



NO.: RZA2008-0449FCC



OET 65

TEST REPORT

Test name	Electromagnetic Field (Specific Absorption Rate)
Product	HSDPA USB Stick
Model	E166
FCC ID	QISE166
Client	HUAWEI Technologies Co., Ltd.

TA Technology (Shanghai) Co., Ltd.



GENERAL TERMS

1. The test report is invalid if not marked with “exclusive stamp for the data report” or the stamp of the TA.
2. Any copy of the test report is invalid if not re-marked with the “exclusive stamp for the test report” or the stamp of TA.
3. The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.
4. The test report is invalid if there is any evidence of erasure and/or falsification.
5. If there is any dissidence for the test report, please file objection to the test center with in 15 days from the date of receiving the test report.
6. Normally, entrust test is only responsible for the samples that have undergone the test.
7. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permissions of TA.

Address: Room4,No.399,Cailun Rd,Zhangjiang Hi-Tech Park, Pudong Shanghai,China

Post code: 201203

Telephone: +86-021-50791141/2/3

Fax: +86-021-50791141/2/3-8000

Website: <http://www.ta-shanghai.com>

E-mail: service@ta-shanghai.com

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

No. RZA2008-0449FCC

Page 3 of 128

GENERAL SUMMARY

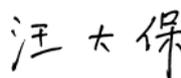
Product	HSDPA USB Stick	Model	E166
Client	HUAWEI Technologies Co., Ltd.	Type of test	Entrusted
Manufacturer	HUAWEI Technologies Co., Ltd.	Arrival Date of sample	April.1 st , 2008
Place of sampling	(Blank)	Carrier of the samples	Ting Zhang
Quantity of the samples	One	Date of product	(Blank)
Base of the samples	(Blank)	Items of test	SAR
Series number	DC2AA10831800117		
Standard(s)	<p>EN 50360–2001: Product standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.</p> <p>EN 50361–2001: Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.</p> <p>ANSI 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>IEEE 1528–2003: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.</p> <p>OET Bulletin 65 supplement C, published June 2001 including DA 02-1438, published June 2002: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits. Transition Period for the Phantom Requirements of Supplement C to OET Bulletin 65.</p> <p>IEC 62209-2 (Draft): Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 2: Procedure to determine the Specific Absorption Rate (SAR)in the head and body for 30MHz to 6GHz Handheld and Body-Mounted Devices used in close proximity to the body.</p> <p>Vodafone SAR_Data_cards_V1.1: Global Test Specification for Terminals for Performance Measurements –Performance TST- Specific Absorption Rate (SAR) for Data Cards and External Antennas.</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 6.2 of this test report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 6.1 of this test report.</p> <p>General Judgment: Pass</p> <p style="text-align: right;">(Stamp)</p> <p style="text-align: right;">Date of issue: June 8th, 2008</p>		
Comment	The test result only responds to the measured sample.		

Approved by



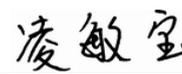
Chengguang zheng

Revised by



Dabao wang

Performed by



Minbao ling

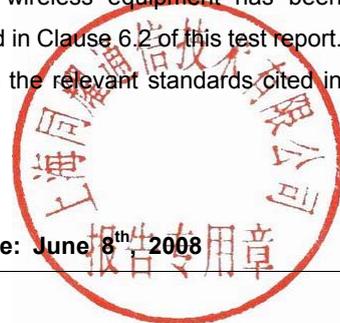


TABLE OF CONTENT

1.	COMPETENCE AND WARRANTIES	6
2.	GENERAL CONDITIONS	6
3.	DESCRIPTION OF EUT	7
3.1.	ADDRESSING INFORMATION RELATED TO EUT	7
3.2.	CONSTITUENTS OF EUT	7
3.3.	OPERATING CONDITIONS	7
3.4.	GENERAL DESCRIPTION	8
4.	OPERATIONAL CONDITIONS DURING TEST	9
4.1.	WCDMA TEST CONFIGURATION	9
4.2.	HSDPA TEST CONFIGURATION	9
4.3.	GSM TEST CONFIGURATION	11
4.4.	POSITION OF MODULE IN PORTABLE DEVICES	12
4.5.	PICTURE OF HOST PRODUCT	13
5.	SAR MEASUREMENTS SYSTEM CONFIGURATION	14
5.1.	SAR MEASUREMENT SET-UP	14
5.2.	DASY4 E-FIELD PROBE SYSTEM	15
5.3.	E-FIELD PROBE CALIBRATION	16
5.4.	OTHER TEST EQUIPMENT	16
5.5.	EQUIVALENT TISSUES	18
5.6.	SYSTEM SPECIFICATIONS	18
5.6.1	Robotic System Specifications	18
6.	CHARACTERISTICS OF THE TEST	19
6.1.	APPLICABLE LIMIT REGULATIONS	19
6.2.	APPLICABLE MEASUREMENT STANDARDS	19
7.	LABORATORY ENVIRONMENT	20
8.	CONDUCTED OUTPUT POWER MEASUREMENT	20
8.1.	SUMMARY	20
8.2.	POWER DRIFT	20
8.3.	CONDUCTED POWER	20
8.3.1	MEASUREMENT METHODS	20
8.3.2	MEASUREMENT RESULT	21
9.	TEST RESULTS	22
9.1.	DIELECTRIC PERFORMANCE	22
9.2.	SYSTEM VALIDATION	22
9.3.	SUMMARY OF MEASUREMENT RESULTS	23
9.3.1.	GPRS/EGPRS/GSM 850	23
9.3.2.	GPRS/EGPRS/GSM1900	25
9.3.3.	HSDPA /WCDMA Band II	27
9.3.4.	HSDPA /WCDMA Band V	29
9.4.	CONCLUSION	30
10.	MEASUREMENT UNCERTAINTY	31

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

No. RZA2008-0449FCC

Page 5 of 128

11.	MAIN TEST INSTRUMENTS.....	32
12.	TEST PERIOD.....	32
13.	TEST LOCATION	32
ANNEX A:	MEASUREMENT PROCESS.....	33
ANNEX B:	TEST LAYOUT	34
ANNEX C:	GRAPH RESULTS.....	36
ANNEX D:	SYSTEM VALIDATION RESULTS	96
ANNEX E:	PROBE CALIBRATION CERTIFICATE.....	98
ANNEX F:	D835V2 DIPOLE CALIBRATION CERTIFICATE.....	107
ANNEX G:	D1900V2 DIPOLE CALIBRATION CERTIFICATE	113
ANNEX H:	DAE3 CALIBRATION CERTIFICATE.....	122
ANNEX I:	THE EUT APPEARANCES AND TEST CONFIGURATION	128

1. COMPETENCE AND WARRANTIES

TA Technology (Shanghai) Co., Ltd. is a test laboratory competent to carry out the tests described in this 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.

2. GENERAL CONDITIONS

This report only refers to the item that has undergone the test.

This report standalone does not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This document is only valid if complete; no partial reproduction can be made without written approval of **TA Technology (Shanghai) Co., Ltd.**

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.

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

No. RZA2008-0449FCC

Page 7 of 128

3. DESCRIPTION OF EUT

3.1. Addressing Information Related to EUT

Table 1: Applicant (The Client)

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

Table 2: Manufacturer

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

3.2. Constituents of EUT

Table 3: Constituents of Samples

Description	Model	Serial Number	Manufacturer
HSDPA USB Stick	E166	DC2AA10831800117	HUAWEI Technologies Co., Ltd.

Note: The EUT appearances see ANNEX I.

3.3. Operating Conditions

	GSM850	GSM1900	WCDMA Band II	WCDMA Band V
TX frequency range	824.2~848.8MHz	1850.2 ~1909.8 MHz	1852.4 ~1907.6 MHz	826.4 ~846.6 MHz
RX frequency range	869.2 ~893.8 MHz	1930.2 ~1989.8 MHz	1932.4 ~1987.6 MHz	871.4 ~891.6 MHz
Standard output power	33dBm (2W)	30dBm (1W)	24dBm (0.25W)	24dBm (0.25W)
Power level	Tested with power level 5	Tested with power level 0	All up bit	All up bit
Modulation	GPRS:GMSK		QPSK	

3.4. General Description

Equipment Under Test (EUT) is a HSDPA USB Stick. SAR is tested for the EUT respectively for WCDMA Band V, WCDMA Band II, GSM 850 and GSM 1900. Also SAR is tested for HSDPA in the worst cases of WCDMA Band V and WCDMA Band II, The EUT has GPRS and EGPRS function of class 12.

Since the EUT only has the data transfer function, but does not have the speech transfer function, the tests in the band of GSM 850 and GSM1900 are performed in the mode of GPRS and EGPRS.

The measurements were performed in combination with two different host products [BenQ Joy book S72 and BenQ Joybook R55V (118)]. BenQ Joy book S72 laptop has horizontal USB slots, BenQ Joybook R55V (118) laptop has vertical USB slot.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

4. OPERATIONAL CONDITIONS DURING TEST

4.1. WCDMA Test Configuration

As the SAR body tests for WCDMA Band V and WCDMA Band II, we established the radio link through call processing. The maximum output power were verified on high, middle and low channels for each test band according to 3GPP TS 34.121 with the following configuration:

- 1) 12.2kbps RMC, 64,144,384 kbps RMC with TPC set to all "all '1's"
- 2) Test loop Mode 1

For the output power, the configurations for the DPCCH and DPDCH₁ are as followed (EUT do not support the DPDCH_{2-n})

	Channel Bit Rate(kbps)	Channel Symbol Rate(kcps)	Spreading Factor	Spreading Code Number	Bits/Slot
DPCCH	15	15	256	0	10
DPDCH ₁	15	15	256	64	10
	30	30	128	32	20
	60	60	64	16	40
	120	120	32	8	80
	240	240	16	4	160
	480	480	8	2	320
	960	960	4	1	640

SAR is tested with 12.2kps RMC and not required for other spreading codes (64,144, and 384 kbps RMC) and multiple DPDCH_n, because the maximum output power for each of these other configurations < 0.25dB higher than 12.2kbps RMC and the multiple DPDCH_n is not applicable for the EUT.

4.2. HSDPA Test Configuration

As stated by the manufacture, the UE is full compliant with 3GPP standards defining required UMTS spreading factors.

- 1) The DPCCH spreading factors is 256 per 3GPP TS 25.213 section 4.3.1.2.1
- 2) The DPDCH spreading factors is dependent on number of DPDCH channels and data rage. For a single channel the spreading factors can range from 4 to 256. For more than one DPDCH channel the spreading factors is 4. Further details are defined by 3GPP in TS 25.213 section 4.3.1.2.1.
- 3) HS-DPCCH spreading factors is 256. Further details can be found in 3GPP TS 25.213 section 4.3.1.2.1.

TA Technology (Shanghai) Co., Ltd.

Test Report

When voice transmission and head exposure conditions are applicable to a WCDMA/HSDPA data device, head exposure is measured according to the “ Head SAR Measurements” procedures in the ‘ WCDMA handsets” section of the 3 GPP Release 6 and –on Release 5. SAR for body exposure configurations is measured according to the” Body SAR Measurements” procedures of that section. In addition, body SAR is also measured for HSDPA when the maximum average output of each RF channel with HSDPA active is at least 1/4 dB higher than that measured without HSDPA using 12.2kbps RMC or the maximum SAR 12.2kbps RMC is above 75% of the SAR limit. Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2kbps RMC configured in Test Loop Mode 1.

HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set f. To maintain a consistent test configuration and stable transmission condition, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(β_c, β_d), and HS-DPCCH power offset parameters ($\Delta_{ACK}, \Delta_{NACK}, \Delta_{CQI}$) should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Sub-Test 1 Setup for Release 5 HSDPA

Sub-set	β_c	β_d	β_d (SF)	β_c / β_d	$\beta_{hs}^{(1)}$	CM (dB) ⁽²⁾
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 ⁽³⁾	15/15 ⁽³⁾	64	12/15 ⁽³⁾	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note1: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
 Note2: CM=1 for $\beta_c/\beta_d = 12/15, \beta_{hs}/\beta_c = 24/15$
 Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factor for the reference TFC (TFC1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

4.3. GSM Test Configuration

For the SAR body tests for GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. The EUT is commanded to operate at maximum transmitting power.

Since the EUT only has the data transfer function, but does not have the speech transfer function.

The tests in the band of GSM 850 and GSM 1900 are only performed in the mode of GPRS. And since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink. According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot. The allowed power reduction in the multi-slot configuration is as following:

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power,(dB)
1	0
2	0 to 3,0
3	1,8 to 4,8
4	3,0 to 6,0

For this EUT, the tests for GSM 850 GPRS and GSM 1900 GPRS band will be performed under the following 4 setups at one same test position:

- 1) Using 1 timeslot in uplink with the power of 33 dBm for GSM 850 and 30 dBm for GSM1900
- 2) Using 2 timeslots in uplink with the power reduced 2dB
- 3) Using 3 timeslots in uplink with the power reduced 4dB
- 4) Using 4 timeslots in uplink with the power reduced 6dB

After drawn the worst case, the tests will be continued to perform with the same EUT setup for the whole tests for GSM 850 GPRS and GSM 1900 GPRS.

And according to the "3 dB rule" OET Bulletin 65 supplement C, published June 2001 including DA 02-1438, published June 2002: "**If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tile/Ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s)**".

Then The Absolute Radio Frequency Channel Number (ARFCN) is firstly allocated to 4182, 9400, 190 and 661 respectively in the case of WCDMA Band V (HSDPA), WCDMA Band II (HSDPA), GSM 850 and GSM 1900.

4.4. Position of module in Portable devices

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 is towards the bottom of the flat phantom. (ANNEX I Picture 6-a)
- Test Position 2: The EUT is connected to the portable computer with horizontal USB slot. The top side of the EUT is towards the bottom of the flat phantom. (ANNEX I Picture 6-b)
- Test Position 3: The EUT is connected to the portable computer with vertical USB slot. The right side of the EUT is towards the bottom of the flat phantom. (ANNEX I Picture 6-c)
- Test Position 4: The EUT is connected to the portable computer with vertical USB slot. The top side of the EUT is towards the bottom of the flat phantom. (ANNEX I Picture 6-d)

4.5. Picture of host product

During the test, The BENQ laptop and Acer laptop are used as an assistant to help to setup communication. (See Picture 1)



Picture 1-a: BenQ Joy book S72 Close



Picture 1-b: BenQ Joy book S72 Open



Picture 1-c: BenQ R55V Close



Picture 1-d: BenQ R55V Open



Picture 1-e: BenQ Joy book S72 with horizontal USB slot



Picture 1-f: BenQ Joybook R55V(118) with Vertical USB slot

Picture 1: Computer as a test assistant

5. SAR MEASUREMENTS SYSTEM CONFIGURATION

5.1. SAR Measurement Set-up

These measurements were performed with the automated near-field scanning system DASY4 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m) which positions the probes with a positional repeatability of better than $\pm 0.02\text{mm}$. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit.

A cell controller system contains the power supply, robot controller, teaches pendant (Joystick) and remote control, is used to drive the robot motors. The PC consists of the Micron Pentium III 800 MHz computer with Windows 2000 system and SAR Measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

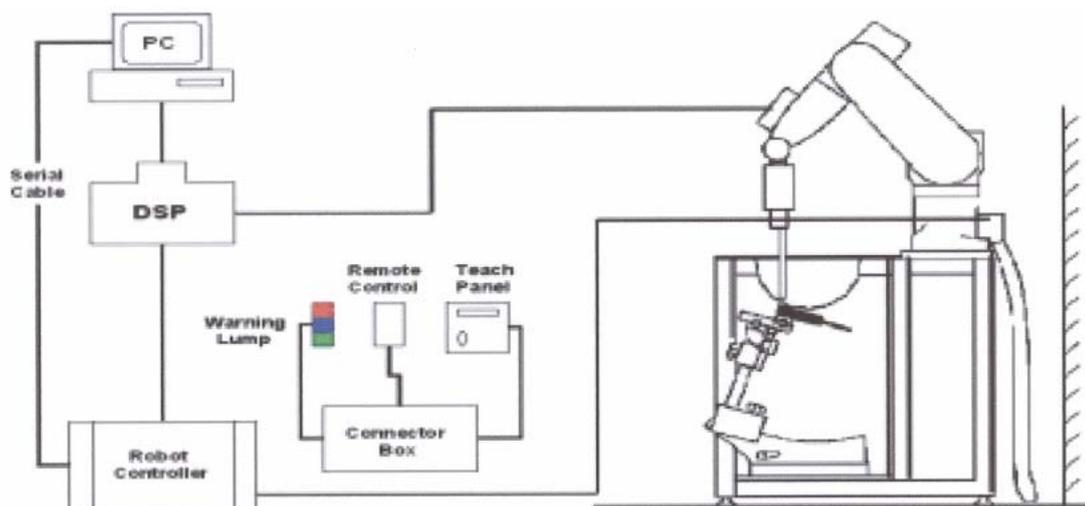


Figure1. SAR Lab Test Measurement Set-up

The DAE3 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

5.2. Dasy4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe ET3DV6 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the standard procedure with an accuracy of better than $\pm 10\%$. The spherical isotropy was evaluated and found to be better than $\pm 0.25\text{dB}$.

ET3DV6 Probe Specification

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection System (ET3DV6 only) Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.q., glycol)
Calibration	In air from 10 MHz to 2.5 GHz In brain and muscle simulating tissue at frequencies of 900MHz, 1750 MHz, 1950MHz and 2450 MHz. (accuracy $\pm 8\%$) Calibration for other liquids and frequencies upon request
Frequency	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity	± 0.2 dB in brain tissue (rotation around probe axis) ± 0.4 dB in brain tissue (rotation around probe axis)
Dynamic Range	5 μ W/g to > 100mW/g; Linearity: $\pm 0.2\text{dB}$
Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surface (ET3DV6 only)
Dimensions	Overall length: 330mm Tip length: 16mm Body diameter: 12mm Tip diameter: 6.8mm Distance from probe tip to dipole centers: 2.7mm
Application	General dosimetry up to 3GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

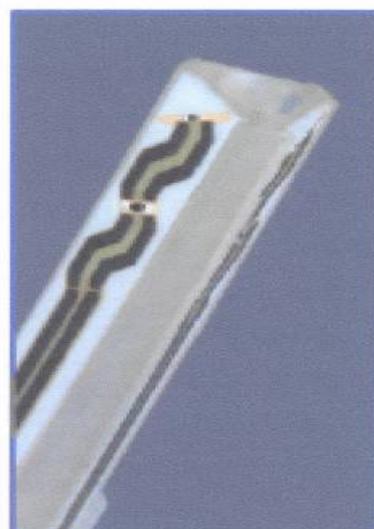


Figure 2.ET3DV6 E-field Probe



Figure3. ET3DV6 E-field probe

5.3. 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/m³).

5.4. Other Test Equipment

5.4.1 Device Holder for Transmitters

In combination with the Generic Twin Phantom V3.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeat ably positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).



Figure 4. Device Holder

5.4.2 Phantom

The Generic Twin Phantom is constructed of a fiberglass shell integrated in a wooden table. 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



Figure5.Generic Twin Phantom

5.5. Equivalent Tissues

The liquid used for the frequency range of 800-2000 MHz consisted of water, sugar, salt, Glycol and Cellulose. The liquid has previously been proven to be suited for worst-case. The Table 4 and Table 5 show the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528.

Table 4: Composition of the Body Tissue Equivalent Matter

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

Table 5: Composition of the Body Tissue Equivalent Matter

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

5.6. System Specifications

5.6.1 Robotic System Specifications

Specifications

Positioner: Stäubli Unimation Corp. Robot Model: RX90L

Repeatability: ± 0.02 mm

No. of Axis: 6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor: Pentium III

Clock Speed: 800 MHz

Operating System: Windows 2000

Data Converter

Features: Signal Amplifier, multiplexer, A/D converter, and control logic

Software: DASY4 software

Connecting Lines: Optical downlink for data and status info. Optical uplink for commands and clock.

6. CHARACTERISTICS OF THE TEST

6.1. Applicable Limit Regulations

EN 50360–2001: Product standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.

It specifies the maximum exposure limit of **2.0 W/kg** as averaged over any 10 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

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

It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

6.2. Applicable Measurement Standards

EN 50361–2001: Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.

It specifies the measurement method for demonstration of compliance with the SAR limits for such equipments.

IEEE 1528–2003: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.

OET Bulletin 65 supplement C, published June 2001 including DA 02-1438, published June 2002: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits. Transition Period for the Phantom Requirements of Supplement C to OET Bulletin 65.

IEC 62209-1: Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 1: Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)

Vodafone SAR_Data_cards_V1.1: Global Test Specification for Terminals for Performance Measurements –Performance TST- Specific Absorption Rate (SAR) for Data Cards and External Antennas.

7. LABORATORY ENVIRONMENT

Table 6: The Ambient Conditions during Test

Temperature	Min. = 20C, 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.	

8. CONDUCTED OUTPUT POWER MEASUREMENT

8.1. Summary

During the process of testing, the EUT was controlled via Digital Radio Communication tester to ensure the maximum power transmission and proper modulation. This result contains conducted output power and ERP for the EUT. In all cases, the measured peak output power should be greater and within 5% than EMI measurement.

8.2. Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 10 to Table 17 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 0.21dB.

8.3. Conducted Power

8.3.1 Measurement Methods

The EUT was set up for the maximum output power. The channel power was measured. The measurements were done at 3 channels both before and after SAR tests for each test band.

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

No. RZA2008-0449FCC

Page 21of 128

8.3.2 Measurement result

Table 7: Conducted Power Measurement Results

		Conducted Power		
		Channel Low	Channel Middle	Channel High
WCDMA Band V (12.2kbps RMC)	Before Test (dBm)	21.56	21.66	21.48
	After Test (dBm)	21.41	21.59	21.42
WCDMA Band II (12.2kbps RMC)	Before Test (dBm)	21.76	21.91	21.61
	After Test (dBm)	21.78	21.95	21.64
WCDMA Band V (64kbps RMC)	Before Test (dBm)	21.52	21.64	21.42
	After Test (dBm)	21.54	21.62	21.47
WCDMA Band II (64kbps RMC)	Before Test (dBm)	21.79	21.93	21.63
	After Test (dBm)	21.75	21.97	21.67
WCDMA Band V (144kbps RMC)	Before Test (dBm)	21.53	21.66	21.48
	After Test (dBm)	21.53	21.55	21.49
WCDMA Band II (144kbps RMC)	Before Test (dBm)	21.62	21.94	21.64
	After Test (dBm)	21.79	21.93	21.69
WCDMA Band V (384kbps RMC)	Before Test (dBm)	21.51	21.54	21.48
	After Test (dBm)	21.48	21.54	21.49
WCDMA Band II (384kbps RMC)	Before Test (dBm)	21.73	21.96	21.57
	After Test (dBm)	21.77	21.93	21.66
WCDMA Band V + HSDPA	Before Test (dBm)	21.45	21.57	21.42
	After Test (dBm)	21.42	21.55	21.47
WCDMA Band II + HSDPA	Before Test (dBm)	21.75	21.92	21.57
	After Test (dBm)	21.73	21.94	21.65
GSM 850+GPRS	Before Test (dBm)	32.42	32.43	32.37
	After Test (dBm)	32.39	32.41	32.32
GSM 1900+GPRS	Before Test (dBm)	29.63	29.34	29.71
	After Test (dBm)	29.59	29.25	29.72

9. TEST RESULTS

9.1. Dielectric Performance

Table 8: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 22.5 °C and relative humidity 51%.					
Frequency		Target value	Measurement	Difference	
835 (Body)	Permittivity ϵ_r	55.20	54.68	-0.94	%
	Conductivity σ	0.97	0.99	2.06	%
1900 (Body)	Permittivity ϵ_r	53.30	52.06	-2.32	%
	Conductivity σ	1.52	1.52	0.00	%

9.2. System Validation

Table 9: System Validation

Measurement is made at temperature 23.2 °C, relative humidity 50%, and input power 250 mW. Liquid temperature during the test: 22.3°C							
Liquid parameters	Frequency	Permittivity ϵ		Conductivity σ (S/m)			
	835MHz	42.36		0.92			
	1900MHz	39.68		1.43			
Verification results	Frequency	Target value (W/kg)		Measurement value (W/kg)		Difference percentage	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
	835MHz	1.56	2.43	1.53	2.34	-1.92%	-3.70%
	1900MHz	4.94	9.35	4.93	9.36	-0.20%	-0.11%

Note:

- a. Target Values used derive from the SPEAG calibration certificate and 250 mW is used as feeding power to the validation dipole (SPEAG using).
- b. The graph results see ANNEX D.

TA Technology (Shanghai) Co., Ltd.

Test Report

9.3. Summary of Measurement Results

9.3.1. GPRS/EGPRS/GSM 850

Table 10: SAR Values (GPRS/EGPRS/GSM 850)

Liquid Temperature: 22.4℃						
Limit of SAR (W/kg)			10g Average	1g Average	Power Drift (dB)	Graph Results
			2.0	1.6	± 0.2	
Test Case Of Body			Measurement Result (W/kg)		Power Drift(dB)	
Different Test Position	Different Timeslots	Channel	10g Average	1g Average		
BenQ Joy book S72						
Test Position 1	4 timeslots	Middle	0.238	0.368	-0.016	Figure 7
	3 timeslots	Middle	0.308	0.484	-0.192	Figure 9
	2 timeslots	Middle	0.369	0.582	0.109	Figure 11
	1 timeslot	Middle	0.283	0.448	-0.024	Figure 13
Test Position 2	2 timeslots	Middle	0.043	0.120	0.092	Figure 15
BenQ Joy book R55V						
Test Position 3	2 timeslots	Middle	0.253	0.354	-0.064	Figure 17
Test Position 4	2 timeslots	Middle	0.067	0.206	-0.083	Figure 19
Worst case position of Test Position with EGPRS						
Test Position 1	2 timeslots	Middle	0.079	0.125	0.060	Figure 21

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

Note: 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.

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

No. RZA2008-0449FCC

Page 24of 128

Table 11: SAR Values (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)
BenQ Joy book S72					
Test Position 1	initial position	Middle	0.643	0.321	0.803
	5mm	Middle	0.557		
	10mm	Middle	0.330		
	15mm	Middle	0.216		
BenQ Joy book R55V					
Test Position 3	initial position	Middle	0.378	0.189	0.473
	5mm	Middle	0.331		
	10mm	Middle	0.225		
	15mm	Middle	0.146		

- Note: 1. 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.
2. 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

No. RZA2008-0449FCC

Page 25of 128

9.3.2. GPRS/EGPRS/GSM1900

Table 12: SAR Values (GPRS/EGPRS/GSM 1900)

Liquid Temperature: 22.4°C						
Limit of SAR (W/kg)			10g Average	1g Average	Power Drift (dB)	Graph Results
			2.0	1.6	± 0.2	
Test Case Of Body			Measurement Result (W/kg)		Power Drift(dB)	
Different Test Position	Different Timeslots	Channel	10g Average	1g Average		
BenQ Joy book S72						
Test Position 1	4 timeslots	Middle	0.320	0.661	0.038	Figure 23
	3 timeslots	Middle	0.383	0.768	-0.096	Figure 25
	2 timeslots	Middle	0.413	0.770	-0.083	Figure 27
	1 timeslot	Middle	0.270	0.488	0.050	Figure 29
Test Position 2	2 timeslots	Middle	0.118	0.295	-0.195	Figure 31
BenQ Joy book R55V						
Test Position 3	2 timeslots	Middle	0.198	0.354	-0.067	Figure 33
Test Position 4	2 timeslots	Middle	0.108	0.257	-0.163	Figure 35
worst case position of Test Position with EGPRS						
Test Position 1	2 timeslots	Middle	0.252	0.455	-0.102	Figure 37

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

Note: 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.

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

No. RZA2008-0449FCC

Page 26of 128

Table 13: SAR Values (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)
BenQ Joy book S72					
Test Position 1	initial position	Middle	0.862	0.431	1.078
	5mm	Middle	0.428		
BenQ Joy book R55V					
Test Position 3	initial position	Middle	0.387	0.194	0.484
	5mm	Middle	0.334		
	10mm	Middle	0.210		
	15mm	Middle	0.108		

- Note: 1. 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.
2. 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

No. RZA2008-0449FCC

Page 27 of 128

9.3.3. HSDPA /WCDMA Band II

Table 14: SAR Values (HSDPA /WCDMA Band II)

Liquid Temperature: 22.4°C					
Limit of SAR (W/kg)		10g Average	1g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.2	
Test Case Of Body		Measurement Result (W/kg)		Power Drift(dB)	
Different Test Position	Channel	10g Average	1g Average		
BenQ Joy book S72					
Test Position 1	High	0.574	1.050	0.112	Figure 39
	Middle	0.637	1.140	-0.097	Figure 41
	Low	0.533	0.960	-0.022	Figure 43
Test Position 2	Middle	0.215	0.519	-0.192	Figure 45
BenQ Joy book R55V					
Test Position 3	Middle	0.403	0.731	-0.129	Figure 47
Test Position 4	Middle	0.213	0.523	-0.089	Figure 49
worst case position of Test Position with HSDPA					
Test Position 1	High	0.513	0.943	-0.192	Figure 51
	Middle	0.617	1.100	-0.027	Figure 53
	Low	0.487	0.874	-0.034	Figure 55

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

Note: 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.

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

Table 15: SAR Values (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)
BenQ Joy book S72					
Test Position 1	initial position	Middle	1.250	0.625	1.563
	5mm	Middle	0.435		
BenQ Joy book R55V					
Test Position 3	initial position	0.821	0.821	0.411	1.026
	5mm	0.703	0.703		
	10mm	0.409	0.409		

- Note: 1. 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.
2. 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

9.3.4. HSDPA /WCDMA Band V

Table 16: SAR Values (HSDPA /WCDMA Band V)

Liquid Temperature: 22.4°C					
Limit of SAR (W/kg)		10g Average	1g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.2	
Test Case Of Body		Measurement Result (W/kg)		Power Drift(dB)	
Different Test Position	Channel	10g Average	1g Average		
BenQ Joy book S72					
Test Position 1	Middle	0.292	0.461	0.122	Figure 57
Test Position 2	Middle	0.044	0.135	-0.189	Figure 59
BenQ Joy book R55V					
Test Position 3	Middle	0.174	0.245	-0.053	Figure 61
Test Position 4	Middle	0.047	0.146	0.032	Figure 63
worst case position of Test Position with HSDPA					
Test Position 1	Middle	0.214	0.346	-0.069	Figure 65

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

Note: 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.

Table 17: SAR Values (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)
BenQ Joy book S72					
Test Position 1	initial position	Middle	0.500	0.250	0.625
	5mm	Middle	0.411		
	10mm	Middle	0.279		
	15mm	Middle	0.157		
BenQ Joy book R55V					
Test Position 3	initial position	Middle	0.264	0.132	0.330
	5mm	Middle	0.231		
	10mm	Middle	0.158		
	15mm	Middle	0.112		

- Note: 1. 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.
2. 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.

9.4. 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 6.2 of this report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 6.1 of this test report.

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

No. RZA2008-0449FCC

Page 31 of 128

10. MEASUREMENT UNCERTAINTY

No.	a	Type	c	d	e=f(d, k)	f	h=cxf / e	k
	Uncertainty Component		Tol. (±%)	Prob. Dist	Div.	c ₁ (1g)	1g u (± %)	v ₁
1	System repetivity	A	0.5	N	1	1	0.5	9
Measurement system								
2	Probe Calibration	B	5	N	2	1	2.5	∞
3	Axial isotropy	B	4.7	R	$\sqrt{3}$	(1-cp) ^{1/2}	4.3	∞
4	Hemisphere Isotropy	B	9.4	R	$\sqrt{3}$	$\sqrt{C_P}$		∞
5	Boundary Effect	B	0.4	R	$\sqrt{3}$	1	0.23	∞
6	Linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
7	System Detection Limits	B	1.0	R	$\sqrt{3}$	1	0.6	∞
8	Readout Electronics	B	1.0	N	1	1	1.0	∞
9	RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
10	Probe Positioner Mechanical Tolerance	B	0.4	R	$\sqrt{3}$	1	0.2	∞
11	Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞
12	Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞
Test Sample Related								
13	Test Sample Positioning	A	4.9	N	1	1	4.9	N-1
14	Device Holder Uncertainty	A	6.1	N	1	1	6.1	N-1
15	Output Power Variation-SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.9	∞
Phantom and Tissue Parameters								
16	Phantom Uncertainty(shape and thickness tolerances)	B	1.0	R	$\sqrt{3}$	1	0.6	∞
17	Liquid Conductivity-deviation from target values	B	5.0	R	$\sqrt{3}$	0.64	1.7	∞
18	Liquid Conductivity-measurement uncertainty	B	5.0	N	1	0.64	1.7	M
19	Liquid Permittivity-deviation from target values	B	5.0	R	$\sqrt{3}$	0.6	1.7	∞
20	Liquid Permittivity- measurement uncertainty	B	5.0	N	1	0.6	1.7	M
Combined Standard Uncertainty				RSS			11.25	
Expanded Uncertainty (95 % CONFIDENCE INTERVAL)				K=2			22.5	

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

No. RZA2008-0449FCC

Page 32 of 128

11. MAIN TEST INSTRUMENTS

Table 18: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent 8753E	US37390326	September 15, 2007	One year
02	Dielectric Probe Kit	Agilent 85070E	US44020115	No Calibration Requested	
03	Power meter	Agilent E4417A	GB41291714	March 14, 2008	One year
04	Power sensor	Agilent 8481H	MY41091316	March 14, 2008	One year
05	Signal Generator	HP 8341B	2730A00804	September 15, 2007	One year
06	Amplifier	IXA-020	0401	No Calibration Requested	
07	Validation Kit 835MHz	SPEAG D835V2	443	December 9, 2007	One year
08	Validation Kit 1900MHz	SPEAG D1900V2	5d018	April 23, 2007	One year
09	BTS	E5515C	GB46490218	September 15, 2007	One year
10	E-field Probe	ET3DV6	1531	January 29, 2008	One year
11	DAE	DAE3	452	September 6, 2007	One year

12. TEST PERIOD

The test is performed from June 6th, 2008 to June 8th, 2008.

13. TEST LOCATION

The test is performed at TA Technology (Shanghai) Co., Ltd.

END OF REPORT BODY

ANNEX A: MEASUREMENT PROCESS

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the ear point was measured and was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of the head was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 20 mm x 20 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Around this point, a volume of 32 mm x 32 mm x 34 mm was assessed by measuring 7 x 7 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

- a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
- b. The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot"-condition (in x ~ y and z-directions). The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
- c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation is repeated.

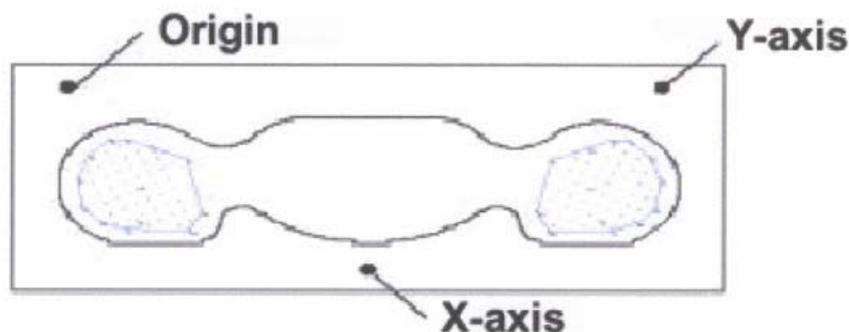
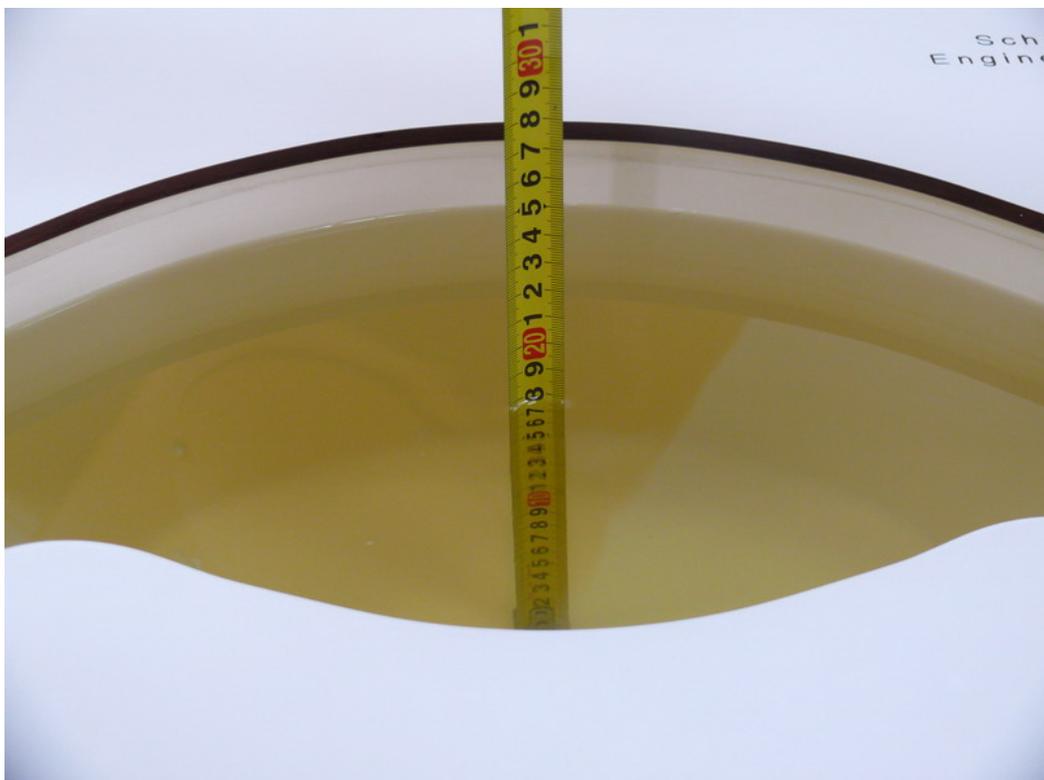


Figure 6 SAR Measurement Points in Area Scan

ANNEX B: 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 (1900 MHz)

ANNEX C: GRAPH RESULTS

GSM 850 GPRS (4 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Middle

Communication System: GSM 850+GPRS(4Up); Frequency: 836.6 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.401 mW/g

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

Reference Value = 15.5 V/m; Power Drift = -0.016 dB

Peak SAR (extrapolated) = 0.531 W/kg

SAR(1 g) = 0.368 mW/g; SAR(10 g) = 0.238 mW/g

Maximum value of SAR (measured) = 0.406 mW/g

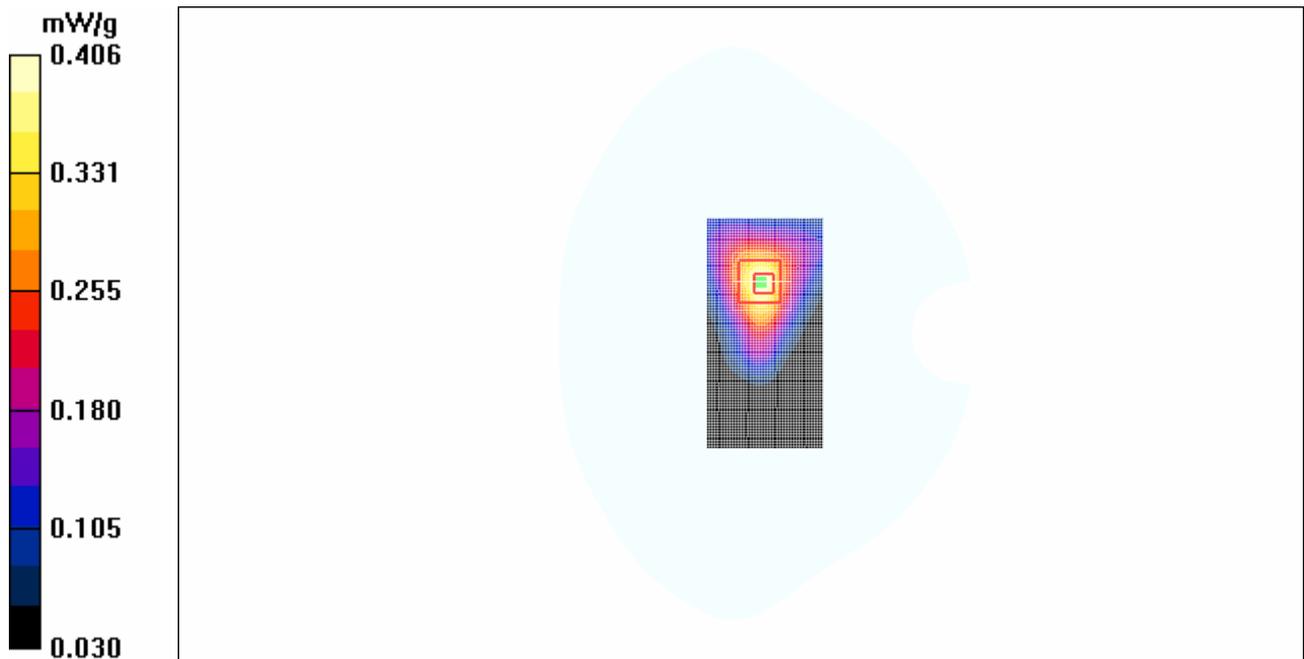


Figure 7 GSM 850 GPRS (4 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 190

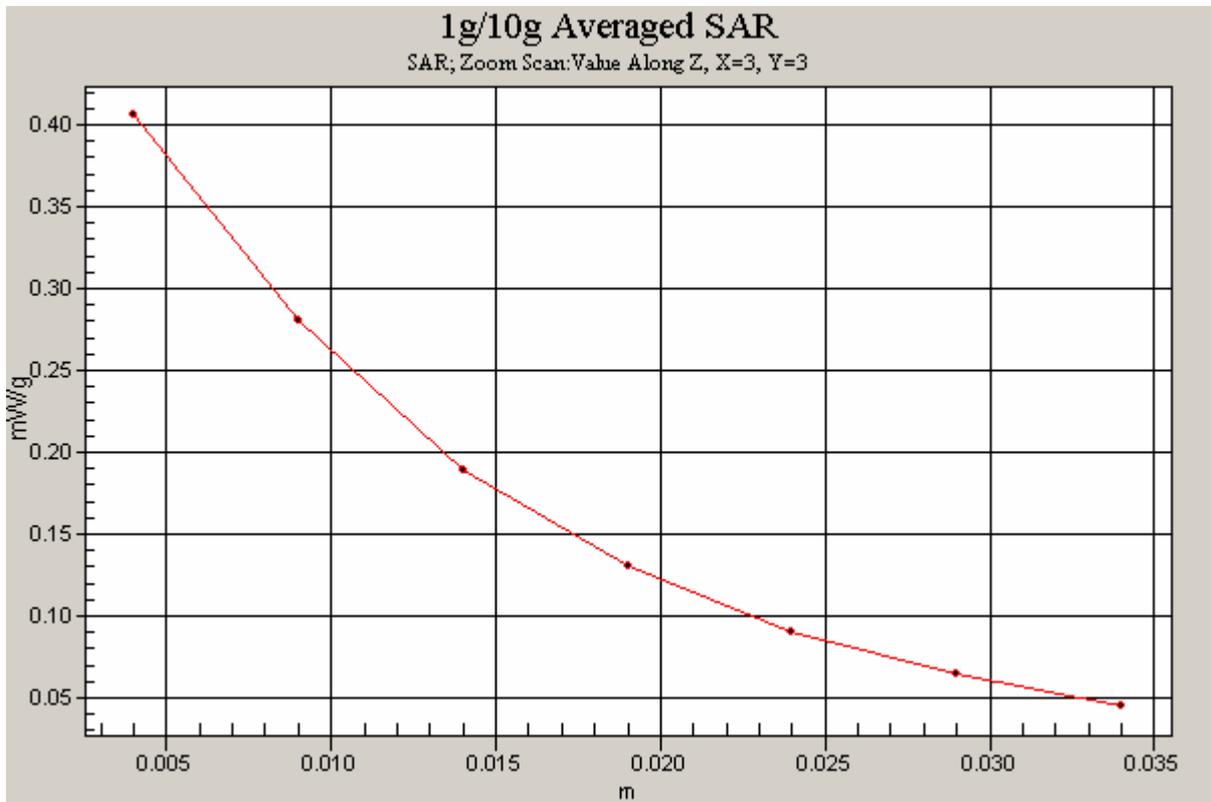


Figure 8 Z-Scan at power reference point [GSM 850 GPRS (4 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 190]

GSM 850 GPRS (3 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Middle

Communication System: GSM850 + GPRS(3Up); Frequency: 836.6 MHz; Duty Cycle: 1:2.67

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.539 mW/g

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

Reference Value = 17.9 V/m; Power Drift = -0.192 dB

Peak SAR (extrapolated) = 0.717 W/kg

SAR(1 g) = 0.484 mW/g; SAR(10 g) = 0.308 mW/g

Maximum value of SAR (measured) = 0.527 mW/g

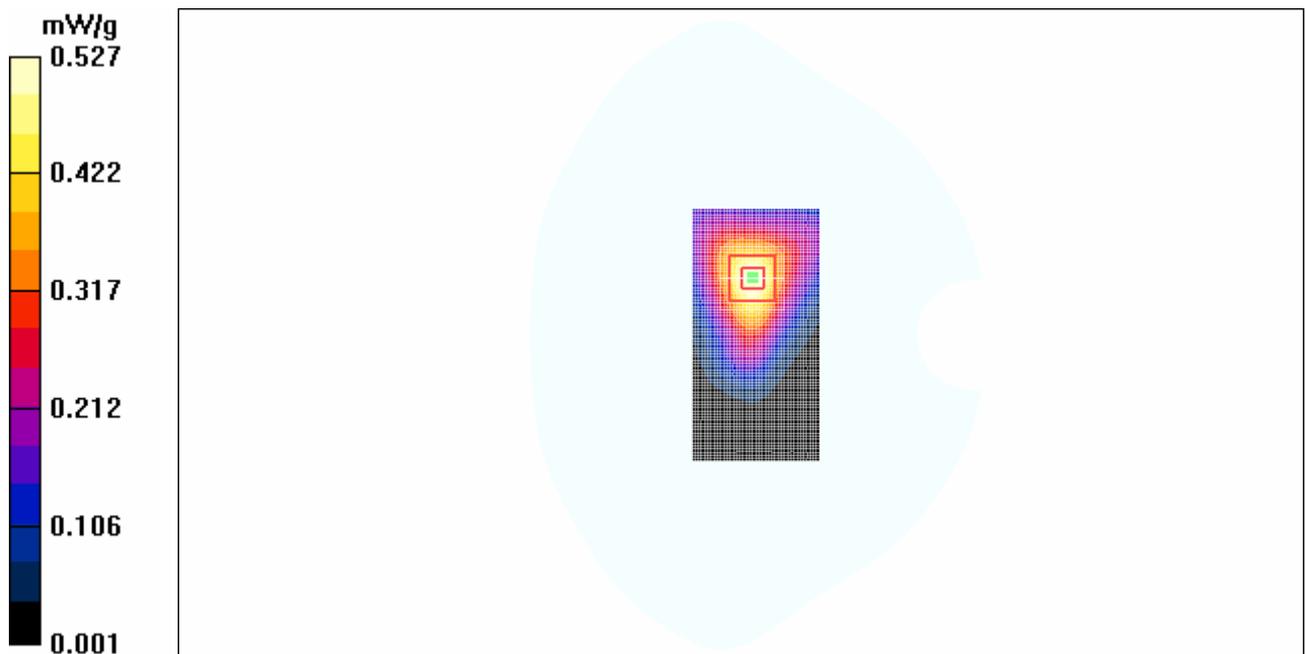


Figure 9 GSM 850 GPRS (3 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 190

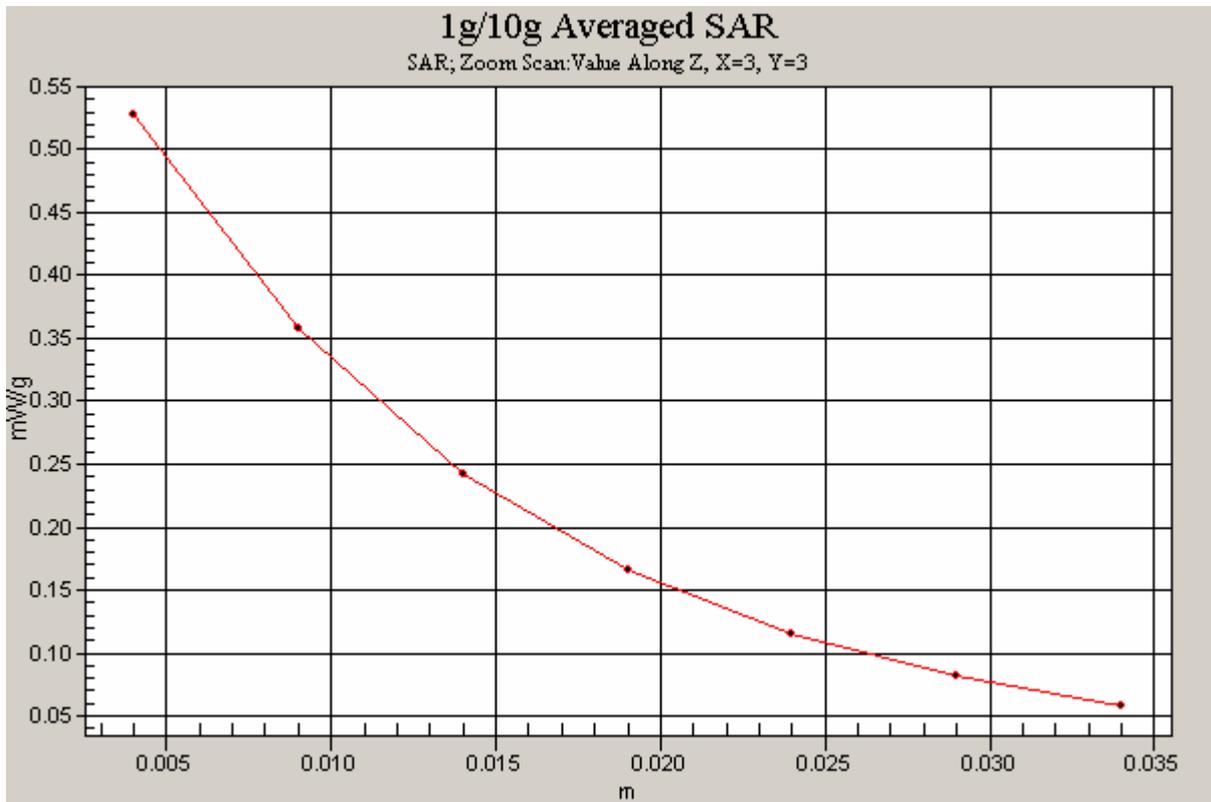


Figure 10 Z-Scan at power reference point [GSM 850 GPRS (3 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 190]

GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Middle

Communication System: GSM850 + GPRS(2Up); Frequency: 836.6 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.636 mW/g

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

Reference Value = 19.9 V/m; Power Drift = 0.109 dB

Peak SAR (extrapolated) = 1.83 W/kg

SAR(1 g) = 0.582 mW/g; SAR(10 g) = 0.369 mW/g

Maximum value of SAR (measured) = 0.643 mW/g

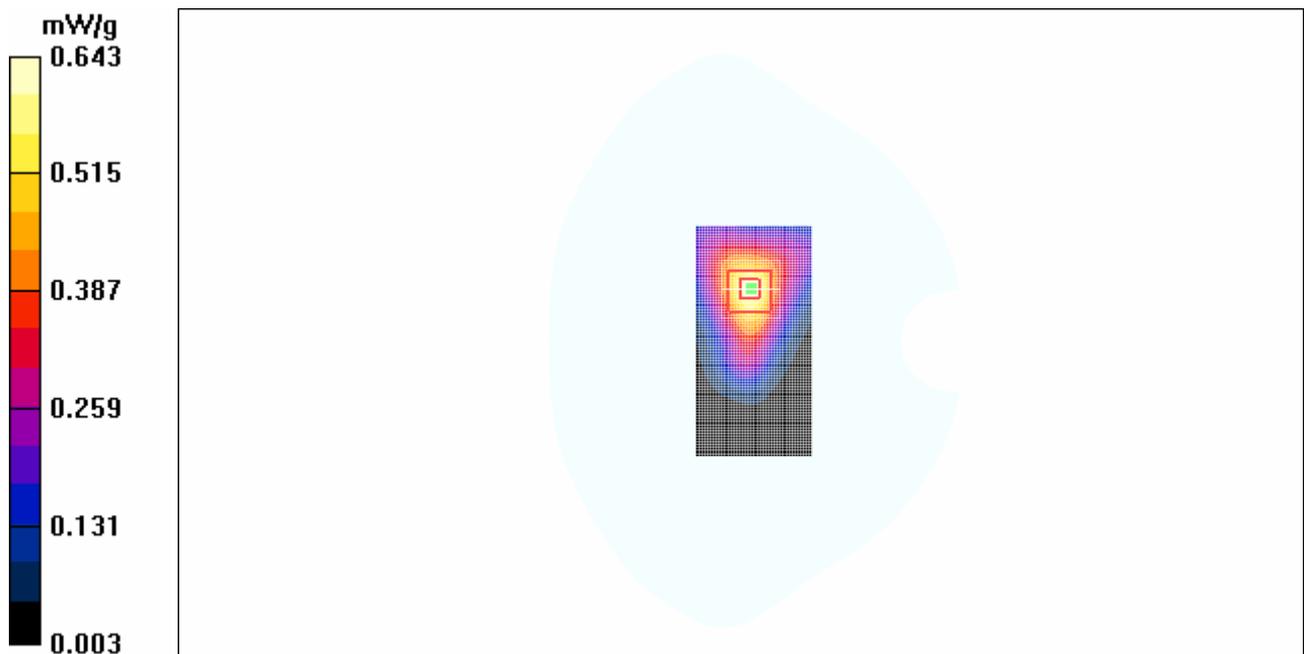


Figure 11 GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 190

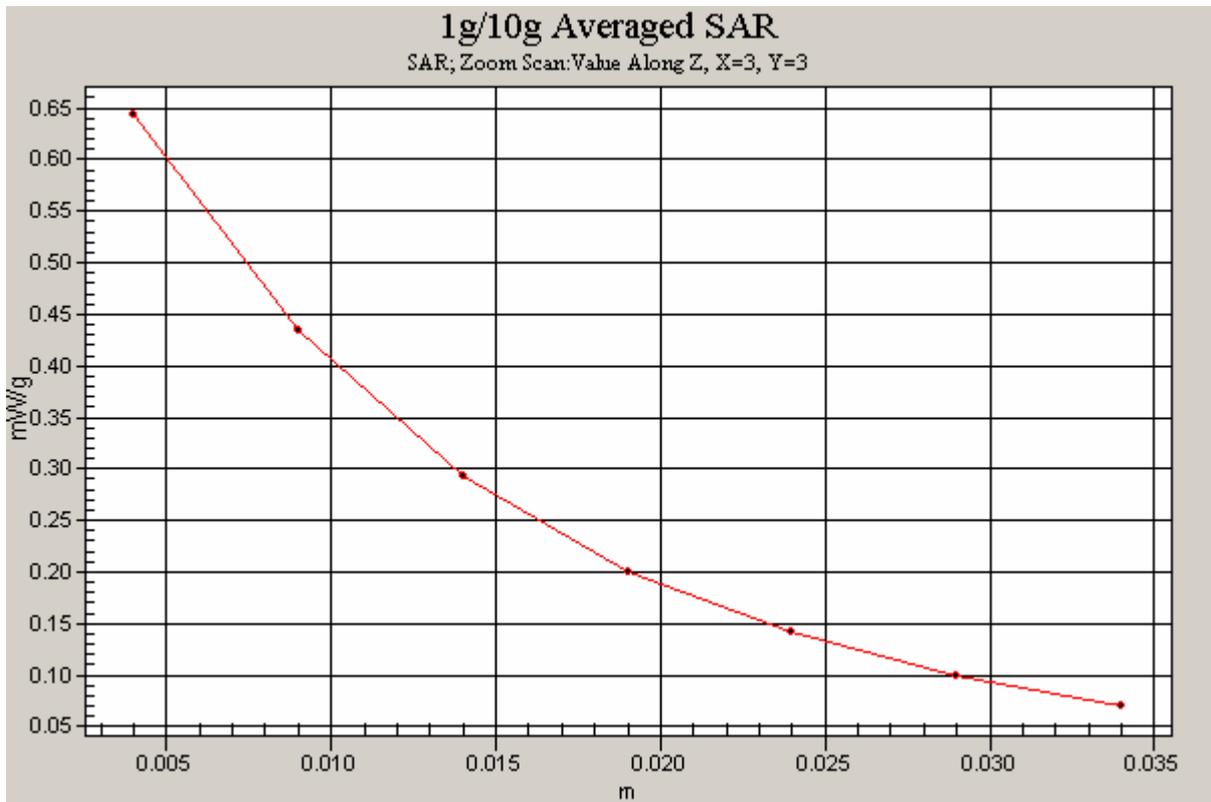


Figure 12 Z-Scan at power reference point [GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 190]

GSM 850 GPRS (1 timeslot in uplink) with BenQ Joy book S72 Test Position 1 Middle

Communication System: GSM850 + GPRS(1Up); Frequency: 836.6 MHz;Duty Cycle: 1:8

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.469 mW/g

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

Reference Value = 17.3 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 0.666 W/kg

SAR(1 g) = 0.448 mW/g; SAR(10 g) = 0.283 mW/g

Maximum value of SAR (measured) = 0.491 mW/g

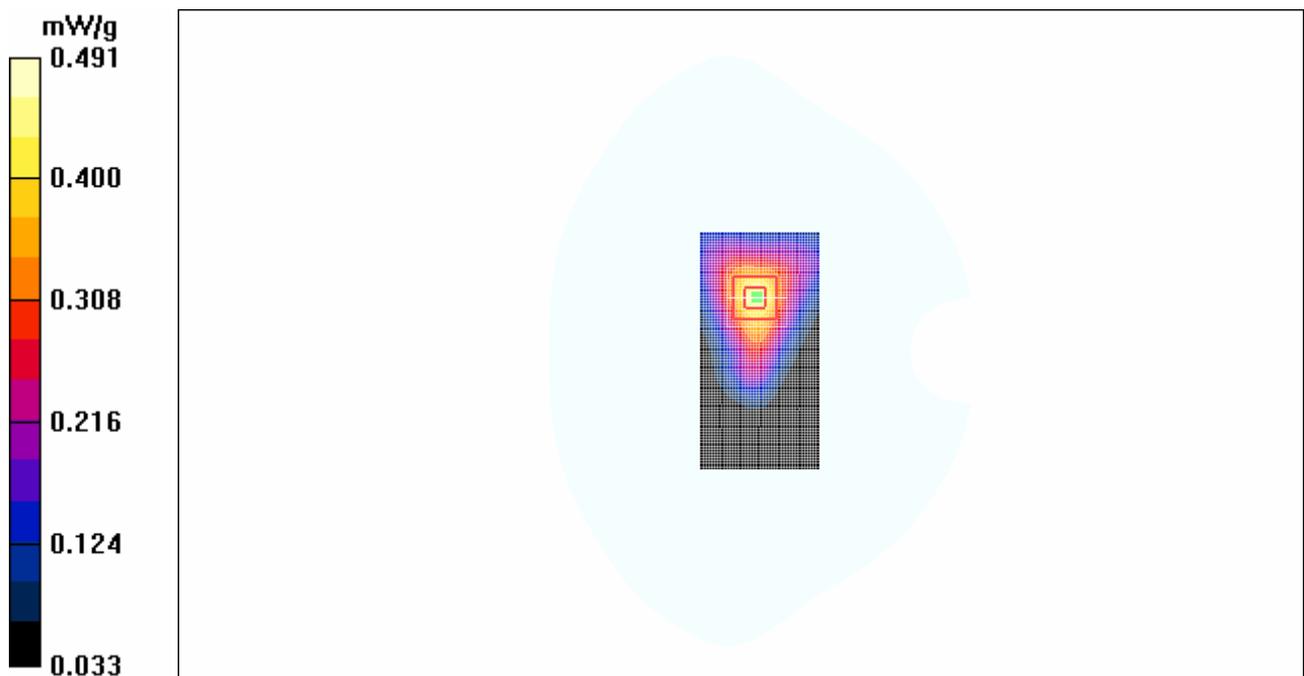


Figure 13 GSM 850 GPRS (1 timeslot in uplink) with BenQ Joy book S72 Test Position 1 Channel 190

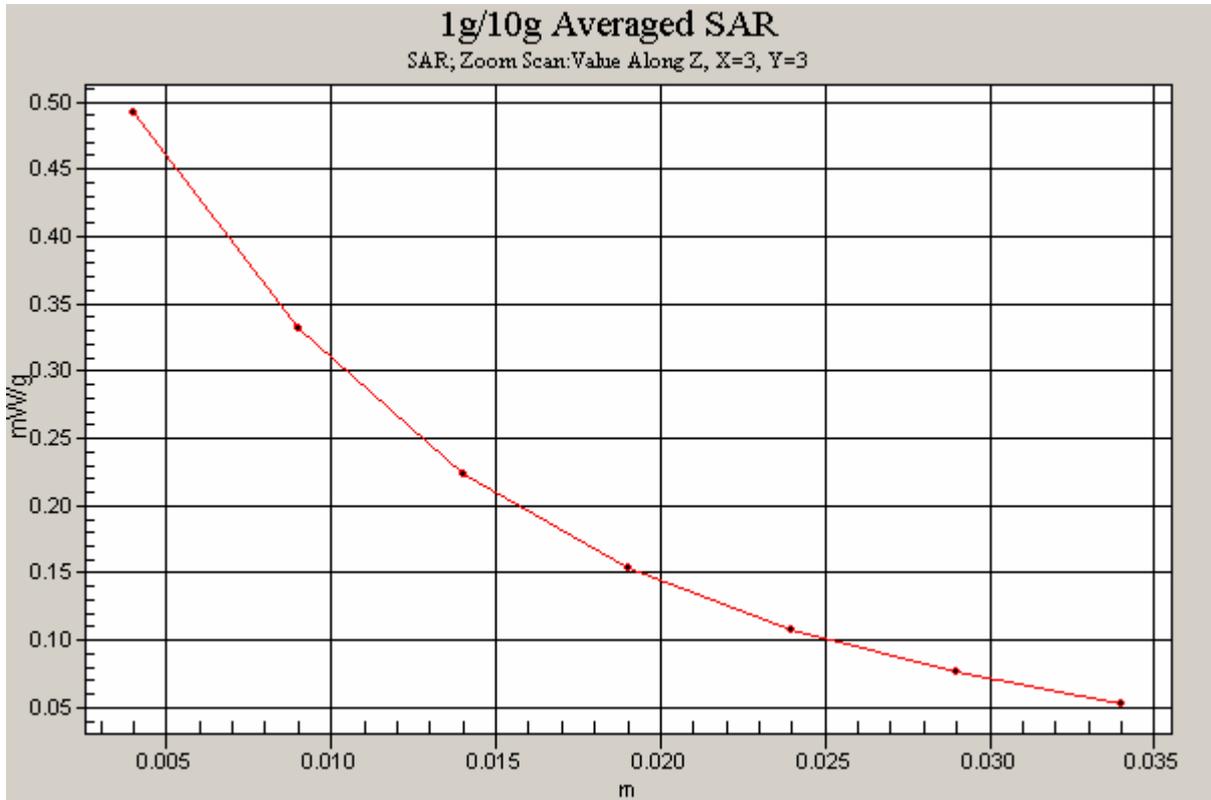


Figure 14 Z-Scan at power reference point [GSM 850 GPRS (1 timeslot in uplink) with BenQ Joy book S72 Test Position 1 Channel 190]

GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 2 Middle

Communication System: GSM850 + GPRS(2Up); Frequency: 836.6 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 2 Middle/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.086 mW/g

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

Reference Value = 12.6 V/m; Power Drift = 0.092 dB

Peak SAR (extrapolated) = 0.351 W/kg

SAR(1 g) = 0.120 mW/g; SAR(10 g) = 0.043 mW/g

Maximum value of SAR (measured) = 0.160 mW/g

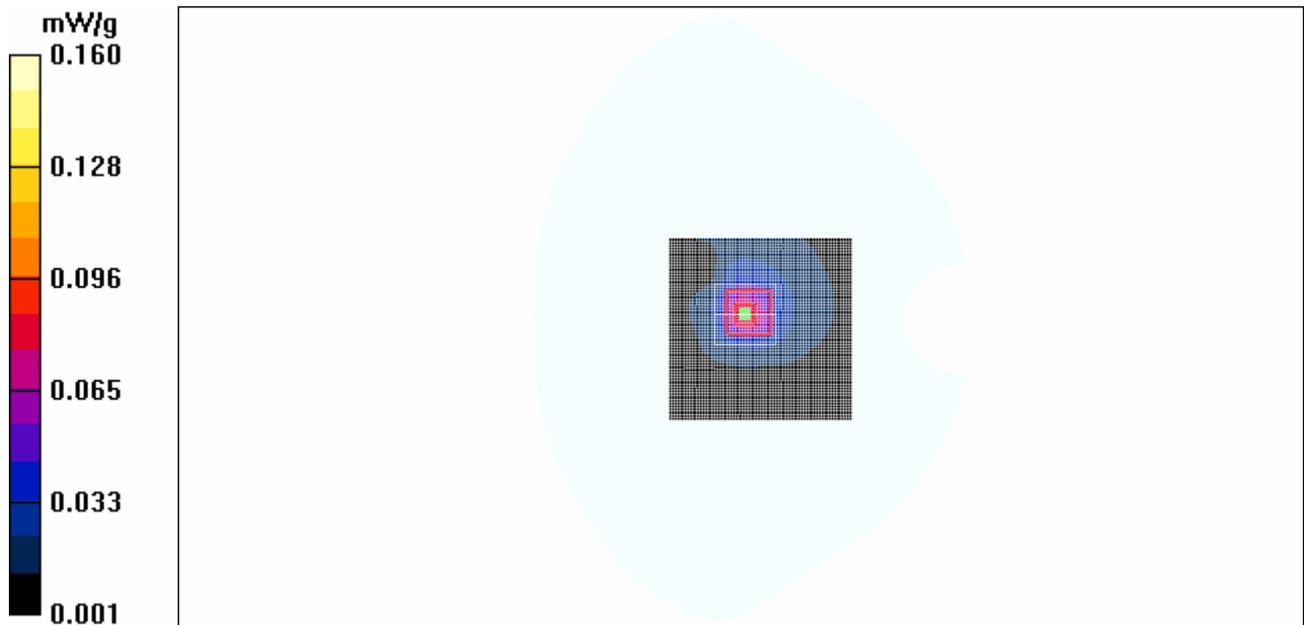


Figure 15 GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 2 Channel 190

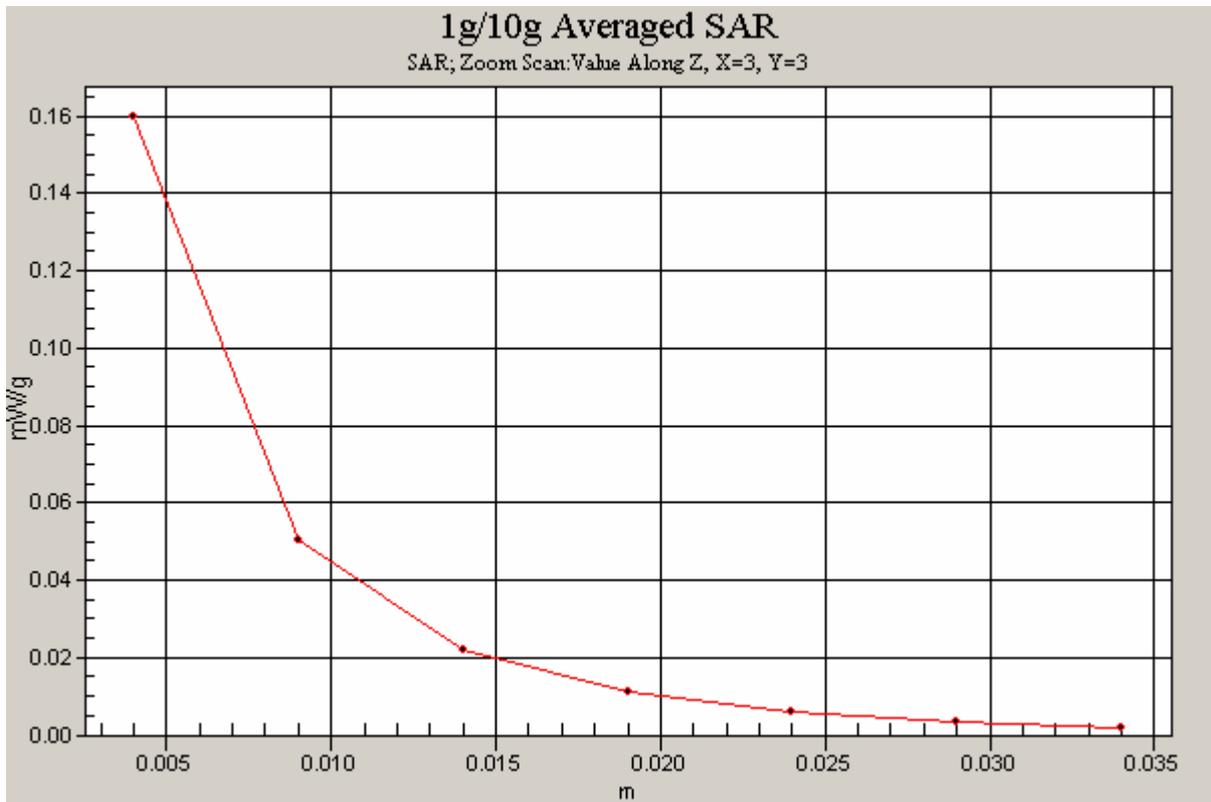


Figure 16 Z-Scan at power reference point [GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 2 Channel 190]

GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 3 Middle

Communication System: GSM850 + GPRS(2Up); Frequency: 836.6 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 3 Middle /Area Scan (91x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.411 mW/g

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

Reference Value = 19.2 V/m; Power Drift = -0.064 dB

Peak SAR (extrapolated) = 0.475 W/kg

SAR(1 g) = 0.354 mW/g; SAR(10 g) = 0.253 mW/g

Maximum value of SAR (measured) = 0.378 mW/g

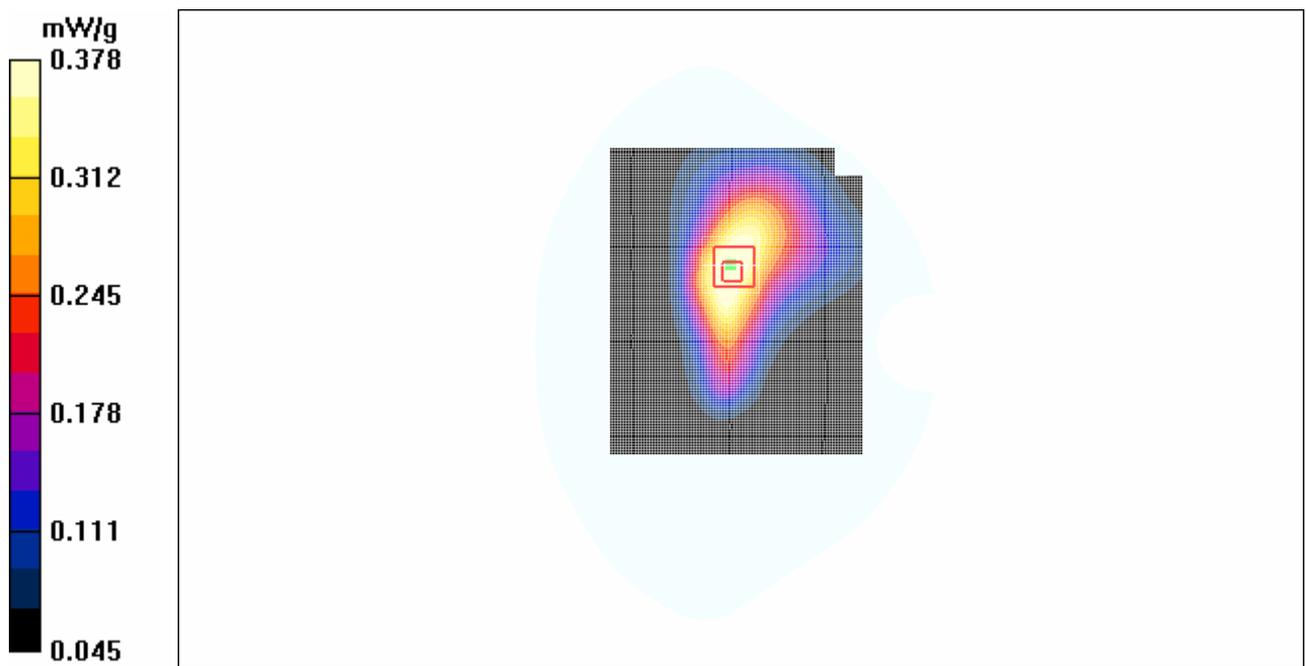


Figure 17 GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 3 Channel 190

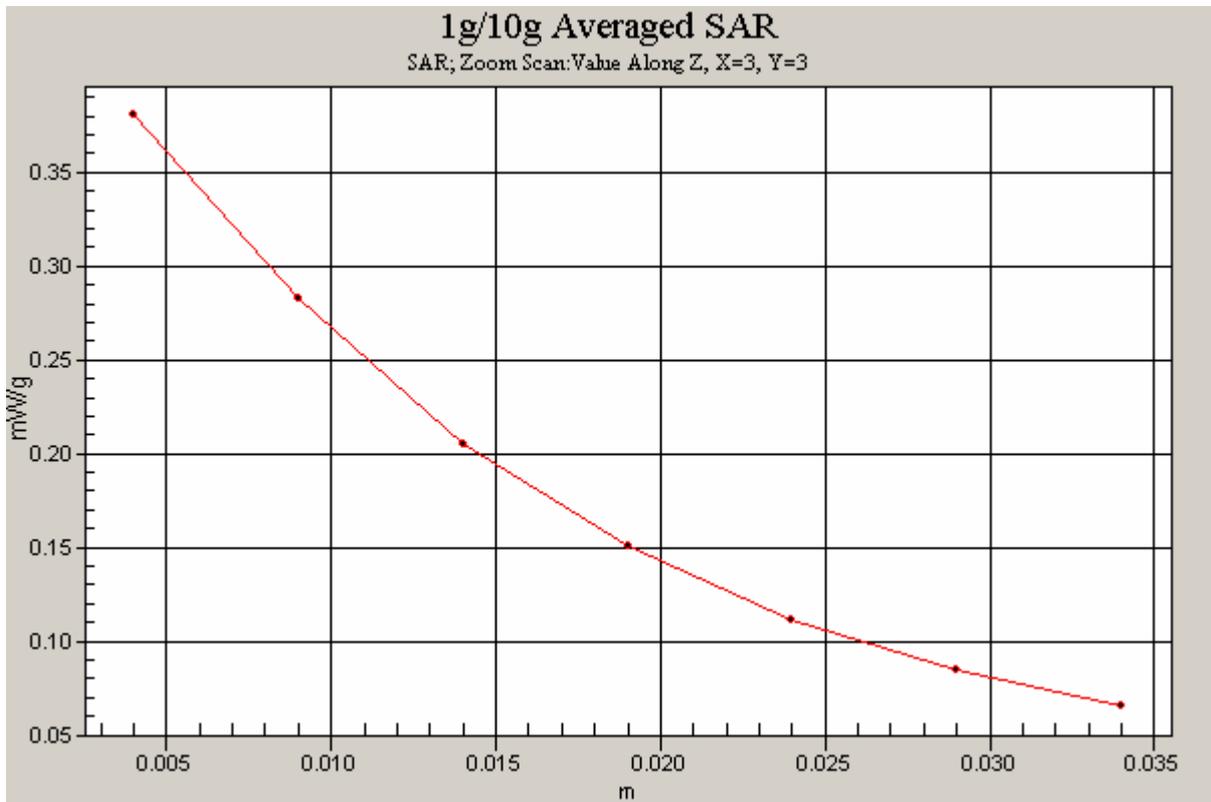


Figure 18 Z-Scan at power reference point [GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 3 Channel 190]

GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 4 Middle

Communication System: GSM850 + GPRS(2Up); Frequency: 836.6 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 4 Middle/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.132 mW/g

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

Reference Value = 17.4 V/m; Power Drift = -0.083 dB

Peak SAR (extrapolated) = 1.00 W/kg

SAR(1 g) = 0.206 mW/g; SAR(10 g) = 0.067 mW/g

Maximum value of SAR (measured) = 0.216 mW/g

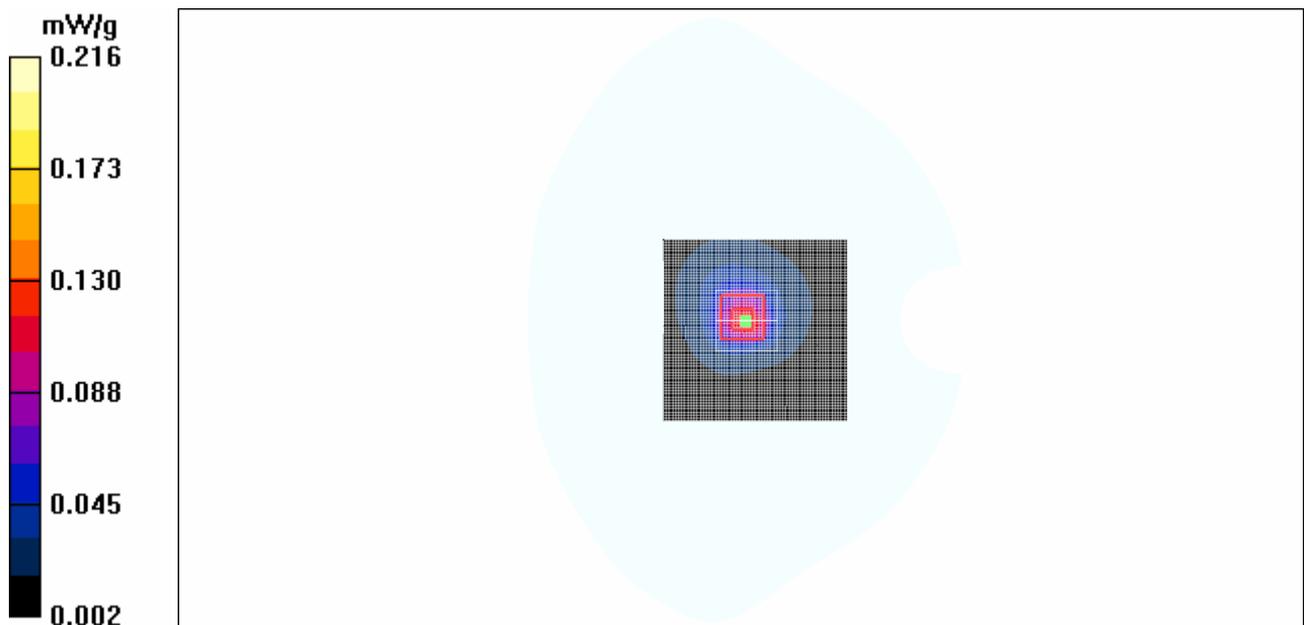


Figure 19 GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 4 Channel 190

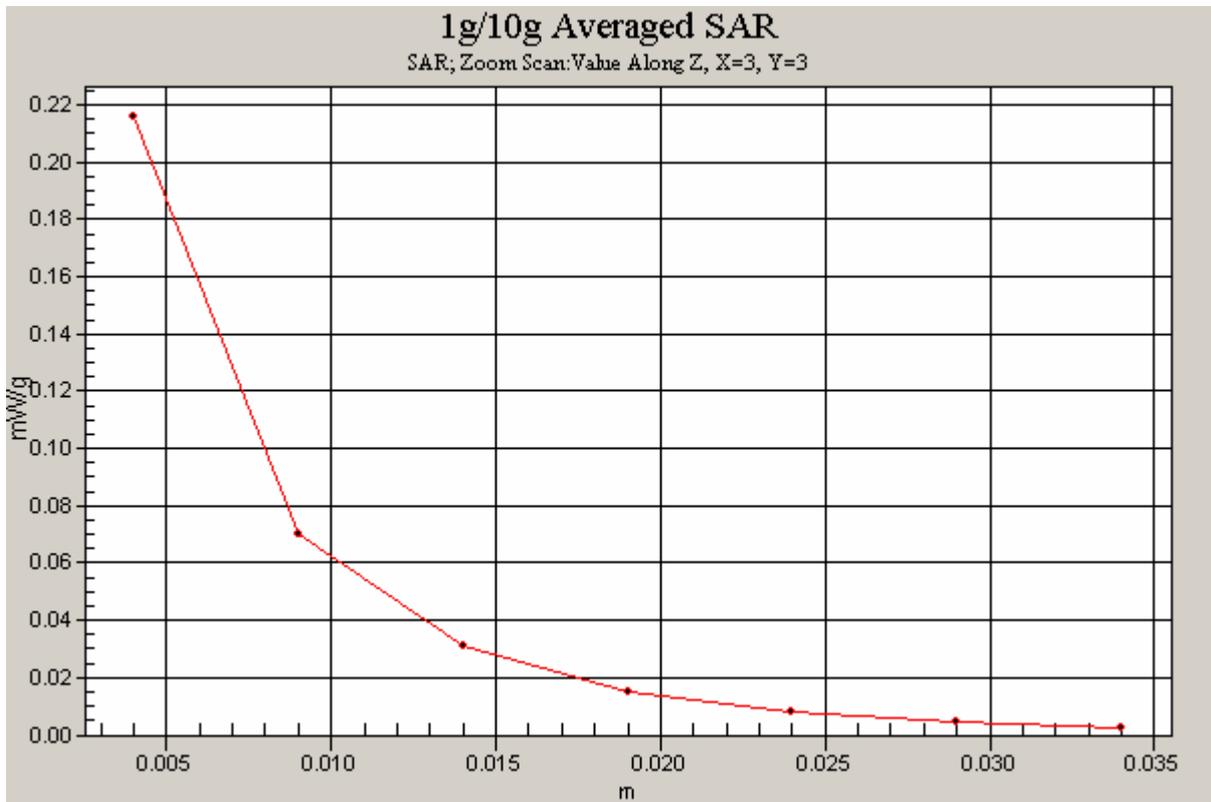


Figure 20 Z-Scan at power reference point [GSM 850 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 4 Channel 190]

GSM 850 EGPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Middle

Communication System: GSM850 + EGPRS(2Up); Frequency: 836.6 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 837$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.175 mW/g

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

Reference Value = 9.94 V/m; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 0.179 W/kg

SAR(1 g) = 0.125 mW/g; SAR(10 g) = 0.079 mW/g

Maximum value of SAR (measured) = 0.138 mW/g

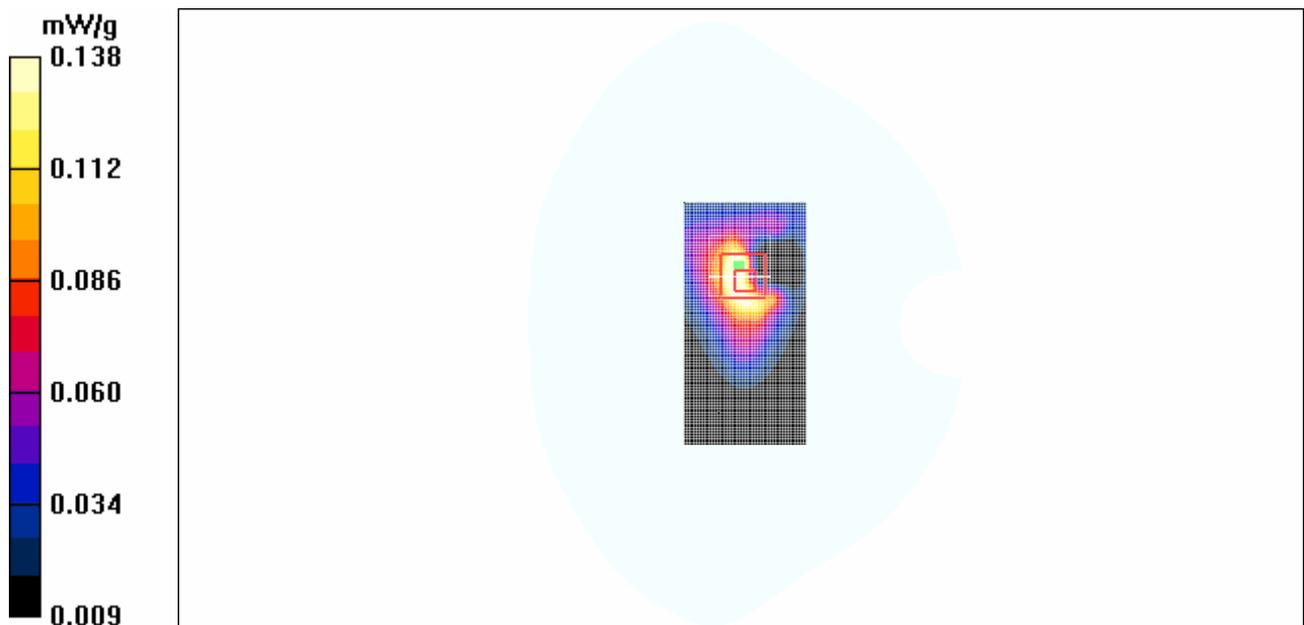


Figure 21 GSM 850 EGPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 190

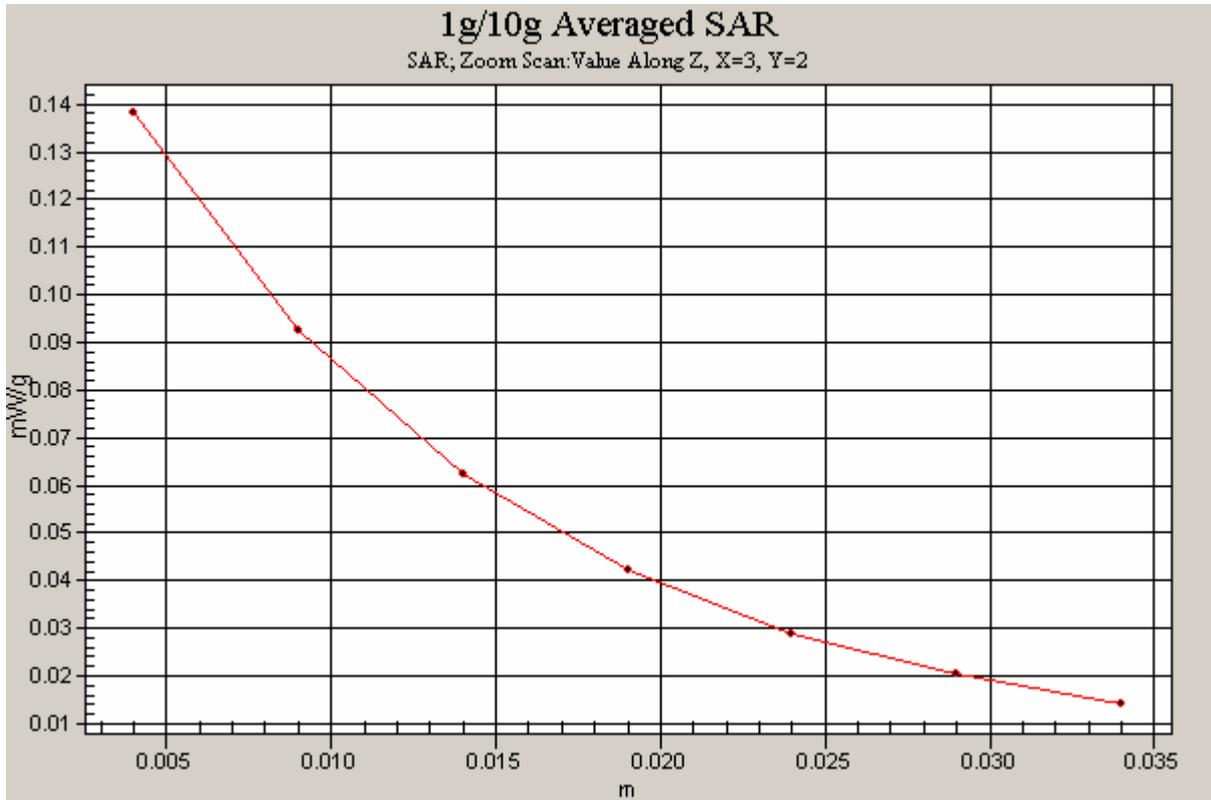


Figure 22 Z-Scan at power reference point [GSM 850 EGPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 190]

GSM 1900 GPRS (4 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Middle

Communication System: GSM 1900+GPRS(4Up); Frequency: 1880 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.811 mW/g

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

Reference Value = 15.2 V/m; Power Drift = 0.038 dB

Peak SAR (extrapolated) = 1.65 W/kg

SAR(1 g) = 0.661 mW/g; SAR(10 g) = 0.320 mW/g

Maximum value of SAR (measured) = 0.691 mW/g

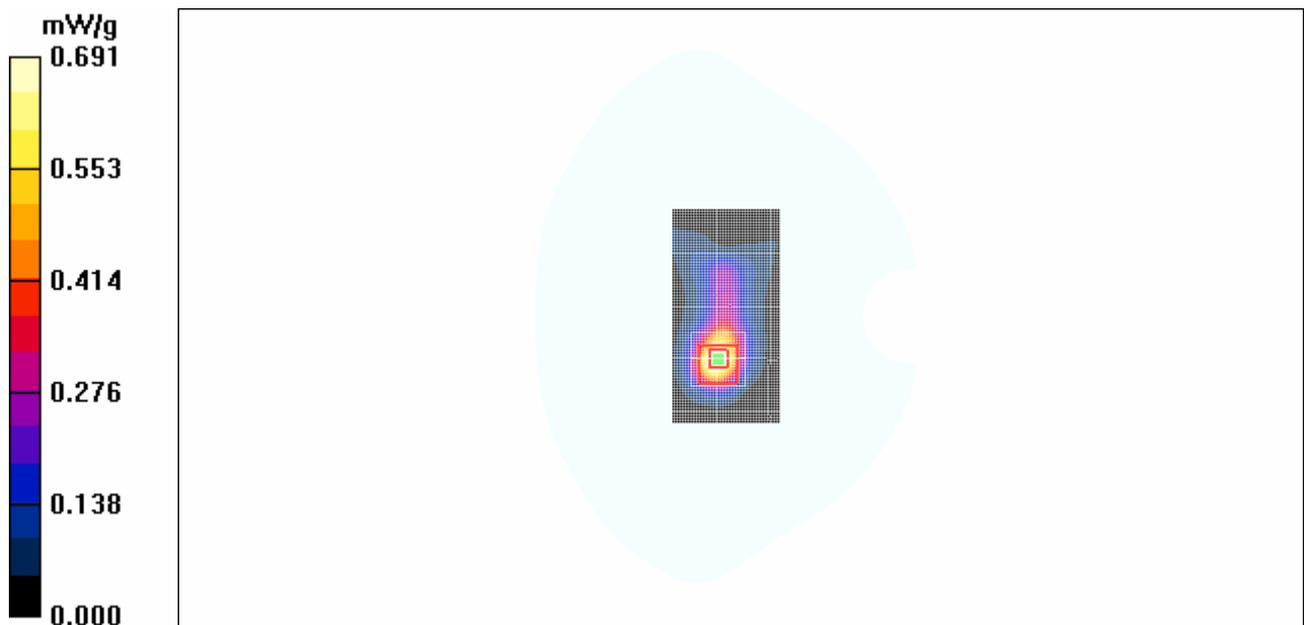


Figure 23 GSM 1900 GPRS (4 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 661

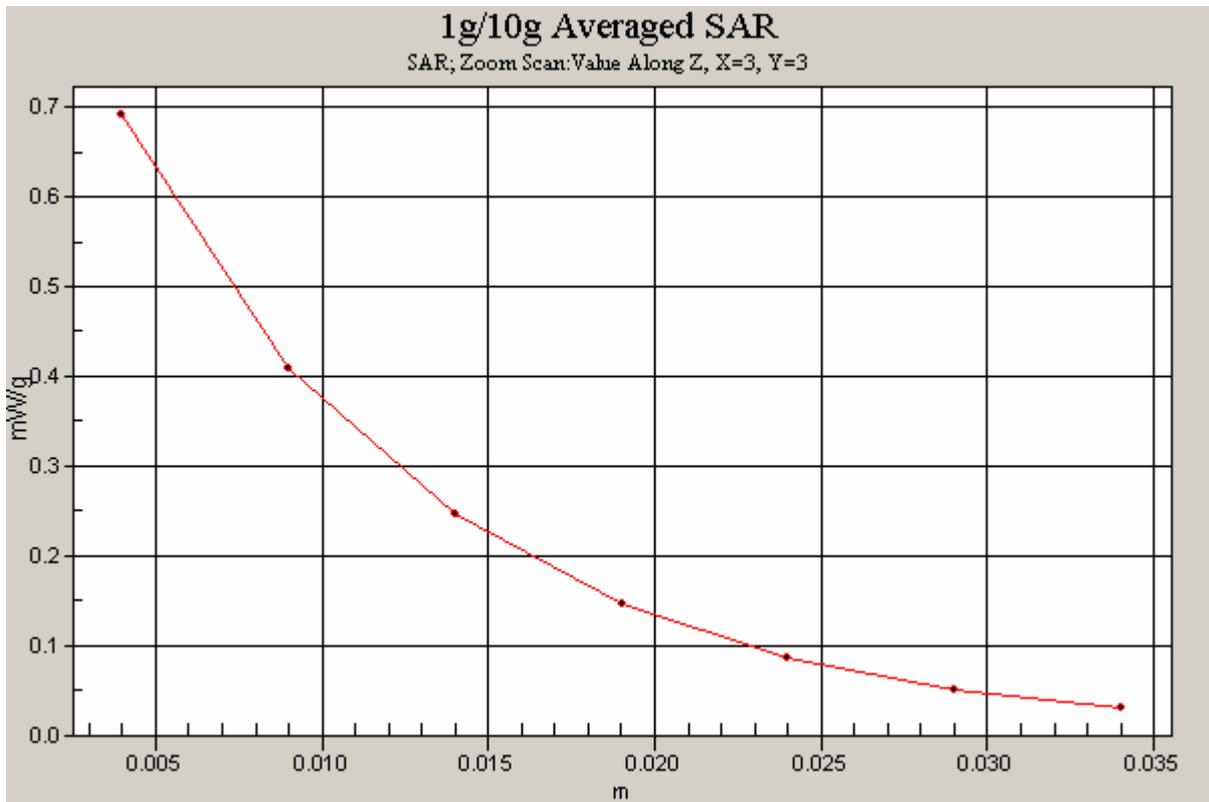


Figure 24 Z-Scan at power reference point [GSM 1900 GPRS (4 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 661]

GSM 1900 GPRS (3 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Middle

Communication System: GSM 1900+GPRS(3Up); Frequency: 1880 MHz; Duty Cycle: 1:2.67

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.959 mW/g

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

Reference Value = 16.7 V/m; Power Drift = -0.096 dB

Peak SAR (extrapolated) = 1.61 W/kg

SAR(1 g) = 0.768 mW/g; SAR(10 g) = 0.383 mW/g

Maximum value of SAR (measured) = 0.818 mW/g



Figure 25 GSM 1900 GPRS (3 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 661

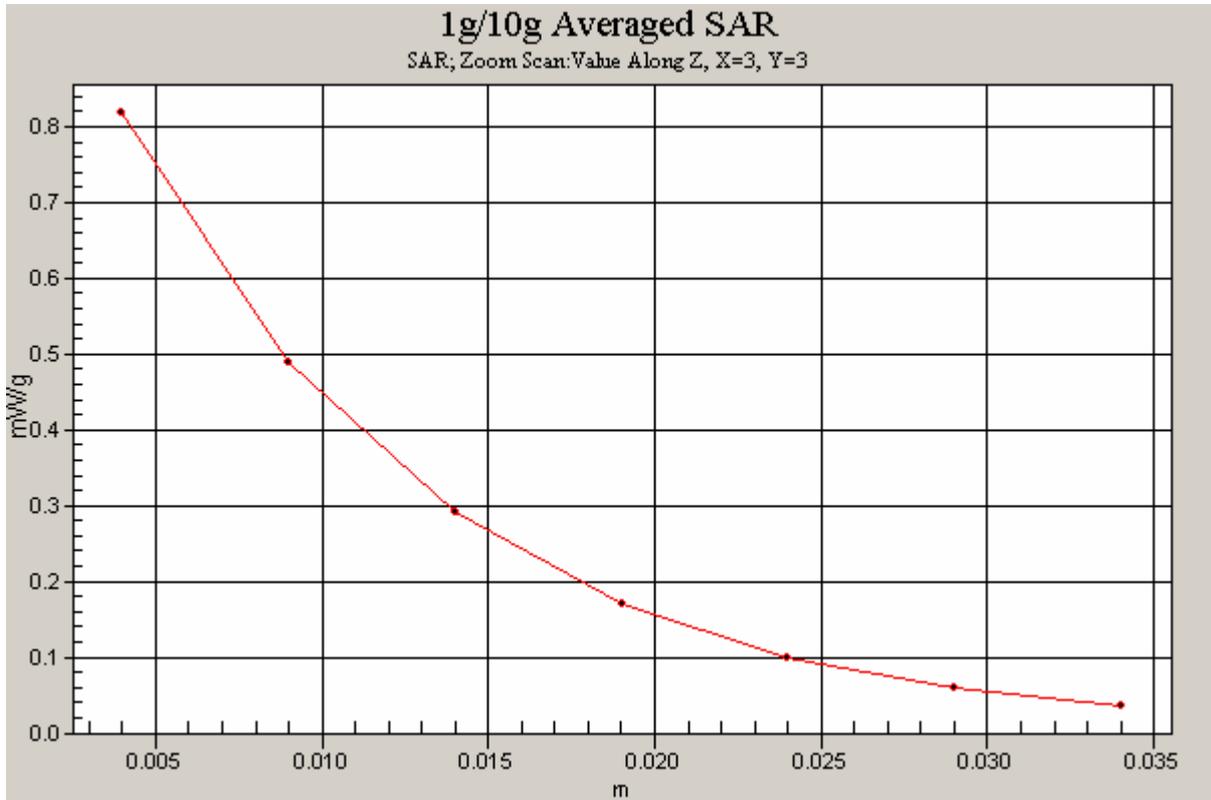


Figure 26 Z-Scan at power reference point [GSM 1900 GPRS (3 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 661]

GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Middle

Communication System: GSM 1900+GPRS(2Up); Frequency: 1880 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.02 mW/g

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

Reference Value = 17.2 V/m; Power Drift = -0.083 dB

Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 0.770 mW/g; SAR(10 g) = 0.413 mW/g

Maximum value of SAR (measured) = 0.862 mW/g

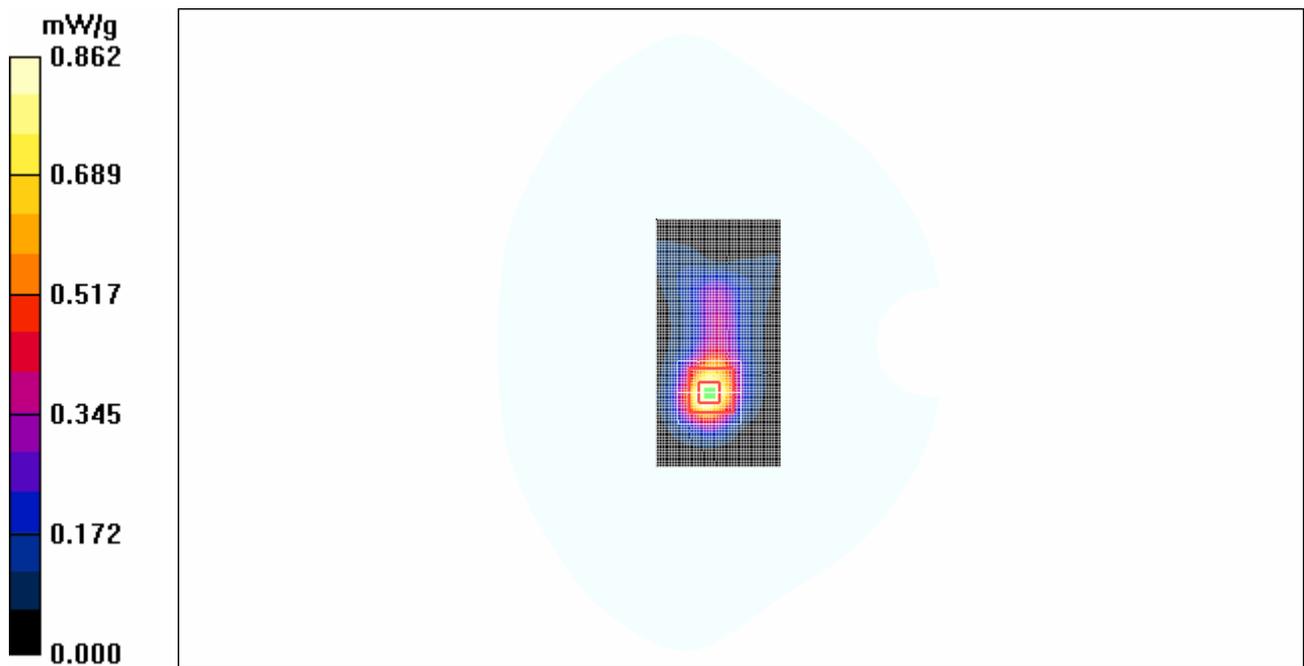


Figure 27 GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 661

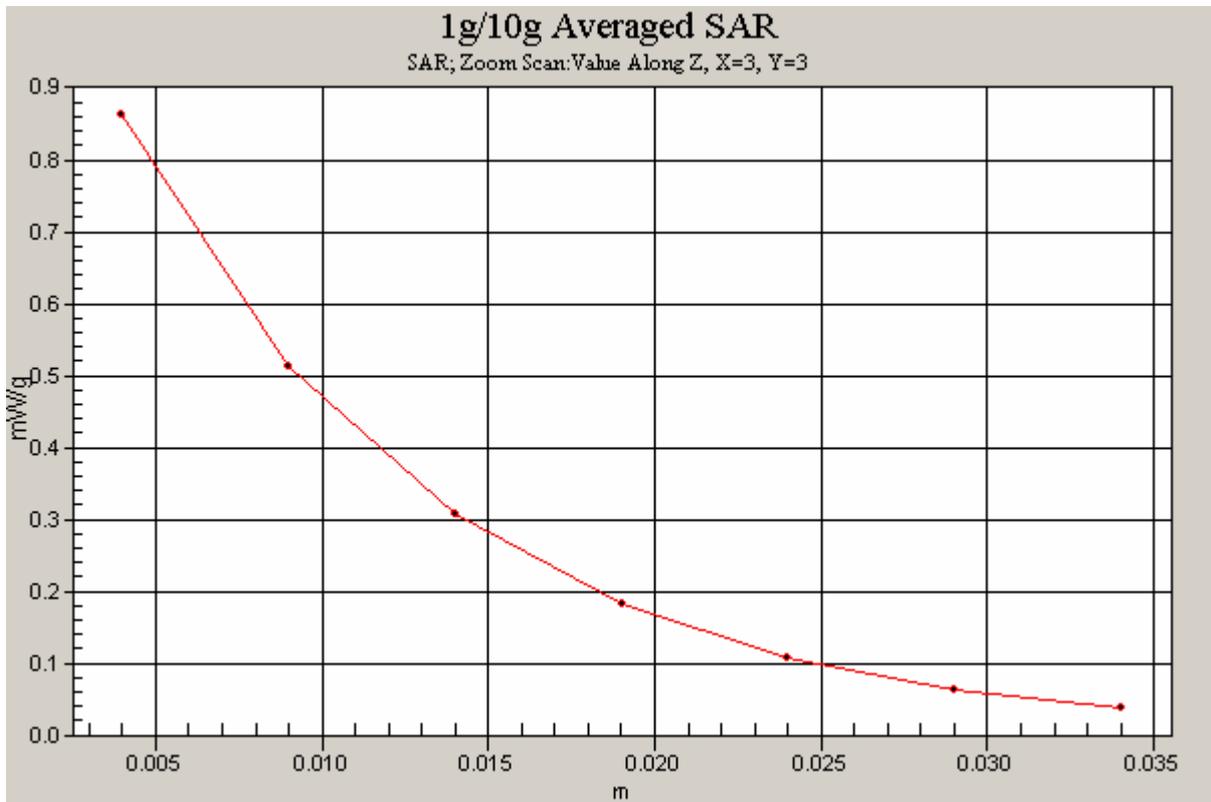


Figure 28 Z-Scan at power reference point [GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 661]

GSM 1900 GPRS (1 timeslot in uplink) with BenQ Joy book S72 Test Position 1 Middle

Communication System: GSM 1900+GPRS(1Up); Frequency: 1880 MHz; Duty Cycle: 1:8

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.629 mW/g

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

Reference Value = 15.7 V/m; Power Drift = 0.050 dB

Peak SAR (extrapolated) = 0.811 W/kg

SAR(1 g) = 0.488 mW/g; SAR(10 g) = 0.270 mW/g

Maximum value of SAR (measured) = 0.541 mW/g



Figure 29 GSM 1900 GPRS (1 timeslot in uplink) with BenQ Joy book S72 Test Position 1 Channel 661

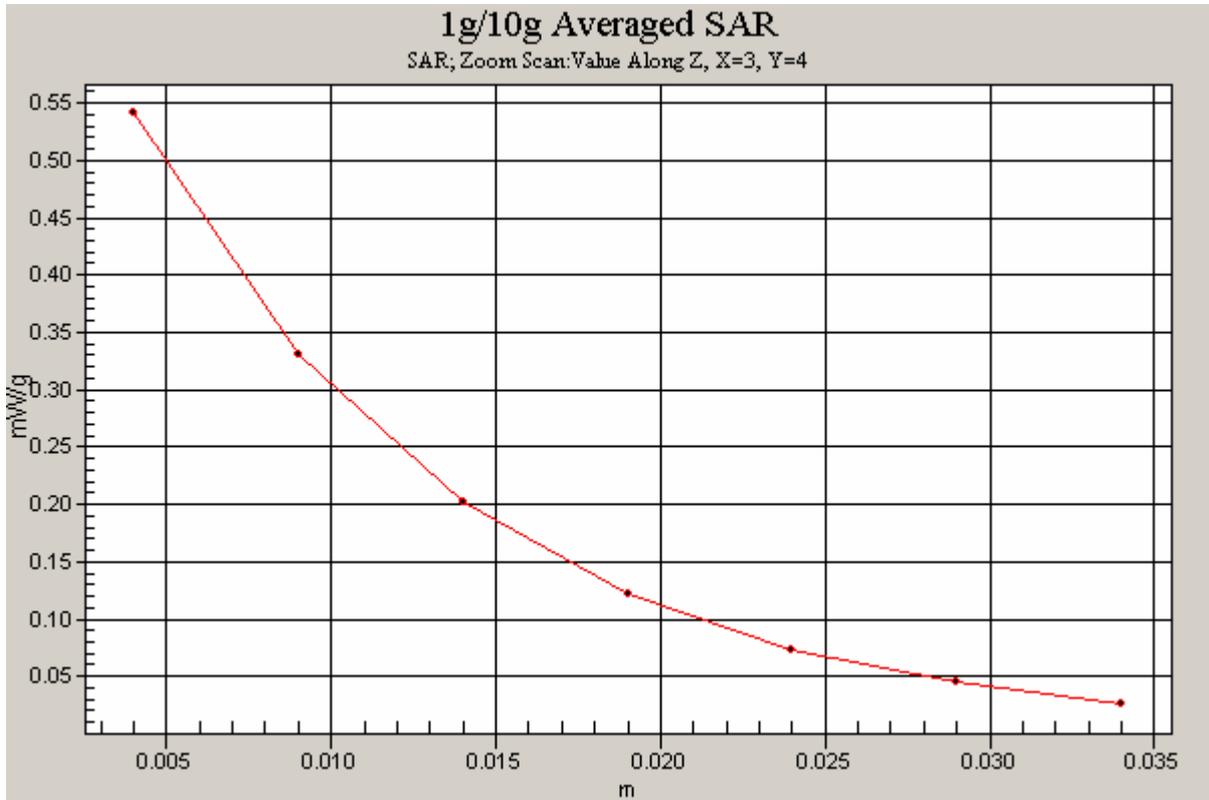


Figure 30 Z-Scan at power reference point [GSM 1900 GPRS (1 timeslot in uplink) with BenQ Joy book S72 Test Position 1 Channel 661]

GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 2 Middle

Communication System: GSM 1900+GPRS(2Up); Frequency: 1880 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 2 Middle/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.324 mW/g

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

Reference Value = 11.4 V/m; Power Drift = -0.195 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.295 mW/g; SAR(10 g) = 0.118 mW/g

Maximum value of SAR (measured) = 0.365 mW/g

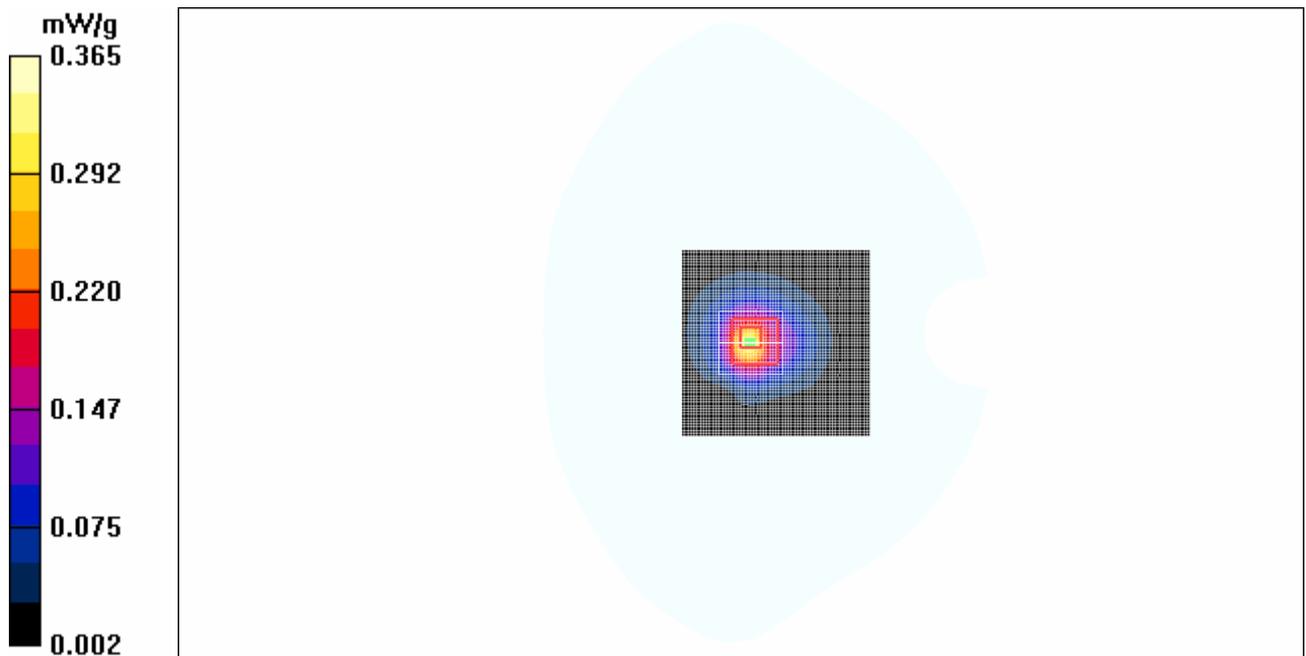


Figure 31 GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 2 Channel 661

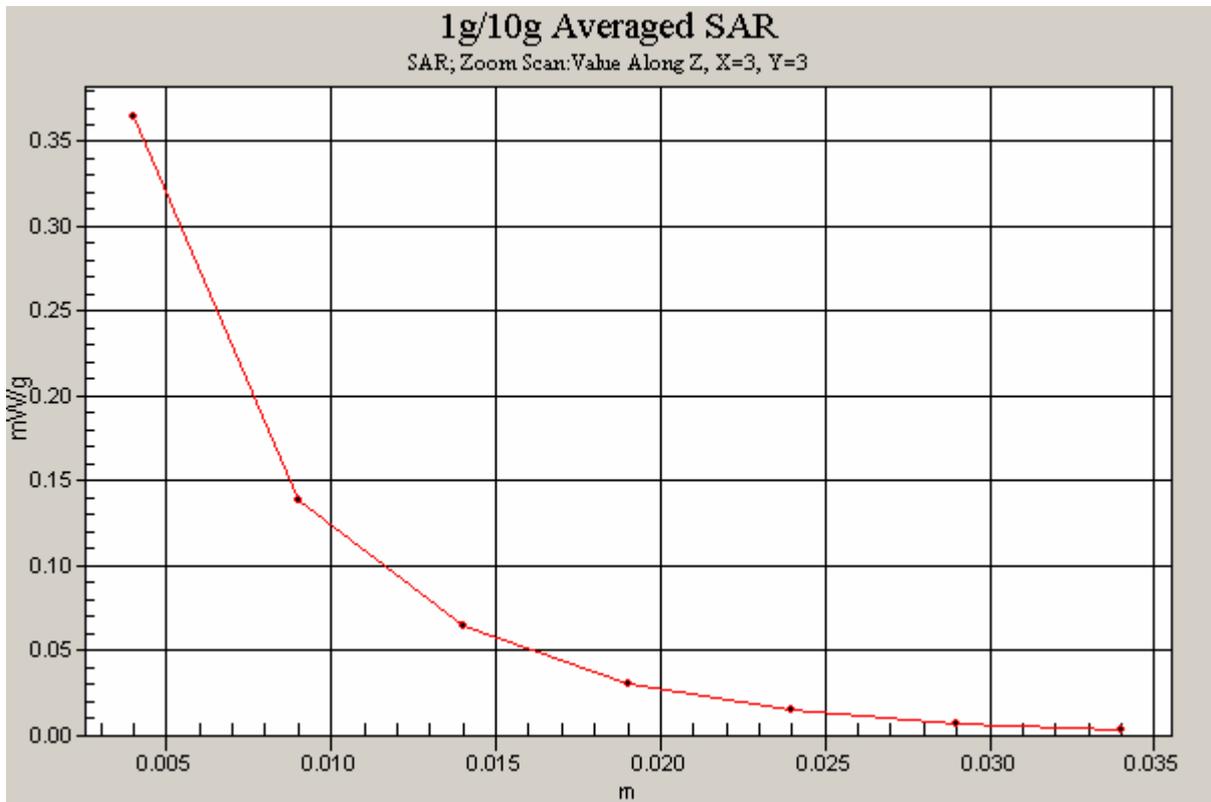


Figure 32 Z-Scan at power reference point [GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 2 Channel 661]

GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 3 Middle

Communication System: GSM 1900+GPRS(2Up); Frequency: 1880 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Towards Phantom Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.428 mW/g

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

Reference Value = 14.7 V/m; Power Drift = -0.067 dB

Peak SAR (extrapolated) = 0.583 W/kg

SAR(1 g) = 0.354 mW/g; SAR(10 g) = 0.198 mW/g

Maximum value of SAR (measured) = 0.387 mW/g

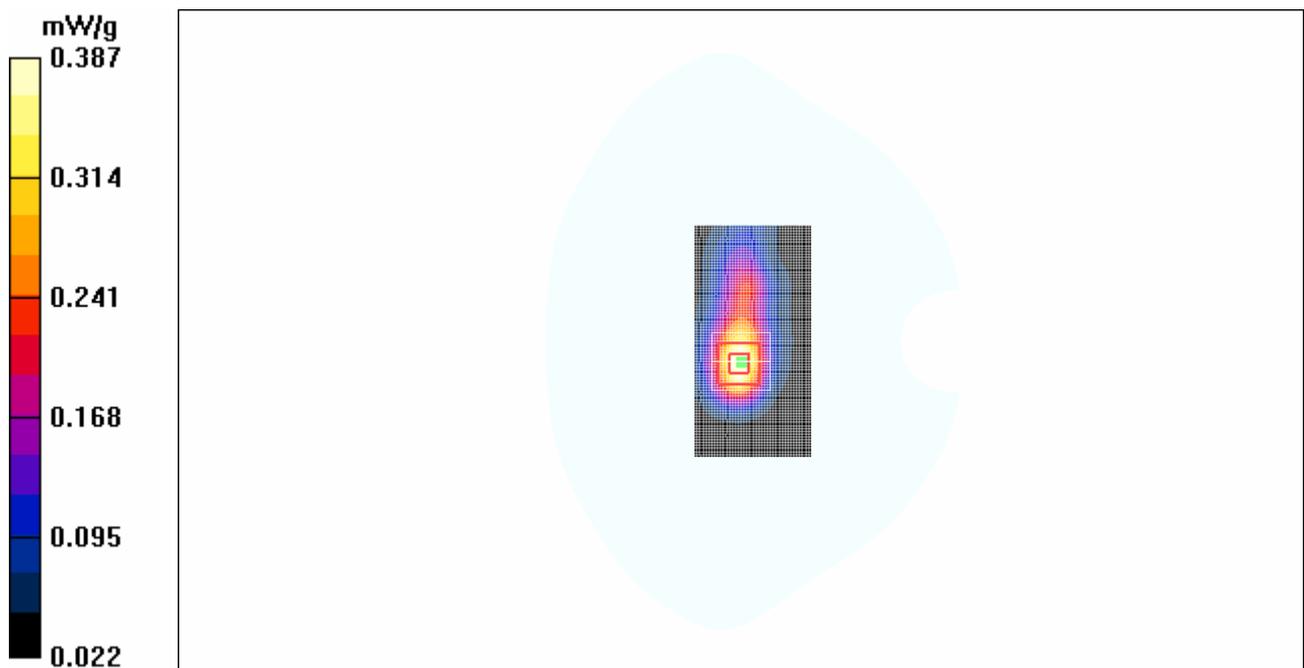


Figure 33 GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 3 Channel 661

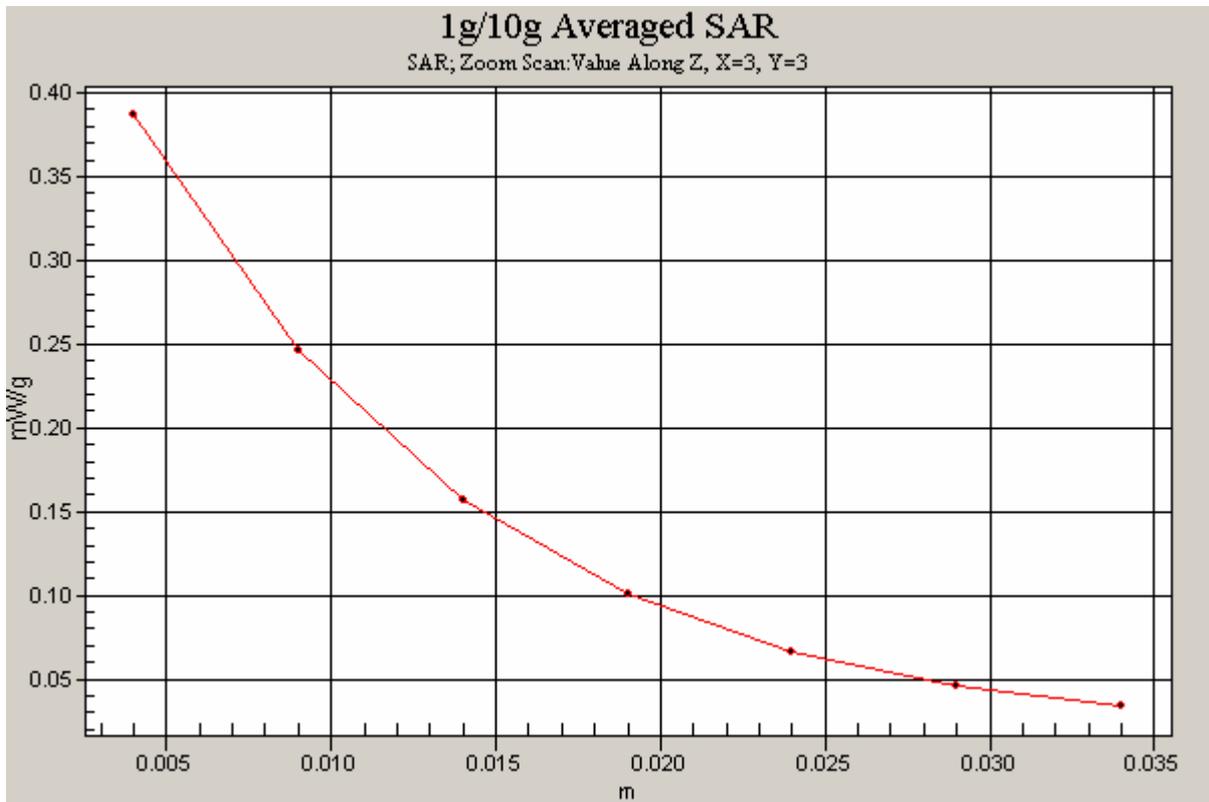


Figure 34 Z-Scan at power reference point [GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 3 Channel 661]

GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 4 Middle

Communication System: GSM 1900+GPRS(2Up); Frequency: 1880 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 4 Middle/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.202 mW/g

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

Reference Value = 14.5 V/m; Power Drift = -0.163 dB

Peak SAR (extrapolated) = 0.795 W/kg

SAR(1 g) = 0.257 mW/g; SAR(10 g) = 0.108 mW/g

Maximum value of SAR (measured) = 0.306 mW/g

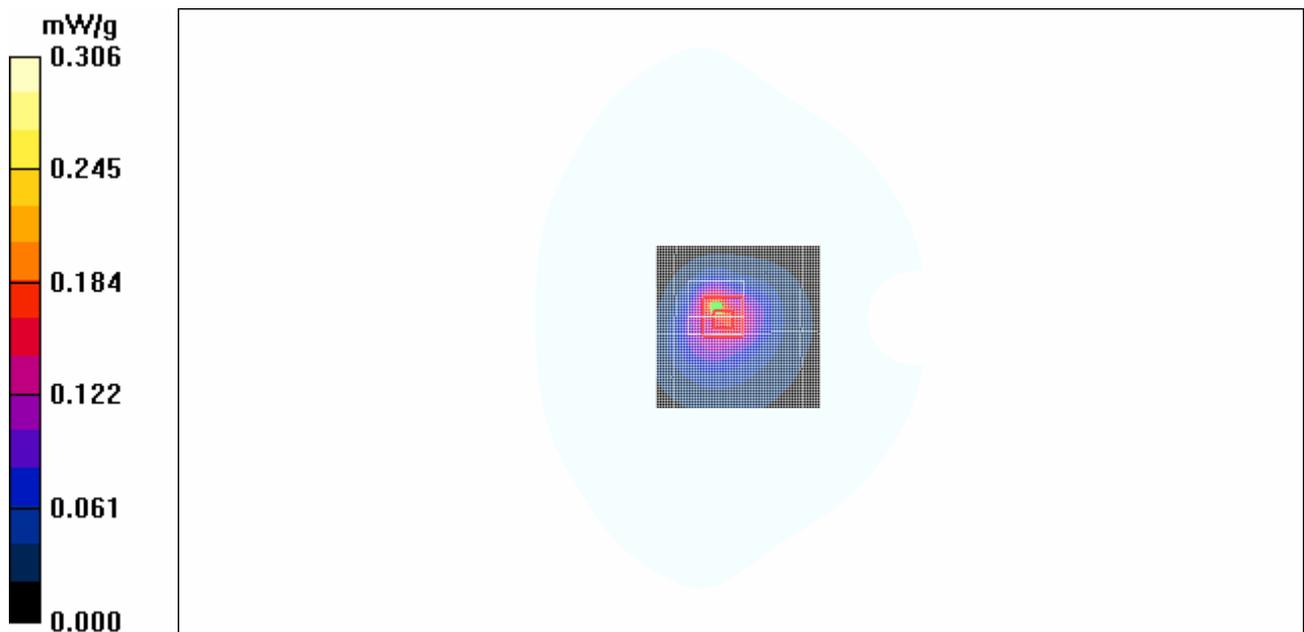


Figure 35 GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 4 Channel 661

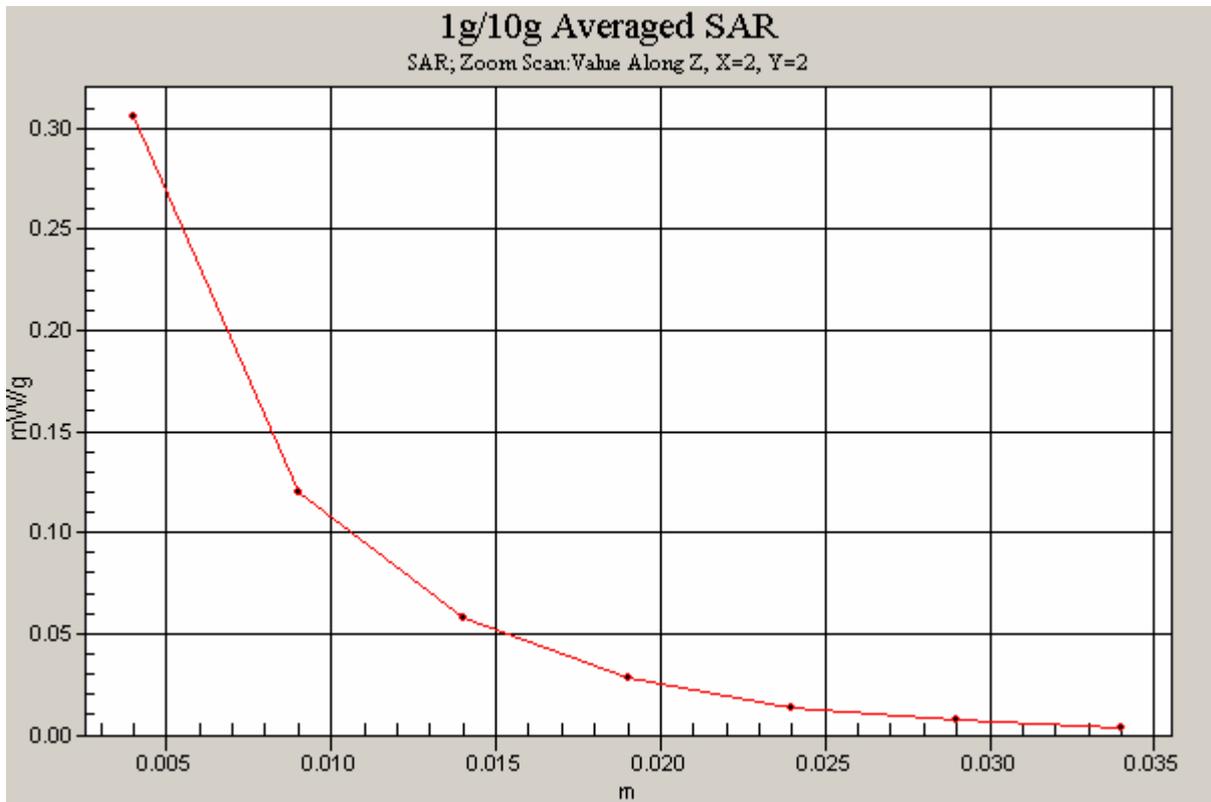


Figure 36 Z-Scan at power reference point [GSM 1900 GPRS (2 timeslots in uplink) with BenQ Joy book R55V Test Position 4 Channel 661]

GSM 1900 EGPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Middle

Communication System: GSM 1900+EGPRS(2Up); Frequency: 1880 MHz; Duty Cycle: 1:4

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.583 mW/g

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

Reference Value = 15.8 V/m; Power Drift = -0.102 dB

Peak SAR (extrapolated) = 0.760 W/kg

SAR(1 g) = 0.455 mW/g; SAR(10 g) = 0.252 mW/g

Maximum value of SAR (measured) = 0.502 mW/g

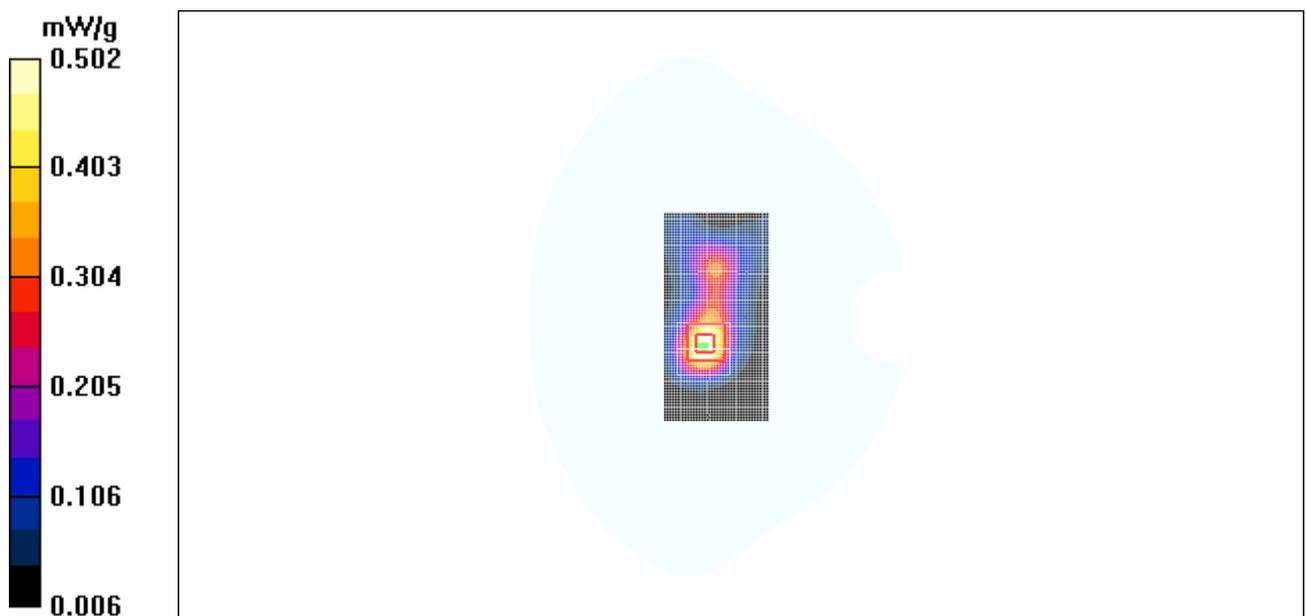


Figure 37 GSM 1900 EGPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 661

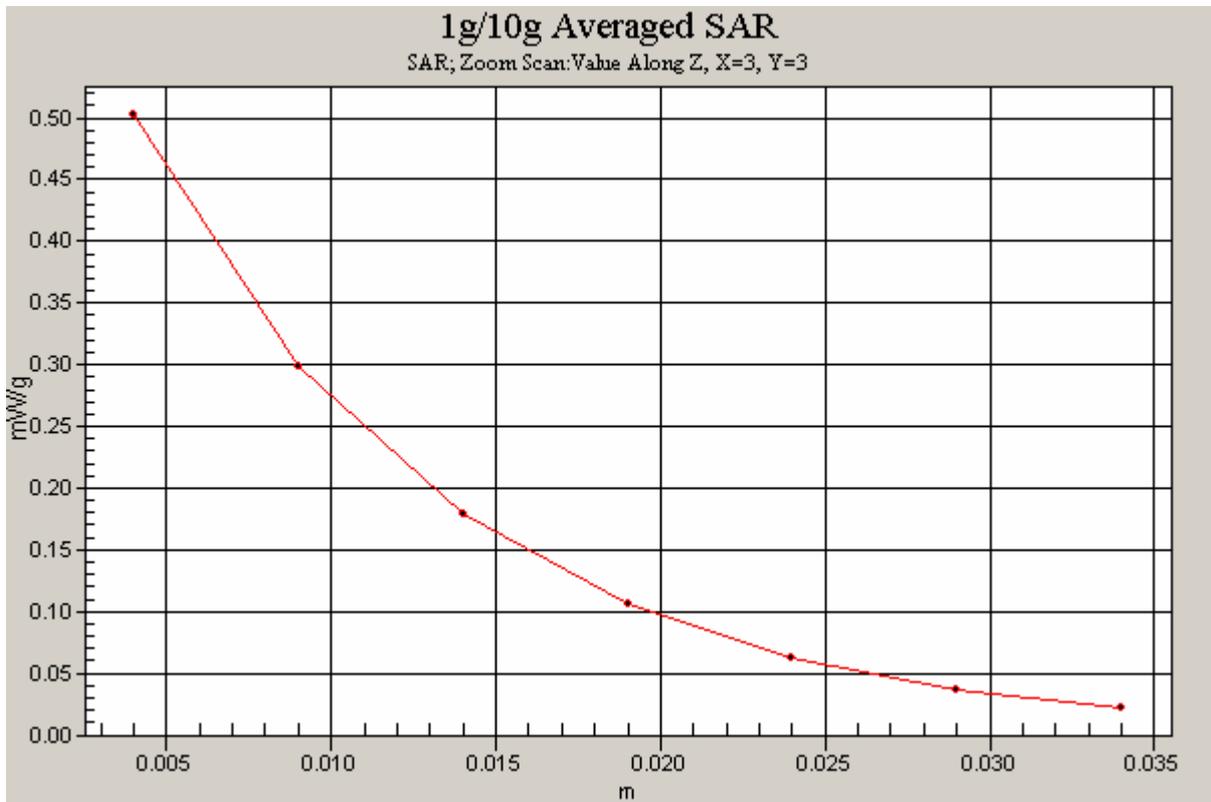


Figure 38 Z-Scan at power reference point [GSM 1900 EGPRS (2 timeslots in uplink) with BenQ Joy book S72 Test Position 1 Channel 661]

WCDMA Band II with BenQ Joy book S72 Test Position 1 High

Communication System: WCDMA Band II; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1908$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³
Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);
Electronics: DAE3 Sn452;

Test Position 1 High/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
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 = 22.9 V/m; Power Drift = 0.112 dB
Peak SAR (extrapolated) = 1.80 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.574 mW/g
Maximum value of SAR (measured) = 1.17 mW/g

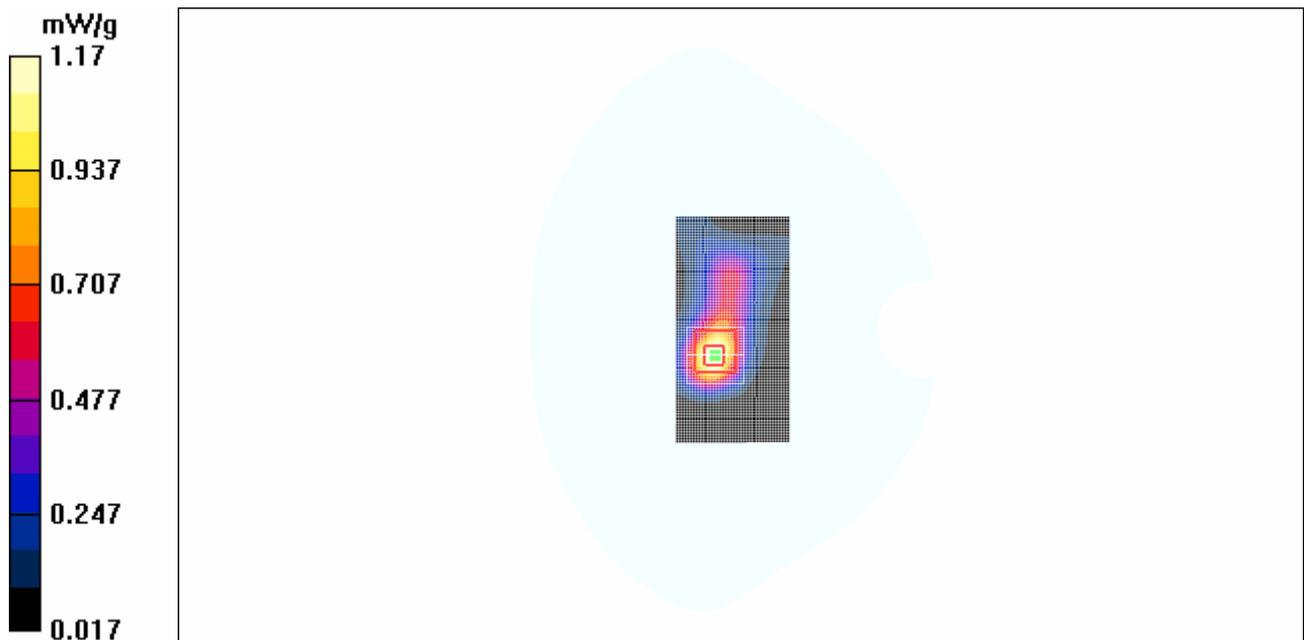


Figure 39 WCDMA Band II with BenQ Joy book S72 Test Position 1 Channel 9538

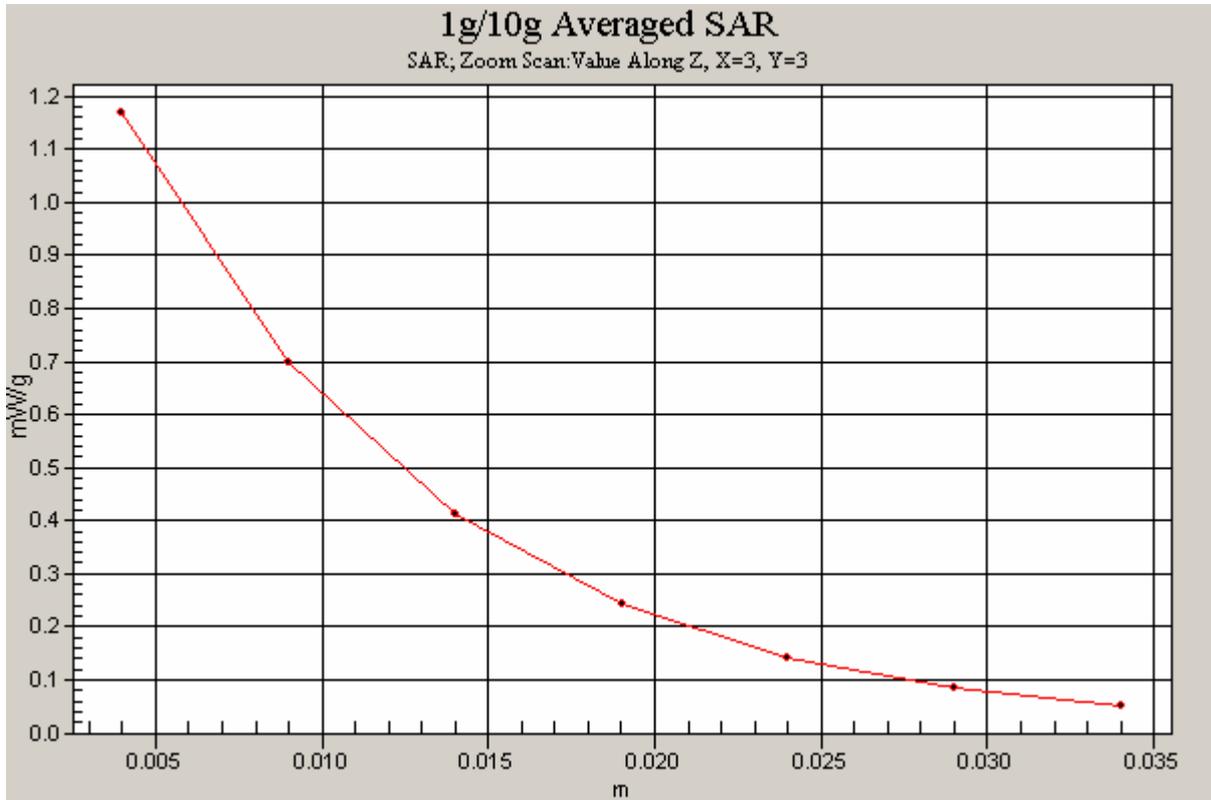


Figure 40 Z-Scan at power reference point (WCDMA Band II with BenQ Joy book S72 Test Position 1 Channel 9538)

WCDMA Band II with BenQ Joy book S72 Test Position 1 Middle

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 23.9 V/m; Power Drift = -0.097 dB

Peak SAR (extrapolated) = 1.89 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.637 mW/g

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

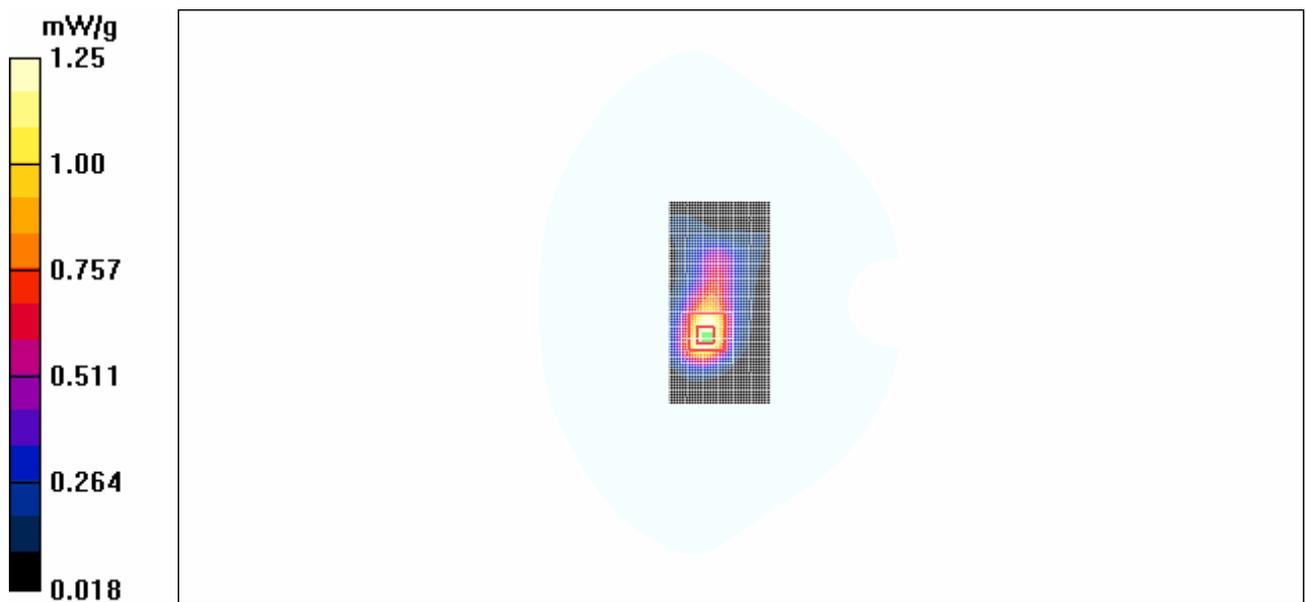


Figure 41 WCDMA Band II with BenQ Joy book S72 Test Position 1 Channel 9400

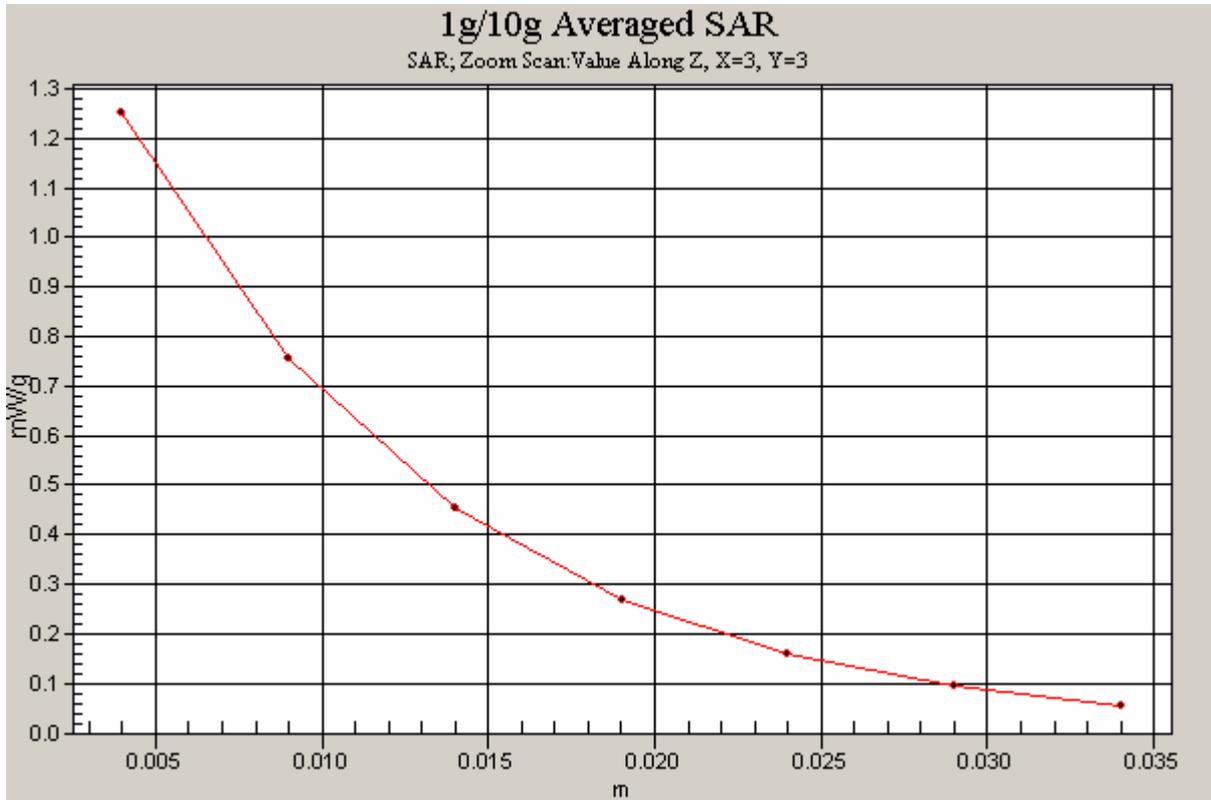


Figure 42 Z-Scan at power reference point (WCDMA Band II with BenQ Joy book S72 Test Position 1 Channel 9400)

WCDMA Band II with BenQ Joy book S72 Test Position 1 Low

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1852.4$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);
Electronics: DAE3 Sn452;

Test Position 1 Low/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.27 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.5 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 1.60 W/kg
SAR(1 g) = 0.960 mW/g; SAR(10 g) = 0.533 mW/g
Maximum value of SAR (measured) = 1.07 mW/g

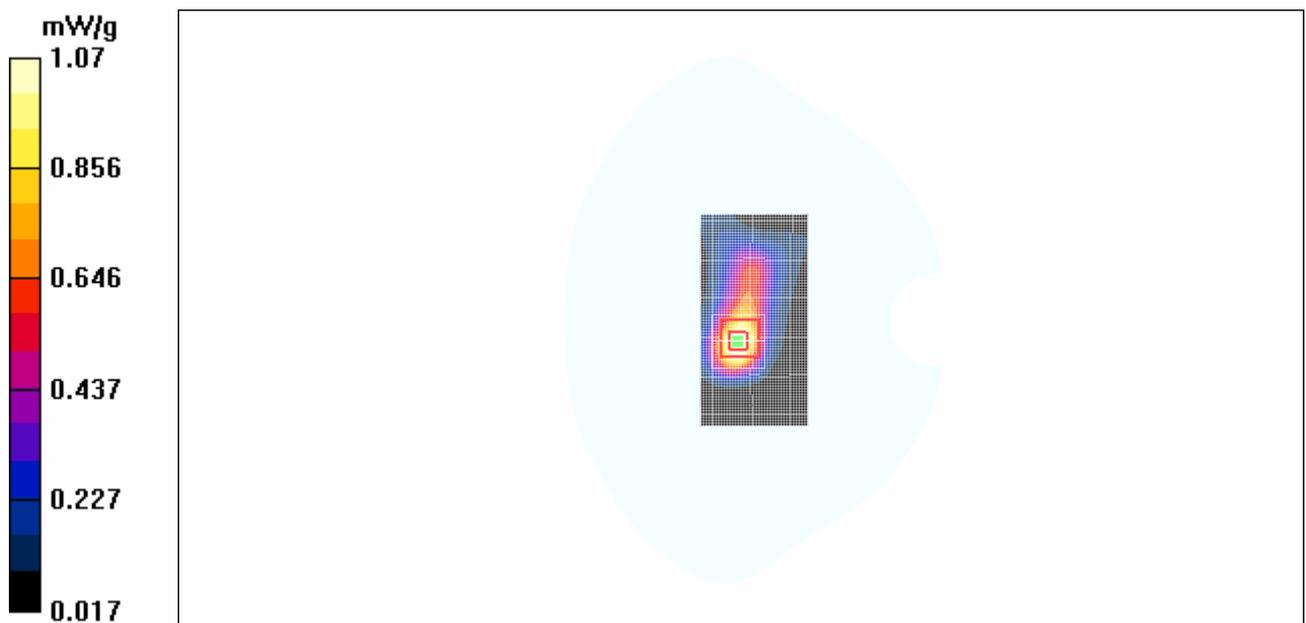


Figure 43 WCDMA Band II with BenQ Joy book S72 Test Position 1 Channel 9262

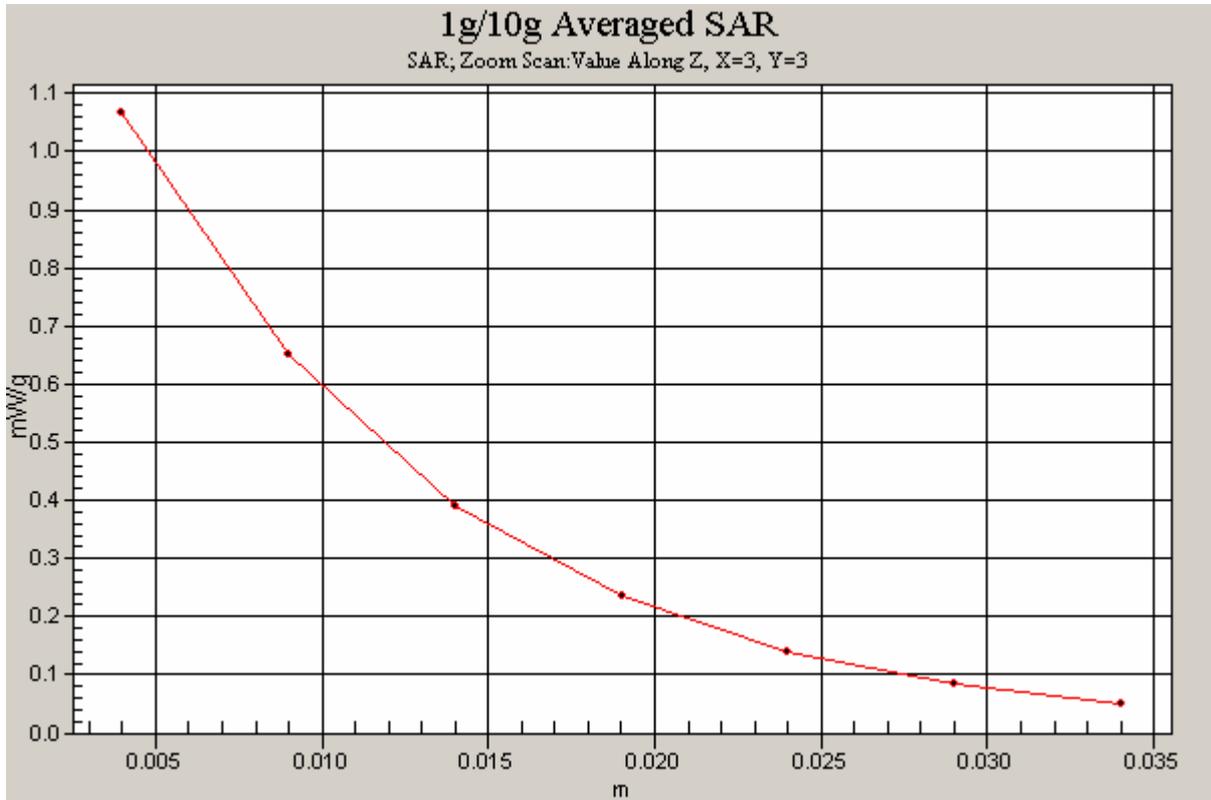


Figure 44 Z-Scan at power reference point (WCDMA Band II with BenQ Joy book S72 Test Position 1 Channel 9262)

WCDMA Band II with BenQ Joy book S72 Test Position 2 Middle

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 2 Middle/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.576 mW/g

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

Reference Value = 15.3 V/m; Power Drift = -0.192 dB

Peak SAR (extrapolated) = 1.83 W/kg

SAR(1 g) = 0.519 mW/g; SAR(10 g) = 0.215 mW/g

Maximum value of SAR (measured) = 0.574 mW/g

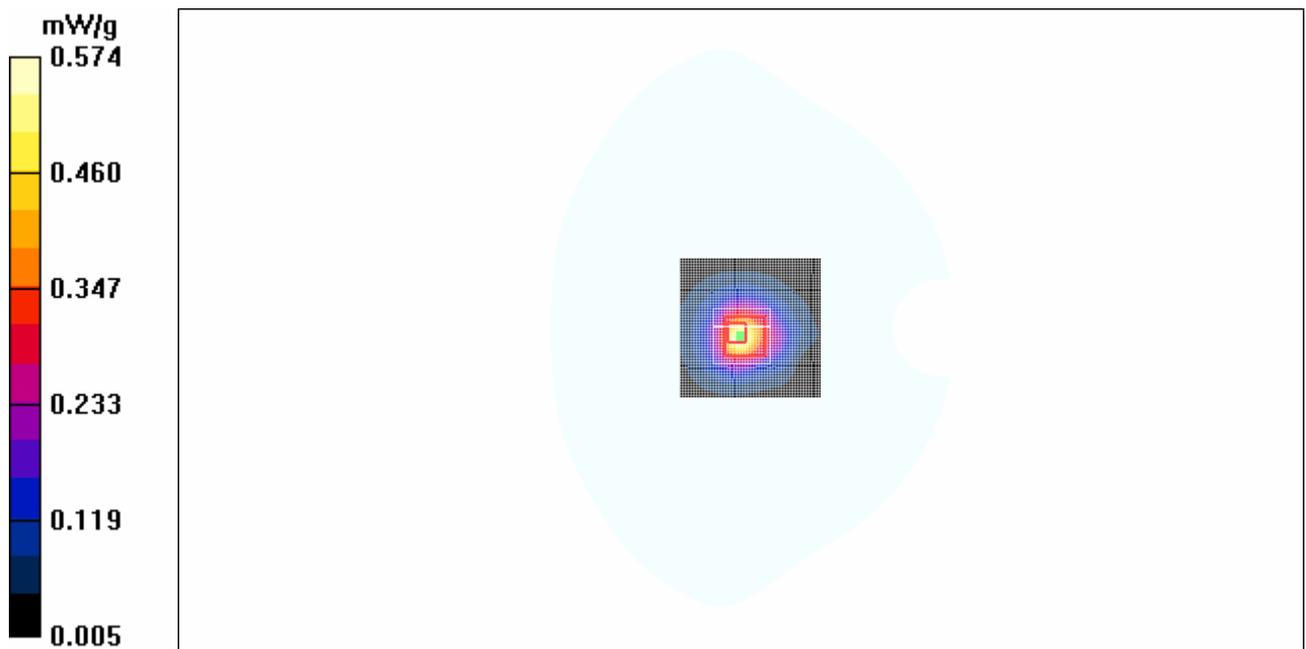


Figure 45 WCDMA Band II with BenQ Joy book S72 Test Position 2 Channel 9400

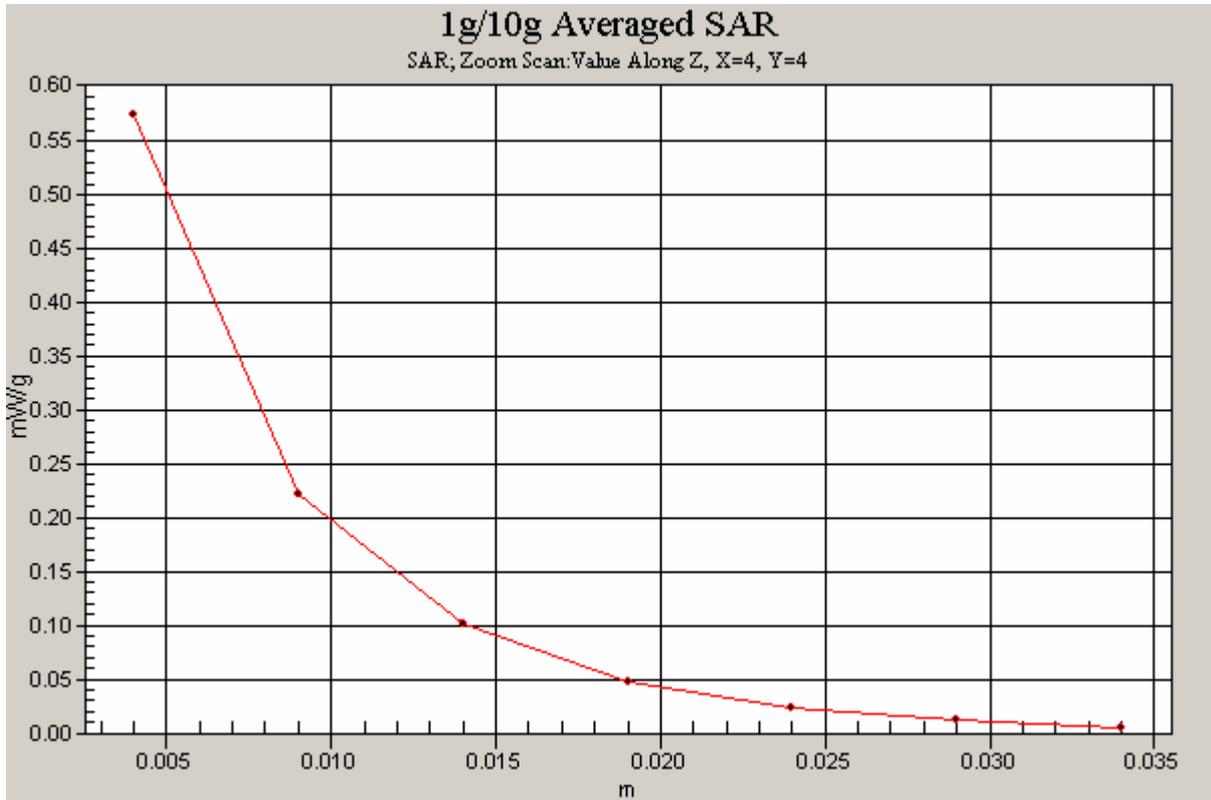


Figure 46 Z-Scan at power reference point (WCDMA Band II with BenQ Joy book S72 Test Position 2 Channel 9400)

WCDMA Band II with BenQ Joy book R55V Test Position 3 Middle

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 3 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.883 mW/g

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

Reference Value = 21.7 V/m; Power Drift = -0.129 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.731 mW/g; SAR(10 g) = 0.403 mW/g

Maximum value of SAR (measured) = 0.821 mW/g

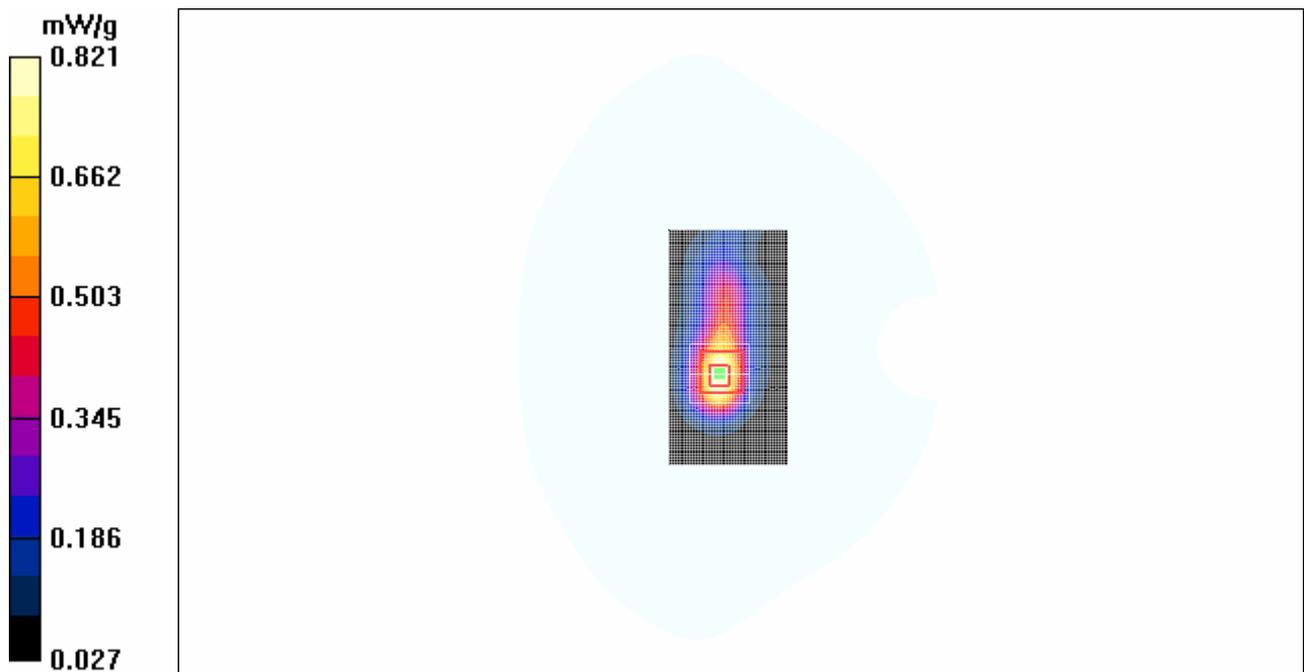


Figure 47 WCDMA Band II with BenQ Joy book R55V Test Position 3 Channel 9400

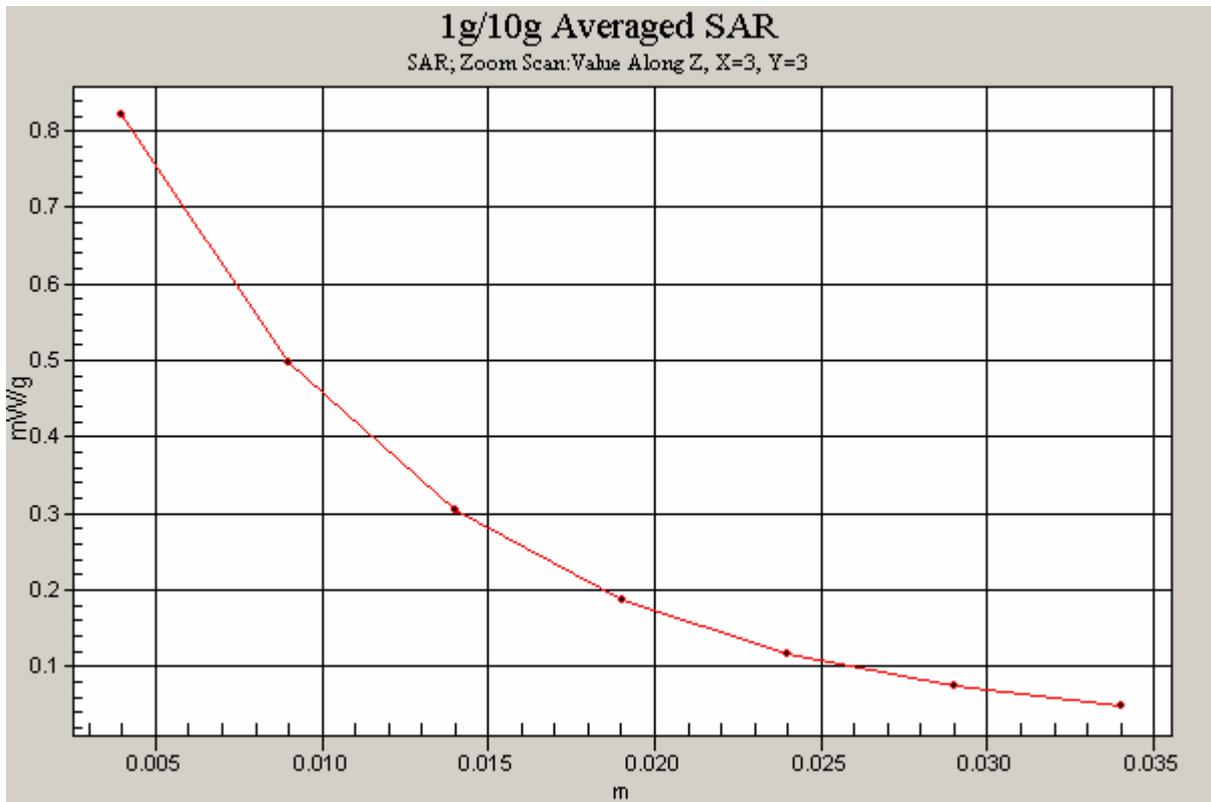


Figure 48 Z-Scan at power reference point (WCDMA Band II with BenQ Joy book R55V Test Position 3 Channel 9400)

WCDMA Band II with BenQ Joy book R55V Test Position 4 Middle

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 4 Middle/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.365 mW/g

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

Reference Value = 21.1 V/m; Power Drift = -0.089 dB

Peak SAR (extrapolated) = 1.72 W/kg

SAR(1 g) = 0.523 mW/g; SAR(10 g) = 0.213 mW/g

Maximum value of SAR (measured) = 0.605 mW/g

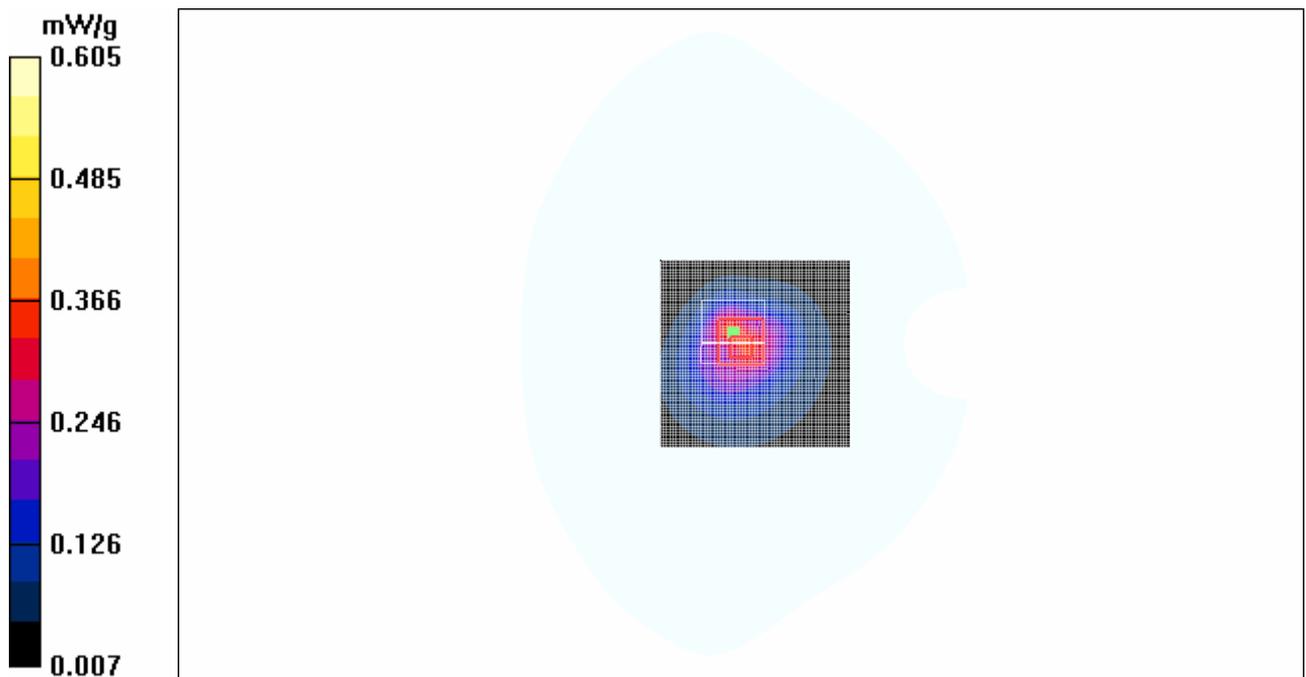


Figure 49 WCDMA Band II with BenQ Joy book R55V Test Position 4 Channel 9400

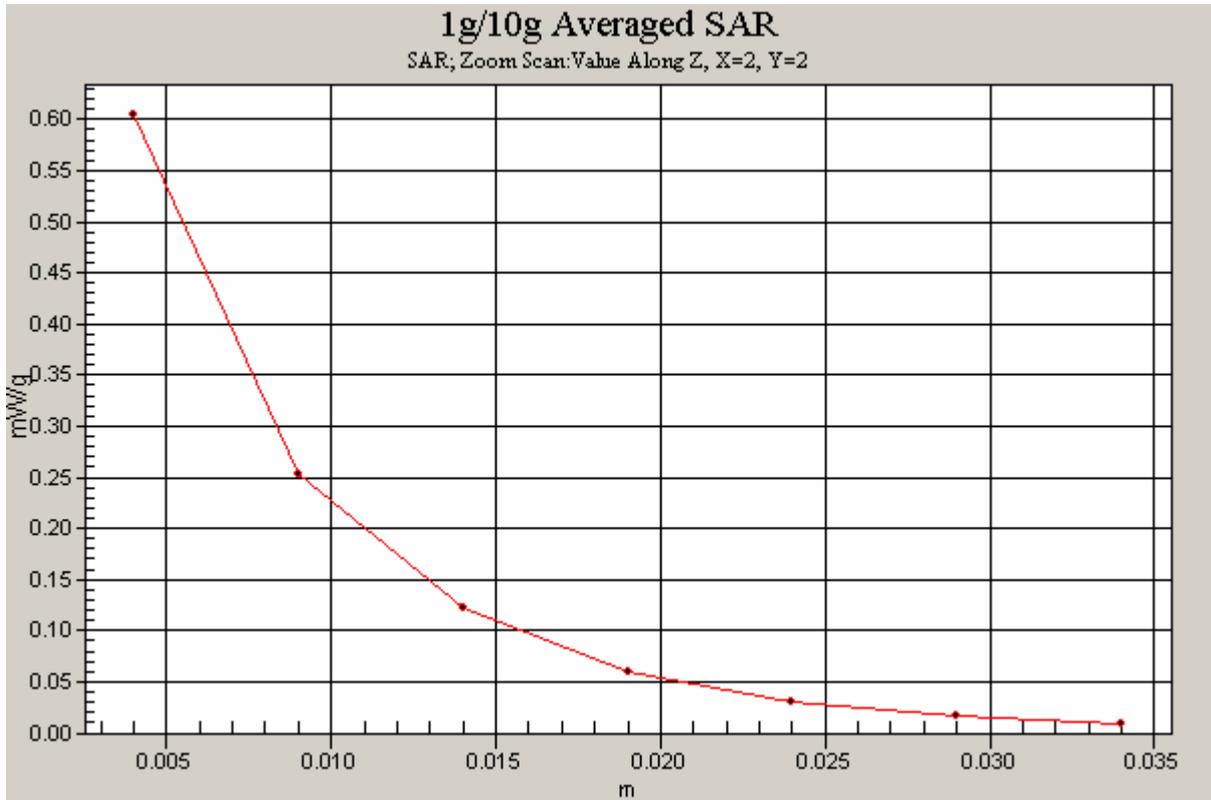


Figure 50 Z-Scan at power reference point (WCDMA Band II with BenQ Joy book R55V Test Position 4 Channel 9400)

WCDMA Band II HSDPA with BenQ Joy book S72 Test Position 1 High

Communication System: WCDMA Band II+HSDPA; Frequency: 1907.6 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 1 High/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 22.9 V/m; Power Drift = -0.192 dB

Peak SAR (extrapolated) = 1.69 W/kg

SAR(1 g) = 0.943 mW/g; SAR(10 g) = 0.513 mW/g

Maximum value of SAR (measured) = 1.09 mW/g

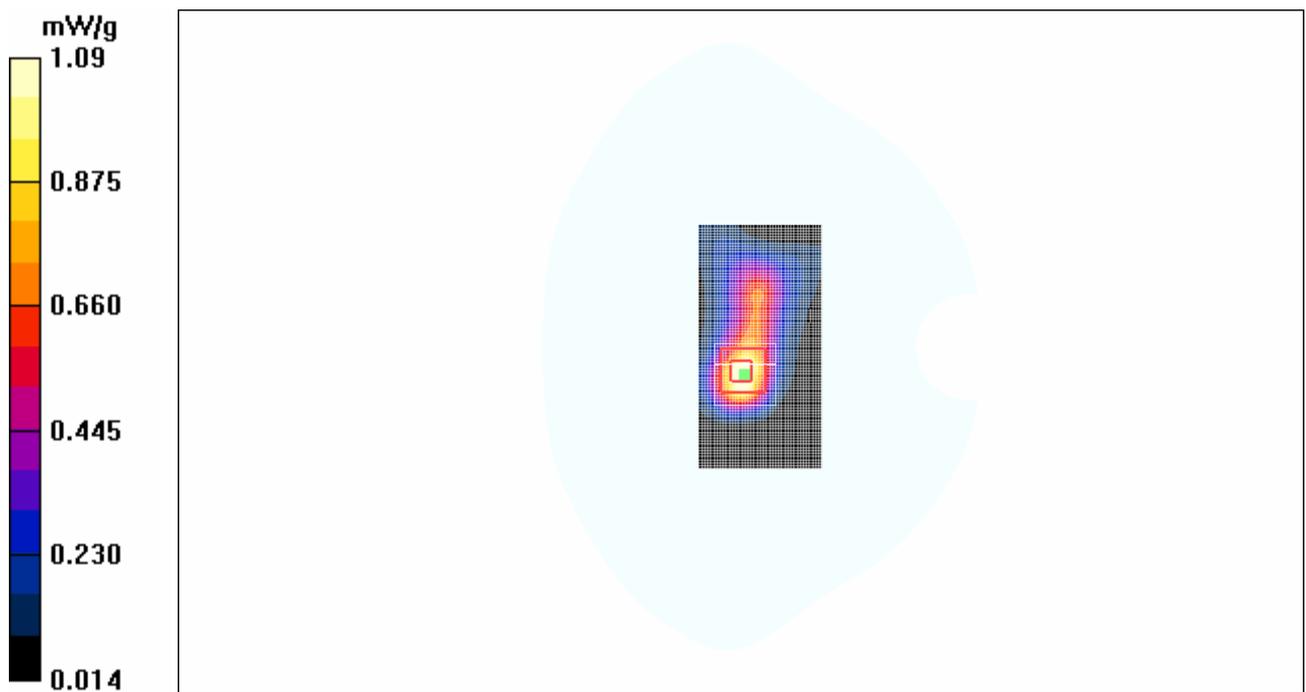


Figure 51 WCDMA Band II HSDPA with BenQ Joy book S72 Test Position 1 Channel 9538

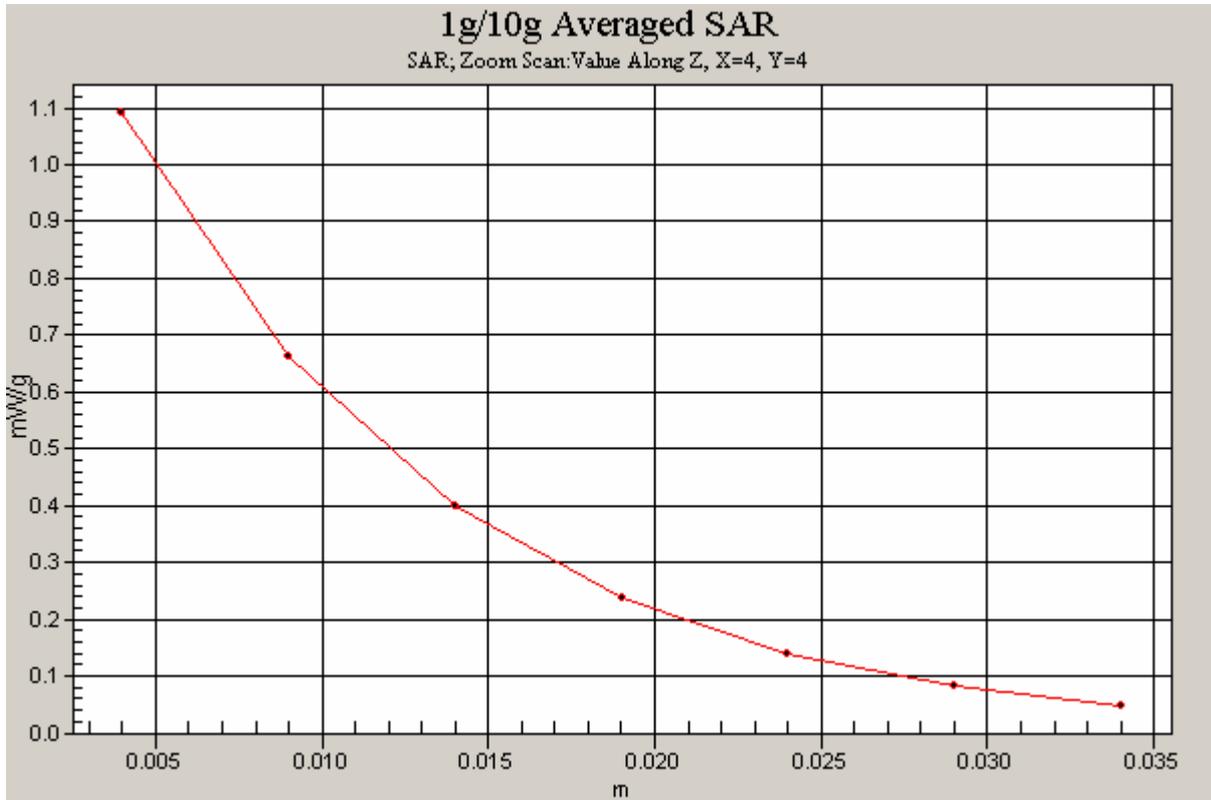


Figure 52 Z-Scan at power reference point (WCDMA Band II HSDPA with BenQ Joy book S72
Test Position 1 Channel 9538)

WCDMA Band II HSDPA with BenQ Joy book S72 Test Position 1 Middle

Communication System: WCDMA Band II+HSDPA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 24.1 V/m; Power Drift = -0.027 dB

Peak SAR (extrapolated) = 1.82 W/kg

SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.617 mW/g

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



Figure 53 WCDMA Band II HSDPA with BenQ Joy book S72 Test Position 1 Channel 9400

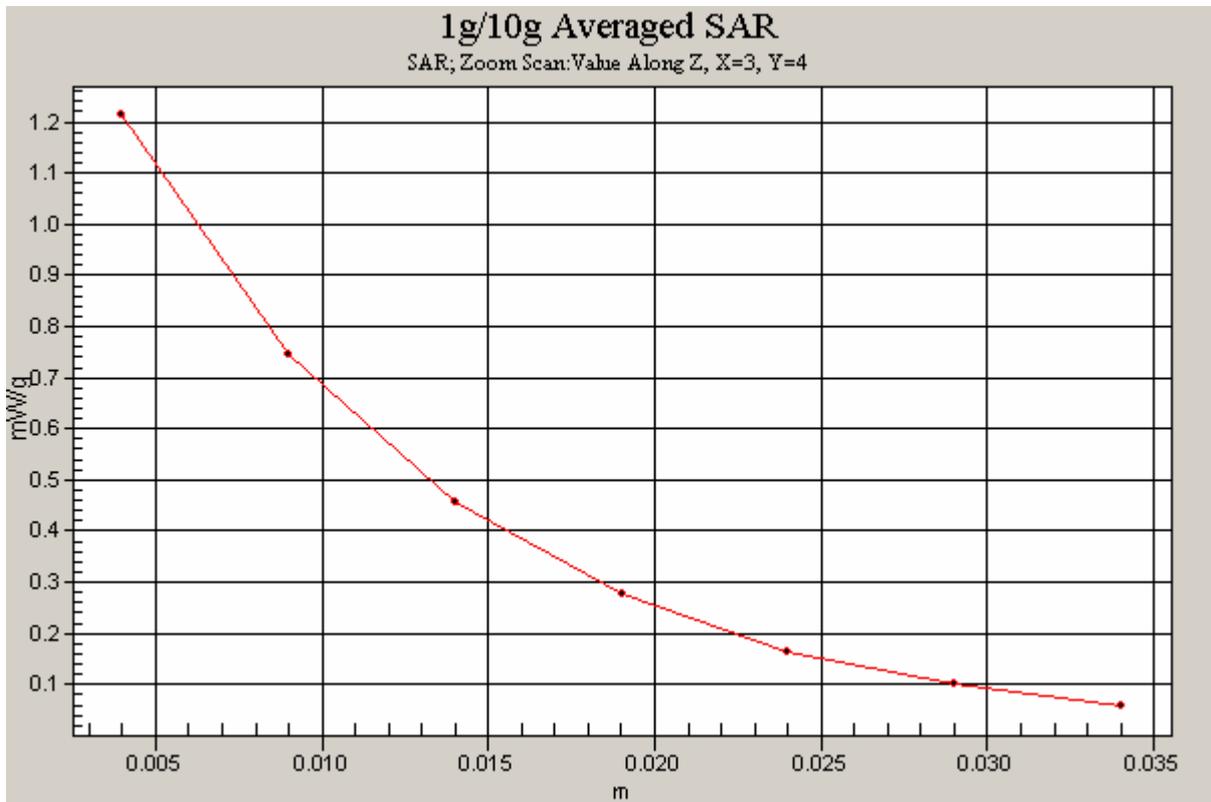


Figure 54 Z-Scan at power reference point (WCDMA Band II HSDPA with BenQ Joy book S72
Test Position 1 Channel 9400)

WCDMA Band II HSDPA with BenQ Joy book S72 Test Position 1 Low

Communication System: WCDMA Band II+HSDPA; Frequency: 1852.4 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1852.4$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64);

Electronics: DAE3 Sn452;

Test Position 1 Low/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 23.6 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.874 mW/g; SAR(10 g) = 0.487 mW/g

Maximum value of SAR (measured) = 0.984 mW/g

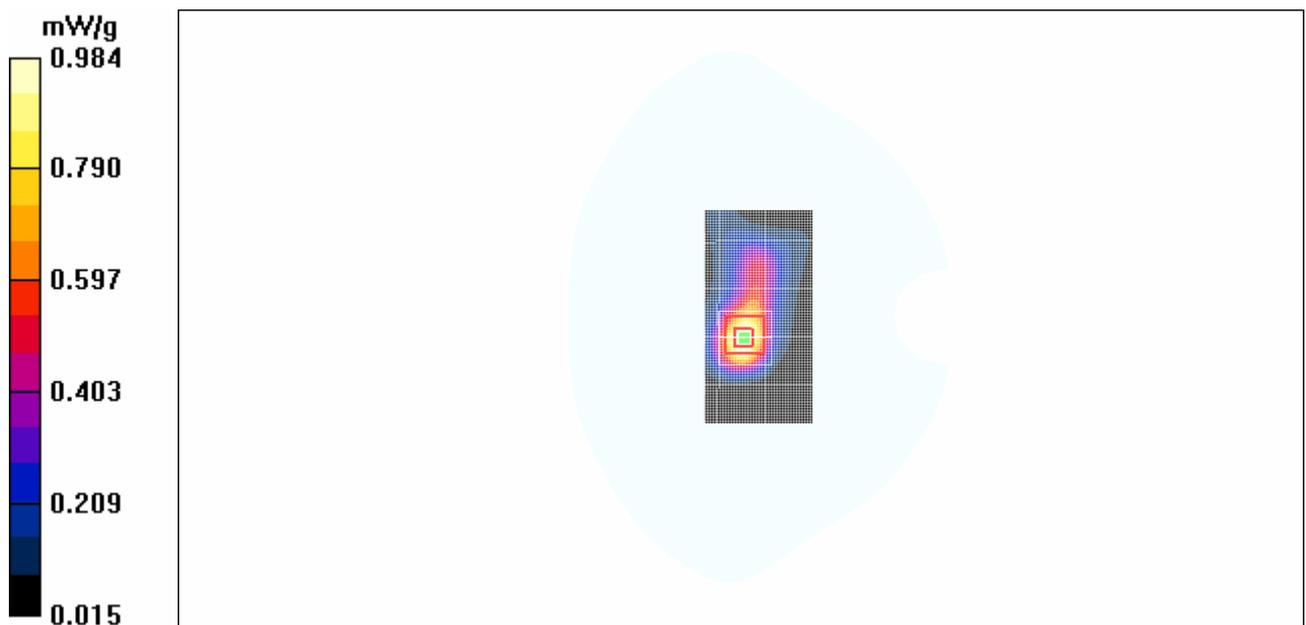


Figure 55 WCDMA Band II HSDPA with BenQ Joy book S72 Test Position 1 Channel 9262

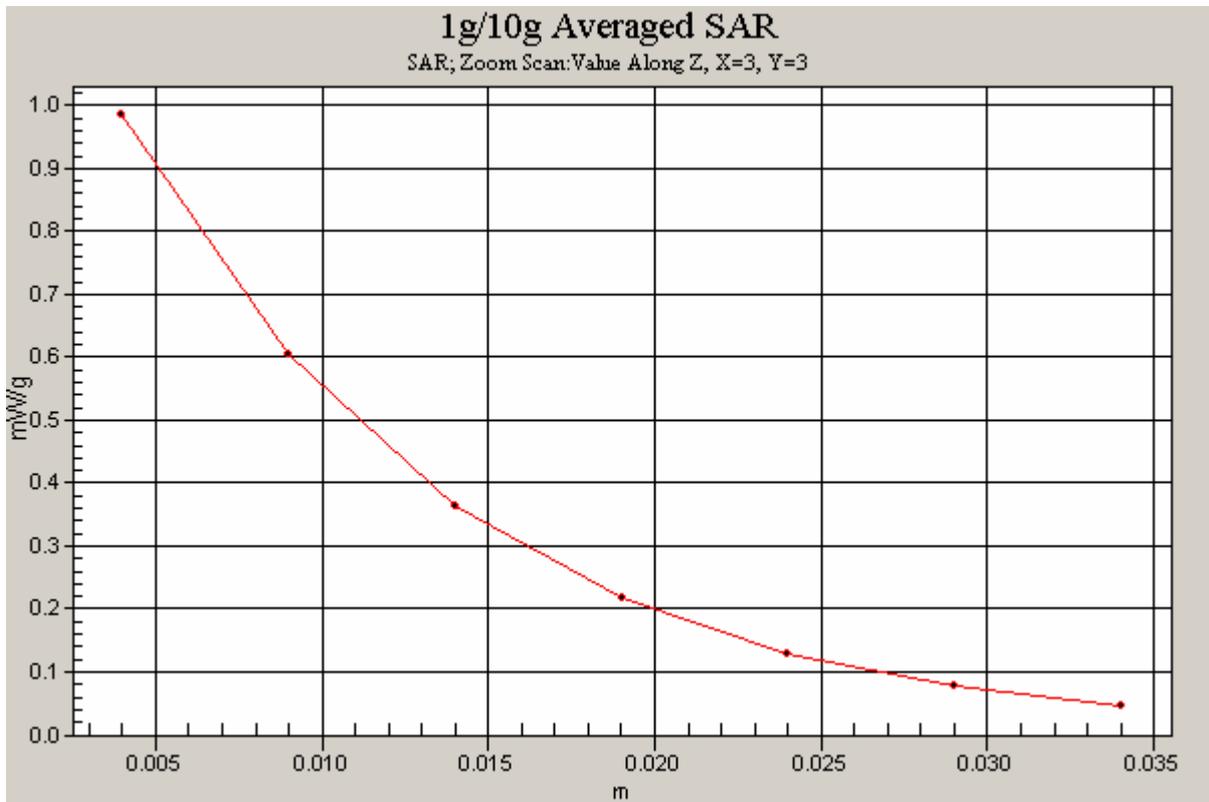


Figure 56 Z-Scan at power reference point (WCDMA Band II HSDPA with BenQ Joy book S72
Test Position 1 Channel 9262)

WCDMA Band V with BenQ Joy book S72 Test Position 1 Middle

Communication System: WCDMA Band V; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.527 mW/g

Test Position 1 Middle/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) = 0.672 W/kg

SAR(1 g) = 0.461 mW/g; SAR(10 g) = 0.292 mW/g

Maximum value of SAR (measured) = 0.500 mW/g



Figure 57 WCDMA Band V with BenQ Joy book S72 Test Position 1 Channel 4182

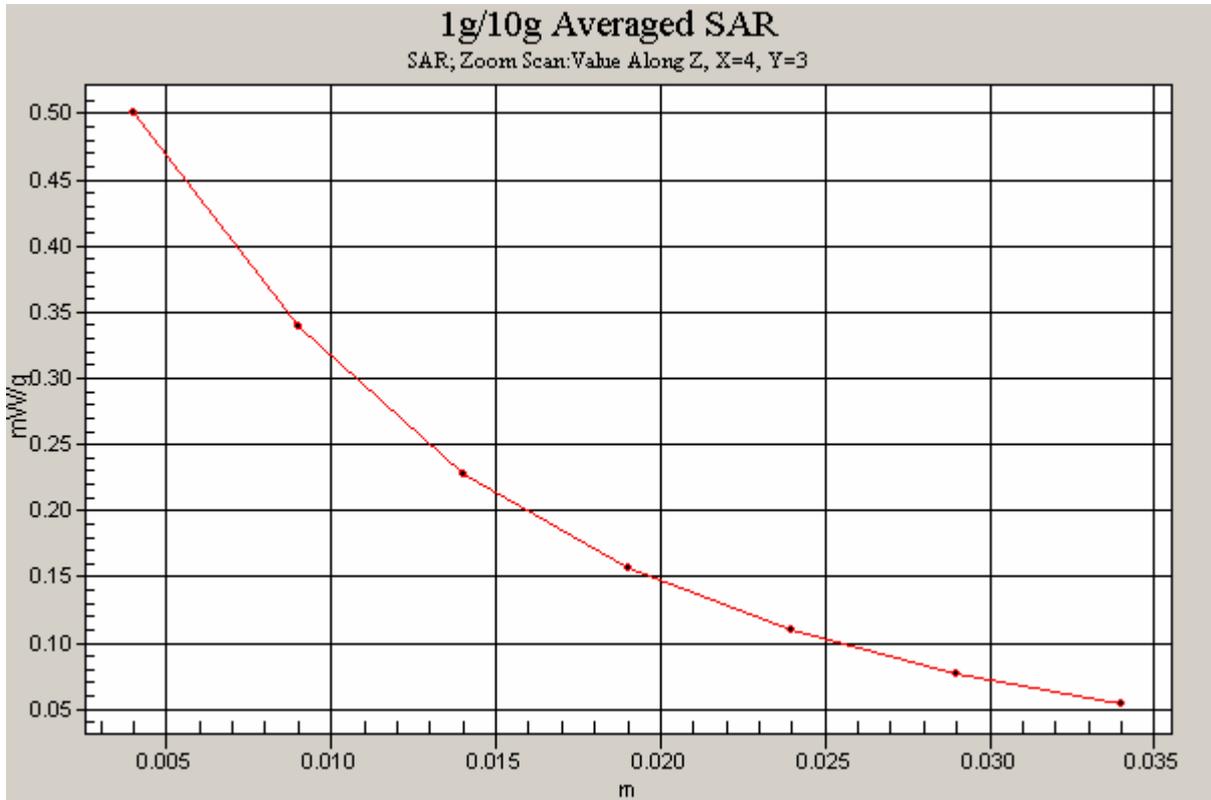


Figure 58 Z-Scan at power reference point (WCDMA Band V with BenQ Joy book S72 Test Position 1 Channel 4182)

WCDMA Band V with BenQ Joy book S72 Test Position 2 Middle

Communication System: WCDMA Band V; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 2 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 12.7 V/m; Power Drift = -0.189 dB

Peak SAR (extrapolated) = 0.679 W/kg

SAR(1 g) = 0.135 mW/g; SAR(10 g) = 0.044 mW/g

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

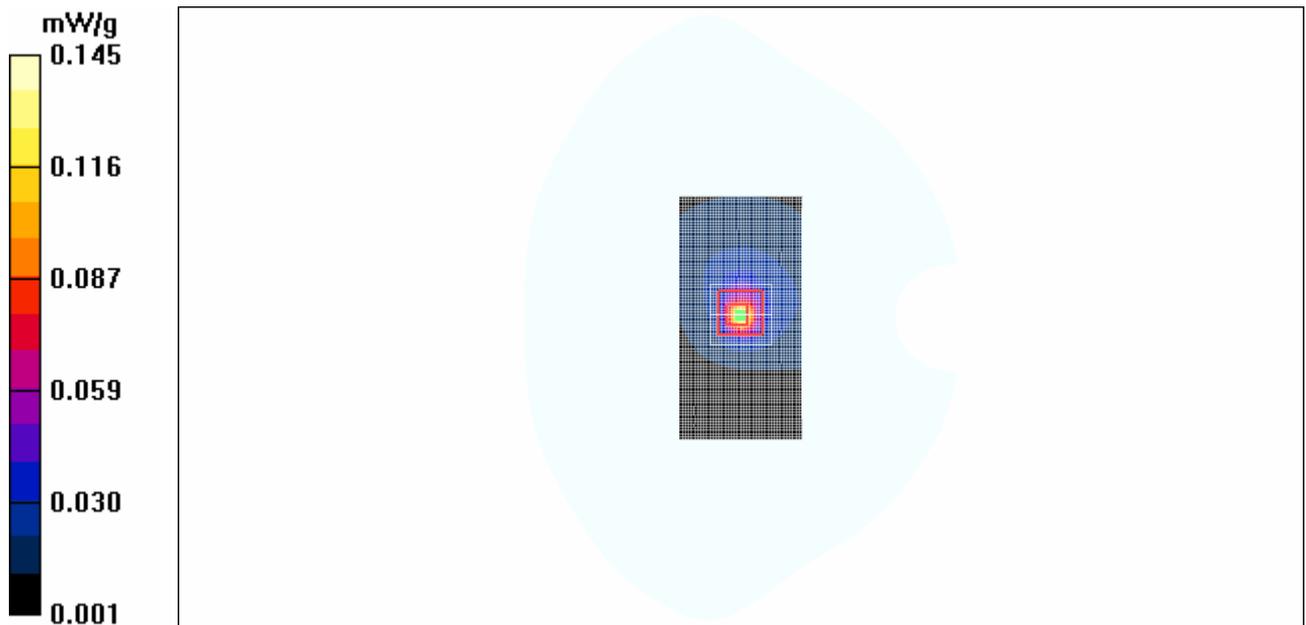


Figure 59 WCDMA Band V with BenQ Joy book S72 Test Position 2 Channel 4182

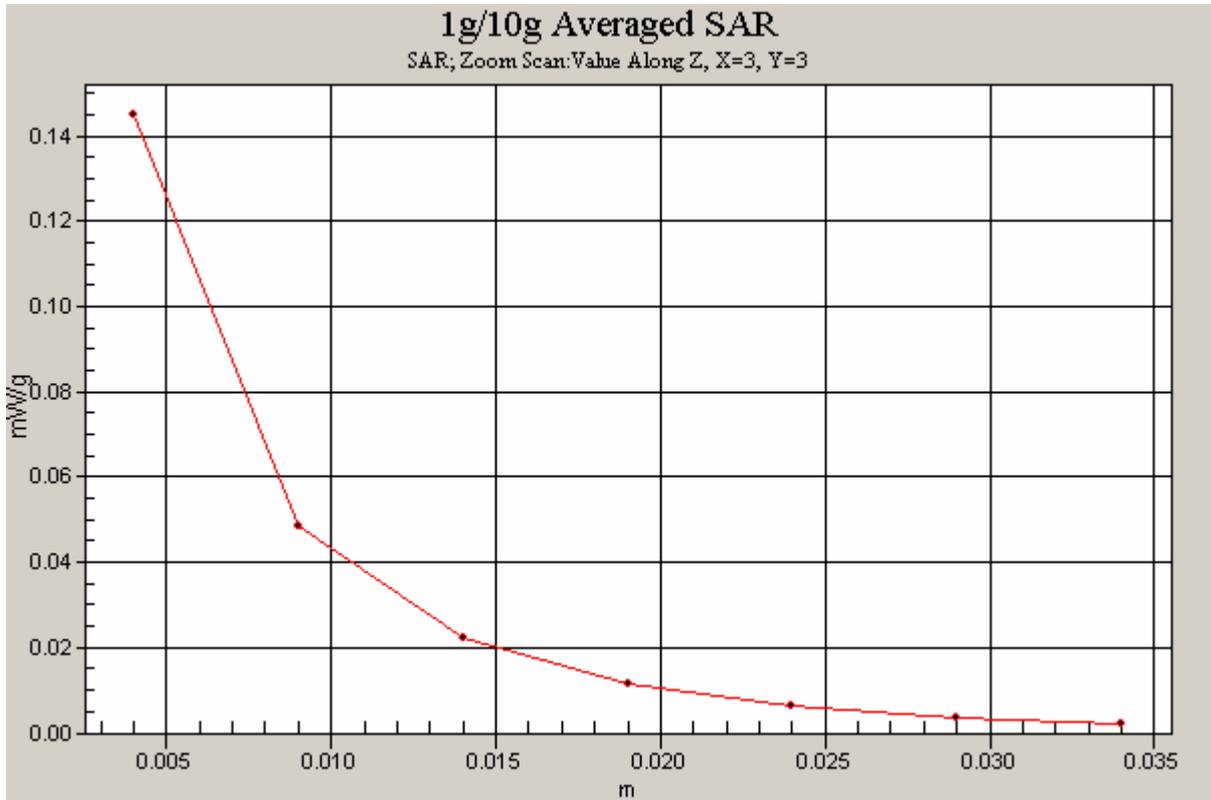


Figure 60 Z-Scan at power reference point (WCDMA Band V with BenQ Joy book S72 Test Position 2 Channel 4182)

WCDMA Band V with BenQ Joy book R55V Test Position 3 Middle

Communication System: WCDMA Band V; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 3 Middle 2/Area Scan (91x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.273 mW/g

Test Position 3 Middle 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.0 V/m; Power Drift = -0.053 dB

Peak SAR (extrapolated) = 0.320 W/kg

SAR(1 g) = 0.245 mW/g; SAR(10 g) = 0.174 mW/g

Maximum value of SAR (measured) = 0.264 mW/g

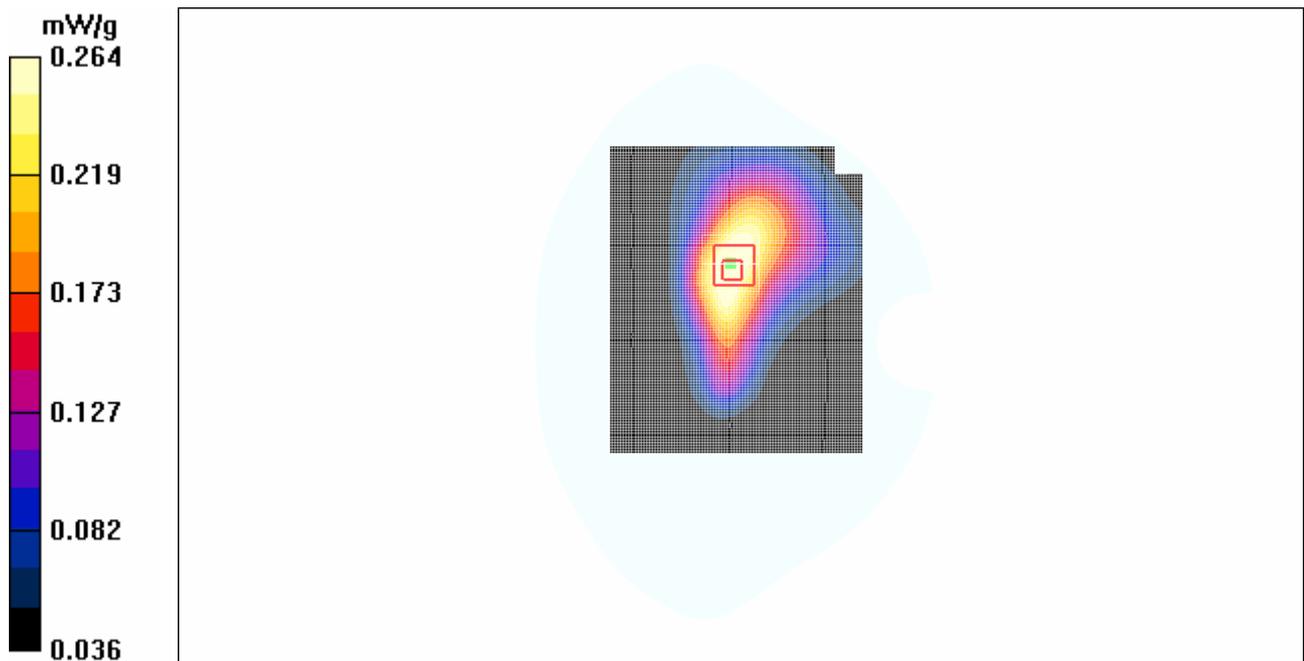


Figure 61 WCDMA Band V with BenQ Joy book R55V Test Position 3 Channel 4182

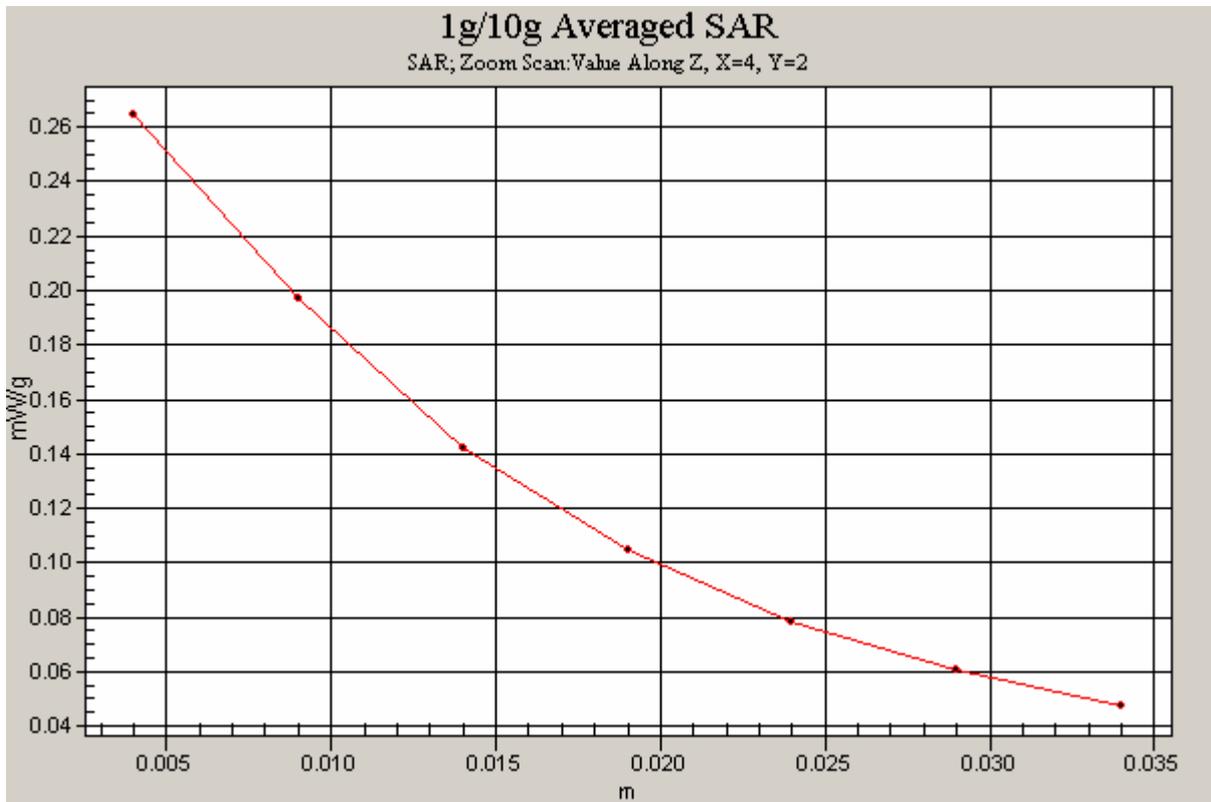


Figure 62 Z-Scan at power reference point (WCDMA Band V with BenQ Joy book R55V Test Position 3 Channel 4182)

WCDMA Band V with BenQ Joy book R55V Test Position 4 Middle

Communication System: WCDMA Band V; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 4 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.154 mW/g

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

Reference Value = 13.5 V/m; Power Drift = 0.032 dB

Peak SAR (extrapolated) = 0.712 W/kg

SAR(1 g) = 0.146 mW/g; SAR(10 g) = 0.047 mW/g

Maximum value of SAR (measured) = 0.148 mW/g

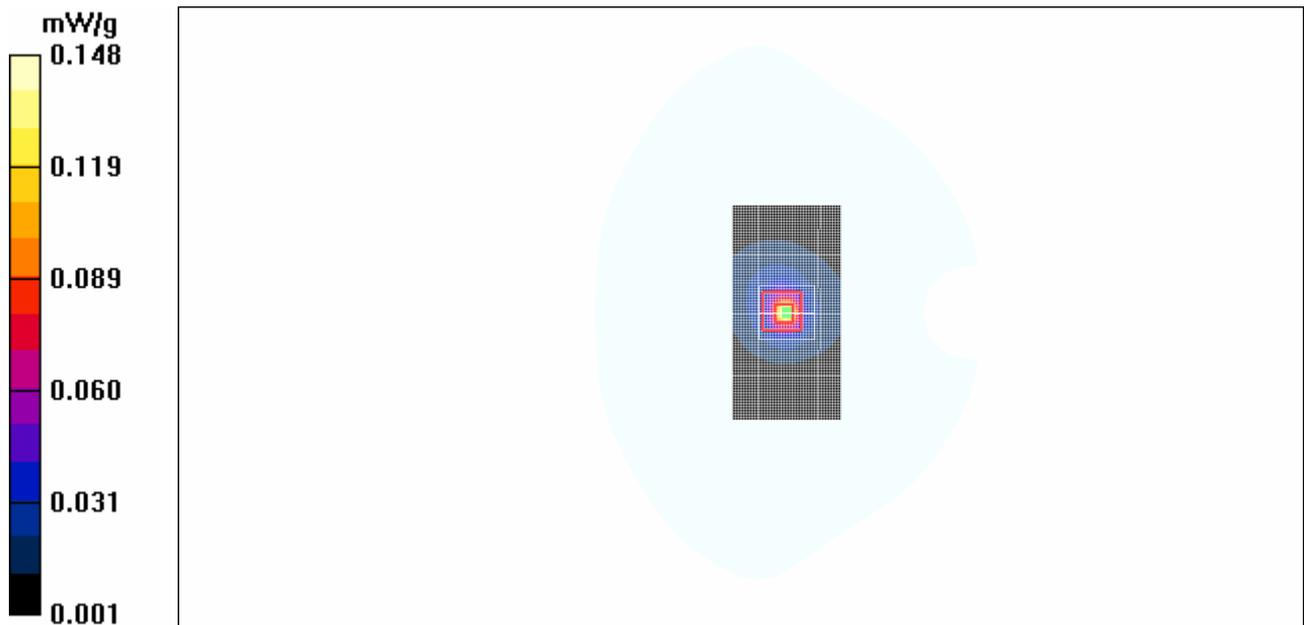


Figure 63 WCDMA Band V with BenQ Joy book R55V Test Position 4 Channel 4182

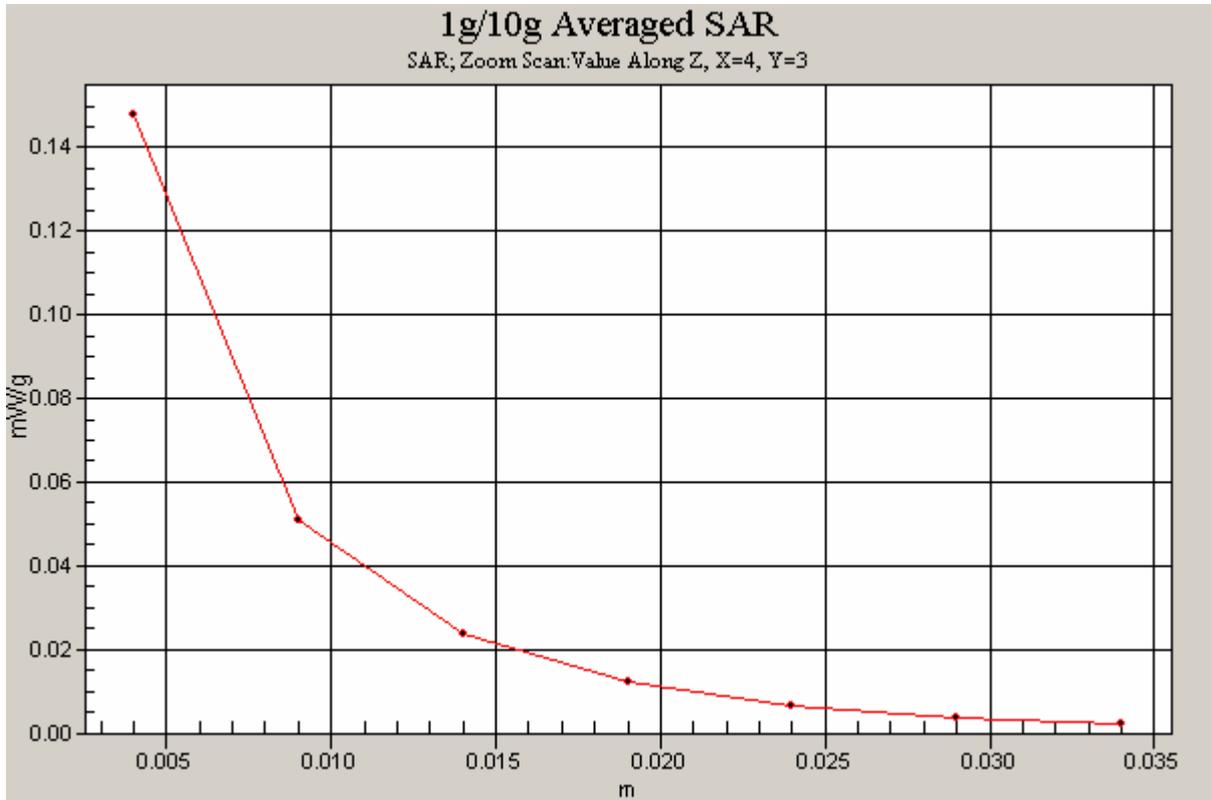


Figure 64 Z-Scan at power reference point (WCDMA Band V with BenQ Joy book R55V Test Position 4 Channel 4182)

WCDMA Band V HSDPA with BenQ Joy book S72 Test Position 1 Middle

Communication System: WCDMA Band V+HSDPA; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(6.52, 6.52, 6.52);

Electronics: DAE3 Sn452;

Test Position 1 Middle/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.385 mW/g

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

Reference Value = 16.7 V/m; Power Drift = -0.069 dB

Peak SAR (extrapolated) = 0.519 W/kg

SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.214 mW/g

Maximum value of SAR (measured) = 0.378 mW/g

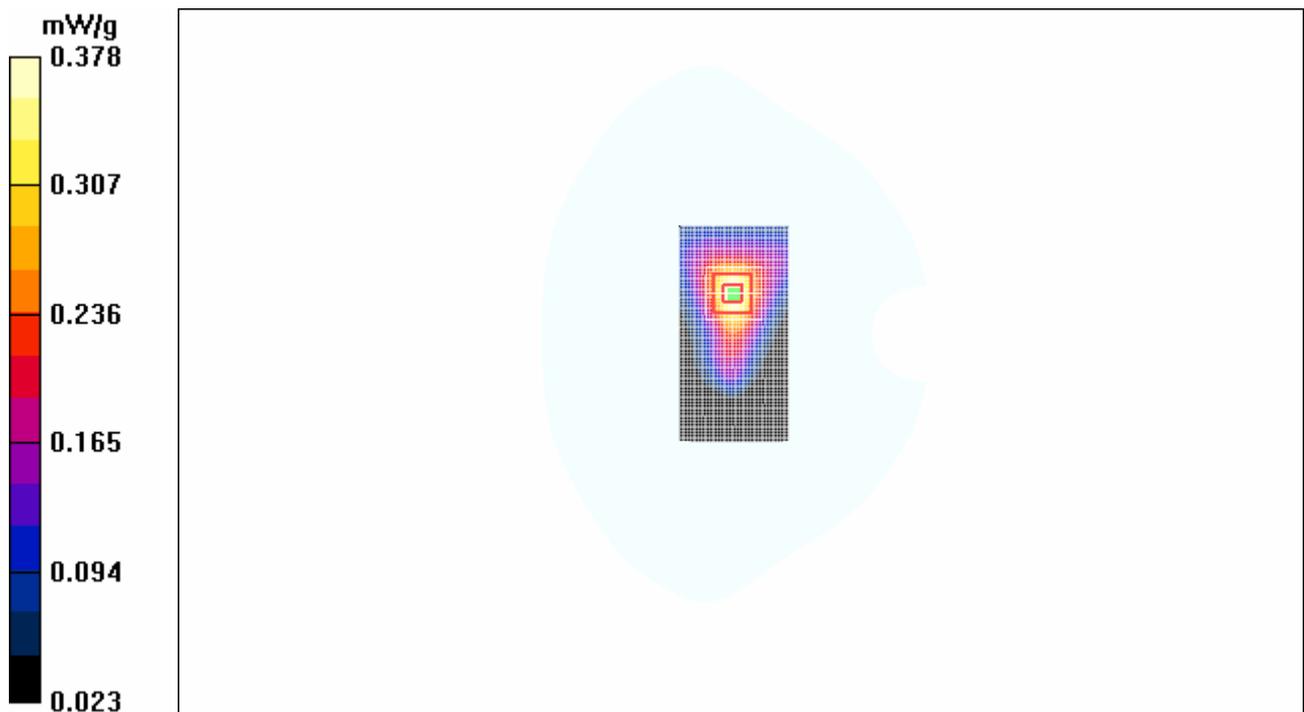


Figure 65 WCDMA Band V HSDPA with BenQ Joy book S72 Test Position 1 Channel 4182

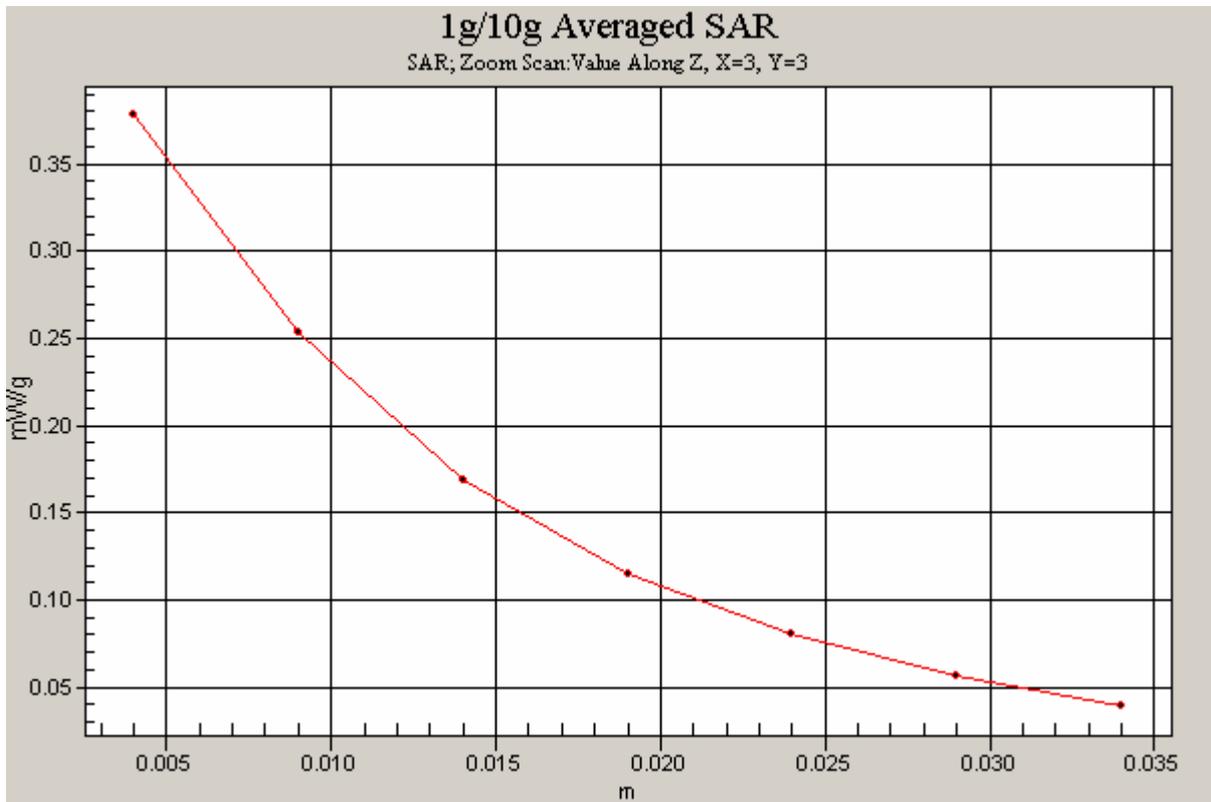


Figure 66 Z-Scan at power reference point (WCDMA Band V HSDPA with BenQ Joy book S72
Test Position 1 Channel 4182)

ANNEX D: SYSTEM VALIDATION RESULTS

System Performance Check at 835 MHz

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 443

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

Medium: Head 835MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.92 \text{ mho/m}$; $\epsilon_r = 42.36$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1531; ConvF(6.85, 6.85, 6.85);

- Electronics: DAE3 Sn452;

d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

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

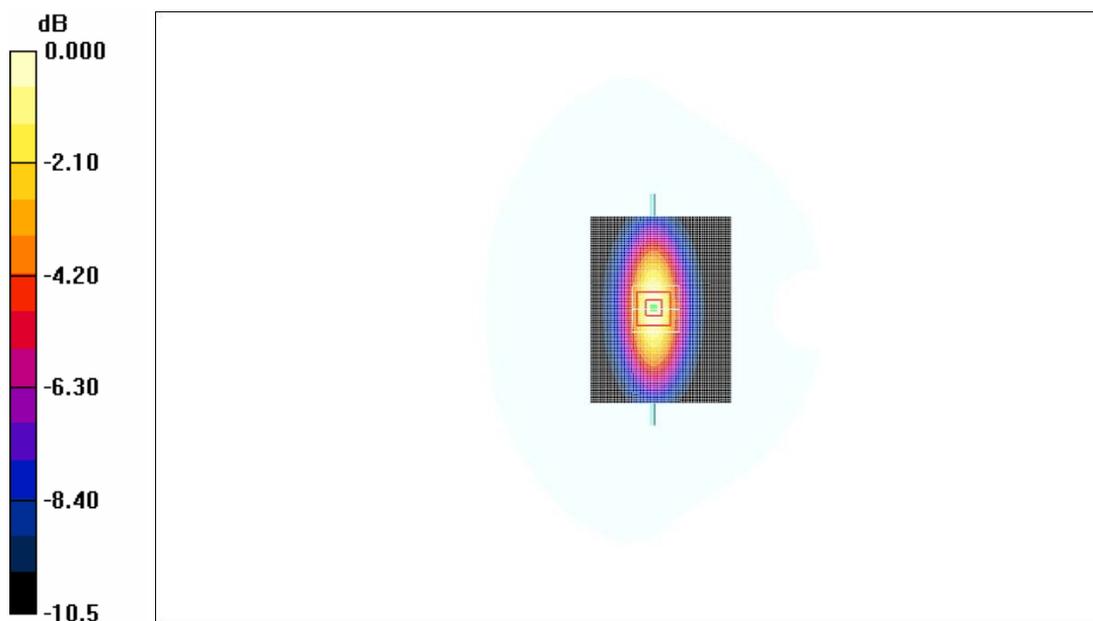
d=15mm, Pin=250mW/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.0 V/m; Power Drift = -0.061 dB

Peak SAR (extrapolated) = 3.44 W/kg

SAR(1 g) = 2.34 mW/g; SAR(10 g) = 1.53 mW/g

Maximum value of SAR (measured) = 2.52 mW/g



0 dB = 2.52mW/g

Figure 67 System Performance Check 835MHz 250mW

System Performance Check at 1900 MHz

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

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 39.68$; $\rho = 1000$ kg/m³

Probe: ET3DV6 - SN1531; ConvF(5.15, 5.15, 5.15);

Electronics: DAE3 Sn452;

d=10mm, Pin=250mW 2/Area Scan (101x121x1): Measurement grid: dx=10mm, dy=10mm

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

d=10mm, Pin=250mW 2/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.8 V/m; Power Drift = -0.018 dB

Peak SAR (extrapolated) = 16.0 W/kg

SAR(1 g) = 9.36 mW/g; SAR(10 g) = 4.93 mW/g

Maximum value of SAR (measured) = 10.7 mW/g

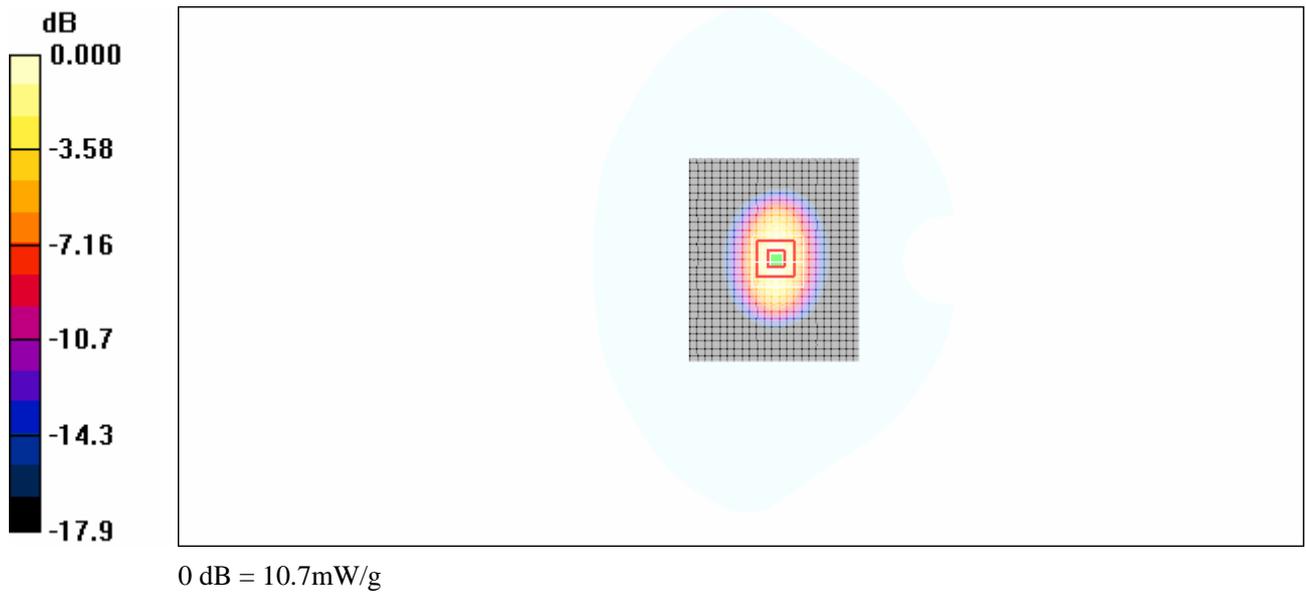


Figure 68 System Performance Check 1900MHz 250mW

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

No. RZA2008-0449FCC

Page 98of 128

ANNEX E: PROBE CALIBRATION CERTIFICATE

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




S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
C 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: **ET3-1531_Jan08**

CALIBRATION CERTIFICATE

Object: **ET3DV6 - SN:1531**

Calibration procedure(s): **QA CAL-01.v6 and QA CAL-12.v5
Calibration procedure for dosimetric E-field probes**

Calibration date: **January 29, 2008**

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&PE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (METAS, No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (SPEAG, No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 654	20-Apr-07 (SPEAG, No. DAE4-654_Apr07)	Apr-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37300585	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Katja Pokorny	Technical Manager	
Approved by:	Nelis Kuster	Quality Manager	

Issued: January 29, 2008

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

Certificate No: ET3-1531_Jan08

Page 1 of 9

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}:** Assessed for E-field polarization $\theta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not 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.

ET3DV6 SN:1531

January 29, 2008

Probe ET3DV6

SN:1531

Manufactured:	July 15, 2000
Last calibrated:	January 22, 2007
Recalibrated:	January 29, 2008

Calibrated for DASY Systems

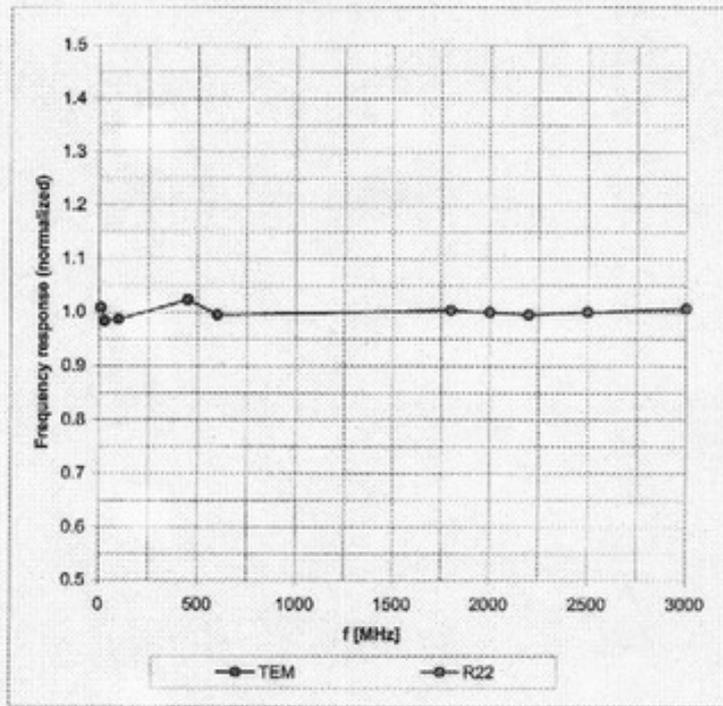
(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1531

January 29, 2008

Frequency Response of E-Field

(TEM-Cell: if1110 EXX, Waveguide: R22)

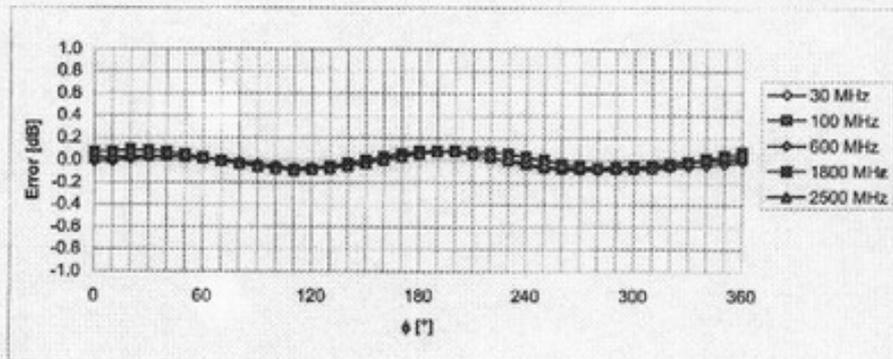
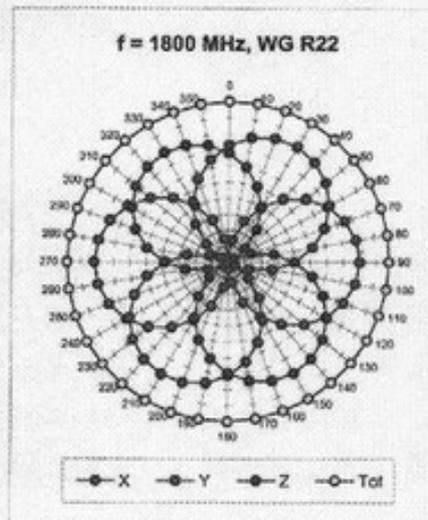
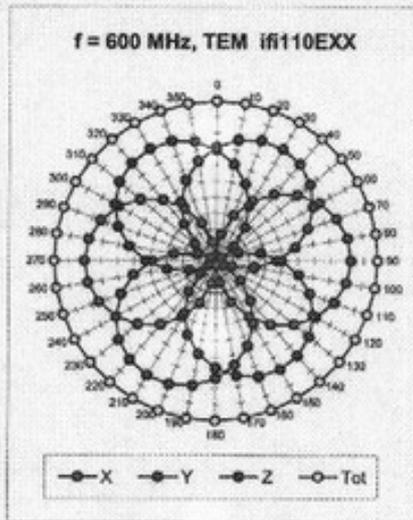


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

ET3DV6 SN:1531

January 29, 2008

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

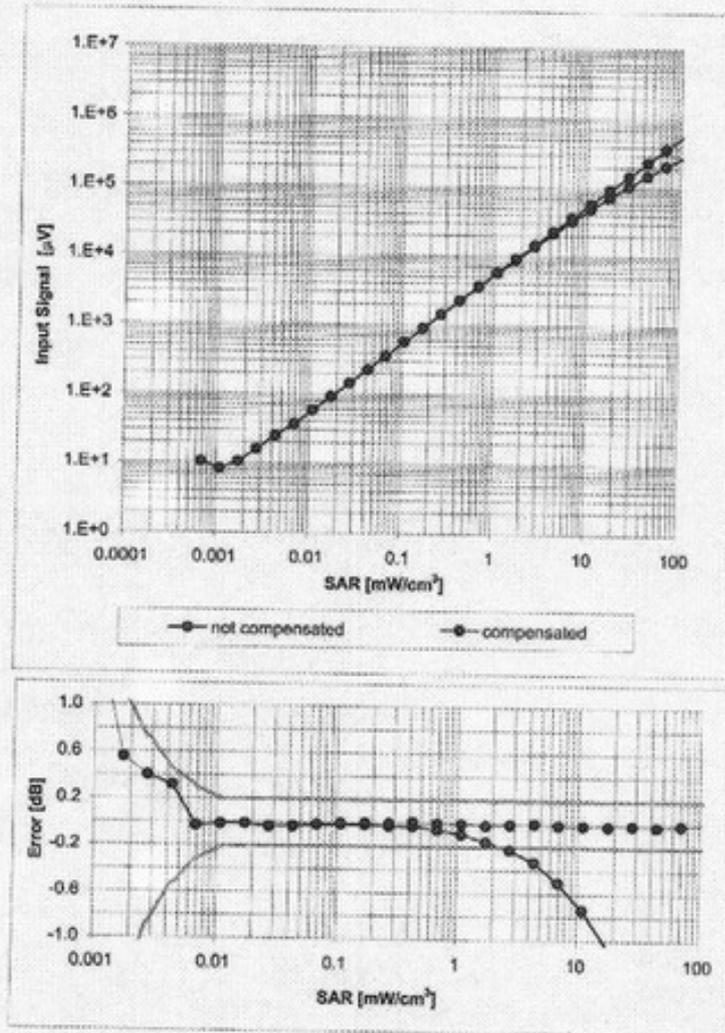


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

ET3DV6 SN:1531

January 29, 2008

Dynamic Range $f(SAR_{head})$
(Waveguide R22, $f = 1800$ MHz)

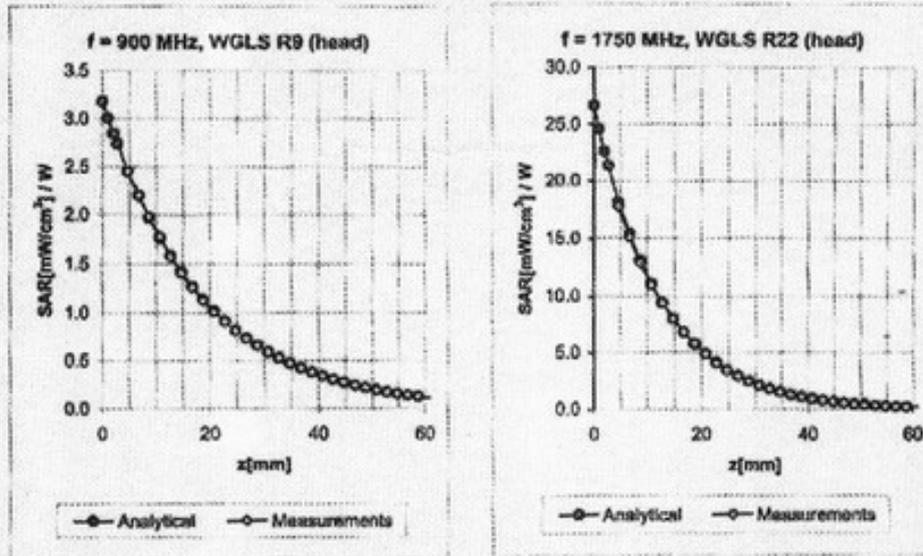


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

ET3DV6 SN:1531

January 29, 2008

Conversion Factor Assessment



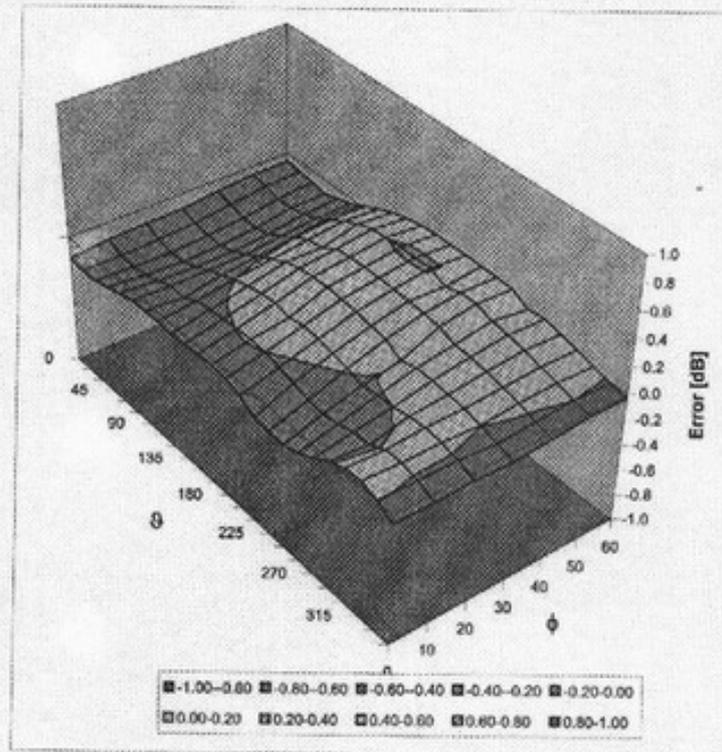
f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.27	2.89	6.85 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.52	2.56	5.42 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.49	2.89	5.15 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.35	2.82	6.52 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.56	2.68	4.97 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.88	2.07	4.64 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.68	2.16	4.10 ± 11.8% (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.

ET3DV6 SN:1531

January 29, 2008

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

No. RZA2008-0449FCC

Page 107 of 128

ANNEX F: 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 Federal Office of Metrology and Accreditation
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 **TMC China**

Certificate No: **D835V2-443_Dec07**

CALIBRATION CERTIFICATE

Object	D835V2-SN: 443
Calibration procedure(s)	QA CAL-05.v6 Calibration procedure for dipole validation kits
Calibration date:	December 9, 2007
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 at an environment temperature (22±3)°C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	13-Sep-07 (METAS, NO. 217-00608)	Sep-08
Power sensor 8481A	US37292783	13-Sep-07 (METAS, NO. 217-00608)	Sep-08
Reference 20 dB Attenuator	SN:5088 (20g)	12-Jul-07 (METAS, NO. 217-00591)	Jul-08
Reference 10 dB Attenuator	SN:5047_2 (10r)	12-Jul-07 (METAS, NO. 217-00591)	Jul-08
DAE4	SN:601	30-Jan-07 (SPEAG, NO.DAE4-601_Jan07)	Jan-08
Reference Probe ET3DV6 (HF)	SN: 1507	19-Sep-07 (SPEAG, NO. ET3-1507_Sep07)	Sep-08
Secondary Standards	ID#	Check Data (In house)	Scheduled Calibration
Power sensor HP 8481A	MY41092317	18-Oct-02(SPEAG, in house check Oct-07)	In house check: Oct-09
RF generator Agilent E4421B	MY41000878	11-May-05(SPEAG, in house check Nov-07)	In house check: Nov-09
Network Analyzer HP 8753E	US37390585S4208	18-Oct-01(SPEAG, in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Marcel Fehr	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Director	

Issued: December 10, 2007

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

TA Technology (Shanghai) Co., Ltd.

Test Report

No. RZA2008-0449FCC

Page 108 of 128

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8804 Zurich, Switzerland



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

Accredited by the Swiss Federal Office of Metrology and Accreditation
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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- 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 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	DASY4	V4.7
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 ± 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 ± 0.2) °C	40.2 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature during test	(21.2 ± 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	2.43 mW / g
SAR normalized	normalized to 1W	9.72 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	9.70 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.56 mW / g
SAR normalized	normalized to 1W	6.24 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	6.31 mW / g ± 16.5 % (k=2)

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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.9Ω - 6.8 jΩ
Return Loss	- 25.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.402 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	September 3, 2001

DASY4 Validation Report for Head TSL

Date/Time: 9.12.2007 14:20:15

Test laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; serial: D835V2-SN: 443

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

Medium: HSL 835 MHz;

Medium parameters used: $f=835$ MHz; $\sigma=0.89$ mho/m; $\epsilon_r=40.2$; $\rho= 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6-SN1507(HF); ConvF(6.01,6.01,6.01); Calibrated: 19.9.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.1_2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA;
- Measurement SW: DASY, V4.7 Build 53; Post processing SW: SEMCAD, V1.8 Build 172

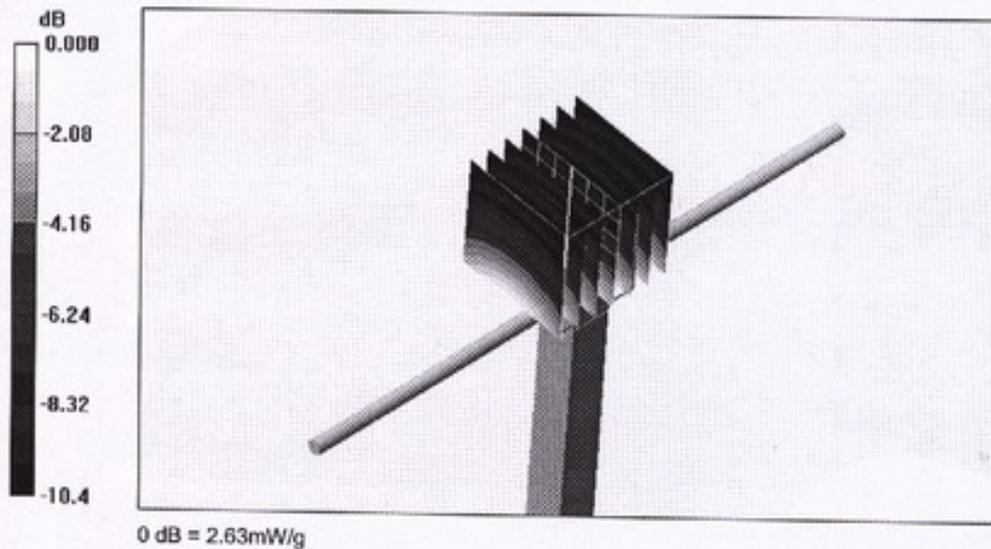
Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.3 V/m; Power Drift = 0.015dB

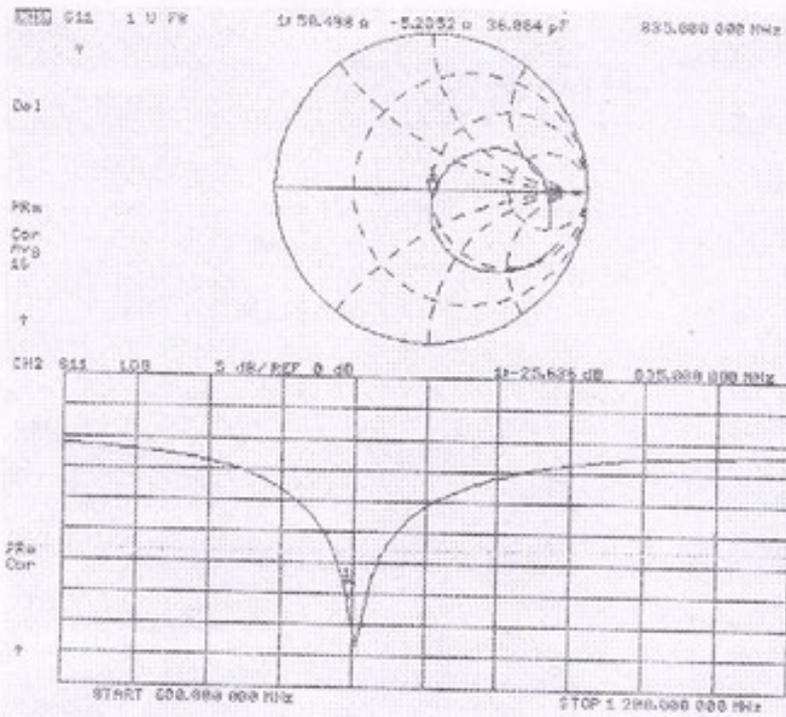
Peak SAR (extrapolated) = 3.65 W/kg

SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.56 mW/g

Maximum value of SAR (measured) = 2.63 mW/g



Impedance measurement Plot for Head TSL



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

No. RZA2008-0449FCC

Page 113 of 128

ANNEX G: D1900V2 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 Federal Office of Metrology and Accreditation
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: **D1900V2-5d018_Mar08**

CALIBRATION CERTIFICATE

Object: **D1900V2 - SN: 5d018**

Calibration procedure(s): **QA CAL-05.v6
Calibration procedure for dipole validation kits**

Calibration date: **March 21, 2008**

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	23-Sep-07 (METAS, No. 217-00608)	Sep-08
Power sensor HP 8481A	US37292783	23-Sep-07 (METAS, No. 217-00608)	Sep-08
Reference 20 dB Attenuator	SN: 5086 (20g)	21-Jun-07 (METAS, No 217-00581)	Jun-08
Reference 10 dB Attenuator	SN: 5047.2 (10r)	21-Jun-07 (METAS, No 217-00591)	Jun-08
Reference Probe ET3DV6	SN: 1507	11-Sep-07 (SPEAG, No. ET3-1507_Sep07)	Sep-08
Reference Probe ES3DV3	SN: 3025	11-Sep-07 (SPEAG, No. ES3-3025_Sep07)	Sep-08
DAE4	SN 601	15-Jan-06 (SPEAG, No. DAE4-601_Jan06)	Jan-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-07)	In house check: Oct-09
RF generator Agilent E4421B	MY41000875	11-May-05 (SPEAG, in house check Nov-07)	In house check: Nov-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

Calibrated by: **Claudio Leubler** (Name), **Laboratory Technician** (Function), *[Signature]* (Signature)

Approved by: **Katja Pokovic** (Name), **Technical Manager** (Function), *[Signature]* (Signature)

Issued: **March 22, 2008**

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

TA Technology (Shanghai) Co., Ltd.

Test Report

No. RZA2008-0449FCC

Page 114 of 128

**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 Federal Office of Metrology and Accreditation
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 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	DASY4	V4.7
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	1900 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	39.6 ± 6 %	1.43 mho/m ± 6 %
Head TSL temperature during test	(21.3 ± 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	9.45 mW / g
SAR normalized	normalized to 1W	37.8 mW / g
SAR for nominal Head TSL parameters. ¹	normalized to 1W	36.4 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	4.98 mW / g
SAR normalized	normalized to 1W	19.9 mW / g
SAR for nominal Head TSL parameters. ¹	normalized to 1W	19.5 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	52.0 ± 6 %	1.55 mho/m ± 6 %
Body TSL temperature during test	(21.3 ± 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	9.63 mW / g
SAR normalized	normalized to 1W	38.5 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	36.8 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.21 mW / g
SAR normalized	normalized to 1W	20.8 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	20.2 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	52.5 Ω + 3.3 j Ω
Return Loss	-27.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.5 Ω + 2.9 j Ω
Return Loss	-29.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.203 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	June 4, 2002

4

DASY4 Validation Report for Head TSL

Date/Time: 21.03.2008 15:30:20

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.97, 4.97, 4.97); Calibrated: 11.09.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.01.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

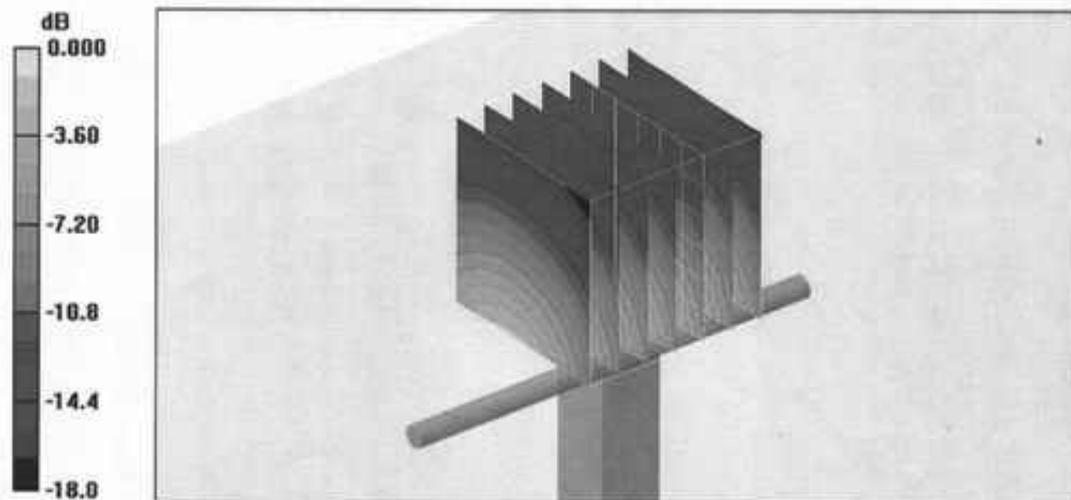
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.8 V/m; Power Drift = 0.057 dB

Peak SAR (extrapolated) = 16.2 W/kg

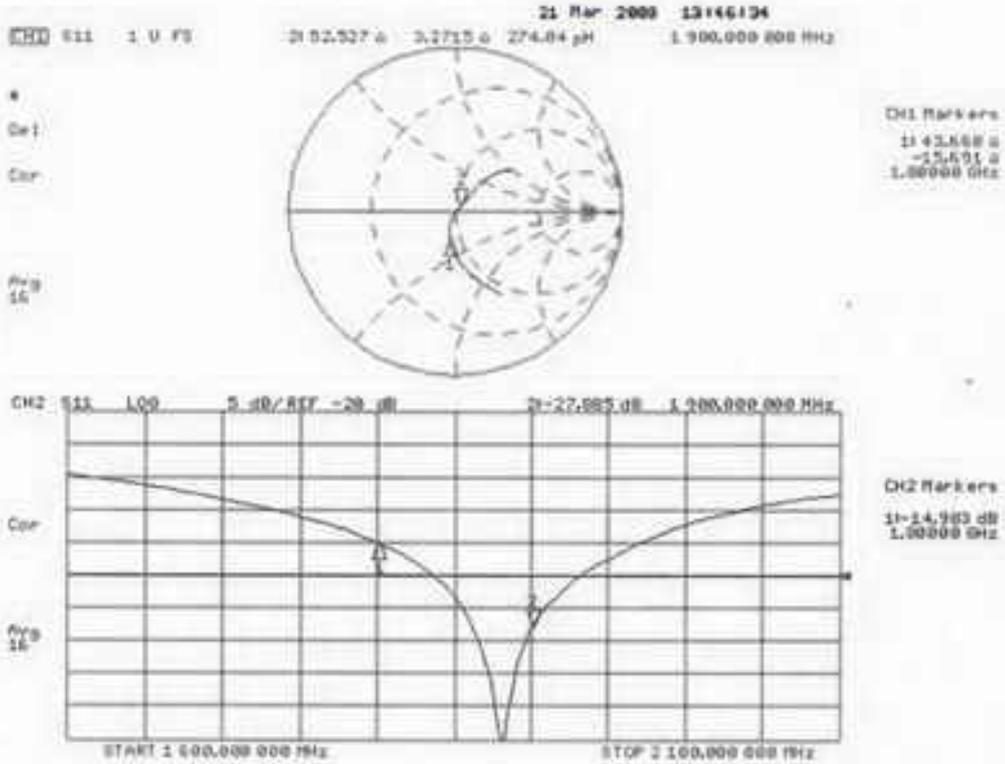
SAR(1 g) = 9.45 mW/g; SAR(10 g) = 4.98 mW/g

Maximum value of SAR (measured) = 10.7 mW/g



0 dB = 10.7mW/g

Impedance Measurement Plot for Head TSL



DASY4 Validation Report for Body TSL

Date/Time: 21.03.2008 16:41:02

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: MSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.43, 4.43, 4.43); Calibrated: 11.09.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.01.2008
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

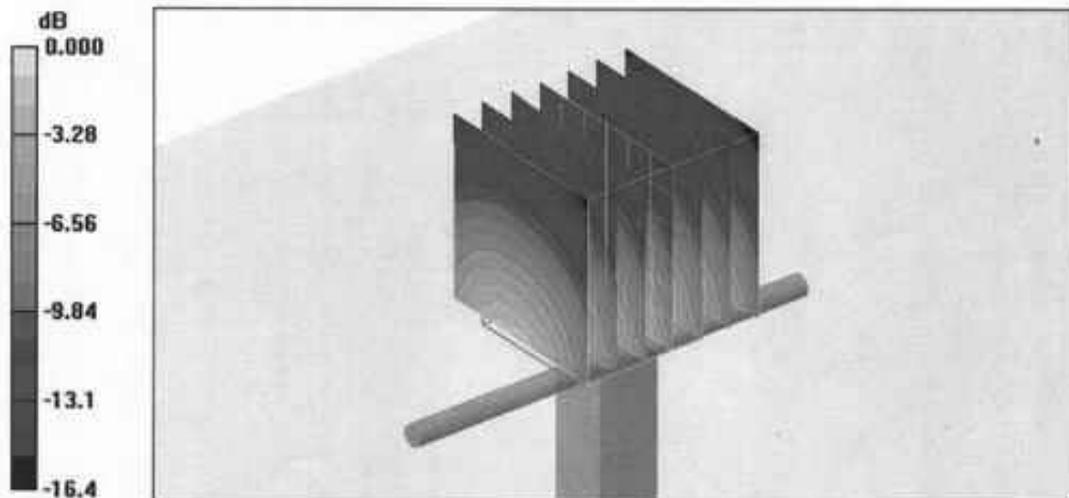
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.2 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 16.1 W/kg

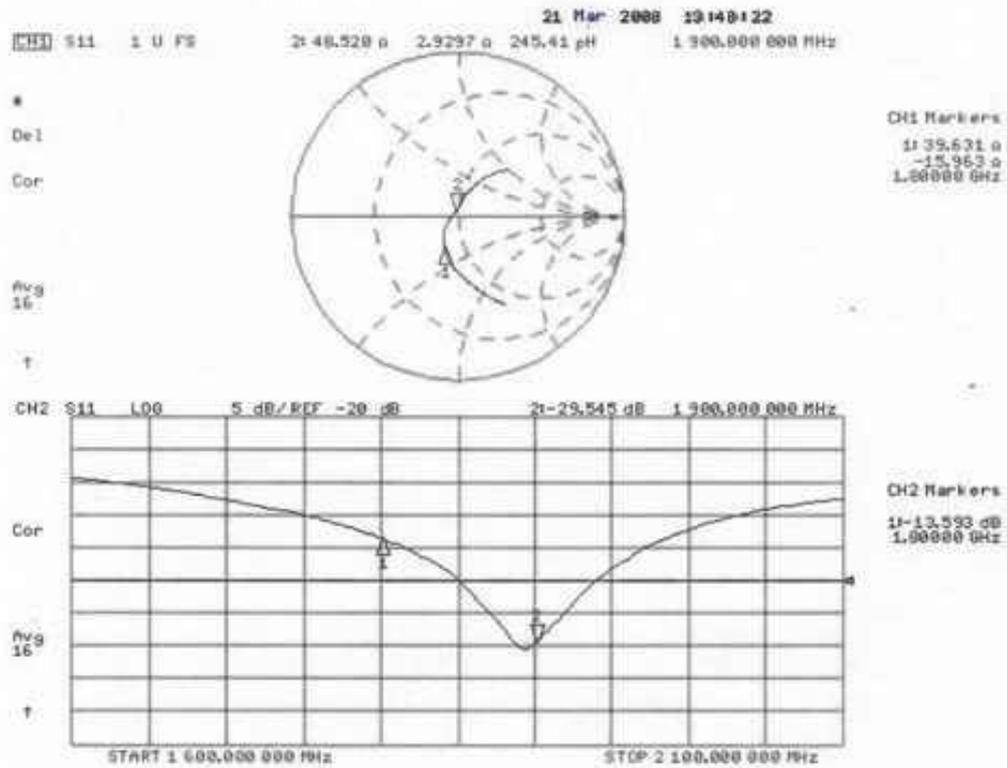
SAR(1 g) = 9.63 mW/g; SAR(10 g) = 5.21 mW/g

Maximum value of SAR (measured) = 11.3 mW/g



0 dB = 11.3mW/g

Impedance Measurement Plot for Body TSL



ANNEX H: DAE3 CALIBRATION CERTIFICATE

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

IMPORTANT NOTICE

USAGE OF THE DAE 3

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

Battery Exchange: The battery cover of the DAE3 unit is connected to a fragile 3-pin battery connector. Customer is responsible to apply utmost caution not to bend or damage the connector when changing batteries.

Shipping of the DAE: Before shipping the DAE to SPEAG for calibration Customer shall remove the batteries and pack the DAE in an antistatic bag. The packaging shall protect the DAE from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside.

E-Stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, Customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

Important Note:

Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.

Important Note:

Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.

Schmid & Partner Engineering

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

No. RZA2008-0449FCC

Page 123 of 128

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



S Schweizerischer Kalibrierdienst
S Service suisse d'étalonnage
C 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: **DAE3-452_Sep07**

CALIBRATION CERTIFICATE

Object: **DAE3 - SD 000 D03 AA - SN: 452**

Calibration procedure(s): **QA CAL-06.v12
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **September 6, 2007**

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
Fuke Process Calibrator Type 702	SN: 6295803	04-Oct-06 (Eloca AG, No: 6467)	Oct-07
Keithley Multimeter Type 2001	SN: 0810278	03-Oct-06 (Eloca AG, No: 6465)	Oct-07
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1004	25-Jun-07 (SPEAG, in house check)	In house check Jun-06

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	
Approved by:	Fin Bornhof	R&D Director	

Issued: **September 6, 2007**

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

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



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

Accredited by the Swiss Federal Office of Metrology and Accreditation
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

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

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters contain technical information as a result from the performance test and require no uncertainty.
- *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
- *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
- *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
- *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
- *Input Offset Measurement:* Output voltage and statistical results over a large number of zero voltage measurements.
- *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
- *Input resistance:* DAE input resistance at the connector, during internal auto-zeroing and during measurement.
- *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
- *Power consumption:* Typical value for information. Supply currents in various operating modes.

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

DC Voltage Measurement

AD - Converter Resolution nominal

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

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

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

Calibration Factors	X	Y	Z
High Range	404.641 \pm 0.1% (k=2)	404.461 \pm 0.1% (k=2)	404.611 \pm 0.1% (k=2)
Low Range	3.96707 \pm 0.7% (k=2)	3.94791 \pm 0.7% (k=2)	3.96578 \pm 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	59° \pm 1°
---	--------------

TA Technology (Shanghai) Co., Ltd.

Test Report

No. RZA2008-0449FCC

Page 126 of 128

Appendix

1. DC Voltage Linearity

High Range	Input (μV)	Reading (μV)	Error (%)
Channel X + Input	200000	200000.7	0.00
Channel X + Input	20000	20005.67	0.03
Channel X - Input	20000	-20003.73	0.02
Channel Y + Input	200000	200000.0	0.00
Channel Y + Input	20000	20005.09	0.03
Channel Y - Input	20000	-20008.03	0.04
Channel Z + Input	200000	200000.3	0.00
Channel Z + Input	20000	20005.24	0.03
Channel Z - Input	20000	-20003.69	0.02

Low Range	Input (μV)	Reading (μV)	Error (%)
Channel X + Input	2000	1999.9	0.00
Channel X + Input	200	200.45	0.22
Channel X - Input	200	-200.63	0.31
Channel Y + Input	2000	2000.0	0.00
Channel Y + Input	200	199.25	-0.38
Channel Y - Input	200	-201.06	0.53
Channel Z + Input	2000	2000.1	0.00
Channel Z + Input	200	198.97	-0.51
Channel Z - Input	200	-201.22	0.61

2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	4.57	3.52
	-200	-3.00	-3.68
Channel Y	200	-8.79	-8.42
	-200	7.01	6.81
Channel Z	200	10.74	10.57
	-200	-14.09	-13.18

3. Channel separation

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

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	1.64	-0.44
Channel Y	200	0.09	-	1.73
Channel Z	200	-1.33	0.97	-

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

No. RZA2008-0449FCC

Page 127 of 128

4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	16115	16846
Channel Y	15877	16977
Channel Z	16145	17545

5. Input Offset Measurement

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

Input 10M Ω

	Average (μ V)	min. Offset (μ V)	max. Offset (μ V)	Std. Deviation (μ V)
Channel X	0.51	-0.06	1.31	0.23
Channel Y	-1.82	-2.65	-0.52	0.44
Channel Z	0.11	-0.74	0.80	0.33

6. Input Offset Current

Nominal input circuitry offset current on all channels: <25fA

7. Input Resistance

	Zeroing (M Ω)	Measuring (M Ω)
Channel X	0.2001	200.7
Channel Y	0.2000	201.1
Channel Z	0.2000	200.6

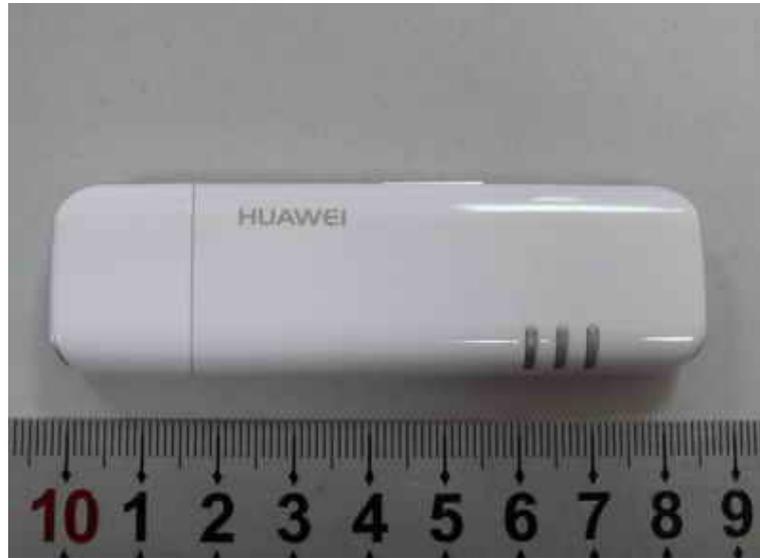
8. Low Battery Alarm Voltage (verified during pre test)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (verified during pre test)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.0	+6	+14
Supply (- Vcc)	-0.01	-8	-9

ANNEX I: THE EUT APPEARANCES AND TEST CONFIGURATION



Picture 5: Constituents of the sample



Picture 6-a: Test position 1



Picture 6-b: Test position 2



Picture 6-c: Test position 3



Picture 6-d: Test position 4

Picture 6: Test positions of EUT