

CERTIFICATE OF COMPLIANCE (SAR EVALUATION)

APPLICANT NAME & ADDRESS:

MOTOROLA, INC.
8000 West Sunrise Blvd.
Ft. Lauderdale, FL 33322

DATE & LOCATION OF TESTING:

Dates of Tests: April 2-8 & 16-17, 2004
Test Report S/N: SAR.240319197-R3.AZ4
Test Site: PCTEST Lab, Columbia MD

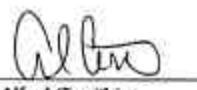
FCC ID:	AZ489FT5832
APPLICANT:	MOTOROLA, INC.

EUT Type:	Dual-Mode PTT Phone (iDEN/ISM)
Tx Frequency:	806.013 – 824.987 MHz (iDEN/33) / 896.019 – 901.981 MHz (iDEN II/33) 902.525 – 927.475 MHz (ISM)
Max. RF Output Power:	28.33 dBm Conducted iDEN/33 28.23 dBm Conducted iDEN II/33 29.10 dBm Conducted ISM
Max. SAR Measurement:	1.453 W/kg iDEN/33 Head SAR; 1.258W/kg iDEN/66 Body SAR; 0.097 W/kg iDEN/16 Face SAR 1.131 W/kg iDEN II/33 Head SAR; 0.340 W/kg iDEN II/33 Body SAR; 0.078 W/kg iDEN II/16 Face SAR; 0.588 W/kg ISM Face SAR; 0.584 W/kg ISM Body SAR
Trade Name/Model(s):	H69XAH6RR1AN
FCC Classification:	Licensed Non-Broadcast Transmitter Held to Ear (TNE)
FCC Rule Part(s):	§2.1093; FCC/OET Bulletin 65 Supplement C [July 2001]
Application Type:	Certification
Test Device Serial No.:	identical prototype [S/N: #364ADW003L]

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE Std. C95.1-1992 and had been tested in accordance with the measurement procedures specified in FCC/OET Bulletin 65 Supplement C (2001) and IEEE Std. 1528 D1.2 (April 2003).

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.


Alfred Cirwithian
Vice President Engineering



PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
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1. INTRODUCTION / SAR DEFINITION

The FCC has adopted the guidelines for evaluating the environmental effects of radiofrequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.[1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in *IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*. (c) 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.[2] The measurement procedure described in *IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave*[3] is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in *Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields*, NCRP Report No. 86 (c) NCRP, 1986, Bethesda, MD 20814.[6] SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (r). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Fig. 1.1).

$$SAR = \frac{d}{dt} \left(\frac{dU}{dm} \right) = \frac{d}{dt} \left(\frac{dU}{r dV} \right)$$

Figure 1.1
SAR Mathematical Equation

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = s E^2 / r$$

where:

- s = conductivity of the tissue-simulant material (S/m)
- r = mass density of the tissue-simulant material (kg/m³)
- E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

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2. SAR MEASUREMENT SETUP

Roboticsstem

Measurements are performed using the DASY4 automated dosimetric assessment system. The DASY4 is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland and consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Fig. 2.1).

System Hardware

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and a remote control used to drive the robot motors. The PC consists of the Gateway Pentium 4 2.53 GHz computer with Windows XP system and SAR Measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit that performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

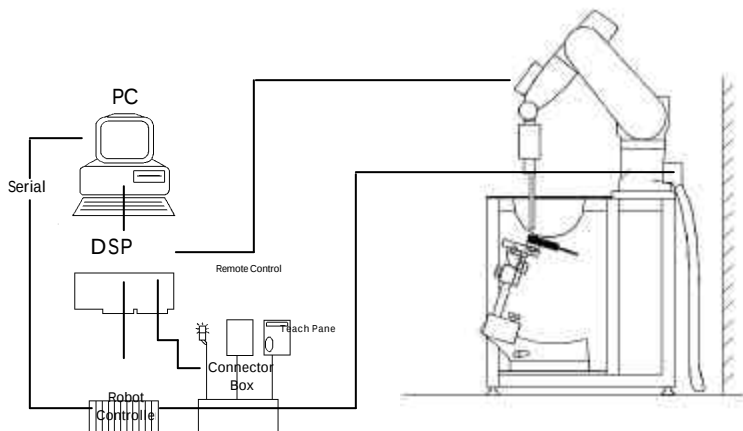


Figure 2.1 SAR Measurement System Setup

System Electronics

The DAE3 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in [7].

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3. DASY4 E-FIELD PROBE SYSTEM

Probe Measurement System



Figure 3.1 DAE System

The SAR measurements were conducted with the dosimetric probe ET3DV6, designed in the classical triangular configuration [7] (see Fig. 3.2) 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 multifiber line ending at the front of the probe tip (see Fig. 3.3). 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 DASY4 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting (see Fig.3.1). The approach is stopped at reaching the maximum.

Probe Specifications

Calibration:	In air from 10 MHz to 6 GHz In brain and muscle simulating tissue at Frequencies of 150 MHz, 450 MHz, 835 MHz, 900 MHz, 1900MHz, 2450MHz, 5300MHz, & 5800MHz
Frequency:	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity:	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal probe axis)
Dynamic:	5 :W/g to > 100 mW/g;
Range:	Linearity: ± 0.2 dB
Dimensions:	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 3 mm Distance from probe tip to dipole centers: 2 mm
Application:	General dosimetry up to 6 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

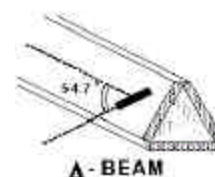


Figure 3.1 Triangular Probe Configuration



Figure 3.2 Probe Thick-Film Technique

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4. Probe Calibration Process

Dosimetric Assessment Procedure

Each probe is calibrated according to a dosimetric assessment procedure described in [8] with accuracy better than +/- 10%. The spherical isotropy was evaluated with the procedure described in [9] 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 is tested.

Free Space Assessment

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies below 1 GHz (see Fig. 4.1), 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 at the proper orientation with the field. The probe is then rotated 360 degrees.

Temperature Assessment *

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe (see Fig. 4.2).

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

where:

Δt = exposure time (30 seconds),

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

ΔT = temperature increase due to RF exposure.

SAR is proportional to $\Delta T / \Delta t$, the initial rate of tissue heating, before thermal diffusion takes place. Now it's possible to quantify the electric field in the simulated tissue by equating the thermally derived SAR to the E- field;

$$SAR = \frac{|E|^2 \cdot s}{r}$$

where:

σ = simulated tissue conductivity,

ρ = Tissue density (1.25 g/cm³ for brain tissue)

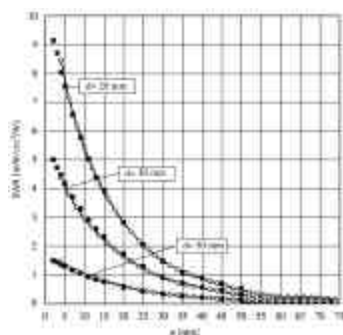


Figure 4.1 E-Field and Temperature measurements at 900MHz [7]

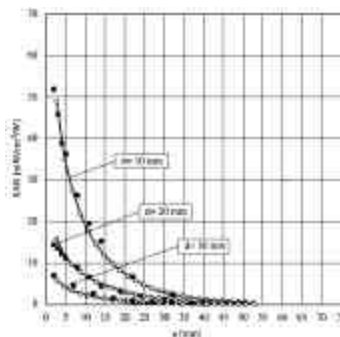


Figure 4.2 E-Field and temperature measurements at 1.9GHz [7]

*NOTE: The temperature calibration was not performed by PCTEST. For information use only.

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5. PHANTOM & EQUIVALENT TISSUES

SAM Phantom

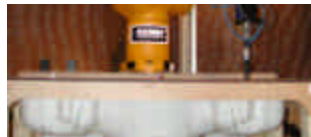


Figure 5.1 SAM Twin Phantom

The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90% of all users [11][12]. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. (see Fig. 5.1)

Brain & Muscle Simulating Mixture Characterization

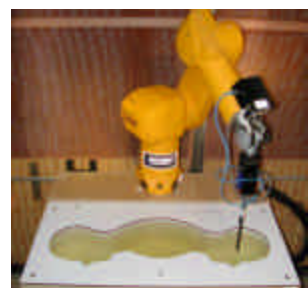


Figure 5.2 Simulated Tissue

The brain and muscle mixtures consist of a viscous gel using hydroxethylcellulose (HEC) gelling agent and saline solution (see Table 6.1). Preservation with a bacteriacide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 have been incorporated in the following table. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations. The mixture characterizations used for the brain and muscle tissue simulating liquids are according to the data by C. Gabriel and G. Hartsgrrove [13]. (see Fig. 5.2)

Table 5.1 Composition of the Brain & Muscle Tissue Equivalent Matter

INGREDIENTS		SIMULATING TISSUE			
		835MHz Brain	835MHz Muscle	900MHz Brain	900MHz Muscle
Mixture Percentage					
WATER		41.45	52.50	40.92	53.06
DGBE		0.000	0.000	0.000	0.000
SUGAR		56.00	45.00	56.50	44.90
SALT		1.450	1.400	1.480	0.940
BACTERIACIDE		0.100	0.100	0.100	0.100
HEC		1.000	1.000	1.000	1.000
Dielectric Constant	Target	41.50	55.20	41.50	55.00
Conductivity (S/m)	Target	0.900	0.970	0.970	1.050

Device Holder for Transmitters



Figure 5.2 Mounting Device

In combination with the SAM Twin Phantom V4.0, the Mounting Device (see Fig. 5.2) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation point is the ear opening. The devices can be easily, accurately, and repeatably be positioned according to the FCC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

* Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produce infinite number of configurations [12]. To produce the worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

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6. TEST SYSTEM SPECIFICATIONS

Automated Test System Specifications

Positioner

Robot: Stäubli Unimation Corp. Robot Model: RX60L
Repeatability: 0.02 mm
No. of axis: 6



Figure 6.1 DASY4 Test System

Data Acquisition Electronic (DAE) System

Cell Controller

Processor: Pentium 4
Clock Speed: 2.53 GHz
Operating System: Windows XP Professional

Data Converter

Features: Signal Amplifier, multiplexer, A/D converter, & control logic
Software: DASY4 software
Connecting Lines: Optical downlink for data and status info.
 Optical uplink for commands and clock

PC Interface Card

Function: 24 bit (64 MHz) DSP for real time processing
 Link to DAE3
 16 bit A/D converter for surface detection system
 serial link to robot
 direct emergency stop output for robot

E-Field Probes

Model: ES3DV2 S/N: 3022
Construction: Triangular core
Frequency: 10 MHz to 6 GHz
Linearity: ± 0.2 dB (30 MHz to 6 GHz)

Phantom

Phantom: SAM Twin Phantom (V4.0)
Shell Material: VIVAC Composite
Thickness: 2.0 ± 0.2 mm

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7. DOSIMETRIC ASSESSMENT & PHANTOM SPECS

Measurement Procedure

The evaluation was performed using the following procedure:

1. The SAR measurement was taken at a selected spatial reference point to monitor power variations during testing. This fixed location point was measured and used as a reference value.
2. The SAR distribution at the exposed side of the head was measured at a distance of 3.9mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm x 15mm.
3. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation. Around this point, a volume of 32mm x 32mm x 34mm (fine resolution volume scan, zoom scan) was assessed by measuring 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see Fig. 7.1):
 - a. The data at the surface was extrapolated, since the center of the dipoles is 2.7mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. The extrapolation was based on a least square algorithm [15]. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
 - b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions) [15][16]. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as procedure #1, was re-measured. If the value changed by more than 5%, the evaluation is repeated.



Figure 7.1 Sample SAR Area Scan

Specific Anthropomorphic Mannequin (SAM) Specifications

The phantom for handset SAR assessment testing is a low-loss dielectric shell, with shape and dimensions derived from the anthropometric data of the 90th percentile adult male head dimensions as tabulated by the US Army. The SAM Twin Phantom shell is bisected along the mid-sagittal plane into right and left halves (see Fig. 7.2). The perimeter sidewalls of each phantom halves are extended to allow filling with liquid to a depth that is sufficient to minimized reflections from the upper surface. The liquid depth is maintained at a minimum depth of 15cm to minimize reflections from the upper surface.



Figure 7.2 SAM Twin Phantom shell

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8. DEFINITION OF REFERENCE POINTS

EAR Reference Point

Figure 8.1 shows the front, back and side views of the SAM Twin Phantom. The point "M" is the reference point for the center of the mouth, "LE" is the left ear reference point (ERP), and "RE" is the right ERP. The ERPs are 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 9.2. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front) is perpendicular to the reference plane and passing through the RE (or LE) is called the Reference Pivoting Line (see Figure 8.2). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

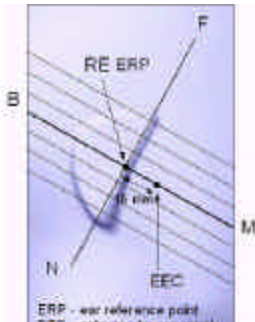


Figure 8.2 Close-up side view of ERPs

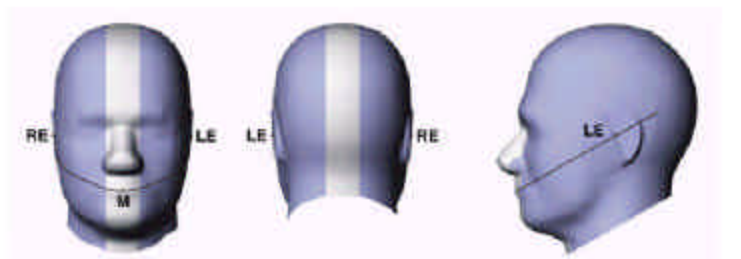


Figure 8.1 Front, back and side view of SAM Twin Phantom

Handset Reference Points

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed 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" (See Fig. 8.3). The "test device reference point" was then located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at it's top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

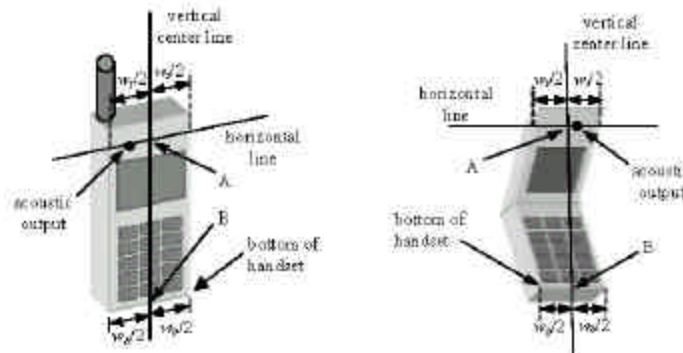


Figure 8.3 Handset Vertical Center & Horizontal Line Reference Points

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9. TEST CONFIGURATION POSITIONS

Positioning for Cheek/Touch

1. The test device was positioned with the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 9.1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.



Figure 9.1 Front, Side and Top View of Cheek/Touch Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the ear.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the plane normal to MB-NF including the line MB (reference plane).
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical with respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the phone contact with the ear, the handset was rotated about the line NF until any point on the handset made contact with a phantom point below the ear (cheek). See Figure 9.2)

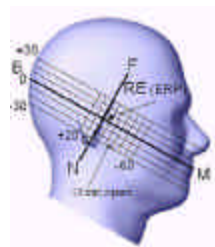


Figure 9.2 Side view w/ relevant markings

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9. TEST CONFIGURATION POSITIONS (Continued)

Positioning for Ear / 15° Tilt

With the test device aligned in the "Cheek/Touch Position":

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15degree.
2. The phone was then rotated around the horizontal line by 15 degree.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the phone touches the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. The tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 9.3).

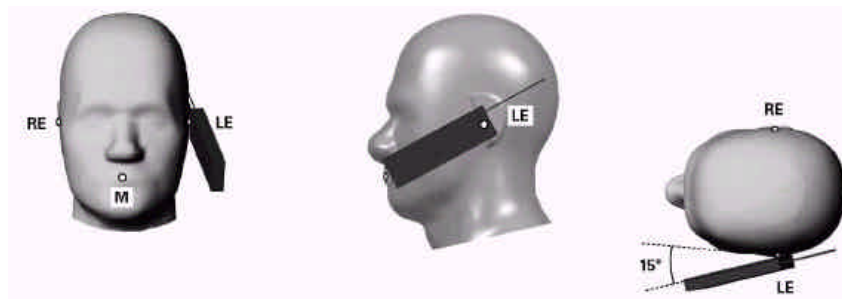


Figure 9.3 Front, Side and Top View of Ear/15° Tilt Position

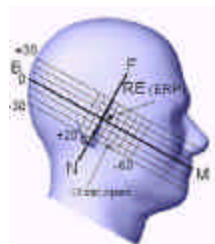


Figure 9.4 Side view w/ relevant markings

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9. TEST CONFIGURATION POSITIONS (Continued)

Body Holster /Belt Clip Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.5). A device with a headset output is tested with a headset connected to the device. Body dielectric parameters are used.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are supplied with the device, the device is tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (i.e. 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 is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration where a separation distance between the back of the device and the flat phantom is used. All test position spacings are documented.

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessory(ies), including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worst-case positioning is then documented and used to perform Body SAR testing.

In order for users to be aware of the body-worn operating requirements for meeting RF exposure compliance, operating instructions and cautions statements are included in the user's manual.



Figure 9.5 Body Belt Clip & Holster Configurations

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
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10. ANSI/IEEE C95.1 - 1992 RF EXPOSURE LIMITS

Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table 10.1. Safety Limits for Partial Body Exposure [2]

	HUMAN EXPOSURE LIMITS	
	UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)
SPATIAL PEAK SAR ¹ Brain	1.60	8.00
SPATIAL AVERAGE SAR ² Whole Body	0.08	0.40
SPATIAL PEAK SAR ³ Hands, Feet, Ankles, Wrists	4.00	20.00

1 The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

2 The Spatial Average value of the SAR averaged over the whole body.

3 The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
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11. MEASUREMENT UNCERTAINTIES

a	b	c	d	e = f(d,k)	f	g	h = cxf/e	i = cxg/e	k
Uncertainty Component	Sec.	Tol. (± %)	Prob. Dist.	Div.	c _i (1 - g)	c _i (10 - g)	1 - g u _i (± %)	10 - g u _i (± %)	v _i
Measurement System									
Probe Calibration	E1.1	4.8	N	1	1	1	4.8	4.8	∞
Axial Isotropy	E1.2	4.7	R	√3	0.7	0.7	1.9	1.9	∞
Hemishperical Isotropy	E1.2	9.6	R	√3	0.7	0.7	3.9	3.9	∞
Boundary Effect	E1.3	1.0	R	√3	1	1	0.6	0.6	∞
Linearity	E1.4	4.7	R	√3	1	1	2.7	2.7	∞
System Detection Limits	E1.5	1.0	R	√3	1	1	0.6	0.6	∞
Readout Electronics	E1.6	1.0	N	1	1	1	1.0	1.0	∞
Response Time	E1.7	0.8	R	√3	1	1	0.5	0.5	∞
Integration Time	E1.8	2.6	R	√3	1	1	1.5	1.5	∞
RF Ambient Conditions	E5.1	3.0	R	√3	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E5.2	0.4	R	√3	1	1	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	E5.3	2.9	R	√3	1	1	1.7	1.7	∞
Extrapolation, Interpolation & Integration Algorithms for Max. SAR Evaluation	E4.2	1.0	R	√3	1	1	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E3.2.1	2.9	N	1	1	1	2.9	2.9	145
Device Holder Uncertainty	E3.1.1	3.6	N	1	1	1	3.6	3.6	5
Output Power Variation - SAR drift measurement	5.6.2	5.0	R	√3	1	1	2.9	2.9	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E2.1	4.0	R	√3	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E2.2	5.0	R	√3	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E2.2	2.5	N	1	0.64	0.43	1.6	1.1	∞
Liquid Permittivity - deviation from target values	E2.2	5.0	R	√3	0.6	0.5	1.7	1.4	∞
Liquid Permittivity - measurement uncertainty	E2.2	2.5	N	1	0.6	0.5	1.5	1.2	∞
Combined Standard Uncertainty (k=1)			RSS				10.3	10.0	
Expanded Uncertainty (k=2) (95% CONFIDENCE LEVEL)							20.6	20.1	

The above measurement uncertainties are according to IEEE Std. P1528 D1.2 (April 2003).

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
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12. SYSTEM VERIFICATION

Tissue Verification

MEASURED TISSUE PARAMETERS						
Date:	Liquid Temp (°C)	Tissue	Targeted Dielectric Constant: ϵ	Measured Dielectric Constant: ϵ	Targeted Conductivity: σ	Measured Conductivity: σ
04/02/04	20.6	835 MHz Brain	41.50	41.32	0.900	0.890
04/05/04	20.6			41.32		0.890
04/06/04	21.3			41.32		0.890
04/07/04	21.0			41.32		0.890
04/08/04	20.8			41.28		0.920
04/16/04	21.2			41.40		0.890
04/17/04	21.6			41.40		0.890
04/08/04	20.8	835 MHz Muscle	55.20	56.40	0.970	0.990
04/16/04	20.9			55.48		0.990
04/17/04	20.8			55.48		0.990
04/06/04	20.6	900 MHz Brain	42.00	41.70	0.970	0.960
04/07/04	20.8			41.70		0.960
04/16/04	20.9			41.90		0.940
04/08/04	20.8	900 MHz Muscle	53.30	53.90	1.050	1.020
04/17/04	20.8			53.70		1.010

Table 12.1 Simulated Tissue Verification [5]

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
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SYSTEM VERIFICATION (Continued)

Test System Validation

Prior to assessment, the system is verified to the $\pm 10\%$ of the specifications at 835MHz by using the system validation kit(s). (Graphic Plots Attached)

SYSTEM VALIDATION TARGET & MEASURED							
Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Tissue	Targeted SAR _{1g} (mW/g)	Measured SAR _{1g} (mW/g)	Deviation (%)
04/02/04	22.3	20.6	0.250	835 MHz Brain	2.375	2.46	3.58
04/05/04	21.8	20.0				2.32	- 2.32
04/06/04	21.6	21.3				2.41	1.47
04/07/04	22.1	21.0				2.39	0.63
04/08/04	21.4	20.8				2.38	0.21
04/16/04	21.9	21.2				2.51	5.68
04/17/04	22.1	21.6				2.54	6.95

Table 12.2 System Validation [5]

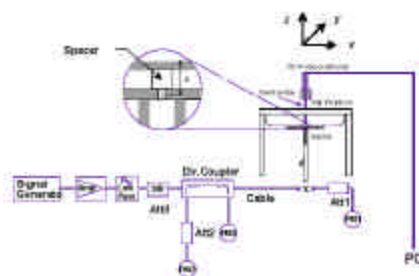


Figure 12.1 Dipole Validation Test Setup

PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	

13. SAR TEST DATA SUMMARY

See Measurement Result Data Pages

Procedures Used To Establish Test Signal

The handset was placed into simulated call mode (iDEN & ISM modes) using manufacturers test codes. Such test signals offer a consistent means for testing SAR and are recommended for evaluating SAR [4]. When test modes are not available or inappropriate for testing a handset, the actual transmission is activated through a base station simulator or similar equipment. See data pages for actual procedure used in measurement.

Device Test Conditions

The handset is battery operated. Each SAR measurement was taken with a fully charged battery. In order to verify that the device was tested at full power, conducted output power measurements were performed before and after each SAR measurement to confirm the output power.

Tested Accessories

Batteries

<u>Name</u>	<u>Kit Number</u>	<u>Description</u>
Li-Ion	SNN5705B	Hi Performance Li-ion, 750 mAh
Li-Ion	SNN5706A	Extra Capacity, 1050 mAh
Li-Ion	NNTN4655A	Maximum Capacity, 1450 mAh

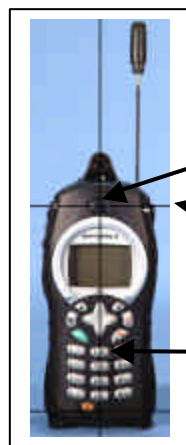
Body Worn Accessories

<u>Name</u>	<u>Kit Number</u>	<u>Description</u>
Holster	NNTN4755A	Carry Holster

Audio Accessories

<u>Name</u>	<u>Kit Number</u>	<u>Description</u>
Headset	SYN8146C	Lightweight headset w/ boom mic

This headset is representative of similar headsets that may be marketed with this phone.



EUT Handset Reference Points

ERP – Ear Reference Point

Horizontal Center Line

Vertical Center Line

Figure 13.1 Handset Reference Points

PCTEST® SAR REPORT		FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 18 of 118

SAR DATA SUMMARY

Mixture Type: 835MHz Brain

14.1 MEASUREMENT RESULTS (iDEN/33 Right Head SAR - Touch)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg)
MHz	Ch.				(dBm)				
806.013	Low	iDEN	Max. Capacity	In	28.20	27.76	0.803	-0.44	0.889
806.013	Low	iDEN	Max. Capacity	Out	28.14	27.90	0.630	-0.24	0.666
813.513	Mid	iDEN	Max. Capacity	In	27.90	27.50	0.818	-0.40	0.897
813.513	Mid	iDEN	Max. Capacity	Out	28.17	27.90	0.767	-0.27	0.816
824.987	High	iDEN	Max. Capacity	In	28.26	28.10	0.759	-0.16	0.787
824.987	High	iDEN	Max. Capacity	Out	27.92	27.66	0.546	-0.26	0.580
813.513	Mid	iDEN	High Performance	In	28.14	28.06	0.815	-0.08	0.830
813.513	Mid	iDEN	High Performance	Out	28.02	27.87	0.551	-0.15	0.570
813.513	Mid	iDEN	Extra Capacity	In	28.21	27.80	0.728	-0.41	0.800
813.513	Mid	iDEN	Extra Capacity	Out	27.92	27.48	0.568	-0.46	0.631
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [‡]Power Measured ☒ Conducted ☐ ERP ☐ EIRP
 SAR Measurement System ☒ DASY4 ☐ IDX
 Phantom Configuration ☐ Left Head ☐ Flat Phantom ☒ Right Head
 SAR Configuration ☒ Head ☐ Body ☐ Face
 Test Signal Call Mode ☐ Manu. Test Codes ☐ Base Station Simulator ☒ Software Call Simulator
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1


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Figure 14.1 Right Head SAR Test Setup -- Cheek / Touch Position --

PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 19 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.2 MEASUREMENT RESULTS (iDEN /33 Right Head SAR - Tilt)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg)
MHz	Ch.				(dBm)				
806.013	Low	iDEN	Max. Capacity	In	27.95	28.05	0.754	0.10	0.737
806.013	Low	iDEN	Max. Capacity	Out	28.28	28.13	0.747	-0.15	0.773
813.513	Mid	iDEN	Max. Capacity	In	27.96	27.65	0.792	-0.31	0.851
813.513	Mid	iDEN	Max. Capacity	Out	28.02	28.13	0.697	0.11	0.680
824.987	High	iDEN	Max. Capacity	In	28.16	28.21	0.759	0.05	0.750
824.987	High	iDEN	Max. Capacity	Out	28.10	27.98	0.661	-0.12	0.680
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							Brain		
Spatial Peak							1.6 W/kg (mW/g)		
Uncontrolled Exposure/General Population							averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [‡]Power Measured
- | | | |
|---|------------------------------|-------------------------------|
| ☒ Conducted | ☐ ERP | ☐ EIRP |
|---|------------------------------|-------------------------------|
- SAR Measurement System

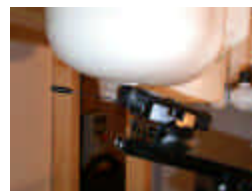
☒ DASY4	☐ IDX
---	------------------------------
 - Phantom Configuration

☐ Left Head	☐ Flat Phantom	☒ Right Head
------------------------------------	---------------------------------------	--
 - SAR Configuration

☒ Head	☐ Body	☐ Face
--	-------------------------------	-------------------------------
 - Test Signal Call Mode

☐ Manu. Test Codes	☐ Base Station Simulator	☒ Software Call Simulator
---	---	---
 - Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1


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**Figure 14.2 Right Head SAR Test Setup
-- Ear / Tilt Position --**

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 20 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.3 MEASUREMENT RESULTS (iDEN/33 Left Head SAR - Touch)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg)
MHz	Ch.				(dBm)				
806.013	Low	iDEN	Max. Capacity	In	28.54	28.10	1.400	-0.10	1.433
806.013	Low	iDEN	Max. Capacity	Out	28.31	27.90	0.673	-0.41	0.740
813.513	Mid	iDEN	Max. Capacity	In	28.33	27.93	1.410	-0.13	1.453
813.513	Mid	iDEN	Max. Capacity	Out	28.43	28.09	0.657	-0.34	0.711
824.987	High	iDEN	Max. Capacity	In	28.05	28.18	1.210	0.13	1.174
824.987	High	iDEN	Max. Capacity	Out	28.37	28.11	0.549	-0.26	0.583
813.513	Mid	iDEN	High Performance	In	28.29	27.90	1.140	-0.39	1.247
813.513	Mid	iDEN	High Performance	Out	28.25	28.10	0.527	-0.15	0.546
813.513	Mid	iDEN	Extra Capacity	In	28.38	28.12	1.100	-0.26	1.168
813.513	Mid	iDEN	Extra Capacity	Out	28.21	27.99	0.583	-0.22	0.613
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [‡]Power Measured
- | | | |
|---|---|---|
| ☒ Conducted | ☐ ERP | ☐ EIRP |
| ☒ DASY4 | ☐ IDX | |
| ☒ Left Head | ☐ Flat Phantom | ☐ Right Head |
| ☒ Head | ☐ Body | ☐ Face |
| ☐ Manu. Test Codes | ☐ Base Station Simulator | ☒ Software Call Simulator |
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1


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Figure 14.3 Left Head SAR Test Setup
-- Cheek / Touch Position --

PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 21 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.4 MEASUREMENT RESULTS (iDEN /33 Left Head SAR - Tilt)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg)
MHz	Ch.				(dBm)				
806.013	Low	iDEN	Max. Capacity	In	28.34	28.21	0.895	-0.13	0.922
806.013	Low	iDEN	Max. Capacity	Out	28.13	28.09	0.842	-0.04	0.850
813.513	Mid	iDEN	Max. Capacity	In	28.32	27.94	0.926	-0.38	1.011
813.513	Mid	iDEN	Max. Capacity	Out	28.24	28.02	0.838	-0.22	0.882
824.987	High	iDEN	Max. Capacity	In	28.19	27.97	0.707	-0.22	0.744
824.987	High	iDEN	Max. Capacity	Out	28.16	28.02	0.811	-0.14	0.838
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [†]Power Measured ☒ Conducted ☐ ERP ☐ EIRP
 SAR Measurement System ☒ DASY4 ☐ IDX
 Phantom Configuration ☒ Left Head ☐ Flat Phantom ☐ Right Head
 SAR Configuration ☒ Head ☐ Body ☐ Face
 Test Signal Call Mode ☐ Manu. Test Codes ☐ Base Station Simulator ☒ Software Call Simulator
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. $\pm$ 0.1


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Figure 14.4 Left Head SAR Test Setup
-- Ear / Tilt Position --

PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 22 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 900MHz Brain

14.5 MEASUREMENT RESULTS (iDEN II/33 Right Head SAR - Touch)									
FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg)
MHz	Ch.				(dBm)				
896.019	Low	iDEN	Max. Capacity	In	27.98	27.66	0.752	-0.32	0.810
896.019	Low	iDEN	Max. Capacity	Out	28.16	28.07	0.365	-0.09	0.373
898.494	Mid	iDEN	Max. Capacity	In	27.93	27.66	0.796	-0.27	0.847
898.494	Mid	iDEN	Max. Capacity	Out	28.21	27.93	0.382	-0.28	0.407
901.981	High	iDEN	Max. Capacity	In	28.30	28.14	0.828	-0.16	0.859
901.981	High	iDEN	Max. Capacity	Out	28.22	27.97	0.405	-0.25	0.429
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [‡]Power Measured ☒ Conducted ☐ ERP ☐ EIRP
 SAR Measurement System ☒ DASY4 ☐ IDX
 Phantom Configuration ☐ Left Head ☐ Flat Phantom ☒ Right Head
 SAR Configuration ☒ Head ☐ Body ☐ Face
 Test Signal Call Mode ☐ Manu. Test Codes ☐ Base Station Simulator ☒ Software Call Simulator
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1

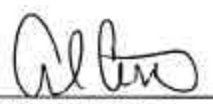

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Figure 14.5 Right Head SAR Test Setup
-- Cheek / Touch Position --

PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 23 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 900MHz Brain

14.6 MEASUREMENT RESULTS (iDEN II/33 Right Head SAR - Tilt)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg)
MHz	Ch.				(dBm)				
896.019	Low	iDEN	Max. Capacity	In	28.34	28.15	0.490	-0.19	0.512
896.019	Low	iDEN	Max. Capacity	Out	29.02	28.43	0.597	-0.59	0.684
898.494	Mid	iDEN	Max. Capacity	In	28.41	28.22	0.497	-0.19	0.519
898.494	Mid	iDEN	Max. Capacity	Out	28.16	28.03	0.573	-0.13	0.590
901.981	High	iDEN	Max. Capacity	In	28.15	27.98	0.537	-0.17	0.558
901.981	High	iDEN	Max. Capacity	Out	28.32	28.10	0.661	-0.22	0.695
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [‡]Power Measured
- | | | |
|---|------------------------------|-------------------------------|
| ☒ Conducted | ☐ ERP | ☐ EIRP |
|---|------------------------------|-------------------------------|
- SAR Measurement System

☒ DASY4	☐ IDX
---	------------------------------
 - Phantom Configuration

☐ Left Head	☐ Flat Phantom	☒ Right Head
------------------------------------	---------------------------------------	--
 - SAR Configuration

☒ Head	☐ Body	☐ Face
--	-------------------------------	-------------------------------
 - Test Signal Call Mode

☐ Manu. Test Codes	☐ Base Station Simulator	☒ Software Call Simulator
---	---	---
 - Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1


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Figure 14.6 Right Head SAR Test Setup
-- Ear / Tilt Position --

PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 24 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 900MHz Brain

14.7 MEASUREMENT RESULTS (iDEN II/33 Left Head SAR - Touch)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg)
MHz	Ch.				(dBm)				
896.019	Low	iDEN	Max. Capacity	In	28.23	28.04	0.864	-0.19	0.903
896.019	Low	iDEN	Max. Capacity	Out	27.97	28.03	0.392	0.06	0.387
898.494	Mid	iDEN	Max. Capacity	In	28.06	27.89	0.971	-0.17	1.010
898.494	Mid	iDEN	Max. Capacity	Out	28.16	28.02	0.410	-0.14	0.423
901.981	High	iDEN	Max. Capacity	In	28.23	28.07	1.090	-0.16	1.131
901.981	High	iDEN	Max. Capacity	Out	28.14	27.92	0.506	-0.22	0.532
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [‡]Power Measured ☒ Conducted ☐ ERP ☐ EIRP
 4. SAR Measurement System ☒ DASY4 ☐ IDX
 Phantom Configuration ☒ Left Head ☐ Flat Phantom ☐ Right Head
 5. SAR Configuration ☒ Head ☐ Body ☐ Face
 6. Test Signal Call Mode ☐ Manu. Test Codes ☐ Base Station Simulator ☒ Software Call Simulator
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1


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**Figure 14.7 Left Head SAR Test Setup
-- Cheek / Touch Position --**

PCTEST SAR REPORT		FCC CERTIFICATION		 Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	

SAR DATA SUMMARY (Continued)

Mixture Type: 900MHz Brain

14.8 MEASUREMENT RESULTS (iDEN II/33 Left Head SAR - Tilt)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg)
MHz	Ch.				(dBm)				
896.019	Low	iDEN	Max. Capacity	In	28.28	28.06	0.604	-0.06	0.635
896.019	Low	iDEN	Max. Capacity	Out	29.03	28.31	0.813	-0.19	0.849
898.494	Mid	iDEN	Max. Capacity	In	28.25	28.11	0.592	-0.14	0.611
898.494	Mid	iDEN	Max. Capacity	Out	27.90	27.79	0.788	-0.11	0.808
901.981	High	iDEN	Max. Capacity	In	28.16	27.93	0.618	-0.23	0.652
901.981	High	iDEN	Max. Capacity	Out	28.24	28.10	0.842	-0.14	0.870
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [‡]Power Measured
- | | | |
|---|------------------------------|-------------------------------|
| ☒ Conducted | ☐ ERP | ☐ EIRP |
|---|------------------------------|-------------------------------|
- SAR Measurement System

☒ DASY4	☐ IDX
---	------------------------------
 - Phantom Configuration

☒ Left Head	☐ Flat Phantom	☐ Right Head
---	---------------------------------------	-------------------------------------
 - SAR Configuration

☒ Head	☐ Body	☐ Face
--	-------------------------------	-------------------------------
 - Test Signal Call Mode

☐ Manu. Test Codes	☐ Base Station Simulator	☒ Software Call Simulator
---	---	---
 - Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. $\pm$ 0.1


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Figure 14.8 Left Head SAR Test Setup
-- Ear / Tilt Position --

PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 26 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Brain

14.9 MEASUREMENT RESULTS (iDEN/1:6 Face SAR – 2.5 cm Spacing)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg) ^{‡‡}
MHz	Ch.				(dBm)				
806.013	Low	iDEN	Max. Capacity	In	28.32	28.26	0.187	-0.06	0.095
806.013	Low	iDEN	Max. Capacity	Out	28.28	28.22	0.124	-0.06	0.063
813.513	Mid	iDEN	Max. Capacity	In	28.34	28.19	0.186	-0.15	0.097
813.513	Mid	iDEN	Max. Capacity	Out	28.26	28.20	0.134	-0.06	0.068
824.987	High	iDEN	Max. Capacity	In	28.37	28.21	0.152	-0.16	0.079
824.987	High	iDEN	Max. Capacity	Out	28.29	28.20	0.136	-0.09	0.070
813.513	Mid	iDEN	High Performance	In	28.21	27.92	0.155	-0.29	0.083
813.513	Mid	iDEN	High Performance	Out	28.25	27.89	0.132	-0.36	0.072
813.513	Mid	iDEN	Extra Capacity	In	28.32	28.18	0.141	-0.14	0.073
813.513	Mid	iDEN	Extra Capacity	Out	28.29	28.17	0.125	-0.12	0.065
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [†]Power Measured ☒ Conducted ☐ ERP ☐ EIRP
^{‡‡}SAR Measurement System ☒ DASY4 ☐ IDX
 Phantom Configuration ☐ Left Head ☒ Flat Phantom ☐ Right Head
 SAR Configuration ☐ Head ☐ Body ☒ Face
 Test Signal Call Mode ☐ Manu. Test Codes ☐ Base Station Simulator ☒ Software Call Simulator
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1
 - ^{‡‡} Extrapolated data column includes drift and 50% Duty Cycle correction factor.

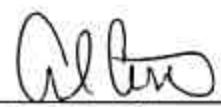

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 Vice President Engineering



Figure 14.9 SAR Test Setup
-- Face Position --

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 27 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 900MHz Brain

14.10 MEASUREMENT RESULTS (iDEN II/1:6 Face SAR – 2.5 cm Spacing)									
FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [†]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg) ^{††}
MHz	Ch.				(dBm)				
896.019	Low	iDEN	Max. Capacity	In	28.14	27.95	0.134	-0.19	0.070
896.019	Low	iDEN	Max. Capacity	Out	28.26	27.97	0.126	-0.29	0.068
898.494	Mid	iDEN	Max. Capacity	In	28.19	28.06	0.151	-0.13	0.078
898.494	Mid	iDEN	Max. Capacity	Out	28.20	28.21	0.104	0.01	0.052
901.981	High	iDEN	Max. Capacity	In	28.24	28.29	0.146	0.05	0.072
901.981	High	iDEN	Max. Capacity	Out	28.12	28.09	0.133	-0.03	0.067
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [†]Power Measured ☒ Conducted ☐ ERP ☐ EIRP
^{††}SAR Measurement System ☒ DASY4 ☐ IDX
 Phantom Configuration ☐ Left Head ☒ Flat Phantom ☐ Right Head
 SAR Configuration ☐ Head ☐ Body ☒ Face
 Test Signal Call Mode ☐ Manu. Test Codes ☐ Base Station Simulator ☒ Software Call Simulator
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1
 - ^{††} Extrapolated data column includes drift and 50% Duty Cycle correction factor.

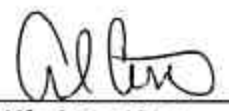

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Figure 14.10 SAR Test Setup
-- Face Position --

PCTEST SAR REPORT		FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832		Page 28 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 900MHz Brain

14.11 MEASUREMENT RESULTS (ISM Face SAR - 2.5 cm Spacing)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg)
MHz	Ch.				(dBm)				
902.525	Low	ISM	Max. Capacity	In	29.05	28.75	0.944	-0.30	0.506
902.525	Low	ISM	Max. Capacity	Out	29.13	28.70	0.512	-0.43	0.283
915.525	Mid	ISM	Max. Capacity	In	28.83	29.02	0.848	0.19	0.406
915.525	Mid	ISM	Max. Capacity	Out	29.06	28.91	0.471	-0.15	0.244
927.475	High	ISM	Max. Capacity	In	28.72	28.55	1.130	-0.17	0.588
927.475	High	ISM	Max. Capacity	Out	29.03	28.76	0.586	-0.27	0.312
927.475	High	ISM	High Performance	In	29.04	28.62	1.030	-0.42	0.568
927.475	High	ISM	High Performance	Out	28.99	28.80	0.602	-0.19	0.312
927.475	High	ISM	Extra Capacity	In	29.05	28.76	0.974	-0.29	0.521
927.475	High	ISM	Extra Capacity	Out	29.02	28.84	0.616	-0.18	0.321
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Brain 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [†]Power Measured
- | | | |
|---|------------------------------|-------------------------------|
| ☒ Conducted | ☐ ERP | ☐ EIRP |
|---|------------------------------|-------------------------------|
4. SAR Measurement System
- | | |
|---|------------------------------|
| ☒ DASY4 | ☐ IDX |
|---|------------------------------|
- Phantom Configuration
- | | | |
|------------------------------------|--|-------------------------------------|
| ☐ Left Head | ☒ Flat Phantom | ☐ Right Head |
|------------------------------------|--|-------------------------------------|
5. SAR Configuration
- | | | |
|-------------------------------|-------------------------------|--|
| ☐ Head | ☐ Body | ☒ Face |
|-------------------------------|-------------------------------|--|
6. Test Signal Call Mode
- | | | |
|---|---|---|
| ☐ Manu. Test Codes | ☐ Base Station Simulator | ☒ Software Call Simulator |
|---|---|---|
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. $\pm$ 0.1
 - [‡] Extrapolated data column includes drift and 50% Duty Cycle correction factor.


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Figure 14.11 SAR Test Setup
-- Face Position --

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 29 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Muscle

14.12 MEASUREMENT RESULTS (iDEN/1:3 Body SAR w/out Belt-clip – 2.5 cm Spacing)									
FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg) ^{††}
MHz	Ch.				(dBm)				
806.013	Low	iDEN	Max. Capacity	In	28.21	28.16	0.368	-0.05	0.372
806.013	Low	iDEN	Max. Capacity	Out	28.26	28.19	0.349	-0.07	0.355
813.513	Mid	iDEN	Max. Capacity	In	28.32	28.26	0.495	-0.06	0.502
813.513	Mid	iDEN	Max. Capacity	Out	28.24	28.10	0.465	-0.14	0.480
824.987	High	iDEN	Max. Capacity	In	28.10	27.84	0.418	-0.26	0.444
824.987	High	iDEN	Max. Capacity	Out	28.17	28.02	0.384	-0.15	0.397
813.513	Mid	iDEN	High Performance	In	28.30	28.19	0.446	-0.11	0.457
813.513	Mid	iDEN	High Performance	Out	28.23	28.12	0.397	-0.11	0.407
813.513	Mid	iDEN	Extra Capacity	In	28.14	27.92	0.490	-0.22	0.515
813.513	Mid	iDEN	Extra Capacity	Out	28.19	27.96	0.404	-0.23	0.426
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Muscle 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- | | | | |
|---------------------------|---|---|---|
| *Power Measured | ☒ Conducted | ☐ ERP | ☐ EIRP |
| 4. SAR Measurement System | ☒ DASY4 | ☐ IDX | |
| Phantom Configuration | ☐ Left Head | ☒ Flat Phantom | ☐ Right Head |
| 5. SAR Configuration | ☐ Head | ☒ Body | ☐ Face |
| 6. Test Signal Call Mode | ☐ Manu. Test Codes | ☐ Base Station Simulator | ☒ Software Call Simulator |
| 7. **Test Configuration | ☐ With Belt-clip | ☒ Without Belt-clip | |
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1


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**Figure 14.12 Body SAR Test Setup
-- w/out Belt-clip --**

PCTEST® SAR REPORT		FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832		Page 30 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Muscle

14.13 MEASUREMENT RESULTS (iDEN/1:3 Body SAR w/ Belt-clip – 2.8 cm Spacing)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg) ^{##}
MHz	Ch.				(dBm)				
806.013	Low	iDEN	Max. Capacity	In	28.27	28.14	0.362	-0.13	0.373
806.013	Low	iDEN	Max. Capacity	Out	28.32	28.19	0.261	-0.13	0.269
813.513	Mid	iDEN	Max. Capacity	In	28.29	28.20	0.433	-0.09	0.442
813.513	Mid	iDEN	Max. Capacity	Out	28.24	28.17	0.264	-0.07	0.268
824.987	High	iDEN	Max. Capacity	In	28.16	28.09	0.379	-0.07	0.385
824.987	High	iDEN	Max. Capacity	Out	28.14	27.90	0.257	-0.24	0.272
813.513	Mid	iDEN	High Performance	In	28.20	28.14	0.396	-0.06	0.402
813.513	Mid	iDEN	High Performance	Out	28.26	28.19	0.282	-0.07	0.287
813.513	Mid	iDEN	Extra Capacity	In	28.18	27.98	0.393	-0.20	0.412
813.513	Mid	iDEN	Extra Capacity	Out	28.20	27.96	0.271	-0.24	0.286
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Muscle 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [†]Power Measured ☒ Conducted ☐ ERP ☐ EIRP
^{††}SAR Measurement System ☒ DASY4 ☐ IDX
 Phantom Configuration ☐ Left Head ☒ Flat Phantom ☐ Right Head
 SAR Configuration ☐ Head ☒ Body ☐ Face
 Test Signal Call Mode ☐ Manu. Test Codes ☐ Base Station Simulator ☒ Software Call Simulator
 Test Configuration ☒ With Belt-clip ☐ Without Belt-clip
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1


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Figure 14.13 Body SAR Test Setup
-- w/ Belt-clip --

PCTEST SAR REPORT		FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832		Page 31 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 900MHz Muscle

14.14 MEASUREMENT RESULTS (iDEN II/1:3 w/out Belt-clip – 2.5 cm Spacing)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [†]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg) ^{‡‡}
MHz	Ch.				(dBm)				
896.019	Low	iDEN	Max. Capacity	In	28.12	27.98	0.213	-0.14	0.220
896.019	Low	iDEN	Max. Capacity	Out	28.19	28.04	0.176	-0.15	0.182
898.494	Mid	iDEN	Max. Capacity	In	28.22	28.08	0.239	-0.14	0.247
898.494	Mid	iDEN	Max. Capacity	Out	28.25	28.17	0.224	-0.08	0.228
901.981	High	iDEN	Max. Capacity	In	28.14	27.98	0.198	-0.16	0.205
901.981	High	iDEN	Max. Capacity	Out	28.16	27.94	0.221	-0.22	0.232
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Muscle 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [†]Power Measured
- | | | |
|---|------------------------------|-------------------------------|
| ☒ Conducted | ☐ ERP | ☐ EIRP |
|---|------------------------------|-------------------------------|
4. SAR Measurement System
- | | |
|---|------------------------------|
| ☒ DASY4 | ☐ IDX |
|---|------------------------------|
- Phantom Configuration
- | | | |
|------------------------------------|--|-------------------------------------|
| ☐ Left Head | ☒ Flat Phantom | ☐ Right Head |
|------------------------------------|--|-------------------------------------|
5. SAR Configuration
- | | | |
|-------------------------------|--|-------------------------------|
| ☐ Head | ☒ Body | ☐ Face |
|-------------------------------|--|-------------------------------|
6. Test Signal Call Mode
- | | | |
|---|---|---|
| ☐ Manu. Test Codes | ☐ Base Station Simulator | ☒ Software Call Simulator |
|---|---|---|
7. [‡]Test Configuration
- | | |
|---|---|
| ☐ With Belt-clip | ☒ Without Belt-clip |
|---|---|
8. Tissue parameters and temperatures are listed on the SAR plots.
9. Liquid tissue depth is 15.1 cm. ± 0.1


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Figure 14.14 Body SAR Test Setup
-- w/out Belt-clip --

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 32 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 900MHz Muscle

14.15 MEASUREMENT RESULTS (iDEN II/1:3 w/ Belt-clip – 2.8 cm Spacing)									
FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg) ^{‡‡}
MHz	Ch.				(dBm)				
896.019	Low	iDEN	Max. Capacity	In	28.21	28.16	0.312	-0.05	0.316
896.019	Low	iDEN	Max. Capacity	Out	28.30	28.19	0.178	-0.11	0.183
898.494	Mid	iDEN	Max. Capacity	In	28.24	28.10	0.329	-0.14	0.340
898.494	Mid	iDEN	Max. Capacity	Out	28.23	28.15	0.171	-0.08	0.174
901.981	High	iDEN	Max. Capacity	In	28.19	28.04	0.277	-0.15	0.287
901.981	High	iDEN	Max. Capacity	Out	28.27	28.12	0.163	-0.15	0.169
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Muscle 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

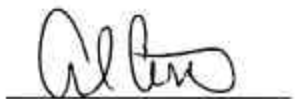
- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [‡]Power Measured
- | | | |
|---|------------------------------|-------------------------------|
| ☒ Conducted | ☐ ERP | ☐ EIRP |
|---|------------------------------|-------------------------------|
- ^{‡‡}Test Configuration
- | | |
|--|--|
| ☒ With Belt-clip | ☐ Without Belt-clip |
|--|--|
- SAR Measurement System

☒ DASY4	☐ IDX
---	------------------------------
 - Phantom Configuration

☐ Left Head	☒ Flat Phantom	☐ Right Head
------------------------------------	--	-------------------------------------
 - SAR Configuration

☐ Head	☒ Body	☐ Face
-------------------------------	--	-------------------------------
 - Test Signal Call Mode

☐ Manu. Test Codes	☐ Base Station Simulator	☒ Software Call Simulator
---	---	---
 - Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1


Alfred Cirwithian
Vice President Engineering



**Figure 14.15 Body SAR Test Setup
-- w/ Belt-clip --**

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 33 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Muscle

14.16 MEASUREMENT RESULTS (iDEN/66 Body SAR w/out Belt-clip – 2.5 cm Spacing)									
FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg) ^{‡‡}
MHz	Ch.				(dBm)				
806.013	Low	iDEN	Max. Capacity	In	28.27	28.02	1.120	-0.25	1.186
806.013	Low	iDEN	Max. Capacity	Out	28.30	27.98	0.701	-0.32	0.755
813.513	Mid	iDEN	Max. Capacity	In	27.98	28.11	1.250	0.13	1.213
813.513	Mid	iDEN	Max. Capacity	Out	27.96	27.98	0.731	0.02	0.728
824.987	High	iDEN	Max. Capacity	In	28.12	27.89	1.090	-0.23	1.149
824.987	High	iDEN	Max. Capacity	Out	28.10	28.00	0.711	-0.10	0.728
813.513	Mid	iDEN	High Performance	In	28.30	28.10	1.201	-0.20	1.258
813.513	Mid	iDEN	High Performance	Out	28.21	27.88	0.697	-0.33	0.752
813.513	Mid	iDEN	Extra Capacity	In	28.12	28.02	1.190	-0.10	1.218
813.513	Mid	iDEN	Extra Capacity	Out	28.25	28.00	0.688	-0.25	0.729
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Muscle 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- | | | | |
|---------------------------|---|---|---|
| *Power Measured | ☒ Conducted | ☐ ERP | ☐ EIRP |
| 4. SAR Measurement System | ☒ DASY4 | ☐ IDX | |
| Phantom Configuration | ☐ Left Head | ☒ Flat Phantom | ☐ Right Head |
| 5. SAR Configuration | ☐ Head | ☒ Body | ☐ Face |
| 6. Test Signal Call Mode | ☐ Manu. Test Codes | ☐ Base Station Simulator | ☒ Software Call Simulator |
| 7. **Test Configuration | ☐ With Belt-clip | ☒ Without Belt-clip | |
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1


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 Vice President Engineering



**Figure 14.16 Body SAR Test Setup
-- w/out Belt-clip --**

PCTEST SAR REPORT		FCC CERTIFICATION		 Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	

SAR DATA SUMMARY (Continued)

Mixture Type: 835MHz Muscle

14.17 MEASUREMENT RESULTS (iDEN/66 Body SAR w/ Belt-clip – 2.8 cm Spacing)									
FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg) ^{††}
MHz	Ch.				(dBm)				
806.013	Low	iDEN	Max. Capacity	In	28.14	28.03	0.901	-0.11	0.924
806.013	Low	iDEN	Max. Capacity	Out	28.21	28.09	0.561	-0.12	0.577
813.513	Mid	iDEN	Max. Capacity	In	28.11	27.89	1.110	-0.22	1.168
813.513	Mid	iDEN	Max. Capacity	Out	28.20	28.05	0.536	-0.15	0.555
824.987	High	iDEN	Max. Capacity	In	27.97	27.83	0.921	-0.14	0.951
824.987	High	iDEN	Max. Capacity	Out	28.05	27.87	0.429	-0.18	0.447
813.513	Mid	iDEN	High Performance	In	28.21	28.05	0.980	-0.16	1.017
813.513	Mid	iDEN	High Performance	Out	27.92	27.89	0.491	-0.03	0.494
813.513	Mid	iDEN	Extra Capacity	In	28.04	27.86	1.000	-0.18	1.042
813.513	Mid	iDEN	Extra Capacity	Out	28.10	28.02	0.516	-0.08	0.526
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Muscle 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- | | | | |
|-------------------------------------|--|--|---|
| *Power Measured | ☒ Conducted | ☐ ERP | ☐ EIRP |
| 4. SAR Measurement System | ☒ DASY4 | ☐ IDX | |
| Phantom Configuration | ☐ Left Head | ☒ Flat Phantom | ☐ Right Head |
| 5. SAR Configuration | ☐ Head | ☒ Body | ☐ Face |
| 6. Test Signal Call Mode | ☐ Manu. Test Codes | ☐ Base Station Simulator | ☒ Software Call Simulator |
| 7. ^{††} Test Configuration | ☒ With Belt-clip | ☐ Without Belt-clip | |
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1


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**Figure 14.17 Body SAR Test Setup
-- w/ Belt-clip --**

PCTEST SAR REPORT		FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832		Page 35 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 900MHz Muscle

14.18 MEASUREMENT RESULTS (ISM Body SAR w/out Belt-clip – 2.5 cm Spacing)									
FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [‡]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg) ^{‡‡}
MHz	Ch.				(dBm)				
902.525	Low	ISM	Max. Capacity	In	28.80	28.56	1.023	-0.24	0.541
902.525	Low	ISM	Max. Capacity	Out	29.00	28.82	0.781	-0.18	0.407
915.525	Mid	ISM	Max. Capacity	In	29.03	28.79	1.034	-0.24	0.547
915.525	Mid	ISM	Max. Capacity	Out	28.90	28.30	0.725	-0.60	0.416
927.475	High	ISM	Max. Capacity	In	28.92	28.79	1.134	-0.13	0.584
927.475	High	ISM	Max. Capacity	Out	29.01	28.75	0.868	-0.26	0.461
927.475	High	ISM	High Performance	In	28.90	28.80	1.045	-0.10	0.535
927.475	High	ISM	High Performance	Out	28.93	28.76	0.896	-0.17	0.466
927.475	High	ISM	Extra Capacity	In	29.01	28.87	0.989	-0.14	0.511
927.475	High	ISM	Extra Capacity	Out	28.92	28.54	0.600	-0.38	0.328
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Muscle 1.6 W/kg (mW/g) averaged over 1 gram		

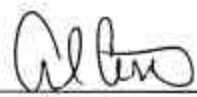
NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
- All modes of operation were investigated, and worst-case results are reported.
- Battery is fully charged for all readings.
- [†]Power Measured
 SAR Measurement System
 Phantom Configuration
 SAR Configuration
 Test Signal Call Mode

☒ Conducted
☒ DASY4
☐ Left Head
☐ Head
☐ Manu. Test Codes
☐ With Belt-clip

☐ ERP
☐ IDX
☒ Flat Phantom
☒ Body
☐ Base Station Simulator
☒ Without Belt-clip

☐ EIRP
☐ Right Head
☐ Face
☒ Software Call Simulator
- ^{‡‡}Test Configuration
- Tissue parameters and temperatures are listed on the SAR plots.
- Liquid tissue depth is 15.1 cm. ± 0.1
- ^{‡‡} Extrapolated data column includes drift and 50% Duty Cycle correction factor.


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**Figure 14.18 Body SAR Test Setup
-- w/out Belt-clip --**

PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 36 of 118

SAR DATA SUMMARY (Continued)

Mixture Type: 900MHz Muscle

14.19 MEASUREMENT RESULTS (ISM Body SAR w/ Belt-clip – 2.8 cm Spacing)

FREQUENCY		Modulation	Battery	Antenna Position	Begin / End POWER [†]		Measured SAR (W/kg)	Drift (dB)	Extrapolated SAR (W/kg) ^{‡‡}
MHz	Ch.				(dBm)				
902.525	Low	ISM	Max. Capacity	In	28.70	28.34	1.020	-0.36	0.554
902.525	Low	ISM	Max. Capacity	Out	29.01	28.80	0.681	-0.21	0.358
915.525	Mid	ISM	Max. Capacity	In	29.03	28.76	0.989	-0.27	0.526
915.525	Mid	ISM	Max. Capacity	Out	28.89	28.33	0.684	-0.56	0.389
927.475	High	ISM	Max. Capacity	In	28.92	28.75	1.040	-0.17	0.541
927.475	High	ISM	Max. Capacity	Out	29.01	28.70	0.731	-0.31	0.393
927.475	High	ISM	High Performance	In	28.80	28.79	0.999	-0.01	0.500
927.475	High	ISM	High Performance	Out	28.93	28.66	0.720	-0.27	0.383
927.475	High	ISM	Extra Capacity	In	29.01	28.87	0.974	-0.14	0.503
927.475	High	ISM	Extra Capacity	Out	28.86	28.54	0.542	-0.32	0.292
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Muscle 1.6 W/kg (mW/g) averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001] and IEEE Std. 1528 D1.2 (April 2003).
 - All modes of operation were investigated, and worst-case results are reported.
 - Battery is fully charged for all readings.
- [†]Power Measured ☒ Conducted ☐ ERP ☐ EIRP
^{††}SAR Measurement System ☒ DASY4 ☐ IDX
 Phantom Configuration ☐ Left Head ☒ Flat Phantom ☐ Right Head
 SAR Configuration ☐ Head ☒ Body ☐ Face
 Test Signal Call Mode ☐ Manu. Test Codes ☐ Base Station Simulator ☒ Software Call Simulator
 Test Configuration ☒ With Belt-clip ☐ Without Belt-clip
- Tissue parameters and temperatures are listed on the SAR plots.
 - Liquid tissue depth is 15.1 cm. ± 0.1
 - ^{††} Extrapolated data column includes drift and 50% Duty Cycle correction factor.


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Figure 14.19 Body SAR Test Setup
-- w/ Belt-clip --

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 37 of 118

15. SAR TEST EQUIPMENT

Equipment Calibration

Table 15.1 Test Equipment Calibration

EQUIPMENT SPECIFICATIONS			
Type		Calibration Date	Serial Number
Stäubli Robot RX60L		February 2004	599131-01
Stäubli Robot Controller		February 2004	PCT592
Stäubli Teach Pendant (Joystick)		February 2004	3323-00161
Micron Computer, 450 MHz Pentium III, Windows NT		February 2004	PCT577
SPEAG EDC3		February 2004	321
SPEAG DAE3		January 2004	455
SPEAG E-Field Probe ES3DV2		September 2003	3022
SPEAG Dummy Probe		February 2004	PCT583
SPEAG SAM Twin Phantom V4.0		February 2004	TP 1197
SPEAG Light Alignment Sensor		February 2004	205
PCTEST Validation Dipole D300V2		September 2003	PCT301
SPEAG Validation Dipole D835V2		January 2004	PCT406
SPEAG Validation Dipole D1900V2		January 2004	PCT613
Brain Equivalent Matter (300MHz)		April 2004	PCTBEM601
Brain Equivalent Matter (835MHz)		April 2004	PCTBEM101
Brain Equivalent Matter (1900MHz)		April 2004	PCTBEM301
Muscle Equivalent Matter (300MHz)		April 2004	PCTMEM701
Muscle Equivalent Matter (835MHz)		April 2004	PCTMEM201
Muscle Equivalent Matter (1900MHz)		April 2004	PCTMEM401
Microwave Amp. Model: 5S1G4, (800MHz - 4.2GHz)		January 2004	22332
Gigatronics 8651A Power Meter		January 2004	1835299
HP-8648D (9kHz ~ 4GHz) Signal Generator		January 2004	PCT530
Amplifier Research 5S1G4 Power Amp		January 2004	PCT540
HP-8753E (30kHz ~ 3GHz) Network Analyzer		January 2004	PCT552
HP85070B Dielectric Probe Kit		January 2004	PCT501
Ambient Noise/Reflection, etc.	<12mW/kg/<3%of SAR	January 2004	Anechoic Room PCT01

NOTE:

The E-field probe was calibrated by SPEAG, by waveguide technique procedure. Dipole Validation measurement is performed by PCTEST Lab. before each test. The brain simulating material is calibrated by PCTEST using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain-equivalent material.

PCTEST SAR REPORT		FCC CERTIFICATION		 Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	

16. CONCLUSION

Measurement Conclusion

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC. These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The tested device complies with the requirements in respect to all parameters subject to the test. The test results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because innumerable factors may interact to determine the specific biological outcome of an exposure to electromagnetic fields, any protection guide shall consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.[3]

PCTEST® SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)		FCC ID: AZ489FT5832 Page 39 of 118

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PCTEST® SAR REPORT		FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832		

APPENDIX A: SAR TEST DATA

PCTEST SAR REPORT			FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 41 of 118	

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315 iDEN/ISM Phone; FCC ID: AZ489FT5832; SN: 364ADW003L

Communication System: iDEN33; Frequency: 813.513 MHz; Duty Cycle: 1:3

Medium: 835 Brain ($\sigma = 0.89$ mho/m, $\epsilon_r = 41.32$, $\rho = 1000$ kg/m³)

Phantom section: Right Section

Test Date: 04-02-2004; Ambient Temp: 22.3 °C; Tissue Temp: 20.6 °C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Right Touch, Mid Ch, Antenna In, Maximum Capacity Battery

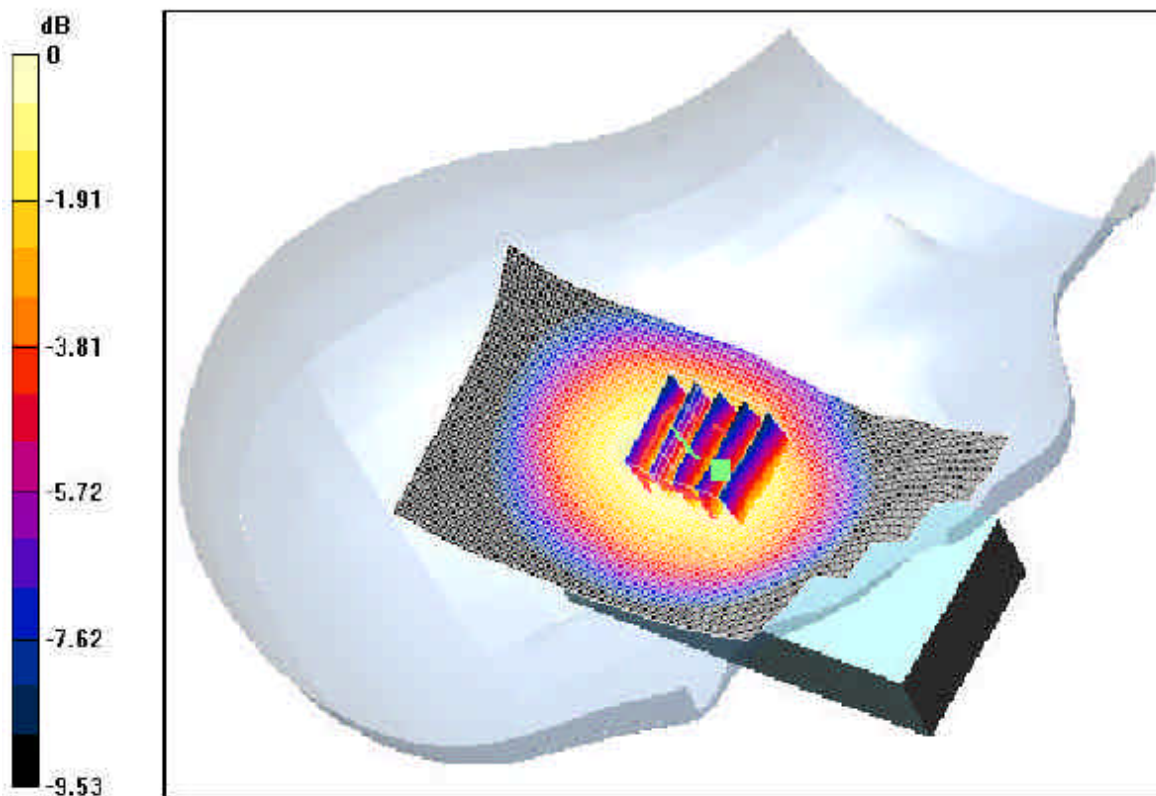
Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.818 mW/g; SAR(10 g) = 0.597 mW/g

Reference Value = 27.3 V/m



0 dB = 0.942mW/g

PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)		FCC ID: AZ489FT5832 Page 42 of 118

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315 iDEN/ISM Phone; FCC ID: AZ489FT5832; SN:364ADW003L

Communication System: iDEN33; Frequency: 813.513 MHz; Duty Cycle: 1:3

Medium: 835 Brain ($\sigma = 0.89$ mho/m, $\epsilon_r = 41.32$, $\rho = 1000$ kg/m³)

Phantom section: Right Section

Test Date: 04-02-2004; Ambient Temp: 22.3°C; Tissue Temp: 20.6°C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Right Tilt, Mid Ch, Antenna In, Maximum Capacity Battery

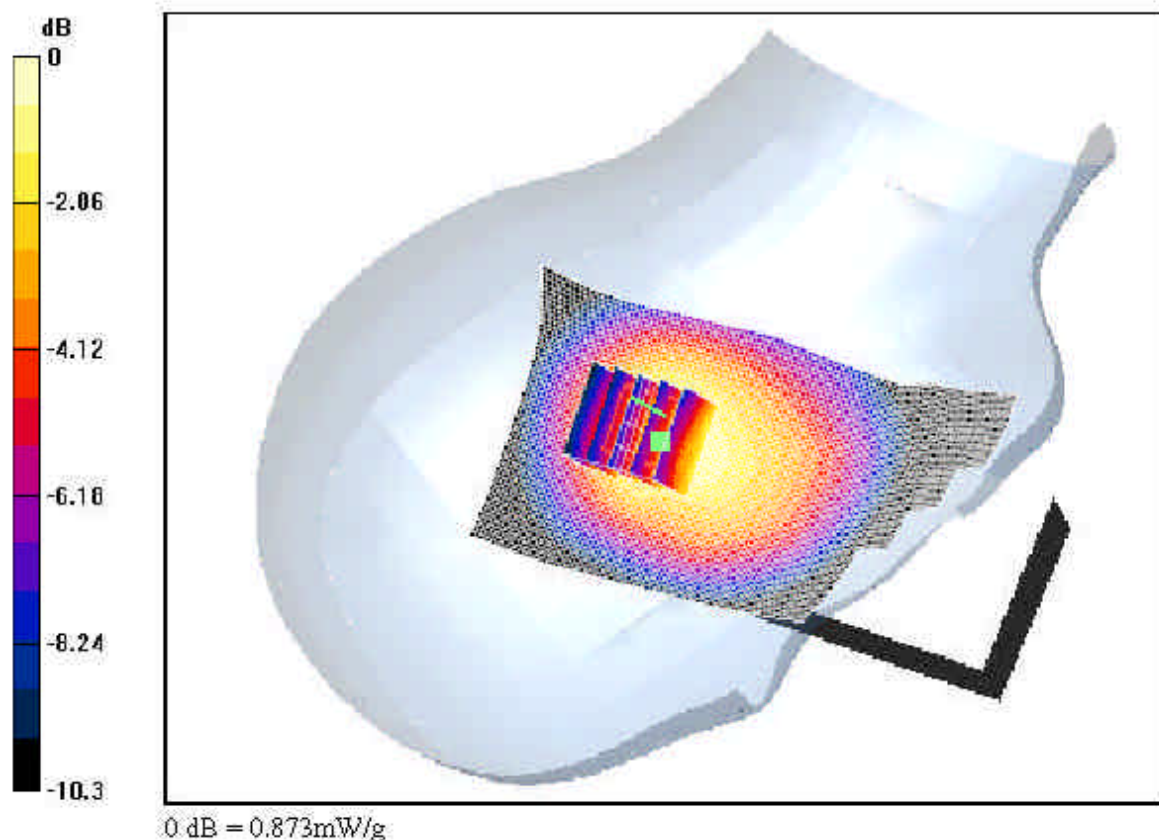
Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 1.07 W/kg

SAR(1 g) = 0.792 mW/g; SAR(10 g) = 0.554 mW/g

Reference Value = 29.2 V/m



PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by:
				Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 43 of 118

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315 iDEN/ISM Phone; FCC ID: AZ489FT5832; SN: 364ADW003L

Communication System: iDEN33; Frequency: 813.513 MHz; Duty Cycle: 1:3

Medium: 835 Brain ($\sigma = 0.89$ mho/m, $\epsilon_r = 41.32$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

Test Date: 04-05-2004; Ambient Temp: 22.4°C; Tissue Temp: 20.6°C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Left Touch, Mid Ch, Antenna In, Maximum Capacity Battery

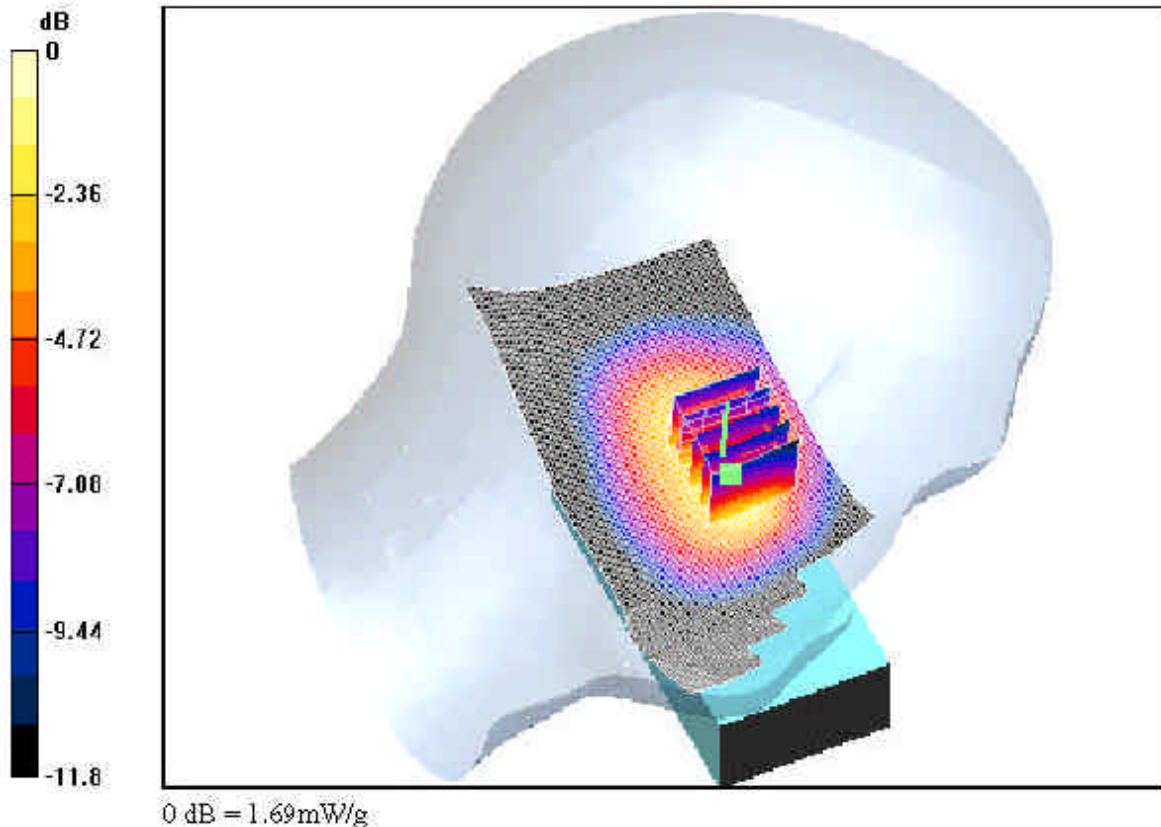
Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 2.09 W/kg

SAR(1 g) = 1.41 mW/g; SAR(10 g) = 0.920 mW/g

Reference Value = 28.9 V/m



PCTEST SAR REPORT			FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 44 of 118	

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315 iDEN/ISM Phone; FCC ID: AZ489FT5832; SN: 364ADW003L

Communication System: iDEN33; Frequency: 813.513 MHz; Duty Cycle: 1:3

Medium: 835 Brain ($\sigma = 0.89$ mho/m, $\epsilon_r = 41.32$, $\rho = 1000$ kg/m³)

Phantom section: Left Section

Test Date: 04-05-2004; Ambient Temp: 22.4°C; Tissue Temp: 20.6°C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Left Tilt, Mid Ch, Antenna In, Maximum Capacity Battery

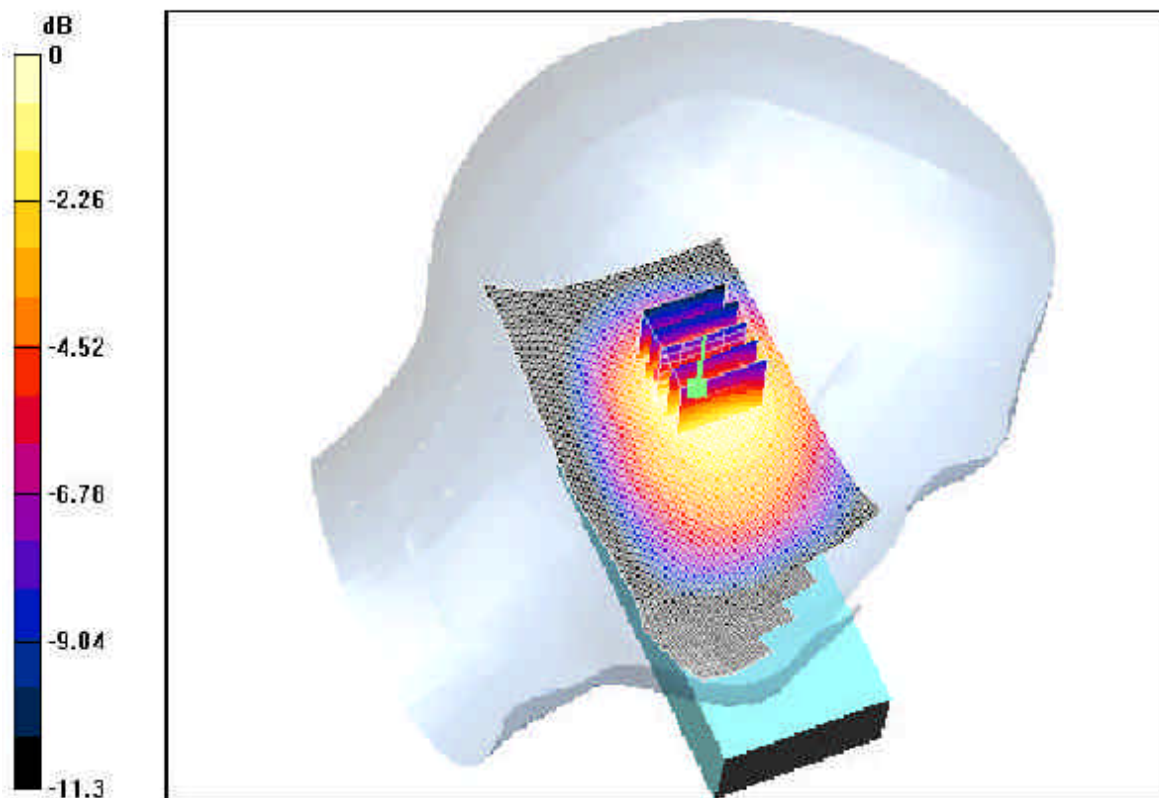
Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 1.35 W/kg

SAR(1 g) = 0.926 mW/g; SAR(10 g) = 0.649 mW/g

Reference Value = 30.2 V/m



0 dB = 1.05mW/g

PCTEST SAR REPORT			FCC CERTIFICATION		Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 45 of 118	

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315 iDEN/ISM Phone; FCC ID: AZ489FT5832; SN: 364ADW003L

Communication System: iDEN33 (II); Frequency: 901.981 MHz; Duty Cycle: 1:3

Medium: 900 Brain ($\sigma = 0.96 \text{ mho/m}$, $\epsilon_r = 41.7$, $\rho = 1000 \text{ kg/m}^3$)

Phantom section: Right Section

Test Date: 04-06-2004; Ambient Temp: 22.4°C; Tissue Temp: 20.6°C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Right Touch, High Ch, Antenna In, Maximum Capacity Battery

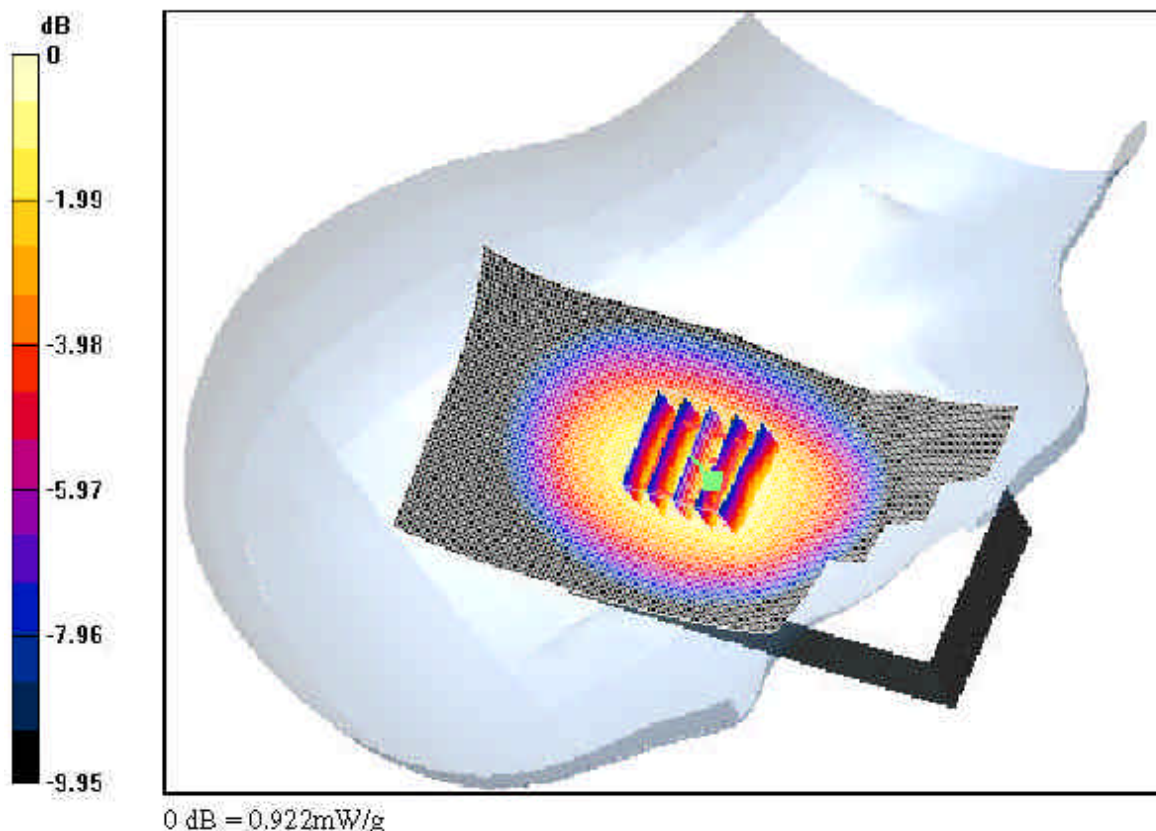
Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.828 mW/g; SAR(10 g) = 0.590 mW/g

Reference Value = 25.3 V/m



PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)		FCC ID: AZ489FT5832 Page 46 of 118

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315iDEN/ISM Phone; FCC ID: AZ489FT5832; SN: 364AWD003L

Communication System: iDEN33 (II); Frequency: 901.981 MHz; Duty Cycle: 1:3

Medium: 900 Brain ($\sigma = 0.96 \text{ mho/m}$, $\epsilon_r = 41.7$, $\rho = 1000 \text{ kg/m}^3$)

Phantom section: Right Section

Test Date: 04-06-2003; Ambient Temp: 22.4°C; Tissue Temp: 20.6°C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Right Tilt, High Ch, Antenna Out, Maximum Capacity Battery

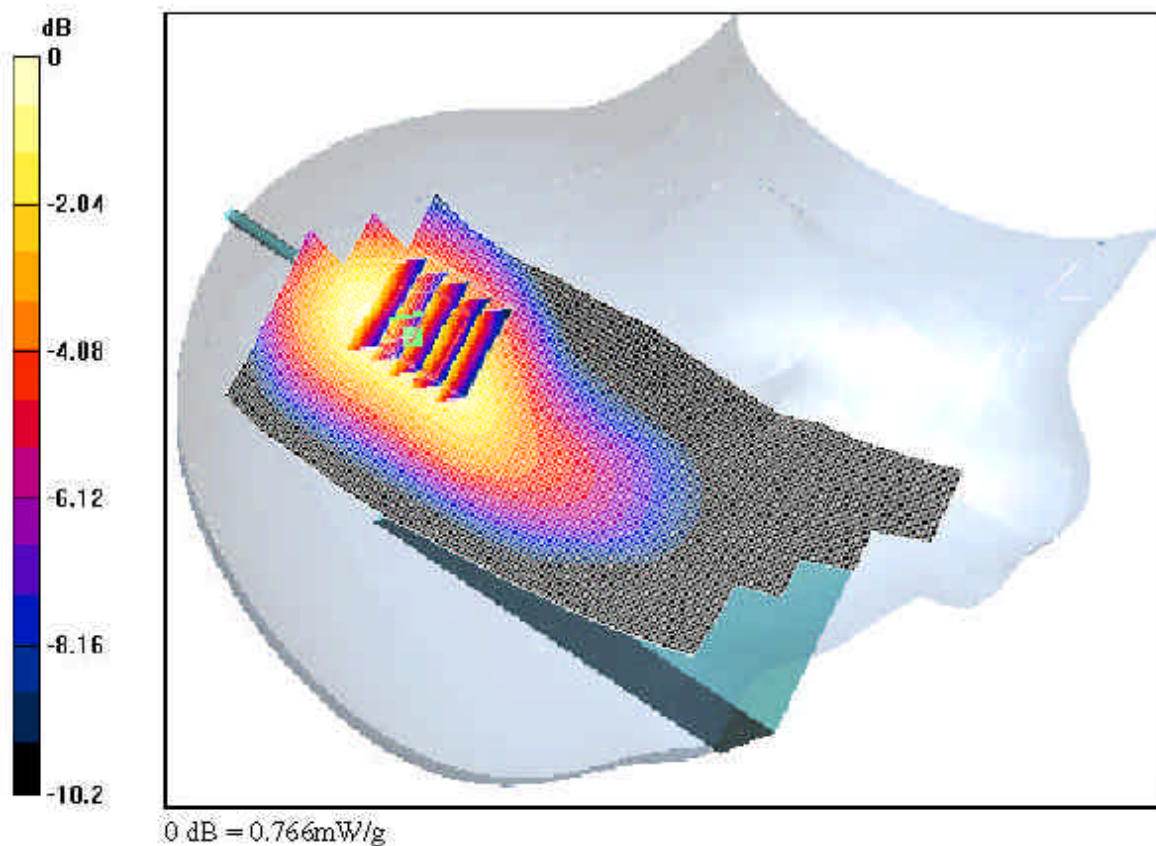
Area Scan (61x161x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 0.895 W/kg

SAR(1 g) = 0.661 mW/g; SAR(10 g) = 0.464 mW/g

Reference Value = 18.5 V/m



PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)		
			FCC ID: AZ489FT5832	Page 47 of 118

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315iDEN/ISM Phone; FCC ID: AZ489FT5832; SN: 364ADW003L

Communication System: iDEN33 (II); Frequency: 901.981 MHz; Duty Cycle: 1:3

Medium: 900 Brain ($\sigma = 0.96 \text{ mho/m}$, $\epsilon_r = 41.7$, $\rho = 1000 \text{ kg/m}^3$)

Phantom section: Left Section

Test Date: 04-06-2004; Ambient Temp: 22.4°C; Tissue Temp: 20.6°C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Left Touch, High Ch, Antenna In, Maximum Capacity Battery

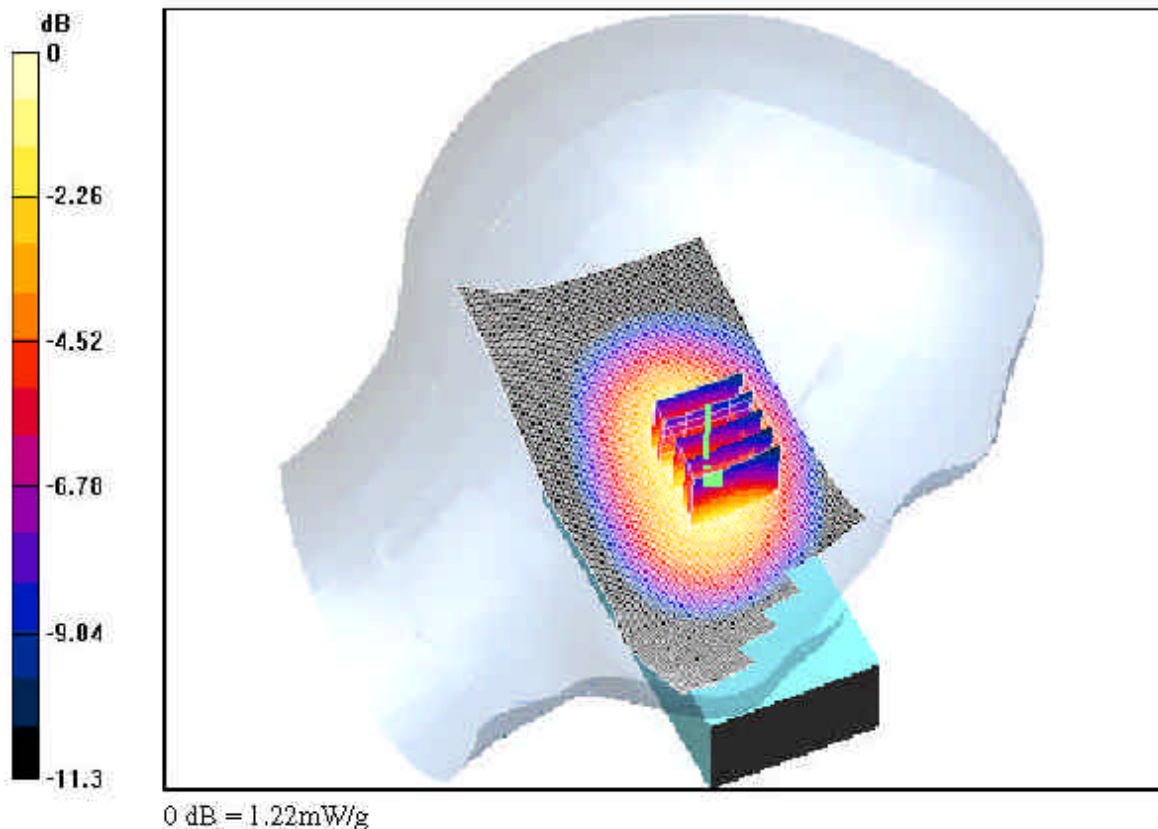
Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 1.58 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.758 mW/g

Reference Value = 27.3 V/m



PCTEST SAR REPORT	FCC CERTIFICATION			Reviewed by: Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)		FCC ID: AZ489FT5832 Page 48 of 118

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315 iDEN/ISM Phone; FCC ID: AZ489FT5832; SN: 364ADW003L

Communication System: iDEN33 (II); Frequency: 901.981 MHz; Duty Cycle: 1:3

Medium: 900 Brain ($\sigma = 0.96 \text{ mho/m}$, $\epsilon_r = 41.7$, $\rho = 1000 \text{ kg/m}^3$)

Phantom section: Left Section

Test Date: 04-06-2004; Ambient Temp: 22.4°C; Tissue Temp: 20.6°C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Left Tilt, High Ch, Antenna Out, Maximum Capacity Battery

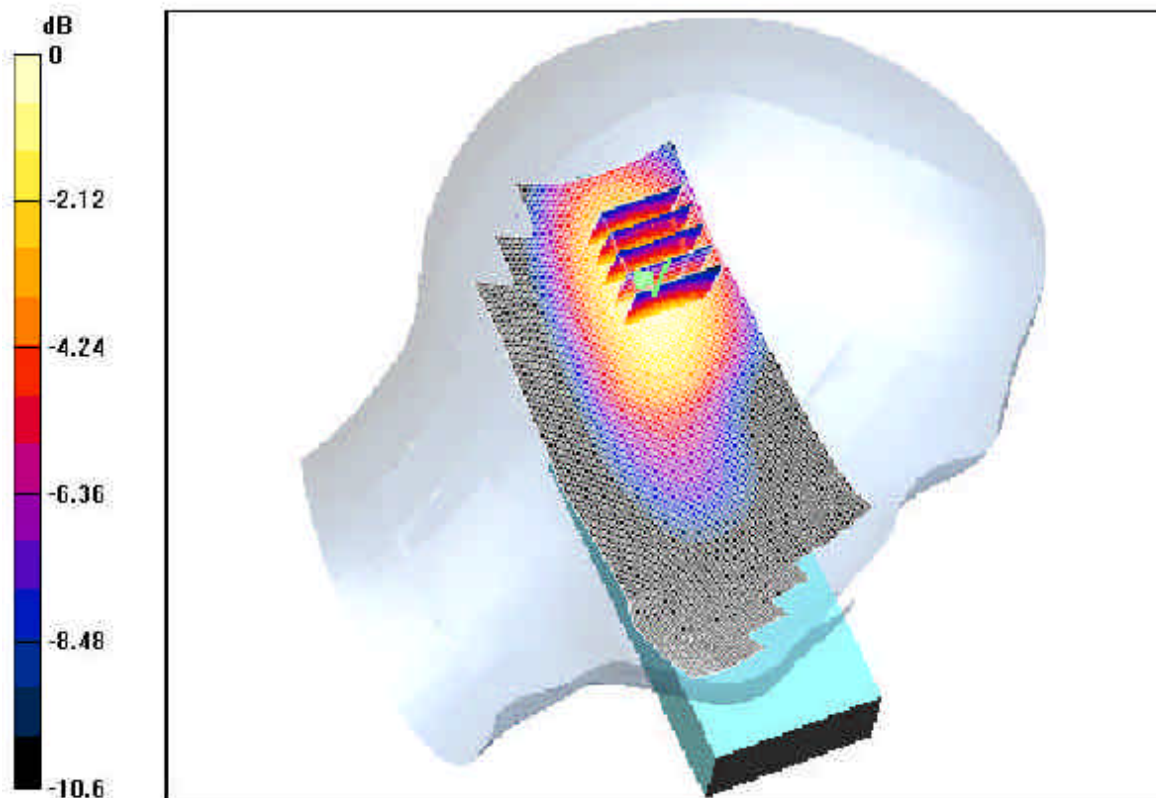
Area Scan (61x161x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 1.16 W/kg

SAR(1 g) = 0.842 mW/g; SAR(10 g) = 0.573 mW/g

Reference Value = 19.1 V/m



0 dB = 0.971mW/g

PCTEST SAR REPORT	FCC CERTIFICATION		Reviewed by:	
			Quality Manager	
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 49 of 118

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315 iDEN/ISM Phone; FCC ID: AZ489FT5832; SN: 364ADW003L

Communication System: iDEN 6-1; Frequency: 813.513 MHz; Duty Cycle: 1:6

Medium: 835 Brain ($\sigma = 0.89$ mho/m, $\epsilon_r = 41.4$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section

Test Date: 04-16-2004; Ambient Temp: 22.8°C; Tissue Temp: 20.9°C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Face, PTT, 2.5cm.Space, Mid Ch, Antenna In, Maximum Capacity Battery

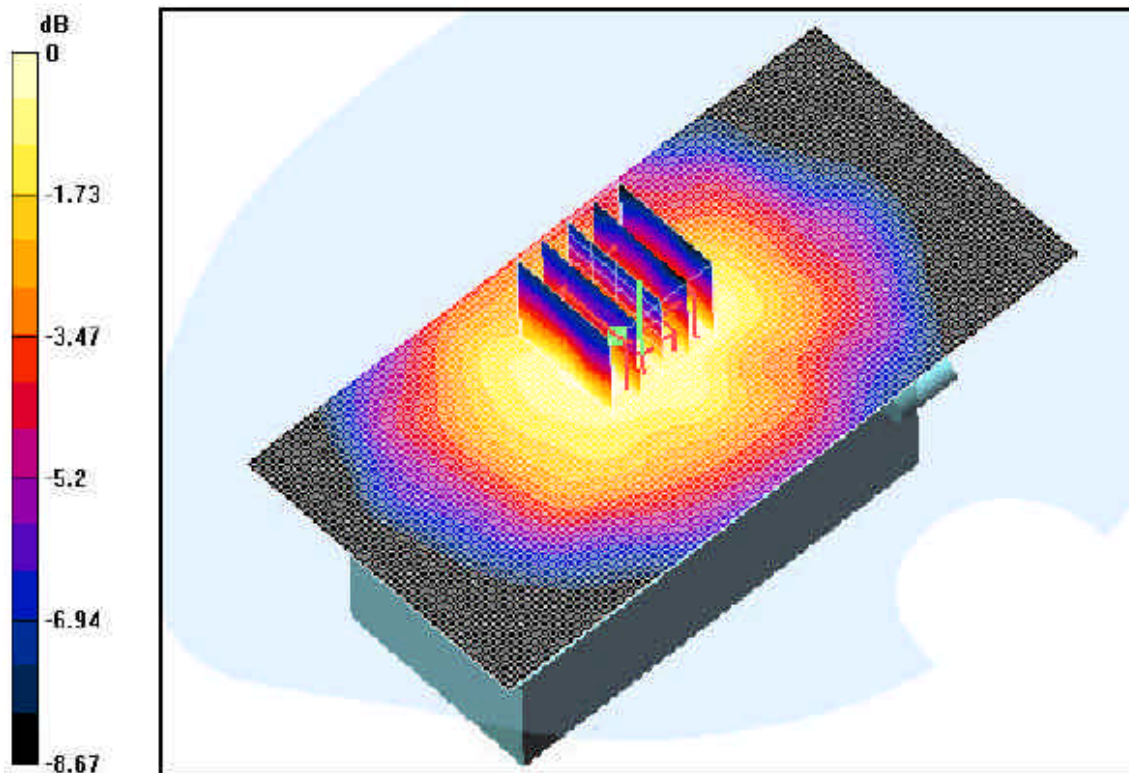
Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 0.247 W/kg

SAR(1 g) = 0.186 mW/g; SAR(10 g) = 0.134 mW/g

Reference Value = 13.4 V/m



0 dB = 0.21 mW/g

PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by:
				Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 50 of 118

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315 iDEN/ISM Phone; FCC ID: AZ489FT5832; SN: 364ADW003L

Communication System: iDENII 6-1; Frequency: 898.494 MHz; Duty Cycle: 1:6

Medium: 900 Brain ($\sigma = 0.94 \text{ mho/m}$, $\epsilon_r = 41.9$, $\rho = 1000 \text{ kg/m}^3$)

Phantom section: Flat Section

Test Date: 04-16-2004; Ambient Temp: 22.8°C; Tissue Temp: 20.9°C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Face, PTT, 2.5cm.Space, Mid Ch, Antenna In, Maximum Capacity Battery

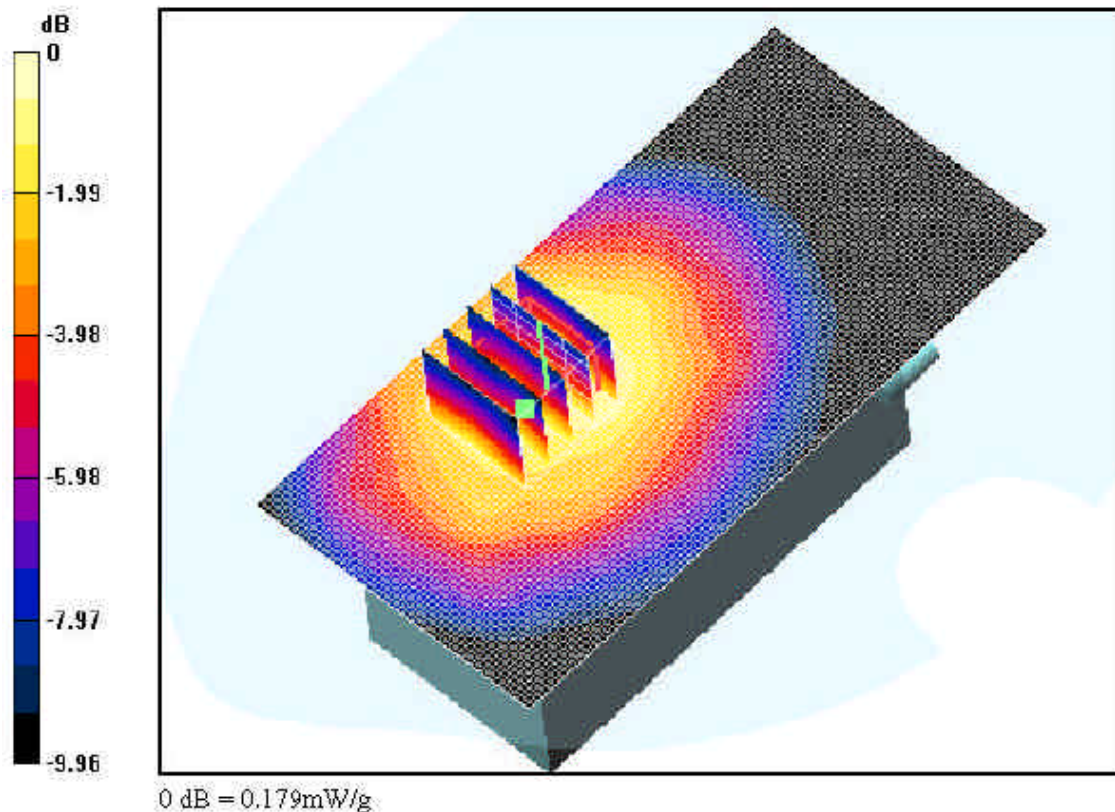
Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 0.215 W/kg

SAR(1 g) = 0.151 mW/g; SAR(10 g) = 0.103 mW/g

Reference Value = 10.3 V/m



PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by:
				Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 51 of 118

PCTEST ENGINEERING LABORATORY, INC.

DUT: MOTOROLA i315 iDEN/ISM Phone; FCC ID: AZ489FT5832; SN: 364ADW003L

Communication System: ISM; Frequency: 927.475 MHz; Duty Cycle: 1:1

Medium: 900 Brain ($\sigma = 0.96$ mho/m, $\epsilon_r = 41.7$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section

Test Date: 04-07-2004; Ambient Temp: 22.5°C; Tissue Temp: 20.8°C

Probe: ES3DV2 - SN3022; ConvF(6.1, 6.1, 6.1); Calibrated: 9/23/2003

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE3 Sn455; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Face, PTT, High Ch, Antenna In, Maximum Capacity Battery

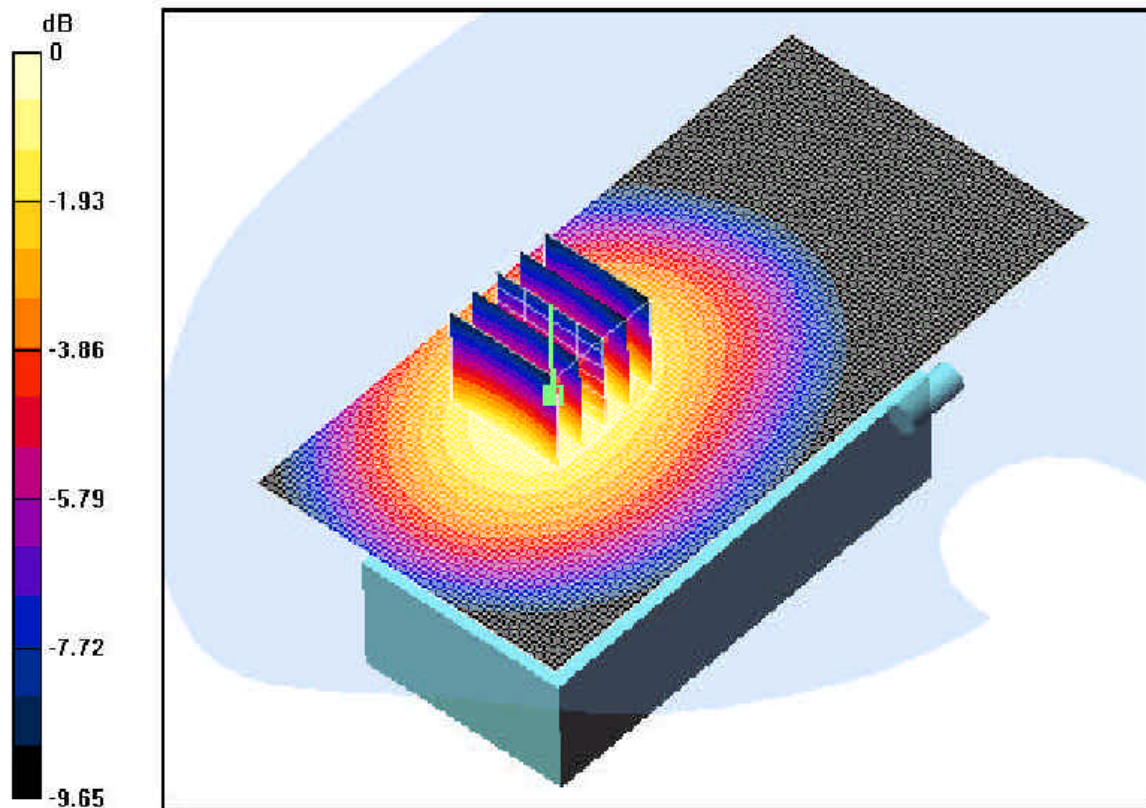
Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.798 mW/g

Reference Value = 24 V/m



0 dB = 1.28mW/g

PCTEST SAR REPORT		FCC CERTIFICATION		Reviewed by:
				Quality Manager
SAR Filename: SAR.240319197-R3.AZ4	Test Dates: April 2-8 & 16-17, 2004	Phone Type: Dual-Mode PTT Phone (iDEN/ISM)	FCC ID: AZ489FT5832	Page 52 of 118