# Exhibit 11: SAR Test Report IHDT5CA1

| | |
|---|---|
| **Date of test:** | 08/07/2002 – 08/14/2002 |
| **Date of Report:** | 08/16/2002 |
| **Laboratory:** | Motorola Personal Communications Sector Product Safety & Compliance Laboratory<br>2001 N. Division<br>Room: AS228<br>Harvard, Illinois 60033 |
| **Test Responsible:** | Firass Badaruzzaman<br>SAR Engineer |
| **Accreditation:** | This laboratory is accredited to ISO/IEC 17025-1999 to perform the following electromagnetic exposure tests:<br>System Validation & Interlaboratory Comparison<br>Simulated Tissue Specifications and Procedure<br>EME Cellular Phone Testing Procedure<br><br>On the following types of products:<br>Wireless Communications Devices (Examples): Two Way Radios; Portable Phones (including Cellular, Licensed Non-Broadcast and PCS); Low Frequency Readers; and Pagers<br><br>A2LA certificate #1651-01 |
| **Statement of Compliance:** | Motorola declares under its sole responsibility that portable cellular telephone FCC ID IHDT5CA1 to which this declaration relates, is in conformity with the appropriate General Population/Uncontrolled RF exposure standards, recommendations and guidelines (FCC 47 CFR §2.1093). It also declares that the product was tested in accordance with the appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below:<br><br>(none) |

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The results and statements contained herein relate only to the items tested. The names of individuals involved may be mentioned only in connection with the statements or results from this report.

Motorola encourages all feedback, both positive and negative, on this test report.

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# 1. Introduction

The Motorola Personal Communications Sector Product Safety Laboratory has performed measurements of the maximum potential exposure to the user of portable cellular phone (FCC ID IHDT5CA1). The Specific Absorption Rate (SAR) of this product was measured. The portable cellular phone was tested in accordance with FCC OET Bulletin 65 Supplement C 01-01.

# 2. Description of the Device Under Test

## Antenna description

| | | |
|---|---|---|
| **Type** | Stubby | |
| **Location** | Right Side | |
| **Dimensions** | Length | 25mm |
| | Width | 5mm |
| **Configuration** | Stuby | |

## Device description

| | | |
|---|---|---|
| **FCC ID Number** | IHDT5CA1 | |
| **Serial number(s)** | 52FCE020 | |
| **Mode(s) of Operation** | 800 AMPS | TDMA 800 |
| **Modulation Mode(s)** | AMPS | TDMA |
| **Maximum Output Power Setting** | 25.50 dBm | 27.50 dBm |
| **Duty Cycle** | 1:1 | 1:3 |
| **Transmitting Frequency Rang(s)** | 824.04-848.97 MHz | 824.04-848.97 MHz |
| **Production Unit or Identical Prototype (47 CFR §2..908)** | Identical Prototype | |
| **Device Category** | Portable | |
| **RF Exposure Limits** | General Population / Uncontrolled | |

# 3. Test Equipment Used

## 3.1 Dosimetric System

The Motorola Personal Communications Sector Product Safety & Compliance Laboratory utilizes a Dosimetric Assessment System (Dasy3™ v3.1d) manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The overall RSS uncertainty of the measurement system is ±11.7% (K=1) with an expanded uncertainty of ±23.0% (K=2). The measurement uncertainty budget is given in Appendix 6. The list of calibrated equipment used for the measurements is shown below.

| Description | Serial Number | Cal Due Date |
|---|---|---|
| DASY3 DAE V1 | SN365 / SN398 | 9/26/2002 |
| E-Field Probe ETDV6 | SN1508 / SN1513 | 5/8/2003 |
| Dipole Validation Kit, DV900V2 | SN92 | 1/3/2003 |
| Dipole Validation Kit, DV900V2 | SN94 | 1/3/2003 |
| Dipole Validation Kit, DV900V2 | SN95 | 1/3/2003 |
| S.A.M. Phantom used for 800MHz | TP-1005 / TP-1131 | |

## 3.2 Additional Equipment

| Description | Serial Number | Cal Due Date |
|---|---|---|
| Signal Generator HP8648C | 3847A04848 | 01/19/2003 |
| Power Meter E4419B | GB39511090 | 11/28/2002 |
| Power Sensor #1 - 8481A | US39211007 | 12/19/2002 |
| Power Sensor #2 - 8481A | US39210929 | 12/19/2002 |
| Network Analyzer HP8753ES | US39171846 | 05/01/2003 |
| Dielectric Probe Kit HP85070B | US99360074 | |

| Description | Serial Number | Cal Due Date |
|---|---|---|
| Signal Generator HP8648C | 3847A04845 | 10/05/2002 |
| Power Meter E4419B | US39210932 | 02/14/2003 |
| Power Sensor #1 - 8481A | US39210934 | 02/14/2003 |
| Power Sensor #2 - 8481A | GB39511084 | 01/18/2003 |
| Network Analyzer HP8753ES | US39171846 | 05/01/2003 |
| Dielectric Probe Kit HP85070B | US99360074 | |

## 4. Electrical parameters of the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity, $\varepsilon_r$, and the conductivity, $\sigma$, of the tissue simulating liquids were measured with the HP85070 Dielectric Probe Kit These values, along with the temperature of the tissue simulate are shown in the table below. The recommended limits for maximum permittivity and minimum conductivity are also shown. These come from the Federal Communication Commission, OET Bulletin 65 Supplement C 01-01. It is seen that the measured parameters are satisfactory for compliance testing.

| *f* (MHz) | Tissue type | Limits / Measured | Dielectric Parameters | | |
|---|---|---|---|---|---|
| | | | $e_r$ | s (S/m) | Temp (°C) |
| 835 | **Head** | **Measured, 08/01/2002** | 42.00 | 0.91 | N/A |
| | | **Recommended Limits** | 41.50 | 0.90 | 20-25 |
| | | **Measured, 08/02/2002** | 41.20 | 0.90 | N/A |
| | | **Recommended Limits** | 41.50 | 0.90 | 20-25 |
| | | **Measured, 08/02/2002** | 42.00 | 0.91 | N/A |
| | | **Recommended Limits** | 41.50 | 0.90 | 20-25 |
| | | **Measured, 08/06/2002** | 42.60 | 0.91 | N/A |
| | | **Recommended Limits** | 41.50 | 0.90 | 20-25 |
| | | **Measured, 08/08/2002** | 42.50 | 0.90 | N/A |
| | | **Recommended Limits** | 41.50 | 0.90 | 20-25 |
| 835 | **Body** | **Measured, 08/08/2002** | 54.50 | 0.96 | N/A |
| | | **Recommended Limits** | 55.20 | 0.97 | 20-25 |
| | | **Measured, 08/09/2002** | 54.60 | 0.98 | N/A |
| | | **Recommended Limits** | 55.20 | 0.97 | 20-25 |

The list of ingredients and the percent composition used for the tissue simulates are indicated in the table below.

| Ingredient | 800MHz Head | 800MHz Body | 1900MHz Head | 1900MHz Body |
|---|---|---|---|---|
| Sugar | 57.0 | 44.9 | 47.0 | 30.80 |
| DGBE | -- | -- | 52.8 | 68.91 |
| Water | 40.45 | 53.06 | 0.2 | 0.29 |
| Salt | 1.45 | 0.94 | -- | -- |
| HEC | 1.0 | 1.0 | -- | -- |
| Bact. | 0.1 | 0.1 | -- | -- |

## 5. System Accuracy Verification

A system accuracy verification of the DASY3 was performed using the measurement equipment listed in Section 3.1. The daily system accuracy verification occurs within center section of the SAM phantom.

A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR indicated on the dipole certification sheet. These tests were done at 900MHz and/or 1800MHz. These frequencies are within 100MHz of the mid-band frequency of the test device. This is within the allowable window given in Supplement C 01-01 *Appendix D System Verification* section item #5. The test was conducted on the same days as the measurement of the DUT. Recommended limits for maximum permittivity, minimum conductivity are shown in the table below. These come from the Federal Communication Commission, OET Bulletin 65 Supplement C 01-01. The obtained results from the system accuracy verification are displayed in the table below. The distributions of SAR compare well with those of the reference measurements (see Appendix 1). The tissue stimulant depth was verified to be 15.0cm ±0.5cm. Z-axis scans showing the SAR penetration are also included in Appendix 1. SAR values are normalized to 1W forward power delivered to the dipole.

Daily, prior to conducting tests, measurements were made with the RF sources powered off to determine the system noise level. The highest system noise was 0.0036 W/kg, which is below the recommended limit.

| *f* (MHz) | Description | SAR (W/kg), 1gram | Dielectric Parameters | | Ambient Temp (°C) | Tissue Temp (°C) |
|---|---|---|---|---|---|---|
| | | | $e_r$ | s (S/m) | | |
| 900 | **Measured, 08/01/2002** | 11.84 | 41.2 | 0.97 | 24.00 | 23.00 |
| | **Recommended Limits** | 11.40 | 40.3 | 0.95 | N/A | N/A |
| | **Measured, 08/02/2002** | 11.76 | 40.4 | 0.96 | 23.00 | 22.40 |
| | **Recommended Limits** | 11.40 | 40.3 | 0.95 | N/A | N/A |
| | **Measured, 08/06/2002** | 11.74 | 41.8 | 0.97 | 23.00 | 22.80 |
| | **Recommended Limits** | 11.40 | 40.3 | 0.95 | N/A | N/A |
| | **Measured, 08/08/2002** | 11.38 | 41.7 | 0.95 | 23.00 | 22.20 |
| | **Recommended Limits** | 11.40 | 40.3 | 0.95 | N/A | N/A |
| | **Measured, 08/09/2002** | 11.46 | 41.7 | 0.97 | 23.00 | 22.30 |
| | **Recommended Limits** | 11.40 | 40.3 | 0.95 | N/A | N/A |

The following probe conversion factors were used on the E-Field probe(s) used for the system accuracy verification measurements:

| Description | Serial Number | f (MHz) | Conversion Factor | Cal Cert page # |
|---|---|---|---|---|
| E-Field Probe ETDV6 | SN1508 | 900 | 6.35 | 2 |
| E-Field Probe ETDV6 | SN1513 | 900 | 6.10 | 2 |

## 6. Test Results

The test sample was operated in a test mode that allows control of the transmitter without the need to place actual phone calls. For the purposes of this test the unit is commanded to test mode and manually set to the proper channel, transmitter power level and transmit mode of operation. The phone was tested in the configurations stipulated in OET Bulletin 65 Supplement C 01-01. Motorola also followed the requirements in Supplement. C / Appendix D: SAR Measurement Procedures, section titled "*Devices Operating Next To A Person's Ear* ". These directions state "The device should be tested on the left and right side of the head phantom in the "Cheek/Touch" and "Ear/Tilt" positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tile/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s)."

The DASY v3.1d SAR measurement system specified in section 3.1 was utilized within the intended operations as set by the SPEAG™ setup. The phone was positioned into the measurement configurations using the positioner supplied with the DASY 3.1d SAR measurement system. The measured dielectric constant of the material used for the positioner is less than 2.9 and the loss tangent is less than 0.02 (± 30%) at 850MHz. The default settings for the "coarse" and "cube" scans were chosen and use for measurements. The grid spacing of the course scan was set to 15cm as shown in the SAR plots included in appendix 2 and 3. Please refer to the DASY manual for additional information on SAR scanning procedures and algorithms used.

The Cellular Phone (FCC ID IHDT5CA1) has the following battery options:

SNN5571A 1100mAH Battery

This battery was used to do all of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery.

### 6.1 Head Adjacent Test Results

The SAR results shown in tables 1 through 4 are maximum SAR values averaged over 1 gram of phantom tissue. Also shown are the measured conducted output powers, the temperature of the test facility during the test, the temperature of the tissue simulate after the test, the measured drift and the extrapolated SAR. The exact method of extrapolation is New SAR = Old SAR * 10^(drift/10). The SAR reported at the end of the measurement process by the DASY™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test. The test conditions indicated as bold numbers in the following table are included in Appendix 2

The SAR measurements were performed using the SAM phantoms listed in section 3.1. Since same phantoms and tissue simulate are used for the system accuracy verification as the device SAR measurements, the Z-axis scans included in within Appendix 1 are applicable for verification of tissue simulate depth to be 15.0cm ±0.5cm. All other test conditions measured lower SAR values than those included in Appendix 2. Note that 800MHz digital mode SAR measurements were performed in accordance with Supplement C.

The following probe conversion factors were used on the E-Field probe(s) used for the head adjacent measurements:

| Description | Serial Number | f (MHz) | Conversion Factor | Additional Cal Cert page # |
|---|---|---|---|---|
| E-Field Probe ETDV6 | SN1508 | 900 | 6.50 | 2 |
| E-Field Probe ETDV6 | SN1513 | 900 | 6.20 | 2 |

| f (MHz) | Description | Conducted Output Power (dBm) | Left Head (Cheek / Touch Position) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Ant Fixed | | | | |
| | | | Measured (W/kg) | Drift (dB) | Extrapolated (W/kg) | Amb. Temp (°C) | Simulate Temp (°C) |
| Analog 800MHz | Channel 991 | 25.40 | 1.28 | -0.22 | 1.35 | 22.40 | 23.00 |
| | Channel 384 | 25.46 | 1.19 | -0.12 | 1.22 | 23.00 | 22.80 |
| | Channel 799 | 25.49 | 1.20 | -0.03 | 1.21 | 22.40 | 23.00 |
| Digital 800MHz | Channel 1013 | 27.53 | | | | | |
| | Channel 384 | 27.49 | 0.873 | 0.01 | 0.87 | 22.80 | 22.60 |
| | Channel 779 | 27.51 | | | | | |

**Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT5CA1 at highest possible output power. Measured against the left head in the Cheek/Touch Position.**

| f (MHz) | Description | Conducted Output Power (dBm) | Right Head (Cheek / Touch Position) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Ant Fixed | | | | |
| | | | Measured (W/kg) | Drift (dB) | Extrapolated (W/kg) | Amb. Temp (°C) | Simulate Temp (°C) |
| Analog 800MHz | Channel 991 | 25.40 | 1.21 | -0.11 | 1.24 | 23.00 | 22.80 |
| | Channel 384 | 25.46 | 1.07 | -0.07 | 1.09 | 23.00 | 22.80 |
| | Channel 799 | 25.49 | 1.13 | -0.01 | 1.13 | 23.00 | 22.80 |
| Digital 800MHz | Channel 1013 | 27.53 | | | | | |
| | Channel 384 | 27.49 | 0.814 | -0.05 | 0.82 | 22.80 | 22.60 |
| | Channel 779 | 27.51 | | | | | |

**Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT5CA1 at highest possible output power. Measured against the right head in the Cheek/Touch Position.**

| f (MHz) | Description | Conducted Output Power (dBm) | Left Head (15° Tilt Position) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Ant Fixed | | | | |
| | | | Measured (W/kg) | Drift (dB) | Extrapolated (W/kg) | Amb. Temp (°C) | Simulate Temp (°C) |
| Analog 800MHz | Channel 991 | 25.40 | | | | | |
| | Channel 384 | 25.46 | 0.677 | 0.01 | 0.677 | 22.40 | 23.00 |
| | Channel 799 | 25.49 | | | | | |
| Digital 800MHz | Channel 1013 | 27.53 | | | | | |
| | Channel 384 | 27.49 | 0.501 | -0.06 | 0.51 | 22.20 | 22.20 |
| | Channel 779 | 27.51 | | | | | |

**Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT5CA1 at highest possible output power. Measured against the left head in the 15° Tilt Position.**

| f (MHz) | Description | Conducted Output Power (dBm) | Right Head (15° Tilt Position) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Ant Fixed | | | | |
| | | | Measured (W/kg) | Drift (dB) | Extrapolated (W/kg) | Amb. Temp (°C) | Simulate Temp (°C) |
| Analog 800MHz | Channel 991 | 25.40 | | | | | |
| | Channel 384 | 25.46 | 0.59 | 0.04 | 0.59 | 23.00 | 22.80 |
| | Channel 799 | 25.49 | | | | | |
| Digital 800MHz | Channel 1013 | 27.53 | | | | | |
| | Channel 384 | 27.49 | 0.46 | 0.06 | 0.46 | 22.80 | 22.60 |
| | Channel 779 | 27.51 | | | | | |

**Table 4: SAR measurement results for the portable cellular telephone FCC ID IHDT5CA1 at highest possible output power. Measured against the right head in the 15° Tilt Position.**

## 6.2 Body-Worn Test Results

The SAR results shown in table 5 are the maximum SAR values averaged over 1 gram of phantom tissue. Also shown are the measured conducted output powers, the temperature of the test facility during the test, the temperature of the tissue simulate after the test, the measured drift and the extrapolated SAR. The exact method of extrapolation is New SAR = Old SAR * 10^(drift/10). The SAR reported at the end of the measurement process by the DASY™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test. The test conditions indicated as bold numbers in the following table are included in Appendix 3. Note that 800MHz digital mode SAR measurements were performed in accordance with OET Bulletin 65 Supplement C 01-01. All other test conditions measured lower SAR values than those included in Appendix 3.

A "flat" phantom was for the body-worn tests. This "flat" phantom is made out of 1" thick natural High Density Polyethylene with a thickness at the bottom equal to 2.0mm. It measures 52.7cm(long) x 26.7cm(wide) x 21.2cm(tall). The measured dielectric constant of the material used is less than 2.3 and the loss tangent is less than 0.0046 all the way up to 2.184GHz.

The tissue stimulant depth was verified to be 15.0cm ±0.5cm. The same device holder described in section 6 was used for positioning the phone. The functional accessories were divided into two categories, the ones with metal components and the ones with non-metal components. For non-metallic component accessories', testing was performed on the accessory that displayed the closest proximity to the flat phantom. Each metallic component accessory, if any, was checked for uniqueness of metal component so that each is tested with the device. If multiple accessories shared an identical metal component, only the accessory that dictates the closest spacing to the body was tested. The cellular phone was tested with a headset connected to the device for all body-worn SAR measurements.

There are two Body-Worn Accessories available for this phone:

A Plastic Belt Clip: SHN7175A
A Leather Pouch with Belt Clip: SYN9170A / SYN8631A

The leather pouch causes closer proximity and differs in metal components. Both accessories were fully tested for SAR.

The following probe conversion factors were used on the E-Field probe(s) used for the body worn measurements:

| Description | Serial Number | f (MHz) | Conversion Factor | Additional Cal Cert page # |
|---|---|---|---|---|
| E-Field Probe ETDV6 | SN1513 | 900 | 6.20 | 2 |

| f (MHz) | Description | Conducted Output Power (dBm) | Body Worn (Belt Clip SHN7175A) Ant Fixed | | | | |
|---|---|---|---|---|---|---|---|
| | | | Measured (W/kg) | Drift (dB) | Extrapolated (W/kg) | Amb. Temp (°C) | Simulate Temp (°C) |
| Analog 800MHz | Channel 991 | 25.40 | 0.476 | -0.05 | 0.48 | 22.90 | 22.20 |
| | Channel 384 | 25.46 | 0.527 | -0.14 | 0.54 | 22.90 | 22.30 |
| | Channel 799 | 25.49 | 0.497 | -0.10 | 0.51 | 22.90 | 22.20 |
| Digital 800MHz | Channel 1013 | 27.53 | 0.343 | -0.05 | 0.35 | 22.30 | 22.20 |
| | Channel 384 | 27.49 | 0.342 | 0.00 | 0.34 | 22.30 | 22.20 |
| | Channel 779 | 27.51 | 0.362 | 0.07 | 0.36 | 22.30 | 22.20 |

**Table 5: SAR measurement results for the portable cellular telephone FCC ID IHDT5CA1 at highest possible output power. Measured against the body.**

| f (MHz) | Description | Conducted Output Power (dBm) | Body Worn (Leather Pouch with Wishbone SYN9170A / SYN8631A) Ant Fixed | | | | |
|---|---|---|---|---|---|---|---|
| | | | Measured (W/kg) | Drift (dB) | Extrapolated (W/kg) | Amb. Temp (°C) | Simulate Temp (°C) |
| Analog 800MHz | Channel 991 | 25.40 | 0.629 | -0.05 | 0.64 | 22.90 | 22.23 |
| | Channel 384 | 25.46 | 0.547 | -0.19 | 0.57 | 22.90 | 22.20 |
| | Channel 799 | 25.49 | 0.571 | -0.11 | 0.59 | 22.90 | 22.30 |
| Digital 800MHz | Channel 1013 | 27.53 | 0.319 | 0.00 | 0.32 | 22.90 | 22.25 |
| | Channel 384 | 27.49 | 0.294 | 0.03 | 0.29 | 22.90 | 22.00 |
| | Channel 779 | 27.51 | 0.434 | 0.30 | 0.43 | 22.30 | 22.20 |

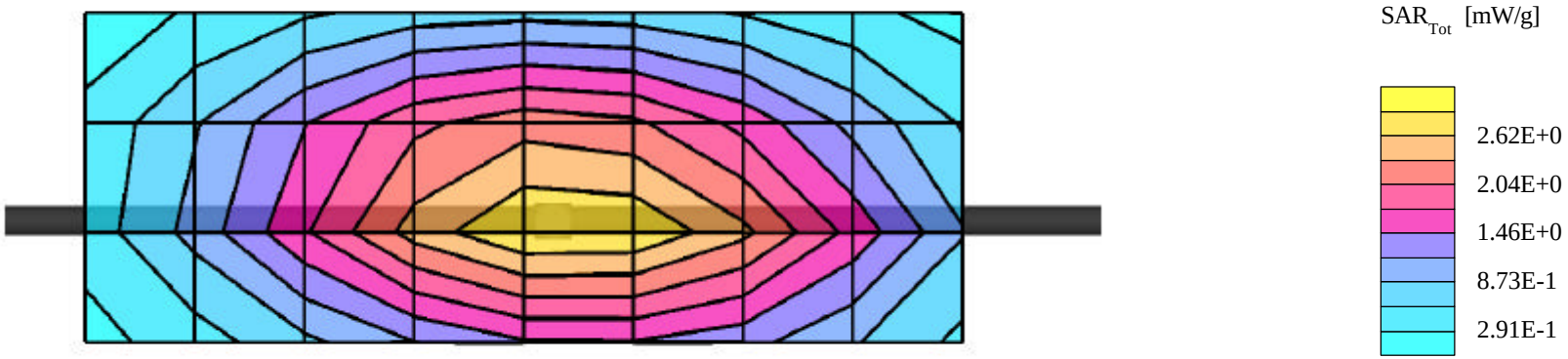
**Table 6: SAR measurement results for the portable cellular telephone FCC ID IHDT5CA1 at highest possible output power. Measured against the body.**

# Appendix 1

## SAR distribution comparison for the system accuracy verification

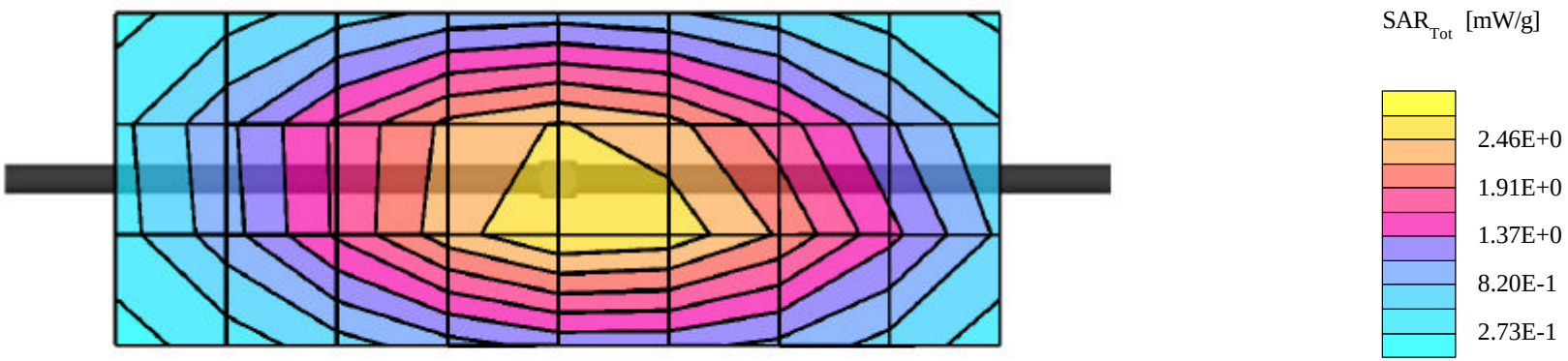
# Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 95 / Forward Power = 250mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 24 C
Simulant Temp at time of measurement =23 C
R1: TP-1005 SUGAR (rev. 3) Phantom; Flat Section; Position: (90°,90°); Frequency: 900 MHz
Probe: ET3DV6 - SN1508 - Validation; ConvF(6.35,6.35,6.35); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma$ = 0.97 mho/m $\varepsilon_r$ = 41.2 $\rho$ = 1.00 g/cm$^3$
Cubes (2): SAR (1g): 2.96 mW/g ± 0.05 dB, SAR (10g): 1.88 mW/g ± 0.05 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 11.9 (11.0, 13.1) [mm]
Powerdrift: 0.04 dB



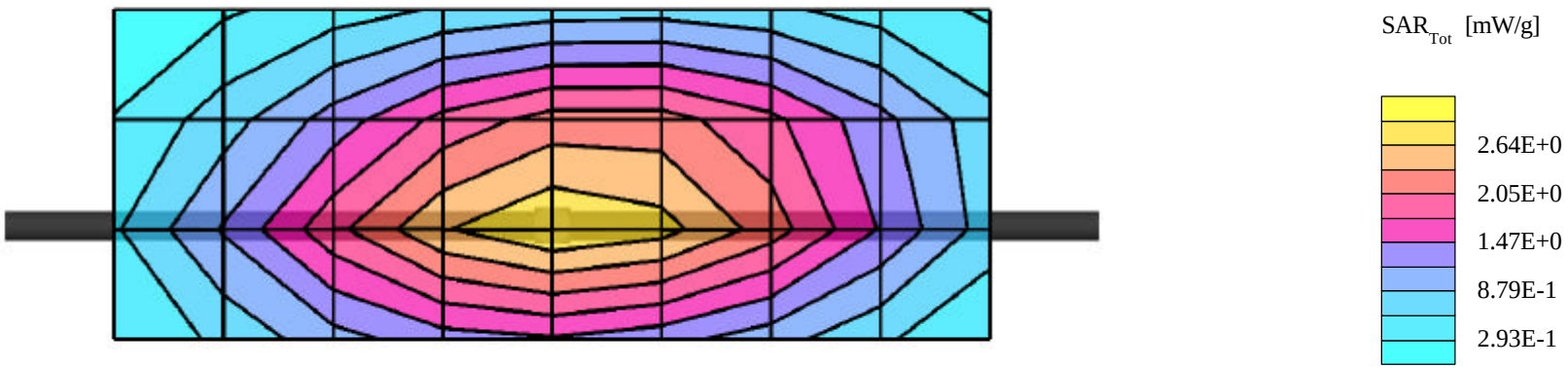
# Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 95 / Forward Power = 250mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23 C
Simulant Temp at time of measurement = 22.4 C
R1: TP-1005 SUGAR (rev. 3) Phantom; Flat Section; Position: (90°,90°); Frequency: 900 MHz
Probe: ET3DV6 - SN1508 - Validation; ConvF(6.35,6.35,6.35); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma$ = 0.96 mho/m $\varepsilon_r$ = 40.4 $\rho$ = 1.00 g/cm$^3$
Cubes (2): SAR (1g): 2.94 mW/g ± 0.03 dB, SAR (10g): 1.87 mW/g ± 0.04 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 11.9 (11.0, 13.1) [mm]
Powerdrift: 0.06 dB



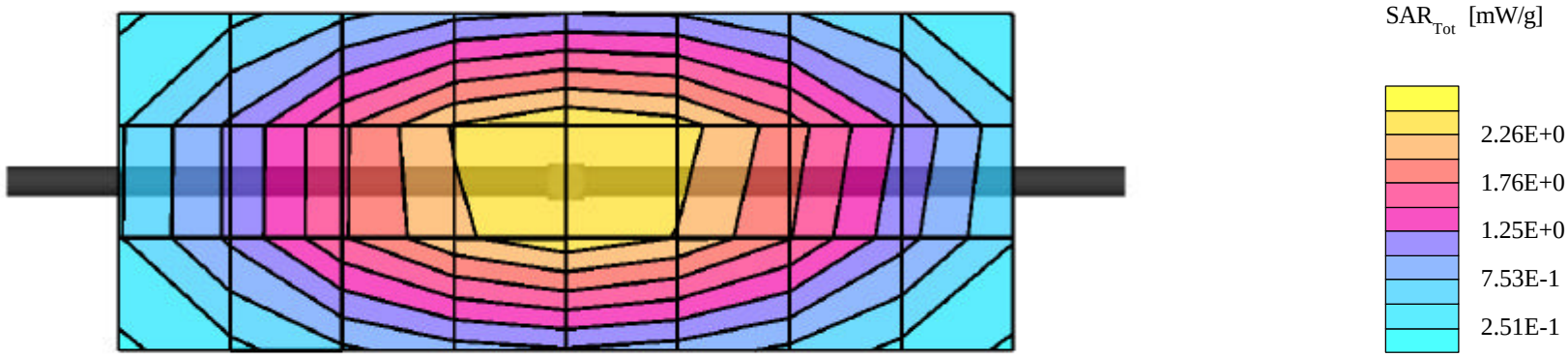
# Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 092 / Forward Power = 251mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23C
Simulant Temp at time of measurement = 22.8C
R1: TP-1005 SUGAR (rev. 3) Phantom; Flat Section; Position: (90°,90°); Frequency: 900 MHz
Probe: ET3DV6 - SN1508 - Validation; ConvF(6.35,6.35,6.35); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma$ = 0.97 mho/m $\varepsilon_r$ = 41.8 $\rho$ = 1.00 g/cm$^3$
Cubes (2): SAR (1g): 2.94 mW/g ± 0.04 dB, SAR (10g): 1.87 mW/g ± 0.04 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 11.8 (11.0, 13.0) [mm]
Powerdrift: 0.05 dB



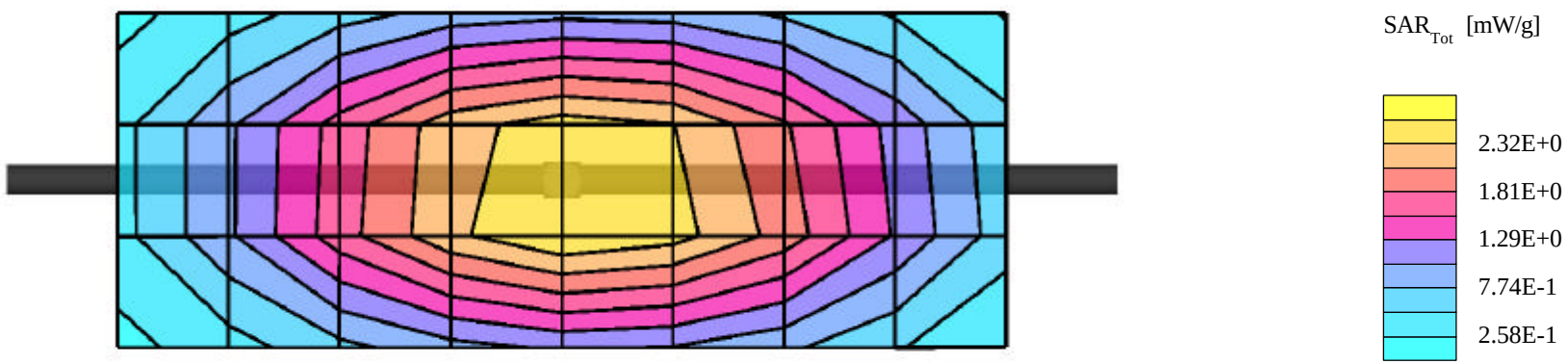
# Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 094 / Forward Power = 252mw / Acceptable Temp Range is 15-25°C / Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement =22.2*C
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Flat Section; Position: (90°,90°); Frequency: 900 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma$ = 0.95 mho/m $\varepsilon_r$ = 41.7 $\rho$ = 1.00 g/cm$^3$
Cubes (2): SAR (1g): 2.87 mW/g ± 0.05 dB, SAR (10g): 1.81 mW/g ± 0.06 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 11.5 (10.7, 12.6) [mm]
Powerdrift: 0.01 dB



# Dipole 900 MHz

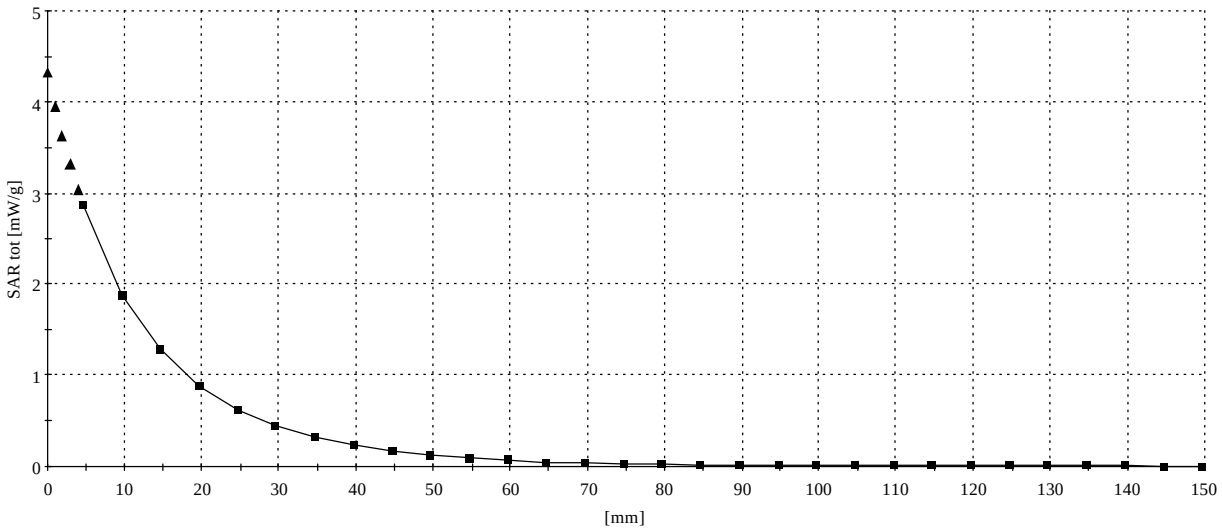
900 MHz Dipole Validation / Dipole Sn# 094 / Forward Power = 252mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement =22.3*C
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Flat Section; Position: (90°,90°); Frequency: 900 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma$ = 0.97 mho/m $\varepsilon_r$ = 41.7 $\rho$ = 1.00 g/cm$^3$
Cubes (2): SAR (1g): 2.89 mW/g ± 0.02 dB, SAR (10g): 1.82 mW/g ± 0.03 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 11.6 (10.7, 12.8) [mm]
Powerdrift: 0.02 dB



# Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 95 / Forward Power = 250mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 24 C
Simulant Temp at time of measurement =23 C
R1: TP-1005 SUGAR (rev. 3) Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6 - SN1508 - Validation; ConvF(6.35,6.35,6.35); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma$ = 0.97 mho/m $\varepsilon_r$ = 41.2 $\rho$ = 1.00 g/cm$^3$

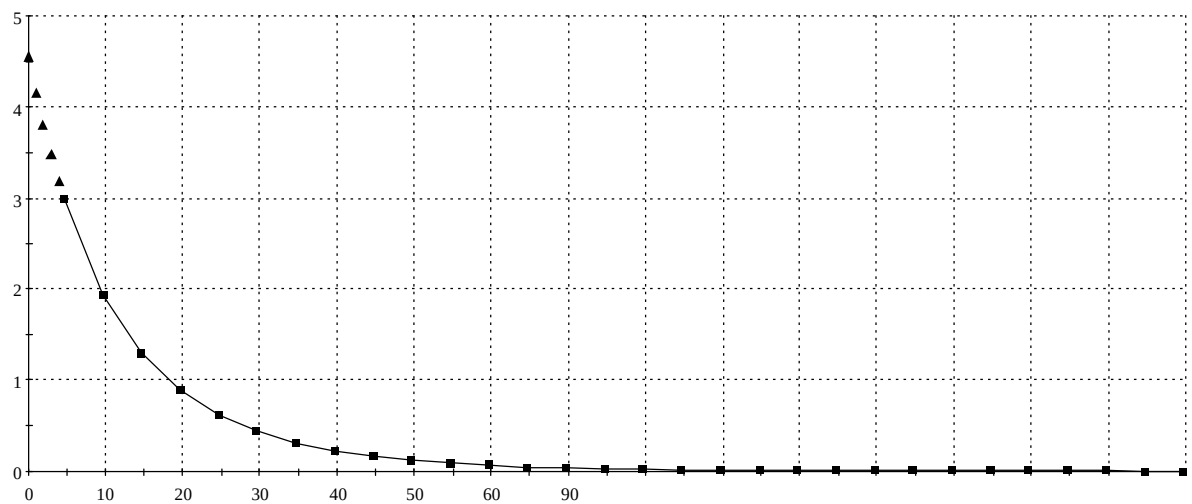
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 12.3 (11.6, 13.3) [mm]



# Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 95 / Forward Power = 250mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23 C
Simulant Temp at time of measurement = 22.4 C
R1: TP-1005 SUGAR (rev. 3) Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6 - SN1508 - Validation; ConvF(6.35,6.35,6.35); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma$ = 0.96 mho/m $\varepsilon_r$ = 40.4 $\rho$ = 1.00 g/cm$^3$

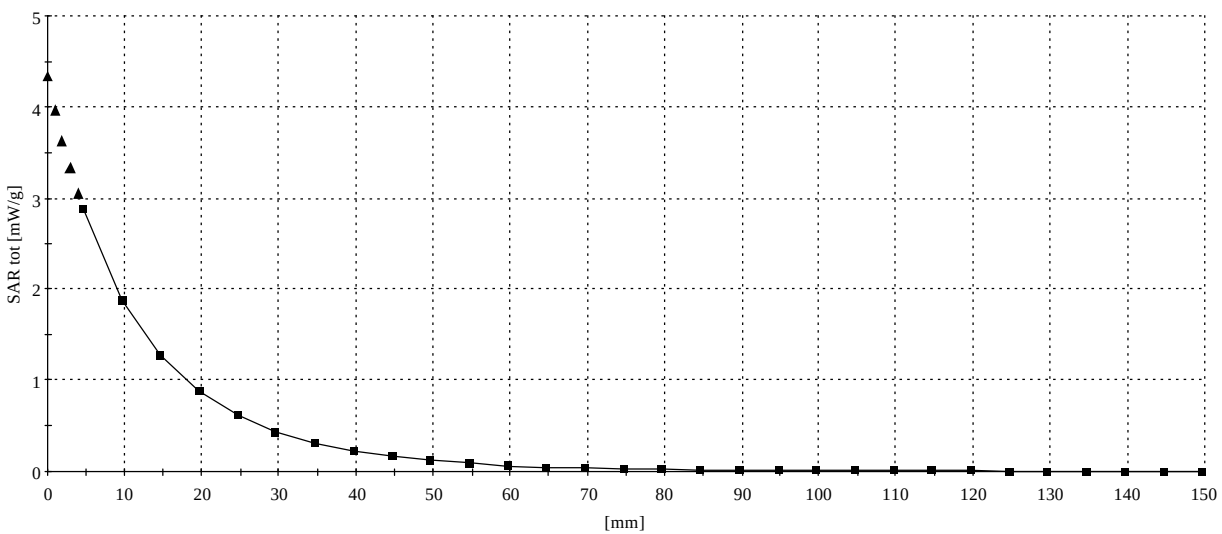
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 11.9 (11.2, 12.8) [mm]



# Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 092 / Forward Power = 251mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23C
Simulant Temp at time of measurement = 22.8C
R1: TP-1005 SUGAR (rev. 3) Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6 - SN1508 - Validation; ConvF(6.35,6.35,6.35); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma$ = 0.97 mho/m $\varepsilon_r$ = 41.8 $\rho$ = 1.00 g/cm$^3$

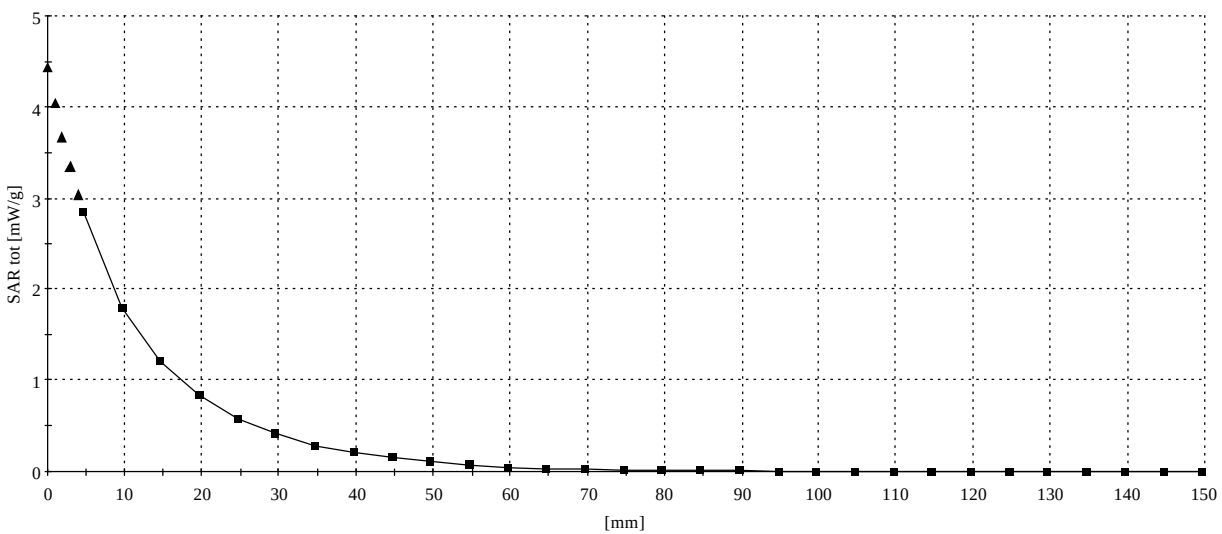
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 12.2 (11.5, 13.1) [mm]



# Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 094 / Forward Power = 252mw / Acceptable Temp Range is 15-25°C / Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement =22.2*C
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma$ = 0.95 mho/m $\varepsilon_r$ = 41.7 $\rho$ = 1.00 g/cm$^3$

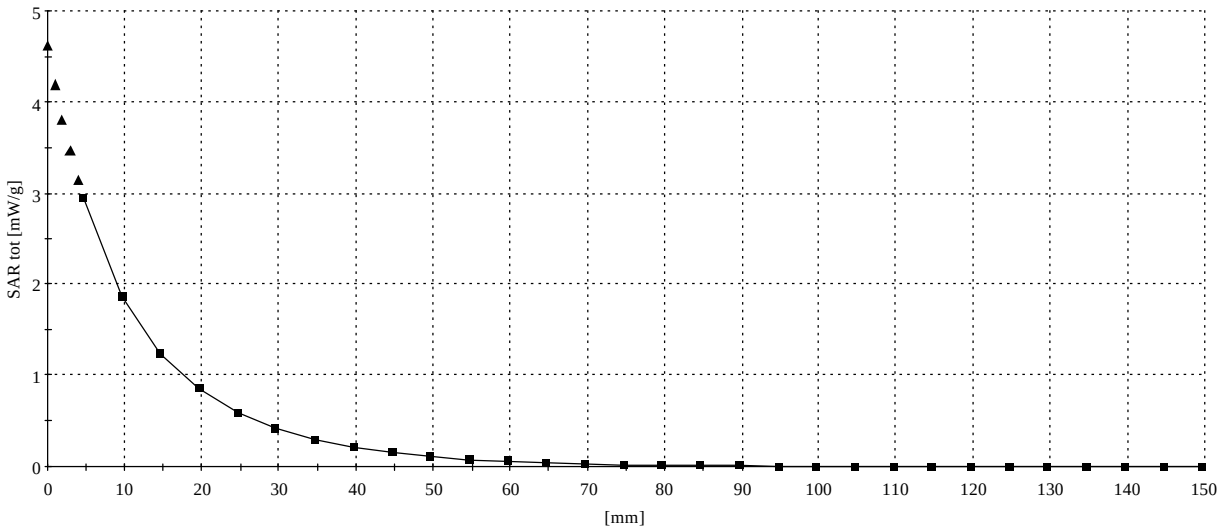
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 11.6 (10.7, 12.9) [mm]



# Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 094 / Forward Power = 252mW / Acceptable Temp Range is 15-25°C Room Temp at time of measurement = 23*C
Simulant Temp at time of measurement =22.3*C
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6R - SN1513 - VALIDATION; ConvF(6.10,6.10,6.10); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma$ = 0.97 mho/m $\varepsilon_r$ = 41.7 $\rho$ = 1.00 g/cm$^3$

Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 11.5 (10.6, 12.7) [mm]

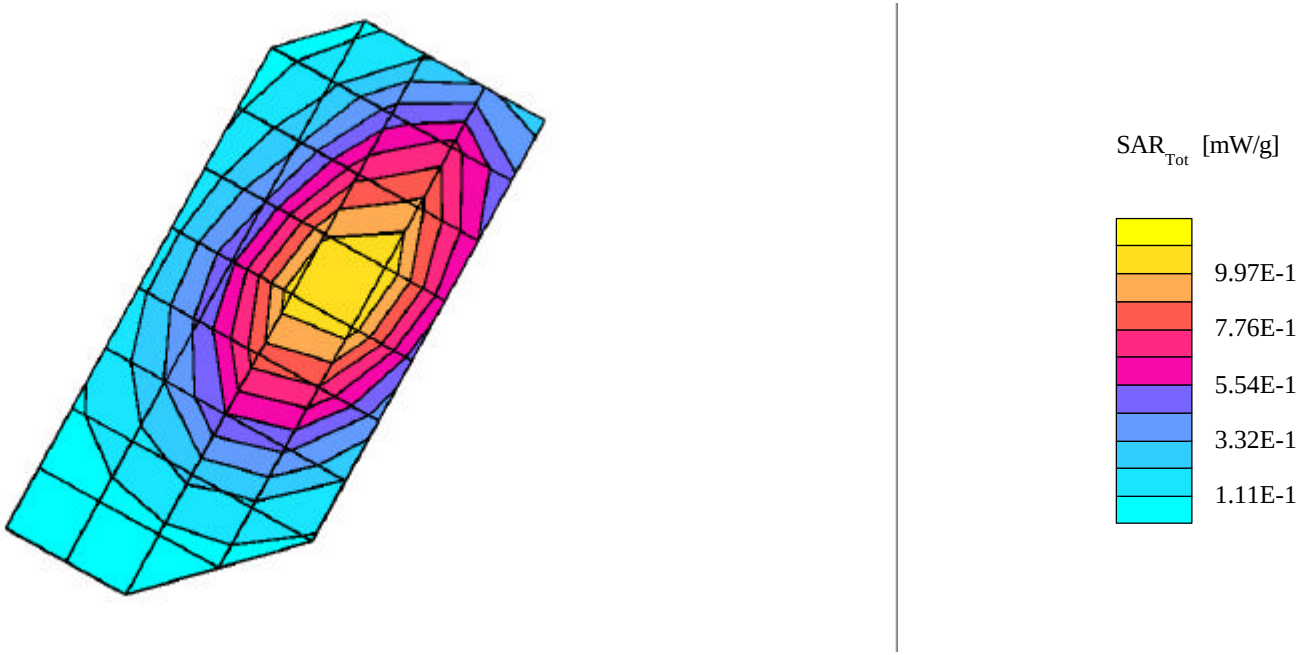


# Appendix 2

## SAR distribution plots for Phantom Head Adjacent Use

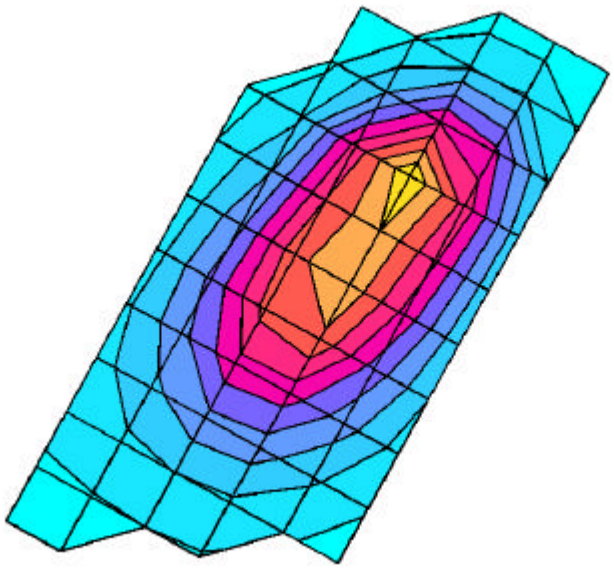
# SN# 52FCE020

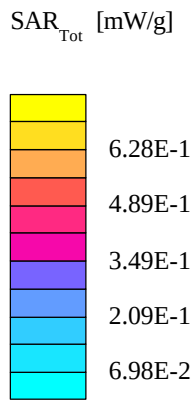
Ch# 383 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION: Cheek touch
R1: TP-1005 SUGAR (rev. 3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.91 mho/m $\varepsilon_r$ = 42.0 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 1.19 mW/g, SAR (10g): 0.817 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 15.3 (14.0, 16.7) [mm]
Powerdrift: -0.12 dB



# SN# 52FCE020

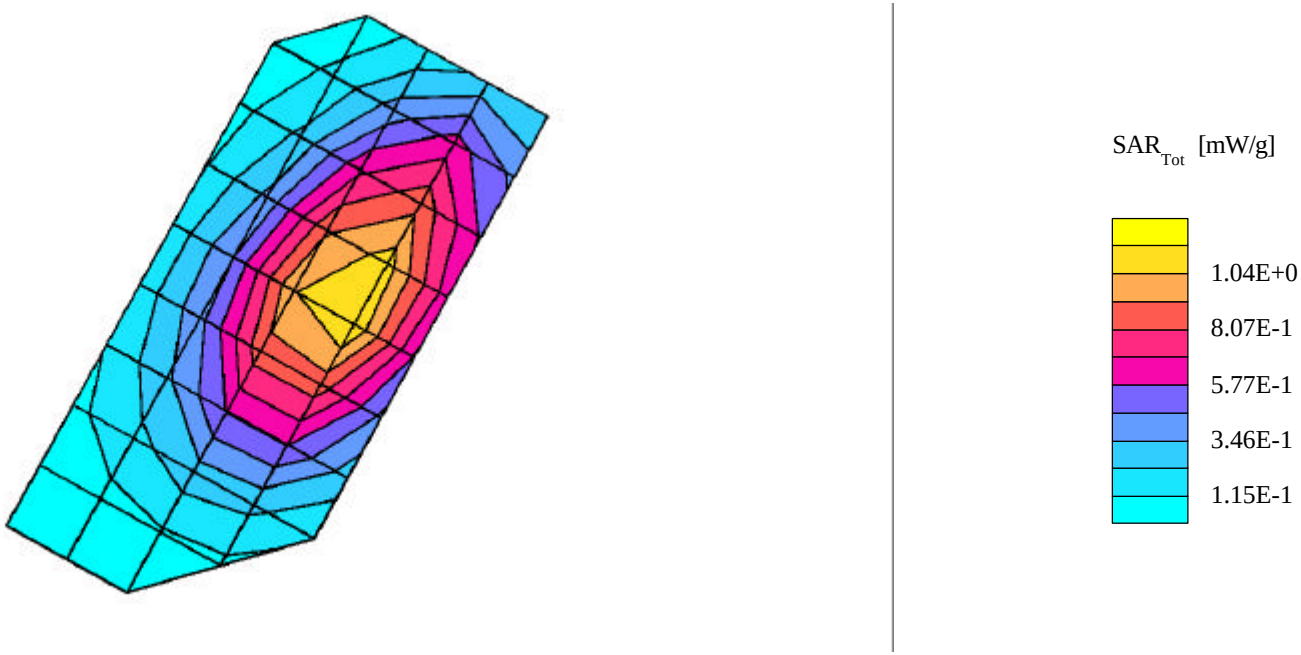
Ch# 383 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION: Tilt 15*
R1: TP-1005 SUGAR (rev. 3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.90 mho/m $\varepsilon_r$ = 41.2 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.677 mW/g, SAR (10g): 0.447 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 12.7 (12.3, 13.4) [mm]
Powerdrift: 0.01 dB





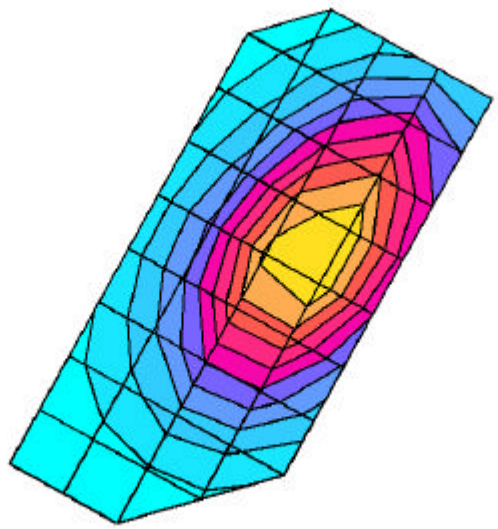
# SN# 52FCE020

Ch# 799 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION: Cheek touch
R1: TP-1005 SUGAR (rev. 3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 849 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.90 mho/m $\varepsilon_r$ = 41.2 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 1.20 mW/g, SAR (10g): 0.818 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 15.4 (14.5, 16.4) [mm]
Powerdrift: -0.03 dB



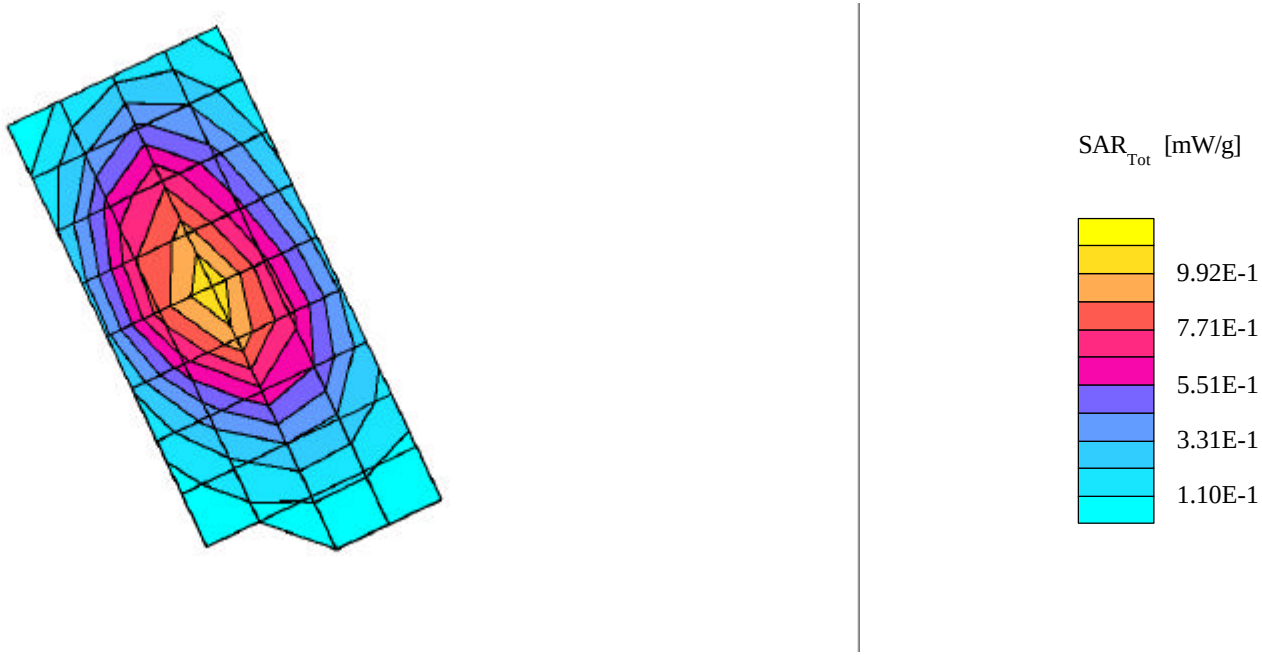
# SN# 52FCE020

Ch# 991 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION: Cheek touch
R1: TP-1005 SUGAR (rev. 3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 824 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.90 mho/m $\varepsilon_r$ = 41.2 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 1.28 mW/g, SAR (10g): 0.880 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 15.2 (14.6, 16.0) [mm]
Powerdrift: -0.22 dB



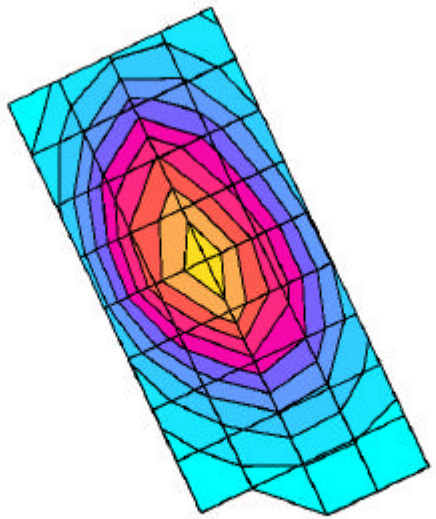
# SN# 52FCE020

Ch# 383 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION: Cheek touch
R1: TP-1005 SUGAR (rev. 3) Phantom; Right Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.91 mho/m $\varepsilon_r$ = 42.0 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 1.07 mW/g, SAR (10g): 0.742 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 15.8 (14.6, 17.2) [mm]
Powerdrift: -0.07 dB



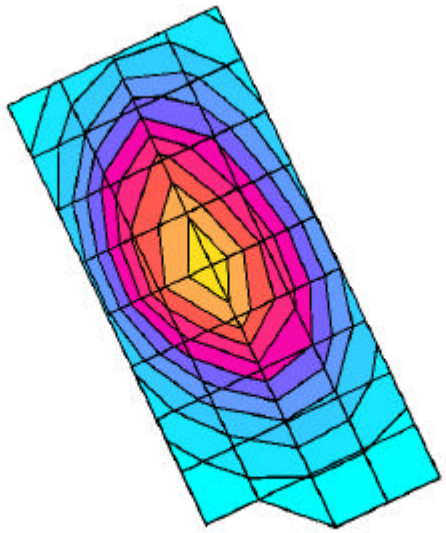
# SN# 52FCE020

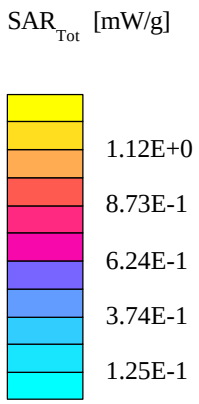
Ch# 799 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION: Cheek touch
R1: TP-1005 SUGAR (rev. 3) Phantom; Right Hand Section; Position: (90°,180°); Frequency: 848 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.91 mho/m $\varepsilon_r$ = 42.0 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 1.13 mW/g, SAR (10g): 0.786 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 15.9 (14.6, 17.3) [mm]
Powerdrift: -0.01 dB



# SN# 52FCE020

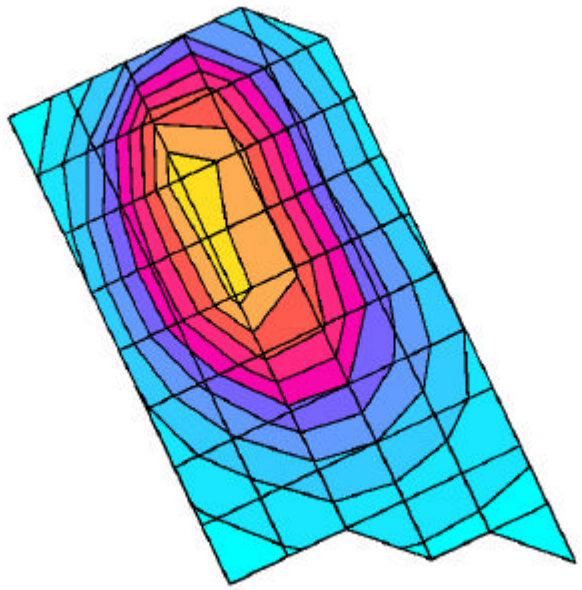
Ch# 991 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION: Cheek touch
R1: TP-1005 SUGAR (rev. 3) Phantom; Right Hand Section; Position: (90°,180°); Frequency: 824 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.91 mho/m $\varepsilon_r$ = 42.0 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 1.21 mW/g, SAR (10g): 0.845 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 16.1 (14.6, 17.6) [mm]
Powerdrift: -0.11 dB

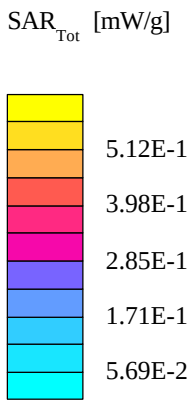




# SN# 52FCE020

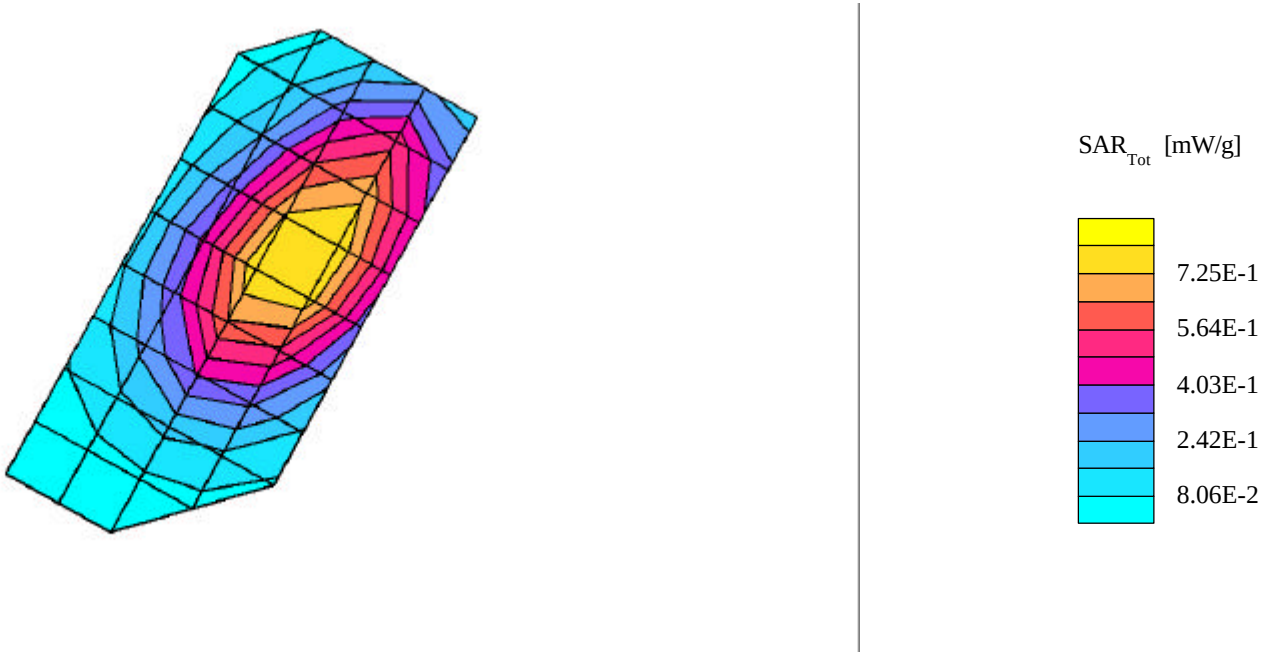
Ch# 383 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION: 15 degree Tilted
R1: TP-1005 SUGAR (rev. 3) Phantom; Right Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.91 mho/m $\varepsilon_r$ = 42.0 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.590 mW/g, SAR (10g): 0.396 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 15.9 (15.8, 16.0) [mm]
Powerdrift: 0.04 dB





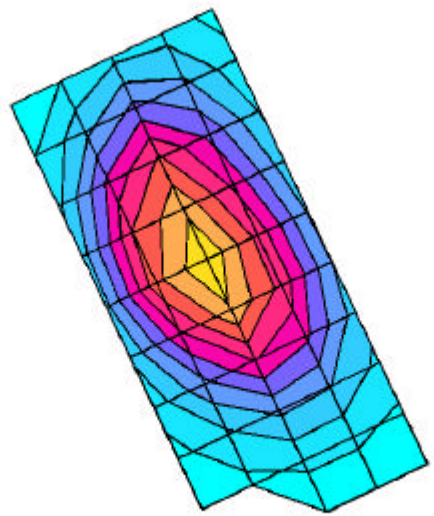
# SN# 52FCE020

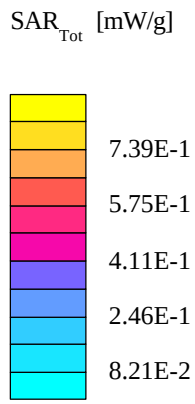
Ch# 383 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION : Cheek touch
R1: TP-1005 SUGAR (rev. 3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 3.0; 835 MHz Head & Body: $\sigma$ = 0.91 mho/m $\varepsilon_r$ = 42.6 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.873 mW/g, SAR (10g): 0.605 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 15.9 (14.8, 17.0) [mm]
Powerdrift: 0.01 dB



# SN# 52FCE020

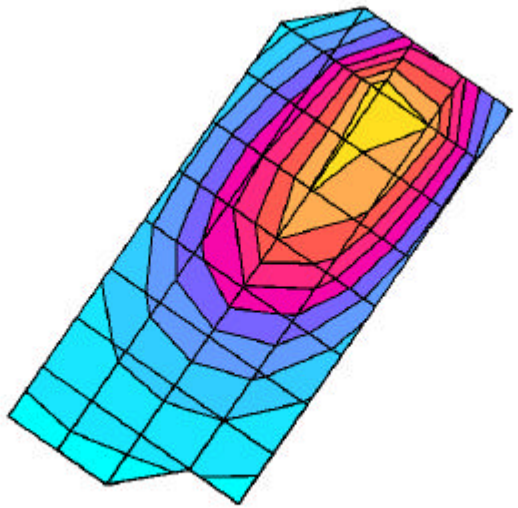
Ch# 383 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION : Cheek touch
R1: TP-1005 SUGAR (rev. 3) Phantom; Right Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 3.0; 835 MHz Head & Body: $\sigma$ = 0.91 mho/m $\varepsilon_r$ = 42.6 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.814 mW/g, SAR (10g): 0.570 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 16.3 (15.3, 17.4) [mm]
Powerdrift: -0.05 dB

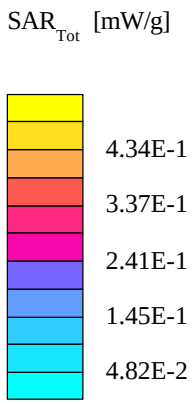




# SN# 52FCE020

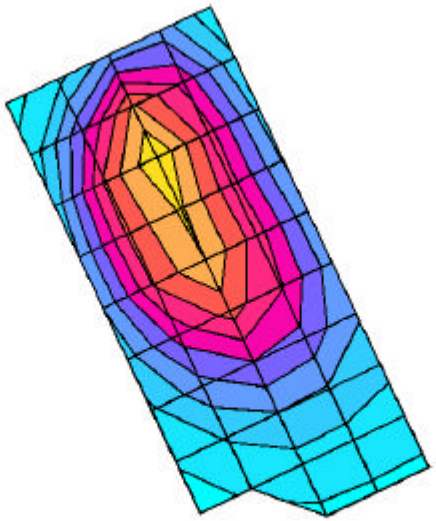
Ch# 383 / Pwr Step: 2(OTA) / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION: 15 degree tilt
R4 TP-1131 Sugar SAM (rev. 4) 26Apr02 Phantom; Left Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6R - SN1513 - IEEE Head; ConvF(6.20,6.20,6.20); Crest factor: 3.0; 835 MHz Head & Body: $\sigma$ = 0.90 mho/m $\varepsilon_r$ = 42.5 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.501 mW/g, SAR (10g): 0.328 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 12.5 (11.9, 13.2) [mm]
Powerdrift: -0.06 dB

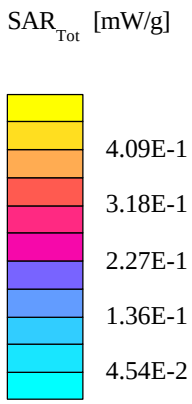




# SN# 52FCE020

Ch# 383 / Pwr Step: 2 / Antenna Position: Fixed / Battery Model #: SNN5571A / DEVICE POSITION : 15 degree Tilt
R1: TP-1005 SUGAR (rev. 3) Phantom; Right Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 3.0; 835 MHz Head & Body: $\sigma$ = 0.91 mho/m $\varepsilon_r$ = 42.6 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.461 mW/g, SAR (10g): 0.307 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 14.1 (13.3, 15.0) [mm]
Powerdrift: 0.06 dB





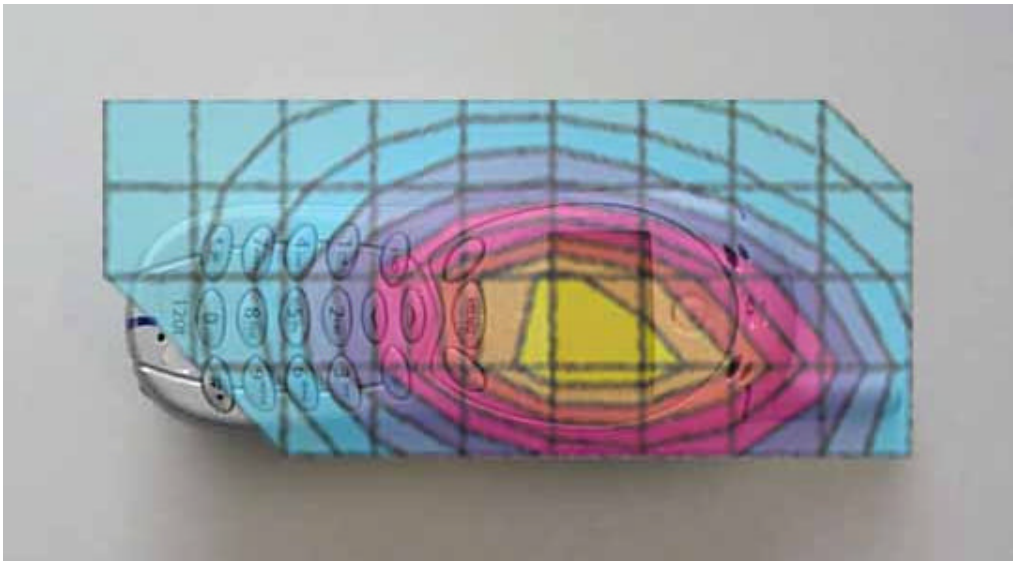



Figure 1.Typical 800MHz Left Head Adjacent Contour Overlaid on Phone with Antenna Fixed (Cheek Touch)

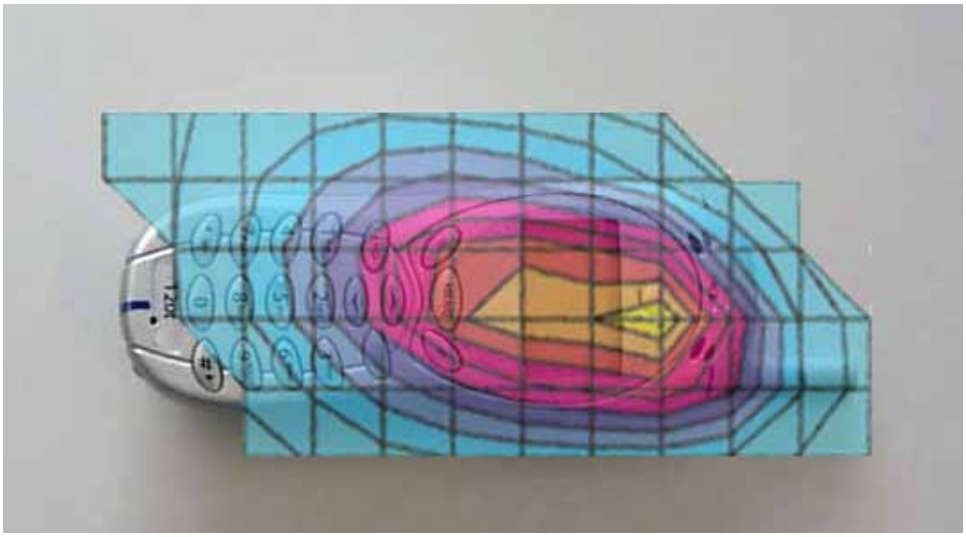


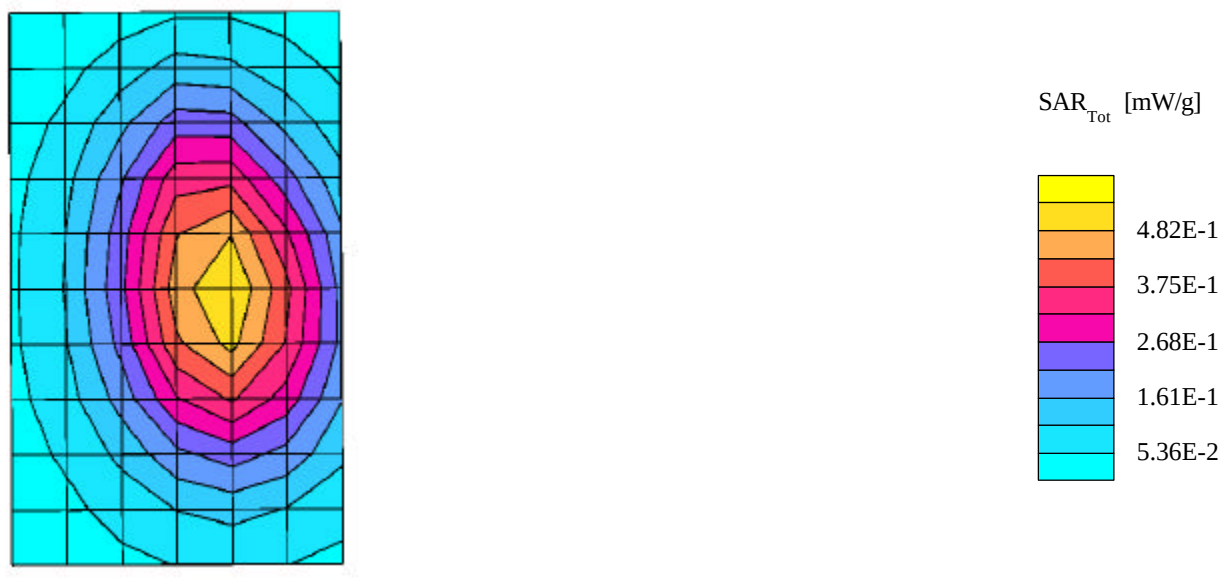

Figure 2.Typical 800MHz Left Head Adjacent Contour Overlaid on Phone with Antenna Fixed (15 ° Tilt)

# Appendix 3

## SAR distribution plots for Body Worn Configuration

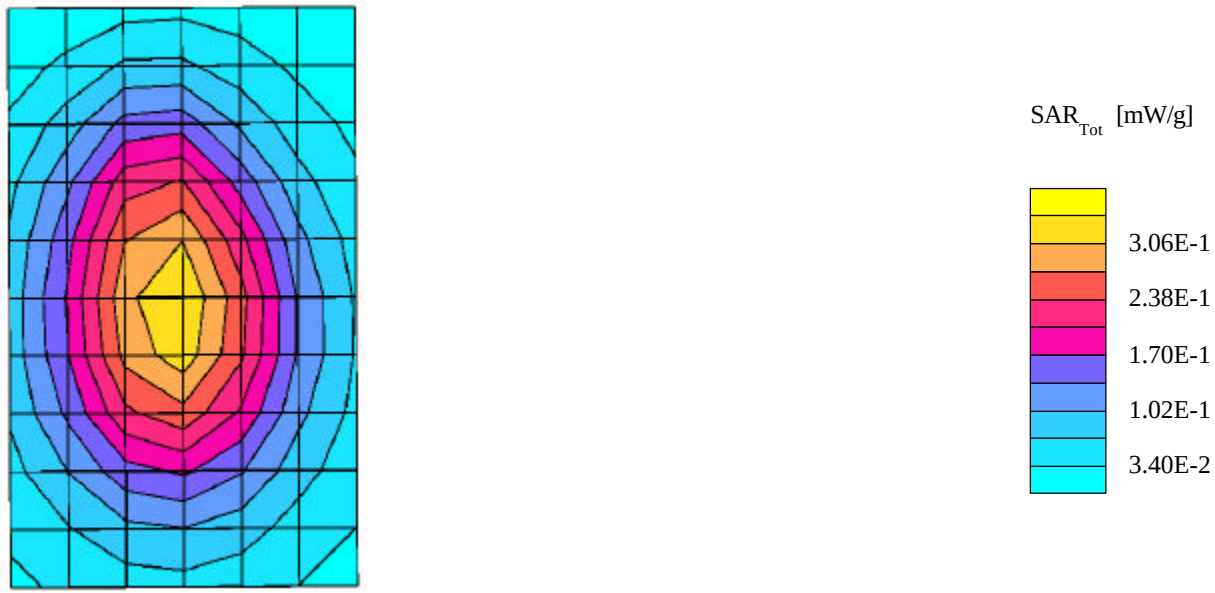
# SN# 52FCE020

Ch# 383 / Pwr Step: 2(OTA) / Antenna Position: Fixed / Battery Model #: SNN5571A / Accessory Model #: SHN7175A
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 836 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.96 mho/m $\varepsilon_r$ = 54.5 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.527 mW/g, SAR (10g): 0.377 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.8 (16.7, 17.1) [mm]
Powerdrift: -0.14 dB



# SN# 52FCE020

Ch# 383 / Pwr Step: 2 (OTA) / Antenna Position: FIXED / Battery Model #: SNN5571A / Accessory Model #: clip (SHN7175A) / Temperature: (22.2*C)
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 836 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 3.0; 835 MHz Head & Body: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.6 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.342 mW/g, SAR (10g): 0.246 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.8 (15.4, 18.3) [mm]
Powerdrift: -0.00 dB



# SN# 52FCE020

Ch# 383 / Pwr Step: 2 (OTA) / Antenna Position: FIXED / Battery Model #: SNN5571A / Accessory Model #: leather case (SYN9170A) wishbone clip (SYN8631A) / Temperature: (22.2*C)

R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 836 MHz

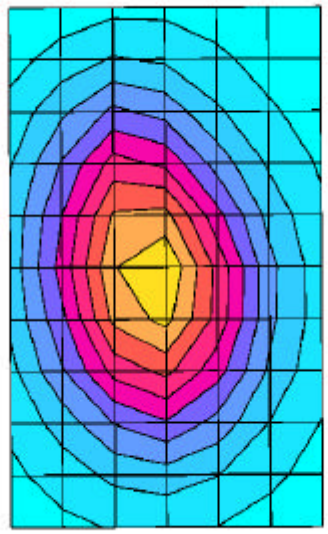
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.96 mho/m $\varepsilon_r$ = 54.5 $\rho$ = 1.00 g/cm$^3$

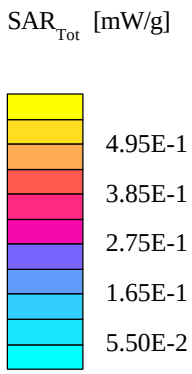
Cube 7x7x7: SAR (1g): 0.547 mW/g, SAR (10g): 0.388 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 15.8 (13.9, 18.0) [mm]

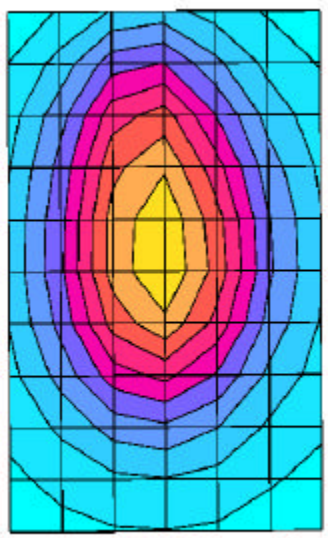
Powerdrift: -0.19 dB

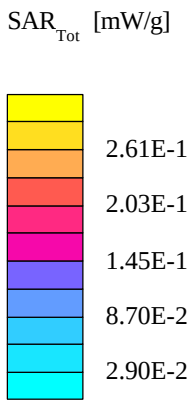




# SN# 52CFE020

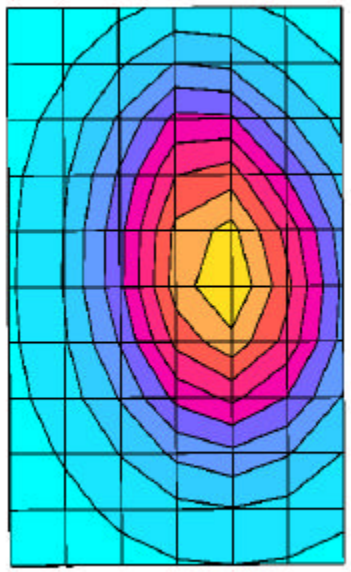
Ch# 383 / Pwr Step: 2(OTA) / Antenna Position: Fixed / Battery Model #: SNN5571A / Accessory Model #: SYN9170A with SYN8631A
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 836 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 3.0; 835 MHz Head & Body: $\sigma$ = 0.96 mho/m $\varepsilon_r$ = 54.5 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.294 mW/g, SAR (10g): 0.212 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.8 (15.2, 18.5) [mm]
Powerdrift: 0.03 dB

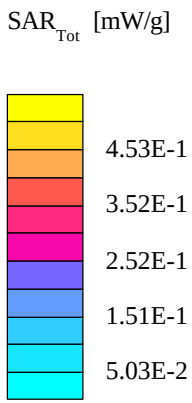




# SN# 52FCE020

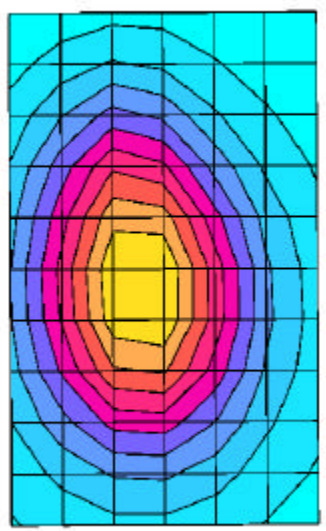
Ch# 799 / Pwr Step: 2(OTA) / Antenna Position: Fixed / Battery Model #: SNN5571A / Accessory Model #: SHN7175A
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 849 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.96 mho/m $\varepsilon_r$ = 54.5 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.497 mW/g, SAR (10g): 0.355 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.8 (15.0, 18.5) [mm]
Powerdrift: -0.10 dB

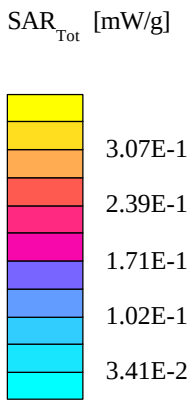




# SN# 52FCE020

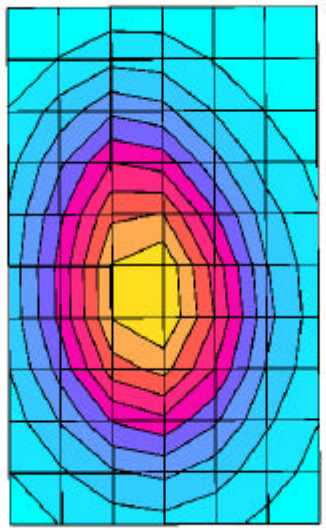
Ch# 799 / Pwr Step: 2 (OTA) / Antenna Position: FIXED / Battery Model #: SNN5571A / Accessory Model #: clip (SHN7175A) / Temperature:(22.2*C)
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 849 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 3.0; 835 MHz Head & Body: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.6 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.362 mW/g, SAR (10g): 0.259 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.5 (15.3, 17.9) [mm]
Powerdrift: 0.07 dB

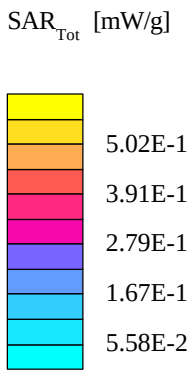




# SN# 52FCE020

Ch# 799/ Pwr Step: 2 (OTA) / Antenna Position: FIXED / Battery Model #: SNN5571A / Accessory Model #: leather case (SYN9170A) wishbone clip (SYN8631A) / (22.3*C)
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 849 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.96 mho/m $\varepsilon_r$ = 54.5 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.571 mW/g, SAR (10g): 0.408 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.4 (15.2, 17.8) [mm]
Powerdrift: -0.11 dB



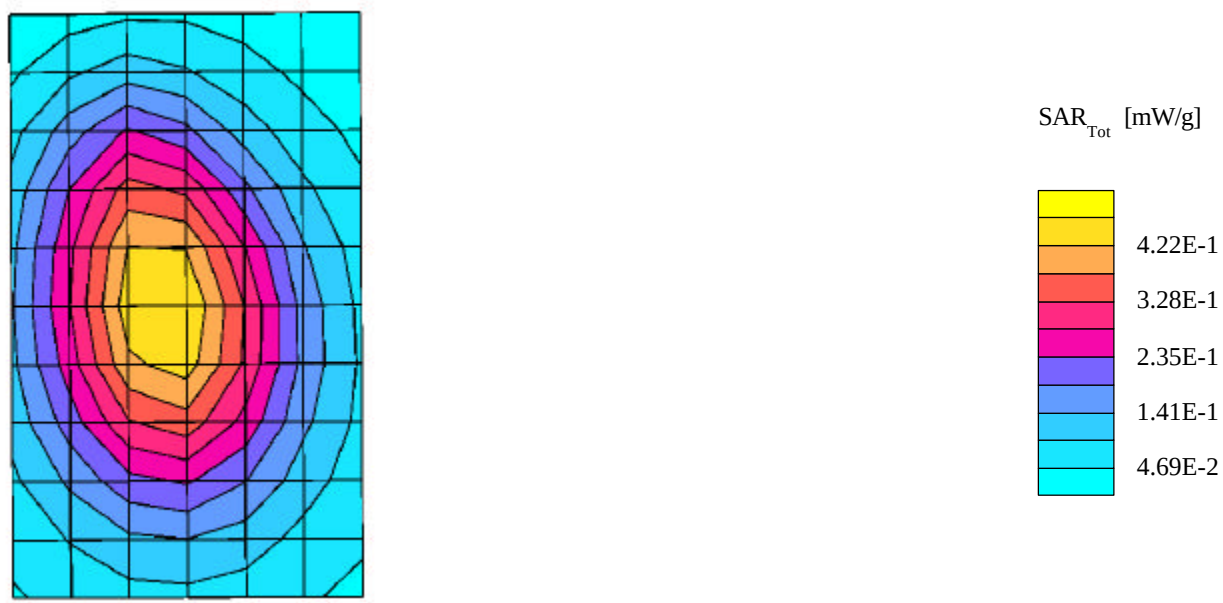


# SN# 52FCE020

Ch# 799 / Pwr Step: 2 (OTA) / Antenna Position: FIXED / Battery Model #: SNN5571A / Accessory Model #: leather case (SYN9170A) / wishbone clip (SYN8631A) / Temperature (22.2*C)
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 849 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 3.0; 835 MHz Head & Body: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.6 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.434 mW/g, SAR (10g): 0.308 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.3 (15.2, 17.6) [mm]
Powerdrift: 0.00 dB

# SN# 52FCE020

Ch# 991 / Pwr Step: 2 (OTA) / Antenna Position: FIXED/ Battery Model #: SNN5571A / Accessory Model #: clip (SHN7175A)
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 824 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.96 mho/m $\varepsilon_r$ = 54.5 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.476 mW/g, SAR (10g): 0.344 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 17.1 (15.2, 19.2) [mm]
Powerdrift: -0.05 dB



# SN# 52FCE020

Ch# 991 / Pwr Step: 2 (OTA) / Antenna Position: FIXED / Battery Model #: SNN5571A / Accessory Model #: clip (SHN7175A) / Temperature: (22.2*C)
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 824 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 3.0; 835 MHz Head & Body: $\sigma$ = 0.98 mho/m $\varepsilon_r$ = 54.6 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.343 mW/g, SAR (10g): 0.248 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 17.0 (15.6, 18.5) [mm]
Powerdrift: -0.05 dB

# SN# 52FCE020

Ch# 991/ Pwr Step: 2 / Antenna Position: FIXED / Battery Model #: SNN5571A / Accessory Model #: leather case (SYN9170A) wishbone clip (SYN8631A) / Temperature: (23*C)

R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 824 MHz

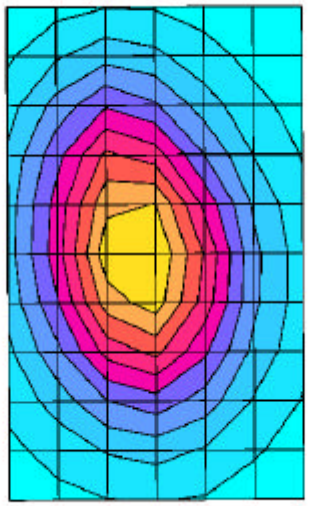
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 1.0; 835 MHz Head & Body: $\sigma$ = 0.96 mho/m $\varepsilon_r$ = 54.5 $\rho$ = 1.00 g/cm$^3$

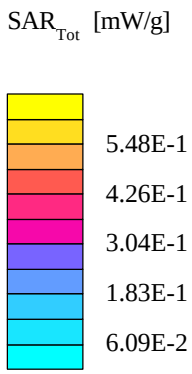
Cube 7x7x7: SAR (1g): 0.629 mW/g, SAR (10g): 0.448 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 16.3 (15.1, 17.8) [mm]

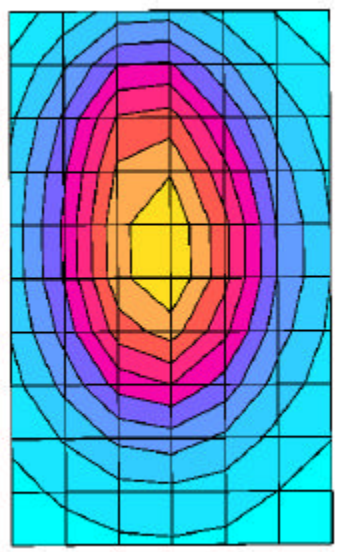
Powerdrift: -0.05 dB

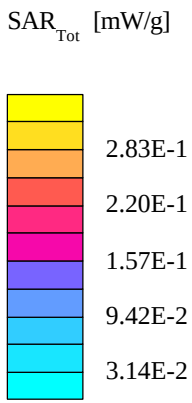




# SN# 52FCE020

Ch# 991 / Pwr Step: 2(OTA) / Antenna Position: Fixed / Battery Model #: SNN5571A / Accessory Model #: SYN9170A with SYN8631A
R4 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 824 MHz
Probe: ET3DV6R - SN1513 - FCC Body; ConvF(6.00,6.00,6.00); Crest factor: 3.0; 835 MHz Head & Body: $\sigma$ = 0.96 mho/m $\varepsilon_r$ = 54.5 $\rho$ = 1.00 g/cm$^3$
Cube 7x7x7: SAR (1g): 0.319 mW/g, SAR (10g): 0.230 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.9 (15.6, 18.4) [mm]
Powerdrift: 0.00 dB





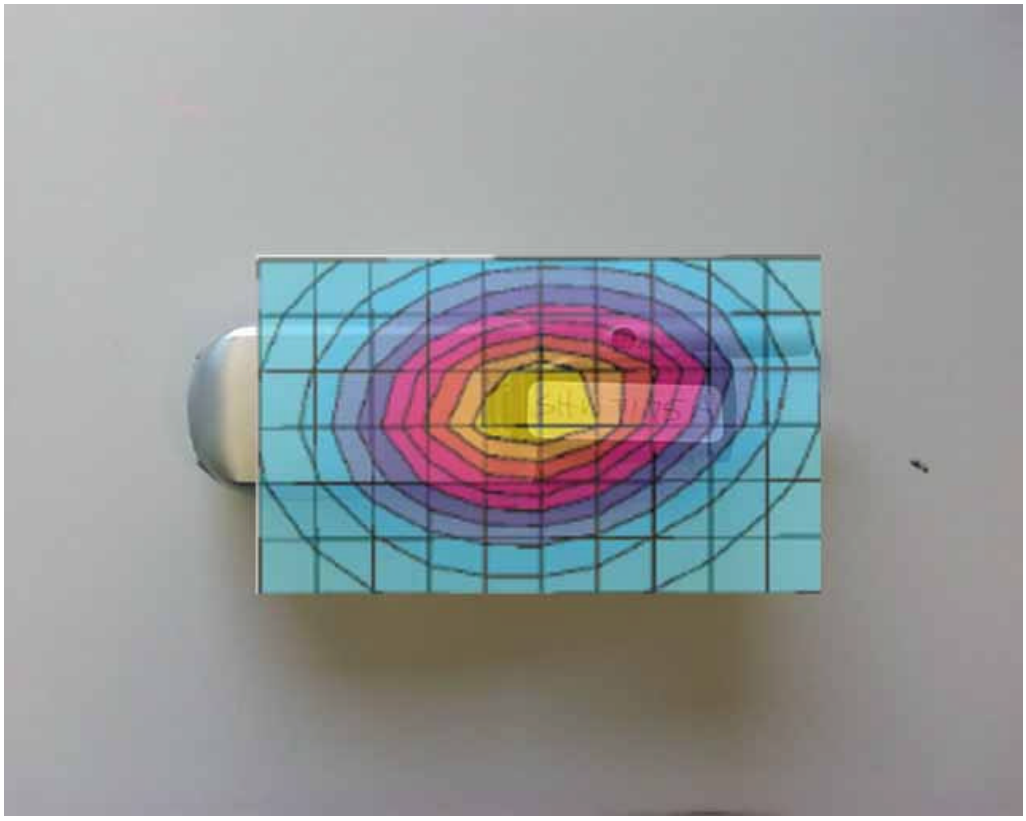


Figure 9.Typical 800 MHz Body-Worn Contour Overlaid on Phone with Antenna Extended with Belt Clip

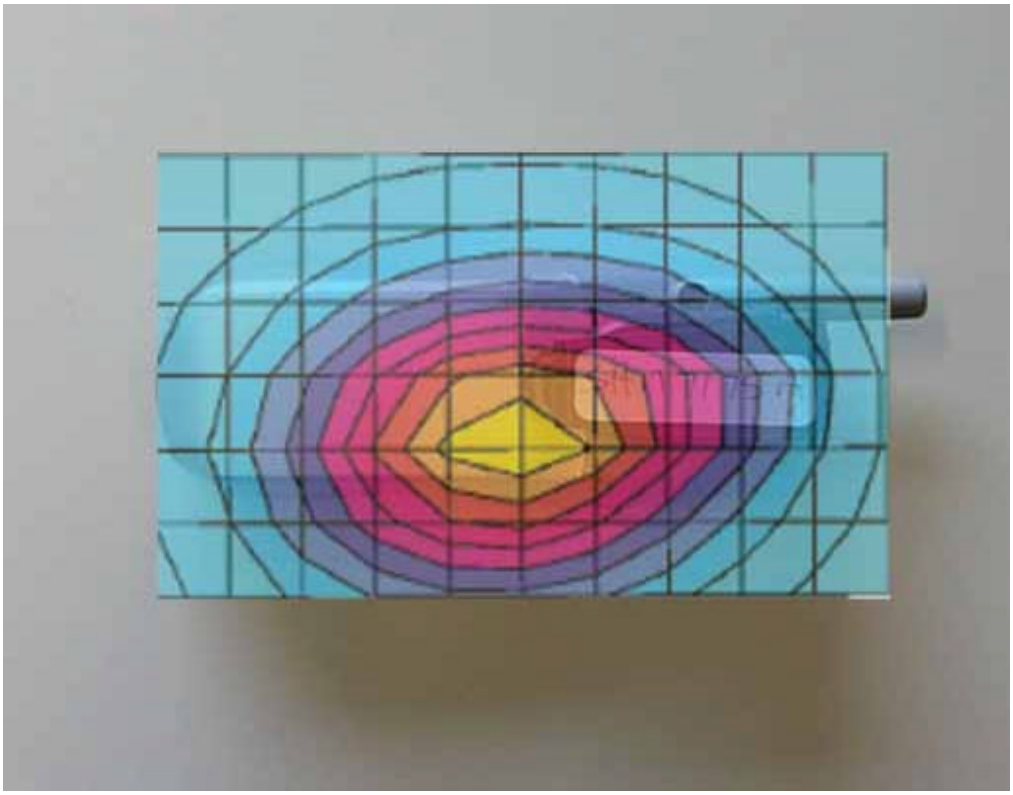


Figure 10. Typical 800 MHz Body-Worn Contour Overlaid on Phone with Antenna Retracted With Leather Holster / Wishbone Belt Clip

## Appendix 4 (Please See Attachement)

## Probe Calibration Certificate

# Appendix 5

## Dipole Characterization Certificate

# Interim Dipole Correlation Certificate

FCD-0359, Rev.001

| | | | |
|---|---|---|---|
| **Dipole Serial Number:** | # 092 | Last Calibration Date: | 3-Jan-01 |
| Dipole Type (MHz): | 900 MHz | Calibration Due: | 3-Jan-03 |
| | | Manufacturer: | SPEAG |

**-Manufacturer's Original Calibration Information-**

**Dipole to be correlated:** **[Serial Number: 092 ]**

| | |
|---|---|
| 1g SAR normalized to 1W forward power (mW/g): | 10.12 mW/g |
| Relative Dielectric: | 40.6 |
| Conductivity: | 0.85 |
| Probe Serial Number: | SN 1307 |
| Forward Power: | 250mW +/-3% |

**Primary Dipole Referenced:** **[Serial Number: 077 ]**

| | |
|---|---|
| 1g SAR normalized to 1W forward power (mW/g): | 11.4 mW/g |
| Relative Dielectric: | 40.3 |
| Conductivity: | 0.95 |
| Probe Serial Number: | SN 1307 |
| Forward Power: | 250mW +/-3% |

**-Correlation Method Utilized-** per DOI-1265
(select one)

By Similarity: [X] By Transfer Calibration: [ ]

**-Measured Data-**

| | | | |
|---|---|---|---|
| Probe S/N: | SN 1515 | Conductivity (meas.): | 0.97 |
| Robot Cell #: | RVD 98 | Permittivity (meas.): | 42.5 |

**Primary Standard** (average of 0-degree & 90-degree 1g cubes):

| | | |
|---|---|---|
| 2.375 mW/g | N/R (if required) | N/R (if required) |

**Secondary Standard** (average of 0-degree & 90-degree 1g cubes):

| | | |
|---|---|---|
| 2.[illegible] mW/g | N/R (if required) | N/R (if required) |

## -NEW Correlated Target-

| | |
|---|---|
| 1g SAR normalized to 1W forward power (mW/g): | 11.4 mW/g |
| Relative Dielectric: | 40.3 |
| Conductivity: | 0.95 |

**Approved by:** Anton Ferenc **Date:** 11/13/2001

***Comments:*** Secondary dipole measured –2.4% from primary dipole.

# Interim Dipole Correlation Certificate

FCD-0359, Rev.001

| | | | |
|---|---|---|---|
| **Dipole Serial Number:** | # 094 | Last Calibration Date: | 3-Jan-01 |
| Dipole Type (MHz): | 900 MHz | Calibration Due: | 3-Jan-03 |
| | | Manufacturer: | SPEAG |

**-Manufacturer's Original Calibration Information-**

**Dipole to be correlated: [Serial Number: 094 ]**

| | |
|---|---|
| 1g SAR normalized to 1W forward power (mW/g): | 10.24 mW/g |
| Relative Dielectric: | 40.6 |
| Conductivity: | 0.85 |
| Probe Serial Number: | SN 1507 |
| Forward Power: | 250mW +/-3% |

**Primary Dipole Referenced: [Serial Number: 077 ]**

| | |
|---|---|
| 1g SAR normalized to 1W forward power (mW/g): | 11.4 mW/g |
| Relative Dielectric: | 40.3 |
| Conductivity: | 0.95 |
| Probe Serial Number: | SN 1507 |
| Forward Power: | 250mW +/-3% |

**-Correlation Method Utilized-** per DOI-1265

(select one)

By Similarity: [X] By Transfer Calibration: [ ]

**-Measured Data-**

| | | | |
|---|---|---|---|
| Probe S/N: | SN 1515 | Conductivity (meas.): | 0.97 |
| Robot Cell #: | HVD #8 | Permittivity (meas.): | 42.5 |

**Primary Standard** (average of 0-degree & 90-degree 1g cubes):

| | | |
|---|---|---|
| 2.375 mW/g | N/R (if required) | N/R (if required) |

**Secondary Standard** (average of 0-degree & 90-degree 1g cubes):

| | | |
|---|---|---|
| 2.81 mW/g | N/R (if required) | N/R (if required) |

## -NEW Correlated Target-

| | |
|---|---|
| 1g SAR normalized to 1W forward power (mW/g): | 11.4 mW/g |
| Relative Dielectric: | 40.3 |
| Conductivity: | 0.95 |

**Approved by:** Antonio Faraone **Date:** 11/13/2001

***Comments:*** Secondary dipole measured –2.3% from primary dipole.

# Interim Dipole Correlation Certificate

FCD-0359, Rev.001

| | | | |
|---|---|---|---|
| **Dipole Serial Number:** | # 095 | Last Calibration Date: | 3-Jan-01 |
| Dipole Type (MHz): | 900 MHz | Calibration Due: | 3-Jan-03 |
| | | Manufacturer: | SPEAG |

**-Manufacturer's Original Calibration Information-**

**Dipole to be correlated:** **[Serial Number: 095 ]**

| | |
|---|---|
| 1g SAR normalized to 1W forward power (mW/g): | 10.24 mW/g |
| Relative Dielectric: | 40.6 |
| Conductivity: | 0.85 |
| Probe Serial Number: | SN 1507 |
| Forward Power: | 250mW +/-3% |

**Primary Dipole Referenced:** **[Serial Number: 077 ]**

| | |
|---|---|
| 1g SAR normalized to 1W forward power (mW/g): | 11.4 mW/g |
| Relative Dielectric: | 40.3 |
| Conductivity: | 0.95 |
| Probe Serial Number: | SN 1507 |
| Forward Power: | 250mW +/-3% |

**-Correlation Method Utilized-** per DOI-1265
(select one)

By Similarity: [X] By Transfer Calibration: [ ]

**-Measured Data-**

| | | | |
|---|---|---|---|
| Probe S/N: | SN 1315 | Conductivity (meas.): | 0.97 |
| Robot Cell #: | HVD 08 | Permittivity (meas.): | 42.5 |

**Primary Standard** (average of 0-degree & 90-degree 1g cubes):

| | | |
|---|---|---|
| 2.375 mW/g | N/R (if required) | N/R (if required) |

**Secondary Standard** (average of 0-degree & 90-degree 1g cubes):

| | | |
|---|---|---|
| 2.40 mW/g | N/R (if required) | N/R (if required) |

## -NEW Correlated Target-

| | |
|---|---|
| 1g SAR normalized to 1W forward power (mW/g): | 11.4 mW/g |
| Relative Dielectric: | 40.3 |
| Conductivity: | 0.95 |

**Approved by:** Antonio Fenoane **Date:** 11/13/2001

***Comments:*** Secondary dipole measured –1.2% from primary dipole.

# Appendix 6

## Measurement Uncertainty Budget

## Uncertainty Budget for Device Under Test

| *a* | *b* | *c* | *d* | *e = f(d,k)* | *f* | *g* | *h = c x f / e* | *i = c x g / e* | *k* |
|---|---|---|---|---|---|---|---|---|---|
| **Uncertainty Component** | **Sec.** | **Tol. (± %)** | **Prob. Dist.** | **Div.** | $c_i$ **(1 g)** | $c_i$ **(10 g)** | **1 g** $u_i$ **(±%)** | **10 g** $u_i$ **(±%)** | $v_i$ |
| **Measurement System** | | | | | | | | | |
| Probe Calibration | E.2.1 | 9.5 | N | 2.00 | 1 | 1 | 4.8 | 4.8 | ∞ |
| Axial Isotropy | E.2.2 | 4.7 | R | 1.73 | 0.707 | 0.707 | 1.9 | 1.9 | ∞ |
| Spherical Isotropy | E.2.2 | 9.6 | R | 1.73 | 0.707 | 0.707 | 3.9 | 3.9 | ∞ |
| Boundary Effect | E.2.3 | 5.8 | R | 1.73 | 1 | 1 | 3.3 | 3.3 | ∞ |
| Linearity | E.2.4 | 4.7 | R | 1.73 | 1 | 1 | 2.7 | 2.7 | ∞ |
| System Detection Limits | E.2.5 | 1.0 | R | 1.73 | 1 | 1 | 0.6 | 0.6 | ∞ |
| Readout Electronics | E.2.6 | 1.0 | N | 1.00 | 1 | 1 | 1.0 | 1.0 | ∞ |
| Response Time | E.2.7 | 0.8 | R | 1.73 | 1 | 1 | 0.5 | 0.5 | ∞ |
| Integration Time | E.2.8 | 1.3 | R | 1.73 | 1 | 1 | 0.8 | 0.8 | ∞ |
| RF Ambient Conditions | E.6.1 | 3.0 | R | 1.73 | 1 | 1 | 1.7 | 1.7 | ∞ |
| Probe Positioner Mechanical Tolerance | E.6.2 | 0.3 | R | 1.73 | 1 | 1 | 0.2 | 0.2 | ∞ |
| Probe Positioning with respect to Phantom Shell | E.6.3 | 1.1 | R | 1.73 | 1 | 1 | 0.6 | 0.6 | ∞ |
| Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation | E.5 | 3.9 | R | 1.73 | 1 | 1 | 2.3 | 2.3 | ∞ |
| **Test sample Related** | | | | | | | | | |
| Test Sample Positioning | E.4.2 | 3.6 | N | 1.00 | 1 | 1 | 3.6 | 3.6 | 29 |
| Device Holder Uncertainty | E.4.1 | 2.8 | N | 1.00 | 1 | 1 | 2.8 | 2.8 | 8 |
| Output Power Variation - SAR drift measurement | 6.6.2 | 5.0 | R | 1.73 | 1 | 1 | 2.9 | 2.9 | ∞ |
| **Phantom and Tissue Parameters** | | | | | | | | | |
| Phantom Uncertainty (shape and thickness tolerances) | E.3.1 | 4.0 | R | 1.73 | 1 | 1 | 2.3 | 2.3 | ∞ |
| Liquid Conductivity - deviation from target values | E.3.2 | 5.0 | R | 1.73 | 0.64 | 0.43 | 1.8 | 1.2 | ∞ |
| Liquid Conductivity - measurement uncertainty | E.3.3 | 10.0 | R | 1.73 | 0.64 | 0.43 | 3.7 | 2.5 | ∞ |
| Liquid Permittivity - deviation from target values | E.3.2 | 10.0 | R | 1.73 | 0.6 | 0.49 | 3.5 | 2.8 | ∞ |
| Liquid Permittivity - measurement uncertainty | E.3.3 | 5.0 | R | 1.73 | 0.6 | 0.49 | 1.7 | 1.4 | ∞ |
| **Combined Standard Uncertainty** | | | RSS | | | | 11.72 | 11.09 | 1363 |
| **Expanded Uncertainty** (95% CONFIDENCE LEVEL) | | | *k* =2 | | | | 22.98 | 21.75 | |

## Uncertainty Budget for System Performance Check (dipole & flat phantom)

| *a* | *b* | *c* | *d* | *e = f(d,k)* | *f* | *g* | *h = c x f / e* | *i = c x g / e* | *k* |
|---|---|---|---|---|---|---|---|---|---|
| **Uncertainty Component** | Sec. | **Tol. (± %)** | **Prob. Dist.** | **Div.** | **$c_i$ (1 g)** | **$c_i$ (10 g)** | **1 g $u_i$ (±%)** | **10 g $u_i$ (±%)** | **$v_i$** |
| **Measurement System** | | | | | | | | | |
| Probe Calibration | E.2.1 | 9.5 | N | 2.00 | 1 | 1 | 4.8 | 4.8 | ∞ |
| Axial Isotropy | E.2.2 | 4.7 | R | 1.73 | 1 | 1 | 2.7 | 2.7 | ∞ |
| Spherical Isotropy | E.2.2 | 9.6 | R | 1.73 | 0 | 0 | 0.0 | 0.0 | ∞ |
| Boundary Effect | E.2.3 | 5.8 | R | 1.73 | 1 | 1 | 3.3 | 3.3 | ∞ |
| Linearity | E.2.4 | 4.7 | R | 1.73 | 1 | 1 | 2.7 | 2.7 | ∞ |
| System Detection Limits | E.2.5 | 1.0 | R | 1.73 | 1 | 1 | 0.6 | 0.6 | ∞ |
| Readout Electronics | E.2.6 | 1.0 | N | 1.00 | 1 | 1 | 1.0 | 1.0 | ∞ |
| Response Time | E.2.7 | 0.0 | R | 1.73 | 1 | 1 | 0.0 | 0.0 | ∞ |
| Integration Time | E.2.8 | 0.0 | R | 1.73 | 1 | 1 | 0.0 | 0.0 | ∞ |
| RF Ambient Conditions | E.6.1 | 3.0 | R | 1.73 | 1 | 1 | 1.7 | 1.7 | ∞ |
| Probe Positioner Mechanical Tolerance | E.6.2 | 0.3 | R | 1.73 | 1 | 1 | 0.2 | 0.2 | ∞ |
| Probe Positioning with respect to Phantom Shell | E.6.3 | 1.1 | R | 1.73 | 1 | 1 | 0.6 | 0.6 | ∞ |
| Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation | E.5 | 3.9 | R | 1.73 | 1 | 1 | 2.3 | 2.3 | ∞ |
| **Dipole** | | | | | | | | | |
| Dipole Axis to Liquid Distance | 8, E.4.2 | 1.0 | R | 1.73 | 1 | 1 | 0.6 | 0.6 | ∞ |
| Input Power and SAR Drift Measurement | 8, 6.6.2 | 4.7 | R | 1.73 | 1 | 1 | 2.7 | 2.7 | ∞ |
| **Phantom and Tissue Parameters** | | | | | | | | | |
| Phantom Uncertainty (shape and thickness tolerances) | E.3.1 | 4.0 | R | 1.73 | 1 | 1 | 2.3 | 2.3 | ∞ |
| Liquid Conductivity - deviation from target values | E.3.2 | 5.0 | R | 1.73 | 0.64 | 0.43 | 1.8 | 1.2 | ∞ |
| Liquid Conductivity - measurement uncertainty | E.3.3 | 10.0 | R | 1.73 | 0.64 | 0.43 | 3.7 | 2.5 | ∞ |
| Liquid Permittivity - deviation from target values | E.3.2 | 10.0 | R | 1.73 | 0.6 | 0.49 | 3.5 | 2.8 | ∞ |
| Liquid Permittivity - measurement uncertainty | E.3.3 | 5.0 | R | 1.73 | 0.6 | 0.49 | 1.7 | 1.4 | ∞ |
| **Combined Standard Uncertainty** | | | RSS | | | | 10.16 | 9.43 | 99999 |
| **Expanded Uncertainty** (95% CONFIDENCE LEVEL) | | | *k*=2 | | | | 19.92 | 18.48 | |

# Appendix 7

## Photographs of the device under test

Figure 7. Front of Phone

Figure 8. Back of Phone with Plastic Belt Clip Attached

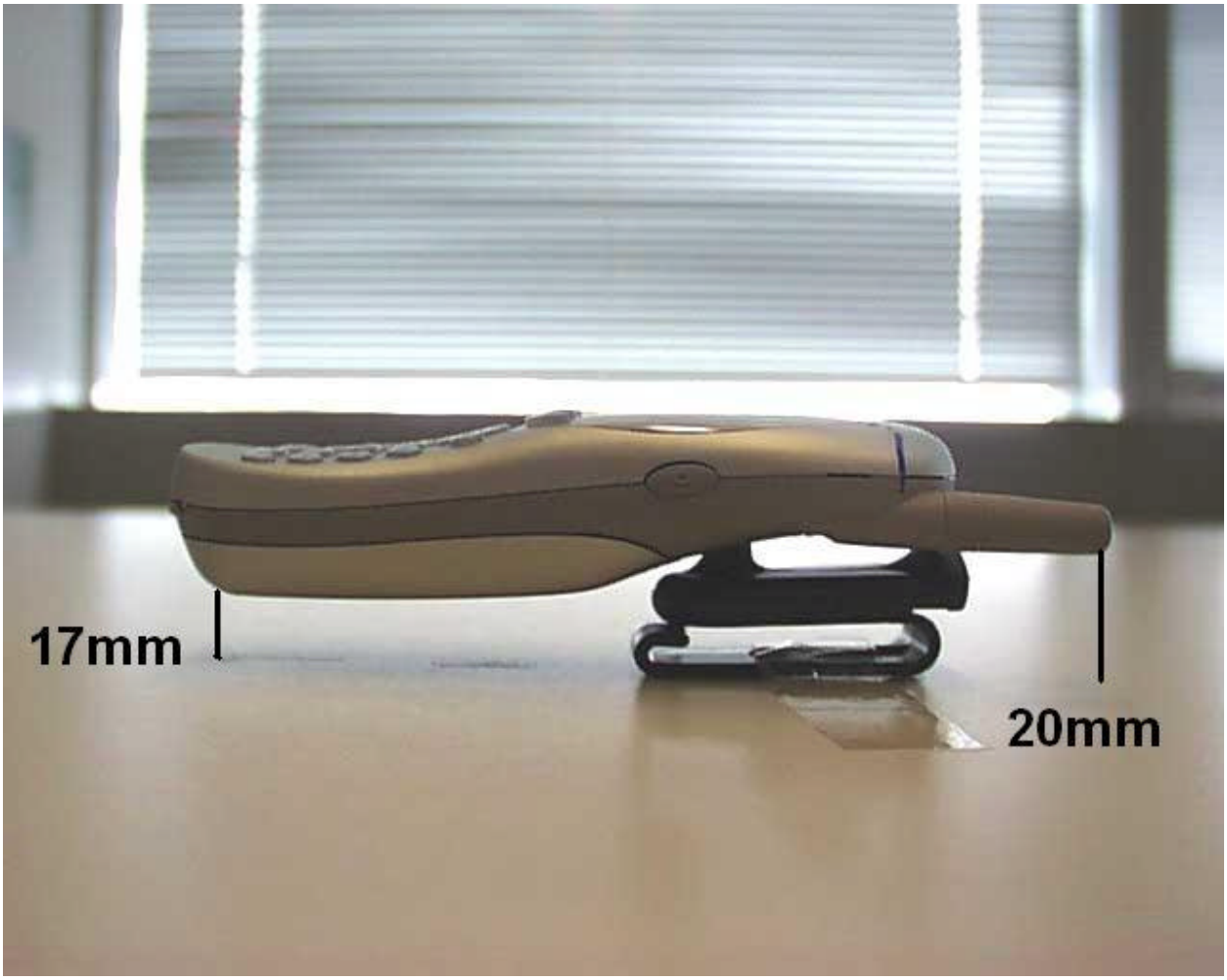



Figure 9. Separation Distance Provided from Plastic Belt Clip

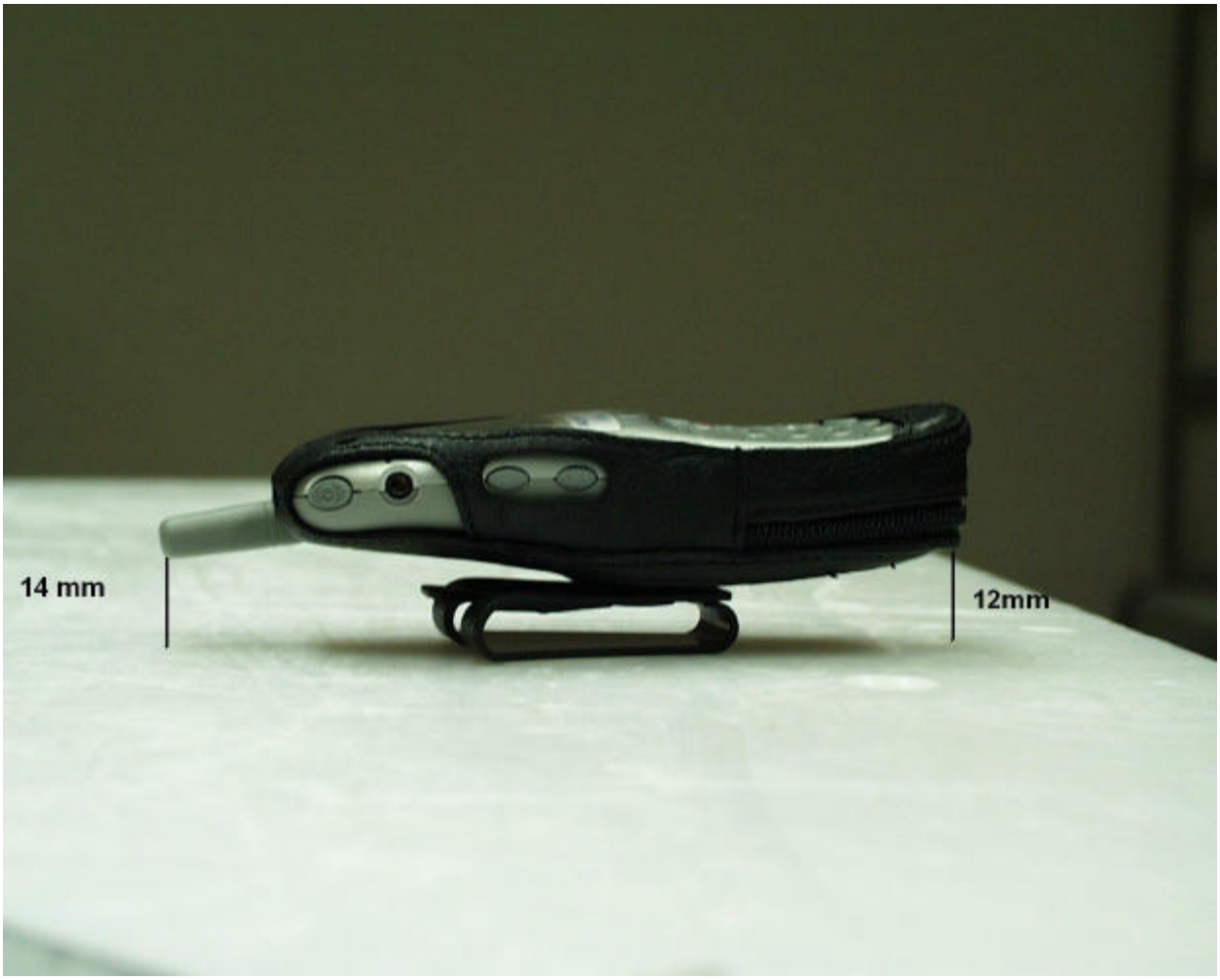



Figure 10. Separation Distance Provided from Leather Pouch

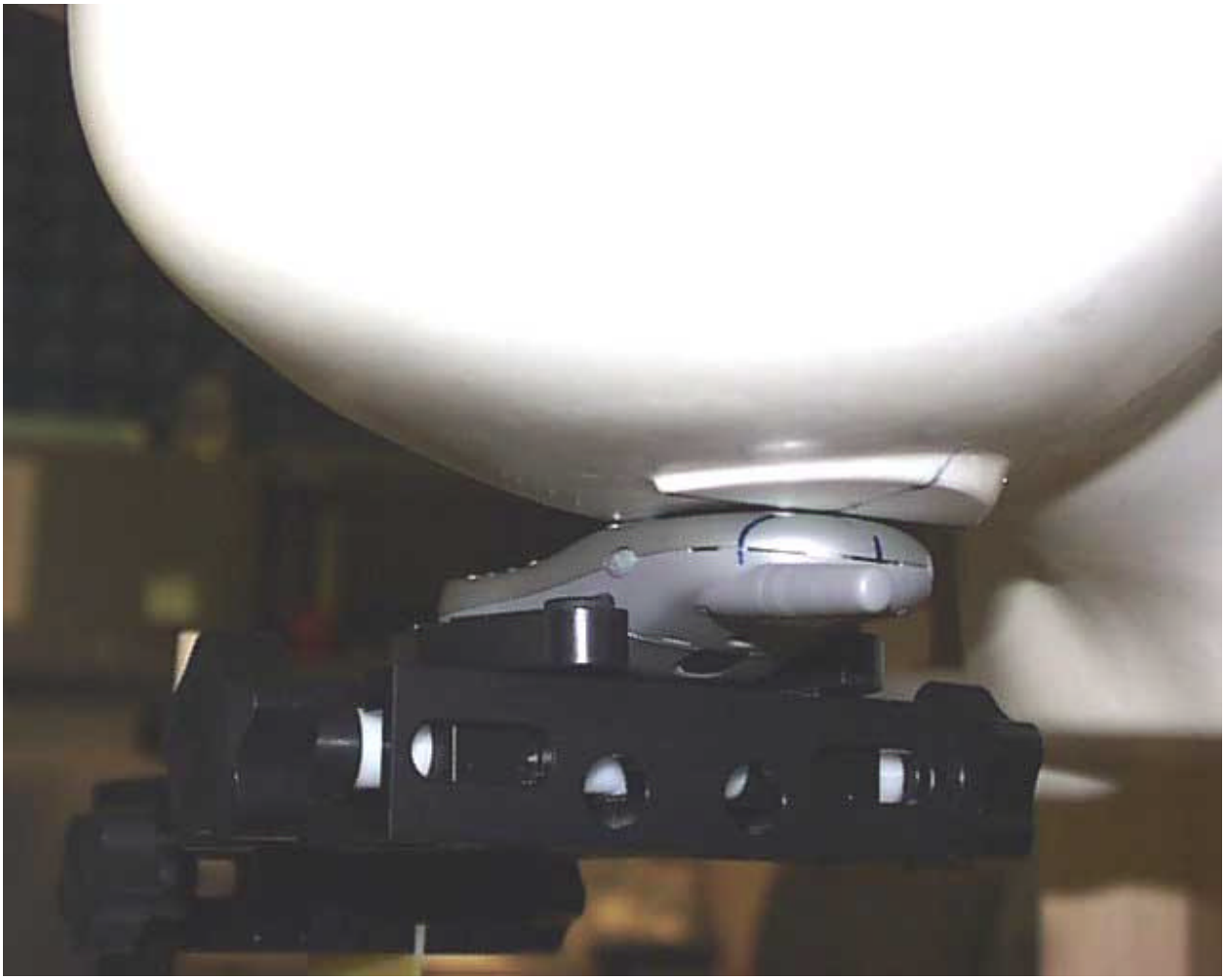


Figure 11. Top of Phone Seen in Cheek Touch Testing Configuration

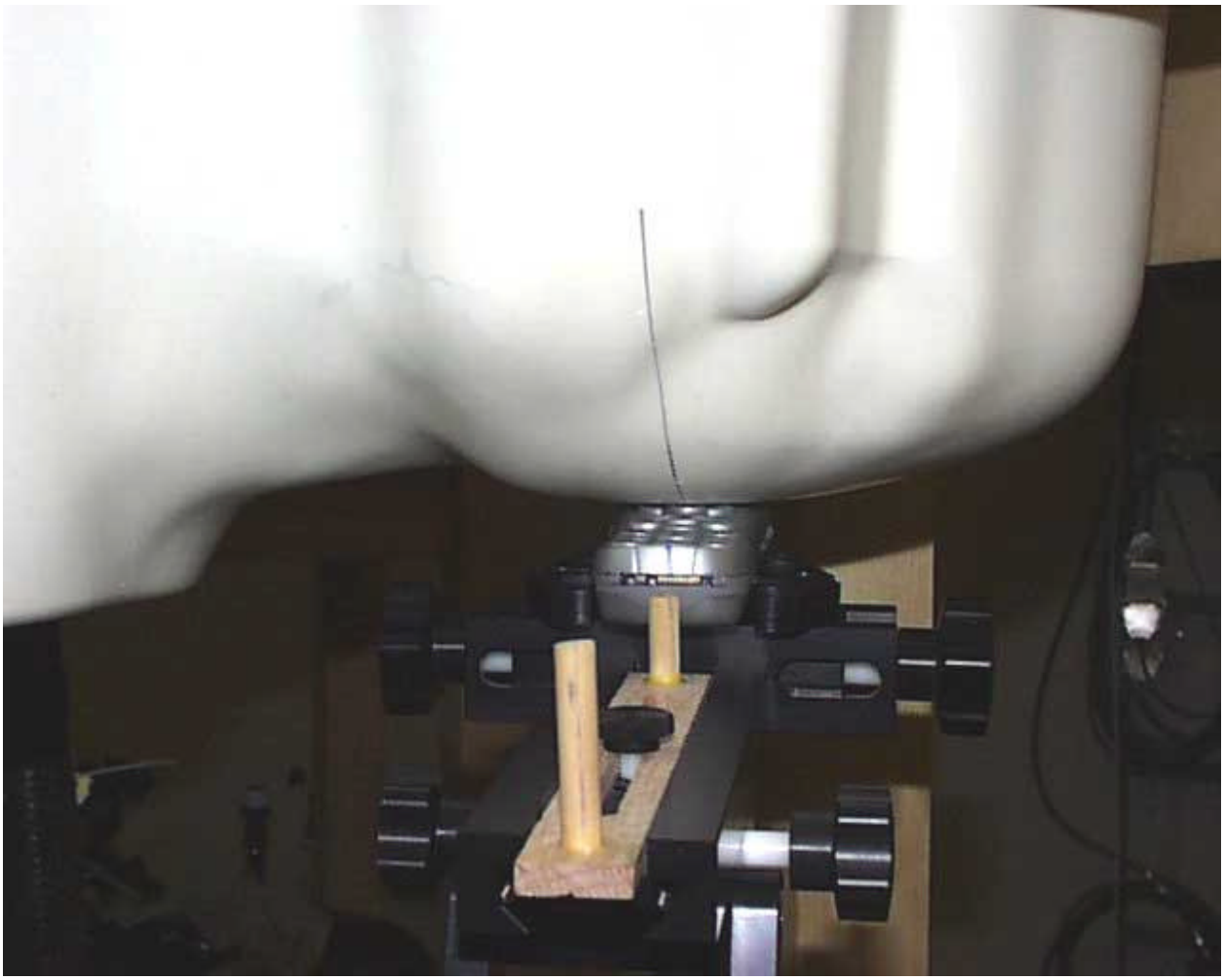


Figure 12. Bottom of Phone Seen in Cheek Touch Testing Configuration

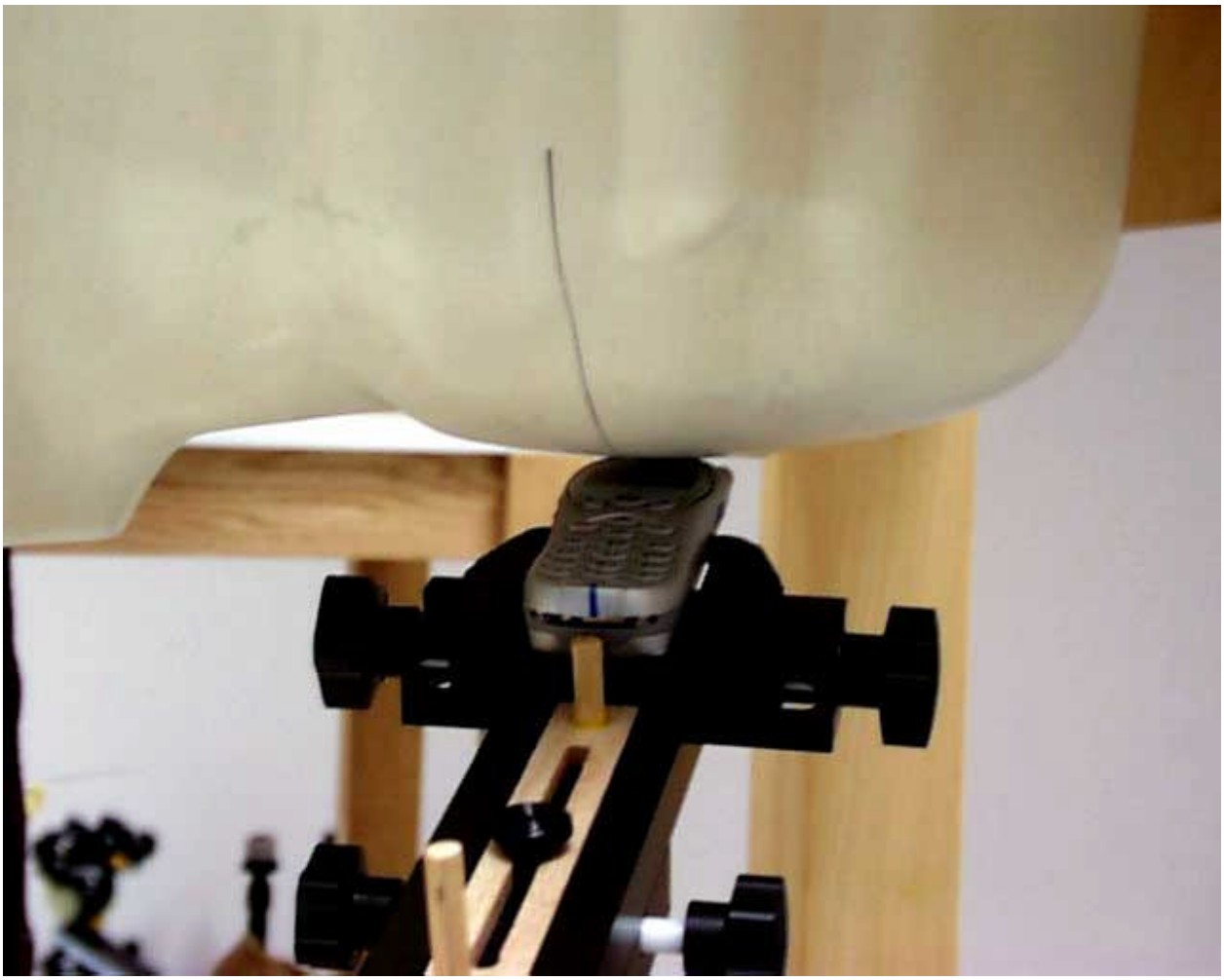


Figure 13. Bottom of Phone Seen in 15 Degree Tilt Testing Configuration

Figure 14. Top of Phone Seen in 15 Degree Tilt Testing Configuration

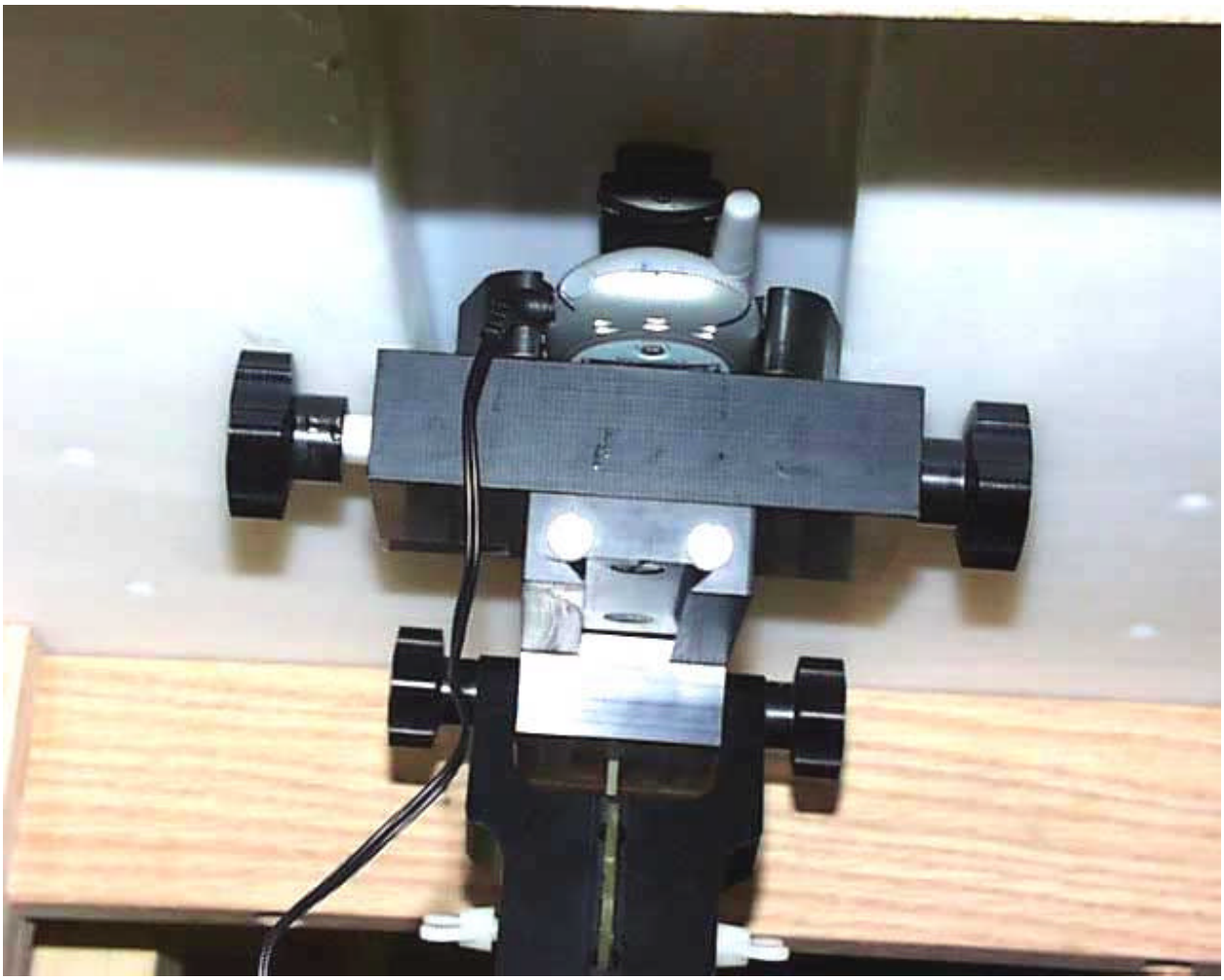


Figure 15. Phone Placed in Body Worn Testing Configuration with Plastic Belt Clip and Headset Attached

Figure 15. Phone Placed in Body Worn Testing Configuration with Leather Pouch / Belt Clip and Headset Attached