

## **CERTIFICATE OF COMPLIANCE** **SAR EVALUATION**

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### **Applicant Information:**

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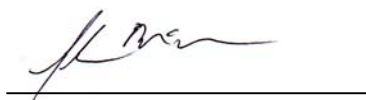
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<b>FCC ID:</b>	<b>POQWCE-210</b>
<b>Model(s):</b>	<b>WCE-210</b>
<b>Equipment Type:</b>	<b>Dual-Mode AMPS/CDMA Cellular Phone</b>
<b>Classification:</b>	<b>Licensed Non-Broadcast Transmitter Held to Ear (TNE)</b>
<b>Tx Frequency Range:</b>	<b>824.04 - 848.97 MHz (AMPS) 824.70 - 848.31 MHz (CDMA)</b>
<b>Rx Frequency Range:</b>	<b>869.04 - 893.97 MHz (AMPS) 869.70 - 893.31 MHz (CDMA)</b>
<b>Rated RF Conducted Power:</b>	<b>26.1 dBm (AMPS) 25.1 dBm (CDMA)</b>
<b>FCC Rule Part(s):</b>	<b>2.1093; ET Docket 96.326</b>

Celltech Research Inc. declares under its sole responsibility that this device was found to be in compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in OET Bulletin 65, Supplement C, Edition 01-01 (General Population / Uncontrolled Exposure), and was tested in accordance with the appropriate measurement standards, guidelines, and recommended practices specified in American National Standards Institute C95.1-1992.

I attest to the accuracy of data. All measurements 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.

*This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Research Inc.  
The results and statements contained in this report pertain only to the device(s) evaluated.*



**Shawn McMillen**  
**General Manager**  
**Celltech Research Inc.**



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## 1.0 INTRODUCTION

This measurement report shows that the WITHUS IT CO., LTD. Model: WCE-210 Dual-Mode AMPS/CDMA Cellular Phone FCC ID: POQWCE-210 complies with FCC Part 2.1093, ET Docket 96-326 Rules for mobile and portable devices. The test procedures, as described in American National Standards Institute C95.1-1992 (see reference [1]), and FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [2]) were employed. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used, and the various provisions of the rules are included within this test report.

## 2.0 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

<b>EUT Type</b>	Dual-Mode AMPS/CDMA Cellular Phone	<b>FCC ID</b>	POQWCE-210
<b>Equipment Class</b>	Licensed Non-Broadcast Transmitter Held to Ear (TNE)	<b>Model No.(s)</b>	WCE-210
<b>FCC Rule Part(s)</b>	§ 2.1093, Docket 96-326	<b>Application Type</b>	FCC Part 22 Certification
<b>Tx Frequency Range (MHz)</b>	824.04 - 848.97 (AMPS) 824.70 - 848.31 (CDMA)	<b>Serial No.</b>	Pre-production Unit
<b>Rx Frequency Range (MHz)</b>	869.04 - 893.97 (AMPS) 869.70 - 893.31 (CDMA)	<b>Battery Type(s)</b>	Lithium-Ion Battery Standard: 3.7V 950mA/h Extended: 3.7V 1700mA/h
<b>Rated RF Conducted Output Power</b>	26.1 dBm (AMPS) 25.1 dBm (CDMA)	<b>Antenna Type</b>	Retractable Whip (1/4λ)
<b>Modulation(s)</b>	AMPS (Analog) CDMA (Digital)	<b>Antenna Length</b>	111 mm

### **3.0 SAR MEASUREMENT SYSTEM**

Celltech Research SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY system is comprised of the robot controller, computer, near-field probe, probe alignment sensor, specific anthropomorphic mannequin (SAM) phantom, and various planar phantoms for brain or body SAR evaluations. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE3 utilizes 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.



DASY3 SAR Measurement System with SAM phantom

#### 4.0 MEASUREMENT SUMMARY

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the EUT are reported in Appendix A.

#### HEAD SAR MEASUREMENT RESULTS - AMPS Mode - Left Head Section

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Test Position	SAR 1g (w/kg)
824.04	991	AMPS	26.12	26.03	Standard	Retracted	Left Ear	Cheek/Touch	0.802
824.04	991	AMPS	26.11	26.07	Standard	Extended	Left Ear	Cheek/Touch	1.40
824.04	991	AMPS	26.10	26.18	Extended	Extended	Left Ear	Cheek/Touch	1.38
836.49	383	AMPS	26.10	26.06	Standard	Retracted	Left Ear	Cheek/Touch	0.826
836.49	383	AMPS	26.10	26.07	Standard	Extended	Left Ear	Cheek/Touch	1.43
836.49	383	AMPS	26.11	26.14	Extended	Extended	Left Ear	Cheek/Touch	1.42
848.97	799	AMPS	26.10	25.95	Standard	Retracted	Left Ear	Cheek/Touch	0.937
848.97	799	AMPS	26.10	25.98	Standard	Extended	Left Ear	Cheek/Touch	1.42
848.97	799	AMPS	26.10	25.94	Extended	Extended	Left Ear	Cheek/Touch	1.38
836.49	383	AMPS	26.10	25.97	Standard	Retracted	Left Ear	Ear/Tilt	0.218
836.49	383	AMPS	26.10	26.03	Standard	Extended	Left Ear	Ear/Tilt	0.421
<b>Mixture Type: Brain (Measured)</b> <b>Dielectric Constant: 41.0</b> <b>Conductivity: 0.90</b>				<b>ANSI / IEEE C95.1 1992 - SAFETY LIMIT</b> <b>Spatial Peak - Uncontrolled Exposure - General Population</b> <b>BRAIN: 1.6 W/kg (averaged over 1 gram)</b>					

Notes:

1. Test Date(s): January 16, 2002.
2. The SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest AMPS mode head SAR value measured (left head section) was 1.43 w/kg (cheek/touch position, mid channel, antenna extended, with standard-life battery).
4. The EUT was tested with the clamshell open, which is the only ear-held operating configuration for this phone.
5. Ambient TEMPERATURE: 23.8°C  
Relative HUMIDITY: 34%  
Atmospheric PRESSURE: 102.4 kPa
6. Fluid Temperature ≈ 23 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

**MEASUREMENT SUMMARY (CONT.)**

**HEAD SAR MEASUREMENT RESULTS - AMPS Mode - Right Head Section**

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Test Position	SAR 1g (w/kg)
824.04	991	AMPS	26.14	26.06	Standard	Retracted	Right Ear	Cheek/Touch	0.853
824.04	991	AMPS	26.10	25.90	Standard	Extended	Right Ear	Cheek/Touch	1.40
824.04	991	AMPS	26.10	25.91	Extended	Extended	Right Ear	Cheek/Touch	1.36
836.49	383	AMPS	26.10	26.16	Standard	Retracted	Right Ear	Cheek/Touch	0.848
836.49	383	AMPS	26.10	25.98	Standard	Extended	Right Ear	Cheek/Touch	1.45
836.49	383	AMPS	26.10	26.04	Extended	Extended	Right Ear	Cheek/Touch	1.45
848.97	799	AMPS	26.12	26.02	Standard	Retracted	Right Ear	Cheek/Touch	1.10
848.97	799	AMPS	26.10	25.90	Standard	Extended	Right Ear	Cheek/Touch	1.44
848.97	799	AMPS	26.10	25.94	Extended	Extended	Right Ear	Cheek/Touch	1.41
836.49	383	AMPS	26.10	25.96	Standard	Retracted	Right Ear	Ear/Tilt	0.152
836.49	383	AMPS	26.10	26.09	Standard	Extended	Right Ear	Ear/Tilt	0.487
<b>Mixture Type: Brain (Measured) Dielectric Constant: 41.0 Conductivity: 0.90</b>				<b>ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Uncontrolled Exposure / General Population BRAIN: 1.6 W/kg (averaged over 1 gram)</b>					

Notes:

1. Test Date(s): January 16, 2002.
2. The SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest AMPS mode head SAR value measured (right head section) was 1.45 w/kg (cheek/touch position, mid channel, antenna extended, with both standard-life and extended-life batteries).
4. The EUT was tested with the clamshell open, which is the only ear-held operating configuration for this phone.
5. Ambient TEMPERATURE: 23.8°C  
Relative HUMIDITY: 34%  
Atmospheric PRESSURE: 102.4 kPa
6. Fluid Temperature  $\approx$  23.0 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

**MEASUREMENT SUMMARY (CONT.)**

**HEAD SAR MEASUREMENT RESULTS - CDMA Mode - Left Head Section**

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Test Position	SAR 1g (w/kg)
824.70	1013	CDMA	25.13	25.19	Standard	Retracted	Left Ear	Cheek/Touch	0.644
824.70	1013	CDMA	25.10	25.10	Standard	Extended	Left Ear	Cheek/Touch	1.14
824.70	1013	CDMA	25.10	25.03	Extended	Extended	Left Ear	Cheek/Touch	1.10
835.89	363	CDMA	25.13	24.99	Standard	Retracted	Left Ear	Cheek/Touch	0.663
835.89	363	CDMA	25.10	25.20	Standard	Extended	Left Ear	Cheek/Touch	1.21
835.89	363	CDMA	25.10	24.99	Extended	Extended	Left Ear	Cheek/Touch	1.09
848.31	777	CDMA	25.10	24.96	Standard	Retracted	Left Ear	Cheek/Touch	0.928
848.31	777	CDMA	25.13	25.02	Standard	Extended	Left Ear	Cheek/Touch	1.34
848.31	777	CDMA	25.10	24.93	Extended	Extended	Left Ear	Cheek/Touch	1.22
835.89	363	CDMA	25.10	24.92	Standard	Retracted	Left Ear	Ear/Tilt	0.172
835.89	363	CDMA	25.10	25.06	Standard	Extended	Left Ear	Ear/Tilt	0.383
<b>Mixture Type: Brain (Measured) Dielectric Constant: 41.2 Conductivity: 0.90</b>				<b>ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Uncontrolled Exposure / General Population BRAIN: 1.6 W/kg (averaged over 1 gram)</b>					

Notes:

1. Test Date(s): January 17, 2002.
2. The SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest CDMA mode head SAR value measured (left head section) was 1.34 w/kg (cheek/touch position, high channel, antenna extended, with standard-life battery).
4. The EUT was tested with the clamshell open, which is the only ear-held operating configuration for this phone.
5. Ambient TEMPERATURE: 22.2°C  
Relative HUMIDITY: 35%  
Atmospheric PRESSURE: 102.2 kPa
6. Fluid Temperature ≈ 23.0 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.



**MEASUREMENT SUMMARY (CONT.)**

**HEAD SAR MEASUREMENT RESULTS - CDMA Mode - Right Head Section**

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Test Position	SAR 1g (w/kg)
824.70	1013	CDMA	25.10	25.09	Standard	Retracted	Right Ear	Cheek/Touch	0.719
824.70	1013	CDMA	25.10	25.10	Standard	Extended	Right Ear	Cheek/Touch	1.22
824.70	1013	CDMA	25.10	25.03	Extended	Extended	Right Ear	Cheek/Touch	1.15
835.89	363	CDMA	25.10	24.94	Standard	Retracted	Right Ear	Cheek/Touch	0.683
835.89	363	CDMA	25.12	24.96	Standard	Extended	Right Ear	Cheek/Touch	1.16
835.89	363	CDMA	25.10	25.19	Extended	Extended	Right Ear	Cheek/Touch	1.21
848.31	777	CDMA	25.10	24.93	Standard	Retracted	Right Ear	Cheek/Touch	0.917
848.31	777	CDMA	25.10	24.98	Standard	Extended	Right Ear	Cheek/Touch	1.35
848.31	777	CDMA	25.11	24.97	Extended	Extended	Right Ear	Cheek/Touch	1.32
835.89	363	CDMA	25.14	25.01	Standard	Retracted	Right Ear	Ear/Tilt	0.137
835.89	363	CDMA	25.10	25.06	Standard	Extended	Right Ear	Ear/Tilt	0.373
<b>Mixture Type: Brain (Measured) Dielectric Constant: 41.2 Conductivity: 0.90</b>				<b>ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak: Uncontrolled Exposure/General Population BRAIN: 1.6 W/kg (averaged over 1 gram)</b>					

Notes:

1. Test Date(s): January 17, 2002.
2. The SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest CDMA mode head SAR value measured (right head section) was 1.35 w/kg (cheek/touch position, high channel, antenna extended, with standard-life battery).
4. The EUT was tested with the clamshell open, which is the only ear-held operating configuration for this phone.
5. Ambient TEMPERATURE: 22.2°C  
Relative HUMIDITY: 35%  
Atmospheric PRESSURE: 102.2 kPa
6. Fluid Temperature  $\approx$  23.0 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.



## MEASUREMENT SUMMARY (CONT.)

### BODY SAR MEASUREMENT RESULTS - AMPS Mode

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Separation Distance (cm)	SAR 1g (w/kg)
824.04	991	AMPS	26.11	26.01	Standard	Retracted	Planar	1.5	0.699
824.04	991	AMPS	26.12	26.02	Standard	Extended	Planar	1.5	1.37
836.49	383	AMPS	26.12	25.92	Standard	Retracted	Planar	1.5	0.657
836.49	383	AMPS	26.10	26.02	Standard	Extended	Planar	1.5	1.38
836.49	383	AMPS	26.10	26.01	Extended	Extended	Planar	1.5	1.13
848.97	799	AMPS	26.12	25.97	Standard	Retracted	Planar	1.5	0.756
848.97	799	AMPS	26.10	25.90	Standard	Extended	Planar	1.5	1.26
<b>Mixture Type: Body (Measured)</b> <b>Dielectric Constant: 55.0</b> <b>Conductivity: 0.97</b>				<b>ANSI / IEEE C95.1 1992 - SAFETY LIMIT</b> <b>Spatial Peak: Uncontrolled Exposure/General Population</b> <b>BODY: 1.6 W/kg (averaged over 1 gram)</b>					

#### Notes:

1. Test Date(s): January 18, 2002.
2. The body SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest AMPS mode body SAR value found was 1.38 w/kg (mid channel, antenna extended, with standard-life battery).
4. The EUT was tested for body SAR with ear-microphone connected.
5. The EUT was tested for body SAR with the clamshell closed, which is the only intended body-worn operating configuration for this phone. A 1.5cm separation distance was maintained between the back of the phone and the outer surface of the SAM planar phantom.
6. Ambient TEMPERATURE: 22.6°C  
Relative HUMIDITY: 35%  
Atmospheric PRESSURE: 102.5 kPa
7. Fluid Temperature  $\approx$  23.0 °C
8. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

**MEASUREMENT SUMMARY (CONT.)**

**BODY SAR MEASUREMENT RESULTS - CDMA Mode**

Freq. (MHz)	Channel	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Battery Type	Antenna Position	Phantom Section	Separation Distance (cm)	SAR 1g (w/kg)
824.70	1013	CDMA	25.13	25.08	Standard	Retracted	Planar	1.5	0.542
824.70	1013	CDMA	25.14	25.12	Standard	Extended	Planar	1.5	1.15
835.89	363	CDMA	25.15	24.98	Standard	Retracted	Planar	1.5	0.499
835.89	363	CDMA	25.15	25.08	Standard	Extended	Planar	1.5	1.14
848.31	777	CDMA	25.13	24.97	Standard	Retracted	Planar	1.5	0.485
848.31	777	CDMA	25.14	24.96	Standard	Extended	Planar	1.5	1.17
848.31	777	CDMA	25.12	25.04	Extended	Extended	Planar	1.5	0.959
<b>Mixture Type: Body (Measured) Dielectric Constant: 55.0 Conductivity: 0.97</b>				<b>ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak: Uncontrolled Exposure/General Population BODY: 1.6 W/kg (averaged over 1 gram)</b>					

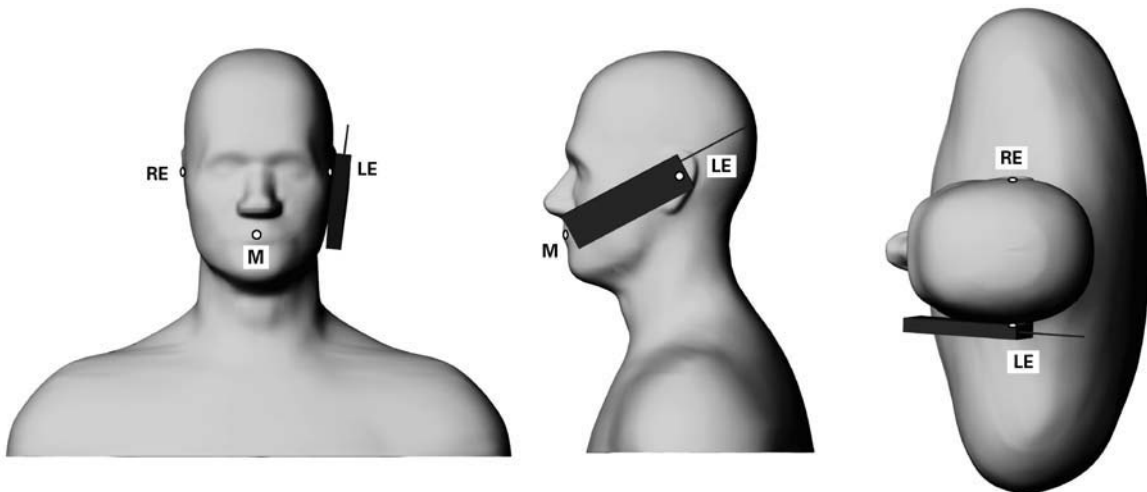
Notes:

1. Test Date(s): January 18, 2002.
2. The body SAR values found were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
3. The highest CDMA mode body SAR value found was 1.17 w/kg (high channel, antenna extended, with standard-life battery).
4. The EUT was tested for body SAR with ear-microphone connected.
5. The EUT was tested for body SAR with the clamshell closed, which is the only intended body-worn operating configuration for this phone. A 1.5cm separation distance was maintained between the back of the phone and the outer surface of the SAM planar phantom.
6. Ambient TEMPERATURE: 22.6°C  
Relative HUMIDITY: 35%  
Atmospheric PRESSURE: 102.5 kPa
7. Fluid Temperature  $\approx$  23.0 °C
8. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

## 5.0 DETAILS OF SAR EVALUATION

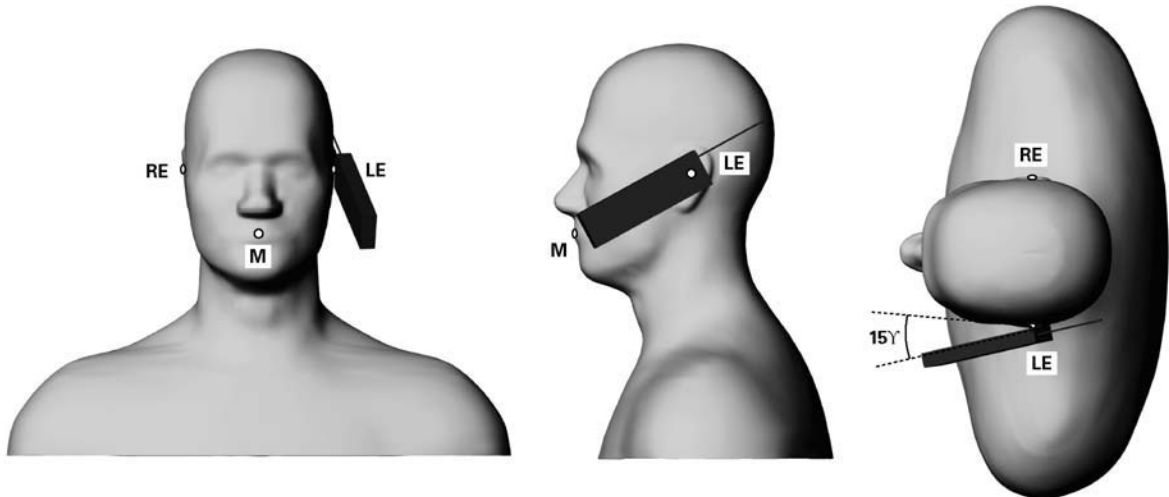
The WITHUS IT CO., LTD. Model: WCE-210 Dual-Mode AMPS/CDMA Cellular Phone FCC ID: POQWCE-210 was found to be compliant for localized Specific Absorption Rate (SAR) based on the following test provisions and conditions:

- 1) The EUT was tested in an ear-held configuration on both the left and right sections of the phantom with the device antenna in both the extended and retracted positions as follows:
  - a) The handset was placed in the device holder 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, with the center of the earpiece touching the center of the ear spacer of the SAM phantom.
  - b) With the handset positioned parallel to the cheek, the test device reference point was aligned to the ear reference point on the head phantom, and the vertical centerline was aligned to the phantom reference plane (initial ear position).
  - c) While maintaining the three alignments, the body of the handset was gradually adjusted to each of the following test positions:
    - Cheek/Touch Position: The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.



**Phone position 1, “cheek” or “touch” position.** The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning, are indicated (Shoulders are shown for illustration only).

- Ear/Tilt Position: With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.



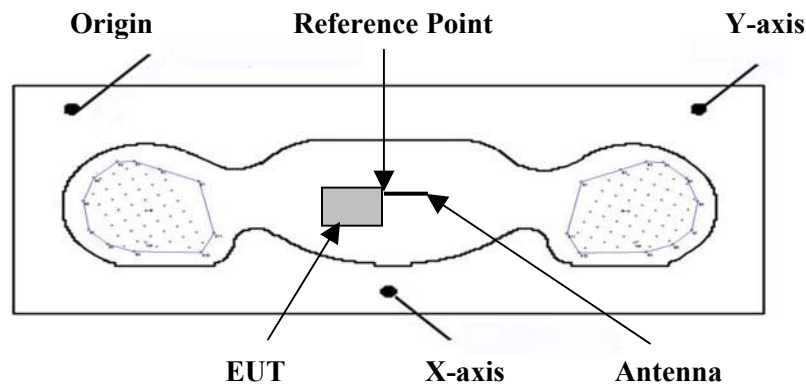
**Phone position 2, “tilted position.”** The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning, are indicated (Shoulders are shown for illustration only).

- 2) The EUT was tested in a body-worn configuration with the device in the clamshell-closed position and the back of the device placed parallel to the outer surface of the planar phantom at a separation distance of 1.5 cm (Note: A body-holster or belt-clip were not available at the time of evaluation). Both antenna extended and antenna retracted modes were tested.
- 3) The EUT was tested for body SAR with ear-microphone connected.
- 4) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimize drift. The conducted power levels were checked before and after each test. If the conducted power level deviated more than 5% of the initial power level, then the EUT was retested. Any unusual anomalies over the course of the test also warranted a re-evaluation.
- 5) The conducted power was measured according to the procedures described in FCC Part 2.1046.
- 6) The EUT was placed into test mode via keypad access or base station simulator at a full data rate in the “always up” power control mode.
- 7) The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the handset and its antenna.
- 8) The EUT was tested with a fully charged battery.

## 6.0 EVALUATION PROCEDURES

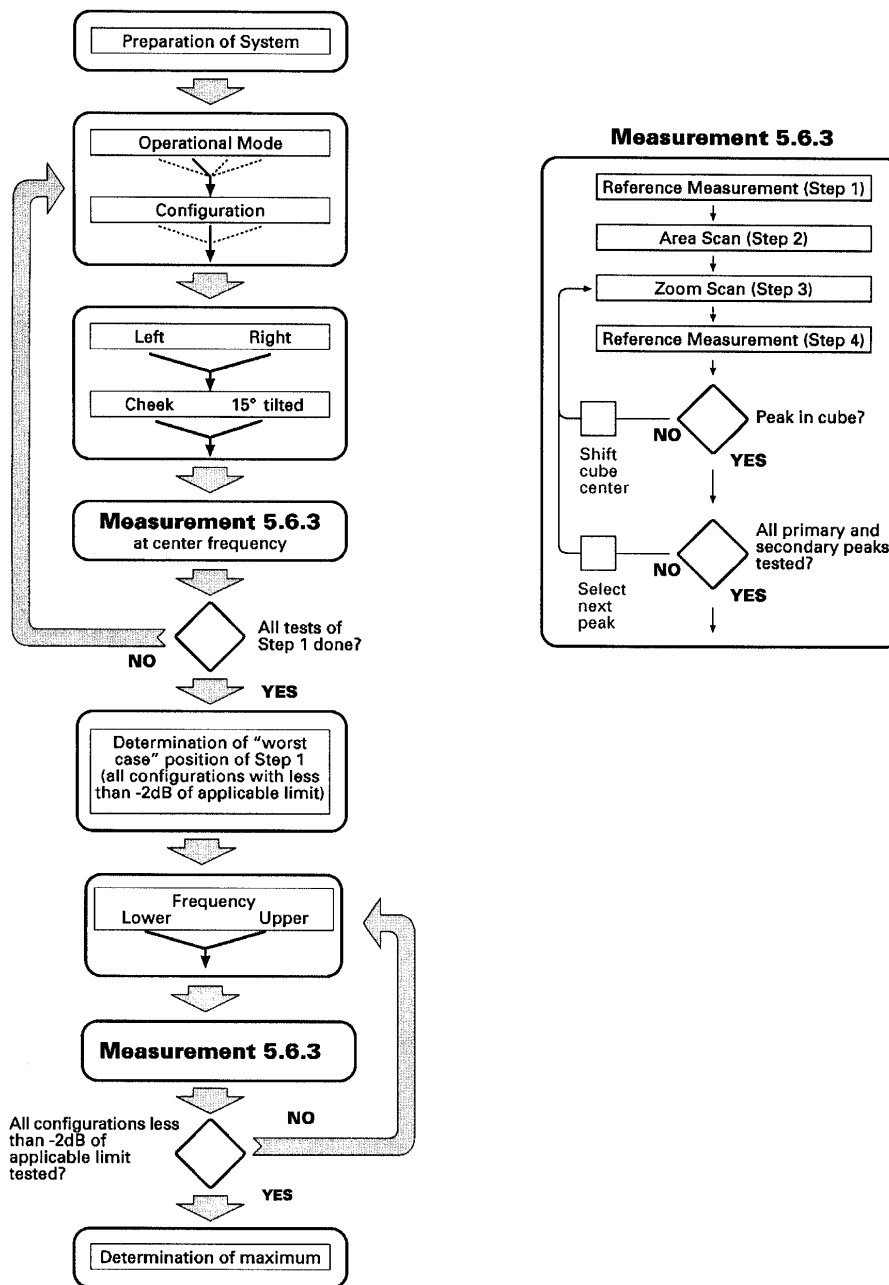
The Specific Absorption Rate (SAR) evaluation was performed in the following manner:

- a. (i) The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation both the left and right ear positions were evaluated at the low, middle, and high frequencies of the band at maximum power, and with the device antenna in both the extended and extracted positions as applicable. The positioning of the ear-held device relative to the phantom was performed in accordance with FCC OET Bulletin 65, Supplement C (Edition 01-01) using the SAM phantom.
- (ii) For face-held and body-worn devices, a planar phantom was used.
- b. The SAR was determined by a pre-defined procedure within the DASY3 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface using a uniform grid spacing.
- c. A 5x5x7 matrix was performed around the greatest spatial SAR distribution found during the area scan of the applicable exposed region. SAR values were then calculated using a 3-D spline interpolation algorithm and averaged over spatial volumes of 1 and 10 grams.
- d. The depth of the simulating tissue in the phantom used for the system validation and SAR evaluation was no less than 15cm.
- e. The E-field probe conversion factors for 835MHz were determined as follows:
  - In brain and muscle tissue between 750MHz and 1GHz, the conversion factor decreases approximately 1.3% per 100MHz frequency increase.
  - In brain and muscle tissue between 1.6GHz and 2GHz, the conversion factor decreases approximately 1% per 100MHz frequency increase.



Device Positioning & Reference Point (Body SAR)

## EVALUATION Procedures (Cont.)



Flow Chart of the recommended practices and procedures per IEEE Std 1528 (Draft) [5]

## 7.0 SAR SAFETY LIMITS

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

Notes:

1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

## 8.0 SIMULATED TISSUES

The 835MHz and 900MHz brain and body mixtures consist of a viscous gel using hydroxyethylcellulose (HEC) gelling agent and saline solution. Preservation with a bactericide is added and visual inspection is made to ensure air bubbles are not trapped during the mixing process. The fluid was prepared according to standardized procedures, and measured for dielectric parameters (permittivity and conductivity).

835MHz & 900MHz TISSUE MIXTURE - DIPOLE VALIDATION & EUT EVALUATION			
INGREDIENT	900MHz Brain Mixture (Validation)	835MHz Brain Mixture (EUT Evaluation)	835MHz Body Mixture (EUT Evaluation)
Water	40.71 %	40.71 %	53.70 %
Sugar	56.63 %	56.63 %	45.10 %
Salt	1.48 %	1.48 %	0.97 %
HEC	1.00 %	1.00 %	0.13%
Bactericide	0.18 %	0.18 %	0.10 %



## 9.0 TISSUE PARAMETERS

The dielectric parameters of the fluids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an 8753E Network Analyzer. The dielectric parameters of the fluid are shown in the table below. See Appendix D for printout of measured tissue dielectric parameters.

TISSUE PARAMETERS - DIPOLE VALIDATION & EUT EVALUATION			
Equivalent Tissue	Dielectric Constant $\epsilon_r$	Conductivity $\sigma$ (mho/m)	$\rho$ (Kg/m <sup>3</sup> )
900MHz Brain (Target)	41.5 $\pm$ 5%	0.97 $\pm$ 5%	1000
900MHz Brain (Validation - Measured: 01/16/02)	40.2	0.95	1000
900MHz Brain (Validation - Measured: 01/17/02)	40.5	0.96	1000
900MHz Brain (Validation - Measured: 01/18/02)	40.4	0.96	1000
835MHz Brain (Target)	41.5 $\pm$ 5%	0.90 $\pm$ 5%	1000
835MHz Brain (Evaluation - Measured: 01/16/02)	41.0	0.90	1000
835MHz Brain (Evaluation - Measured: 01/17/02)	41.2	0.90	1000
835MHz Brain (Evaluation - Measured: 01/18/02)	41.1	0.90	1000
835MHz Body (Target)	55.2 $\pm$ 5%	0.97 $\pm$ 5%	1000
835MHz Body (Evaluation - Measured: 01/17/02)	55.0	0.97	1000

## 10.0 SYSTEM VALIDATION

Prior to the assessment, the system was verified in the planar section of the SAM phantom using a 900MHz dipole. A forward power of 250mW was applied to the dipole, and the system was verified to a tolerance of  $\pm$ 10%. The applicable verification is as follows (see Appendix B for validation test plots):

Dipole Validation Kit	Target SAR 1g (w/kg)	Measured SAR 1g (w/kg)	Fluid Temperature	Validation Date
D900V2	2.78	2.75	$\approx$ 23.0 °C	01/16/02
		2.72	$\approx$ 23.0 °C	01/17/02
		2.76	$\approx$ 23.0 °C	01/18/02

## ***11.0 ROBOT SYSTEM SPECIFICATIONS***

### **Specifications**

**POSITIONER:** Staubli Unimation Corp. Robot Model: RX60L  
**Repeatability:** 0.02 mm  
**No. of axis:** 6

### **Data Acquisition Electronic (DAE) System**

#### **Cell Controller**

**Processor:** Pentium III  
**Clock Speed:** 450 MHz  
**Operating System:** Windows NT  
**Data Card:** DASY3 PC-Board

#### **Data Converter**

**Features:** Signal Amplifier, multiplexer, A/D converter, and control logic  
**Software:** DASY3 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 Probe**

**Model:** ET3DV6  
**Serial No.:** 1590  
**Construction:** Triangular core fiber optic detection system  
**Frequency:** 10 MHz to 6 GHz  
**Linearity:**  $\pm 0.2$  dB (30 MHz to 3 GHz)

### **Phantom**

**Type:** SAM V4.0C  
**Configuration:** Left Head, Right Head, Planar Section  
**Shell Material:** Fiberglass  
**Thickness:**  $2.0 \pm 0.1$  mm  
**Volume:** Approx. 20 liters

## 12.0 SAM PHANTOM V4.0C

The SAM phantom V4.0C is a fiberglass shell phantom with a 2.0 mm shell thickness for left and right head and flat planar area integrated in a wooden table. The shape of the fiberglass shell corresponds to the phantom defined by SCC34-SC2. The device holder positions are adjusted to the standard measurement positions in the three sections.



SAM Phantom V4.0C

## 13.0 DEVICE HOLDER

The DASY3 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.



Device Holder

## 14.0 PROBE SPECIFICATION (ET3DV6)

- Construction: Symmetrical design with triangular core  
Built-in shielding against static charges  
PEEK enclosure material (resistant to organic solvents, e.g. glycol)
- Calibration: In air from 10 MHz to 2.5 GHz  
In brain simulating tissue at frequencies of 900 MHz and 1.8 GHz (accuracy  $\pm 8\%$ )
- Frequency: 10 MHz to >6 GHz; Linearity:  $\pm 0.2$  dB (30 MHz to 3 GHz)
- Directivity:  $\pm 0.2$  dB in brain tissue (rotation around probe axis)  
 $\pm 0.4$  dB in brain tissue (rotation normal to probe axis)
- Dynam. Rnge: 5  $\mu\text{W/g}$  to >100 mW/g; Linearity:  $\pm 0.2$  dB
- Srfce. Detect.  $\pm 0.2$  mm repeatability in air and clear liquids over diffuse reflecting surfaces
- Dimensions: Overall length: 330 mm  
Tip length: 16 mm  
Body diameter: 12 mm  
Tip diameter: 6.8 mm  
Distance from probe tip to dipole centers: 2.7 mm
- Application: General dosimetry up to 3 GHz  
Compliance tests of mobile phone



ET3DV6 E-Field Probe

## 15.0 TEST EQUIPMENT LIST

SAR MEASUREMENT SYSTEM		
<u>EQUIPMENT</u>	<u>SERIAL NO.</u>	<u>DATE CALIBRATED</u>
<b>DASY3 System</b> -Robot -ET3DV6 E-Field Probe -300MHz Validation Dipole -450MHz Validation Dipole -900MHz Validation Dipole -1800MHz Validation Dipole -2450MHz Validation Dipole -SAM Phantom V4.0C	599396-01 1590 135 136 054 247 150 N/A	N/A Mar 2001 Oct 2001 Oct 2001 June 2001 June 2001 Oct 2001 N/A
<b>85070C Dielectric Probe Kit</b>	N/A	N/A
<b>Gigatronics 8652A Power Meter</b> -Power Sensor 80701A -Power Sensor 80701A	1835272 1833535 1833542	Oct 2001 Jan 2002 Jan 2002
<b>E4408B Spectrum Analyzer</b>	US39240170	Nov 2001
<b>8594E Spectrum Analyzer</b>	3543A02721	Mar 2001
<b>8753E Network Analyzer</b>	US38433013	Nov 2001
<b>8648D Signal Generator</b>	3847A00611	Aug 2001
<b>5S1G4 Amplifier Research Power Amplifier</b>	26235	N/A

## 16.0 MEASUREMENT UNCERTAINTIES

Error Description	Uncertainty Value $\pm\%$	Probability Distribution	Divisor	$c_i$ 1g	Standard Uncertainty $\pm\%$ (1g)	$v_i$ or $v_{eff}$
<b>Measurement System</b>						
Probe calibration	$\pm 4.4$	Normal	1	1	$\pm 4.4$	$\infty$
Axial isotropy of the probe	$\pm 4.7$	Rectangular	$\sqrt{3}$	$(1-c_p)$	$\pm 1.9$	$\infty$
Spherical isotropy of the probe	$\pm 9.6$	Rectangular	$\sqrt{3}$	$(c_p)$	$\pm 3.9$	$\infty$
Spatial resolution	$\pm 0.0$	Rectangular	$\sqrt{3}$	1	$\pm 0.0$	$\infty$
Boundary effects	$\pm 5.5$	Rectangular	$\sqrt{3}$	1	$\pm 3.2$	$\infty$
Probe linearity	$\pm 4.7$	Rectangular	$\sqrt{3}$	1	$\pm 2.7$	$\infty$
Detection limit	$\pm 1.0$	Rectangular	$\sqrt{3}$	1	$\pm 0.6$	$\infty$
Readout electronics	$\pm 1.0$	Normal	1	1	$\pm 1.0$	$\infty$
Response time	$\pm 0.8$	Rectangular	$\sqrt{3}$	1	$\pm 0.5$	$\infty$
Integration time	$\pm 1.4$	Rectangular	$\sqrt{3}$	1	$\pm 0.8$	$\infty$
RF ambient conditions	$\pm 3.0$	Rectangular	$\sqrt{3}$	1	$\pm 1.7$	$\infty$
Mech. constraints of robot	$\pm 0.4$	Rectangular	$\sqrt{3}$	1	$\pm 0.2$	$\infty$
Probe positioning	$\pm 2.9$	Rectangular	$\sqrt{3}$	1	$\pm 1.7$	$\infty$
Extrap. & integration	$\pm 3.9$	Rectangular	$\sqrt{3}$	1	$\pm 2.3$	$\infty$
<b>Test Sample Related</b>						
Device positioning	$\pm 6.0$	Normal	0.89	1	$\pm 6.7$	12
Device holder uncertainty	$\pm 5.0$	Normal	0.84	1	$\pm 5.9$	8
Power drift	$\pm 5.0$	Rectangular	$\sqrt{3}$		$\pm 2.9$	$\infty$
<b>Phantom and Setup</b>						
Phantom uncertainty	$\pm 4.0$	Rectangular	$\sqrt{3}$	1	$\pm 2.3$	$\infty$
Liquid conductivity (target)	$\pm 5.0$	Rectangular	$\sqrt{3}$	0.6	$\pm 1.7$	$\infty$
Liquid conductivity (measured)	$\pm 10.0$	Rectangular	$\sqrt{3}$	0.6	$\pm 3.5$	$\infty$
Liquid permittivity (target)	$\pm 5.0$	Rectangular	$\sqrt{3}$	0.6	$\pm 1.7$	$\infty$
Liquid permittivity (measured)	$\pm 5.0$	Rectangular	$\sqrt{3}$	0.6	$\pm 1.7$	$\infty$
Combined Standard Uncertainty					$\pm 13.6$	
<b>Expanded Uncertainty</b>					<b><math>\pm 27.1</math></b>	

The divisor for device positioning uncertainty and holder uncertainty are based on the procedure defined in IEEE Std 1528 (draft) (see reference [5]), or based on the degrees of freedom for each error source.

For estimation of Device Positioning Uncertainty (divisor=0.89) 12 different devices were used (see last column - i.e. degrees of freedom). The corresponding  $k_p$  factor for  $v_{eff}=12$  is 2.23, therefore the divisor is  $2/2.23=0.89$ .

For estimation of Device Holder Uncertainty (divisor=0.84) 8 different devices were used (see last column - i.e. degrees of freedom). The corresponding  $k_p$  factor for  $v_{eff}=8$  is 2.37, therefore the divisor is  $2/2.37=0.84$ .

## **17.0 REFERENCES**

- [1] ANSI, ANSI/IEEE C95.1: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 Ghz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY: 1992.
- [2] Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.
- [3] Thomas Schmid, Oliver Egger, and Niels Kuster, “Automated E-field scanning system for dosimetric assessments”, IEEE Transaction on Microwave Theory and Techniques, Vol. 44, pp. 105 - 113: January 1996.
- [4] Niels Kuster, Ralph Kastle, and Thomas Schmid, “Dosimetric evaluation of mobile communications equipment with know precision”, IEICE Transactions of Communications, vol. E80-B, no. 5, pp. 645 – 652: May 1997.
- [5] IEEE Standards Coordinating Committee 34, Std 1528, DRAFT Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques: Draft, December 2001.

***APPENDIX A - SAR MEASUREMENT DATA***

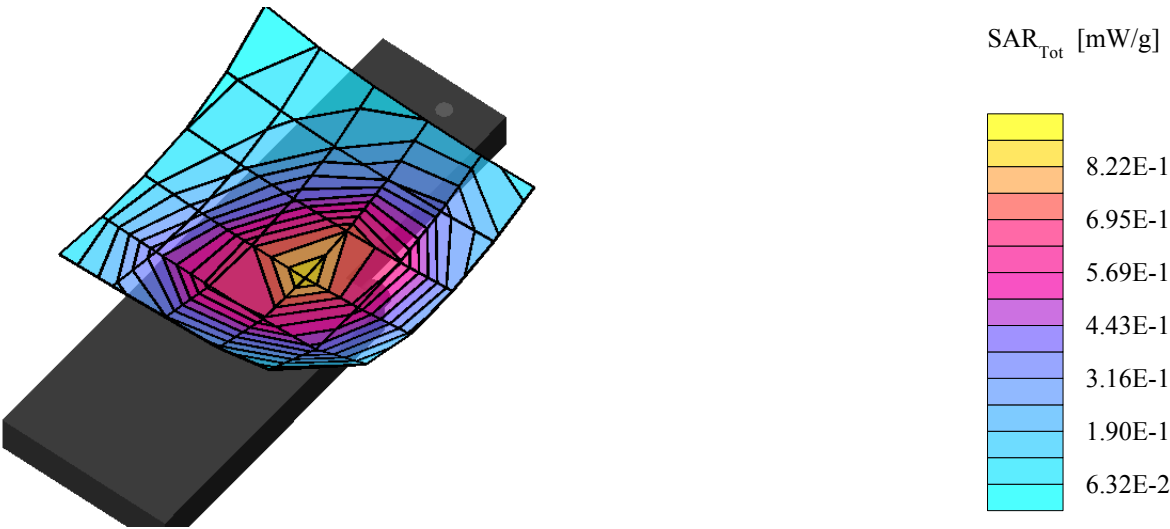


## **HEAD SAR TEST PLOTS - AMPS MODE - LEFT EAR**

Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.01 dB  
SAR (1g): 0.802 mW/g, SAR (10g): 0.545 mW/g

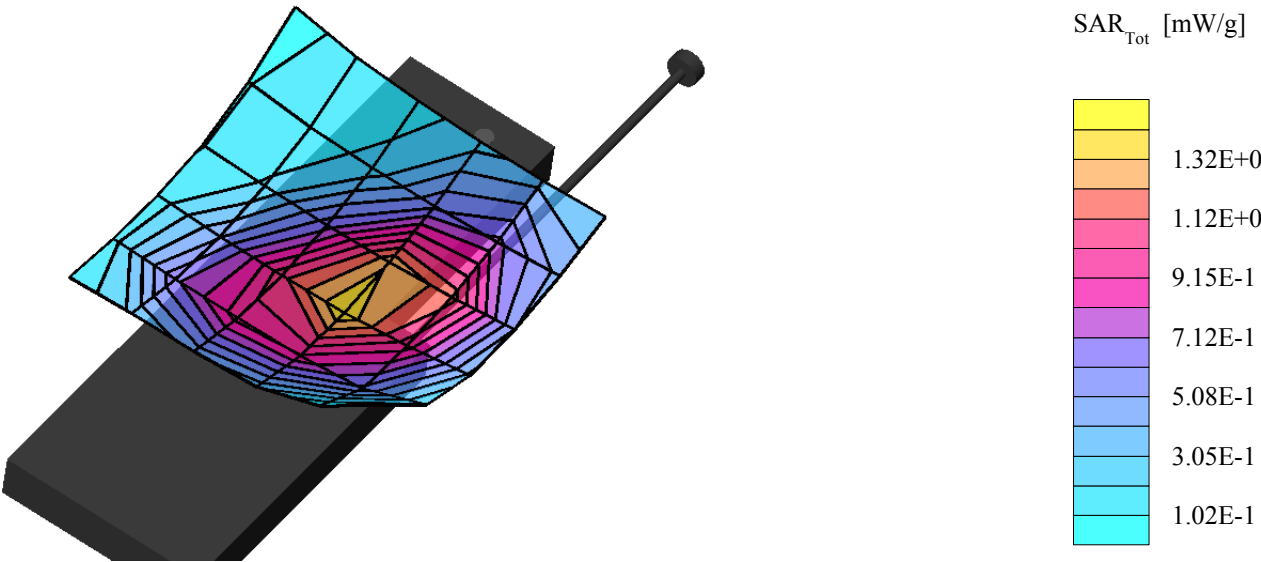
Head SAR - Left Cheek/Touch Position  
Antenna In  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 991 [824.04 MHz]  
Conducted Power: 26.12 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.08 dB  
SAR (1g): 1.40 mW/g, SAR (10g): 0.922 mW/g

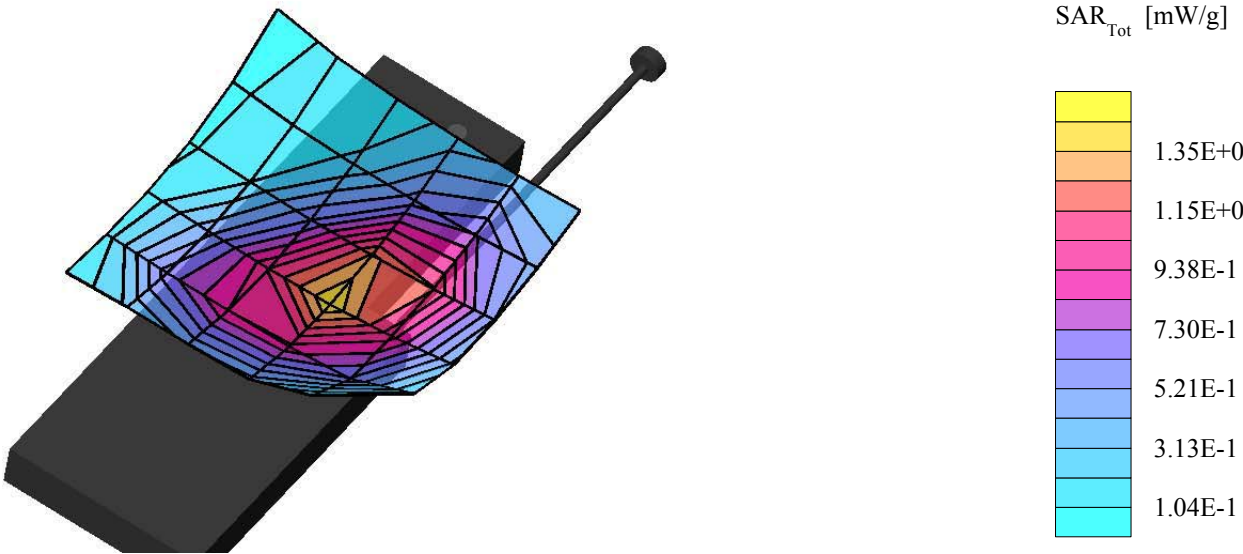
Head SAR - Left Cheek/Touch Positon  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 991 [824.04 MHz]  
Conducted Power: 26.11 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.11 dB  
SAR (1g): 1.38 mW/g, SAR (10g): 0.912 mW/g

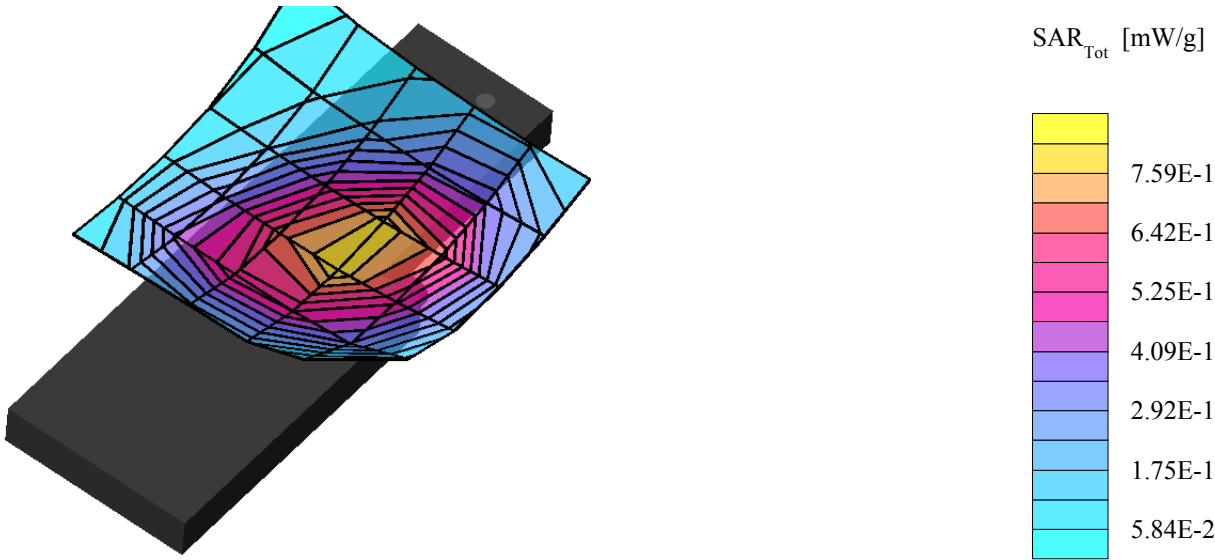
Head SAR - Left Cheek/Touch Positon  
Antenna Out  
Extended Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 991 [824.04 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.05 dB  
SAR (1g): 0.826 mW/g, SAR (10g): 0.554 mW/g

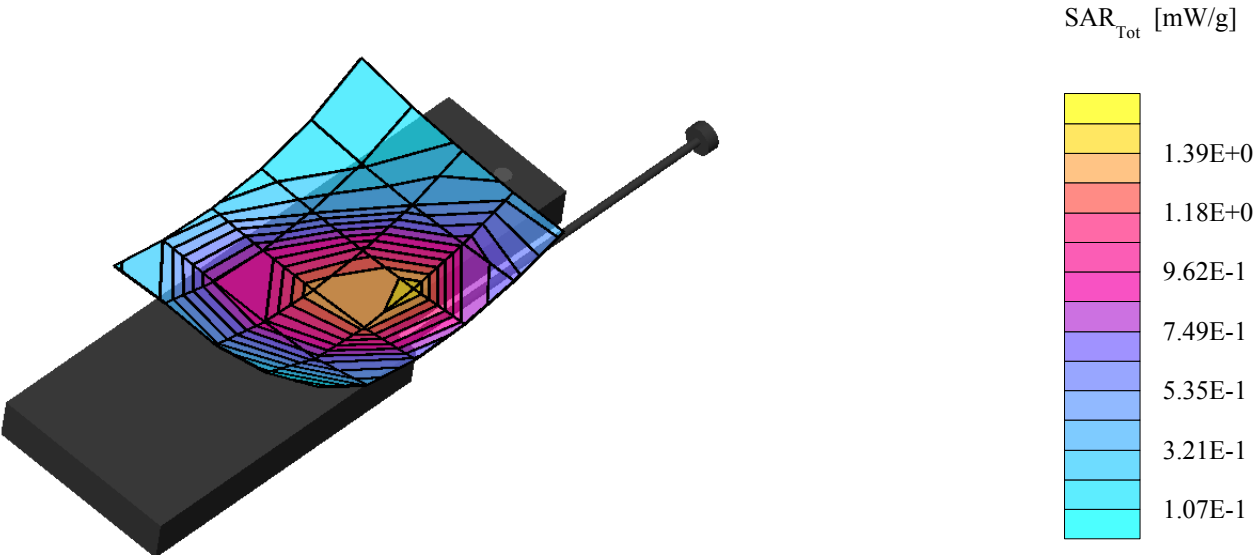
Head SAR - Left Cheek/Touch Positon  
Antenna In  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.06 dB  
SAR (1g): 1.43 mW/g, SAR (10g): 0.933 mW/g

Head SAR - Left Cheek/Touch Positon  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section

Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0;  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.0$   $\rho = 1.00$  g/cm<sup>3</sup>

Z-Axis Extrapolation at Peak SAR Location

Head SAR - Left Cheek/Touch Position

Antenna Out

Standard Battery

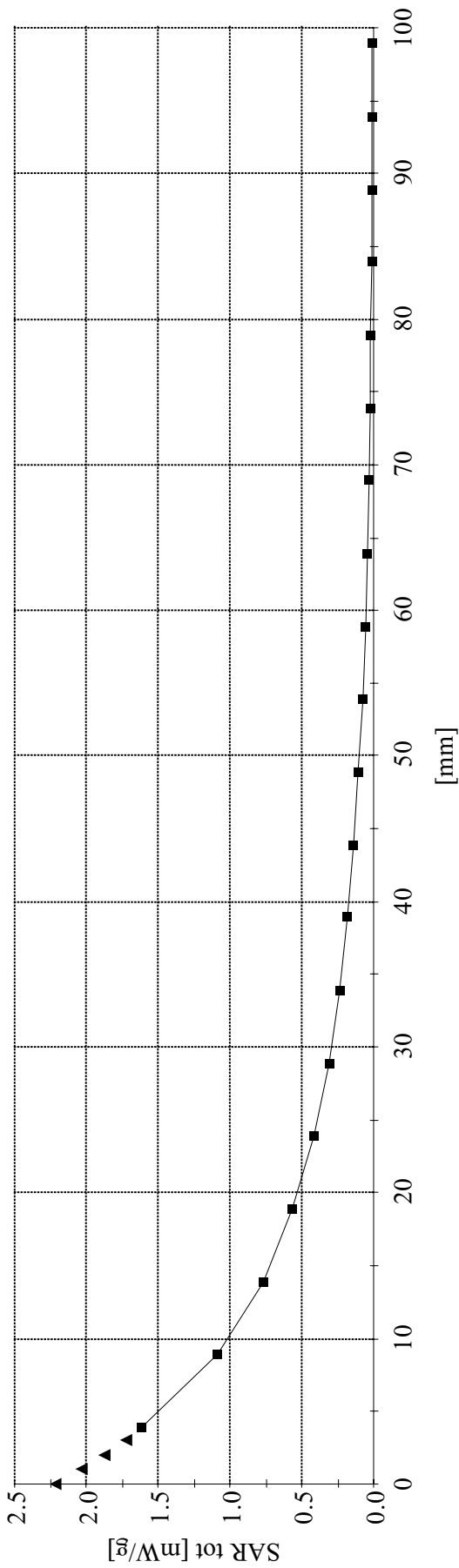
Withus Model: WCE-210

AMPS Mode

Channel 383 [836.49 MHz]

Conducted Power: 26.10 dBm

Date Tested: January 16, 2002

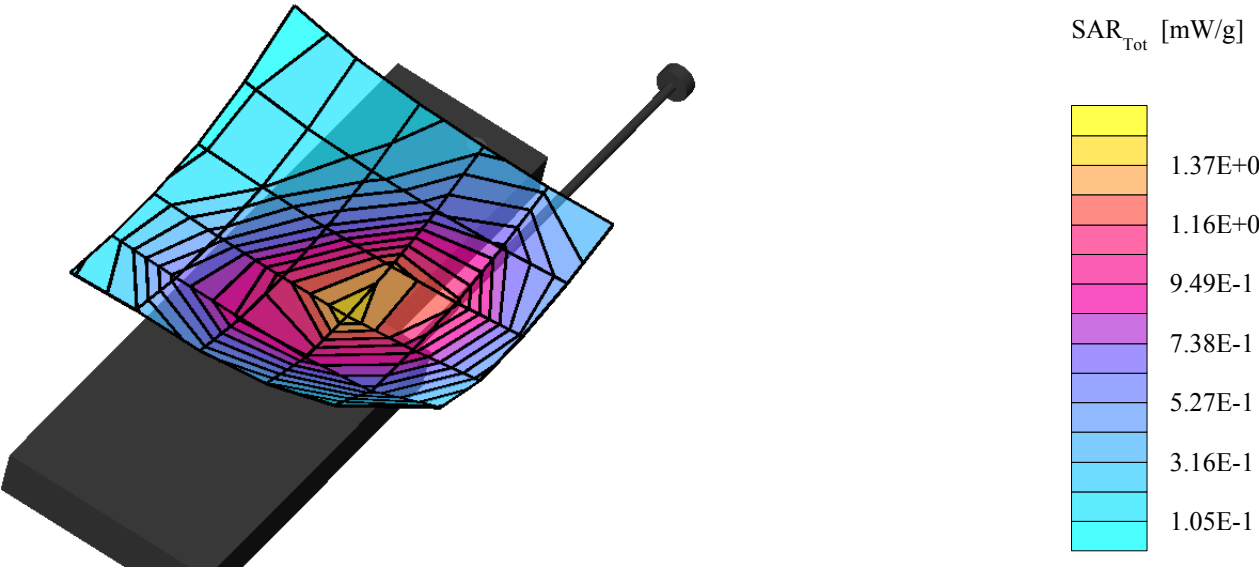




Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.0$   $\rho = 1.00$  g/cm<sup>3</sup>  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.07 dB  
SAR (1g): 1.42 mW/g, SAR (10g): 0.931 mW/g

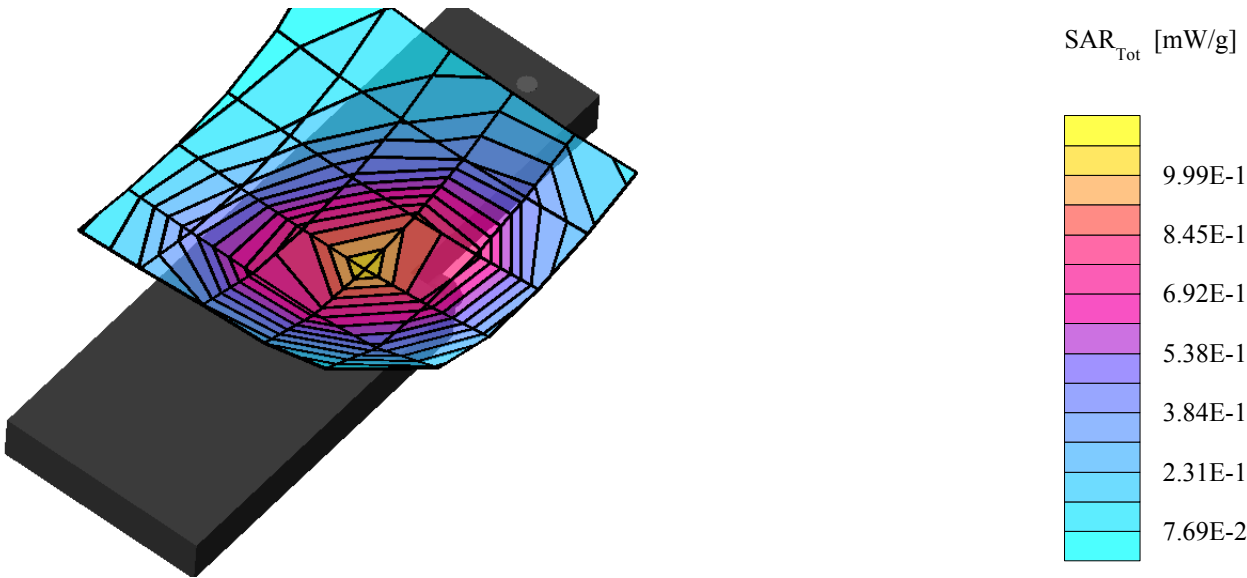
Head SAR - Left Cheek/Touch Positon  
Antenna Out  
Extended Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.11 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.16 dB  
SAR (1g): 0.937 mW/g, SAR (10g): 0.626 mW/g

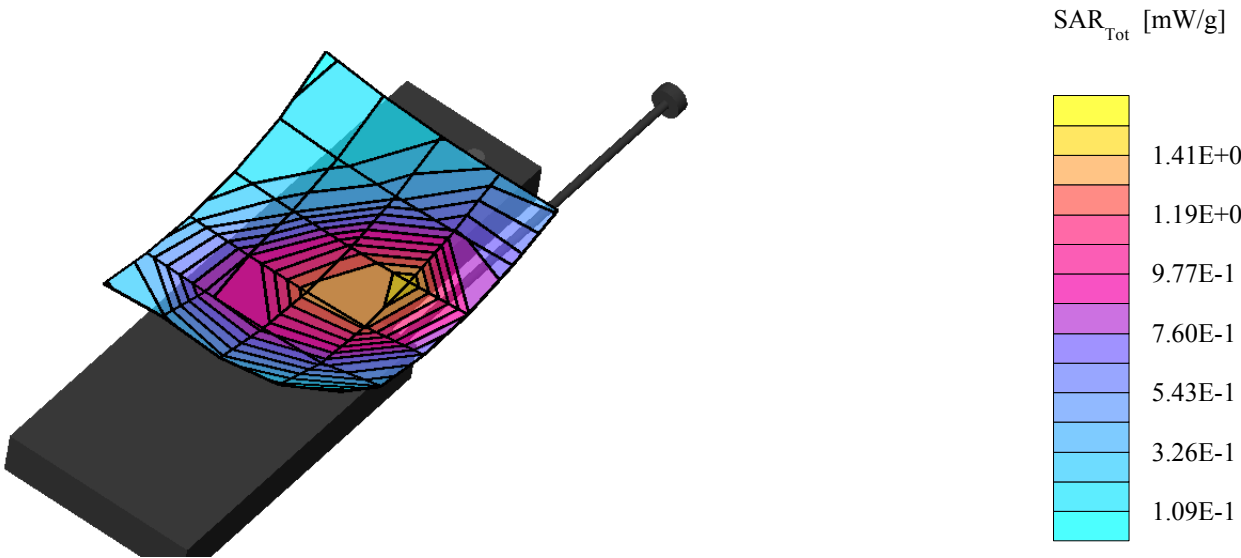
Head SAR - Left Cheek/Touch Positon  
Antenna In  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 799 [848.97 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.14 dB  
SAR (1g): 1.42 mW/g, SAR (10g): 0.936 mW/g

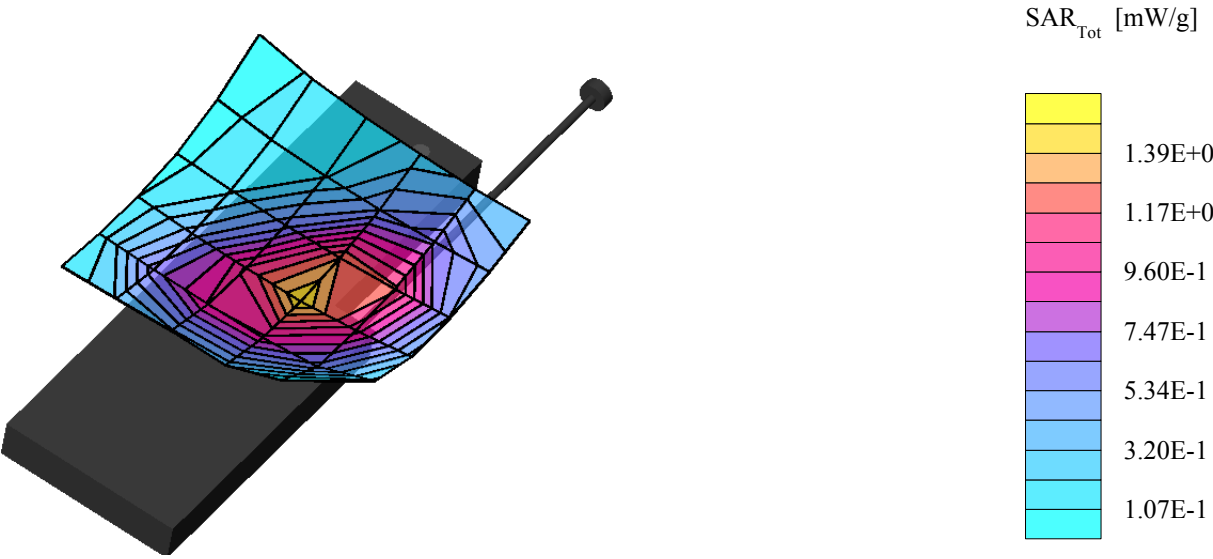
Head SAR - Left Cheek/Touch Positon  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 799 [848.97 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.18 dB  
SAR (1g): 1.38 mW/g, SAR (10g): 0.906 mW/g

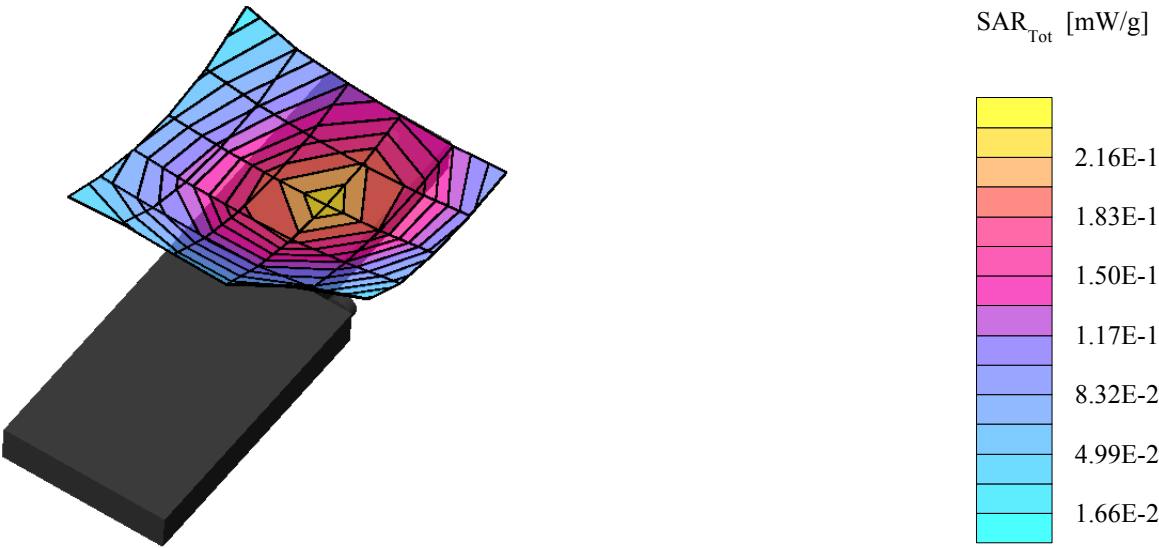
Head SAR - Left Cheek/Touch Positon  
Antenna Out  
Extended Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 799 [848.97 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.16 dB  
SAR (1g): 0.218 mW/g, SAR (10g): 0.156 mW/g

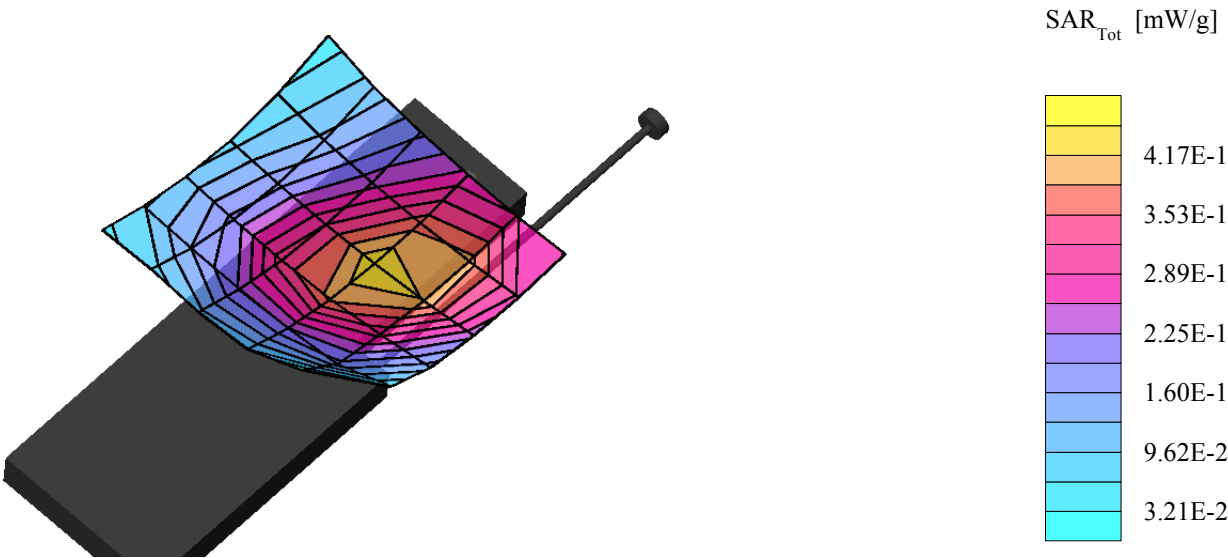
Head SAR - Left Ear/Tilt Position  
Antenna In  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.10 dB  
SAR (1g): 0.421 mW/g, SAR (10g): 0.302 mW/g

Head SAR - Left Ear/Tilt Position  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



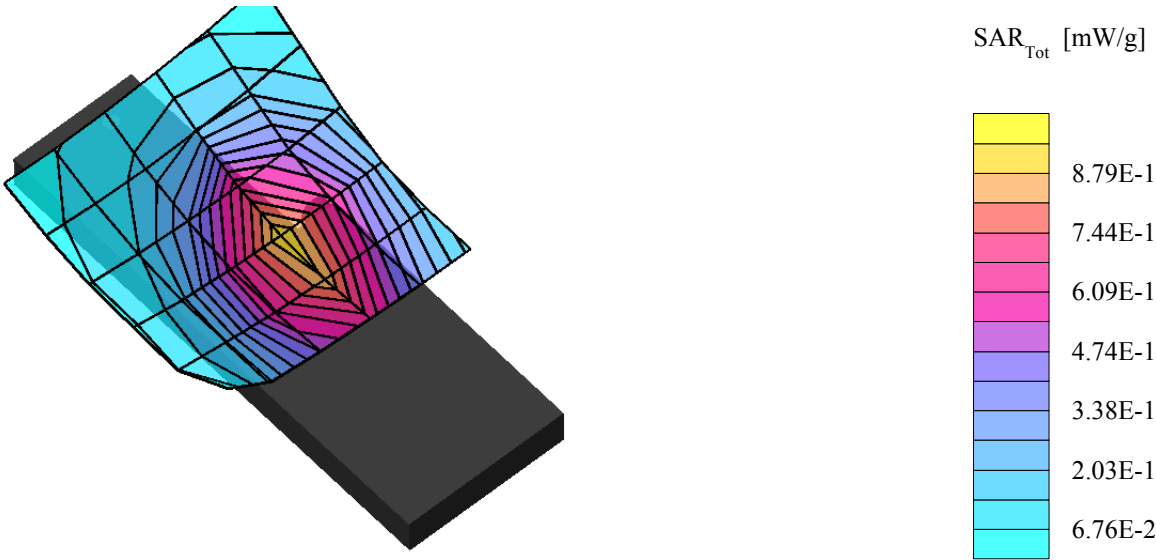
## **HEAD SAR TEST PLOTS - AMPS MODE - RIGHT EAR**



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.02 dB  
SAR (1g): 0.853 mW/g, SAR (10g): 0.567 mW/g

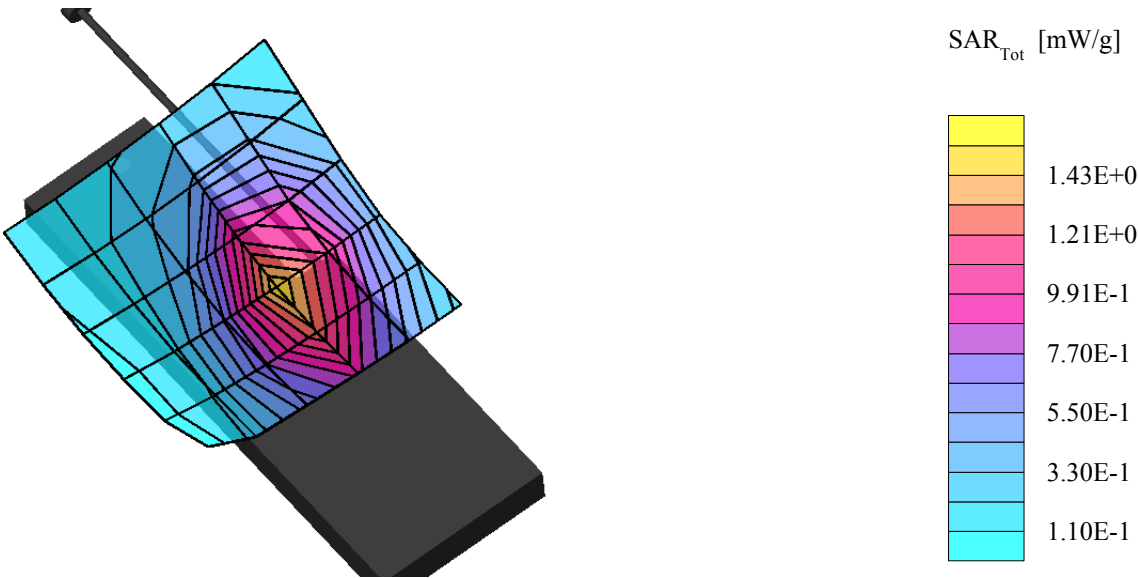
Head SAR - Right Cheek/Touch Position  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
AMPS Mode  
Channel 991 [824.04 MHz]  
Conducted Power: 26.14 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.18 dB  
SAR (1g): 1.40 mW/g, SAR (10g): 0.896 mW/g

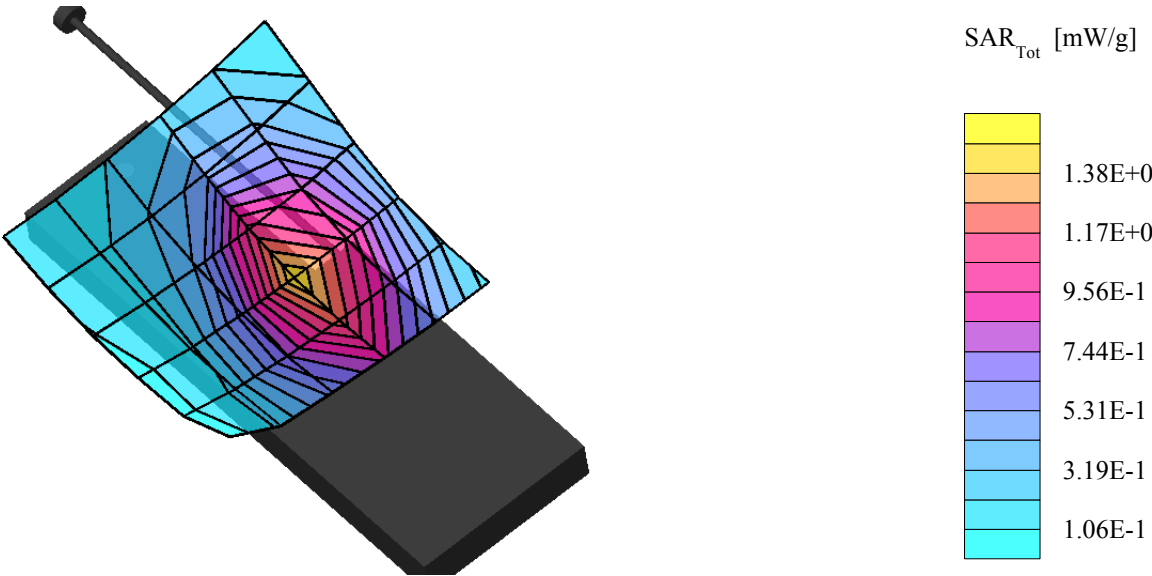
Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
AMPS Mode  
Channel 991 [824.04 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.20 dB  
SAR (1g): 1.36 mW/g, SAR (10g): 0.870 mW/g

Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Extended Battery  
AMPS Mode  
Channel 991 [824.04 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



# Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.0$   $\rho = 1.00$  g/cm<sup>3</sup>  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.08 dB  
SAR (1g): 0.848 mW/g, SAR (10g): 0.555 mW/g

Head SAR - Right Cheek/Touch Position

Antenna In

Withus Model: WCE-210

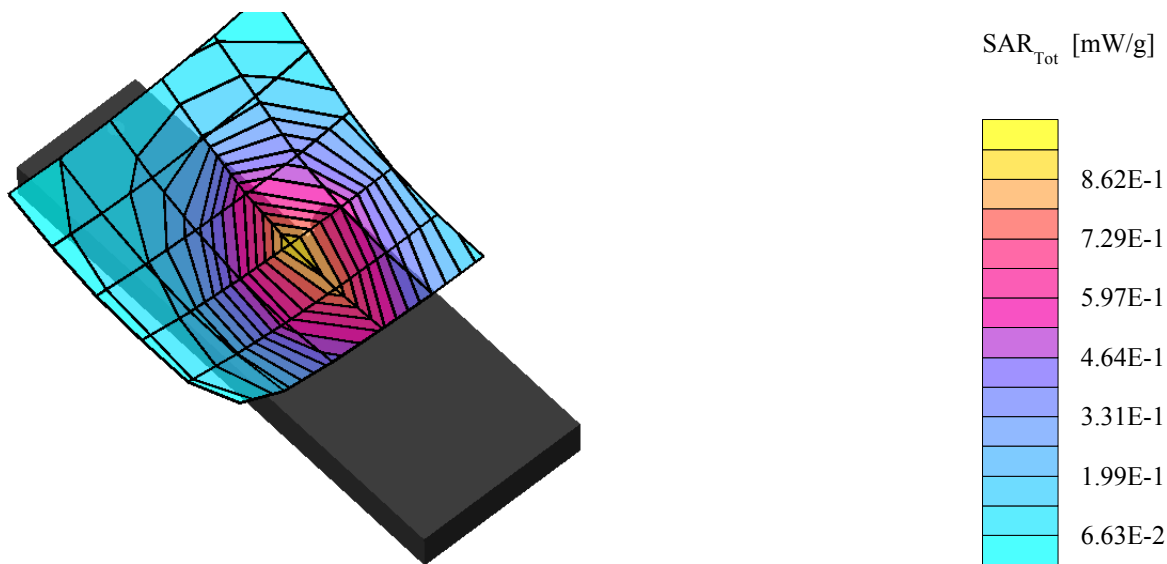
Standard Battery

AMPS Mode

Channel 383 [836.49 MHz]

Conducted Power: 26.10 dBm

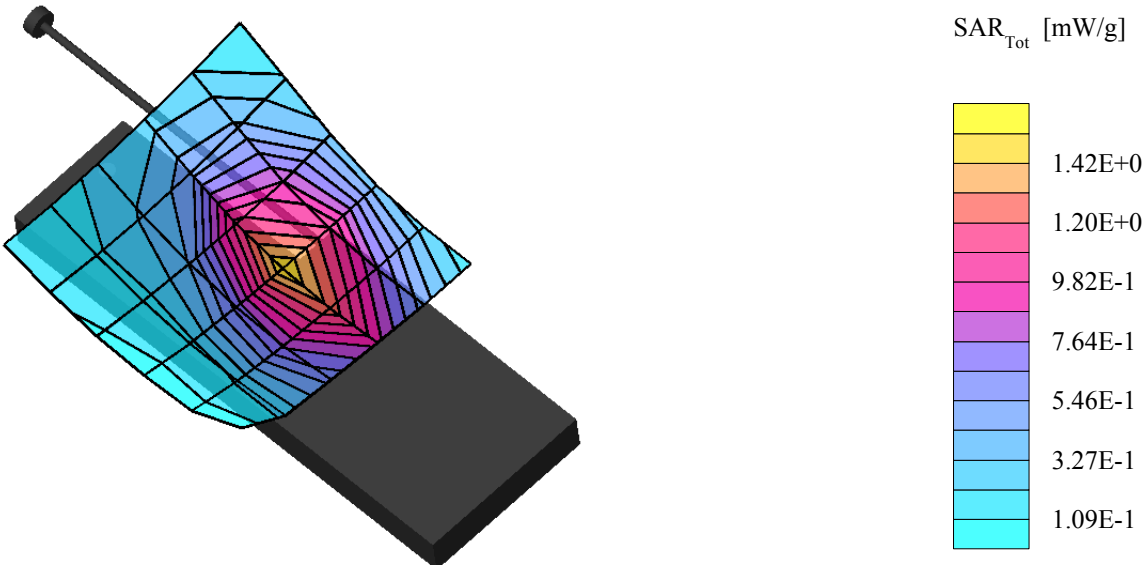
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.11 dB  
SAR (1g): 1.45 mW/g, SAR (10g): 0.920 mW/g

Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section

Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0;  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.0$   $\rho = 1.00$  g/cm<sup>3</sup>

Z-Axis Extrapolation at Peak SAR Location

Head SAR - Right Cheek/Touch Position

Antenna Out

Standard Battery

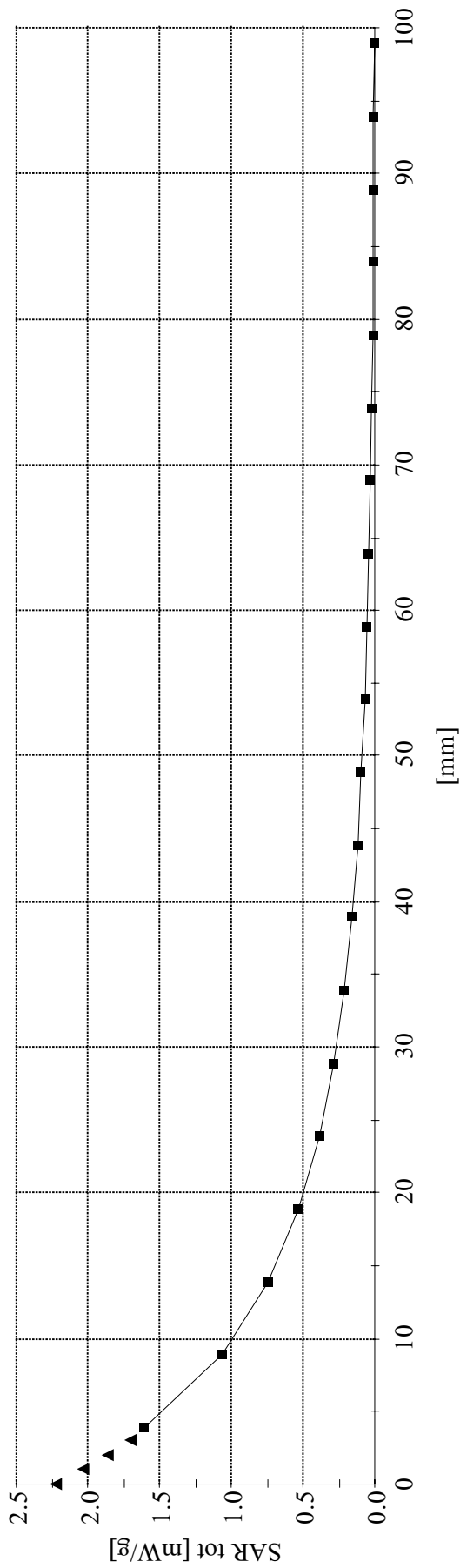
Withus Model: WCE-210

AMPS Mode

Channel 383 [836.49 MHz]

Conducted Power: 26.10 dBm

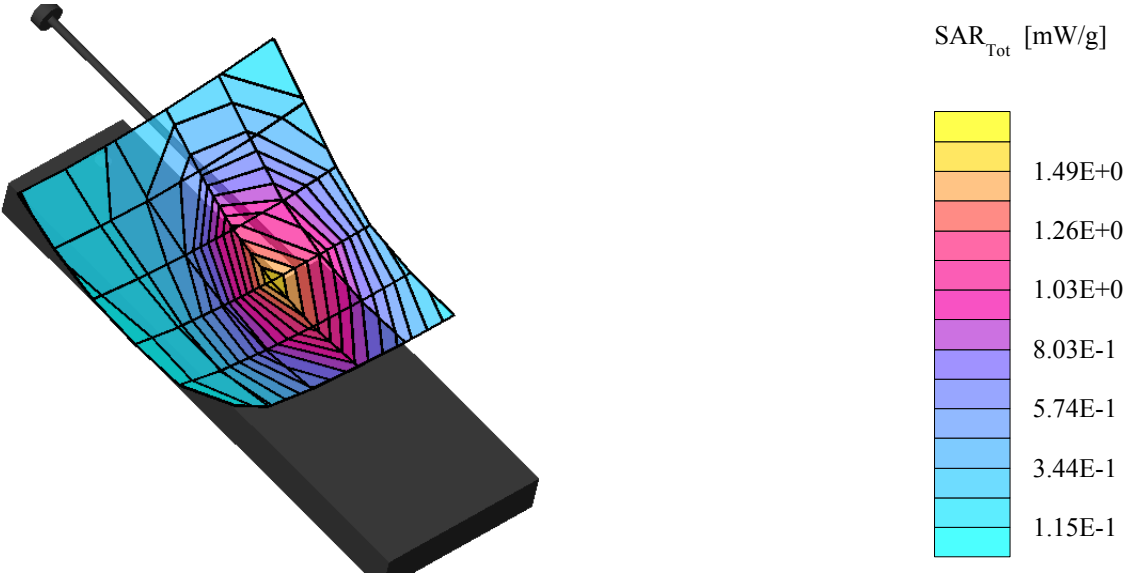
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.0$   $\rho = 1.00$  g/cm<sup>3</sup>  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.09 dB  
SAR (1g): 1.45 mW/g, SAR (10g): 0.923 mW/g

Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Extended Battery  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210  
SAM Phantom; Right Cheek Section  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0;  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.0$   $\rho = 1.00$  g/cm<sup>3</sup>

Z-Axis Extrapolation at Peak SAR Location

Head SAR - Right Cheek/Touch Position  
Antenna Out

Extended Battery

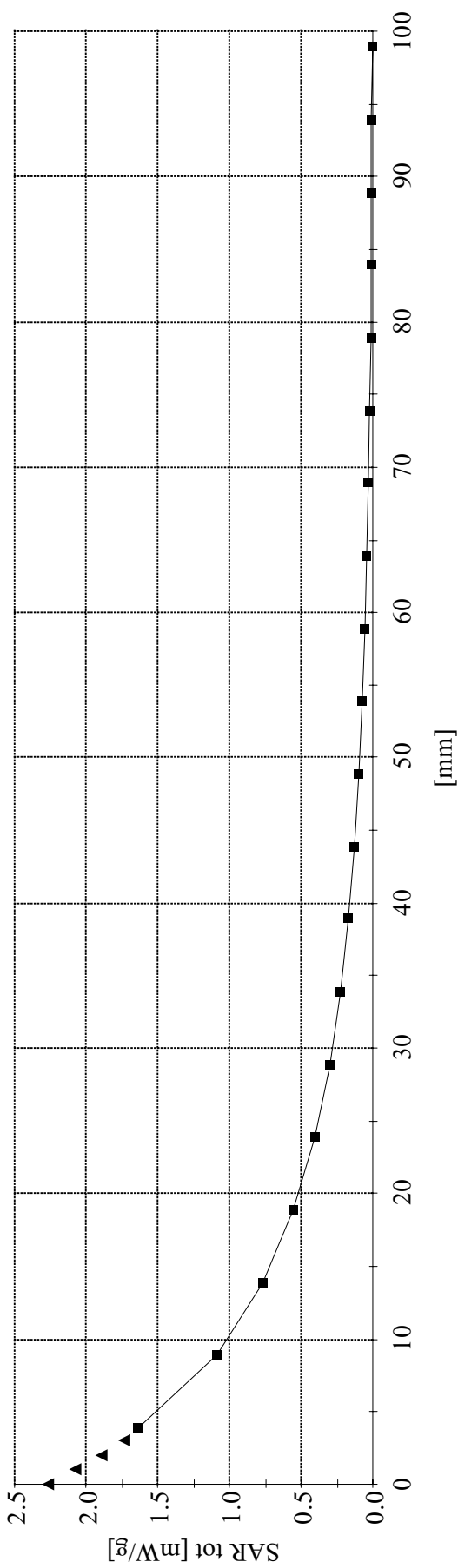
Withus Model: WCE-210

AMPS Mode

Channel 383 [836.49 MHz]

Conducted Power: 26.10 dBm

Date Tested: January 16, 2002

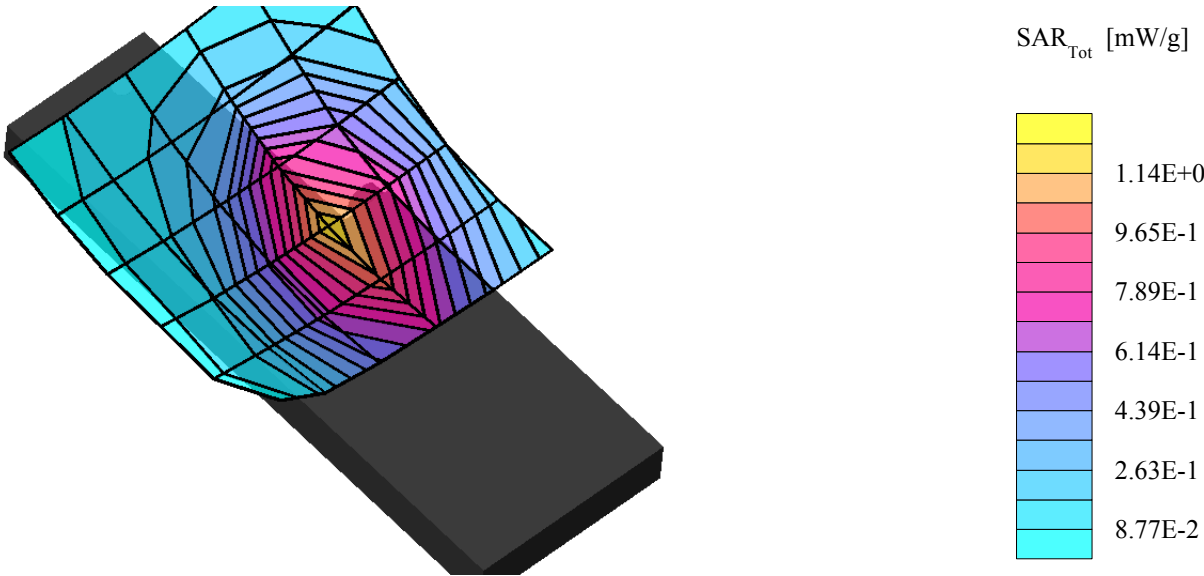




Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.15 dB  
SAR (1g): 1.10 mW/g, SAR (10g): 0.699 mW/g

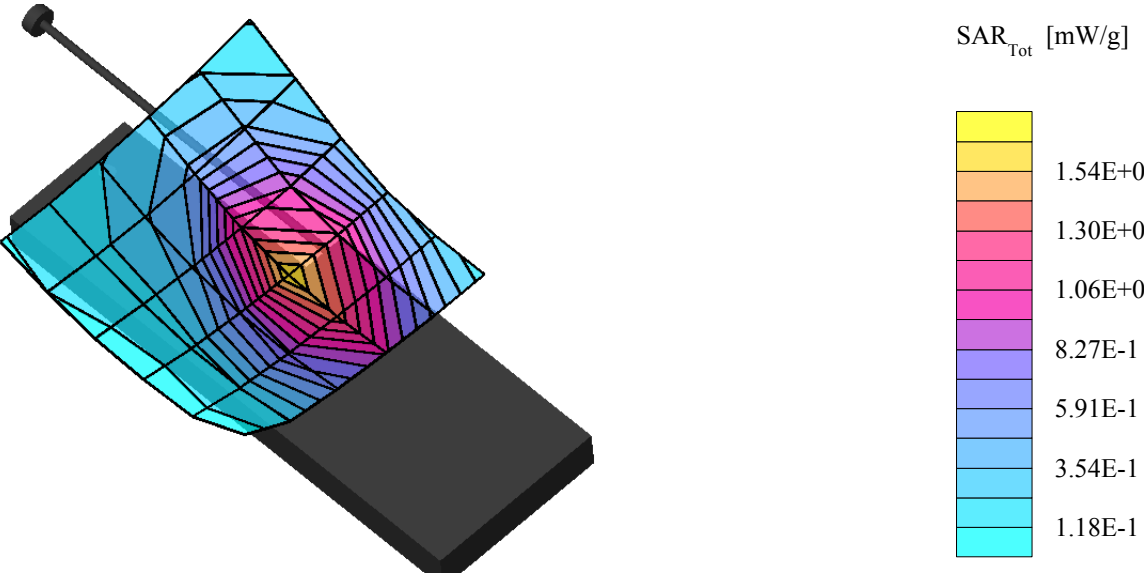
Head SAR - Right Cheek/Touch Position  
Antenna In  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 799 [848.97 MHz]  
Conducted Power: 26.12 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.19 dB  
SAR (1g): 1.44 mW/g, SAR (10g): 0.916 mW/g

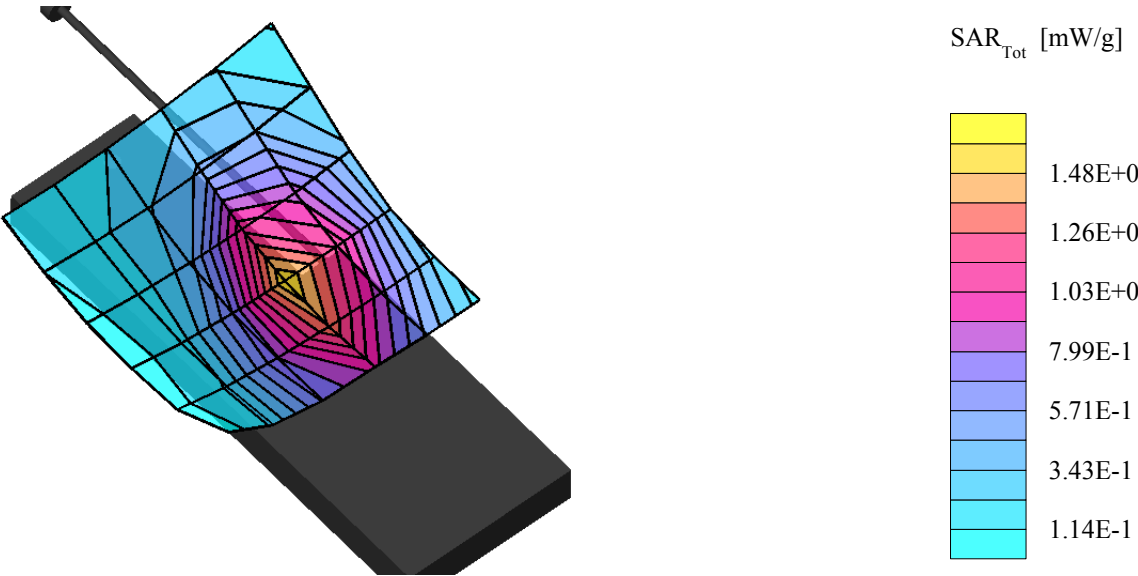
Head SAR - Right Cheek/Touch Position  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 799 [848.97 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.0$   $\rho = 1.00$  g/cm<sup>3</sup>  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.15 dB  
SAR (1g): 1.41 mW/g, SAR (10g): 0.896 mW/g

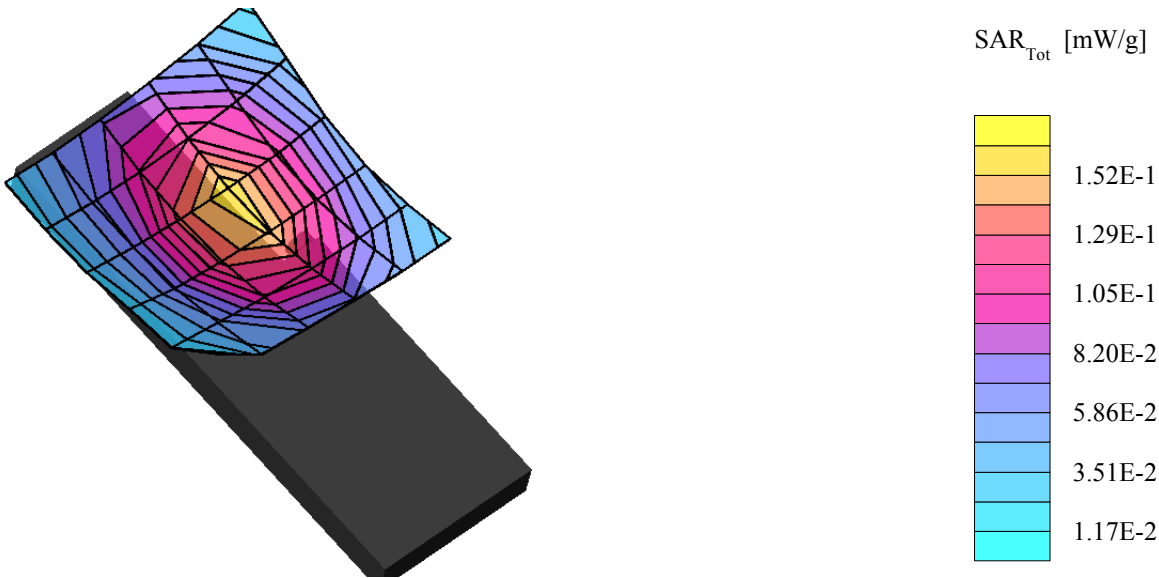
Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Extended Battery  
AMPS Mode  
Channel 799 [848.97 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



# Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (80°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.12 dB  
SAR (1g): 0.152 mW/g, SAR (10g): 0.108 mW/g

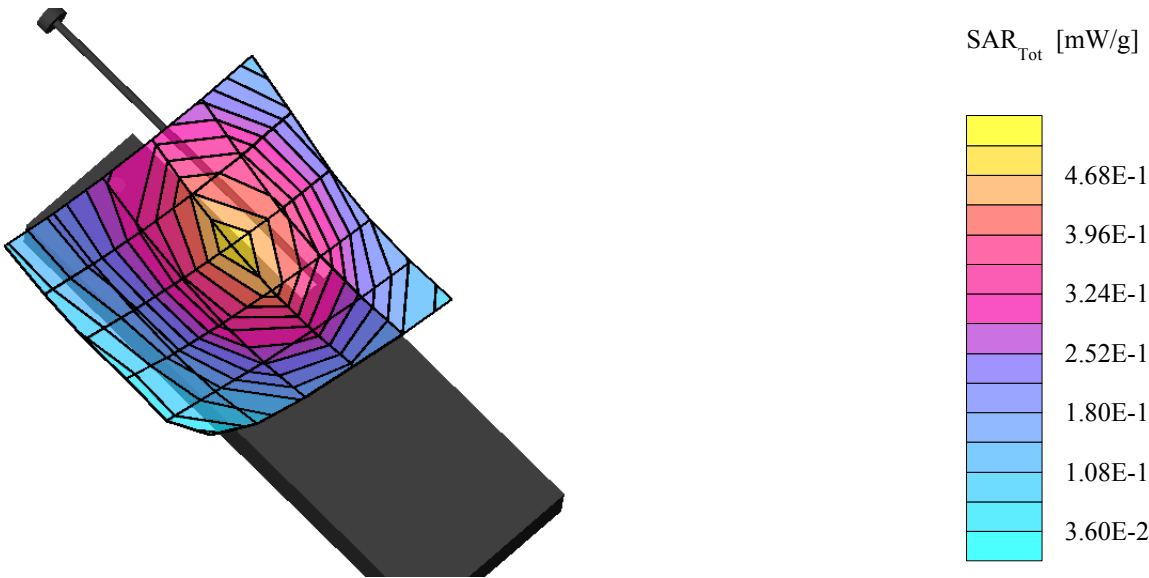
Head SAR - Right Ear/Tilt Position  
Antenna In  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (80°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.03 dB  
SAR (1g): 0.487 mW/g, SAR (10g): 0.345 mW/g

Head SAR - Right Ear/Tilt Position  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 16, 2002

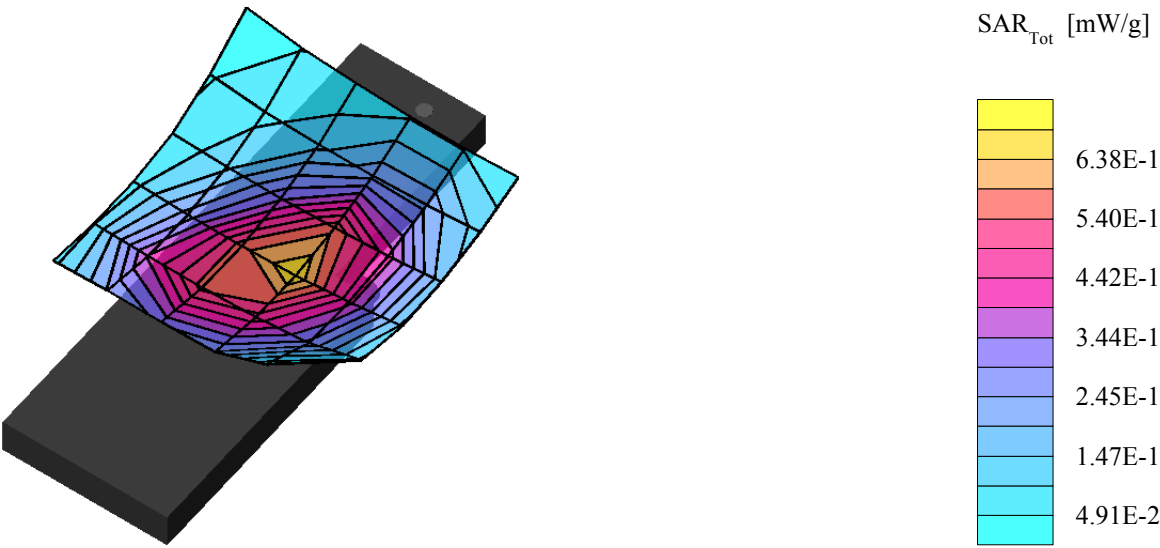


## **HEAD SAR TEST PLOTS - CDMA MODE - LEFT EAR**

Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.2$   $\rho = 1.00$  g/cm<sup>3</sup>  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.05 dB  
SAR (1g): 0.644 mW/g, SAR (10g): 0.437 mW/g

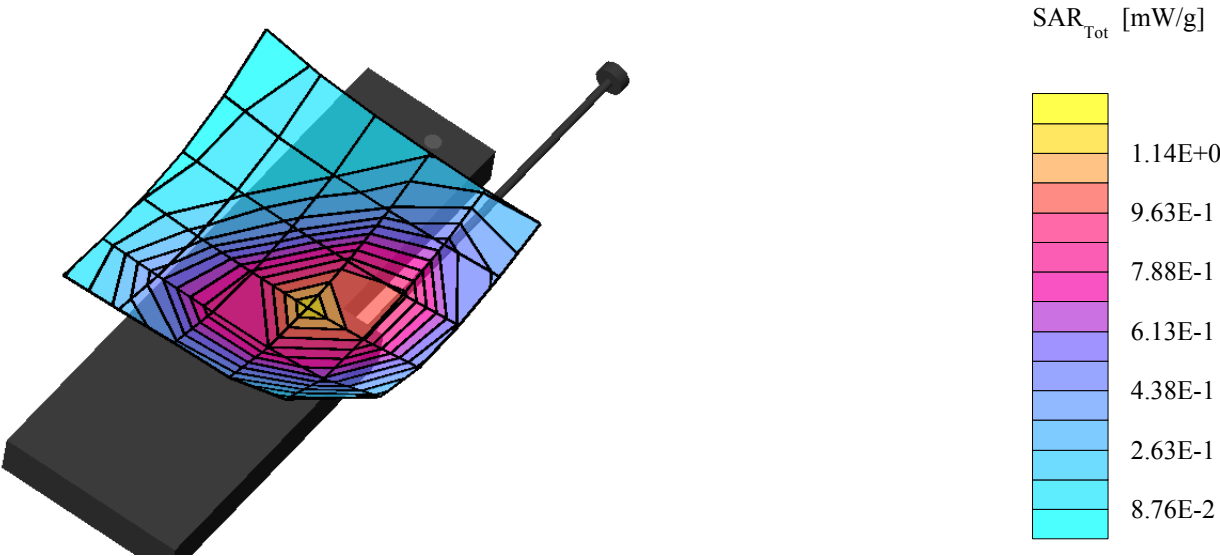
Head SAR - Left Cheek/Touch Position  
Antenna In  
Standard Battery  
Withus Model: WCE-210  
CDMA Mode  
Channel 1013 [824.70 MHz]  
Conducted Power: 25.13 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.02 dB  
SAR (1g): 1.14 mW/g, SAR (10g): 0.758 mW/g

Head SAR - Left Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 1013 [824.70 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002

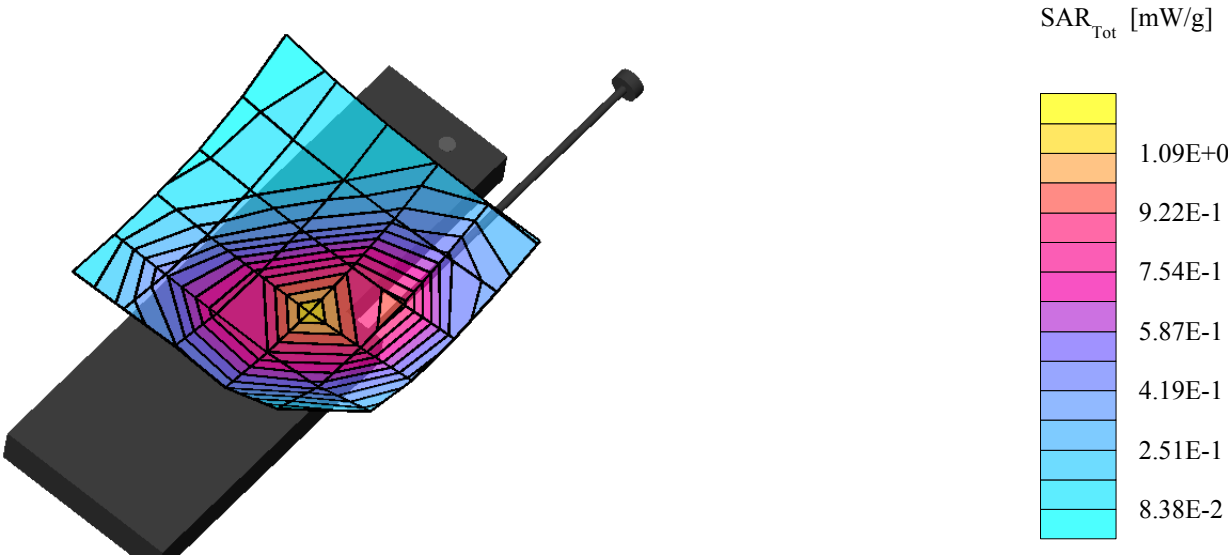




Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.04 dB  
SAR (1g): 1.10 mW/g, SAR (10g): 0.732 mW/g

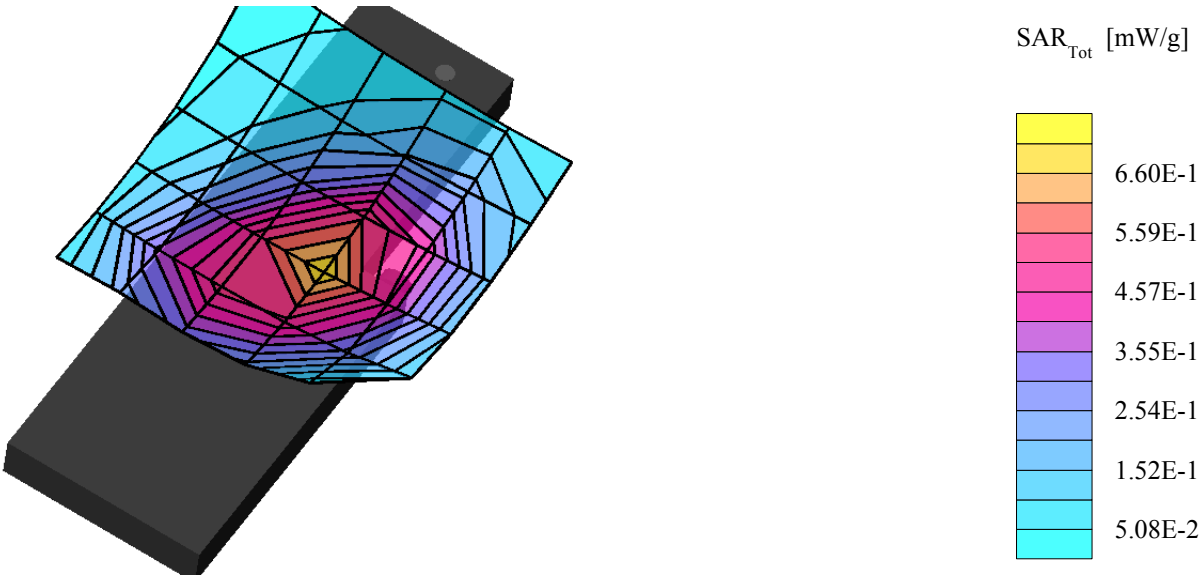
Head SAR - Left Cheek/Touch Position  
Antenna Out  
Extended Battery  
Withus Model: WCE-210  
CDMA Mode  
Channel 1013 [824.70 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: --0.16 dB  
SAR (1g): 0.663 mW/g, SAR (10g): 0.443 mW/g

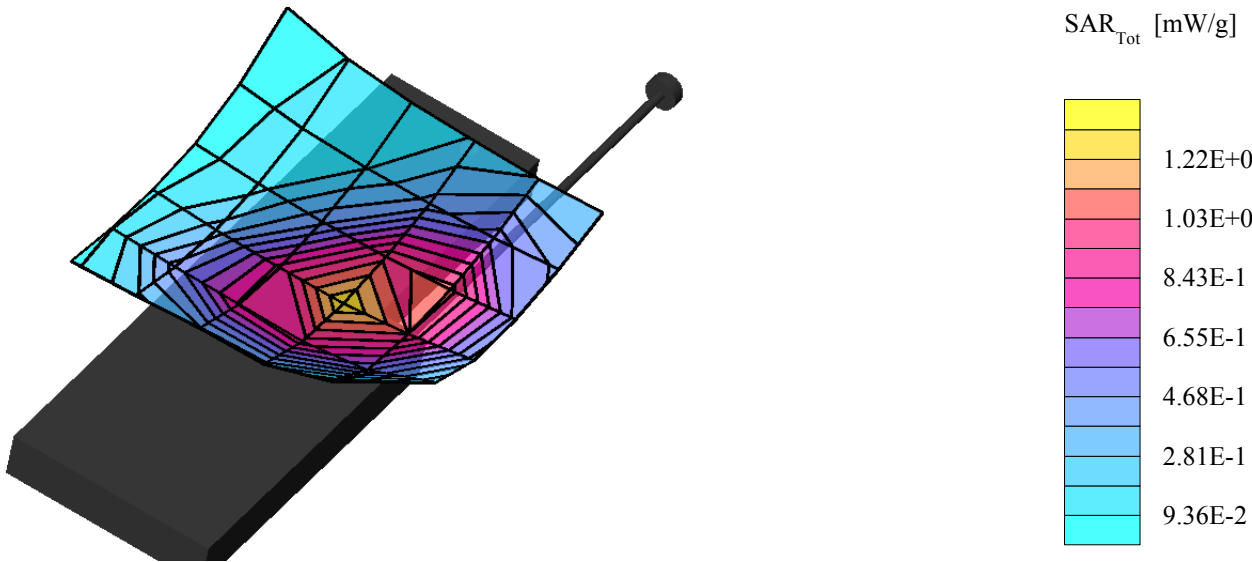
Head SAR - Left Cheek/Touch Position  
Antenna In  
Standard Battery  
Withus Model: WCE-210  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.13 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.13 dB  
SAR (1g): 1.21 mW/g, SAR (10g): 0.797 mW/g

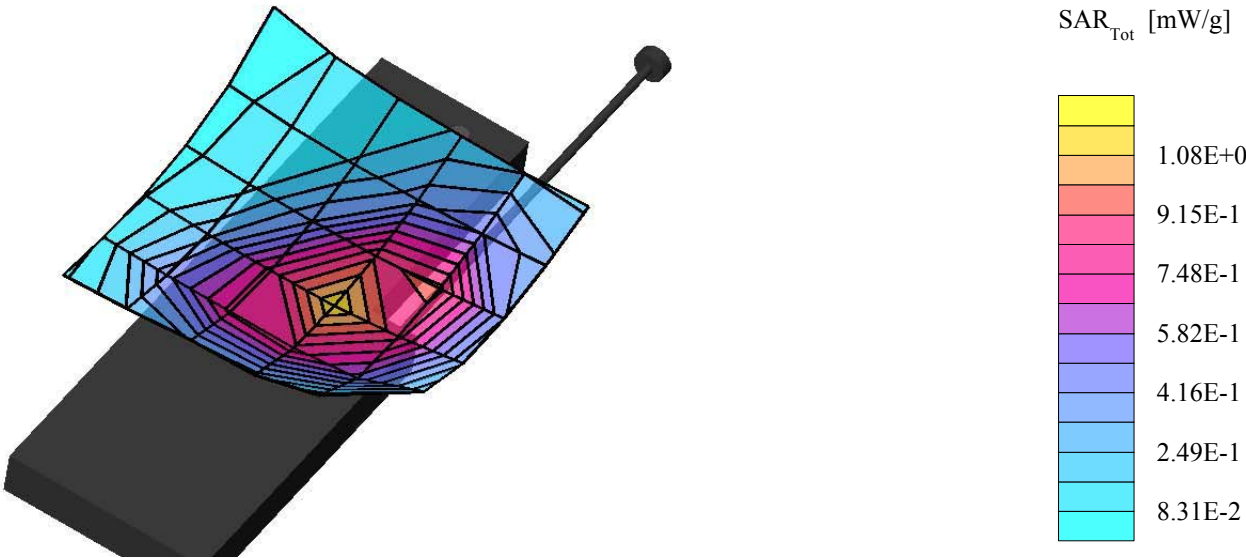
Head SAR - Left Cheek/Touch Position  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.14 dB  
SAR (1g): 1.09 mW/g, SAR (10g): 0.717 mW/g

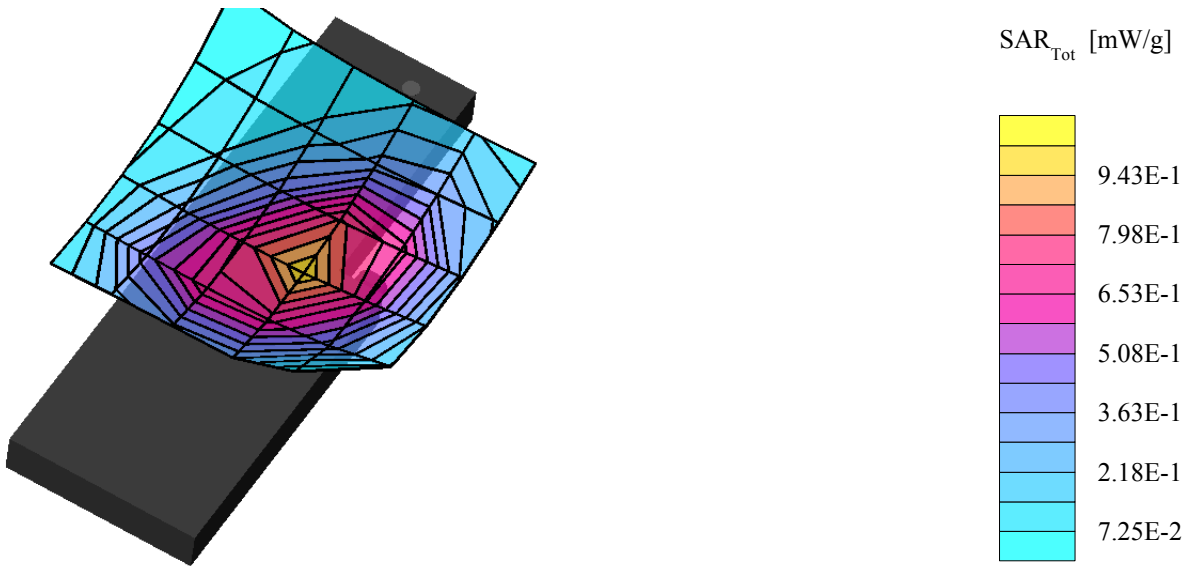
Head SAR - Left Cheek/Touch Position  
Antenna Out  
Extended Battery  
Withus Model: WCE-210  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.15 dB  
SAR (1g): 0.928 mW/g, SAR (10g): 0.612 mW/g

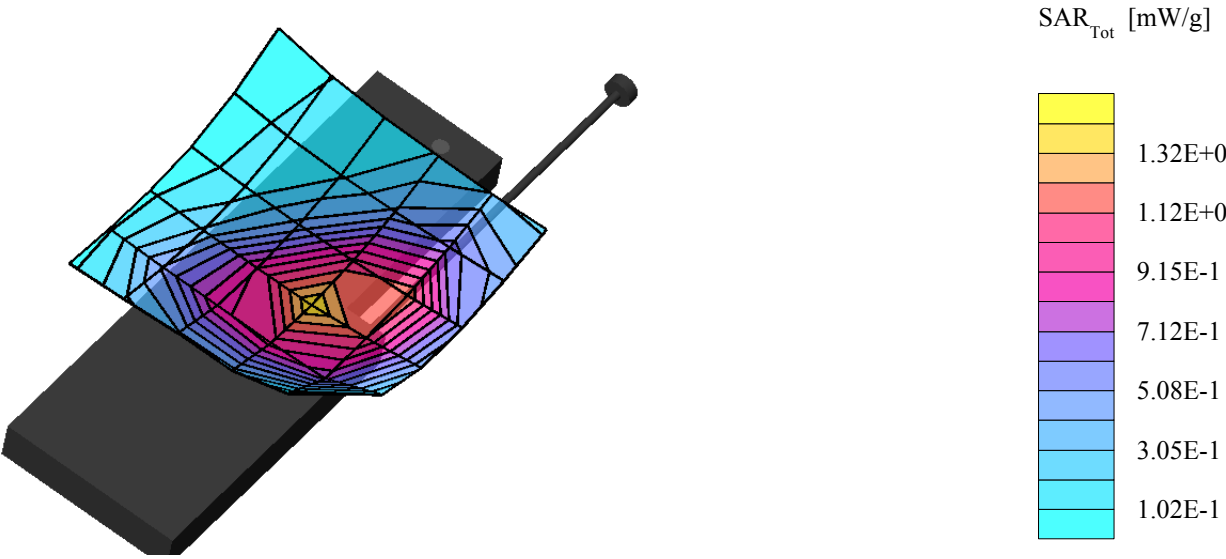
Head SAR - Left Cheek/Touch Position  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.10 dB  
SAR (1g): 1.34 mW/g, SAR (10g): 0.880 mW/g

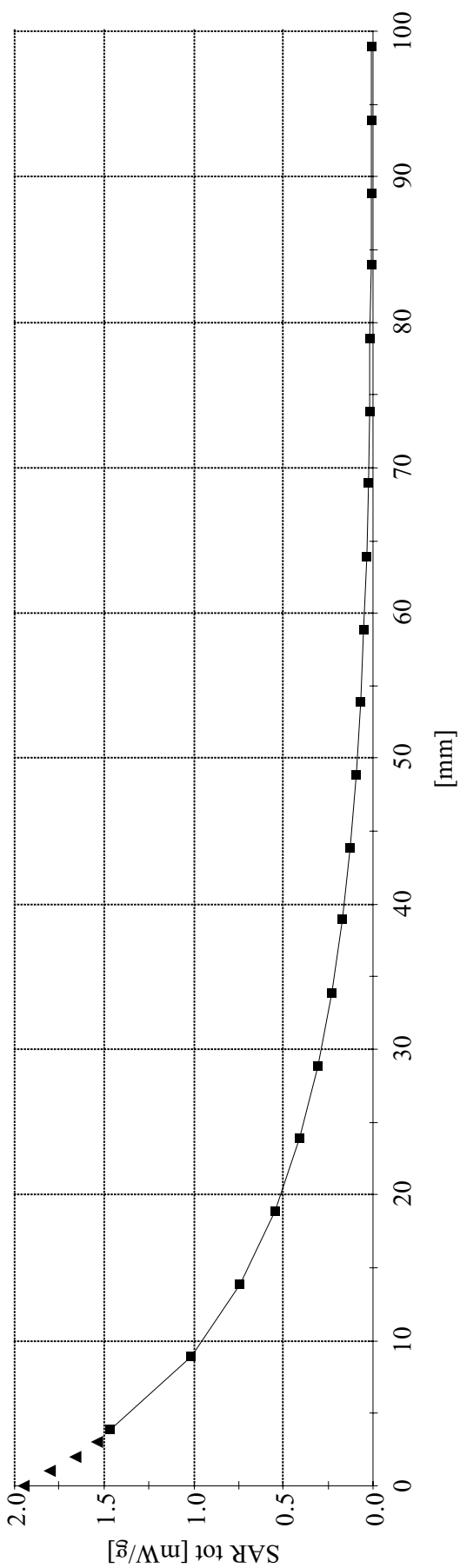
Head SAR - Left Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.13 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210  
SAM Phantom; Left Cheek Section  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0;  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.2$   $\rho = 1.00$  g/cm<sup>3</sup>

Z-Axis Extrapolation at Peak SAR Location

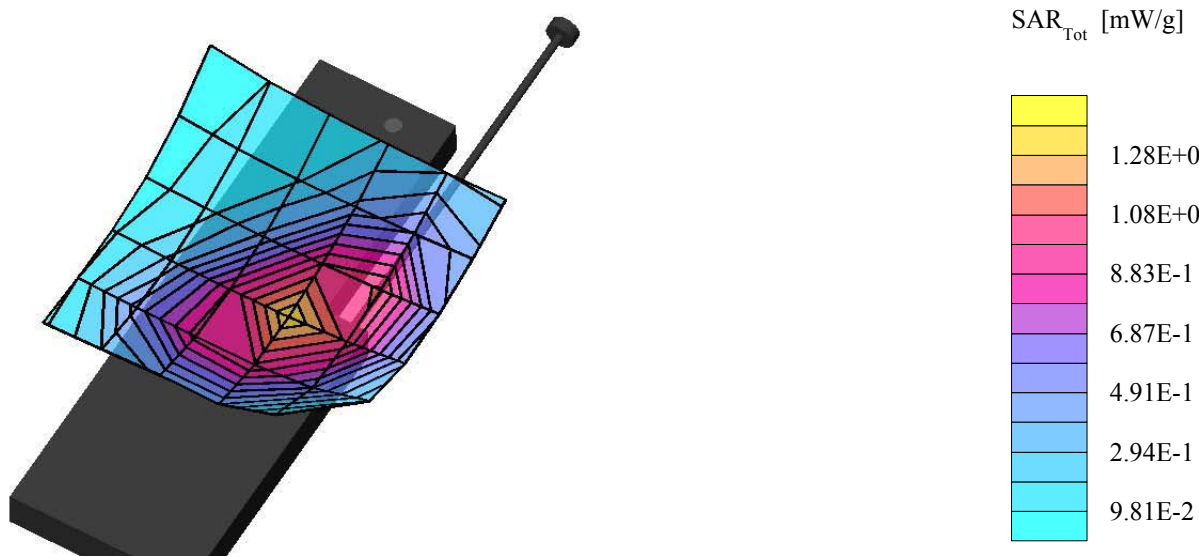
Head SAR - Left Cheek/Touch Position  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.13 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (65°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.18 dB  
SAR (1g): 1.22 mW/g, SAR (10g): 0.798 mW/g

Head SAR - Left Cheek/Touch Position  
Antenna Out  
Extended Battery  
Withus Model: WCE-210  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002

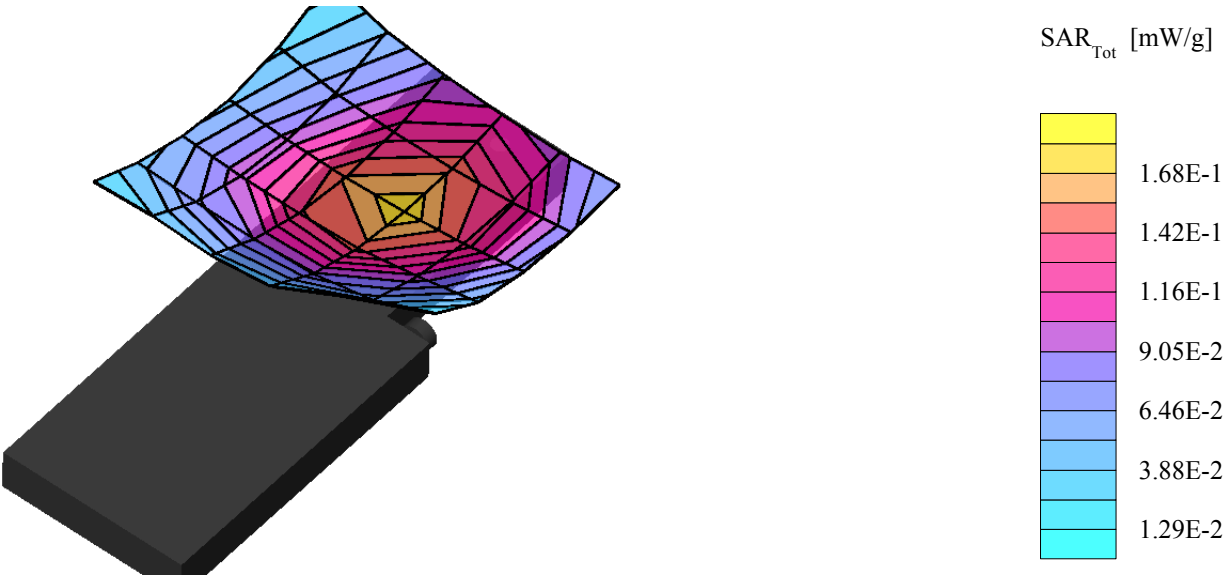




Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (80°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.20 dB  
SAR (1g): 0.172 mW/g, SAR (10g): 0.125 mW/g

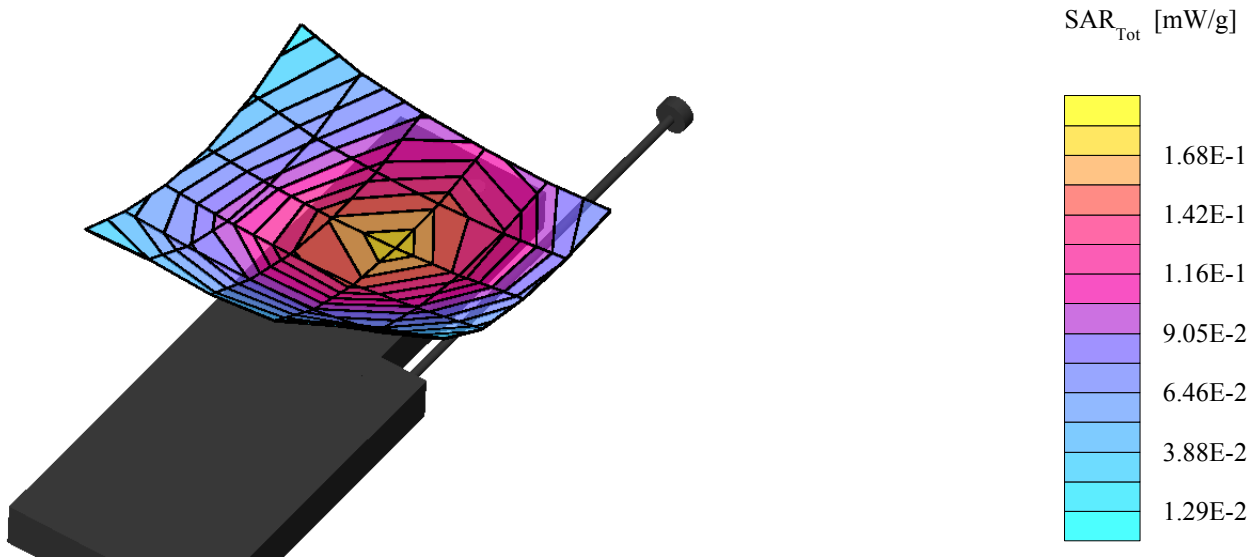
Head SAR - Left Ear/Tilt Position  
Antenna In  
Standard Battery  
Withus Model: WCE-210  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Left Cheek Section; Position: (80°,180°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.2$   $\rho = 1.00$  g/cm<sup>3</sup>  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.07 dB  
SAR (1g): 0.383 mW/g, SAR (10g): 0.269 mW/g

Head SAR - Left Ear/Tilt Position  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002

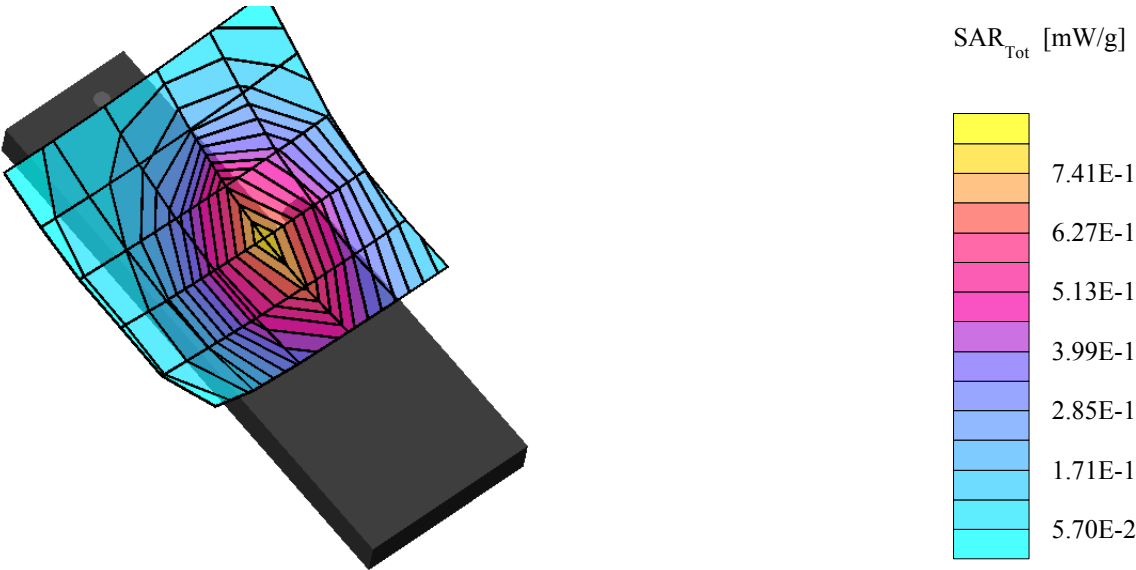


## **HEAD SAR TEST PLOTS - CDMA MODE - RIGHT EAR**

Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.00 dB  
SAR (1g): 0.719 mW/g, SAR (10g): 0.478 mW/g

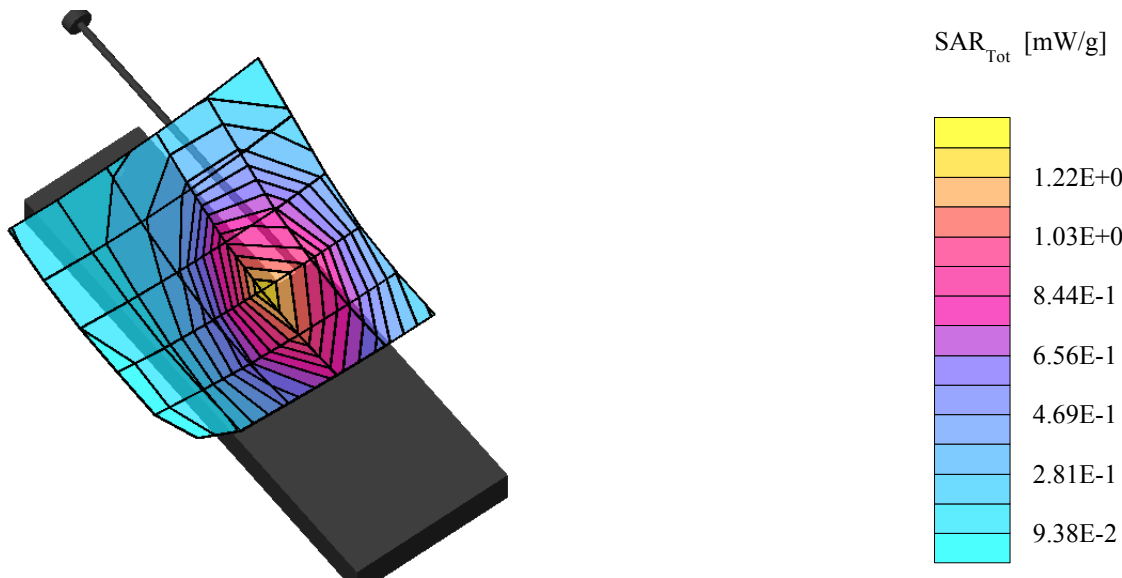
Head SAR - Right Cheek/Touch Position  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 1013 [824.70 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

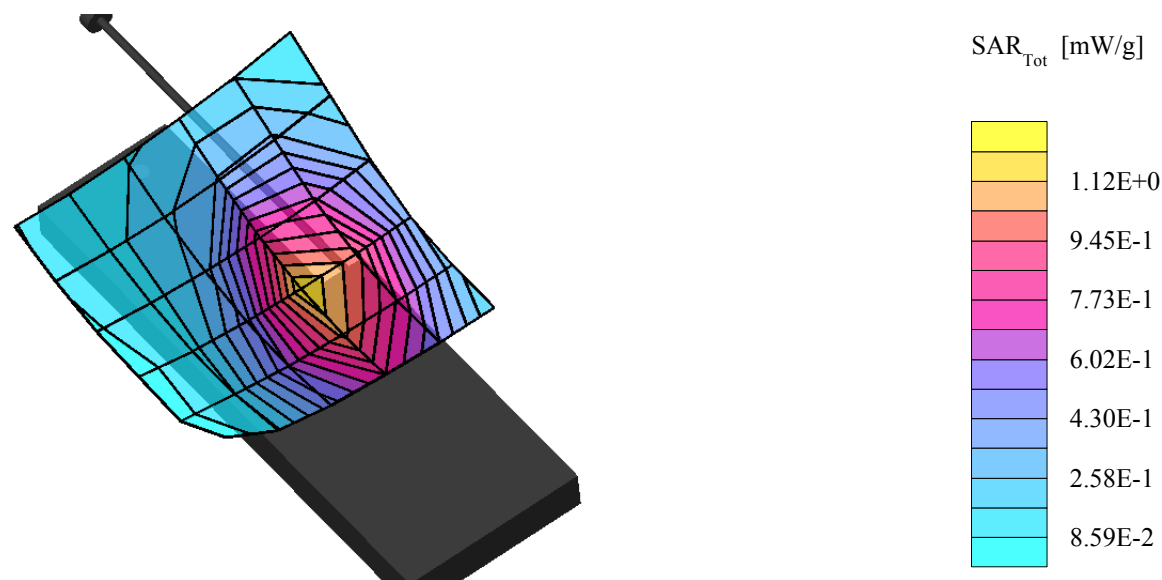
SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.02 dB  
SAR (1g): 1.22 mW/g, SAR (10g): 0.771 mW/g

Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 1013 [824.70 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210  
SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.2$   $\rho = 1.00$  g/cm<sup>3</sup>  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.09 dB  
SAR (1g): 1.15 mW/g, SAR (10g): 0.737 mW/g

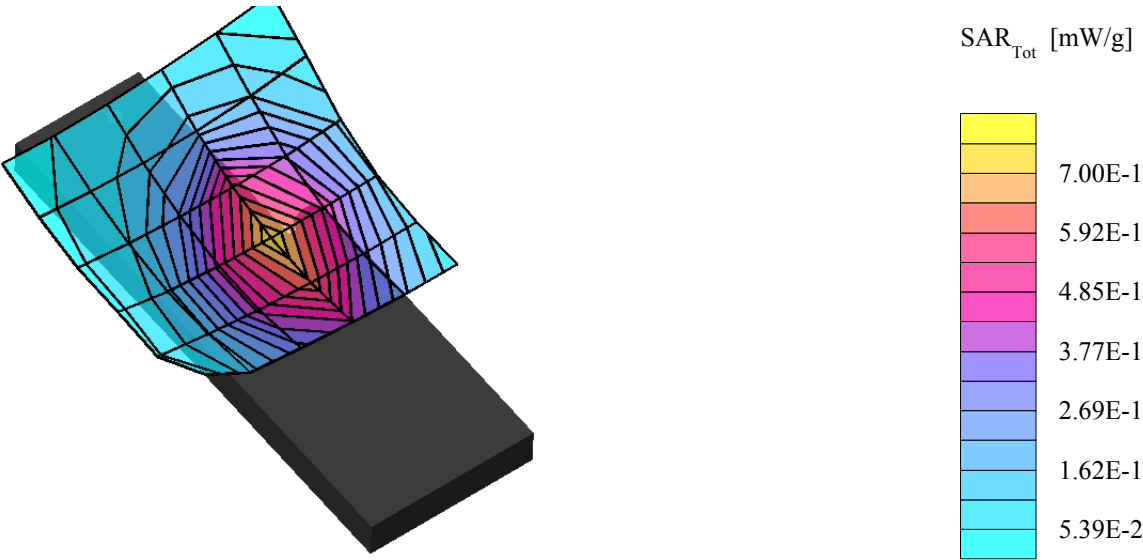
Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Extended Battery  
CDMA Mode  
Channel 1013 [824.70 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.15 dB  
SAR (1g): 0.683 mW/g, SAR (10g): 0.448 mW/g

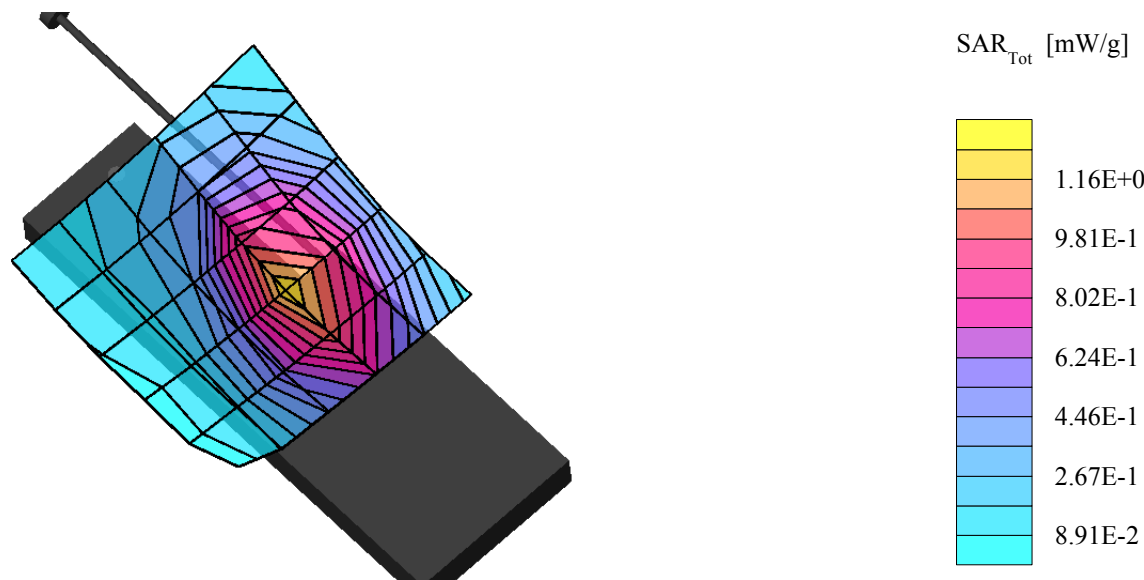
Head SAR - Right Cheek/Touch Position  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.18 dB  
SAR (1g): 1.16 mW/g, SAR (10g): 0.739 mW/g

Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.12 dBm  
Date Tested: January 17, 2002

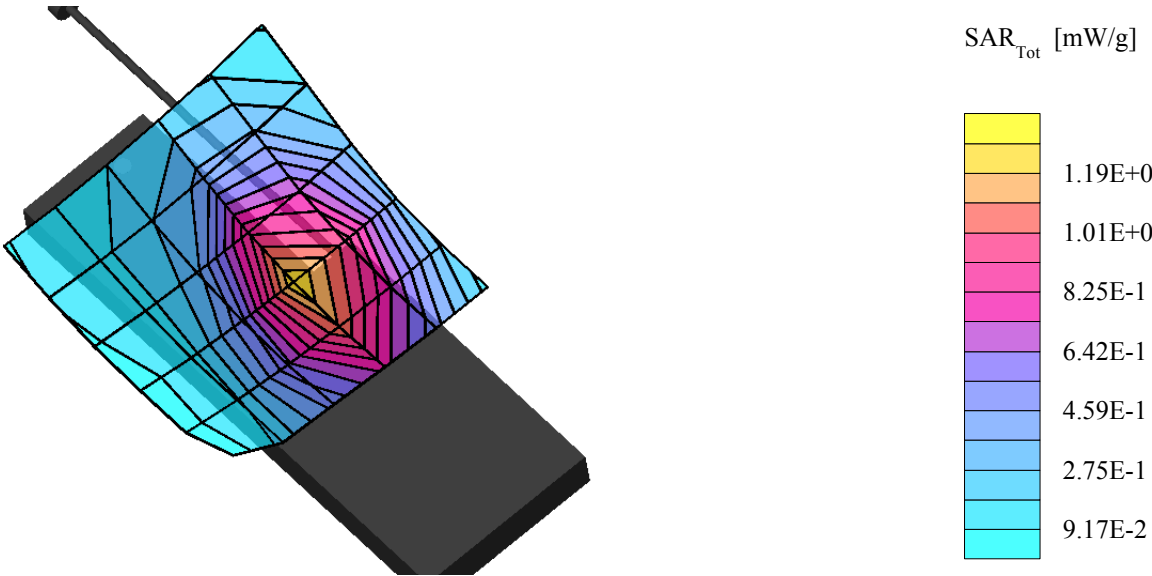




Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.08 dB  
SAR (1g): 1.21 mW/g, SAR (10g): 0.771 mW/g

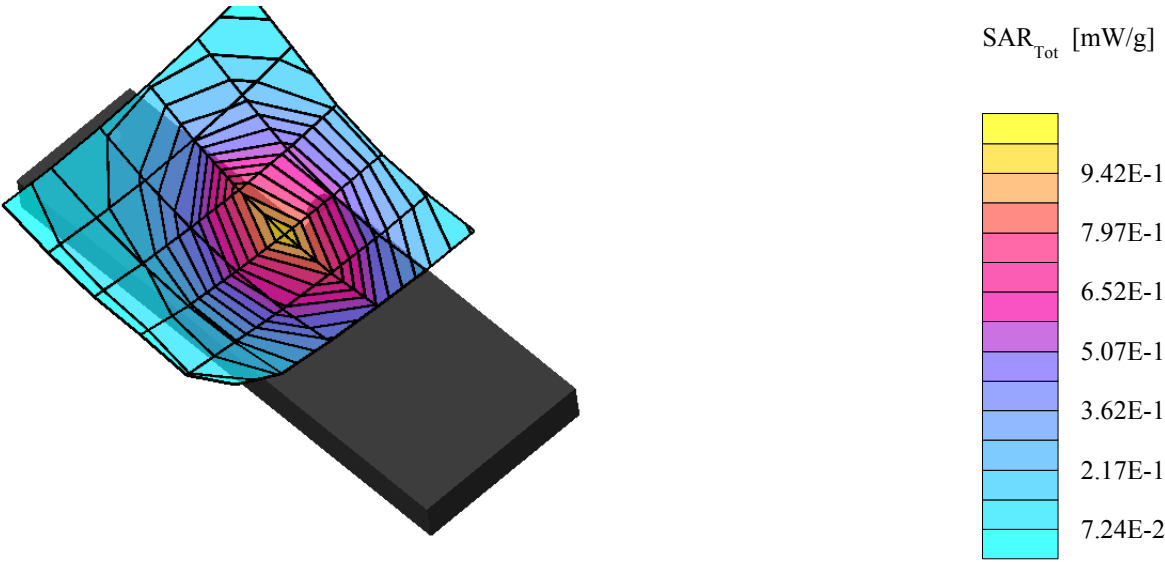
Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Extended Battery  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.20 dB  
SAR (1g): 0.917 mW/g, SAR (10g): 0.584 mW/g

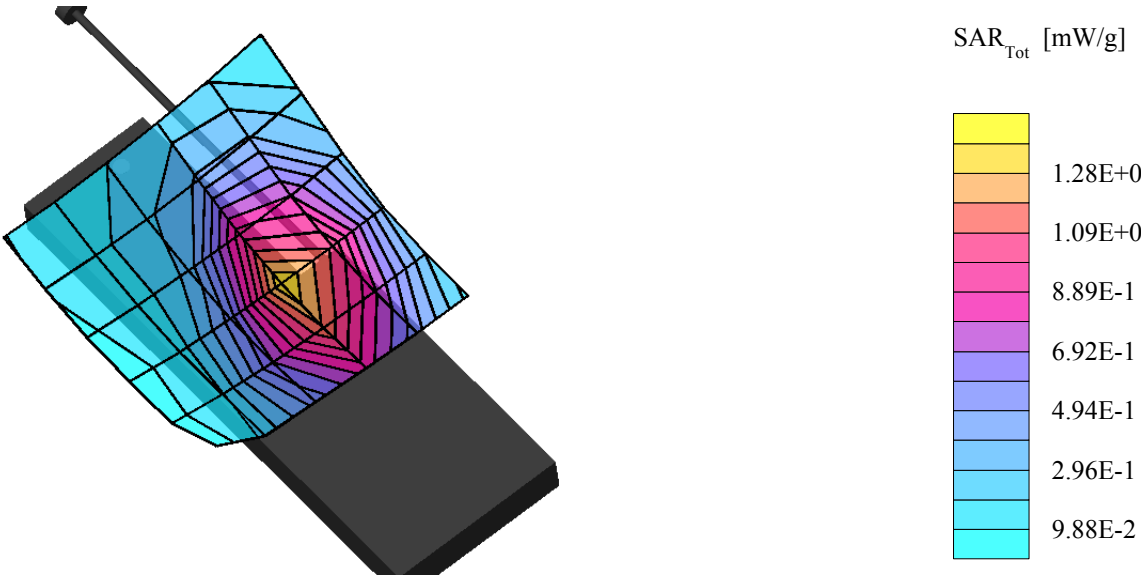
Head SAR - Right Cheek/Touch Position  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.15 dB  
SAR (1g): 1.35 mW/g, SAR (10g): 0.848 mW/g

Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210  
SAM Phantom; Right Cheek Section  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0;  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.2$   $\rho = 1.00$  g/cm<sup>3</sup>

Z-Axis Extrapolation at Peak SAR Location

Head SAR - Right Cheek/Touch Position  
Antenna Out

Standard Battery

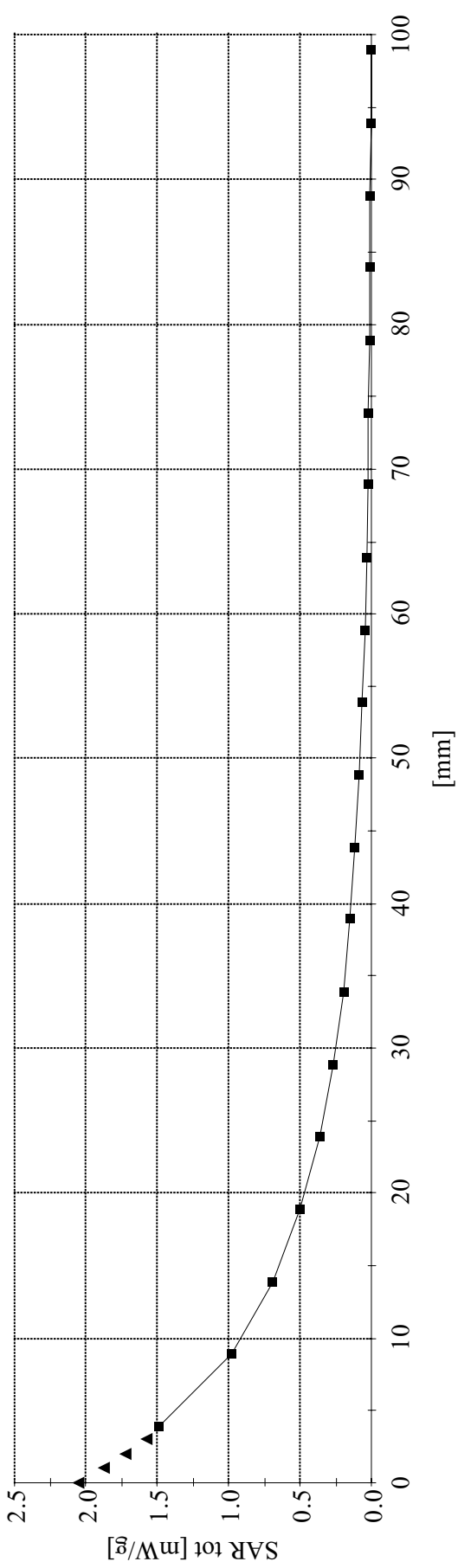
Withus Model: WCE-210

CDMA Mode

Channel 777 [848.31 MHz]

Conducted Power: 25.10 dBm

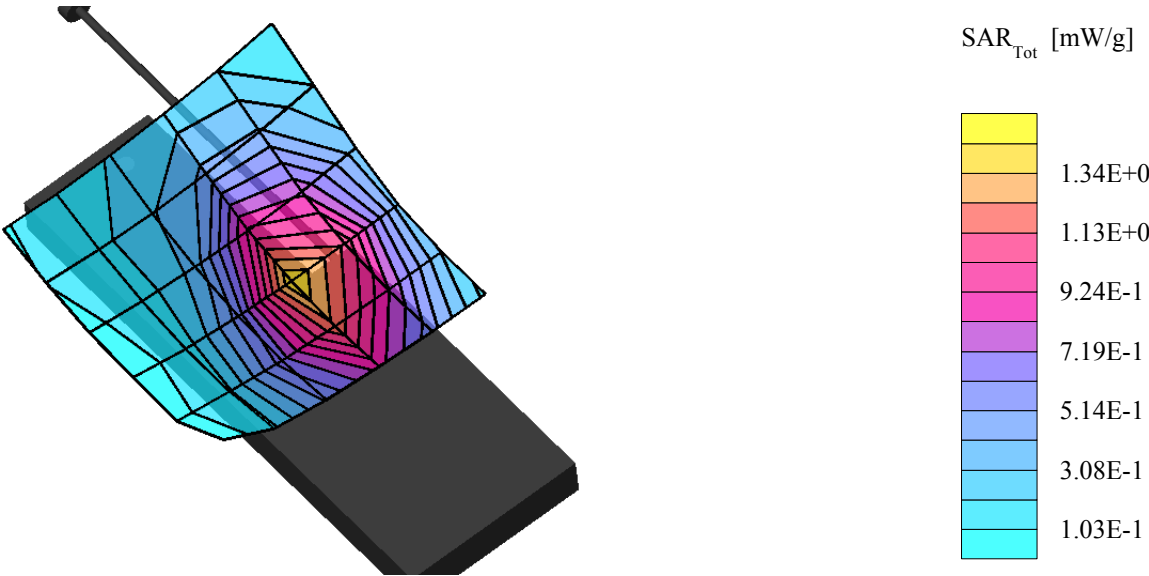
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

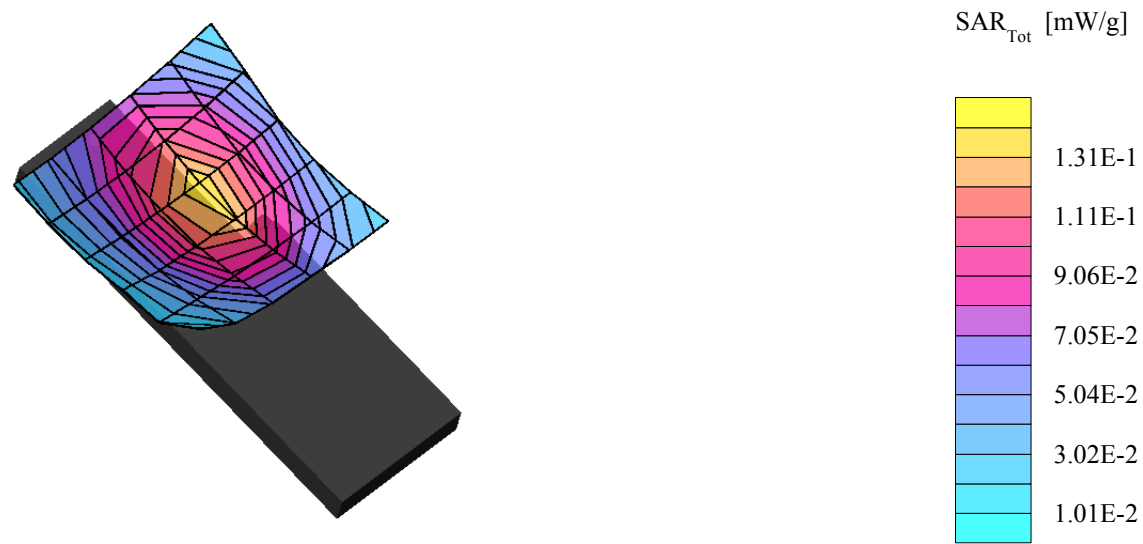
SAM Phantom; Right Cheek Section; Position: (65°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.12 dB  
SAR (1g): 1.32 mW/g, SAR (10g): 0.835 mW/g

Head SAR - Right Cheek/Touch Position  
Antenna Out  
Withus Model: WCE-210  
Extended Battery  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.11 dBm  
Date Tested: January 17, 2002



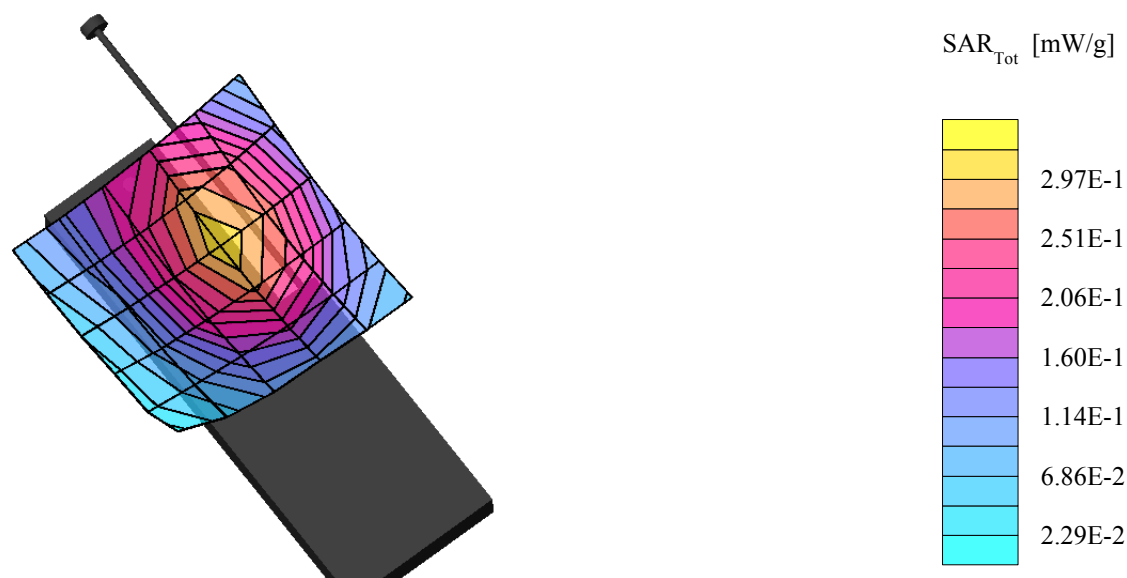
Withus IT Co. Ltd. FCC ID: POQWCE-210  
SAM Phantom; Right Cheek Section; Position: (80°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90 \text{ mho/m}$   $\epsilon_r = 41.2$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.10 dB  
SAR (1g): 0.137 mW/g, SAR (10g): 0.0969 mW/g

Head SAR - Right Ear/Tilt Position  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.14 dBm  
Date Tested: January 17, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210  
SAM Phantom; Right Cheek Section; Position: (80°,230°)  
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0  
835 MHz Brain:  $\sigma = 0.90$  mho/m  $\epsilon_r = 41.2$   $\rho = 1.00$  g/cm<sup>3</sup>  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.06 dB  
SAR (1g): 0.373 mW/g, SAR (10g): 0.264 mW/g

Head SAR - Right Ear/Tilt Position  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.10 dBm  
Date Tested: January 17, 2002



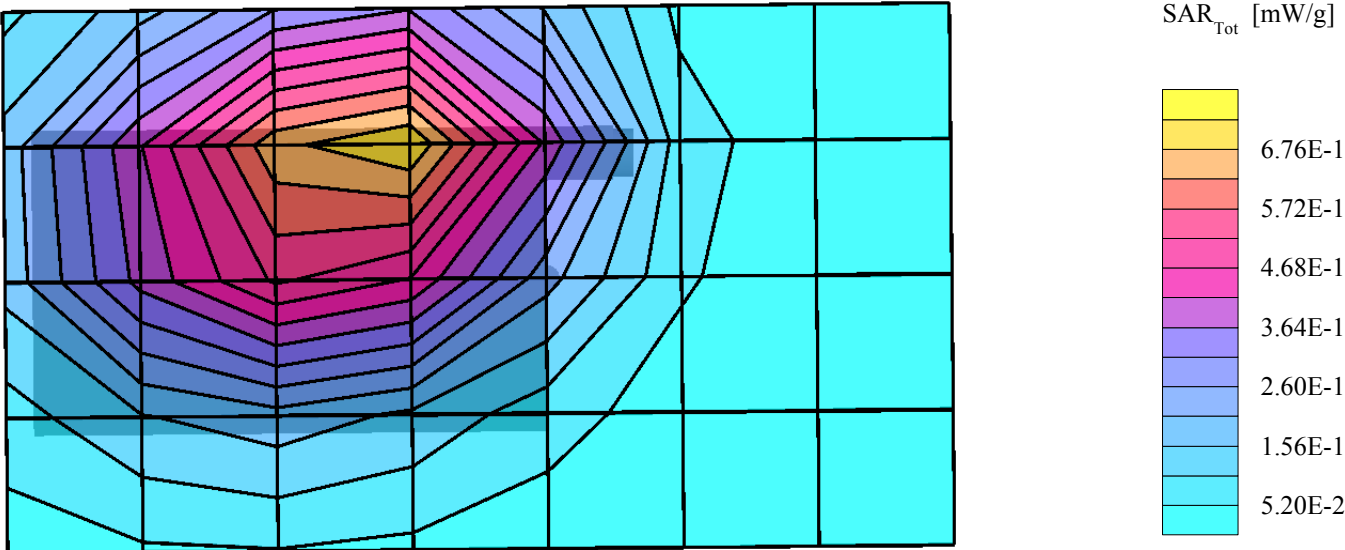
## **BODY SAR TEST PLOTS - AMPS MODE**



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.03 dB  
SAR (1g): 0.699 mW/g, SAR (10g): 0.469 mW/g

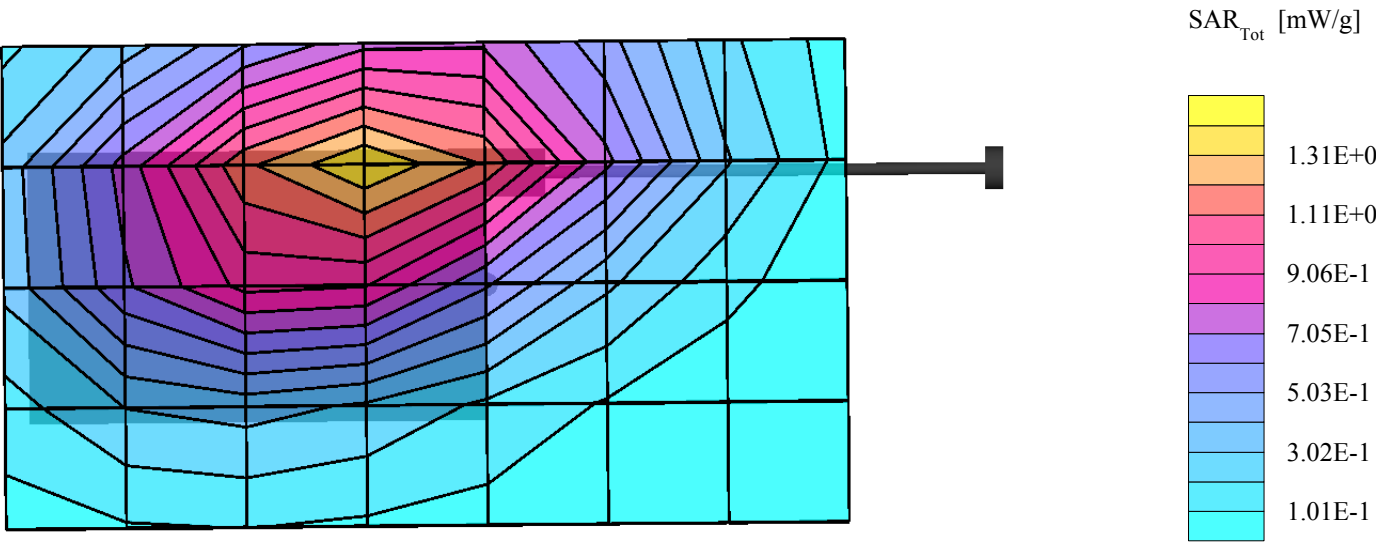
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
AMPS Mode  
Channel 991 [824.04 MHz]  
Conducted Power: 26.11 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.12 dB  
SAR (1g): 1.37 mW/g, SAR (10g): 0.935 mW/g

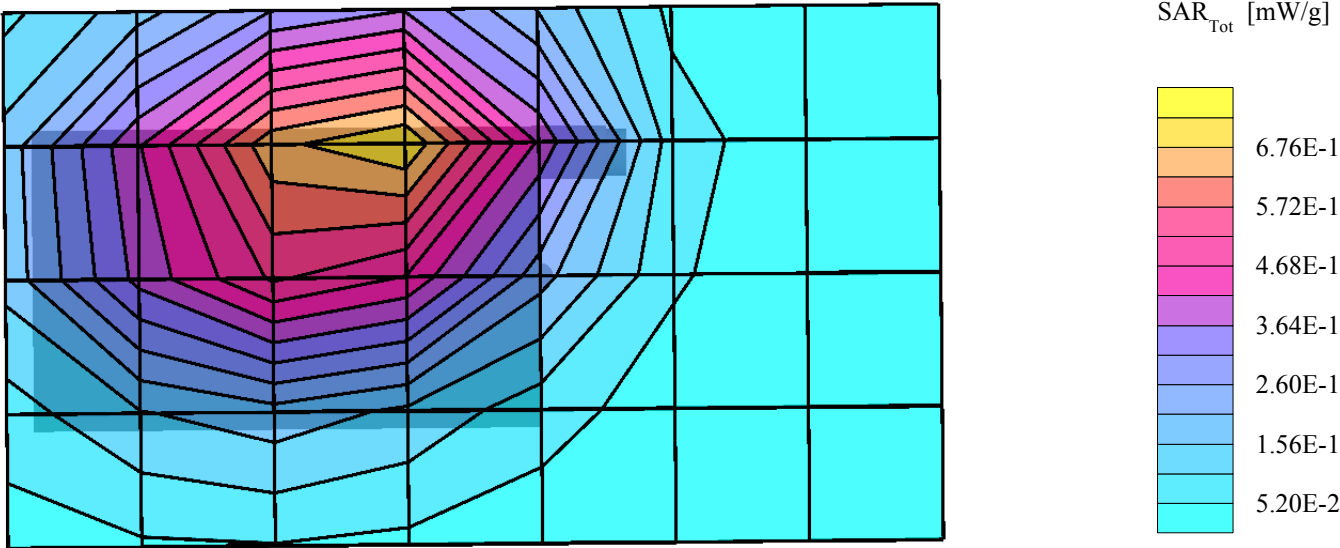
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
AMPS Mode  
Channel 991 [824.04 MHz]  
Conducted Power: 26.12 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.18 dB  
SAR (1g): 0.657 mW/g, SAR (10g): 0.451 mW/g

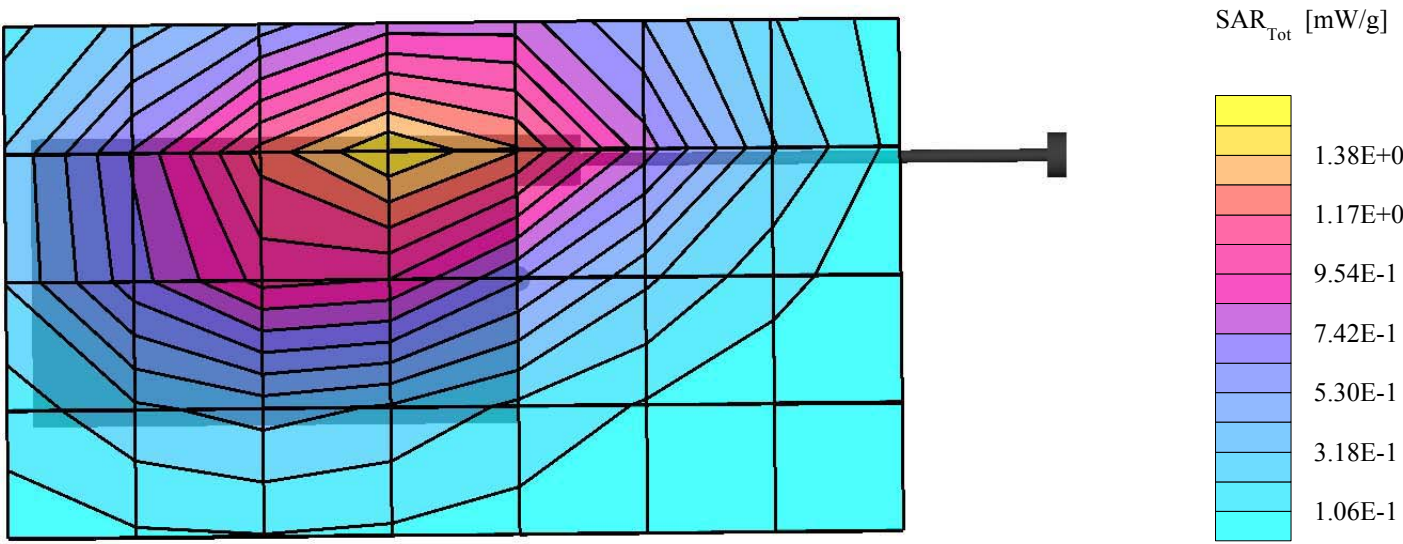
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.12 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

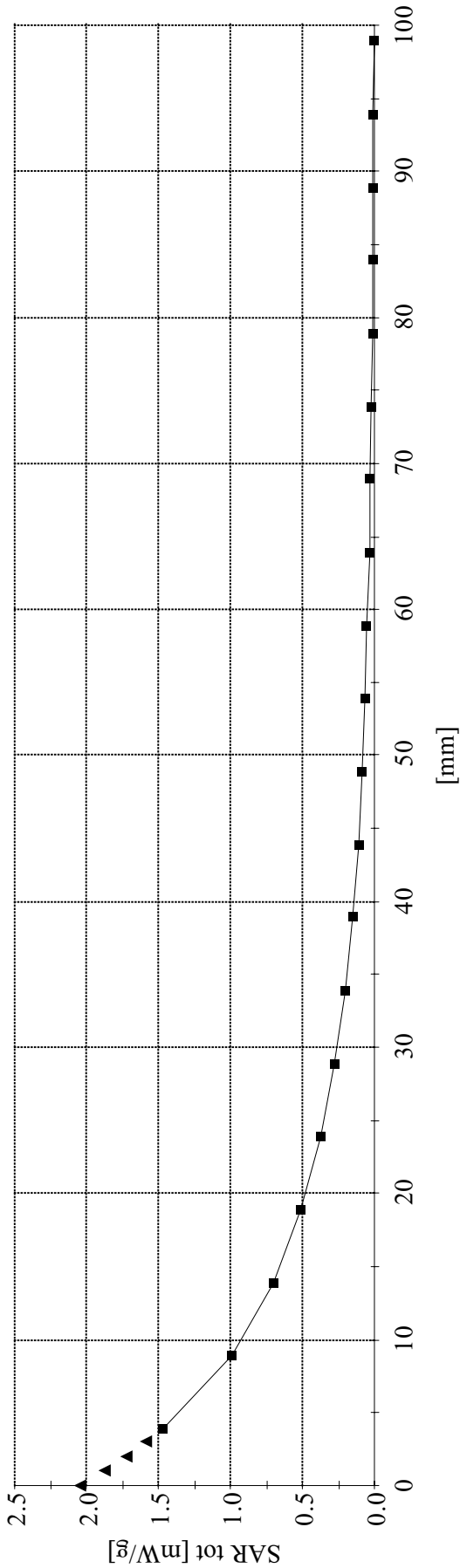
SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.09 dB  
SAR (1g): 1.38 mW/g, SAR (10g): 0.943 mW/g

Body-Worn SAR at 1.5 cm Separation Distance  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210  
SAM Phantom; Flat Section  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0;  
835 MHz Muscle:  $\sigma = 0.97$  mho/m  $\epsilon_r = 55.0$   $\rho = 1.00$  g/cm<sup>3</sup>

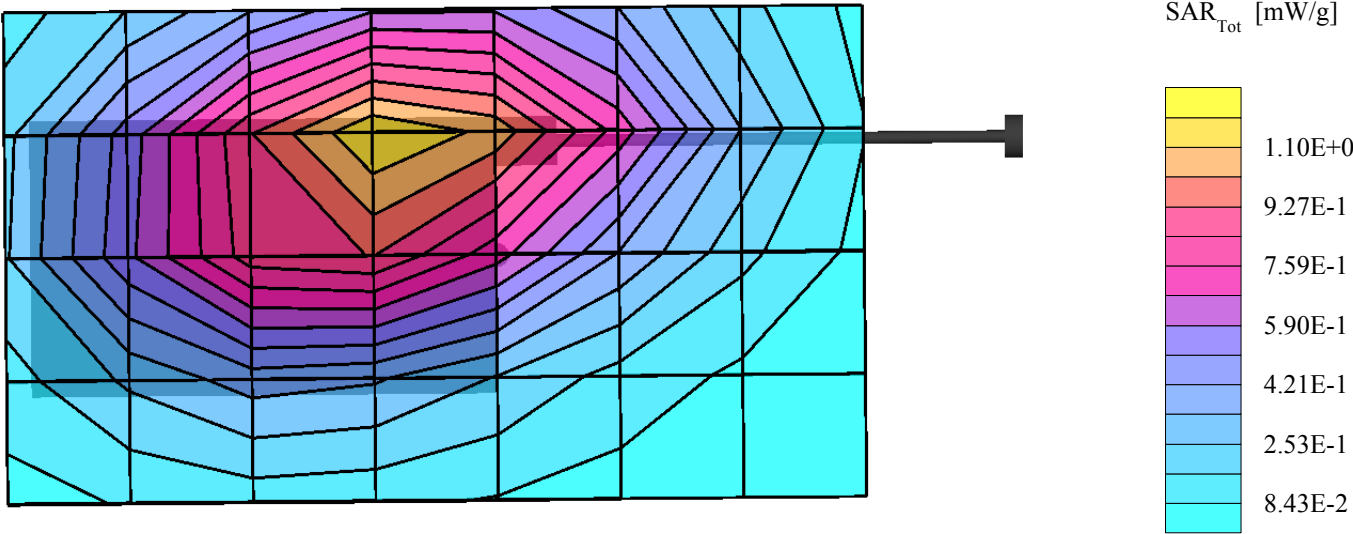
Z-Axis Extrapolation at Peak SAR Location  
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.12 dB  
SAR (1g): 1.13 mW/g, SAR (10g): 0.783 mW/g

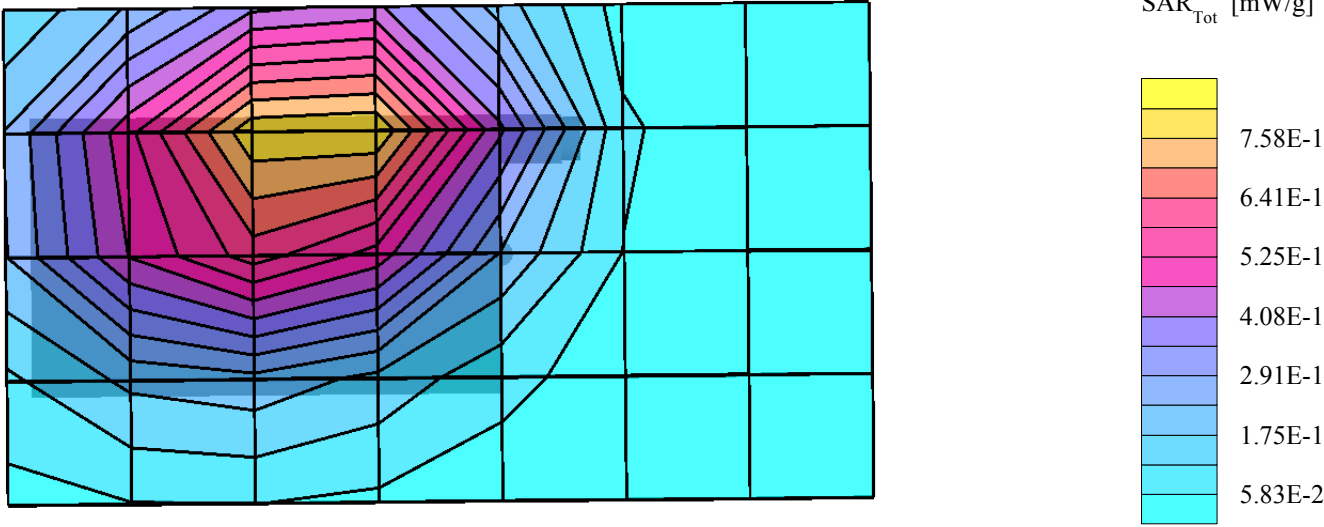
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna Out  
Withus Model: WCE-210  
Extended Battery  
AMPS Mode  
Channel 383 [836.49 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.18 dB  
SAR (1g): 0.756 mW/g, SAR (10g): 0.512 mW/g

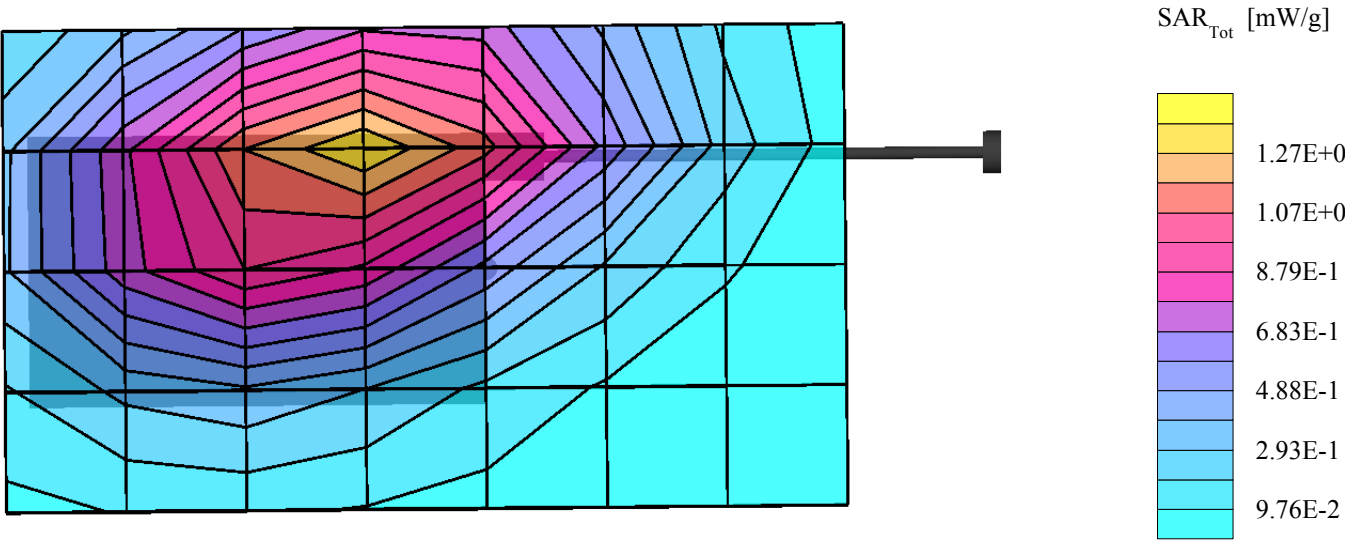
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
AMPS Mode  
Channel 799 [848.97 MHz]  
Conducted Power: 26.12 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.17 dB  
SAR (1g): 1.26 mW/g, SAR (10g): 0.854 mW/g

Body-Worn SAR at 1.5 cm Separation Distance  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
AMPS Mode  
Channel 799 [848.97 MHz]  
Conducted Power: 26.10 dBm  
Date Tested: January 18, 2002





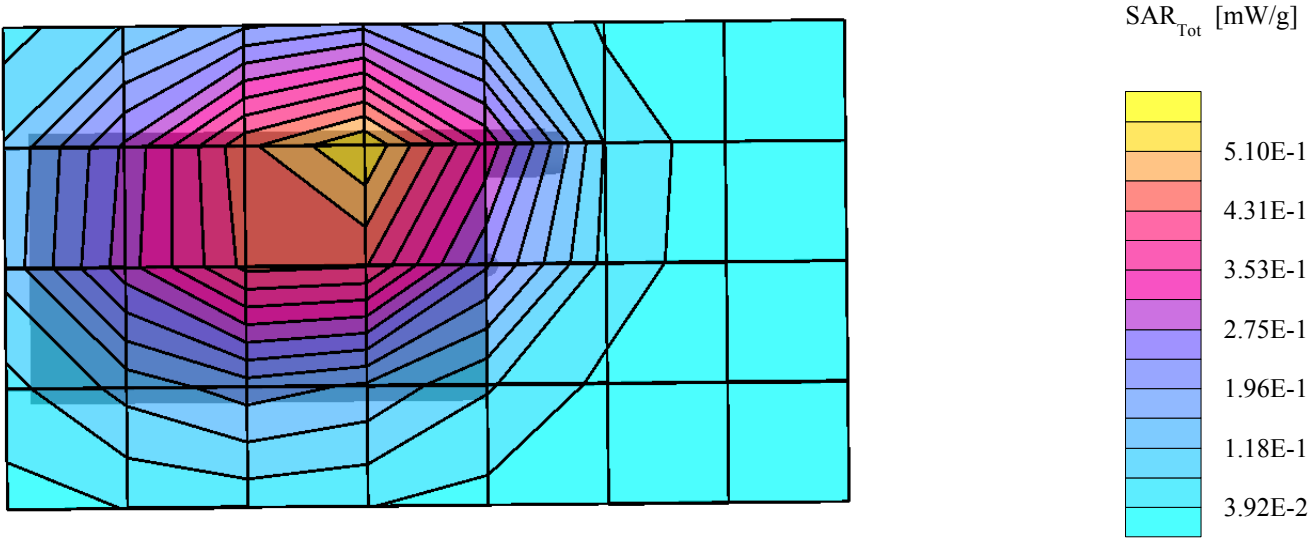
## **BODY SAR TEST PLOTS - CDMA MODE**

Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.10 dB  
SAR (1g): 0.542 mW/ g, SAR (10g): 0.370 mW/g

Body-Worn SAR at 1.5 cm Separation Distance

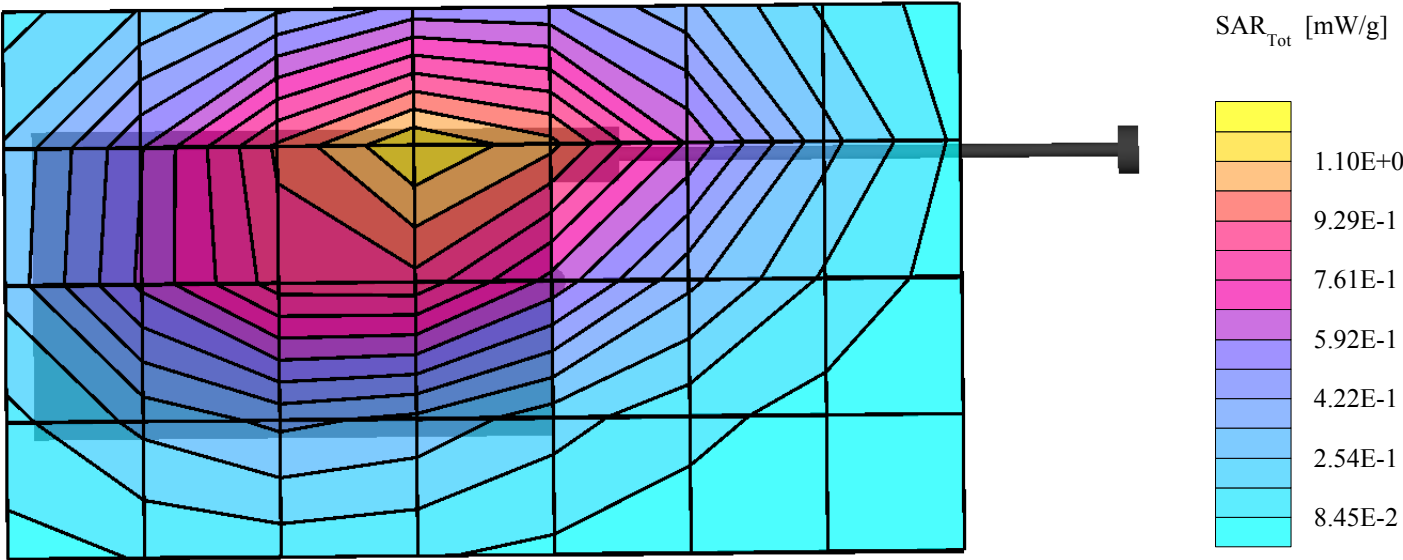
Antenna In  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 1013 [824.70 MHz]  
Conducted Power: 25.13 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97$  mho/m  $\epsilon_r = 55.0$   $\rho = 1.00$  g/cm<sup>3</sup>  
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.04 dB  
SAR (1g): 1.15 mW/g, SAR (10g): 0.785 mW/g

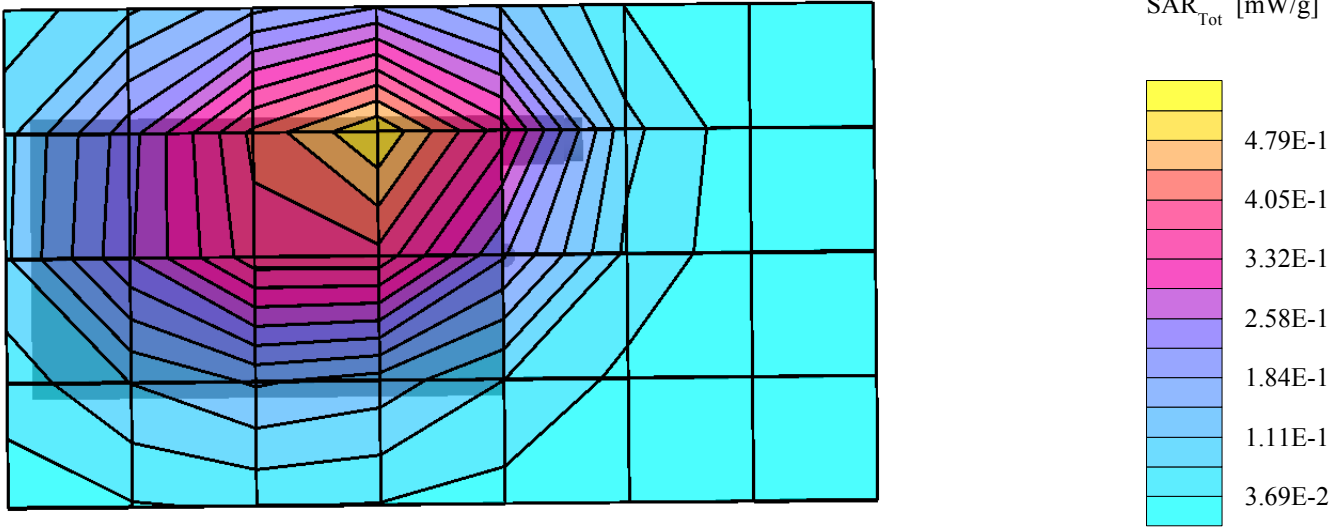
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 1013 [824.70 MHz]  
Conducted Power: 25.14 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.20 dB  
SAR (1g): 0.499 mW/g, SAR (10g): 0.338 mW/g

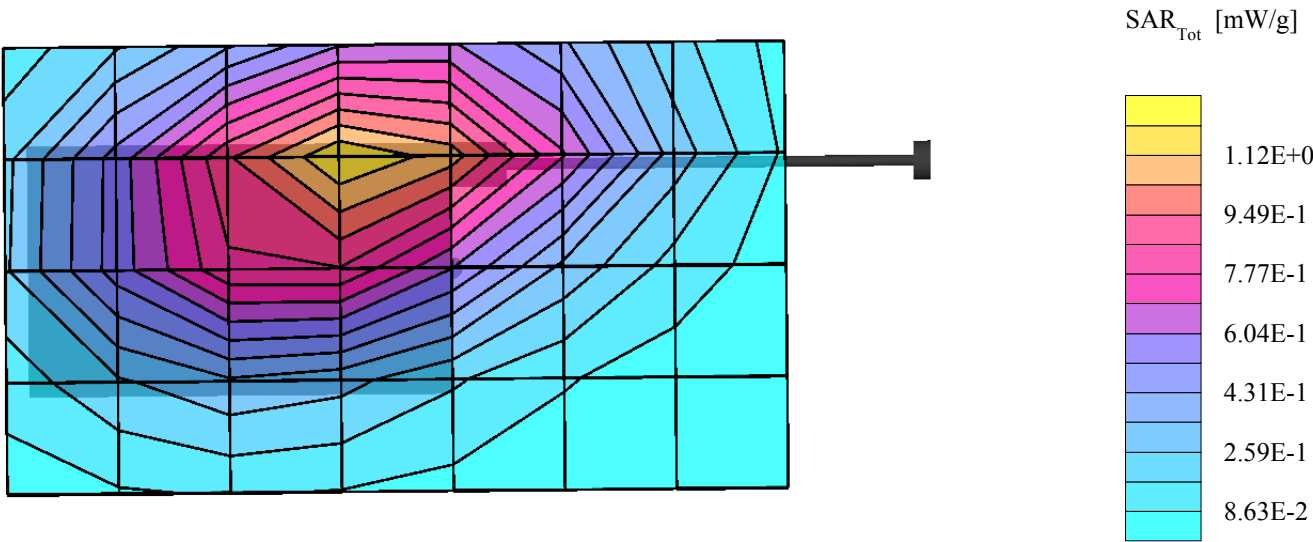
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.15 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: 0.05 dB  
SAR (1g): 1.14 mW/g, SAR (10g): 0.778 mW/g

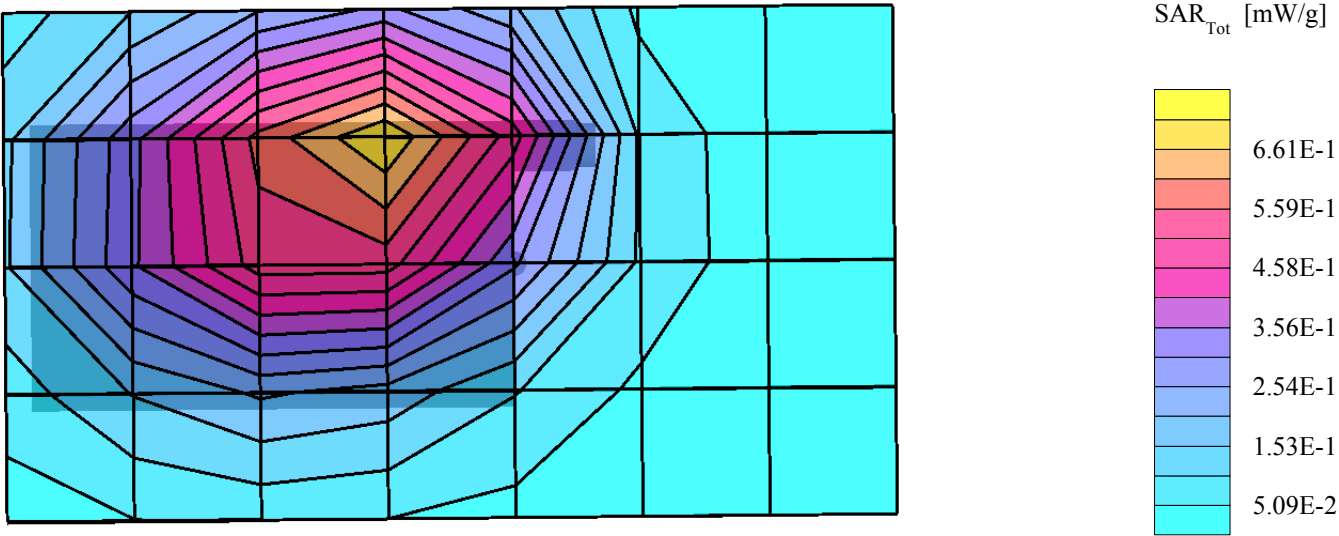
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 363 [835.89 MHz]  
Conducted Power: 25.15 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.17 dB  
SAR (1g): 0.485 mW/g, SAR (10g): 0.329 mW/g

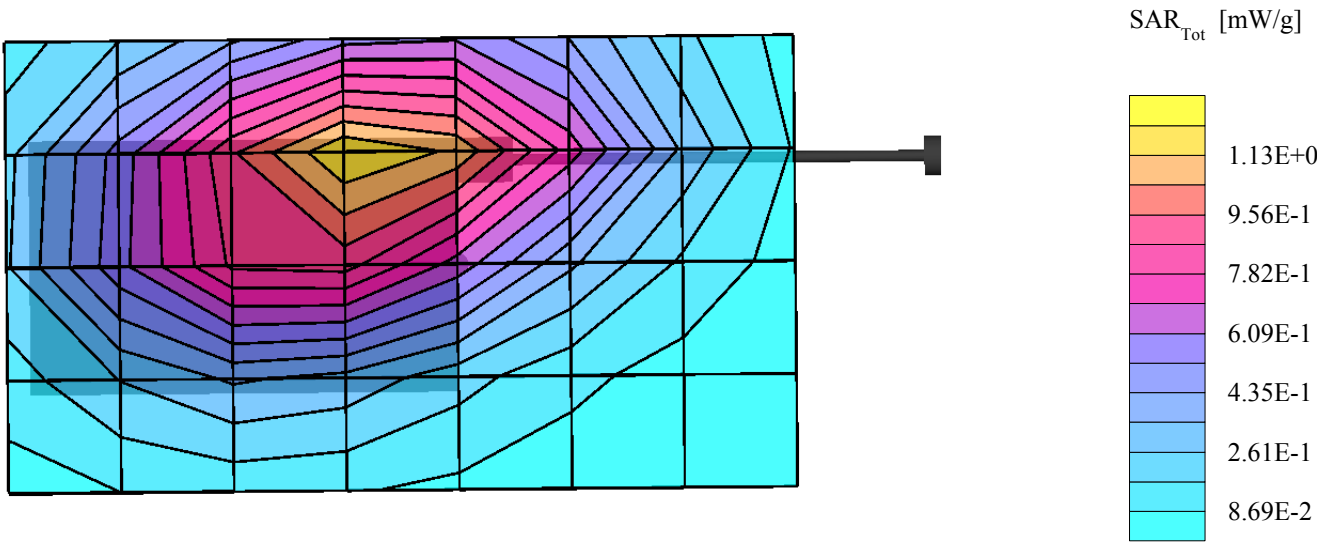
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna In  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.13 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210

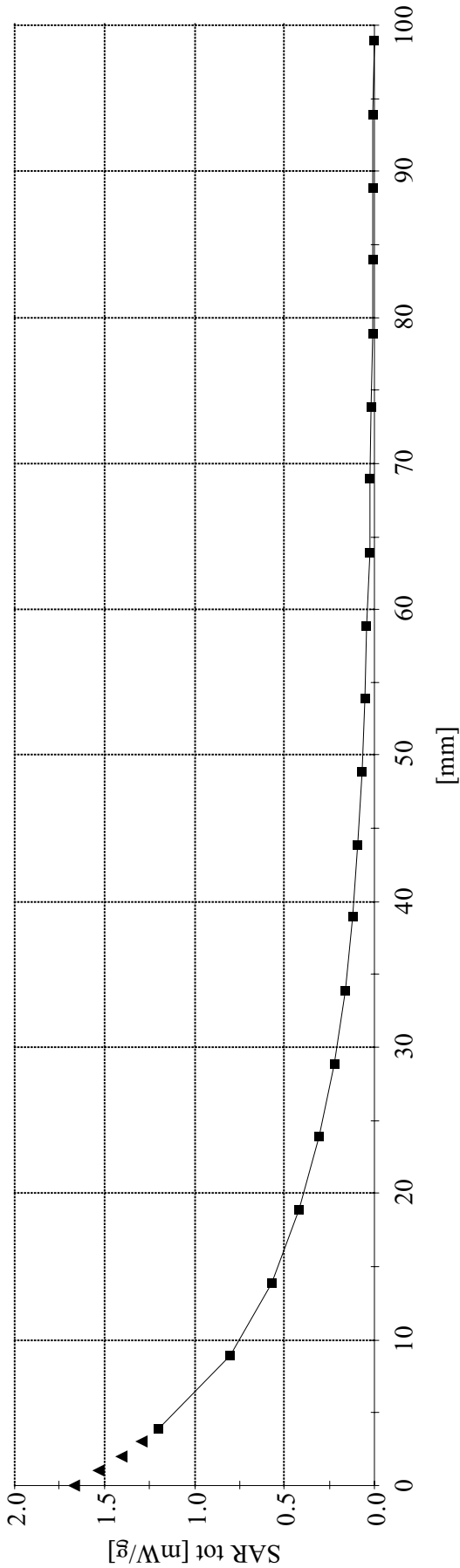
SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.18 dB  
SAR (1g): 1.17 mW/g, SAR (10g): 0.793 mW/g

Body-Worn SAR at 1.5 cm Separation Distance  
Antenna Out  
Withus Model: WCE-210  
Standard Battery  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.14 dBm  
Date Tested: January 18, 2002



Withus IT Co. Ltd. FCC ID: POQWCE-210  
SAM Phantom; Flat Section  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0;  
835 MHz Muscle:  $\sigma = 0.97$  mho/m  $\epsilon_r = 55.0$   $\rho = 1.00$  g/cm<sup>3</sup>

Z-Axis Extrapolation at Peak SAR Location  
Body-Worn SAR at 1.5 cm Separation Distance  
Antenna Out  
Standard Battery  
Withus Model: WCE-210  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.14 dBm  
Date Tested: January 18, 2002

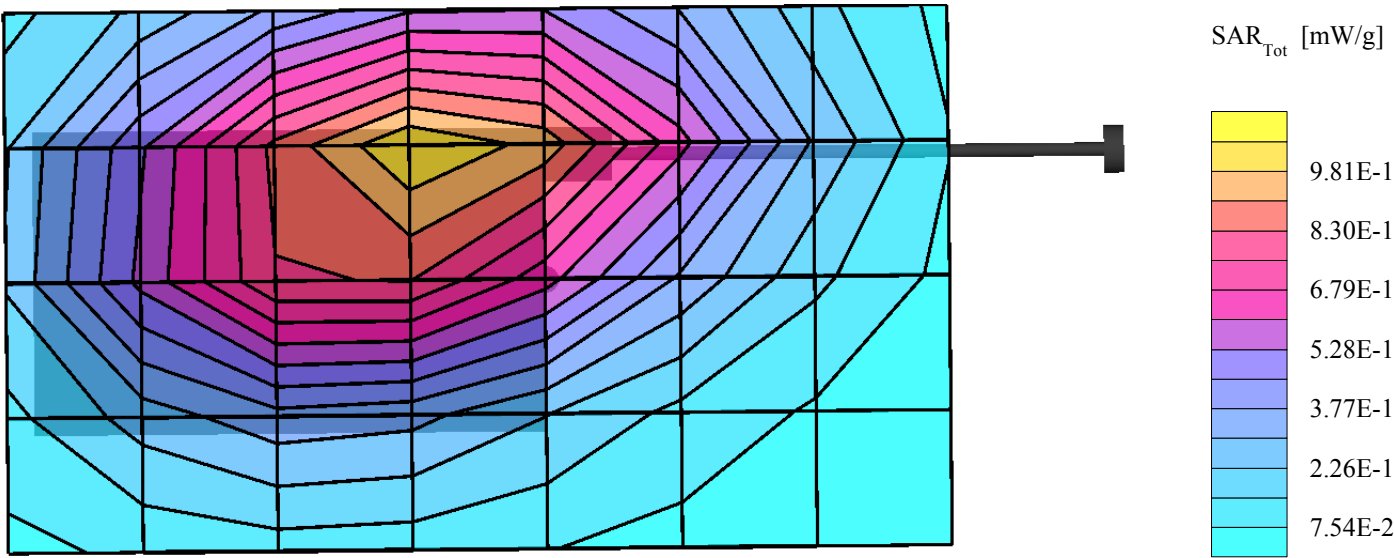




Withus IT Co. Ltd. FCC ID: POQWCE-210

SAM Phantom; Flat Section; Position: (270°,270°)  
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0  
835 MHz Muscle:  $\sigma = 0.97 \text{ mho/m}$   $\epsilon_r = 55.0$   $\rho = 1.00 \text{ g/cm}^3$   
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Cube 5x5x7; Powerdrift: -0.15 dB  
SAR (1g): 0.959 mW/g, SAR (10g): 0.664 mW/g

Body-Worn SAR at 1.5 cm Separation Distance  
Antenna Out  
Withus Model: WCE-210  
Extended Battery  
CDMA Mode  
Channel 777 [848.31 MHz]  
Conducted Power: 25.12 dBm  
Date Tested: January 18, 2002



## ***APPENDIX B - DIPOLE VALIDATION***

# Dipole 900 MHz

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1590; ConvF(6.83,6.83); Crest factor: 1.0; 900 MHz Brain:  $\sigma = 0.95$  mho/m  $\epsilon_r = 40.2$   $\rho = 1.00$  g/cm<sup>3</sup>

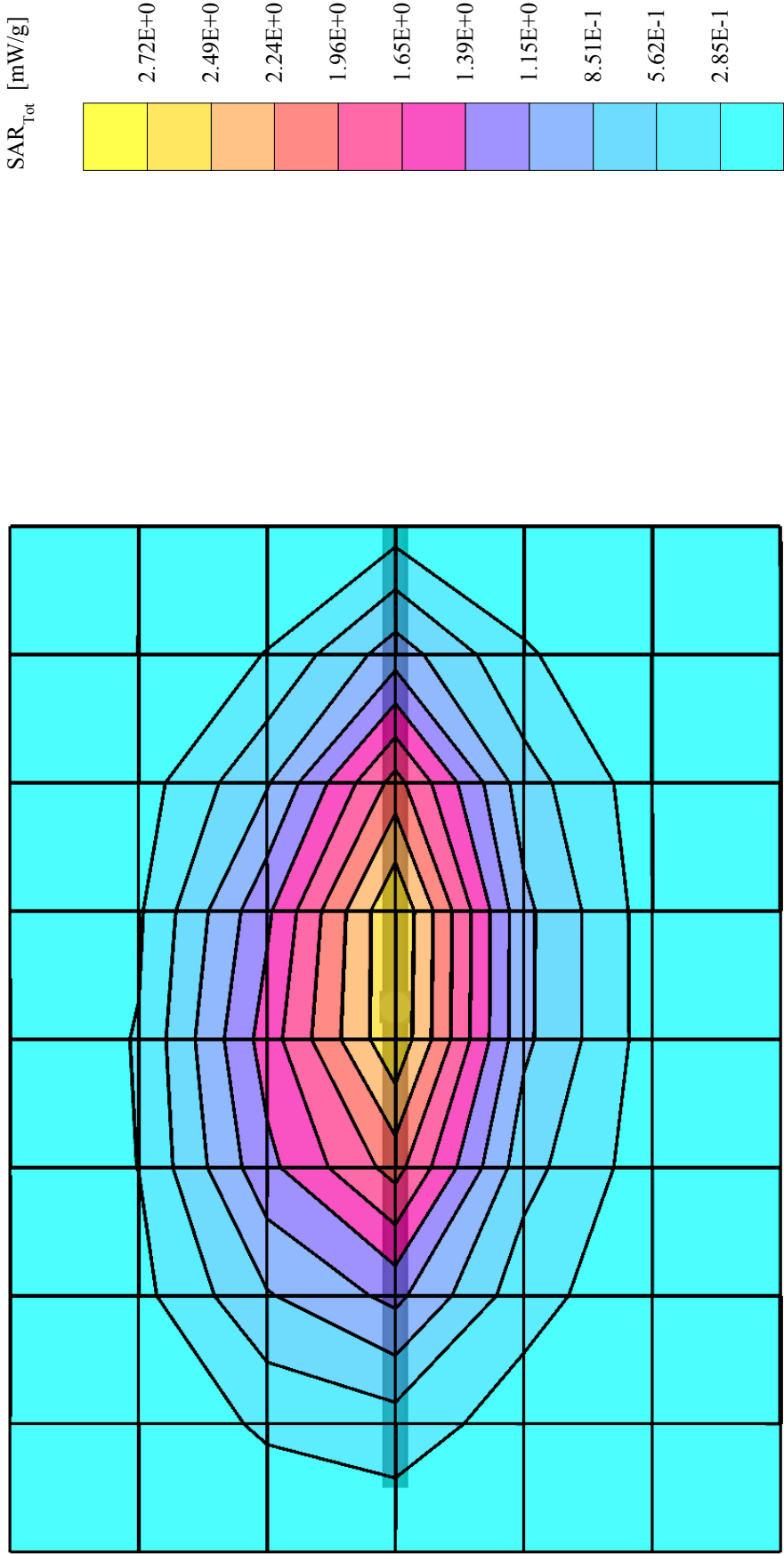
Cube 5x5x7: Peak: 4.38 mW/g, SAR (1g): 2.75 mW/g, SAR (10g): 1.73 mW/g, (Worst-case extrapolation)

Penetration depth: 11.3 (10.2, 12.7) [mm]

Powerdrift: 0.02 dB

Conducted Power: 250.0 mW

Date Tested: January 16, 2002



# Dipole 900 MHz

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1590; ConvF(6.83,6.83); Crest factor: 1.0; 900 MHz Brain:  $\sigma = 0.96$  mho/m  $\epsilon_r = 40.5$   $\rho = 1.00$  g/cm<sup>3</sup>

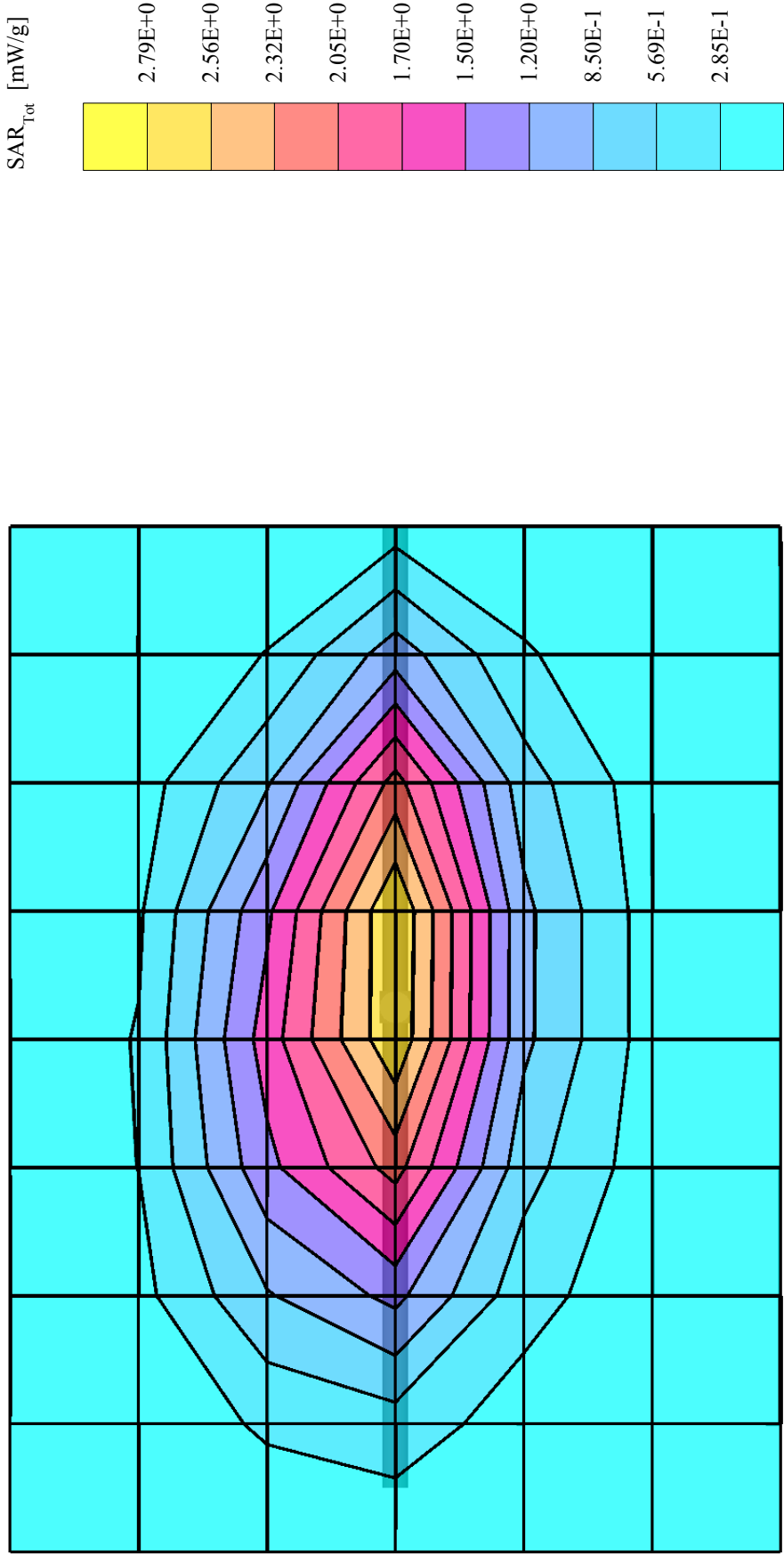
Cube 5x5x7: Peak: 4.40 mW/g, SAR (1g): 2.72 mW/g, SAR (10g): 1.70 mW/g, (Worst-case extrapolation)

Penetration depth: 11.3 (10.2, 12.7) [mm]

Powerdrift: 0.05 dB

Conducted Power: 250.0 mW

Date Tested: January 17, 2002



# Dipole 900 MHz

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1590; ConvF(6.83,6.83); Crest factor: 1.0; 900 MHz Brain:  $\sigma = 0.96 \text{ mho/m}$   $\epsilon_r = 40.4$   $\rho = 1.00 \text{ g/cm}^3$

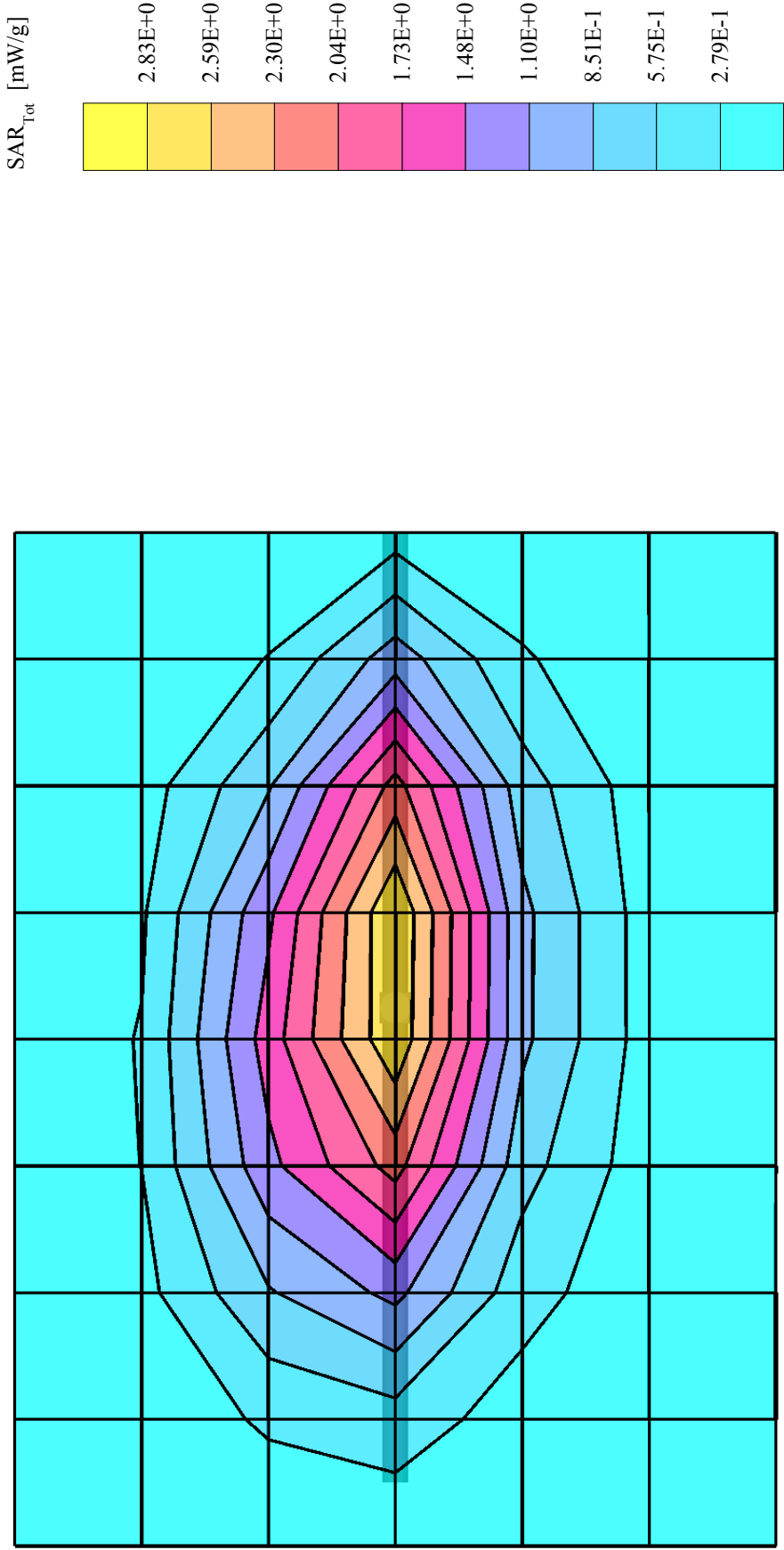
Cube 5x5x7: Peak: 4.43 mW/g, SAR (1g): 2.76 mW/g, SAR (10g): 1.73 mW/g, (Worst-case extrapolation)

Penetration depth: 11.3 (10.2, 12.7) [mm]

Powerdrift: 0.04 dB

Conducted Power: 250.0 mW

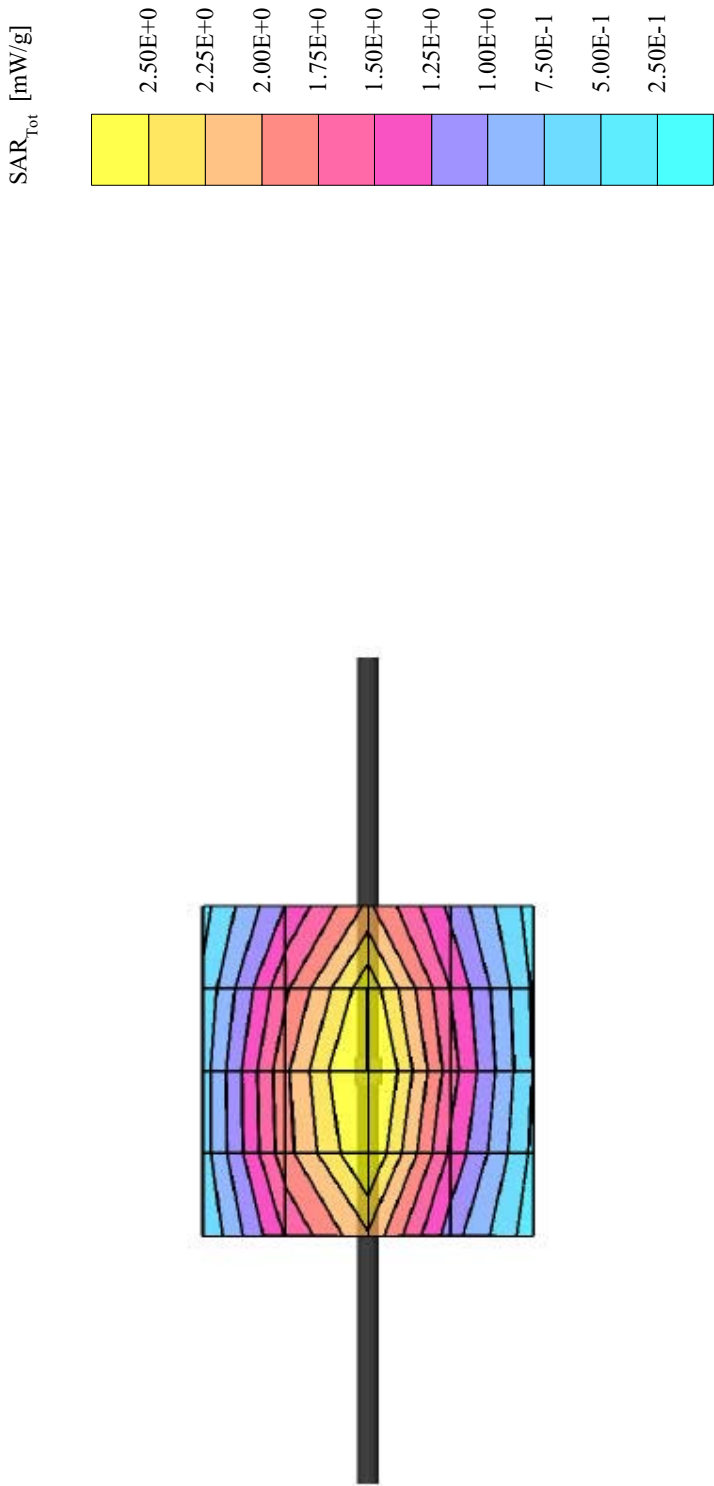
Date Tested: January 18, 2002



## ***APPENDIX C - DIPOLE CALIBRATION***

### Validation Dipole D900V2 SN:054, d = 15 mm

Frequency: 900 MHz; Antenna Input Power: 250 [mW]  
Generic Twin Phantom; Flat Section; Grid Spacing: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Probe: ET3DV6 - SN1507; ConvF(6.27,6.27,6.27); Crest factor: 1.0; IEEE1528 900 MHz:  $\sigma = 0.97 \text{ mho/m}$ ,  $\epsilon_r = 42.4$ ,  $\rho = 1.00 \text{ g/cm}^3$   
Cubes (2): Peak: 4.47 mW/g  $\pm 0.05 \text{ dB}$ , SAR (1g): 2.78 mW/g  $\pm 0.04 \text{ dB}$ , SAR (10g): 1.76 mW/g  $\pm 0.02 \text{ dB}$ , (Worst-case extrapolation)  
Penetration depth: 11.5 (10.3, 13.2) [mm]  
Powerdrift: -0.00 dB



## ***APPENDIX D - PROBE CALIBRATION***



# Probe ET3DV6

SN:1590

Manufactured:	March 19, 2001
Calibrated:	March 26, 2001

Calibrated for System DASY3

**DASY3 - Parameters of Probe: ET3DV6 SN:1590**

## Sensitivity in Free Space

## Diode Compression

NormX	<b>1.77</b> $\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	<b>100</b> mV
NormY	<b>1.91</b> $\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	<b>100</b> mV
NormZ	<b>1.67</b> $\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	<b>100</b> mV

## Sensitivity in Tissue Simulating Liquid

<b>Head</b>	<b>450 MHz</b>	$\epsilon_r = 43.5 \pm 5\%$	$\sigma = 0.87 \pm 10\% \text{ mho/m}$
ConvF X	<b>7.36</b> extrapolated	Boundary effect:	
ConvF Y	<b>7.36</b> extrapolated	Alpha	<b>0.29</b>
ConvF Z	<b>7.36</b> extrapolated	Depth	<b>2.72</b>
<b>Head</b>	<b>900 MHz</b>	$\epsilon_r = 42 \pm 5\%$	$\sigma = 0.97 \pm 10\% \text{ mho/m}$
ConvF X	<b>6.83</b> $\pm 7\%$ (k=2)	Boundary effect:	
ConvF Y	<b>6.83</b> $\pm 7\%$ (k=2)	Alpha	<b>0.37</b>
ConvF Z	<b>6.83</b> $\pm 7\%$ (k=2)	Depth	<b>2.48</b>
<b>Head</b>	<b>1500 MHz</b>	$\epsilon_r = 40.4 \pm 5\%$	$\sigma = 1.23 \pm 10\% \text{ mho/m}$
ConvF X	<b>6.13</b> interpolated	Boundary effect:	
ConvF Y	<b>6.13</b> interpolated	Alpha	<b>0.47</b>
ConvF Z	<b>6.13</b> interpolated	Depth	<b>2.17</b>
<b>Head</b>	<b>1800 MHz</b>	$\epsilon_r = 40 \pm 5\%$	$\sigma = 1.40 \pm 10\% \text{ mho/m}$
ConvF X	<b>5.78</b> $\pm 7\%$ (k=2)	Boundary effect:	
ConvF Y	<b>5.78</b> $\pm 7\%$ (k=2)	Alpha	<b>0.53</b>
ConvF Z	<b>5.78</b> $\pm 7\%$ (k=2)	Depth	<b>2.01</b>

## Sensor Offset

Probe Tip to Sensor Center	<b>2.7</b>	mm
Optical Surface Detection	<b>1.2 <math>\pm</math> 0.2</b>	mm

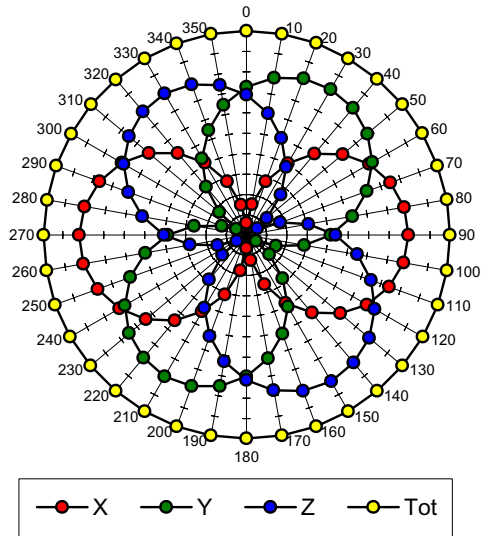
ET3DV6 SN:1590

## DASY3 - Parameters of Probe: ET3DV6 SN: 1590

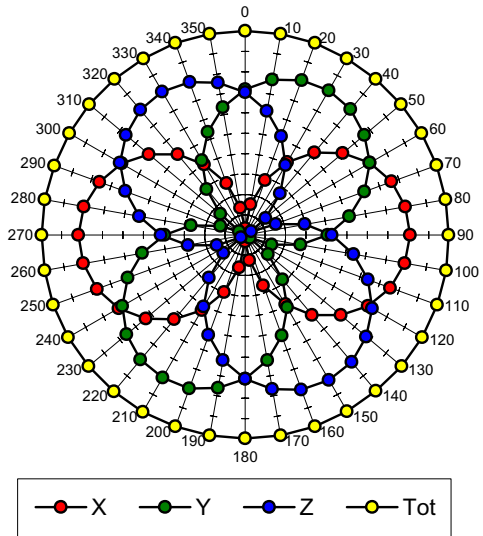
<b>Body</b>	<b>450 MHz</b>	<b><math>\epsilon_r = 56.7 \pm 5\%</math></b>	<b><math>\sigma = 0.94 \pm 10\%</math> mho/m</b>
ConvF X	<b>7.23</b>	extrapolated	
ConvF Y	<b>7.23</b>	extrapolated	
ConvF Z	<b>7.23</b>	extrapolated	
<b>Body</b>	<b>900 MHz</b>	<b><math>\epsilon_r = 55.0 \pm 5\%</math></b>	<b><math>\sigma = 1.05 \pm 10\%</math> mho/m</b>
ConvF X	<b>6.61</b>	$\pm 7\%$ (k=2)	
ConvF Y	<b>6.61</b>	$\pm 7\%$ (k=2)	
ConvF Z	<b>6.61</b>	$\pm 7\%$ (k=2)	
<b>Body</b>	<b>1500 MHz</b>	<b><math>\epsilon_r = 54.0 \pm 5\%</math></b>	<b><math>\sigma = 1.30 \pm 10\%</math> mho/m</b>
ConvF X	<b>5.78</b>	interpolated	
ConvF Y	<b>5.78</b>	interpolated	
ConvF Z	<b>5.78</b>	interpolated	
<b>Body</b>	<b>1800 MHz</b>	<b><math>\epsilon_r = 53.3 \pm 5\%</math></b>	<b><math>\sigma = 1.52 \pm 10\%</math> mho/m</b>
ConvF X	<b>5.36</b>	$\pm 7\%$ (k=2)	
ConvF Y	<b>5.36</b>	$\pm 7\%$ (k=2)	
ConvF Z	<b>5.36</b>	$\pm 7\%$ (k=2)	

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

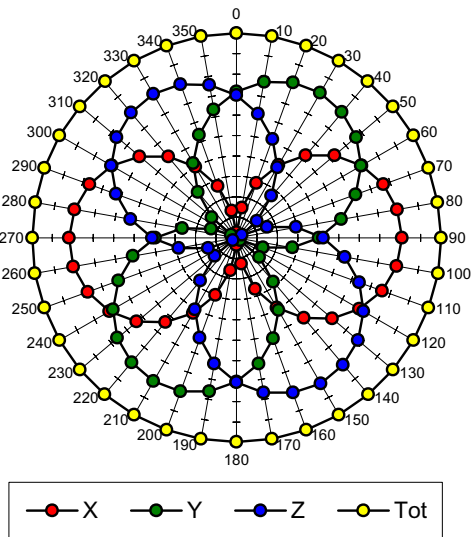
**f = 30 MHz, TEM cell ifi110**



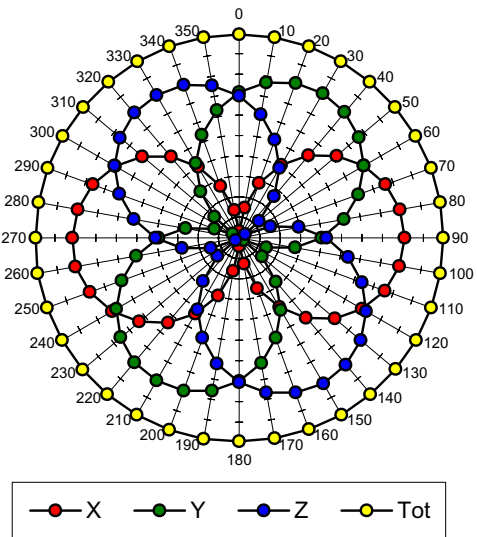
**f = 100 MHz, TEM cell ifi110**

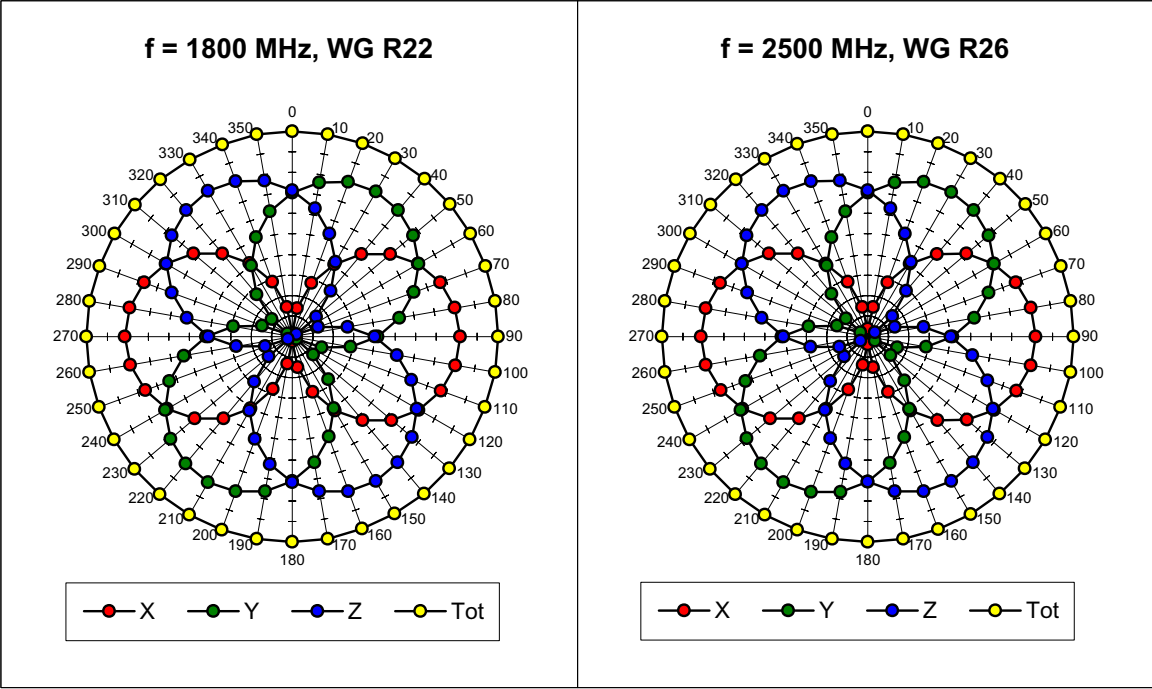


**f = 300 MHz, TEM cell ifi110**

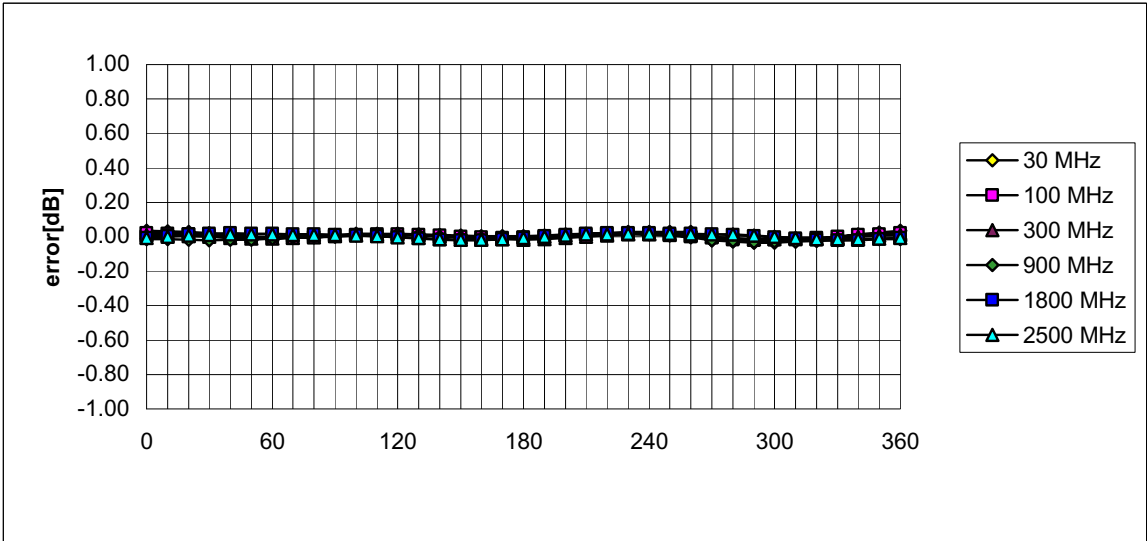


**f = 900 MHz, TEM cell ifi110**



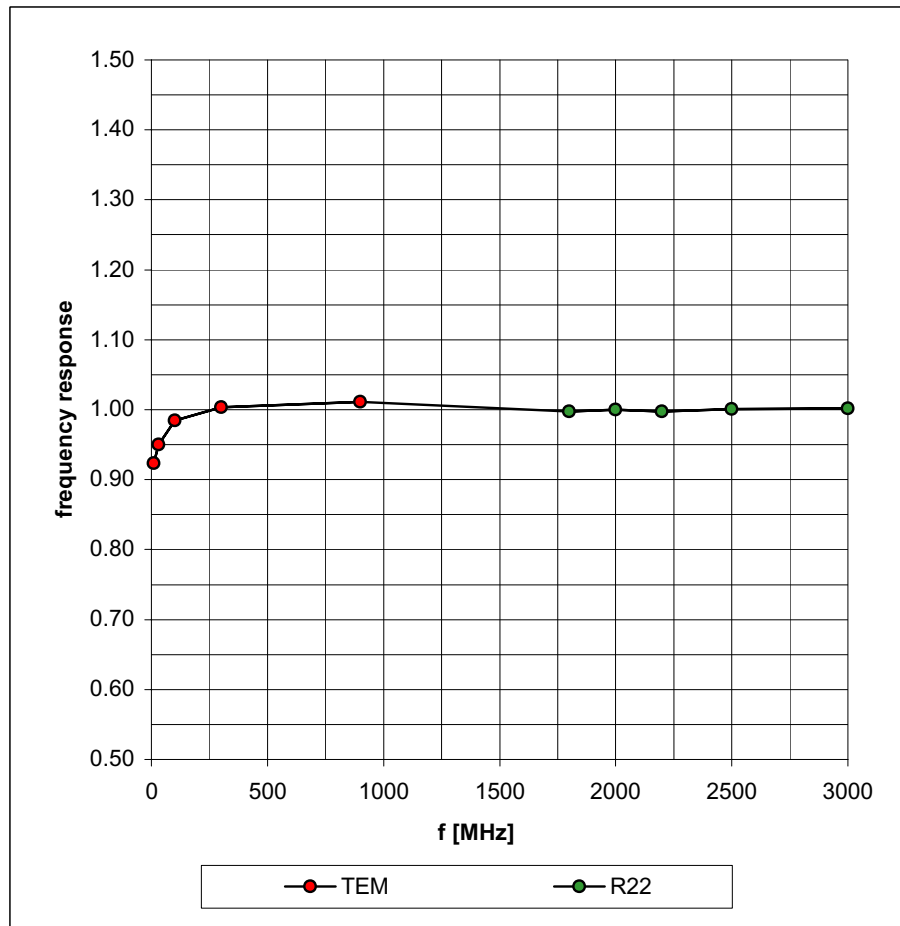


Isotropy Error ( $\phi$ ),  $\theta = 0^\circ$

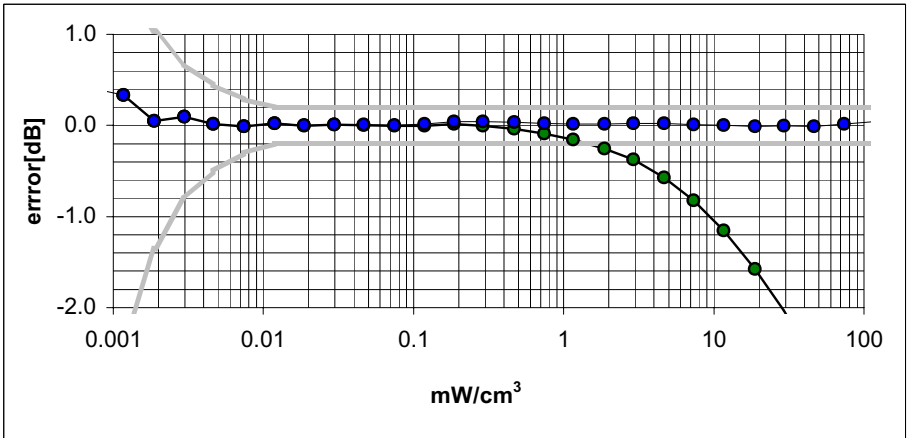
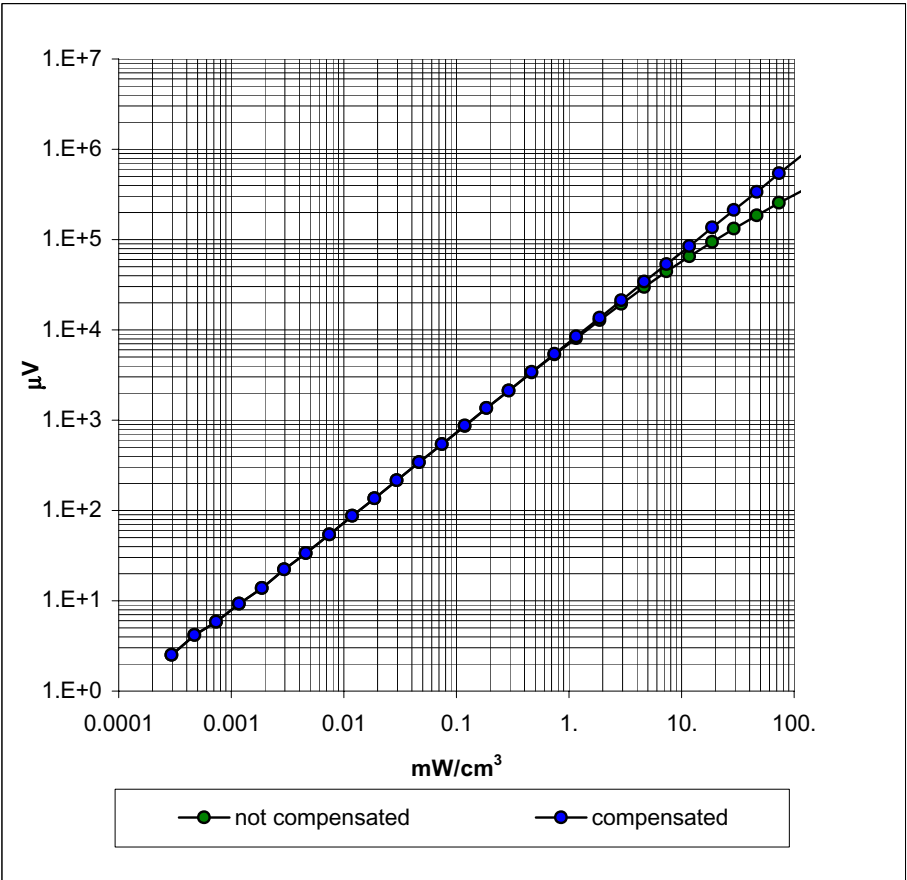


## Frequency Response of E-Field

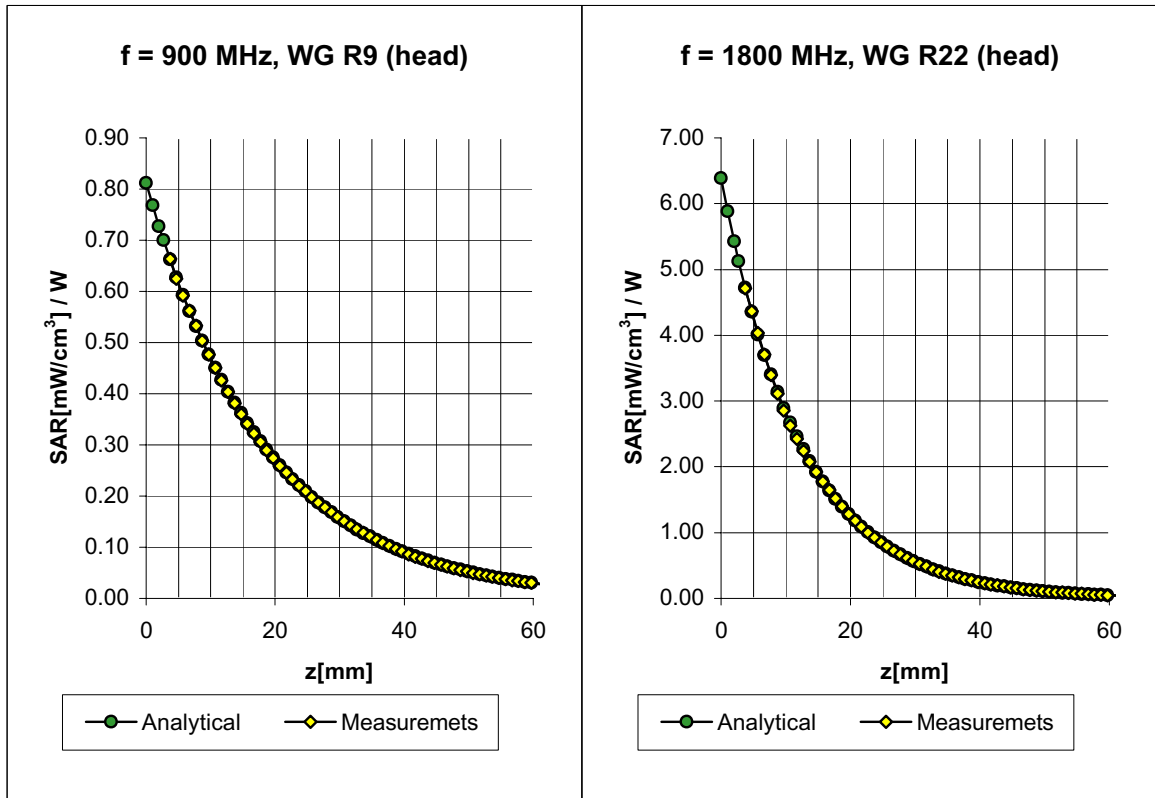
( TEM-Cell:ifi110, Waveguide R22)



Dynamic Range f(SAR<sub>brain</sub>)  
( TEM-Cell:ifi1110 )



# Conversion Factor Assessment

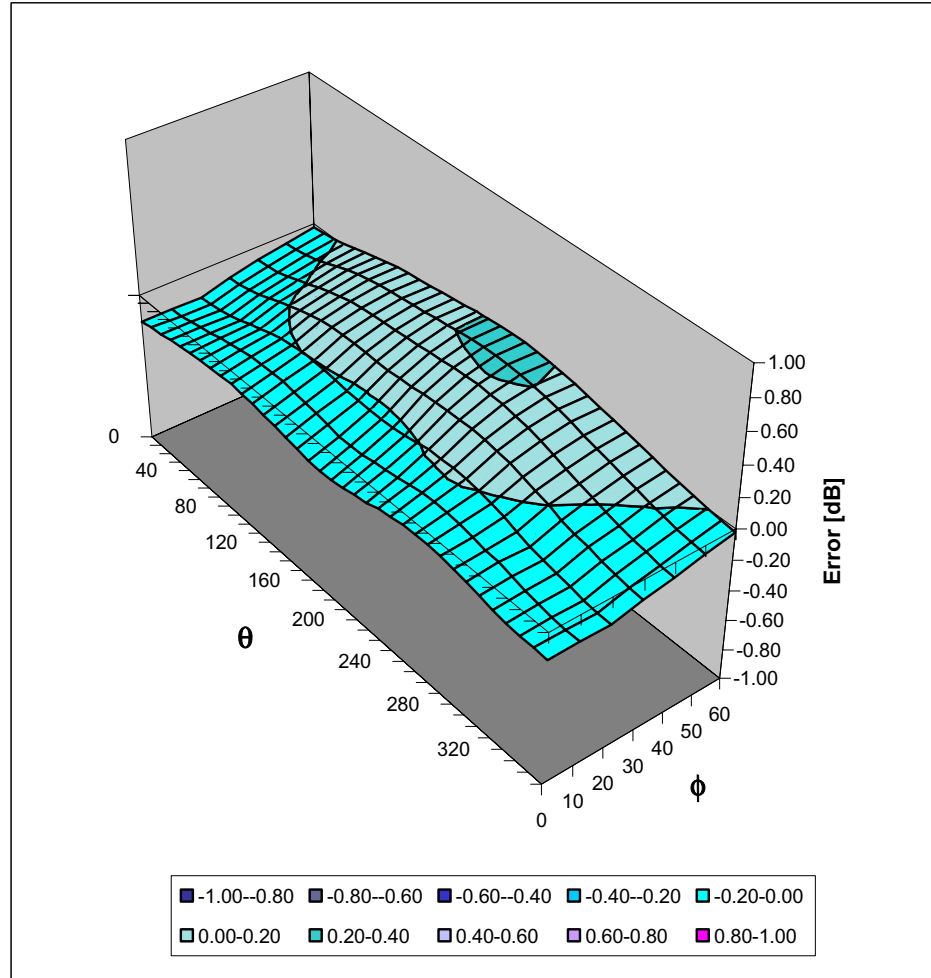


ET3DV6 SN:1590



# Deviation from Isotropy in HSL

Error ( $\theta, \phi$ ),  $f = 900$  MHz



***APPENDIX E - MEASURED TISSUE DIELECTRIC PARAMETERS***

# 900MHz Validation & 835MHz Evaluation

## Measured Liquid Dielectric Parameters (Brain)

January 16, 2002

Frequency	$\epsilon'$	$\epsilon''$
800.000000 MHz	41.4153	19.4078
805.000000 MHz	41.3496	19.3975
810.000000 MHz	41.3014	19.3882
815.000000 MHz	41.2359	19.3515
820.000000 MHz	41.1891	19.3210
825.000000 MHz	41.1063	19.3114
830.000000 MHz	41.0234	19.2968
835.000000 MHz	40.9569	19.2992
840.000000 MHz	40.9318	19.2589
845.000000 MHz	40.8328	19.2499
850.000000 MHz	40.7517	19.2261
855.000000 MHz	40.7111	19.2325
860.000000 MHz	40.6552	19.1818
865.000000 MHz	40.5772	19.1584
870.000000 MHz	40.5229	19.1794
875.000000 MHz	40.4616	19.1721
880.000000 MHz	40.4172	19.1502
885.000000 MHz	40.3498	19.1852
890.000000 MHz	40.3071	19.1632
895.000000 MHz	40.2662	19.1111
900.000000 MHz	40.2299	19.0730
905.000000 MHz	40.1769	19.0599
910.000000 MHz	40.1337	19.0442
915.000000 MHz	40.0527	19.0301
920.000000 MHz	40.0003	19.0274
925.000000 MHz	39.9709	19.0179
930.000000 MHz	39.8896	19.0097
935.000000 MHz	39.8331	18.9848
940.000000 MHz	39.7651	18.9828
945.000000 MHz	39.7129	18.9668
950.000000 MHz	39.6527	18.9535
955.000000 MHz	39.5960	18.9488
960.000000 MHz	39.5263	18.9296
965.000000 MHz	39.4712	18.9250
970.000000 MHz	39.3973	18.9170

# 900 MHz Validation & 835MHz Evaluation

## Measured Liquid Dielectric Parameters (Brain)

January 17, 2002

Frequency	$\epsilon'$	$\epsilon''$
800.000000 MHz	41.6687	19.4597
805.000000 MHz	41.5833	19.4213
810.000000 MHz	41.5457	19.4352
815.000000 MHz	41.4554	19.4098
820.000000 MHz	41.4278	19.3945
825.000000 MHz	41.3375	19.3807
830.000000 MHz	41.2744	19.3650
835.000000 MHz	41.1861	19.3304
840.000000 MHz	41.1513	19.3339
845.000000 MHz	41.0389	19.3174
850.000000 MHz	40.9952	19.2822
855.000000 MHz	40.9412	19.2812
860.000000 MHz	40.8868	19.2395
865.000000 MHz	40.8009	19.2276
870.000000 MHz	40.7336	19.2414
875.000000 MHz	40.6993	19.2255
880.000000 MHz	40.6631	19.2003
885.000000 MHz	40.5920	19.2256
890.000000 MHz	40.5270	19.1992
895.000000 MHz	40.5243	19.1451
900.000000 MHz	40.4635	19.1283
905.000000 MHz	40.4062	19.1205
910.000000 MHz	40.3660	19.1178
915.000000 MHz	40.2916	19.0960
920.000000 MHz	40.2484	19.0945
925.000000 MHz	40.2096	19.0724
930.000000 MHz	40.1537	19.0558
935.000000 MHz	40.0723	19.0471
940.000000 MHz	40.0007	19.0359
945.000000 MHz	39.9561	19.0167
950.000000 MHz	39.8802	19.0169
955.000000 MHz	39.8173	18.9945
960.000000 MHz	39.7578	18.9807
965.000000 MHz	39.7077	18.9645
970.000000 MHz	39.6577	18.9764

# 900MHz Validation

## Measured Liquid Dielectric Parameters (Brain)

January 18, 2002

Frequency	e'	e''
800.000000 MHz	41.5792	19.5510
805.000000 MHz	41.4870	19.5255
810.000000 MHz	41.4458	19.5246
815.000000 MHz	41.3733	19.5039
820.000000 MHz	41.3262	19.4973
825.000000 MHz	41.2365	19.4801
830.000000 MHz	41.1726	19.4691
835.000000 MHz	41.0831	19.4579
840.000000 MHz	41.0752	19.3936
845.000000 MHz	40.9605	19.3776
850.000000 MHz	40.8830	19.3215
855.000000 MHz	40.8349	19.2999
860.000000 MHz	40.7838	19.2678
865.000000 MHz	40.7187	19.2397
870.000000 MHz	40.6638	19.2105
875.000000 MHz	40.6112	19.2002
880.000000 MHz	40.5594	19.1899
885.000000 MHz	40.4980	19.2127
890.000000 MHz	40.4637	19.1876
895.000000 MHz	40.4286	19.1234
900.000000 MHz	40.3636	19.1081
905.000000 MHz	40.3159	19.0979
910.000000 MHz	40.2851	19.0927
915.000000 MHz	40.2052	19.0679
920.000000 MHz	40.1419	19.0630
925.000000 MHz	40.1049	19.0457
930.000000 MHz	40.0380	19.0231
935.000000 MHz	39.9624	19.0323
940.000000 MHz	39.9000	19.0185
945.000000 MHz	39.8498	19.0109
950.000000 MHz	39.7917	19.0059
955.000000 MHz	39.7119	18.9889
960.000000 MHz	39.6657	18.9714
965.000000 MHz	39.6058	18.9678
970.000000 MHz	39.5680	18.9575

# 835MHz Evaluation

## Measured Liquid Dielectric Parameters (Body)

January 18, 2002

Frequency	$\epsilon'$	$\epsilon''$
800.000000 MHz	55.3442	21.0522
805.000000 MHz	55.2876	21.0266
810.000000 MHz	55.2444	21.0191
815.000000 MHz	55.2026	20.9662
820.000000 MHz	55.1565	20.9601
825.000000 MHz	55.0938	20.9212
830.000000 MHz	55.0151	20.9109
835.000000 MHz	54.9607	20.9030
840.000000 MHz	54.9521	20.8670
845.000000 MHz	54.8924	20.8394
850.000000 MHz	54.8302	20.8023
855.000000 MHz	54.7740	20.8068
860.000000 MHz	54.7212	20.7884
865.000000 MHz	54.6845	20.7533
870.000000 MHz	54.6279	20.7477
875.000000 MHz	54.5630	20.7454
880.000000 MHz	54.5435	20.7469
885.000000 MHz	54.4955	20.7276
890.000000 MHz	54.4540	20.6955
895.000000 MHz	54.4551	20.6363
900.000000 MHz	54.4141	20.6150
905.000000 MHz	54.3756	20.5720
910.000000 MHz	54.3363	20.5765
915.000000 MHz	54.2684	20.5718
920.000000 MHz	54.2308	20.5499
925.000000 MHz	54.1968	20.5473
930.000000 MHz	54.1667	20.5022
935.000000 MHz	54.1045	20.5012
940.000000 MHz	54.0274	20.4863
945.000000 MHz	54.0018	20.4705
950.000000 MHz	53.9533	20.4947
955.000000 MHz	53.9050	20.4686
960.000000 MHz	53.8525	20.4544
965.000000 MHz	53.7672	20.4545
970.000000 MHz	53.7383	20.4209

***APPENDIX F - SAM PHANTOM CERTIFICATE OF CONFORMANCE***

# Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

## Certificate of conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 BA
Series No	TP-1002 and higher
Manufacturer / Origin	Untersee Composites Hauptstr. 69 CH-8559 Fruthwilen Switzerland

### Tests

The series production process used allows the limitation to test of first articles. Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series units (called samples).

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz – 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

### Standards

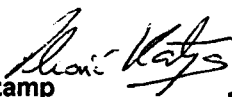
- [1] CENELEC EN 50361
- [2] IEEE P1528-200x draft 6.5
- [3] IEC PT 62209 draft 0.9
- (\*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

### Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

Date 18.11.2001

Signature / Stamp



**Schmid & Partner  
Engineering AG**



Zeughausstrasse 43, CH-8004 Zurich  
Tel. +41 1 245 97 00, Fax +41 1 245 97 79



***APPENDIX G - SAR TEST SETUP PHOTOGRAPHS***

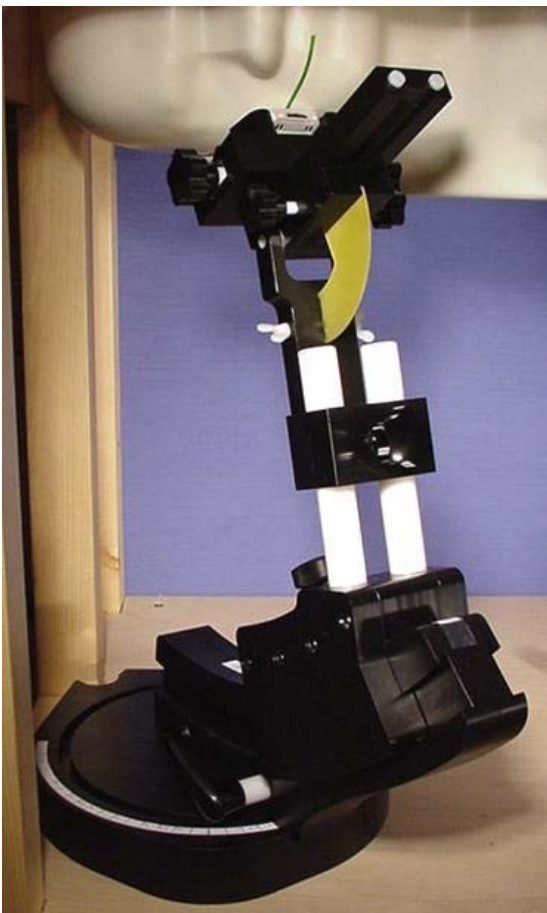
**SAR TEST SETUP PHOTOGRAPHS**  
**Left Head Section – Cheek/Touch Position**



**SAR TEST SETUP PHOTOGRAPHS**  
**Left Head Section – Ear/Tilt Position**



**SAR TEST SETUP PHOTOGRAPHS**  
**Right Head Section – Cheek/Touch Position**

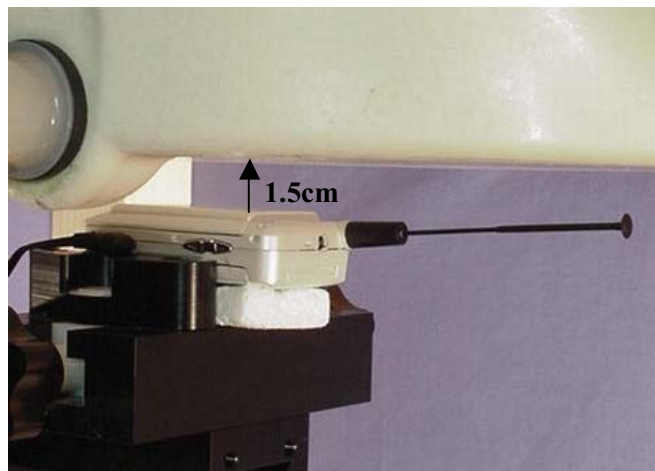
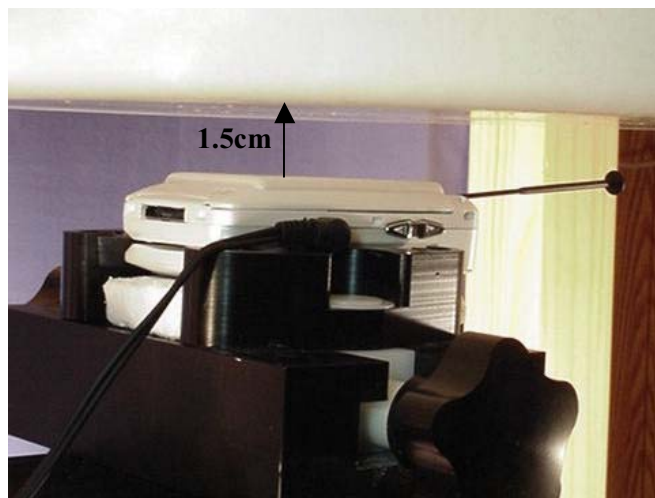




**SAR TEST SETUP PHOTOGRAPHS**  
**Right Head Section – Ear/Tilt Position**



**SAR TEST SETUP PHOTOGRAPHS**  
**Planar Section - Body-Worn Configuration**  
**1.5cm Separation Distance - with Standard Battery**



**SAR TEST SETUP PHOTOGRAPHS**  
**Planar Section - Body-Worn Configuration**  
**2.0 cm Separation Distance - with Extended Battery**

