



**No.** DAT-P-114/01-01

# TEST REPORT

No. 2006E00684-SAR

|                     |                                                  |
|---------------------|--------------------------------------------------|
| <b>Test name</b>    | Electromagnetic Field (Specific Absorption Rate) |
| <b>Product</b>      | GSM/GPRS Mobile Phone with Bluetooth Function    |
| <b>Model</b>        | CTS900                                           |
| <b>Client</b>       | CEC Wireless R&D Ltd                             |
| <b>Type of test</b> | Non Type Approval                                |

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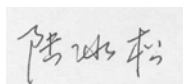
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|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                             |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------|
| Product Name                | GSM/GPRS Mobile Phone with Bluetooth Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Sample Model          | CTS900                      |
| Client                      | CEC Wireless R&D Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Type of test          | Non Type Approval           |
| Factory                     | CEC Wireless R&D Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Sampling arrival date | June 5 <sup>th</sup> , 2006 |
| Manufacturer                | CEC Wireless R&D Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |                             |
| Sampling/<br>Sending sample | Sending sample                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Sample sent by        | Xinglan Yu                  |
| Sampling location           | /                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Sampling person       | /                           |
| Sample quantity             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Sample matrix         | /                           |
| Series number of the Sample | /                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |                             |
| Test basis                  | <p><b>EN 50360–2001:</b> Product standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.</p> <p><b>EN 50361–2001:</b> Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones.</p> <p><b>IEC 62209-1-2005:</b> 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)</p> <p><b>ANSI C95.1–1999:</b> IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz</p> <p><b>OET Bulletin 65 (Edition 97-01) and Supplement C(Edition 01-01):</b> Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits.</p> <p><b>IEEE 1528–2003:</b> Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.</p> |                       |                             |
| Test conclusion             | <p>Localized Specific Absorption Rate (SAR) of this portable wireless equipment has been measured in all cases requested by the relevant standards cited in Clause 5.2 of this test report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 5.1 of this test report.</p> <p>General Judgment: <b>Pass</b></p> <p style="text-align: right;">(Stamp)<br/><b>Date of issue: June 22<sup>nd</sup>, 2006</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                             |
| Note                        | The test results relate only to the items tested of the sample(s).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                       |                             |

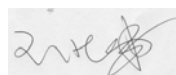
Approved by



(Lu Bingsong)

Deputy Director of the laboratory

Reviewed by



(Wang Hongbo)

Tested by



(Qi Dianyuan)

## **1 COMPETENCE AND WARRANTIES**

**Telecommunication Metrology Center of Ministry of Information Industry** is a test laboratory accredited by DAR (DATech) – Deutschen Akkreditierungs Rat (Deutsche Akkreditierungsstelle Technik) for the tests indicated in the Certificate No. **DAT-P-114/01-01**.

Telecommunication Metrology Center of Ministry of Information Industry is a test laboratory competent to carry out the tests described in this test report.

**Telecommunication Metrology Center of Ministry of Information Industry** 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 **Telecommunication Metrology Center of Ministry of Information Industry** at the time of execution of the test.

**Telecommunication Metrology Center of Ministry of Information Industry** 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**

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## **3 DESCRIPTION OF EUT**

### **3.1 Addressing Information Related to EUT**

**Table 1: Applicant (The Client)**

|                 |                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------|
| Name or Company | CEC Wireless R&D Ltd                                                                    |
| Address/Post    | P.O.Box 707-27 West M5 Building ,No.1 East Road Jiuxianqiao ChaoYang District, Beijing, |
| City            | Beijing                                                                                 |
| Postal Code     | /                                                                                       |
| Country         | CHINA                                                                                   |
| Telephone       | 010-58270277                                                                            |
| Fax             | 010-84568718                                                                            |

**Table 2: Manufacturer**

|                 |                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------|
| Name or Company | CEC Wireless R&D Ltd                                                                    |
| Address/Post    | P.O.Box 707-27 West M5 Building ,No.1 East Road Jiuxianqiao ChaoYang District, Beijing, |
| City            | Beijing                                                                                 |
| Postal Code     | /                                                                                       |
| Country         | CHINA                                                                                   |
| Telephone       | 010-58270277                                                                            |
| Fax             | 010-84568718                                                                            |

### 3.2 Constituents of EUT

**Table 3: Constituents of Samples**

| Description     | Model      | Serial Number | Manufacturer                 |
|-----------------|------------|---------------|------------------------------|
| Handset         | CTS900     | /             | CEC Wireless R&D Ltd.        |
| Lithium Battery | A20KCP/OZC | FMA0000214    | Scudcn Co., Ltd.             |
| AC/DC Adapter   | A1F2CL/OZP | /             | DEE VAN enterprise CO., Ltd. |



**Picture 1: Constituents of the sample (Lithium Battery is in the Handset)**

### 3.3 General Description

Equipment Under Test (EUT) is a model of GSM Tri-band Smartphone (MS) with integrated antenna. It consists of Handset and normal options: Lithium Battery and AC/DC Adapter as Table 3 and Picture 1. With the request of the client, SAR is tested for PCS 1900MHz. Its GPRS class is 10.

The sample undergoing test was selected by the Client.

Components list please refer to documents of the manufacturer

## **4 OPERATIONAL CONDITIONS DURING TEST**

### **4.1 Schematic Test Configuration**

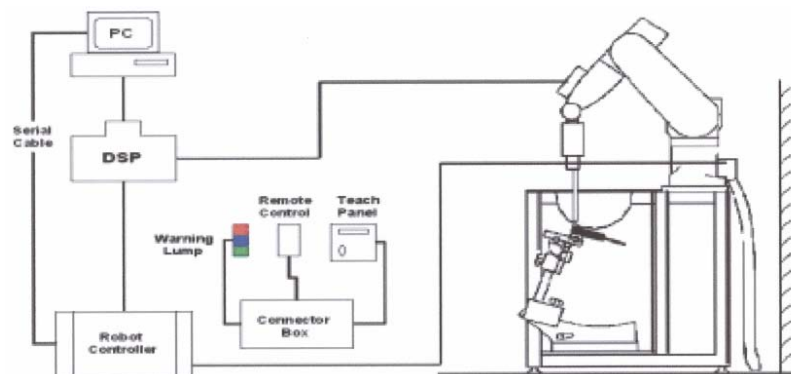
A communication link is set up with a System Simulator (SS) by air link, and a call is established. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 512, 661 and 810 respectively in the case of PCS 1900 MHz. The EUT is commanded to operate at maximum transmitting power.

The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the handset. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the handset by at least 30 dB.

### **4.2 SAR Measurement Set-up**

These measurements were performed with the automated near-field scanning system DASY4 Professional 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.



**Picture 2: SAR Lab Test Measurement Set-up**

The DAE 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

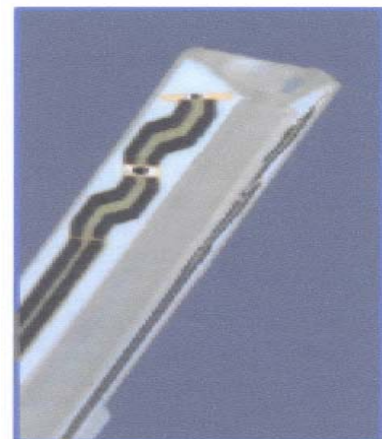
unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

### 4.3 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<br>Built-in optical fiber for surface detection<br>System(ET3DV6 only)<br>Built-in shielding against static charges<br>PEEK enclosure material(resistant to organic solvents, e.q., glycol) |
| Calibration       | In air from 10 MHz to 2.5 GHz<br>In brain and muscle simulating tissue at frequencies of 450MHz, 900MHz and 1.8GHz (accuracy $\pm 8\%$ )<br>Calibration for other liquids and frequencies upon request                              |
| Frequency         | 10 MHz to > 6 GHz; Linearity: $\pm 0.2\text{ dB}$<br>(30 MHz to 3 GHz)                                                                                                                                                              |
| Directivity       | $\pm 0.2\text{ dB}$ in brain tissue (rotation around probe axis)<br>$\pm 0.4\text{ dB}$ in brain tissue (rotation normal probe axis)                                                                                                |
| Dynamic Range     | 5u W/g to > 100mW/g; Linearity: $\pm 0.2\text{ dB}$                                                                                                                                                                                 |
| Surface Detection | $\pm 0.2\text{ mm}$ repeatability in air and clear liquids over diffuse reflecting surface(ET3DV6 only)                                                                                                                             |
| Dimensions        | Overall length: 330mm<br>Tip length: 16mm<br>Body diameter: 12mm<br>Tip diameter: 6.8mm<br>Distance from probe tip to dipole centers: 2.7mm                                                                                         |
| Application       | General dosimetry up to 3GHz<br>Compliance tests of mobile phones<br>Fast automatic scanning in arbitrary phantoms                                                                                                                  |



**Picture 3: ET3DV6 E-field Probe**



**Picture4:ET3DV6 E-field probe**

### 4.4 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.

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

Where:  $\Delta t$  = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

$\Delta T$  = Temperature increase due to RF exposure.

Or

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

Where:  $\sigma$  = Simulated tissue conductivity,

$\rho$  = Tissue density (kg/m<sup>3</sup>).

Note: Please see Annex E to check the probe calibration certificate.



**Picture 5: Device Holder**

## **4.5 Other Test Equipment**

### **4.5.1 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).

### **4.5.2 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 all



**Picture6: Generic Twin Phantom**

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

Shell Thickness     $2 \pm 0.1$  mm

Filling Volume    Approx. 20 liters

Dimensions        810 x 1000 x 500 mm (H x L x W)

Available          Special

#### 4.6 Equivalent Tissues

The liquid used for the frequency range of 800-2000 MHz consisted of water, sugar, salt and Cellulose. The liquid has previously been proven to be suited for worst-case. The Table 4 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and OET Bulletin 65 (Edition 97-01) and Supplement C (Edition 01-01).

**Table 4. Composition of the Head Tissue Equivalent Matter**

| MIXTURE %                             | FREQUENCY 1900MHz                       |
|---------------------------------------|-----------------------------------------|
| Water                                 | 55.242                                  |
| Glycol monobutyl                      | 44.452                                  |
| Salt                                  | 0.306                                   |
| Dielectric Parameters<br>Target Value | f=1900MHz $\epsilon=40.0$ $\sigma=1.40$ |

**Table 5. Composition of the Body Tissue Equivalent Matter**

| MIXTURE %                             | FREQUENCY 1900MHz                       |
|---------------------------------------|-----------------------------------------|
| Water                                 | 69.91                                   |
| Glycol monobutyl                      | 29.96                                   |
| Salt                                  | 0.13                                    |
| Dielectric Parameters<br>Target Value | f=1900MHz $\epsilon=53.3$ $\sigma=1.52$ |

#### 4.7 System Specifications

##### 4.7.1 Robotic System Specifications

###### Specifications

**Positioner:** Stäubli Unimation Corp. Robot Model: RX90L

**Repeatability:**  $\pm 0.02$  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

## **5 CHARACTERISTICS OF THE TEST**

### **5.1 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 mm 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 mm of the user in the uncontrolled environment.

### **5.2 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.

**IEC 62209-1-2005:** 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)

**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 (Edition 97-01) and Supplement C (Edition 01-01):** Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits.

They specify the measurement method for demonstration of compliance with the SAR limits for such equipments.

## **6 LABORATORY ENVIRONMENT**

**Table 6: The Ambient Conditions during EMF Test**

|                                                                                                 |                            |
|-------------------------------------------------------------------------------------------------|----------------------------|
| Temperature                                                                                     | Min. = 15 °C, Max. = 30 °C |
| Relative humidity                                                                               | Min. = 30%, Max. = 70%     |
| Ground system resistance                                                                        | < 0.5 $\Omega$             |
| 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. |                            |

## 7 CONDUCTED OUTPUT POWER MEASUREMENT

### 7.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200) 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.

### 7.2 Conducted Power

#### 7.2.1 Measurement Methods

The EUT was set up for the maximum output power. The channel power was measured with Agilent Spectrum Analyzer E4440A. These measurements were done at 3 channels, 512, 661 and 810 before SAR test and after SAR test.

#### 7.2.2 Measurement result

**Table 7: Conducted Power Measurement Results**

|                   | Conducted Power            |                          |                            |
|-------------------|----------------------------|--------------------------|----------------------------|
|                   | Channel 512<br>(1850.2MHz) | Channel 661<br>(1880MHz) | Channel 810<br>(1909.8MHz) |
| Before Test (dBm) | 28.7                       | 28.5                     | 28.5                       |
| After Test (dBm)  | 28.6                       | 28.5                     | 28.6                       |

#### 7.2.3 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 11 to Table 16 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

## 8 TEST RESULTS

### 8.1 Dielectric Performance

**Table 8: Dielectric Performance of Head Tissue Simulating Liquid**

| Measurement is made at temperature 22.5 °C and relative humidity 49%.<br>Liquid temperature during the test: 21.4°C |           |                         |                             |
|---------------------------------------------------------------------------------------------------------------------|-----------|-------------------------|-----------------------------|
| /                                                                                                                   | Frequency | Permittivity $\epsilon$ | Conductivity $\sigma$ (S/m) |
| <b>Target value</b>                                                                                                 | 1900MHz   | 40.0                    | 1.40                        |
| <b>Measurement value<br/>(Average of 10 tests)</b>                                                                  | 1900MHz   | 40.27                   | 1.45                        |

**Table 9: Dielectric Performance of Body Tissue Simulating Liquid**

| Measurement is made at temperature 22.5 °C and relative humidity 49%.<br>Liquid temperature during the test: 21.4°C |           |                         |                             |
|---------------------------------------------------------------------------------------------------------------------|-----------|-------------------------|-----------------------------|
| /                                                                                                                   | Frequency | Permittivity $\epsilon$ | Conductivity $\sigma$ (S/m) |
| <b>Target value</b>                                                                                                 | 1900MHz   | 53.3                    | 1.52                        |
| <b>Measurement value<br/>(Average of 10 tests)</b>                                                                  | 1900MHz   | 55.85                   | 1.55                        |

## 8.2 System Validation

**Table 10: System Validation**

| Measurement is made at temperature 23.3 °C, relative humidity 47%, input power 250 mW.<br>Liquid temperature during the test: 22.5°C |           |                     |                         |                             |             |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------|-------------------------|-----------------------------|-------------|
| Liquid parameters                                                                                                                    |           | Frequency           | Permittivity $\epsilon$ | Conductivity $\sigma$ (S/m) |             |
|                                                                                                                                      |           | 1900 MHz            | 40.27                   | 1.45                        |             |
| Verification results                                                                                                                 | Frequency | Target value (W/kg) |                         | Measurement value (W/kg)    |             |
|                                                                                                                                      |           | 10 g Average        | 1 g Average             | 10 g Average                | 1 g Average |
|                                                                                                                                      | 1900 MHz  | 5.125               | 9.925                   | 5.27                        | 9.91        |

Note: Target Values used are one fourth of those in IEEE Std 1528-2003 (feeding power is normalized to 1 Watt), i.e. 250 mW is used as feeding power to the validation dipole (SPEAG using).

## 8.3 Summary of Measurement Results

**Table 11: SAR Values (Head, 1900 MHz Band)**

| Limit of SAR (W/kg)                                      | 10 g Average              | 1 g Average | Power Drift (dB) |
|----------------------------------------------------------|---------------------------|-------------|------------------|
|                                                          | 2.0                       | 1.6         |                  |
| Test Case                                                | Measurement Result (W/kg) |             |                  |
|                                                          | 10 g Average              | 1 g Average |                  |
| Left hand, Touch cheek, Top frequency(See Fig.1)         | 0.378                     | 0.695       | 0.086            |
| Left hand, Touch cheek, Mid frequency(See Fig.3)         | 0.321                     | 0.590       | 0.041            |
| Left hand, Touch cheek, Bottom frequency(See Fig.5)      | 0.258                     | 0.465       | -0.034           |
| Left hand, Tilt 15 Degree, Top frequency(See Fig.7)      | 0.113                     | 0.192       | -0.014           |
| Left hand, Tilt 15 Degree, Mid frequency(See Fig.9)      | 0.100                     | 0.168       | -0.002           |
| Left hand, Tilt 15 Degree, Bottom frequency(See Fig.11)  | 0.067                     | 0.111       | -0.118           |
| Right hand, Touch cheek, Top frequency(See Fig.13)       | 0.459                     | 0.840       | -0.064           |
| Right hand, Touch cheek, Mid frequency(See Fig.15)       | 0.392                     | 0.710       | -0.145           |
| Right hand, Touch cheek, Bottom frequency(See Fig.17)    | 0.309                     | 0.559       | -0.098           |
| Right hand, Tilt 15 Degree, Top frequency(See Fig.19)    | 0.115                     | 0.193       | 0.054            |
| Right hand, Tilt 15 Degree, Mid frequency(See Fig.21)    | 0.099                     | 0.161       | -0.024           |
| Right hand, Tilt 15 Degree, Bottom frequency(See Fig.23) | 0.076                     | 0.122       | 0.129            |

**Table 12: SAR Values (Body, 1900 MHz Band)**

| Limit of SAR (W/kg)                                 | 10 g<br>Average              | 1 g<br>Average | Power<br>Drift<br>(dB) |
|-----------------------------------------------------|------------------------------|----------------|------------------------|
|                                                     | 2.0                          | 1.6            |                        |
| Test Case                                           | Measurement Result<br>(W/kg) |                |                        |
|                                                     | 10 g<br>Average              | 1 g<br>Average |                        |
| Body, Towards Ground, Top frequency(See Fig.25)     | 0.152                        | 0.258          | -0.176                 |
| Body, Towards Ground, Mid frequency(See Fig.27)     | 0.128                        | 0.215          | -0.055                 |
| Body, Towards Ground, Bottom frequency(See Fig.29)  | 0.096                        | 0.164          | 0.056                  |
| Body, Towards Phantom, Top frequency(See Fig.31)    | 0.135                        | 0.223          | -0.146                 |
| Body, Towards Phantom, Mid frequency(See Fig.33)    | 0.110                        | 0.182          | -0.028                 |
| Body, Towards Phantom, Bottom frequency(See Fig.35) | 0.096                        | 0.157          | -0.200                 |

**Table 13: SAR Values (Body, 1900 MHz Band with GPRS)**

| Limit of SAR (W/kg)                                 | 10 g<br>Average              | 1 g<br>Average | Power<br>Drift<br>(dB) |
|-----------------------------------------------------|------------------------------|----------------|------------------------|
|                                                     | 2.0                          | 1.6            |                        |
| Test Case                                           | Measurement Result<br>(W/kg) |                |                        |
|                                                     | 10 g<br>Average              | 1 g<br>Average |                        |
| Body, Towards Ground, Top frequency(See Fig.37)     | 0.353                        | 0.610          | -0.053                 |
| Body, Towards Ground, Mid frequency(See Fig.39)     | 0.287                        | 0.503          | 0.005                  |
| Body, Towards Ground, Bottom frequency(See Fig.41)  | 0.212                        | 0.364          | 0.000                  |
| Body, Towards Phantom, Top frequency(See Fig.43)    | 0.272                        | 0.455          | 0.089                  |
| Body, Towards Phantom, Mid frequency(See Fig.45)    | 0.243                        | 0.403          | -0.096                 |
| Body, Towards Phantom, Bottom frequency(See Fig.47) | 0.170                        | 0.281          | 0.063                  |

#### 8.4 Summary of Bluetooth Measurement Results

According to the results above in 8.3, the configurations with the highest SAR value when dominant transmitter is ON and Bluetooth transmitter is OFF are determined. Then the following test results are in the same configurations with dominant transmitter and co-located Bluetooth transmitter both

ON.

**Table 14: SAR Values (Head, 1900 MHz Band with Bluetooth)**

| Limit of SAR (W/kg)                                | 10 g<br>Average              | 1 g<br>Average | Power<br>Drift<br>(dB) |
|----------------------------------------------------|------------------------------|----------------|------------------------|
|                                                    | 2.0                          | 1.6            |                        |
| Test Case                                          | Measurement Result<br>(W/kg) |                |                        |
|                                                    | 10 g<br>Average              | 1 g<br>Average |                        |
| Right hand, Touch cheek, Top frequency(See Fig.49) | 0.460                        | 0.840          | -0.056                 |

**Table 15: SAR Values (Body, 1900 MHz Band with Bluetooth)**

| Limit of SAR (W/kg)                             | 10 g<br>Average              | 1 g<br>Average | Power<br>Drift<br>(dB) |
|-------------------------------------------------|------------------------------|----------------|------------------------|
|                                                 | 2.0                          | 1.6            |                        |
| Test Case                                       | Measurement Result<br>(W/kg) |                |                        |
|                                                 | 10 g<br>Average              | 1 g<br>Average |                        |
| Body, Towards Ground, Top frequency(See Fig.51) | 0.151                        | 0.257          | -0.091                 |

**Table 16: SAR Values (Body, 1900 MHz Band with GPRS and Bluetooth)**

| Limit of SAR (W/kg)                             | 10 g<br>Average              | 1 g<br>Average | Power<br>Drift<br>(dB) |
|-------------------------------------------------|------------------------------|----------------|------------------------|
|                                                 | 2.0                          | 1.6            |                        |
| Test Case                                       | Measurement Result<br>(W/kg) |                |                        |
|                                                 | 10 g<br>Average              | 1 g<br>Average |                        |
| Body, Towards Ground, Top frequency(See Fig.53) | 0.353                        | 0.611          | -0.025                 |

## 8.5 Conclusion

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 5.2 of this report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 5.1 of this test report.

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## 9 Measurement Uncertainty

| SN | a                                                                               | Type | c             | d              | e =<br>f(d,k) | f                       | h =<br>c x f / e              | k              |
|----|---------------------------------------------------------------------------------|------|---------------|----------------|---------------|-------------------------|-------------------------------|----------------|
|    | Uncertainty Component                                                           |      | Tol.<br>(± %) | Prob.<br>Dist. | Div.          | c <sub>i</sub><br>(1 g) | 1 g<br>u <sub>i</sub><br>(±%) | v <sub>i</sub> |
| 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              | √3            | (1-cp)<br>1/2           | 4.3                           | ∞              |
| 4  | Hemispherical Isotropy                                                          | B    | 9.4           | R              | √3            | √c <sub>p</sub>         |                               | ∞              |
| 5  | Boundary Effect                                                                 | B    | 0.4           | R              | √3            | 1                       | 0.23                          | ∞              |
| 6  | Linearity                                                                       | B    | 4.7           | R              | √3            | 1                       | 2.7                           | ∞              |
| 7  | System Detection Limits                                                         | B    | 1.0           | R              | √3            | 1                       | 0.6                           | ∞              |
| 8  | Readout Electronics                                                             | B    | 1.0           | N              | 1             | 1                       | 1.0                           | ∞              |
| 9  | RF Ambient Conditions                                                           | B    | 3.0           | R              | √3            | 1                       | 1.73                          | ∞              |
| 10 | Probe Positioner Mechanical Tolerance                                           | B    | 0.4           | R              | √3            | 1                       | 0.2                           | ∞              |
| 11 | Probe Positioning with respect to Phantom Shell                                 | B    | 2.9           | R              | √3            | 1                       | 1.7                           | ∞              |
| 12 | Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation | B    | 3.9           | R              | √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              | √3            | 1                       | 2.9                           | ∞              |
|    | Phantom and Tissue Parameters                                                   |      |               |                |               |                         |                               |                |
| 16 | Phantom Uncertainty (shape and thickness tolerances)                            | B    | 1.0           | R              | √3            | 1                       | 0.6                           | ∞              |
| 17 | Liquid Conductivity - deviation from target values                              | B    | 5.0           | R              | √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              | √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<br>(95% CONFIDENCE INTERVAL)                               |      |               | K=2            |               |                         | 22.5                          |                |

## 10 MAIN TEST INSTRUMENTS

**Table17: List of Main Instruments**

| No. | Name             | Type         | Serial Number | Calibration Date         | Valid Period |
|-----|------------------|--------------|---------------|--------------------------|--------------|
| 01  | Network analyzer | HP 8753E     | US38433212    | August 29,2005           | One year     |
| 02  | Power meter      | NRVD         | 101253        | June 20, 2005            | One year     |
| 03  | Power sensor     | NRV-Z5       | 100333        |                          |              |
| 04  | Power sensor     | NRV-Z6       | 100011        | September 3, 2005        | One year     |
| 05  | Signal Generator | E4433B       | US37230472    | September 5, 2005        | One Year     |
| 06  | Amplifier        | VTL5400      | 0505          | No Calibration Requested |              |
| 07  | BTS              | CMU 200      | 105948        | August 15, 2005          | One year     |
| 08  | E-field Probe    | SPEAG ET3DV6 | 1736          | November 25, 2005        | One year     |
| 09  | DAE              | SPEAG DAE3   | 536           | July 11, 2005            | One year     |

## 11 TEST PERIOD

The test is performed from June 16<sup>th</sup>, 2006 to June 20<sup>th</sup>, 2006.

## 12 TEST LOCATION

The test is performed at Radio Communication & Electromagnetic Compatibility Laboratory of Telecommunication Metrology Center

\*\*\*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 reference 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 phantom was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the flat phantom and the horizontal grid spacing was 10 mm x 10 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

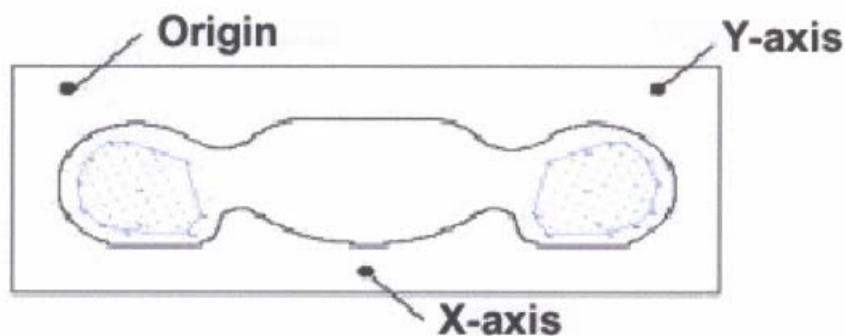
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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.

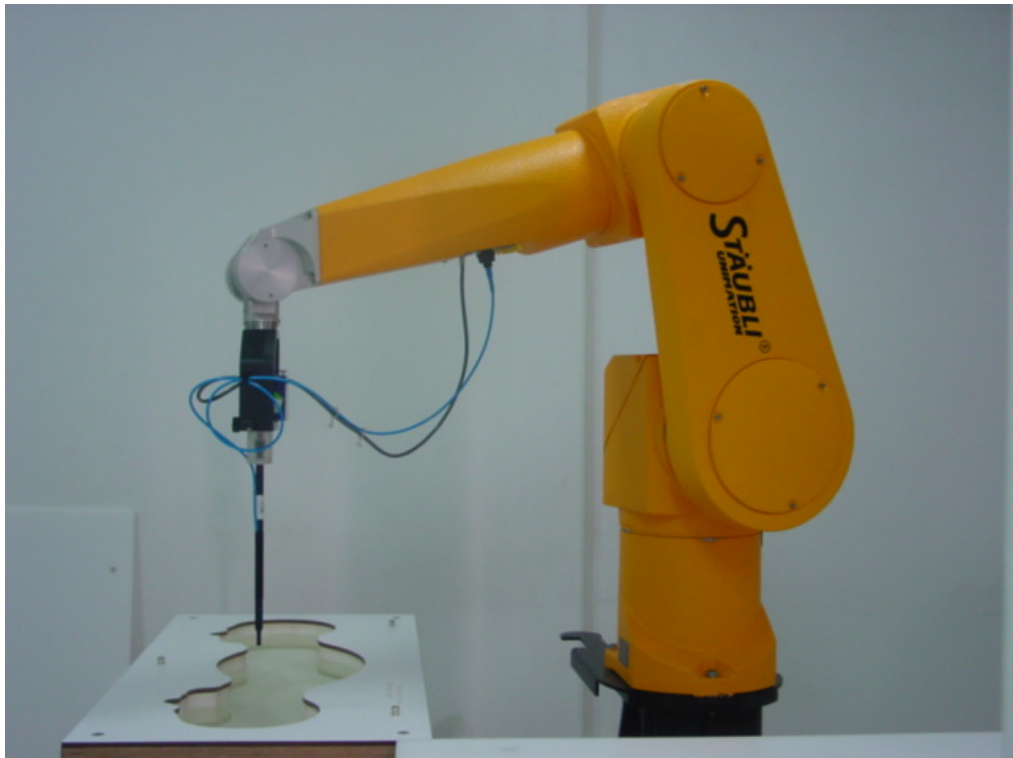
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

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.



**Picture A: SAR Measurement Points in Area Scan**

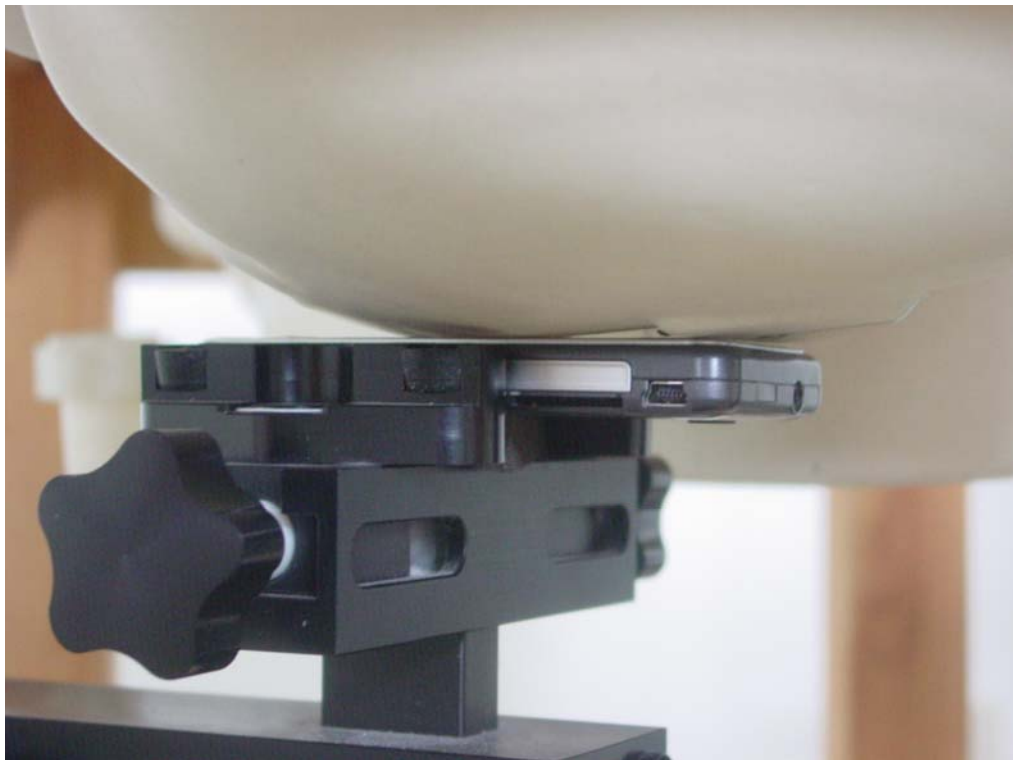
## ANNEX B TEST LAYOUT



Picture B1: Specific Absorption Rate Test Layout



Picture B2: Liquid depth in the Flat Phantom (PCS 1900MHz)



**Picture B4: Left Hand Touch Cheek Position**



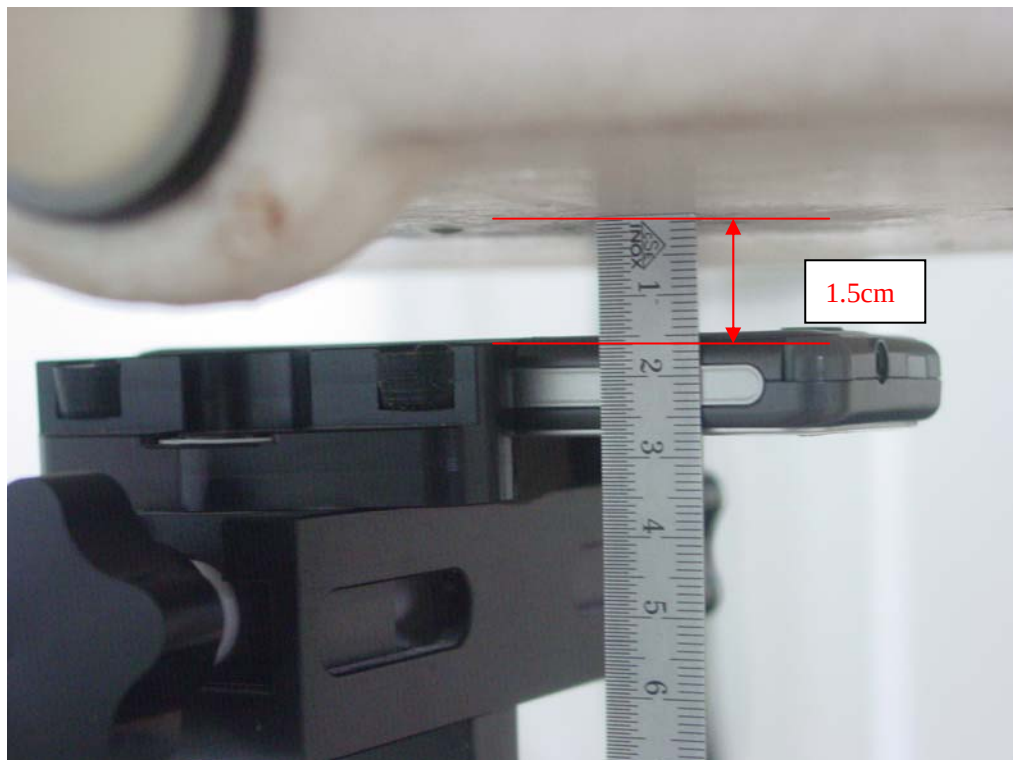
**Picture B5: Left Hand Tilt 15° Position**



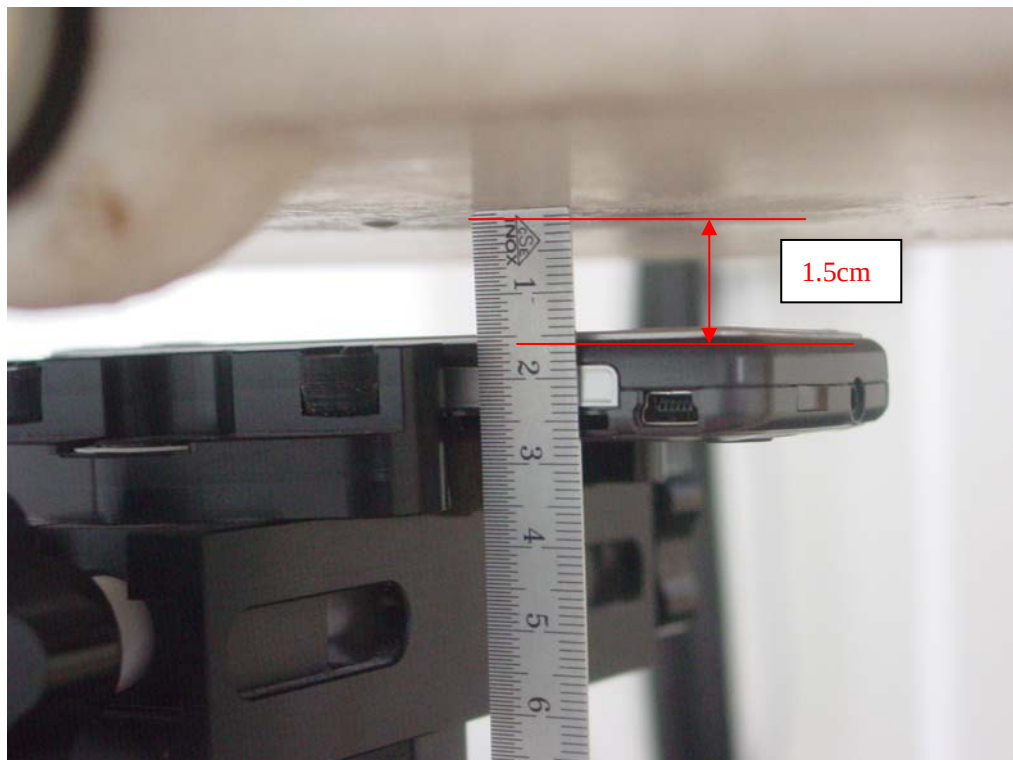
**Picture B6: Right Hand Touch Cheek Position**



**Picture B7: Right Hand Tilt 15° Position**



Picture B8: Body-worn Position (toward ground, the distance from handset to the bottom of the Phantom is 1.5cm)



Picture B9: Body-worn Position (toward phantom, the distance from handset to the bottom of the Phantom is 1.5cm)

## ANNEX C GRAPH RESULTS

### 1900 Left Cheek High

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Cheek High/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.679 mW/g

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

Reference Value = 8.51 V/m; Power Drift = 0.086 dB

Peak SAR (extrapolated) = 1.16 W/kg

**SAR(1 g) = 0.695 mW/g; SAR(10 g) = 0.378 mW/g**

Maximum value of SAR (measured) = 0.764 mW/g

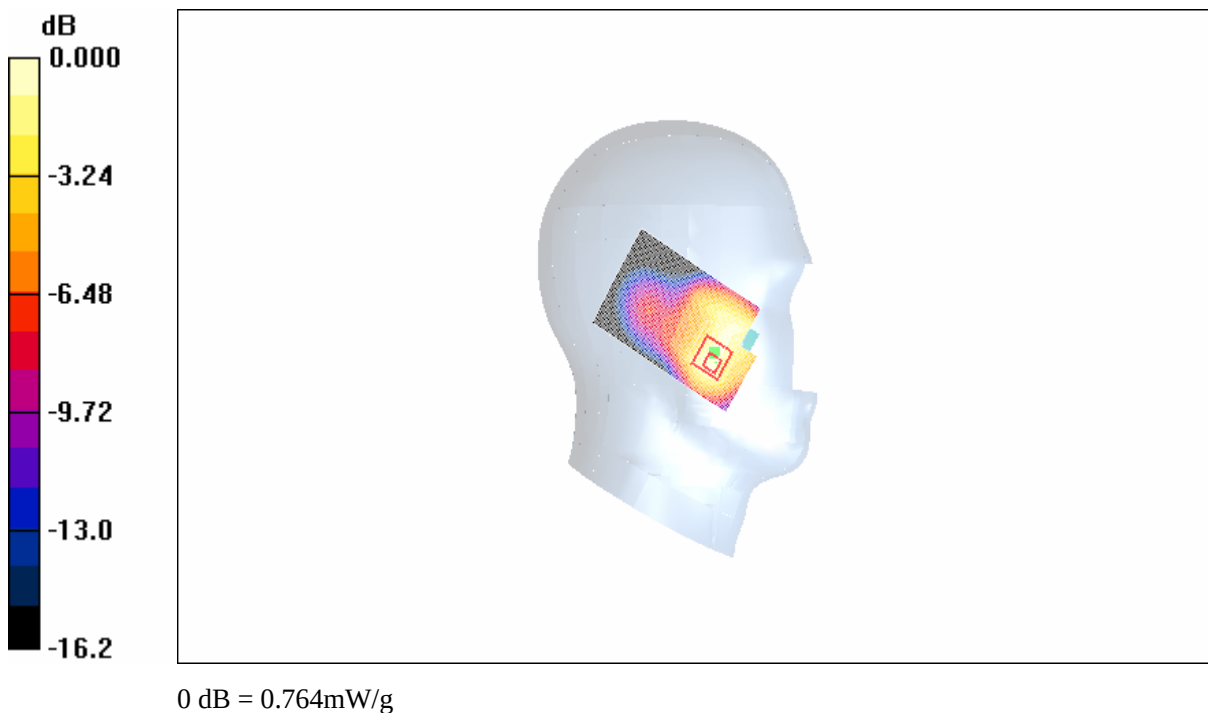


Fig. 1 Left Hand Touch Cheek PCS 1900MHz CH810

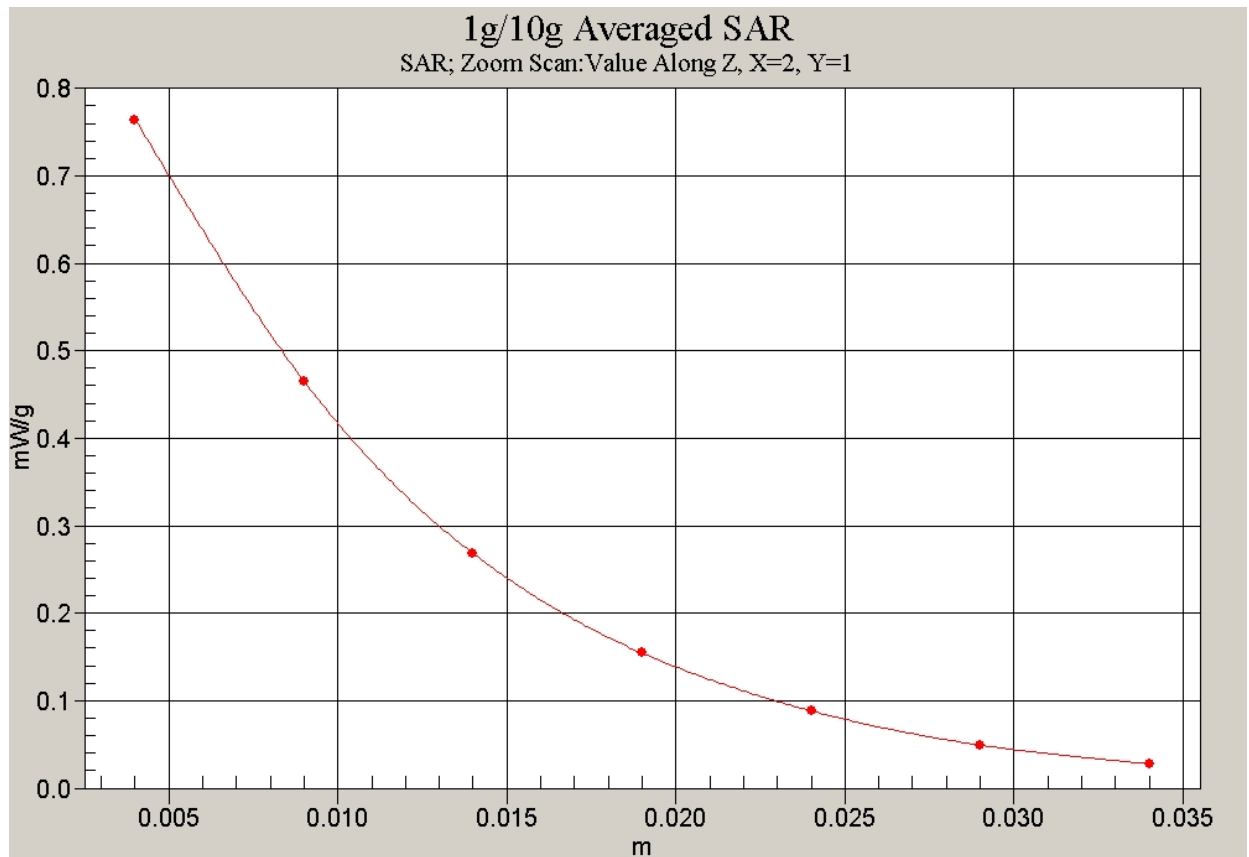


Fig. 2 Z-Scan at power reference point (PCS 1900MHz CH810)

**1900 Left Cheek Middle**

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Cheek Middle/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.582 mW/g

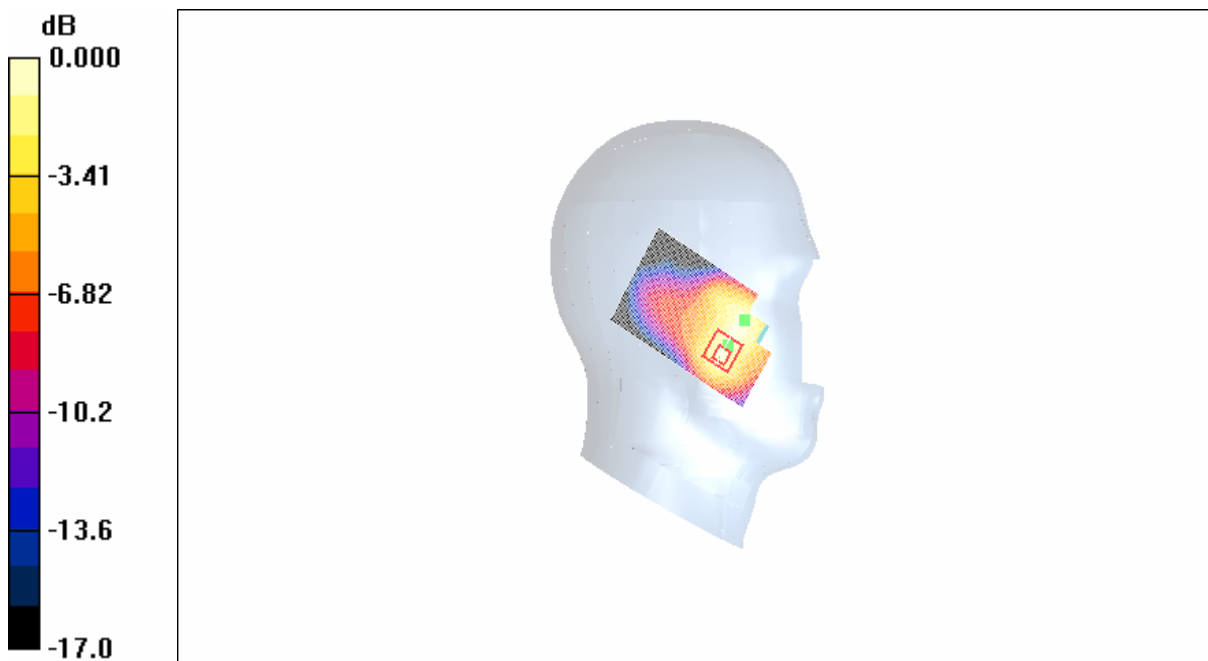
**Cheek Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.90 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 1.00 W/kg

**SAR(1 g) = 0.590 mW/g; SAR(10 g) = 0.321 mW/g**

Maximum value of SAR (measured) = 0.667 mW/g



0 dB = 0.667mW/g

**Fig. 3 Left Hand Touch Cheek PCS 1900MHz CH661**

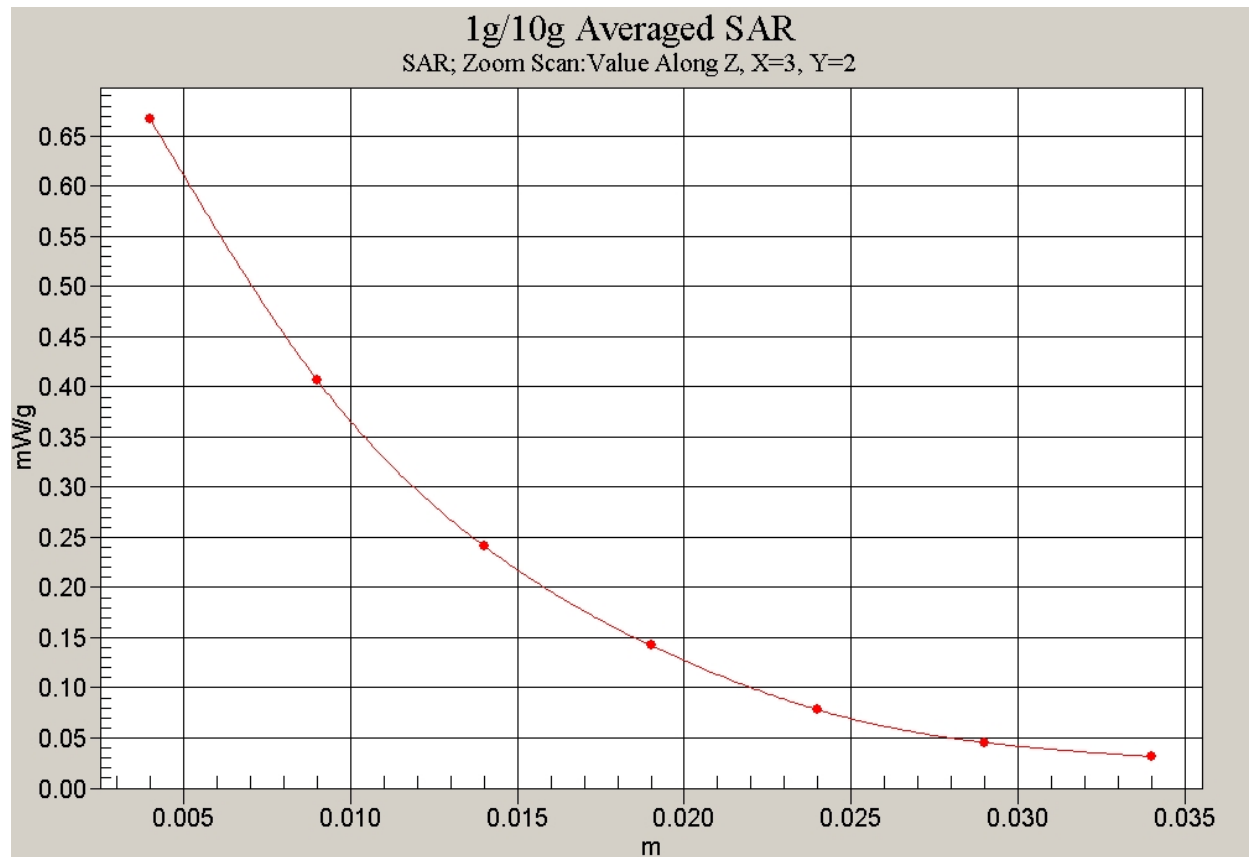


Fig. 4 Z-Scan at power reference point (PCS 1900MHz CH661)

**1900 Left Cheek Low**

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Cheek Low/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.467 mW/g

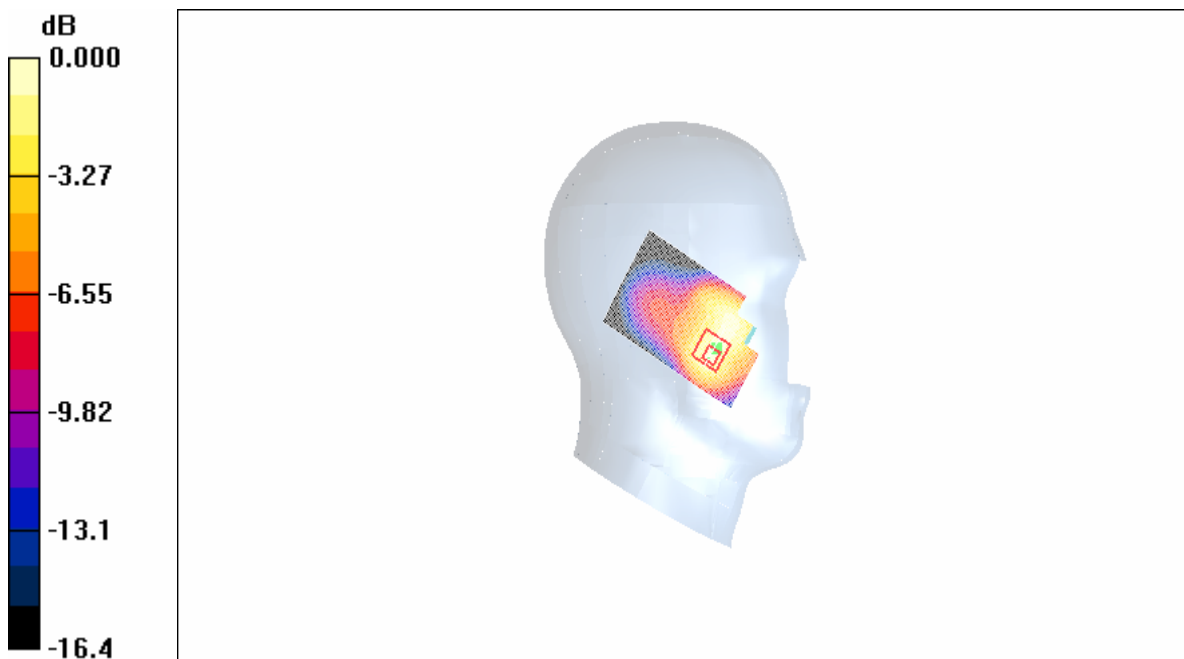
**Cheek Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.04 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 0.768 W/kg

**SAR(1 g) = 0.465 mW/g; SAR(10 g) = 0.258 mW/g**

Maximum value of SAR (measured) = 0.518 mW/g



0 dB = 0.518mW/g

**Fig. 5 Left Hand Touch Cheek PCS 1900MHz CH512**

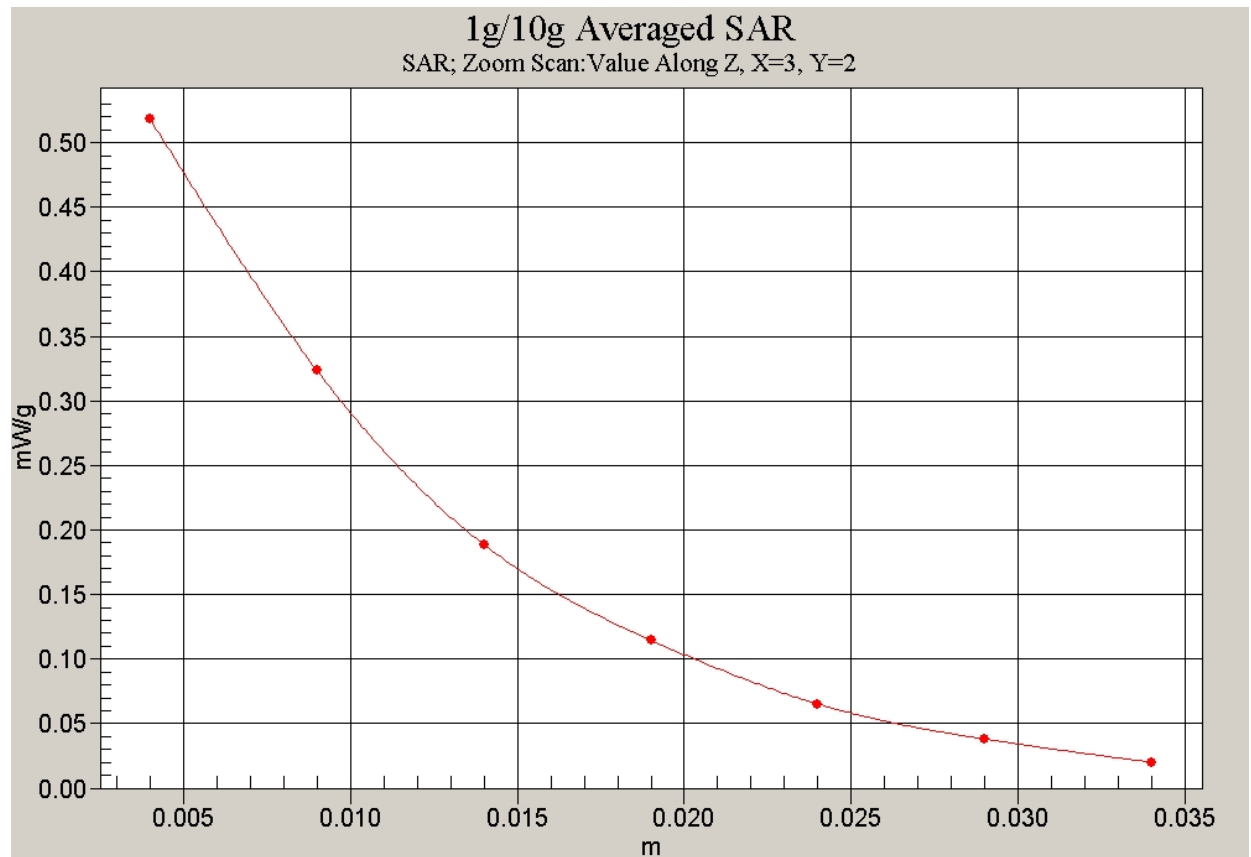


Fig. 6 Z-Scan at power reference point (PCS 1900MHz CH512)

### 1900 Left Tilt High

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Tilt High/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.226 mW/g

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

Reference Value = 12.1 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.307 W/kg

**SAR(1 g) = 0.192 mW/g; SAR(10 g) = 0.113 mW/g**

Maximum value of SAR (measured) = 0.212 mW/g

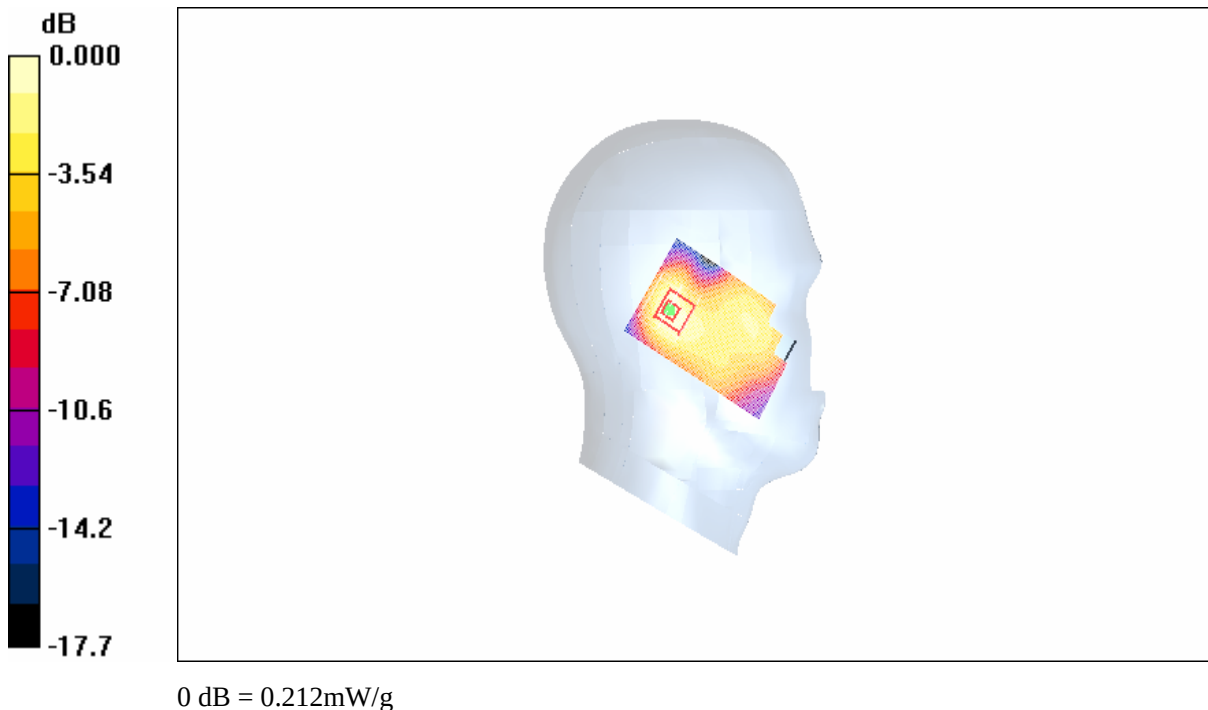


Fig. 7 Left Hand Tilt 15° PCS 1900MHz CH810

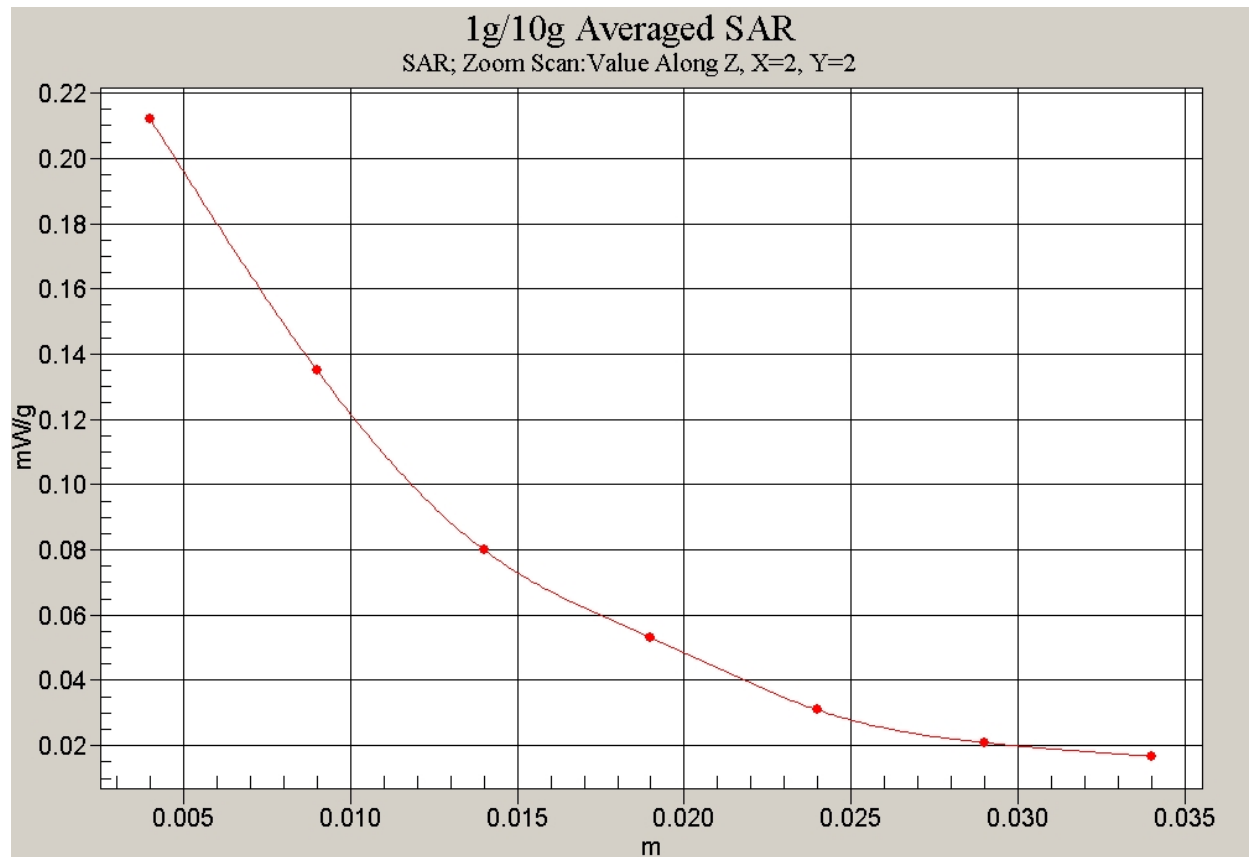


Fig. 8 Z-Scan at power reference point (PCS 1900MHz CH810)

### 1900 Left Tilt Middle

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Tilt Middle/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.189 mW/g

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

Reference Value = 11.3 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 0.271 W/kg

**SAR(1 g) = 0.168 mW/g; SAR(10 g) = 0.100 mW/g**

Maximum value of SAR (measured) = 0.185 mW/g

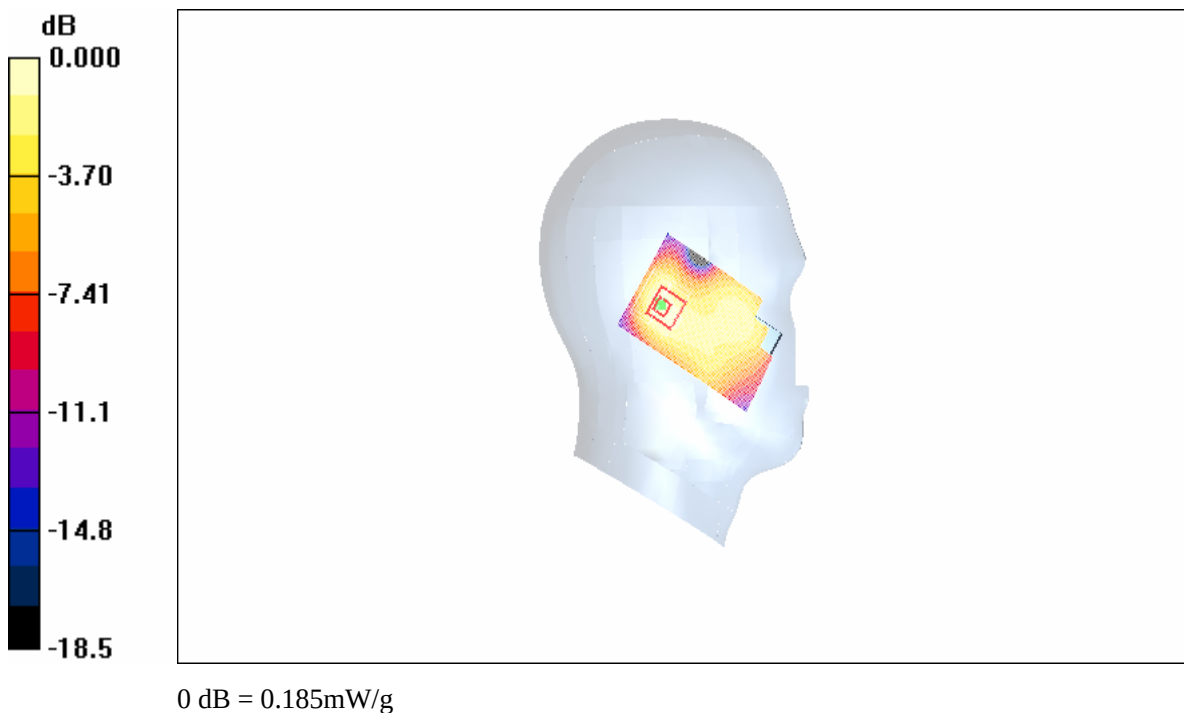


Fig. 9 Left Hand Tilt 15°PCS 1900MHz CH661

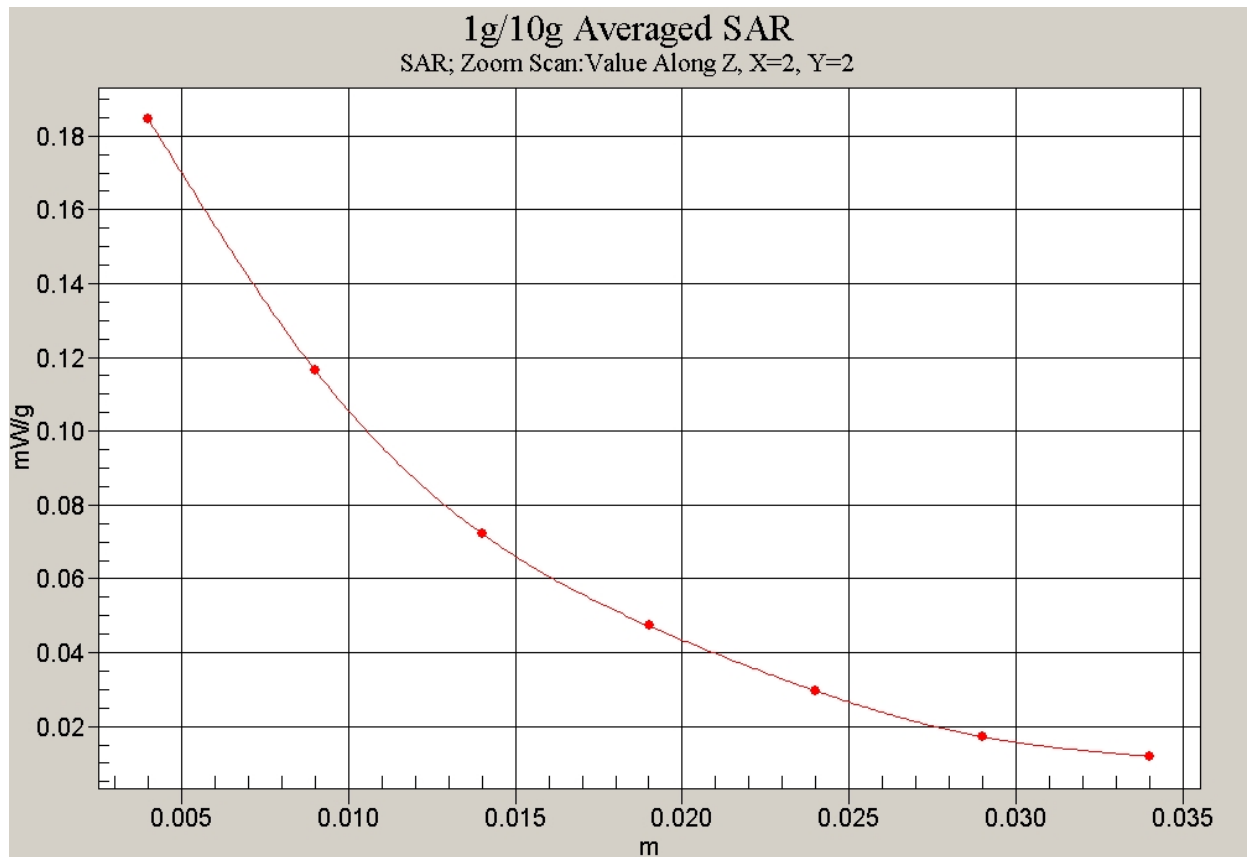


Fig. 10 Z-Scan at power reference point (PCS 1900MHz CH661)

**1900 Left Tilt Low**

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Tilt Low/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.125 mW/g

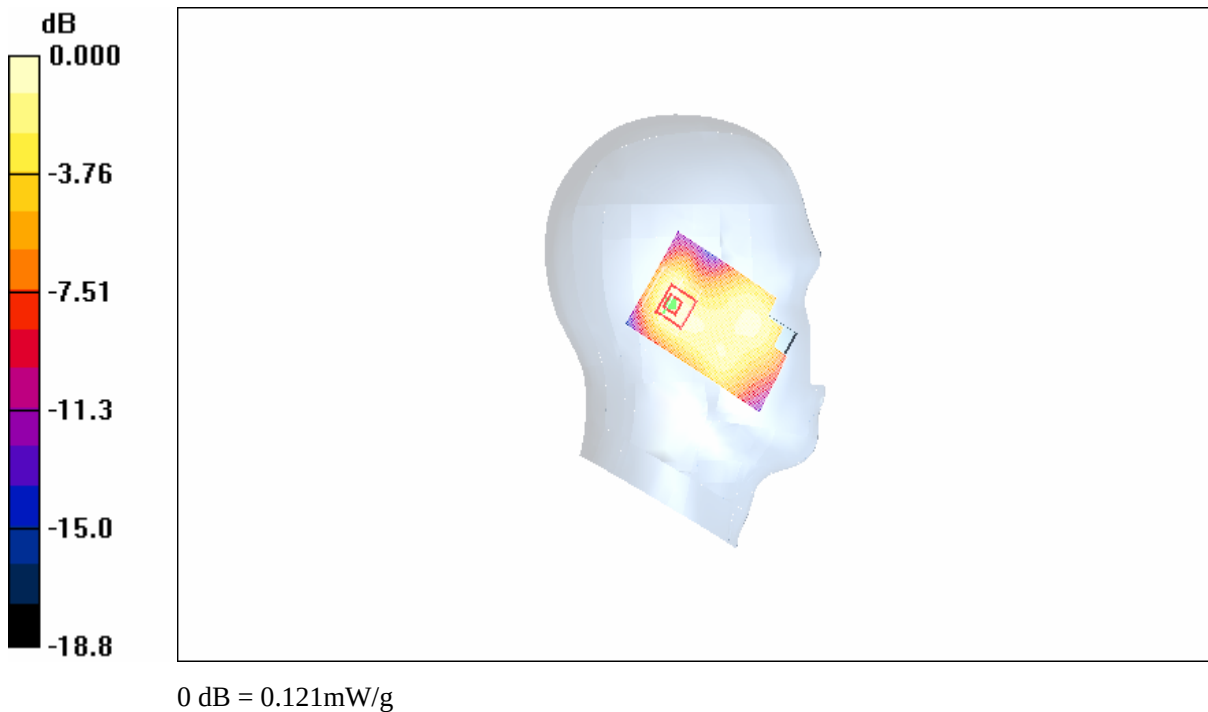
**Tilt Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.48 V/m; Power Drift = -0.118 dB

Peak SAR (extrapolated) = 0.187 W/kg

**SAR(1 g) = 0.111 mW/g; SAR(10 g) = 0.067 mW/g**

Maximum value of SAR (measured) = 0.121 mW/g



**Fig. 11 Left Hand Tilt 15°PCS 1900MHz CH512**

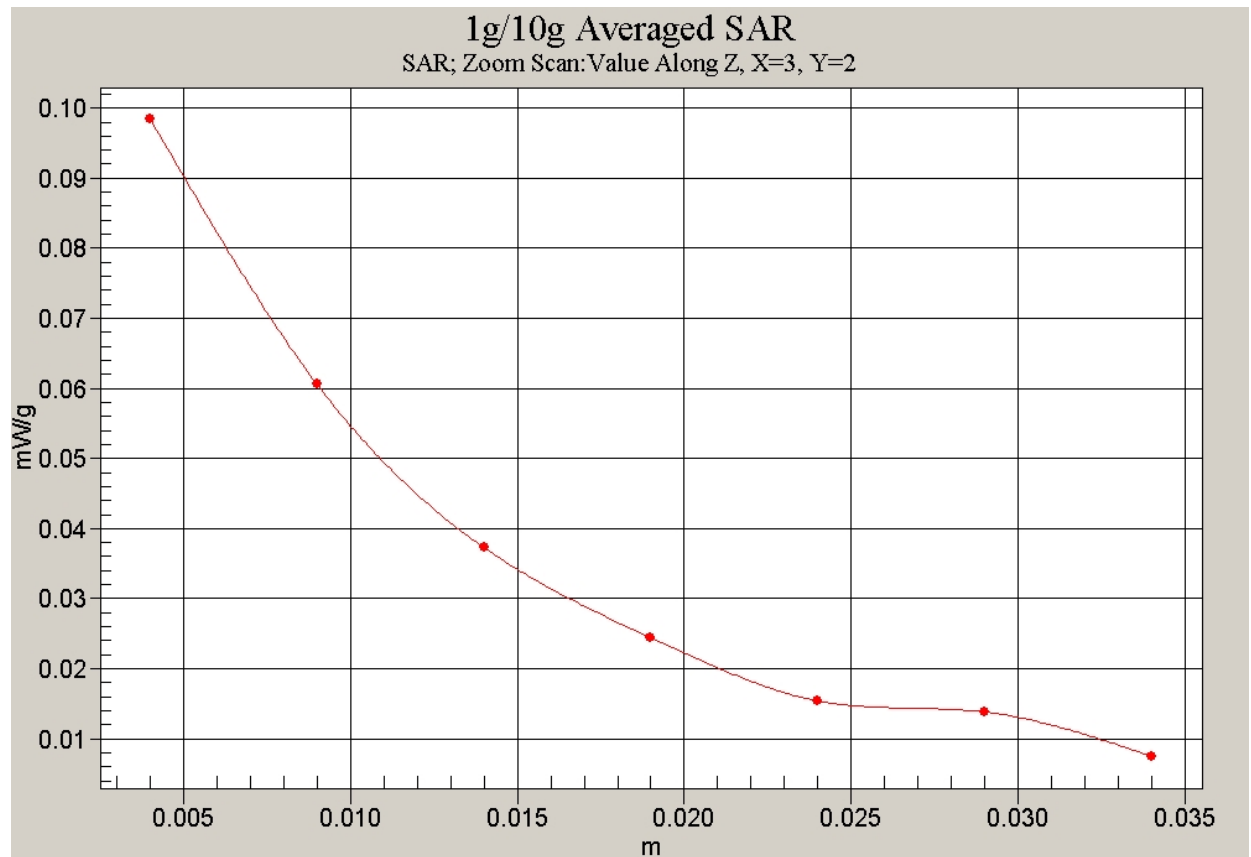


Fig. 12 Z-Scan at power reference point (PCS 1900MHz CH512)

### 1900 Right Cheek High

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Cheek High/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.946 mW/g

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

Reference Value = 7.13 V/m; Power Drift = -0.064 dB

Peak SAR (extrapolated) = 1.44 W/kg

**SAR(1 g) = 0.840 mW/g; SAR(10 g) = 0.459 mW/g**

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

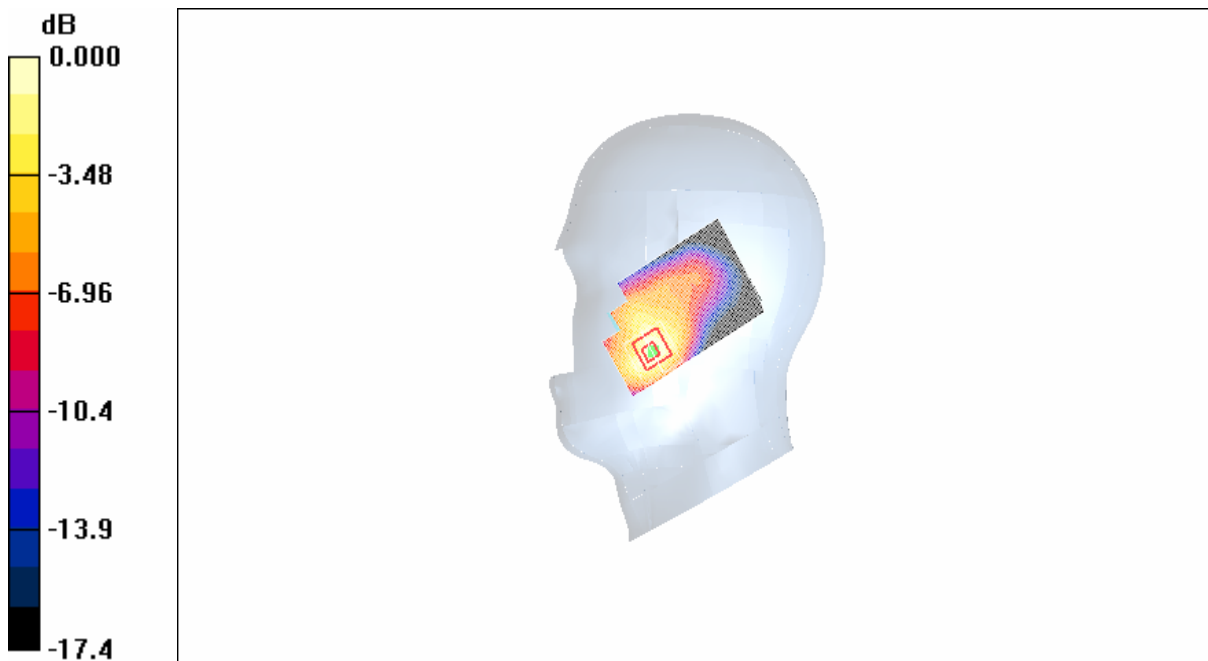


Fig. 13 Right Hand Touch Cheek PCS 1900MHz CH810

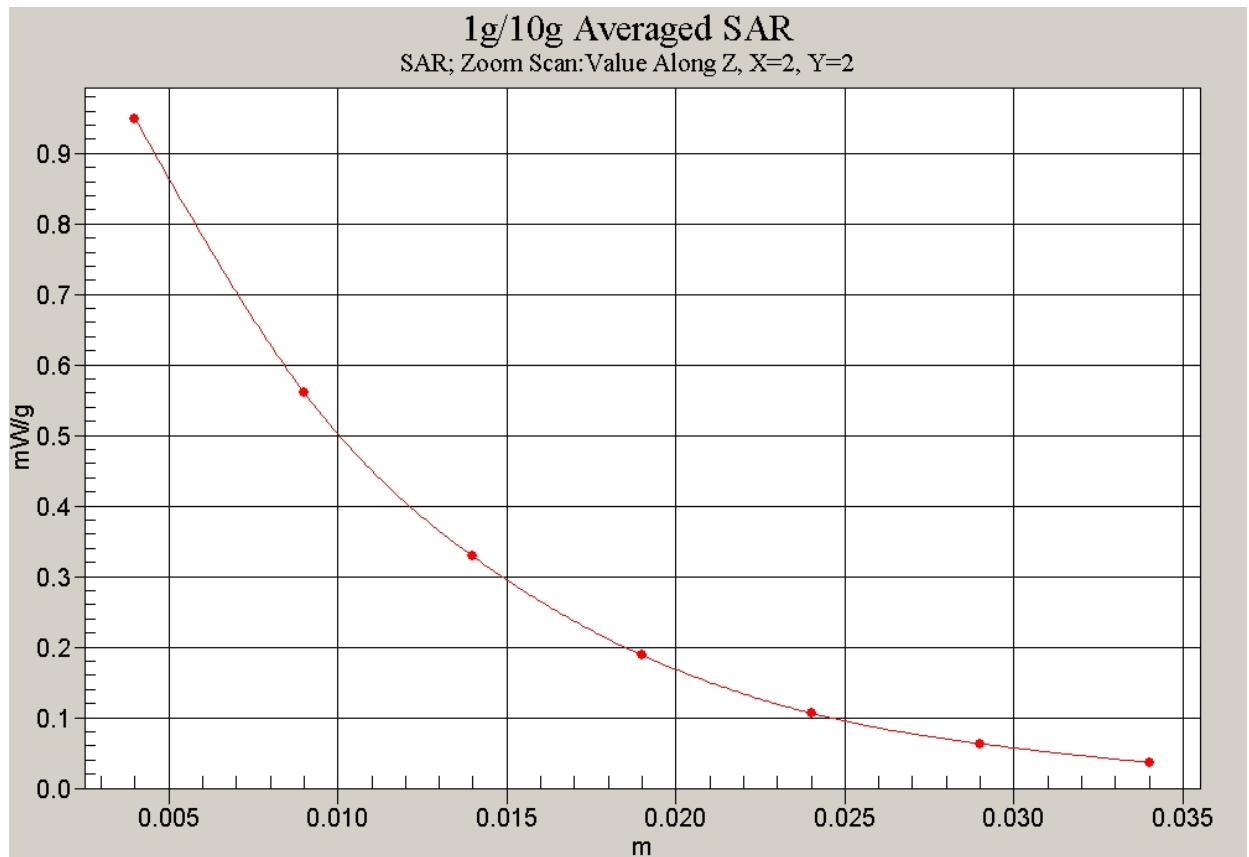


Fig. 14 Z-Scan at power reference point (PCS 1900MHz CH810)

### 1900 Right Cheek Middle

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Cheek Middle/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.819 mW/g

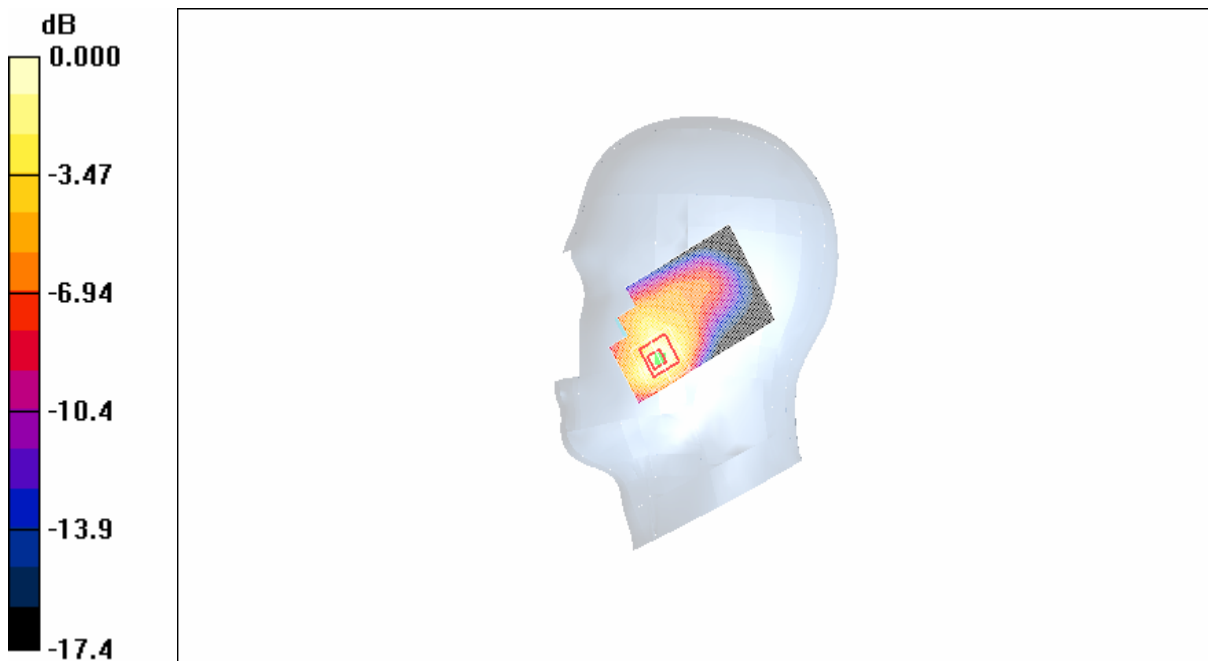
**Cheek Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.71 V/m; Power Drift = -0.145 dB

Peak SAR (extrapolated) = 1.19 W/kg

**SAR(1 g) = 0.710 mW/g; SAR(10 g) = 0.392 mW/g**

Maximum value of SAR (measured) = 0.795 mW/g



0 dB = 0.795mW/g

Fig.15 Right Hand Touch Cheek PCS 1900MHz CH661

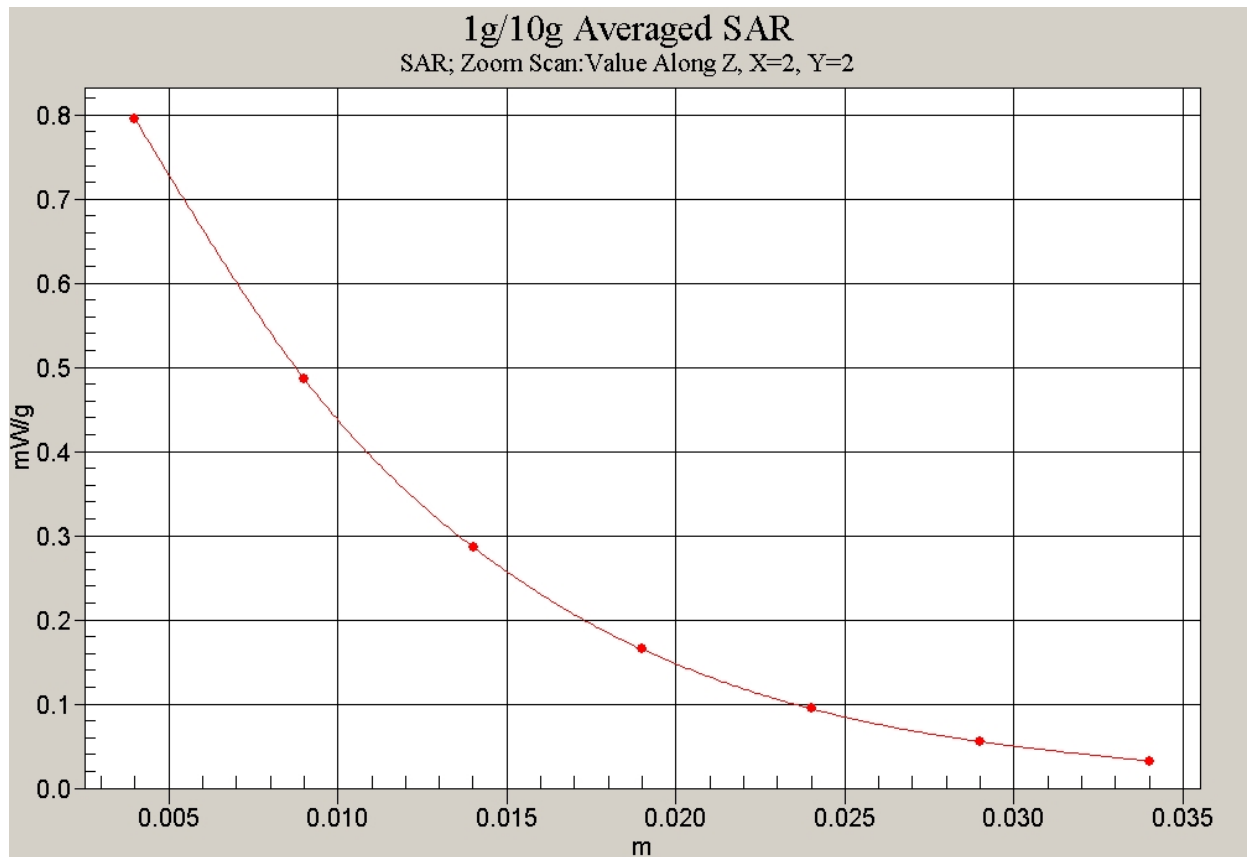


Fig. 16 Z-Scan at power reference point (PCS 1900MHz CH661)

**1900 Right Cheek Low**

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Cheek Low/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.639 mW/g

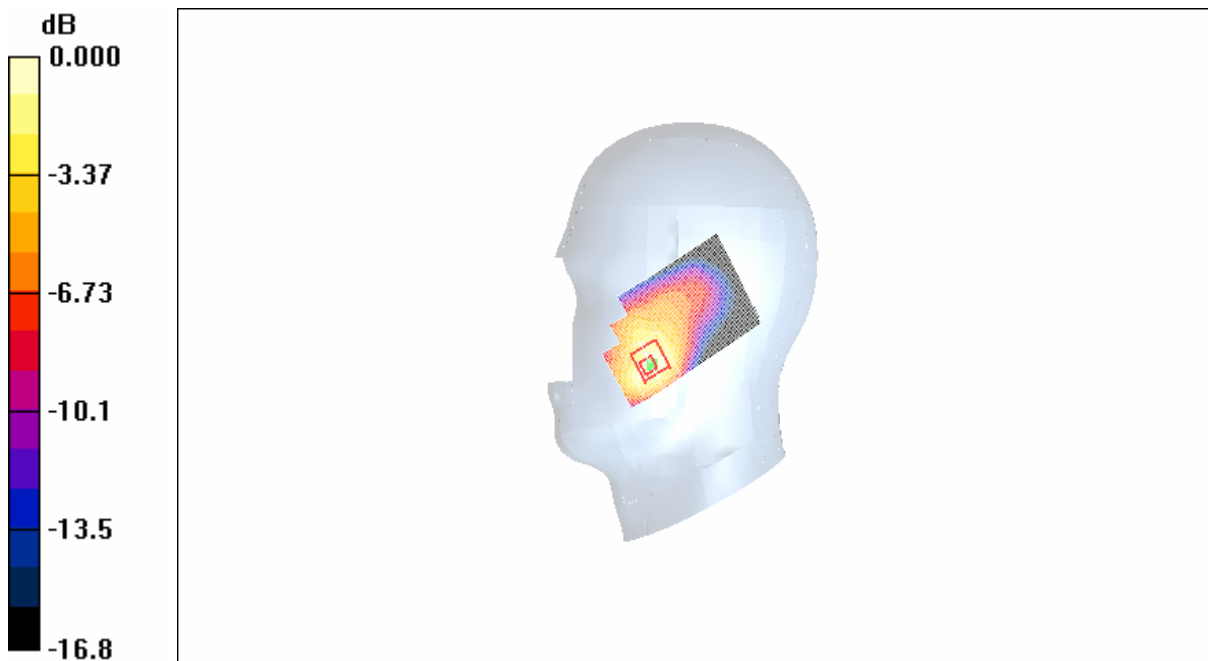
**Cheek Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.90 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 0.937 W/kg

**SAR(1 g) = 0.559 mW/g; SAR(10 g) = 0.309 mW/g**

Maximum value of SAR (measured) = 0.631 mW/g



0 dB = 0.631mW/g

**Fig. 17 Right Hand Touch Cheek PCS 1900MHz CH512**

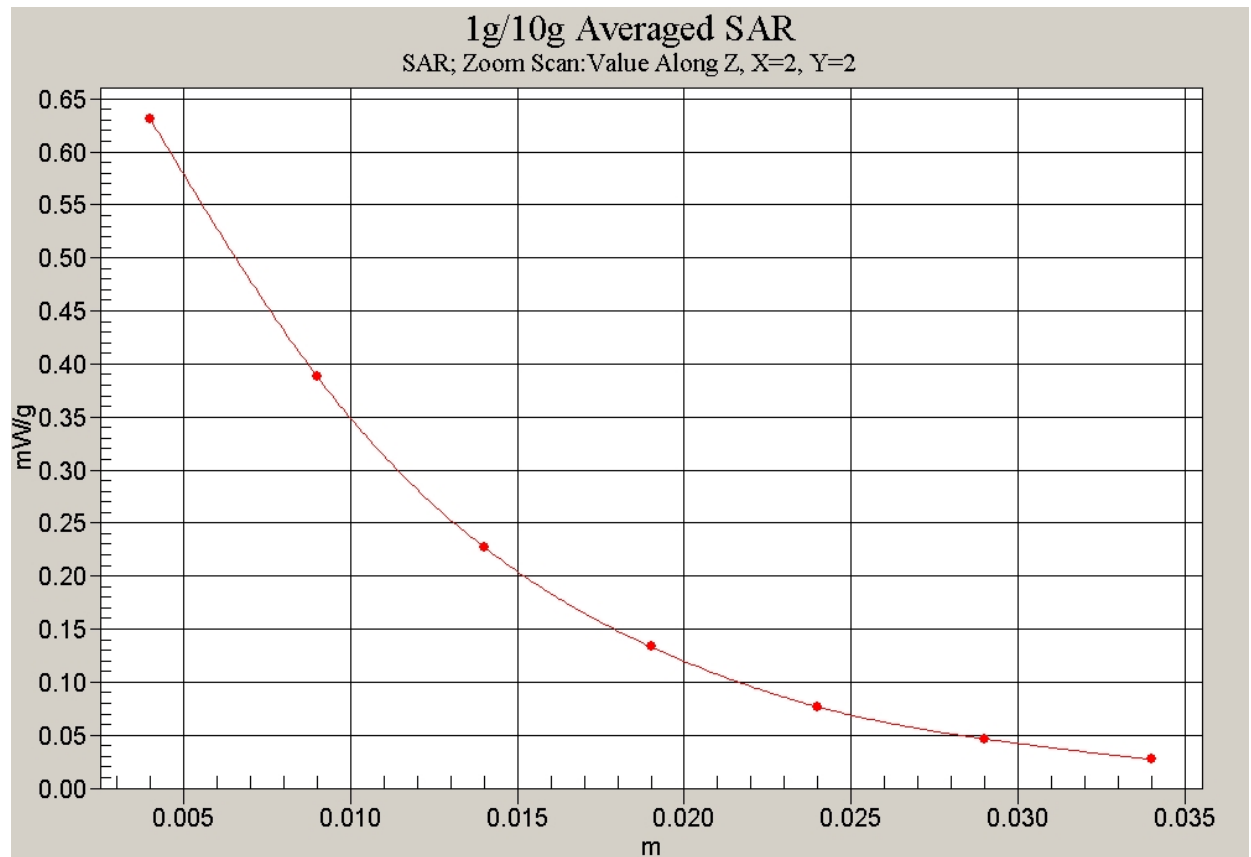


Fig. 18 Z-Scan at power reference point (PCS 1900MHz CH512)

### 1900 Right Tilt High

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Tilt High/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.218 mW/g

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

Reference Value = 10.9 V/m; Power Drift = 0.054 dB

Peak SAR (extrapolated) = 0.309 W/kg

**SAR(1 g) = 0.193 mW/g; SAR(10 g) = 0.115 mW/g**

Maximum value of SAR (measured) = 0.210 mW/g

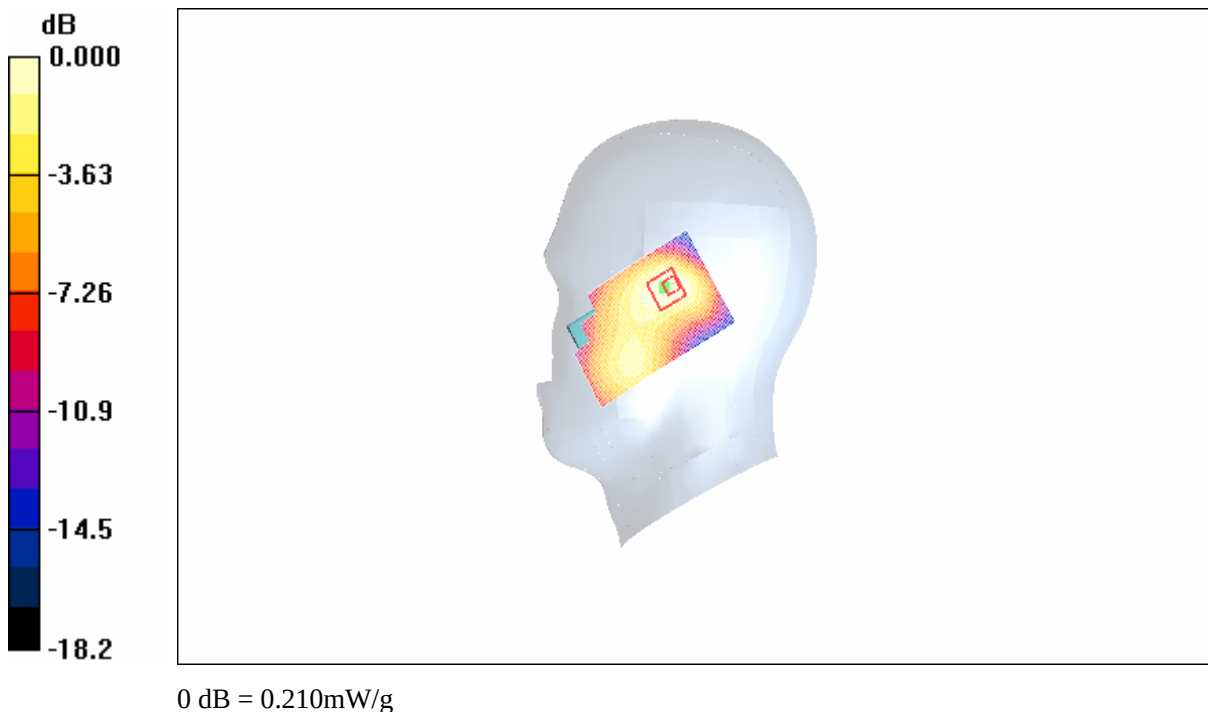


Fig. 19 Right Hand Tilt 15°PCS 1900MHz CH810

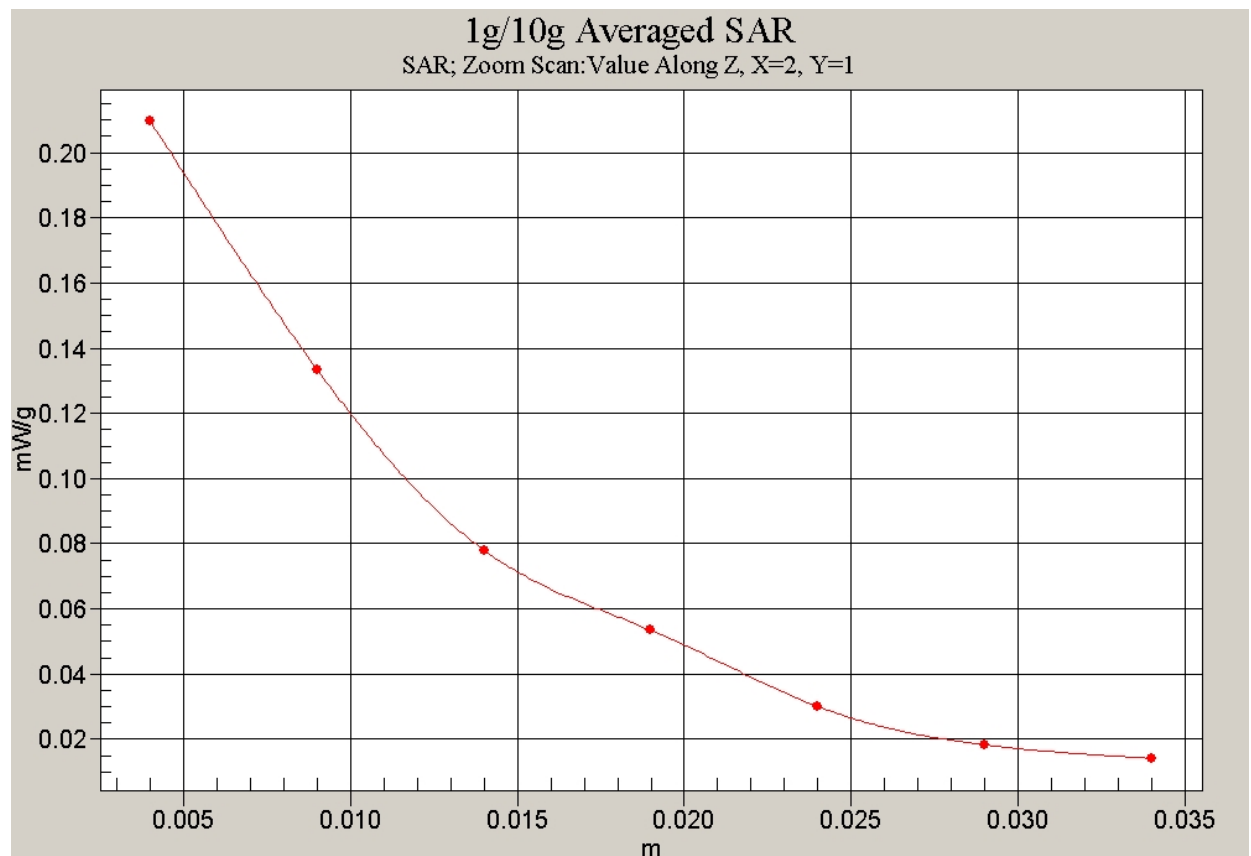


Fig. 20 Z-Scan at power reference point (PCS 1900MHz CH810)

### 1900 Right Tilt Middle

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Tilt Middle/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.187 mW/g

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

Reference Value = 9.76 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 0.260 W/kg

**SAR(1 g) = 0.161 mW/g; SAR(10 g) = 0.099 mW/g**

Maximum value of SAR (measured) = 0.172 mW/g



0 dB = 0.172mW/g

Fig. 21 Right Hand Tilt 15°PCS 1900MHz CH661

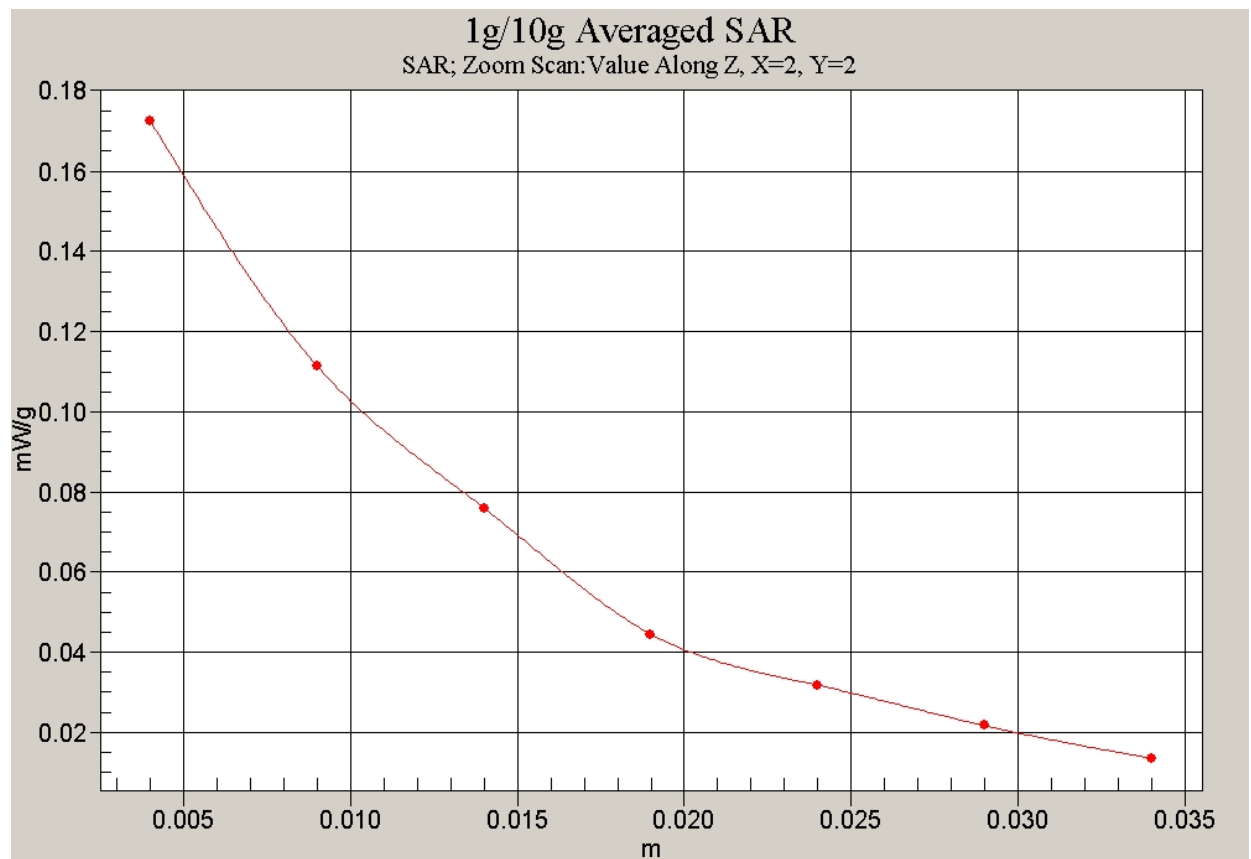


Fig. 22 Z-Scan at power reference point (PCS 1900MHz CH661)

**1900 Right Tilt Low**

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

**Tilt Low/Area Scan (51x81x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.140 mW/g

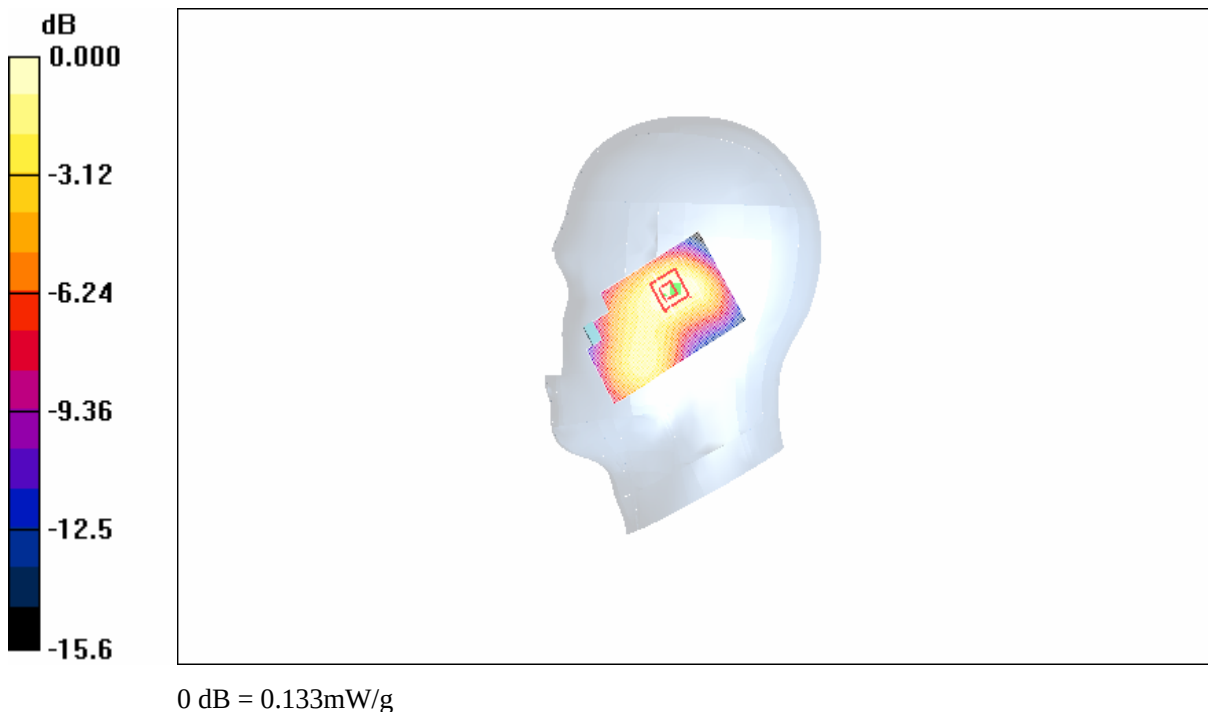
**Tilt Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.36 V/m; Power Drift = 0.129 dB

Peak SAR (extrapolated) = 0.185 W/kg

**SAR(1 g) = 0.122 mW/g; SAR(10 g) = 0.076 mW/g**

Maximum value of SAR (measured) = 0.133 mW/g



**Fig. 23 Right Hand Tilt 15°PCS 1900MHz CH512**

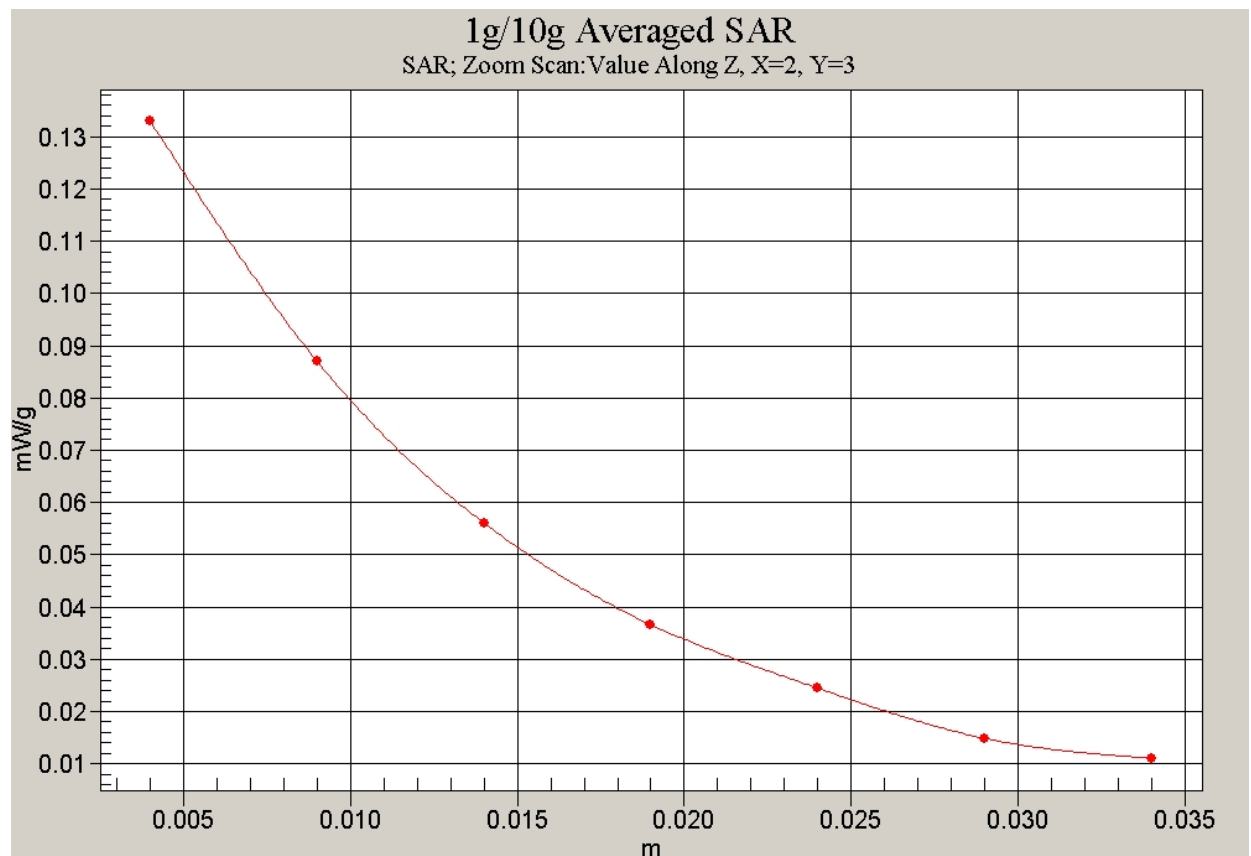


Fig. 24 Z-Scan at power reference point (PCS 1900MHz CH512)

### 1900 Body Toward Ground High

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

**Toward Ground High/Area Scan (71x121x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.285 mW/g

**Toward Ground High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.57 V/m; Power Drift = -0.176 dB

Peak SAR (extrapolated) = 0.454 W/kg

**SAR(1 g) = 0.258 mW/g; SAR(10 g) = 0.152 mW/g**

Maximum value of SAR (measured) = 0.278 mW/g

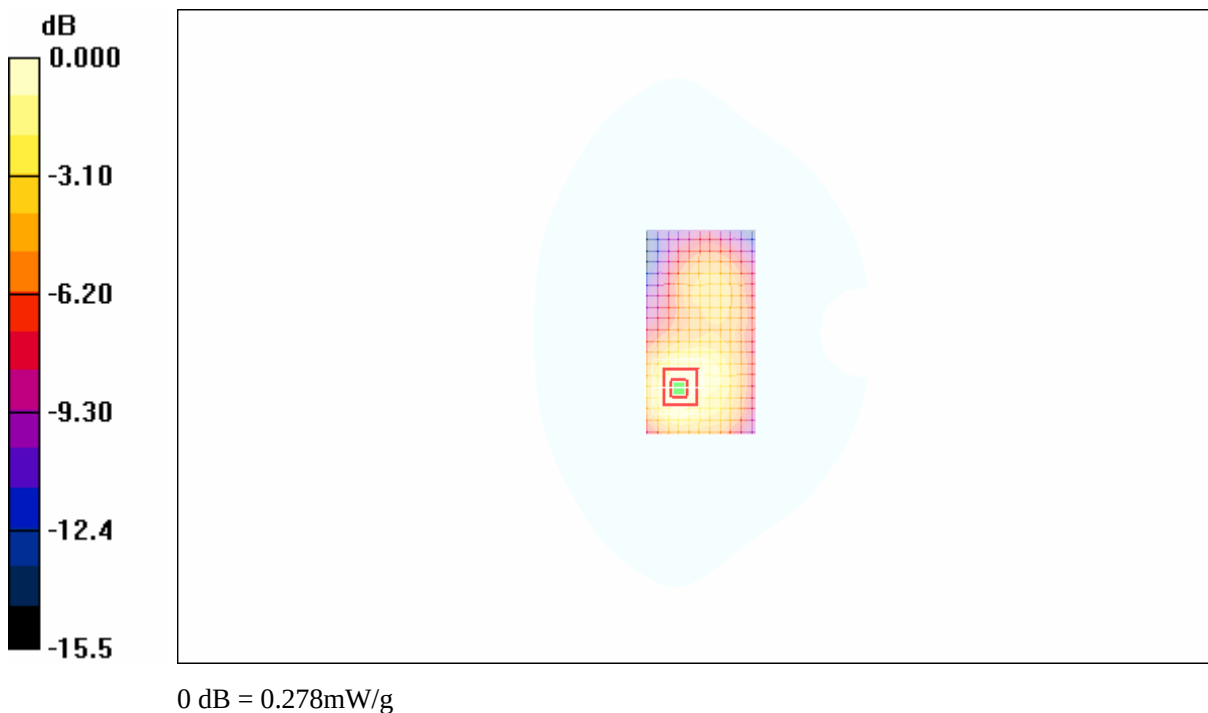


Fig. 25 PCS 1900MHz, Body, Towards Ground, CH810

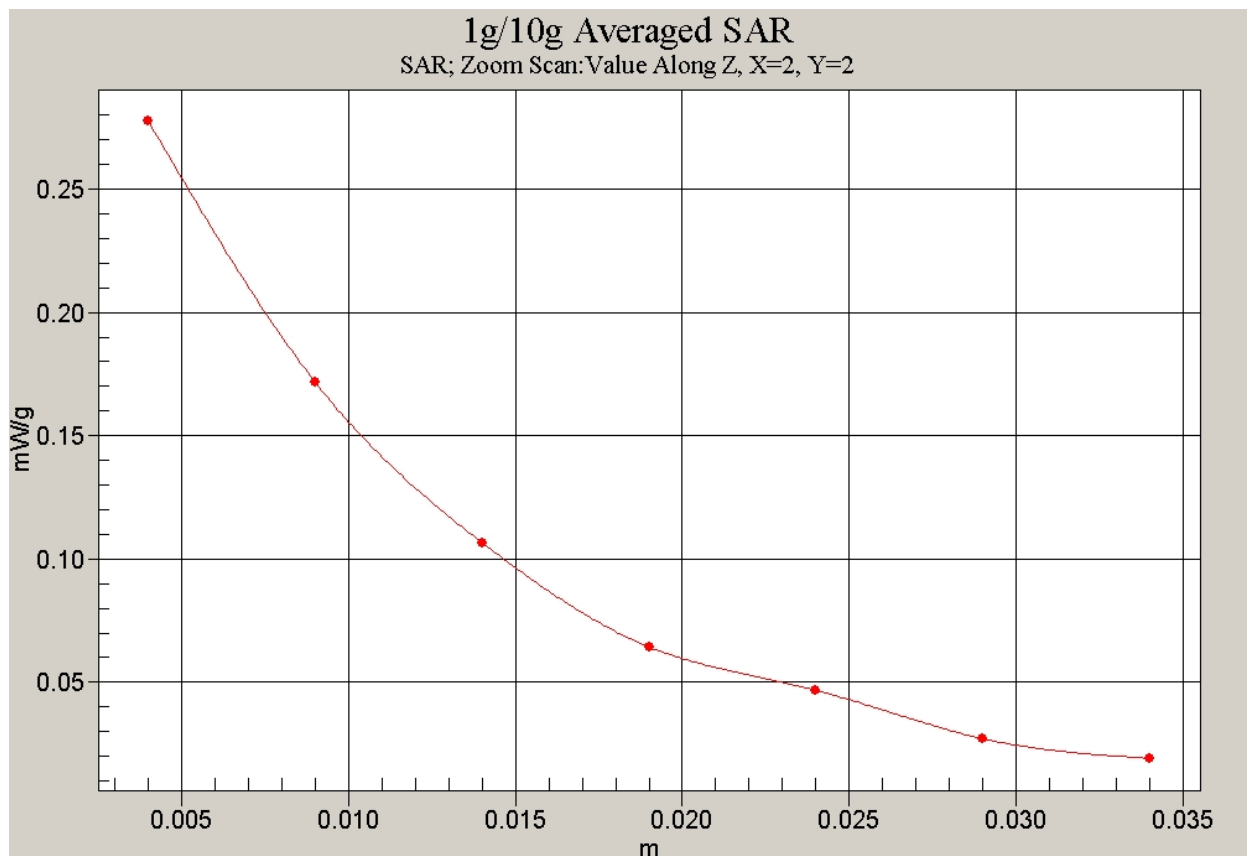


Fig. 26 Z-Scan at power reference point (PCS 1900MHz, Body Towards Ground, CH810)

### 1900 Body Toward Ground Middle

Electronics: DAE3 Sn536

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

**Toward Ground Middle/Area Scan (71x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.239 mW/g

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

Reference Value = 7.98 V/m; Power Drift = -0.055 dB

Peak SAR (extrapolated) = 0.369 W/kg

**SAR(1 g) = 0.215 mW/g; SAR(10 g) = 0.128 mW/g**

Maximum value of SAR (measured) = 0.235 mW/g

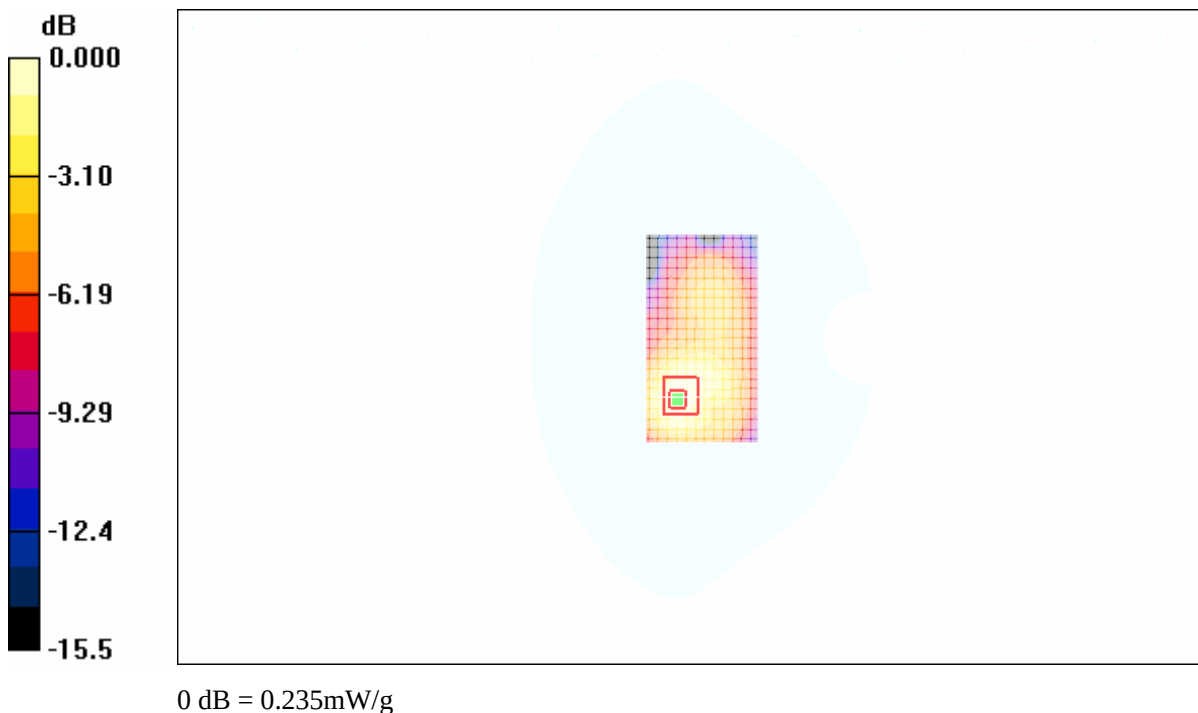


Fig. 27 PCS 1900MHz, Body, Towards Ground, CH661