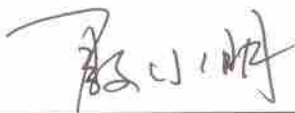


SAR TEST REPORT

No. 2012SAR109

FCC ID: Q78-ZTECQ210
Applicant: ZTE Corporation
Product: CDMA 1X Digital Mobile Phone
Model: ZTE-C Q210
HW Version: cw8C
SW Version: VE_Q210_NBTL25FV1.0.0B02

Prepared by:



Date:

2012. 6. 5

Yin Xiaoming

Reviewed by:



Date:

2012. 4. 5

Xue Jianguo

Approved by:



Date:

2012. 6. 5

Wang Jianrong

Note:

The following test results relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of the test laboratory.

General Information

Product Name	CDMA 1X Digital Mobile Phone	Model Name	ZTE-C Q210
Applicant	ZTE CORPORATION		
Manufacturer	ZTE CORPORATION		
Applicable Standard	ANSI/IEEE C95.1-2005 Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields. 3 kHz to 300 GHz		
	ANSI/IEEE C95.3-2002 Recommended Practice For Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to such Fields. 100 kHz-300 GHz		
	IEEE Std 1528™-2003: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques		
	OET Bulletin 65-(Edition 97-01) Supplement C (edition01-01) Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields---Additional Supplement C (Edition 01-01)Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions		
Test Results	Pass		

Change History

Version	Change Contents	Author	Date
V1.0	First edition	Yinxiaoming	2012-03-15
V2.0	Page 11-12, add description for head and body SAR measurements, add photo of antennas.	Yinxiaoming	2012-03-26
V3.0	Page 12, Update the photo of the distance between antennas. Page 23-24, add evaluation for head and body measurements	Yinxiaoming	2012-04-05

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1. Test Laboratory

1.1 Testing Location:

Company: Shanghai Tejet Communications Technology Co., Ltd Testing Center.
Address: Room 6205-6208, Building 6, No.399 Cailun Rd. Zhangjiang Hi-Tech Park,
Shanghai, China
Post Code : 210203
Tel: +86-21-61650880
Fax: +86-21-61650881
Website: www.tejet.cn

1.2 Laboratory Environment

Temperature 20° C ~ 25 ° C
Relative humidity 20% ~ 70%

1.3 Testing date

Test start date: 2012-03-08
Test end date: 2012-03-09

2. Client Information

2.1 Applicant information

Company Name: ZTE Corporation
Address: #55 Keji Road South , Shenzhen ,P.R.China
Post Code : 518057
Country: China
Tel: 021-68897541
Fax: 021-50801070

2.2 Manufacturer Information

Company Name: ZTE Corporation
Address: #55 Keji Road South , Shenzhen ,P.R.China
Post Code : 518057
Country: China
Tel: 021-68897541
Fax: 021-50801070

3.Equipment Under Test (EUT) and Accessory Equipment (AE)

3.1 Information of EUT

Device type	Portable device	
Product name	CDMA 1X Digital Mobile Phone	
Exposure category	Uncontrolled environment / general population	
Device operation configuration:		
Operating mode(s):	CDMA800	
Modulation Type	(CDMA)QPSK	
Rated output power	CDMA800: 24dBm	
Antenna type:	Internal antenna	
Operating frequency range(s):	Band	Tx(MHz)
	CDMA800	824~849

Note: Equipment under test (EUT) is CDMA 1X Digital Mobile Phone with internal antenna. It consists of mobile phone ,battery and adaptor and the detail about these is in this report. SAR is tested for CDMA800.

3.2 Information Of AE

AE ID*	Description
AE1	Battery
AE2	Travel Adaptor
AE3	Earphone

AE1

Model	Li3708T42P3h453756
Manufacturer	ZTE CORPORATION
Capacitance	800mAh
Nominal Voltage	3.7V

AE2

Model	STC-A22O50I700USBA-Z
Manufacturer	ZTE CORPORATION
Length of DC line	0cm with USB connector

AE3

Model	HMZ1-OMTP-3.5
Manufacturer	ZTE CORPORATION
Length of DC line	120cm

*AE ID: is used to identify the test sample in the lab internally.

4. Characteristics of the Test

4.1. Applicable Limit Regulations

ANSI/IEEE C95.1-2005 Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields. 3 kHz to 300 GHz

4.2. Applicable Measurement Standards

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

ANSI/IEEE C95.3-2002 Recommended Practice For Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to such Fields. 100 kHz-300 GHz

OET Bulletin 65-(Edition 97-01) Supplement C(edition01-01) Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields---Additional Supplement C (Edition 01-01)Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions

5. Operational Conditions During Test

5.1 General description of test procedures

A communication link is set up with a system simulator by air link, and a call is established. The absolute radio frequency channel is allocated to low, middle, high in the case of each band. The EUT is commanded to operate at maximum transmitting power. 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.

5.2 CDMA Test Configuration

SAR test for CDMA 800, a communication link is set up with a system simulator by air link. Using CMU200 the power level is set to "1" in SAR of CDMA 800. The tests in the band of CDMA 800 are performed in the mode of data transfer function.

Head SAR measurements

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 1/4 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.

Body SAR Measurements

SAR for body exposure configurations is measured in RC3 with the DUT configured using TDSO/SO32, to transmit at full rate on FCH with all other code channels disabled. SAR for multiple code channels (FCH+SCHn) is not required when the maximum average output of each RF channel is less than 1/4 dB higher than that measured with FCH only. Otherwise, SAR is measured on the maximum output channel (FCH+SCHn) with FCH at full rate and SCH0 enabled at 9600 bps, using the exposure configurations that results in the highest SAR with FCH only for that channel. 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.

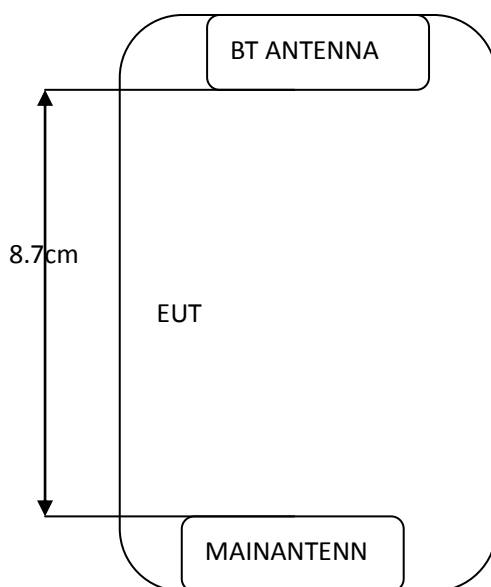
Body SAR in RC1 is not required when the maximum average output of each channel is less than 1/4 dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1; with Loopback Service Option SO55, at full rate, using

the body exposure configurations that results in the highest SAR for that channel in RC3.

5.3 Bluetooth Test Configuration

The Bluetooth transmitter of the device under test can be excluded from stand-alone and simultaneous SAR evaluation, per the requirements from FCC KDB 648474, as follows:

1. The separation between the Bluetooth antenna and the main antenna is $8.7\text{cm} > 5\text{cm}$
 2. The maximum conducted output power of Bluetooth is $5.75\text{mW} < 2 \cdot P(\text{Ref}) = 24\text{mW}$.
- According to FCC KDB648474, stand along SAR and Simultaneous Transmission SAR are not required



Picture of antennas (distance 8.7cm)

6. SAR Measurements system configuration

6.1 SAR Measurement set-up

The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Staubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic _field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (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.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as 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.

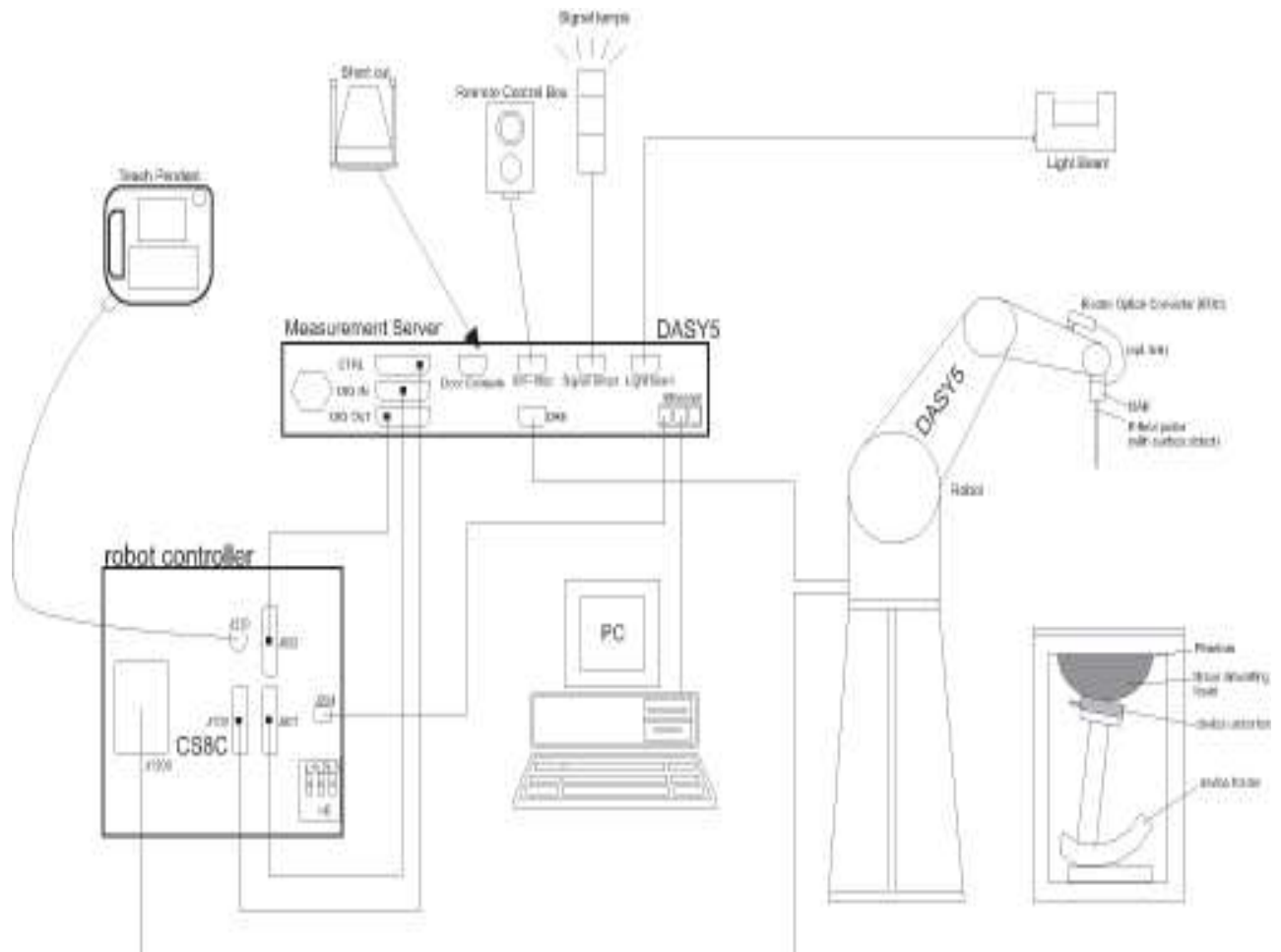


Figure 1. SAR Lab Test Measurement Set-up

6.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe ES3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

6.2.1. Ex3DV3 Probe Specification

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 850 and HSL 1750 Additional CF for other liquids and frequencies upon request
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material

	(rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g Linearity: $\pm$ 0.2dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.



Figure 2.ES3DV3 E-field Probe



Figure 3. ES3DV3 E-field probe

6.2.2. E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. The spherical isotropy was evaluated and found to be better than ± 0.25 dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies below 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C \frac{\Delta T}{\Delta t}$$

Where: Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),

ΔT = Temperature increase due to RF exposure.

Or

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m³).

6.3. Other Test Equipment

6.3.1. Device Holder for Transmitters

The DASY5 device holder is designed to cope with the die rent positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the inference of the clamp on the test results could thus be lowered.



Figure 4. Device Holder

6.3.2. Phantom

The Generic Twin Phantom is constructed of a fiberglass shell integrated in a wooden Figure. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90% of all users. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on

the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

Shell Thickness	2±0.1 mm
Filling Volume	Approx. 20 liters
Dimensions	810 x 1000 x 500 mm (H x L x W)
Available	Special



Figure 5. Generic Twin Phantom

6.4. 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. $\pm 5\%$.
- The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above $\pm 0.1\text{mm}$). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within $\pm 30^\circ$.)

- Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot. Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged.

After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

- Zoom Scan

Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

- Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY5 system allows evaluations that combine measured data and robot positions, such as:

- maximum search
- extrapolation
- boundary correction
- peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space.

They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation. For a grid using 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

- 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 5mm steps.

6.5. Data Storage and Evaluation

6.5.1. 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.

6.5.2. 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	Normi, a _{i0} , a _{i1} , a _{i2}
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	
	- Density	

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:

$$V_i = U_i + U_i^2 \cdot c f / d c p_i$$

With V_i = compensated signal of channel i (i = x, y, z)

U_i = input signal of channel i (i = x, y, z)

cf = crest factor of exciting field (DASY parameter)

dcp_i = diode compression point (DASY parameter)

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

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

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

With V_i = compensated signal of channel i (i = x, y, z)

$Norm_i$ = sensor sensitivity of channel i (i = x, y, z)

[mV/(V/m)²] for E-field Probes

$ConvF$ = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel i in A/m

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

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

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

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

with SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m

σ = conductivity in [mho/m] or [Siemens/m]

= equivalent tissue density in g/cm³

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

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

with P_{pwe} = equivalent power density of a plane wave in mW/cm²

E_{tot} = total electric field strength in V/m

H_{tot} = total magnetic field strength in A/m

6.6. System check

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulates were measured every day using the dielectric probe kit and the network analyzer. A system check measurement was made following the determination of the dielectric parameters of the simulates, 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. The system check results (dielectric parameters and SAR values) are given in the 8.1 and 8.2.

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system ($\pm 10\%$).

System check is performed regularly on all frequency bands where tests are performed with the DASY 5 system.

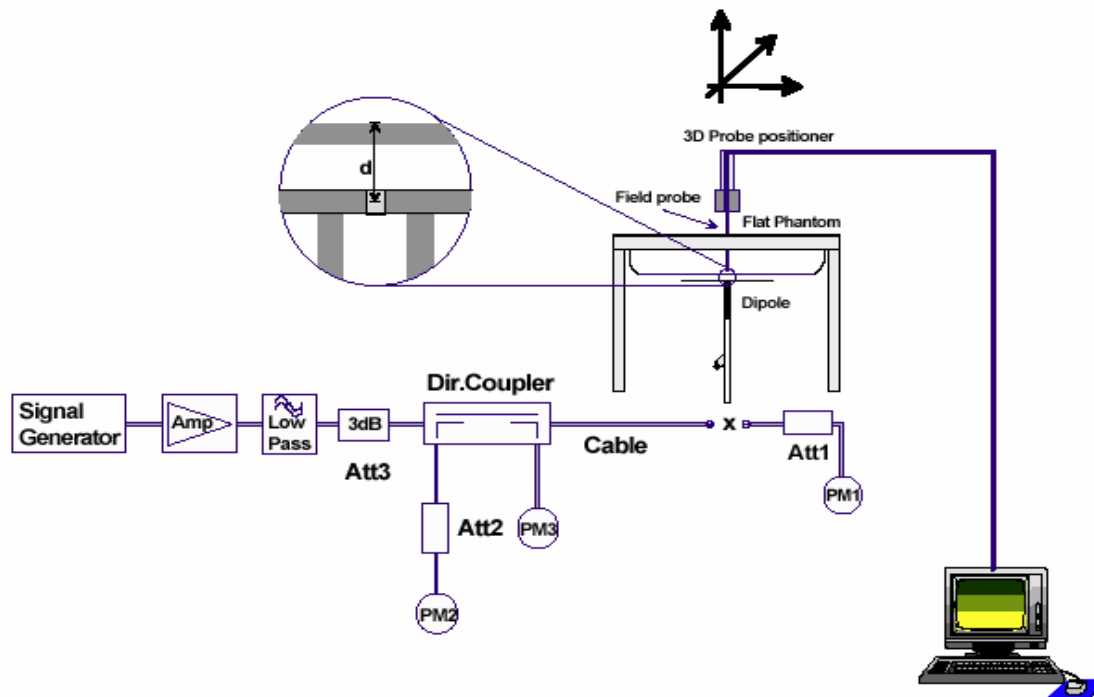


Figure 6. System Check Set-up

6.7. Equivalent Tissues

The liquid is consisted of water, salt, Glycol, Sugar, Preventol and Cellulose. The liquid has previously been proven to be suited for worst-case. The Table 1 and Table 2 show the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the OET 65.

MIXTURE%	FREQUENCY(head) 835MHz
Water	41.45
Sugar	56
Salt	1.45
Preventol	0.1
Cellulose	1.0
Dielectric Parameters Target Value	f=835MHz $\epsilon=41.5$ $\sigma=0.9$
MIXTURE%	FREQUENCY(body) 835MHz
Water	52.5
Sugar	45
Salt	1.4
Preventol	0.1
Cellulose	1.0
Dielectric Parameters Target Value	f=835MHz $\epsilon=55.2$ $\sigma=0.97$

7. Conducted Output Power Measurement

7.1. Summary

The DUT is tested using an CMU200 communications tester as controller unit to set test channels

and maximum output power to the DUT, as well as for measuring the conducted power. Conducted output power was measured using an integrated RF connector and attached RF cable.

This result contains conducted output power for the EUT.

Output power verification

Maximum output power is verified on the High, Middle and Low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98E. Results for at least steps 3, 4 and 10 of the power measurement procedures should be tabulated in the SAR report. Steps 3 and 4 should be measured using SO55 with power control bits in “All Up” condition. TDSO/So32 may be measured instead of SO55 for step 4. Step 10 should be measured using TDSO/So32 with power control bits in “Bits Hold” condition. All power measurements defined in C.S0011/TIA-98E that are inapplicable to the DUT or cannot be measured due to technical or equipment limitations should be clearly identified in the test report.

7.2. Conducted Power Results

CDMA800			Conducted Power (dBm)		
			Channel 1013	Channel 387	Channel 777
SO55	Full rate	RC3	24.56	24.47	24.32
		RC1	24.48	24.41	24.29

SAR for RC1 is not required when the maximum average output of each channel is less than 1/4 dB higher than that measured in RC3.

SAR for head exposure configurations is measured in RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55.

CDMA800			Conducted Power (dBm)		
			Channel 1013	Channel 387	Channel 777
Step3	SO55	11	24.56	24.47	24.32
Step4	SO32	33	24.18	24.21	24.14
		43	24.28	24.26	24.21
		54	24.22	24.32	24.42
Step10	SO32	33	6.17	7.16	7.21
		43	9.23	6.84	6.93
		54	7.31	8.15	8.84

SAR for body exposure configurations is measured in RC3 with the DUT configured using TDSO/SO32 , to transmit at full rate on FCH with all other code channels disabled.SAR for multiple code channels (FCH+SCHn) is not required when the maximum average output of each RF channel is less than 1/4 dB higher than that measured with FCH only.

8 Test Results

8.1. Dielectric Performance

Dielectric Performance of Head Tissue Simulating Liquid

Frequency	Description	Dielectric Parameters ϵ_r	σ (s/m)	temp °C
835MHz (head)	Target value 5% window	41.5 39.42-43.57	0.9 0.85-0.945	/
	Measurement value 2012-03-09	41.6	0.88	21.7
835MHz (body)	Target value 5% window	55.2 52.44-57.96	0.97 0.92-1.02	/
	Measurement value 2012-03-08	54.5	0.962	21.5

8.2. System Check Results

System Check for Head tissue simulation liquid

Frequency	Description	SAR(W/kg)		Dielectric Parameter ϵ_r	σ (s/m)	Temp °C
		10g	1g			
835MHz (head)	Recommended result ±10% window	1.53 1.38-1.68	2.37 2.13-2.61	41.5	0.9	/
	Measurement value 2012-03-09	1.57	2.37	41.6	0.88	21.7
835MHz (body)	Recommended result ±10% window	1.59 1.43-1.75	2.45 2.20-2.70	55.2	0.97	/
	Measurement value 2012-03-08	1.48	2.27	54.5	0.962	21.5

Note: 1. the graph results see ANNEX D.

2 .Recommended Values used derive from the calibration certificate and 250 mW is used as feeding power to the calibrated dipole.

8.3. Test Results

8.3.1. Summary of Measurement Results (CDMA800)

SAR Values (CDMA800)

Test Case		Measurement Result(W/kg)	Power Drift(dB)	Note
Different Test Position	Channel	1g		
		Average		
Test position of Head				
Left head, Touch cheek	middle	1.16	-0.144	
Left head, Tilt 15 Degree	middle	0.602	-0.162	
Right head, Touch cheek	middle	1.11	0.102	
Right head, Tilt 15 Degree	middle	0.565	0.045	
Left head, Touch cheek	low	0.888	0.084	
	high	1.17	-0.026	
Right head, Touch cheek	low	0.823	-0.033	
	high	1.18	0.138	max
Test position of Body (Distance 15mm)				
Towards phantom	middle	0.575	-0.094	
Towards Ground	middle	0.697	-0.104	
Towards Ground	low	0.614	-0.015	
	high	0.870	-0.073	max
Worst case position of Body with earphone (Distance 15mm)				
Towards Ground	high	0.807	-0.044	

Note: 1. The value with blue color is the maximum SAR Value of test case of head and body in each test band.

- Upper and lower frequencies were measured at the worst position.
- 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 ($< 0.8\text{W/kg}$), testing at the high and low channels is optional.

8.4. Conclusion

Maximum SAR

TEST BAND	Worst Position		Channel	Maximum SAR(1g) (W/kg)	Limit of SAR(1g) (W/kg)
CDMA800	Head	Right head, Touch cheek	high	1.18	1.6
	Body	Towards Ground	high	0.870	1.6

General Judgment: PASS

ANNEX A: Photograph of EUT



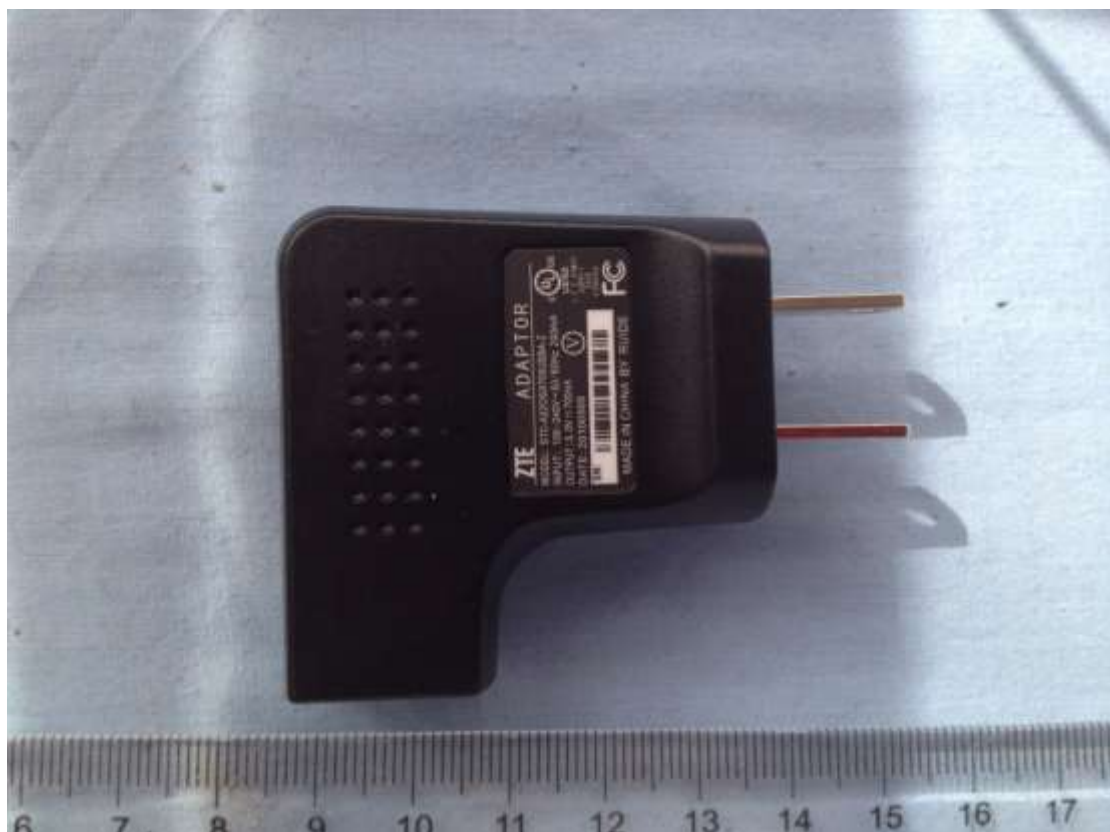
EUT



EUT



Battery



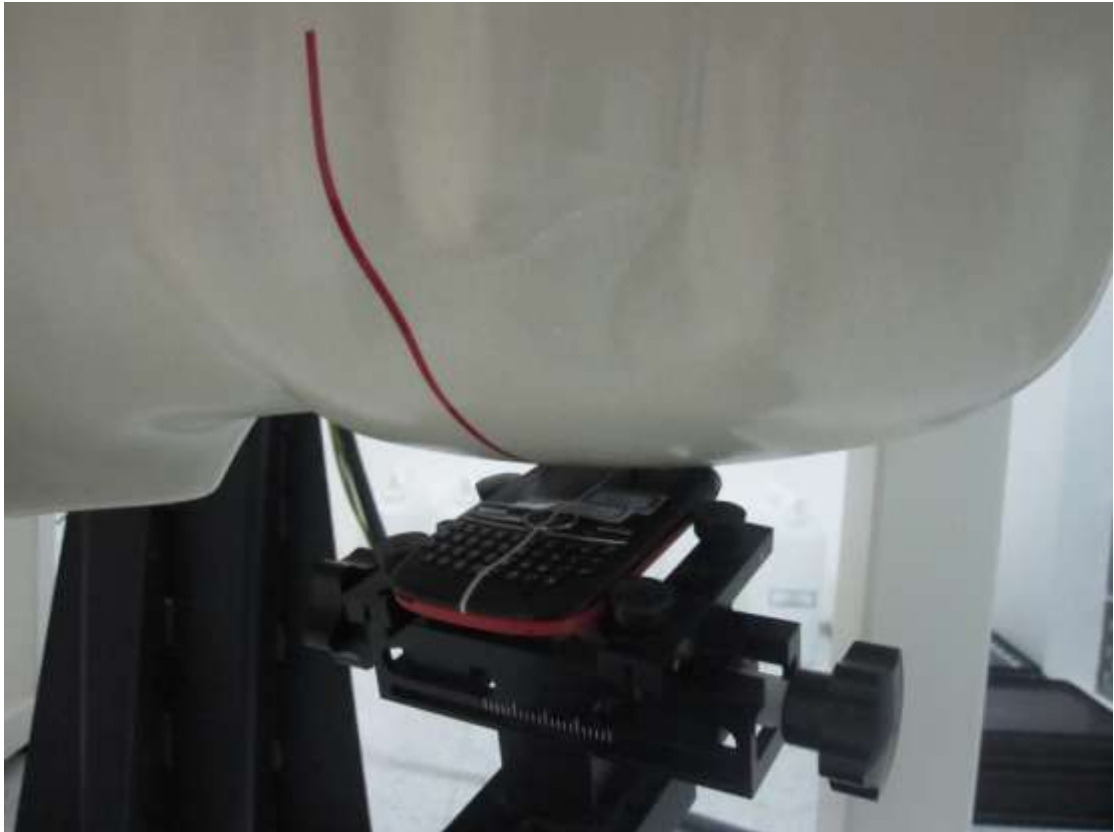
Travel Adaptor



Earphone



POSITION OF LEFT HEAD TOUCH



POSITION OF LEFT HEAD TILT



POSITION OF RIGHT HEAD TOUCH



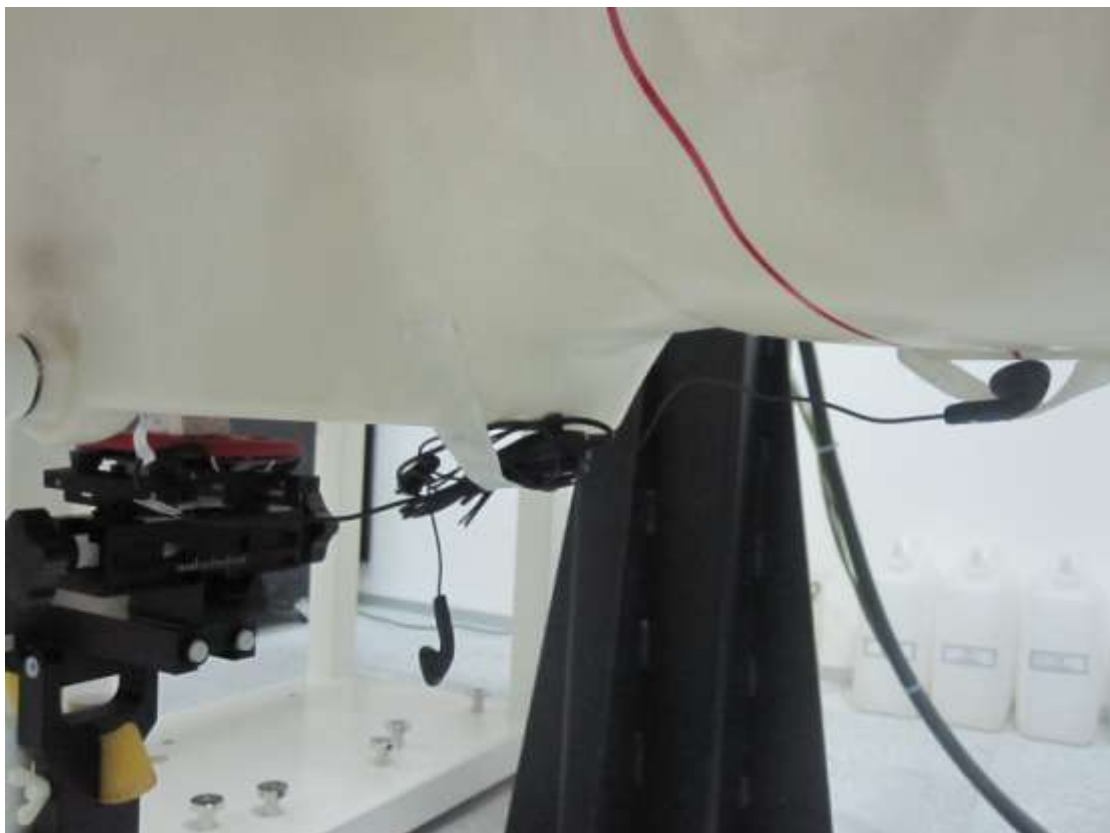
POSITION OF RIGHT HEAD TILT



POSITION OF BODY TOWARDS PHANTOM WITH 15mm DISTANCE



POSITION OF BODY TOWARDS GROUND WITH 15mm DISTANCE



POSITION OF BODY TOWARDS GROUND WITH 15mm DISTANCE (WITH EARPHONE)

ANNEX B: Measurement Uncertainty

No.	source	type	Uncertainty Value (%)	Probability Distribution	k	c_i	Standard uncertainty u_i (%)	Degree of freedom V_{eff} or v_i
1	-System repetivity	A	0.3	N	1	1	0.5	9
Measurement system								
2	—probe calibration	B	7	N	2	1	3.5	∞
3	—axial isotropy of the probe	B	4.7	R	$\sqrt{3}$	0.5	4.3	∞
4	— Hemispherical isotropy of the probe	B	9.4	R	$\sqrt{3}$	1	0	∞
5	—probe linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
6	— System detection limits	B	1.0	R	$\sqrt{3}$	1	0.6	∞
7	—boundary effect	B	11.0	R	$\sqrt{3}$	1	6.4	∞
8	—response time	B	0	R	$\sqrt{3}$	1	0	∞
9	—noise	B	0	N	$\sqrt{3}$	1	0	∞
10	—integration time	B	5.0	R	$\sqrt{3}$	1	2.9	∞
11	—readout Electronics	B	0.4	R	$\sqrt{3}$	1	0.2	∞
12	—-phantom	B	2.9	R	$\sqrt{3}$	1	1.7	∞
13	—Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞
14	—Device Holder Uncertainty	A	4.9	R	1	1	4.9	5
物理参数								
15	-liquid density	B	0	R	$\sqrt{3}$	1	0	∞
16	-liquid conductivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.5	2.9	∞
17	-liquid conductivity (measurement uncertainty)	A	0.23	N	1	1	0.23	9

18	-liquid permittivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.5	2.9	∞
19	-liquid permittivity (measurement uncertainty)	A	0.46	N	1	1	0.46	9
20	— Probe Positioner Mechanical Tolerance	B	5.0	R	$\sqrt{3}$	1	2.9	∞
21	— Environment	B	3.0	R	$\sqrt{3}$	1	1.7	∞
22	— Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$					12.2	88.7
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N	K=2	24.4		

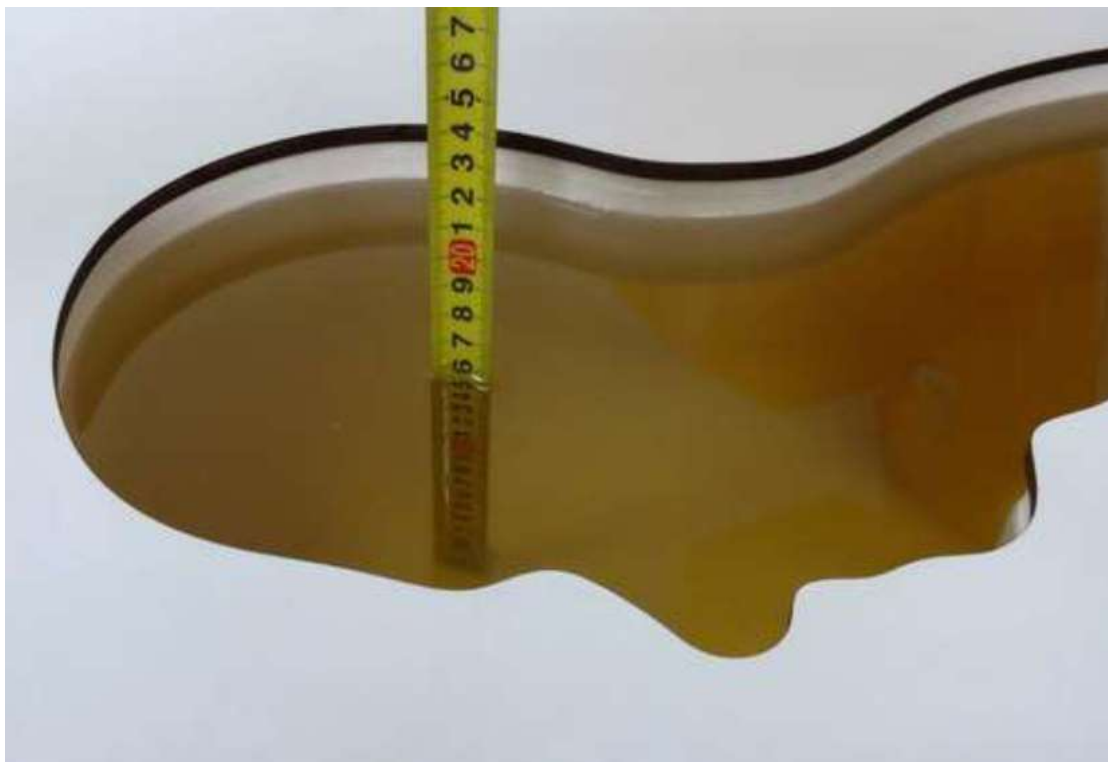
ANNEX C: Main Test Instruments

No.	Name	Type	Calibration Date	Valid Period
01	Network analyzer	Agilent E5071E	Oct 14 th , 2011	One year
02	Dielectric Probe Kit	Agilent 85070E	No Calibration Requested	
03	Power meter	Agilent E4418B	Oct 14 th , 2011	One year
04	Power sensor	Agilent E9200B	Oct 14 th , 2011	One year
05	Signal Generator	Agilent N5182A	Oct 14 th , 2011	One year
06	Amplifier	ZHL-42W	No Calibration Requested	
07	BTS	CMU200	Oct 14 th , 2011	One year
08	E-field Probe	ES3DV3	Sep 27 th , 2011	One year
09	DAE	DAE4	June 13 th , 2011	One year
10	Validation Kit 835MHz	D835V2	June 14 th , 2011	One year

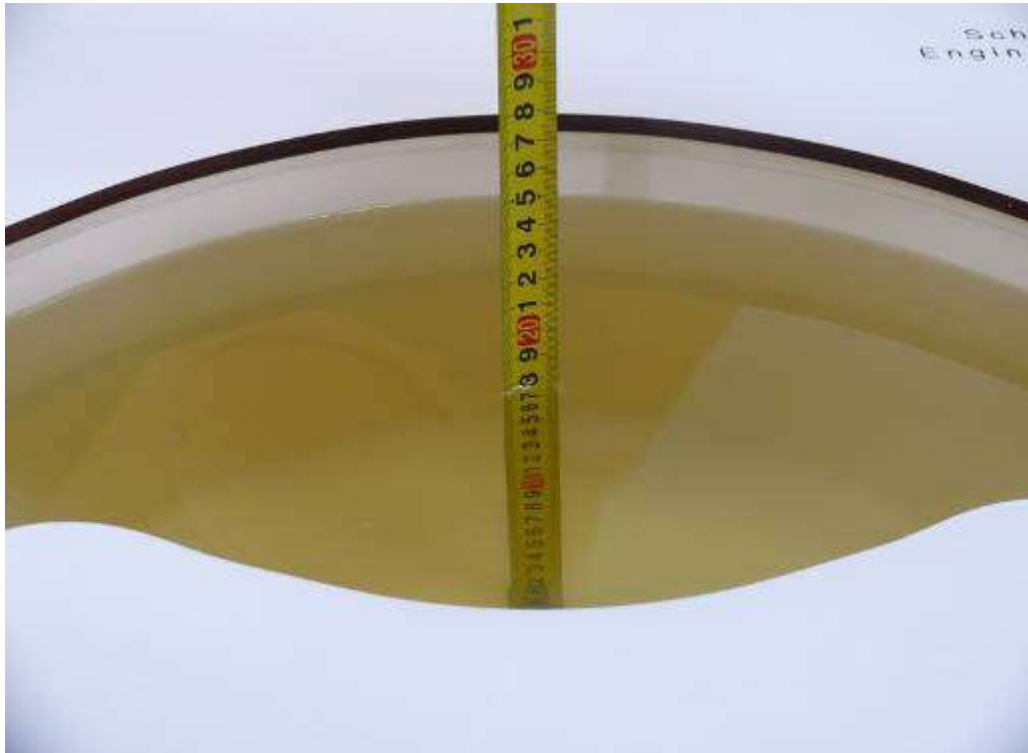
ANNEX D: Test Layout



Picture 1: Specific Absorption Rate Test Layout



Picture 2: Liquid depth in the head Phantom (835MHz) (16cm deep)



Picture 3 Liquid depth in the flat Phantom (835MHz) (17.5cm deep)

ANNEX E: System Check Results

System check 835 head

Date/Time: 2012/3/9 9:39:42

Communication System: CW; Communication System Band: D835 (835.0 MHz);

Frequency: 835 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 835$ MHz; $\sigma = 0.88$ mho/m; $\epsilon_r = 41.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528/OET65C)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.18, 6.18, 6.18);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2 Version 14.2.2 (1685) (Deployment Build)

835head/d=15mm, Pin=250 mW, dist=3.0mm (ES-Probe)-head/Area

Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.71 mW/g

835head/d=15mm, Pin=250 mW, dist=3.0mm (ES-Probe)-head/Zoom

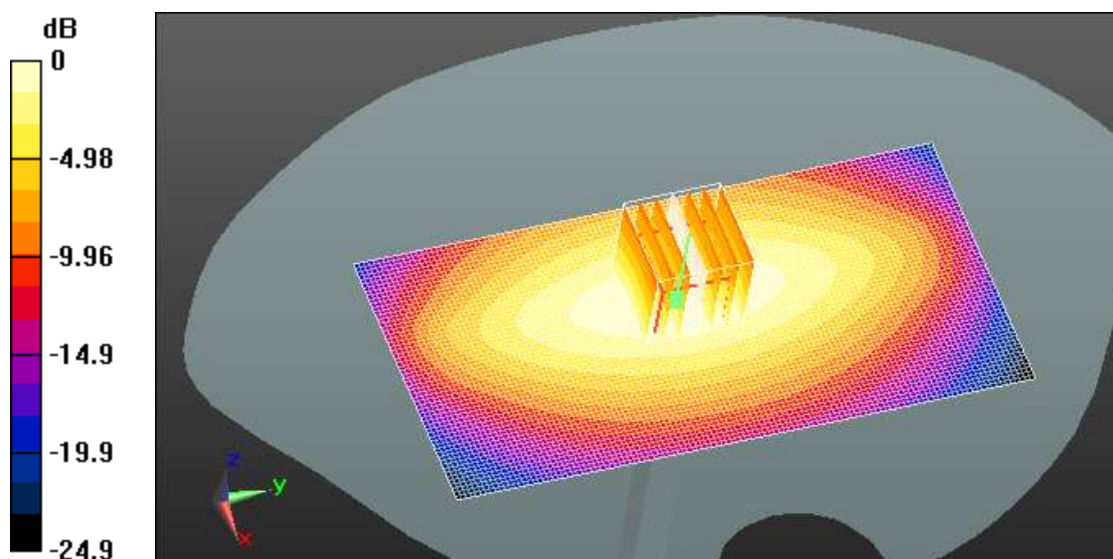
Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.5 V/m; Power Drift = -0.00668 dB

Peak SAR (extrapolated) = 3.63 W/kg

SAR(1 g) = 2.37 mW/g; SAR(10 g) = 1.57 mW/g

Maximum value of SAR (measured) = 2.78 mW/g



0 dB = 2.71mW/g

System check 835 body

Date/Time: 2012/3/8 8:24:54,

Communication System: CW; Communication System Band: D835 (835.0 MHz);

Frequency: 835 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 835$ MHz; $\sigma = 0.948$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528/OET65C)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.19, 6.19, 6.19);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2 Version 14.2.2 (1685) (Deployment Build)

835body/d=15mm, Pin=250 mW, dist=3.0mm (ES-Probe)-BODY/Area

Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.64 mW/g

835body/d=15mm, Pin=250 mW, dist=3.0mm (ES-Probe)-BODY/Zoom

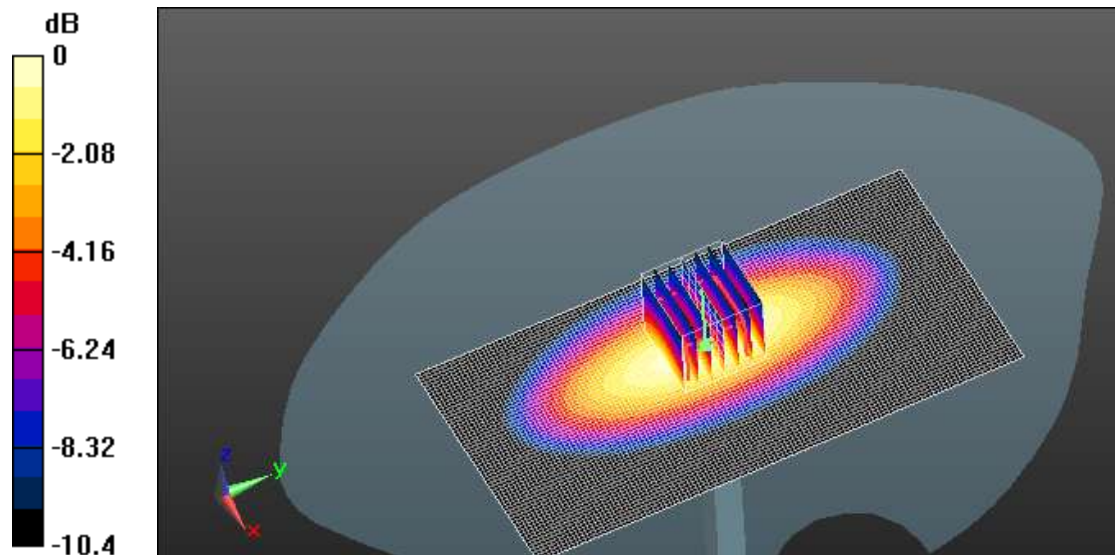
Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.5 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 3.54 W/kg

SAR(1 g) = 2.27 mW/g; SAR(10 g) = 1.48 mW/g

Maximum value of SAR (measured) = 2.69 mW/g



0 dB = 2.69mW/g

ANNEX F: Graph Result

CDMA800 left cheek mid

Date/Time: 2012/3/9 13:34:21, Date/Time: 2012/3/9 13:46:14

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 836.52 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 837$ MHz; $\sigma = 0.882$ mho/m; $\epsilon_r = 41.6$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.18, 6.18, 6.18);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

left/Touch Position - mid/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR = 1.21 mW/g

left/Touch Position - mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

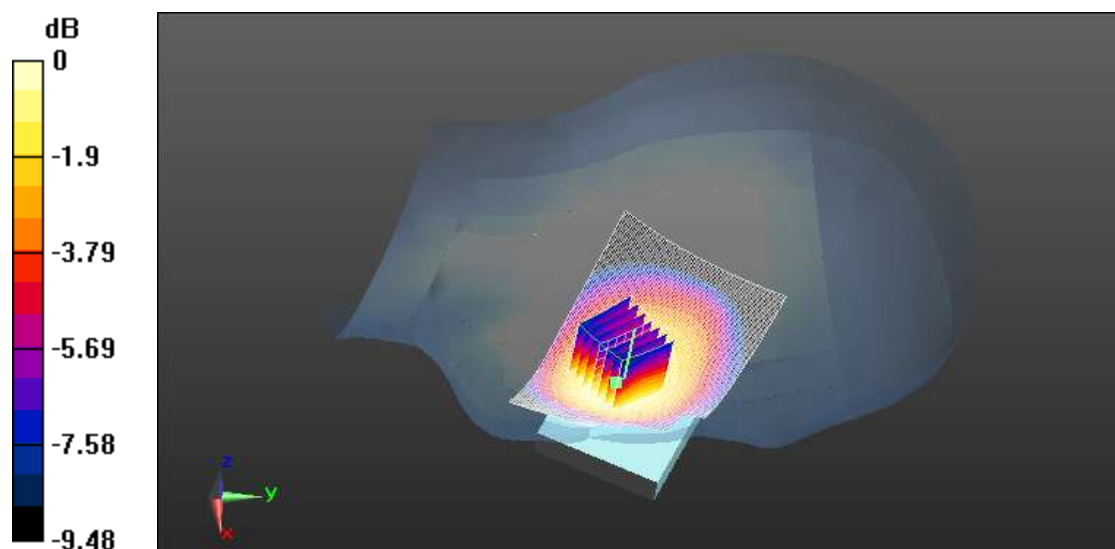
dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.2 V/m; Power Drift = -0.144 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.846 mW/g

Maximum value of SAR (measured) = 1.21 mW/g



0 dB = 1.21mW/g

CDMA800 left tilt mid

Date/Time: 2012/3/9 16:17:01, Date/Time: 2012/3/9 16:28:54, Date/Time: 2012/3/9 16:42:07

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 836.52 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 837$ MHz; $\sigma = 0.882$ mho/m; $\epsilon_r = 41.6$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASYS (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.18, 6.18, 6.18);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASYS2, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

left/Tilt Position - mid/Area Scan (81x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR = 0.642 mW/g

left/Tilt Position - mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.3 V/m; Power Drift = -0.162 dB

Peak SAR (extrapolated) = 0.764 W/kg

SAR(1 g) = 0.602 mW/g; SAR(10 g) = 0.462 mW/g

Maximum value of SAR (measured) = 0.634 mW/g

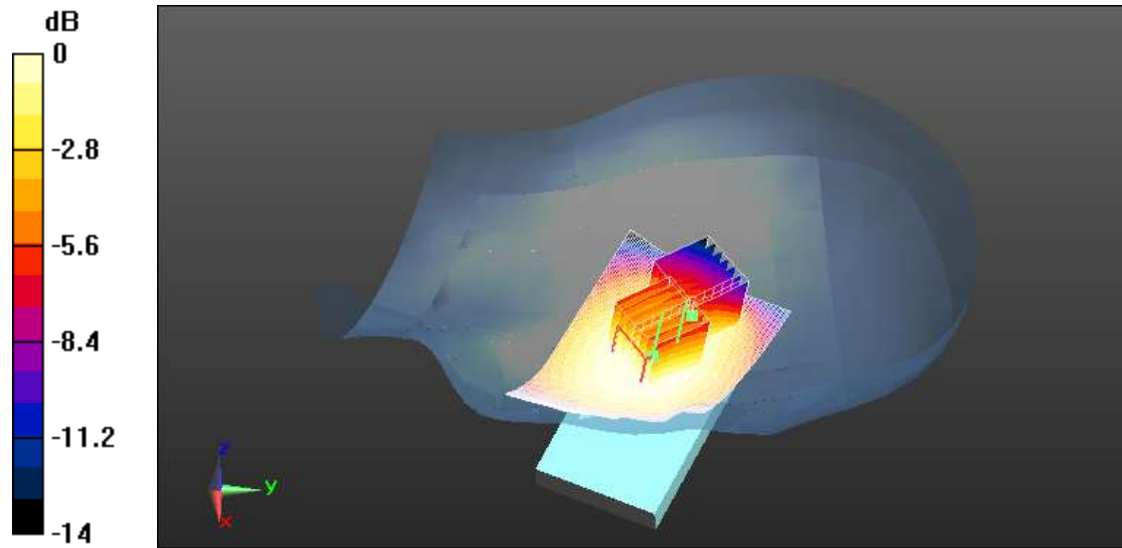
left/Tilt Position - mid/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.3 V/m; Power Drift = -0.162 dB

Peak SAR (extrapolated) = 0.666 W/kg

SAR(1 g) = 0.489 mW/g; SAR(10 g) = 0.335 mW/g

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



0 dB = 0.557mW/g

CDMA800 right cheek mid

Date/Time: 2012/3/9 10:36:15, Date/Time: 2012/3/9 10:48:02

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 836.52 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 837$ MHz; $\sigma = 0.882$ mho/m; $\epsilon_r = 41.6$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.18, 6.18, 6.18);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

right/Touch Position - mid/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR = 1.17 mW/g

right/Touch Position - mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

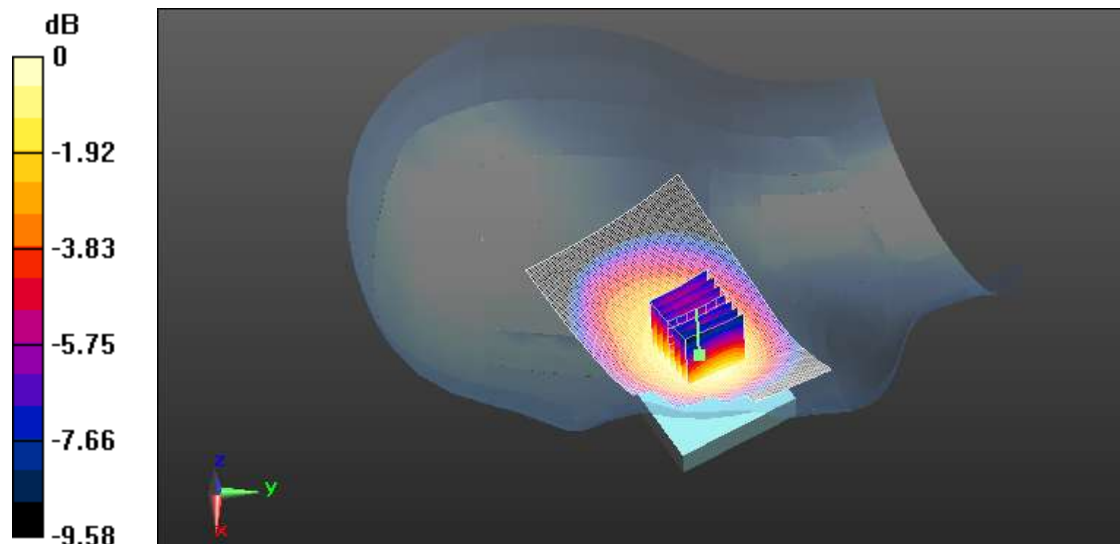
dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.5 V/m; Power Drift = 0.102 dB

Peak SAR (extrapolated) = 1.47 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.811 mW/g

Maximum value of SAR (measured) = 1.18 mW/g



0 dB = 1.18mW/g

CDMA800 right tilt mid

Date/Time: 2012/3/9 13:02:05, Date/Time: 2012/3/9 13:13:53

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 836.52 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 837$ MHz; $\sigma = 0.882$ mho/m; $\epsilon_r = 41.6$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.18, 6.18, 6.18);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

right/Tilt Position - mid/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR = 0.602 mW/g

right/Tilt Position - mid/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

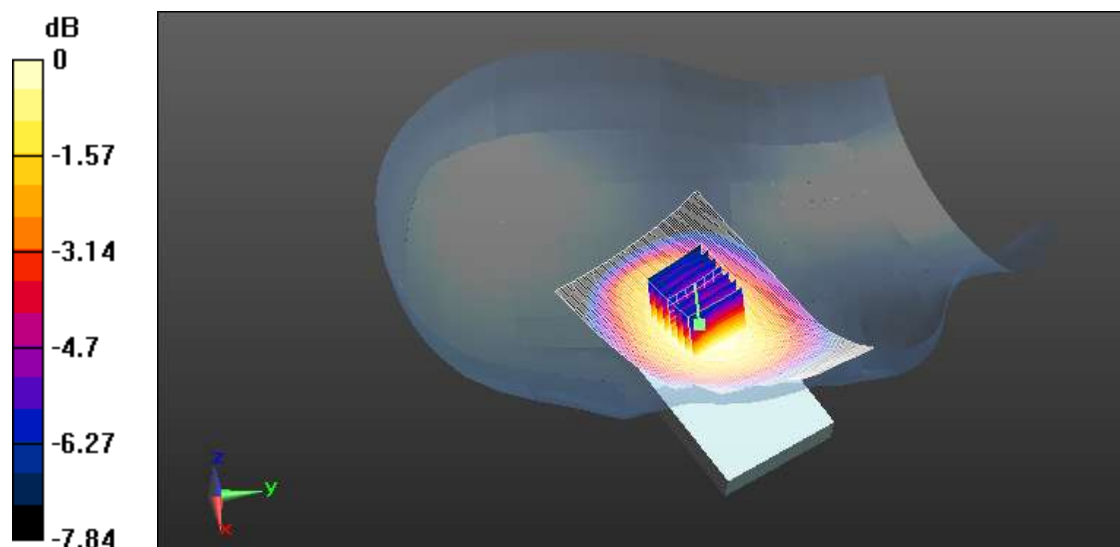
dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.2 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 0.735 W/kg

SAR(1 g) = 0.565 mW/g; SAR(10 g) = 0.430 mW/g

Maximum value of SAR (measured) = 0.596 mW/g



0 dB = 0.596mW/g

CDMA800 left cheek low

Date/Time: 2012/3/9 14:00:55, Date/Time: 2012/3/9 14:35:09

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 824.7 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 825$ MHz; $\sigma = 0.869$ mho/m; $\epsilon_r = 41.8$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.18, 6.18, 6.18);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

left/Touch Position - low/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR = 0.924 mW/g

left/Touch Position - low/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

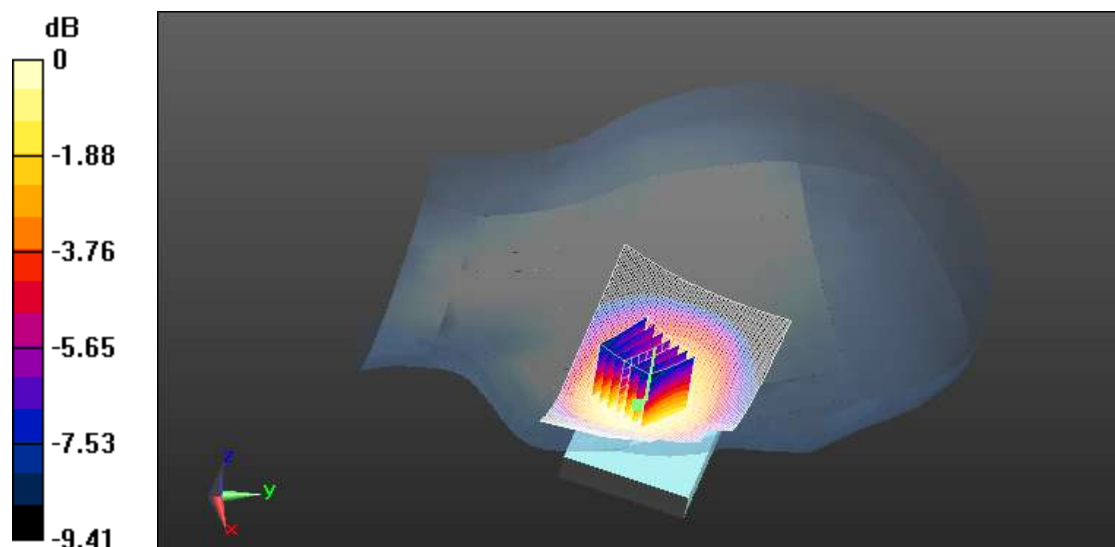
dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.5 V/m; Power Drift = 0.084 dB

Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.888 mW/g; SAR(10 g) = 0.654 mW/g

Maximum value of SAR (measured) = 0.936 mW/g



0 dB = 0.936mW/g

CDMA800 left cheek high

Date/Time: 2012/3/9 15:24:51, Date/Time: 2012/3/9 15:36:44

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 848.31 MHz; Communication System PAR: 0 dB

Medium parameters used : $f = 848.31$ MHz; $\sigma = 0.894$ mho/m; $\epsilon_r = 41.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASYS (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.18, 6.18, 6.18);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASYS2, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

left/Touch Position - high/Area Scan (81x131x1): Measurement grid:

$dx=10$ mm, $dy=10$ mm

Maximum value of SAR = 1.21 mW/g

left/Touch Position - high/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

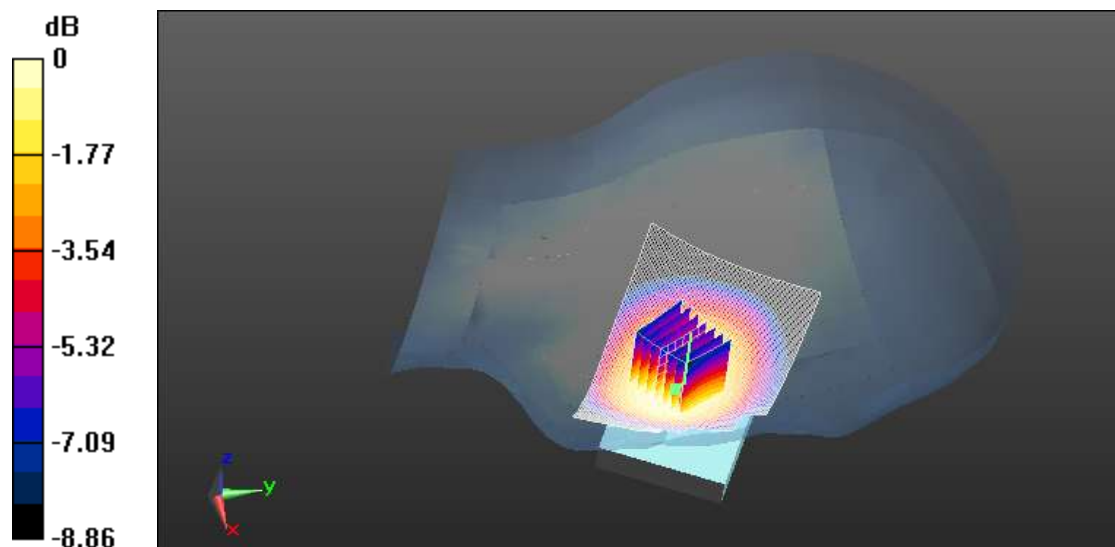
$dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 20.5 V/m; Power Drift = -0.026 dB

Peak SAR (extrapolated) = 1.46 W/kg

SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.874 mW/g

Maximum value of SAR (measured) = 1.22 mW/g



0 dB = 1.22mW/g

CDMA800 right cheek low

Date/Time: 2012/3/9 11:39:03, Date/Time: 2012/3/9 11:50:52

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 824.7 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 825$ MHz; $\sigma = 0.869$ mho/m; $\epsilon_r = 41.8$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.18, 6.18, 6.18);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

right/Touch Position - low/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR = 0.872 mW/g

right/Touch Position - low/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

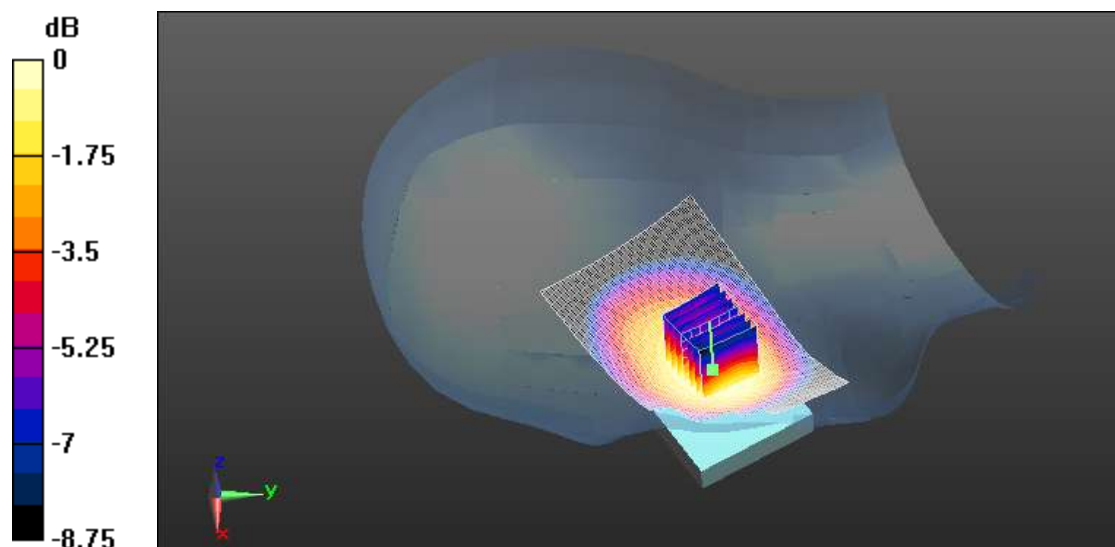
dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.3 V/m; Power Drift = -0.033 dB

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.823 mW/g; SAR(10 g) = 0.607 mW/g

Maximum value of SAR (measured) = 0.864 mW/g



0 dB = 0.864mW/g

CDMA800 right cheek high

Date/Time: 2012/3/9 12:32:42, Date/Time: 2012/3/9 12:44:30

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 848.31 MHz; Communication System PAR: 0 dB

Medium parameters used : $f = 848.31$ MHz; $\sigma = 0.894$ mho/m; $\epsilon_r = 41.4$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASYS (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.18, 6.18, 6.18);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASYS2, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

right/Touch Position - high/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR = 1.25 mW/g

right/Touch Position - high/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

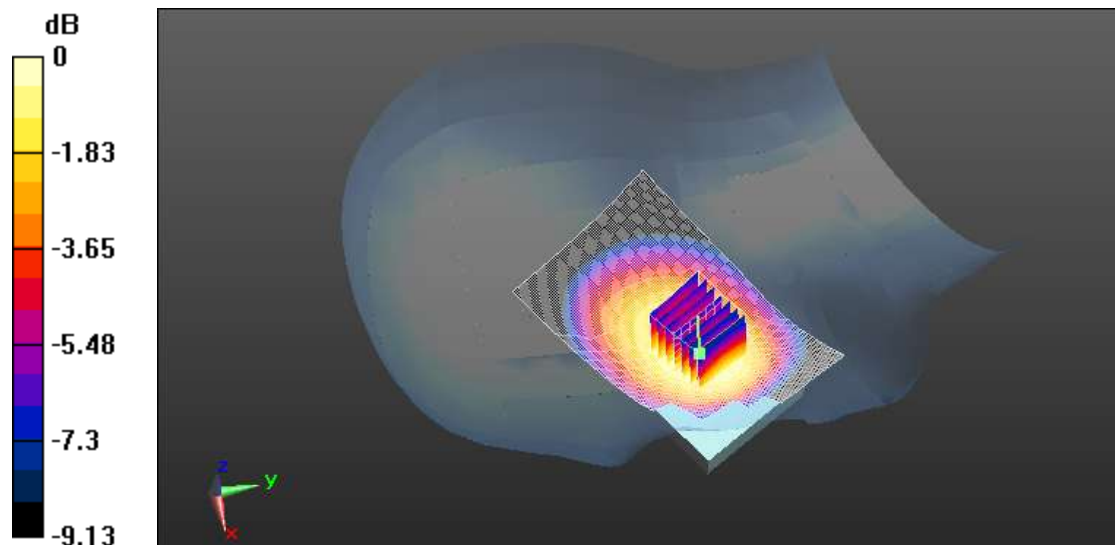
dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.4 V/m; Power Drift = 0.138 dB

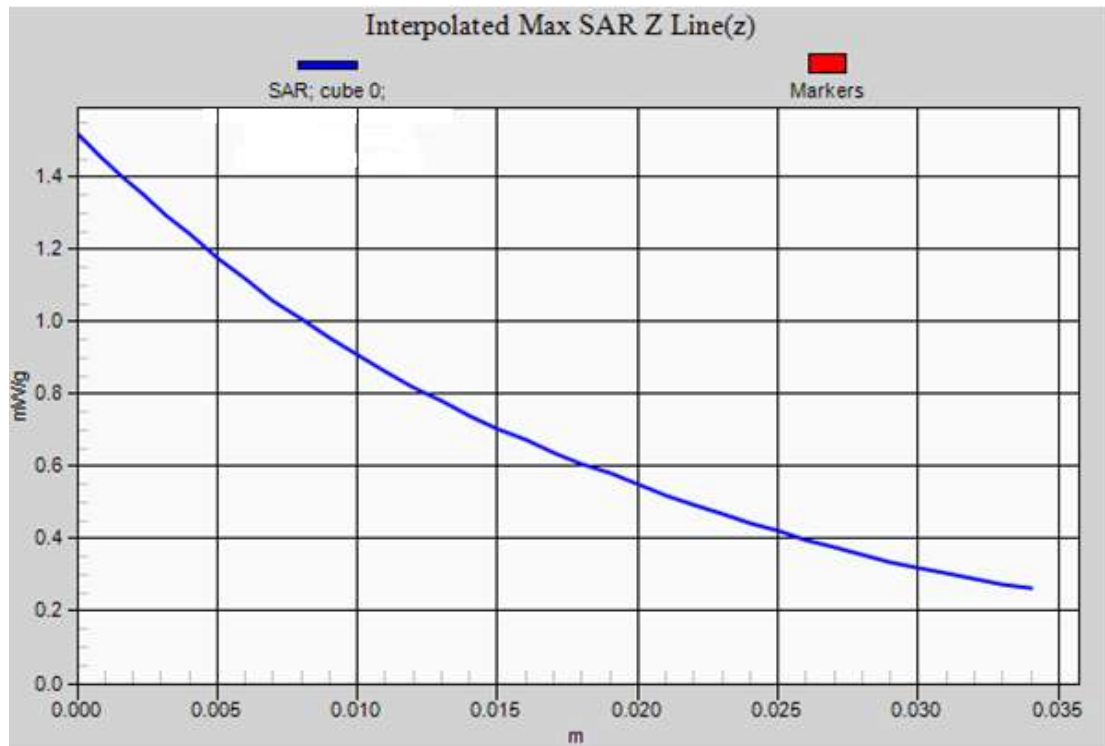
Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.872 mW/g

Maximum value of SAR (measured) = 1.25 mW/g



0 dB = 1.25mW/g



CDMA800 Towards phantom - mid

Date/Time: 2012/3/8 11:52:04, Date/Time: 2012/3/8 12:04:27

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 836.52 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 837$ MHz; $\sigma = 0.951$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.19, 6.19, 6.19);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

body/Towards phantom - mid/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR = 0.610 mW/g

body/Towards phantom - mid/Zoom Scan (7x7x7)/Cube 0: Measurement

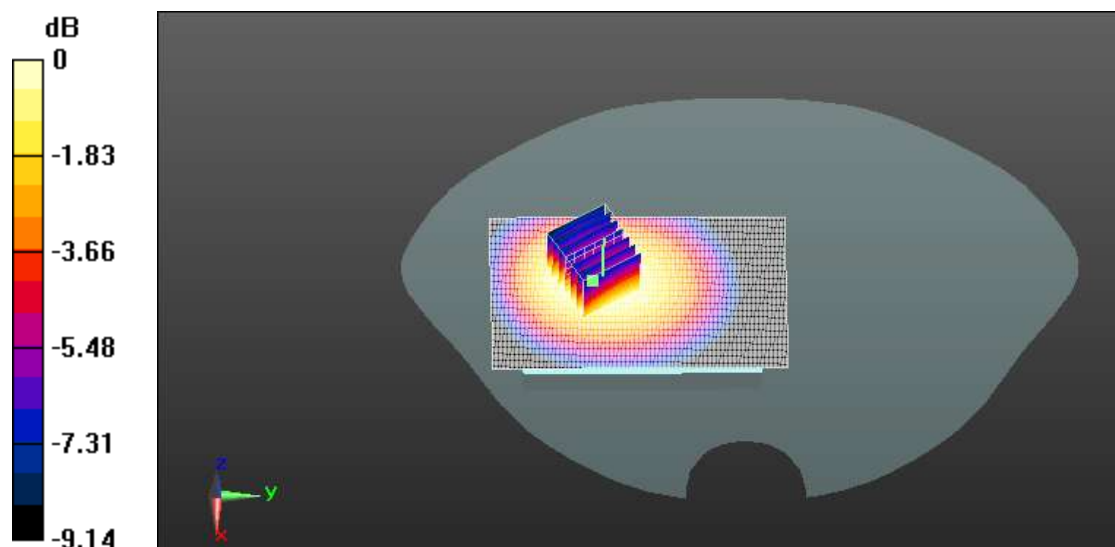
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.61 V/m; Power Drift = -0.094 dB

Peak SAR (extrapolated) = 0.752 W/kg

SAR(1 g) = 0.575 mW/g; SAR(10 g) = 0.423 mW/g

Maximum value of SAR (measured) = 0.609 mW/g



0 dB = 0.609mW/g

CDMA800 Towards ground - mid

Date/Time: 2012/3/8 12:19:37, Date/Time: 2012/3/8 12:32:00

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 836.52 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 837$ MHz; $\sigma = 0.951$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.19, 6.19, 6.19);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

body/Towards ground - mid/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR = 0.735 mW/g

body/Towards ground - mid/Zoom Scan (7x7x7)/Cube 0: Measurement

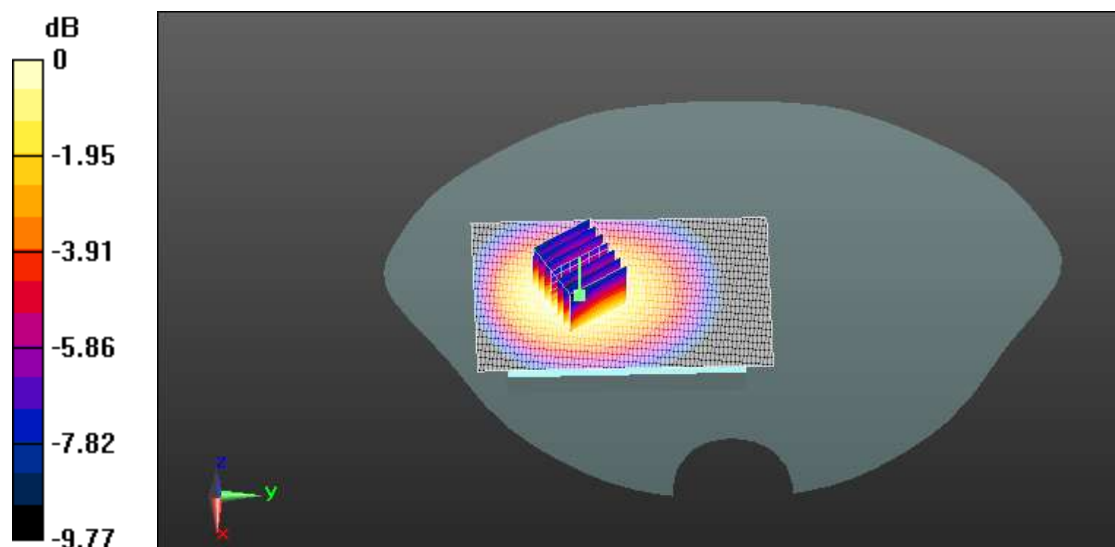
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.6 V/m; Power Drift = -0.104 dB

Peak SAR (extrapolated) = 0.966 W/kg

SAR(1 g) = 0.697 mW/g; SAR(10 g) = 0.501 mW/g

Maximum value of SAR (measured) = 0.744 mW/g



0 dB = 0.744mW/g

CDMA800 Towards ground - low

Date/Time: 2012/3/8 14:22:18, Date/Time: 2012/3/8 14:34:41

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 824.7 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 825$ MHz; $\sigma = 0.934$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.19, 6.19, 6.19);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

body/Towards ground - low/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR = 0.655 mW/g

body/Towards ground - low/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

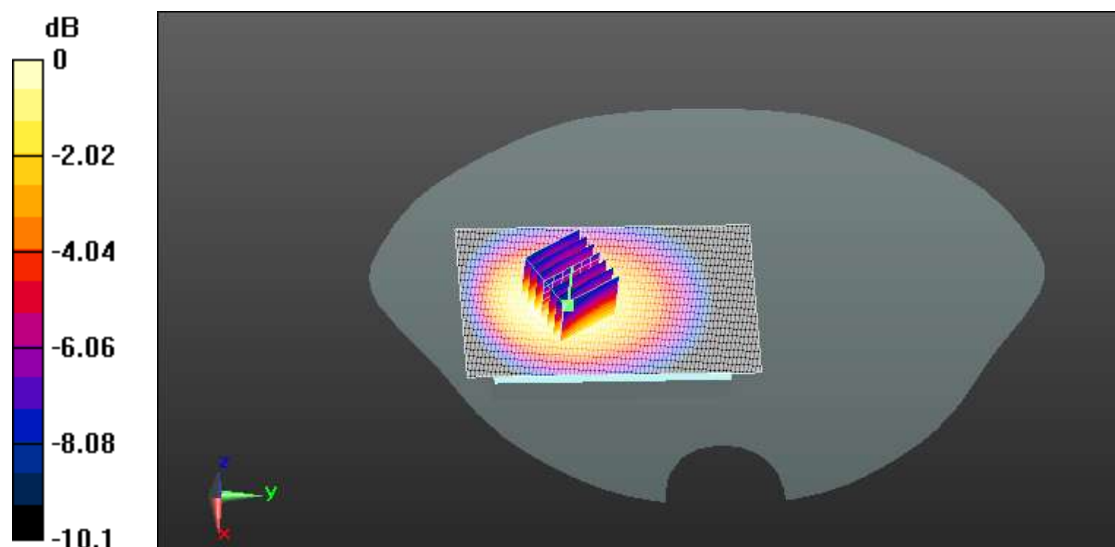
dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.41 V/m; Power Drift = -0.015 dB

Peak SAR (extrapolated) = 0.852 W/kg

SAR(1 g) = 0.614 mW/g; SAR(10 g) = 0.438 mW/g

Maximum value of SAR (measured) = 0.654 mW/g



0 dB = 0.654mW/g

CDMA800 Towards ground - high

Date/Time: 2012/3/8 13:41:53, Date/Time: 2012/3/8 13:54:13

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 848.31 MHz; Communication System PAR: 0 dB

Medium parameters used: $f = 848.31$ MHz; $\sigma = 0.966$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.19, 6.19, 6.19);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

body/Towards ground - high/Area Scan (81x131x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR = 0.946 mW/g

body/Towards ground - high/Zoom Scan (7x7x7)/Cube 0: Measurement

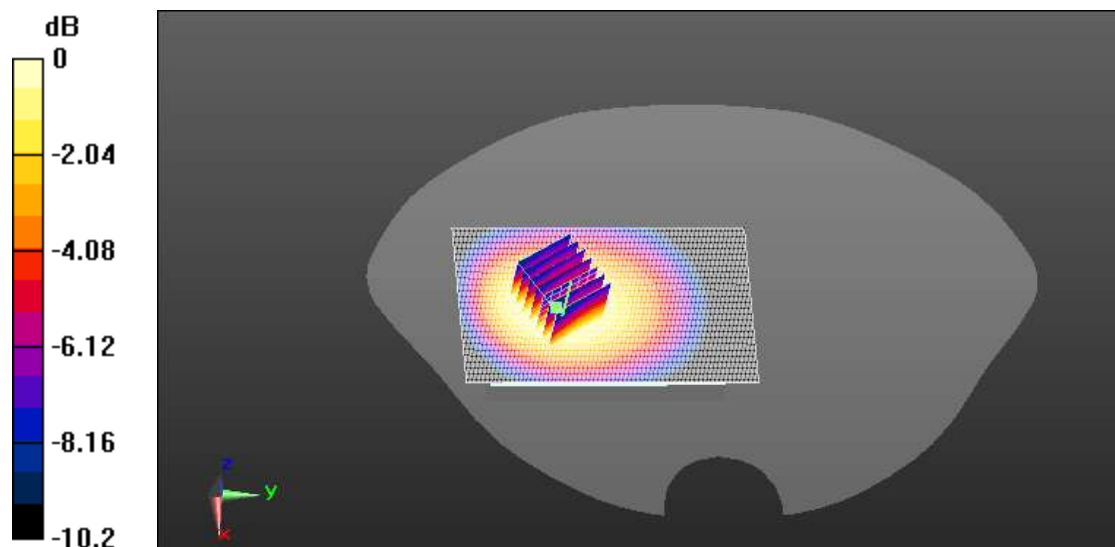
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11 V/m; Power Drift = -0.073 dB

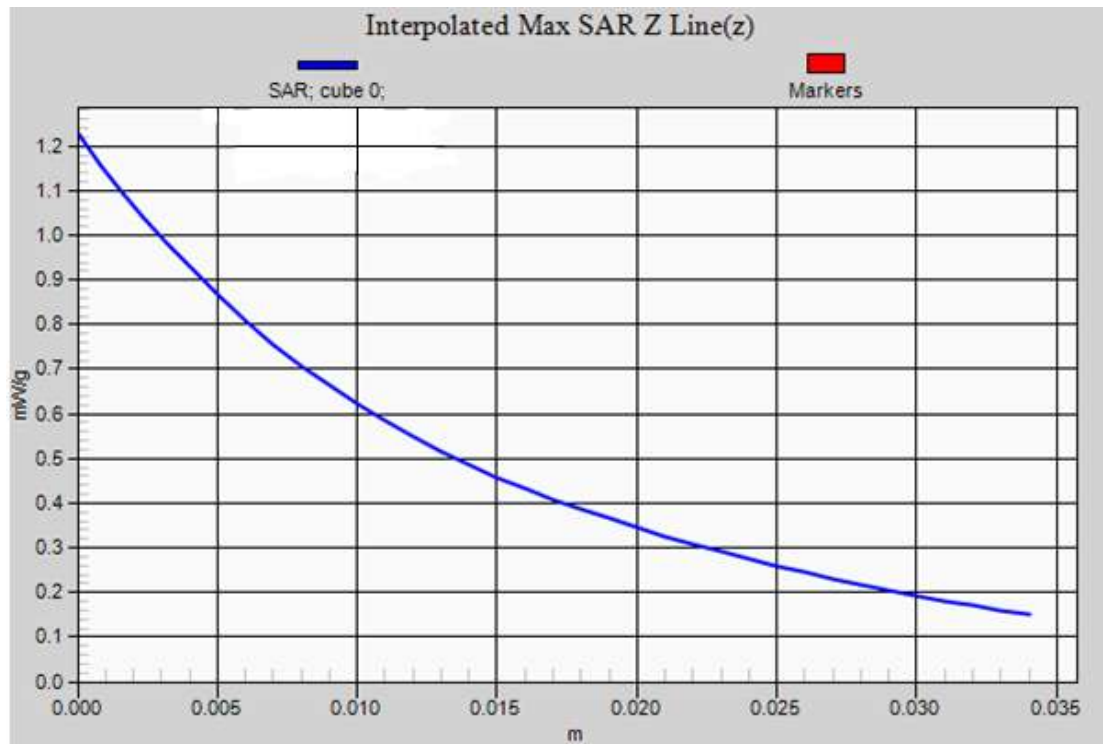
Peak SAR (extrapolated) = 1.23 W/kg

SAR(1 g) = 0.870 mW/g; SAR(10 g) = 0.616 mW/g

Maximum value of SAR (measured) = 0.925 mW/g



0 dB = 0.925mW/g



CDMA800 Towards ground - high with earphone

Date/Time: 2012/3/8 14:54:21, Date/Time: 2012/3/8 15:15:06

Communication System: CDMA; Communication System Band: BandClass0;

Frequency: 848.31 MHz; Communication System PAR: 0 dB

Medium parameters used : $f = 848.31$ MHz; $\sigma = 0.966$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE1528/oet65)

DASY5 Configuration:

- Probe: ES3DV3 - SN3241; ConvF(6.19, 6.19, 6.19);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1226; Calibrated: 2011/6/13
- Phantom: SAM1; Type: SAM; Serial: TP1576
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685) (Deployment Build)

body/Towards ground - high with earphone/Area Scan (81x131x1):

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR = 0.758 mW/g

body/Towards ground - high with earphone/Zoom Scan (7x7x7)/Cube 0:

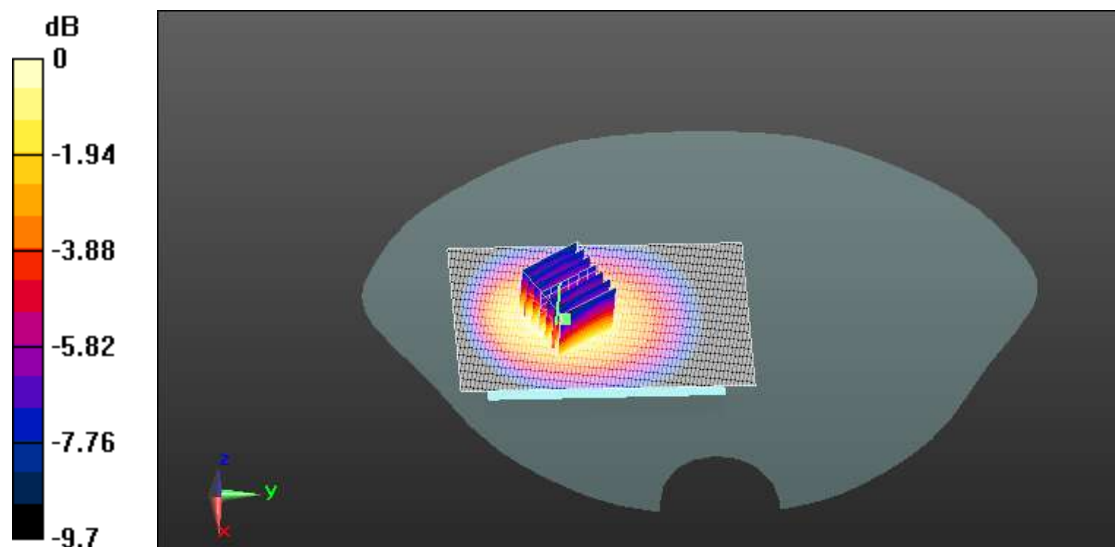
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.4 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.807 mW/g; SAR(10 g) = 0.572 mW/g

Maximum value of SAR (measured) = 0.859 mW/g



0 dB = 0.859mW/g

ANNEX G: Probe Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
 Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
 The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **ZTE Shanghai (Auden)**

Certificate No: **ES3-3241_Sep11**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3241**

Calibration procedure(s) **QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4**
Calibration procedure for dosimetric E-field probes

Calibration date: **September 27, 2011**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642J01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

Calibrated by:	Name Claudio Leubler	Function Laboratory Technician	Signature 
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature 
Issued: September 28, 2011			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: SCS 108

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization ϕ	ϕ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\theta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx,y,z**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,y,z}; A, B, C** are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3241

Manufactured: May 5, 2009
Calibrated: September 27, 2011

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3241

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V/m})^2$) ^a	1.18	0.87	1.05	$\pm 10.1 \%$
DCP (mV) ^b	101.3	104.7	100.8	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^c (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	146.9	$\pm 3.0 \%$
			Y	0.00	0.00	1.00	123.7	
			Z	0.00	0.00	1.00	140.3	

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

^a The uncertainties of NormX,Y,Z do not affect the E^2 -field uncertainty inside TSL (see Pages 5 and 6).

^b Numerical linearization parameter: uncertainty not required.

^c Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3241

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^c	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	41.5	0.90	6.18	6.18	6.18	0.80	1.00	± 12.0 %
900	41.5	0.97	6.07	6.07	6.07	0.80	1.00	± 12.0 %
1750	40.1	1.37	5.32	5.32	5.32	0.80	1.25	± 12.0 %
1810	40.0	1.40	5.15	5.15	5.15	0.80	1.26	± 12.0 %
1900	40.0	1.40	5.09	5.09	5.09	0.80	1.25	± 12.0 %
2000	40.0	1.40	5.07	5.07	5.07	0.80	1.22	± 12.0 %
2450	39.2	1.80	4.45	4.45	4.45	0.74	1.30	± 12.0 %

^c Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: ES3DV3- SN:3241

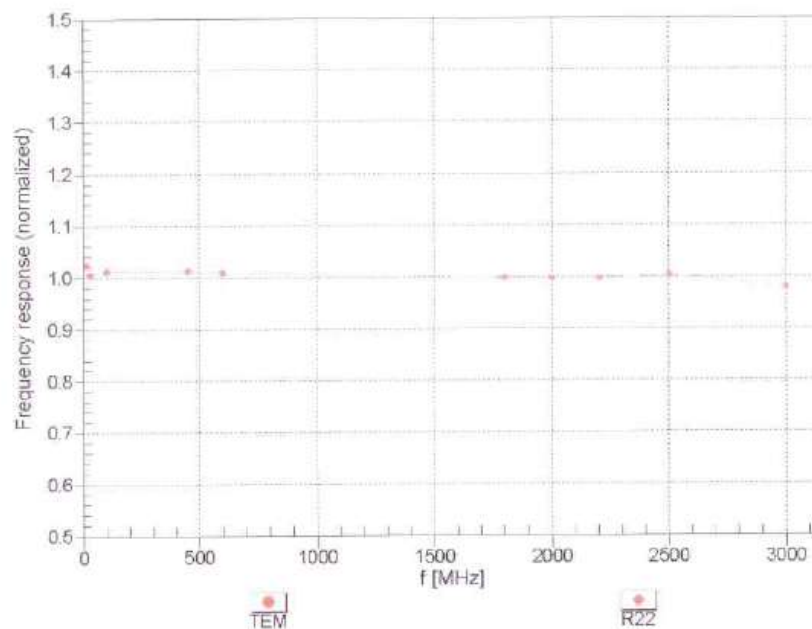
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^c	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	55.2	0.97	6.19	6.19	6.19	0.80	1.00	± 12.0 %
900	55.0	1.05	6.12	6.12	6.12	0.80	1.00	± 12.0 %
1750	53.4	1.49	4.85	4.85	4.85	0.80	1.32	± 12.0 %
1810	53.3	1.52	4.78	4.78	4.78	0.80	1.29	± 12.0 %
1900	53.3	1.52	4.67	4.67	4.67	0.80	1.32	± 12.0 %
2000	53.3	1.52	4.76	4.76	4.76	0.75	1.35	± 12.0 %
2450	52.7	1.95	4.29	4.29	4.29	0.80	1.20	± 12.0 %

^c Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

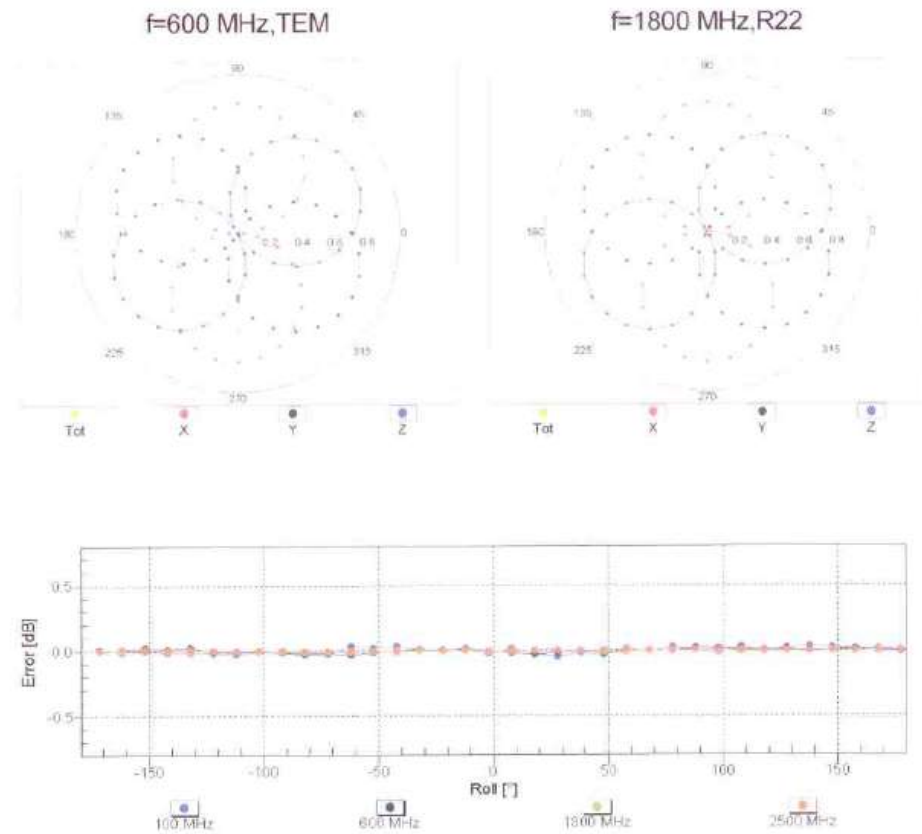
^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



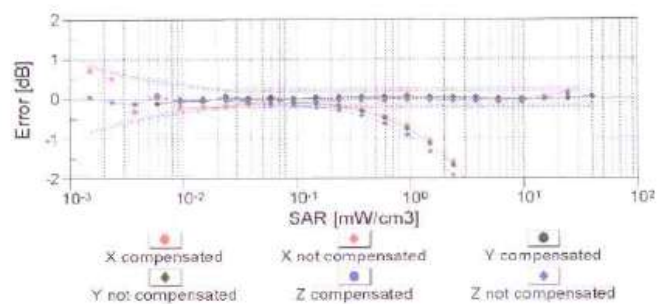
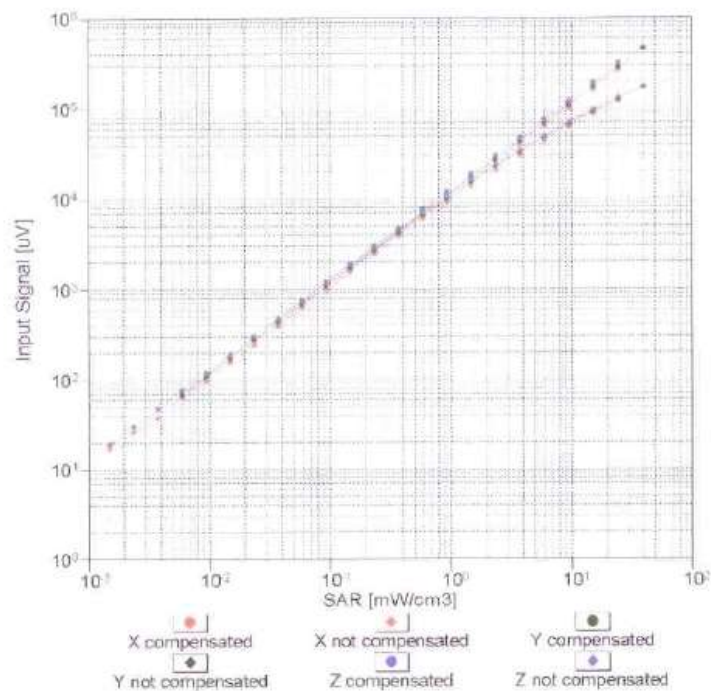
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

Receiving Pattern (ϕ), $\theta = 0^\circ$



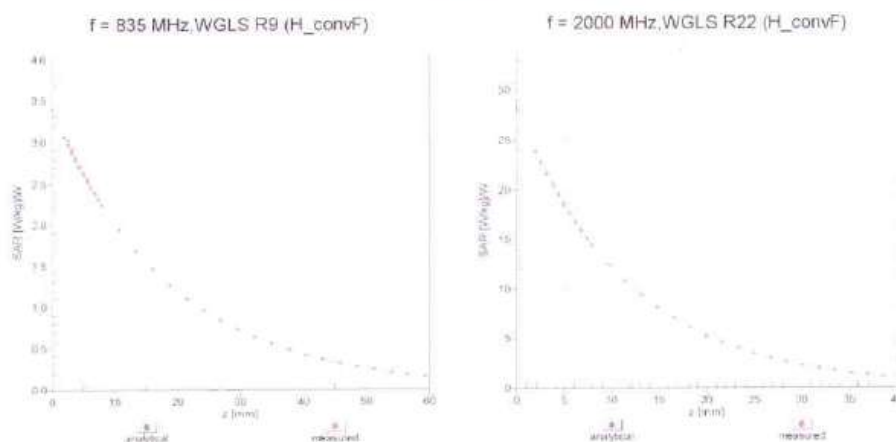
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f = 900 \text{ MHz}$)



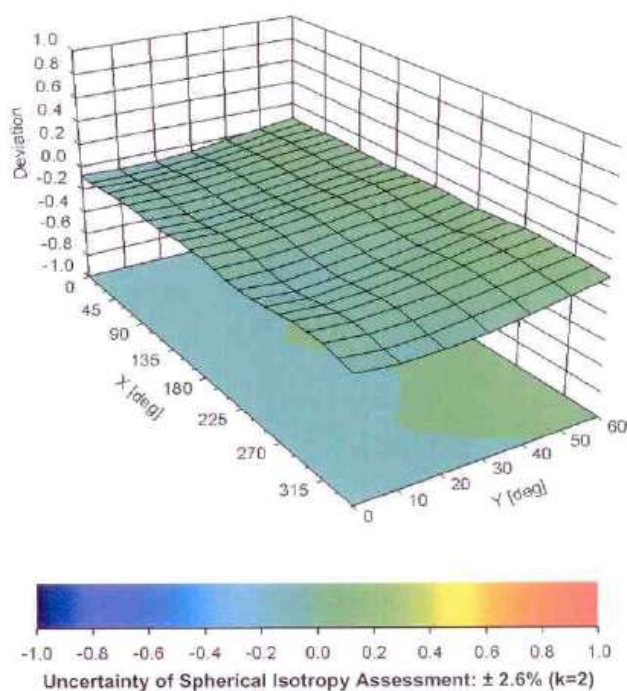
Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in Liquid

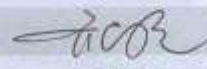
Error (ϕ , θ), f = 900 MHz



DASY/EASY - Parameters of Probe: ES3DV3 - SN:3241**Other Probe Parameters**

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

ANNEX H:DAE4 Calibration Certificate

工业和信息化部通信计量中心 Telecommunication Metrology Center of MIIT		  
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2079 Fax: +86-10-62304793 E-mail: info@emcite.com Http://www.emcite.com		
Client	Tejet	Certificate No: DAE4-1226_Jun11
CALIBRATION CERTIFICATE		
Object	DAE4 - SN: 1226	
Calibration Procedure(s)	TMC-XZ-01-029 Calibration procedure for the data acquisition electronics (DAE)	
Calibration date:	June 13, 2011	
Condition of the calibrated item	In Tolerance	
This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.		
All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.		
Calibration Equipment used (M&TE critical for calibration)		
Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)
Multimeter 3458A	MY45041463	12-Nov-10 (TMC, No: DLsc2010-1115)
DC POWER SUPPLY 66321D	MY43001657	12-Nov-10 (TMC, No: JZ10-290)
Scheduled Calibration		
		Nov-11
		Nov-11
Secondary Standards	ID #	Check Date (in house)
Calibrator Box	/	18-Jun-10 (TMC, in house check)
Scheduled Check		
		In house check Jun-11
Calibrated by:	Name Lin Hao	Function SAR Test Engineer
Reviewed by:	Qi Dianyuan	SAR Project Leader
Approved by:	Xiao Li	Deputy Director of the laboratory
		Signature   
		Issued: June 13, 2011
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.		
Certificate No: DAE4-1226_Jun11		Page 1 of 5

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304793
E-mail: info@emcite.com Http://www.emcite.com

Glossary:

DAE data acquisition electronics
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters:

- DC Voltage Measurement: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- Connector angle: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters contain technical information as a result from the performance test and require no uncertainty.
- DC Voltage Measurement Linearity: Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
- Common mode sensitivity: Influence of a positive or negative common mode voltage on the differential measurement.
- Channel separation: Influence of a voltage on the neighbor channels not subject to an input voltage.
- AD Converter Values with inputs shorted: Values on the internal AD converter corresponding to zero input voltage.
- Input Offset Measurement: Output voltage and statistical results over a large number of zero voltage measurements.

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
 Tel: +86-10-62304633-2079 Fax: +86-10-62304793
 E-mail: Info@emcite.com Http://www.emcite.com

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = $6.1 \mu V$, full range = -100...+300 mV

Low Range: 1LSB = $61nV$, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	$405.837 \pm 0.1\% (k=2)$	$405.272 \pm 0.1\% (k=2)$	$405.326 \pm 0.1\% (k=2)$
Low Range	$3.99601 \pm 0.7\% (k=2)$	$4.01768 \pm 0.7\% (k=2)$	$4.02083 \pm 0.7\% (k=2)$

Connector Angle

Connector Angle to be used in DASY system	$112.5^\circ \pm 1^\circ$
---	---------------------------

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Appendix

1. DC Voltage Linearity

High Range	Input (μ V)	Reading (μ V)	Error (%)
Channel X + Input	200000	200000	0.00
Channel X + Input	20000	20003.91	0.03
Channel X - Input	20000	-20002.26	0.01
Channel Y + Input	200000	200000	0.00
Channel Y + Input	20000	20004.30	0.02
Channel Y - Input	20000	-20001.84	0.01
Channel Z + Input	200000	200000.6	0.00
Channel Z + Input	20000	20002.05	0.01
Channel Z - Input	20000	-20003.32	0.02

Low Range	Input (μ V)	Reading (μ V)	Error (%)
Channel X + Input	2000	1999.9	0.00
Channel X + Input	200	199.61	-0.19
Channel X - Input	200	-200.68	0.36
Channel Y + Input	2000	1999.9	0.00
Channel Y + Input	200	199.40	-0.29
Channel Y - Input	200	-200.46	0.23
Channel Z + Input	2000	2000	0.00
Channel Z + Input	200	199.33	-0.34
Channel Z - Input	200	-201.29	0.66

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μ V)	Low Range Average Reading (μ V)
Channel X	200	3.40	3.47
	- 200	-2.47	-3.10
Channel Y	200	0.15	-0.51
	- 200	-0.60	-1.12
Channel Z	200	-9.89	-10.17
	- 200	7.71	8.15

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3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μ V)	Channel Y (μ V)	Channel Z (μ V)
Channel X	200	-	2.59	-0.31
Channel Y	200	0.57	-	2.47
Channel Z	200	-1.89	0.23	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16128	16441
Channel Y	15957	16202
Channel Z	15979	16032

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M Ω

	Average (μ V)	min. Offset (μ V)	max. Offset (μ V)	Std. Deviation(μ V)
Channel X	0.57	-1.05	2.02	0.41
Channel Y	-1.02	-1.96	-0.02	0.39
Channel Z	1.15	-0.07	1.94	0.34

6. Input Offset Current

Nominal Input Circuitry offset current on all channels: <25fA

7. Input Resistance

	Zeroing (MOhm)	Measuring (MOhm)
Channel X	0.2000	200.0
Channel Y	0.2000	200.0
Channel Z	0.2000	200.0

ANNEX I: D835V2 Calibration Certificate



工业和信息化部通信计量中心
Telecommunication Metrology Center of MIIT




校准
CNAS L0442

Client **Tejet**
Certificate No: D835V2-4d100_Jun11

CALIBRATION CERTIFICATE

Object
D835V2 - SN: 4d100

Calibration Procedure(s)
TMC-XZ-01-027
Calibration procedure for dipole validation kits

Calibration date:
June 14, 2011

Condition of the calibrated item
In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	101253	03-Sep-10 (TMC, No.JZ10-248)	Sep-11
Power sensor NRV-Z5	100333	03-Sep-10 (TMC, No. JZ10-248)	Sep-11
Reference Probe ES3DV3	SN 3149	25-Sep-10(SPEAG No.ES3-3149_Sep10)	Sep-11
DAE4	SN 771	21-Nov-10(SPEAG No.DAE4-771_Nov10)	Nov-11
RF generator E4438C	MY45092879	17-Jun-10(TMC, No.JZ10-302)	Jun-11
Network Analyzer 8753E	US38433212	28-Aug-10(TMC, No.JZ10-056)	Aug-11

Calibrated by:

Reviewed by:

Approved by:

Name

Lin Hao

Qi Dianyuan

Xiao Li

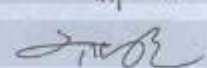
Function

SAR Test Engineer

SAR Project Leader

Deputy Director of the laboratory

Signature


Issued: July 5, 2011

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

Certificate No: D835V2-4d100_Jun11
Page 1 of 9

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM _{x,y,z}
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- d) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	2mm Oval Phantom ELI4	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	41.4 $\pm$ 6 %	0.89mho/m $\pm$ 6 %
Head TSL temperature during test	(21.7 $\pm$ 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.37 mW / g
SAR normalized	normalized to 1W	9.48 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	9.53 mW /g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.53 mW / g
SAR normalized	normalized to 1W	6.12 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	6.14 mW /g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d). chapter "SAR Sensitivities"

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.8 ± 6%	1.00mho/m ± 6 %
Body TSL temperature during test	(21.9 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.45 mW / g
SAR normalized	normalized to 1W	9.80 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	9.47 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.59 mW / g
SAR normalized	normalized to 1W	6.36 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	6.21 mW /g ± 16.5 % (k=2)

² Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$47.8\Omega + 0.22j\Omega$
Return Loss	- 32.8dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$45.9\Omega + 3.6j\Omega$
Return Loss	- 24.9dB

General Antenna Parameters and Design

Electrical Delay (one direction)	2.983 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 9, 2010

DASY5 Validation Report for Head TSL

Date/Time: 2011-6-14 8:57:36

Test Laboratory: TMC, Beijing, China

DUT: Dipole 835 MHz; Type: D835V2; Serial: SN: 4d100

Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1

Medium: Head 835MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 41.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(6.56, 6.56, 6.56); Calibrated: 25.09.10
- Electronics: DAE4 Sn771; Calibration: 21.11.10
- Phantom: 2mm Oval Phantom ELI4; Type: QDOVA001BB
- Measurement SW: DASY5, V5.0 Build 119.9; Postprocessing SW: SEMCAD, V13.2 Build 87

Pin=250mW; d=15mm/Zoom Scan (7x7x7)/Cube 0:

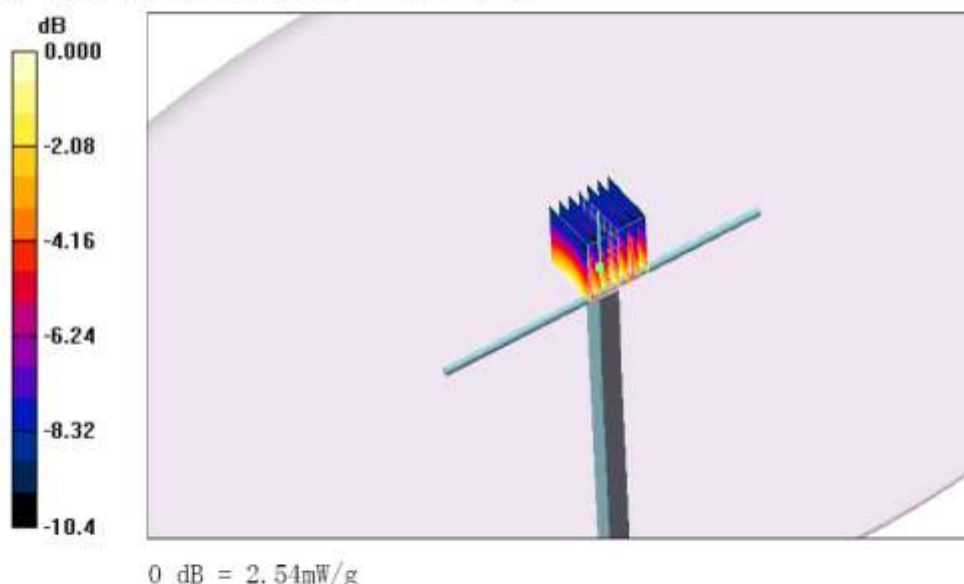
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.1 V/m; Power Drift = 0.096 dB

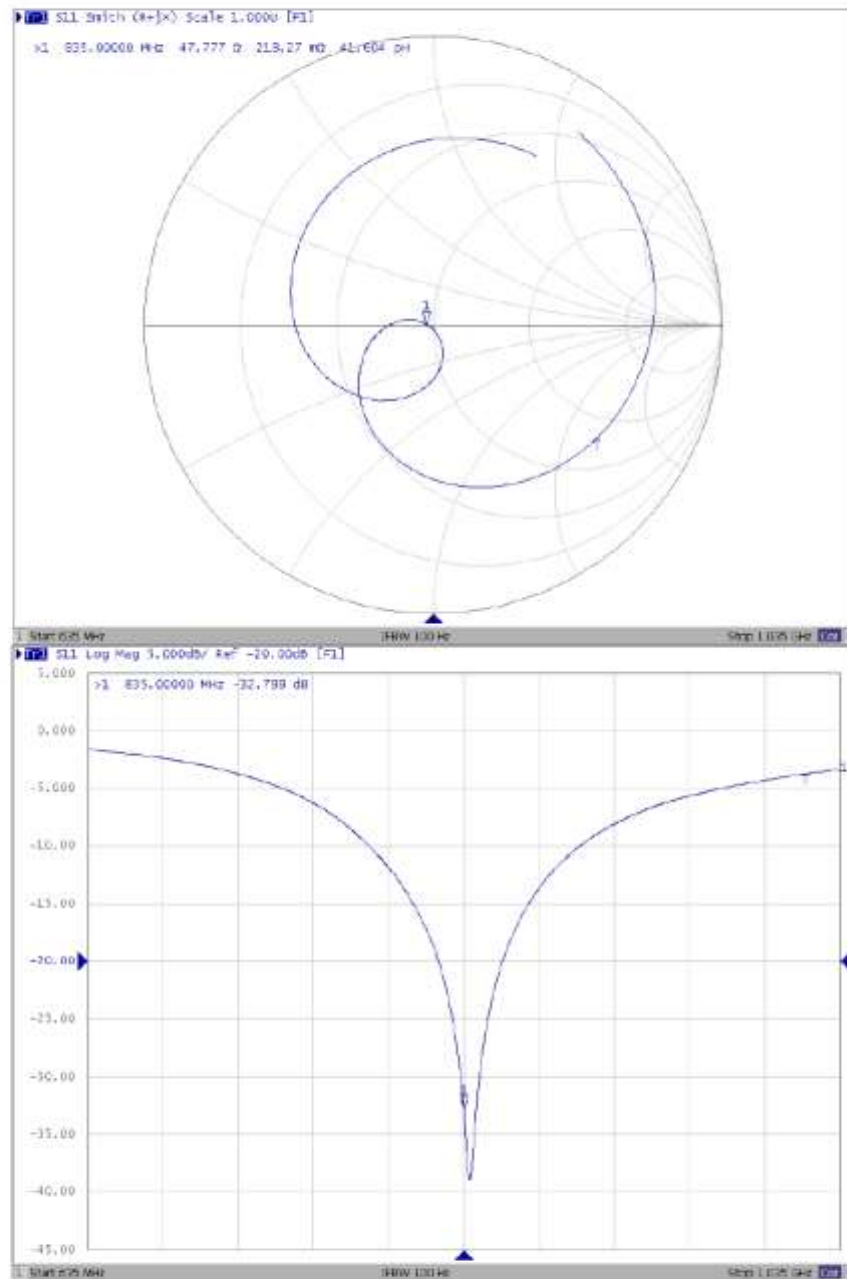
Peak SAR (extrapolated) = 3.45 W/kg

SAR(1 g) = 2.37 mW/g; SAR(10 g) = 1.53 mW/g

Maximum value of SAR (measured) = 2.54 mW/g



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 2011-6-14 9:52:23

Test Laboratory: TMC, Beijing, China

DUT: Dipole 835 MHz; Type: D835V2; Serial: SN: 4d100

Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1

Medium: Body 835MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 1.00$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(6.22, 6.22, 6.22); Calibrated: 25.09.10
- Electronics: DAE4 Sn771; Calibration: 21.11.10
- Phantom: 2mm Oval Phantom ELI4; Type: QDOVA001BB
- Measurement SW: DASY5, V5.0 Build 119.9; Postprocessing SW: SEMCAD, V13.2 Build 87

Pin=250mW; d=15mm/Zoom Scan (7x7x7)/Cube 0:

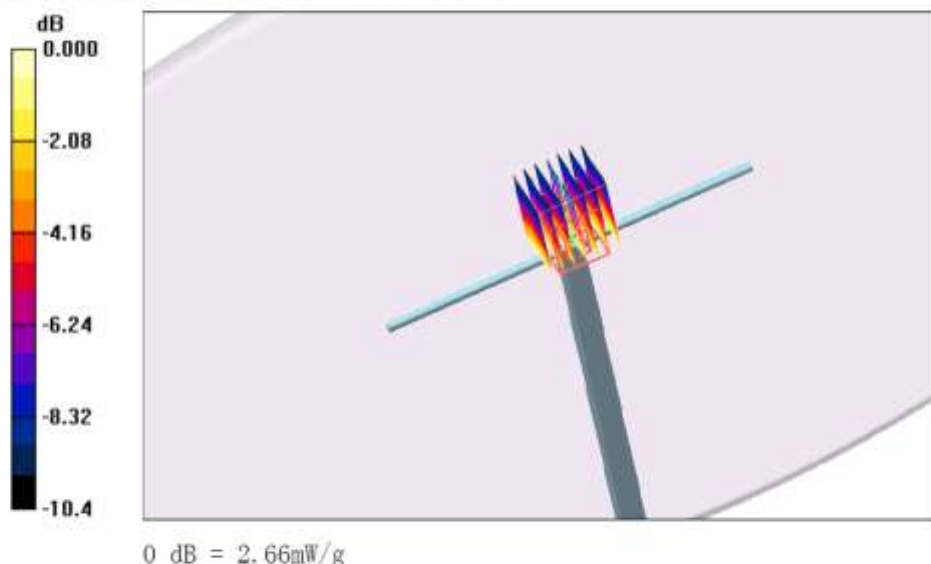
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 41.3 V/m; Power Drift = -0.084 dB

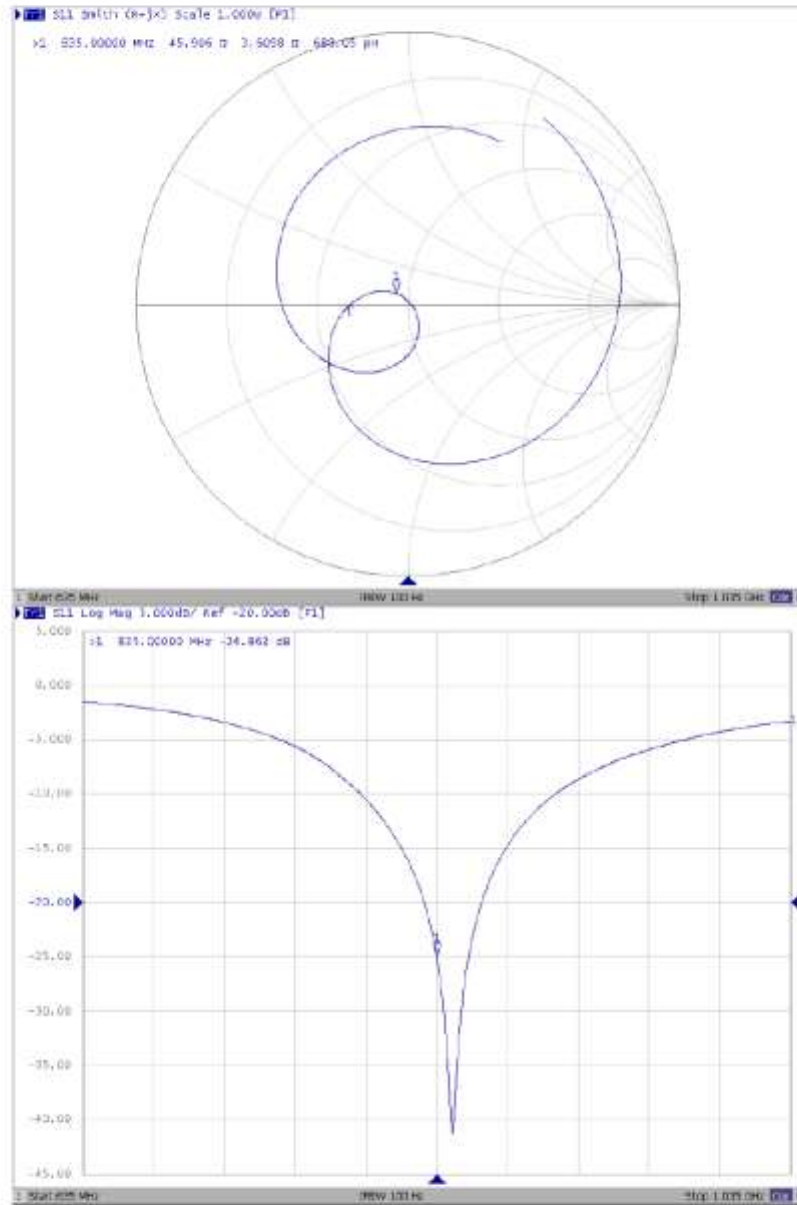
Peak SAR (extrapolated) = 3.52 W/kg

SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.59 mW/g

Maximum value of SAR (measured) = 2.66 mW/g



Impedance Measurement Plot for Body TSL



-----END OF REPORT-----