SAR EVALUATION REPORT

For

Ezfone Telecommunication Ltd.

Flat 9, 16th Floor, Lemmi Center, 50 Hoi Yuen Road, Kwun Tong,
Kowloon, Hong Kong, China

FCC ID: YLXC1-0725

Report Type: Original Report	**Product Type:** GSM Mobile Phone

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Summary of Test Results		
Rule Part(s):	FCC §2.1093	
Test Procedure(s):	IEEE 1528, FCC KDB 447498	
Device Category: Exposure Category:	Portable Device General Population/Uncontrolled Exposure	
Device Type:	GSM Mobile Phone	
Modulation Type:	GSM/GPRS: GMSK Bluetooth: GFSK, π/4-DQPSK, 8DPSK	
TX Frequency Range:	Cellular Band: 824.2-848.8 MHz PCS Band: 1850.2-1909.8 MHz Bluetooth: 2402-2480 MHz	
Conducted RF Out Power:	Cellular Band: 31.25 dBm PCS Band: 28.60 dBm Bluetooth: 5.9 dBm	
Antenna Type(s):	Integrated Antennas	
Body-Worn Accessories:	Headset	
Face-Head Accessories:	None	
Battery Type (s):	Li-Ion rechargeable Battery: 3.7 VDC	
Max. SAR Level (s) Reported:	0.555 W/Kg, Head 1g Tissue 0.703 W/Kg, Body 1g Tissue	Cellular Band
	1.027 W/Kg, Head 1g Tissue 0.500 W/Kg, Body 1g Tissue	PCS Band
	1.187 W/Kg, Head 1g Tissue 0.753 W/Kg, Body 1g Tissue	Simultaneous Transmission

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1 GENERAL DESCRIPTION

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report has been compiled on behalf of the company *Ezfone Telecommunication Ltd.* and their product, model: *C1*, *FCC ID: YLXC1-0725,* which will henceforth in this report be referred to as the EUT. The EUT is a GSM/GPRS mobile phone with BT functionalities.

1.2 EUT Technical Specification

Item	Description
Modulation	GSM/GPRS: GMSK Bluetooth: GFSK, π/4-DQPSK, 8DPSK
Frequency Range	Cellular Band: 824.2-848.8 MHz PCS Band: 1850.2-1909.8 MHz Bluetooth: 2402-2480 MHz
Max Output Power	Cellular Band: 31.25 dBm PCS Band: 28.60 dBm Bluetooth: 5.9 dBm
GPRS Class	Class 12
Capability Class	B
DTM Multi-slot Class	EUT does not support DTM
Dimensions (L*W*H)	115mm(L)×50mm(W)×13mm(H)
Power Source	Li-Ion: 3.7 VDC
Weight	89 g
Normal Operation	Head and Body-worn

The test data gathered are from typical production sample, serial No.: 13091611-1, assigned by BACL.

2 TEST FACILITY

The test site used by Bay Area Compliance Labs Corp. (BACL) to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2003, ANSI C63.4-2009, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: R-3729, C-4176, G-469, and T-1206. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is an American Association for laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-77422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b

3 REFERENCE, STANDARDS AND GUILDELINES

FCC:

The Report and Order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g as recommended by the ANSI/IEEE standard C95.1-1992 [6] for an uncontrolled environment (Paragraph 65). The report is tested according to KDB 447498: General RF Exposure Guidance v05.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in North America is 1.6 mW/g average over 1 gram of tissue mass.

CE:

The CE requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 2 mW/g as recommended by the EN50360 for an uncontrolled environment. According to the Standard, the device should be evaluated at maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits? SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in Europe is 2 mW/g average over 10 gram of tissue mass.

The test configurations were laid out on a specially designed test fixture to ensure the reproducibility of measurements. Each configuration was scanned for SAR. Analysis of each scan was carried out to characterize the above effects in the device.

3.1 SAR Limits

FCC Limit (1g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

CE Limit (10g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	2.0	10
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.

Occupational/Controlled Environments are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).

General Population/Uncontrolled environments Spatial Peak limit 1.6 W/kg (FCC) & 2 W/kg (CE) applied to the EUT.

4 DESCRIPTION OF TEST SYSTEM

These measurements were performed with the automated near-field scanning system DASY4 from Schmid & Partner Engineering AG (SPEAG) which is the fourth generation of the system shown in the figure hereinafter:

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 ±0.02mm. 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 to the data acquisition unit.

The SAR measurements were conducted with the dosimetric probe ET3DV6 SN: 1604 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure with accuracy of better than ±10%. The spherical isotropy was evaluated with the procedure and found to be better than ±0.25dB.

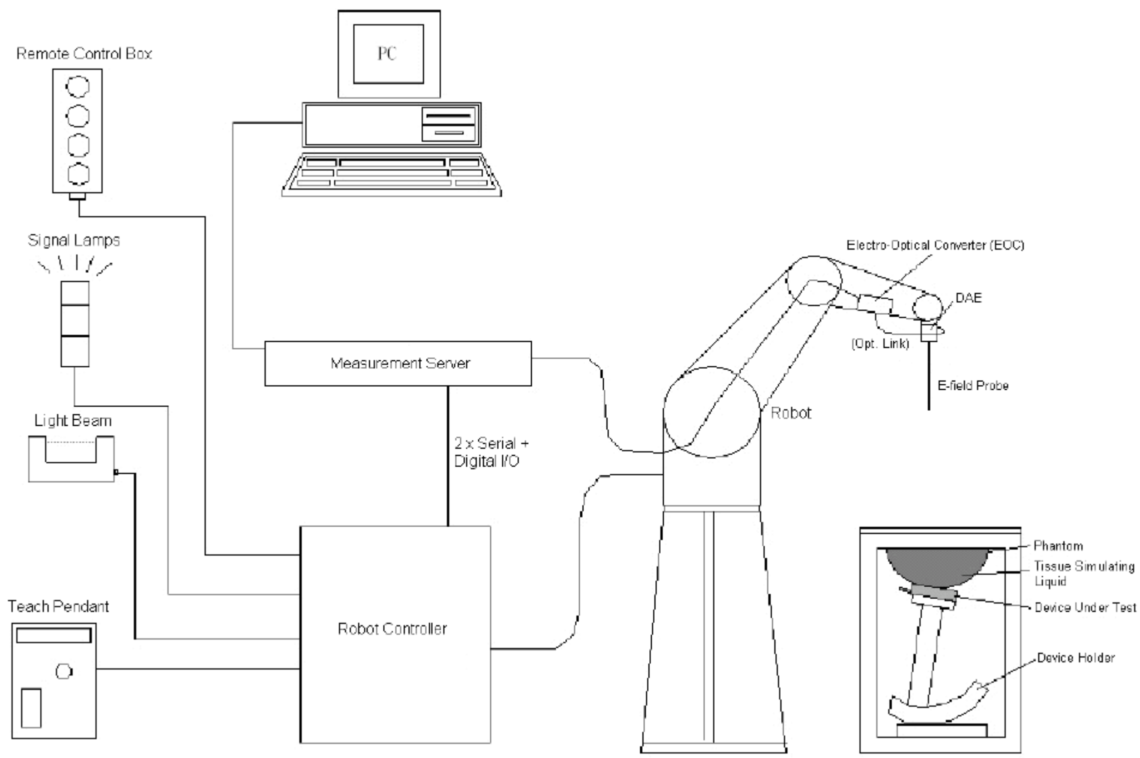
The phantom used was the Generic Twin Phantom”. The ear was simulated as a spacer of 4 mm thickness between the earpiece of the phone and the tissue simulating liquid. The Tissue simulation liquid used for each test is in according with the FCC OET65 supplement C as listed below.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	52.66	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton x-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Recommended Tissue Dielectric Parameters

Frequency (MHz)	Head Tissue		Body Tissue	
	εr	Ơ (S/m)	εr	Ơ (S/m)
150	52.1	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	55.6	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5200	36.0	4.66	49.0	5.30
5500	35.6	4.96	48.6	5.65
5800	35.3	5.27	48.2	6.00

Measurement System Diagram



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

• A standard high precision 6-axis robot (Stäubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).

• A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

• A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

• The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.

• The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.

• A probe alignment unit which improves the (absolute) accuracy of the probe positioning.

• A computer operating Windows 2000 or Windows XP.

• DASY4 software.

• Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.

• The SAM twin phantom enabling testing left-hand and right-hand usage.

• The device holder for handheld mobile phones.

• Tissue simulating liquid mixed according to the given recipes.

• Validation dipole kits allowing system validation.

System Components

• DASY4 Measurement Server
• Data Acquisition Electronics
• Probes
• Light Beam Unit
• Medium
• SAM Twin Phantom
• Device Holder for SAM Twin Phantom
• System Validation Kits
• Robot

DASY4 Measurement Server

The DASY4 measurement server is based on a PC/104 CPU board with a 166MHz low-power Pentium, 32MB chip disk and 64MB RAM. The necessary circuits for communication with either the DAE4 (or DAE3) electronic box as well as the 16-bit AD-converter system for optical detection and digital I/O interface are contained on the DASY4 I/O-board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. The PC-operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with two expansion slots which are reserved for future applications. Please note that the expansion slots do not have a standardized pin out and therefore only the expansion cards provided by SPEAG can be inserted. Expansion cards from any other supplier could seriously damage the measurement server.

Data Acquisition Electronics

The data acquisition electronics 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 measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

Probes

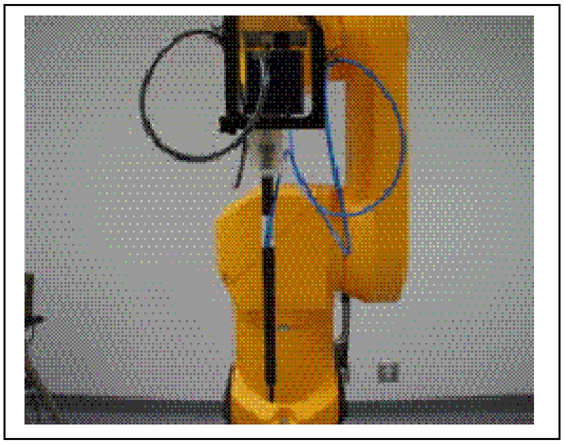
The DASY system can support many different probe types.

Dosimetric Probes: These probes are specially designed and calibrated for use in liquids with high permittivities. They should not be used in air, since the spherical isotropy in air is poor (±2 dB). The dosimetric probes have special calibrations in various liquids at different frequencies.

Free Space Probes: These are electric and magnetic field probes specially designed for measurements in free space. The z-sensor is aligned to the probe axis and the rotation angle of the x-sensor is specified. This allows the DASY system to automatically align the probe to the measurement grid for field component measurement. The free space probes are generally not calibrated in liquid. (The H-field probes can be used in liquids without any change of parameters.)

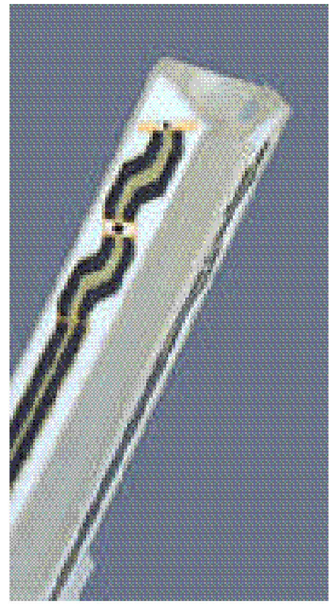
ET3DV6 Probe Specification

Construction Symmetrical design with triangular core
Built-in optical fiber for surface detection System
Built-in shielding against static charges
Calibration In air from 10 MHz to 2.5 GHz
In brain and muscle simulating tissue at
Frequencies of 450 MHz, 900 MHz and
1.8 GHz (accuracy ± 8%)
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 normal probe axis)
Dynamic 5 mW/g to > 100 mW/g;
Range Linearity: ± 0.2 dB
Surface ± 0.2 mm repeatability in air and clear liquids
Detection over diffuse reflecting surfaces.
Dimensions Overall length: 330 mm
Tip length: 16 mm
Body diameter: 12 mm
Tip diameter: 6.8 mm
Distance from probe tip to dipole centers: 2.7 mm
Application General dosimetric up to 3 GHz
Compliance tests of mobile phones
Fast automatic scanning in arbitrary phantoms



Photograph of the probe

The SAR measurements were conducted with the dosimetric probe ET3DV6 designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY3 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped when reaching the maximum.



Inside view of ET3DV6 E-field Probe

E-Field Probe Calibration Process

Each probe is calibrated according to a dosimetric assessment procedure described in [6] with accuracy better than +/- 10%. The spherical isotropy was evaluated with the procedure described in [7] and found to be better than +/-0.25dB. 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 bellow 1 GHz, and in a waveguide 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 dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

Data Evaluation

The DASY4 Post processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters: - Sensitivity Normi, ai0, ai1, ai2
- Conversion factor ConvFi
- Diode compression point dcpi

Device parameters: - Frequency f
- Crest factor cf

Media parameters: - Conductivity σ
- Density ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.
The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

With Vi = compensated signal of channel i (i =x, y, z)
Ui = input signal of channel i (i =x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp_i = diode compression point (DASY parameter)

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

$$\mathrm{E-fieldprobes:} \qquad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

$$\mathrm{H-fieldprobes:} \qquad H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

With Vi = compensated signal of channel i (i =x, y, z)
$Norm_i$ = sensor sensitivity of channel i (i =x, y, z)
$\mu V/(V/m)^2$ for E-field probes
ConF = sensitivity enhancement in solution
a_{ij} = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strenggy of channel i in V/m
H_i = diode compression point (DASY parameter)

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

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

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

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

With SAR = local specific absorption rate in mW/g
E_{tot} = total field strength in V/m
σ = conductivity in [mho/meter] or [Siemens/meter]
ρ = equivalent tissue density in g/cm^3

Note that the density is normally set to 1, to account for actual brain density rather than the density of the simulation liquid.

Light Beam Unit

The light beam switch allows automatic “tooling” of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, so that the robot coordinatesare valid for the probe tip. The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned probe, the same position will be reached with another aligned probe within 0.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position.

Medium

Parameters

The parameters of the tissue simulating liquid strongly influence the SAR in the liquid. The parameters for the different frequencies are defined in the corresponding compliance standards (e.g., EN 50361, IEEE 1528-2003).

Parameter measurements

Several measurement systems are available for measuring the dielectric parameters of liquids:

- The open coax test method (e.g., HP85070 dielectric probe kit) is easy to use, but has only moderate acuracy. It is calibrated with open, short, and deionized water and the calibrations a critical process.

- The transmission line method (e.g., model 1500T from DAMASKOS, INC.) measures the transmission and reflection in a liquid filled high precision line. It needs standard two port calibration and is probably more accurate than the open coax method.

- The reflection line method measures the reflection in a liquid filled shorted precision lined.The method is not suitable for these liquids because of its low sensitivity.

• The slotted line method scans the field magnitude and phase along a liquid filled line. The evaluation is straight forward and only needs a simple response calibration. The method is very accurate, but can only be used in high loss liquids and at frequencies above 100 to 200MHz. Cleaning the line can be tedious.

SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas:

• Left hand
• Right hand
• Flat phantom

The phantom table comes in two sizes: A 100 x 50 x 85 cm (L x W x H) table for use with free standing robots (DASY4 professional system option) or as a second phantom and a 100 x 75 x 85 cm(L x W x H) table with reinforcements for table mounted robots (DASY4 compact system option) .
The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. Only one device holder is necessary if two phantoms are used (e.g., for different liquids) A white cover is provided to tap the phantom during o_-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on the cover are possible. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

The phantom can be used with the following tissue simulating liquids:

• Water-sugar based liquids can be left permanently in the phantom. Always cover the liquid if the system is not used, otherwise the parameters will change due to water evaporation.

• Glycol based liquids should be used with care. As glycol is a softener for most plastics, the liquid should be taken out of the phantom and the phantom should be dried when the system is not used (desirable at least once a week).

• Do not use other organic solvents without previously testing the phantom’s compatibility.

Device Holder for SAM Twin Phantom

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source in 5mm distance, a positioning uncertainty of ±0.5 mm would produce a SAR uncertainty of ±20%. An accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions, in which the devices must be measured, are defined by the standards.

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centers for both scales are the ear reference point ERP). Thus the device needs no repositioning when changing the angles.


The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity "=3 and loss tangent _=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

System Validation Kits

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performance check and system validation. For that purpose a well defined SAR distribution in the flat section of the SAM twin phantom is produced.

System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder. Dipoles are available for the variety of frequencies between 300MHz and 6 GHz (dipoles for other frequencies or media and other calibration conditions are available upon request).

The dipoles are highly symmetric and matched at the center frequency for the specified liquid and distance to the flat phantom (or flat section of the SAM-twin phantom). The accurate distance between the liquid surface and the dipole center is achieved with a distance holder that snaps on the dipole.

Robot

The DASY4 system uses the high precision industrial robots RX60L, RX90 and RX90L, as well as the RX60BL and RX90BL types out of the newer series from Stäubli SA (France). The RX robot series offers many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance-free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchronous motors; no stepper motors)
- Low ELF interference (the closed metallic construction shields against motor control fields)

For the newly delivered DASY4 systems as well as for the older DASY3 systems delivered since 1999, the CS7MB robot controller version from Stäubli is used. Previously delivered systems have either a CS7 or CS7M controller; the differences to the CS7MB are mainly in the hardware, but some procedures in the robot software from Stäubli are also not completely the same. The following descriptions about robot hard- and software correspond to CS7MB controller with software version 13.1 (edit S5). The actual commands, procedures and configurations, also including details in hardware, might differ if an older robot controller is in use. In this case please also refer to the Stäubli manuals for further information.

5 EQUIPMENT LIST AND CALIBRATION

5.1 Equipments List & Calibration Info

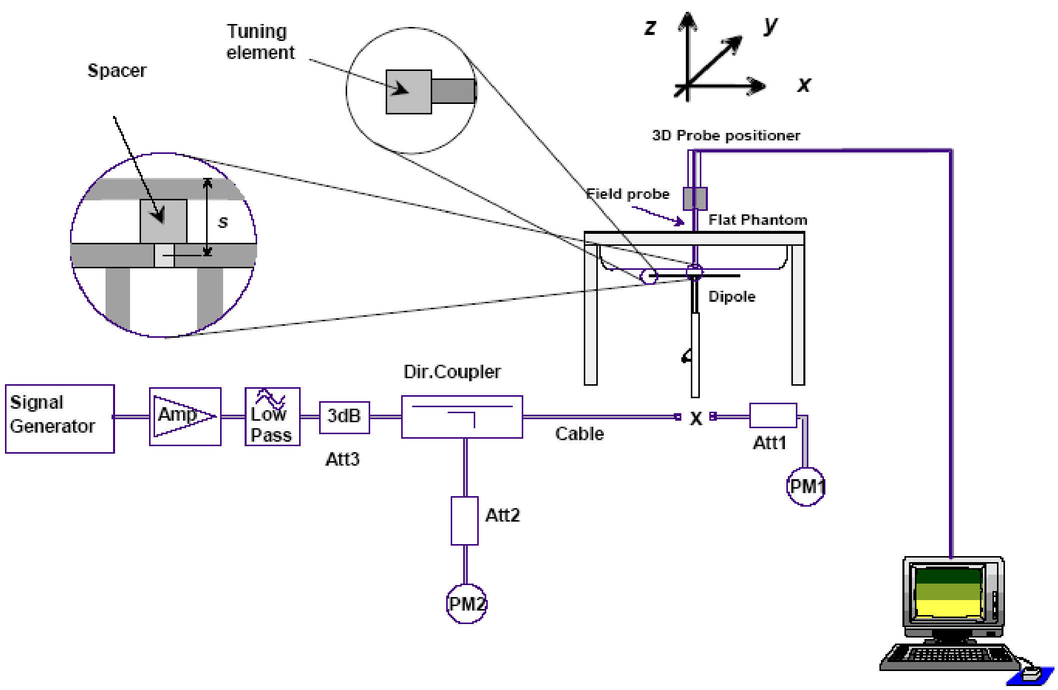
Type/Model	Cal. Due Date	S/N
DASY4 Professional Dosimetric System	N/A	N/A
Robot RX60L	N/A	CS7MBSP / 467
Robot Controller	N/A	F01/5J72A1/A/01
Dell Computer Dimension 3000	N/A	N/A
SPEAG EDC3	N/A	N/A
SPEAG DAE3	2014-03-16	456
DASY4 Measurement Server	N/A	1176
Speag, Probe, ES3DV2	2014-08-26	3109
Aprel Dipole Antenna, ALS-D-835-S-2	2014-10-27	180-00564
Aprel Dipole Antenna, ALS-D-1900-S-2	2014-10-24	210-00715
SPEAG Flat Phantom	N/A	1004
Brain Equivalent Matter (835 MHz)	Each Time	N/A
Muscle Equivalent Matter (835 MHz)	Each Time	N/A
Brain Equivalent Matter (1900 MHz)	Each Time	N/A
Muscle Equivalent Matter (1900 MHz)	Each Time	N/A
Agilent, Spectrum Analyzer E4440A	2014-08-22	US45303156
Microwave Amp. 8349A	N/A	2644A02662
Power Meter Agilent E4419B	2014-10-03	MY4121511
Power Sensor Agilent E4412A	N/A	N/A
Dielectric Probe Kit HP85070A	N/A	US99360201
HP, Signal Generator, 83650B	2014-07-13	3614A00276
Amplifier, ST181-20	N/A	E012-0101
Antenna, Horn DRH-118	N/A	A052704

6 SAR MEASUREMENT SYSTEM VERIFICATION

6.1 System Accuracy Verification

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ±10%. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

6.2 System Verification Setup



The dipole must be placed beneath at the phantom section of the SAM Twin Phantom with the correct distance spacer in place. The distance spacer should touch the phantom surface with a light pressure at the reference marking (little cross) and be oriented parallel to the long side of the phantom. The forward power into the dipole at the dipole SMA connector should be determined as accurately as possible.

6.3 Liquid and System Validation Results

Measured Date	Simulant	Freq. [MHz]	Parameters	Liquid Temp [ºC]	Target Value	Measured Value	Deviation [%]	Limits [%]
2013-09-23	Body	835	ερ	22	55.2	55.9	1.27	± 5
			σ	22	0.97	0.99	2.06	± 5
			1g SAR	22	9.98	10.6	6.21	± 10
2013-09-23	Head	835	ερ	22	41.5	41.6	0.24	± 5
			σ	22	0.9	0.89	-1.11	± 5
			1g SAR	22	9.59	9.32	-2.81	± 10
2013-09-23	Body	1900	ερ	22	55.6	53.7	-3.42	± 5
			σ	22	1.52	1.51	-1.32	± 5
			1g SAR	22	39.654	40.4	1.88	± 10
2013-09-23	Head	1900	ερ	22	40	39.8	-0.5	± 5
			σ	22	1.4	1.38	-1.43	± 5
			1g SAR	22	39.379	41	4.12	± 10

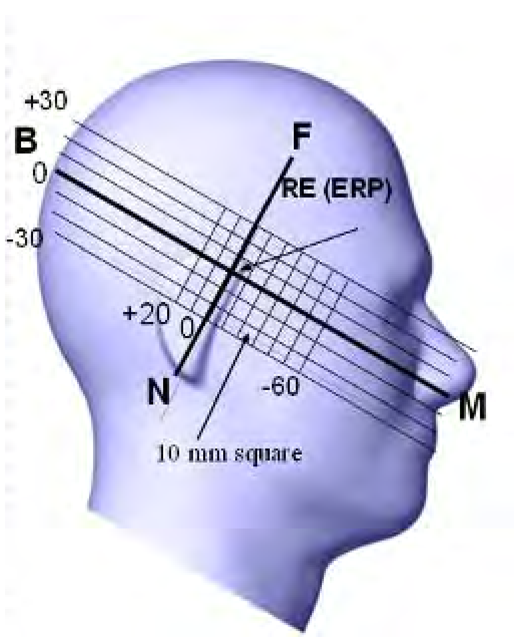
εr = relative permittivity, σ = conductivity and ρ=1000 kg/m^3

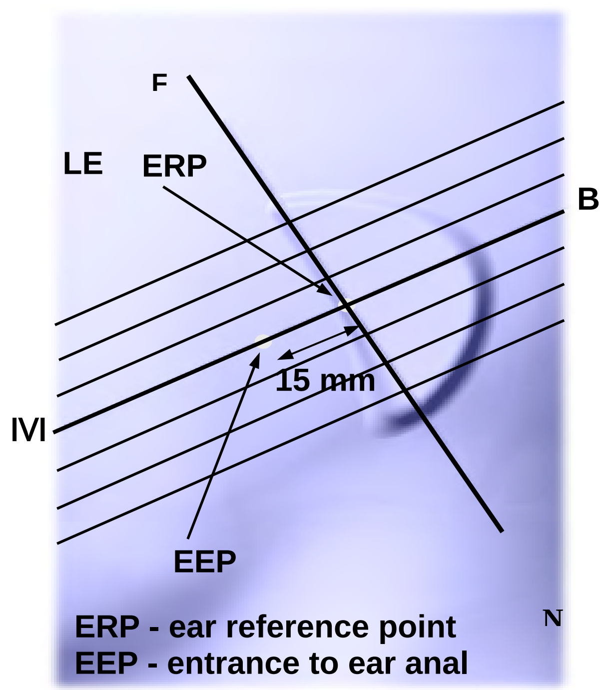
7 EUT TEST STRATEGY AND METHODOLOGY

7.1 Test Positions for Device Operating Next to a Person's Ear

This category includes most wireless handsets with fixed, retractable or internal antennas located toward the top half of the device, with or without a foldout, sliding or similar keypad cover. The handset should have its earpiece located within the upper ¼ of the device, either along the centerline or off-centered, as perceived by its users. This type of handset should be positioned in a normal operating position with the "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point". The "test device reference point" should be located at the same level as the center of the earpiece region. The "vertical centerline" should bisect the front surface of the handset at its top and bottom edges. An "ear reference point" is located on the outer surface of the head phantom on each ear spacer. It is located 1.5 cm above the center of the ear canal entrance in the "phantom reference plane" defined by the three lines joining the center of each "ear reference point" (left and right) and the tip of the mouth.

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom. For the SCC-34/SC-2 head phantom, the device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". For interim head phantoms, the device should be positioned parallel to the cheek for maximum RF energy coupling. The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane". This is called the "initial ear position". While maintaining these three alignments, the body of the handset is gradually adjusted to each of the following positions for evaluating SAR:





7.2 Cheek/Touch Position

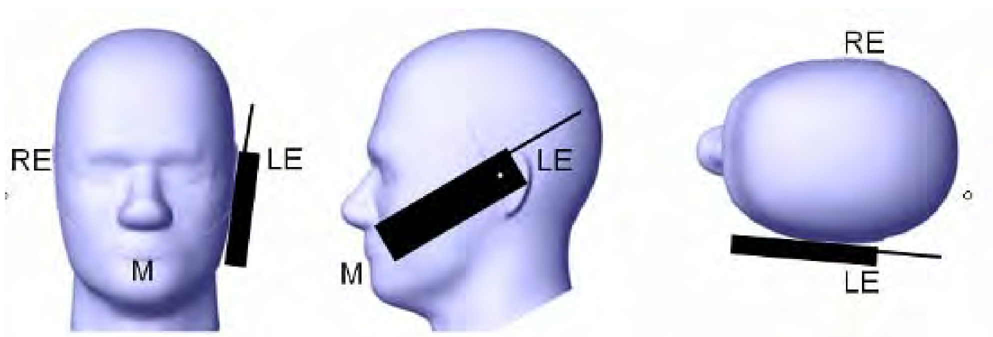
The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line for the SCC-34/SC-2 head phantom.

This test position is established:

- o When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
- o (or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms – when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touches the cheek of the phantom or breaks its last contact from the ear spacer.

Cheek /Touch Position



7.3 Ear/Tilt Position

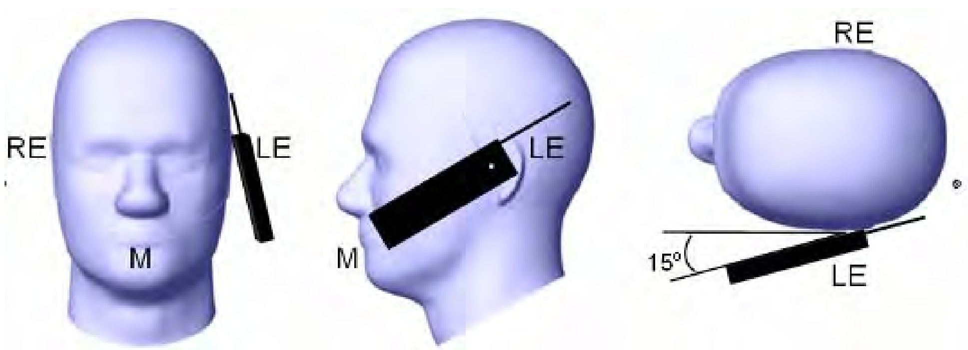
With the handset aligned in the "Cheek/Touch Position":

1) If the earpiece of the handset is not in full contact with the phantom's ear spacer (in the "Cheek/Touch position") and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.

2) (otherwise) The handset should be moved (translated) away from the cheek perpendicular to the line passes through both "ear reference points" (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3 cm. While it is in this position, the device handset is tilted away from the mouth with respect to the "test device reference point" until the inside angle between the vertical centerline on the front surface of the phone and the horizontal line passing through the ear reference point isby 15 80°. After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

If a device is also designed to transmit with its keypad cover closed for operating in the head position, such positions should also be considered in the SAR evaluation. The device should be tested on the left and right side of the head phantom in the "Cheek/Touch" and "Ear/Tilt" positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tile/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s). If the transmission band of the test device is less than 10 MHz, testing at the high and low frequency channels is optional.

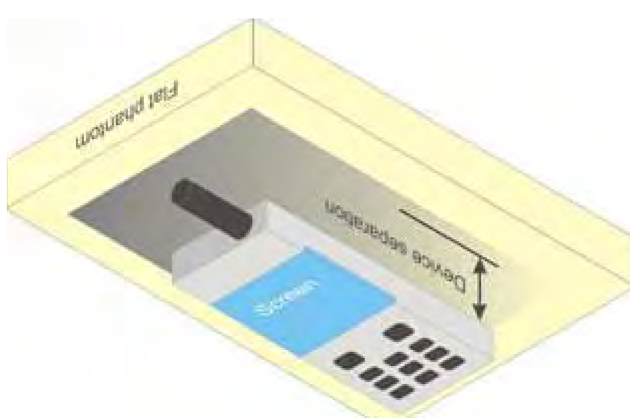
Ear /Tilt 15° Position



7.4 Test positions for body-worn and other configurations

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only the accessory that dictates the closest spacing to the body must be tested.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.



7.5 SAR Evaluation Procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the ear point or central position was used as a reference value for assessing the power drop. The SAR at this point is measured at the start of the test and then again at the end of the testing.

Step 2: The SAR distribution at the exposed side of the head was measured at a distance of 4 mm from the inner surface of the shell. The area covered the entire dimension of the head or EUT and the horizontal grid spacing was 15 mm x 15 mm. Based on these data, the area of the maximum absorption was determined by line interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.

Step 3: Around this point, a volume of 30 mm x 30 mm x 21 mm was assessed by measuring 5 x 5 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

1. The data at the surface were extrapolated, since the center of the dipoles is 1.2 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 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.

2. The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by 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 averages.

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

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

8 DASY4 SAR EVALUATION PROCEDURE

8.1 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurement jobs are useful jobs for monitoring the power drift of the device under test in the batch process. Both jobs measure the field at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. By default, the Minimum distance of probe sensors to surface is 4mm. This distance can be modified by the user, but cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties (for example, 2.7mm for an ET3DV6 probe type).

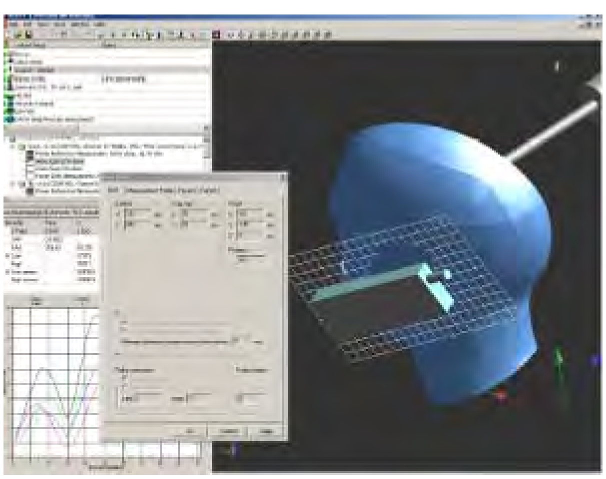
8.2 Area Scan

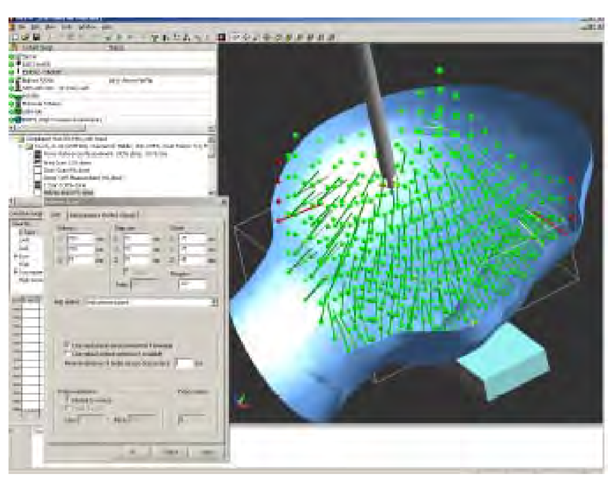
The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot. The sophisticated interpolation routines implemented in DASY4 software can find the maximum locations even in relatively coarse grids.

The scanning area is defined by an editable grid. This grid is anchored at the grid reference point of the selected section in the phantom. When the Area Scan's property sheet is brought-up, grid settings can be edited by a user.

When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE 1528-2003, EN 50361 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

After measurement is completed, all maxima and their coordinates are listed in the Results property page. The maximum selected in the list is highlighted in the 3-D view. For the secondary maxima returned from an Area Scan, the user can specify a lower limit (peak SAR value), in addition to the Find secondary maxima within x dB condition. Only the primary maximum and any secondary maxima within x dB from the primary maximum and above this limit will be measured.





8.3 Zoom Scan

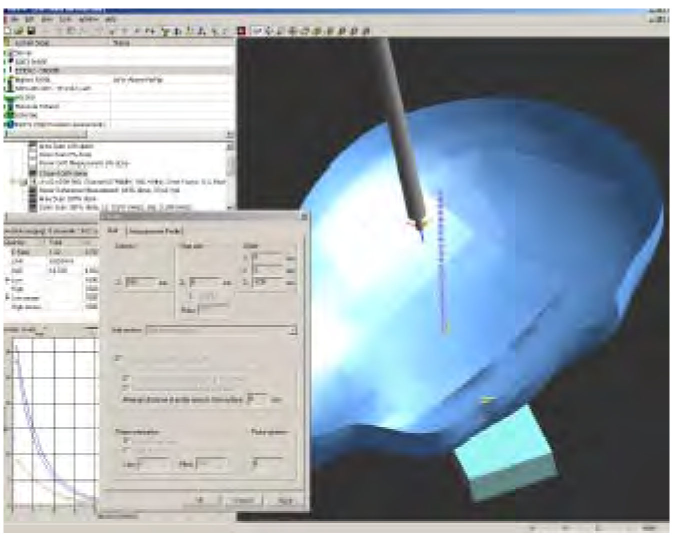
Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan measures 5 x 5 x 7 points within a cube whose base faces are centered around the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

8.4 Power drift measurement

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

8.5 Z-Scan

The Z Scan job measures points along a vertical straight line. The line runs along the Z axis of a one-dimensional grid. A user can anchor the grid to the section reference point, to any defined user point or to the current probe location. As with any other grids, the local Z axis of the anchor location establishes the Z axis of the grid.



9 FCC 2G/3G MEASUREMENT PROCEDURES

Power measurements were performed using a base station simulator under average power.

Procedures Used to Establish RF Signal for SAR

The following procedures are applicable to HSDPA data devices operating under 3GPP Release 5. Body exposure conditions are typically applicable to these devices, including handsets and data modems operating in various electronics devices. HSDPA operates in conjunction with WCDMA and requires an active DPCCH. The default test configuration is to measure SAR in WCDMA and requires without HSDPA, with an established radio link between the DUT and communication test set using a 12.2kbps RMC configured in Test Loop Mode 1; and test HSDPA within FRC and a 12.2 kbps RMC using highest SAR configuration in WCDMA. SAR is selectively confirmed for other physical channels configurations according to output power, exposure conditions and device operating capabilities. Maximum output power is verified according to 3GPP TS 23.121 (Release 5) and SAR must be measured according to these maximum output conditions.

The device was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and recommended for evaluating SAR [4]. SAR measurements were taken with a fully charged battery. In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. The SAR measurement software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more that 5% occurred, the test were repeated.

SAR Measurement Conditions for HSDPA Data Devices

Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121 (release 5), using the appropriate RMC with TPC (Transmit Power Control) set to all “1s”. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH) are tabulated in the test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations is identified.

For WCDMA/HSDPA/HSUPA

Configure the Agilent 8960 to support all WCDMA tests in respect to the 3GPP TS 34.121, measure the power at channel 4132, 4182 abd 4233 for UC cellular, channel 9262, 9400 and 9538 for US PCS band.

For Rel 99:
Set the test mode 1 loop using 12.2kbps RMC. Set and send continuously up power control commands to the EUT. And measure the power through the antenna connector of the EUT.

For HSDPA Rel 6:
Set the test mode 1 loop using 12.2kbps RMC abd a H-set1 FRC. Set the HSDPA setting for HSDPA sebtest 1 and send the continuously up power command to the EUT. And measure the power through the antenna connector of the EUT. Repeat the measurement for sub test 2, 3 and 4.

For HSUPA Rel 6:
Set the test mode 1 loop using 12.2kbps RMC abd a H-set1 FRC. Set the HSUPA setting for HSDPA sebtest 1. Set the UNDP power to at least 5dB lower then the MAX output power. Send power control bit to give TPC_cmd=+1 command to the UNDP. Confirm the E-TFCI transmitted by the UNDP is equal to the target E-TFCI in 3GPP TS 34.121. And measure the power through the antenna connector of the EUT. Repeat the measurement for sub test 2, 3, 4 and 5.

For GSM/GPRS/EDGE

This EUT is a class B device which means the EUT can connect to GPRS and GSM service but using only one or the other at the given time.

And the EUT has one time slot transmission and two time slots (two UL and two DL MAX) transmission for GMSK GPRS. And one time slot for 8PSK EDGE.

Configure the 8960 to support GPRS and EDGE, and set one time slot transmission for GPRS and EDGE. Measure the power output from the antenna port of the EUT. Repeat the measurement by configure the 2 time slots for GPRS.

Body SAR Measurements

For WCDMA/HSDPA/HSUPA

SAR body exposure configuration is measured using 12.2 kbps RMC with the TPC bits configured for all “1s”. SAR for other spreading codes and multiple $DPDCH_n$, when supported by the DUT, are not required when the maximum average outputs of each RF channel, for each spreading code and $DPDCH_n$ configuration, are less than ¼ dB higher than those measured in 12.2 RMC. Otherwise, SAR is measured on the maximum output channel with an applicable RMS configuration that results in the highest SAR with 12.2 RMC. When more that

2 $DPDCH_n$ are supported by the DUT, it may be necessary to configure additional $DPDCH_n$ for DUT using FTM (Factory Test Mode) with parameters similar to those used in 384 kbps and 768 kbps RMC. In addition, body SAR is also measured in HSDPA with an FRC, together with a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA.

The H-set used in FRC for HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HSDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the applicable H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the FRC for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 2 ms to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors of β_c=9 and β_d=15, and power offset parameters of $\Delta_{ACK} = \Delta_{NACK} = 5$ and $\Delta_{CQI} = 2$ should be used. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the FRC.

For GSM/GPRS/EDGE

SAR body exposure configuration is measured using GPRS 4 time slots as the time average power is higher then GPRS 1 time slot and EDGE.

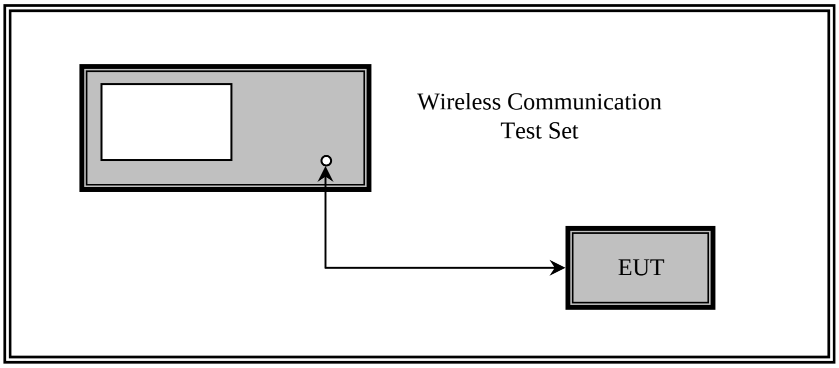
Agilent 8960 measures the average output power for active timeslots. For SAR the time-based average power is relevant. The difference in between depends on the duty cycle of the TDMA signal:

Number of Timeslots	1	2	3	4
Duty Cycle	1:8	1:4	1:2.67	1:2
Time-based Ave. power compared to slotted Ave. power	- 9.03 dB	- 6.02 dB	- 4.26 dB	- 3.01 dB

10 RF OUTPUT VERIFICATION

10.1 Test Procedure and Block Diagram

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.



10.2 Test Results

Cellular Band

Mode	Channel	Frequency (MHz)	Conducted Output Power dBm)			
GSM	128	824.2	31.10			
	190	836.6	31.20			
	251	848.8	31.25			
Mode	**Channel**	**Frequency (MHz)**	**Conducted Output Power Note 1 (dBm)**			
			1 slot	**2 slots**	**3 slots**	**4 slots**
GPRS	128	824.2	31.10	29.60	27.10	25.95
	190	836.6	31.20	29.83	27.30	26.25
	251	848.8	31.23	29.95	27.50	26.43

PCS Band

Mode	Channel	Frequency (MHz)	Conducted Output Power (dBm)			
GSM	512	1850.2	28.59			
	661	1880.0	28.60			
	810	1909.8	28.55			
Mode	**Channel**	**Frequency (MHz)**	**Conducted Output Power Note 1 (dBm)**			
			1 slot	**2 slots**	**3 slots**	**4 slots**
GPRS	512	1850.2	28.59	28.55	26.65	25.15
	661	1880.0	28.60	28.48	26.58	25.39
	810	1909.8	28.55	28.53	26.55	25.33

SAR measurement is base on time average power, the different depending on the duty Cycle of the TDMA signal on GPRS:

Number of Timeslots	1	2	3	4
Duty Cycle	1:8	1:4	1:2.67	1:2
Time-based Ave. power compared to slotted Ave. power	- 9.03 dB	- 6.02 dB	- 4.26 dB	- 3.01 dB
Crest Factor	8	4	2.66	2

The time bases average power for GPRS

Mode	Channel	Frequency (MHz)	Conducted Output Power [Note 1] (dBm)			
			1 slot	2 slots	3 slots	4 slots
GPRS	128	824.2	22.07	**23.58**	22.84	22.94
	190	836.6	22.17	**23.81**	23.04	23.24
	251	848.8	22.2	**23.93**	23.24	23.42
Mode	**Channel**	**Frequency (MHz)**	**Conducted Output Power [Note 1] (dBm)**			
			1 slot	**2 slots**	**3 slots**	**4 slots**
GPRS	512	1850.2	19.56	**22.53**	22.39	22.14
	661	1880.0	19.57	**22.46**	22.32	22.38
	810	1909.8	19.52	**22.51**	22.29	22.32

Note: 1. Agilent 8960 communication tested was used for the measurement of GSM and GPRS power for active time slots.
2. For GPRS, 1, 2, 3, 4, times slots had been active separately with power level 5 for 850 MHz band and power level 0 for 1900 MHz band. GPRS 2 slots shown as the worst time average power, therefore all GPRS modes were tested base on 2 time slots with a crest factor of 4.

Bluetooth

Mode	Channel	Frequency (MHz)	Conducted Output Power (dBm)		
			GFSK	π/4-DQPSK	8DPSK
Bluetooth	1	2402	5.36	4.63	5.05
	40	2441	5.85	4.97	5.46
	79	2480	5.90	5.17	5.49

Standalone SAR is not result for Bluetooth base on KDB 447498 with the calculation result table below:

Head Position

Mode	Frequency (MHz)	Power (mW)	Distance (mm)	Calculated Value (mW/g)	Threshold Level	SAR Test Exclusion
Bluetooth	2450	3.89	0	1.22	3	Yes

Body Position

Mode	Frequency (MHz)	Power (mW)	Distance (mm)	Calculated Value (mW/g)	Threshold Level	SAR Test Exclusion
Bluetooth	2450	3.89	15	0.41	3	Yes

Note: Standalone SAR exclusion calculation

[(Max power of channel, mW)/(Min test separation distance, mm)].[$\sqrt{f_{(GHz)}}$]≤3.0 for 1-g SAR and 7.5 for 10-g extremity SAR.

11 SAR MEASUREMENT RESULTS

This page summarizes the results of the performed dosimetric evaluation. The plots with the corresponding SAR distributions, which reveal information about the location of the maximum SAR with respect to the device, could be found in Appendix E.

11.1 Test Environmental Conditions

Temperature:	21-23 ^{O}C
Relative Humidity:	45-50 %
ATM Pressure:	101.7-102.1kPa

Testing was performed by Bo Li on 2012-09-23 ~ 2012-09-24 in SAR chamber.

Cellular Band

EUT Position	Frequency (MHz)	Test Type	Max Power Meas. (dBm)	Max Rated Power (dBm)	Scaled Factor	SAR Value Meas. (W/Kg) 1g Tissue	Reported SAR (W/Kg) 1g Tissue	Limit (W/Kg) 1g Tissue	Plot #
1.5 cm Body-Worn Front Side	848.8	GSM	31.25	32	1.189	0.301	0.358	1.6	1
1.5 cm Body-Worn Back Side	848.8	GSM	31.25	32	1.189	0.493	**0.586**	1.6	2
Right Head Tilt	848.8	GSM	31.25	32	1.189	0.199	0.237	1.6	3
Right Head Touch	848.8	GSM	31.25	32	1.189	0.289	0.343	1.6	4
Left Head Tilt	848.8	GSM	31.25	32	1.189	0.287	0.341	1.6	5
Left Head Touch	824.2	GSM	31.10	32	1.23	0.229	0.282	1.6	6
Left Head Touch	836.6	GSM	31.10	32	1.23	0.335	0.412	1.6	7
Left Head Touch	848.8	GSM	31.25	32	1.189	0.467	**0.555**	1.6	8
1.5 cm Body-Worn Front Side	848.8	GPRS 2 Slots	29.95	29	1.122	0.334	0.375	1.6	9
1.5 cm Body-Worn Back Side	848.8	GPRS 2 Slots	29.95	29	1.122	0.627	**0.703**	1.6	10

PCS Band

EUT Position	Frequency (MHz)	Test Type	Max Power Meas. (dBm)	Max Rated Power (dBm)	Scaled Factor	SAR Value Meas. (W/Kg) 1g Tissue	Reported SAR (W/Kg) 1g Tissue	Limit (W/Kg) 1g Tissue	Plot #
1.5 cm Body-Worn Front Side	1850.2	GSM	28.59	29	1.099	0.258	0.284	1.6	11
1.5 cm Body-Worn Back Side	1850.2	GSM	28.59	29	1.099	0.428	**0.470**	1.6	12
Right Head Tilt	1850.2	GSM	28.59	29	1.099	0.86	0.945	1.6	13
Right Head Tilt	1880	GSM	28.60	29	1.096	0.836	0.919	1.6	14
Right Head Tilt	1909.8	GSM	28.55	29	1.109	0.823	0.913	1.6	15
Right Head Touch	1850.2	GSM	28.59	29	1.099	0.745	0.819	1.6	16
Left Head Tilt	1850.2	GSM	28.59	29	1.099	0.996	1.095	1.6	17
Left Head Tilt	1880	GSM	28.60	29	1.096	0.937	**1.027**	1.6	18
Left Head Tilt	1909.8	GSM	28.55	29	1.109	0.921	1.021	1.6	19
Left Head Touch	1850.2	GSM	28.59	29	1.099	0.767	0.843	1.6	20
1.5 cm Body-Worn Front Side	1850.2	GPRS 2 Slots	28.55	28	/	0.265	0.265	1.6	21
1.5 cm Body-Worn Back Side	1850.2	GPRS 2 Slots	28.55	28	/	0.50	**0.50**	1.6	22

12 SAR SIMULTANEOUS TRANSMISSION DESCRIPTION

According to KDB 447498 General RF Exposure Guidance v05

The Simultaneous SAR test exclusion considerations show below:

From section 10 of this report, it determined that the Bluetooth stand alone SAR is not required, therefore, base on KDB 447498, the Bluetooth Estimated (1g) SAR is calculated as below:

Mode	Frequency (GHz)	Power (mW)	Distance (mm)	Estimated Value (W/Kg)
BT Head	2.45	3.89	0	0.16
BT Body	2.45	3.89	15	0.05

- *(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)*]·[$\sqrt{f_{(GHz)}}/x$] W/kg for *test separation distances* ≤ 50 mm;
  where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.

Therefore the Simultaneous SAR result is calculated as below base on the worst case of Head and Body Position:

Mode	Position	Reported Worst SAR (W/Kg)		Total SAR (W/Kg)
		GSM/GPRS	Bluetooth	
Cellular Band GSM/GPRS with Bluetooth	Head	0.586	0.16	0.746
	Body	0.703	0.05	0.753
PCS Band GSM/GPRS with Bluetooth	Head	1.027	0.16	**1.187**
	Body	0.50	0.05	0.550

Conclusion: Total SAR is less then 1.6W/Kg, therefore simultaneous transmission SAR is not required.

13 APPENDIX A – MEASUREMENT UNCERTAINTY

The uncertainty budget has been determined for the DASY4 measurement system and is given in the following Table.

Measurement uncertainty for 300 MHz to 3 GHz

SASY4 Uncertainty Budget According to IEEE 1528								
Error Description	Uncertainty Value	Prob. Dist.	Div.	(c i) 1g	(c i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v i) veff
Measurement System								
Probe Calibration	± 6.0 %	N	1	1	1	± 6.0 %	± 6.0 %	∝
Axial Isotropy	± 4.7 %	R	$\sqrt{3}$	0.7	0.7	± 1.9 %	± 1.9 %	∝
Hemispherical Isotropy	± 9.6 %	R	$\sqrt{3}$	0.7	0.7	± 3.9 %	± 3.9 %	∝
Boundary Effects	± 1.0 %	R	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∝
Linearity	± 4.7 %	R	$\sqrt{3}$	1	1	± 2.7 %	± 2.7 %	∝
System Detection Limits	± 1.0 %	R	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∝
Readout Electronics	± 0.3 %	N	1	1	1	± 0.3 %	± 0.3 %	∝
Response Time	± 0.8 %	R	$\sqrt{3}$	1	1	± 0.5 %	± 0.5 %	∝
Integration Time	± 2.6 %	R	$\sqrt{3}$	1	1	± 1.5 %	± 1.5 %	∝
RF Ambient Conditions	± 3.0 %	R	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∝
Probe Positioner	± 0.4 %	R	$\sqrt{3}$	1	1	± 0.2 %	± 0.2 %	∝
Probe Positioning	± 2.9 %	R	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∝
Max. SAR Eval.	± 1.0 %	R	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∝
Test Sample Related								
Device Positioning	± 2.9 %	N	1	1	1	± 2.9 %	± 2.9 %	145
Device Holder	± 3.6 %	N	1	1	1	± 3.6 %	± 2.6 %	5
Power Drift	± 5.0 %	R		1	1	± 2.9 %	± 2.9 %	∝
Phantom and Setup								
Phantom Uncertainty	± 4.0 %	R	$\sqrt{3}$	1	1	± 2.3 %	± 2.3 %	∝
Liquid Conductivity (Target)	± 5.0 %	R	$\sqrt{3}$	0.64	0.43	± 1.8 %	± 1.2 %	∝
Liquid Conductivity (meas.)	± 2.5 %	N	1	0.64	0.43	± 1.6 %	± 1.1 %	∝
Liquid Permittivity (Target)	± 5.0 %	R	$\sqrt{3}$	0.6	0.49	± 1.7 %	± 1.4 %	∝
Liquid Permittivity (Target)	± 2.5 %	N	1	0.6	0.49	± 1.5 %	± 1.0 %	∝
Combined Std. Uncertainty	-	-	-	-	-	± 10.8 %	± 10.6 %	330
Expanded STD Uncertainty	-	-	-	-	-	± 21.6 %	± 21.1 %	-

14 APPENDIX B – PROBECALIBRATION 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
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 **BACL**

Certificate No: **ES3-3019_Aug13**

CALIBRATION CERTIFICATE

Object: ES3DV2 - SN:3019

Calibration procedure(s): QA CAL-01.v9, QA CAL-12.v8, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: August 26, 2013

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 (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	31-Jan-13 (No. DAE4-660_Jan13)	Jan-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-15
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

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

Issued: August 28, 2013

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

Certificate No: ES3-3019_Aug13 Page 1 of 11

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z*: *A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV2

SN:3019

Manufactured: December 5, 2002
Calibrated: August 26, 2013

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

ES3DV2– SN:3019 August 26, 2013

DASY/EASY - Parameters of Probe: ES3DV2 - SN:3019

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (µV/(V/m)^2)[A]	1.04	1.15	0.96	± 10.1 %
DCP (mV)[B]	105.4	98.8	105.2	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√µV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	193.2	±3.0 %
		Y	0.0	0.0	1.0		148.8	
		Z	0.0	0.0	1.0		187.1	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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ES3DV2– SN:3019 August 26, 2013

DASY/EASY - Parameters of Probe: ES3DV2 - SN:3019

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
300	45.3	0.87	7.08	7.08	7.08	0.22	1.01	± 13.4 %
450	43.5	0.87	6.56	6.56	6.56	0.15	1.73	± 13.4 %
835	41.5	0.90	6.23	6.23	6.23	0.18	2.38	± 12.0 %
900	41.5	0.97	6.05	6.05	6.05	0.23	1.87	± 12.0 %
1810	40.0	1.40	4.89	4.89	4.89	0.37	1.51	± 12.0 %
1900	40.0	1.40	4.85	4.85	4.85	0.47	1.35	± 12.0 %
2450	39.2	1.80	4.19	4.19	4.19	0.63	1.27	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: ES3DV2 - SN:3019

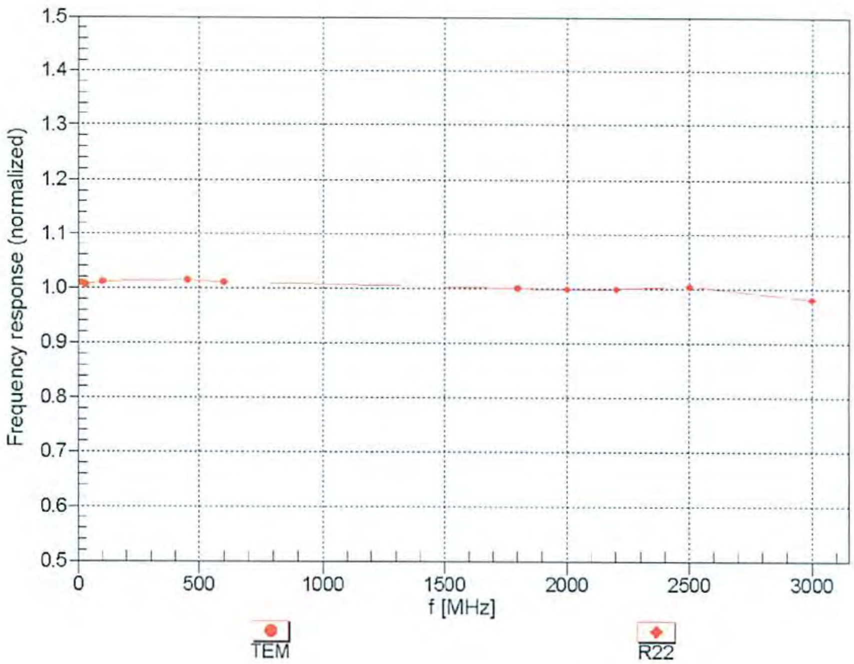
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
300	58.2	0.92	6.89	6.89	6.89	0.23	1.78	± 13.4 %
450	56.7	0.94	7.25	7.25	7.25	0.10	1.20	± 13.4 %
835	55.2	0.97	6.05	6.05	6.05	0.36	1.59	± 12.0 %
900	55.0	1.05	5.88	5.88	5.88	0.29	1.80	± 12.0 %
1810	53.3	1.52	4.55	4.55	4.55	0.31	2.02	± 12.0 %
1900	53.3	1.52	4.42	4.42	4.42	0.32	1.97	± 12.0 %
2450	52.7	1.95	3.87	3.87	3.87	0.80	1.13	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Frequency Response of E-Field

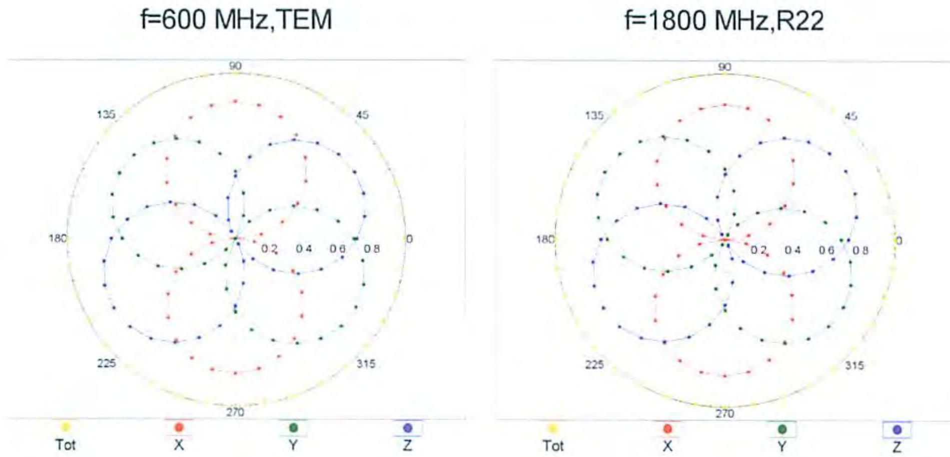
(TEM-Cell:ifi110 EXX, Waveguide: R22)

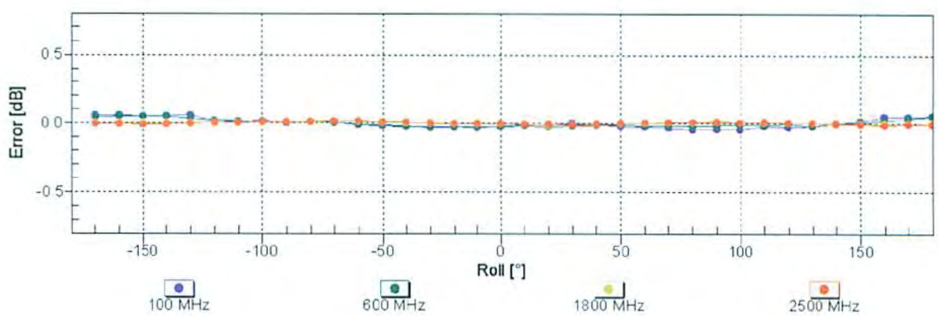


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ES3DV2– SN:3019 August 26, 2013

Receiving Pattern (ϕ), ϑ = 0°

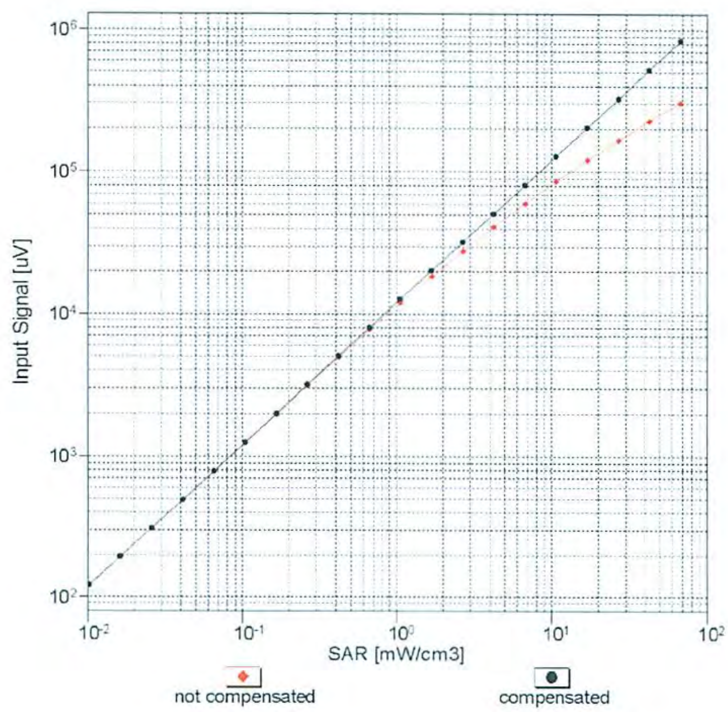


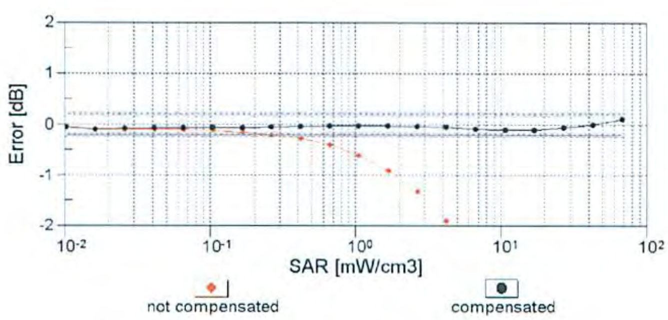


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

ES3DV2– SN:3019 August 26, 2013

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)

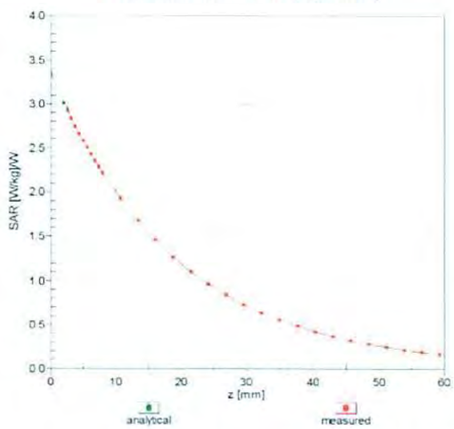




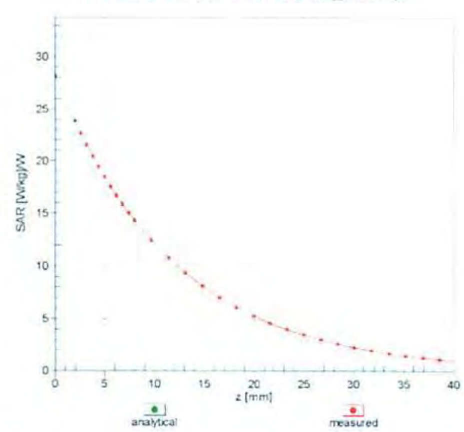
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

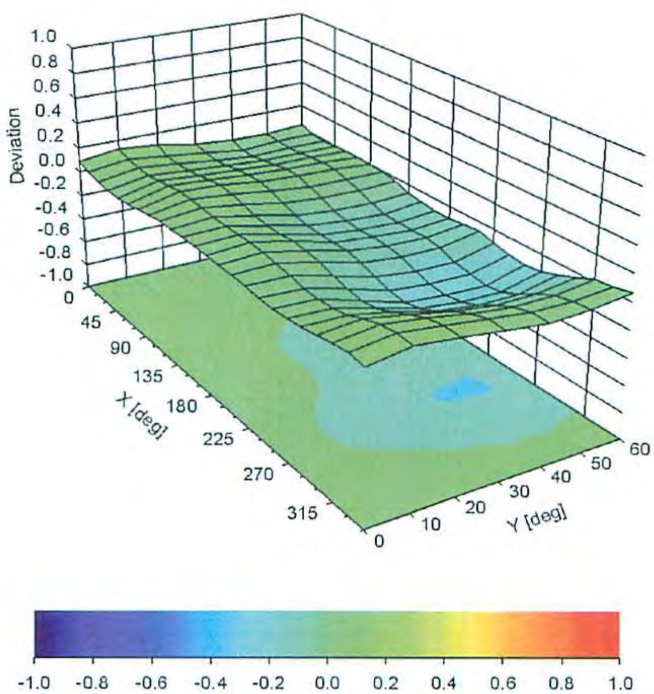


f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: ES3DV2 - SN:3019

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-60.1
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

15 APPENDIX C - DIPOLE CALIBRATION CERTIFICATES

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1384
Project Number: BAC-835-dipole-cal-5626

CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the **NCL CALIBRATION LABORATORIES** by qualified personnel following recognized procedures and using transfer standards traceable to NRC/NIST.

Validation Dipole
835MHz Head & Body

Manufacturer: APREL Laboratories
Part number: ALS-D-835-S-2
Frequency: 835MHz
Serial No: 180-00564

Customer: Bay Area Compliance

Calibrated: 24th October 2011
Released on: 27th October 2011

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: ______________________

NCL CALIBRATION LABORATORIES
303 Terry Fox Drive, Suite 102
Kanata, Ontario
CANADA K2K 3J1
Division of APREL
TEL: (613) 435-8300
FAX: (613) 435-8306

NCL Calibration Laboratories
Division of APREL Inc.

Conditions

Dipole 180-00565 was a recalibration.

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C
Temperature of the Tissue: 21 °C +/- 0.5°C

We the undersigned attest that to the best of our knowledge the calibration of this device has been accurately conducted and that all information contained within this report has been reviewed for accuracy.

Stuart Nicol

C. Teodorian

Primary Measurement Standards

Instrument	Serial Number	Cal due date
Power meter Anritsu MA2408A	90025437	Nov.4, 2011
Power Sensor Anritsu MA2481D	103555	Nov 4, 2011
Attenuator HP 8495A (70dB)	1944A10711	Sept. 14, 2012
Network Analyzer Agilent E5071C	1334746J	Aug. 8, 2012

Secondary Measurement Standards

Signal Generator Agilent E4438C -506	MY55182336	June 7, 2012

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NCL Calibration Laboratories
Division of APREL Inc.

Calibration Results Summary

The following results relate the Calibrated Dipole and should be used as a quick reference for the user.

Mechanical Dimensions

Length: 161.0 mm
Height: 89.8 mm

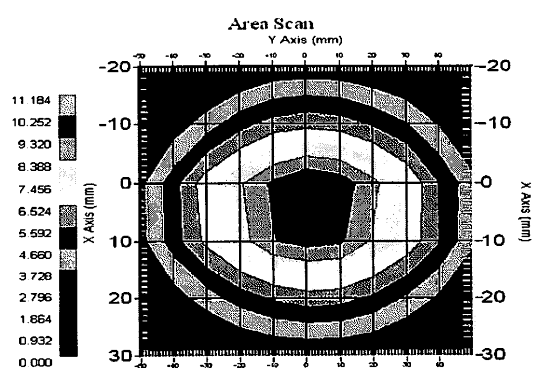
Electrical Specification 835MHz

Tissue Type	Return Loss:	Impedance:	SWR:
Head	-32.132	48.897	1.0621U
Body	-24.800	53.311	1.1206U

System Validation Results

Tissue	Frequency	1 Gram	10 Gram	Peak
Head	835 MHz	9.590	6.003	15.013
Body	835 MHz	9.981	6.006	15.013

835MHz



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NCL Calibration Laboratories

Division of APREL Inc.

Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole 180-00565. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-030 130 MHz to 26 GHz E-Field Probe Serial Number 215.

References

- IEEE Standard 1528 (2003) including Amendment 1
  IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
- EN 62209-1 (2006)
  Human Exposure to RF Fields from hand-held and body-mounted wireless communication devices - Human models. instrumentation, and procedures-Part 1: Procedure to measure the Specific Absorption Rate (SAR) for hand-held mobile wireless devices
- IEC 62209-2 Ed. 1.0 (2010-03)
  Human exposure to RF fields from hand-held and body-mounted wireless devices - Human models, instrumentation, and procedures - Part 2: specific absorption rate (SAR) for wireless communication devices (30 MHz - 6 GHz)
- TP-D01-032-E020-V2 E-Field probe calibration procedure
- D22-012-Tissue dielectric tissue calibration procedure
- D28-002-Dipole procedure for validation of SAR system using a dipole
- IEEE 1309 Draft Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

Conditions

Dipole 180-00564 was a recalibration.

Ambient Temperature of the Laboratory:	22 °C +/- 0.5°C
Temperature of the Tissue:	20 °C +/- 0.5°C

Dipole Calibration uncertainty

The calibration uncertainty for the dipole is made up of various parameters presented below.

Mechanical	1%
Positioning Error	1.22%
Electrical	1.7%
Tissue	2.2%
Dipole Validation	2.2%
TOTAL	**8.32% (16.64% K=2)**

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NCL Calibration Laboratories
Division of APREL Inc.

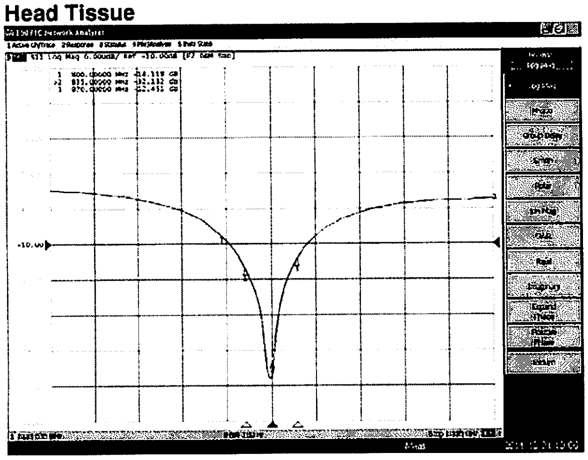
Electrical Calibration

Electrical Specification 835MHz

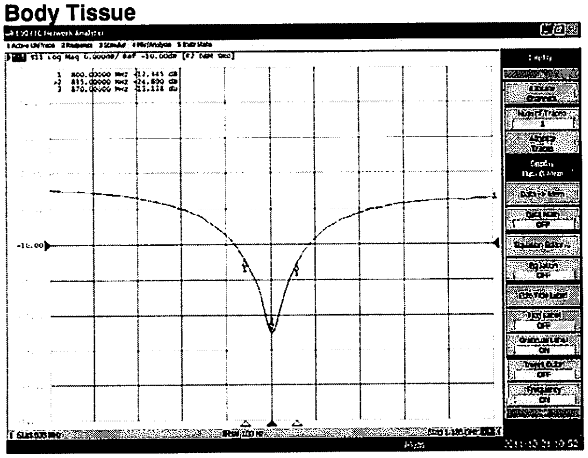
Tissue Type	Measured Epsilon	Measured Sigma
Head	41.09	0.89
Body	53.15	0.95

Forward Reflection

Head Tissue



Body Tissue



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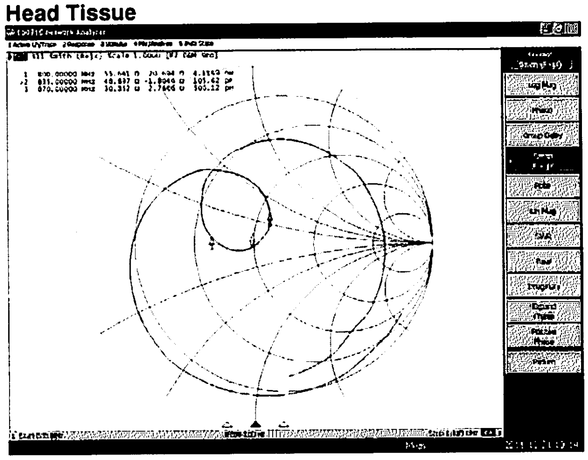
NCL Calibration Laboratories
Division of APREL Inc.

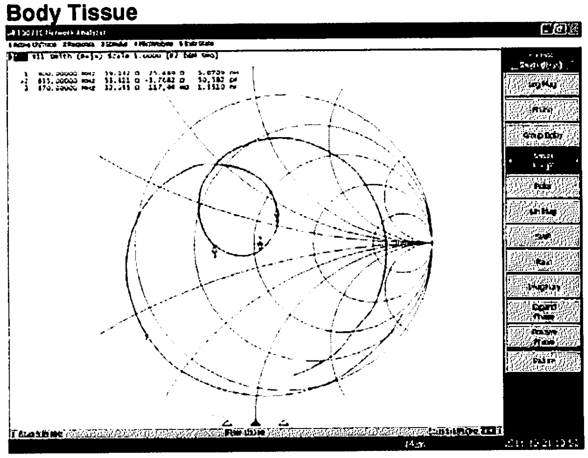
Electrical Specification 835MHz
Impedance

Tissue Type	Measured Epsilon	Measured Sigma
Head	41.09	0.89
Body	53.15	0.95

Head Tissue



Body Tissue



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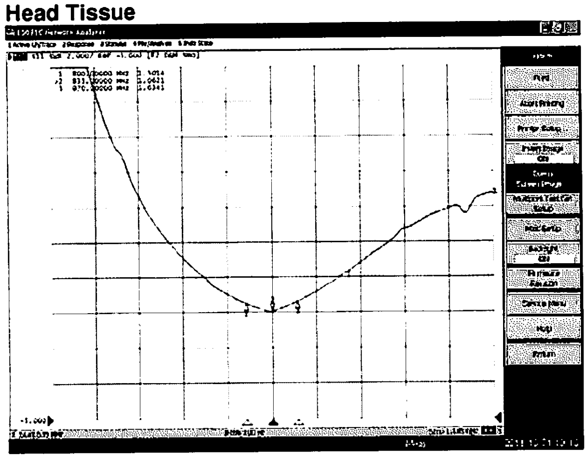
NCL Calibration Laboratories
Division of APREL Inc.

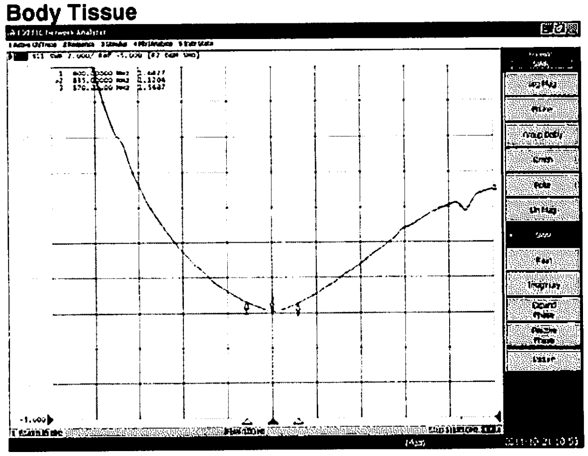
Electrical Specification 835MHz
Standing Wave Ratio

Tissue Type	Measured Epsilon	Measured Sigma
Head	41.09	0.89
Body	53.15	0.95

Head Tissue



Body Tissue



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NCL Calibration Laboratories
Division of APREL Inc.

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2011.

This page has been reviewed for content and attested to by signature within this document.

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1385
Project Number: BAC-1900-dipole-cal-5627

CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the **NCL CALIBRATION LABORATORIES** by qualified personnel following recognized procedures and using transfer standards traceable to NRC/NIST.

Validation Dipole
1900MHz Head & Body

Manufacturer: APREL Laboratories
Part number: ALS-D-1900-S-2
Frequency: 1900MHz
Serial No: 210-00715

Customer:Bay Area Compliance

Calibrated: 24th October 2011
Released on: 27th October 2011

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: ______________________

NCL CALIBRATION LABORATORIES

303 Terry Fox Drive, Suite 102
Kanata, Ontario
CANADA K2K 3J1

Division of APREL
TEL: (613) 435-8300
FAX: (613) 435-8306

NCL Calibration Laboratories
Division of APREL Inc.

Conditions

Dipole 210-00715 was a recalibration.

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C
Temperature of the Tissue: 21 °C +/- 0.5°C

We the undersigned attest that to the best of our knowledge the calibration of this device has been accurately conducted and that all information contained within this report has been reviewed for accuracy.

Stuart Nicol

C. Teodorian

Primary Measurement Standards

Instrument	**Serial Number**	**Cal due date**
Power meter Anritsu MA2408A	190025437	Nov.4, 2011
Power Sensor Anritsu MA2481D	103555	Nov 4, 2011
Attenuator HP 8495A (70dB)	1944A10711	Sept. 14, 2012
Network Analyzer Agilent E5071C	1334746J	Aug. 8, 2012

Secondary Measurement Standards

Signal Generator Agilent E4438C -506	MY55182336	June 7, 2012

This page has been reviewed for content and attested to by signature within this document.

NCL Calibration Laboratories
Division of APREL Inc.

Calibration Results Summary

The following results relate the Calibrated Dipole and should be used as a quick reference for the user.

Mechanical Dimensions

Length: 67.1 mm
Height: 38.9 mm

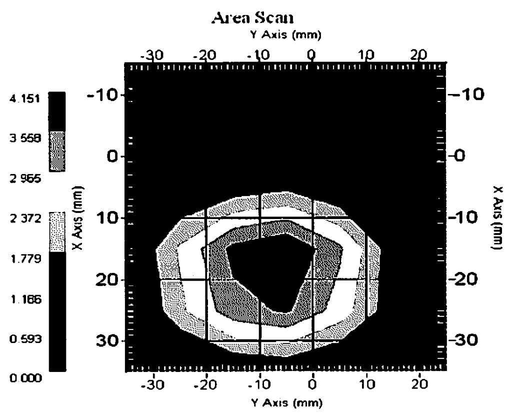
Electrical Specification 1900MHz

Tissue Type	Return Loss:	Impedance:	SWR:
Head	-28.634	46.965	1.0813U
Body	-23.129	47.664	1.1520U

System Validation Results

Tissue	Frequency	1 Gram	10 Gram	Peak
Head	1900 MHz	39.378	19.668	77.268
Body	1900 MHz	39.654	19.668	77.268

1900MHz



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NCL Calibration Laboratories
Division of APREL Inc.

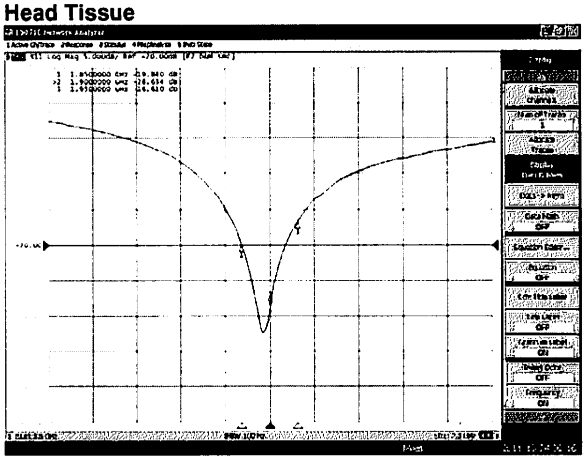
Electrical Calibration

Electrical Specification 1900MHz

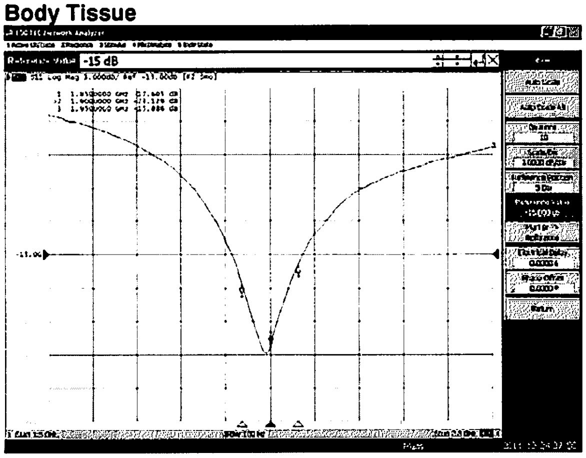
Forward Reflection

Tissue Type	Measured Epsilon	Measured Sigma
Head	38.12	1.41
Body	51.52	1.57

Head Tissue



Body Tissue



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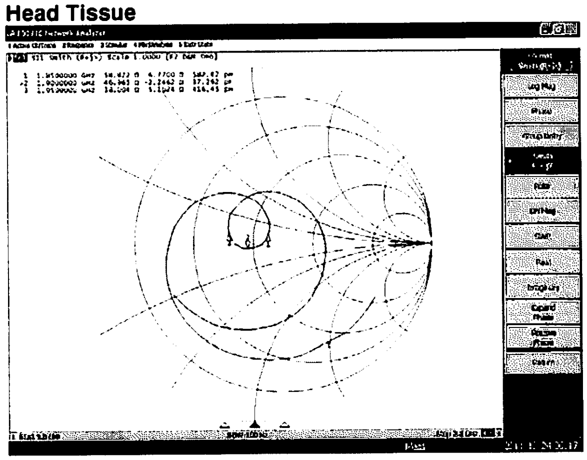
NCL Calibration Laboratories
Division of APREL Inc.

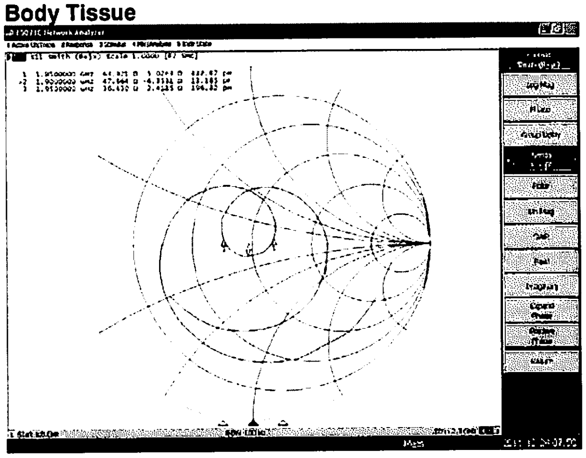
Electrical Specification 1900MHz
Impedance

Tissue Type	Measured Epsilon	Measured Sigma
Head	38.12	1.41
Body	51.52	1.57

Head Tissue



Body Tissue



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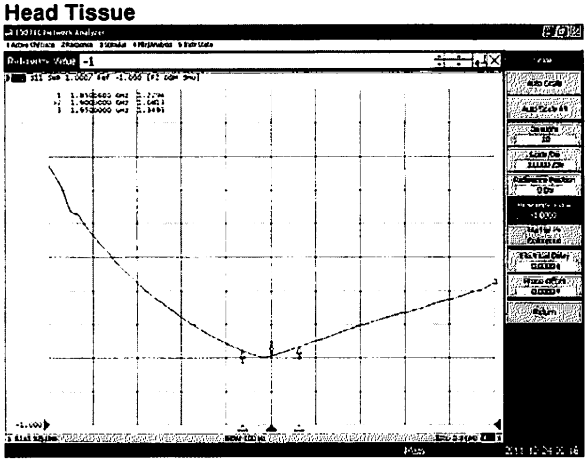
NCL Calibration Laboratories
Division of APREL Inc.

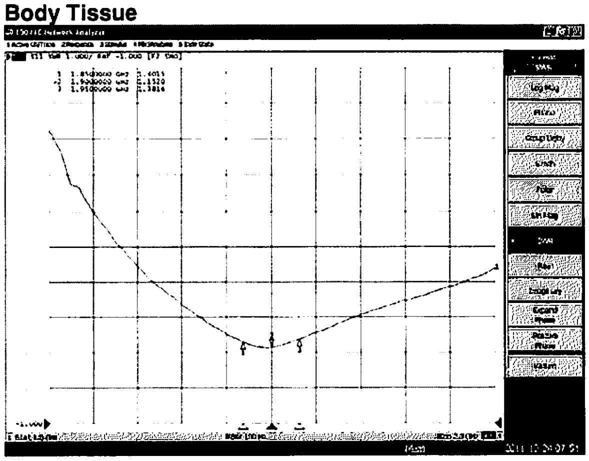
Electrical Specification 1900MHz
Standing Wave Ratio

Tissue Type	Measured Epsilon	Measured Sigma
Head	38.12	1.41
Body	51.52	1.57

Head Tissue



Body Tissue



This page has been reviewed for content and attested to by signature within this document. 7

NCL Calibration Laboratories
Division of APREL Inc.

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2011.

This page has been reviewed for content and attested to by signature within this document.

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1285
Project Number: BACL-dipole-cal-5612

CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the **NCL CALIBRATION LABORATORIES** by qualified personnel following recognized procedures and using transfer standards traceable to NRC/NIST.

BACL Validation Dipole (Head & Body)

Manufacturer: APREL Laboratories
Part number: D-2450-S-1
Frequency: 2450 MHz
Serial No: BCL-141

Customer: Bay Area Compliance Laboratory

Calibrated: 25th July 2011
Released on: 27th July 2011

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: ______________________

NCL CALIBRATION LABORATORIES

Suite 102, 303 Terry Fox Dr.
Kanata, ONTARIO
CANADA K2K 3J1

Division of APREL Lab.
TEL: (613) 435-8300
FAX: (613) 432-8306

8.19.2011

NCL Calibration Laboratories
Division of APREL Laboratories.

Conditions

Dipole BCL-141 was received from customer in good condition for re-calibration, SMA connector required cleaning prior to calibration.

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C
Temperature of the Tissue: 21 °C +/- 0.5°C

We the undersigned attest that to the best of our knowledge the calibration of this device has been accurately conducted and that all information contained within this report has been reviewed for accuracy.

Stuart Nicol

C. Teodorian

Primary Measurement Standards

Instrument	Serial Number	Cal due date
Power meter Anritsu MA2408A	245025437	Nov.4, 2011
Power Sensor Anritsu MA2481D	103555	Nov 4, 2011
Attenuator HP 8495A (70dB) 1	944A10711	Sept. 14, 2011
Network Analyzer Anritsu MT8801C	MB11855	Feb. 8, 2012
Secondary Measurement Standards		
Signal Generator Agilent E4438C	-506 MY55182336	June 7, 2012

This page has been reviewed for content and attested to by signature within this document.

NCL Calibration Laboratories
Division of APREL Laboratories.

Calibration Results Summary

The following results relate the Calibrated Dipole and should be used as a quick reference for the user.

Mechanical Dimensions

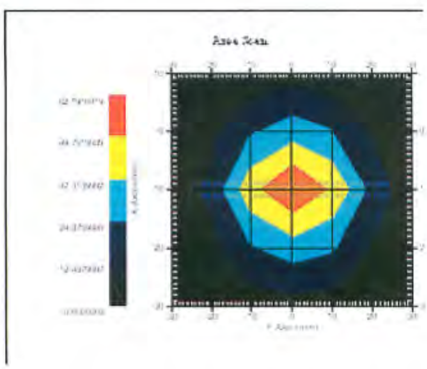
Length: 51.5 mm
Height: 30.4 mm

Electrical Specification 2450MHz

Tissue Type	Return Loss:	SWR:	Impedance:
Head	-29.565	1.076u	52.887
Body	-25.834	1.111u	55.110

System Validation Results

Tissue	Frequency	1 Gram	10 Gram	Peak
Head	2450MHz	54.075	24.19	113.98
Body	2450MHz	53.115	24.011	109.960



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Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole BCL-141. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-020 130 MHz to 26 GHz E-Field Probe Serial Number 212.

References

SSI-TP-018-ALSAS Dipole Calibration Procedure
SSI-TP-016 Tissue Calibration Procedure
IEEE 1528 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"

Conditions

Dipole BCL-141 was received from customer in good condition for re-calibration, SMA connector required cleaning prior to calibration.

Ambient Temperature of the Laboratory:	22 °C +/- 0.5°C
Temperature of the Tissue:	20 °C +/- 0.5°C

Dipole Calibration uncertainty

The calibration uncertainty for the dipole is made up of various parameters presented below.

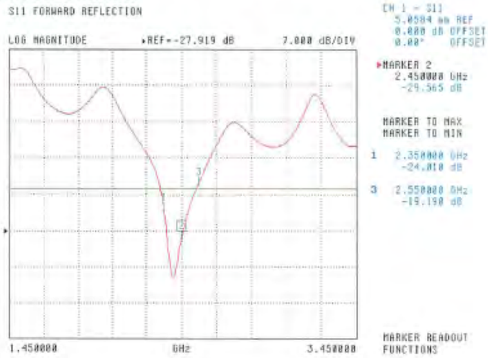
Mechanical	1%
Positioning Error	1.22%
Electrical	1.7%
Tissue	2.2%
Dipole Validation	2.2%
TOTAL	**8.32% (16.64% K=2)**

NCL Calibration Laboratories
Division of APREL Laboratories.

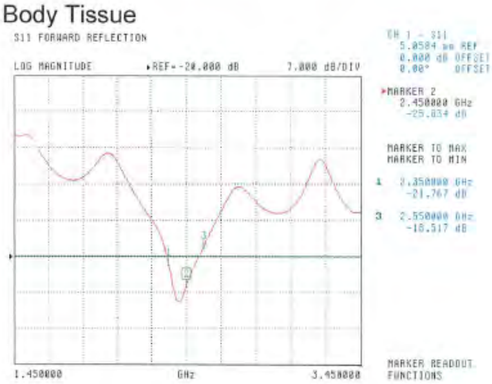
Tissue Type	Measured Epsilon	Measured Sigma
Head	38.06	1.86
Body	50.22	2.03

Electrical Calibration
The Following Graphs are the results as displayed on the Vector Network Analyzer.

S11 Parameter Return Loss
Head Tissue



Body Tissue



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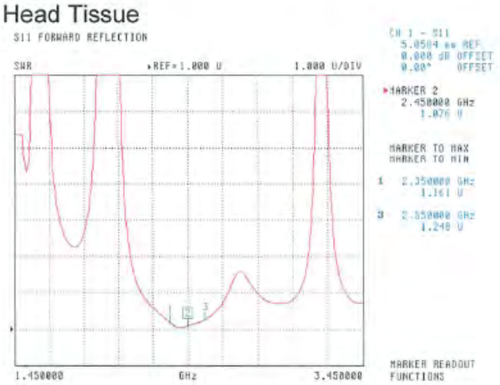
NCL Calibration Laboratories

Division of APREL Laboratories.

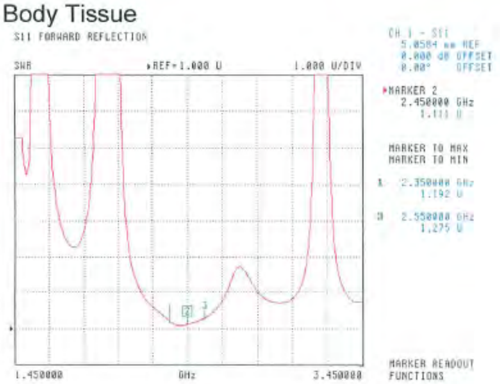
Tissue Type	Measured Epsilon	Measured Sigma
Head	38.06	1.86
Body	50.22	2.03

SWR

Head Tissue



Body Tissue



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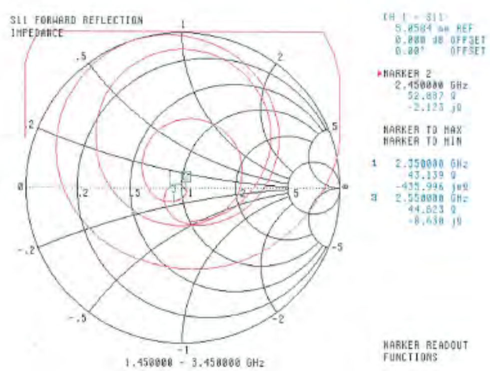
NCL Calibration Laboratories
Division of APREL Laboratories.

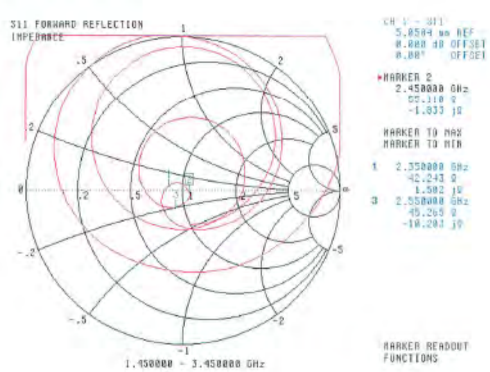
Tissue Type	Measured Epsilon	Measured Sigma
Head	38.06	1.86
Body	50.22	2.03

Smith Chart Dipole Impedance

Head Tissue



Body Tissue



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Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List

16 APPENDIX D - SYSTEM VERIFICATIONS

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

System Performance Test (835 MHz, Body)

DUT: Dipole 835 MHz; Type: ALS-D-835-S-2; Serial: 180-00564

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

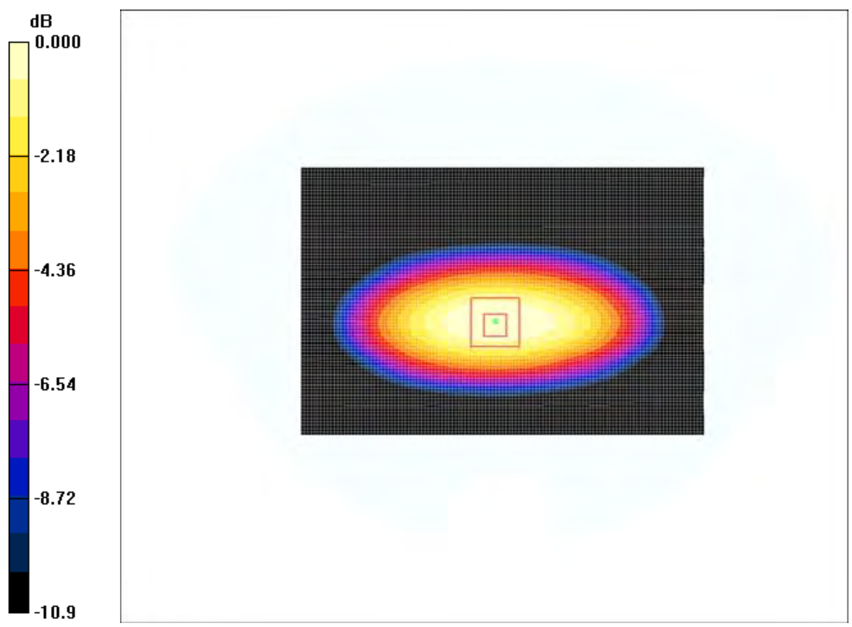
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.19, 6.19, 6.19); Calibrated: 8/25/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=15mm, Pin=0.5 W/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 5.87 mW/g

d=15mm, Pin=0.5 W/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 81.5 V/m; Power Drift = -2.48 dB
Peak SAR (extrapolated) = 8.34 W/kg

SAR(1 g) = 5.3 mW/g; SAR(10 g) = 3.38 mW/g
Maximum value of SAR (measured) = 5.71 mW/g



0 dB = 5.71mW/g

835 MHz Body System Validation

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

System Performance (835 MHz, Head)

DUT: Dipole 835 MHz; Type: ALS-D-835-S-2; Serial: 180-00564

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; $\sigma = 0.9$ mho/m; $\varepsilon_r = 42.5$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

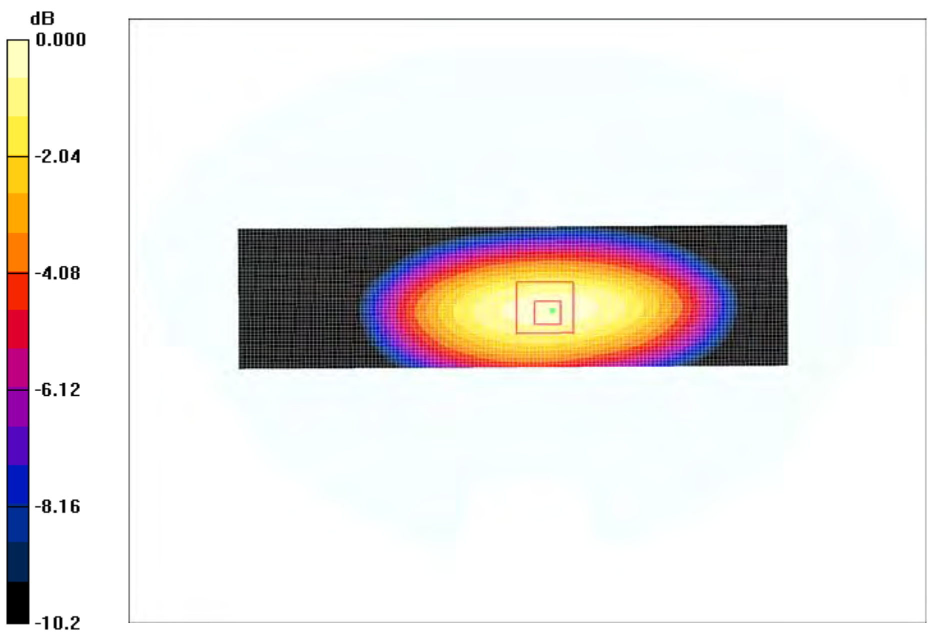
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.23, 6.23, 6.23); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=15mm, Pin=0.5 W/Area Scan (41x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.75 mW/g

d=15mm, Pin=0.5 W/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 73.2 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 6.83 W/kg

SAR(1 g) = 4.66 mW/g; SAR(10 g) = 3.1 mW/g
Maximum value of SAR (measured) = 5.05 mW/g



0 dB = 5.05mW/g

835 MHz Head System Validation

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

System Performance Test (1900 MHz, Body)

DUT: Dipole 1900 MHz; Type: ALS-D-1900-S-2; Serial: 210-00715

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.55 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

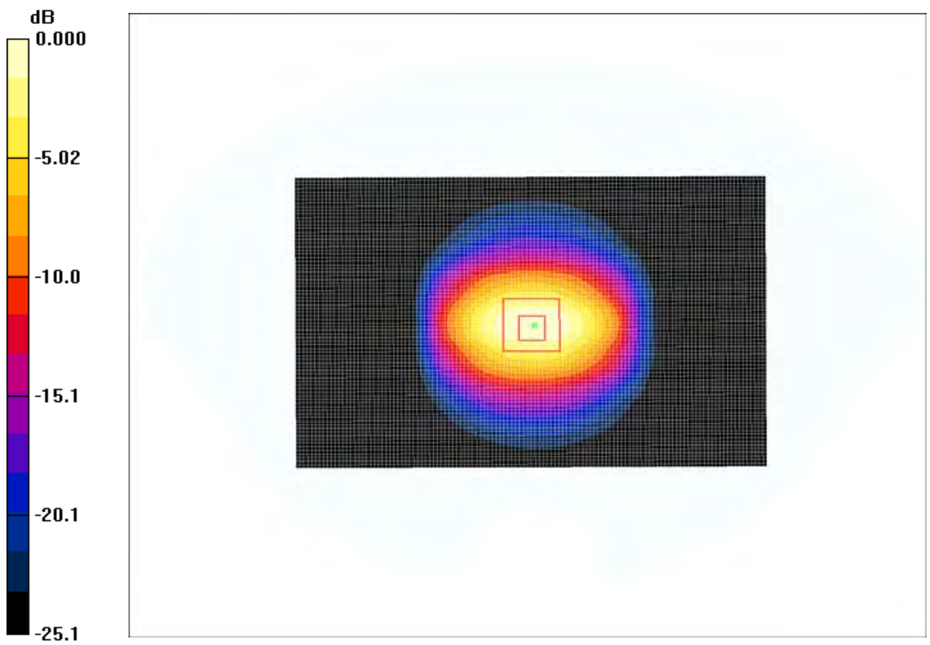
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.42, 4.42, 4.42); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=0.5 W/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 21.9 mW/g

d=10mm, Pin=0.5 W/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 121.9 V/m; Power Drift = -0.165 dB
Peak SAR (extrapolated) = 45.2 W/kg

SAR(1 g) = 20.2 mW/g; SAR(10 g) = 9.35 mW/g
Maximum value of SAR (measured) = 22.5 mW/g



0 dB = 22.5mW/g

1900 MHz Body System Validation

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

System Performance (1900 MHz, Head)

DUT: Dipole 1900 MHz; Type: ALS-D-1900-S-2; Serial: 210-00715

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.39 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

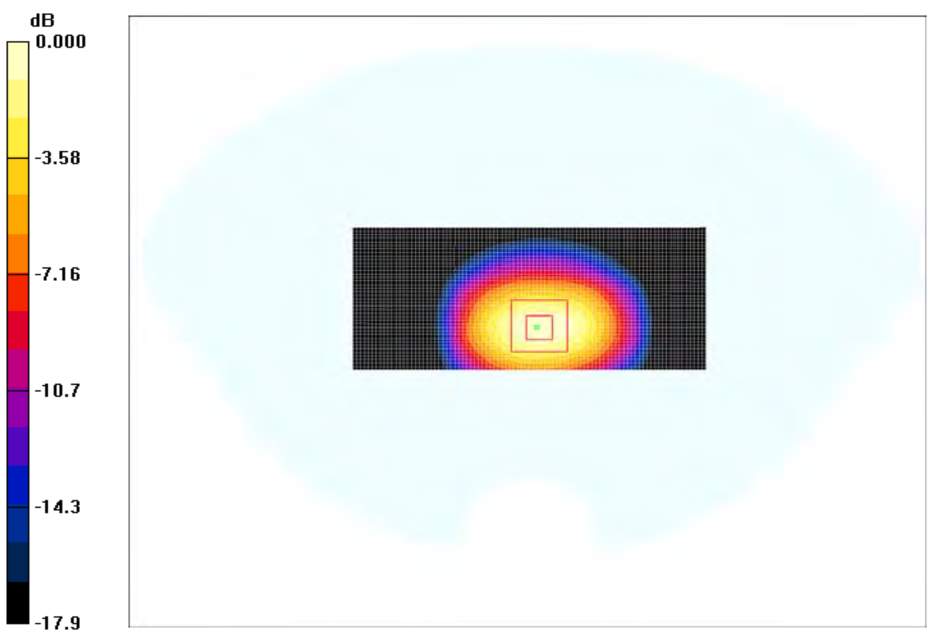
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.85, 4.85, 4.85); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=0.5 W/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 21.9 mW/g

d=10mm, Pin=0.5 W/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.5 V/m; Power Drift = 0.037 dB
Peak SAR (extrapolated) = 39.4 W/kg

SAR(1 g) = 20.5 mW/g; SAR(10 g) = 10.7 mW/g
Maximum value of SAR (measured) = 22.8 mW/g



0 dB = 22.8mW/g

1900 MHz Head System Validation

17 APPENDIX E – EUT SCAN RESULTS

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

1.5 cm Front to Flat Phantom-GSM 850 (High Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.984 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

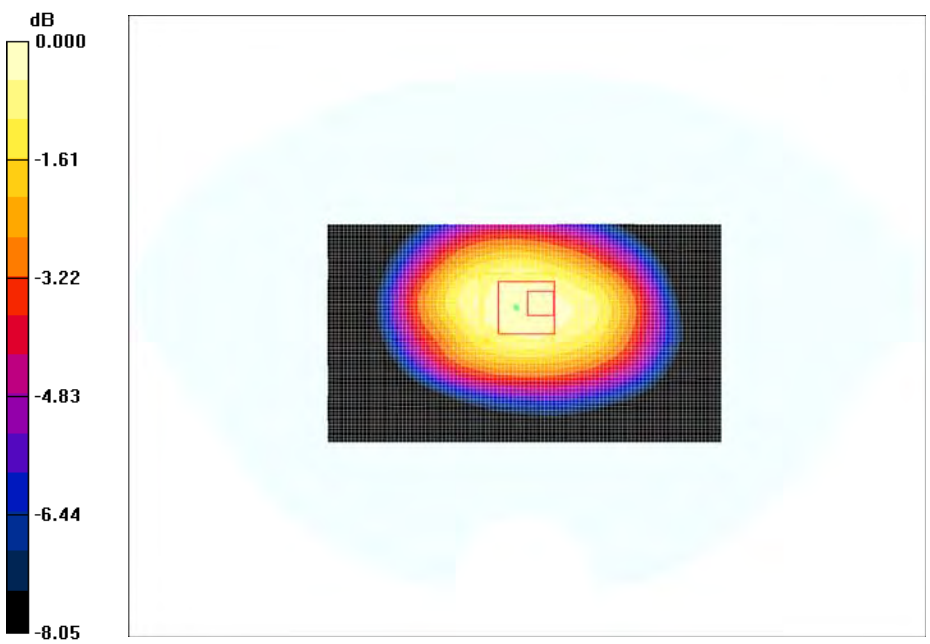
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.05, 6.05, 6.05); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Front 15mm/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.323 mW/g

Front 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = 0.882 dB
Peak SAR (extrapolated) = 0.408 W/kg

SAR(1 g) = 0.301 mW/g; SAR(10 g) = 0.227 mW/g
Maximum value of SAR (measured) = 0.321 mW/g



0 dB = 0.321mW/g

#1

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

1.5 cm Back to Flat Phantom-GSM 850 (High Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.984 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

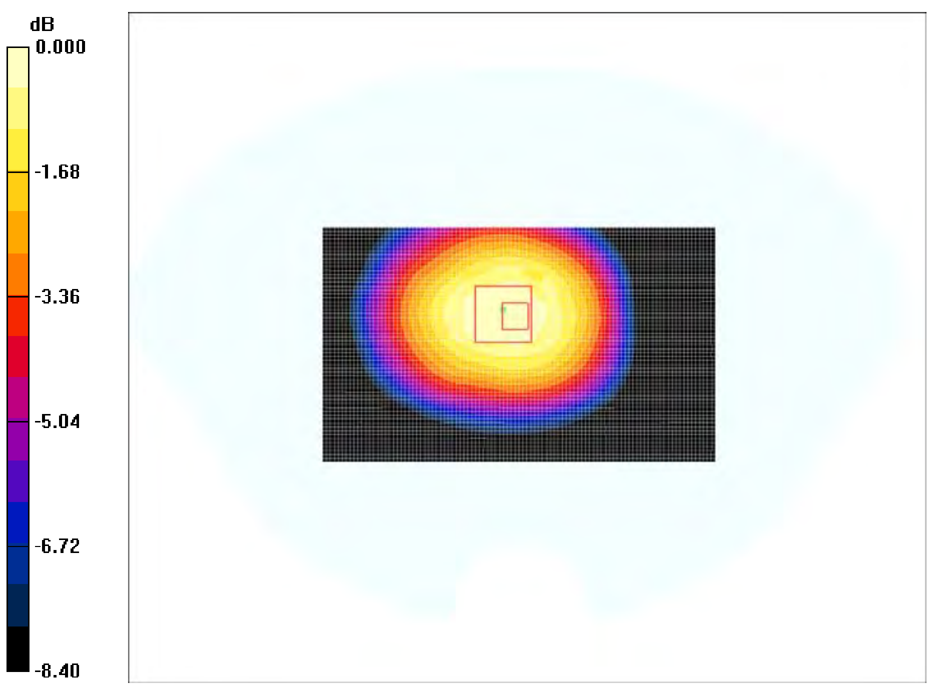
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.05, 6.05, 6.05); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Back 15mm/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.512 mW/g

Back 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.6 V/m; Power Drift = 0.983 dB
Peak SAR (extrapolated) = 0.641 W/kg

SAR(1 g) = 0.493 mW/g; SAR(10 g) = 0.370 mW/g.
Maximum value of SAR (measured) = 0.521 mW/g



0 dB = 0.521mW/g

#2

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Right Head Tilt (High Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.904 mho/m; ε_r = 42.3; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

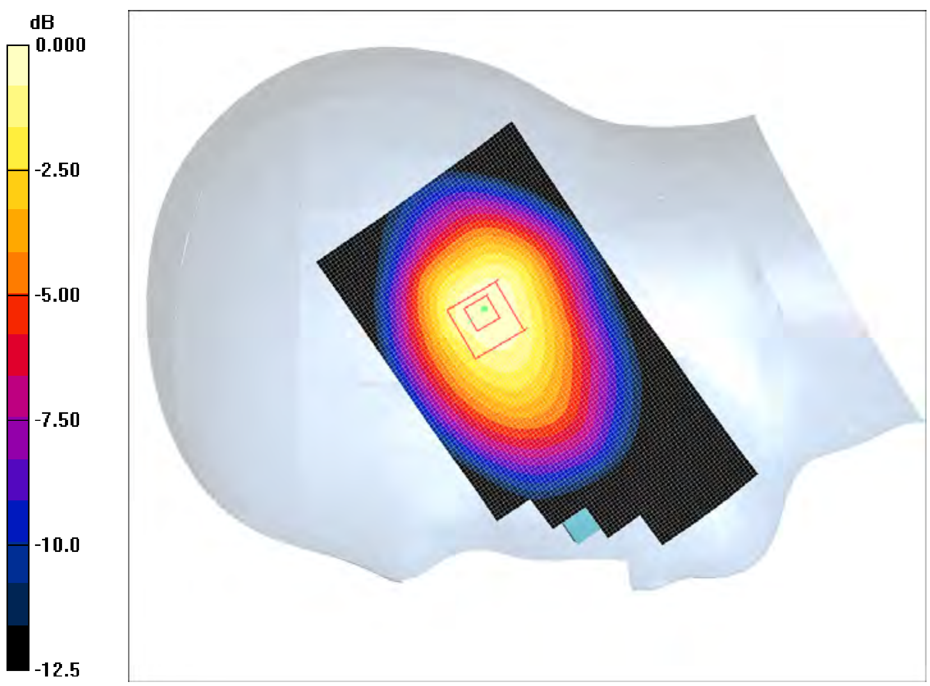
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.23, 6.23, 6.23); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Tilt/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.217 mW/g

Right Head Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.6 V/m; Power Drift = -0.366 dB
Peak SAR (extrapolated) = 0.255 W/kg

SAR(1 g) = 0.199 mW/g; SAR(10 g) = 0.136 mW/g
Maximum value of SAR (measured) = 0.217 mW/g



0 dB = 0.217mW/g

#3

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Right Head Touch (High Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.904 mho/m; ε_r = 42.3; ρ = 1000 kg/m^3
Phantom section: Right Section

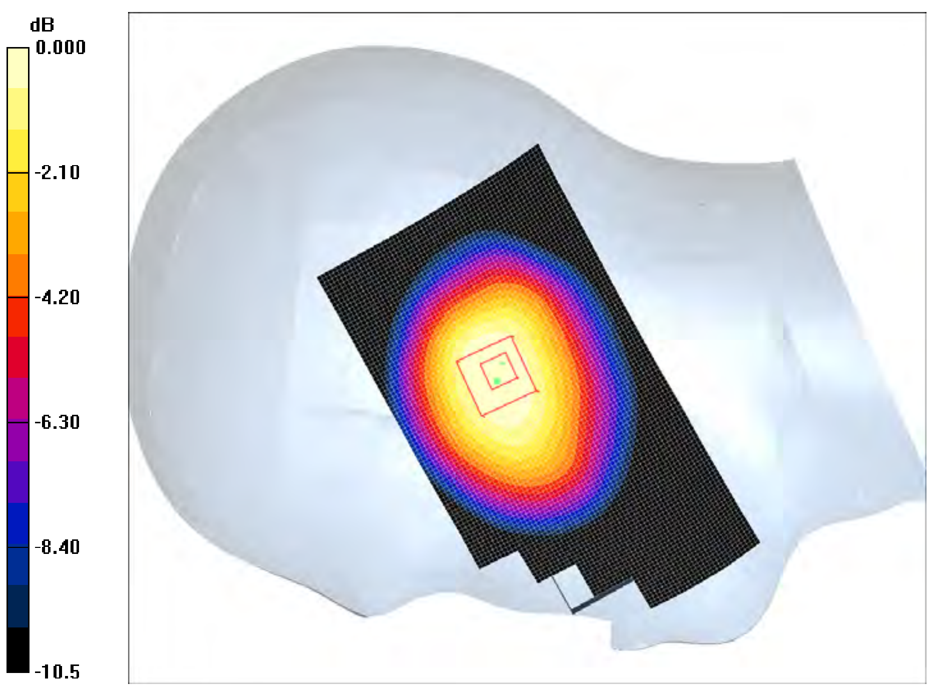
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.23, 6.23, 6.23); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Touch/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.319 mW/g

Right Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.5 V/m; Power Drift = 0.006 dB
Peak SAR (extrapolated) = 0.372 W/kg

SAR(1 g) = 0.289 mW/g; SAR(10 g) = 0.205 mW/g
Maximum value of SAR (measured) = 0.307 mW/g



0 dB = 0.307mW/g

#4

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Left Head Tilt (High Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.904 mho/m; ε_r = 42.3; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

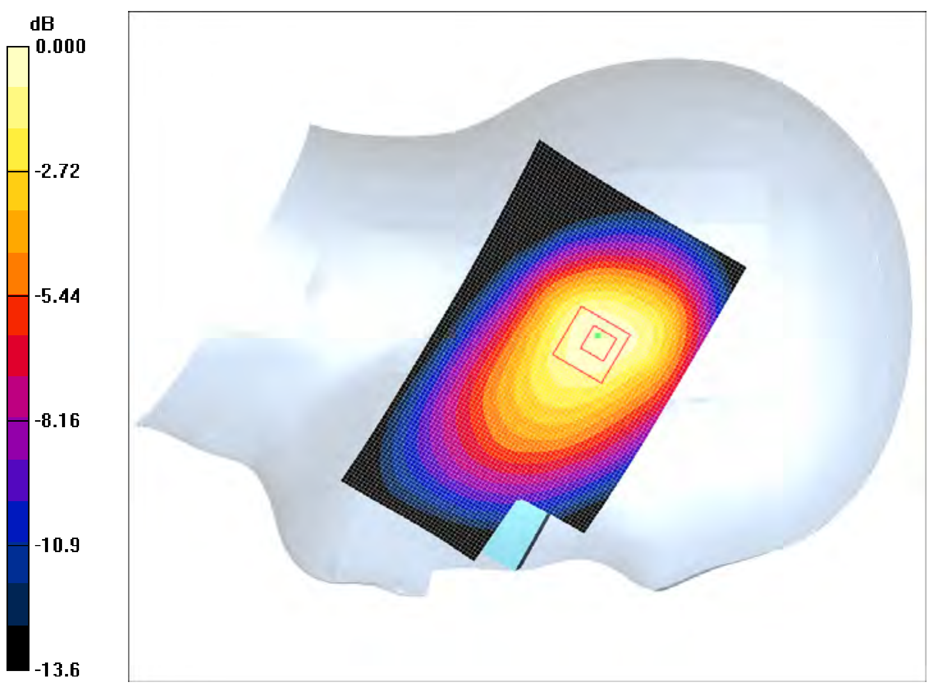
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.23, 6.23, 6.23); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Tilt/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.307 mW/g

Left Head Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.4 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 0.438 W/kg

SAR(1 g) = 0.287 mW/g; SAR(10 g) = 0.188 mW/g
Maximum value of SAR (measured) = 0.308 mW/g



0 dB = 0.308mW/g

#5

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Left Head Touch (Low Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.897 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

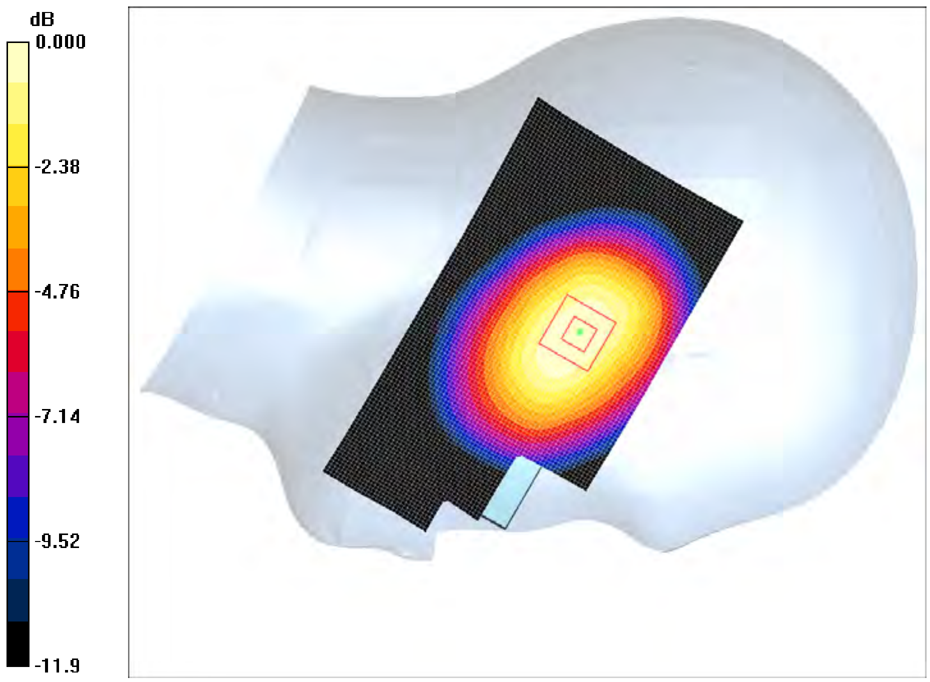
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.23, 6.23, 6.23); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Touch/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.259 mW/g

Left Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = -0.163 dB
Peak SAR (extrapolated) = 0.352 W/kg

SAR(1 g) = 0.229 mW/g; SAR(10 g) = 0.159 mW/g
Maximum value of SAR (measured) = 0.257 mW/g



0 dB = 0.257mW/g

#6

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Left Head Touch (Middle Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.9 mho/m; ε_r = 42.5; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

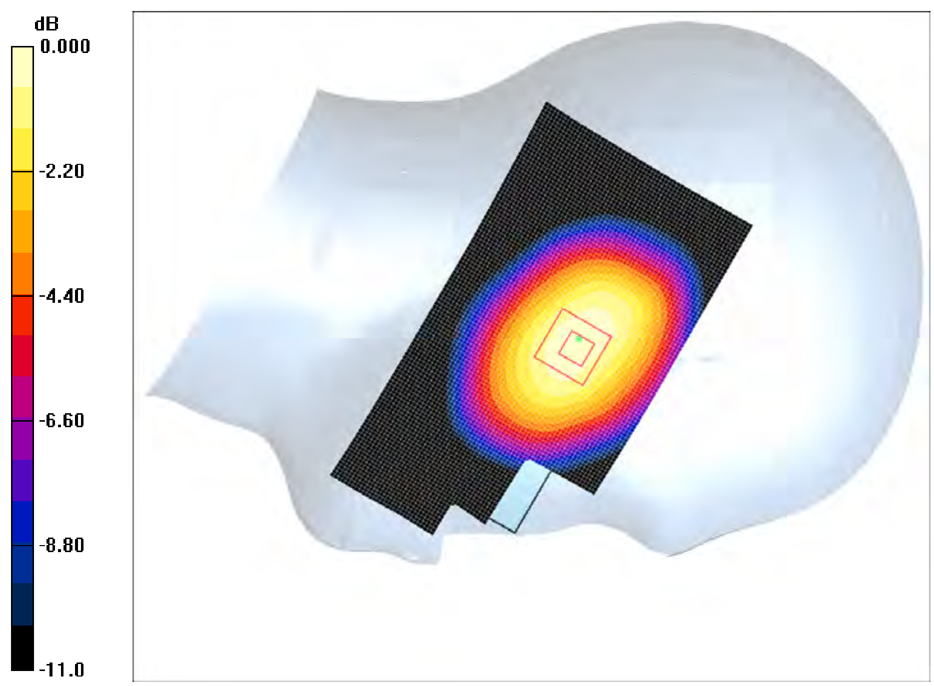
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.23, 6.23, 6.23); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Touch/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.342 mW/g

Left Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.1 V/m; Power Drift = 0.039 dB
Peak SAR (extrapolated) = 0.457 W/kg

SAR(1 g) = 0.335 mW/g; SAR(10 g) = 0.237 mW/g
Maximum value of SAR (measured) = 0.358 mW/g



0 dB = 0.358mW/g

#7

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Left Head Touch (High Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.904 mho/m; ε_r = 42.3; ρ = 1000 kg/m^3
Phantom section: Left Section

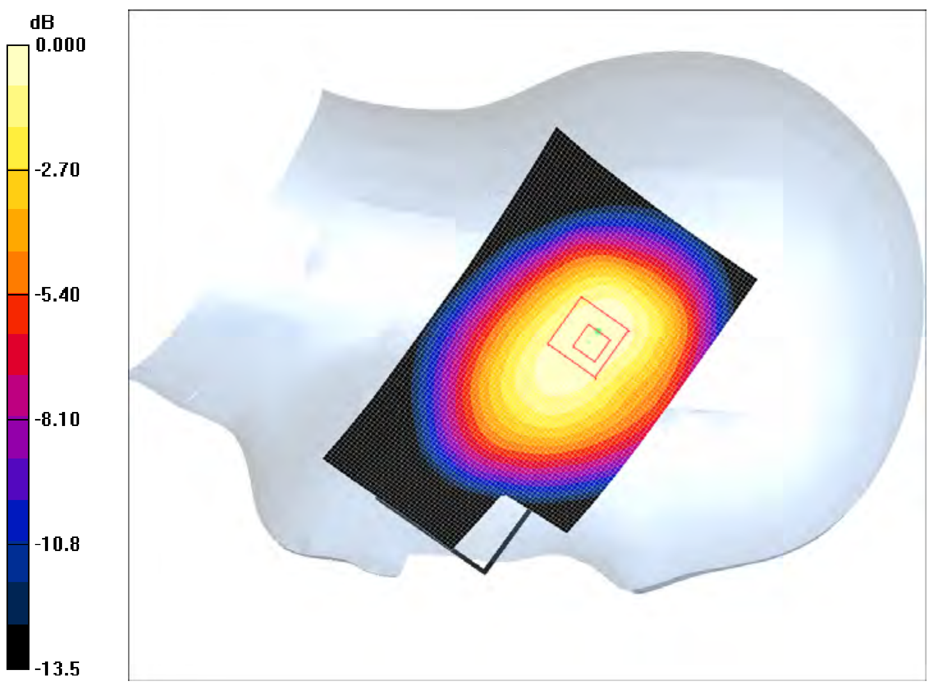
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.23, 6.23, 6.23); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Touch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.515 mW/g

Left Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.0 V/m; Power Drift = -0.266 dB
Peak SAR (extrapolated) = 0.672 W/kg

SAR(1 g) = 0.467 mW/g; SAR(10 g) = 0.321 mW/g
Maximum value of SAR (measured) = 0.499 mW/g



0 dB = 0.499mW/g

#8

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

1.5 cm Front to Flat Phantom-GPRS 850 (High Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 850, 2 slot; Frequency: 848.8 MHz; Duty Cycle: 1:4.15
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.984 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

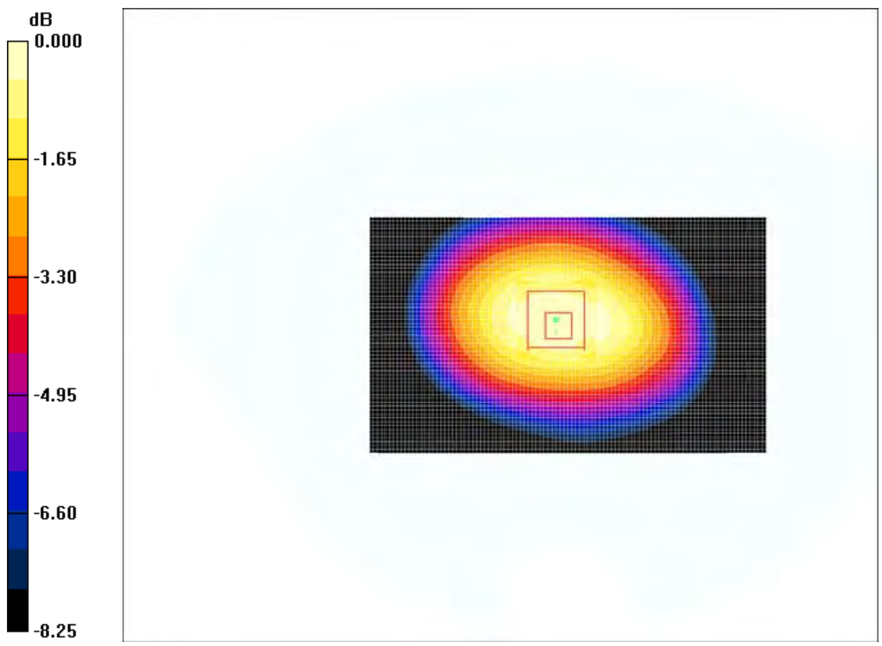
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.05, 6.05, 6.05); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Front 15mm/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.365 mW/g

Front 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.6 V/m; Power Drift = -0.394 dB
Peak SAR (extrapolated) = 0.422 W/kg

SAR(1 g) = 0.334 mW/g; SAR(10 g) = 0.248 mW/g
Maximum value of SAR (measured) = 0.351 mW/g



0 dB = 0.351mW/g

#9

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

1.5 cm Back to Flat Phantom-GPRS 850 (High Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 850, 2 slot; Frequency: 848.8 MHz; Duty Cycle: 1:4.15
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.984 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

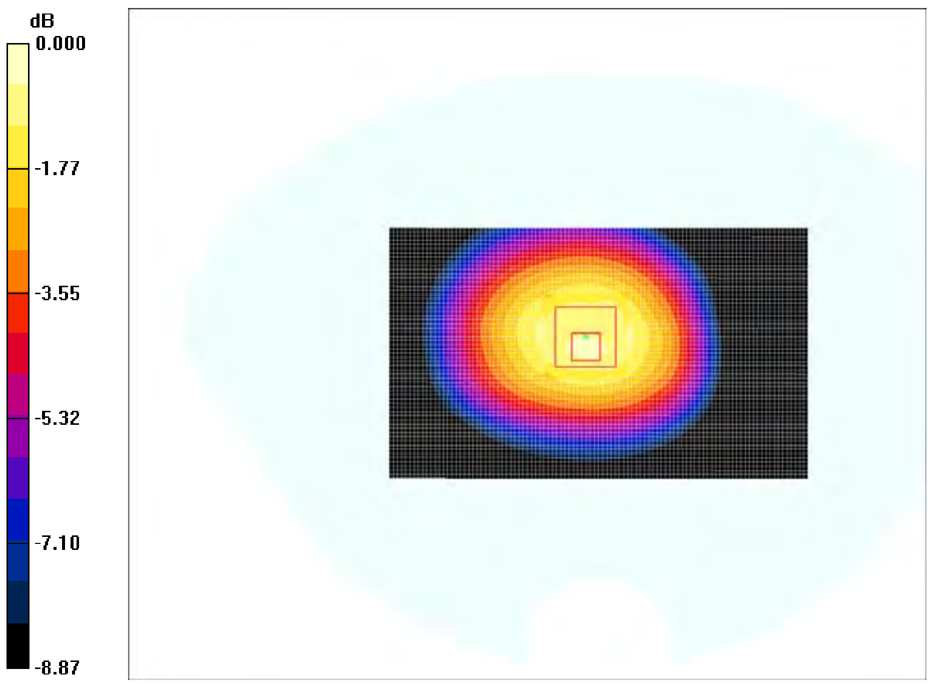
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(6.05, 6.05, 6.05); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Back 15mm/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.647 mW/g

Back 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.2 V/m; Power Drift = -0.298 dB
Peak SAR (extrapolated) = 0.839 W/kg

SAR(1 g) = 0.627 mW/g; SAR(10 g) = 0.452 mW/g
Maximum value of SAR (measured) = 0.719 mW/g



0 dB = 0.719mW/g

#10

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

1.5 cm Front to Flat Phantom-GSM1900 (Low Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium parameters used: f = 1850.2 MHz; σ = 1.53 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

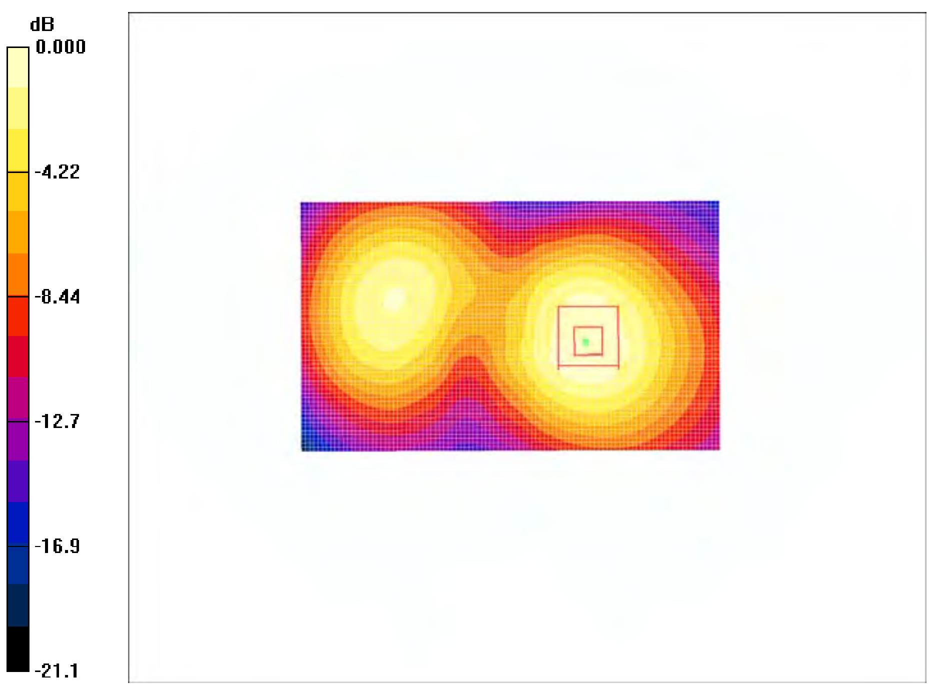
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.42, 4.42, 4.42); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Front 15mm/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.295 mW/g

Front 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.65 V/m; Power Drift = -0.297 dB
Peak SAR (extrapolated) = 0.461 W/kg

SAR(1 g) = 0.258 mW/g; SAR(10 g) = 0.145 mW/g
Maximum value of SAR (measured) = 0.280 mW/g



0 dB = 0.280mW/g

#11

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

1.5 cm Back to Flat Phantom-GSM 1900 (Low Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium parameters used: f = 1850.2 MHz; σ = 1.53 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

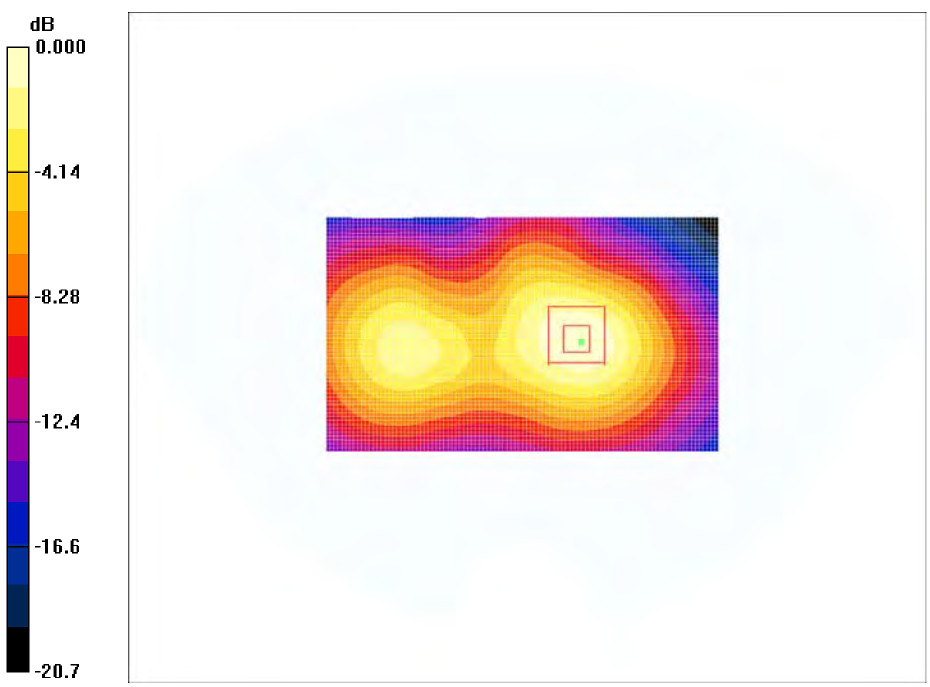
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.42, 4.42, 4.42); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Back 15mm/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.495 mW/g

Back 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.5 V/m; Power Drift = -0.018 dB
Peak SAR (extrapolated) = 0.796 W/kg

SAR(1 g) = 0.428 mW/g; SAR(10 g) = 0.236 mW/g
Maximum value of SAR (measured) = 0.478 mW/g



0 dB = 0.478mW/g

#12

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Right Head Tilt (Low Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

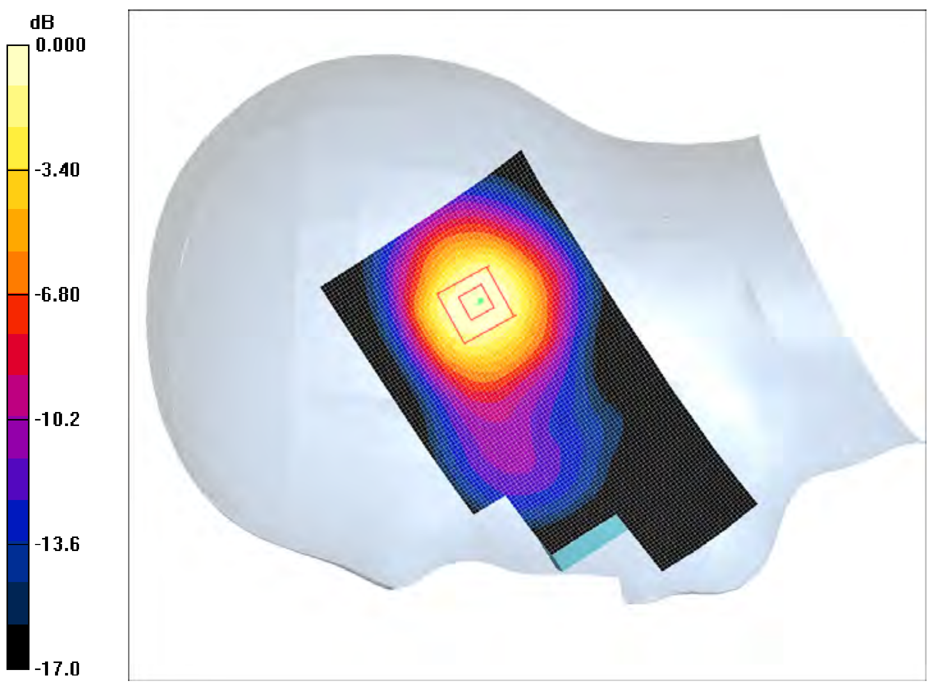
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.85, 4.85, 4.85); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Tilt/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.999 mW/g

Right Head Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.7 V/m; Power Drift = -0.226 dB
Peak SAR (extrapolated) = 1.39 W/kg

SAR(1 g) = 0.860 mW/g; SAR(10 g) = 0.499 mW/g
Maximum value of SAR (measured) = 0.939 mW/g



0 dB = 0.939mW/g

#13

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Right Head Tilt (Middle Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1880 MHz; σ = 1.38 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

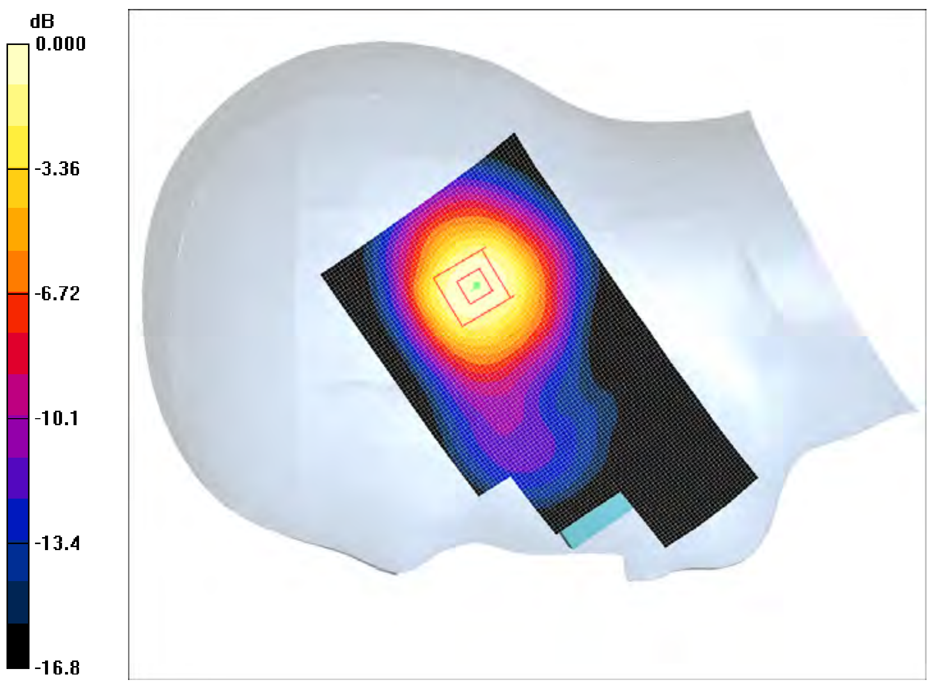
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.85, 4.85, 4.85); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Tilt/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.967 mW/g

Right Head Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.9 V/m; Power Drift = 0.003 dB
Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 0.836 mW/g; SAR(10 g) = 0.482 mW/g
Maximum value of SAR (measured) = 0.919 mW/g



0 dB = 0.919mW/g

#14

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Right Head Tilt (High Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1909.8 MHz; σ = 1.39 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

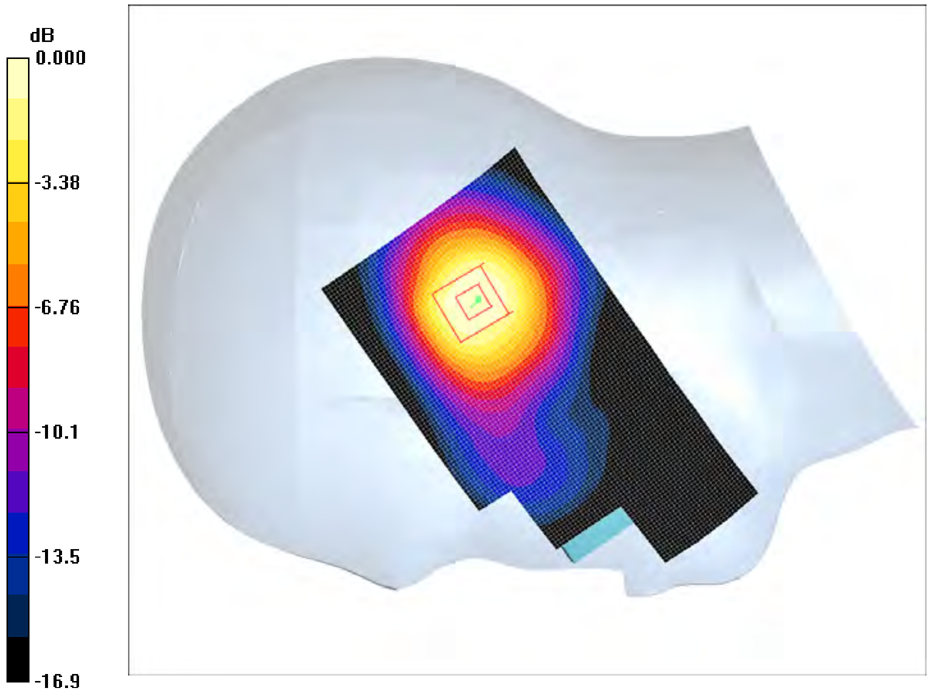
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.85, 4.85, 4.85); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Tilt/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.952 mW/g

Right Head Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.8 V/m; Power Drift = 0.180 dB
Peak SAR (extrapolated) = 1.34 W/kg

SAR(1 g) = 0.823 mW/g; SAR(10 g) = 0.474 mW/g
Maximum value of SAR (measured) = 0.894 mW/g



0 dB = 0.894mW/g

#15

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Right Head Touch (Low Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

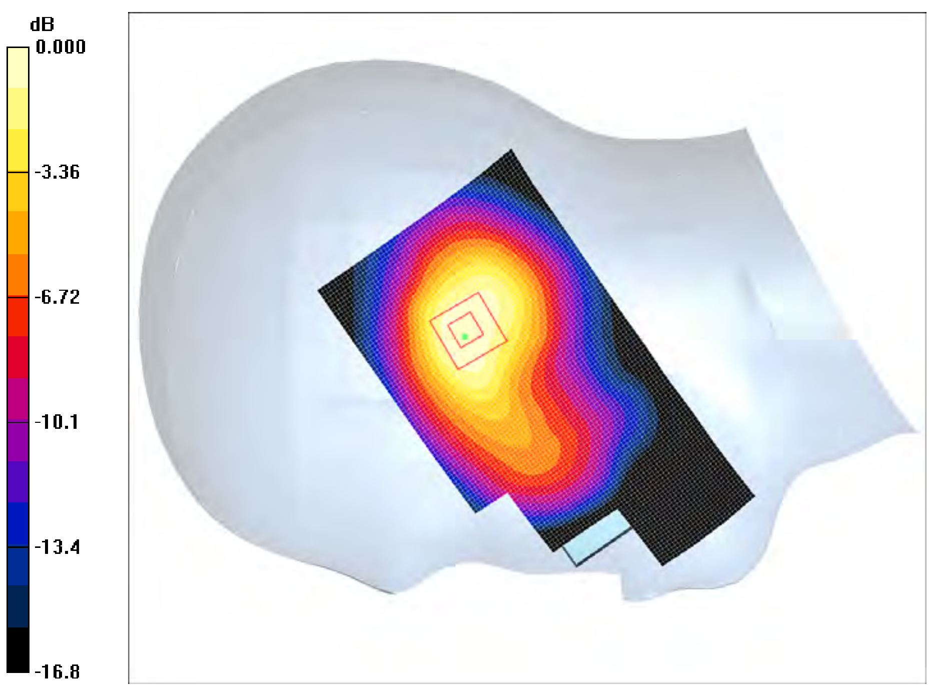
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.85, 4.85, 4.85); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Touch/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.862 mW/g

Right Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.5 V/m; Power Drift = 0.094 dB
Peak SAR (extrapolated) = 1.10 W/kg

SAR(1 g) = 0.745 mW/g; SAR(10 g) = 0.450 mW/g
Maximum value of SAR (measured) = 0.808 mW/g



0 dB = 0.808mW/g

#16

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Left Head Tilt (Low Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Left Section

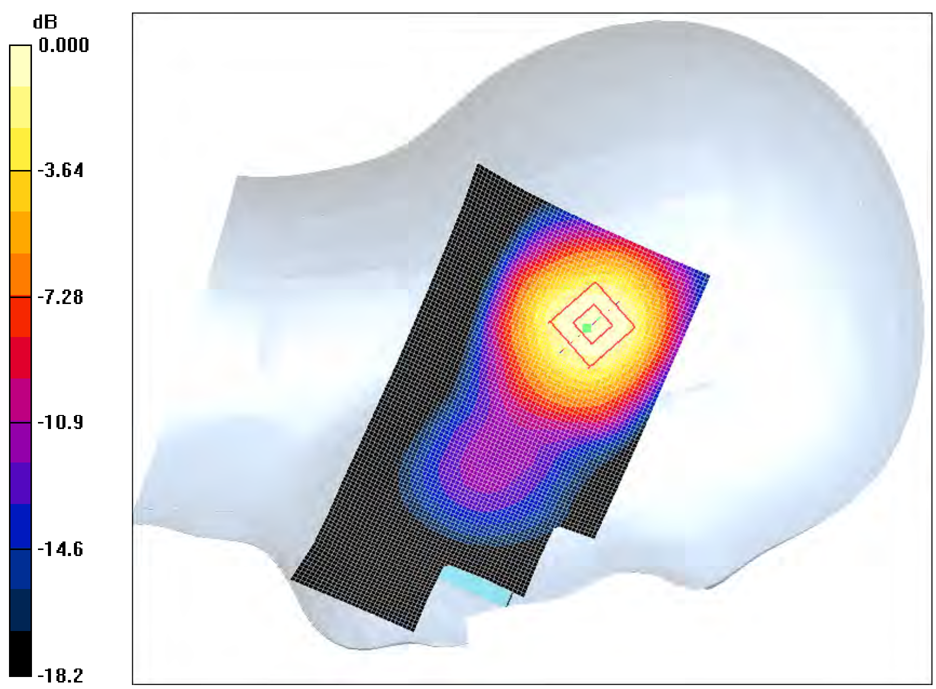
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.85, 4.85, 4.85); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Tilt/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.15 mW/g

Left Head Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.6 V/m; Power Drift = -0.217 dB
Peak SAR (extrapolated) = 1.73 W/kg

SAR(1 g) = 0.996 mW/g; SAR(10 g) = 0.563 mW/g
Maximum value of SAR (measured) = 1.09 mW/g



0 dB = 1.09mW/g

#17

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Left Head Tilt (Middle Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1880 MHz; σ = 1.38 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Left Section

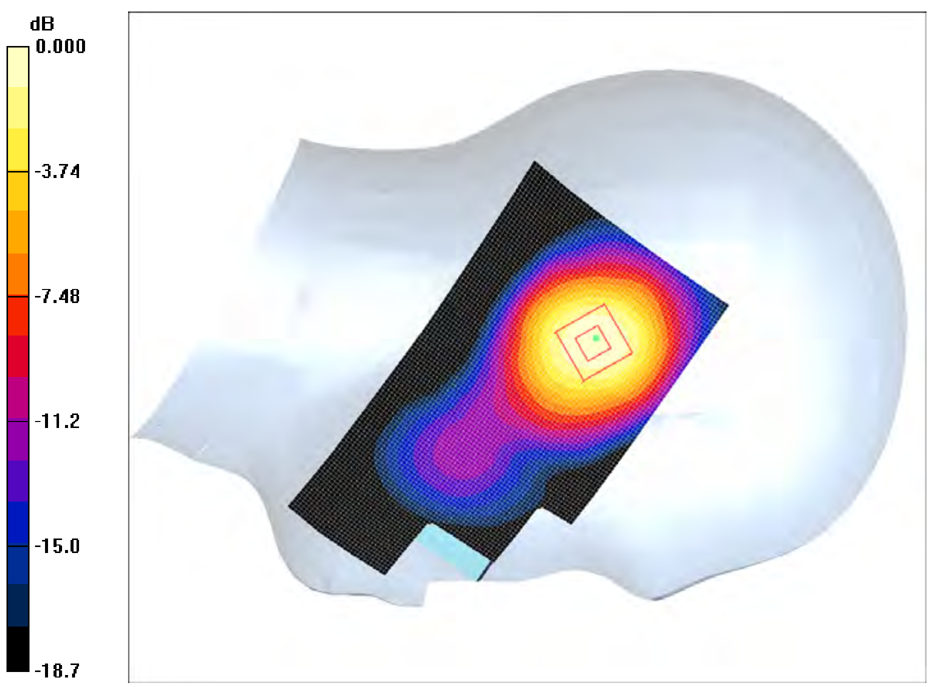
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.85, 4.85, 4.85); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Tilt/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.06 mW/g

Left Head Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.5 V/m; Power Drift = -0.059 dB
Peak SAR (extrapolated) = 1.61 W/kg

SAR(1 g) = 0.937 mW/g; SAR(10 g) = 0.536 mW/g
Maximum value of SAR (measured) = 1.01 mW/g



0 dB = 1.01mW/g

#18

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Left Head Tilt (High Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1909.8 MHz; σ = 1.39 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

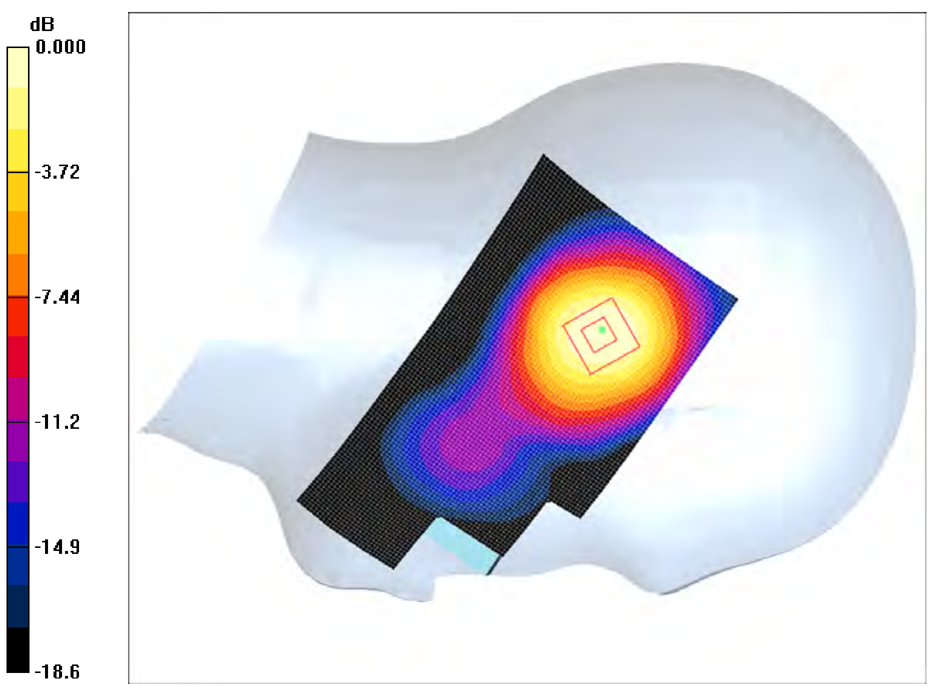
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.85, 4.85, 4.85); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Tilt/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.08 mW/g

Left Head Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.3 V/m; Power Drift = -0.323 dB
Peak SAR (extrapolated) = 1.56 W/kg

SAR(1 g) = 0.921 mW/g; SAR(10 g) = 0.525 mW/g
Maximum value of SAR (measured) = 1.00 mW/g



0 dB = 1.00mW/g

#19

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

Left Head Touch (Low Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Left Section

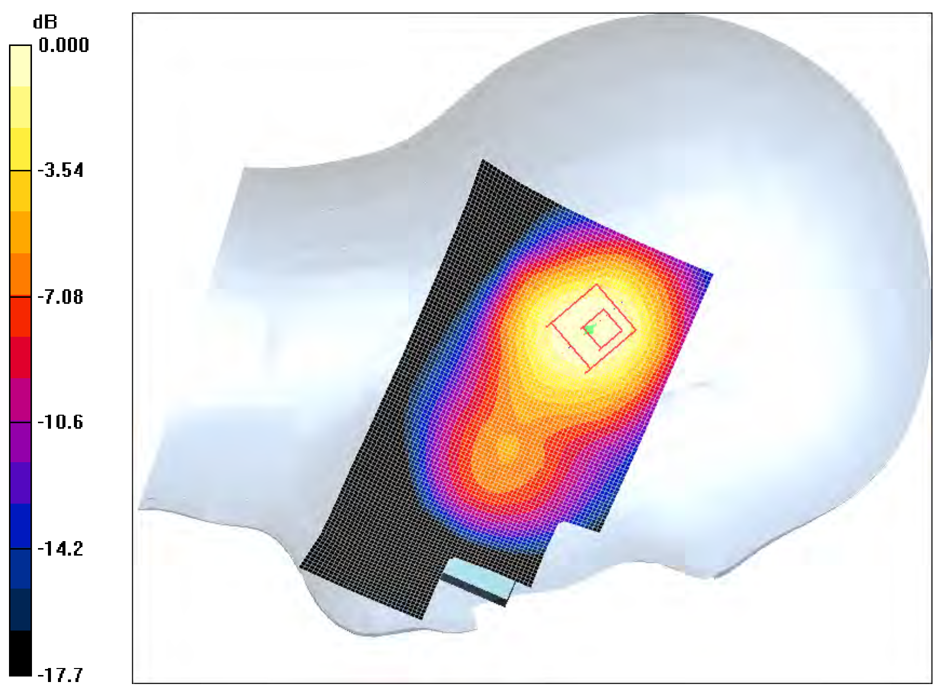
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.85, 4.85, 4.85); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Touch/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.892 mW/g

Left Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.7 V/m; Power Drift = -0.052 dB
Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 0.767 mW/g; SAR(10 g) = 0.451 mW/g
Maximum value of SAR (measured) = 0.822 mW/g



0 dB = 0.822mW/g

#20

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

1.5 cm Front to Flat Phantom- GPRS1900 (Low Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900, 2 slot; Frequency: 1850.2 MHz; Duty Cycle: 1:4.15
Medium parameters used: f = 1850.2 MHz; σ = 1.53 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

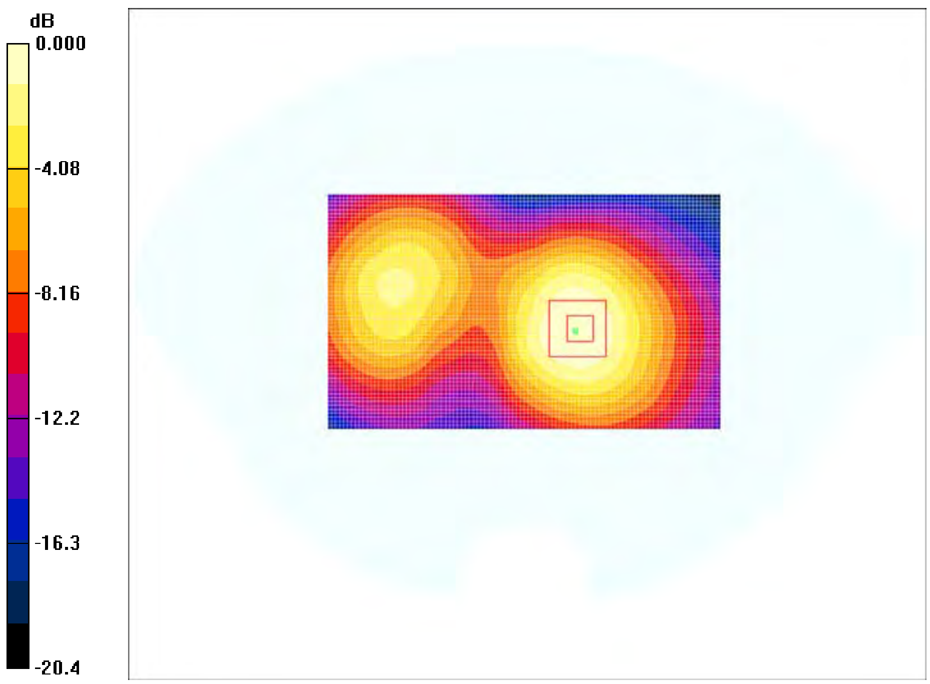
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.42, 4.42, 4.42); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Front 15mm/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.308 mW/g

Front 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = -1.01 dB
Peak SAR (extrapolated) = 0.492 W/kg

SAR(1 g) = 0.265 mW/g; SAR(10 g) = 0.146 mW/g
Maximum value of SAR (measured) = 0.293 mW/g



0 dB = 0.293mW/g

#21

Test Laboratory: Bay Area Compliance Lab Corp. (BACL)

1.5 cm Back to Flat Phantom-GPRS 1900 (Low Channel)

DUT: Ezfone; Type: Mobile phone; Serial: R13091611

Communication System: GSM 1900, 2 slot; Frequency: 1850.2 MHz; Duty Cycle: 1:4.15
Medium parameters used: f = 1850.2 MHz; σ = 1.53 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

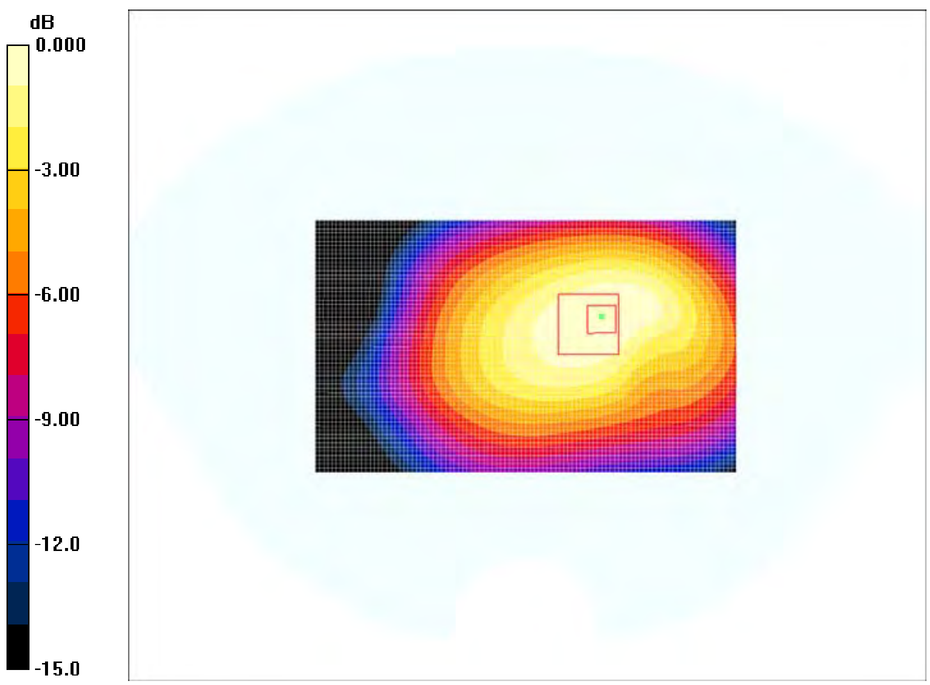
DASY4 Configuration:

- Probe: ES3DV2 - SN3019; ConvF(4.42, 4.42, 4.42); Calibrated: 8/26/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn456; Calibrated: 3/16/2012
- Phantom: SAM with CRP; Type: Twin SAM; Serial: TP-1032
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Back 15mm/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.561 mW/g

Back 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.3 V/m; Power Drift = -0.073 dB
Peak SAR (extrapolated) = 0.891 W/kg

SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.274 mW/g
Maximum value of SAR (measured) = 0.539 mW/g

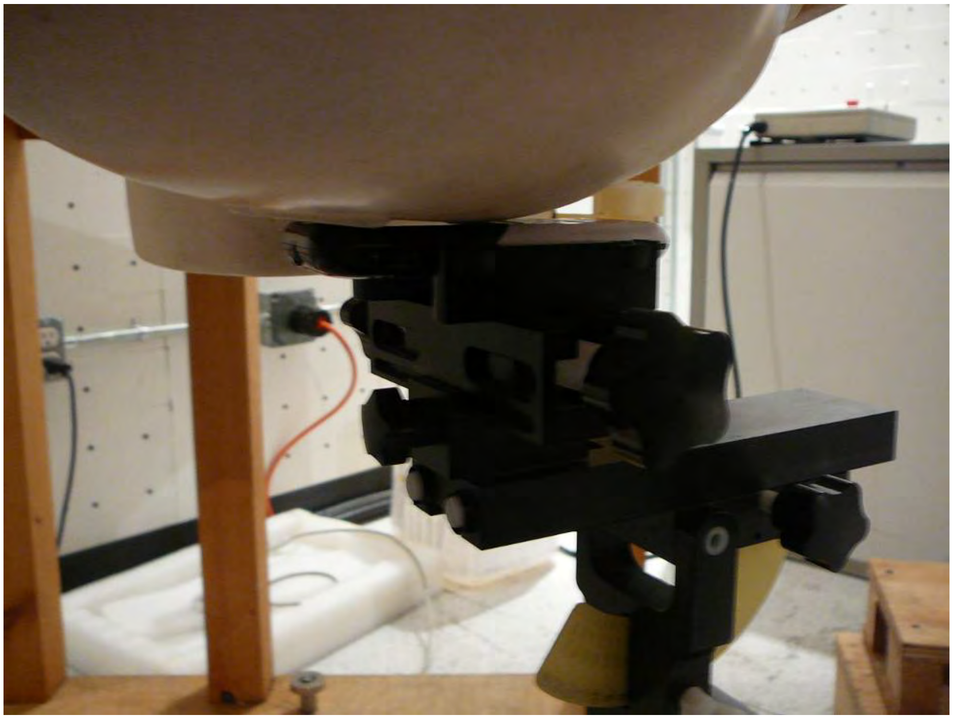


0 dB = 0.679mW/g

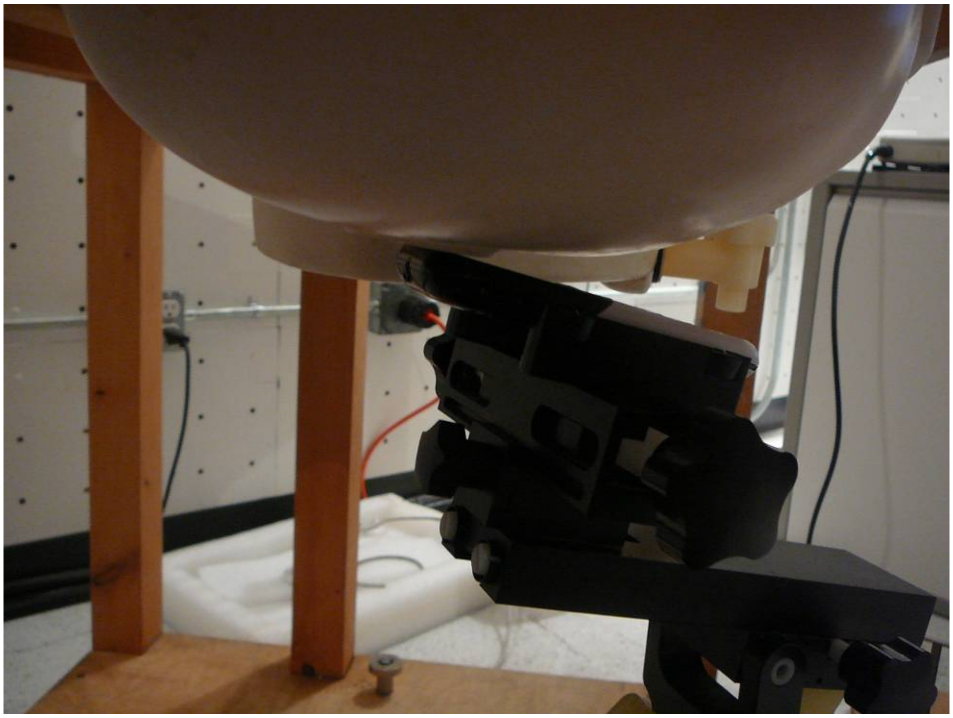
#22

18 APPENDIX F – TEST SETUP PHOTOS

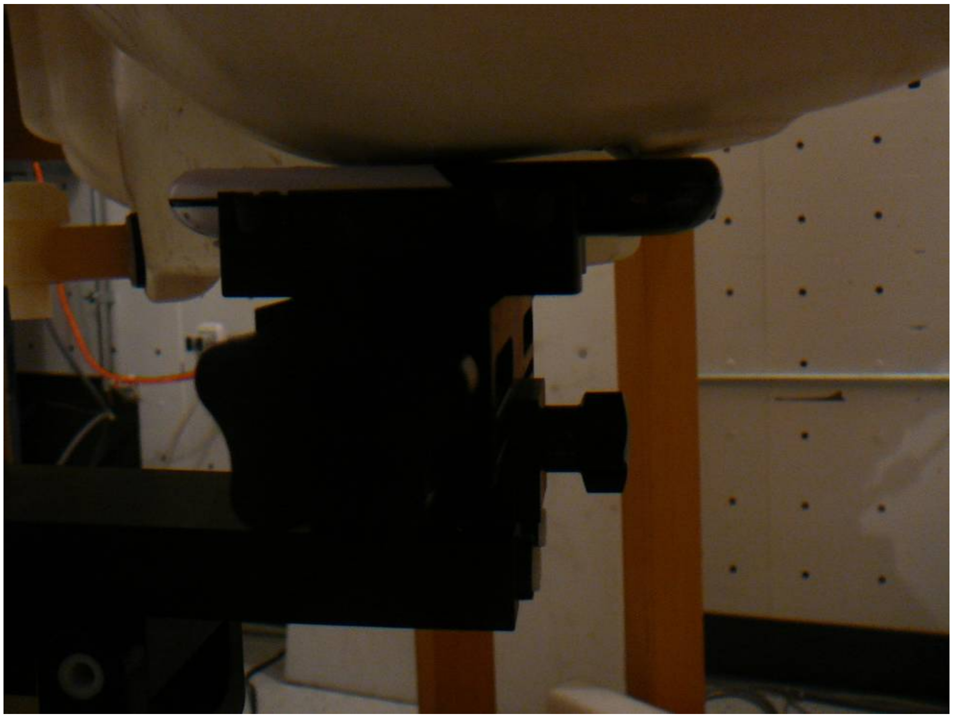
18.1 Right Head-Touch Setup Photo



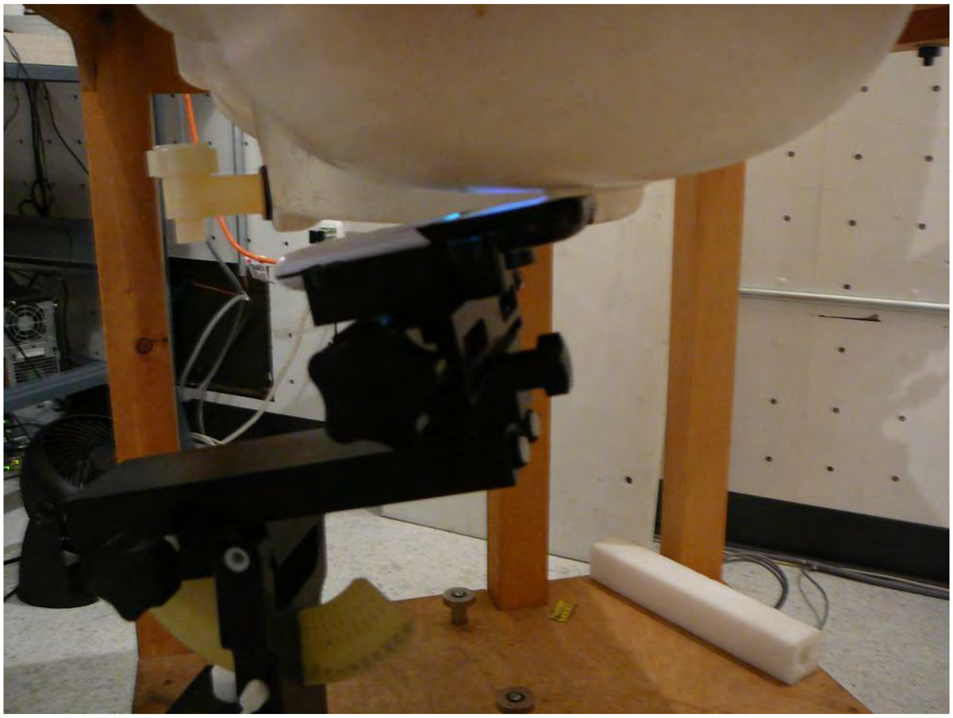
18.2 Right Head-Tilt Setup Photo



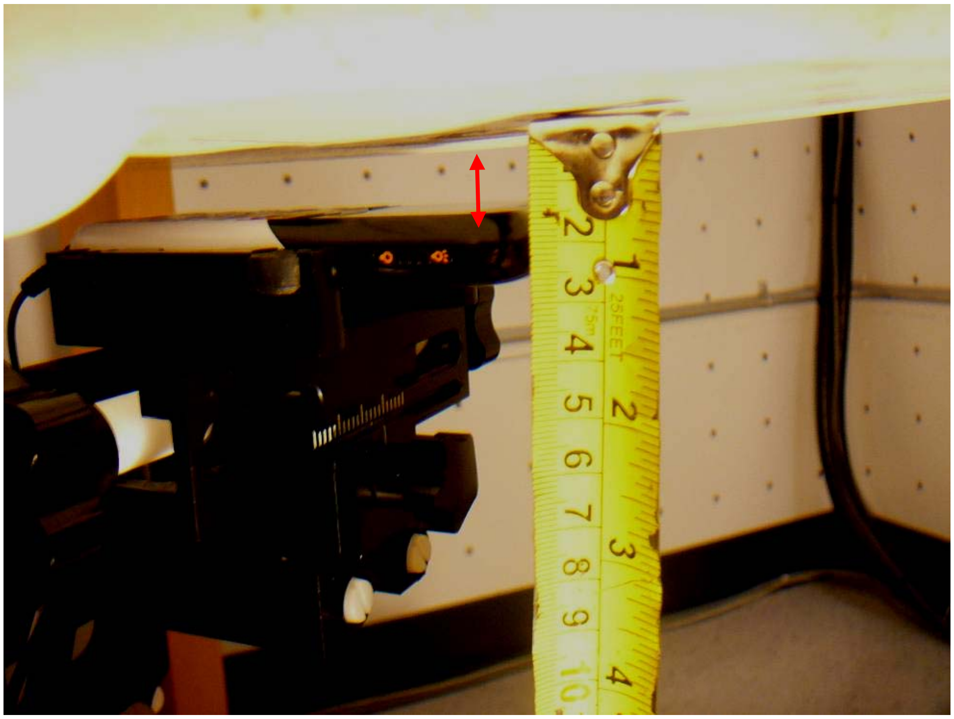
18.3 Left Head-Touch Setup Photo



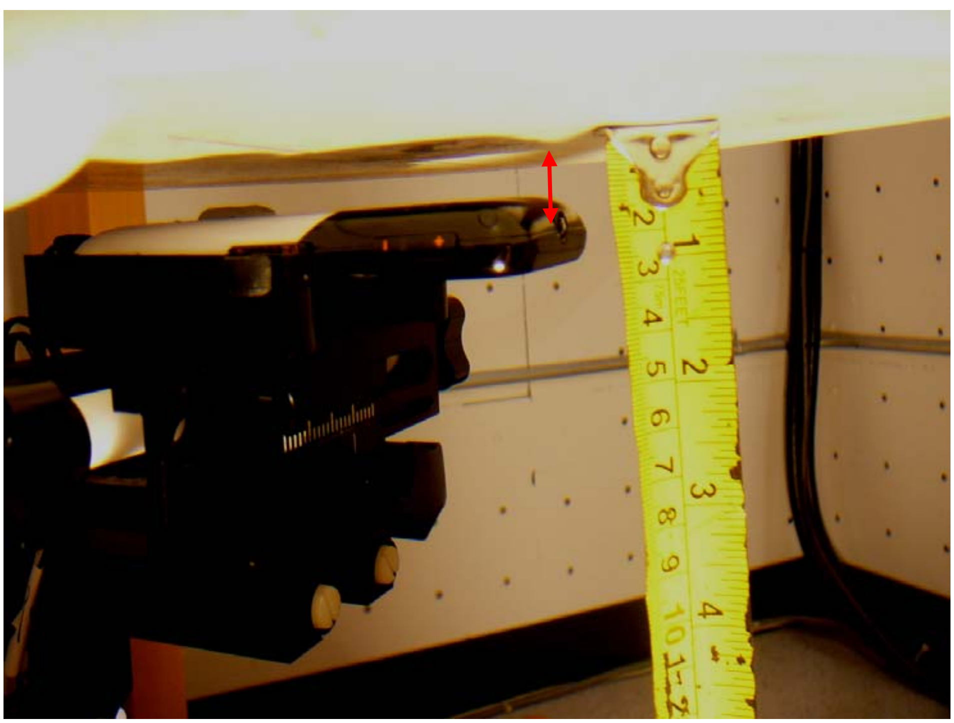
18.4 Left Head-Tilt Setup Photo



18.5 1.5 cm Front Side to the flat phantom with Headset Setup Photo



18.6 1.5 cm Back Side to the flat phantom with Headset Setup Photo



19 APPENDIX H – EUT PHOTOS

19.1 EUT – Front View

19.2 EUT – Bottom View

19.3 EUT – Battery Compartment View

19.4 EUT – Accessory Headset

20 APPENDIX H - INFORMATIVE REFERENCES

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