



Report No.: RZA2010-0480



OET 65

TEST REPORT

Product Name	EVDO Rev.A USB Stick
FCC ID	QISEC1705
Model	EC1705
Client	HUAWEI Technologies Co., Ltd.

TA Technology (Shanghai) Co., Ltd.



GENERAL SUMMARY

Product Name	EVDO Rev.A USB Stick	Model	EC1705
FCC ID	QISEC1705	Report No.	RZA2010-0480
Client	HUAWEI Technologies Co., Ltd.		
Manufacturer	HUAWEI Technologies Co., Ltd.		
Standard(s)	<p>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.</p> <p>Supplement C Edition 01-01 to OET Bulletin 65 Edition 97-01 June 2001 + DA 02-1438, published June 2002: Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields Additional Information for Evaluation Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions</p> <p>IEC 62209-2 Ed.1(2008-10): Human exposure to radio frequency fields from handheld and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 2: Procedure to determine the Specific Absorption Rate (SAR)for wireless communication devices used in close proximity to the human body .(frequency rang of 30MHz to 6GHz)</p> <p>KDB 447498 D02:2009-11-13</p>		
Conclusion	<p>Localized Specific Absorption Rate (SAR) of this portable wireless equipment has been measured in all cases requested by the relevant standards cited in Clause 5.2 of this test report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 5.1 of this test report.</p> <p>General Judgment: Pass</p> <p style="text-align: right;">(Stamp) Date of issue: April 6th, 2010</p>		
Comment	The test result only responds to the measured sample.		

Approved by 杨伟中
Yang Weizhong

Revised by 凌敏宝
Ling Minbao

Performed by 李金昌
Li Jinchang

TABLE OF CONTENT

1. General Information	5
1.1. Notes of the test report	5
1.2. Testing laboratory	5
1.3. Applicant Information	6
1.4. Manufacturer Information	6
1.5. Information of EUT	7
1.6. Test Date	7
2. Operational Conditions during Test	8
2.1. General description of test procedures	8
2.2. Information for the measurement of CDMA 1x devices	8
2.2.1. Output Power Verification	8
2.2.2. Body SAR measurement	8
2.3. Information for the measurement of CDMA 1x EV-DO devices	9
2.3.1. Output Power Verification for EV-DO	9
2.3.2. SAR measurement	9
2.4. Position of module in Portable devices	10
2.5. Picture of host product	11
3. SAR Measurements System Configuration	13
3.1. SAR Measurement Set-up	13
3.2. DASY4 E-field Probe System	14
3.2.1. EX3DV4 Probe Specification	14
3.2.2. E-field Probe Calibration	15
3.3. Other Test Equipment	15
3.3.1. Device Holder for Transmitters	15
3.3.2. Phantom	16
3.4. Scanning procedure	16
3.5. Data Storage and Evaluation	18
3.5.1. Data Storage	18
3.5.2. Data Evaluation by SEMCAD	18
3.6. System check	21
3.7. Equivalent Tissues	22
4. Laboratory Environment	22
5. Characteristics of the Test	23
5.1. Applicable Limit Regulations	23
5.2. Applicable Measurement Standards	23
6. Conducted Output Power Measurement	24
6.1. Summary	24
6.2. Conducted Power Results	24
7. Test Results	26
7.1. Dielectric Performance	26

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RZA2010-0480

Page 4 of 117

7.2.	System check.....	26
7.3.	Summary of Measurement Results.....	27
7.3.1.	Summary of Measurement Results (CDMA Cellular).....	27
7.3.2.	Summary of Measurement Results (CDMA PCS).....	28
7.3.3.	Summary of Measurement Results (CDMA AWS).....	30
7.4.	Conclusion.....	31
8.	Measurement Uncertainty.....	32
9.	Main Test Instruments.....	33
ANNEX A:	Test Layout.....	34
ANNEX B:	System Check Results.....	36
ANNEX C:	Graph Results.....	39
ANNEX D:	Probe Calibration Certificate.....	75
ANNEX E:	D835V2 Dipole Calibration Certificate.....	84
ANNEX F:	D1800V2 Dipole Calibration Certificate.....	93
ANNEX G:	D1900V2 Dipole Calibration Certificate.....	102
ANNEX H:	DAE4 Calibration Certificate.....	111
ANNEX I:	The EUT Appearances and Test Configuration.....	116

1. General Information

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report standalone dose not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai,China
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Yang Weizhong
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: yangweizhong@ta-shanghai.com

1.3. Applicant Information

Company: HUAWEI Technologies Co., Ltd.
Address: Bantian, Longgang District
City: Shenzhen
Postal Code: 518129
Country: P.R. China
Contact: Zhang Ting
Telephone: 0755-28780808
Fax: 0755-28780808

1.4. Manufacturer Information

Company: HUAWEI Technologies Co., Ltd.
Address: Bantian, Longgang District
City: Shenzhen
Postal Code: 518129
Country: P.R. China
Telephone: 0755-28780808
Fax: 0755-28780808

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No. RZA2010-0480

Page 7 of 117

1.5. Information of EUT

General information

Device type :	portable device		
Exposure category:	uncontrolled environment / general population		
Name of EUT:	EVDO Rev.A USB Stick		
IMEI or SN:	NC2AA11020500004		
Device operating configurations :			
Operating mode(s):	CDMA Cellular		
	CDMA PCS		
	CDMA AWS		
Test Modulation:	QPSK		
Operating frequency range(s)	Band	TX(MHz)	Rx(MHz)
	CDMA Cellular	824.7 ~ 848.31	869.7 ~ 893.31
	CDMA PCS	1851.25 ~ 1908.75	1931.25 ~ 1988.75
	CDMA AWS	1711.25 ~ 1752.5	2111.25 ~ 2152.5
Test channel (Low –Middle –High)	1013 – 384 – 777	(CDMA Cellular)	(tested)
	25 – 600 – 1175	(CDMA PCS)	(tested)
	25 – 450 – 850	(CDMA AWS)	(tested)
hardware version:	CE1EC1705M001		
software version:	11.104.05.02.644		
antenna type:	Internal antenna		

Equipment Under Test (EUT) is a model of EVDO Rev.A USB Stick. During SAR test of the EUT, it was connected to a portable computer. The tests in the band of CDMA Cellular, CDMA PCS and CDMA AWS are performed in the mode of CDMA and EVDO. The measurements were performed in combination with two different host products (IBM T61, BenQ Joybook R55V, Lenovo Y-450). IBM T61, BenQ Joybook R55V laptop has horizontal USB slot, Lenovo Y-450 laptop has vertical USB slot.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. Test Date

The test is performed from April 1, 2010 to April 4, 2010.

2. Operational Conditions during Test

2.1. General description of test procedures

A communication link is set up with a System Simulator (SS) by air link, and a call is established. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 1013, 384 and 777 respectively in the case of CDMA Cellular, to 25, 600 and 1175 respectively in the case of CDMA PCS, to 25, 450 and 850 respectively in the case of CDMA AWS. The EUT is commanded to operate at maximum transmitting power.

Connection to the EUT is established via air interface with E5515C, and the EUT is set to maximum output power by E5515C. 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.

2.2. Information for the measurement of CDMA 1x devices

2.2.1. Output Power Verification

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

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

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

2.2.2. Body SAR measurement

SAR is measured in RC3 with the EUT configured to transmit at full rate using TDSO/SO32 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 0.25dB higher than measured with FCH only.

Body SAR in RC1 is not required because the maximum average output of each channel is less than 0.25 dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1; with Loopback Service Option SO55, at full rate using the body exposure configuration that results in the highest SAR for that channel in RC3.

Test communication setup meet as followings:

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

2.3. Information for the measurement of CDMA 1x EV-DO devices

2.3.1. Output Power Verification for EV-DO

Maximum output power is verified on the High, Middle, Low channel according to procedures in section 3.1.1.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rev.0 and section 4.3.4 of 3GPP2 C.S0033-A for Rev. A. For Rev. A, maximum output power for both Subtype 0/1 and Subtype 2 Physical Layer configurations should be measured.

2.3.2. SAR measurement

SAR is measured using FTAP/RTAP and FETAP/RETAP respectively for Rev.0 and Rev. A devices. The AT is tested with a Reverse Data Channel rate of 153.6kbps IN Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations. Both FTAP and FETAP are configured with a Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2kbps with the ACK Channel transmitting in all slots. AT power control should be in "All Bits Up" conditions for TAP/ETAP.

Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev.0. SAR for Subtype 2 Physical Layer configurations is not required for Rev. A when the maximum average output of each RF channels is less that measured in Subtype 0/1 Physical Layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for that RF channels in Rev.0¹⁴.

For Ev-Do devices that also support 1x RTT voice and/or data operations, SAR is not required for 1x RTT when the maximum average output of each channel is less than ¼ dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0. Otherwise, the 'Body SAR Measurements' procedures in the 'CDMA-2000 1x Handsets' section should be applied.

2.4. Position of module in Portable devices

The measurements were performed in combination with two host products (IBMT61, BenQ Joybook R55V, Lenovo Y-450). IBM T61, BenQ Joybook R55V laptop has horizontal USB slot, Lenovo Y-450 laptop has vertical USB slot.

A test distance of 5mm or less, according to KDB 447498, should be considered for the orientation that can satisfy such requirements.

For each channel, the EUT is tested at the following 4 test positions:

- Test Position 1: The EUT is connected to the portable computer with horizontal USB slot. The back side of the EUT towards the bottom of the flat phantom. (ANNEX I Picture 7-a)
- Test Position 2: The EUT is connected to the portable computer with horizontal USB slot. The front side of the EUT towards the bottom of the flat phantom. (ANNEX I Picture 7-b)
- Test Position 3: The EUT is connected to the portable computer through a 19 cm USB cable. The left side of the EUT towards the bottom of the flat phantom. (ANNEX I Picture 7-c)
- Test Position 4: The EUT is connected to the portable computer with vertical USB slot. the right side of the EUT towards the bottom of the flat phantom. (ANNEX I Picture 7-d)

2.5. Picture of host product

During the test, IBM T61, Lenovo Y-450 and BenQ Joybook R55V laptop were used as an assistant to help to setup communication. (See Picture 1)



Picture 1-a: IBM T61 Close



Picture 1-b: IBM T61 Open



Picture 1-c: BenQ Joybook R55V Close



Picture 1-d: BenQ Joybook R55V Open



Picture 1-e: Lenovo Y-450 Close



Picture 1-f: Lenovo Y-450 Open



Picture 1-g: BenQ Joybook R55V with horizontal USB slot



Picture 1-h: IBM T61 with horizontal USB slot



Picture 1-i: Lenovo Y-450 with horizontal USB slot



Picture 1-j: a 19 cm USB cable

Picture 1: Computer as a test assistant

3. SAR Measurements System Configuration

3.1. SAR Measurement Set-up

The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY4 measurement server.
- The DASY4 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003
- DASY4 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System validation dipoles allowing to validate the proper functioning of the system.

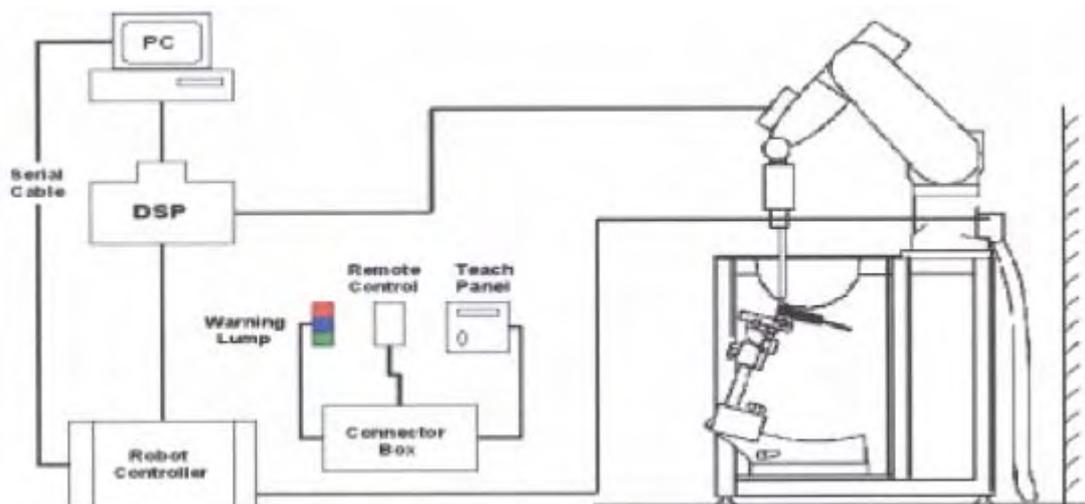


Figure 1. SAR Lab Test Measurement Set-up

3.2. DASY4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

3.2.1. EX3DV4 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 835 ,HSL 900, HSL 1750 and HSL 1950 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: ± 0.2 dB (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. EX3DV4 E-field Probe



Figure 3. EX3DV4 E-field probe

3.2.2. 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 $\pm 0.25\text{dB}$. 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.

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

Where: Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
 ΔT = Temperature increase due to RF exposure.
Or

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

Where:
 σ = Simulated tissue conductivity,
 ρ = Tissue density (kg/m^3).

3.3. Other Test Equipment

3.3.1. Device Holder for Transmitters

Construction: Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.) It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI4 and SAM v6.0 Phantoms.

Material: POM, Acrylic glass, Foam

3.3.2. 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 4. Generic Twin Phantom

3.4. Scanning procedure

The DASY4 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

- The "reference" and "drift" measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT's output power and should vary max. ± 5 %.
- The "surface check" measurement tests the optical surface detection system of the DASY4 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)
- 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 10 mm x 10 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 DASY4 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.

3.5. Data Storage and Evaluation

3.5.1. Data Storage

The DASY4 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.

3.5.2. 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	Norm _i , a _{i0} , a _{i1} , a _{i2}
	- Conversion factor	ConvF _i
	- Diode compression point	Dcp _i
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 DASY4 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,

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RZA2010-0480

Page 19 of 117

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.

$$SAR = (E_{tot}^2 \cdot \rho) / (4 \pi \cdot 1000)$$

with **SAR** = local specific absorption rate in mW/g

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

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

ρ = equivalent tissue density in g/cm³

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

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

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

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

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

3.6. System check

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyser. A system check measurement was made following the determination of the dielectric parameters of the simulant, 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 table 5.

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 DASY4 system.

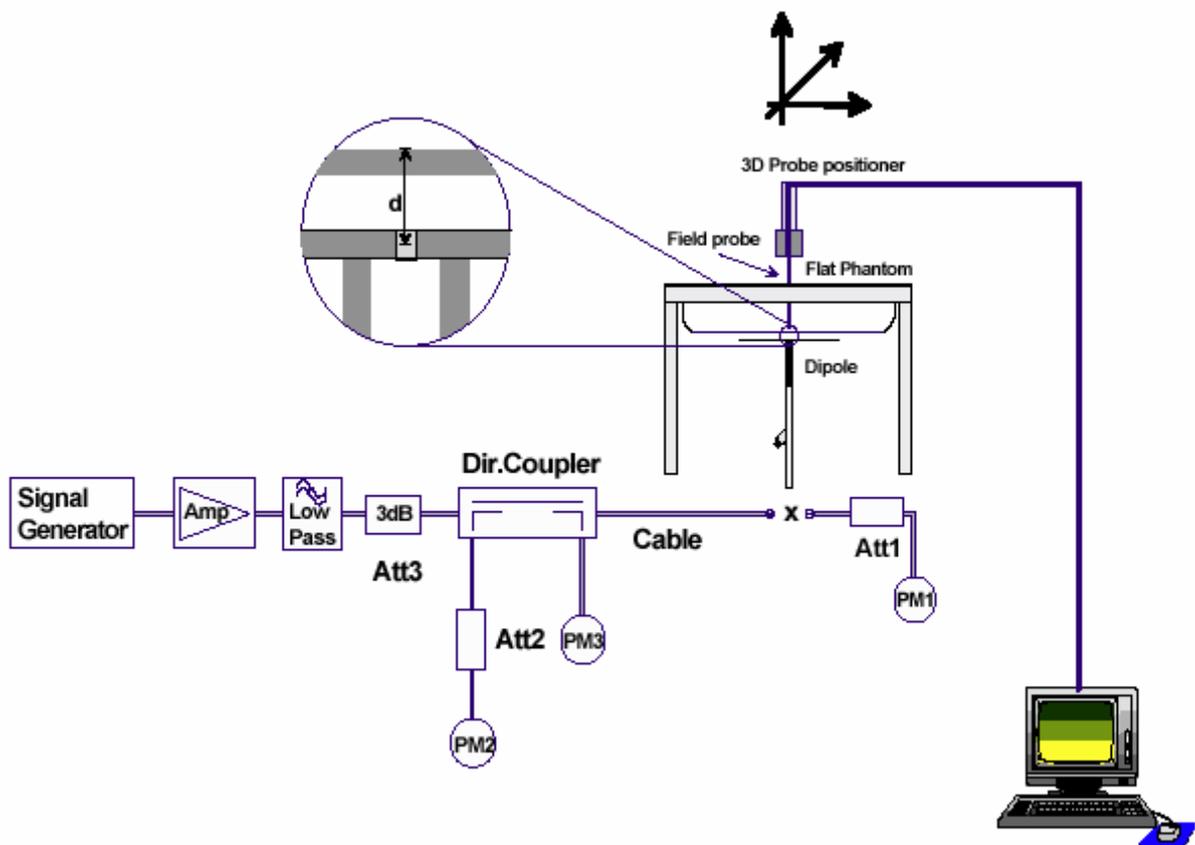


Figure 5. System check Set-up

3.7. Equivalent Tissues

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

Table 1: Composition of the Body Tissue Equivalent Matter

MIXTURE%	FREQUENCY (Body)835MHz
Water	52.5
Sugar	45
Salt	1.4
Preventol	0.1
Cellulose	1.0
Dielectric Parameters Target Value	f=835MHz $\epsilon=55.2$ $\sigma=0.97$

MIXTURE%	FREQUENCY(Brain) 1750MHz
Water	55.242
Glycol	44.452
Salt	0.306
Dielectric Parameters Target Value	f=1750MHz $\epsilon=40.1$ $\sigma=1.37$

MIXTURE%	FREQUENCY (Body) 1900MHz
Water	69.91
Glycol	29.96
Salt	0.13
Dielectric Parameters Target Value	f=1900MHz $\epsilon=53.3$ $\sigma=1.52$

4. Laboratory Environment

Table 2: The Ambient Conditions during Test

Temperature	Min. = 20°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

5. Characteristics of the Test

5.1. Applicable Limit Regulations

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.

5.2. Applicable Measurement Standards

SUPPLEMENT C Edition 01-01 to OET BULLETIN 65 Edition 97-01 June 2001+ DA 02-1438, published June 2002: Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields Additional Information for Evaluation Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions

IEC 62209-2 Ed.1(2008-10): Human exposure to radio frequency fields from handheld and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 2: Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body .(frequency rang of 30MHz to 6GHz)

KDB 447498 D02:2009-11-13

6. Conducted Output Power Measurement

6.1. Summary

The DUT is tested using an E5515C 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.

6.2. Conducted Power Results

Table 3: Conducted Power Measurement Results

CDMA Cellular (RC1)	Conducted Power		
	Channel 1013	Channel 384	Channel 777
Before test (dBm)	23.96	24.00	24.03
After test (dBm)	23.95	24.01	24.02
CDMA Cellular (RC3)	Conducted Power		
	Channel 1013	Channel 384	Channel 777
Before test (dBm)	24.13	23.99	23.98
After test (dBm)	24.12	23.98	23.97
CDMA Cellular + EV-DO (Subtype0)	Conducted Power		
	Channel 1013	Channel 384	Channel 777
Before Test(dBm)	24.18	24.09	24.15
After Test(dBm)	24.17	24.08	24.14
CDMA Cellular + EV-DO (Subtype2)	Conducted Power		
	Channel 1013	Channel 384	Channel 777
Before Test(dBm)	24.03	24.27	24.27
After Test(dBm)	24.02	24.26	24.26
CDMA PCS (RC1)	Conducted Power		
	Channel 25	Channel 600	Channel 1175
Before test (dBm)	24.11	24.21	24.12
After test (dBm)	24.10	24.20	24.11
CDMA PCS (RC3)	Conducted Power		
	Channel 25	Channel 600	Channel 1175
Before test (dBm)	24.09	24.18	24.11
After test (dBm)	24.08	24.17	24.10
CDMA PCS + EV-DO (Subtype0)	Conducted Power		
	Channel 25	Channel 600	Channel 1175
Before Test(dBm)	24.25	24.29	24.12
After Test(dBm)	24.24	24.28	24.11
CDMA PCS + EV-DO (Subtype2)	Conducted Power		
	Channel 25	Channel 600	Channel 1175
Before Test(dBm)	24.22	24.28	24.13

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RZA2010-0480

Page 25 of 117

After Test(dBm)	24.21	24.27	24.12
CDMA AWS (RC1)	Conducted Power		
	Channel 25	Channel 450	Channel 850
Before test (dBm)	24.05	24.15	24.03
After test (dBm)	24.04	24.14	24.02
CDMA AWS (RC3)	Conducted Power		
	Channel 25	Channel 450	Channel 850
Before test (dBm)	24.01	24.17	24.08
After test (dBm)	24.00	24.16	24.07
CDMA AWS + EV-DO (Subtype0)	Conducted Power		
	Channel 25	Channel 450	Channel 850
Before Test(dBm)	24.01	24.22	24.10
After Test(dBm)	24.00	24.21	24.11
CDMA AWS + EV-DO (Subtype2)	Conducted Power		
	Channel 25	Channel 450	Channel 850
Before Test(dBm)	24.03	24.19	24.12
After Test(dBm)	24.02	24.18	24.11

7. Test Results

7.1. Dielectric Performance

Table 4: Dielectric Performance of Body Tissue Simulating Liquid

Frequency	Description	Dielectric Parameters		Temp °C
		ϵ_r	σ (s/m)	
835MHz (body)	Target value ±5% window	55.20 52.44 - 57.96	0.97 0.92 - 1.02	/
	Measurement value 2010-4-3	53.79	0.96	22.5
1750MHz (body)	Target value ±5% window	53.4 50.64 – 55.97	1.49 1.44 – 1.60	/
	Measurement value 2010-4-3	53.16	1.52	21.9
1900MHz (body)	Target value ±5% window	53.3 50.64 – 55.97	1.52 1.44 – 1.60	/
	Measurement value 2010-4-1	52.21	1.53	21.8

7.2. System check

Table 5: System Check for Body tissue stimulant

Frequency	Description	SAR(W/kg)		Dielectric Parameters		Temp °C
		10g	1g	ϵ_r	σ (s/m)	
835MHz	Recommended value ±10% window	1.68 1.51 - 1.85	2.56 2.30 - 2.82	53	0.99	/
	Measurement value 2010-4-3	1.68	2.56	53.79	0.96	21.9
1800 MHz	Recommended value ±10% window	4.97 4.47 — 5.47	9.31 8.38 — 10.24	54.2	1.49	/
	Measurement value 2010-4-3	5.25	10.1	52.87	1.56	22.1
1900 MHz	Recommended value ±10% window	5.52 4.97 — 6.07	10.5 9.45 — 11.55	54	1.55	/
	Measurement value 2010-4-1	5.17	9.73	52.21	1.53	21.7

Note: 1. the graph results see ANNEX B.

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

TA Technology (Shanghai) Co., Ltd.

Test Report

7.3. Summary of Measurement Results

7.3.1. Summary of Measurement Results (CDMA Cellular)

Table 6: SAR Values (CDMA Cellular)

Limit of SAR (W/kg)		10 g Average	1 g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.21	
Test Case Of Body		Measurement Result(W/kg)		Power Drift(dB)	
Different Test Position	Channel	10 g Average	1 g Average	Power Drift(dB)	
IBM T61(Rev.0)					
Test Position 1	Middle	0.398	0.627	0.003	Figure 9
BenQ Joybook R55V(Rev.0)					
Test Position 2	High	0.547	0.862	0.028	Figure 10
	Middle	0.426	0.679	-0.110	Figure 11
	Low	0.466	0.730	0.083	Figure 12
Lenovo Y-450(Rev.0)					
Test Position 3	Middle	0.213	0.342	0.120	Figure 13
Test Position 4	Middle	0.254	0.380	0.097	Figure 14
Worst case position of Rev.0 with Rev.A					
Test Position 2	High	0.535	0.846	-0.142	Figure 15
Worst case position of Rev.0 with 1×RTT					
Test Position 2	High	0.536	0.839	0.020	Figure 16

Note: 1. The value with blue color is the maximum SAR Value of each test band.

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

Table 7: SAR Values [CDMA Cellular, enhanced energy coupling at increased separation distances]

Different Test Position	Distance of EUT to Phantom	Channel	Measurement Result (W/kg)	50% of initial position SAR (W/kg)	125% of initial position SAR (W/kg)
Test Position 2	initial position	High	1.070	0.535	1.338
	5mm		0.580		
	10mm		0.340		

Note: 1. The probe tip location is fixed at the distance of 2mm from the phantom surface.

2. When the device position with the highest point SAR is > 25% of that measured at the initial position, a complete 1-g SAR evaluation is required for this configuration.
3. A single point SAR is measured for each of these device positions until the SAR is less than 50% of that measured at the initial position.

TA Technology (Shanghai) Co., Ltd.

Test Report

7.3.2. Summary of Measurement Results (CDMA PCS)

Table 8: SAR Values (CDMA PCS)

Limit of SAR (W/kg)		10 g Average	1 g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.21	
Test Case Of Body		Measurement Result(W/kg)		Power Drift(dB)	
Different Test Position	Channel	10 g Average	1 g Average		
IBM T61(Rev.0)					
Test Position 1	High	0.602	1.140	0.125	Figure 17
	Middle	0.648	1.220	0.168	Figure 18
	Low	0.690	1.280	-0.144	Figure 19
BenQ Joybook R55V(Rev.0)					
Test Position 2	High	0.545	1.070	0.089	Figure 20
	Middle	0.668	1.320	0.153	Figure 21
	Low	0.718	1.390	0.049	Figure 22
Lenovo Y-450(Rev.0)					
Test Position 3	High	0.585	1.100	0.123	Figure 23
	Middle	0.595	1.110	0.002	Figure 24
	Low	0.610	1.130	0.041	Figure 25
Test Position 4	Middle	0.172 max.cube)	0.286(max.cube)	0.000	Figure 26
Worst case position of Rev.0 with Rev.A					
Test Position 2	Low	0.750	1.450	0.197	Figure 27
Worst case position of Rev.0 with 1×RTT					
Test Position 2	Low	0.705	1.340	-0.164	Figure 28

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8 W/kg), testing at the high and low channels is optional.
3. Upper and lower frequencies were measured at the worst position.
4. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above; the value from the second assessed cube is given in the SAR distribution plots (See ANNEX C).

TA Technology (Shanghai) Co., Ltd.
Test Report

Table 9: SAR Values [CDMA PCS, enhanced energy coupling at increased separation distances]

Different Test Position	Distance of EUT to Phantom	Channel	Measurement Result (W/kg)	50% of initial position SAR (W/kg)	125% of initial position SAR (W/kg)
Test Position 2	initial position	Low	1.730	0.865	2.163
	5mm		0.850		

- Note: 1. The probe tip location is fixed at the distance of 2mm from the phantom surface.
 2. when the device position with the highest point SAR is > 25% of that measured at the initial position, a complete 1-g SAR evaluation is required for this configuration.
 3. A single point SAR is measured for each of these device positions until the SAR is less than 50% of that measured at the initial position.

TA Technology (Shanghai) Co., Ltd.

Test Report

7.3.3. Summary of Measurement Results (CDMA AWS)

Table 10: SAR Values (CDMA AWS)

Limit of SAR (W/kg)		10 g Average	1 g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.21	
Test Case Of Body		Measurement Result(W/kg)		Power	
Different Test Position	Channel	10 g Average	1 g Average	Drift(dB)	
IBM T61(Rev.0)					
Test Position 1	High	0.657	1.230	0.017	Figure 29
	Middle	0.589	1.090	0.059	Figure 30
	Low	0.647	1.200	-0.093	Figure 31
BenQ Joybook R55V(Rev.0)					
Test Position 2	High	0.731	1.410	0.122	Figure 32
	Middle	0.687	1.320	-0.078	Figure 33
	Low	0.724	1.380	0.195	Figure 34
Lenovo Y-450(Rev.0)					
Test Position 3	High	0.555	1.030	0.100	Figure 35
	Middle	0.531	0.974	-0.186	Figure 36
	Low	0.588	1.080	-0.015	Figure 37
Test Position 4	Middle	0.162	0.267	0.193	Figure 38
Worst case position of Rev.0 with Rev.A					
Test Position 2	High	0.737	1.400	-0.070	Figure 39
Worst case position of Rev.0 with 1×RTT					
Test Position 2	High	0.740	1.420	-0.011	Figure 40

Note: 1. The value with blue color is the maximum SAR Value of each test band.

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

Table 11: SAR Values [CDMA Cellular, enhanced energy coupling at increased separation distances]

Different Test Position	Distance of EUT to Phantom	Channel	Measurement Result (W/kg)	50% of initial position SAR (W/kg)	125% of initial position SAR (W/kg)
Test Position 2	initial position	High	1.930	0.965	2.413
	5mm		0.740		

Note: 1. The probe tip location is fixed at the distance of 2mm from the phantom surface.

- when the device position with the highest point SAR is > 25% of that measured at the initial position, a complete 1-g SAR evaluation is required for this configuration.
- A single point SAR is measured for each of these device positions until the SAR is less than 50% of that measured at the initial position.

7.4. Conclusion

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 5.2 of this report. Maximum localized SAR_{1g} is **1.45** W/kg that is below exposure limits specified in the relevant standards cited in Clause 5.1 of this test report.

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RZA2010-0480

Page 32 of 117

8. 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	0.5	N	1	1	0.5	9
Measurement system								
2	probe calibration	B	5.9	N	1	1	5.9	∞
3	axial isotropy of the probe	B	4.7	R	$\sqrt{3}$	$\sqrt{0.5}$	1.9	∞
4	Hemispherical isotropy of the probe	B	9.4	R	$\sqrt{3}$	$\sqrt{0.5}$	3.9	∞
6	boundary effect	B	1.9	R	$\sqrt{3}$	1	1.1	∞
7	probe linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
8	System detection limits	B	1.0	R	$\sqrt{3}$	1	0.6	∞
9	readout Electronics	B	1.0	N	1	1	1.0	∞
10	response time	B	0	R	$\sqrt{3}$	1	0	∞
11	integration time	B	4.32	R	$\sqrt{3}$	1	2.5	∞
12	noise	B	0	R	$\sqrt{3}$	1	0	∞
13	RF Ambient Conditions	B	3	R	$\sqrt{3}$	1	1.73	∞
14	Probe Positioner Mechanical Tolerance	B	0.4	R	$\sqrt{3}$	1	0.2	∞
15	Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞
16	Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞
Test sample Related								
17	-Test Sample Positioning	A	2.9	N	1	1	2.9	5
18	-Device Holder Uncertainty	A	4.1	N	1	1	4.1	5
19	-Output Power Variation - SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.9	∞
Physical parameter								

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RZA2010-0480

Page 33 of 117

20	-phantom	B	4.0	R	$\sqrt{3}$	1	2.3	∞
21	-liquid conductivity (deviation from target)	B	5.0	R	$\sqrt{3}$	$\frac{0.6}{4}$	1.8	∞
22	-liquid conductivity (measurement uncertainty)	B	5.0	N	1	$\frac{0.6}{4}$	3.2	∞
23	-liquid permittivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.6	1.7	∞
24	-liquid permittivity (measurement uncertainty)	B	5.0	N	1	0.6	3.0	∞
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$					12.0	
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N	k=2		24.0	

9. Main Test Instruments

Table 12: List of Main Instruments

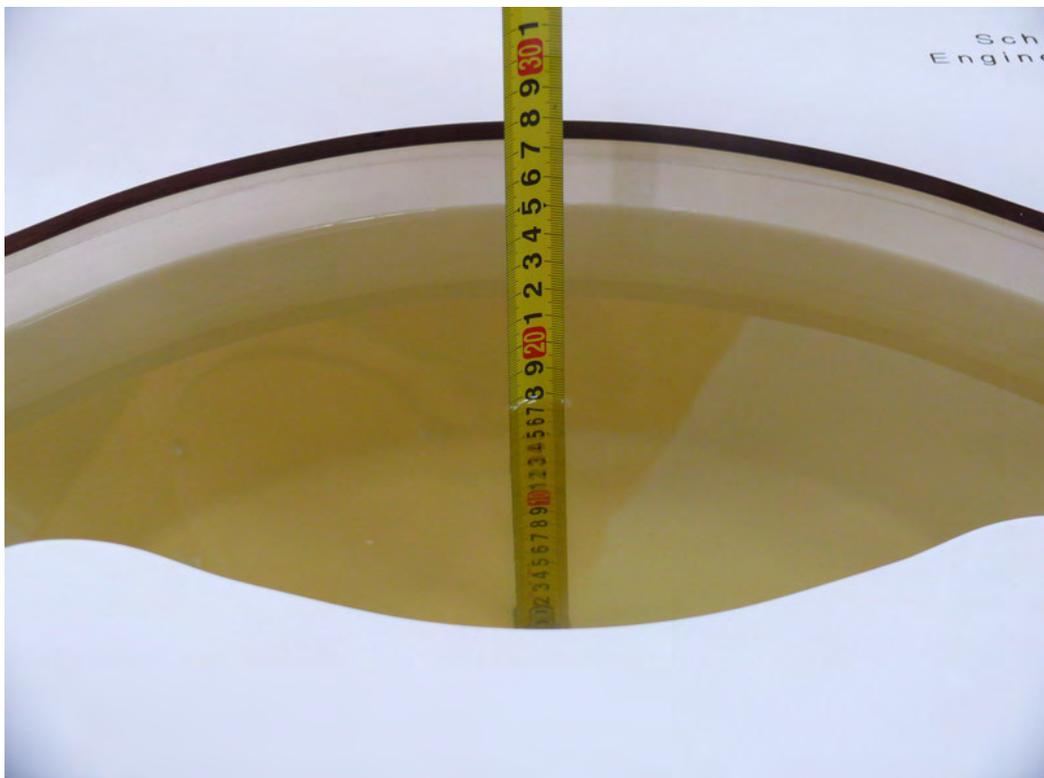
No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent 8753E	US37390326	September 13, 2009	One year
02	Dielectric Probe Kit	Agilent 85070E	US44020115	No Calibration Requested	
03	Power meter	Agilent E4417A	GB41291714	March 13, 2010	One year
04	Signal Generator	HP 8341B	2730A00804	September 13, 2009	One year
05	Amplifier	IXA-020	0401	No Calibration Requested	
06	Validation Kit 835MHz	D835V2	4d082	July 13, 2009	One year
07	Validation Kit 1900MHz	D1900V2	5d018	June 26, 2009	One year
08	Validation Kit 1800MHz	D1800V2	2d052	June 26, 2009	One year
09	E-field Probe	EX3DV4	3677	September 23, 2009	One year
10	DAE	DAE4	871	November 11, 2009	One year

END OF REPORT BODY

ANNEX A: Test Layout



Picture 2 Specific Absorption Rate Test Layout



Picture 3 Liquid depth in the Flat Phantom (835 MHz)



Picture 4: Liquid depth in the Flat Phantom (1750 MHz)



Picture 5: Liquid depth in the Flat Phantom (1900 MHz)

ANNEX B: System Check Results

System Performance Check at 835 MHz Body TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d082

Date/Time: 4/3/2010 9:18:20 PM

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

Medium parameters used: $f = 835$ MHz; $\sigma = 0.96$ mho/m; $\epsilon_r = 53.79$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM1; Type: SAM;

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

835 MHz Dipole/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.77 mW/g

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

Reference Value = 50.9 V/m; Power Drift = 0.023 dB

Peak SAR (extrapolated) = 3.68 W/kg

SAR(1 g) = 2.56 mW/g; SAR(10 g) = 1.68 mW/g

Maximum value of SAR (measured) = 2.77 mW/g

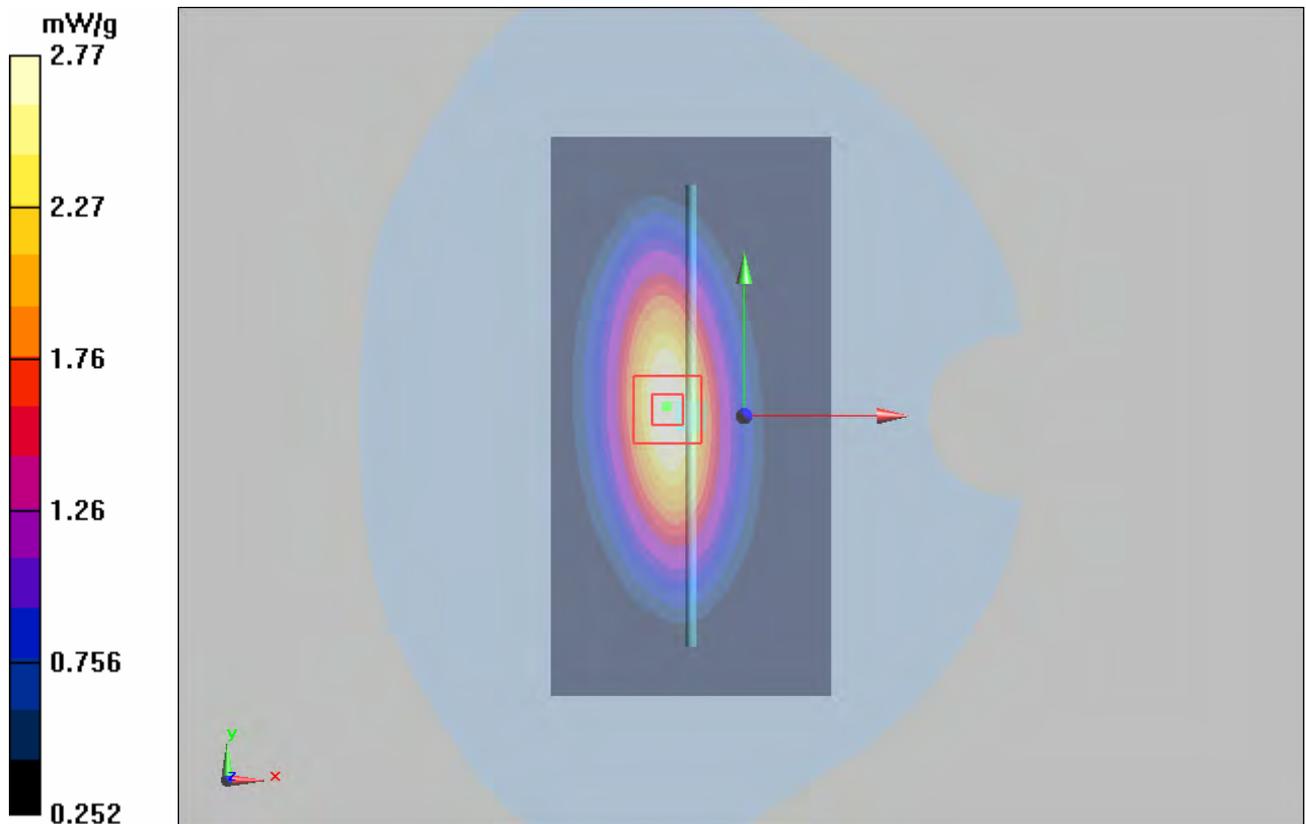


Figure 6 System Performance Check 835MHz 250Mw

System Performance Check at 1800 MHz Body TSL

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d052

Date/Time: 4/3/2010 10:55:45 AM

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 52.87$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1800 MHz Dipole/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 12.2 mW/g

1800 MHz Dipole/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 83.2 V/m; Power Drift = 0.050 dB

Peak SAR (extrapolated) = 18.5 W/kg

SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.25 mW/g

Maximum value of SAR (measured) = 11.4 mW/g

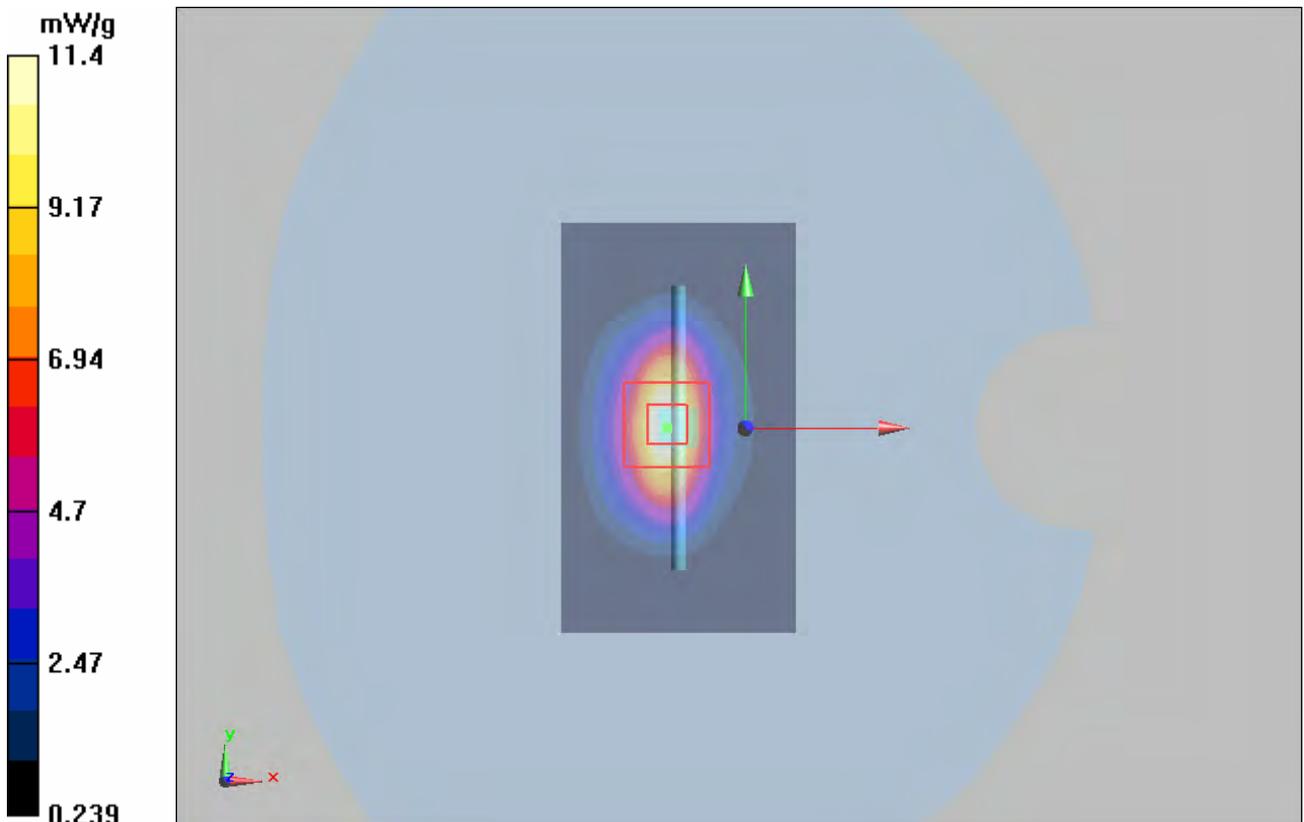


Figure 7 System Performance Check 1800MHz 250mW

System Performance Check at 1900 MHz Body TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d018

Date/Time: 4/1/2010 5:02:19 PM

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.21$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM2; Type: SAM;

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1900 MHz Dipole/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 12.5 mW/g

1900 MHz Dipole/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 75.9 V/m; Power Drift = 0.051 dB

Peak SAR (extrapolated) = 16.8 W/kg

SAR(1 g) = 9.73 mW/g; SAR(10 g) = 5.17 mW/g

Maximum value of SAR (measured) = 11 mW/g

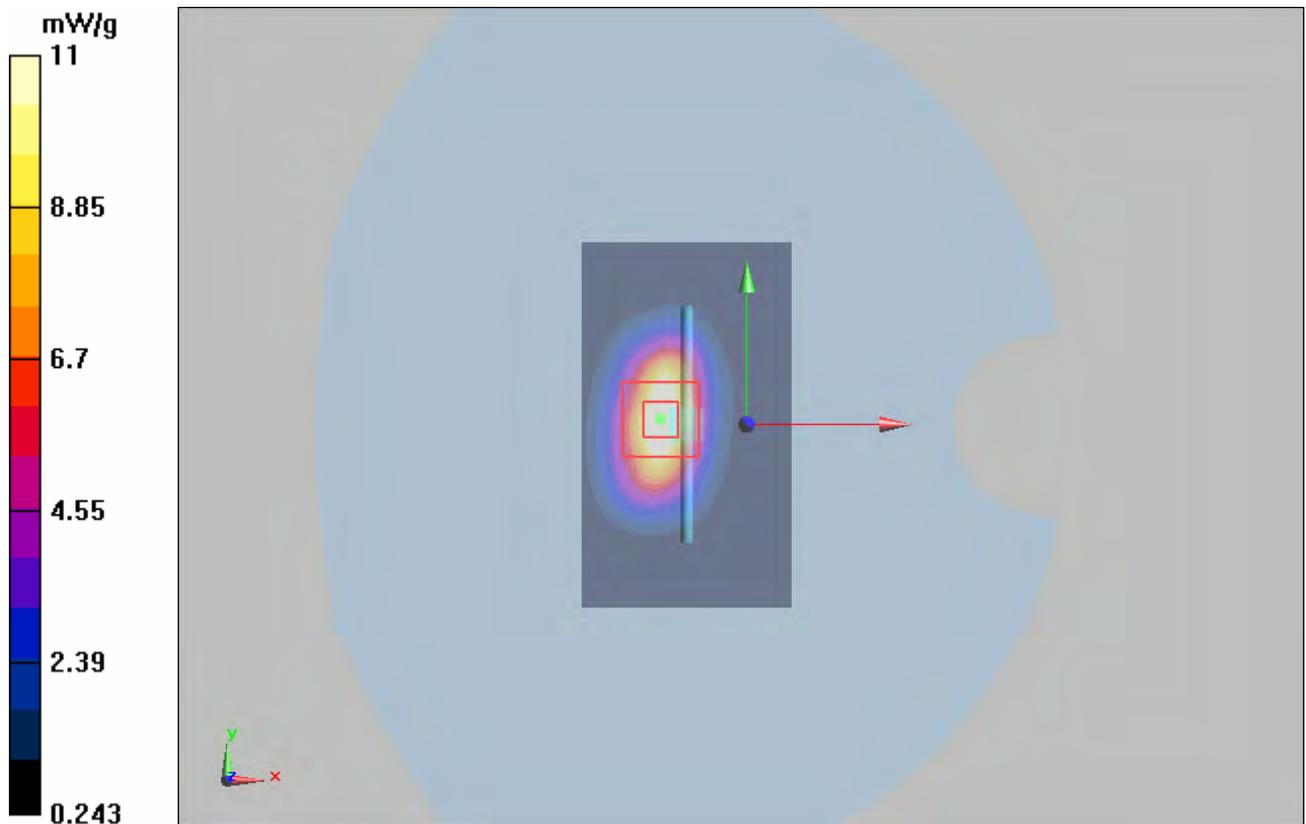


Figure 8 System Performance Check 1900MHz 250mW

ANNEX C: Graph Results

CDMA Cellular EV-DO REV.0 with IBM T61 Test Position 1 Middle

Date/Time: 4/3/2010 10:54:00 PM

Communication System: CDMA Cellular EVDO Rev.0; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 837$ MHz; $\sigma = 0.964$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 1 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.683 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.7 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 0.932 W/kg

SAR(1 g) = 0.627 mW/g; SAR(10 g) = 0.398 mW/g

Maximum value of SAR (measured) = 0.679 mW/g

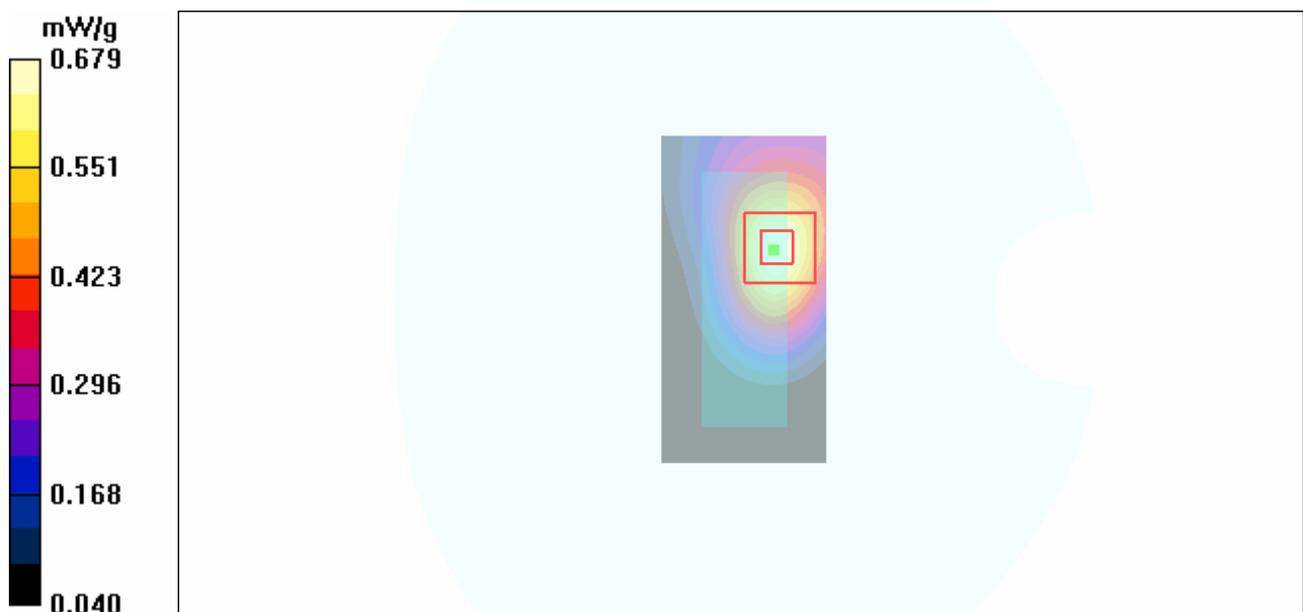


Figure 9 CDMA Cellular EV-DO REV.0 with IBM T61 Test Position 1 Channel 384

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RZA2010-0480

Page 40 of 117

CDMA Cellular EV-DO REV.0 with BenQ Joybook R55V Test Position 2 High

Date/Time: 4/4/2010 1:35:04 PM

Communication System: CDMA Cellular EVDO Rev.0; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.976$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 High/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.952 mW/g

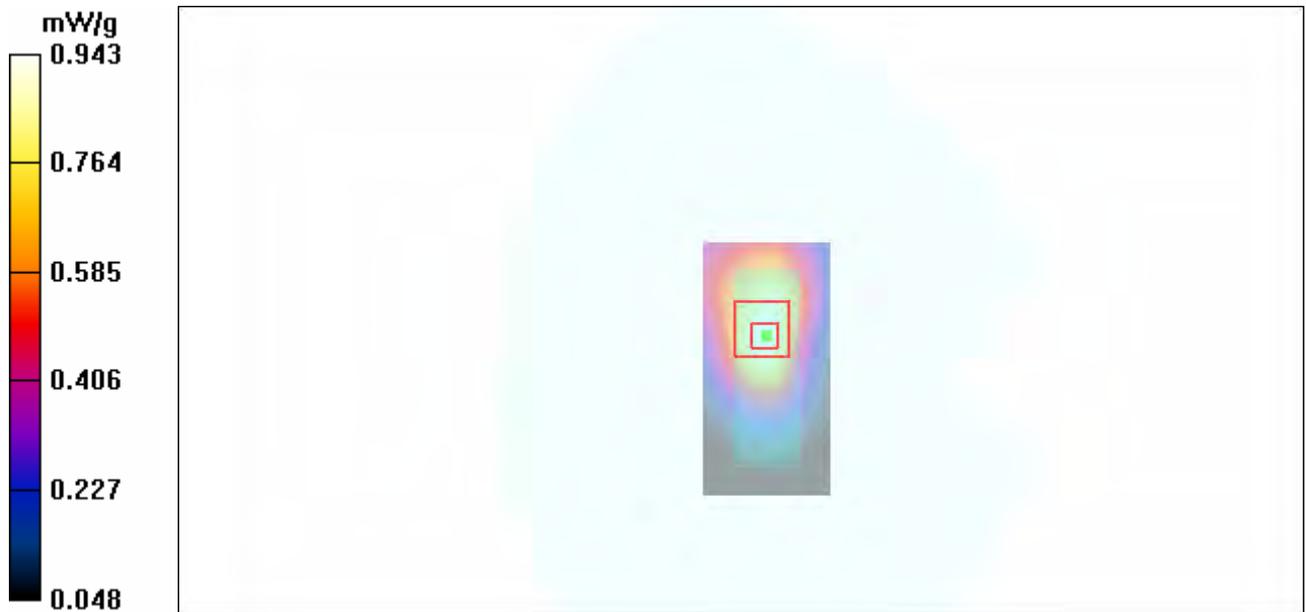
Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.8 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 1.32 W/kg

SAR(1 g) = 0.862 mW/g; SAR(10 g) = 0.547 mW/g

Maximum value of SAR (measured) = 0.943 mW/g



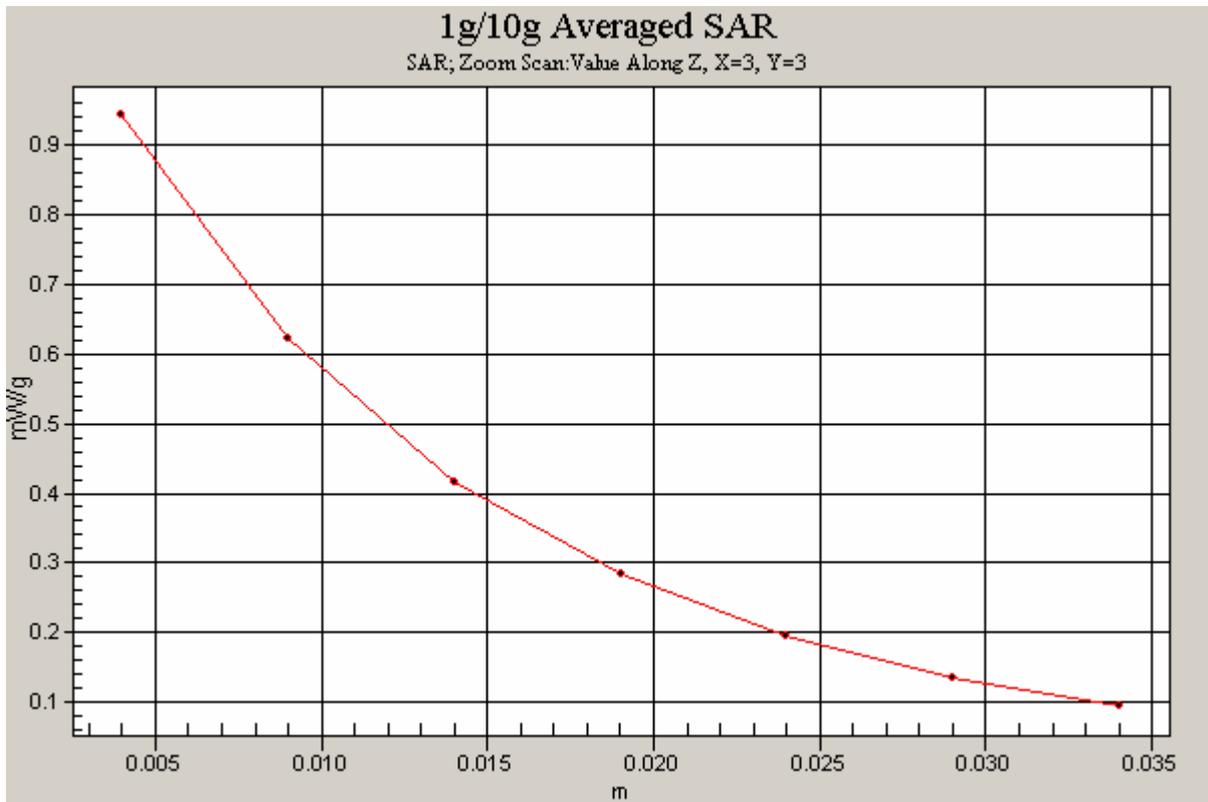


Figure 10 CDMA Cellular EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Channel 777

CDMA Cellular EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Middle

Date/Time: 4/3/2010 10:33:48 PM

Communication System: CDMA Cellular EVDO Rev.0; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 837$ MHz; $\sigma = 0.964$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.756 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.5 V/m; Power Drift = -0.110 dB

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.679 mW/g; SAR(10 g) = 0.426 mW/g

Maximum value of SAR (measured) = 0.742 mW/g

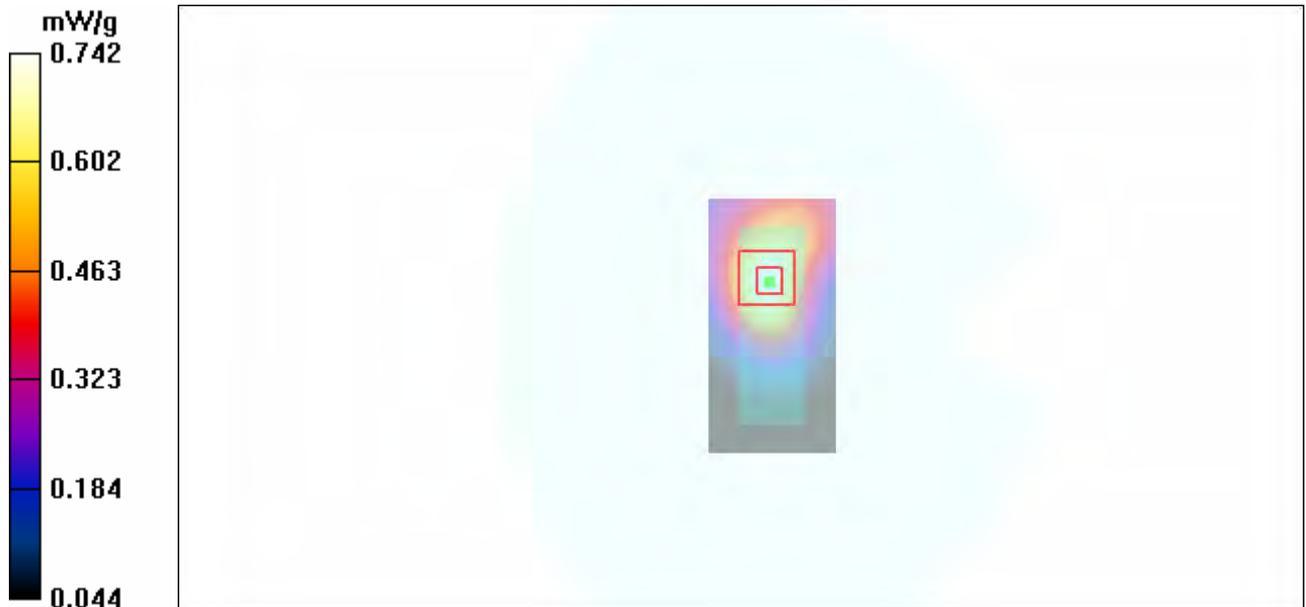


Figure 11 CDMA Cellular EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Channel 384

CDMA Cellular EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Low

Date/Time: 4/4/2010 1:14:11 PM

Communication System: CDMA Cellular EVDO Rev.0; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 825$ MHz; $\sigma = 0.955$ mho/m; $\epsilon_r = 53.9$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 Low/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.759 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.7 V/m; Power Drift = 0.083 dB

Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.730 mW/g; SAR(10 g) = 0.466 mW/g

Maximum value of SAR (measured) = 0.797 mW/g

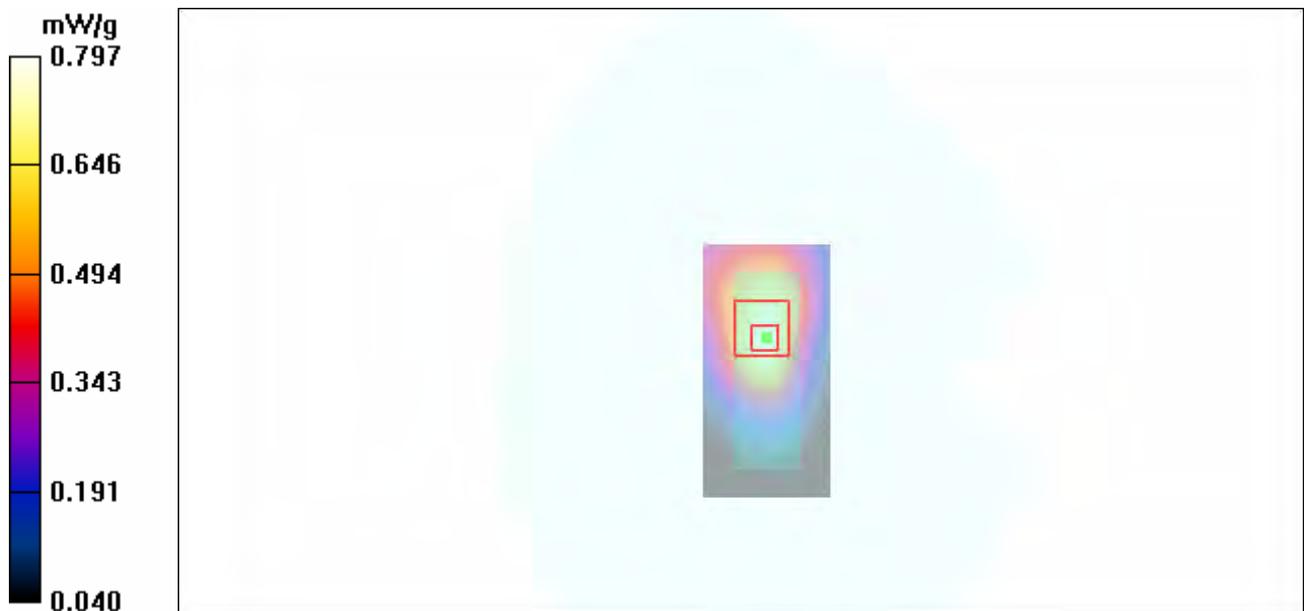


Figure 12 CDMA Cellular EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Channel 1013

CDMA Cellular EV-DO REV.0 with Lenovo Y-450 Test Position 3 Middle

Date/Time: 4/4/2010 12:13:08 PM

Communication System: CDMA Cellular EVDO Rev.0; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 837$ MHz; $\sigma = 0.964$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 3 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.377 mW/g

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.4 V/m; Power Drift = 0.120 dB

Peak SAR (extrapolated) = 0.546 W/kg

SAR(1 g) = 0.342 mW/g; SAR(10 g) = 0.213 mW/g

Maximum value of SAR (measured) = 0.374 mW/g

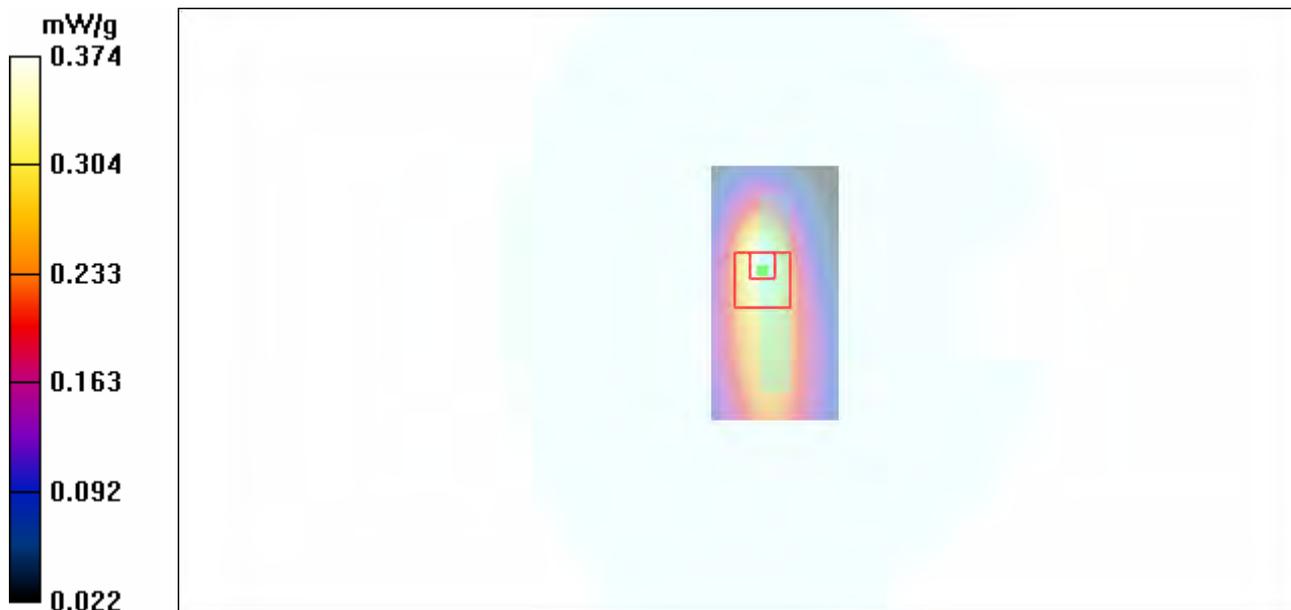


Figure 13 CDMA Cellular EV-DO REV.0 with Lenovo Y-450 Test Position 3 Channel 384

CDMA Cellular EV-DO REV.0 with Lenovo Y-450 Test Position 4 Middle

Date/Time: 4/4/2010 12:43:37 PM

Communication System: CDMA Cellular EVDO Rev.0; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 837$ MHz; $\sigma = 0.964$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 4 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.391 mW/g

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.3 V/m; Power Drift = 0.097 dB

Peak SAR (extrapolated) = 0.569 W/kg

SAR(1 g) = 0.380 mW/g; SAR(10 g) = 0.254 mW/g

Maximum value of SAR (measured) = 0.408 mW/g

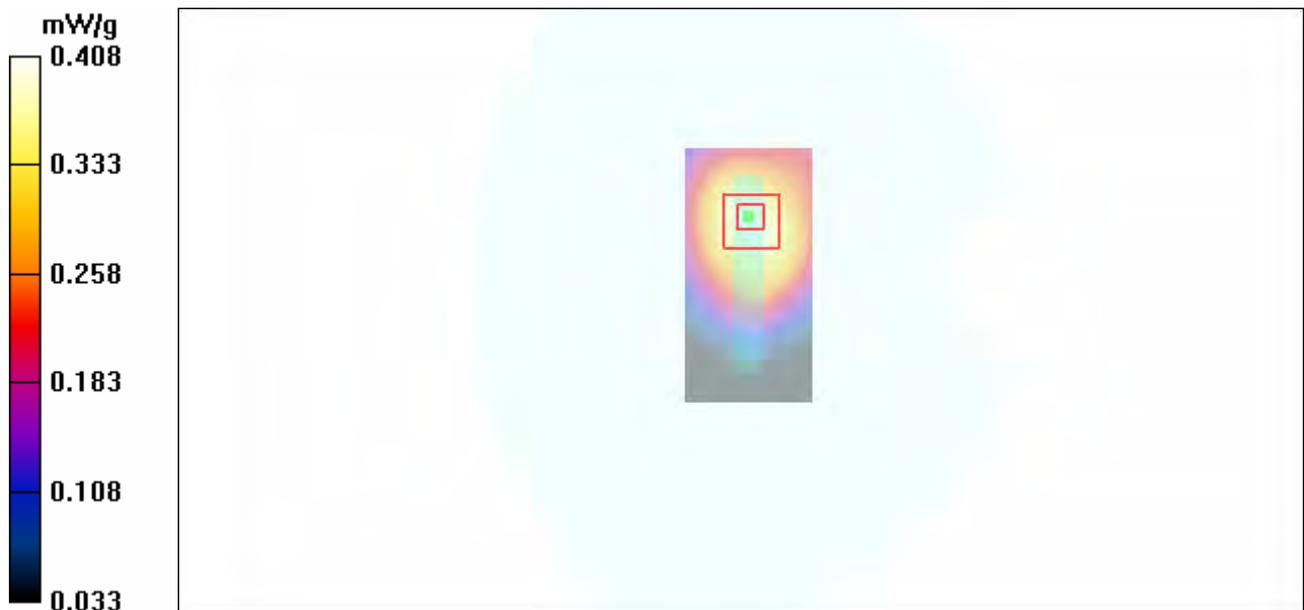


Figure 14 CDMA Cellular EV-DO REV.0 with Lenovo Y-450 Test Position 4 Channel 384

CDMA Cellular EV-DO REV.A with BenQ Joybook R55V Test Position 2 High

Date/Time: 4/4/2010 1:58:19 PM

Communication System: CDMA Cellular EVDO Rev.A; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.976$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 High/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.921 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.7 V/m; Power Drift = -0.142 dB

Peak SAR (extrapolated) = 1.29 W/kg

SAR(1 g) = 0.846 mW/g; SAR(10 g) = 0.535 mW/g

Maximum value of SAR (measured) = 0.924 mW/g

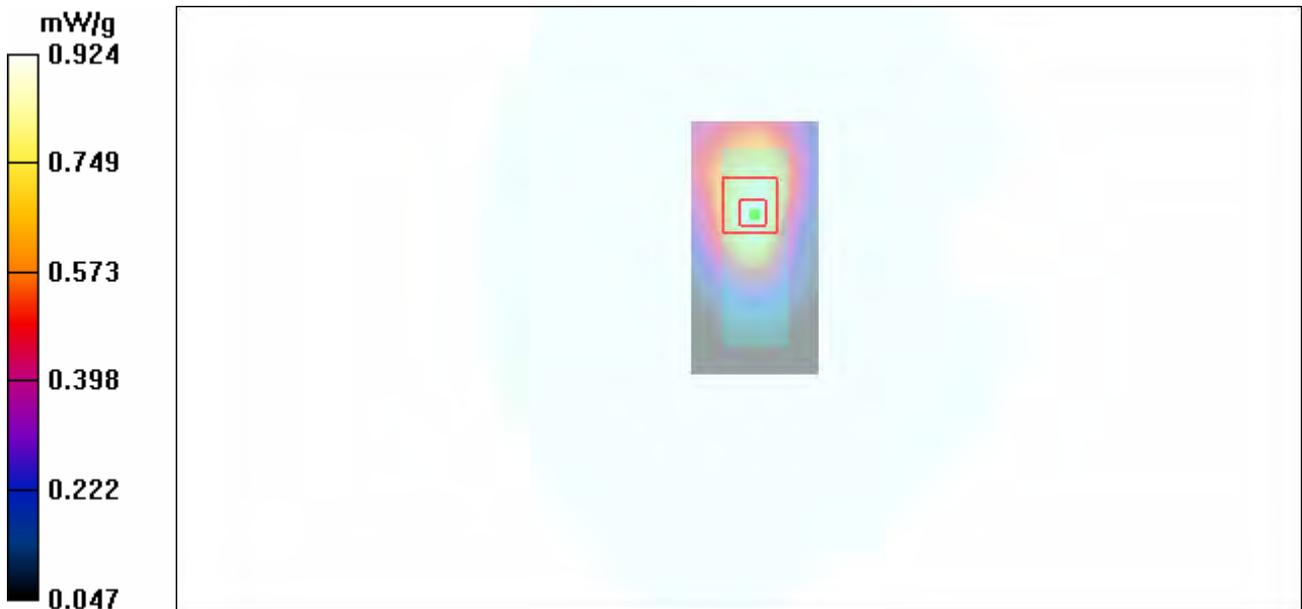


Figure 15 CDMA Cellular EV-DO REV.A with BenQ Joybook R55V Test Position 2 Channel 777

CDMA Cellular 1×RTT with BenQ Joybook R55V Test Position 2 High

Date/Time: 4/4/2010 2:23:12 PM

Communication System: CDMA Cellular; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 0.976$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.11, 9.11, 9.11); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 High/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.900 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.3 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 1.27 W/kg

SAR(1 g) = 0.839 mW/g; SAR(10 g) = 0.536 mW/g

Maximum value of SAR (measured) = 0.916 mW/g

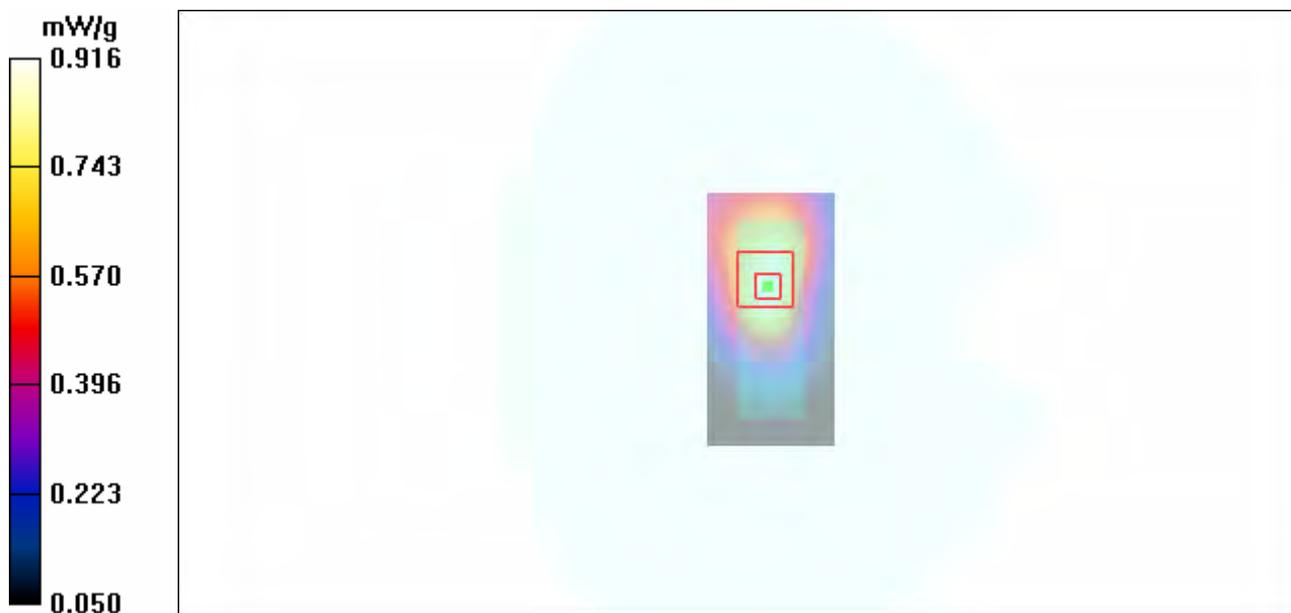


Figure 16 CDMA Cellular 1×RTT with BenQ Joybook R55V Test Position 2 Channel 777

CDMA PCS EV-DO REV.0 with IBM T61 Test Position 1 High

Date/Time: 4/3/2010 7:40:37 PM

Communication System: CDMA PCS EVD0 Rev.0; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 1 High/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.31 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.1 V/m; Power Drift = 0.125 dB

Peak SAR (extrapolated) = 1.93 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.602 mW/g

Maximum value of SAR (measured) = 1.28 mW/g

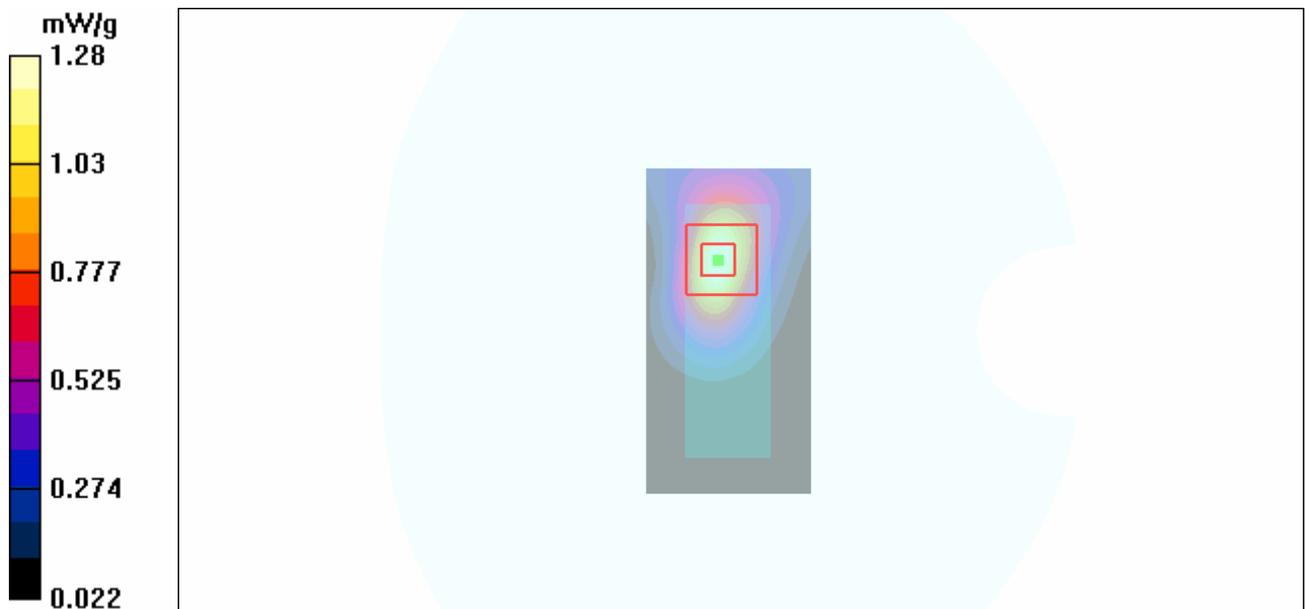


Figure 17 CDMA PCS EV-DO REV.0 with IBM T61 Test Position 1 Channel 1175

CDMA PCS EV-DO REV.0 with IBM T61 Test Position 1 Middle

Date/Time: 4/3/2010 7:03:03 PM

Communication System: CDMA PCS EVD0 Rev.0; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 1 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.39 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.2 V/m; Power Drift = 0.168 dB

Peak SAR (extrapolated) = 2.05 W/kg

SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.648 mW/g

Maximum value of SAR (measured) = 1.37 mW/g

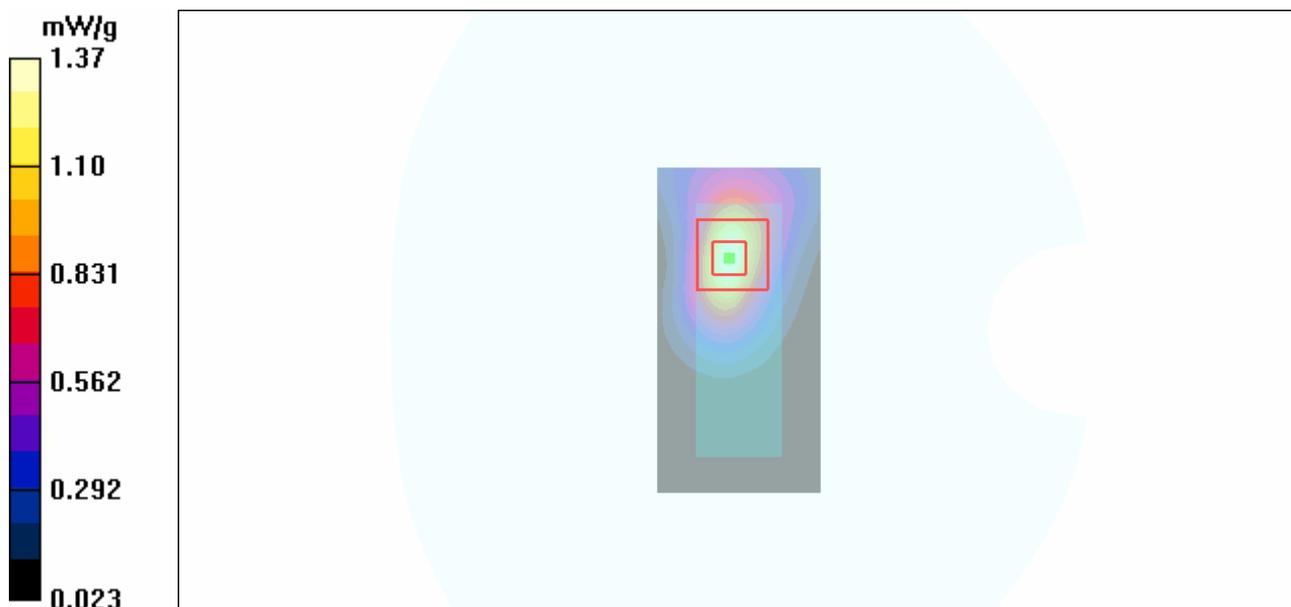


Figure 18 CDMA PCS EV-DO REV.0 with IBM T61 Test Position 1 Channel 600

CDMA PCS EV-DO REV.0 with IBM T61 Test Position 1 Low

Date/Time: 4/3/2010 7:21:47 PM

Communication System: CDMA PCS EVD0 Rev.0; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1852 \text{ MHz}$; $\sigma = 1.48 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: $22.3 \text{ }^\circ\text{C}$ Liquid Temperature: $21.5 \text{ }^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 1 Low/Area Scan (51x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 1.50 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.3 V/m ; Power Drift = -0.144 dB

Peak SAR (extrapolated) = 2.14 W/kg

SAR(1 g) = 1.28 mW/g ; SAR(10 g) = 0.690 mW/g

Maximum value of SAR (measured) = 1.45 mW/g

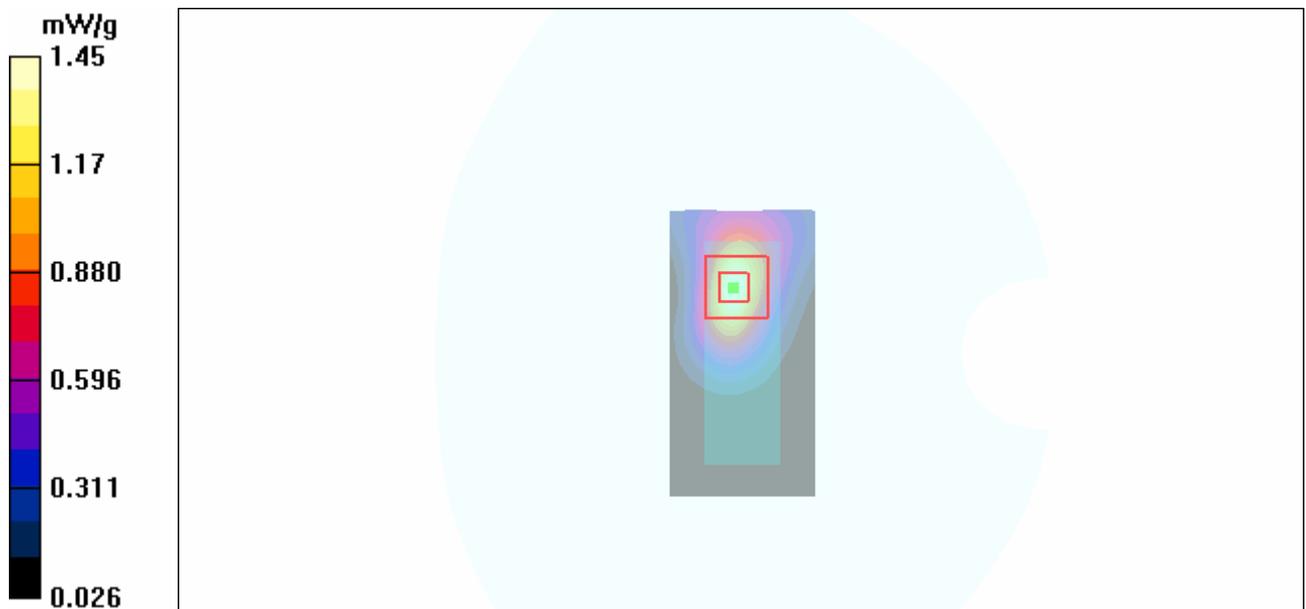


Figure 19 CDMA PCS EV-DO REV.0 with IBM T61 Test Position 1 Channel 25

CDMA PCS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 High

Date/Time: 4/3/2010 3:23:20 PM

Communication System: CDMA PCS EVD0 Rev.0; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 High/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.20 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.1 V/m; Power Drift = 0.089 dB

Peak SAR (extrapolated) = 1.93 W/kg

SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.545 mW/g

Maximum value of SAR (measured) = 1.23 mW/g

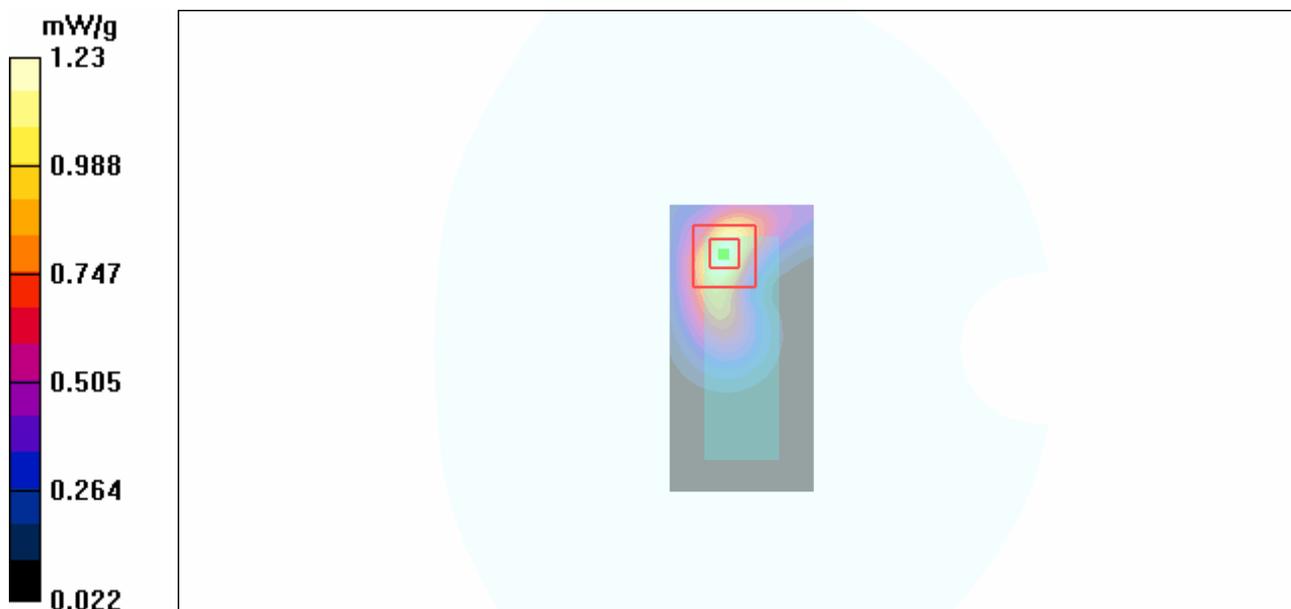


Figure 20 CDMA PCS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Channel 1175

CDMA PCS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Middle

Date/Time: 4/3/2010 3:04:38 PM

Communication System: CDMA PCS EVD0 Rev.0; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.39 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.8 V/m; Power Drift = 0.153 dB

Peak SAR (extrapolated) = 2.50 W/kg

SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.668 mW/g

Maximum value of SAR (measured) = 1.54 mW/g

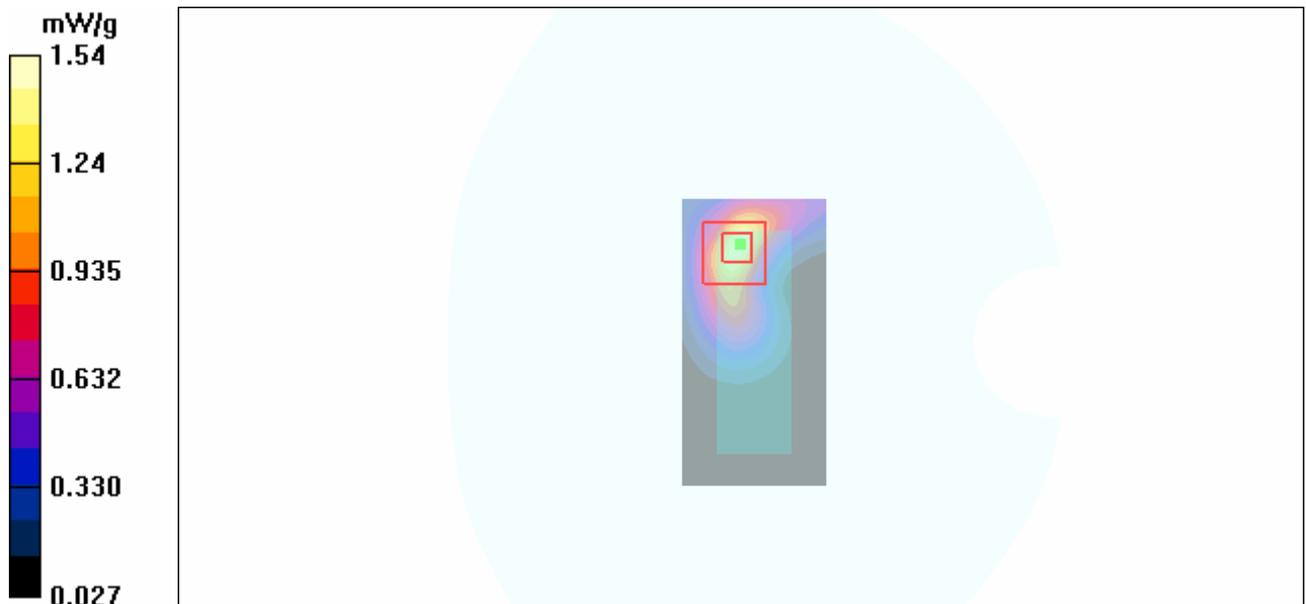


Figure 21 CDMA PCS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Channel 600

CDMA PCS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Low

Date/Time: 4/3/2010 3:42:51 PM

Communication System: CDMA PCS EVD0 Rev.0; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1852$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 Low/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.54 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.7 V/m; Power Drift = 0.049 dB

Peak SAR (extrapolated) = 2.52 W/kg

SAR(1 g) = 1.39 mW/g; SAR(10 g) = 0.718 mW/g

Maximum value of SAR (measured) = 1.53 mW/g

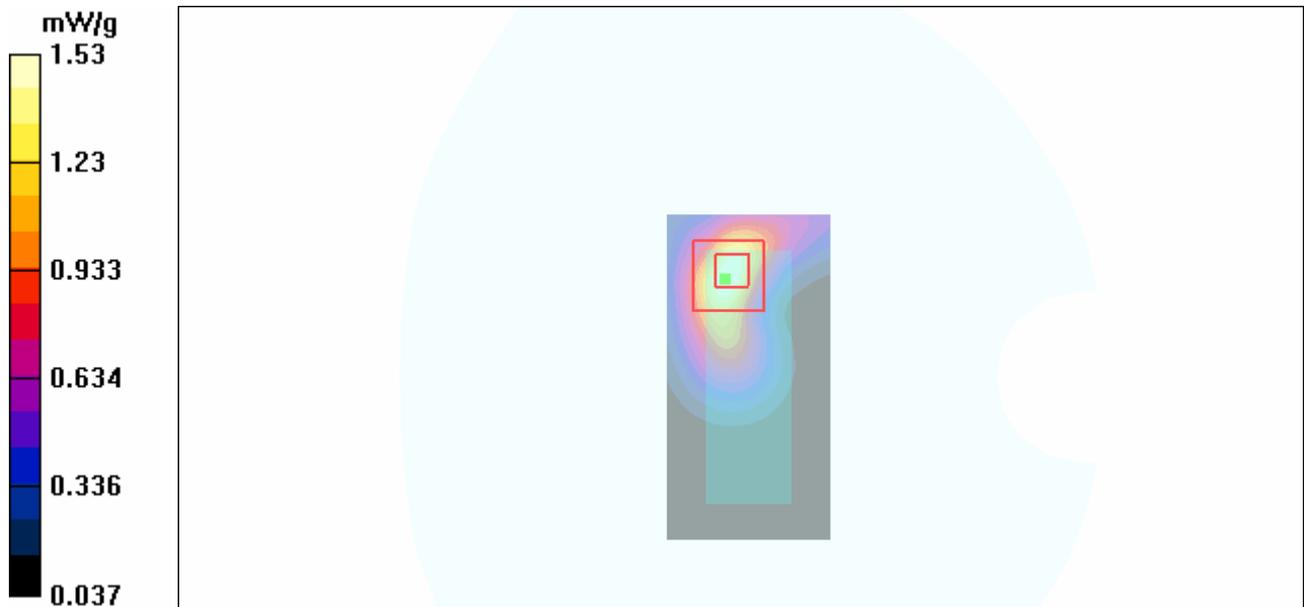


Figure 22 CDMA PCS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Channel 25

CDMA PCS EV-DO REV.0 with Lenovo Y-450 Test Position 3 High

Date/Time: 4/3/2010 9:17:50 PM

Communication System: CDMA PCS EVD0 Rev.0; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 3 High/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

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

Test Position 3 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 27.1 V/m; Power Drift = 0.123 dB

Peak SAR (extrapolated) = 2.01 W/kg

SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.585 mW/g

Maximum value of SAR (measured) = 1.24 mW/g

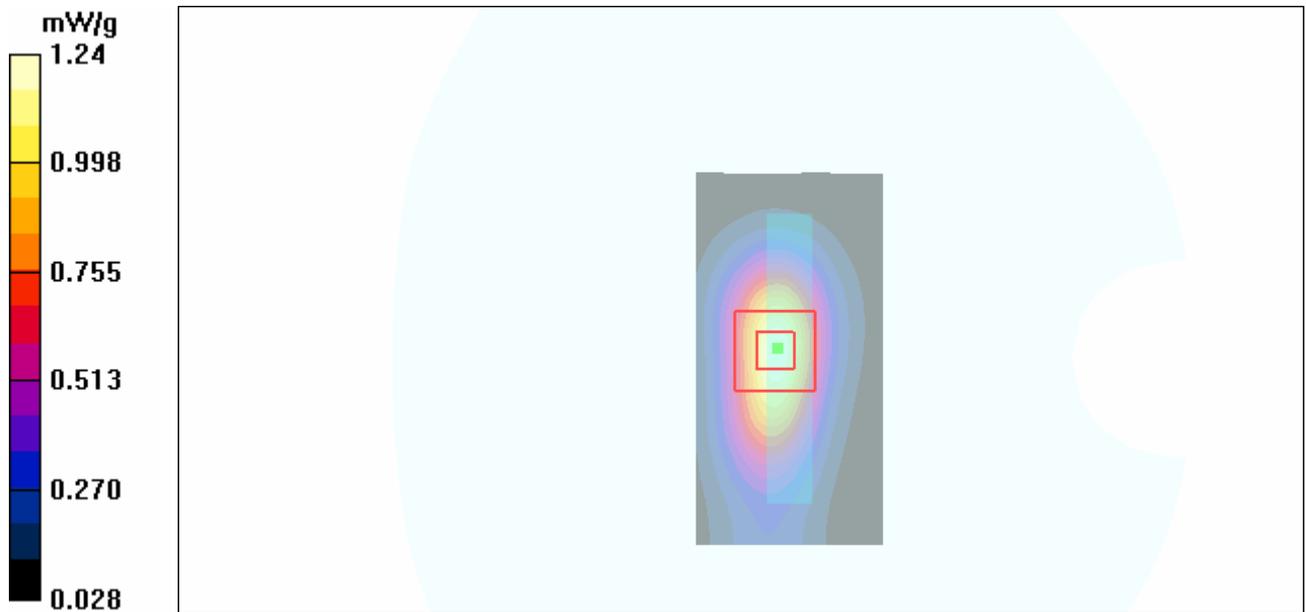


Figure 23 CDMA PCS EV-DO REV.0 with Lenovo Y-450 Test Position 3 Channel 1175

CDMA PCS EV-DO REV.0 with Lenovo Y-450 Test Position 3 Middle

Date/Time: 4/3/2010 8:39:56 PM

Communication System: CDMA PCS EVD0 Rev.0; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liqjud Temperature: 21.5°C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 3 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

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

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 27.5 V/m; Power Drift = 0.002 dB

Peak SAR (extrapolated) = 2.01 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.595 mW/g

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

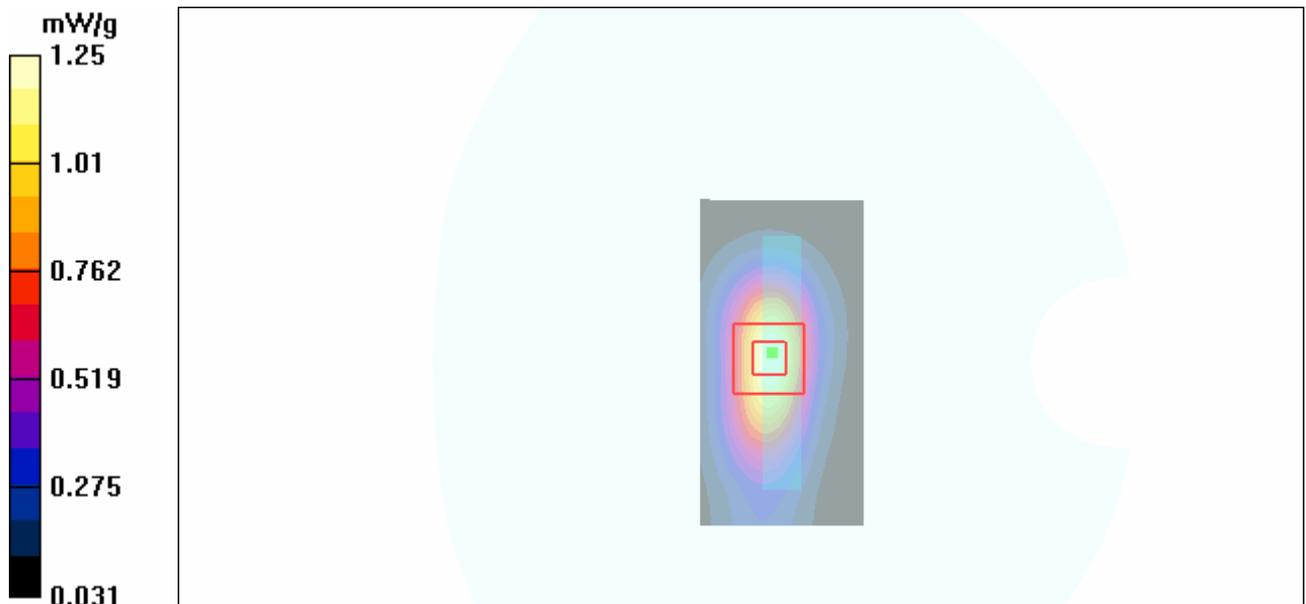


Figure 24 CDMA PCS EV-DO REV.0 with Lenovo Y-450 Test Position 3 Channel 600

CDMA PCS EV-DO REV.0 with Lenovo Y-450 Test Position 3 Low

Date/Time: 4/3/2010 8:58:42 PM

Communication System: CDMA PCS EVD0 Rev.0; Frequency: 1851.25 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1852$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liqjud Temperature: 21.5°C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 3 Low/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

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

Test Position 3 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.4 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 2.04 W/kg

SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.610 mW/g

Maximum value of SAR (measured) = 1.26 mW/g

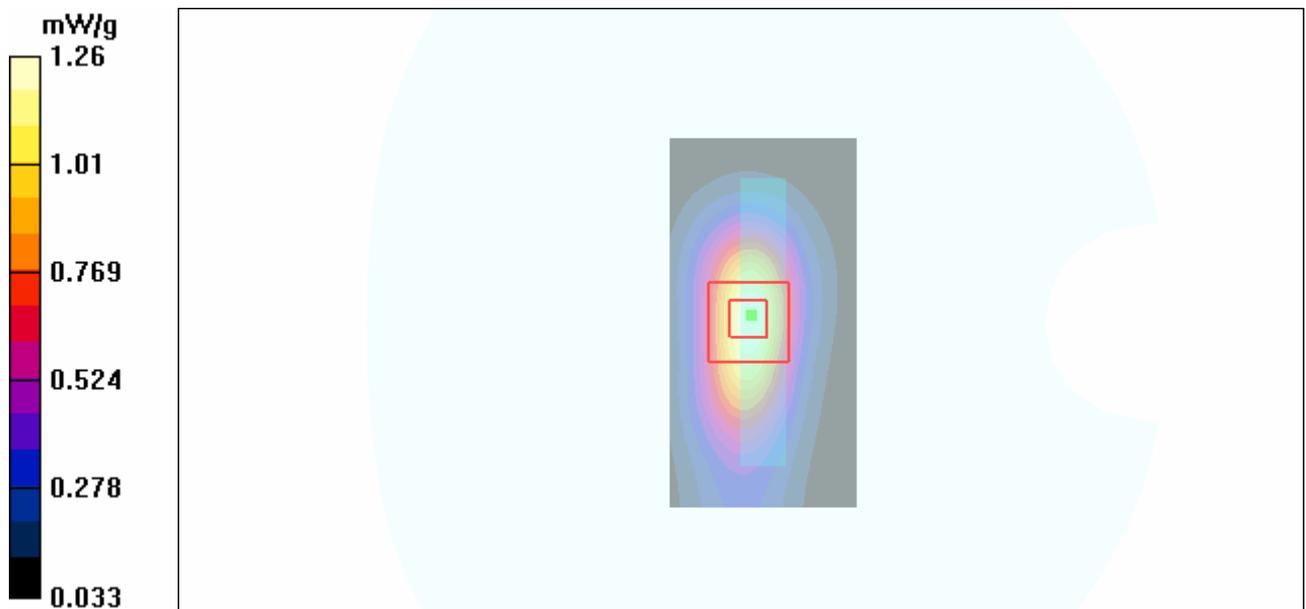


Figure 25 CDMA PCS EV-DO REV.0 with Lenovo Y-450 Test Position 3 Channel 25

CDMA PCS EV-DO REV.0 with Lenovo Y-450 Test Position 4 Middle

Date/Time: 4/3/2010 8:03:12 PM

Communication System: CDMA PCS EVD0 Rev.0; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liqjud Temperature: 21.5°C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 4 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.304 mW/g

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.72 V/m; Power Drift = 0.000 dB

Peak SAR (extrapolated) = 0.482 W/kg

SAR(1 g) = 0.286 mW/g; SAR(10 g) = 0.172 mW/g

Maximum value of SAR (measured) = 0.309 mW/g

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.72 V/m; Power Drift = 0.000 dB

Peak SAR (extrapolated) = 0.478 W/kg

SAR(1 g) = 0.278 mW/g; SAR(10 g) = 0.160 mW/g

Maximum value of SAR (measured) = 0.305 mW/g

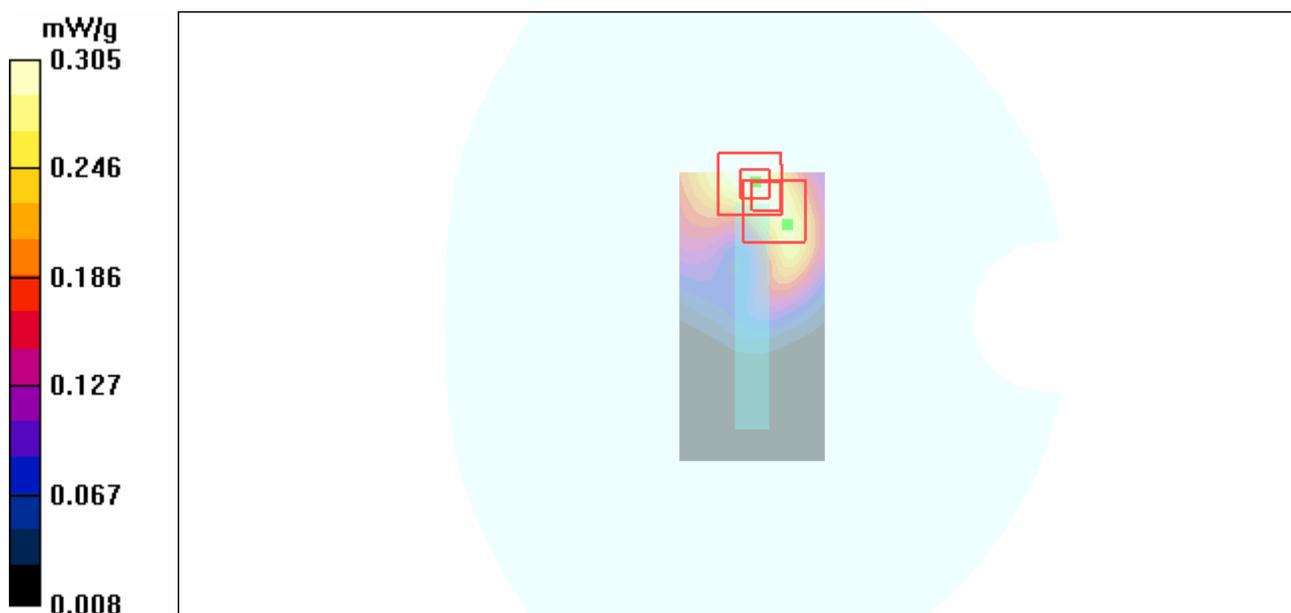


Figure 26 CDMA PCS EV-DO REV.0 with Lenovo Y-450 Test Position 4 Channel 600

CDMA PCS EV-DO REV.A with BenQ Joybook R55V Test Position 2 Low

Date/Time: 4/3/2010 4:48:16 PM

Communication System: CDMA PCS EVD0 Rev.A; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1852 \text{ MHz}$; $\sigma = 1.48 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: $22.3 \text{ }^\circ\text{C}$ Liquid Temperature: $21.5 \text{ }^\circ\text{C}$

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 Low/Area Scan (51x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 1.64 mW/g

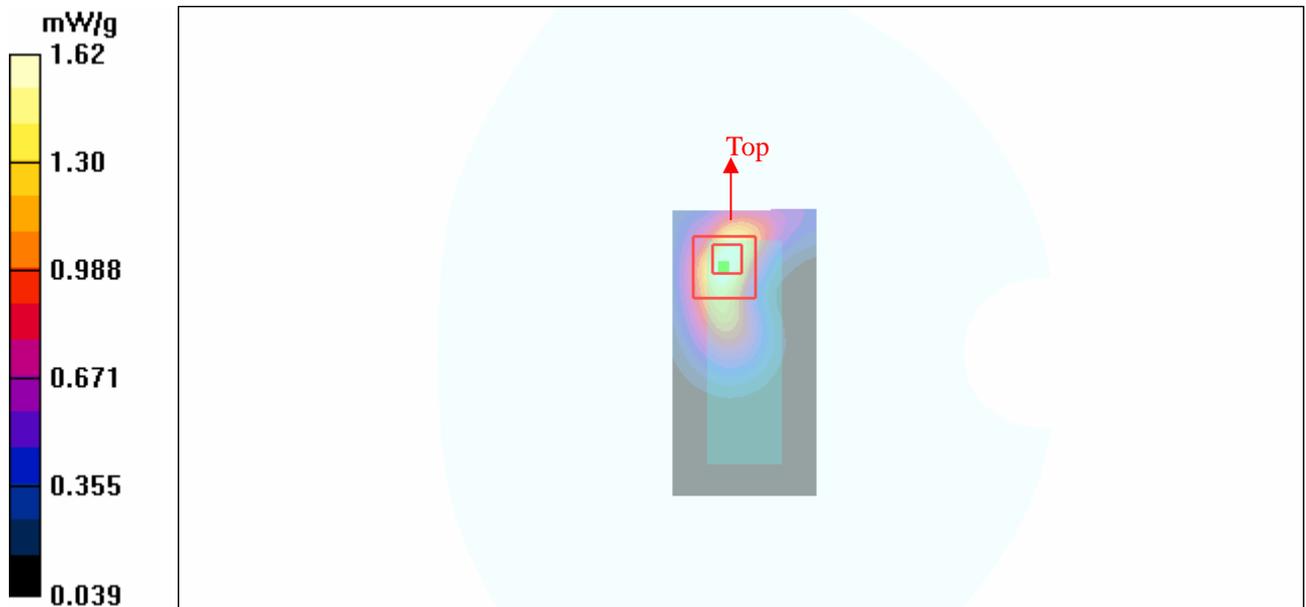
Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.9 V/m ; Power Drift = 0.197 dB

Peak SAR (extrapolated) = 2.61 W/kg

SAR(1 g) = 1.45 mW/g ; SAR(10 g) = 0.750 mW/g

Maximum value of SAR (measured) = 1.62 mW/g



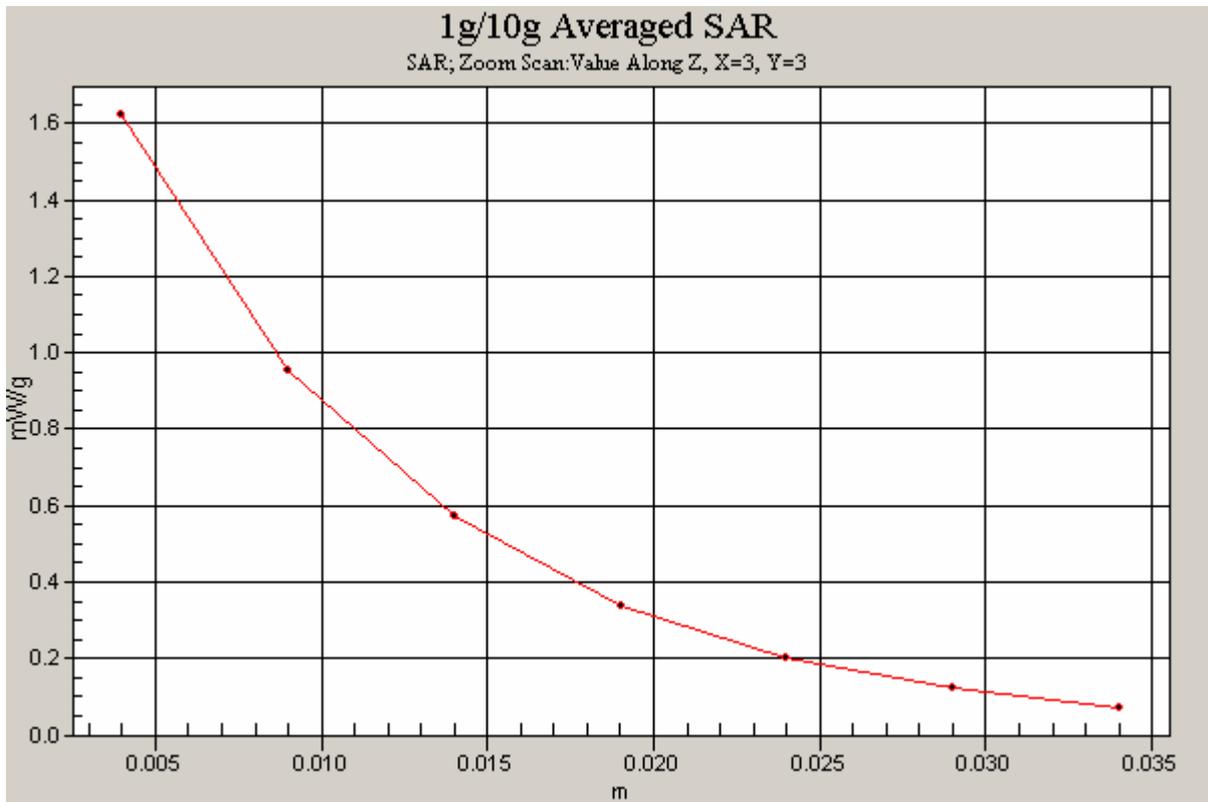


Figure 27 CDMA PCS EV-DO REV.A with BenQ Joybook R55V Test Position 2 Channel 25

CDMA PCS 1×RTT with BenQ Joybook R55V Test Position 2 Low

Date/Time: 4/3/2010 6:05:26 PM

Communication System: CDMA PCS; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1852$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.62, 7.62, 7.62); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 Low/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.54 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.9 V/m; Power Drift = -0.164 dB

Peak SAR (extrapolated) = 2.45 W/kg

SAR(1 g) = 1.34 mW/g; SAR(10 g) = 0.705 mW/g

Maximum value of SAR (measured) = 1.54 mW/g

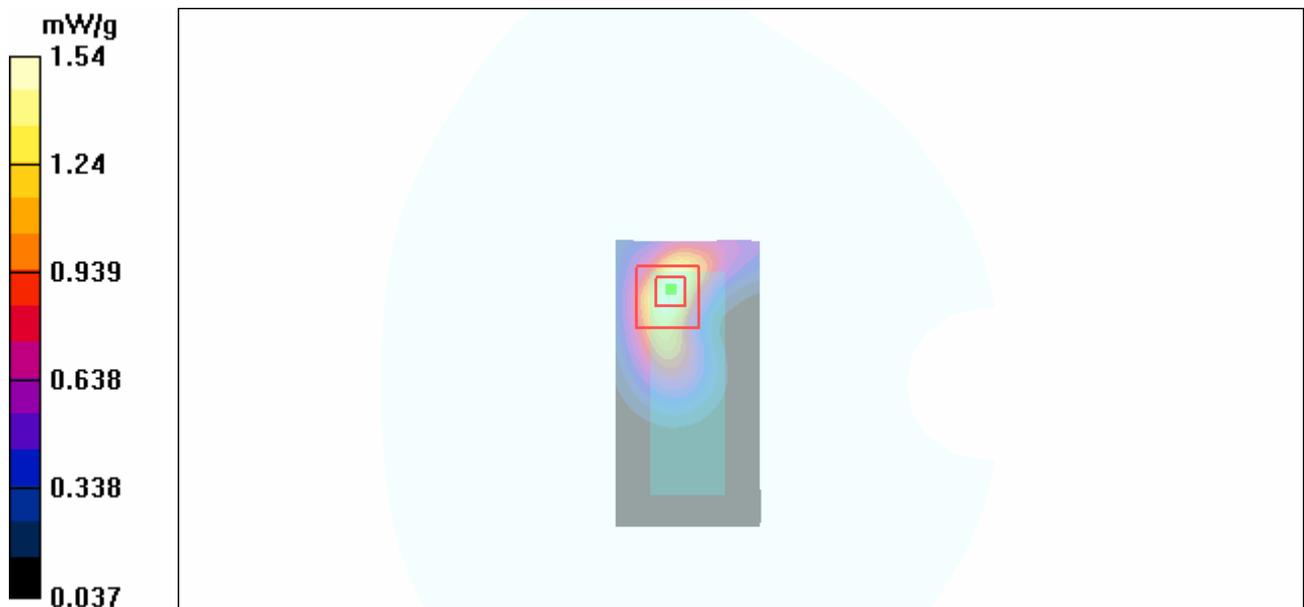


Figure 28 CDMA PCS 1×RTT with BenQ Joybook R55V Test Position 2 Channel 25

CDMA AWS EV-DO REV.0 with IBM T61 Test Position 1 High

Date/Time: 4/1/2010 8:18:54 PM

Communication System: CDMA AWS EVDO Rev.0; Frequency: 1752.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1752.5$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 1 High/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.37 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.9 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 2.07 W/kg

SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.657 mW/g

Maximum value of SAR (measured) = 1.38 mW/g

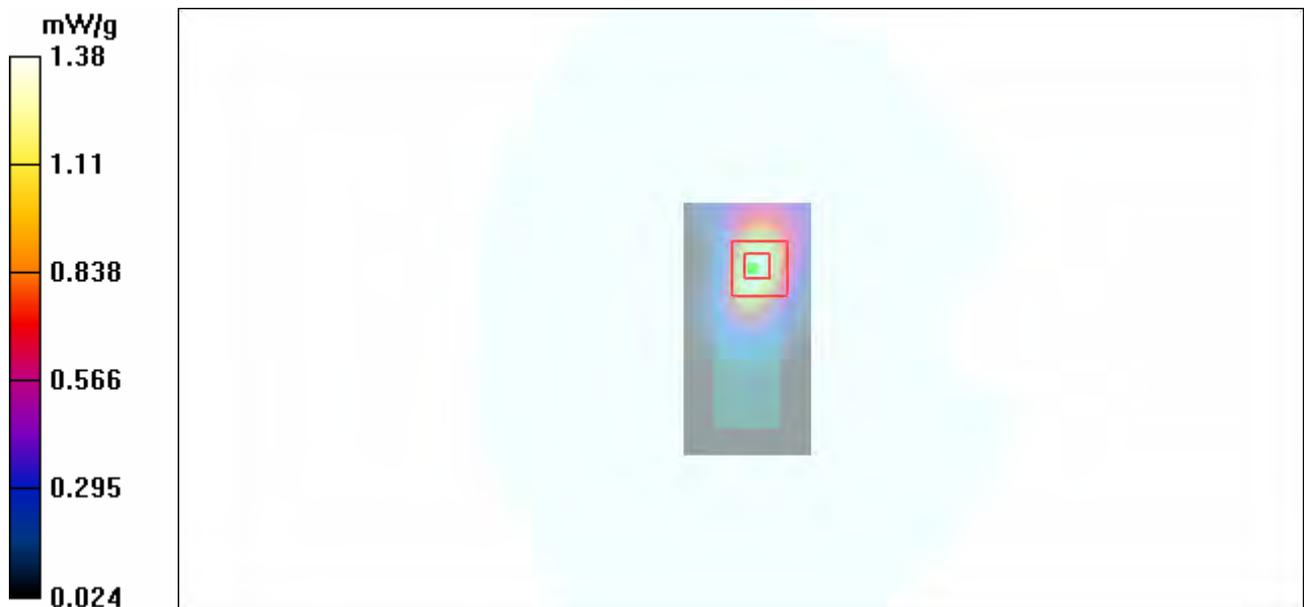


Figure 29 CDMA AWS EV-DO REV.0 with IBM T61 Test Position 1 Channel 850

CDMA AWS EV-DO REV.0 with IBM T61 Test Position 1 Middle

Date/Time: 4/1/2010 7:59:58 PM

Communication System: CDMA AWS EVDO Rev.0; Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 1 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.26 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.8 V/m; Power Drift = 0.059 dB

Peak SAR (extrapolated) = 1.82 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.589 mW/g

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

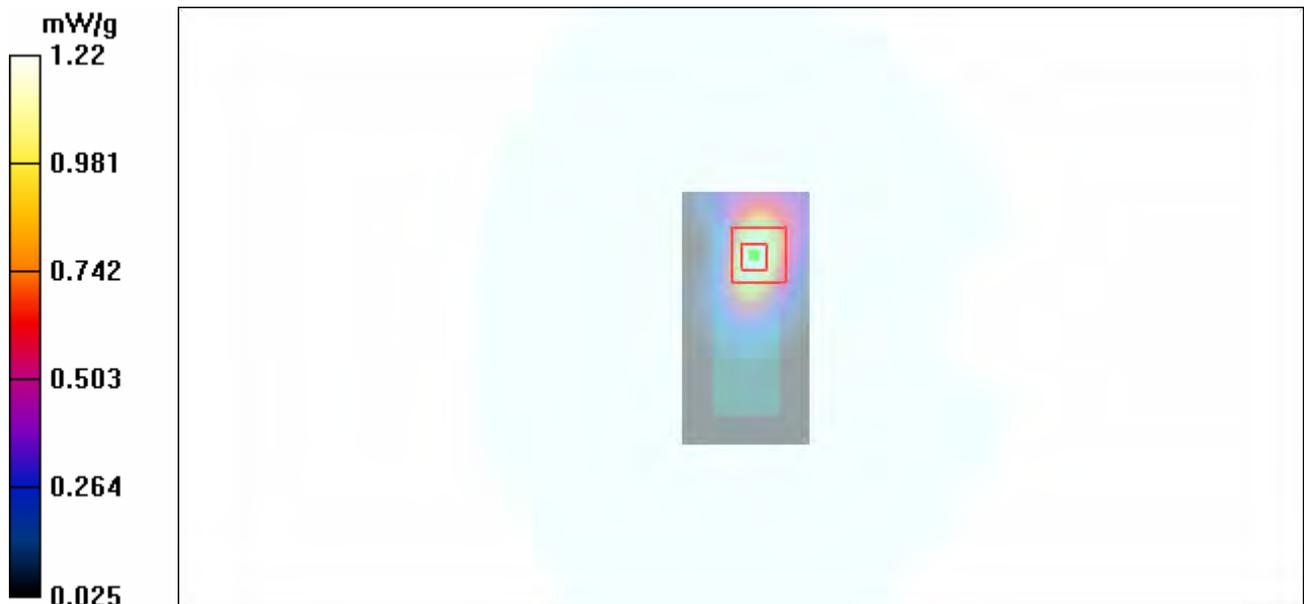


Figure 30 CDMA AWS EV-DO REV.0 with IBM T61 Test Position 1 Channel 450

CDMA AWS EV-DO REV.0 with IBM T61 Test Position 1 Low

Date/Time: 4/1/2010 8:37:48 PM

Communication System: CDMA AWS EVDO Rev.0; Frequency: 1711.25 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1712$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 53.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 1 Low/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.38 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.4 V/m; Power Drift = -0.093 dB

Peak SAR (extrapolated) = 2.02 W/kg

SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.647 mW/g

Maximum value of SAR (measured) = 1.35 mW/g

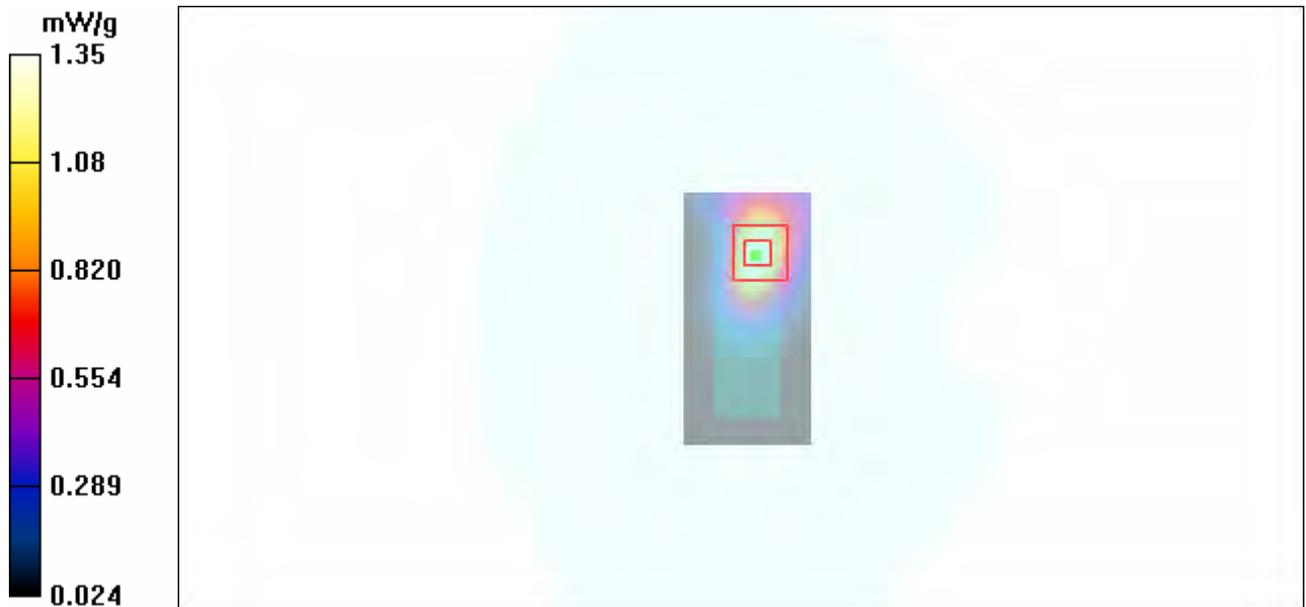


Figure 31 CDMA AWS EV-DO REV.0 with IBM T61 Test Position 1 Channel 25

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No. RZA2010-0480

Page 64 of 117

CDMA AWS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 High

Date/Time: 4/1/2010 6:57:50 PM

Communication System: CDMA AWS EVDO Rev.0; Frequency: 1752.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1752.5$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 High /Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.60 mW/g

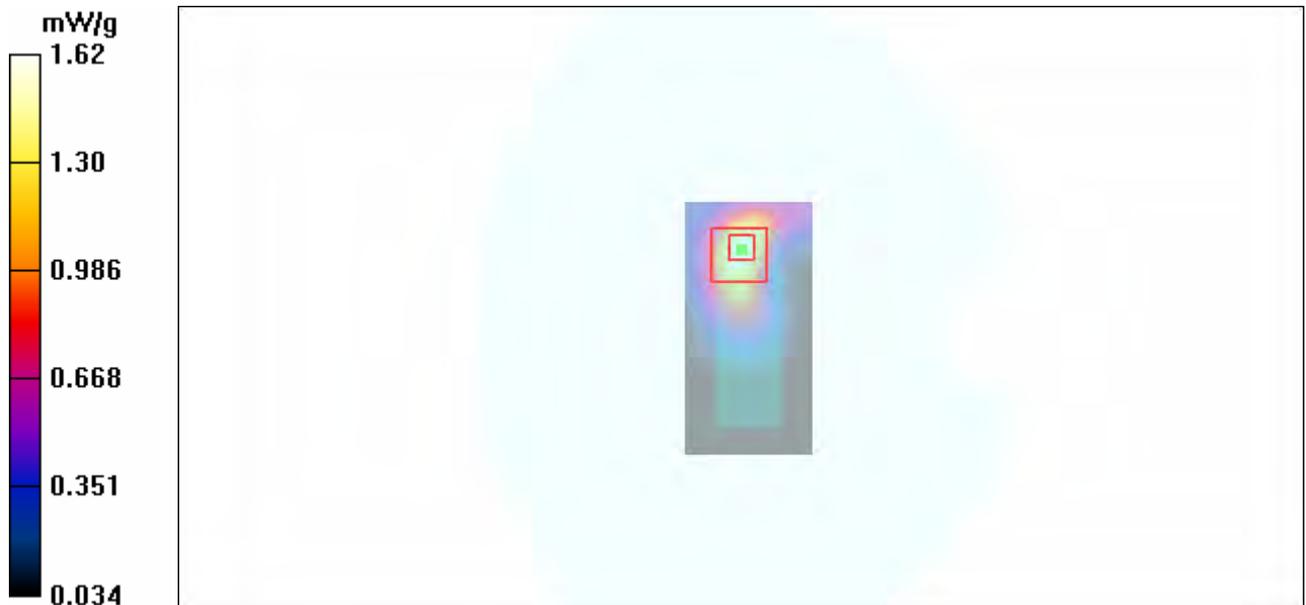
Test Position 2 High /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.0 V/m; Power Drift = 0.122 dB

Peak SAR (extrapolated) = 2.55 W/kg

SAR(1 g) = 1.41 mW/g; SAR(10 g) = 0.731 mW/g

Maximum value of SAR (measured) = 1.62 mW/g



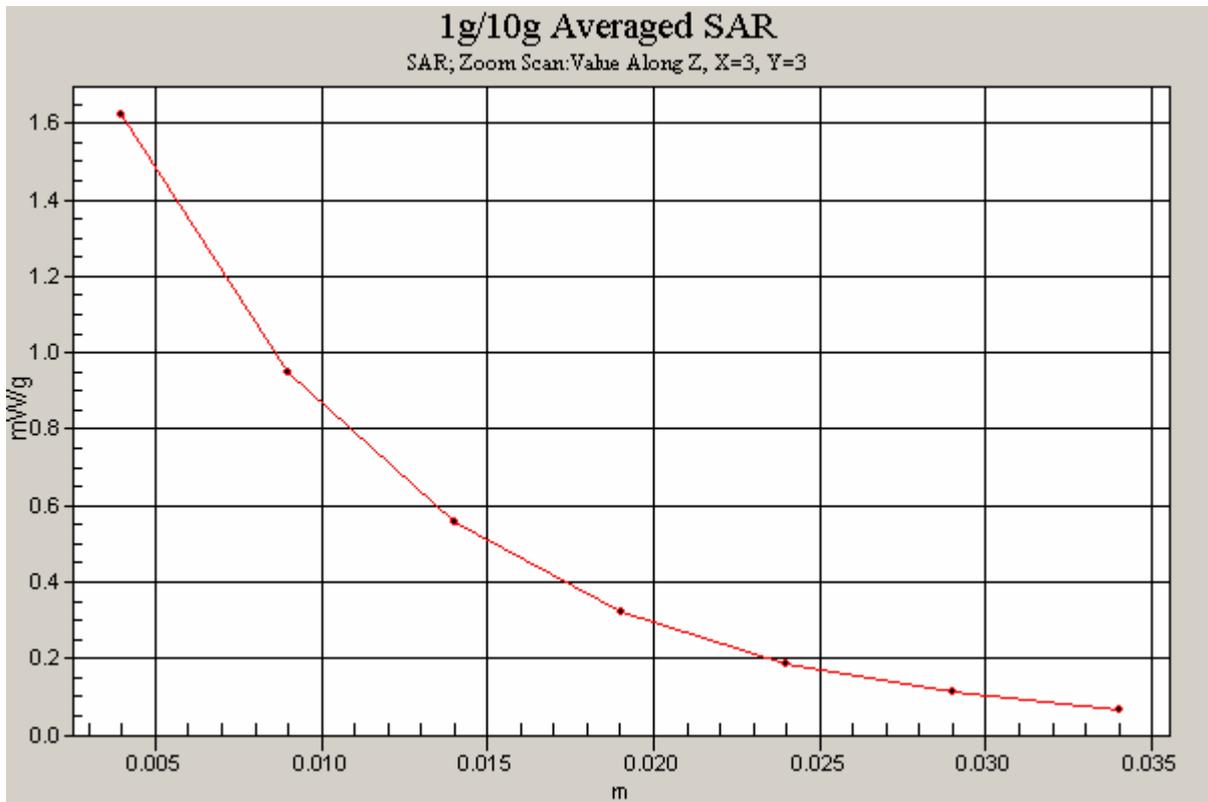


Figure 32 CDMA AWS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Channel 850

CDMA AWS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Middle

Date/Time: 4/1/2010 7:16:45 PM

Communication System: CDMA AWS EVDO Rev.0; Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.53 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.0 V/m; Power Drift = -0.078 dB

Peak SAR (extrapolated) = 2.35 W/kg

SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.687 mW/g

Maximum value of SAR (measured) = 1.48 mW/g

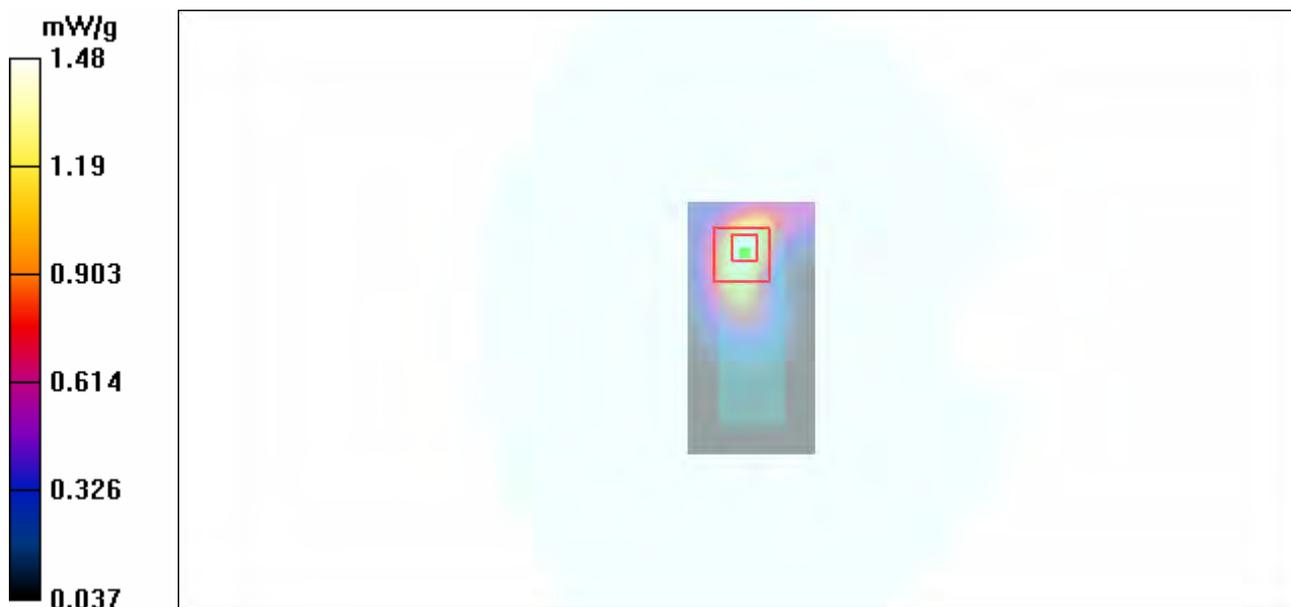


Figure 33 CDMA AWS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Channel 450

CDMA AWS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Low

Date/Time: 4/1/2010 7:35:34 PM

Communication System: CDMA AWS EVDO Rev.0; Frequency: 1711.25 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1712$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 53.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 Low/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.56 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.7 V/m; Power Drift = 0.195 dB

Peak SAR (extrapolated) = 2.46 W/kg

SAR(1 g) = 1.38 mW/g; SAR(10 g) = 0.724 mW/g

Maximum value of SAR (measured) = 1.56 mW/g

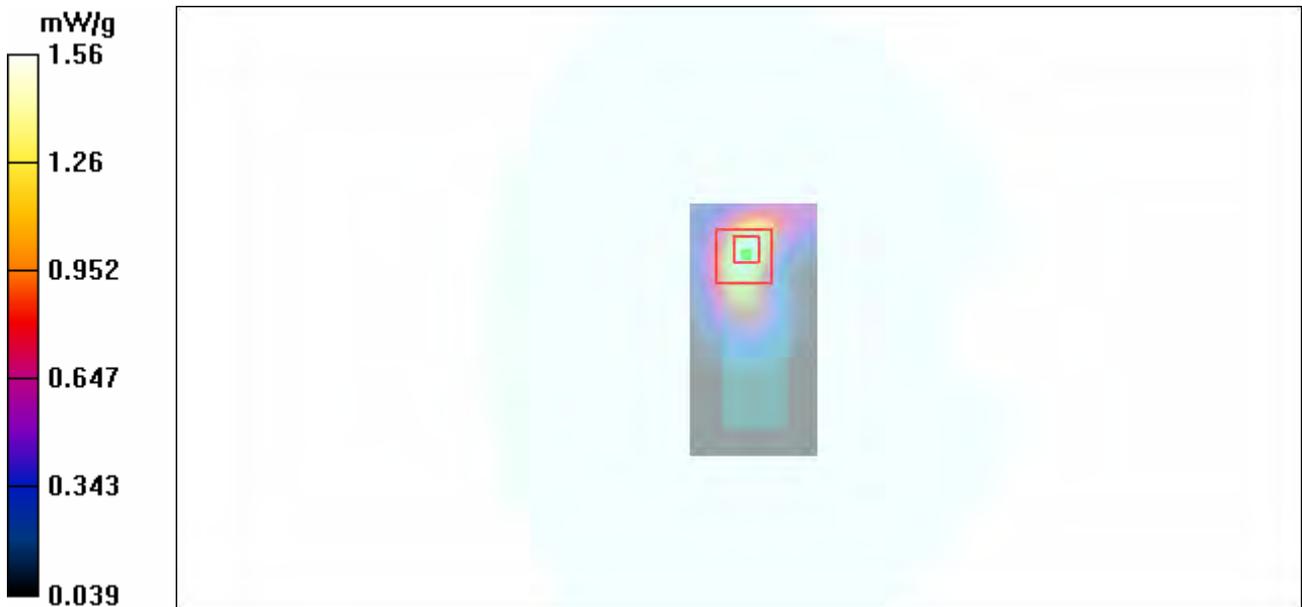


Figure 34 CDMA AWS EV-DO REV.0 with BenQ Joybook R55V Test Position 2 Channel 25

CDMA AWS EV-DO REV.0 with Lenovo Y-450 Test Position 3 High

Date/Time: 4/1/2010 11:13:58 PM

Communication System: CDMA AWS EVDO Rev.0; Frequency: 1752.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1752.5$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 3 High/Area Scan (41x101x1): Measurement grid: dx=10mm, dy=10mm

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

Test Position 3 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 27.6 V/m; Power Drift = 0.100 dB

Peak SAR (extrapolated) = 1.89 W/kg

SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.555 mW/g

Maximum value of SAR (measured) = 1.17 mW/g

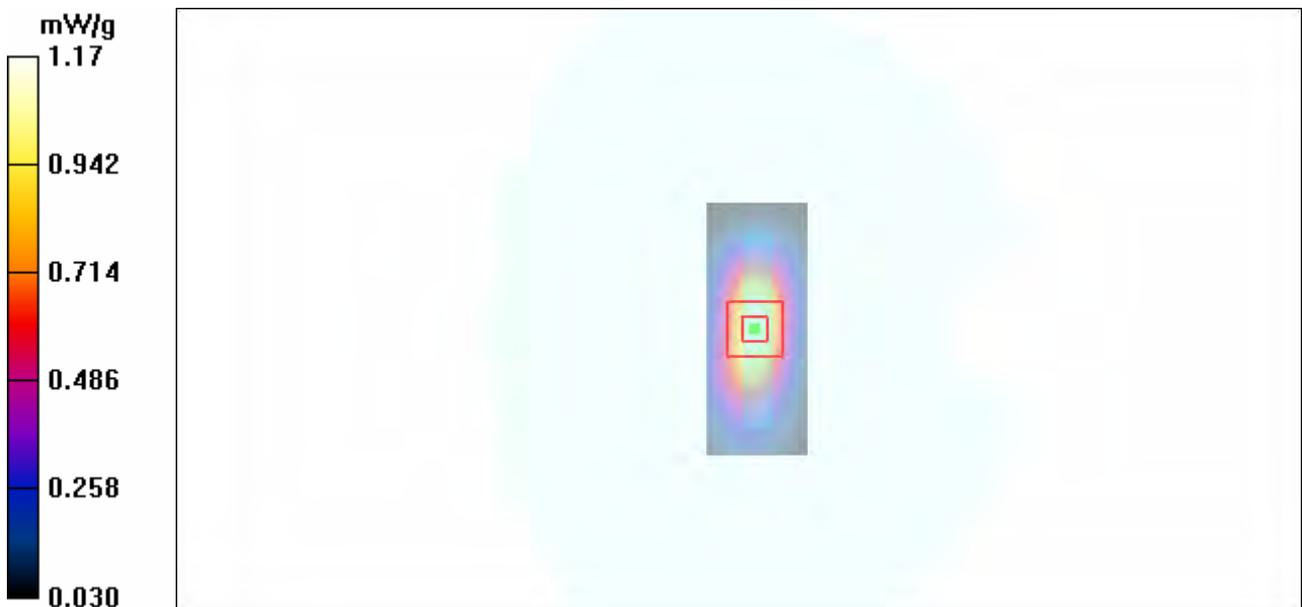


Figure 35 CDMA AWS EV-DO REV.0 with Lenovo Y-450 Test Position 3 Channel 850

CDMA AWS EV-DO REV.0 with Lenovo Y-450 Test Position 3 Middle

Date/Time: 4/1/2010 10:55:44 PM

Communication System: CDMA AWS EVDO Rev.0; Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 3 Middle/Area Scan (41x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.06 mW/g

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.2 V/m; Power Drift = -0.186 dB

Peak SAR (extrapolated) = 1.77 W/kg

SAR(1 g) = 0.974 mW/g; SAR(10 g) = 0.531 mW/g

Maximum value of SAR (measured) = 1.10 mW/g

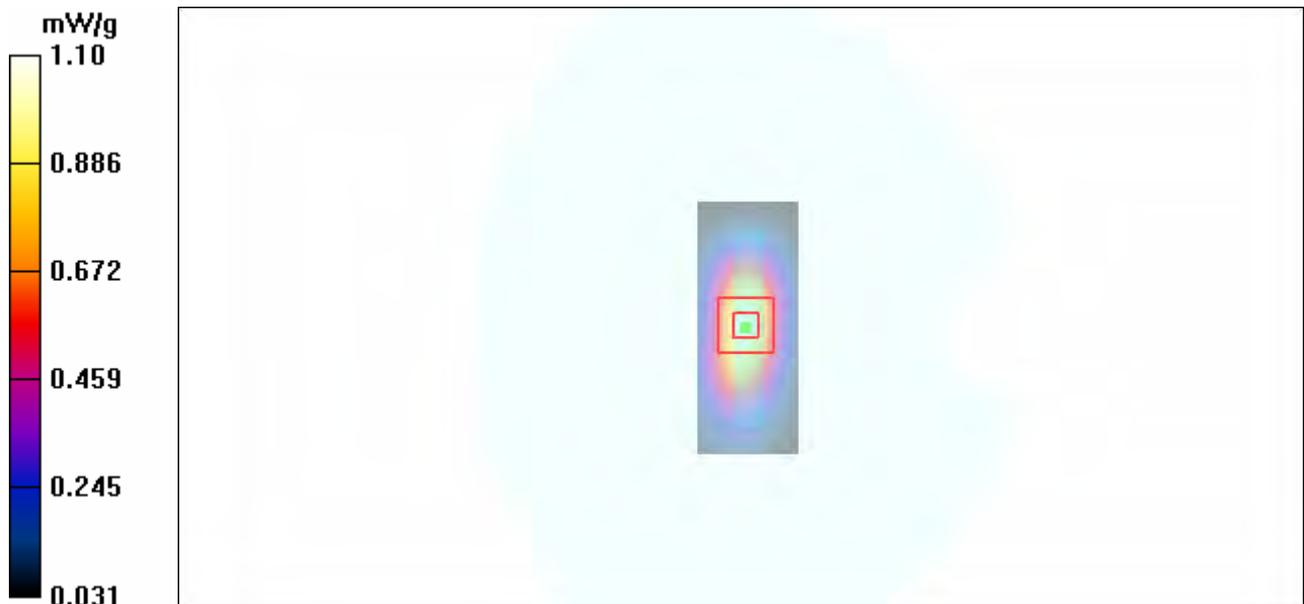


Figure 36 CDMA AWS EV-DO REV.0 with Lenovo Y-450 Test Position 3 Channel 450

CDMA AWS EV-DO REV.0 with Lenovo Y-450 Test Position 3 Low

Date/Time: 4/1/2010 11:32:29 PM

Communication System: CDMA AWS EVDO Rev.0; Frequency: 1711.25 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1712$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 53.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 3 Low/Area Scan (41x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.23 mW/g

Test Position 3 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.9 V/m; Power Drift = -0.015 dB

Peak SAR (extrapolated) = 1.94 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.588 mW/g

Maximum value of SAR (measured) = 1.20 mW/g

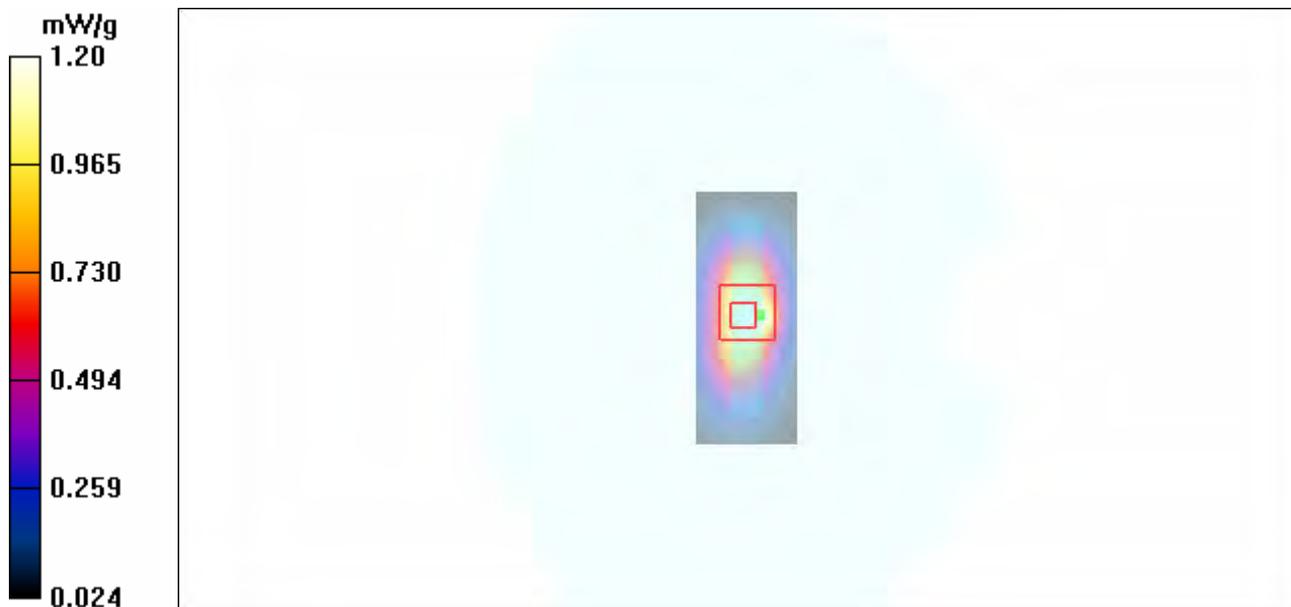


Figure 37 CDMA AWS EV-DO REV.0 with Lenovo Y-450 Test Position 3 Channel 25

CDMA AWS EV-DO REV.0 with Lenovo Y-450 Test Position 4 Middle

Date/Time: 4/1/2010 10:06:07 PM

Communication System: CDMA AWS EVDO Rev.0; Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 4 Middle/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.284 mW/g

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.64 V/m; Power Drift = 0.193 dB

Peak SAR (extrapolated) = 0.451 W/kg

SAR(1 g) = 0.267 mW/g; SAR(10 g) = 0.162 mW/g

Maximum value of SAR (measured) = 0.290 mW/g

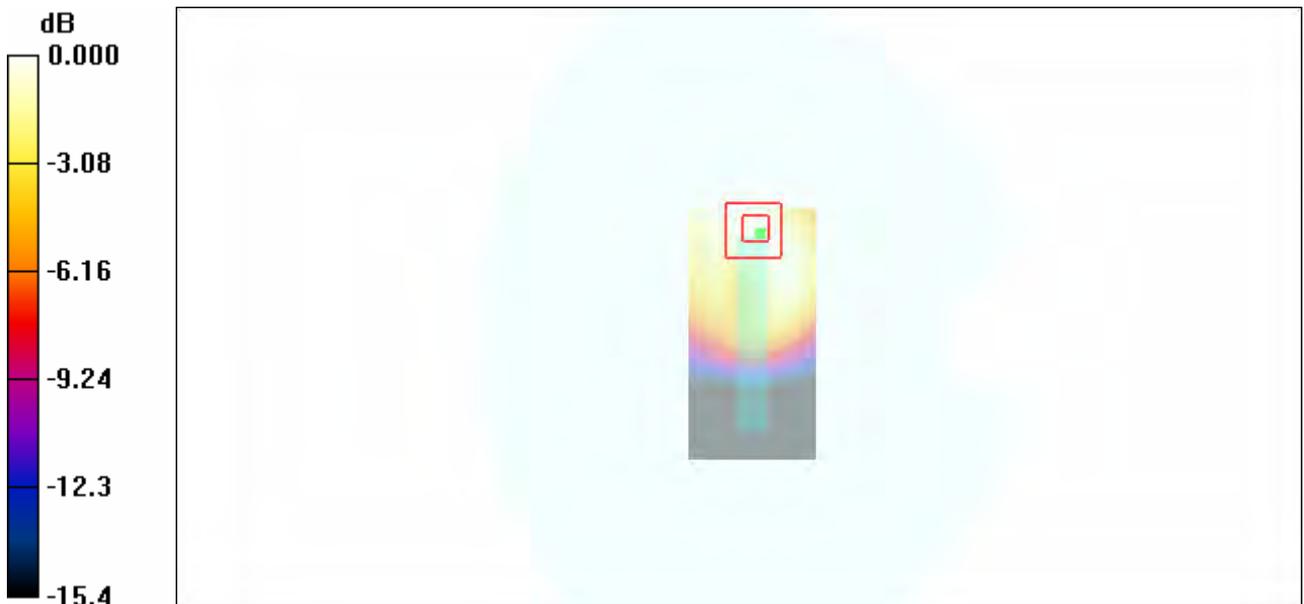


Figure 38 CDMA AWS EV-DO REV.0 with Lenovo Y-450 Test Position 4 Channel 450

CDMA AWS EV-DO REV.A with BenQ Joybook R55V Test Position 2 High

Date/Time: 4/1/2010 10:10:00 PM

Communication System: CDMA AWS EVDO Rev.A; Frequency: 1752.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1752.5$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 High/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.59 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.9 V/m; Power Drift = -0.070 dB

Peak SAR (extrapolated) = 2.49 W/kg

SAR(1 g) = 1.4 mW/g; SAR(10 g) = 0.737 mW/g

Maximum value of SAR (measured) = 1.58 mW/g

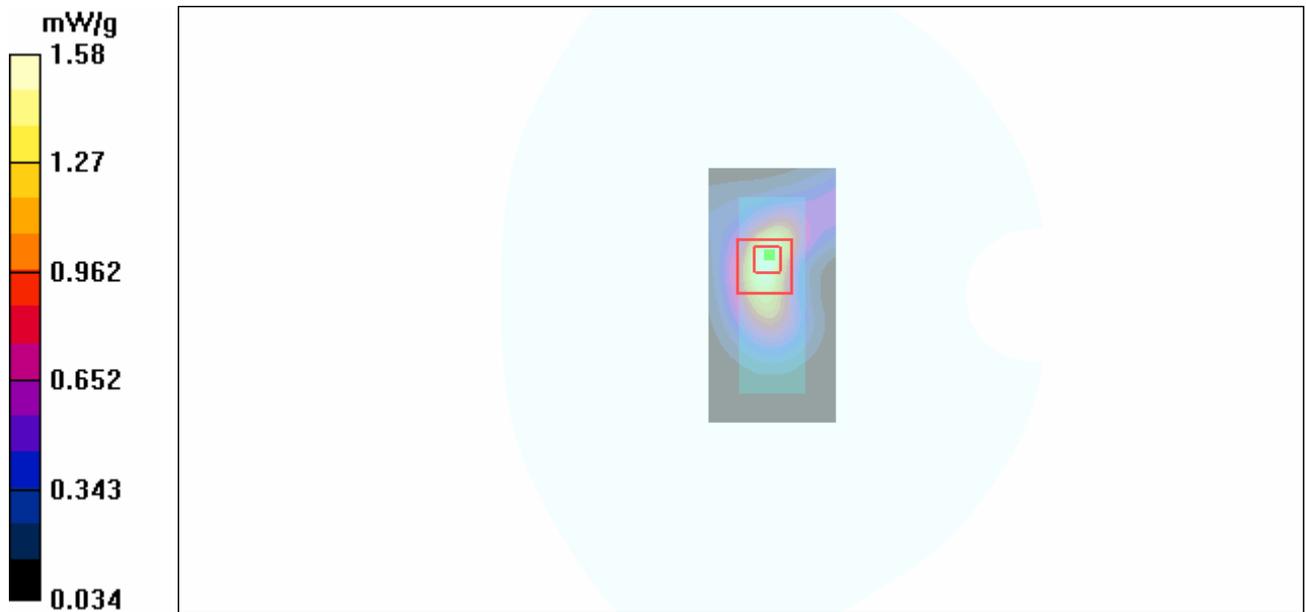


Figure 39 CDMA AWS EV-DO REV.A with BenQ Joybook R55V Test Position 2 Channel 850

CDMA AWS 1×RTT with BenQ Joybook R55V Test Position 2 High

Date/Time: 4/1/2010 9:25:29 PM

Communication System: CDMA AWS ; Frequency: 1752.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1752.5$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.7, 7.7, 7.7); Calibrated: 9/23/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: SAM000 T01 ; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Test Position 2 High/Area Scan (51x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.63 mW/g

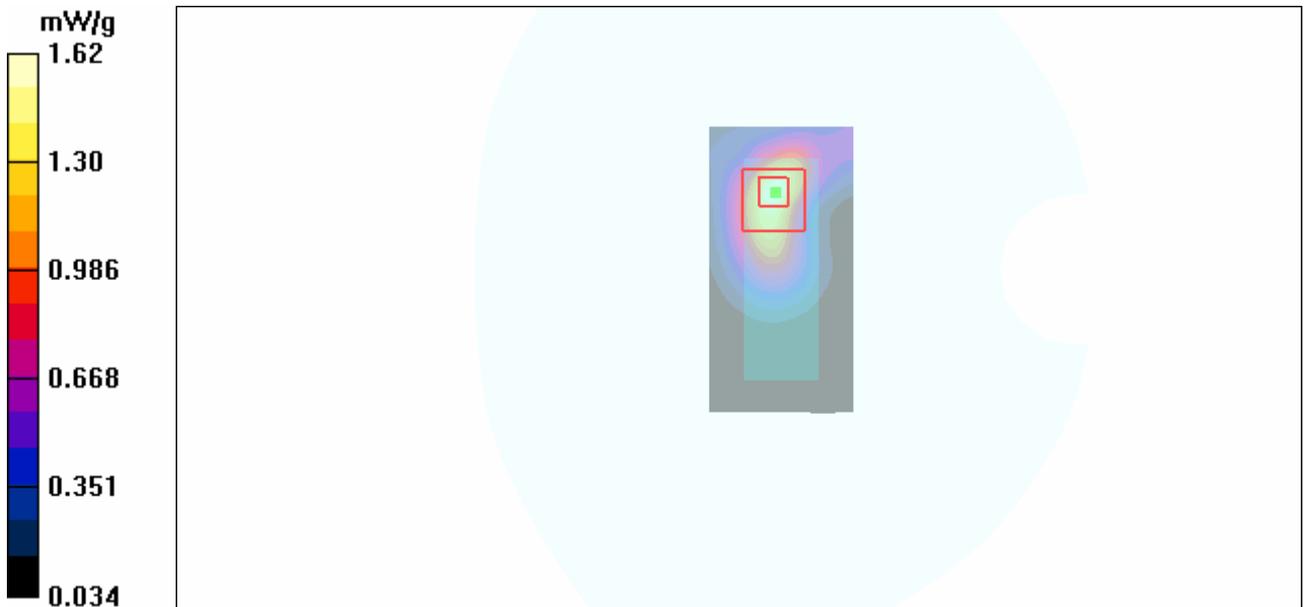
Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.9 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 2.54 W/kg

SAR(1 g) = 1.42 mW/g; SAR(10 g) = 0.740 mW/g

Maximum value of SAR (measured) = 1.62 mW/g



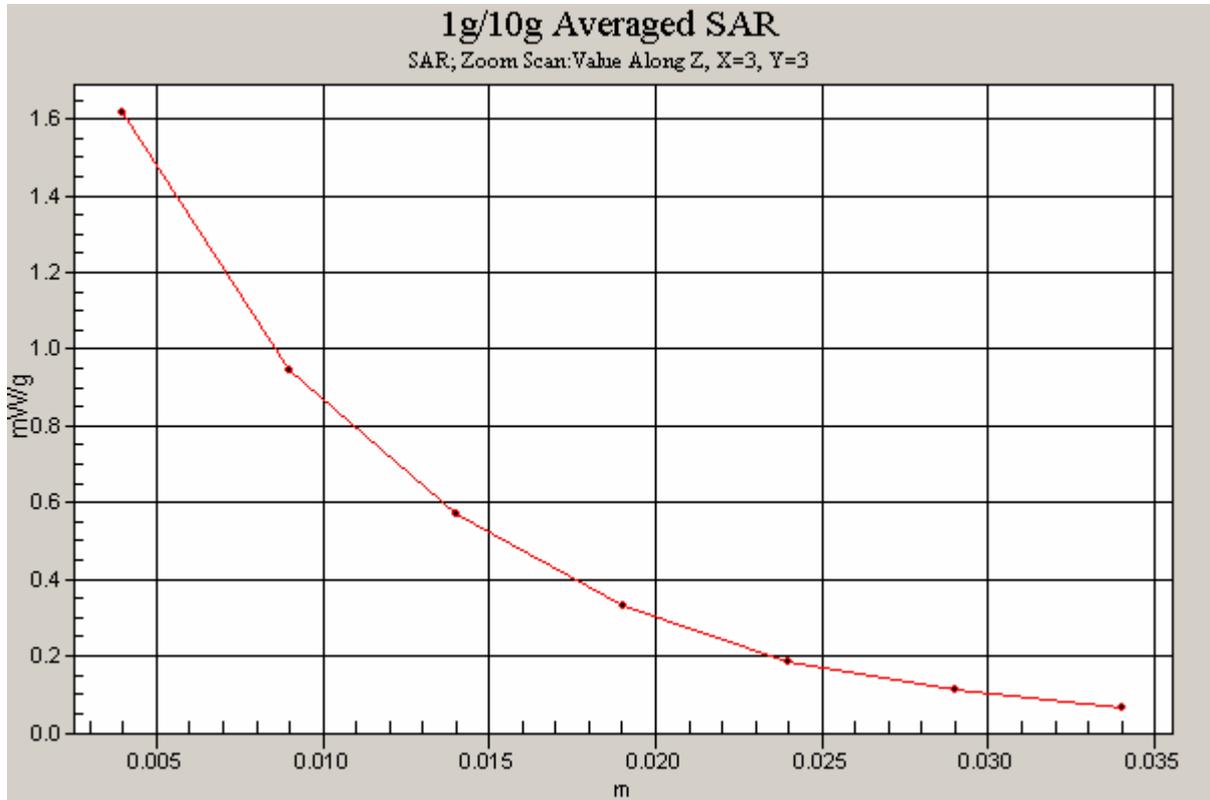


Figure 40 CDMA AWS 1×RTT with BenQ Joybook R55V Test Position 2 Channel 850

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RZA2010-0480

Page 75 of 117

ANNEX D: 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 **TA (Auden)**

Certificate No: **EX3-3677_Sep09**

CALIBRATION CERTIFICATE																																																			
Object	EX3DV4 - SN:3677																																																		
Calibration procedure(s)	QA CAL-01.v6, QA CAL-12.v5, QA CAL-23.v3 and QA CAL-25.v2 - Calibration procedure for dosimetric E-field probes																																																		
Calibration date:	September 23, 2009																																																		
Condition of the calibrated item	In Tolerance																																																		
<p>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.</p> <p>All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.</p> <p>Calibration Equipment used (M&TE critical for calibration)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Primary Standards</th> <th style="width: 15%;">ID #</th> <th style="width: 30%;">Cal Date (Certificate No.)</th> <th style="width: 25%;">Scheduled Calibration</th> </tr> </thead> <tbody> <tr> <td>Power meter E4419B</td> <td>GB41293874</td> <td>1-Apr-09 (No. 217-01030)</td> <td>Apr-10</td> </tr> <tr> <td>Power sensor E4412A</td> <td>MY41495277</td> <td>1-Apr-09 (No. 217-01030)</td> <td>Apr-10</td> </tr> <tr> <td>Power sensor E4412A</td> <td>MY41498087</td> <td>1-Apr-09 (No. 217-01030)</td> <td>Apr-10</td> </tr> <tr> <td>Reference 3 dB Attenuator</td> <td>SN: S5054 (3c)</td> <td>31-Mar-09 (No. 217-01026)</td> <td>Mar-10</td> </tr> <tr> <td>Reference 20 dB Attenuator</td> <td>SN: S5086 (20b)</td> <td>31-Mar-09 (No. 217-01028)</td> <td>Mar-10</td> </tr> <tr> <td>Reference 30 dB Attenuator</td> <td>SN: S5129 (30b)</td> <td>31-Mar-09 (No. 217-01027)</td> <td>Mar-10</td> </tr> <tr> <td>Reference Probe ES3DV2</td> <td>SN: 3013</td> <td>2-Jan-09 (No. ES3-3013_Jan09)</td> <td>Jan-10</td> </tr> <tr> <td>DAE4</td> <td>SN: 660</td> <td>9-Sep-08 (No. DAE4-660_Sep08)</td> <td>Sep-09</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Secondary Standards</th> <th style="width: 15%;">ID #</th> <th style="width: 30%;">Check Date (in house)</th> <th style="width: 25%;">Scheduled Check</th> </tr> </thead> <tbody> <tr> <td>RF generator HP 8648C</td> <td>US3642U01700</td> <td>4-Aug-98 (in house check Oct-07)</td> <td>In house check: Oct-09</td> </tr> <tr> <td>Network Analyzer HP 8753E</td> <td>US37390585</td> <td>18-Oct-01 (in house check Oct-08)</td> <td>In house check: Oct-09</td> </tr> </tbody> </table>				Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration	Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10	Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10	Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10	Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10	Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10	Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10	Reference Probe ES3DV2	SN: 3013	2-Jan-09 (No. ES3-3013_Jan09)	Jan-10	DAE4	SN: 660	9-Sep-08 (No. DAE4-660_Sep08)	Sep-09	Secondary Standards	ID #	Check Date (in house)	Scheduled Check	RF generator HP 8648C	US3642U01700	4-Aug-98 (in house check Oct-07)	In house check: Oct-09	Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration																																																
Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10																																																
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10																																																
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10																																																
Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10																																																
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10																																																
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10																																																
Reference Probe ES3DV2	SN: 3013	2-Jan-09 (No. ES3-3013_Jan09)	Jan-10																																																
DAE4	SN: 660	9-Sep-08 (No. DAE4-660_Sep08)	Sep-09																																																
Secondary Standards	ID #	Check Date (in house)	Scheduled Check																																																
RF generator HP 8648C	US3642U01700	4-Aug-98 (in house check Oct-07)	In house check: Oct-09																																																
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09																																																
Calibrated by:	Name Claudio Leubler	Function Laboratory Technician	Signature 																																																
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature 																																																
Issued: September 23, 2009																																																			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.																																																			

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No. RZA2010-0480

Page 76 of 117

**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**

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
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., $\vartheta = 0$ 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 $\vartheta = 0$ ($f \leq 900$ 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 effect 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*.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ 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.

EX3DV4 SN:3677

September 23, 2009

Probe EX3DV4

SN:3677

Manufactured:	September 9, 2008
Last calibrated:	November 7, 2008
Recalibrated:	September 23, 2009

Calibrated for DASYS Systems

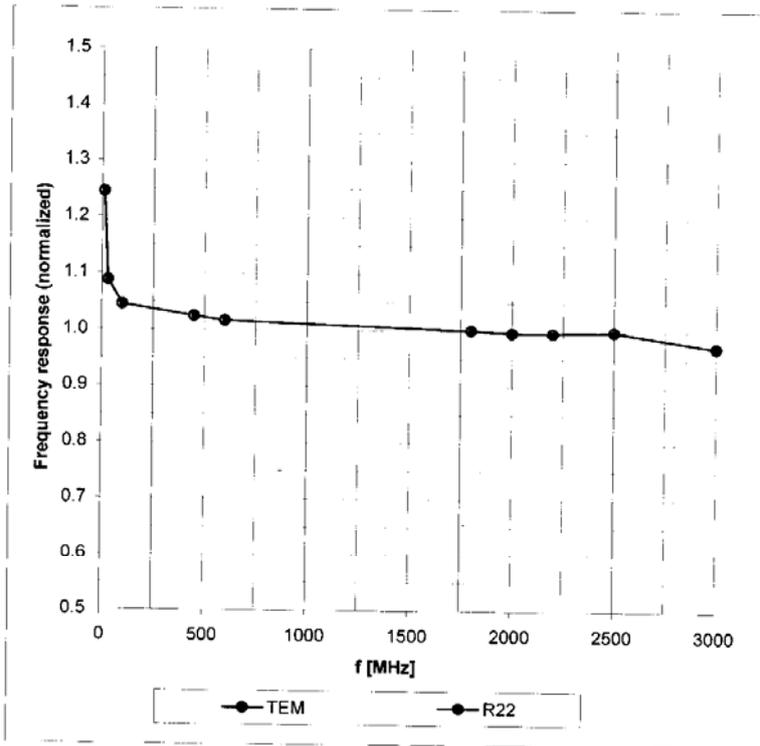
(Note: non-compatible with DASYS2 system!)

EX3DV4 SN:3677

September 23, 2009

Frequency Response of E-Field

(TEM-Cell: ifi110 EXX, Waveguide: R22)

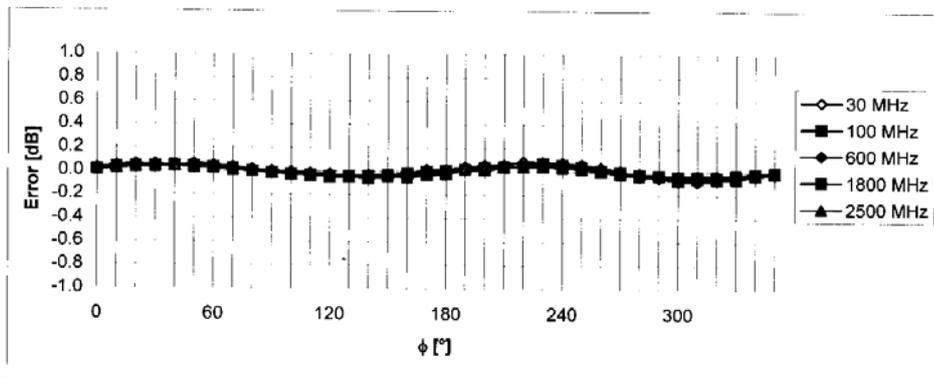
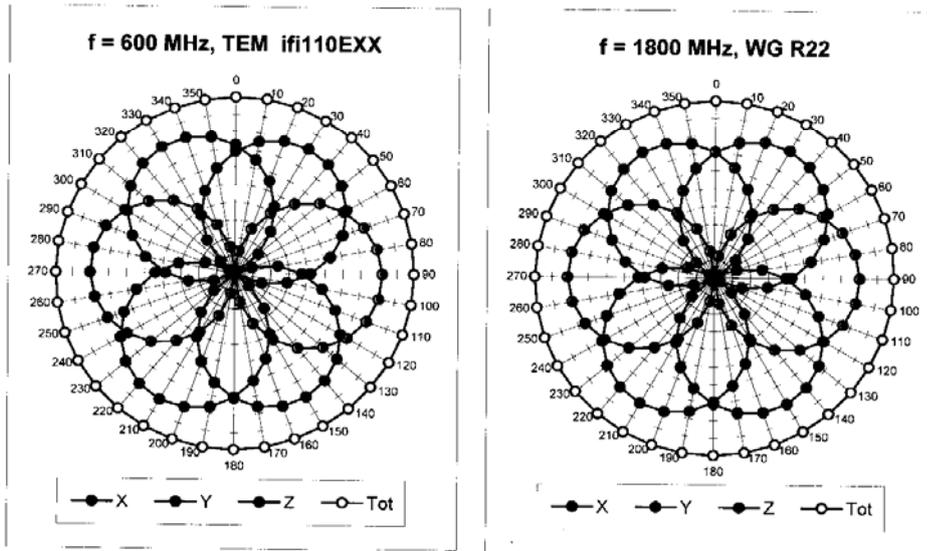


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

EX3DV4 SN:3677

September 23, 2009

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

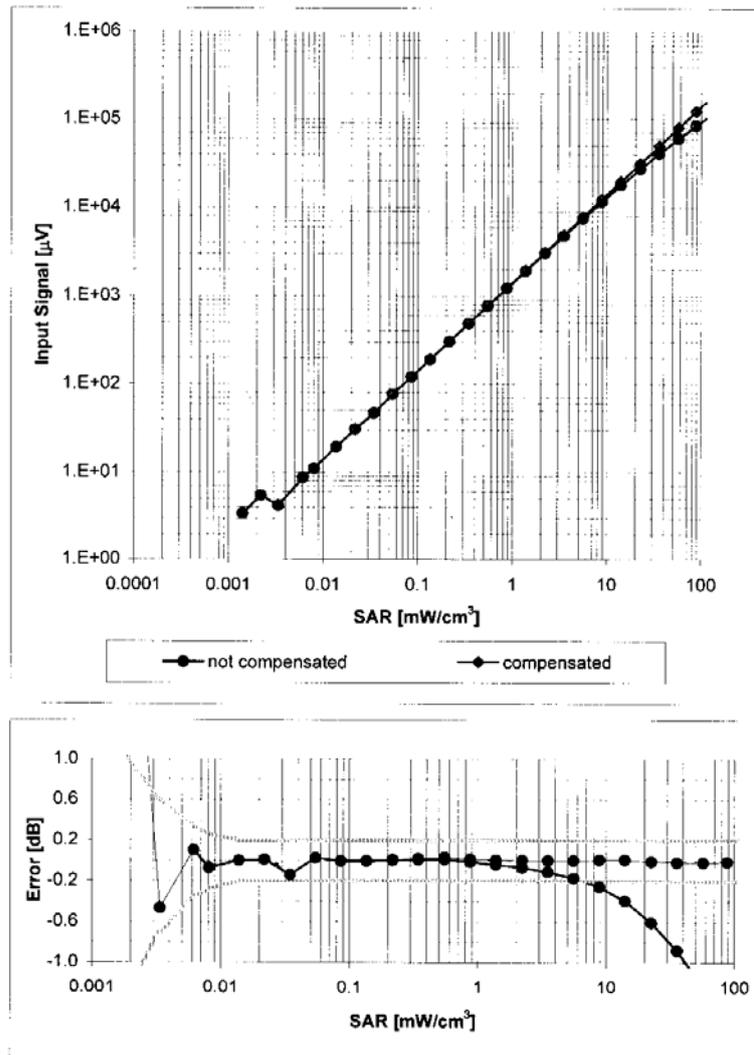


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

EX3DV4 SN:3677

September 23, 2009

Dynamic Range $f(\text{SAR}_{\text{head}})$
(Waveguide R22, $f = 1800 \text{ MHz}$)

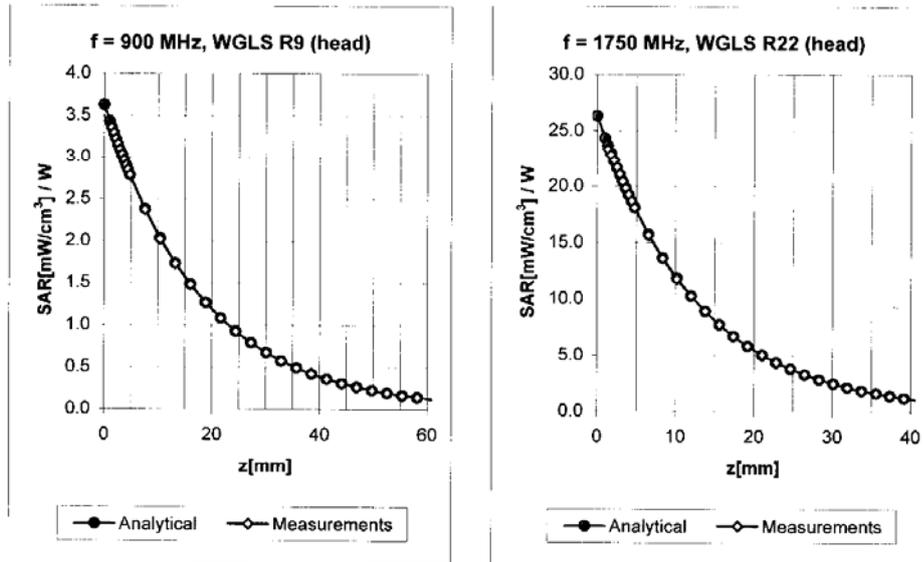


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

EX3DV4 SN:3677

September 23, 2009

Conversion Factor Assessment



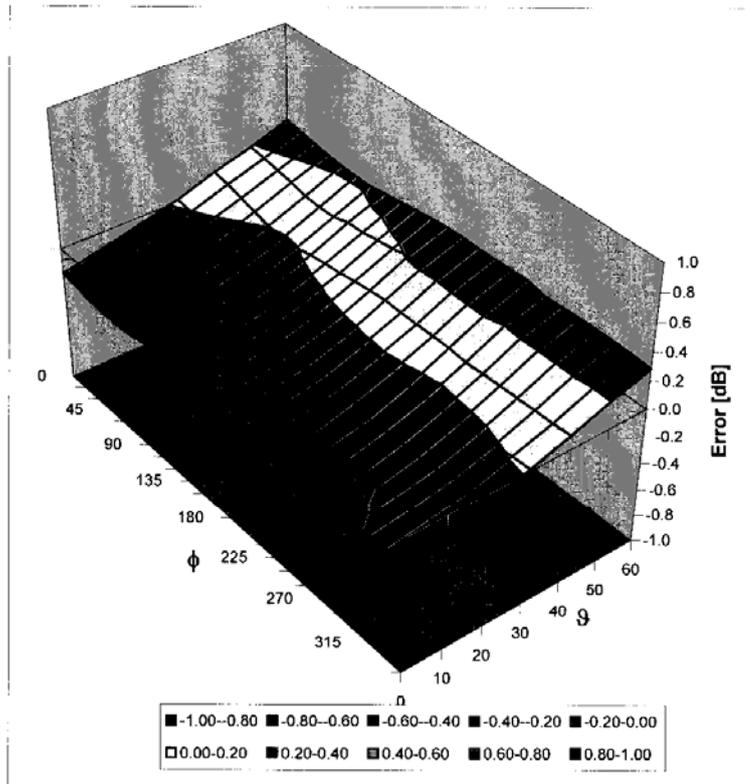
f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.68	0.64	9.20 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.71	0.62	8.91 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.68	0.62	8.04 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.70	0.60	7.53 ± 11.0% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.32	0.49	10.43 ± 13.3% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.54	0.73	9.11 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.63	0.71	8.89 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.55	0.74	7.70 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.30	1.01	7.62 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.56	0.68	7.28 ± 11.0% (k=2)

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

EX3DV4 SN:3677

September 23, 2009

Deviation from Isotropy in HSL
Error (ϕ , θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RZA2010-0480

Page 84 of 117

ANNEX E: D835V2 Dipole 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 **ATL (Auden)**

Certificate No: **D835V2-4d082_Jul09**

CALIBRATION CERTIFICATE			
Object	D835V2 - SN: 4d082		
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits		
Calibration date:	July 13, 2009		
Condition of the calibrated item	In Tolerance		
<p>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.</p> <p>All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.</p> <p>Calibration Equipment used (M&TE critical for calibration)</p>			
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV2	SN: 3025	30-Apr-09 (No. ES3-3025_Apr09)	Apr-10
DAE4	SN: 601	07-Mar-09 (No. DAE4-601_Mar09)	Mar-10
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	in house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	in house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-08)	in house check: Oct-09
Calibrated by:	Name	Function	Signature
	Jeton Kastrati	Laboratory Technician	
Approved by:	Name	Function	Signature
	Katja Pokovic	Technical Manager	
			Issued: July 13, 2009
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No. RZA2010-0480

Page 85of 117

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**

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:

- 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
- 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:

- DASY4/5 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.

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No. RZA2010-0480

Page 86 of 117

Measurement Conditions

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

DASY Version	DASY5	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
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	40.4 \pm 6 %	0.89 mho/m \pm 6 %
Head TSL temperature during test	(22.2 \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	2.42 mW / g
SAR normalized	normalized to 1W	9.68 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	9.71 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	1.58 mW / g
SAR normalized	normalized to 1W	6.32 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	6.34 mW / g \pm 16.5 % (k=2)

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

TA Technology (Shanghai) Co., Ltd. Test Report

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	53.0 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature during test	(22.5 ± 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	2.56 mW / g
SAR normalized	normalized to 1W	10.2 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	10.0 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.68 mW / g
SAR normalized	normalized to 1W	6.72 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	6.61 mW / g ± 16.5 % (k=2)

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

TA Technology (Shanghai) Co., Ltd.

Test Report

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.3 Ω - 2.5 $\mu\Omega$
Return Loss	- 29.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω - 4.3 $\mu\Omega$
Return Loss	- 26.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.390 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	October 17, 2008

DASY5 Validation Report for Head TSL

Date/Time: 13.07.2009 11:31:45

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

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

Medium: HSL 900 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.86, 5.86, 5.86); Calibrated: 30.04.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

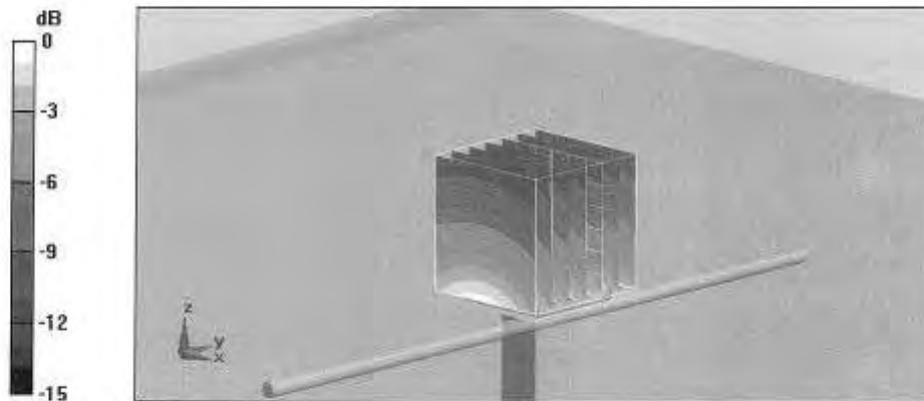
Pin=250mW; dip=15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.4 V/m; Power Drift = 0.00639 dB

Peak SAR (extrapolated) = 3.62 W/kg

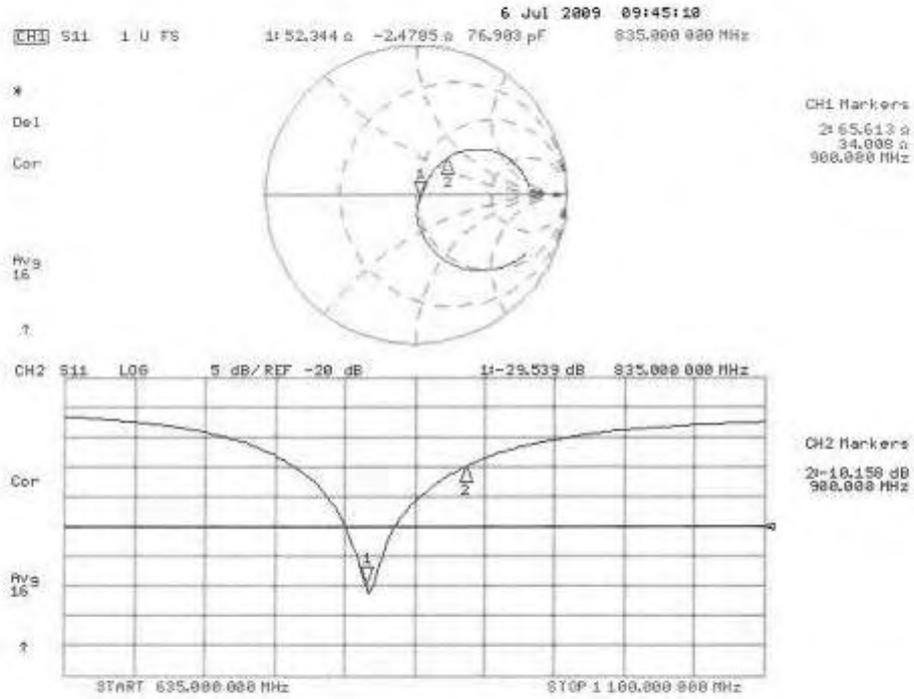
SAR(1 g) = 2.42 mW/g; SAR(10 g) = 1.58 mW/g

Maximum value of SAR (measured) = 2.8 mW/g



0 dB = 2.8mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 13.07.2009 11:50:13

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

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

Medium: MSL900

Medium parameters used: $f = 835$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.79, 5.79, 5.79); Calibrated: 30.04.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

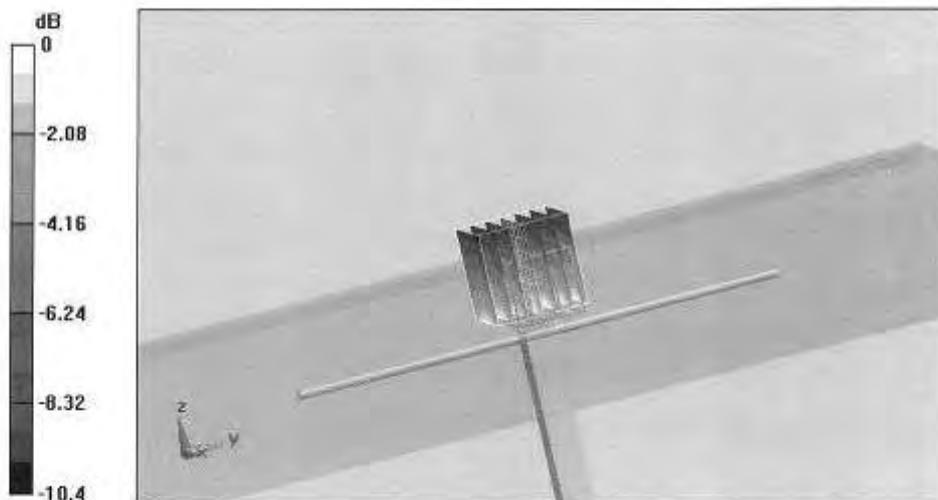
Pin = 250mW, d = 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.4 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 3.76 W/kg

SAR(1 g) = 2.56 mW/g; SAR(10 g) = 1.68 mW/g

Maximum value of SAR (measured) = 2.97 mW/g



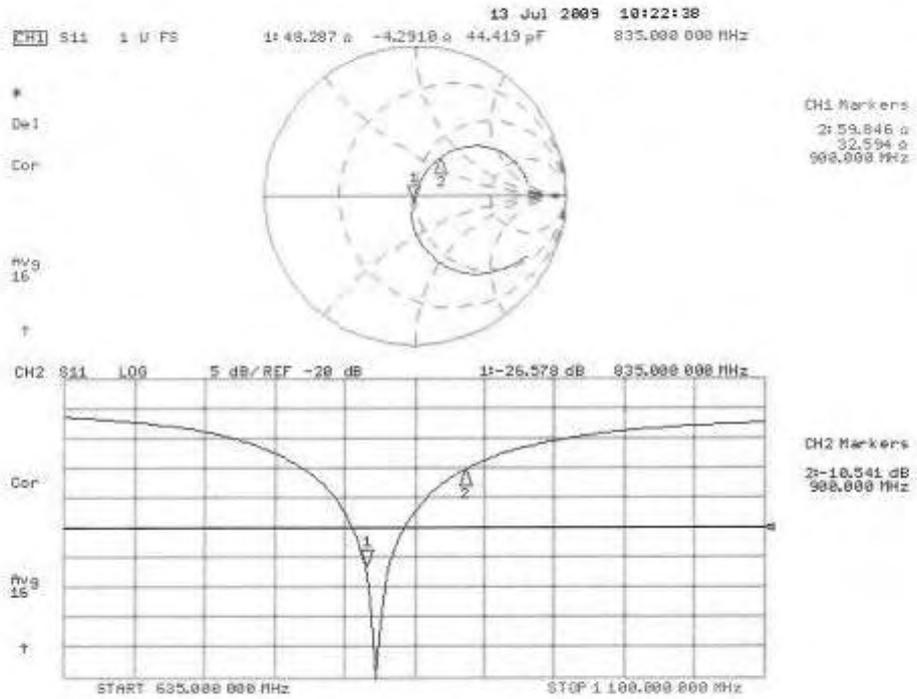
0 dB = 2.97mW/g

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RZA2010-0480

Page 92 of 117

Impedance Measurement Plot for Body TSL



TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RZA2010-0480

Page 93of 117

ANNEX F: D1800V2 Dipole 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 **Auden**

Certificate No: **D1800V2-2d052_Jun09**

CALIBRATION CERTIFICATE

Object: **D1800V2 - SN: 2d052**

Calibration procedure(s): **QA CAL-05.v7
Calibration procedure for dipole validation kits**

Calibration date: **June 26, 2009**

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 EPM-442A	GB37480704	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV2	SN: 3025	30-Apr-09 (No. ES3-3025_Apr09)	Apr-10
DAE4	SN: 601	07-Mar-09 (No. DAE4-601_Mar09)	Mar-10
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 54205	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

Calibrated by:	Name Jeton Kastrab	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Technical Manager	

Issued: June 29, 2009

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

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No. RZA2010-0480

Page 94 of 117

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**

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:

- 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
- 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:

- DASY4/5 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.

TA Technology (Shanghai) Co., Ltd.

Test Report

Measurement Conditions

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

DASY Version	DASY5	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.1 ± 6 %	1.37 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 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	9.66 mW /g
SAR normalized	normalized to 1W	38.6 mW /g
SAR for nominal Head TSL parameters ¹	normalized to 1W	39.4 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.14 mW /g
SAR normalized	normalized to 1W	20.6 mW /g
SAR for nominal Head TSL parameters ¹	normalized to 1W	20.8 mW / g ± 16.5 % (k=2)

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

TA Technology (Shanghai) Co., Ltd. Test Report

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.0 ± 6 %	1.49 mho/m ± 6 %
Body TSL temperature during test	(21.0 ± 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	9.31 mW /g
SAR normalized	normalized to 1W	37.2 mW /g
SAR for nominal Body TSL parameters ²	normalized to 1W	37.9 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.97 mW /g
SAR normalized	normalized to 1W	19.9 mW /g
SAR for nominal Body TSL parameters ²	normalized to 1W	20.1 mW / g ± 16.5 % (k=2)

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

TA Technology (Shanghai) Co., Ltd.

Test Report

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	46.8 Ω - 5.7 $j\Omega$
Return Loss	- 23.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	43.0 Ω - 4.5 $j\Omega$
Return Loss	- 21.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.215 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	July 05, 2002

DASY5 Validation Report for Head TSL

Date/Time: 26.06.2009 11:56:04

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: SN:2d052

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: HSL U11 BB

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.93, 4.93, 4.93); Calibrated: 30.04.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Pin = 250 mW; dip = 10 mm/Zoom Scan (dist=3mm, probe 0deg) (7x7x7)/Cube 0:

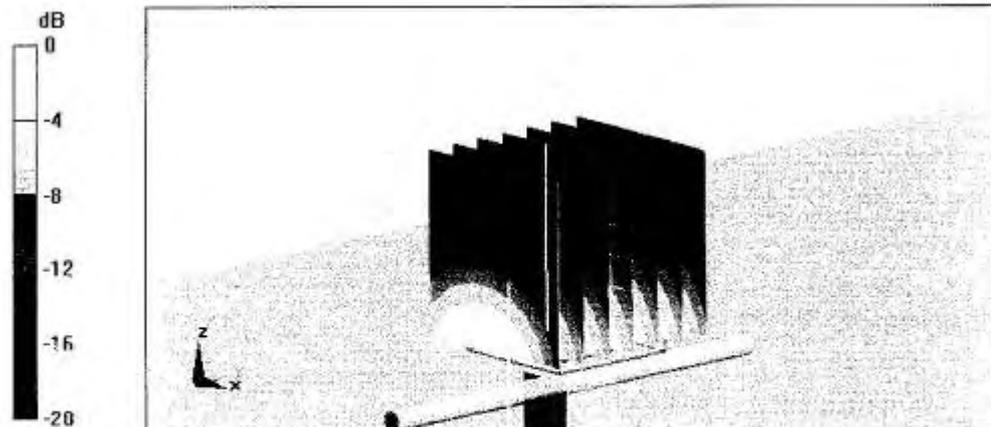
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.3 V/m; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 17.3 W/kg

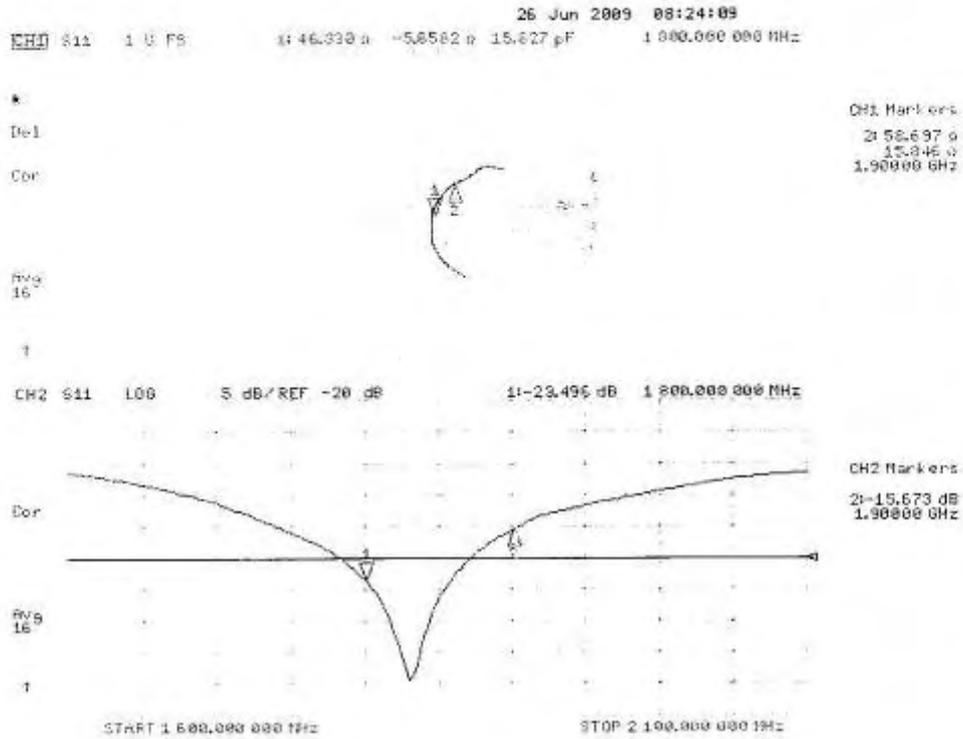
SAR(1 g) = 9.66 mW/g; SAR(10 g) = 5.14 mW/g

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



0 dB = 11.7mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 23.06.2009 18:19:26

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:2d052

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: MSL U10

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.62, 4.62, 4.62); Calibrated: 30.04.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Pin = 250 mW; dip = 10 mm/Zoom Scan (dist=3.0mm, probe 0deg) (7x7x7)/Cube 0:

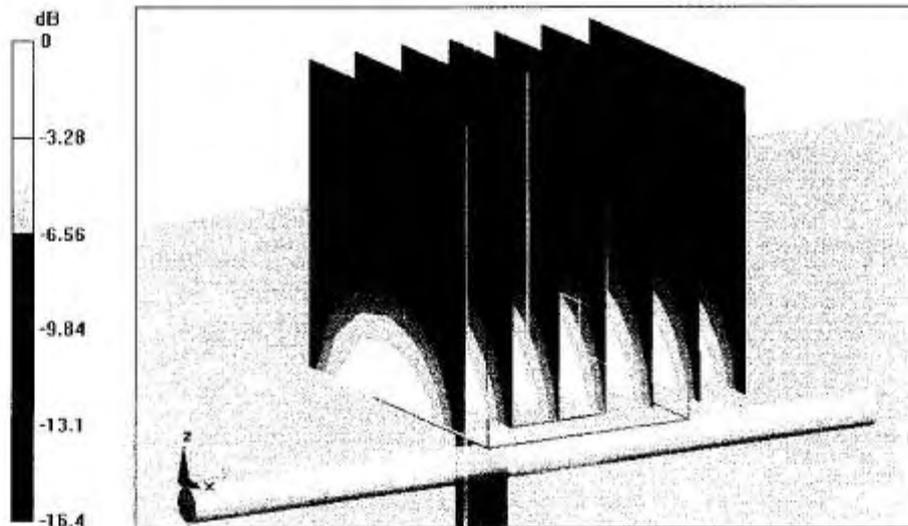
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.3 V/m; Power Drift = -0.00221 dB

Peak SAR (extrapolated) = 16.1 W/kg

SAR(1 g) = 9.31 mW/g; SAR(10 g) = 4.97 mW/g

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



0 dB = 11.7mW/g