Huawei Technologies Co.,Ltd.

Huawei Base, Bantian, Longgang District, Shenzhen, P.R.China Phone: +86-755-28785513
SAR-Laboratory Fax: +86-755-36834474 .

Accredited testing laboratory

CNAS Registration number: L0310

Report On SAR Test of
CDMA 1X Digital Mobile Phone with Bluetooth
M/N: HUAWEI M615

Test report no.	**: SYBH(Z-SAR)008032011-2**
Type identification	**: HUAWEI M615**
FCC ID	**: QISC6070**
Test specification	**: IEEE 1528-2003**
	: ANSI C95.1-1999
	: RSS-102 issue 4 (2010)
	: OET Bulletin 65 Supplement C

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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.

1.1.1 Statement of Compliance

The SAR values found for the HUAWEI M615 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.
For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and that positions the handset a minimum of 15 mm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.
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:

2011-03-23	**Luo Yusheng**	Luo Yusheng
Date	Name	Signature

Reviewed by:

2011-03-23	**Hu Zhongxun**	
Date	Name	Signature

Approved by:

2011-03-23	**Liu Chunlin**	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
Street: Section K3, Bantian, Longgang District, Shenzhen
Country: P.R.China

Telephone: +86-755-28785513
Fax: +86-755-36834474

E-mail: huzhongxun@huawei.com
Internet: www.huawei.com

State of accreditation: The Test laboratory (area of testing) is accredited according to ISO/IEC 17025.
CNAS Registration number: L0310

1.3 Details of applicant

Name: HUAWEI TECHNOLOGIES CO., LTD

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

Contact: Ms. Wang Yue
Telephone: +86-0755-28780808

1.4 Application details

Date of receipt of application: 2011-03-15
Date of receipt of test item: 2011-03-15
Start/Date of test: 2011-03-15
End of test: 2011-03-18

1.5 Test item

Device Information：			
DUT Name:	CDMA 1X Digital Mobile Phone with Bluetooth		
Type Identification:	HUAWEI M615		
FCC ID :	QISC6070		
Serial number :	S9X2B11111400320		
Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Test device Production Information	production unit		
Device Operating Configurations:			
Operating Mode(s)	CDMA 800/1900/AWS Bluetooth		
Test Modulation	QPSK		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	CDMA 800	824.7 ~ 848.31	869.7 ~ 893.31
	CDMA AWS	1711.25 ~ 1752.5	2111.25 ~ 2152.5
	CDMA 1900	1851.25 ~ 1908.75	1931.25 ~ 1988.75
Power Class :	Tested with power control all up bits (CDMA 800)		
	Tested with power control all up bits (CDMA AWS)		
	Tested with power control all up bits (CDMA 1900)		
Test Channels (low-mid-high) :	1013-384-777 (CDMA 800)		
	25-450-850 (CDMA AWS)		
	25-600-1175 (CDMA 1900)		
Hardware Version :	Ver.B		
Software Version :	M615C1TB106		
Antenna Type :	Integrated antenna		
Accessories/Body-worn Configurations:	Stereo headset		
Battery Options :	Huawei Technologies Co., Ltd. Rechargeable Li-ion Battery Model: HB4A1H; Rated capacity: 900mAh Nominal Voltage: ⎓ +3.7V; Charging Voltage: ⎓ +4.2V S/N: YHCAC31HI5305005		
Charger Options:	Manufacturer: SHENZHEN HUNTKEY POWER TECHNOLOGY CO., LTD AC/DC Adapter Model: HS-050040U5 Rated Voltage：~ 120V, 60Hz Input Voltage: ~ 100-240V 50/60Hz Output Voltage: ⎓ 5.0V Rated Power: 2W S/N: HKAAA2315321		

Table 1: Device information and operating configurations

1.6 EUT Description

HUAWEI CDMA Mobile Phone M615 is subscriber equipment in the CDMA system. The frequency band is US Cellular, PCS, AWS. The Mobile Phone implements such functions as RF signal receiving / Transmitting, CDMA protocol processing, voice and SMS service etc. It also provides Bluetooth module to synchronize data between a PC and the phone, or to exchange data with other Bluetooth devices.

1.7 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.

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

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

648474 D01 SAR Evaluation Considerations for Mobile Phones with Multiple Transmitters and Antennas.

1.7.1 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 2: 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)

1.8 Operating conditions during test

1.8.1 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.
The test positions please refer to Annex 4.2.

1.8.2 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 channele disabled. SAR for multiple code channels (FCH + SCH_n) 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 + SCH_n) with FCH at full rate and SCH_0 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	SAR_{1g} (W/kg)		Test Result
	Head	Body	
CDMA 800	**1.130**	**0.992**	PASS
CDMA AWS	0.970	0.646	
CDMA 1900	1.100	0.929	

Table 3: The Maximum SAR1g Values for Head and Body position

Band		Maximum Conducted Power (dBm)	Maximum Average Power (dBm)
CDMA 800	RC 3	24.5	\
	RC 1	24.5	\
CDMA AWS	RC 3	24.5	\
	RC 1	24.5	\
CDMA 1900	RC 3	24.5	\
	RC 1	24.4	\

Table 4: The Maximum Conducted Power and Average Power

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%

Exact temperature values for each test are shown in the table(s) under 2.5. and/or on the measurement plots.

2.3 Measurement and test set-up

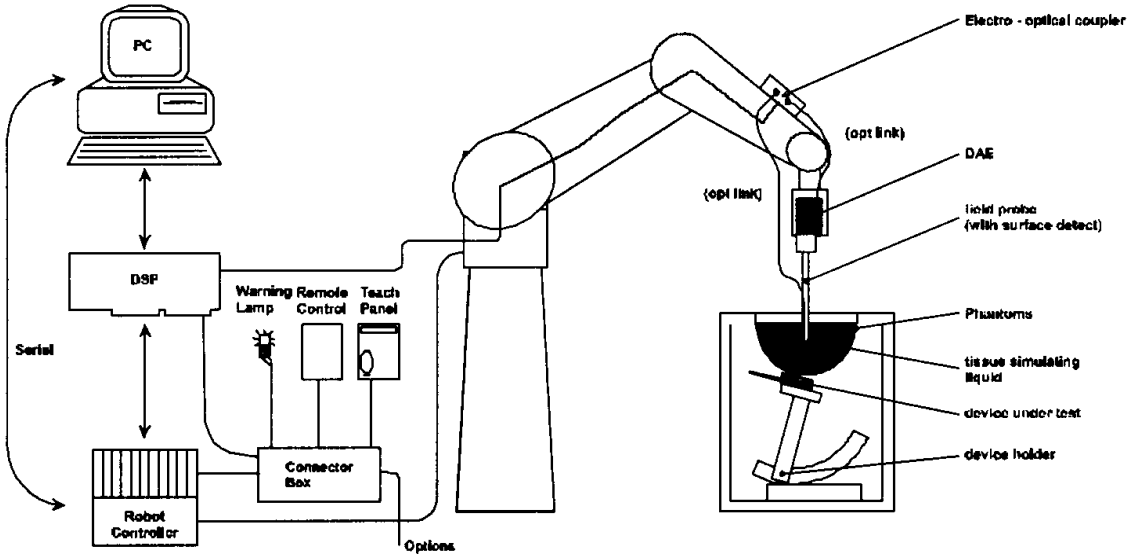
The measurement system is described in chapter 2.4.

The test setup for the system validation can be found in chapter 2.4.14.

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 DASY5 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 DASY5 measurement server.
- The DASY5 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.
- DASY5 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., glycolether)
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 ± 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 µW/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 dosimetry 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 µW/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 Dosimetry in strong gradient fields Compliance tests of mobile phones

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 ± 0.1mm). 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 ± 30°.)

- 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 compansate 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 [mV/(V/m)^2] for E-field Probes (i = x, y, z)
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/cm^3

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.

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

with P_{pwe} = equivalent power density of a plane wave in mW/cm^2
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)*
☒	Schmid & Partner Engineering AG	Dosimetric E-Field Probe	ES3DV3	3168	2010-12-23
☒	Schmid & Partner Engineering AG	835 MHz System Validation Dipole	D835V2	4d095	2011-02-23
☐	Schmid & Partner Engineering AG	900 MHz System Validation Dipole	D900V2	1d063	2011-02-23
☒	Schmid & Partner Engineering AG	1800 MHz System Validation Dipole	D1800V2	2d157	2011-02-23
☒	Schmid & Partner Engineering AG	1900 MHz System Validation Dipole	D1900V2	5d091	2011-02-23
☐	Schmid & Partner Engineering AG	2000 MHz System Validation Dipole	D2000V2	1036	2011-02-23
☐	Schmid & Partner Engineering AG	2300 MHz System Validation Dipole	D2300V2	1016	2010-09-21
☐	Schmid & Partner Engineering AG	Data acquisition electronics	DAE4	851	2010-06-30
☒	Schmid & Partner Engineering AG	Data acquisition electronics	DAE4	852	2010-12-24
☒	Schmid & Partner Engineering AG	Software	DASY 5	N/A	N/A
☒	Schmid & Partner Engineering AG	Twin Phantom	SAM1	TP-1475	N/A
☒	Schmid & Partner Engineering AG	Twin Phantom	SAM2	TP-1474	N/A
☒	Rohde & Schwarz	Universal Radio Communication Tester	CMU 200	111379	2010-08-11
☒	Agilent)*	Network Analyser 300 kHz to 8.5 GHz	E5071B	MY42404956	2011-02-22
☒	Agilent	Dielectric Probe Kit	85070E	2484	N/A
☒	Agilent	Signal Generator	N5181A	MY47420989	2011-02-22
☒	MINI-CIRCUITS	Amplifier	ZHL-42W	QA0746001	N/A
☒	Agilent	Power Meter	E4417A	MY45101339	2011-02-22
☒	Agilent	Power Meter Sensor	E9321A	MY44420359	2011-02-22

Note:
1) Per KDB 450824 D02 requirements for dipole calibration, HUAWEI GCTC SAR lab has adopted three years calibration interval. But each measured dipole is expected to evaluate with the following criteria at least on annual interval.
a) There is no physical damage on the dipole;
b) System validation with specific dipole is within 10% of calibrated value;
c) Return-loss is within 10% of calibrated measurement;
d) Impedance is within 5Ω from the previous measurement.

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)**					
frequency band	☐ 450	☒ 835	☐ 900	☒ 1800	☒ 1900	☐ 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	36.8
DGBE	0.0	0.0	0.0	47.0	44.92	0.0

Table 5: Head tissue dielectric properties

Ingredients (% of weight)	**Frequency (MHz)**					
frequency band	☐ 450	☒ 835	☐ 900	☒ 1800	☒ 1900	☐ 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 6: 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

Note : Due to their availability body tissue simulating liquids as defined by FCC OET Bulletin 65 Supplement C are generally used for body worn SAR testing according to European standards.

2.4.11 Tissue simulating liquids: parameters

Used Target Frequency	Target Head Tissue		Measured Head Tissue		Measured Date
[MHz]	Permittivity (+/-5%)	Conductivity [S/m] (+/-5%)	Permittivity	Conductivity [S/m]	YYYY-MM-DD
835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	42.69	0.890	2011-03-15
1800	40.0 (38.00~42.00)	1.40 (1.33~1.47)	39.06	1.379	2011-03-17
1900	40.0 (38.00~42.00)	1.40 (1.33~1.47)	39.36	1.400	2011-03-16

Table 7: Parameter of the head tissue simulating liquid

Used Target Frequency	Target Body Tissue		Measured Body Tissue		Measured Date
[MHz]	Permittivity (+/-5%)	Conductivity [S/m] (+/-5%)	Permittivity	Conductivity [S/m]	YYYY-MM-DD
835	55.2 (52.44~57.96)	0.97 (0.92~1.02)	55.12	0.970	2011-03-16
1800	53.3 (50.64~55.97)	1.52 (1.44~1.60)	51.55	1.530	2011-03-17
1900	53.3 (50.64~55.97)	1.52 (1.44~1.60)	51.07	1.514	2011-03-15

Table 8: Parameter of the body 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 ± 10.7% (K=1).
The expanded uncertainty (k=2) is assessed to be ± 21.4%
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:

Error Sources	Uncertainty Value	Probability Distribution	Divi-sor	c_i 1g	c_i 10g	Standard Uncertainty 1g	Standard Uncertainty10g	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 5.9%	Normal	1	1	1	± 5.9%	± 5.9%	∞
Axial isotropy	± 4.7%	Rectangular	√3	0.7	0.7	± 1.9%	± 1.9%	∞
Hemispherical isotropy	± 9.6%	Rectangular	√3	0.7	0.7	± 3.9%	± 3.9%	∞
Spatial resolution	± 0.0%	Rectangular	√3	1	1	± 0.0%	± 0.0%	∞
Boundary effects	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Probe linearity	± 4.7%	Rectangular	√3	1	1	± 2.7%	± 2.7%	∞
System detection limits	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Readout electronics	± 0.3%	Normal	1	1	1	± 0.3%	± 0.3%	∞
Response time	± 0.8%	Rectangular	√3	1	1	± 0.5%	± 0.5%	∞
Integration time	± 2.6%	Rectangular	√3	1	1	± 1.5%	± 1.5%	∞
RF ambient conditions	± 3.0%	Rectangular	√3	1	1	± 1.7%	± 1.7%	∞
Probe positioner	± 0.4%	Rectangular	√3	1	1	± 0.2%	± 0.2%	∞
Probe positioning	± 2.9%	Rectangular	√3	1	1	± 1.7%	± 1.7%	∞
Max. SAR evaluation	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Test Sample Related								
Device positioning	± 2.9%	Normal	1	1	1	± 2.9%	± 2.9%	145
Device holder uncertainty	± 3.6%	Normal	1	1	1	± 3.6%	± 3.6%	5
Power drift	± 5.0%	Rectangular	√3	1	1	± 2.9%	± 2.9%	∞
Phantom and Set-up								
Phantom uncertainty	± 4.0%	Rectangular	√3	1	1	± 2.3%	± 2.3%	∞
Liquid conductivity (target)	± 5.0%	Rectangular	√3	0.64	0.43	± 1.8%	± 1.2%	∞
Liquid conductivity (meas.)	± 2.5%	Normal	1	0.64	0.43	± 1.6%	± 1.1%	∞
Liquid permittivity (target)	± 5.0%	Rectangular	√3	0.6	0.49	± 1.7%	± 1.4%	∞
Liquid permittivity (meas.)	± 2.5%	Normal	1	0.6	0.49	± 1.5%	± 1.2%	∞
Combined Uncertainty						± 10.9%	± 10.7%	387
Expanded Std. Uncertainty						**± 21.9%**	**± 21.4%**	

Table 9: Measurement uncertainties

2.4.13 Measurement uncertainty evaluation for system validation

The overall combined measurement uncertainty of the measurement system is ± 9.2% (K=1).
The expanded uncertainty (k=2) is assessed to be ± 18.4%
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:

Error Sources	Uncertainty Value	Probability Distribution	Divisor	c_i 1g	c_i 10g	Standard Uncertainty 1g	Standard Uncertainty10g	v_i^2 or v_{eff}
Measurement System								
Probe calibration	± 5.9%	Normal	1	1	1	± 5.9%	± 5.9%	∞
Axial isotropy	± 4.7%	Rectangular	√3	1	1	± 2.7%	± 2.7%	∞
Hemispherical isotropy	± 9.6%	Rectangular	√3	0.7	0.7	± 0.0%	± 0.0%	∞
Boundary effects	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Probe linearity	± 4.7%	Rectangular	√3	1	1	± 2.7%	± 2.7%	∞
System detection limits	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Readout electronics	± 0.3%	Normal	1	1	1	± 0.3%	± 0.3%	∞
Response time	± 0.0%	Rectangular	√3	1	1	± 0.0%	± 0.0%	∞
Integration time	± 0.0%	Rectangular	√3	1	1	± 0.0%	± 0.0%	∞
RF ambient conditions	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Probe positioner	± 0.4%	Rectangular	√3	1	1	± 0.2%	± 0.2%	∞
Probe positioning	± 2.9%	Rectangular	√3	1	1	± 1.7%	± 1.7%	∞
Max. SAR evaluation	± 1.0%	Rectangular	√3	1	1	± 0.6%	± 0.6%	∞
Dipole								
Deviation of experimental dipole	± 5.5%	Rectangular	√3	1	1	± 3.2%	± 3.2%	∞
Dipole axis to liquid distance	± 2.0%	Rectangular	1	1	1	± 1.2%	± 1.2%	∞
Power drift	± 4.7%	Rectangular	√3	1	1	± 2.7%	± 2.7%	∞
Phantom and Set-up								
Phantom uncertainty	± 4.0%	Rectangular	√3	1	1	± 2.3%	± 2.3%	∞
Liquid conductivity (target)	± 5.0%	Rectangular	√3	0.64	0.43	± 1.8%	± 1.2%	∞
Liquid conductivity (meas.)	± 2.5%	Normal	1	0.64	0.43	± 1.6%	± 1.1%	∞
Liquid permittivity (target)	± 5.0%	Rectangular	√3	0.6	0.49	± 1.7%	± 1.4%	∞
Liquid permittivity (meas.)	± 2.5%	Normal	1	0.6	0.49	± 1.5%	± 1.2%	∞
Combined Uncertainty						**± 9.5%**	**± 9.2%**	
Expanded Std. Uncertainty						**± 18.9%**	**± 18.4%**	

Table 10: Measurement uncertainties

2.4.14 System validation

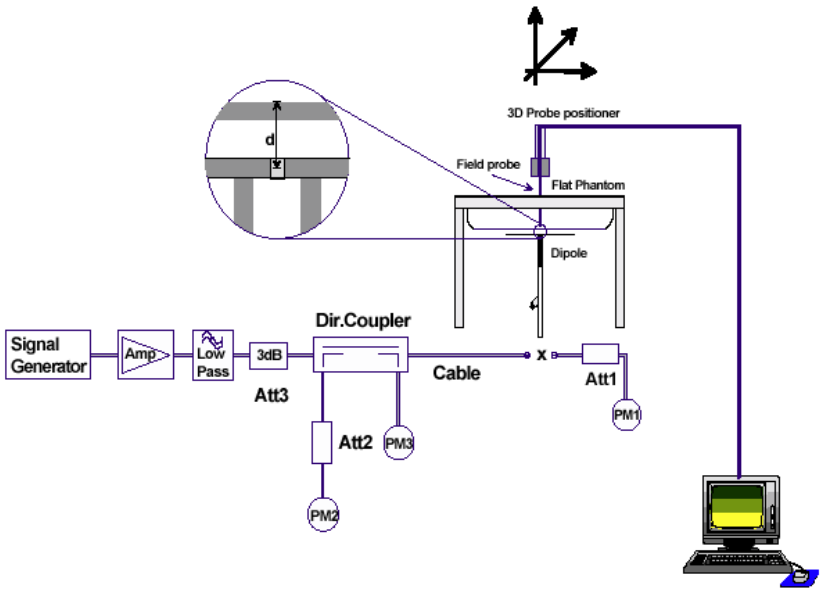
The system validation is performed for verifying the accuracy of the complete measurement system and performance of the software. The system validation is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows validation results for all frequency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

System Validation dipole	250 mW input power				Measured date YYYY-MM-DD
	SAR Value	Target (+/- 10%)	Measured	Percent (%)	
D835V2 Head	SAR_{1g}(mW/g)	2.39	2.53	5.86%	2011-03-15
	SAR_{10g}(mW/g)	1.54	1.66	7.79%	
D835V2 Body	SAR_{1g}(mW/g)	2.47	2.64	6.88%	2011-03-16
	SAR_{10g}(mW/g)	1.61	1.74	8.07%	
D1800V2 Head	SAR_{1g}(mW/g)	9.33	9.92	6.32%	2011-03-17
	SAR_{10g}(mW/g)	4.89	5.08	3.89%	
D1800V2 Body	SAR_{1g}(mW/g)	9.49	9.8	3.27%	2011-03-17
	SAR_{10g}(mW/g)	5.02	5.12	1.99%	
D1900V2 Head	SAR_{1g}(mW/g)	9.90	10.4	5.05%	2011-03-16
	SAR_{10g}(mW/g)	5.10	5.3	3.92%	
D1900V2 Body	SAR_{1g}(mW/g)	10.2	10.2	0.00%	2011-03-15
	SAR_{10g}(mW/g)	5.24	5.21	-0.57%	

Table 11: Results system validation

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

CDMA 800MHz

CDMA Cellular (RC3)	Conducted Power		
	Channel 1013	**Channel 384**	**Channel 777**
Before test (dBm)	24.3	24.4	**24.5**
After test (dBm)	24.4	24.4	24.4
CDMA Cellular (RC1)	**Conducted Power**		
	Channel 1013	**Channel 384**	**Channel 777**
Before test (dBm)	24.3	**24.5**	24.4
After test (dBm)	24.4	24.4	24.4

Table 12: Test results conducted power measurement CDMA 800MHz

CDMA AWS 1700MHz

CDMA AWS (RC3)	Conducted Power		
	Channel 25	**Channel 450**	**Channel 850**
Before test (dBm)	24.2	**24.5**	24.3
After test (dBm)	24.3	24.4	24.4
CDMA AWS (RC1)	**Conducted Power**		
	Channel 25	**Channel 450**	**Channel 850**
Before test (dBm)	24.4	24.4	24.2
After test (dBm)	24.4	**24.5**	24.3

Table 13: Test results conducted power measurement CDMA AWS 1700MHz

CDMA 1900MHz

CDMA PCS(RC3)	Conducted Power		
	Channel 25	**Channel 600**	**Channel 1175**
Before test (dBm)	24.3	24.3	24.4
After test (dBm)	24.4	24.4	**24.5**
CDMA PCS (RC1)	**Conducted Power**		
	Channel 25	**Channel 600**	**Channel 1175**
Before test (dBm)	24.4	**24.4**	24.3
After test (dBm)	24.3	24.4	24.4

Table 14: Test results conducted power measurement CDMA 1900MHz

Note: 1) The maximum 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 2.5.2.

2.5.2 Test results (Head and Body SAR)

CDMA 800MHz

Test Position	Test Mode	Channel / frequency	SAR (W/kg)		Power Drift (dB)	Limit (W/kg)	Liquid temperature
			1-g	10-g			
Test Position of Head							
Left hand cheek	RC3,SO55	384 / 836.52 MHz	**1.130**	0.831	-0.140	1.6	21.7°C
Left hand tilted15°	RC3,SO55	384 / 836.52 MHz	0.618	0.465	0.038	1.6	21.7°C
Right hand cheek	RC3,SO55	384 / 836.52 MHz	1.110	0.822	-0.083	1.6	21.7°C
Right hand tilted15°	RC3,SO55	384 / 836.52 MHz	0.624	0.472	-0.150	1.6	21.7°C
Left hand cheek	RC3,SO55	777 / 848.31 MHz	0.958	0.701	0.033	1.6	21.7°C
Left hand cheek	RC3,SO55	1013 / 824.7 MHz	0.856	0.630	-0.038	1.6	21.7°C
Right hand cheek	RC3,SO55	777 / 848.31 MHz	0.951	0.704	0.075	1.6	21.7°C
Right hand cheek	RC3,SO55	1013 / 824.7 MHz	0.833	0.622	0.082	1.6	21.7°C
Test Position of Body (Distance of 15mm)							
Towards phantom	RC3,SO32	384 / 836.52 MHz	0.807	0.601	-0.155	1.6	21.8°C
Towards ground	RC3,SO32	384 / 836.52 MHz	**0.992**	0.721	-0.106	1.6	21.8°C
Towards phantom	RC3,SO32	777 / 848.31 MHz	0.700	0.520	0.116	1.6	21.8°C
Towards phantom	RC3,SO32	1013 / 824.7 MHz	0.592	0.443	-0.010	1.6	21.8°C
Towards ground	RC3,SO32	777 / 848.31 MHz	0.860	0.624	0.007	1.6	21.8°C
Towards ground	RC3,SO32	1013 / 824.7 MHz	0.775	0.559	-0.188	1.6	21.8°C
with Headset							
Towards ground	RC3,SO55	384 / 836.52 MHz	0.640	0.457	-0.138	1.6	21.8°C
with Bluetooth Headset							
Towards ground	RC3,SO55	384 / 836.52 MHz	0.978	0.709	0.043	1.6	21.8°C

Table 15: Test results (CDMA800MHz)

Note: 1) The value with blue 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.

CDMA AWS 1700 MHz

Test Position	Test Mode	Channel / frequency	SAR (W/kg)		Power Drift (dB)	Limit (W/kg)	Liquid temperature
			1-g	10-g			
Test Position of Head							
Left hand cheek	RC3,SO55	450 / 1732.5 MHz	0.869	0.539	-0.074	1.6	21.6°C
Left hand tilted15°	RC3,SO55	450 / 1732.5 MHz	0.525	0.324	0.116	1.6	21.6°C
Right hand cheek	RC3,SO55	450 / 1732.5 MHz	0.962	0.610	0.006	1.6	21.6°C
Right hand tilted15°	RC3,SO55	450 / 1732.5 MHz	0.439	0.276	0.065	1.6	21.6°C
Left hand cheek	RC3,SO55	850 /1752.25 MHz	0.891	0.541	-0.011	1.6	21.6°C
Left hand cheek	RC3,SO55	25 /1711.25 MHz	0.855	0.531	0.048	1.6	21.6°C
Right hand cheek	RC3,SO55	850 /1752.25 MHz	**0.970**	0.613	0.162	1.6	21.6°C
Right hand cheek	RC3,SO55	25 /1711.25 MHz	0.941	0.596	0.069	1.6	21.6°C
Test Position of Body (Distance of 15mm)							
Towards phantom	RC3,SO32	450 / 1732.5 MHz	0.353	0.219	0.176	1.6	21.8°C
Towards ground	RC3,SO32	450 / 1732.5 MHz	0.610	0.349	0.024	1.6	21.8°C
Towards ground	RC3,SO32	850 /1752.25 MHz	0.638	0.365	0.134	1.6	21.8°C
Towards ground	RC3,SO32	25 /1711.25 MHz	0.603	0.342	0.171	1.6	21.8°C
with Headset							
Towards ground	RC3,SO55	850 /1752.25 MHz	0.516	0.303	0.038	1.6	21.8°C
with Bluetooth Headset							
Towards ground	RC3,SO55	850 /1752.25 MHz	**0.646**	0.369	-0.042	1.6	21.8°C

Table 16: Test results (CDMA AWS 1700MHz)

Note: 1) The value with blue 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.

CDMA 1900MHz

Test Position	Test Mode	Channel / frequency	SAR (W/kg)		Power Drift (dB)	Limit (W/kg)	Liquid temperature
			1-g	10-g			
Test Position of Head							
Left hand cheek	RC3,SO55	600 / 1880 MHz	1.050	0.631	-0.023	1.6	22.2°C
Left hand tilted15°	RC3,SO55	600 / 1880 MHz	0.566	0.348	0.039	1.6	22.2°C
Right hand cheek	RC3,SO55	600 / 1880 MHz	1.030	0.652	-0.072	1.6	22.2°C
Right hand tilted15°	RC3,SO55	600 / 1880 MHz	0.493	0.305	-0.034	1.6	22.2°C
Left hand cheek	RC3,SO55	1175/1908.75MHz	**1.100**	0.656	0.043	1.6	22.2°C
Left hand cheek	RC3,SO55	25 / 1851.25 MHz	0.871	0.529	-0.078	1.6	22.2°C
Right hand cheek	RC3,SO55	1175/1908.75MHz	1.050	0.669	0.064	1.6	22.2°C
Right hand cheek	RC3,SO55	25 / 1851.25 MHz	0.985	0.622	0.016	1.6	22.2°C
Test Position of Body (Distance of 15mm)							
Towards phantom	RC3,SO32	600 / 1880 MHz	0.516	0.317	-0.182	1.6	22°C
Towards ground	RC3,SO32	600 / 1880 MHz	0.765	0.450	0.053	1.6	22°C
Towards ground	RC3,SO32	1175/1908.75MHz	0.891	0.526	0.120	1.6	22°C
Towards ground	RC3,SO32	25 / 1851.25 MHz	0.729	0.424	-0.142	1.6	22°C
with Headset							
Towards ground	RC3,SO55	1175/1908.75MHz	0.738	0.430	-0.133	1.6	22°C
with Bluetooth Headset							
Towards ground	RC3,SO55	1175/1908.75MHz	**0.929**	0.541	-0.039	1.6	22°C

Table 17: Test results (CDMA1900MHz)

Note: 1) The value with blue 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.

2.5.3 Extrapolated SAR Values

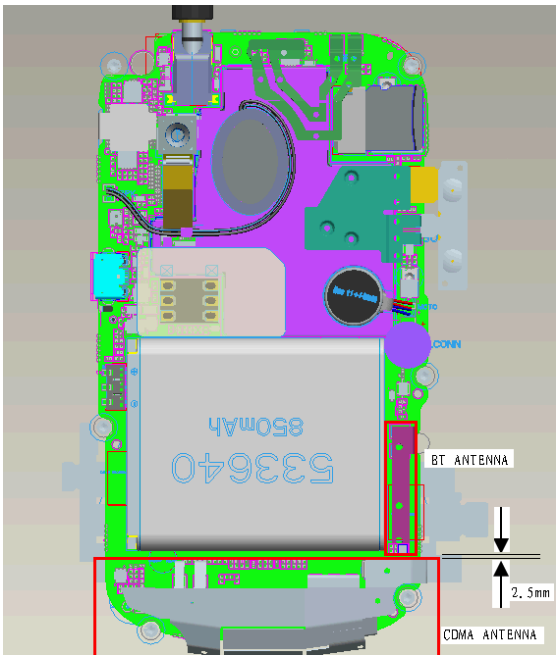
Limit of SAR (W/kg)		Conducted Power	1g Average 1.6	Tune-up procedures maximum Power(dBm)	1g Average 1.6
Worst Case		Measurement Result(dBm)	Measurement Result(W/kg)		Extrapolated Result (W/kg)
Test Position	Channel				
Head CDMA 800 (RC3 , SO55)					
Left hand cheek	Middle	24.4	1.130	25.5	**1.456**
Body CDMA 800 (RC3 , SO32)					
Towards ground	Middle	24.4	0.992	25.5	1.278
Head CDMA AWS 1700 (RC3 , SO55)					
Right hand cheek	High	24.4	0.970	25.5	1.250
Body CDMA AWS 1700 (RC3 , SO55)					
Towards ground	High	24.4	0.646	25.5	0.832
Head CDMA 1900 (RC3 , SO55)					
Left hand cheek	High	24.5	1.100	25.5	1.385
Body CDMA 1900 (RC3 , SO55)					
Towards ground	High	24.5	0.929	25.5	1.170

Table 18: Extrapolated SAR Values of highest measured SAR

2.5.4 Multiple Transmitter Information

BT Function

The closest distance between BT antenna and main antenna is 0.6 cm<2.5 cm，and the location of the antennas inside mobile phone is shown as below picture:



The output power of BT antenna is as following:

Channel	Ch 0 2402 MHz	Ch 39 2441 Mhz	Ch 78 2480 MHz
Peak Conducted Output Power(dBm)	6.75	7.48	7.89

The Max SAR Value of CDMA is as following:

Band	SAR_{1g} (W/kg)	
	Head	Body
CDMA 800	**1.130**	**0.992**
CDMA AWS	0.970	0.646
CDMA 1900	1.100	0.929

The following tables' list information which is relevant for the decision if a simultaneous transmit evaluation is necessary according to KDB 648474.

Stand-alone SAR

According to the output power measurement results , the distance between BT antenna and CDMA antenna and the max 1-g SAR value of CDMA we can draw the conclusion that:

Stand-alone SAR evaluation are not required for BT, because the output power of BT is ≤ P_{Ref}(10.8 dBm) and antenna is < 2.5 cm from other antennas, each with 1-g SAR < 1.2 W/kg .

Simultaneous SAR

Simultaneous Transmission SAR evaluation is not required for CDMA & BT, because stand-alone SAR are not required for BT and the sum of the1-g SAR is <1.6 W/kg for all simultaneous transmitting antennas.

Annex 1 System performance verification

Date/Time: 3/16/2011 23:07:55, Date/Time: 3/16/2011 23:12:00

SystemPerformanceCheck-D1900-ES-Head

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d091

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz; σ = 1.4 mho/m; ε_r = 39.4; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.97, 4.97, 4.97); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/d=10mm, Pin=250mW/Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 11.1 mW/g

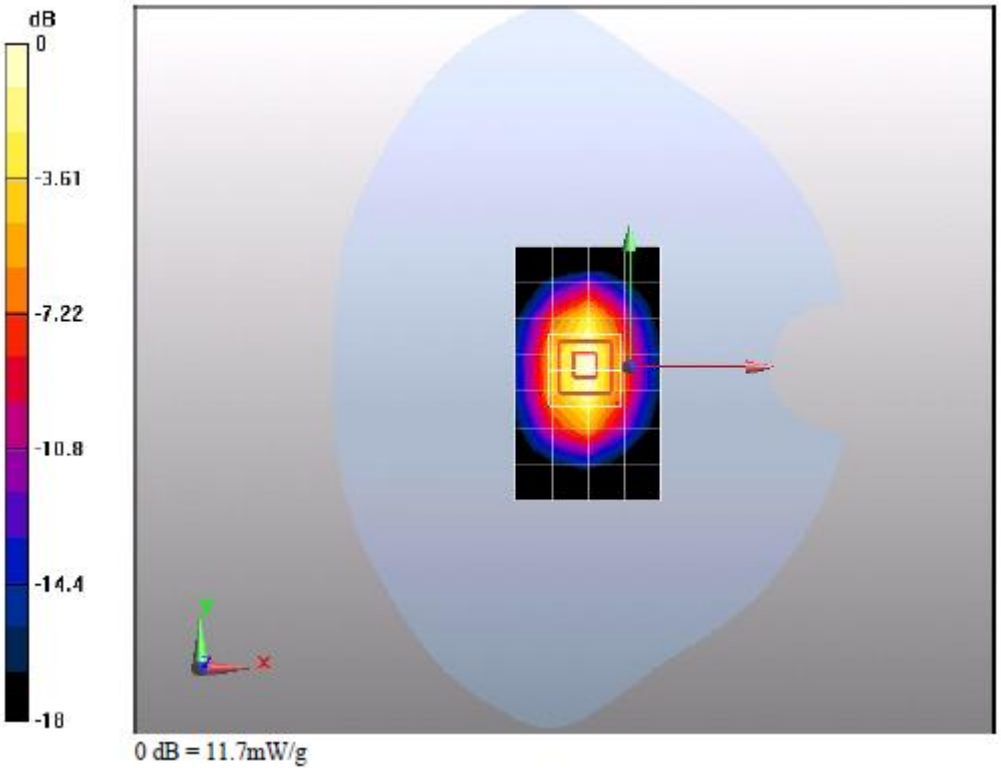
Configuration/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm,
dy=5mm, dz=5mm

Reference Value = 92.6 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 19.3 W/kg

SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.3 mW/g

Maximum value of SAR (measured) = 11.7 mW/g



Additional information:

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

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/15/2011 21:48:31, Date/Time: 3/15/2011 21:52:33

SystemPerformanceCheck-D1900-ES-Body

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d091

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz; σ = 1.51 mho/m; ε_r = 51.1; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.61, 4.61, 4.61); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/d=10mm, Pin=250mW/Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 10.8 mW/g

Configuration/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm,

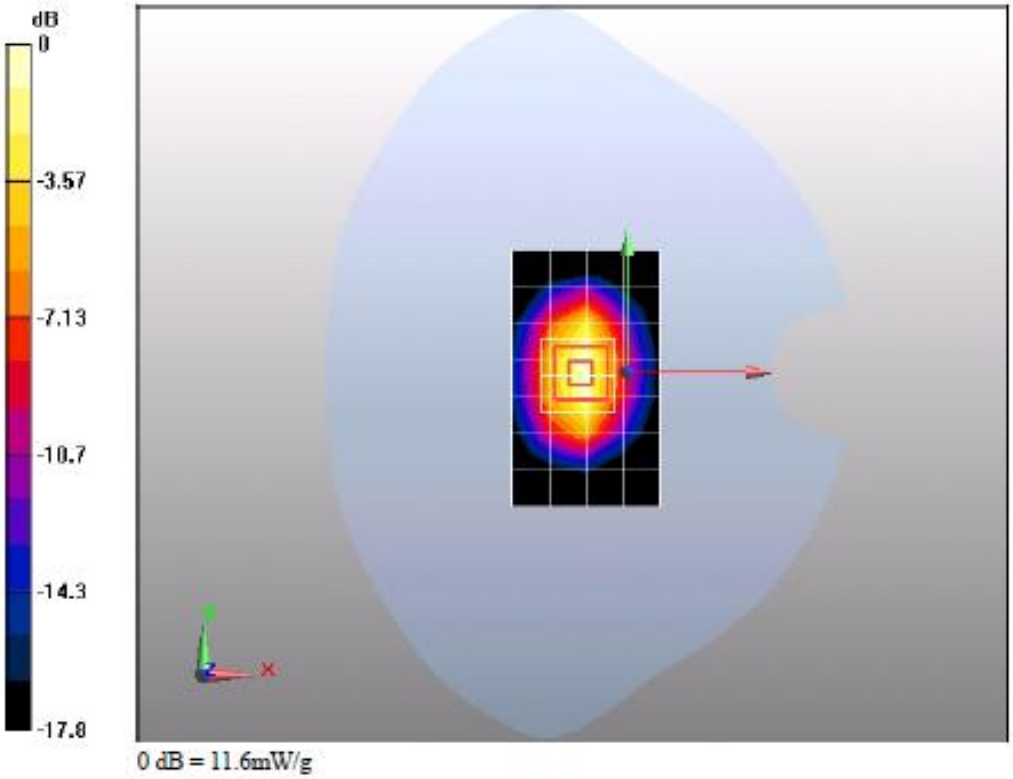
dy=5mm, dz=5mm

Reference Value = 87.9 V/m; Power Drift = 0.054 dB

Peak SAR (extrapolated) = 18.8 W/kg

SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.21 mW/g

Maximum value of SAR (measured) = 11.6 mW/g



Additional information:

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

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/17/2011 22:07:33, Date/Time: 3/17/2011 22:11:36

SystemPerformanceCheck-D1800-ES-Head

DUT: Dipole 1800 MHz D1800V2; Type: D1800V2; Serial: D1800V2 - SN: 2d157

Communication System: CW; Frequency: 1800 MHz

Medium parameters used: f = 1800 MHz; σ = 1.38 mho/m; ε_r = 39.1; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(5.12, 5.12, 5.12); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/d=10mm, Pin=250mW/Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 10.3 mW/g

Configuration/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm,

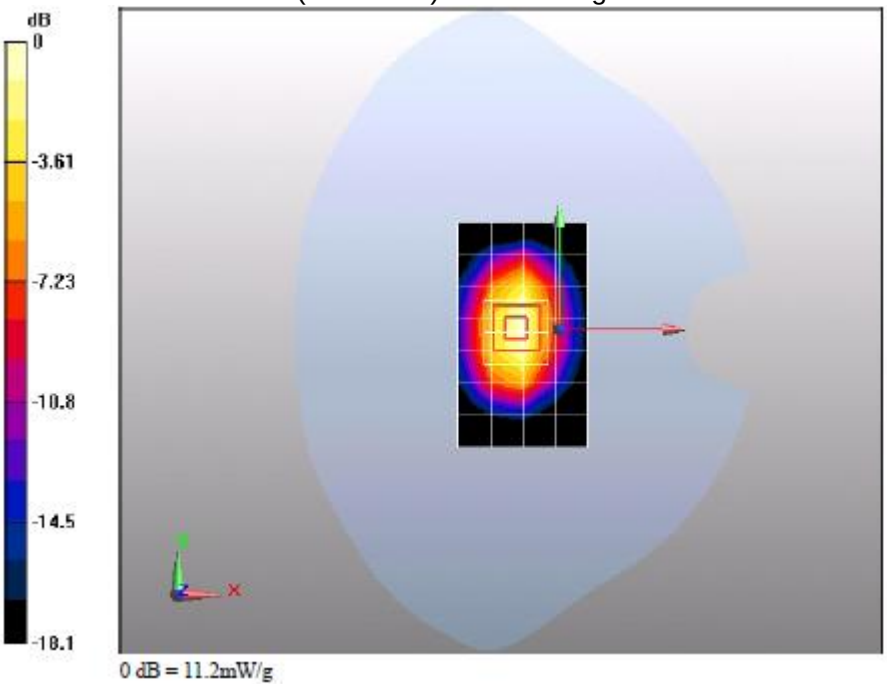
dy=5mm, dz=5mm

Reference Value = 89.1 V/m; Power Drift = 0.086 dB

Peak SAR (extrapolated) = 18.7 W/kg

SAR(1 g) = 9.92 mW/g; SAR(10 g) = 5.08 mW/g

Maximum value of SAR (measured) = 11.2 mW/g



Additional information:

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

ambient temperature: 22.0°C; liquid temperature: 21.6°C

Date/Time: 3/17/2011 10:21:45, Date/Time: 3/17/2011 10:25:46

SystemPerformanceCheck-D1800-ES-Body

DUT: Dipole 1800 MHz D1800V2; Type: D1800V2; Serial: D1800V2 - SN: 2d157

Communication System: CW; Frequency: 1800 MHz

Medium parameters used: f = 1800 MHz; σ = 1.53 mho/m; ε_r = 51.5; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.99, 4.99, 4.99); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/d=10mm, Pin=250mW/Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 10.3 mW/g

Configuration/d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm,

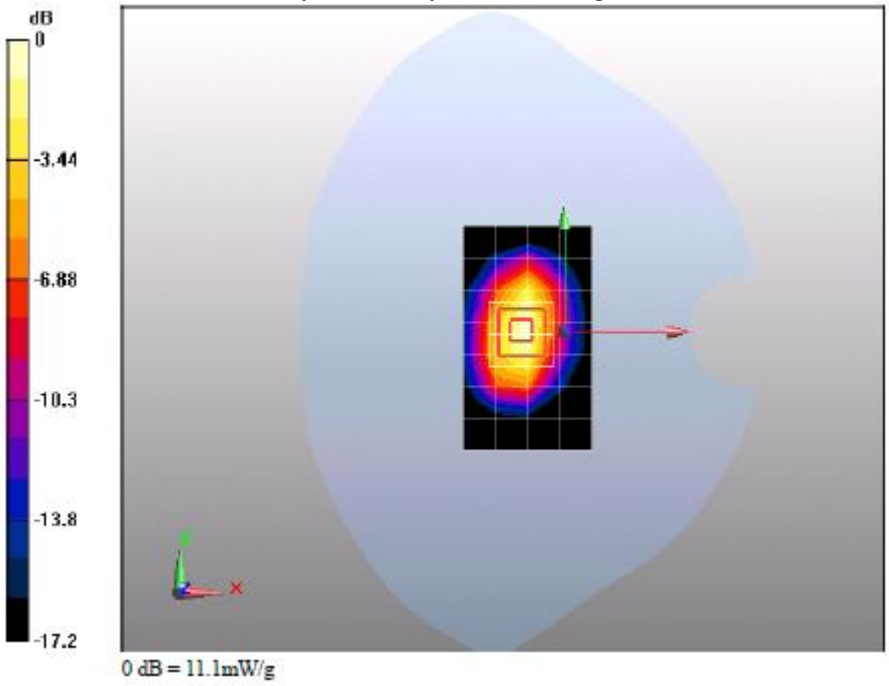
dy=5mm, dz=5mm

Reference Value = 84.4 V/m; Power Drift = 0.053 dB

Peak SAR (extrapolated) = 17.6 W/kg

SAR(1 g) = 9.8 mW/g; SAR(10 g) = 5.12 mW/g

Maximum value of SAR (measured) = 11.1 mW/g



Additional information:

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

ambient temperature: 22.0°C; liquid temperature: 21.8°C

Date/Time: 3/15/2011 10:01:12, Date/Time: 3/15/2011 10:07:50

SystemPerformanceCheck-D835-ES-Head

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN: 4d059

Communication System: CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(5.98, 5.98, 5.98); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

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

Maximum value of SAR (measured) = 2.39 mW/g

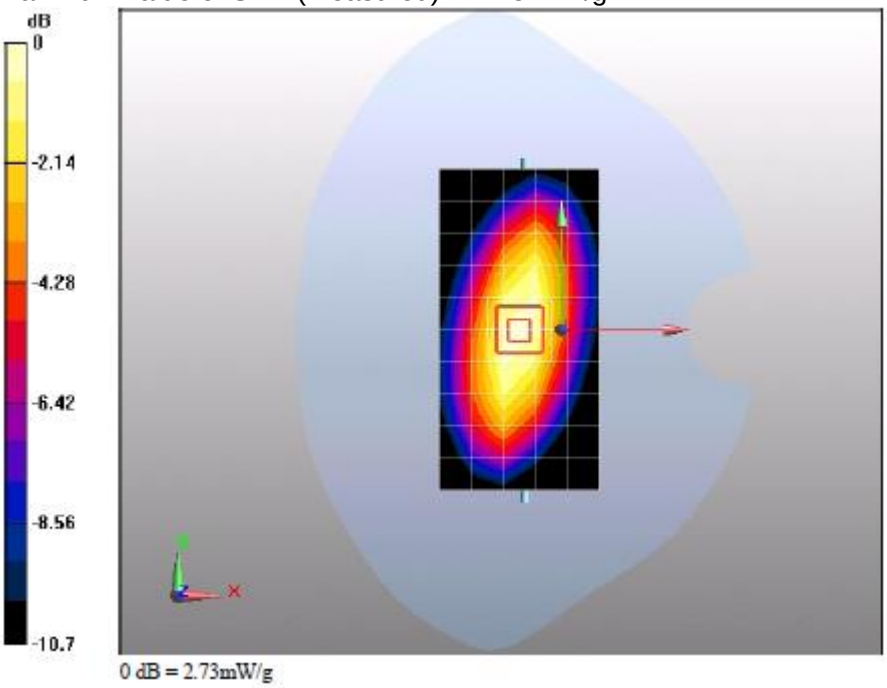
Configuration/d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm,
dy=5mm, dz=5mm

Reference Value = 55.8 V/m; Power Drift = 0.057 dB

Peak SAR (extrapolated) = 3.69 W/kg

SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.66 mW/g

Maximum value of SAR (measured) = 2.73 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

Date/Time: 3/16/2011 10:05:49, Date/Time: 3/16/2011 10:12:27

SystemPerformanceCheck-D835-ES-Body

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN: 4d059

Communication System: CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz; σ = 0.97 mho/m; ε_r = 55.1; ρ = 1000 kg/m^3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(5.92, 5.92, 5.92); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM1; Type: SAM; Serial: TP-1475
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

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

Maximum value of SAR (measured) = 2.61 mW/g

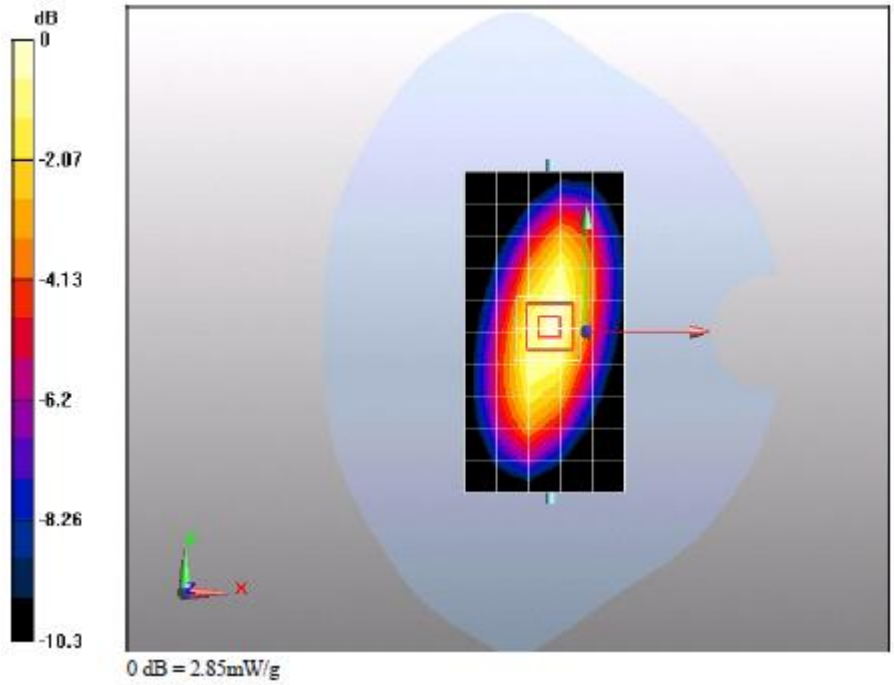
Configuration/d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm,
dy=5mm, dz=5mm

Reference Value = 55 V/m; Power Drift = 0.061 dB

Peak SAR (extrapolated) = 3.79 W/kg

SAR(1 g) = 2.64 mW/g; SAR(10 g) = 1.74 mW/g

Maximum value of SAR (measured) = 2.85 mW/g



Additional information:

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

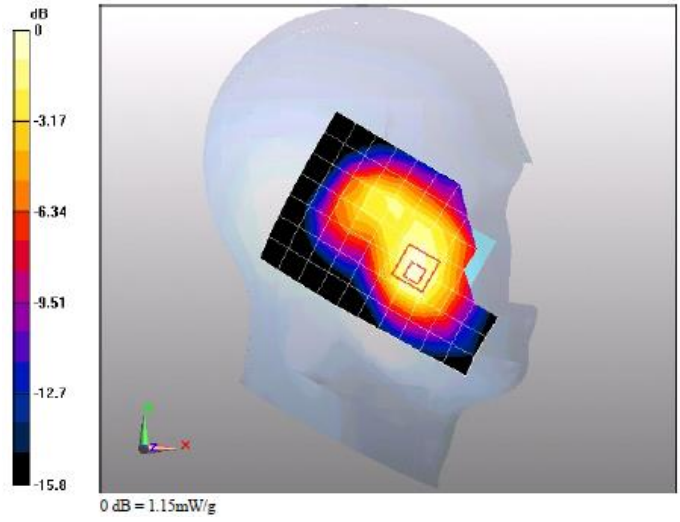
ambient temperature: 22.0°C; liquid temperature: 21.8°C

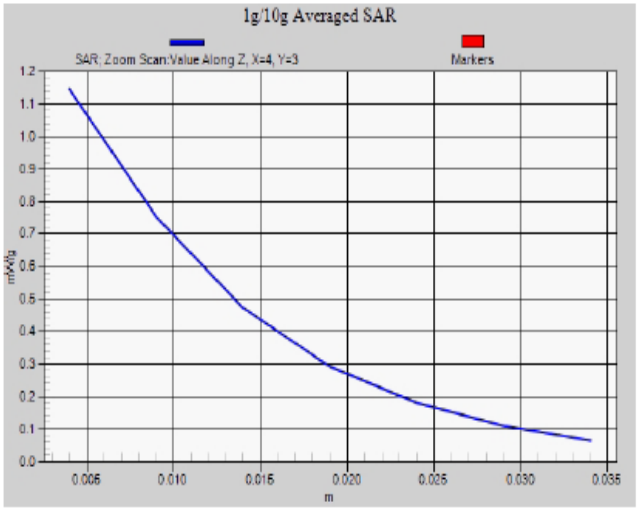
Annex 2 Measurement results (printout from DASY TM)
Remark: results of conducted power measurements: see chapter 2.5/2.6 (if applicable)

Annex 2.1 CDMA1900MHz Head

Date/Time: 3/17/2011 2:58:17, Date/Time: 3/17/2011 3:06:18
M615 CDMA 1900 600CH Left hand touch check
DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320
Communication System: HW -CDMA2000; Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.8; ρ = 1000 kg/m3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:
- Probe: ES3DV3 - SN3168; ConvF(4.97, 4.97, 4.97); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/Body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.1 mW/g
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.6 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 1.59 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.631 mW/g
Maximum value of SAR (measured) = 1.15 mW/g





Additional information:
position or distance of DUT to SAM (if not standard head positions) :
ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/17/2011 3:24:29, Date/Time: 3/17/2011 3:32:30

M615 CDMA 1900 600CH Left hand tilt 15 degree

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1880 MHz

Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.8; ρ = 1000 kg/m3

Phantom section: Left Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.97, 4.97, 4.97); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/Body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.561 mW/g

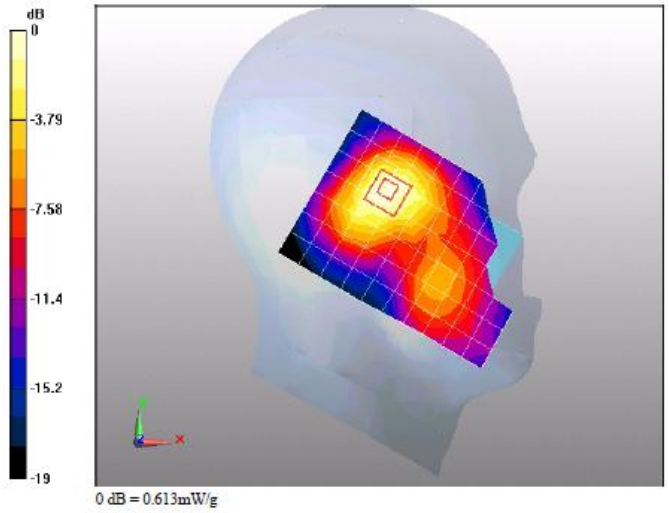
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

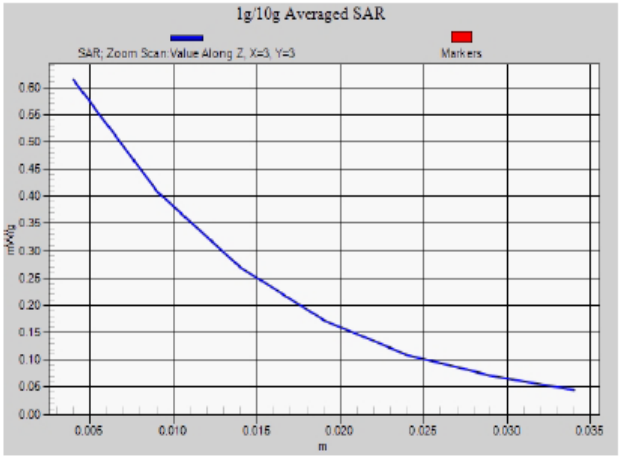
Reference Value = 17.1 V/m; Power Drift = 0.039 dB

Peak SAR (extrapolated) = 0.858 W/kg

SAR(1 g) = 0.566 mW/g; SAR(10 g) = 0.348 mW/g

Maximum value of SAR (measured) = 0.613 mW/g





Additional information:

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

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/16/2011 23:40:43, Date/Time: 3/16/2011 23:48:38

M615 CDMA 1900 600CH Right hand touch check

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1880 MHz

Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.8; ρ = 1000 kg/m3

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.97, 4.97, 4.97); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/Body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.04 mW/g

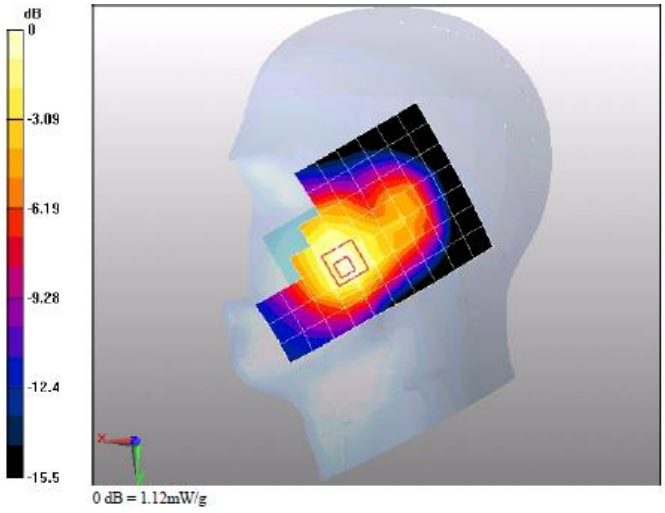
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

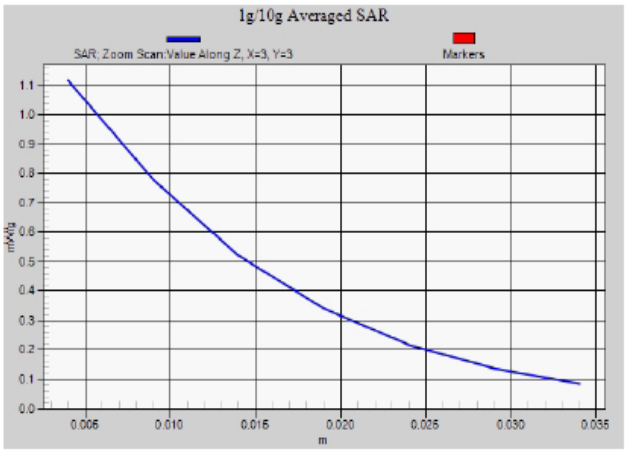
Reference Value = 13.6 V/m; Power Drift = -0.072 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.652 mW/g

Maximum value of SAR (measured) = 1.12 mW/g





Additional information:

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

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/17/2011 1:32:55, Date/Time: 3/17/2011 1:50:30

M615 CDMA 1900 600CH Right hand tilt 15 degree

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1880 MHz

Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.8; ρ = 1000 kg/m3

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.97, 4.97, 4.97); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/Body/Area Scan (12x16x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.511 mW/g

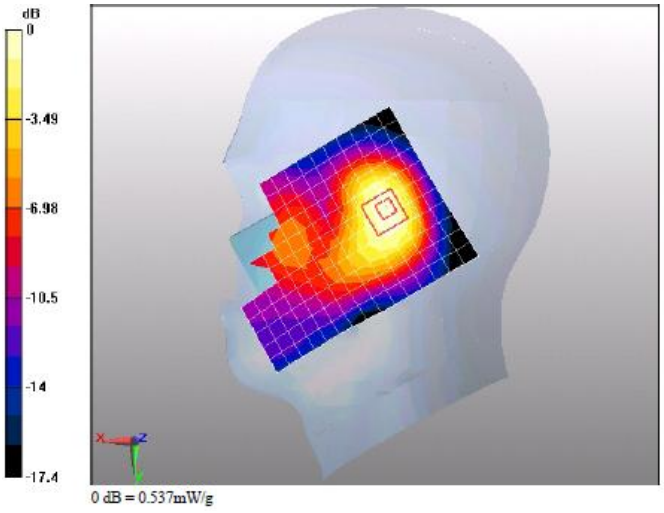
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

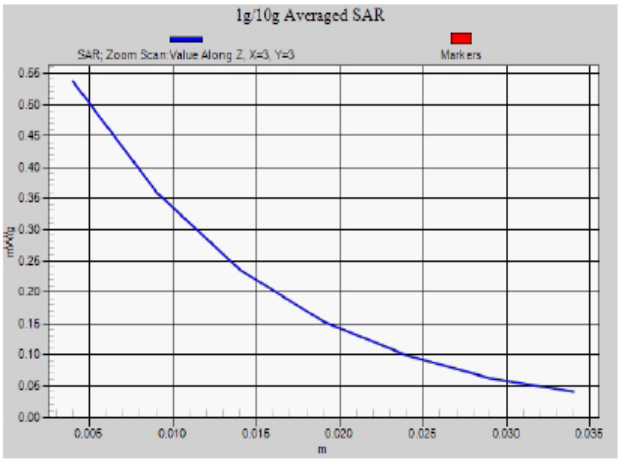
Reference Value = 18.3 V/m; Power Drift = -0.033 dB

Peak SAR (extrapolated) = 0.731 W/kg

SAR(1 g) = 0.493 mW/g; SAR(10 g) = 0.305 mW/g

Maximum value of SAR (measured) = 0.537 mW/g





Additional information:

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

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/17/2011 3:54:38, Date/Time: 3/17/2011 4:02:36

M615 CDMA 1900 1175CH Left hand touch check

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1908.75 MHz

Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.42 mho/m; ε_r = 38.7; ρ = 1000 kg/m3

Phantom section: Left Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.97, 4.97, 4.97); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/Body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.14 mW/g

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

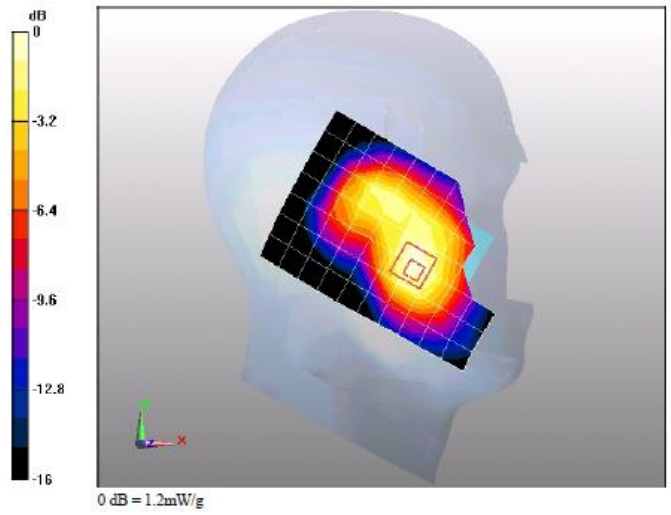
Reference Value = 12.7 V/m; Power Drift = 0.043 dB

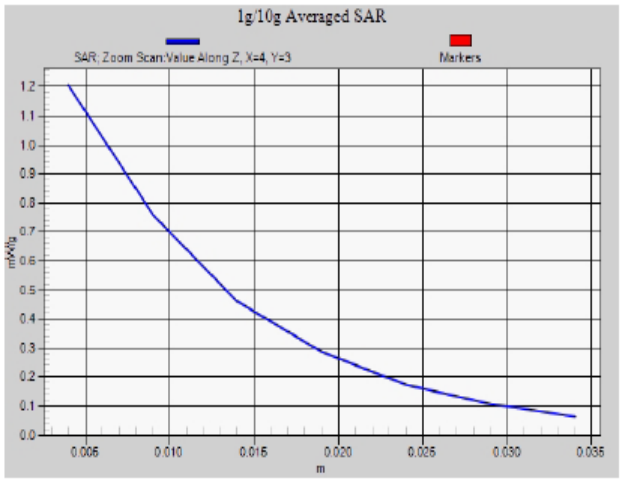
Peak SAR (extrapolated) = 1.75 W/kg

SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.656 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.2 mW/g





Additional information:

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

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/17/2011 4:16:55, Date/Time: 3/17/2011 4:25:59

M615 CDMA 1900 25CH Left hand touch check

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1851.25 MHz

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.36 mho/m; ε_r = 38.9; ρ = 1000 kg/m3

Phantom section: Left Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.97, 4.97, 4.97); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/Body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.897 mW/g

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

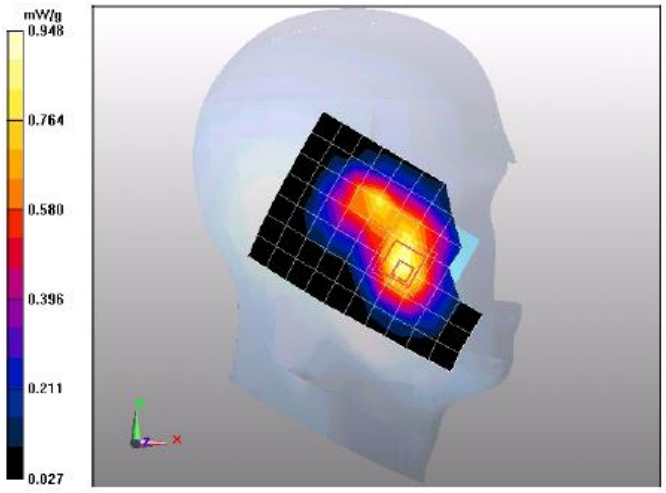
Reference Value = 11.7 V/m; Power Drift = -0.078 dB

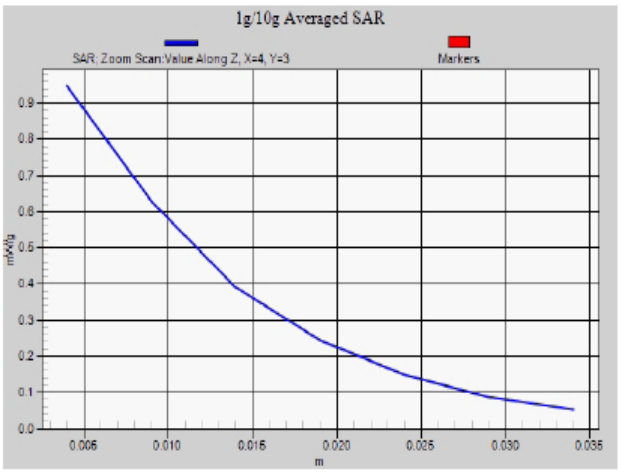
Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 0.871 mW/g; SAR(10 g) = 0.529 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.948 mW/g





Additional information:

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

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/17/2011 0:58:41, Date/Time: 3/17/2011 1:16:19

M615 CDMA 1900 1175CH Right hand touch check

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1908.75 MHz

Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.42 mho/m; ε_r = 38.7; ρ = 1000 kg/m3

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.97, 4.97, 4.97); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/Body/Area Scan (12x16x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.11 mW/g

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

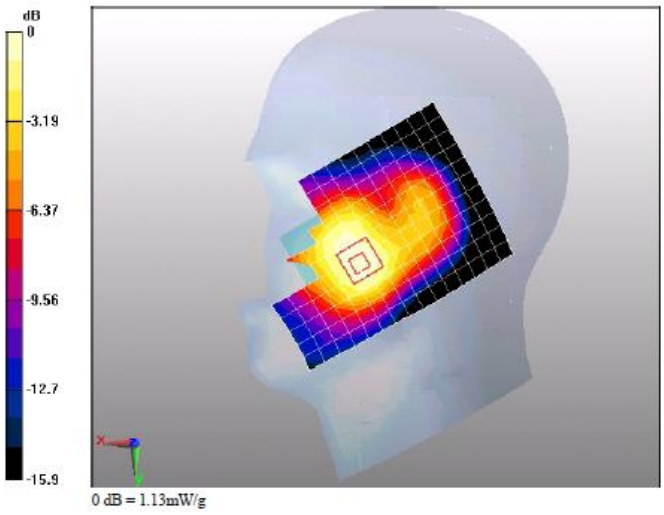
Reference Value = 13.7 V/m; Power Drift = 0.064 dB

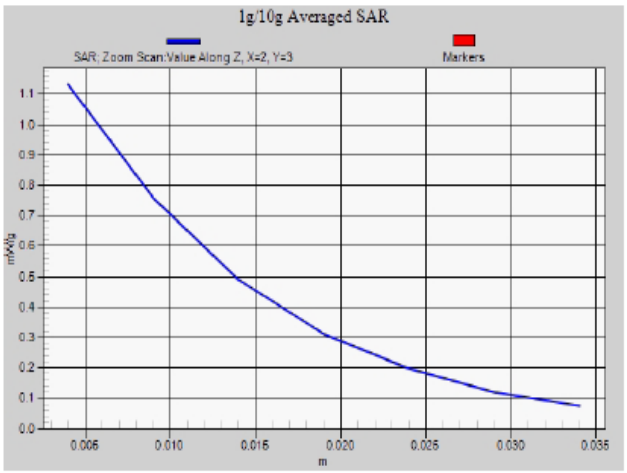
Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.669 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.13 mW/g





Additional information:

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

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/17/2011 0:07:40, Date/Time: 3/17/2011 0:15:35

M615 CDMA 1900 25CH Right hand touch check

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1851.25 MHz

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.36 mho/m; ε_r = 38.9; ρ = 1000 kg/m3

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.97, 4.97, 4.97); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/Body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.998 mW/g

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

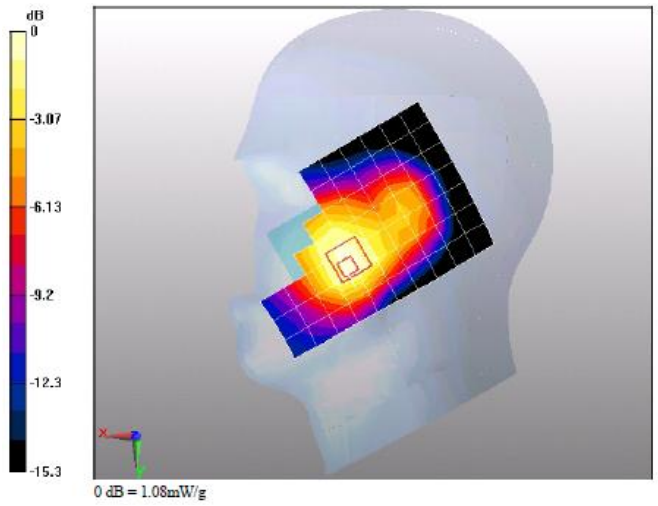
Reference Value = 13.5 V/m; Power Drift = 0.016 dB

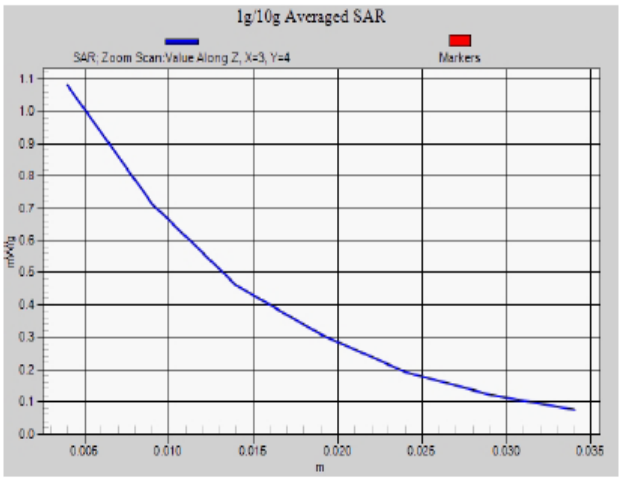
Peak SAR (extrapolated) = 1.51 W/kg

SAR(1 g) = 0.985 mW/g; SAR(10 g) = 0.622 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.08 mW/g





Additional information:

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

ambient temperature: 23.0°C; liquid temperature: 22°C

Annex 2.2 CDMA1900MHz Body

Date/Time: 3/16/2011 0:09:41, Date/Time: 3/16/2011 0:18:32, Date/Time: 3/16/2011 0:32:28

M615 CDMA 1900 600CH towards phantom 15mm

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1880 MHz

Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 51.2; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.61, 4.61, 4.61); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.538 mW/g

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

Reference Value = 10.6 V/m; Power Drift = -0.182 dB

Peak SAR (extrapolated) = 0.821 W/kg

SAR(1 g) = 0.516 mW/g; SAR(10 g) = 0.317 mW/g

Maximum value of SAR (measured) = 0.557 mW/g

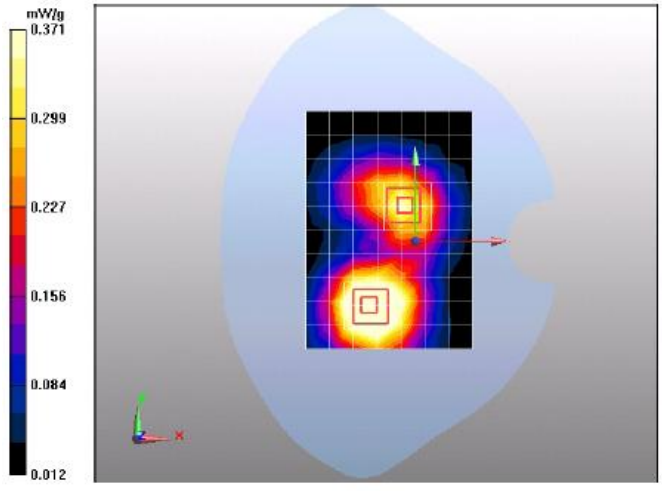
Configuration/body/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

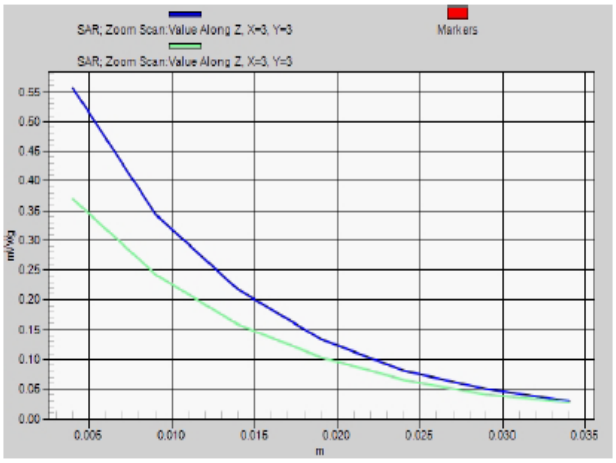
Reference Value = 10.6 V/m; Power Drift = -0.182 dB

Peak SAR (extrapolated) = 0.523 W/kg

SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.220 mW/g

Maximum value of SAR (measured) = 0.371 mW/g





Additional information:

position or distance of DUT to SAM (if not standard head positions) : 15 mm

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/16/2011 0:51:02, Date/Time: 3/16/2011 0:59:53

M615 CDMA 1900 600CH towards ground 15mm

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1880 MHz

Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 51.2; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.61, 4.61, 4.61); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.793 mW/g

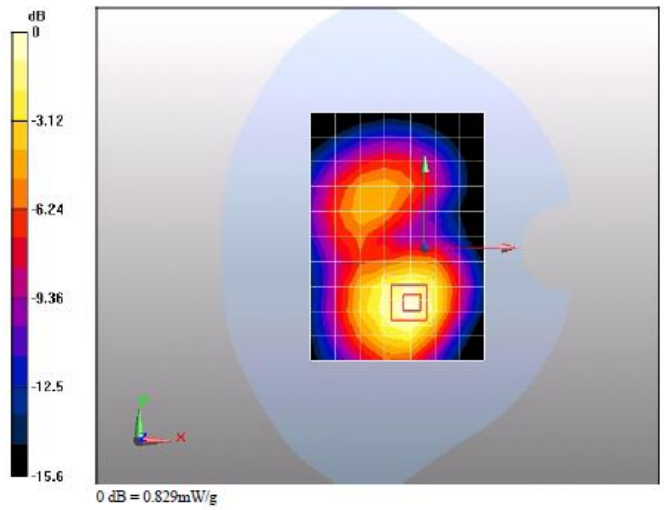
Configuration/body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

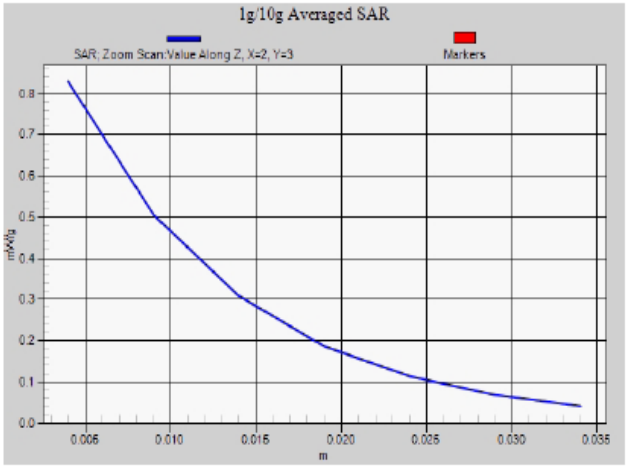
Reference Value = 8.97 V/m; Power Drift = 0.053 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.765 mW/g; SAR(10 g) = 0.450 mW/g

Maximum value of SAR (measured) = 0.829 mW/g





Additional information:

position or distance of DUT to SAM (if not standard head positions) : 15 mm

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/16/2011 2:01:17, Date/Time: 3/16/2011 2:10:09

M615 CDMA 1900 1175CH towards ground 15mm

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1908.75 MHz

Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.52 mho/m; ε_r = 51; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.61, 4.61, 4.61); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.903 mW/g

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

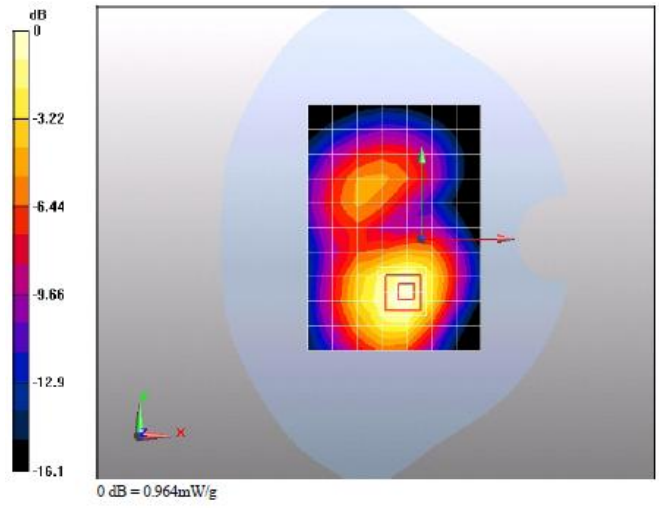
Reference Value = 9.54 V/m; Power Drift = 0.120 dB

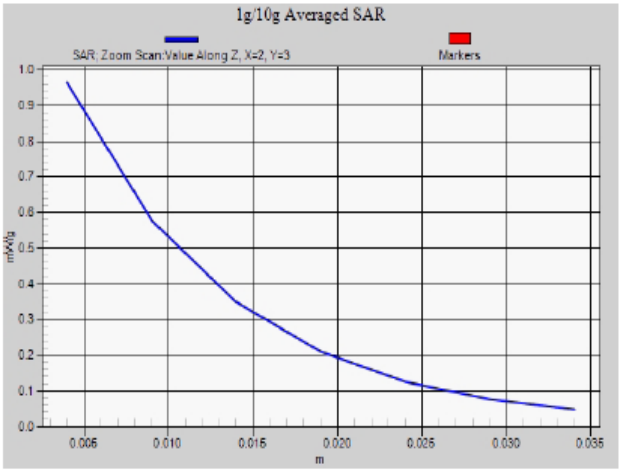
Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 0.891 mW/g; SAR(10 g) = 0.526 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.964 mW/g





Additional information:

position or distance of DUT to SAM (if not standard head positions) : 15 mm

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/16/2011 1:35:30, Date/Time: 3/16/2011 1:44:21

M615 CDMA 1900 25CH towards ground 15mm

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1851.25 MHz

Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.46 mho/m; ε_r = 51.3; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.61, 4.61, 4.61); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.781 mW/g

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

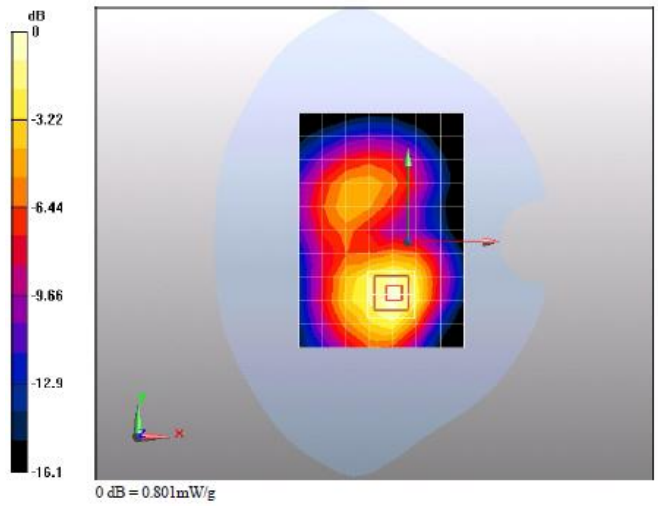
Reference Value = 9.06 V/m; Power Drift = -0.142 dB

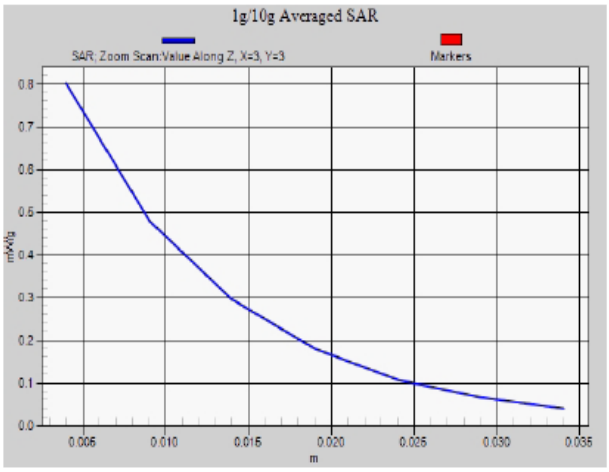
Peak SAR (extrapolated) = 1.2 W/kg

SAR(1 g) = 0.729 mW/g; SAR(10 g) = 0.424 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.801 mW/g





Additional information:

position or distance of DUT to SAM (if not standard head positions) : 15 mm

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/16/2011 3:18:24, Date/Time: 3/16/2011 3:27:14

M615 CDMA 1900 1175CH towards ground 15mm with Headset

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1908.75 MHz

Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.52 mho/m; ε_r = 51; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.61, 4.61, 4.61); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.619 mW/g

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

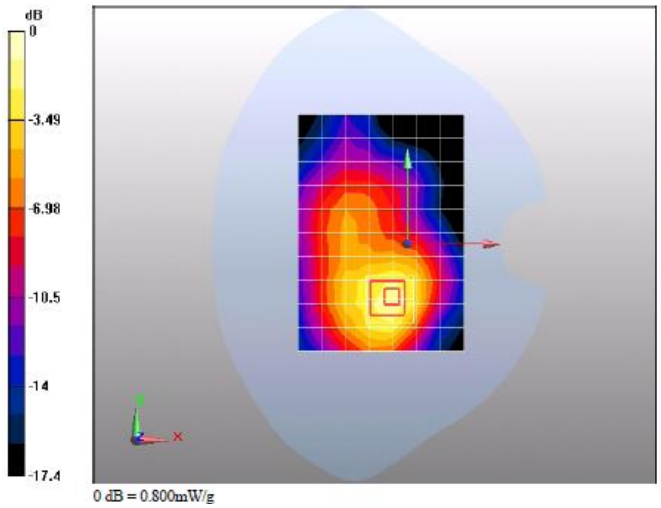
Reference Value = 11.3 V/m; Power Drift = -0.133 dB

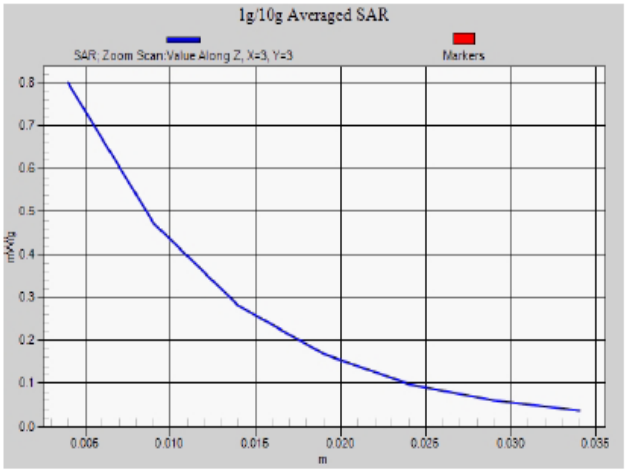
Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.738 mW/g; SAR(10 g) = 0.430 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.800 mW/g





Additional information:

position or distance of DUT to SAM (if not standard head positions) : 15 mm

ambient temperature: 23.0°C; liquid temperature: 22°C

Date/Time: 3/16/2011 4:55:35, Date/Time: 3/16/2011 5:04:26

M615 CDMA 1900 1175CH towards ground 15mm with Bluetooth Headset

DUT: HUAWEI M615; Type: Handset; Serial: S9X2B11111400320

Communication System: HW -CDMA2000; Frequency: 1908.75 MHz

Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.52 mho/m; ε_r = 51; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3168; ConvF(4.61, 4.61, 4.61); Calibrated: 12/23/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn852; Calibrated: 12/24/2010
- Phantom: SAM2; Type: SAM; Serial: TP-1474
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration/body/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.966 mW/g

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

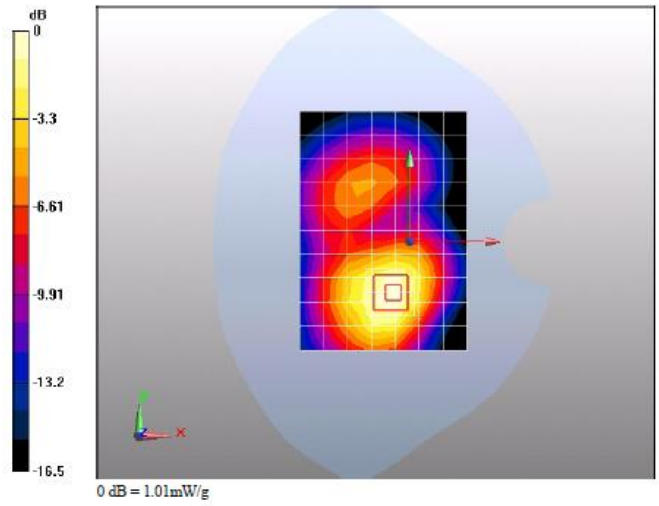
Reference Value = 10.2 V/m; Power Drift = -0.039 dB

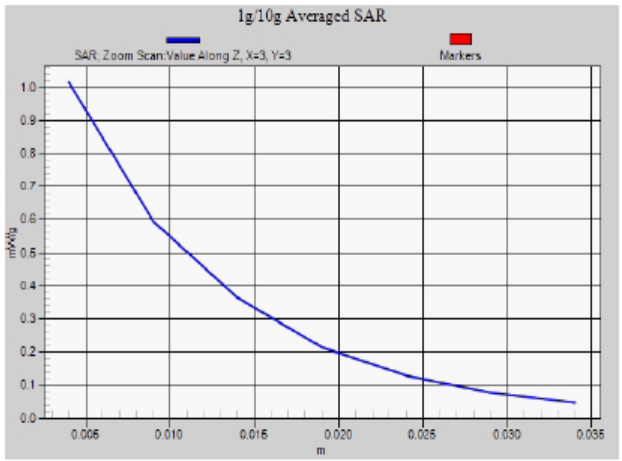
Peak SAR (extrapolated) = 1.6 W/kg

SAR(1 g) = 0.929 mW/g; SAR(10 g) = 0.541 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.01 mW/g





Additional information:

position or distance of DUT to SAM (if not standard head positions) : 15 mm

ambient temperature: 23.0°C; liquid temperature: 22°C