TESTING
CNAS L2779

SAR Test Report

For Ezze MEGA4, FCC ID: RV2MEGA4

Application information:

DUT Type	Qual-band GSM, GPRS mobile phone, GPRS class 8
Trade Name / Mode(s)	Ezze MEGA4
FCC Classification	Licensed Portable Transmitter Held to Ear (PCE)
FCC Rule Part(s)	2.1093; FCC/OET Bulletin65 Supplement C [July 2001]
Application Type	Certification
Production Unit or Identical Prototype (47 CFR §2.908)	Identical prototype
Antenna type	internal antenna
RF exposure limits	General Population / Uncontrolled

Device under test (DUT):

DUT ID	IMEI	HW Ver.	SW Ver.
FCC 10	135790246811220	V 0.1	V 0.1

Accessories of DUT

Accessories ID	Description	Serial Number
A01	Earphone	N.A

Batteries of DUT

Batteries ID	Model	Capacity
B01	MEGA 4	750 mAh
B02	MEGA 4	750 mAh

Executive Summary

The Ezze MEGA4 is in compliance with the Federal Communications Commission (FCC) Guidelines [OET65, June 2001] for uncontrolled exposure. The tests were performed according to the FCC requirements, and no change was made to the DUT during the tests.

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CNAS L2779

Issued by (Test Engineer):	Reviewed by:	Approved by:
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Document No: DCP-BEJLM-TSRP-080035c.1

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1 GENERAL INFORMATION

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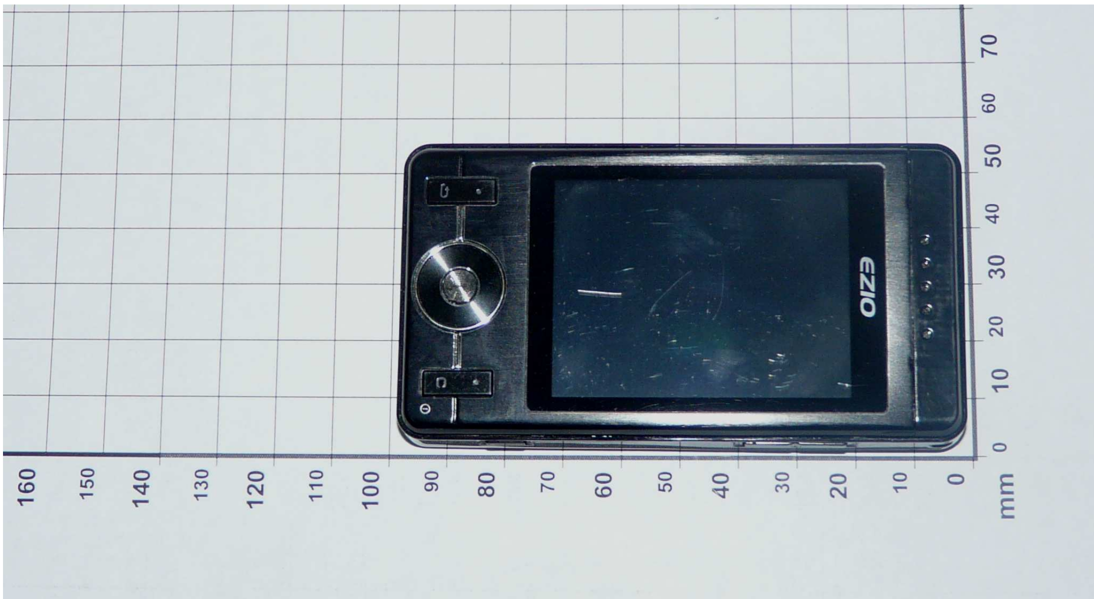
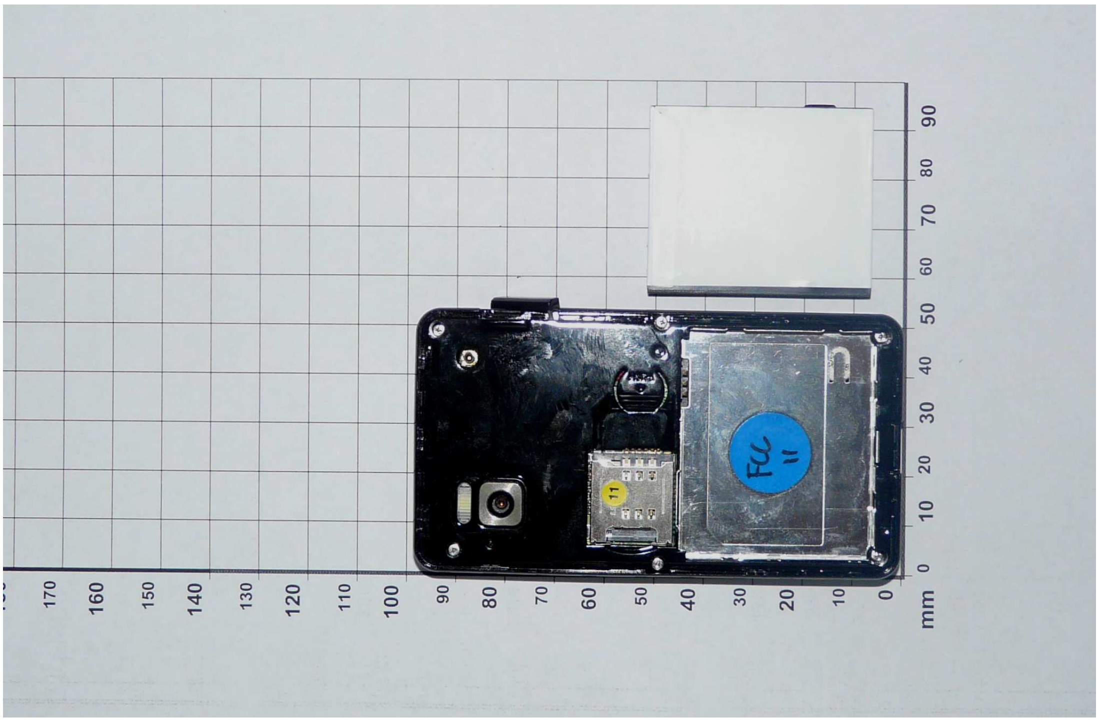
2 SUBJECT OF INVESTIGATION

Picture of the device under test





The objective of the measurements done by FlexMobile test laboratory was the dosimetric assessment. The examinations have been carried out with the dosimetric assessment system "DASY4" described in clause 5 below.

3 STANDARD

In USA the recent FCC exposure criteria [OET 65] are based upon the IEEE Standard C95.1 [IEEE C95.1]. The IEEE standard C95.a sets limits for human exposure to radio frequency electromagnetic in the frequency range 3 kHz to 300GHz.

3.1 Distinction between exposed population, duration of exposure and frequencies

The American standard [IEEE C95.1] distinguishes between controlled and uncontrolled environment. Controlled environments are locations where there is exposure that may be incurred by persons who are aware of the potential for exposure as a concomitant of employment or by other cognizant persons. Uncontrolled environments are locations where there is the exposure of individuals who have no knowledge or control of their exposure. The exposures may occur in living quarters or workplaces. For exposure in controlled environments higher field strengths are admissible. In addition the duration of exposure is considered.

Due to the influence of frequency on important parameters, as the penetration depth of the electromagnetic fields into the human body and the absorption capability of different tissues, the limits in general vary with frequency.

3.2 Distinction between Maximum Permissible Exposure and SAR Limits

The biological relevant parameter describing the effects of electromagnetic fields in the frequency range of interest is the specific absorption rate SAR (dimension: power/mass). It is a measure of the power absorbed per unit mass. The SAR may be spatially averaged over the total mass of an exposed body or its parts. The SAR is calculated from the R.M.S. electric filed strength E inside the human body, the conductivity σ and the mass density ρ of the biological tissue:

$$SAR = \sigma \frac{E^2}{\rho} = c \left. \frac{\partial T}{\partial t} \right|_{t \to 0+}$$

The specific absorption rate describes the initial rate of temperature rise $\partial T/\partial t$ as a function of the specific heat capacity c f the tissue. A limitation of the specific absorption rate perverts an excessive heating of the human body by electromagnetic energy.

As it is sometimes difficult to determine the SAR directly by measurement (e.g. whole body averaged SAR), the standard specifies more readily measurable maximum permissible exposures in terms of external electric E and magnetic field strength H and power density S, derived from the SAR limits. The limits for E, H and S have been fixed so that even under worst case conditions, the limits for the specific absorption rate SAR are not exceeded.

3.3 SAR limit

In this report the comparison between the American exposure limits and the measured data is made using the peak spatial-average SAR; the power level of the device under test guarantees that the whole body averaged SAR is not exceeded.

Having in mind a worst case consideration, the SAR limit is valid for uncontrolled environment and mobile respectively portable transmitters. According to table below the SAR values have to be averaged over a mass of 1g (SAR_{1g}) with the shape of a cube.

Relevant peak spatial-average SAR limit averaged over a mass of 1g.

Exposure limits	SAR(mW/g)	
	General Population/Uncontrolled Environment	Occupational/Controlled Exposure Environment
Spatial Average ANSI (Averaged over the whole body)	0.08	0.4
Spatial Peak ANSI (Averaged over any 1-g of tissue)	1.6	8.0
Spatial Peak ICNIRP/ANSI (hands/wrists/feet/ankles averaged over 10-g)	4.0	20.0
Localized SAR - ICNIRP - (Head and Trunk 10-g)	2.0	10.0

4 TEST REQUIREMENTS

IEEE has published a recommended practice for determining the peak spatial-average specific absorption rate (SAR) in the human body due to wireless communications devices [IEEE 1528-2003] for evaluation compliance of mobile phones with IEEE Standard C95.1 [IEEE C95.1]. The standard defines protocols of the measurement of the specific absorption rate (SAR) inside a simplified model of the head of users. It applies to mobile telecommunication equipment in the frequency range from 300 MHz to 3GHz intended to be operated while held next to the ear.

4.1 General requirements

The test shall be performed in a laboratory with an environment which avoids influence on SAR measurements by ambient EM sources and any reflection from the environment itself. The ambient temperature shall be in the range of 20°C to 24°C during the test.

4.2 Phantom requirements

The phantom is a simplified representation of the human anatomy and comprised of material with electrical properties similar to the corresponding tissues. The physical characteristics of the phantom model shall resemble the head and the neck of a user since the shape is a dominant parameter for exposure.

The shell of the phantom shall be made of low permittivity material and the thickness tolerance shall be ±0.2mm. Additionally the phantom shall enable to simulate both right and left hand operation of the device under test.

For the measurements the Specific Anthropomorphic Mannequin (SAM) which meet these requirements, shall be used.

4.3 Brain & Muscle Simulating Mixture Characterization

The brain and muscle mixtures consist of a viscous gel using hydroxethylcellullose (HEC) gelling agent and saline solution. Preservation with a bacteriacide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 have been incorporated in the following table. Other head and body tissue parameters that have not bee specified in P1528 are derived from the issue dielectric parameters computed from the 4-Cole-Cole equations.

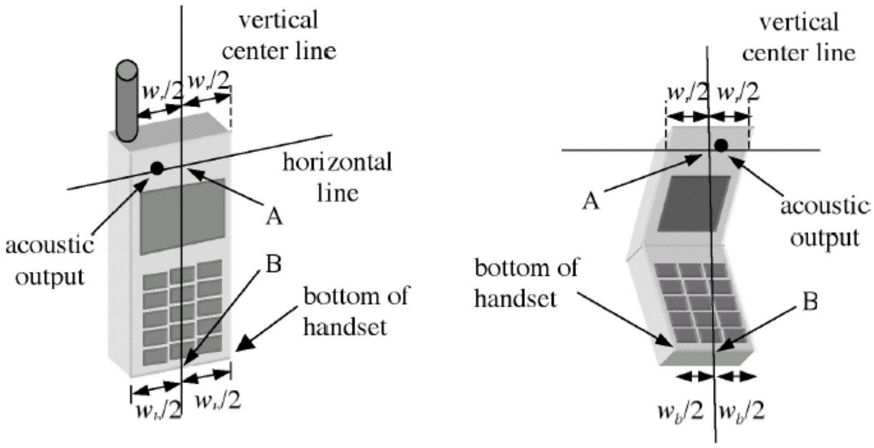
Composition of the Brain & Muscle Tissue Equivalent Matter

INGREDIENTS	SIMULATING TISSUE (%)			
	835MHz Brain	835MHz Muscle	1900MHz Brain	1900MHz Muscle
Water	40.29	50.75	55.24	70.17
DGBE	0	0	44.45	29.44
Sugar	57.90	48.21	0	0
Salt	1.38	0.94	0.31	0.39
Cellulose	0.24	0.00	0	0
Preventol	0.18	0.10	0	0

4.4 Test positions

As it cannot be expected that the user will hold the mobile phone exactly in one well defined position, different operational conditions shall be tested, the IEEE standard requires two test positions. For an exact description helpful geometrical definitions are introduced and shown in the below figure.

There are two imaginary lines on the mobile, the vertical centerline and the horizontal line. The vertical centerline passes though two points on the front side of the handset: the midpoint of the width w_t of the handset at the level of the acoustic output (point A on the below figure), and the midpoint of the width w_b of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The two lines intersect at point A.

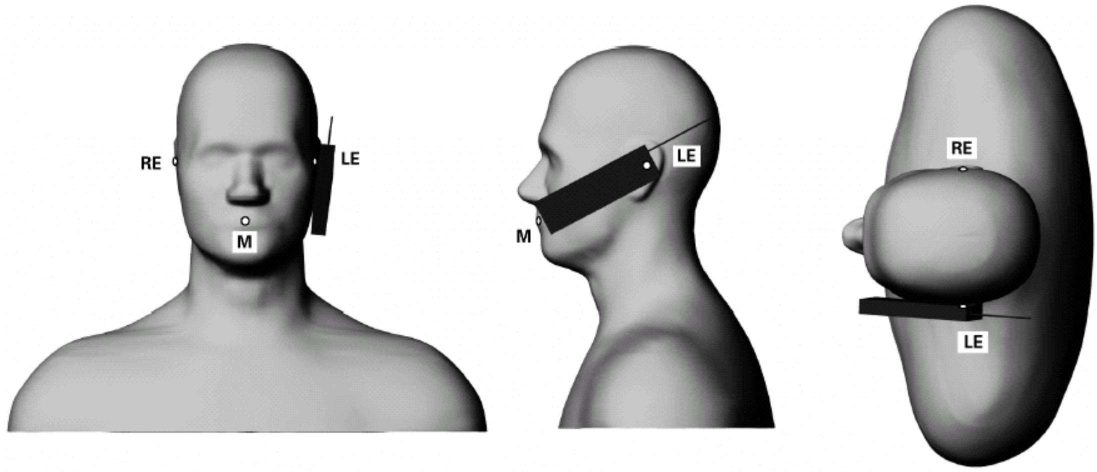


According to below the human head position is given by means of the following three reference points: auditory canal opening of both ears (RE and LE) and the center of the closed moth (M). The ear reference points are 15-17 mm above the entrance t the ear canal along the BM line (back-month), as shown in the below figure. The plane passing through the two ear canals and M is defined as the reference plane. The line NF (Neck-Front) perpendicular to the reference plane and passing through the RF (or LE) is called the reference pivoting line. Line BM is perpendicular to the NF line. With these definitions the test positions are given by:

- Cheek position:

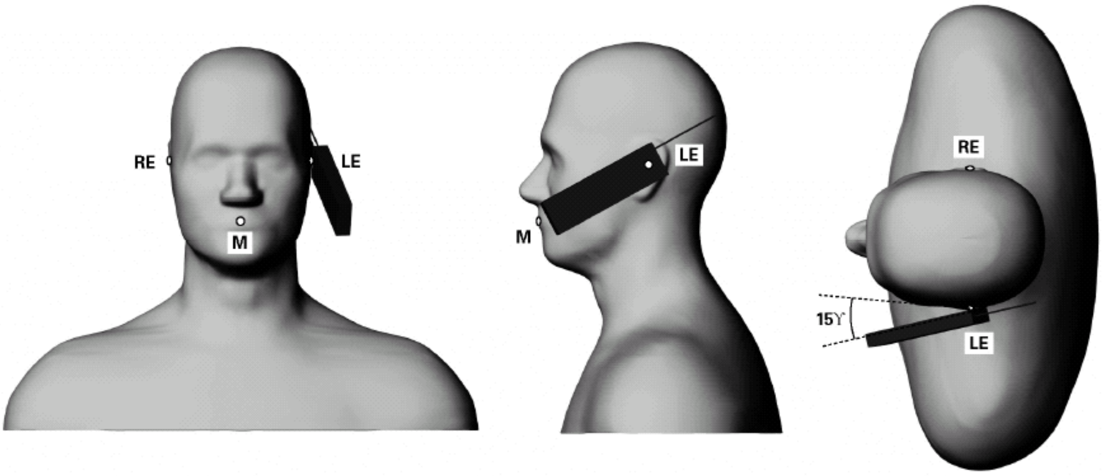
Position the handset close to the surface of phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom, such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom. Translate the handset towards the phantom along the line passing through RE and LE until the handset touches the ear. While maintaining the handset in this plane, rotate it around handset touches the ear. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to MB-NF including the line MB (called the reference plane). Rotate the phone around the vertical centerline until the phone (horizontal line) is symmetrical with respect to the line NF. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the phone contact with the ear, rotate the handset about the line NF until any point any point on the handset is in contact with a phantom point below the ear.

The cheek position:



➢ Tilted position:

While maintaining the orientation of the phone, retract the phone parallel to the reference plane, which is far enough to enable a rotation of the phone by 15°. Rotate the phone around the horizontal line by 15°. While maintaining the orientation of the phone, move the phone parallel to the reference plane until any part of the phone touches the head. In this position, point A will be located on the line RE-LE.



- Body position:

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. A device with a headset output is tested with a headset connected to the device.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are test for SAR compliance with the front of the device positioned to face the flat phantom in brain fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worst-case positioning is then documented and used to perform Body SAR testing.

In this test case, a belt position maintained a distance of approximately 1.5 cm between the back of the device and the flat phantom. The device was placed under the flat section of the phantom and suspended. The device is not provided with belt- clip.

5 TEST PROCEDURE

5.1 Test Equipment List

DASY is an abbreviation of "**D**osimetric **A**ssessment **Sy**stem" and describes a system that is able to determine the SAR distribution inside a phantom of a human being according to different standards. The DASY4 system consists of the following items:

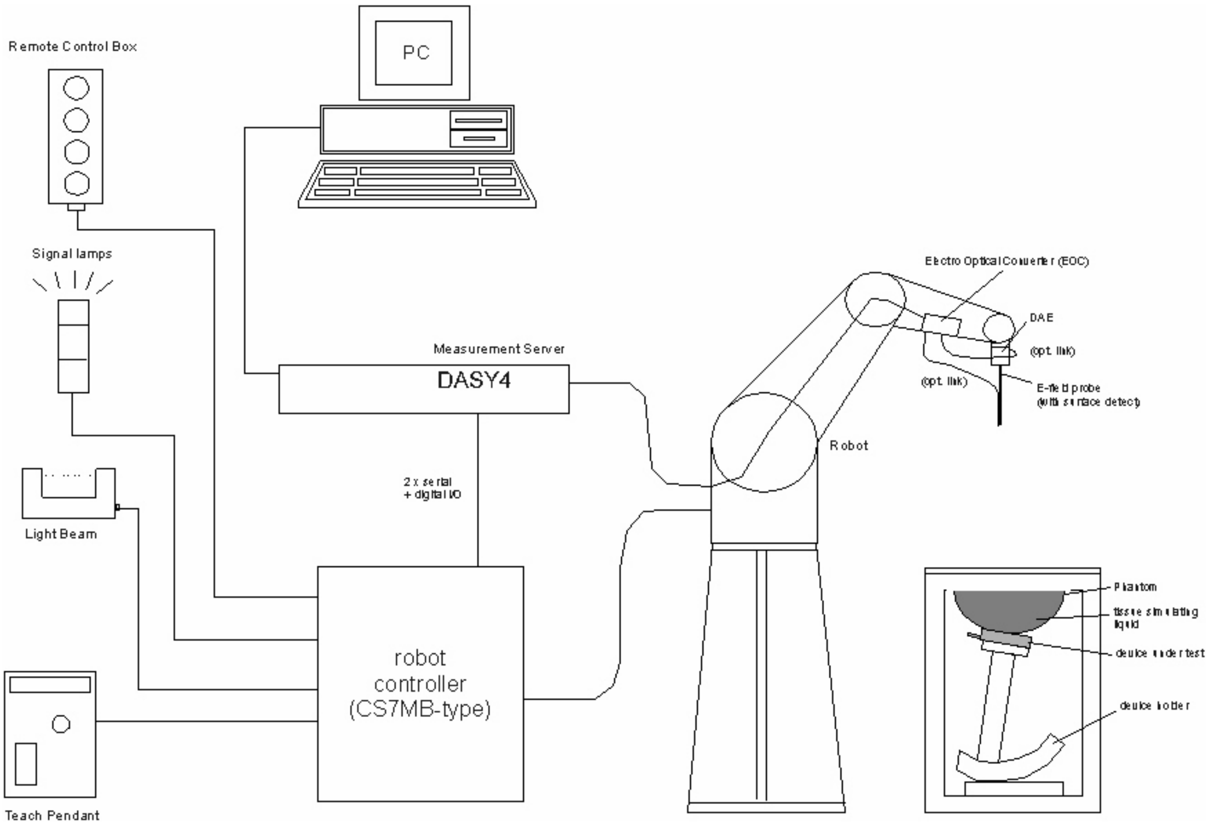
TYPE	ITEM	S/N	CALIBRATION DATE	DUE DATE
CMU200	Wireless Communication Test Set	109172	2008-04-08	2009-04-07
E5515C	Wireless Communication Test Set	GB44400824	N.A	N.A
ES3DV3	probe	3109	2007-11-12	2008-11-11
SD000D04BC	DAE4	685	2007-11-08	2008-11-07
D835V2	dipole	4d038	2007-11-12	2008-11-11
D1900V2	dipole	5d072	2007-11-13	2008-11-12
NRVD	Power Meter	83584310014	2007-12-14	2008-12-13
SME03	Signal Generator	100029	2007-12-27	2008-12-26
NRV-Z4	Power Sensor	100381	2007-09-27	2008-09-26
NRV-Z2	Power Sensor	100211	2007-09-27	2008-09-26
8491B	Attenuator	MY39262528	NA	NA
8491B	Attenuator	MY39262663	NA	NA
8491B	Attenuator	MY39262640	NA	NA
8491B	Attenuator	MY39262638	NA	NA
778D	Dual directional coupler	20040	NA	NA
E3640A	DC Power Supply	MY40008487	2007-08-14	2008-08-13
85070E	Probe kit	MY44300214	N.A.	N.A.
E5071C	Network Analyzer	MY46102372	2007-09-29	2008-09-28

The certifications of DASY4 E-field probe and dipole are attached in the annex document No. DCP-BEJLM-TSRP-080035c.1-A01.

For conducted power testing, CMU200 SN: 109172 is used, and for communicating with the DUT in testing, E5515C SN: GB44400824 is used.

5.2 Test System Setup

Tests are performed in setup according to the scheme below:



5.3 Measurement Procedure

The following steps are used for each test position:

1. The SAR measurement was taken at a selected spatial reference point to monitor power variations during testing. This fixed location point was measured and used as a reference value.

2. The SAR distribution at the exposed side of the head was measured at a distance of 3.9mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm x 15mm.

3. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation. Around this point, a volume of 32mm x 32mm x 30mm (fine resolution volume scan, zoom scan) was assessed by measuring 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

a. The data at the surface was extrapolated, since the center of the dipoles is 2.7mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated

through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions). The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR reference value, at the same location as procedure #1, was remeasured. If the value changed by more than 5%, the evaluation is repeated.

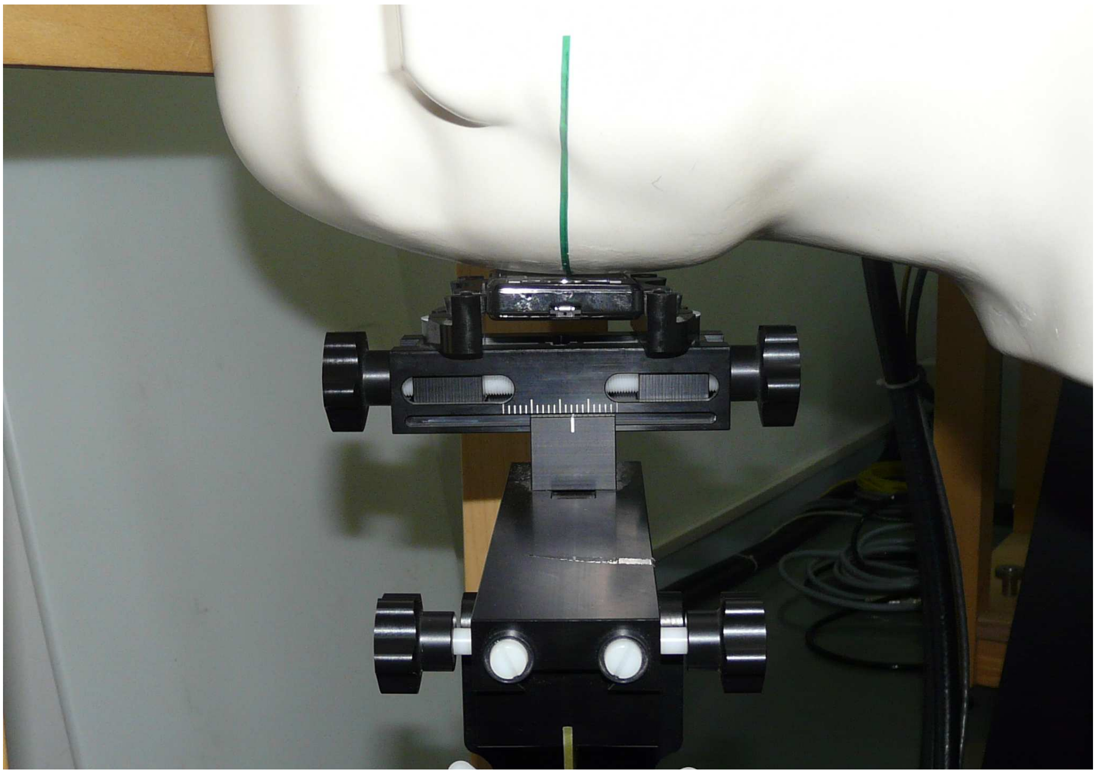
5.4 Test to be performed

The SAR test shall be performed with both phone positions described above, on the left and right side of the phantom. The devices shall be measured for all modes operation when the device is next to the ear, even if the different models operate in the same frequency band. First the SAR test shall be performed using the center frequency of each available operating band and mode with the maximum peak power level. At the device position with highest SAR (check or tilted, left and right), the test is repeated at lowest and highest frequency. In addition, for all other device positions respectively configurations where the spatial peak SAR value is within 2dB of the 1.6W/kg limit, the lowest and highest frequencies should be tested.

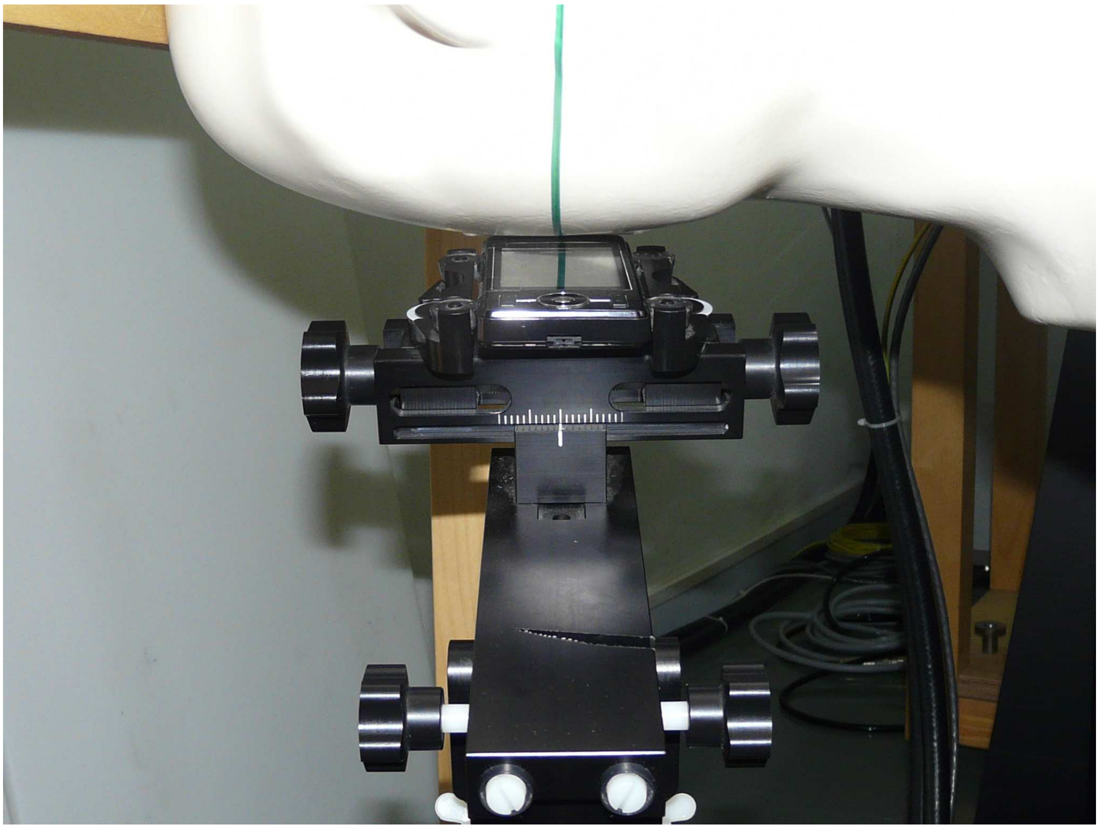
For devices with retractable antenna all of the tests described above shall be performed with the antenna fully extended and fully retracted. Other factors that may affect the exposure should also be tested. For example, optional antennas or optional battery packs which may significantly change the volume, lengths, flip open/closed, etc. of the device, or any other accessories which might have the potential to considerably increase the peak spatial-average SAR value.

5.5 Test positions for device under test

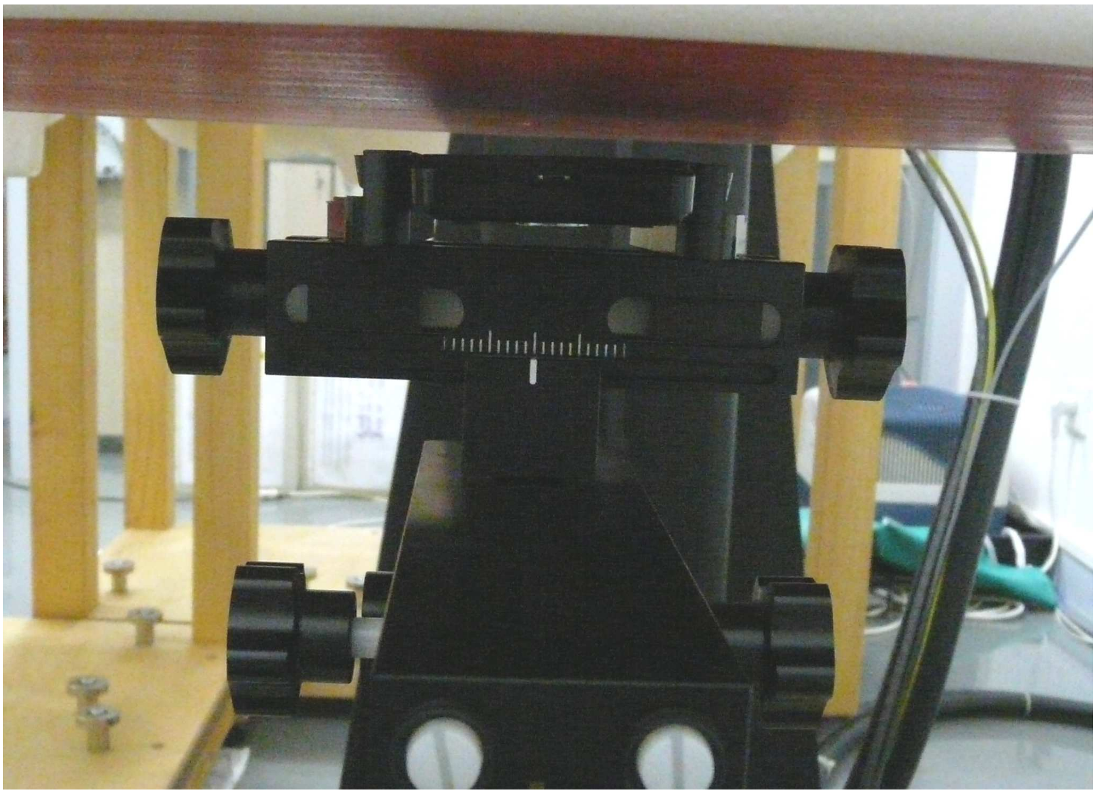
Head SAR touch position:



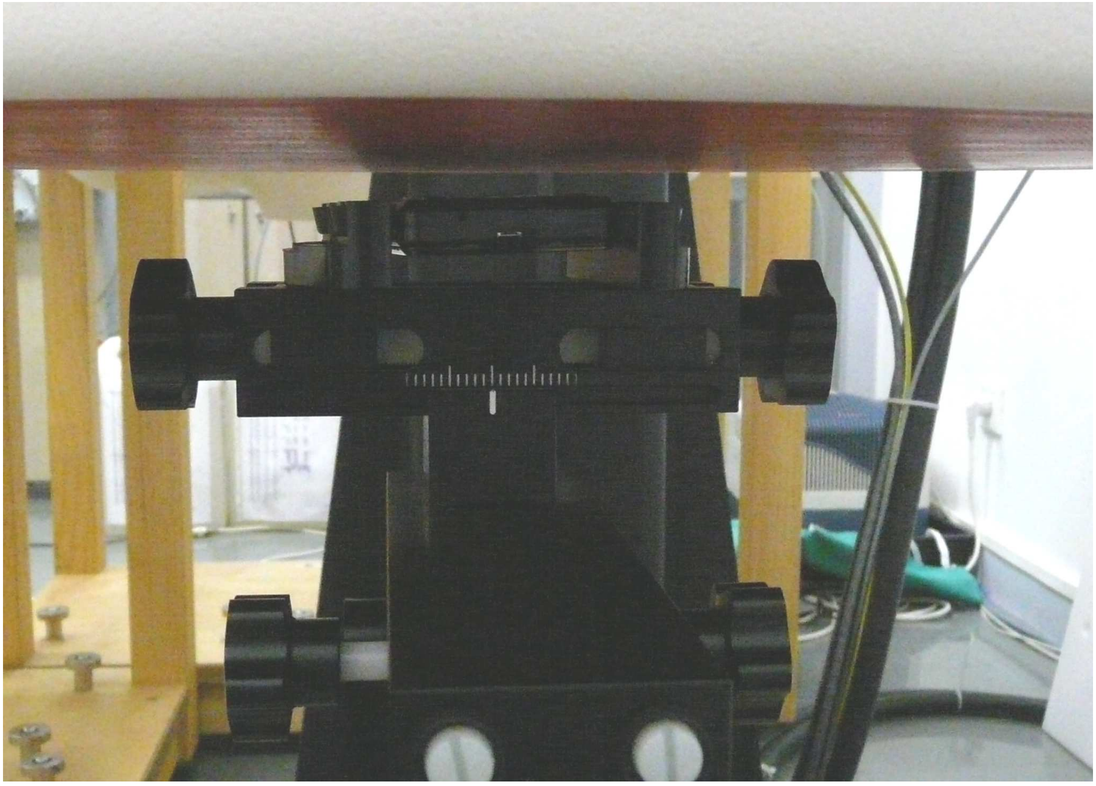
Head SAR tilt position:



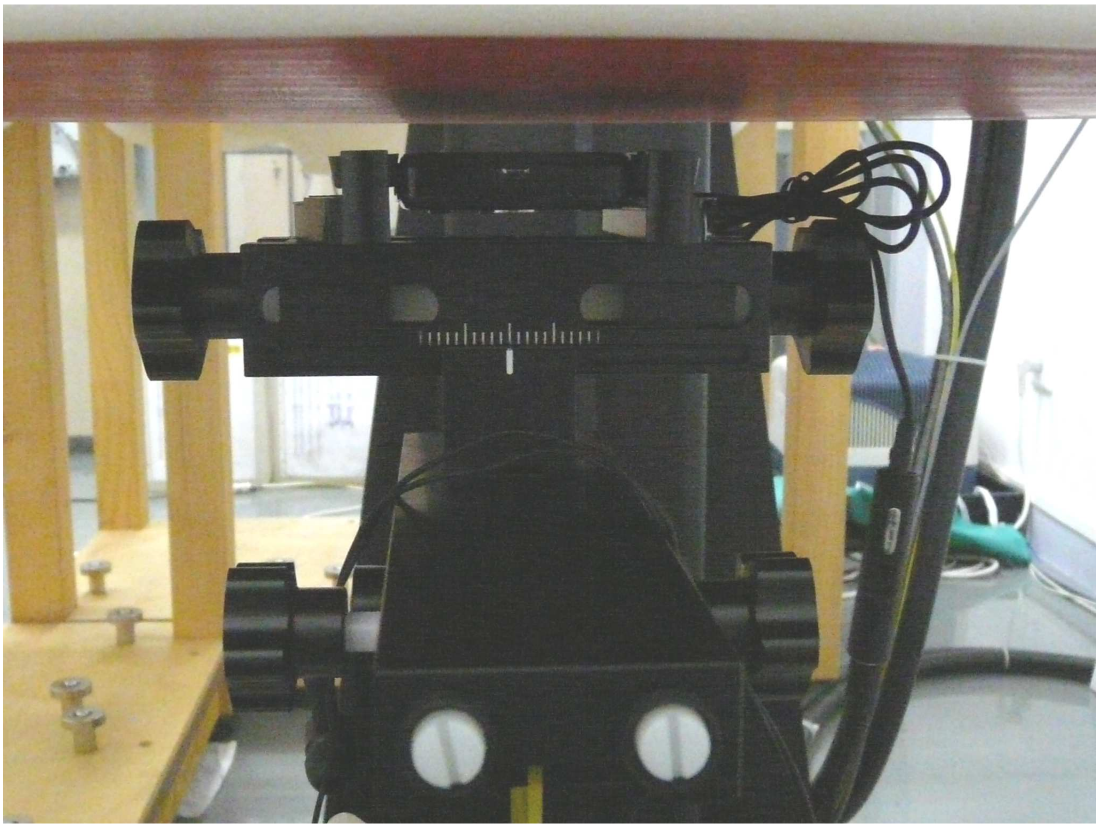
Body SAR front position:



Body SAR back position



Body SAR back position with accessory



5.6 Test environment

	Ambient humidity (%)	Ambient temperature (°C)	Liquid temperature (°C)
standard	30~~70	19~~25	20~~24
Date: 2008-06-11	51	23	21.9
Date: 2008-06-19	56	23	22.4

5.7 Liquid parameters

Prior to conducting SAR measurements, the relative permittivityε_r, and the conductivityσ, of the tissue simulating liquids were measured with the Dielectric Probe Kit These values of the tissue simulate are shown in the table below. The recommended limits for maximum permittivity and minimum conductivity are also shown.

Date: 2008-06-11

Frequency	Tissue Type	Type	Dielectric Parameters	
			permittivity	Conductivity (S/m)
835 MHz	Head	Target	41.5	0.90
		±5% window	39.425~43.575	0.855~0.945
		Measured	40.8	0.888

Date: 2008-06-11

Frequency	Tissue Type	Type	Dielectric Parameters	
			permittivity	Conductivity (S/m)
835 MHz	Body	Target	55.0	0.97
		±5% window	52.25~57.75	0.92~1.02
		Measured	53.6	0.975

Date: 2008-06-19

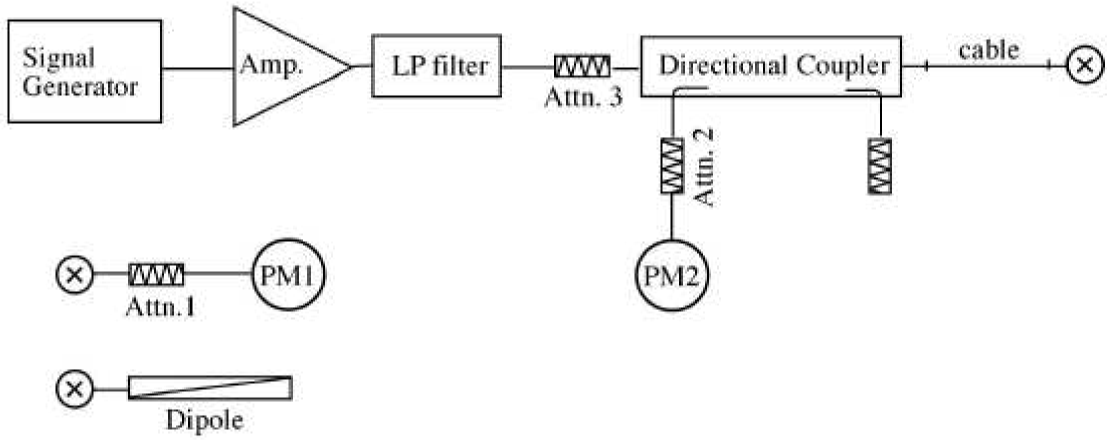
Frequency	Tissue Type	Type	Dielectric Parameters	
			permittivity	Conductivity (S/m)
1900 MHz	Head	Target	40.0	1.38
		±5% window	38.00~42.00	1.33~1.47
		Measured	39.7	1.45

Date: 2008-06-19

Frequency	Tissue Type	Type	Dielectric Parameters	
			permittivity	Conductivity (S/m)
1900 MHz	Body	Target	53.3	1.52
		±5% window	50.635~55.965	1.444~1.596
		Measured	52.5	1.53

5.8 System performance check

A system check measurement was made following the determination of the dielectric parameters of the tissue simulating liquids using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. For power setup, please see the following pictures:



The figure shows the recommended setup. The PM1 (incl. Att1) measures the forward power at the location of the system performance check dipole connector. The signal generator is adjusted for the desired forward power at the dipole connector and the power meter PM2 is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2. The system checking results are given in the table below. Please see Annex B for detailed report.

Date:	Tissue	Input Power (mW)	Targeted SAR_{1g} (mW/g)	Measured SAR_{1g} (mW/g)	Deviation (%) (<±10%)
2008-06-11	835MHz Head	250	2.38	2.36	-0.8
2008-06-11	835 MHZ Body	250	2.39	2.48	3.7
2008-06-19	1900 MHz Head	250	9.85	10.6	7.6
2008-06-19	1900 MHz Body	250	9.41	10.3	9.5

5.9 Conducted power

The conducted power has been compensated with cable loss and connector loss.

GSM 1900	Cable loss [dB]	Channel	Channel 512[low] 1850.2 MHz	Channel 661[Mid] 1880.0 MHz	Channel 810 [high] 1909.8 MHz
	0.6	Conducted power [dBm]	29.2	28.8	28.5
GSM 850	Cable loss [dB]	Channel	Channel 128 [low] 824.20 MHz	Channel 190 [mid] 836.60 MHz	Channel 251 [high] 848.80 MHz
	0.3	Conducted power [dBm]	32.2	32.3	31.9

6 SAR RESULTS AND EVALUATION

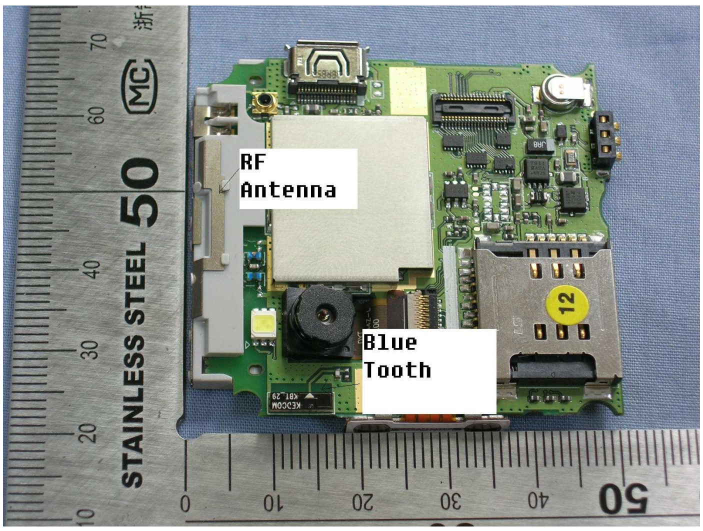
6.1 Measurement Result

Liquid tissue depth is 15.1±0.1 cm.

The Device has the 750mAH model MEGA4 as the only battery option. This battery was used to do all of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery.

For head SAR, the device should be tested on the left and right side of the head phantom in the “Cheek/Touch” and “Ear/Tilt” positions, and for body SAR the device should be tested back and front positions to the flat phantom. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tile/Ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

The mobile phone has Bluetooth function and can transmit with GSM simultaneously. According to FCC KDB publication 648474, If the closest separation distance between the GSM and BT antenna is less than 2.5cm, and if the max 1-gram GSM SAR is less than 1.2W/kg, then no stand-alone BT SAR is required and no simultaneous transmission (BT+GSM) is required. The antenna distance is shown in the next picture:



6.2 Test results

6.2.1 Head SAR test results

GSM 850

Test configuration	Test position	SAR$_{1g}$ [W/kg] / Power Drift [dB]		
		Channel 128[low] 824.20 MHz	Channel 190[Mid] 836.60 MHz	Channel 251 [high] 848.80 MHz
Left side of Head	Cheek	**1.06 / -0.0365**	0.89 / -0.0185	0.708 / 0.0478
	Tilted	- / -	0.534 / 0.0283	- / -
Right side of Head	Cheek	1.04 / -0.139	0.872 / 0.0988	0.672 / 0.039
	Tilted	- / -	0.605 / -0.199	- / -

GSM 1900

Test configuration	Test position	SAR$_{1g}$ [W/kg] / Power Drift [dB]		
		Channel 512 [low] 1850.2 MHz	Channel 661 [Mid] 1880.0 MHz	Channel 810 [high] 1909.8 MHz
Left side of Head	Cheek	0.773 / 0.0638	0.863 / -0.0812	0.865 / -0.0469
	Tilted	- / -	0.296 / -0.0575	- / -
Right side of Head	Cheek	0.874 / -0.0107	1.01 / -0.0319	**1.11 / -0.102**
	Tilted	- / -	0.314 / -0.0453	- / -

6.2.2 Body SAR test results

GSM 850

Test configuration	Test position	SAR$_{1g}$ [W/kg] / Power Drift [dB]		
		Channel 128[low] 824.20 MHz	Channel 190[Mid] 836.60 MHz	Channel 251 [high] 848.80 MHz
Front side	15mm	- / -	0.276 / -0.173	- / -
Back side	15mm	**0.415 / -0.0323**	0.347 / -0.0401	0.251 / 0.152
Back side with earphone	15mm	- / -	0.296 / -0.0733	- / -

GSM 1900

Test configuration	Test position	SAR_{1g} [W/kg] / Power Drift [dB]		
		Channel 512 [low] 1850.2 MHz	Channel 661 [Mid] 1880.0 MHz	Channel 810 [high] 1909.8 MHz
Front side	15mm	- / -	0.123 / -0.0149	- / -
Back side	15mm	0.231 / 0.0539	0.259 / -0.105	**0.274 / -0.0124**
Back side with earphone	15mm	- / -	0.231 / 0.141	- / -

6.3 Summary and comparison to the limit

All test results are passed the uncontrolled SAR limit of 1.6W/kg.

6.4 Detailed Measurement Report

6.4.1 Maximum head SAR of GSM 850

File Name: MEGA4-FCC 11-GSM850-LC-20080611-4.108v.da4

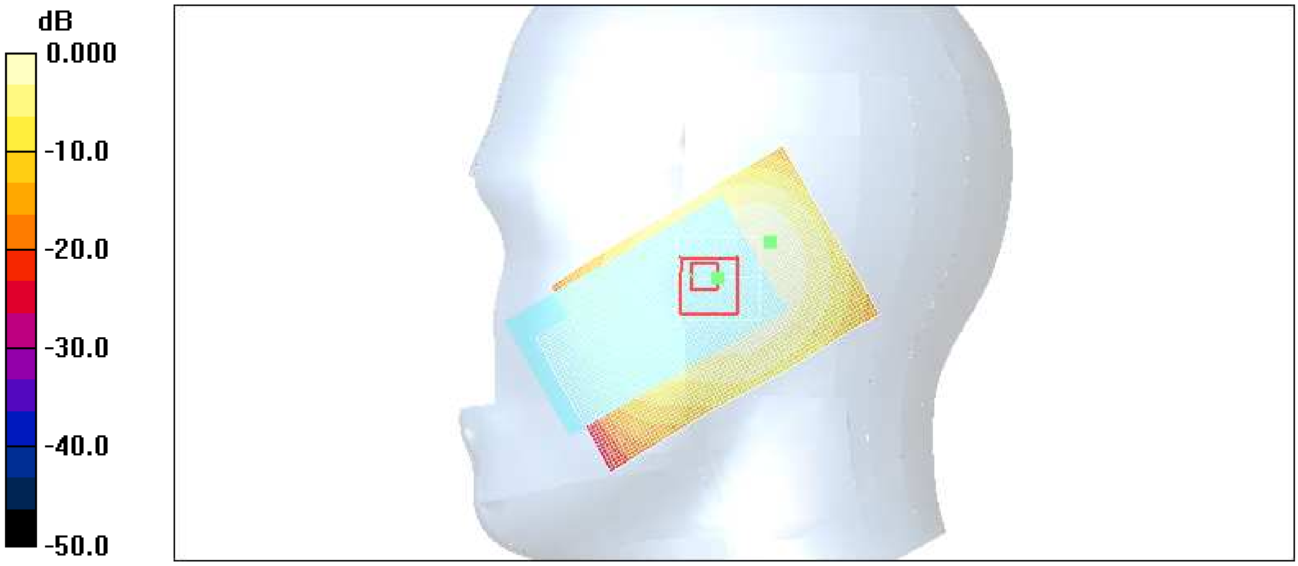
DUT: MEGA4

Communication System: GSM850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3
Medium parameters used: f = 825 MHz; σ = 0.882 mho/m; ε_r = 41.5; ρ = 1000 kg/m^3 ;
Medium Notes: Ambient humidity:51; Ambient temperature: 23.0; Liquid temperature: 21.9;
Phantom section: Left Section ;Phantom: SAM with Front;Type: QD 000 P40 CA

DASY4 Configuration:
- Probe: ES3DV3 - SN3109; ConvF(6.02, 6.02, 6.02); Calibrated: 2007-11-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn685; Calibrated: 2007-11-8
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 171

low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.6 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.786 mW/g
Maximum value of SAR (measured) = 1.12 mW/g

low/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.09 mW/g



0 dB = 1.09mW/g

6.4.2 Maximum body SAR of GPRS 850

File Name: MEGA4-11-GPRS850-BB-20080611-4.097.da4

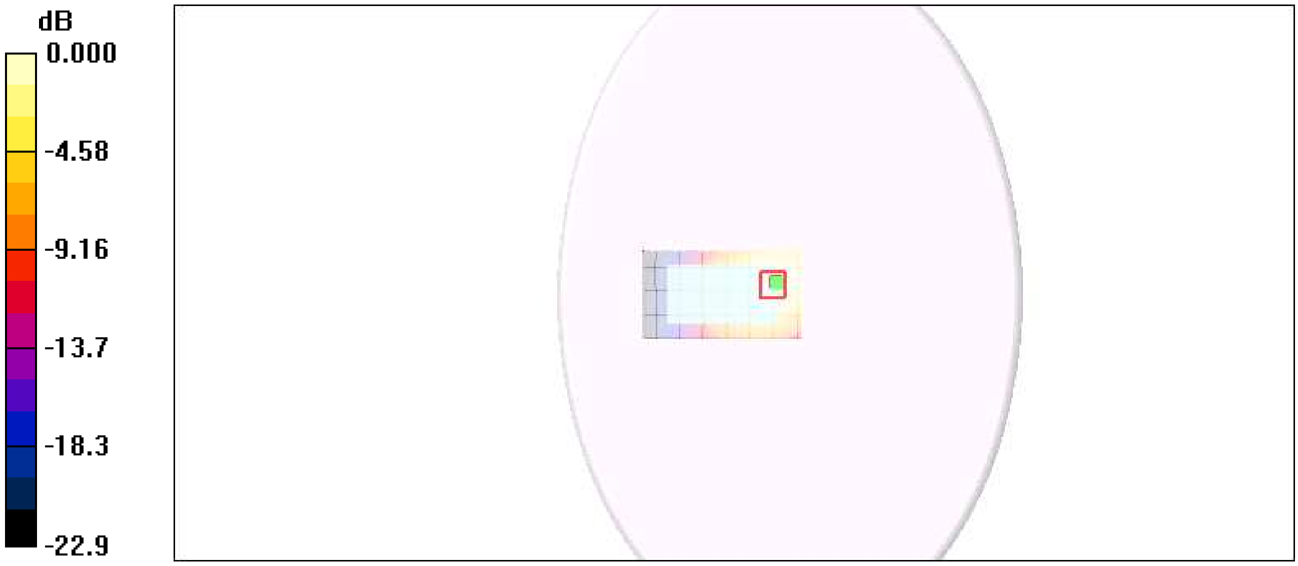
DUT: MEGA4

Communication System: GPRS850 class 8; Frequency: 824.2 MHz; Duty Cycle: 1:8.3
Medium parameters used: f = 825 MHz; σ = 0.967 mho/m; ε_r = 53.7; ρ = 1000 kg/m^3 ;
Medium Notes: Ambient humidity:51; Ambient temperature: 23; Liquid temperature: 21.9;
Phantom section: Flat Section ;Phantom: Flat Phantom ELI4.0;Type: QDOVA001BA

DASY4 Configuration:
- Probe: ES3DV3 - SN3109; ConvF(5.82, 5.82, 5.82); Calibrated: 2007-11-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn685; Calibrated: 2007-11-8
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 171

low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.0 V/m; Power Drift = -0.032 dB
Peak SAR (extrapolated) = 0.555 W/kg
SAR(1 g) = 0.415 mW/g; SAR(10 g) = 0.295 mW/g
Maximum value of SAR (measured) = 0.442 mW/g

low/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.448 mW/g



0 dB = 0.448mW/g

6.4.3 Maximum head SAR of GSM 1900

File Name: MEGA4-FCC 11-GSM1900-RC-20080619.da4

DUT: MEGA4;

Communication System: PCS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1909.8 MHz; σ = 1.46 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3 ;
Medium Notes: Ambient humidity:56; Ambient temperature: 23.0; Liquid temperature: 22.4;
Phantom section: Right Section ;Phantom: SAM with Right;Type: QD 000 P40 CA

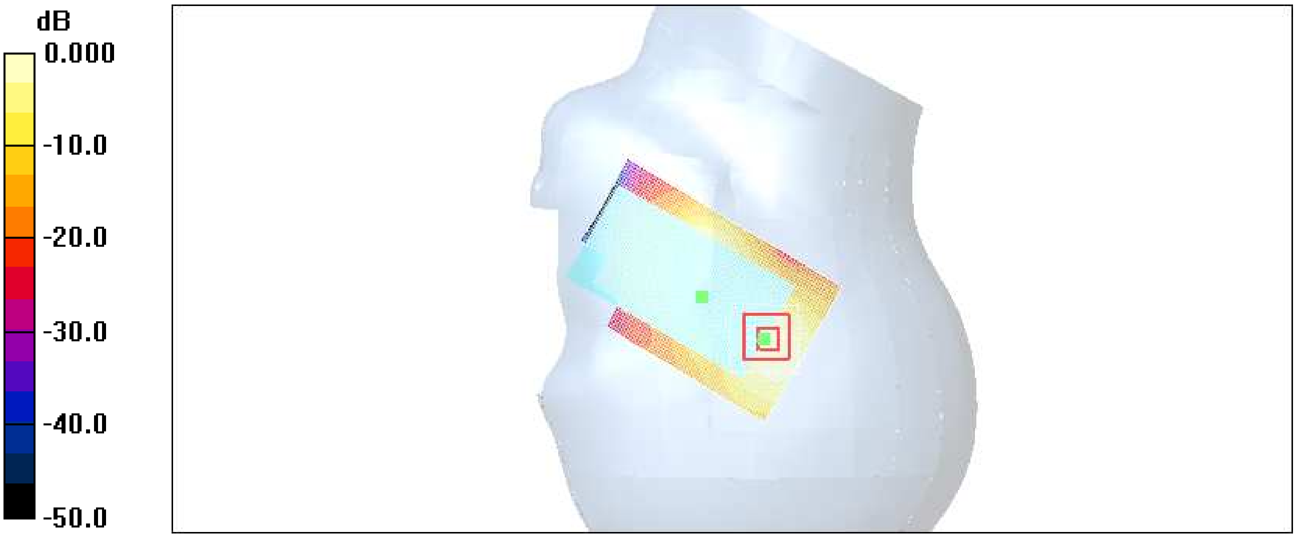
DASY4 Configuration:
- Probe: ES3DV3 - SN3109; ConvF(4.63, 4.63, 4.63); Calibrated: 2007-11-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn685; Calibrated: 2007-11-8
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 171

high/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.5 V/m; Power Drift = -0.102 dB
Peak SAR (extrapolated) = 2.00 W/kg
SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.583 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.24 mW/g

high/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.28 mW/g



0 dB = 1.28mW/g

6.4.4 Maximum body SAR of GPRS 1900

File Name: MEGA4-fcc 11-GPRS1900-BB-20080619.da4

DUT: MEGA4;

Communication System: GPRS 1900 class 8; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1909.8 MHz; σ = 1.55 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ;
Medium Notes: Ambient humidity:56; Ambient temperature: 23.0; Liquid temperature: 22.4
Phantom section: Flat Section ;Phantom: Flat Phantom ELI4.0;Type: QDOVA001BA

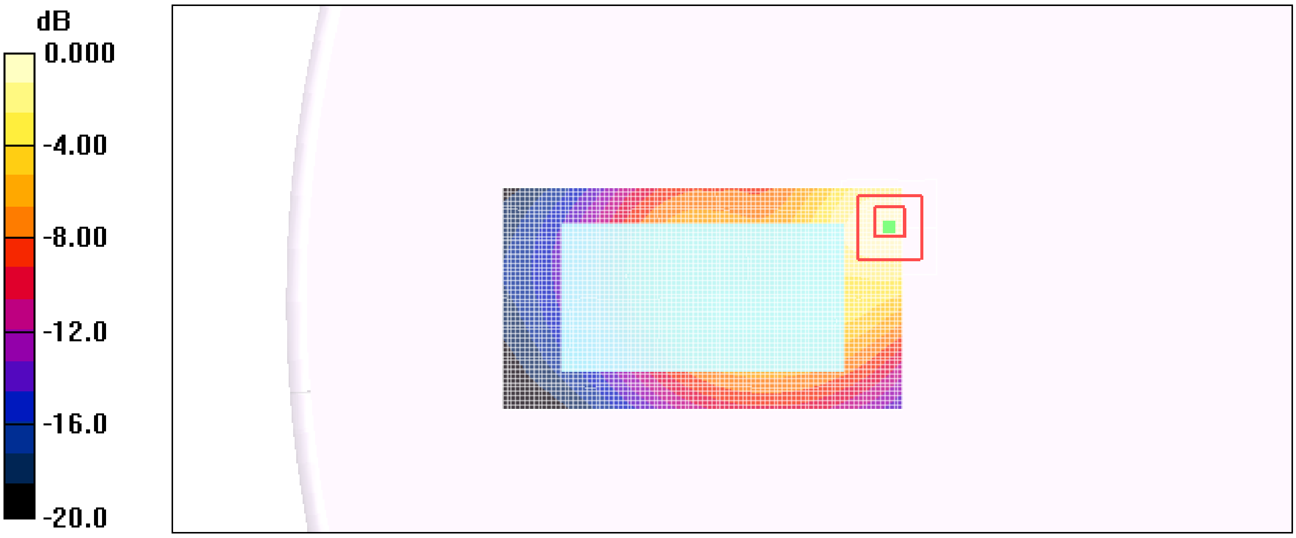
DASY4 Configuration:
- Probe: ES3DV3 - SN3109; ConvF(4.41, 4.41, 4.41); Calibrated: 2007-11-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn685; Calibrated: 2007-11-8
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 171

high/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.89 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 0.457 W/kg
SAR(1 g) = 0.274 mW/g; SAR(10 g) = 0.160 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.297 mW/g

high/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.288 mW/g



0 dB = 0.288mW/g

6.5 System performance check report

File Name: SystemPerformanceCheck-D1900MHz-20080619.da4

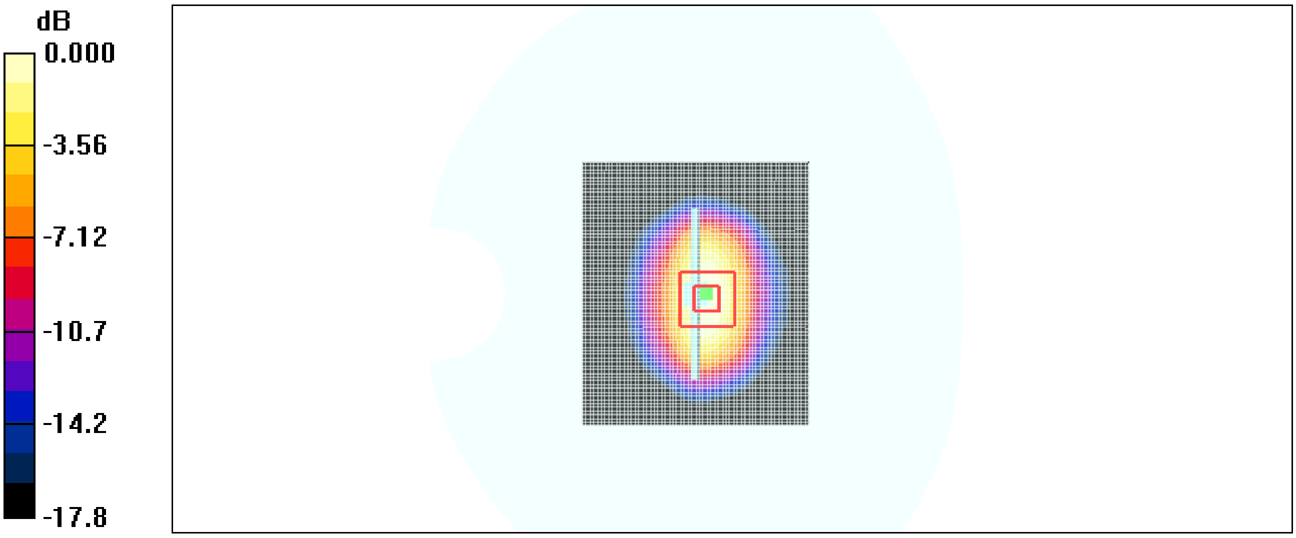
DUT: Dipole 1900 MHz;

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.45 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3 ;
Medium Notes: Ambient humidity:56; Ambient temperature: 23.0; Liquid temperature: 22.4;
Phantom section: Flat Section ;Phantom: SAM with Right;Type: QD 000 P40 CA

DASY4 Configuration:
- Probe: ES3DV3 - SN3109; ConvF(4.63, 4.63, 4.63); Calibrated: 2007-11-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn685; Calibrated: 2007-11-8
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 171

head1900/Area Scan (61x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.3 mW/g

head1900/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.6 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 19.8 W/kg
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.47 mW/g
Maximum value of SAR (measured) = 11.9 mW/g



0 dB = 11.9mW/g

File Name: SystemPerformanceCheck-body-D1900MHz-20080619.da4

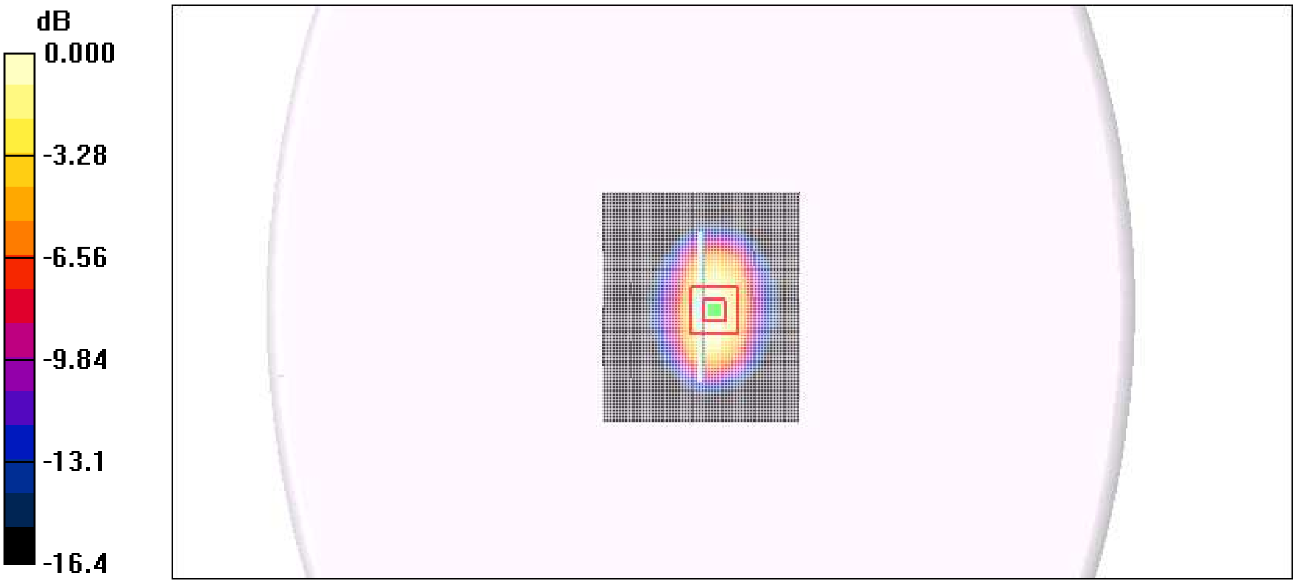
DUT: Dipole 1900 MHz;

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 ;
Medium Notes: Ambient humidity:56; Ambient temperature: 23.0; Liquid temperature: 22.4;
Phantom section: Flat Section ;Phantom: Flat Phantom ELI4.0;Type: QDOVA001BA

DASY4 Configuration:
- Probe: ES3DV3 - SN3109; ConvF(4.41, 4.41, 4.41); Calibrated: 2007-11-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn685; Calibrated: 2007-11-8
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 171

head1900/Area Scan (61x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.0 mW/g

head1900/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 78.6 V/m; Power Drift = -0.018 dB
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.42 mW/g
Maximum value of SAR (measured) = 11.6 mW/g



0 dB = 11.6mW/g

File Name: SystemPerformanceCheck-D835Mhz-080611.da4

DUT: Dipole 835 MHz

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 835 MHz; σ = 0.888 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3 ;
Medium Notes: Ambient humidity:51; Ambient temperature: 23.0; Liquid temperature: 21.9;
Phantom section: Flat Section ;Phantom: SAM with Front;Type: QD 000 P40 CA

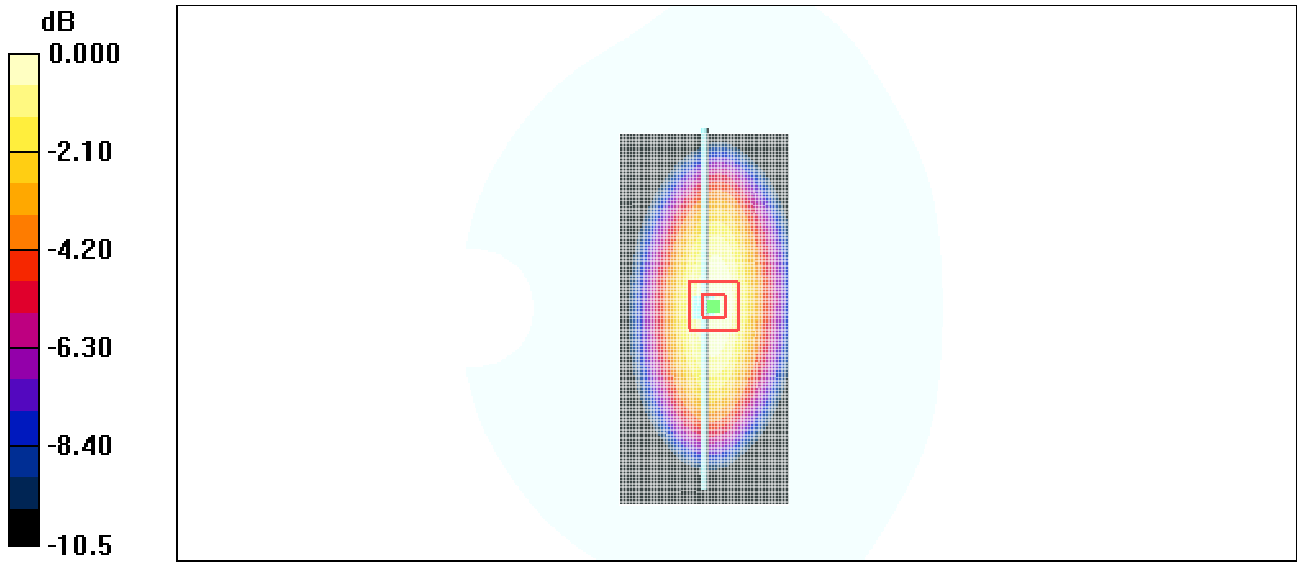
DASY4 Configuration:
- Probe: ES3DV3 - SN3109; ConvF(6.02, 6.02, 6.02); Calibrated: 2007-11-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn685; Calibrated: 2007-11-8
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 171

2008-06-11/Area Scan (51x111x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 2.59 mW/g

2008-06-11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.1 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 3.48 W/kg
SAR(1 g) = 2.36 mW/g; SAR(10 g) = 1.54 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.55 mW/g



0 dB = 2.55mW/g

File Name: SystemPerformanceCheck-body-D835MHz-20080611.da4

DUT: Dipole 835 MHz

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 835 MHz; σ = 0.975 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3 ;
Medium Notes: Ambient humidity:51; Ambient temperature: 23; Liquid temperature: 21.9;
Phantom section: Flat Section ;Phantom: Flat Phantom ELI4.0;Type: QDOVA001BA

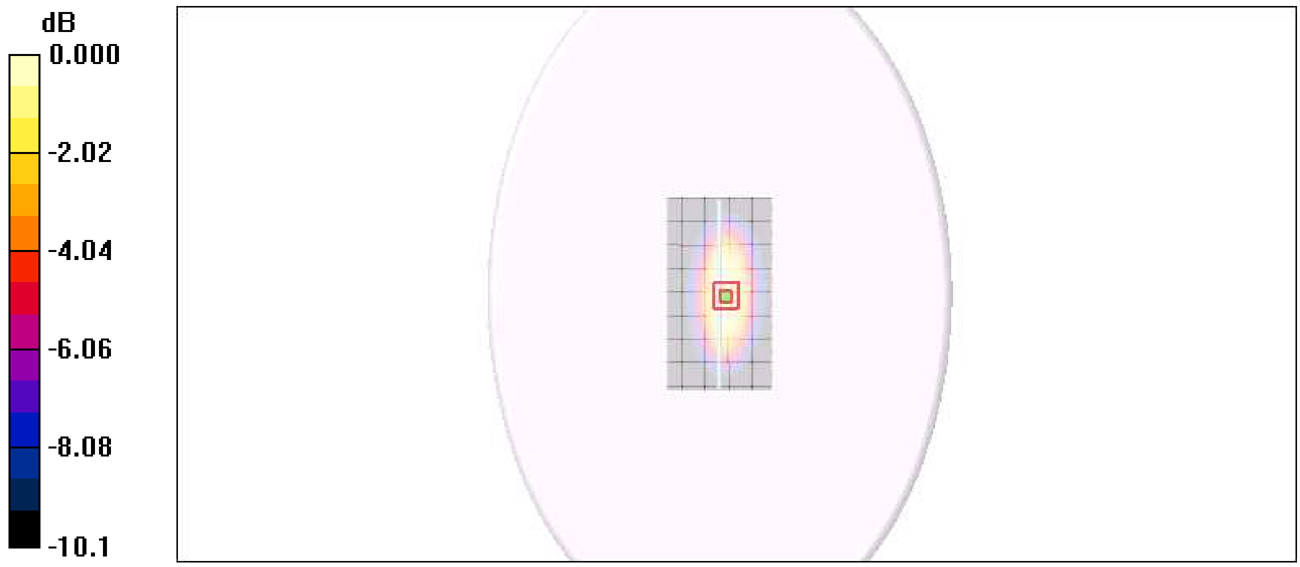
DASY4 Configuration:
- Probe: ES3DV3 - SN3109; ConvF(5.82, 5.82, 5.82); Calibrated: 2007-11-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn685; Calibrated: 2007-11-8
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 171

MSL/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 2.66 mW/g

MSL/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.9 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 3.59 W/kg
SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.64 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.68 mW/g



0 dB = 2.68mW/g

7 UNCERTAINTY BUDGET

It includes the uncertainty budget suggested by the [IEEE P1528] and determined by Schmid & Partner Engineering AG. **The expanded uncertainty (K=2) is assessed to be ±22.0%**.

Error Source	Type	Uncertainty Value (%)	Probability Distribution	ci	Standard Uncertainty (%) u_i' (%)	Degree of freedom Veff or vi
System repetivity	A	0.5	N	1	1.5	4
Measurement system						
—probe calibration	B	5.9	N	1	5.9	∞
—axial isotropy of the probe	B	4.7	R	0.7	1.9	∞
—hemisphere isotropy of the probe	B	9.6	R	0.7	3.9	
—boundary effect	B	0.4	R	1	0.6	∞
—probe linearity	B	4.7	R	1	2.7	∞
—detection limit	B	1.0	R	1	0.6	∞
—Readout Electronics	B	1.0	N	1	0.3	∞
—response time	B	0.8	R	1	0.5	∞
—integration time	B	2.6	R	1	1.5	∞
—RF Ambient Noise	B	3.0	R	1	1.7	∞
—RF Ambient Reflections	B	3.0	R	1	1.7	∞
—Probe Positioning	B	0.4	R	1	0.2	∞
—Probe Positioning	B	2.9	R	1	1.7	∞
—Max. SAR Eval.	B	1.0	R	1	0.6	∞
Test Sample Related						
—Device Positioning	B	2.9	N	1	2.9	145
—Device Holder	B	3.6	N	1	3.6	∞
—Power Drift	B	5.0	R	1	2.9	∞
Phantom and setup						
—Phantom uncertainty	B	4.0	R	1	2.3	∞
—liquid conductivity (deviation from target)	B	5.0	R	0.64	1.8	∞
—liquid conductivity(measurement error)	B	2.5	N	0.64	1.6	∞
—liquid permittivity(deviation from target)	B	5.0	R	0.6	1.7	∞
—liquid permittivity(measurement error)	B	2.5	N	0.6	1.5	∞
—Combined Std. Uncertainty					11.0	∞
Expanded STD Uncertainty					22.0	∞

8 REFERENCE DOCUMENT

The DUT has been tested at Flextronics Mobile Test Laboratory according to the reference documents given below.

[1] Federal Communications Commission: Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields, Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01), FCC, 2001.

[2] IEEE Std C95.1-1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, Inst. of Electrical and Electronics Engineer, Inc., 1999.

[3] IEEE Std 1528-2003: IEEE Recommended Practice for Determining the Peak Spatial-Average Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques. 1528-2003, December 19, 2003.the Institute of Electrical and Electronics Engineers.

[4] Schmid & Partner Engineering AG, DASY4 Manual, February 2004 17-5