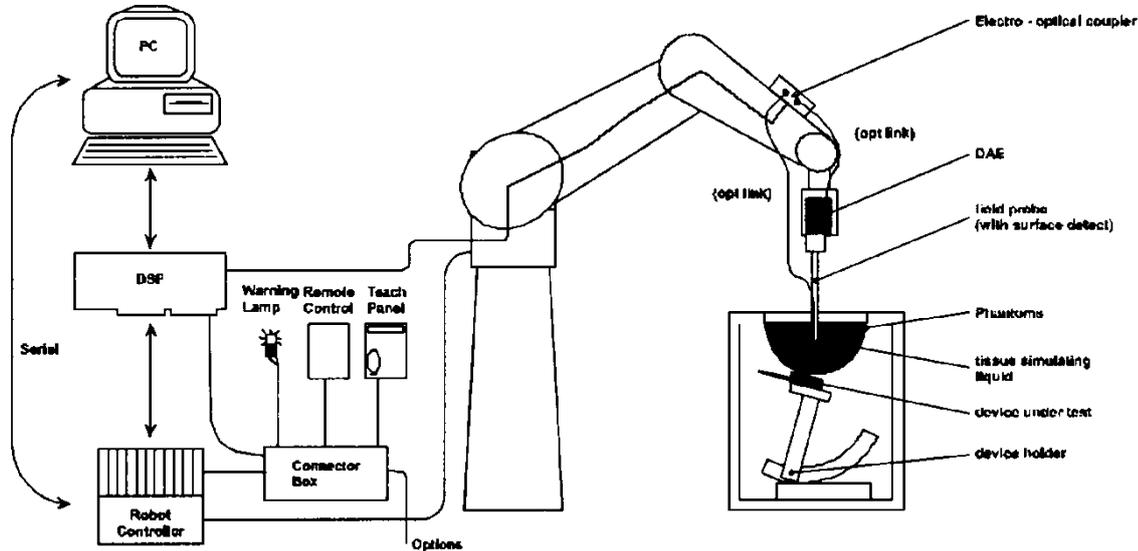
2.3 Measurement and test set-up

The measurement system is described in chapter 2.4.

A description of positioning and test signal control can be found in chapter 2.5 together with the test results.

2.4 Measurement system

2.4.1 System Description



The DASYS5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASYS5 measurement server.
- The DASYS5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows XP.
- DASYS5 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System validation dipoles allowing to validate the proper functioning of the system.

2.4.2 Test environment

The DASY5 measurement system is placed at the head end of a room with dimensions: 4.5 x 4 x 3 m³, the SAM phantom is placed in a distance of 1.3 m from the side walls and 1.1m from the rear wall.

Picture 1 of the photo documentation shows a complete view of the test environment. The system allows the measurement of SAR values larger than 0.005 mW/g.

2.4.3 Probe description

Isotropic E-Field Probe EX3DV4 for Dosimetric Measurements

Technical data according to manufacturer information	
Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycoether)
Calibration	In air from 10 MHz to 2.5 GHz In head tissue simulating liquid (HSL) at 900 (800-1000) MHz and 1.8 GHz (1700-1910 MHz) (accuracy $\pm 11\%$; k=2) Calibration for other liquids and frequencies upon request
Frequency	10 MHz to 3 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic range	5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
Optical Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces (EX3DV4 only)
Dimensions	Overall length: 337 mm Tip length: 9 mm Body diameter: 10 mm Tip diameter: 2.5 mm Distance from probe tip to dipole centers: 1.0 mm
Application	General dosimeters up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms (EX3DV4)

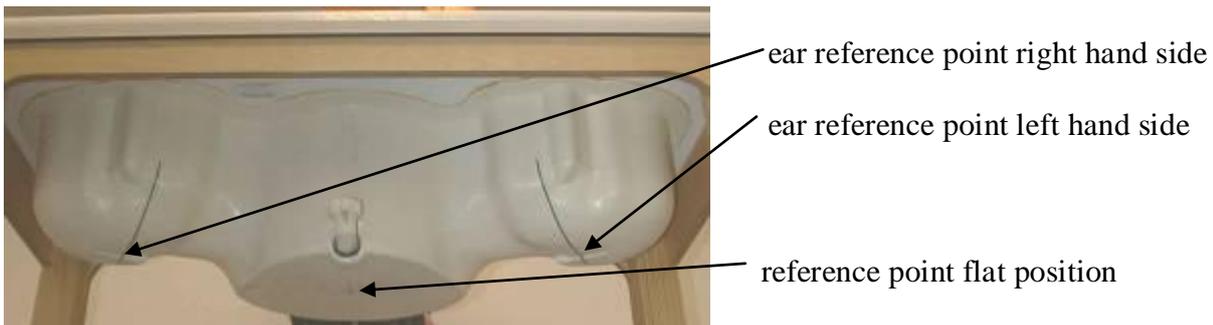
Isotropic E-Field Probe ES3DV3 for Dosimetric Measurements

Technical data according to manufacturer information	
Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic range	5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz

2.4.4 Phantom description

The used SAM Phantom meets the requirements specified in Edition 01-01 of Supplement C to OET Bulletin 65 for Specific Absorption Rate (SAR) measurements.

The phantom consists of a fibreglass shell integrated in a wooden table. It allows left-hand and right-hand head as well as body-worn measurements with a maximum liquid depth of 18 cm in head position and 22 cm in planar position (body measurements). The thickness of the Phantom shell is 2 mm +/- 0.1 mm.



2.4.5 Device holder description

The DASY5 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA's only. If necessary an additional support of polystyrene material is used.



Larger DUT's (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values. Therefore those devices are normally only tested at the flat part of the SAM.

2.4.6 Scanning procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

- The „reference“ and „drift“ measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT's output power and should vary max. +/- 5 %.
- The „surface check“ measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above $\pm 0.1\text{mm}$). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within $\pm 30^\circ$.)
- The „area scan “measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement. Standard grid spacing for head measurements is 15 mm in x- and y- dimension. If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation. Results of this coarse scan are shown in annex 2.
- A „7x7x7 zoom scan“ measures the field in a volume around the 2D peak SAR value acquired in the previous „coarse“ scan. This is a fine 7x7 grid where the robot additionally moves the probe in 7 steps along the z-axis away from the bottom of the Phantom. Grid spacing for the cube measurement is 5 mm in x and y-direction and 5 mm in z-direction. DASY5 is also able to perform repeated zoom scans if more than 1 peak is found during area scan. In this document, the evaluated peak 1g and 10g averaged SAR values are shown in the 2D-graphics in annex 2. Test results relevant for the specified standard (see chapter 1.6.) are shown in table form in chapter 2.5.
- A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 2mm steps. This measurement shows the continuity of the liquid and can - depending in the field strength – also show the liquid depth. A z-axis scan of the measurement with maximum SAR value is shown in annex 2.

2.4.7 Spatial Peak SAR Evaluation

The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The basis of the evaluation are the SAR values measured at the points of the fine cube grid consisting of 7 x 7 x 7 points. The algorithm that finds the maximal averaged volume is separated into three different stages.

- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting 'Graph Evaluated'.
- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.
- All neighboring volumes are evaluated until no neighboring volume with a higher average value is found.

Extrapolation

The extrapolation is based on a least square algorithm [W. Gander, Computermathematik, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].

Volume Averaging

At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.

Advanced Extrapolation

DASY5 uses the advanced extrapolation option which is able to compensate boundary effects on E-field probes.

2.4.8 Data Storage and Evaluation

Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	$Norm_i, a_{i0}, a_{i1}, a_{i2}$
	- Conversion factor	$ConvF_i$
	- Diode compression point	$Dcpi$
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf/dcp_i$$

with V_i = compensated signal of channel i (i = x, y, z)
 U_i = input signal of channel i (i = x, y, z)
 cf = crest factor of exciting field (DASY parameter)
 dcp_i = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:
$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

H-field probes:
$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1}f + a_{i2}f^2)/f$$

with V_i = compensated signal of channel i (i = x, y, z)
 $Norm_i$ = sensor sensitivity of channel i (i = x, y, z)
 [mV/(V/m)²] for E-field Probes
 ConvF = sensitivity enhancement in solution
 a_{ij} = sensor sensitivity factors for H-field probes
 f = carrier frequency [GHz]
 E_i = electric field strength of channel i in V/m
 H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (E_{tot}^2 \cdot \sigma) / (\rho \cdot 1000)$$

with SAR = local specific absorption rate in mW/g
 E_{tot} = total field strength in V/m
 σ = conductivity in [mho/m] or [Siemens/m]
 ρ = equivalent tissue density in g/cm³

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm²
 E_{tot} = total electric field strength in V/m
 H_{tot} = total magnetic field strength in A/m

2.4.9 Test equipment utilized

This table gives a complete overview of the SAR measurement equipment

Devices used during the test described in chapter 2.5 are marked

	Manufacturer	Device	Type	Serial number	Date of last calibration)*
<input type="checkbox"/>	Schmid & Partner Engineering AG	Dosimetric E-Field Probe	ES3DV3	3168	2010-12-23
<input checked="" type="checkbox"/>	Schmid & Partner Engineering AG	Dosimetric E-Field Probe	EX3DV4	3736	2010-11-16
<input checked="" type="checkbox"/>	Schmid & Partner Engineering AG	835 MHz System Validation Dipole	D835V2	4d095	2011-02-23
<input type="checkbox"/>	Schmid & Partner Engineering AG	900 MHz System Validation Dipole	D900V2	1d063	2011-02-23
<input type="checkbox"/>	Schmid & Partner Engineering AG	1800 MHz System Validation Dipole	D1800V2	2d157	2011-02-23
<input type="checkbox"/>	Schmid & Partner Engineering AG	1900 MHz System Validation Dipole	D1900V2	5d091	2011-02-23
<input type="checkbox"/>	Schmid & Partner Engineering AG	2000 MHz System Validation Dipole	D2000V2	1036	2011-02-23
<input type="checkbox"/>	Schmid & Partner Engineering AG	Data acquisition electronics	DAE4	851	2010-06-30
<input type="checkbox"/>	Schmid & Partner Engineering AG	Data acquisition electronics	DAE4	852	2010-12-24
<input checked="" type="checkbox"/>	Schmid & Partner Engineering AG	Data acquisition electronics	DAE4	1236	2010-10-26
<input checked="" type="checkbox"/>	Schmid & Partner Engineering AG	Software	DASY 5	N/A	N/A
<input type="checkbox"/>	Schmid & Partner Engineering AG	Twin Phantom	SAM1	TP-1475	N/A
<input type="checkbox"/>	Schmid & Partner Engineering AG	Twin Phantom	SAM2	TP-1474	N/A
<input checked="" type="checkbox"/>	Schmid & Partner Engineering AG	Twin Phantom	SAM3	TP-1597	N/A
<input checked="" type="checkbox"/>	Schmid & Partner Engineering AG	ELI Phantom	ELI4	TP-1038	N/A
<input type="checkbox"/>	Rohde & Schwarz	Universal Radio Communication Tester	CMU 200	111379	2010-08-11
<input checked="" type="checkbox"/>	Rohde & Schwarz	Universal Radio Communication Tester	CMU 200	111305	2010-08-11
<input checked="" type="checkbox"/>	Agilent)*	Network Analyser 300 kHz to 8.5 GHz	E5071B	MY42404956	2011-02-22
<input checked="" type="checkbox"/>	Agilent	Dielectric Probe Kit	85070E	2484	N/A
<input checked="" type="checkbox"/>	Agilent	Signal Generator	N5181A	MY47420989	2011-02-22
<input checked="" type="checkbox"/>	MINI-CIRCUITS	Amplifier	ZHL-42W	QA0746001	N/A
<input checked="" type="checkbox"/>	Agilent	Power Meter	E4417A	MY45101339	2011-02-22
<input checked="" type="checkbox"/>	Agilent	Power Meter Sensor	E9321A	MY44420359	2011-02-22

Note:

- 1) HUAWEI GCTC SAR lab has adopted three years calibration interval.
- 2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

2.4.10 Tissue simulating liquids: dielectric properties

The following materials are used for producing the tissue-equivalent materials.
(liquids used for tests described in chapter 2.5. are marked with ☒) :

Ingredients (% of weight)	Frequency (MHz)					
	<input type="checkbox"/> 450	<input checked="" type="checkbox"/> 835	<input type="checkbox"/> 900	<input type="checkbox"/> 1800	<input type="checkbox"/> 1900	<input type="checkbox"/> 2450
frequency band	<input type="checkbox"/> 450	<input checked="" type="checkbox"/> 835	<input type="checkbox"/> 900	<input type="checkbox"/> 1800	<input type="checkbox"/> 1900	<input type="checkbox"/> 2450
Tissue Type	Head	Head	Head	Head	Head	Head
Water	38.56	41.45	40.92	52.64	54.9	62.7
Salt (NaCl)	3.95	1.45	1.48	0.36	0.18	0.5
Sugar	56.32	56.0	56.5	0.0	0.0	0.0
HEC	0.98	1.0	1.0	0.0	0.0	0.0
Bactericide	0.19	0.1	0.1	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	0.0	47.0	44.92	36.8

Table 3: Head tissue dielectric properties

Ingredients (% of weight)	Frequency (MHz)					
	<input type="checkbox"/> 450	<input checked="" type="checkbox"/> 835	<input type="checkbox"/> 900	<input type="checkbox"/> 1800	<input type="checkbox"/> 1900	<input type="checkbox"/> 2450
frequency band	<input type="checkbox"/> 450	<input checked="" type="checkbox"/> 835	<input type="checkbox"/> 900	<input type="checkbox"/> 1800	<input type="checkbox"/> 1900	<input type="checkbox"/> 2450
Tissue Type	Body	Body	Body	Body	Body	Body
Water	51.16	52.4	56.0	69.91	69.91	73.2
Salt (NaCl)	1.49	1.40	0.76	0.13	0.13	0.04
Sugar	46.78	45.0	41.76	0.0	0.0	0.0
HEC	0.52	1.0	1.21	0.0	0.0	0.0
Bactericide	0.05	0.1	0.27	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	0.0	29.96	29.96	26.7

Table 4: Body tissue dielectric properties

Salt: 99+% Pure Sodium Chloride

Sugar: 98+% Pure Sucrose

Water: De-ionized, 16MΩ+ resistivity

HEC: Hydroxyethyl Cellulose

DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100(ultra pure): Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl)phenyl]ether

2.4.11 Tissue simulating liquids: parameters

Used Target Frequency	Measured Tissue		Measured Tissue		Liquid Temp.	Test Date
	Permittivity (+/-5%)	Conductivity [S/m] (+/-5%)	Permittivity	Conductivity [S/m]		
835 MHz Head	41.5 (39.43~43.58)	0.90 (0.86~0.94)	41.95	0.874	21.4°C	2011-4-06
835 MHz Body	55.2 (52.44~57.96)	0.97 (0.921~1.018)	55.36	0.984	21.7°C	2011-4-07

Table 5: Parameter of the tissue simulating liquid

Note: The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2°C of the conditions expected during the SAR evaluation to satisfy protocol requirements.

2.4.12 Measurement uncertainty evaluation for SAR test

The overall combined measurement uncertainty of the measurement system is $\pm 4.6\%$ ($K=1$).

The expanded uncertainty ($k=2$) is assessed to be $\pm 9.3\%$

This measurement uncertainty budget is suggested by IEEE P1528 and determined by Schmid & Partner Engineering AG. The breakdown of the individual uncertainties is as follows:

Repeatability Budget for System Check for the 0.3 - 3GHz range								
Error Sources	Uncertainty Value	Probability Distribution	Divisor	c_i 1g	c_i 10g	Standard Uncertainty 1g	Standard Uncertainty 10g	v_i^2 or V_{eff}
Measurement System								
Probe calibration	$\pm 1.8\%$	Normal	1	1	1	$\pm 1.8\%$	$\pm 1.8\%$	∞
Axial isotropy	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Hemispherical isotropy	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Linearity	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Boundary effects	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Modulation Response	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
System detection limits	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Readout electronics	$\pm 0.0\%$	Normal	1	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Response time	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Integration time	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
RF ambient Noise	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
RF ambient Reflection	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Probe positioner	$\pm 0.4\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.2\%$	$\pm 0.2\%$	∞
Probe positioning	$\pm 2.9\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.7\%$	$\pm 1.7\%$	∞
Max. SAR evaluation	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Dipole Related								
Dev. of experimental dipole	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Dipole Axis to Liquid Dist.	$\pm 2.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.2\%$	$\pm 1.2\%$	∞
Input power & SAR drift	$\pm 3.4\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.0\%$	$\pm 2.0\%$	∞
Phantom and Set-up								
Phantom uncertainty	$\pm 4.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.3\%$	$\pm 2.3\%$	∞
SAR correction	$\pm 1.9\%$	Rectangular	$\sqrt{3}$	1	0.84	$\pm 1.1\%$	$\pm 0.9\%$	∞
Liquid conductivity (meas.)	$\pm 2.5\%$	Normal	1	0.78	0.71	$\pm 2.0\%$	$\pm 1.8\%$	∞
Liquid permittivity (meas.)	$\pm 2.5\%$	Normal	1	0.26	0.26	$\pm 0.6\%$	$\pm 0.7\%$	∞
Temp. unc. - Conductivity	$\pm 1.7\%$	Rectangular	$\sqrt{3}$	0.78	0.71	$\pm 0.8\%$	$\pm 0.7\%$	∞
Temp. unc. - Permittivity	$\pm 0.3\%$	Rectangular	$\sqrt{3}$	0.23	0.26	$\pm 0.0\%$	$\pm 0.0\%$	∞
Combined Std. Uncertainty						$\pm 4.7\%$	$\pm 4.6\%$	
Expanded Std. Uncertainty						$\pm 9.5\%$	$\pm 9.3\%$	

Table 6: Repeatability Budget for System Check for the 0.3 - 3GHz range

2.4.13 Measurement uncertainty evaluation for system validation

The overall combined measurement uncertainty of the measurement system is $\pm 10.1\%$).

The expanded uncertainty ($k=2$) is assessed to be $\pm 20.1\%$

This measurement uncertainty budget is suggested by IEEE P1528 and determined by Schmid & Partner Engineering AG. The breakdown of the individual uncertainties is as follows:

Uncertainty Budget for System Validation for the 0.3 - 6GHz range								
Error Sources	Uncertainty Value	Probability Distribution	Divisor	c_i 1g	c_i 10g	Standard Uncertainty y 1g	Standard Uncertainty y10g	v_i^2 or v_{eff}
Measurement System								
Probe calibration	$\pm 6.55\%$	Normal	1	1	1	$\pm 6.55\%$	$\pm 5.9\%$	∞
Axial isotropy	$\pm 4.7\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.7\%$	$\pm 2.7\%$	∞
Hemispherical isotropy	$\pm 9.6\%$	Rectangular	$\sqrt{3}$	0	0	$\pm 0.0\%$	$\pm 0.0\%$	∞
Boundary effects	$\pm 1.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.6\%$	$\pm 0.6\%$	∞
Probe linearity	$\pm 4.7\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.7\%$	$\pm 2.7\%$	∞
System detection limits	$\pm 1.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.6\%$	$\pm 0.6\%$	∞
Modulation Response	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0\%$	$\pm 0\%$	∞
Readout electronics	$\pm 0.3\%$	Normal	1	1	1	$\pm 0.3\%$	$\pm 0.3\%$	∞
Response time	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
Integration time	$\pm 0.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.0\%$	$\pm 0.0\%$	∞
RF ambient Noise	$\pm 1.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.6\%$	$\pm 0.6\%$	∞
RF ambient Reflections	$\pm 1.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.6\%$	$\pm 0.6\%$	∞
Probe positioner	$\pm 0.8\%$	Rectangular	$\sqrt{3}$	1	1	± 0.5	± 0.5	∞
Probe positioning	$\pm 6.7\%$	Rectangular	$\sqrt{3}$	1	1	± 3.9	± 3.9	∞
Max. SAR evaluation	$\pm 20\%$	Rectangular	$\sqrt{3}$	1	1	± 1.2	± 1.2	∞
Dipole								
Deviation of experimental dipole	$\pm 5.5\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 3.2\%$	$\pm 3.2\%$	∞
Dipole axis to liquid distance	$\pm 2.0\%$	Rectangular	1	1	1	$\pm 1.2\%$	$\pm 1.2\%$	∞
Power drift	± 3.4	Rectangular	$\sqrt{3}$	1	1	$\pm 2.0\%$	$\pm 2.0\%$	∞
Phantom and Set-up								
Phantom uncertainty	$\pm 4.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.3\%$	$\pm 2.3\%$	∞
SAR correction	$\pm 1.9\%$	Rectangular	$\sqrt{3}$	1	0.84	± 1.1	± 0.9	∞
Liquid conductivity (meas.)	$\pm 2.5\%$	Normal	1	0.78	0.71	± 2.0	± 1.8	∞
Liquid permittivity (meas.)	$\pm 2.5\%$	Normal	1	0.26	0.26	$\pm 0.6\%$	$\pm 0.7\%$	∞
Temp. unc. - Conductivity	$\pm 1.7\%$	Rectangular	$\sqrt{3}$	0.78	0.71	$\pm 0.8\%$	$\pm 0.7\%$	∞
Temp. unc. - Permittivity	$\pm 0.3\%$	Rectangular	$\sqrt{3}$	0.23	0.26	$\pm 0.0\%$	$\pm 0.0\%$	∞
Combined Uncertainty						$\pm 10.1\%$	$\pm 10.1\%$	
Expanded Std. Uncertainty						$\pm 20.2\%$	$\pm 20.1\%$	

Table 7: Uncertainty Budget for System Validation for the 0.3 - 6GHz range

2.4.14 System check

The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system validation is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows validation results for all frequency bands and tissue liquids used during the tests of the test item described in chapter 1.5. (graphic plot(s) see annex 1).

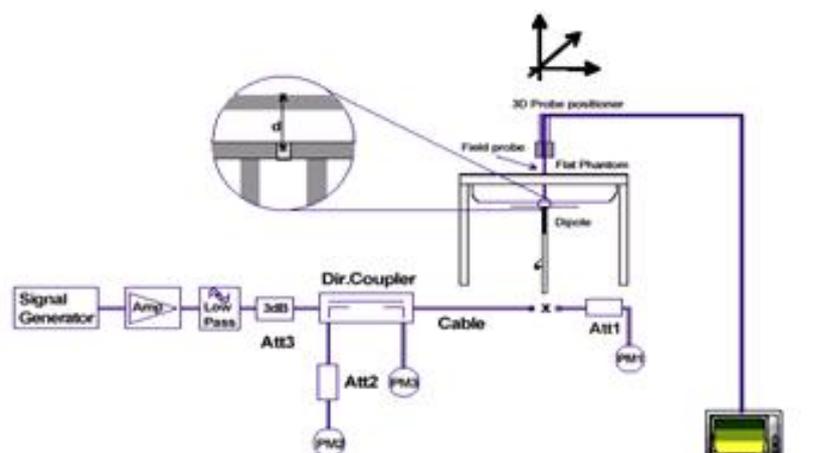
System Check	Target SAR (250 mW) (+/- 10%)		Measured SAR(250mW)		Liquid Temp.	Test Date
	1-g (mW/g)	10-g (mW/g)	1-g (mW/g)	10-g (mW/g)		
D835V2 Head	2.39 (2.15~2.63)	1.54 (1.38~1.69)	2.46	1.62	21.4°C	2011-4-06
D835V2 Body	2.47 (2.22~2.71)	1.61 (1.45~1.77)	2.61	1.73	21.7°C	2011-4-07

Table 8: Results system Check

2.4.15 Validation procedure

The validation is performed by using a validation dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250 mW. To adjust this power a power meter is used. The power sensor is connected to the cable before the validation to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the validation to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).

Validation results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



2.5 Test Results

2.5.1 Conducted power measurements

For the measurements a Rohde & Schwarz Radio Communication Tester CMU 200 was used. The output power was measured using an integrated RF connector and attached RF cable. The conducted output power was also checked before and after each SAR measurement. The resulting power values were within a 0.2 dB tolerance of the values shown below.

2.5.2 Conducted power results

CDMA 800MHz

CDMA Cellular (RC1)	Conducted Power		
	Channel 1013	Channel 384	Channel 777
Before test (dBm)	24.10	24.10	24.50
After test (dBm)	24.20	24.00	24.55
CDMA Cellular (RC3)	Conducted Power		
	Channel 1013	Channel 384	Channel 777
Before test (dBm)	23.98	24.18	24.62
After test (dBm)	24.08	24.08	24.62

Table 9: Conducted power measurement result (CDMA 800MHz)

Note:

- 1) The maximum average power numbers are marks in bold.
- 2) To verify if the output changes within the tolerance before and after each SAR test, please see the power drift of each test in chapter 2.5.3
- 3) For SAR testing, the EUT was set to multi-slot class based on the maximum averaged conducted power.

2.5.3 Test results (Head and Body SAR)

CDMA 800

Test Position of Head	Test channel /Frequency	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Limit (W/kg)	Liquid Temp.
			1-g	10-g			
Left Hand Touched	384/ 836.52MHz	RC3,SO55	0.423	0.293	0.009	1.60	21.4°C
Left Hand Tilted 15°	384/ 836.52MHz	RC3,SO55	0.176	0.126	0.047	1.60	21.4°C
Right Hand Touched	384/ 836.52MHz	RC3,SO55	0.430	0.296	0.036	1.60	21.4°C
Right Hand Tilted 15°	384/ 836.52MHz	RC3,SO55	0.140	0.101	-0.085	1.60	21.4°C
Right Hand Touched	777/ 848.31 MHz	RC3,SO55	0.256	0.176	-0.060	1.60	21.4°C
Right Hand Touched	1013/ 824.7 MHz	RC3,SO55	0.628	0.434	0.130	1.60	21.4°C

Table 10: Test results (Head SAR CDMA 800MHz)

Test Position of Body	Test channel /Frequency	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Limit (W/kg)	Liquid Temp.
			1-g	10-g			
Towards Phantom (15mm)	384/ 836.52MHz	RC3,SO32	0.248	0.175	0.000	1.60	21.7°C
Towards Ground (15mm)	384/ 836.52MHz	RC3,SO32	0.230	0.164	-0.037	1.60	21.7°C
Towards Phantom (15mm)	384/ 836.52MHz	RC3,SO32	0.155	0.110	0.087	1.60	21.7°C
Towards Phantom (15mm)	384/ 836.52MHz	RC3,SO32	0.497	0.355	0.120	1.60	21.7°C

Table 11: Test results (Body SAR CDMA 800MHz)

Note: 1) The value with bold colour is the maximum SAR value of each test band.

2) Upper and lower frequencies were measured at the worst position.

3) The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8 W/kg), testing at the high and low channels is optional.

4) Tests in body position were performed with 15 mm air gap between DUT and SAM to simulate the use of a non-metallic belt-clip or holster.

5) The addition body test was performed at worst case.

Annex 1 Test Plots

Annex 1.1 System performance verification

Date/Time: 4/6/2011 11:27:17, Date/Time: 4/6/2011 11:34:29

Test Laboratory: Huawei GCTC Lab

SystemPerformanceCheck-D835-EX-Head

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 – SN:4d095

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.875$ mho/m; $\epsilon_r = 41.954$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.33, 8.56, 8.97); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: SAM3; Type: SAM; Serial: TP-1597

Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/d=15mm, Pin=250mW/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 2.449 mW/g

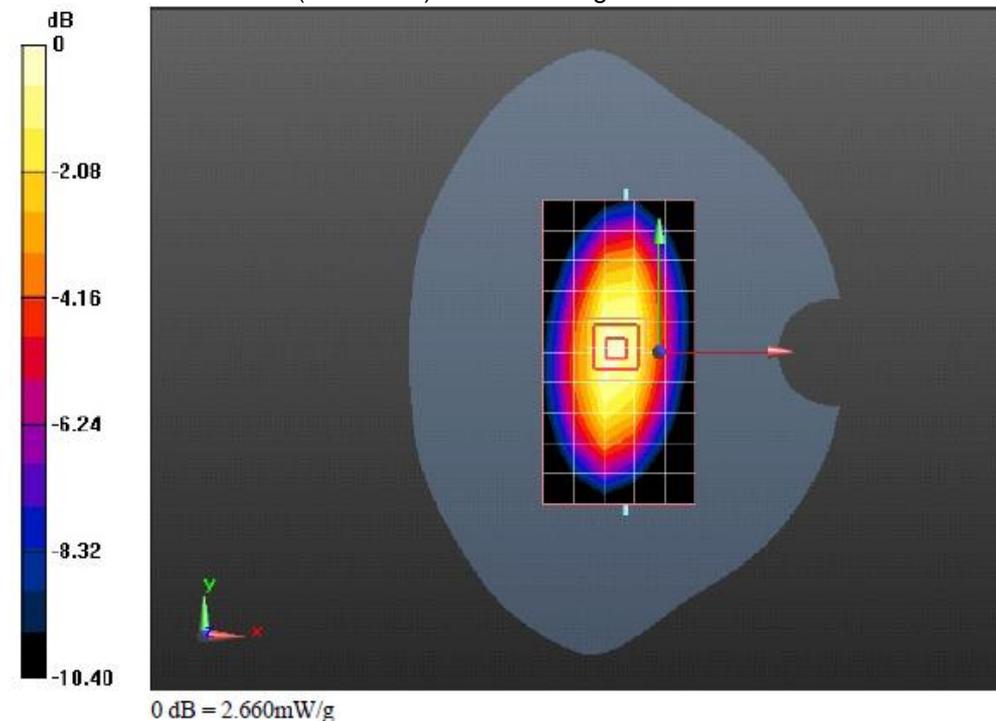
Configuration/d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.959 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 3.566 W/kg

SAR(1 g) = 2.46 mW/g; SAR(10 g) = 1.62 mW/g

Maximum value of SAR (measured) = 2.661 mW/g



Additional information:

position or distance of DUT to SAM (if not standard head positions) :

ambient temperature: 22.0°C; liquid temperature: 21.4°C.

Test report no.:SYBH(Z-SAR)008042011-2

Date/Time: 4/7/2011 16:49:38, Date/Time: 4/7/2011 16:56:50

Test Laboratory: Huawei GCTC Lab

SystemPerformanceCheck-D835-EX-body

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:4d095

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 55.361$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.79, 8.99, 9.47); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP-1038

Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Dipole 835 MHz/d=15mm, Pin=250mW/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 2.560 mW/g

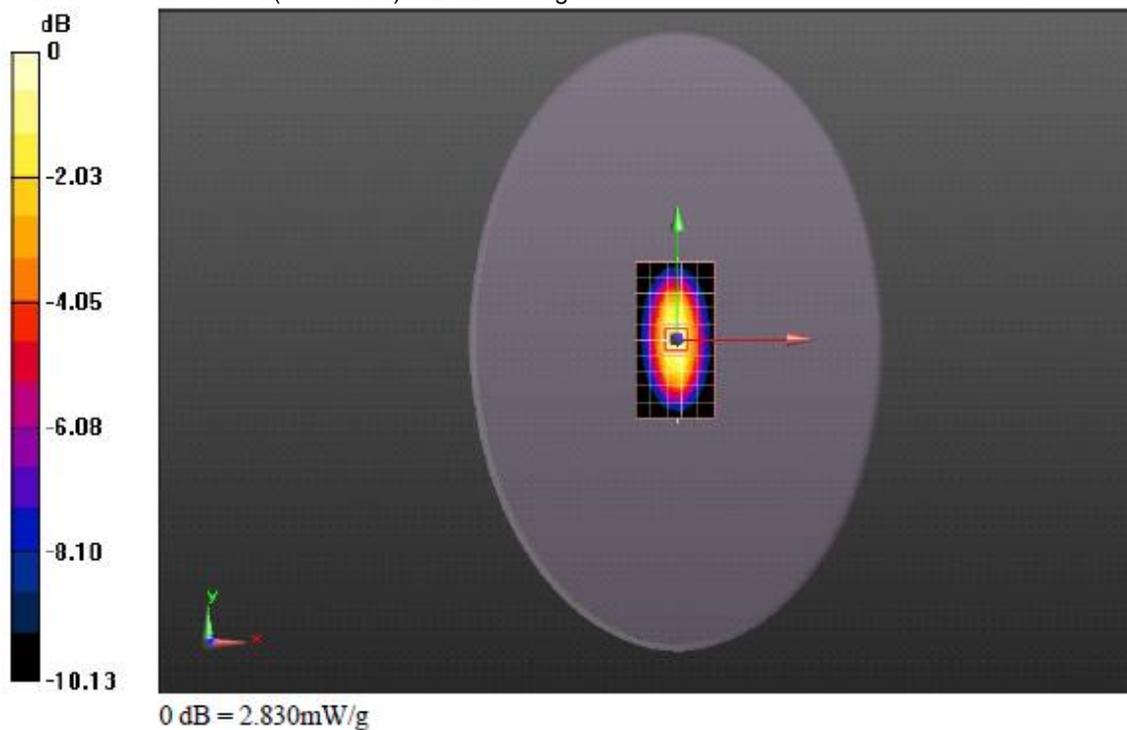
Dipole 835 MHz/d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.983 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 3.772 W/kg

SAR(1 g) = 2.61 mW/g; SAR(10 g) = 1.73 mW/g

Maximum value of SAR (measured) = 2.826 mW/g



Additional information:

position or distance of DUT to SAM (if not standard head positions) :

ambient temperature: 22.0°C; liquid temperature: 21.7°C.

Annex 1.2 CDMA800 MHz Head

Date/Time: 4/6/2011 14:12:32, Date/Time: 4/6/2011 14:21:17

Test Laboratory: Huawei GTC Lab

F261 CDMA800 384CH Left hand touch cheek

DUT: F261; Type: Handset phone; Serial: B9R9KB1132900186

Communication System: CDMA2000; Frequency: 836.52 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.886$ mho/m; $\epsilon_r = 41.687$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.33, 8.56, 8.97); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: SAM3; Type: SAM; Serial: TP-1597

Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/Head/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.427 mW/g

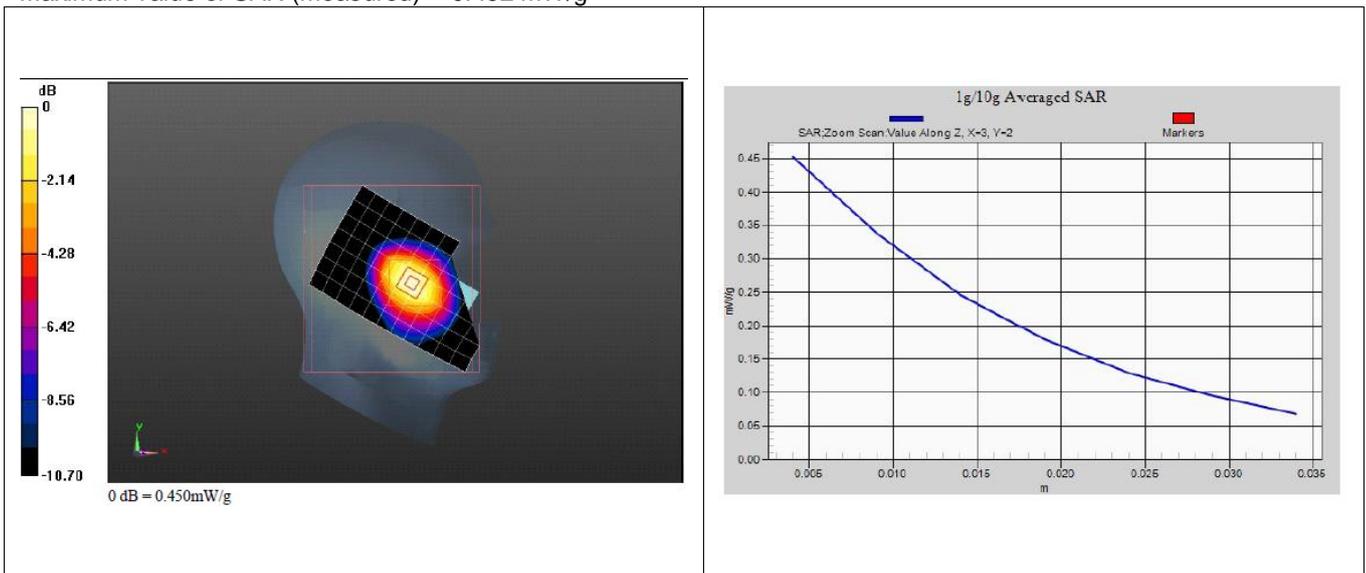
Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.073 V/m; Power Drift = 0.0093 dB

Peak SAR (extrapolated) = 0.548 W/kg

SAR(1 g) = 0.423 mW/g; SAR(10 g) = 0.293 mW/g

Maximum value of SAR (measured) = 0.452 mW/g



Additional information:

position or distance of DUT to SAM (if not standard head positions) :

ambient temperature: 22.0°C; liquid temperature: 21.4°C

Date/Time: 4/6/2011 14:42:25, Date/Time: 4/6/2011 14:51:10

Test Laboratory: Huawei GCTC Lab

F261 CDMA800 384CH Left hand tilt 15 degree

DUT: F261; Type: Handset phone; Serial: B9R9KB1132900186

Communication System: CDMA2000; Frequency: 836.52 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.886$ mho/m; $\epsilon_r = 41.687$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.33, 8.56, 8.97); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: SAM3; Type: SAM; Serial: TP-1597

Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/Head/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.173 mW/g

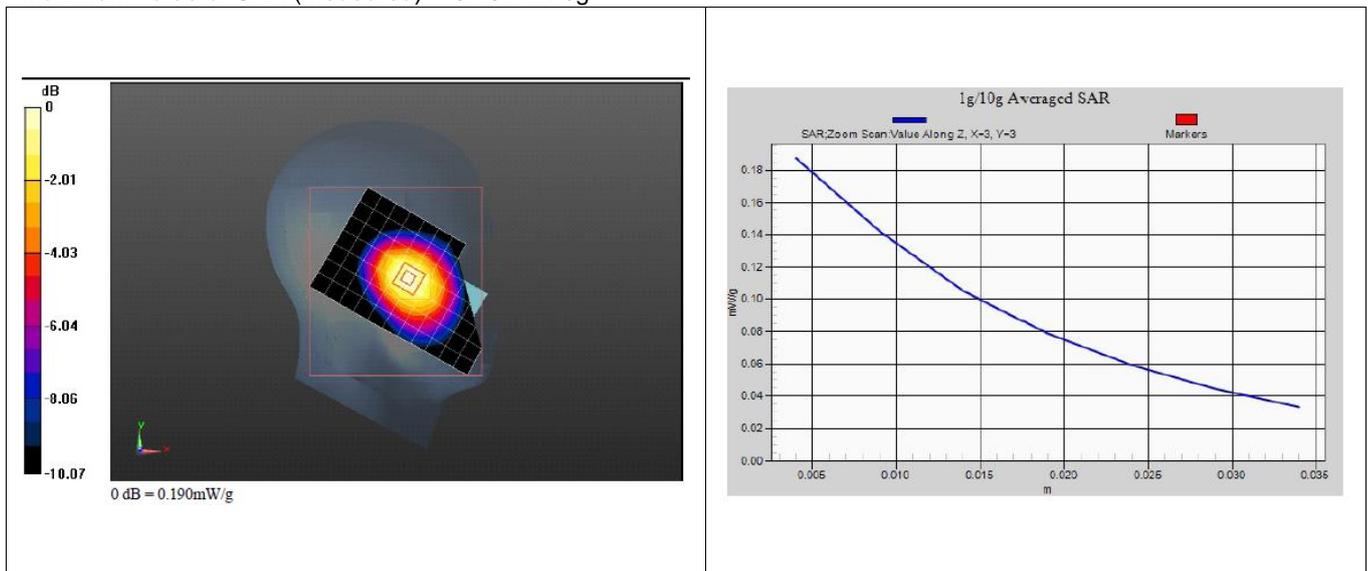
Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.546 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.224 W/kg

SAR(1 g) = 0.176 mW/g; SAR(10 g) = 0.126 mW/g

Maximum value of SAR (measured) = 0.187 mW/g



Additional information:

position or distance of DUT to SAM (if not standard head positions) :

ambient temperature: 22.0°C; liquid temperature: 21.4°C

Test report no.:SYBH(Z-SAR)008042011-2

Date/Time: 4/6/2011 15:11:46, Date/Time: 4/6/2011 15:21:00

Test Laboratory: Huawei GCTC Lab

F261 CDMA800 384CH Right hand touch cheek

DUT: F261; Type: Handset phone; Serial: B9R9KB1132900186

Communication System: CDMA2000; Frequency: 836.52 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.886$ mho/m; $\epsilon_r = 41.687$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.33, 8.56, 8.97); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: SAM3; Type: SAM; Serial: TP-1597

Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/Head/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.439 mW/g

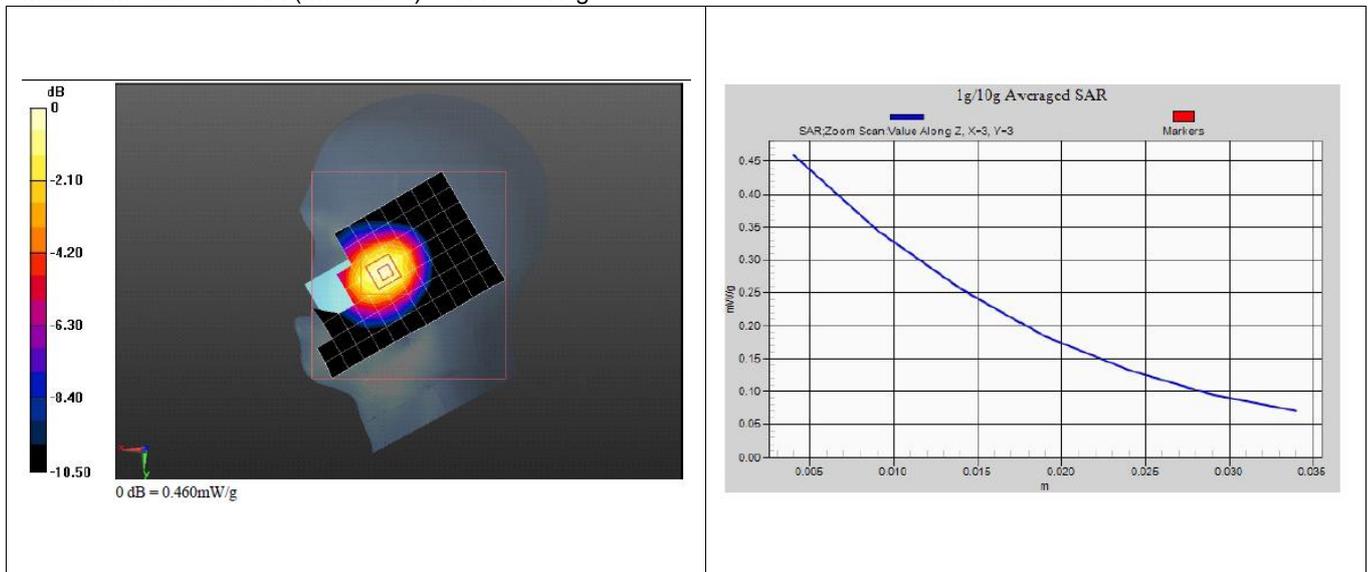
Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.180 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.570 W/kg

SAR(1 g) = 0.430 mW/g; SAR(10 g) = 0.296 mW/g

Maximum value of SAR (measured) = 0.459 mW/g



Additional information:

position or distance of DUT to SAM (if not standard head positions) :

ambient temperature: 22.0°C; liquid temperature: 21.4°C

Test report no.:SYBH(Z-SAR)008042011-2

Date/Time: 4/6/2011 17:51:24, Date/Time: 4/6/2011 18:00:05

Test Laboratory: Huawei GCTC Lab

F261 CDMA800 384CH Right hand tilt 15 degree

DUT: F261; Type: Handset phone; Serial: B9R9KB1132900186

Communication System: CDMA2000; Frequency: 836.52 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.886$ mho/m; $\epsilon_r = 41.687$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.33, 8.56, 8.97); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: SAM3; Type: SAM; Serial: TP-1597

Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/Head/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.145 mW/g

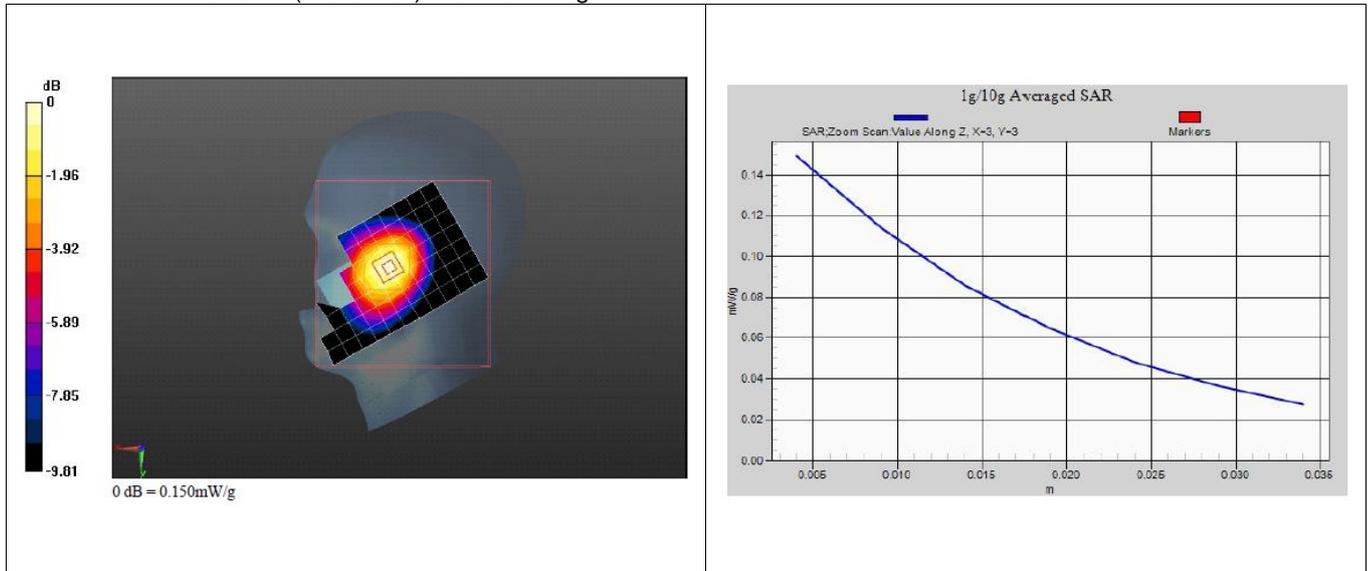
Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.126 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.178 W/kg

SAR(1 g) = 0.140 mW/g; SAR(10 g) = 0.101 mW/g

Maximum value of SAR (measured) = 0.149 mW/g



Additional information:

position or distance of DUT to SAM (if not standard head positions) :

ambient temperature: 22.0°C; liquid temperature: 21.4°C

Date/Time: 4/6/2011 15:52:46, Date/Time: 4/6/2011 16:01:28

Test Laboratory: Huawei GCTC Lab

F261 CDMA800 777CH Right hand touch cheek

DUT: F261; Type: Handset phone; Serial: B9R9KB1132900186

Communication System: CDMA2000; Frequency: 848.31 MHz

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.877$ mho/m; $\epsilon_r = 41.803$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.33, 8.56, 8.97); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: SAM3; Type: SAM; Serial: TP-1597

Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/Head/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.274 mW/g

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

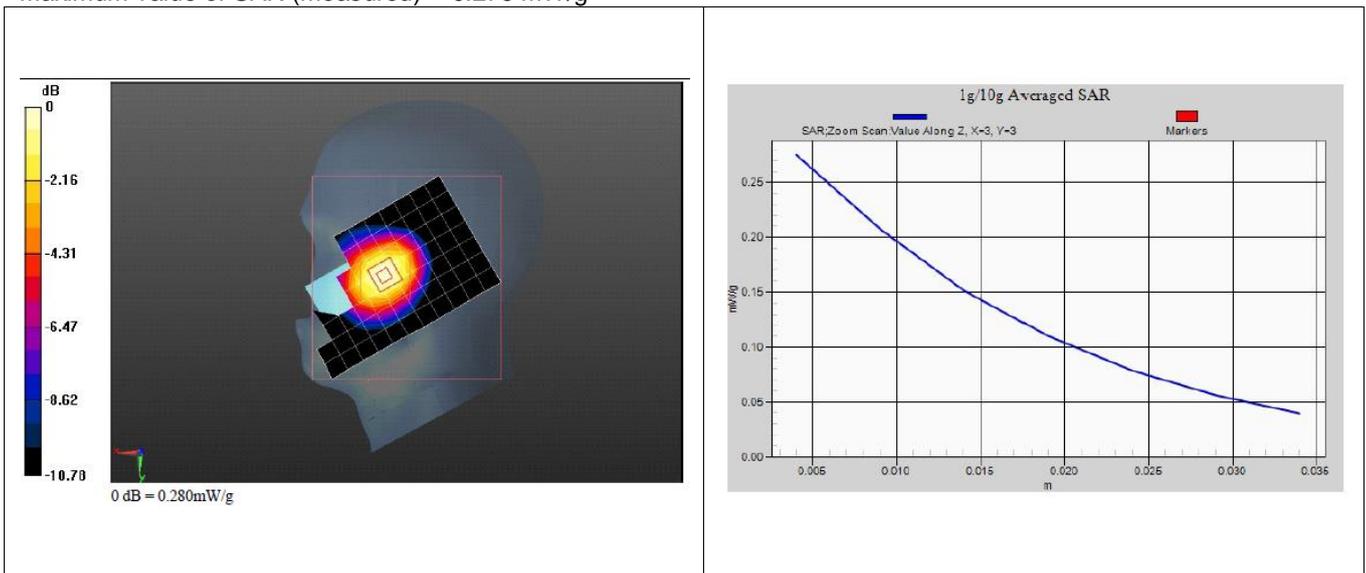
Reference Value = 3.722 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.334 W/kg

SAR(1 g) = 0.256 mW/g; SAR(10 g) = 0.176 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.275 mW/g



Additional information:

position or distance of DUT to SAM (if not standard head positions) :

ambient temperature: 22.0°C; liquid temperature: 21.4°C

Date/Time: 4/6/2011 16:19:27, Date/Time: 4/6/2011 16:30:49

Test Laboratory: Huawei GCTC Lab

F261 CDMA800 1013CH Right hand touch cheek

DUT: F261; Type: Handset phone; Serial: B9R9KB1132900186

Communication System: CDMA2000; Frequency: 824.7 MHz

Medium parameters used: $f = 825$ MHz; $\sigma = 0.865$ mho/m; $\epsilon_r = 42.1$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.33, 8.56, 8.97); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: SAM3; Type: SAM; Serial: TP-1597

Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/Head/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.632 mW/g

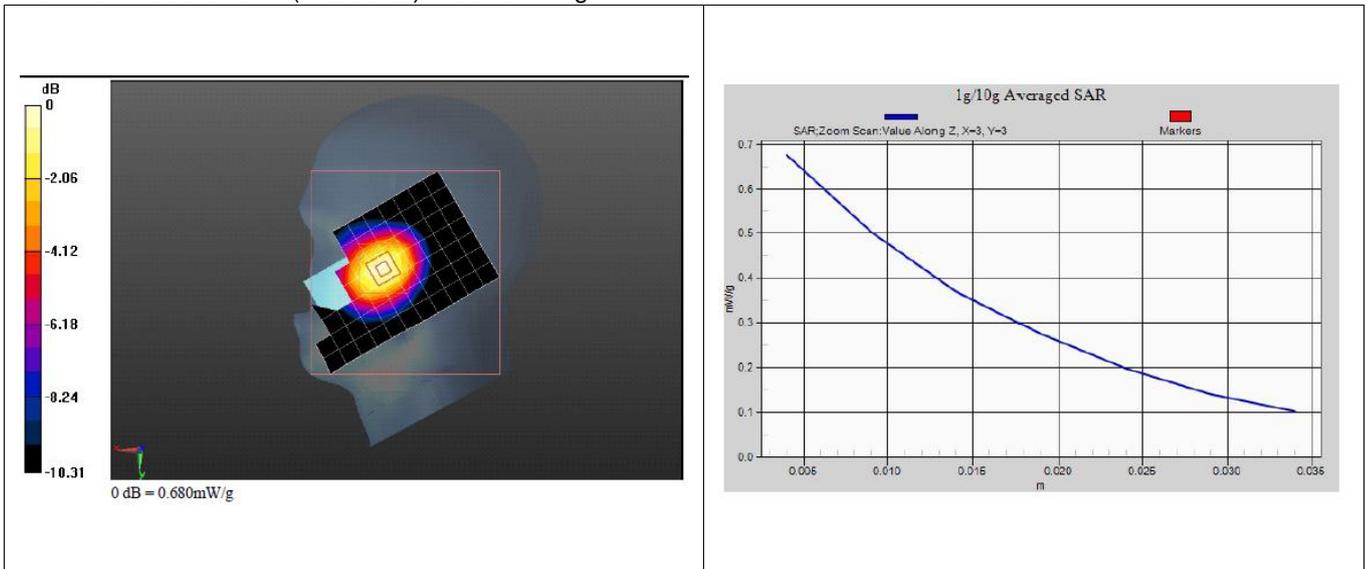
Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.191 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.827 W/kg

SAR(1 g) = 0.628 mW/g; SAR(10 g) = 0.434 mW/g

Maximum value of SAR (measured) = 0.676 mW/g



Additional information:

position or distance of DUT to SAM (if not standard head positions) :

ambient temperature: 22.0°C; liquid temperature: 21.4°C

Annex 1.3 CDMA800 MHz Body

Date/Time: 4/7/2011 17:18:32, Date/Time: 4/7/2011 17:28:26

Test Laboratory: Huawei GCTC Lab

F261 CDMA800 384CH Towards phantom 15mm

DUT: F261; Type: Handset phone; Serial: B9R9KB1132900186

Communication System: CDMA2000; Frequency: 836.52 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.994$ mho/m; $\epsilon_r = 55.268$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.79, 8.99, 9.47); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP-1038

Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/Head/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

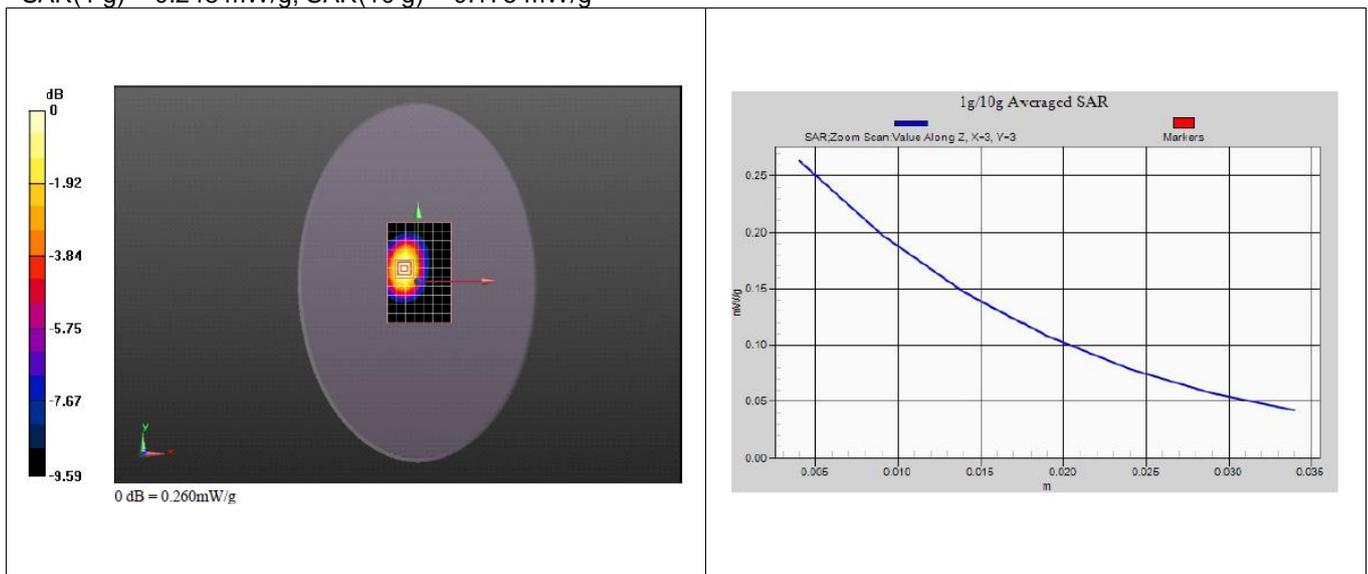
Maximum value of SAR (measured) = 0.263 mW/g

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.430 V/m; Power Drift = -0.00017 dB

Peak SAR (extrapolated) = 0.328 W/kg

SAR(1 g) = 0.248 mW/g; SAR(10 g) = 0.175 mW/g



Additional information:

position or distance of DUT to SAM: 15 mm

ambient temperature: 22.0°C; liquid temperature: 21.7°C

Test report no.:SYBH(Z-SAR)008042011-2

Date/Time: 4/7/2011 17:46:46, Date/Time: 4/7/2011 17:56:40

Test Laboratory: Huawei GCTC Lab

F261 CDMA800 384CH Towards ground 15mm

DUT: F261; Type: Handset phone; Serial: B9R9KB1132900186

Communication System: CDMA2000; Frequency: 836.52 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.994$ mho/m; $\epsilon_r = 55.268$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.79, 8.99, 9.47); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP-1038

Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/Head/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.243 mW/g

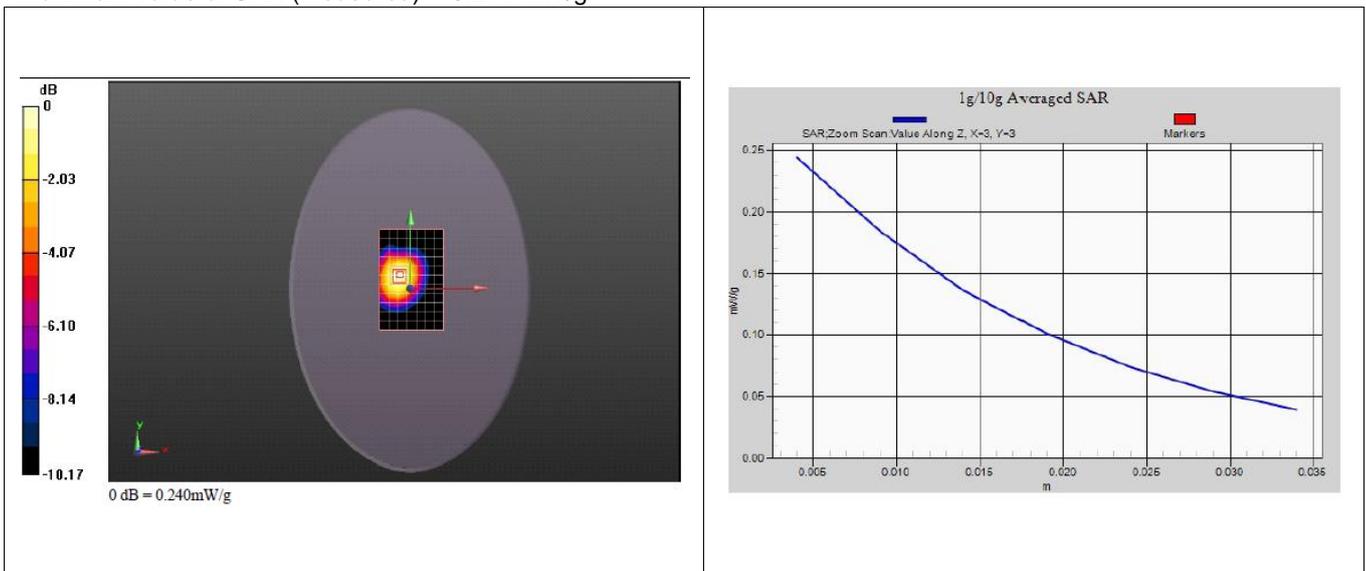
Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.208 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.299 W/kg

SAR(1 g) = 0.230 mW/g; SAR(10 g) = 0.164 mW/g

Maximum value of SAR (measured) = 0.244 mW/g



Additional information:

position or distance of DUT to SAM: 15 mm

ambient temperature: 22.0°C; liquid temperature: 21.7°C

Test report no.:SYBH(Z-SAR)008042011-2

Date/Time: 4/7/2011 18:37:29, Date/Time: 4/7/2011 18:47:22

Test Laboratory: Huawei GCTC Lab

F261 CDMA800 777CH Towards phantom 15mm

DUT: F261; Type: Handset phone; Serial: B9R9KB1132900186

Communication System: CDMA2000; Frequency: 848.31 MHz

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.998$ mho/m; $\epsilon_r = 55.202$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.79, 8.99, 9.47); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP-1038

Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/Head/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.161 mW/g

Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

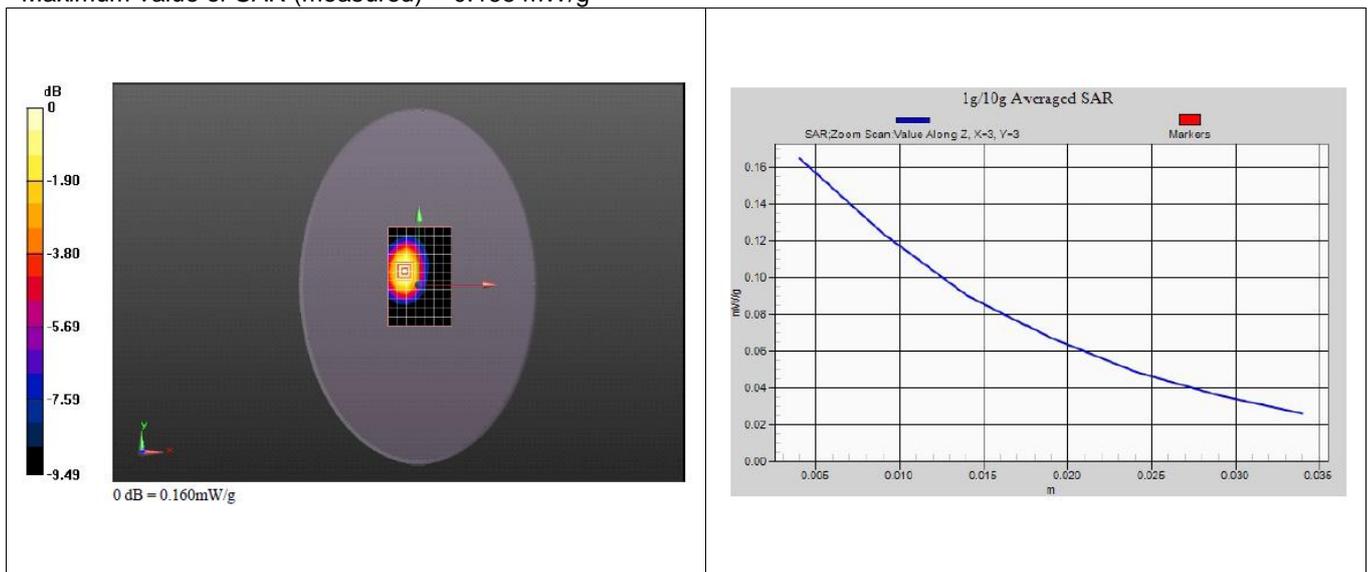
Reference Value = 7.831 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.202 W/kg

SAR(1 g) = 0.155 mW/g; SAR(10 g) = 0.110 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.165 mW/g



Additional information:

position or distance of DUT to SAM: 15 mm

ambient temperature: 22.0°C; liquid temperature: 21.7°C

Date/Time: 4/7/2011 18:12:29, Date/Time: 4/7/2011 18:22:24

Test Laboratory: Huawei GCTC Lab

F261 CDMA800 1013CH Towards phantom 15mm

DUT: F261; Type: Handset phone; Serial: B9R9KB1132900186

Communication System: CDMA2000; Frequency: 824.7 MHz

Medium parameters used: $f = 825$ MHz; $\sigma = 0.964$ mho/m; $\epsilon_r = 55.467$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: EX3DV4 - SN3736; ConvF(8.79, 8.99, 9.47); Calibrated: 11/16/2010

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1236; Calibrated: 10/26/2010

Phantom: ELI 4.0; Type: QDOVA001BA; Serial: TP-1038

Measurement SW: DASYS2, Version 52.6 (2); SEMCAD X Version 14.4.4 (2829)

Configuration/Head/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.523 mW/g

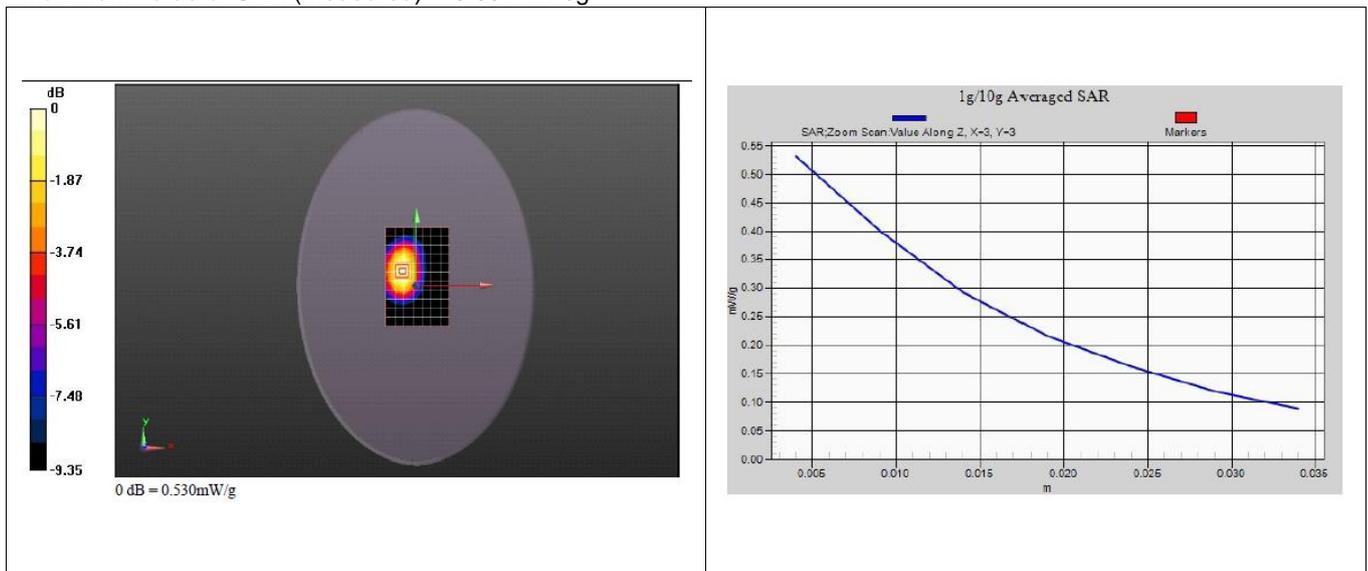
Configuration/Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.310 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.639 W/kg

SAR(1 g) = 0.497 mW/g; SAR(10 g) = 0.355 mW/g

Maximum value of SAR (measured) = 0.531 mW/g



Additional information:

position or distance of DUT to SAM: 15 mm

ambient temperature: 22.0°C; liquid temperature: 21.7°C

Annex 2 Photo documentation

Annex 2.1 Test Facility

Photo 1: Measurement System DASY 5



Annex 2.2 Test Positions

Photo 2: Front View



Photo 3: Rear View



Photo 4: Left Hand Touched

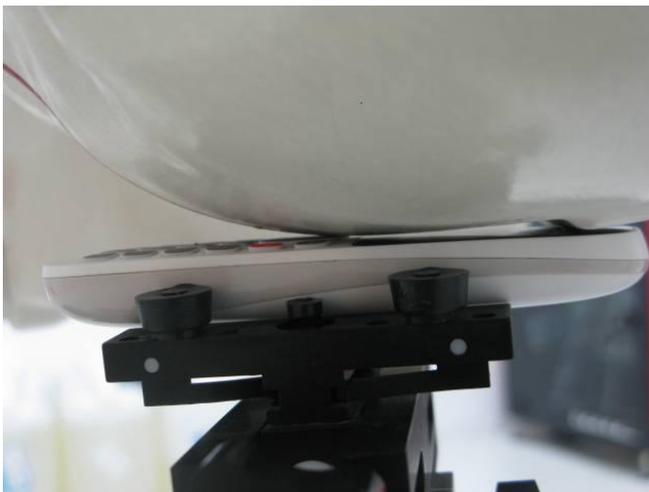


Photo 5: Left Hand Tilted 15°

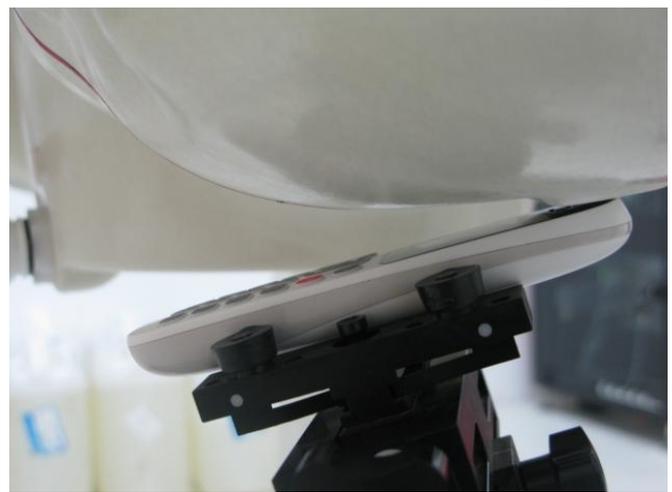


Photo 6: Right Hand Touched

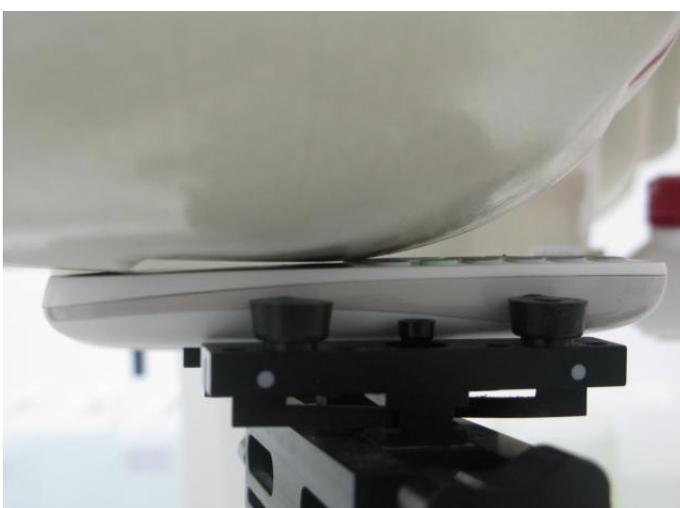


Photo 7: Right Hand Tilted 15°

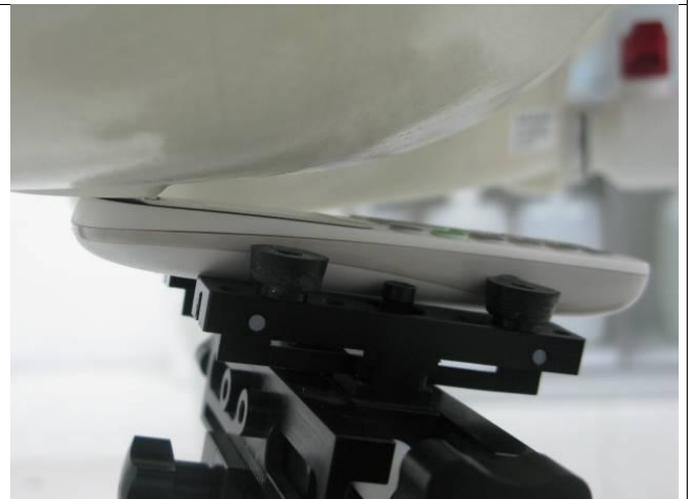


Photo 8: Towards Phantom (15mm)

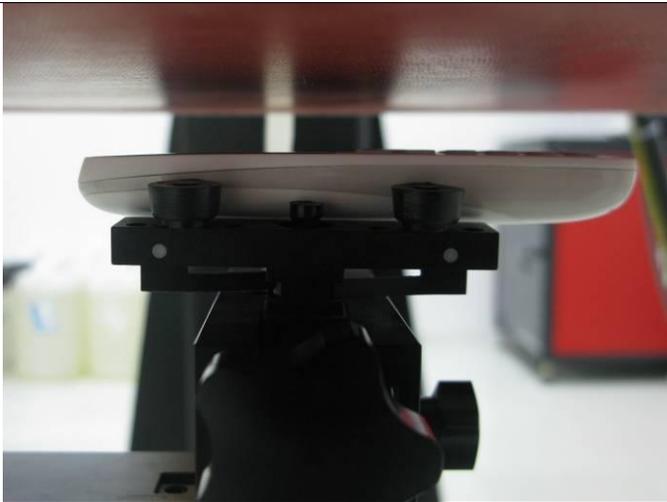


Photo 9: Towards Ground (15mm)

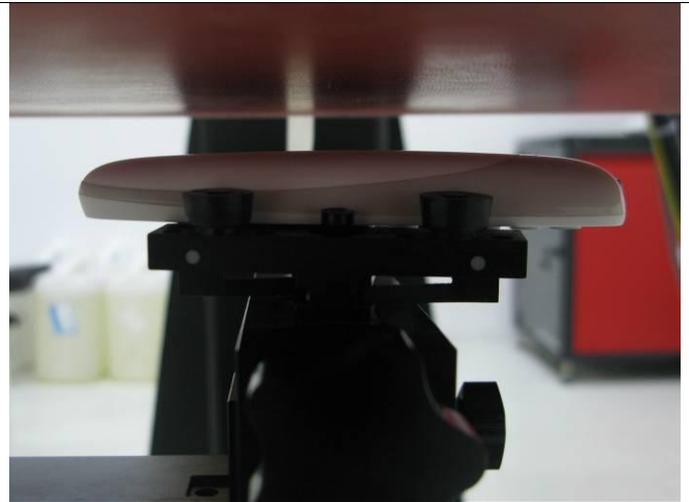


Photo 10: Liquid depth HSL 835MHz (15mm)

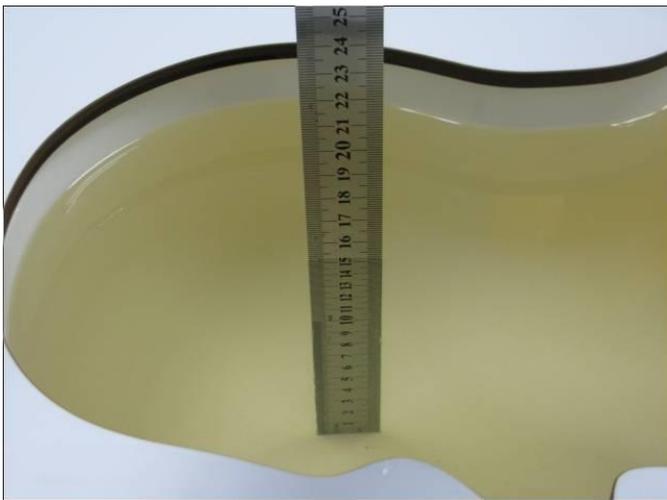
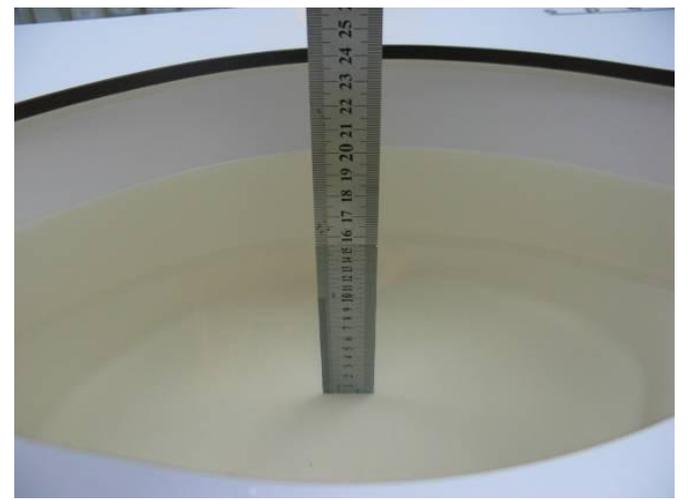


Photo 11: Liquid depth MSL 835MHz (15mm)





Annex 3 Calibration parameters

Annex 3.1 Calibration report “Probe EX3DV4”





工业和信息化部通信计量中心
Telecommunication Metrology Center of MIIT
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62303288-2082 Fax: +86-10-62304793
E-mail: Info@emc.ttc.com Http://www.emc.ttc.com

Client: **Huawei** Certificate No: **EX3-3736_Nov10**

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN: 3736

Calibration Procedure(s): TMC-XZ-01-028
Calibration procedure for dosimetric E-field probes

Calibration date: November 16, 2010

Condition of the calibrated item: In Tolerance

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	SN.	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102083	11-Sep-10 (TMC, No.JZ10-443)	Sep-11
Power sensor NRV-Z5	100542	11-Sep-10 (TMC, No. JZ10-443)	Sep-11
Reference Probe EX3DV4	SN 3631	13-Dec-09 (TMC, No.EX3-3631_Dec09)	Dec-10
DAE4	SN 771	21-Nov-09 (TMC, No.DAE4-771_Nov09)	Nov-10
RF generator E4438C	MY45092879	19-Jun-10 (TMC, No.JZ10-302)	Jun-11
Network Analyzer 8753E	US38433212	04-Aug-10 (TMC, No.JZ10-056)	Aug-11

	Name	Function	Signature
Calibrated by:	Lin Hao	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Xiao Li	Deputy Director of the laboratory	

Issued: November 16, 2010

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: EX3-3736_Nov10 Page 1 of 9

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
 Tel: +86-10-62303288-2082 Fax: +86-10-62304793
 E-mail: Info@emcite.com Http://www.emcite.com

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
Polarization ϕ	ϕ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis(at measurement center), i.e., $\theta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}: Assessed for E-field polarization $\theta = 0$ ($f \leq 900\text{MHz}$ in TEM-cell; $f > 1800\text{MHz}$: waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E^2 -field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z}* frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800\text{MHz}$) and inside waveguide using analytical field distributions based on power measurements for $f > 800\text{MHz}$. The same setups are used for assessment of the parameters applied for boundary compensation (alpha,depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z}* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from $\pm 50\text{MHz}$ to $\pm 100\text{MHz}$.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
 Tel: +86-10-62303288-2082 Fax: +86-10-62304793
 E-mail: Info@emcite.com Http://www.emcite.com

DASY – Parameters of Probe: EX3DV4 SN:3736

Sensitivity in Free Space^A

NormX	0.47 ± 10.1%	$\mu V/(V/m)^2$
NormY	0.44 ± 10.1%	$\mu V/(V/m)^2$
NormZ	0.52 ± 10.1%	$\mu V/(V/m)^2$

Diode Compression^B

DCP X	92mV
DCP Y	93mV
DCP Z	92mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8

Boundary Effect

TSL 900MHz Typical SAR gradient: 5% per mm

Sensor Center to Phantom Surface Distance	2.0 mm	3.0 mm
SARbe[%] Without Correction Algorithm	8.3	4.0
SARbe[%] With Correction Algorithm	0.3	0.1

TSL 1750MHz Typical SAR gradient: 10% per mm

Sensor Center to Phantom Surface Distance	2.0 mm	3.0 mm
SARbe[%] Without Correction Algorithm	7.3	3.3
SARbe[%] With Correction Algorithm	0.2	0.1

Sensor Offset

Probe Tip to Sensor Center 1.0 mm

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor $k=2$, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

^A The uncertainties of NormX,Y,Z do not affect the E^2 -field uncertainty inside TSL (see Page 8).

^B Numerical linearization parameter: uncertainty not required.