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|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <br>Testing and Engineering Services Ltd | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                                                         | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                              |

## RF EXPOSURE EVALUATION

## SPECIFIC ABSORPTION RATE

## **SAR TEST REPORT**

FOR

## **COBRA ELECTRONICS CORPORATION**

## **PORTABLE UHF FRS/GMRS PTT RADIO TRANSCEIVER**

**MODEL(S): PR4100 / PR4500**

|                                              |                                                  |                        |
|----------------------------------------------|--------------------------------------------------|------------------------|
| <b>IDENTIFIER(S)</b>                         | <b>FCC ID: BBOPR4100</b>                         | <b>IC: 906B-PR4100</b> |
| <b>Test Standard(s)<br/>and Procedure(s)</b> | <b>FCC OET Bulletin 65, Supplement C (01-01)</b> |                        |
|                                              | <b>Industry Canada RSS-102 Issue 2</b>           |                        |

### Test Report Serial No.

101206BBO-T781-S95U

### Test Report Revision No.

Revision 1.0 (Initial Release)

### Test Lab and Location

Celltech Compliance Testing & Engineering Lab  
(Celltech Labs Inc.)  
1955 Moss Court  
Kelowna, BC  
Canada  
V1Y 9L3



Certificate No. 2470.01

|                                                                                                          |                                                                                                    |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <u>Test Report Prepared By:</u><br><b>Cheri Frangiadakis</b><br>Test Report Writer<br>Celltech Labs Inc. | <u>Test Report Reviewed By:</u><br><b>Jonathan Hughes</b><br>General Manager<br>Celltech Labs Inc. |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|

|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                 | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                   |
| Certificate No. 2470.01                                                         |                                                     |                                                           |                                                   |                                                                                   |

## DECLARATION OF COMPLIANCE SAR RF EXPOSURE EVALUATION

### Test Lab and Location

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### Company Information

#### **COBRA ELECTRONICS CORPORATION**

6500 West Cortland Street  
Chicago, IL 60707  
United States

#### **FCC IDENTIFIER:**

**BBOPR4100**

#### **IC IDENTIFIER:**

**906B-PR4100**

#### **Model(s):**

**PR4100 / PR4500**

#### **Test Requirement(s):**

**FCC 47 CFR §2.1093; Health Canada Safety Code 6**

#### **Test Procedure(s):**

**FCC OET Bulletin 65, Supplement C (Edition 01-01)  
Industry Canada RSS-102 Issue 2**

#### **Device Description:**

**Portable UHF FRS/GMRS PTT Radio Transceiver**

#### **Modulation Type:**

**FM (UHF)**

#### **Transmit Frequency Range(s):**

**462.5500 - 462.7250 MHz (GMRS Channels 15-22)  
462.5625 - 462.7125 MHz (FRS/GMRS Channels 1-7)  
467.5625 - 467.7125 MHz (FRS Channels 8-14)**

#### **Max. RF Output Power Tested:**

**0.741 Watts (28.7 dBm) ERP (462.7250 MHz) GMRS Ch. 22**

#### **Antenna Type(s) Tested:**

**External Fixed Stubby**

#### **Battery Type(s) Tested:**

**NiMH AAA x4 (1.2 V, 600 mAh)  
Alkaline Duracell Procell AAA x4 (1.5 V, 1150 mAh)**

#### **Body-Worn Accessories Tested:**

**Plastic Belt-Clip (7 mm thickness)**

#### **Audio Accessories Tested:**

**Earbud with Lapel-Microphone (P/N: GA-EBM2)**

#### **Max. SAR Level(s) Evaluated:**

**Face-held: 0.288 W/kg (1g) - 50% duty cycle  
Body-worn: 1.05 W/kg (1g) - 50% duty cycle**

Celltech Labs Inc. declares under its sole responsibility that this wireless portable device has demonstrated compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC 47 CFR §2.1093 and Health Canada's Safety Code 6. The device was tested in accordance with the measurement standards and procedures specified in FCC OET Bulletin 65, Supplement C (Edition 01-01) and Industry Canada RSS-102 Issue 2 for the General Population / Uncontrolled Exposure environment. All measurements were performed in accordance with the SAR system manufacturer recommendations.

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 Labs Inc.  
The results and statements contained in this report pertain only to the device(s) evaluated.

### Test Report Approved By:

**Sean Johnston**  
**SAR Lab Manager**  
**Celltech Labs Inc.**



|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                                                         | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                              |

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| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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## 1.0 INTRODUCTION

This measurement report demonstrates compliance of the Cobra Electronics Corporation Model(s): PR4100 / PR4500 Portable UHF FRS/GMRS PTT Radio Transceiver FCC ID: BBOPR4100 with the SAR (Specific Absorption Rate) RF exposure requirements specified in FCC 47 CFR §2.1093 (see reference [1]) and Health Canada's Safety Code 6 (see reference [2]) for the General Population / Uncontrolled Exposure environment. The test procedures described in FCC OET Bulletin 65, Supplement C (Edition 01-01) (see reference [3]) and IC RSS-102 Issue 2 (see reference [4]) 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 provisions of the rules are included within this test report.

## 2.0 DESCRIPTION OF DEVICE UNDER TEST (DUT)

|                              |                                                |          |                 |                       |                  |  |
|------------------------------|------------------------------------------------|----------|-----------------|-----------------------|------------------|--|
| Test Requirement(s)          | FCC Rule Part 47 CFR §2.1093                   |          |                 |                       |                  |  |
|                              | Health Canada Safety Code 6                    |          |                 |                       |                  |  |
| Test Procedure(s)            | FCC OET Bulletin 65, Supplement C (01-01)      |          |                 |                       |                  |  |
|                              | Industry Canada RSS-102 Issue 2                |          |                 |                       |                  |  |
| Device Description           | Portable FM UHF FRS/GMRS PTT Radio Transceiver |          |                 |                       |                  |  |
| RF Exposure Category         | General Population / Uncontrolled Environment  |          |                 |                       |                  |  |
| FCC IDENTIFIER               | BBOPR4100                                      |          |                 |                       |                  |  |
| IC IDENTIFIER                | 906B-PR4100                                    |          |                 |                       |                  |  |
| Model(s)                     | PR4100 / PR4500                                |          |                 |                       |                  |  |
| Test Sample Serial No.       | S610000001                                     |          |                 | Production Unit       |                  |  |
| Modulation Type              | FM (UHF)                                       |          |                 |                       |                  |  |
| Transmit Frequency Range(s)  | 462.5500 - 462.7250 MHz                        |          |                 | GMRS Channels 15-22   |                  |  |
|                              | 462.5625 - 462.7125 MHz                        |          |                 | FRS/GMRS Channels 1-7 |                  |  |
|                              | 467.5625 - 467.7125 MHz                        |          |                 | FRS Channels 8-14     |                  |  |
| Max. RF Output Power Tested  | 0.741 Watts                                    | 28.7 dBm | ERP             | 462.7250 MHz          | Channel 22       |  |
| Antenna Type(s) Tested       | External Fixed Stubby                          |          |                 |                       |                  |  |
| Battery Type(s) Tested       | NiMH AAA (x4)                                  |          |                 | 1.2 V, 600 mAh        |                  |  |
|                              | Alkaline AAA (x4)                              |          | 1.5 V, 1150 mAh |                       | Duracell Procell |  |
| Body-Worn Accessories Tested | Plastic Belt-Clip (7 mm thickness)             |          |                 | P/N: n/a              |                  |  |
| Audio Accessories Tested     | Earbud with Lapel-Microphone                   |          |                 | P/N: GA-EBM2          |                  |  |

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   |                                                     |                                                           |                                                   | Certificate No. 2470.01                                                             |

### 3.0 SAR MEASUREMENT SYSTEM

Celltech Labs Inc. SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 measurement system is comprised of the measurement server, robot controller, computer, near-field probe, probe alignment sensor, specific anthropomorphic mannequin (SAM) phantom, and various planar phantoms for brain and/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 DASY4 measurement server. The DAE4 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 DASY4 measurement server 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. The sensor systems are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.



DASY4 SAR Measurement System with Plexiglas validation phantom



DASY4 SAR Measurement System with Plexiglas side planar phantom

|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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Certificate No. 2470.01

## 4.0 MEASUREMENT SUMMARY

| SAR EVALUATION RESULTS                |          |                  |                                                                                                                                                                                                                                  |                                               |                  |                   |                                           |                                                         |                        |                             |                       |                                 |       |                    |
|---------------------------------------|----------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------|-------------------|-------------------------------------------|---------------------------------------------------------|------------------------|-----------------------------|-----------------------|---------------------------------|-------|--------------------|
| Test Type                             | Freq.    | Channel          |                                                                                                                                                                                                                                  | Test Mode                                     | Battery Type     | Accessory Type(s) | DUT Separation Distance to Planar Phantom | Start Power (ERP)                                       | Measured SAR 1g (W/kg) |                             | SAR Drift During Test | Scaled SAR with droop 1g (W/kg) |       |                    |
|                                       |          |                  |                                                                                                                                                                                                                                  |                                               |                  | Body-Worn         |                                           |                                                         | Duty Cycle             |                             |                       | Duty Cycle                      |       |                    |
|                                       | MHz      | Audio            | Watts                                                                                                                                                                                                                            | 100%                                          | 50%              | dB                | 100%                                      | 50%                                                     |                        |                             |                       |                                 |       |                    |
| Face                                  | 462.7250 | 22               | GMRS                                                                                                                                                                                                                             | CW                                            | NiMH             | --                | 2.5 cm                                    | 0.741                                                   | 0.426                  | 0.213                       | -0.0492               | 0.431                           | 0.215 |                    |
|                                       |          |                  |                                                                                                                                                                                                                                  |                                               |                  | Front Side        |                                           |                                                         |                        |                             |                       |                                 |       |                    |
| Face                                  | 462.7250 | 22               | GMRS                                                                                                                                                                                                                             | CW                                            | Alkaline         | --                | 2.5 cm                                    | 0.741                                                   | 0.545                  | 0.273                       | -0.246                | 0.577                           | 0.288 |                    |
|                                       |          |                  |                                                                                                                                                                                                                                  |                                               |                  | Front Side        |                                           |                                                         |                        |                             |                       |                                 |       |                    |
| Body                                  | 462.7250 | 22               | GMRS                                                                                                                                                                                                                             | CW                                            | NiMH             | Belt-Clip         | 0.7 cm                                    | 0.741                                                   | 1.75                   | 0.875                       | -0.756                | 2.08                            | 1.04  |                    |
|                                       |          |                  |                                                                                                                                                                                                                                  |                                               |                  | Ear-Bud           | Back Side                                 |                                                         |                        |                             |                       |                                 |       |                    |
| Body                                  | 462.7250 | 22               | GMRS                                                                                                                                                                                                                             | CW                                            | Alkaline         | Belt-Clip         | 0.7 cm                                    | 0.741                                                   | 1.68                   | 0.840                       | -0.962                | 2.10                            | 1.05  |                    |
|                                       |          |                  |                                                                                                                                                                                                                                  |                                               |                  | Ear-Bud           | Back Side                                 |                                                         |                        |                             |                       |                                 |       |                    |
| ANSI / IEEE C95.1 1999 - SAFETY LIMIT |          |                  |                                                                                                                                                                                                                                  | BRAIN / BODY: 1.6 W/kg (averaged over 1 gram) |                  |                   |                                           | Spatial Peak Uncontrolled Exposure / General Population |                        |                             |                       |                                 |       |                    |
| Test Date(s)                          |          | October 17, 2006 |                                                                                                                                                                                                                                  |                                               | October 17, 2006 |                   |                                           | Measured Fluid Type                                     |                        | Brain                       | Body                  | Unit                            |       |                    |
| Dielectric Constant $\epsilon_r$      |          | 450 MHz Brain    |                                                                                                                                                                                                                                  |                                               | 450 MHz Body     |                   |                                           | Atmospheric Pressure                                    |                        | 99.8                        | 101.3                 | kPa                             |       |                    |
|                                       |          | IEEE Target      | Meas.                                                                                                                                                                                                                            | Dev.                                          | IEEE Target      | Meas.             | Dev.                                      | Relative Humidity                                       |                        | 32                          | 33                    | %                               |       |                    |
|                                       |          | 43.5             | $\pm 5\%$                                                                                                                                                                                                                        | 42.8                                          | -1.6%            | 56.7              | $\pm 5\%$                                 | 56.2                                                    | -0.9%                  | Ambient Temperature         |                       | 24.0                            | 24.0  | $^{\circ}\text{C}$ |
| Conductivity $\sigma$ (mho/m)         |          | 450 MHz Brain    |                                                                                                                                                                                                                                  |                                               | 450 MHz Body     |                   |                                           | Fluid Temperature                                       |                        | 22.9                        | 21.7                  | $^{\circ}\text{C}$              |       |                    |
|                                       |          | IEEE Target      | Meas.                                                                                                                                                                                                                            | Dev.                                          | IEEE Target      | Meas.             | Dev.                                      | Fluid Depth                                             |                        | $\geq 15$                   | $\geq 15$             | cm                              |       |                    |
|                                       |          | 0.87             | $\pm 5\%$                                                                                                                                                                                                                        | 0.83                                          | -4.6%            | 0.94              | $\pm 5\%$                                 | 0.90                                                    | -4.3%                  | $\rho$ (Kg/m <sup>3</sup> ) |                       | 1000                            |       |                    |
| Note(s)                               |          | 1.               | The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.                |                                               |                  |                   |                                           |                                                         |                        |                             |                       |                                 |       |                    |
|                                       |          | 2.               | The transmission band of the DUT is less than 10 MHz; therefore single channel data only is reported (per FCC OET Bulletin 65, Supplement C, Edition 01-01 - see reference [3]).                                                 |                                               |                  |                   |                                           |                                                         |                        |                             |                       |                                 |       |                    |
|                                       |          | 3.               | The area scan evaluation was performed with fully charged batteries. After the area scan was completed the radio was cooled down and the batteries were replaced with fully charged batteries prior to the zoom scan evaluation. |                                               |                  |                   |                                           |                                                         |                        |                             |                       |                                 |       |                    |
|                                       |          | 4.               | The power droops measured by the DASY4 system for the duration of the SAR evaluations were added to the measured SAR levels to report scaled SAR results as shown in the above test data table.                                  |                                               |                  |                   |                                           |                                                         |                        |                             |                       |                                 |       |                    |
|                                       |          | 5.               | A SAR-versus-Time power droop evaluation was performed in the test configuration that reported the maximum SAR level. See Appendix A (SAR Test Plots) for SAR-versus-Time power droop evaluation plot.                           |                                               |                  |                   |                                           |                                                         |                        |                             |                       |                                 |       |                    |
|                                       |          | 6.               | The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the SAR evaluations. The temperatures reported were consistent for all measurement periods.                      |                                               |                  |                   |                                           |                                                         |                        |                             |                       |                                 |       |                    |
|                                       |          | 7.               | The dielectric parameters of the simulated tissue mixtures were measured prior to the SAR evaluations using an ALS-PR-DIEL Dielectric Probe Kit and an HP 8753ET Network Analyzer (see Appendix C).                              |                                               |                  |                   |                                           |                                                         |                        |                             |                       |                                 |       |                    |
|                                       |          | 8.               | The SAR evaluations were performed within 24 hours of the system performance check.                                                                                                                                              |                                               |                  |                   |                                           |                                                         |                        |                             |                       |                                 |       |                    |

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
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| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   |                                                     |                                                           |                                                   | Certificate No. 2470.01                                                             |

## 5.0 DETAILS OF SAR EVALUATION

The Cobra Electronics Corporation Model(s): PR4100 / PR4500 Portable FM UHF FRS/GMRS PTT Radio Transceiver FCC ID: BBOPR4100 was compliant for localized Specific Absorption Rate (General Population / Uncontrolled Exposure) based on the test provisions and conditions described below. The detailed test setup photographs are shown in Appendix D.

1. The DUT was evaluated in a face-held configuration with the front of the radio placed parallel to the outer surface of the planar phantom. A 2.5 cm separation distance was maintained between the front of the DUT and the outer surface of the planar phantom.
2. The DUT was tested in a body-worn configuration with the back of the radio placed parallel to the outer surface of the planar phantom. The attached plastic belt-clip accessory was touching the planar phantom and provided a 0.7 cm separation distance from the back of the DUT to the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with an earbud lapel-microphone audio accessory connected to the audio port.
3. The RF conducted output power of the DUT could not be measured due to a non-detachable antenna. The DUT was evaluated for SAR at the maximum conducted power level preset by the manufacturer.
4. The DUT was evaluated for SAR at the maximum ERP channel measured prior to the SAR evaluations by Timco Engineering (radiated power measurements using the signal substitution method).
5. The power drift of the DUT during the SAR evaluations was measured by the DASY4 system.
6. The area scan evaluation was performed with a fully charged battery. After the area scan was completed the radio was cooled down and the battery was replaced with a fully charged battery prior to the zoom scan evaluation.
7. The DUT was tested in unmodulated continuous transmit operation (Continuous Wave mode at 100% duty cycle) with the transmit key constantly depressed. For a push-to-talk device the 50% duty cycle compensation reported assumes a transmit/receive cycle of equal time base.
8. The SAR evaluations were performed using a Plexiglas side-planar phantom.

## 6.0 EVALUATION PROCEDURES

- (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 using the SAM phantom.  
(ii) For body-worn and face-held devices a planar phantom was used.
- The SAR was determined by a pre-defined procedure within the DASY4 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface with a grid spacing of 15mm x 15mm.  
An area scan was determined as follows:
- Based on the defined area scan grid, a more detailed grid is created to increase the points by a factor of 10. The interpolation function then evaluates all field values between corresponding measurement points.
- A linear search is applied to find all the candidate maxima. Subsequently, all maxima are removed that are >2 dB from the global maximum. The remaining maxima are then used to position the cube scans.  
A 1g and 10g spatial peak SAR was determined as follows:
- Extrapolation is used to find the points between the dipole center of the probe and the surface of the phantom. This data cannot be measured, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.4 mm (see probe calibration document in Appendix F). The extrapolation was based on trivariate quadratics computed from the previously calculated 3D interpolated points nearest the phantom surface.
- Interpolated data is used to calculate the average SAR over 1g and 10g cubes by spatially discretizing the entire measured cube. The volume used to determine the averaged SAR is a 1mm grid (42875 interpolated points).
- A zoom scan volume of 32 mm x 32 mm x 30 mm (5 x 5 x 7 points) centered at the peak SAR location determined from the area scan is used for all zoom scans for devices with a transmit frequency < 800 MHz. Zoom scans for frequencies ≥ 800 MHz are determined with a scan volume of 30 mm x 30 mm x 30 mm (7 x 7 x 7) to ensure complete capture of the peak spatial-average SAR.

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   |                                              |                                                    |                                            |                                                                                     |
|-----------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------|
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|                                                                                   | Report Issue Date<br>October 23, 2006        | Description of Test(s)<br>Specific Absorption Rate | RF Exposure Category<br>General Population |                                                                                     |

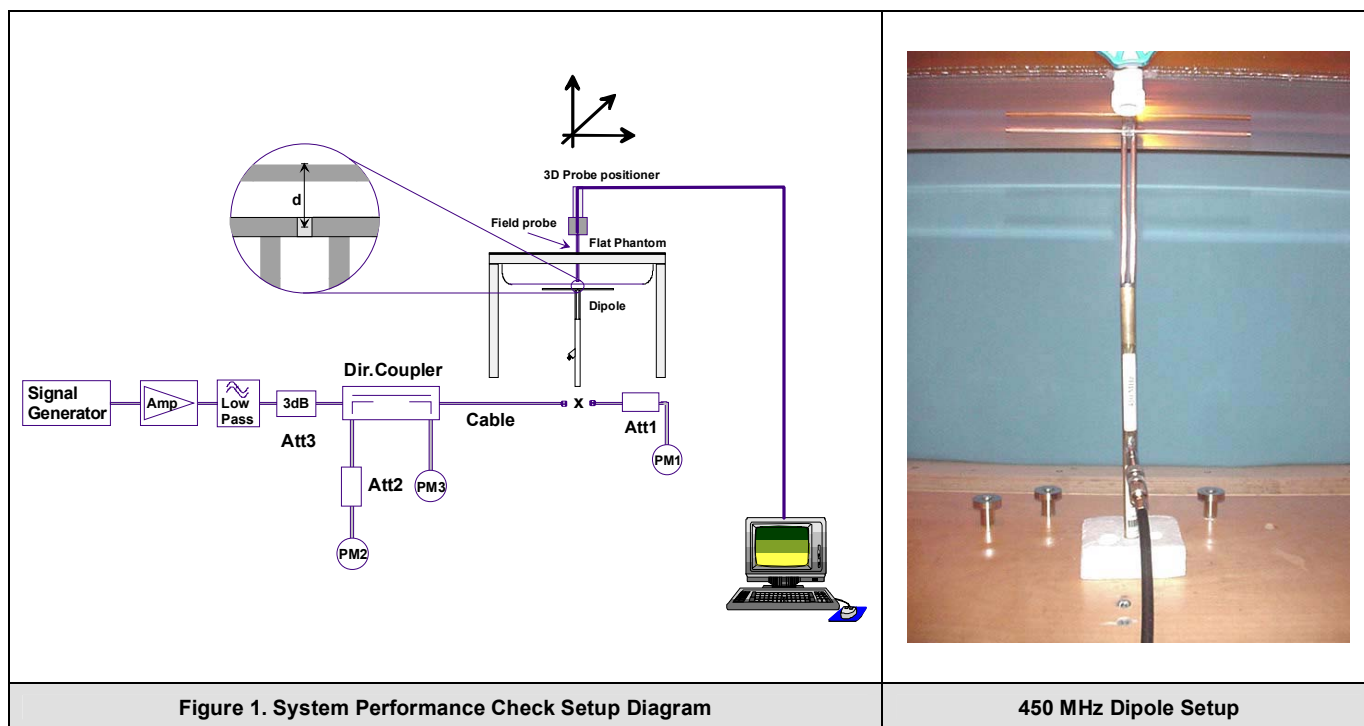
Certificate No. 2470.01

## 7.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluations a system check was performed using a Plexiglas planar phantom and 450MHz dipole (see Appendix E for system validation procedures). The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using an ALS-PR-DIEL Dielectric Probe Kit and HP 8753ET Network Analyzer (see Appendix C). A forward power of 250 mW was applied to the dipole and the system was verified to a tolerance of  $\pm 10\%$  (see Appendix B for system performance check test plot).

### SYSTEM PERFORMANCE CHECK EVALUATION

| Test Date | Equiv. Tissue | SAR 1g (W/kg)                                                                                                                                                                                                                            |       |       | Dielectric Constant $\epsilon_r$ |       |       | Conductivity $\sigma$ (mho/m) |       |       | $\rho$ (Kg/m <sup>3</sup> ) | Amb. Temp. (°C) | Fluid Temp. (°C) | Fluid Depth (cm) | Humid. (%) | Barom. Press. (kPa) |
|-----------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|----------------------------------|-------|-------|-------------------------------|-------|-------|-----------------------------|-----------------|------------------|------------------|------------|---------------------|
|           | Freq. MHz     | IEEE Target                                                                                                                                                                                                                              | Meas. | Dev.  | IEEE Target                      | Meas. | Dev.  | IEEE Target                   | Meas. | Dev.  |                             |                 |                  |                  |            |                     |
| 10/16/06  | Brain<br>450  | 1.23 $\pm 10\%$                                                                                                                                                                                                                          | 1.24  | +0.8% | 43.5 $\pm 5\%$                   | 43.7  | +0.5% | 0.87 $\pm 5\%$                | 0.85  | -2.3% | 1000                        | 25.0            | 22.3             | $\geq 15$        | 34         | 101.3               |
| Note(s)   |               | 1. The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the system performance check. The temperatures listed in the table above were consistent for all measurement periods. |       |       |                                  |       |       |                               |       |       |                             |                 |                  |                  |            |                     |



|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                                                           |                                                     |                                                           |                                                   |                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------|
| <br>Testing and Engineering Services Ltd | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        |  |
|                                                                                                                           | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                    |
| Certificate No. 2470.01                                                                                                   |                                                     |                                                           |                                                   |                                                                                    |

## 8.0 SIMULATED EQUIVALENT TISSUES

The 450MHz brain and body simulated tissue mixtures consist of a viscous gel using hydroxethylcellulose (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).

| SIMULATED TISSUE MIXTURES |                               |                |
|---------------------------|-------------------------------|----------------|
| INGREDIENT                | 450 MHz Brain                 | 450 MHz Body   |
|                           | System Check & DUT Evaluation | DUT Evaluation |
| Water                     | 38.56 %                       | 52.00 %        |
| Sugar                     | 56.32 %                       | 45.65 %        |
| Salt                      | 3.95 %                        | 1.75 %         |
| HEC                       | 0.98 %                        | 0.50 %         |
| Bactericide               | 0.19 %                        | 0.10 %         |

## 9.0 SAR SAFETY LIMITS

| EXPOSURE LIMITS                                                                                                                                                                                | SAR (W/kg)                                               |                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------|
|                                                                                                                                                                                                | (General Population / Uncontrolled Exposure Environment) | (Occupational / Controlled Exposure Environment) |
| Spatial Average<br>(averaged over the whole body)                                                                                                                                              | 0.08                                                     | 0.4                                              |
| Spatial Peak<br>(averaged over any 1 g of tissue)                                                                                                                                              | 1.60                                                     | 8.0                                              |
| Spatial Peak<br>(hands/wrists/feet/ankles<br>averaged over 10 g)                                                                                                                               | 4.0                                                      | 20.0                                             |
| Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.                              |                                                          |                                                  |
| 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. |                                                          |                                                  |

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                                                         |                                                     |                                                           |                                                   |                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <br>Testing and Engineering Services Ltd | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                                                         | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                              |

## 15.0 TEST EQUIPMENT LIST

| USED | TEST EQUIPMENT DESCRIPTION               | ASSET NO. | SERIAL NO. | DATE CALIBRATED | CALIBRATION DUE DATE |
|------|------------------------------------------|-----------|------------|-----------------|----------------------|
| x    | Schmid & Partner DASY4 System            | -         | -          | -               | -                    |
| x    | -DASY4 Measurement Server                | 00158     | 1078       | N/A             | N/A                  |
| x    | -Robot                                   | 00046     | 599396-01  | N/A             | N/A                  |
| x    | -DAE4                                    | 00019     | 353        | 21Jun06         | 21Jun07              |
|      | -DAE3                                    | 00018     | 370        | 08Feb06         | 08Feb07              |
| x    | -ET3DV6 E-Field Probe                    | 00016     | 1387       | 16Mar06         | 16Mar07              |
|      | -EX3DV4 E-Field Probe                    | 00125     | 3547       | 14Feb06         | 14Feb07              |
|      | -300MHz Validation Dipole                | 00023     | 135        | 25Oct05         | 25Oct06              |
| x    | -450MHz Validation Dipole                | 00024     | 136        | 25Oct05         | 25Oct06              |
|      | -835MHz Validation Dipole                | 00022     | 411        | Brain           | 28Mar06              |
|      |                                          |           |            | Body            | 27Mar06              |
|      | -900MHz Validation Dipole                | 00020     | 054        | Brain           | 06Jun06              |
|      |                                          |           |            | Body            | 06Jun06              |
|      | -1640MHz Validation Dipole               | 00211     | 0180       | Brain           | 07Aug06              |
|      | -1800MHz Validation Dipole               | 00021     | 247        | Brain           | 08Jun06              |
|      |                                          |           |            | Body            | 09Jun06              |
|      | -1900MHz Validation Dipole               | 00032     | 151        | Brain           | 09Jun06              |
|      |                                          |           |            | Body            | 12Jun06              |
|      | -2450MHz Validation Dipole               | 00025     | 150        | Body            | 24Apr06              |
|      | -5800MHz Validation Dipole               | 00126     | 1031       | Brain           | 15Mar06              |
|      | -SAM Phantom V4.0C                       | 00154     | 1033       | N/A             | N/A                  |
|      | -Barski Planar Phantom                   | 00155     | 03-01      | N/A             | N/A                  |
| x    | -Plexiglas Side Planar Phantom           | 00156     | 161        | N/A             | N/A                  |
| x    | -Plexiglas Validation Planar Phantom     | 00157     | 137        | N/A             | N/A                  |
| x    | ALS-PR-DIEL Dielectric Probe Kit         | 00160     | 260-00953  | N/A             | N/A                  |
| x    | Gigatronics 8652A Power Meter            | 00110     | 1835801    | 12Apr06         | 12Apr07              |
|      | Gigatronics 8652A Power Meter            | 00007     | 1835272    | 03Feb06         | 03Feb07              |
| x    | Gigatronics 80701A Power Sensor          | 00011     | 1833542    | 03Feb06         | 03Feb07              |
| x    | Gigatronics 80701A Power Sensor          | 00013     | 1833713    | 03Feb06         | 03Feb07              |
| x    | HP 8753ET Network Analyzer               | 00134     | US39170292 | 18Apr06         | 18Apr07              |
| x    | HP 8648D Signal Generator                | 00005     | 3847A00611 | N/A             | N/A                  |
|      | Rohde & Schwarz SMR40 Signal Generator   | 00006     | 100104     | 06Apr06         | 06Apr07              |
| x    | Amplifier Research 5S1G4 Power Amplifier | 00106     | 26235      | N/A             | N/A                  |

|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|  | Date(s) of Evaluation<br>October 16-17, 2006 | Test Report Serial No.<br>101206BBO-T781-S95U      | Report Revision No.<br>Revision 1.0        |  |
|                                                                                   | Report Issue Date<br>October 23, 2006        | Description of Test(s)<br>Specific Absorption Rate | RF Exposure Category<br>General Population |                                                                                     |

Certificate No. 2470.01

## 16.0 MEASUREMENT UNCERTAINTIES

| UNCERTAINTY BUDGET FOR DEVICE EVALUATION |                         |                          |             |          |                              |                                    |
|------------------------------------------|-------------------------|--------------------------|-------------|----------|------------------------------|------------------------------------|
| Error Description                        | Uncertainty Value<br>±% | Probability Distribution | Divisor     | ci<br>1g | Uncertainty Value<br>±% (1g) | V <sub>i</sub> or V <sub>eff</sub> |
| <b>Measurement System</b>                |                         |                          |             |          |                              |                                    |
| Probe calibration                        | 4.0                     | Normal                   | 1           | 1        | 4.0                          | ∞                                  |
| Axial isotropy of the probe              | 4.7                     | Rectangular              | 1.732050808 | 0.7      | 1.9                          | ∞                                  |
| Spherical isotropy of the probe          | 9.6                     | Rectangular              | 1.732050808 | 0.7      | 3.9                          | ∞                                  |
| Spatial resolution                       | 0                       | Rectangular              | 1.732050808 | 1        | 0.0                          | ∞                                  |
| Boundary effects                         | 1                       | Rectangular              | 1.732050808 | 1        | 0.6                          | ∞                                  |
| Probe linearity                          | 4.7                     | Rectangular              | 1.732050808 | 1        | 2.7                          | ∞                                  |
| Detection limit                          | 1                       | Rectangular              | 1.732050808 | 1        | 0.6                          | ∞                                  |
| Readout electronics                      | 0.3                     | Normal                   | 1           | 1        | 0.3                          | ∞                                  |
| Response time                            | 0.8                     | Rectangular              | 1.732050808 | 1        | 0.5                          | ∞                                  |
| Integration time                         | 2.6                     | Rectangular              | 1.732050808 | 1        | 1.5                          | ∞                                  |
| RF ambient conditions                    | 3                       | Rectangular              | 1.732050808 | 1        | 1.7                          | ∞                                  |
| Mech. constraints of robot               | 0.4                     | Rectangular              | 1.732050808 | 1        | 0.2                          | ∞                                  |
| Probe positioning                        | 2.9                     | Rectangular              | 1.732050808 | 1        | 1.7                          | ∞                                  |
| Extrapolation & integration              | 1                       | Rectangular              | 1.732050808 | 1        | 0.6                          | ∞                                  |
| <b>Test Sample Related</b>               |                         |                          |             |          |                              |                                    |
| Device positioning                       | 2.9                     | Normal                   | 1           | 1        | 2.9                          | 12                                 |
| Device holder uncertainty                | 3.6                     | Normal                   | 1           | 1        | 3.6                          | 8                                  |
| Power drift                              | 5                       | Rectangular              | 1.732050808 | 1        | 2.9                          | ∞                                  |
| <b>Phantom and Setup</b>                 |                         |                          |             |          |                              |                                    |
| Phantom uncertainty                      | 4                       | Rectangular              | 1.732050808 | 1        | 2.3                          | ∞                                  |
| Liquid conductivity (target)             | 5                       | Rectangular              | 1.732050808 | 0.64     | 1.8                          | ∞                                  |
| Liquid conductivity (measured)           | 2.5                     | Normal                   | 1           | 0.64     | 1.6                          | ∞                                  |
| Liquid permittivity (target)             | 5                       | Rectangular              | 1.732050808 | 0.6      | 1.7                          | ∞                                  |
| Liquid permittivity (measured)           | 2.5                     | Normal                   | 1           | 0.6      | 1.5                          | ∞                                  |
| <b>Combined Standard Uncertainty</b>     |                         |                          |             |          | <b>9.88</b>                  |                                    |
| <b>Expanded Uncertainty (k=2)</b>        |                         |                          |             |          | <b>19.77</b>                 |                                    |

Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|  | Date(s) of Evaluation<br>October 16-17, 2006 | Test Report Serial No.<br>101206BBO-T781-S95U      | Report Revision No.<br>Revision 1.0        |  |
|                                                                                   | Report Issue Date<br>October 23, 2006        | Description of Test(s)<br>Specific Absorption Rate | RF Exposure Category<br>General Population |                                                                                     |

Certificate No. 2470.01

## MEASUREMENT UNCERTAINTIES (Cont.)

| UNCERTAINTY BUDGET FOR SYSTEM VALIDATION |                         |                          |             |          |                              |                                    |
|------------------------------------------|-------------------------|--------------------------|-------------|----------|------------------------------|------------------------------------|
| Error Description                        | Uncertainty Value<br>±% | Probability Distribution | Divisor     | ci<br>1g | Uncertainty Value<br>±% (1g) | V <sub>i</sub> or V <sub>eff</sub> |
| <b>Measurement System</b>                |                         |                          |             |          |                              |                                    |
| Probe calibration                        | 4.0                     | Normal                   | 1           | 1        | 4.0                          | ∞                                  |
| Axial isotropy of the probe              | 4.7                     | Rectangular              | 1.732050808 | 1        | 2.7                          | ∞                                  |
| Spherical isotropy of the probe          | 0                       | Rectangular              | 1.732050808 | 1        | 0.0                          | ∞                                  |
| Spatial resolution                       | 0                       | Rectangular              | 1.732050808 | 1        | 0.0                          | ∞                                  |
| Boundary effects                         | 1                       | Rectangular              | 1.732050808 | 1        | 0.6                          | ∞                                  |
| Probe linearity                          | 4.7                     | Rectangular              | 1.732050808 | 1        | 2.7                          | ∞                                  |
| Detection limit                          | 1                       | Rectangular              | 1.732050808 | 1        | 0.6                          | ∞                                  |
| Readout electronics                      | 0.3                     | Normal                   | 1           | 1        | 0.3                          | ∞                                  |
| Response time                            | 0                       | Rectangular              | 1.732050808 | 1        | 0.0                          | ∞                                  |
| Integration time                         | 0                       | Rectangular              | 1.732050808 | 1        | 0.0                          | ∞                                  |
| RF ambient conditions                    | 3                       | Rectangular              | 1.732050808 | 1        | 1.7                          | ∞                                  |
| Mech. constraints of robot               | 0.4                     | Rectangular              | 1.732050808 | 1        | 0.2                          | ∞                                  |
| Probe positioning                        | 2.9                     | Rectangular              | 1.732050808 | 1        | 1.7                          | ∞                                  |
| Extrapolation & integration              | 1                       | Rectangular              | 1.732050808 | 1        | 0.6                          | ∞                                  |
| <b>Test Sample Related</b>               |                         |                          |             |          |                              |                                    |
| Dipole Positioning                       | 2                       | Normal                   | 1.732050808 | 1        | 1.2                          | ∞                                  |
| Power & Power Drift                      | 4.7                     | Normal                   | 1.732050808 | 1        | 2.7                          | ∞                                  |
| <b>Phantom and Setup</b>                 |                         |                          |             |          |                              |                                    |
| Phantom uncertainty                      | 4                       | Rectangular              | 1.732050808 | 1        | 2.3                          | ∞                                  |
| Liquid conductivity (target)             | 5                       | Rectangular              | 1.732050808 | 0.64     | 1.8                          | ∞                                  |
| Liquid conductivity (measured)           | 2.5                     | Normal                   | 1           | 0.64     | 1.6                          | ∞                                  |
| Liquid permittivity (target)             | 5                       | Rectangular              | 1.732050808 | 0.6      | 1.7                          | ∞                                  |
| Liquid permittivity (measured)           | 2.5                     | Normal                   | 1           | 0.6      | 1.5                          | ∞                                  |
| <b>Combined Standard Uncertainty</b>     |                         |                          |             |          | <b>7.93</b>                  |                                    |
| <b>Expanded Uncertainty (k=2)</b>        |                         |                          |             |          | <b>15.87</b>                 |                                    |

Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                                |

## 17.0 REFERENCES

- [1] Federal Communications Commission - "Radiofrequency radiation exposure evaluation: portable devices", Rule Part 47 CFR §2.1093: 1999.
- [2] Health Canada - "Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz", Safety Code 6: 1999.
- [3] 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.
- [4] Industry Canada - "Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)", Radio Standards Specification RSS-102 Issue 2: November 2005.
- [5] IEEE Standard 1528-2003 - "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques": December 2003.

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                     |

Certificate No. 2470.01

## APPENDIX A - SAR MEASUREMENT DATA

|                         |                               |                                                                                                                      |                                                |           |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation |                                                                                                                      | FCC ID:                                        | BBOPR4100 | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |           |        |             |                                                                                       |
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|                                                                                   |                                                     |                                                           |                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        |  |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                     |
|                                                                                   |                                                     |                                                           |                                                   | Certificate No. 2470.01                                                             |

Date Tested: 10/17/2006

## Face-Held SAR - NiMH Batteries - GMRS Channel 22 - 462.7250 MHz

**DUT: Cobra Model: PR4500; Type: Portable UHF FRS/GMRS PTT Radio Transceiver; Serial: S610000001**

Ambient Temp: 24.0°C; Fluid Temp: 22.9°C; Barometric Pressure: 99.8 kPa; Humidity: 32%

Communication System: FM UHF

RF Output Power: 0.741 Watts (ERP)

Frequency: 462.7250 MHz; Duty Cycle: 1:1

1.2 V, 600 mAh NiMH Batteries AAA (x4)

Medium: HSL450 Medium parameters used:  $\sigma = 0.83$  mho/m;  $\epsilon_r = 42.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

- Probe: ET3DV6 - SN1387; ConvF(7.4, 7.4, 7.4); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Face-Held SAR - 2.5 cm Separation Distance from Front of DUT to Planar Phantom - Ch. 22

**Area Scan (8x14x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.428 mW/g

### Face-Held SAR - 2.5 cm Separation Distance from Front of DUT to Planar Phantom - Ch. 22

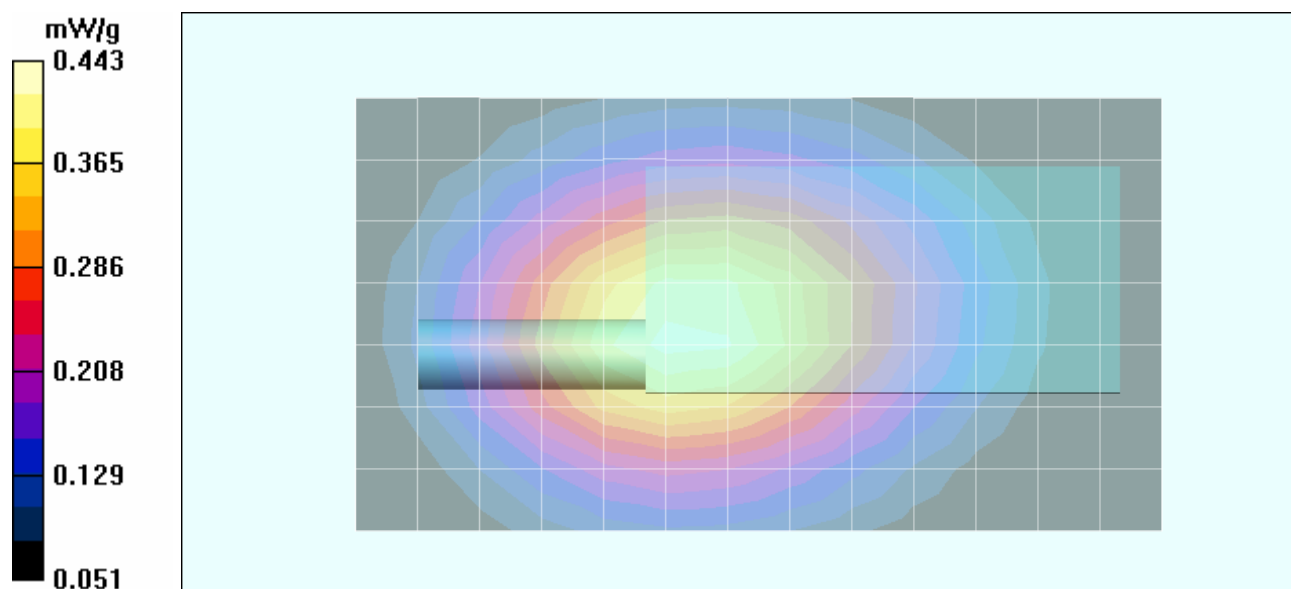
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 22.0 V/m; Power Drift = -0.0492 dB

Peak SAR (extrapolated) = 0.685 W/kg

**SAR(1 g) = 0.426 mW/g; SAR(10 g) = 0.296 mW/g**

Maximum value of SAR (measured) = 0.443 mW/g



|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   |                                                     |                                                           |                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        |  |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                     |
|                                                                                   |                                                     |                                                           |                                                   | Certificate No. 2470.01                                                             |

Date Tested: 10/17/2006

## Face-Held SAR - Alkaline Batteries - GMRS Channel 22 - 462.7250 MHz

**DUT: Cobra Model: PR4500; Type: Portable UHF FRS/GMRS PTT Radio Transceiver; Serial: S610000001**

Ambient Temp: 24.0°C; Fluid Temp: 22.9°C; Barometric Pressure: 99.8 kPa; Humidity: 32%

Communication System: FM UHF

RF Output Power: 0.741 Watts (ERP)

Frequency: 462.7250 MHz; Duty Cycle: 1:1

1.5 V, 1150 mAh Duracell Procell Alkaline Batteries AAA (x4)

Medium: HSL450 Medium parameters used:  $\sigma = 0.83$  mho/m;  $\epsilon_r = 42.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

- Probe: ET3DV6 - SN1387; ConvF(7.4, 7.4, 7.4); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Face-Held SAR - 2.5 cm Separation Distance from Front of DUT to Planar Phantom - Ch. 22

**Area Scan (8x14x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.540 mW/g

### Face-Held SAR - 2.5 cm Separation Distance from Front of DUT to Planar Phantom - Ch. 22

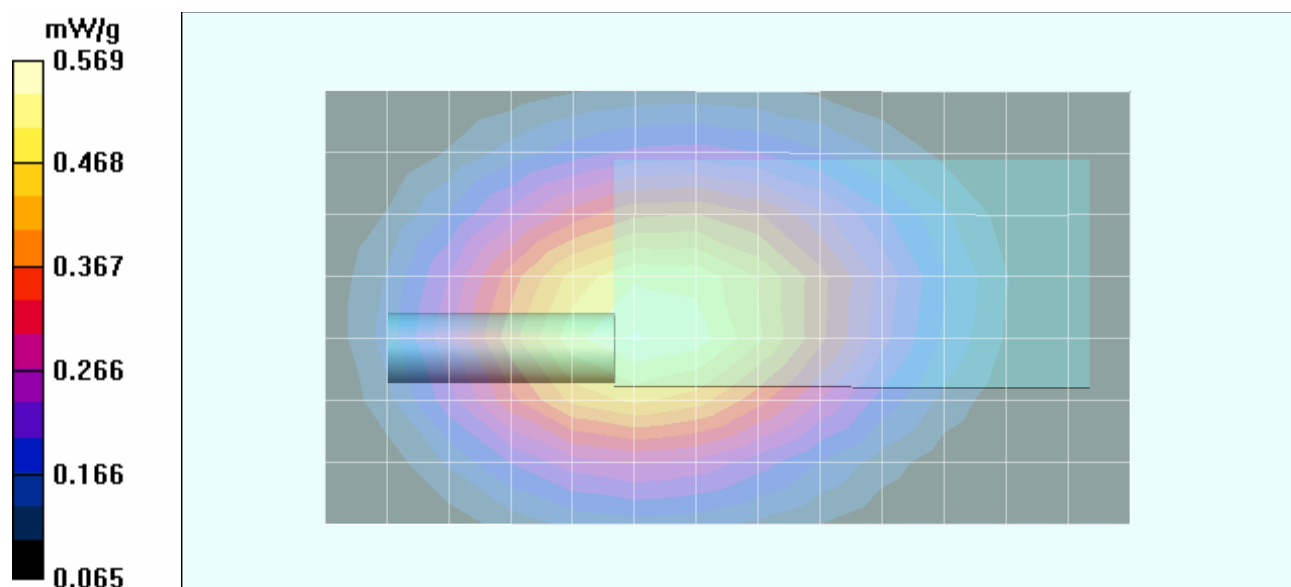
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 25.4 V/m; Power Drift = -0.246 dB

Peak SAR (extrapolated) = 0.866 W/kg

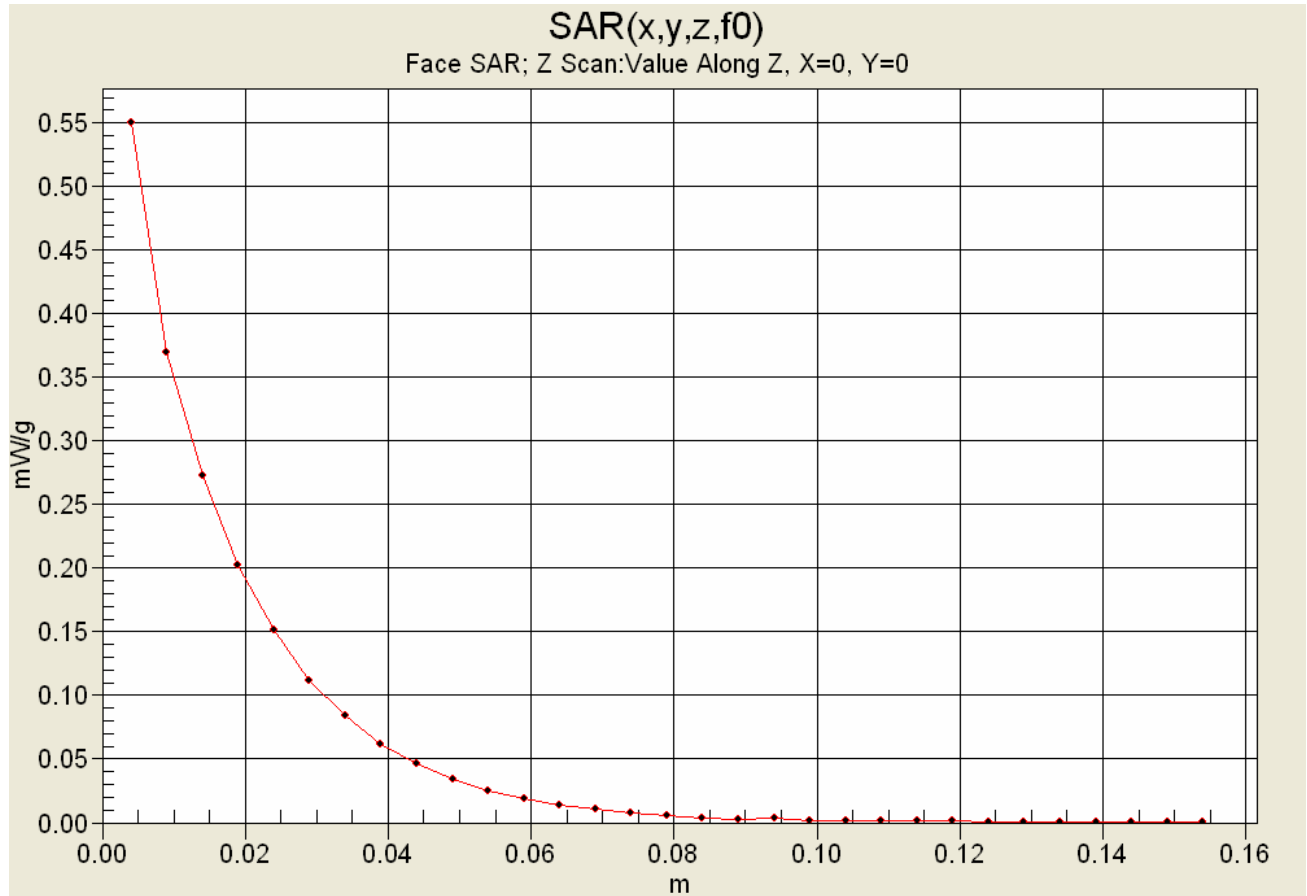
**SAR(1 g) = 0.545 mW/g; SAR(10 g) = 0.381 mW/g**

Maximum value of SAR (measured) = 0.569 mW/g



|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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## Z-Axis Scan



|                                                                                                                          |                                                     |                                                           |                                                   |                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <br>Testing and Engineering Services Ltd | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                                                          | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

Date Tested: 10/17/2006

## Body-Worn SAR - NiMH Batteries - GMRS Channel 22 - 462.7250 MHz

**DUT: Cobra Model: PR4500; Type: Portable UHF FRS/GMRS PTT Radio Transceiver; Serial: S610000001**

**Body-Worn Accessory: Plastic Belt-Clip; Audio Accessory: Earbud with Lapel-Microphone (P/N: GA-EBM2)**

Ambient Temp: 24.0°C; Fluid Temp: 21.7°C; Barometric Pressure: 101.3 kPa; Humidity: 33%

Communication System: FM UHF

RF Output Power: 0.741 Watts (ERP)

Frequency: 462.7250 MHz; Duty Cycle: 1:1

1.2 V, 600 mAh NiMH Batteries AAA (x4)

Medium: M450 Medium parameters used:  $\sigma = 0.90$  mho/m;  $\epsilon_r = 56.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

- Probe: ET3DV6 - SN1387; ConvF(7.3, 7.3, 7.3); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Body-Worn SAR - 0.7 cm Belt-Clip Separation Distance from Back of DUT to Planar Phantom - Ch. 22

**Area Scan (8x14x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.876 mW/g

### Body-Worn SAR - 0.7 cm Belt-Clip Separation Distance from Back of DUT to Planar Phantom - Ch. 22

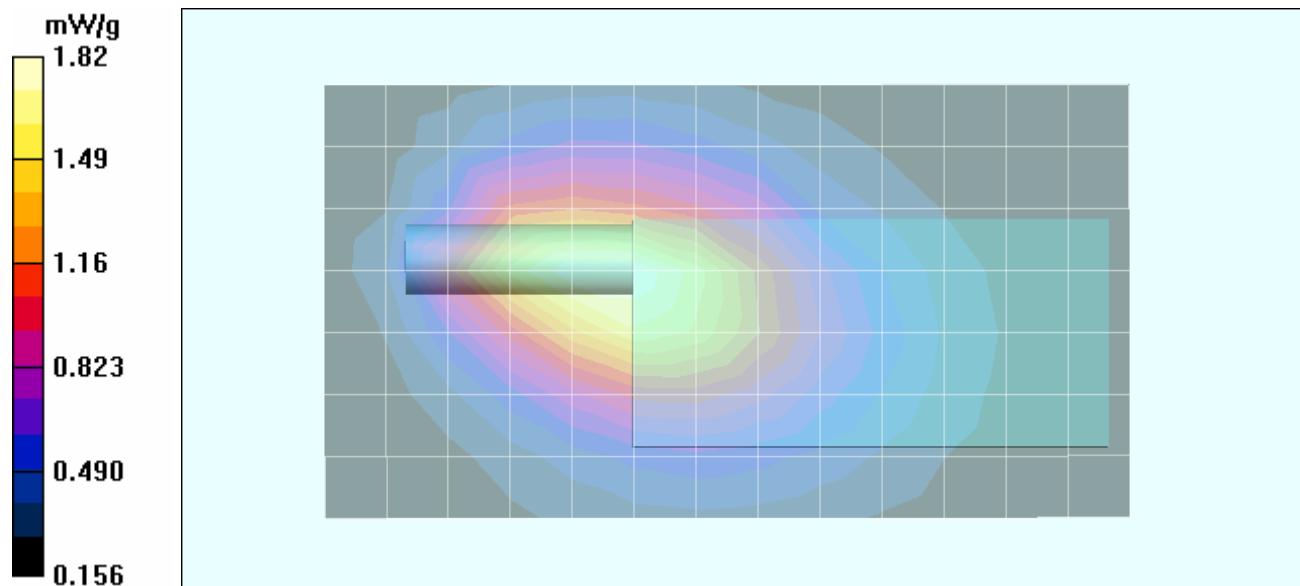
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 45.1 V/m; Power Drift = -0.756 dB

Peak SAR (extrapolated) = 2.91 W/kg

**SAR(1 g) = 1.75 mW/g; SAR(10 g) = 1.18 mW/g**

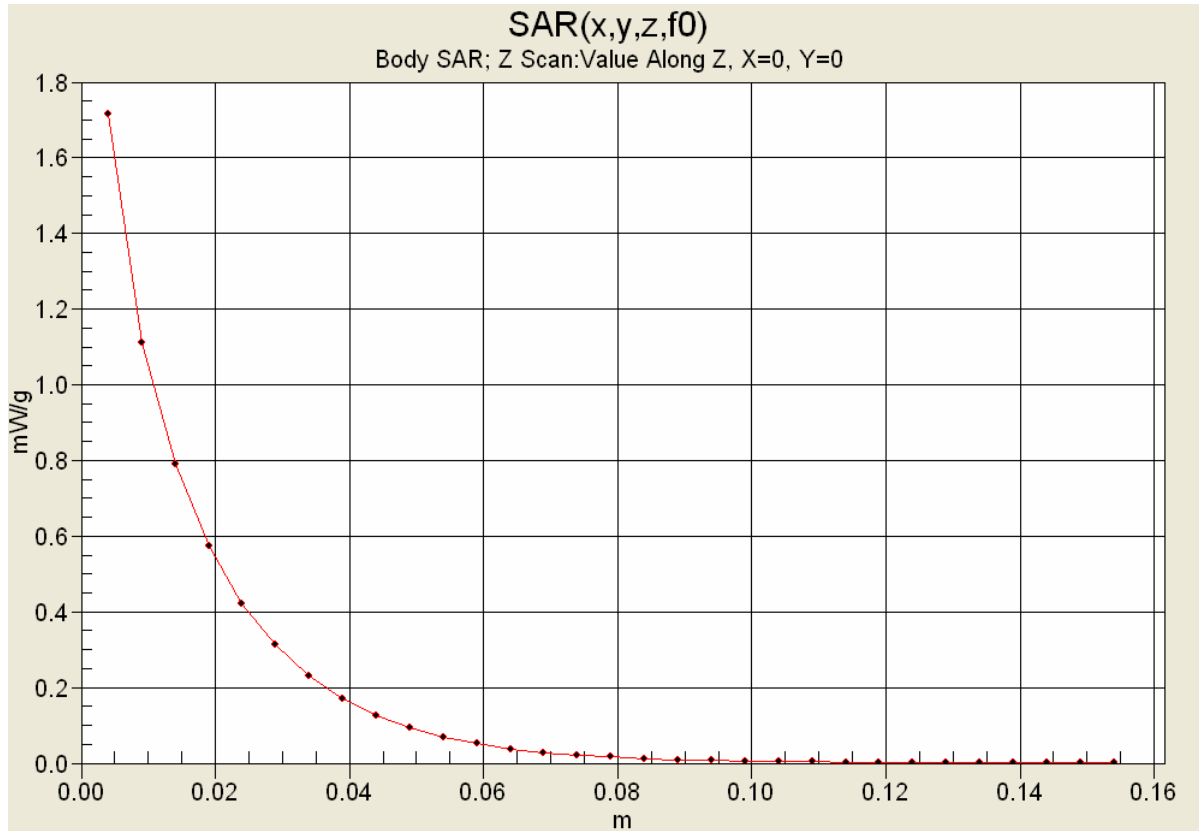
Maximum value of SAR (measured) = 1.82 mW/g



|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                                |

## Z-Axis Scan



|                         |                               |                                                                                                                      |                                                |           |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation |                                                                                                                      | FCC ID:                                        | BBOPR4100 | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |           |        |             |                                                                                       |
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|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        |  |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                     |
|                                                                                   |                                                     |                                                           |                                                   | Certificate No. 2470.01                                                             |

Date Tested: 10/17/2006

## Body-Worn SAR - Alkaline Batteries - GMRS Channel 22 - 462.7250 MHz

**DUT: Cobra Model: PR4500; Type: Portable UHF FRS/GMRS PTT Radio Transceiver; Serial: S610000001**

**Body-Worn Accessory: Plastic Belt-Clip; Audio Accessory: Earbud with Lapel-Microphone (P/N: GA-EBM2)**

Ambient Temp: 24.0°C; Fluid Temp: 21.7°C; Barometric Pressure: 101.3 kPa; Humidity: 33%

Communication System: FM UHF

RF Output Power: 0.741 Watts (ERP)

Frequency: 462.725 MHz; Duty Cycle: 1:1

1.5 V, 1150 mAh Duracell Procell Alkaline Batteries AAA (x4)

Medium: M450 Medium parameters used:  $\sigma = 0.90$  mho/m;  $\epsilon_r = 56.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

- Probe: ET3DV6 - SN1387; ConvF(7.3, 7.3, 7.3); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Body-Worn SAR - 0.7 cm Belt-Clip Separation Distance from Back of DUT to Planar Phantom - Ch. 22

**Area Scan (8x14x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.58 mW/g

### Body-Worn SAR - 0.7 cm Belt-Clip Separation Distance from Back of DUT to Planar Phantom - Ch. 22

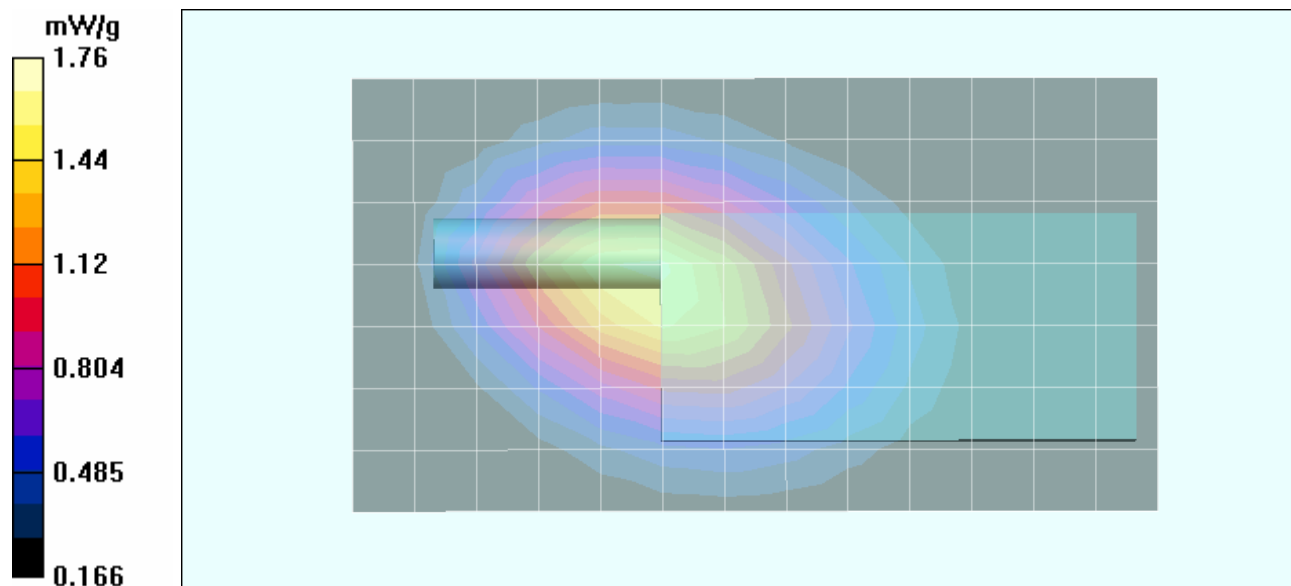
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 42.7 V/m; Power Drift = -0.962 dB

Peak SAR (extrapolated) = 2.87 W/kg

**SAR(1 g) = 1.68 mW/g; SAR(10 g) = 1.1 mW/g**

Maximum value of SAR (measured) = 1.76 mW/g

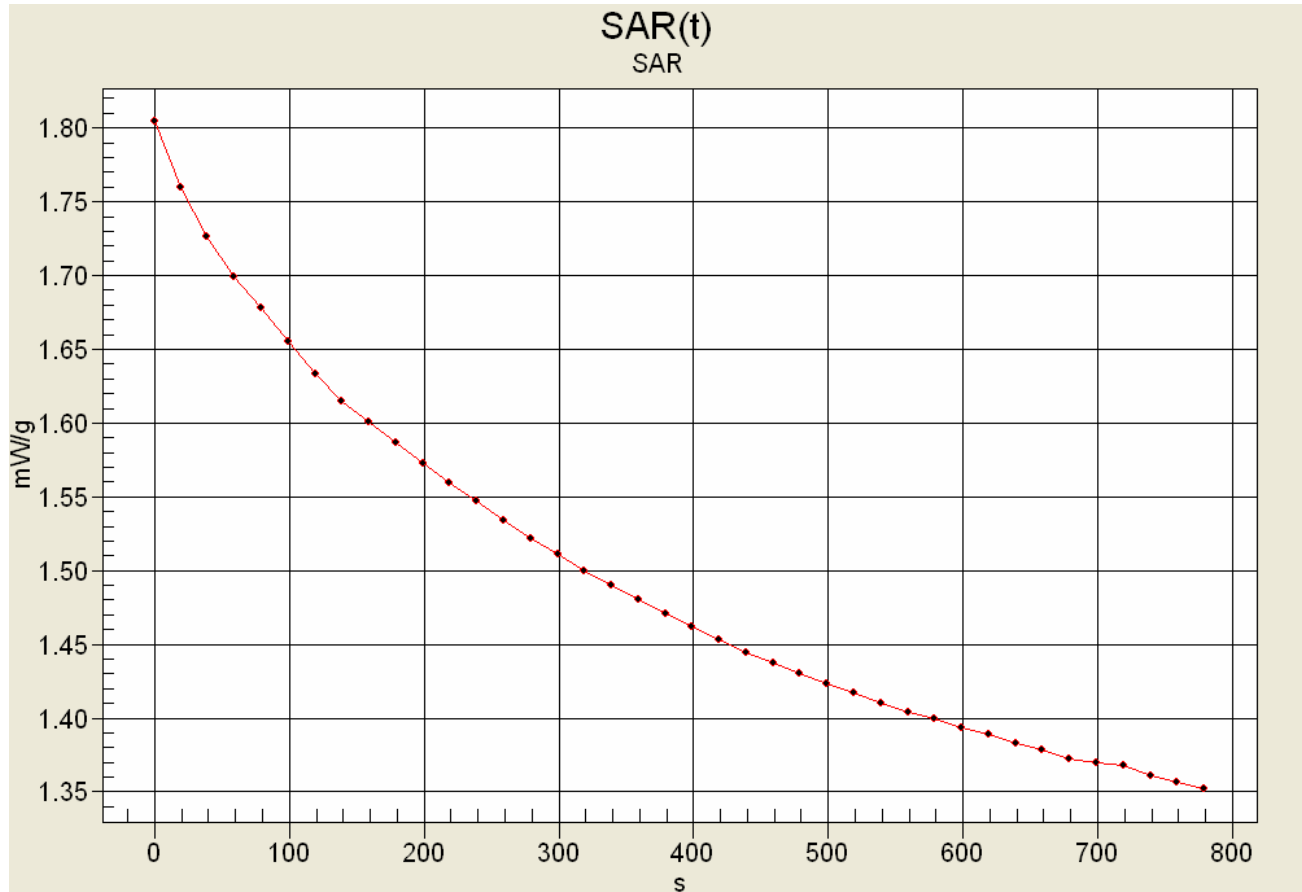


|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                                |

## SAR-versus-Time Power Droop Evaluation

Body-Worn Configuration  
4xAAA Alkaline Batteries  
GMRS Channel 22  
462.7250 MHz



**Max. SAR: 1.80439 mW/g**  
**Min. SAR: 1.35237 mW/g (- 1.25 dB)**  
**SAR after 340s: 1.49037 mW/g (- 1.09 dB)**  
(340s = Zoom Scan Duration)  
(780s = Area Scan Duration)

|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        |  |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                     |

Certificate No. 2470.01

## APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

|                         |                               |                                                                                                                      |                                                |           |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation |                                                                                                                      | FCC ID:                                        | BBOPR4100 | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |           |        |             |                                                                                       |
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|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        |  |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                     |
|                                                                                   |                                                     |                                                           |                                                   | Certificate No. 2470.01                                                             |

Date Tested: 10/16/2006

## System Performance Check - 450 MHz Dipole

**DUT: Dipole 450 MHz; Model: D450V2; Serial: 136; Validation: 10/25/2005**

Ambient Temp: 25.0°C; Fluid Temp: 22.3°C; Barometric Pressure: 101.3 kPa; Humidity: 34%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $\sigma = 0.85$  mho/m;  $\epsilon_r = 43.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

- Probe: ET3DV6 - SN1387; ConvF(7.4, 7.4, 7.4); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### 450 MHz Dipole - System Performance Check/Area Scan (6x11x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.25 mW/g

### 450 MHz Dipole - System Performance Check/Zoom Scan (5x5x7)/Cube 0:

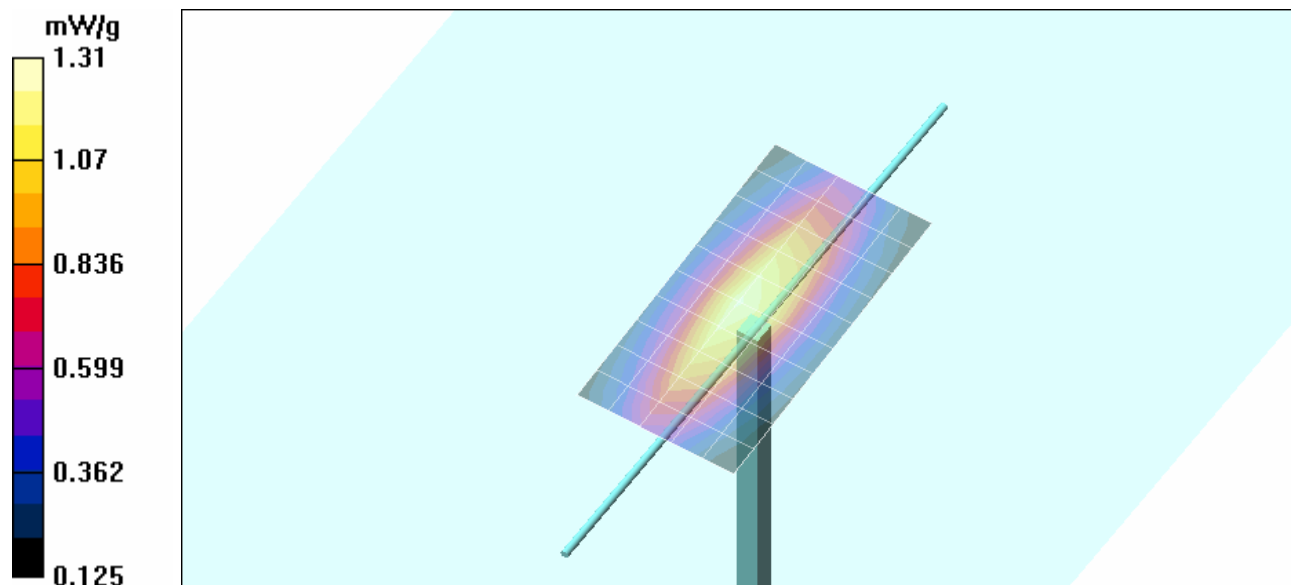
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 39.1 V/m; Power Drift = 0.018 dB

Peak SAR (extrapolated) = 2.18 W/kg

**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.796 mW/g**

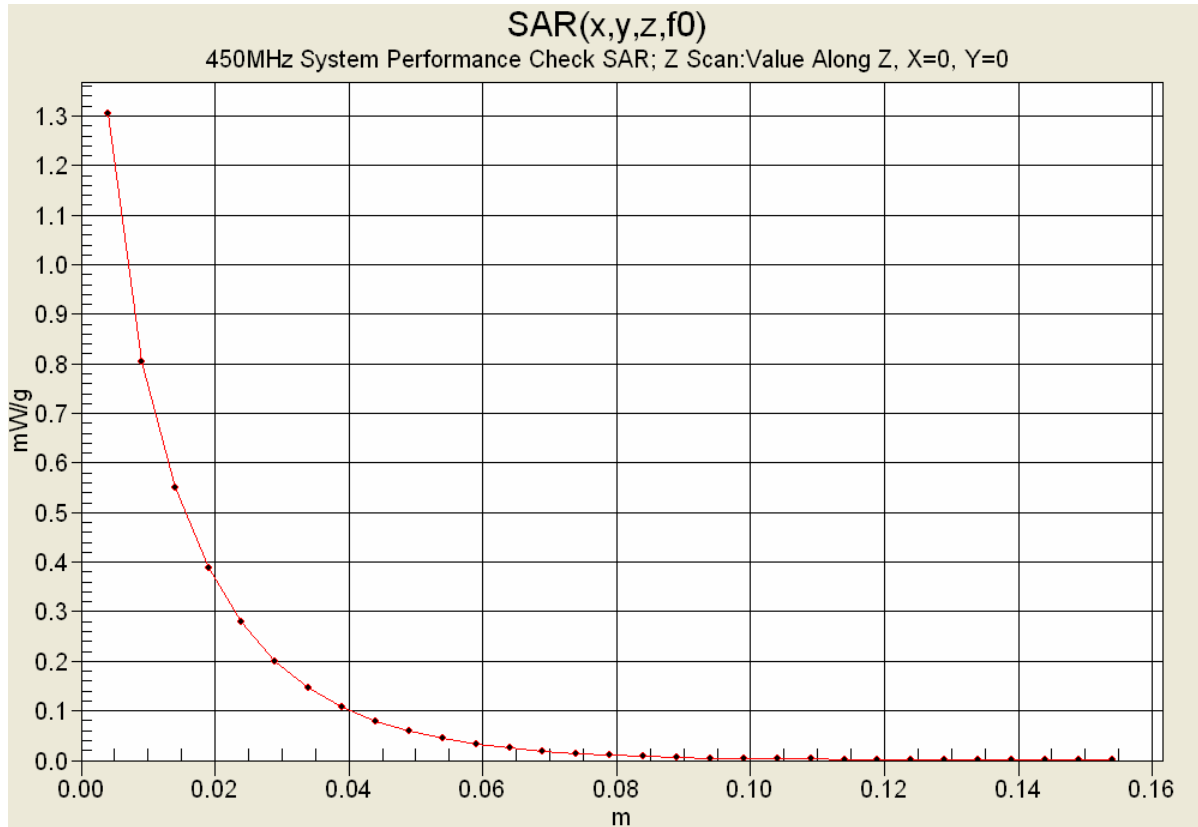
Maximum value of SAR (measured) = 1.31 mW/g



|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   |                                                     |                                                           |                                                   |                                                                                                                |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                                |

## Z-Axis Scan



|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   |                                                     |                                                           |                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        |  |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                     |

Certificate No. 2470.01

## APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

|                         |                               |                                                                                                                      |                                                |           |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation |                                                                                                                      | FCC ID:                                        | BBOPR4100 | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |           |        |             |                                                                                       |
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|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <br>Testing and Engineering Services Ltd | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                                                          | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

### 450 MHz System Performance Check (Brain)

\*\*\*\*\*

Celltech Labs Inc.  
Test Result for UIM Dielectric Parameter  
Mon 16/Oct/2006  
Frequency (GHz)  
FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
Test\_e Epsilon of UIM  
Test\_s Sigma of UIM

\*\*\*\*\*

| Freq   | FCC_eHFCC | sHFCC | Test_e | Test_s |
|--------|-----------|-------|--------|--------|
| 0.3500 | 44.70     | 0.87  | 46.59  | 0.77   |
| 0.3600 | 44.58     | 0.87  | 46.50  | 0.77   |
| 0.3700 | 44.46     | 0.87  | 46.00  | 0.78   |
| 0.3800 | 44.34     | 0.87  | 45.33  | 0.79   |
| 0.3900 | 44.22     | 0.87  | 45.42  | 0.80   |
| 0.4000 | 44.10     | 0.87  | 44.95  | 0.81   |
| 0.4100 | 43.98     | 0.87  | 44.75  | 0.82   |
| 0.4200 | 43.86     | 0.87  | 44.75  | 0.82   |
| 0.4300 | 43.74     | 0.87  | 44.33  | 0.83   |
| 0.4400 | 43.62     | 0.87  | 44.13  | 0.84   |
| 0.4500 | 43.50     | 0.87  | 43.69  | 0.85   |
| 0.4600 | 43.45     | 0.87  | 43.49  | 0.86   |
| 0.4700 | 43.40     | 0.87  | 43.20  | 0.87   |
| 0.4800 | 43.34     | 0.87  | 43.40  | 0.87   |
| 0.4900 | 43.29     | 0.87  | 43.20  | 0.88   |
| 0.5000 | 43.24     | 0.87  | 43.04  | 0.89   |
| 0.5100 | 43.19     | 0.87  | 42.80  | 0.90   |
| 0.5200 | 43.14     | 0.88  | 42.53  | 0.91   |
| 0.5300 | 43.08     | 0.88  | 42.25  | 0.91   |
| 0.5400 | 43.03     | 0.88  | 42.18  | 0.92   |
| 0.5500 | 42.98     | 0.88  | 41.89  | 0.93   |

|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                                                           |                                                     |                                                           |                                                   |                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <br>Testing and Engineering Services Ltd | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                                                           | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

### 450 MHz DUT Evaluation (Face)

\*\*\*\*\*

Celltech Labs Inc.  
Test Result for UIM Dielectric Parameter  
Tue 17/Oct/2006  
Frequency (GHz)  
FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
Test\_e Epsilon of UIM  
Test\_s Sigma of UIM

\*\*\*\*\*

| Freq   | FCC_eHFCC | sH   | Test_e | Test_s |
|--------|-----------|------|--------|--------|
| 0.3500 | 44.70     | 0.87 | 45.30  | 0.74   |
| 0.3600 | 44.58     | 0.87 | 44.94  | 0.75   |
| 0.3700 | 44.46     | 0.87 | 44.85  | 0.75   |
| 0.3800 | 44.34     | 0.87 | 44.63  | 0.76   |
| 0.3900 | 44.22     | 0.87 | 44.20  | 0.77   |
| 0.4000 | 44.10     | 0.87 | 44.05  | 0.78   |
| 0.4100 | 43.98     | 0.87 | 44.09  | 0.79   |
| 0.4200 | 43.86     | 0.87 | 43.67  | 0.80   |
| 0.4300 | 43.74     | 0.87 | 43.26  | 0.81   |
| 0.4400 | 43.62     | 0.87 | 43.13  | 0.82   |
| 0.4500 | 43.50     | 0.87 | 42.83  | 0.83   |
| 0.4600 | 43.45     | 0.87 | 42.61  | 0.83   |
| 0.4700 | 43.40     | 0.87 | 42.43  | 0.84   |
| 0.4800 | 43.34     | 0.87 | 42.26  | 0.84   |
| 0.4900 | 43.29     | 0.87 | 42.30  | 0.85   |
| 0.5000 | 43.24     | 0.87 | 42.25  | 0.86   |
| 0.5100 | 43.19     | 0.87 | 41.56  | 0.87   |
| 0.5200 | 43.14     | 0.88 | 41.58  | 0.88   |
| 0.5300 | 43.08     | 0.88 | 41.61  | 0.88   |
| 0.5400 | 43.03     | 0.88 | 41.31  | 0.90   |
| 0.5500 | 42.98     | 0.88 | 41.22  | 0.90   |

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                                                           |                                                     |                                                           |                                                   |                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <br>Testing and Engineering Services Ltd | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                                                           | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

### 450 MHz DUT Evaluation (Body)

\*\*\*\*\*

Celltech Labs Inc.  
Test Result for UIM Dielectric Parameter  
Tue 17/Oct/2006  
Frequency (GHz)  
FCC\_eHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon  
FCC\_sHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma  
FCC\_eB FCC Limits for Body Epsilon  
FCC\_sB FCC Limits for Body Sigma  
Test\_e Epsilon of UIM  
Test\_s Sigma of UIM

\*\*\*\*\*

| Freq   | FCC_eB | FCC_sB | Test_e | Test_s |
|--------|--------|--------|--------|--------|
| 0.3500 | 57.70  | 0.93   | 58.10  | 0.82   |
| 0.3600 | 57.60  | 0.93   | 57.99  | 0.83   |
| 0.3700 | 57.50  | 0.93   | 57.76  | 0.84   |
| 0.3800 | 57.40  | 0.93   | 57.30  | 0.85   |
| 0.3900 | 57.30  | 0.93   | 57.60  | 0.86   |
| 0.4000 | 57.20  | 0.93   | 56.87  | 0.86   |
| 0.4100 | 57.10  | 0.93   | 56.97  | 0.87   |
| 0.4200 | 57.00  | 0.94   | 56.98  | 0.87   |
| 0.4300 | 56.90  | 0.94   | 56.67  | 0.88   |
| 0.4400 | 56.80  | 0.94   | 56.62  | 0.89   |
| 0.4500 | 56.70  | 0.94   | 56.24  | 0.90   |
| 0.4600 | 56.66  | 0.94   | 56.24  | 0.91   |
| 0.4700 | 56.62  | 0.94   | 55.87  | 0.92   |
| 0.4800 | 56.58  | 0.94   | 56.02  | 0.92   |
| 0.4900 | 56.54  | 0.94   | 55.79  | 0.93   |
| 0.5000 | 56.51  | 0.94   | 55.74  | 0.93   |
| 0.5100 | 56.47  | 0.94   | 55.52  | 0.95   |
| 0.5200 | 56.43  | 0.95   | 55.41  | 0.94   |
| 0.5300 | 56.39  | 0.95   | 55.15  | 0.96   |
| 0.5400 | 56.35  | 0.95   | 55.23  | 0.97   |
| 0.5500 | 56.31  | 0.95   | 54.96  | 0.98   |

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   |                                                     |                                                           |                                                   |                                                                                                                |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                                |

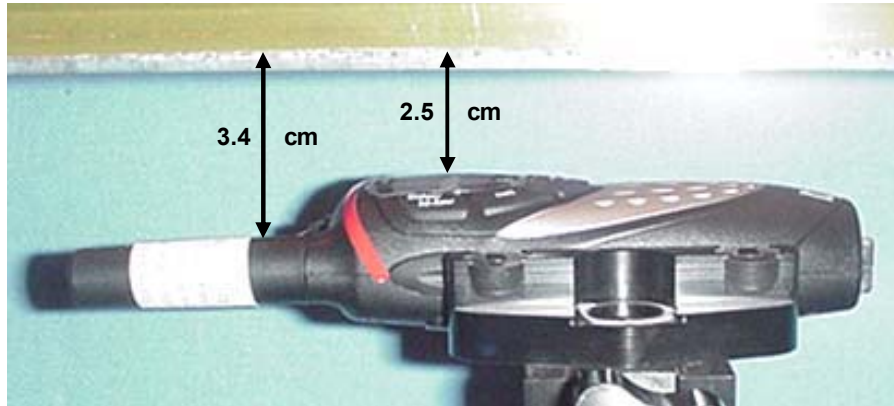
## APPENDIX D - SAR TEST SETUP & DUT PHOTOGRAPHS

|                         |                               |                                                                                                                      |                                                |           |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation |                                                                                                                      | FCC ID:                                        | BBOPR4100 | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |           |        |             |                                                                                       |
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|                                                                                   |                                                     |                                                           |                                                   |                                                                                                                |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                                |

## FACE-HELD SAR TEST SETUP PHOTOGRAPHS

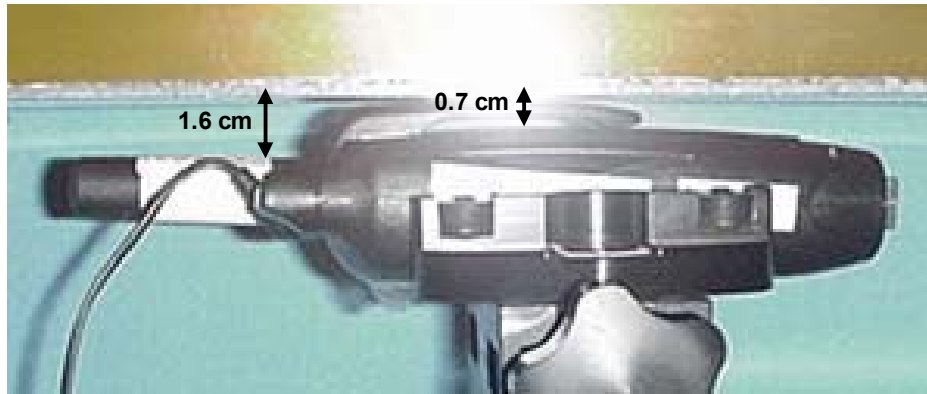
### 2.5 cm Separation Distance from Front of DUT to Planar Phantom



|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                                                          |                                                     |                                                           |                                                   |                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <br>Testing and Engineering Services Ltd | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                                                          | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

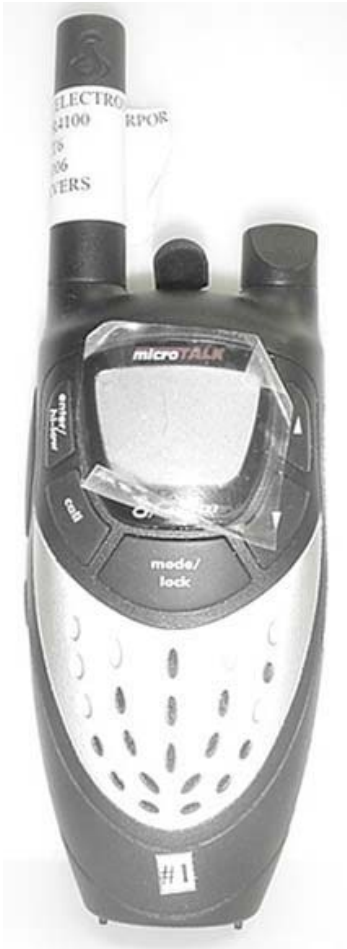
**BODY-WORN SAR TEST SETUP PHOTOGRAPHS**  
**0.7 cm Belt-Clip Spacing from Back of DUT to Planar Phantom**  
**With Earbud Lapel-Microphone Audio Accessory**



|                         |                               |                                                                                                                      |                                                |           |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation |                                                                                                                      | FCC ID:                                        | BBOPR4100 | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |           |        |             |                                                                                       |
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|                                                                                                                           |                                                     |                                                           |                                                   |                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| <br>Testing and Engineering Services Lab | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                                                           | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                                |

## DUT PHOTOGRAPHS



Front of DUT



Back of DUT



Back of DUT with Plastic Belt-Clip



Top end of DUT



Bottom end of DUT

|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   |                                              |                                                    |                                            |                                                                                     |
|-----------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------|
|  | Date(s) of Evaluation<br>October 16-17, 2006 | Test Report Serial No.<br>101206BBO-T781-S95U      | Report Revision No.<br>Revision 1.0        |  |
|                                                                                   | Report Issue Date<br>October 23, 2006        | Description of Test(s)<br>Specific Absorption Rate | RF Exposure Category<br>General Population |                                                                                     |

Certificate No. 2470.01

## DUT PHOTOGRAPHS



Left Side of DUT with Plastic Belt-Clip



Right Side of DUT with Plastic Belt-Clip



DUT Battery Compartment



DUT with Alkaline AAA Batteries



DUT with NiMH AAA Batteries

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   |                                                     |                                                           |                                                   |                                                                                                                |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        | <br>Certificate No. 2470.01 |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                                |

## DUT PHOTOGRAPHS



DUT with Earbud Lapel-Microphone Audio Accessory (P/N: GA-EBM2)

|                         |                               |                                                                                                                      |                                                |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation | FCC ID:                                                                                                              | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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|                                                                                   |                                                     |                                                           |                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        |  |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                     |

Certificate No. 2470.01

## APPENDIX E - SYSTEM VALIDATION

|                         |                               |                                                                                                                      |                                                |           |        |             |                                                                                       |
|-------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation |                                                                                                                      | FCC ID:                                        | BBOPR4100 | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500               | DUT Type:                                                                                                            | Portable FM UHF FRS/GMRS PTT Radio Transceiver |           |        |             |                                                                                       |
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|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |
|                                                                                   |                     |                   | Fluid Type:         | Brain              |

## 450 MHz SYSTEM VALIDATION DIPOLE

Type:

**450 MHz Validation Dipole**

Asset Number:

**00024**

Serial Number:

**136**

Place of Validation:

**Celltech Labs Inc.**

Date of Validation:

**October 25, 2005**

**Celltech Labs Inc. hereby certifies that the system validation was performed on the date indicated above.**

Validated by:



Approved by:



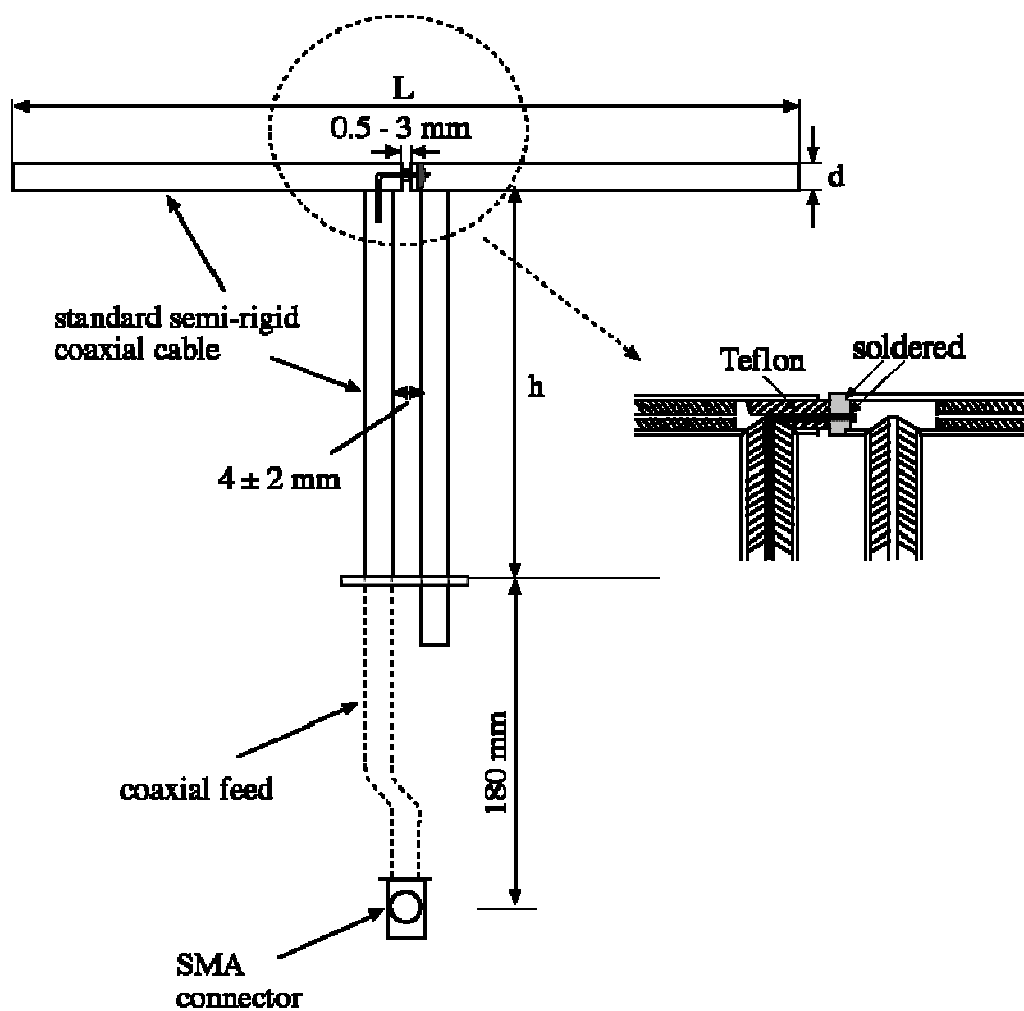
|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |

## 1. Dipole Construction & Electrical Characteristics

The validation dipole was constructed in accordance with the IEEE Std "Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques". The electrical properties were measured using an HP 8753E Network Analyzer. The network analyzer was calibrated to the validation dipole N-type connector feed point using an HP85032E Type N calibration kit. The dipole was placed parallel to a planar phantom at a separation distance of 15.0mm from the simulating fluid using a loss-less dielectric spacer. The measured input impedance is:

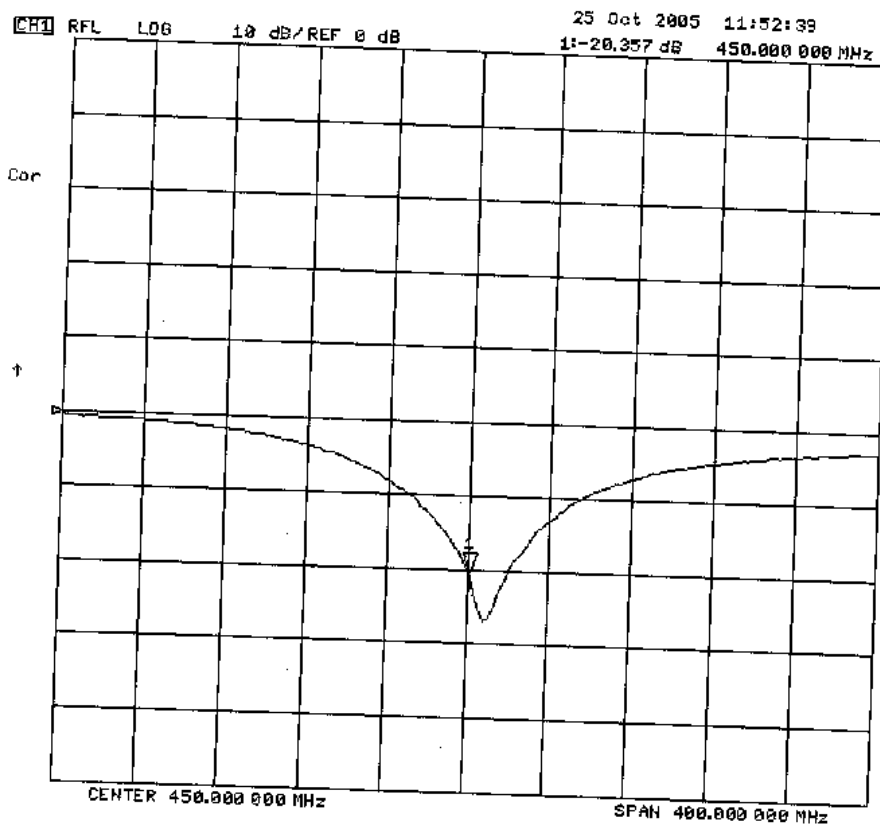
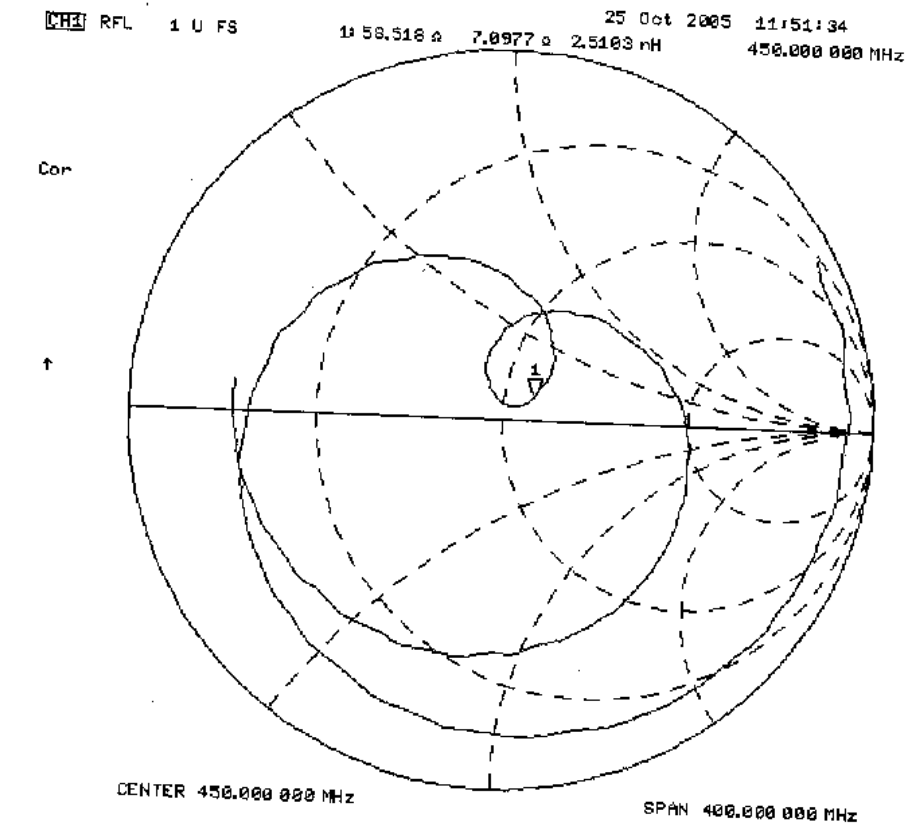
Feed point impedance at 450MHz       $\text{Re}\{Z\} = 58.518\Omega$   
 $\text{Im}\{Z\} = 7.0977\Omega$

Return Loss at 450MHz                      -20.357dB



|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |

## 2. Validation Dipole VSWR Data



|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |

### **3. Validation Dipole Dimensions**

| Frequency (MHz) | L (mm) | h (mm) | d (mm) |
|-----------------|--------|--------|--------|
| 300             | 420.0  | 250.0  | 6.2    |
| 450             | 288.0  | 167.0  | 6.2    |
| 835             | 161.0  | 89.8   | 3.6    |
| 900             | 149.0  | 83.3   | 3.6    |
| 1450            | 89.1   | 51.7   | 3.6    |
| 1800            | 72.0   | 41.7   | 3.6    |
| 1900            | 68.0   | 39.5   | 3.6    |
| 2000            | 64.5   | 37.5   | 3.6    |
| 2450            | 51.8   | 30.6   | 3.6    |
| 3000            | 41.5   | 25.0   | 3.6    |

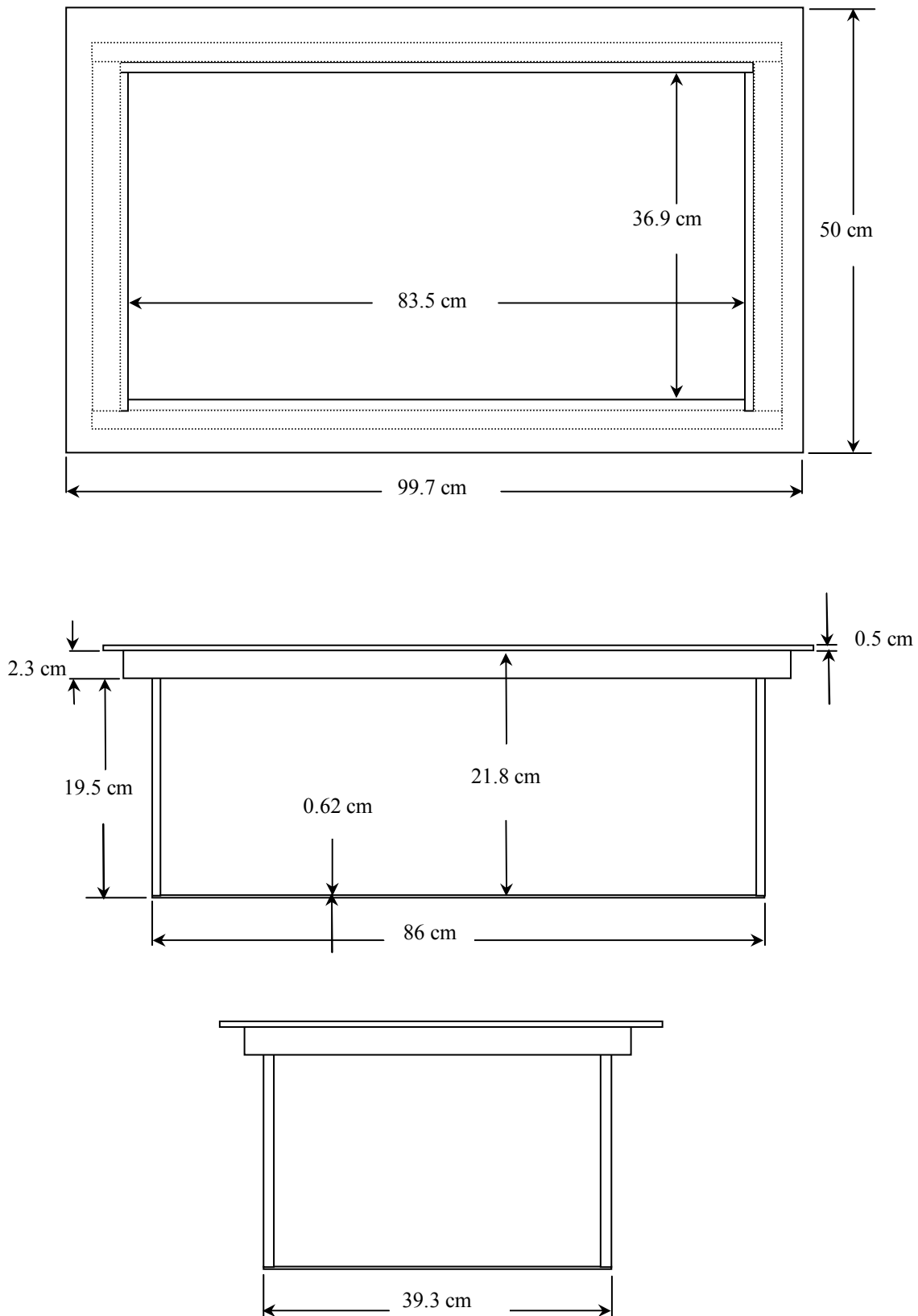
### **4. Validation Phantom**

The validation phantom was constructed using relatively low-loss tangent Plexiglas material. The inner dimensions of the phantom are as follows:

Length: 83.5 cm  
Width: 36.9 cm  
Height: 21.8 cm

The bottom section of the validation phantom is constructed of  $6.2 \pm 0.1$ mm Plexiglas.

## 5. Dimensions of Plexiglas Planar Phantom



|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |

## 6. 450 MHz System Validation Setup



|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |

## 7. 450 MHz Validation Dipole Setup



|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |

## 8. Measurement Conditions

The planar phantom was filled with 450 MHz brain tissue simulant:

Relative Permittivity: 43.2 (-0.7% deviation from target)  
 Conductivity: 0.84 mho/m (-3.4% deviation from target)  
 Fluid Temperature: 22.5 °C  
 Fluid Depth:  $\geq 15.0$  cm

Environmental Conditions:

Ambient Temperature: 23.5 °C  
 Humidity: 34 %  
 Barometric Pressure: 101.4 kPa

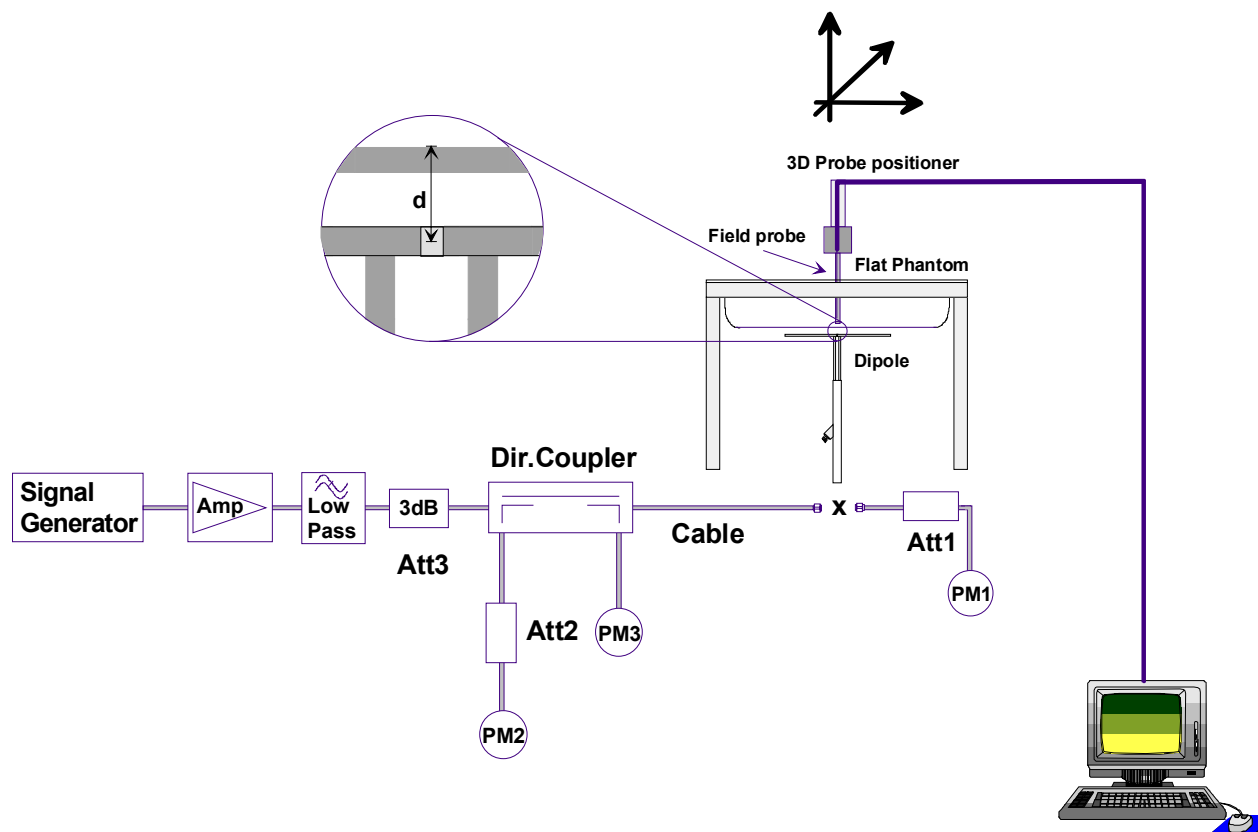
The 450 MHz brain tissue simulant consisted of the following ingredients:

| Ingredient                                    | Percentage by weight                                         |
|-----------------------------------------------|--------------------------------------------------------------|
| Water                                         | 38.56%                                                       |
| Sugar                                         | 56.32%                                                       |
| Salt                                          | 3.95%                                                        |
| HEC                                           | 0.98%                                                        |
| Dowicil 75                                    | 0.19%                                                        |
| 450 MHz Target Dielectric Parameters at 22 °C | $\epsilon_r = 43.5$ (+/- 5%)<br>$\sigma = 0.87$ S/m (+/- 5%) |

|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |

## 9. SAR Measurement

The SAR measurement was performed with the E-field probe in mechanical detection mode only. The setup and determination of the forward power into the dipole was performed using the following procedures.



First the power meter PM1 (including attenuator Att1) is connected to the cable to measure the forward power at the location of the dipole connector (X). The signal generator is adjusted for the desired forward power at the dipole connector (taking into account the attenuation of Att1) as read by power meter PM2. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2. If the signal generator does not allow adjustment in 0.01dB steps, the remaining difference at PM2 must be taken into consideration. PM3 records the reflected power from the dipole to ensure that the value is not changed from the previous value. The reflected power should be 20dB below the forward power.

|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |

## 10. Validation Dipole SAR Test Results

Ten SAR measurements were performed in order to achieve repeatability and to establish an average target value.

| Validation Measurement | SAR @ 0.25W Input averaged over 1g | SAR @ 1W Input averaged over 1g | SAR @ 0.25W Input averaged over 10g | SAR @ 1W Input averaged over 10g | Peak SAR @ 0.25W Input |
|------------------------|------------------------------------|---------------------------------|-------------------------------------|----------------------------------|------------------------|
| Test 1                 | 1.24                               | 4.96                            | 0.800                               | 3.200                            | 1.31                   |
| Test 2                 | 1.24                               | 4.96                            | 0.798                               | 3.192                            | 1.31                   |
| Test 3                 | 1.24                               | 4.96                            | 0.798                               | 3.192                            | 1.31                   |
| Test 4                 | 1.24                               | 4.96                            | 0.799                               | 3.196                            | 1.31                   |
| Test 5                 | 1.24                               | 4.96                            | 0.799                               | 3.196                            | 1.31                   |
| Test 6                 | 1.24                               | 4.96                            | 0.799                               | 3.196                            | 1.31                   |
| Test 7                 | 1.24                               | 4.96                            | 0.801                               | 3.204                            | 1.31                   |
| Test 8                 | 1.24                               | 4.96                            | 0.802                               | 3.208                            | 1.31                   |
| Test 9                 | 1.25                               | 5.00                            | 0.807                               | 3.228                            | 1.31                   |
| Test 10                | 1.25                               | 5.00                            | 0.806                               | 3.224                            | 1.31                   |
| <b>Average</b>         | <b>1.24</b>                        | <b>4.97</b>                     | <b>0.801</b>                        | <b>3.204</b>                     | <b>1.31</b>            |

The results have been normalized to 1W (forward power) into the dipole.

| Target SAR @ 1 Watt Input averaged over 1 gram (W/kg) |         | Measured SAR @ 1 Watt Input averaged over 1 gram (W/kg) | Deviation from Target (%) | Target SAR @ 1 Watt Input averaged over 10 grams (W/kg) |         | Measured SAR @ 1 Watt Input averaged over 10 grams (W/kg) | Deviation from Target (%) |
|-------------------------------------------------------|---------|---------------------------------------------------------|---------------------------|---------------------------------------------------------|---------|-----------------------------------------------------------|---------------------------|
| 4.90                                                  | +/- 10% | 4.97                                                    | +1.4%                     | 3.30                                                    | +/- 10% | 3.204                                                     | -2.9%                     |

|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |

## 450 MHz System Validation (Brain) - October 25, 2005

Dipole: 450 MHz; Model: D450V2; Serial: 136  
 Ambient Temp: 23.5 °C; Fluid Temp: 22.5 °C; Barometric Pressure: 101.4 kPa; Humidity: 34%  
 Communication System: CW  
 Frequency: 450 MHz; Duty Cycle: 1:1  
 Medium: HSL450 ( $\sigma = 0.84$  mho/m;  $\epsilon_r = 43.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>)  
 - Probe: ET3DV6 - SN1387; ConvF(7.5, 7.5, 7.5); Calibrated: 18/03/2005  
 - Sensor-Surface: 4mm (Mechanical Surface Detection)  
 - Electronics: DAE4 Sn353; Calibrated: 15/06/2005  
 - Phantom: Validation Planar; Type: Plexiglas; Serial: 137  
 - Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**450 MHz System Validation/Area Scan (6x11x1):** Measurement grid: dx=15mm, dy=15mm  
 Maximum value of SAR (measured) = 1.27 mW/g

**450 MHz System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 39.3 V/m; Power Drift = -0.025 dB  
**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.800 mW/g**  
 Maximum value of SAR (measured) = 1.31 mW/g

**450 MHz System Validation/Zoom Scan 2 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 39.1 V/m; Power Drift = 0.004 dB  
**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.798 mW/g**  
 Maximum value of SAR (measured) = 1.31 mW/g

**450 MHz System Validation/Zoom Scan 3 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 39.0 V/m; Power Drift = 0.014 dB  
**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.798 mW/g**  
 Maximum value of SAR (measured) = 1.31 mW/g

**450 MHz System Validation/Zoom Scan 4 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 39.0 V/m; Power Drift = 0.040 dB  
**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.799 mW/g**  
 Maximum value of SAR (measured) = 1.31 mW/g

**450 MHz System Validation/Zoom Scan 5 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 39.0 V/m; Power Drift = 0.014 dB  
**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.799 mW/g**  
 Maximum value of SAR (measured) = 1.31 mW/g

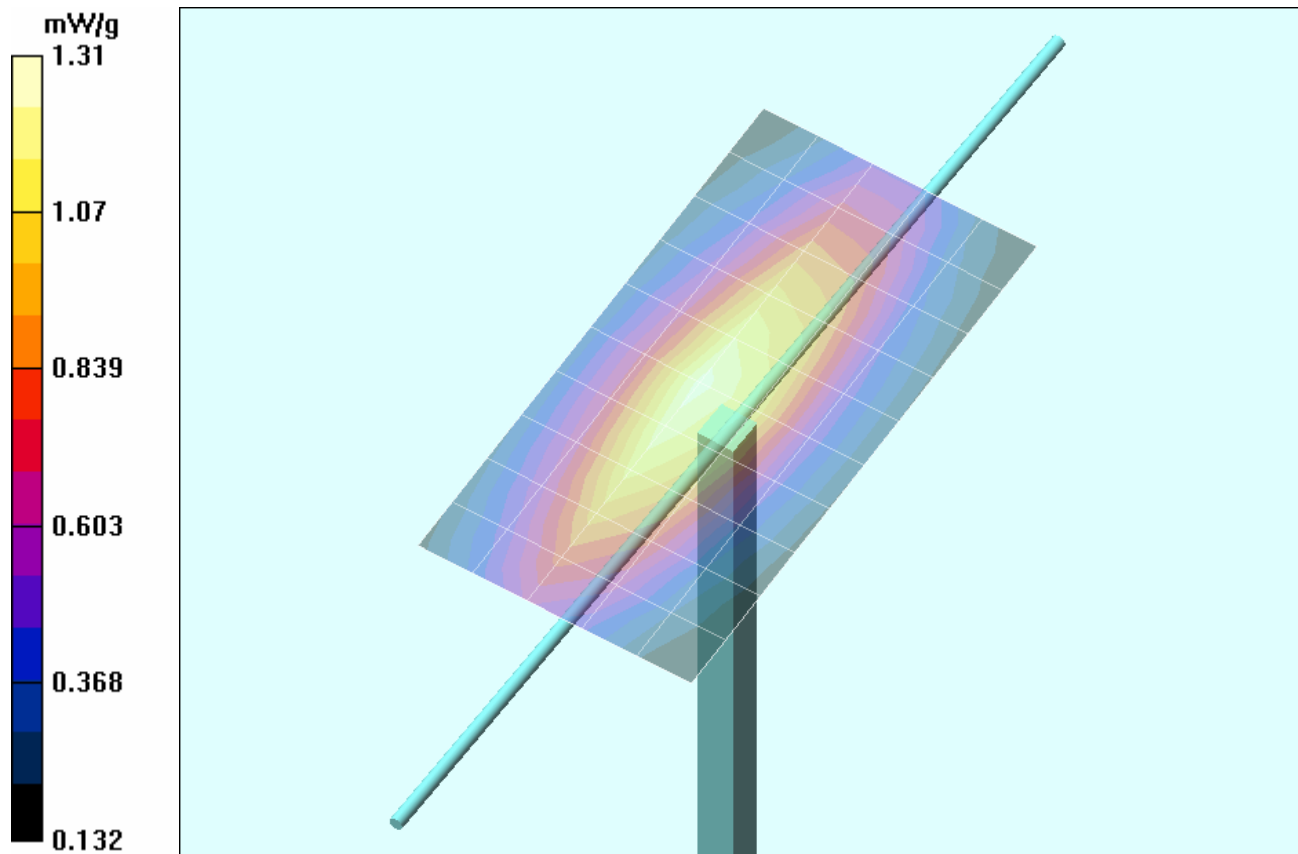
**450 MHz System Validation/Zoom Scan 6 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 39.1 V/m; Power Drift = 0.016 dB  
**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.799 mW/g**  
 Maximum value of SAR (measured) = 1.31 mW/g

**450 MHz System Validation/Zoom Scan 7 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 39.1 V/m; Power Drift = 0.008 dB  
**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.801 mW/g**  
 Maximum value of SAR (measured) = 1.31 mW/g

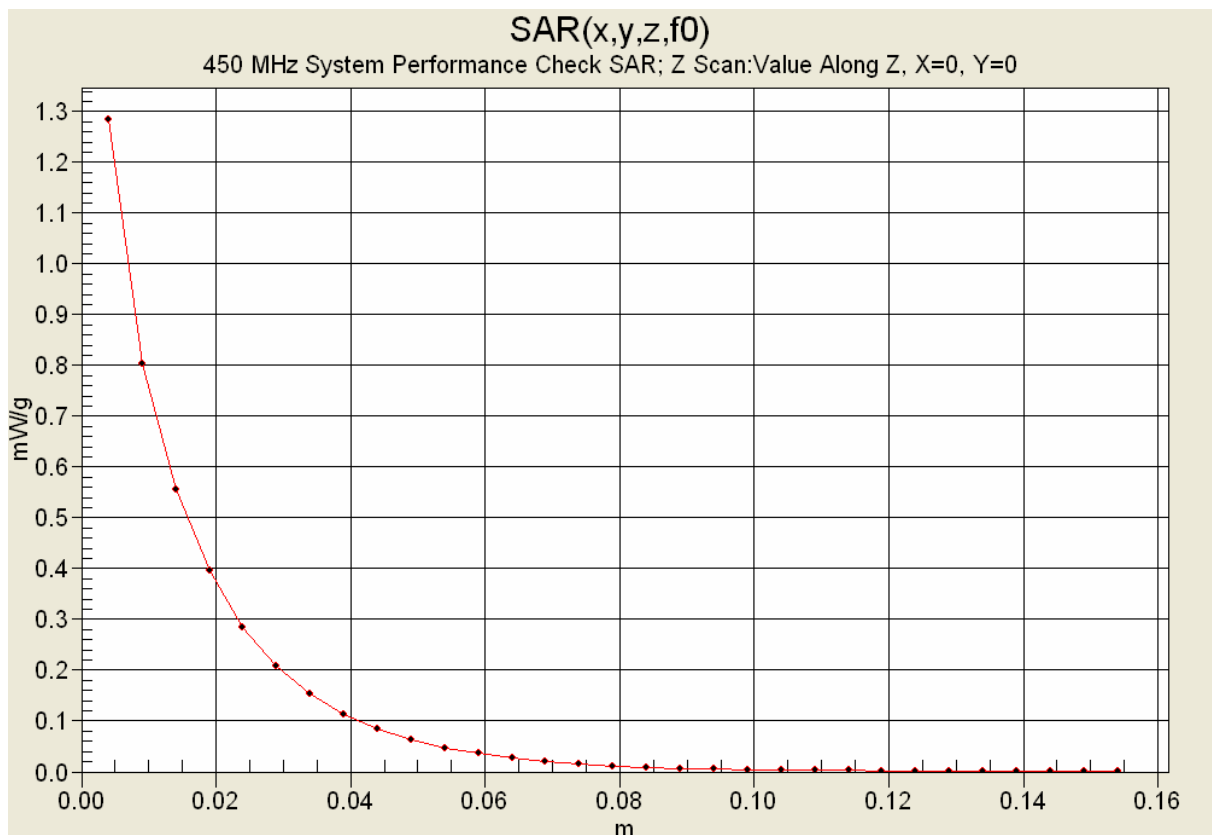
**450 MHz System Validation/Zoom Scan 8 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 39.6 V/m; Power Drift = -0.031 dB  
**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.802 mW/g**  
 Maximum value of SAR (measured) = 1.31 mW/g

**450 MHz System Validation/Zoom Scan 9 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 39.2 V/m; Power Drift = 0.016 dB  
**SAR(1 g) = 1.25 mW/g; SAR(10 g) = 0.807 mW/g**  
 Maximum value of SAR (measured) = 1.31 mW/g

**450 MHz System Validation/Zoom Scan 10 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 39.2 V/m; Power Drift = -0.010 dB  
**SAR(1 g) = 1.25 mW/g; SAR(10 g) = 0.806 mW/g**  
 Maximum value of SAR (measured) = 1.31 mW/g



1 g average of 10 measurements: 1.24 mW/g  
 10 g average of 10 measurements: 0.801 mW/g



|                                                                                   |                     |                   |                     |                    |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|--------------------|
|  | Date of Evaluation: | October 25, 2005  | Document Issue No.: | SV450B-102505-R1.1 |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 450 MHz            |

## 11. Measured Fluid Dielectric Parameters

### System Validation (Brain) - 450 MHz Dipole

\*\*\*\*\*

Celltech Labs Inc.

Test Result for UIM Dielectric Parameter

Tue 25/Oct/2005 12:07:39

Freq Frequency (GHz)

FCC\_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon

FCC\_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma

Test\_e Epsilon of UIM

Test\_s Sigma of UIM

\*\*\*\*\*

| Freq   | FCC_eH | FCC_sH | Test_e | Test_s |
|--------|--------|--------|--------|--------|
| 0.3500 | 44.70  | 0.87   | 46.08  | 0.7567 |
| 0.3600 | 44.58  | 0.87   | 45.12  | 0.7628 |
| 0.3700 | 44.46  | 0.87   | 45.10  | 0.7809 |
| 0.3800 | 44.34  | 0.87   | 45.43  | 0.7839 |
| 0.3900 | 44.22  | 0.87   | 43.97  | 0.7737 |
| 0.4000 | 44.10  | 0.87   | 43.78  | 0.7898 |
| 0.4100 | 43.98  | 0.87   | 43.52  | 0.8094 |
| 0.4200 | 43.86  | 0.87   | 43.40  | 0.8252 |
| 0.4300 | 43.74  | 0.87   | 43.32  | 0.8299 |
| 0.4400 | 43.62  | 0.87   | 43.32  | 0.8412 |
| 0.4500 | 43.50  | 0.87   | 43.20  | 0.8371 |
| 0.4600 | 43.45  | 0.87   | 42.91  | 0.8381 |
| 0.4700 | 43.40  | 0.87   | 42.76  | 0.8474 |
| 0.4800 | 43.34  | 0.87   | 42.33  | 0.8578 |
| 0.4900 | 43.29  | 0.87   | 42.63  | 0.8839 |
| 0.5000 | 43.24  | 0.87   | 42.19  | 0.8784 |
| 0.5100 | 43.19  | 0.87   | 41.77  | 0.8958 |
| 0.5200 | 43.14  | 0.88   | 41.64  | 0.8896 |
| 0.5300 | 43.08  | 0.88   | 41.13  | 0.9037 |
| 0.5400 | 43.03  | 0.88   | 40.85  | 0.9328 |
| 0.5500 | 42.98  | 0.88   | 40.94  | 0.9272 |

|                                                                                   |                                                     |                                                           |                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>October 16-17, 2006 | <u>Test Report Serial No.</u><br>101206BBO-T781-S95U      | <u>Report Revision No.</u><br>Revision 1.0        |  |
|                                                                                   | <u>Report Issue Date</u><br>October 23, 2006        | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                     |

Certificate No. 2470.01

## APPENDIX F - PROBE CALIBRATION

|                         |                                                                                                                      |           |                                                |        |             |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|--------|-------------|---------------------------------------------------------------------------------------|
| Company:                | Cobra Electronics Corporation                                                                                        | FCC ID:   | BBOPR4100                                      | IC ID: | 906B-PR4100 |  |
| Model(s):               | PR4100 / PR4500                                                                                                      | DUT Type: | Portable FM UHF FRS/GMRS PTT Radio Transceiver |        |             |                                                                                       |
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Accredited by the Swiss Federal Office of Metrology and Accreditation  
 The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Celltech Labs**

Certificate No: **ET3-1387\_Mar06**

## CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1387**

Calibration procedure(s) **QA CAL-01.v5**  
**Calibration procedure for dosimetric E-field probes**

Calibration date: **March 16, 2006**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #            | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|----------------------------|-----------------|-------------------------------------------|------------------------|
| Power meter E4419B         | GB41293874      | 3-May-05 (METAS, No. 251-00466)           | May-06                 |
| Power sensor E4412A        | MY41495277      | 3-May-05 (METAS, No. 251-00466)           | May-06                 |
| Power sensor E4412A        | MY41498087      | 3-May-05 (METAS, No. 251-00466)           | May-06                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 11-Aug-05 (METAS, No. 251-00499)          | Aug-06                 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 3-May-05 (METAS, No. 251-00467)           | May-06                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 11-Aug-05 (METAS, No. 251-00500)          | Aug-06                 |
| Reference Probe ES3DV2     | SN: 3013        | 2-Jan-06 (SPEAG, No. ES3-3013_Jan06)      | Jan-07                 |
| DAE4                       | SN: 654         | 2-Feb-06 (SPEAG, No. DAE4-654_Feb06)      | Feb-07                 |
| Secondary Standards        | ID #            | Check Date (in house)                     | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (SPEAG, in house check Nov-05)   | In house check: Nov-07 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (SPEAG, in house check Nov-05)  | In house check: Nov 06 |

Calibrated by: **Katja Pokovic** **Technical Manager**

Approved by: **Niels Kuster** **Quality Manager**

Signature

Issued: March 16, 2006

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



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Accreditation No.: **SCS 108**

## Glossary:

|                          |                                                                                                                                                      |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                      | tissue simulating liquid                                                                                                                             |
| NORM <sub>x,y,z</sub>    | sensitivity in free space                                                                                                                            |
| ConF                     | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                           |
| DCP                      | diode compression point                                                                                                                              |
| Polarization $\varphi$   | $\varphi$ rotation around probe axis                                                                                                                 |
| Polarization $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis |

## Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

## Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>:** Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not effect the  $E^2$ -field uncertainty inside TSL (see below *ConvF*).
- NORM( $f$ )<sub>x,y,z</sub> = NORM<sub>x,y,z</sub> \* frequency\_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP<sub>x,y,z</sub>:** DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters:** Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy):** in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset:** The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

# Probe ET3DV6

## SN:1387

|                  |                    |
|------------------|--------------------|
| Manufactured:    | September 21, 1999 |
| Last calibrated: | March 18, 2005     |
| Recalibrated:    | March 16, 2006     |

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

**DASY - Parameters of Probe: ET3DV6 SN:1387****Sensitivity in Free Space<sup>A</sup>****Diode Compression<sup>B</sup>**

|       |                     |                                     |       |              |
|-------|---------------------|-------------------------------------|-------|--------------|
| NormX | <b>1.62 ± 10.1%</b> | $\mu\text{V}/(\text{V}/\text{m})^2$ | DCP X | <b>92 mV</b> |
| NormY | <b>1.72 ± 10.1%</b> | $\mu\text{V}/(\text{V}/\text{m})^2$ | DCP Y | <b>92 mV</b> |
| NormZ | <b>1.72 ± 10.1%</b> | $\mu\text{V}/(\text{V}/\text{m})^2$ | DCP Z | <b>92 mV</b> |

**Sensitivity in Tissue Simulating Liquid (Conversion Factors)**

Please see Page 8.

**Boundary Effect**

**TSL                      900 MHz      Typical SAR gradient: 5 % per mm**

|                                           |                              |               |               |
|-------------------------------------------|------------------------------|---------------|---------------|
| Sensor Center to Phantom Surface Distance |                              | <b>3.7 mm</b> | <b>4.7 mm</b> |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 9.3           | 5.0           |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.1           | 0.2           |

**Sensor Offset**

Probe Tip to Sensor Center                      **2.7 mm**

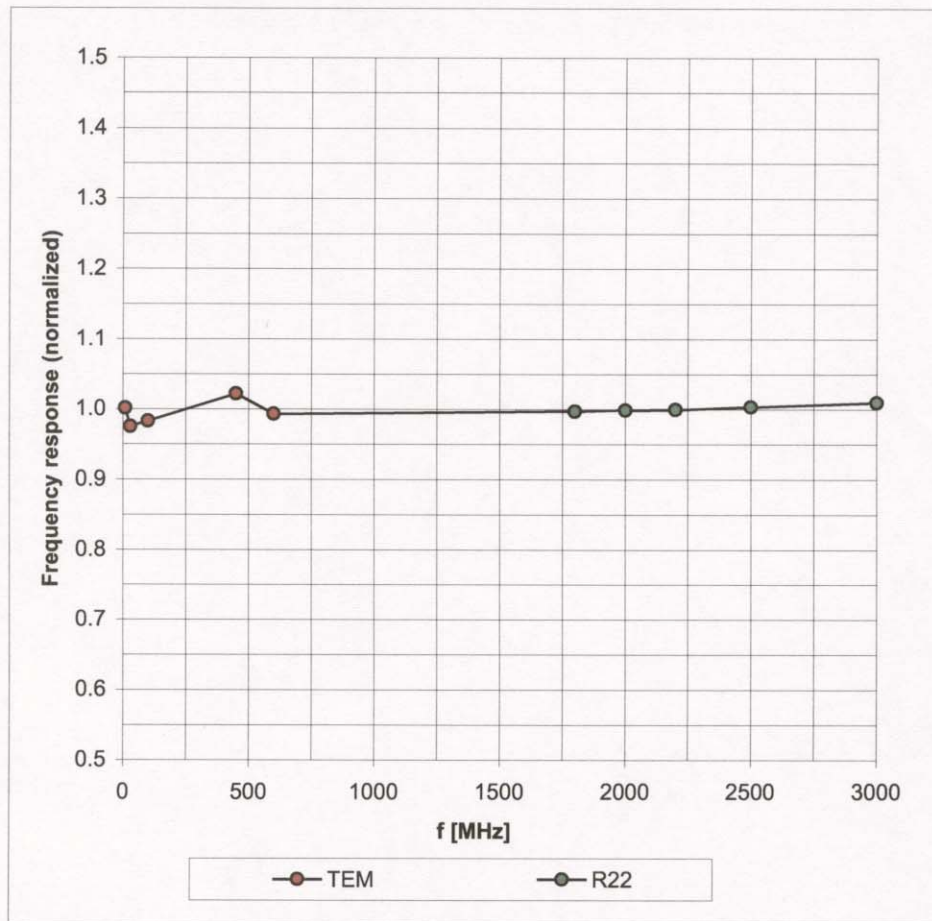
**The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.**

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

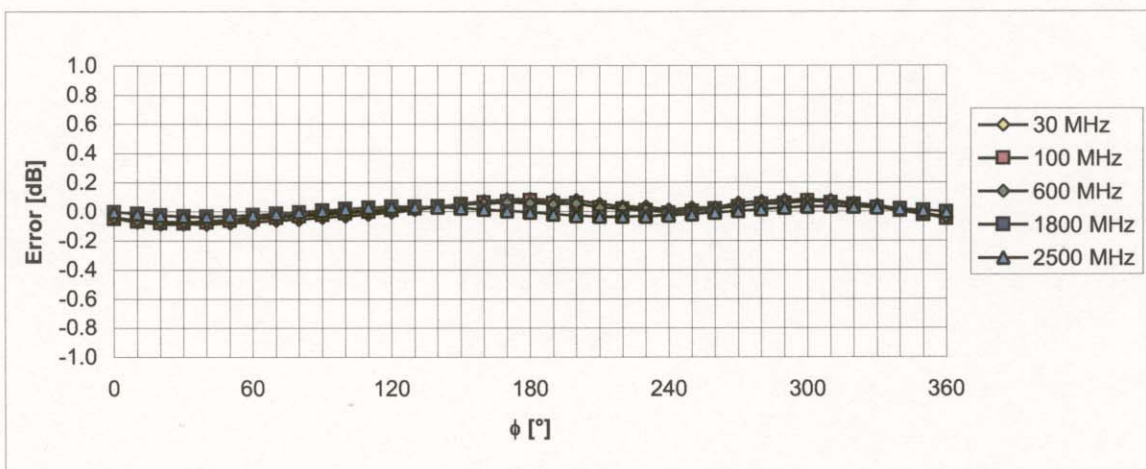
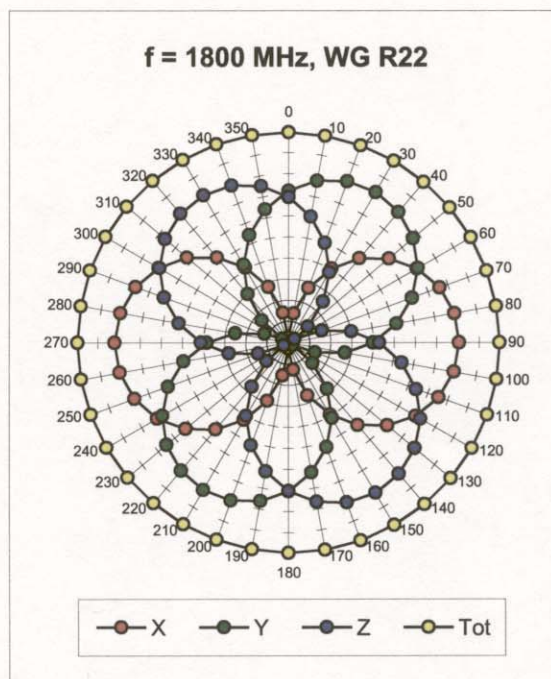
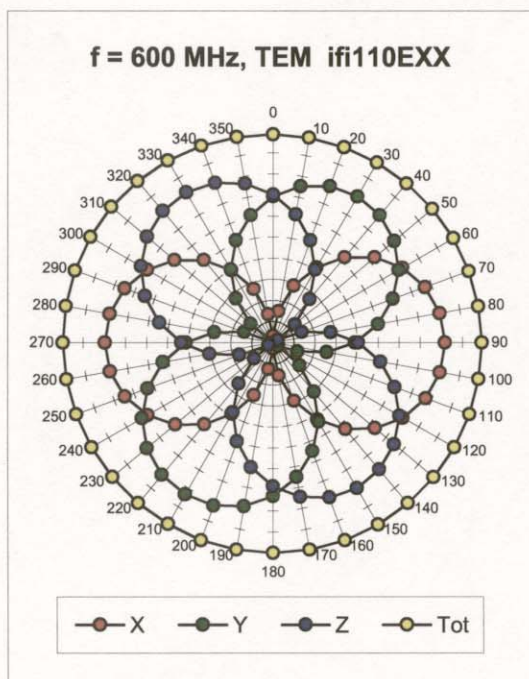
<sup>B</sup> Numerical linearization parameter: uncertainty not required.

## Frequency Response of E-Field

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

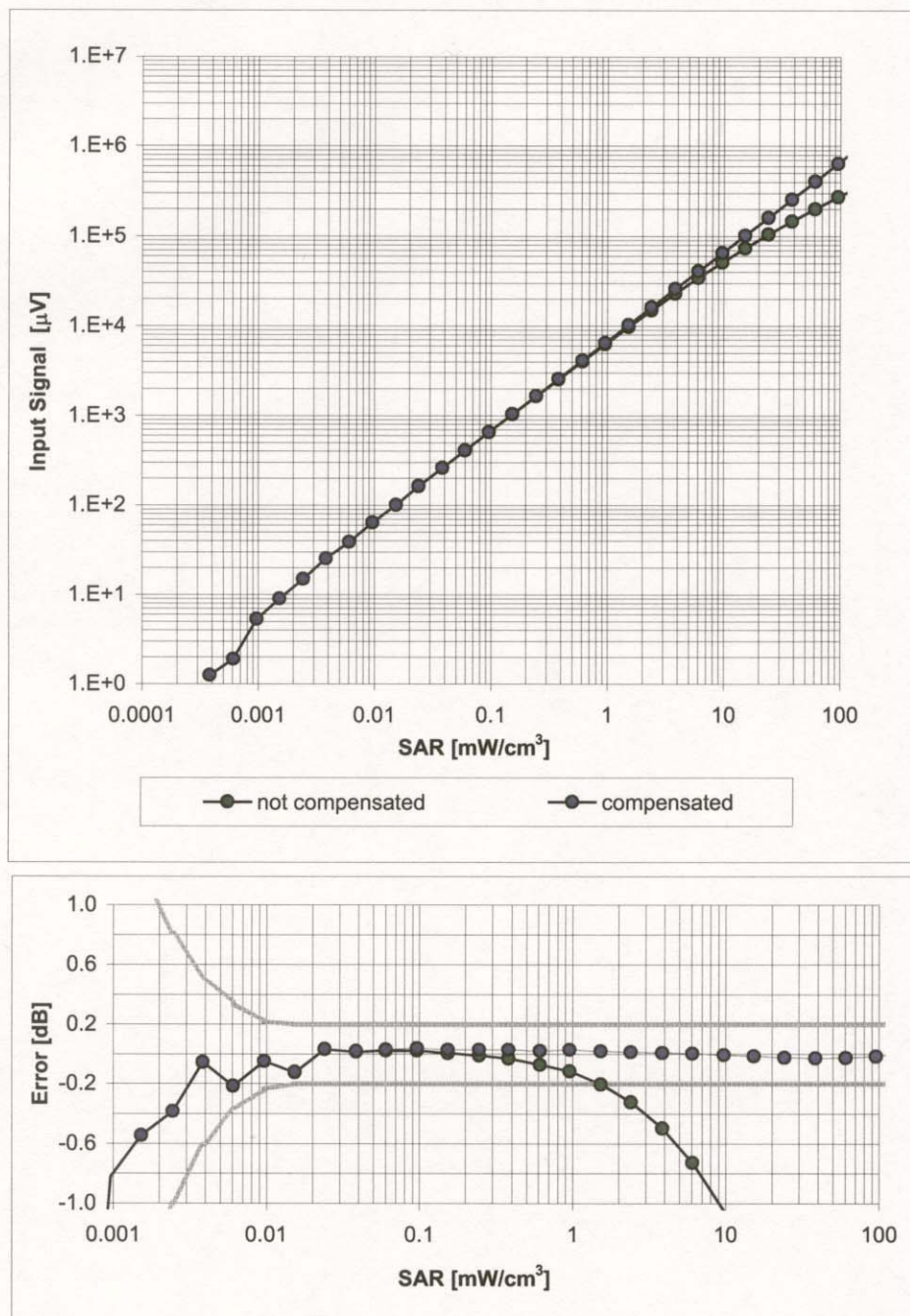


Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

Receiving Pattern ( $\phi$ ),  $\vartheta = 0^\circ$ Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

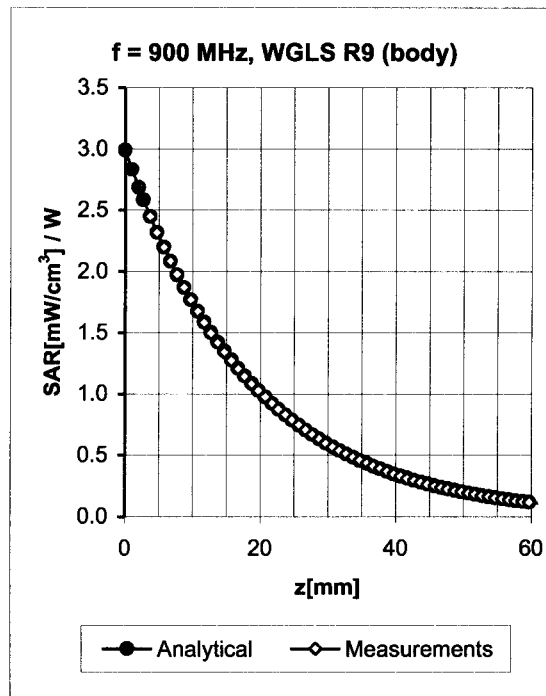
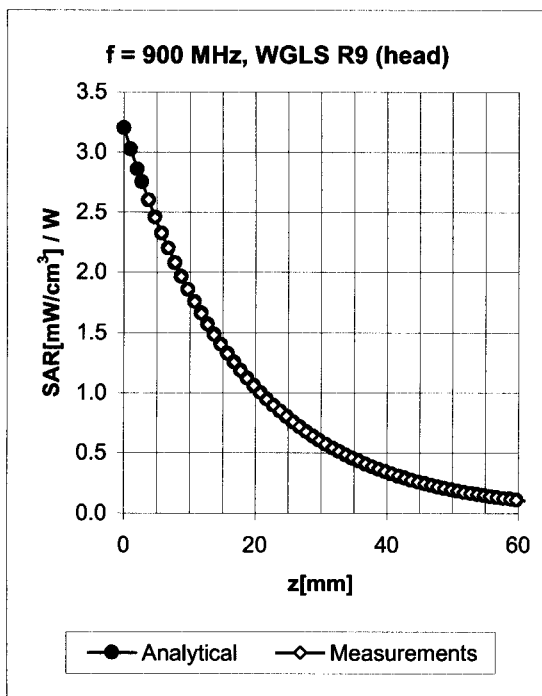
# Dynamic Range $f(\text{SAR}_{\text{head}})$

(Waveguide R22,  $f = 1800 \text{ MHz}$ )



Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

## Conversion Factor Assessment

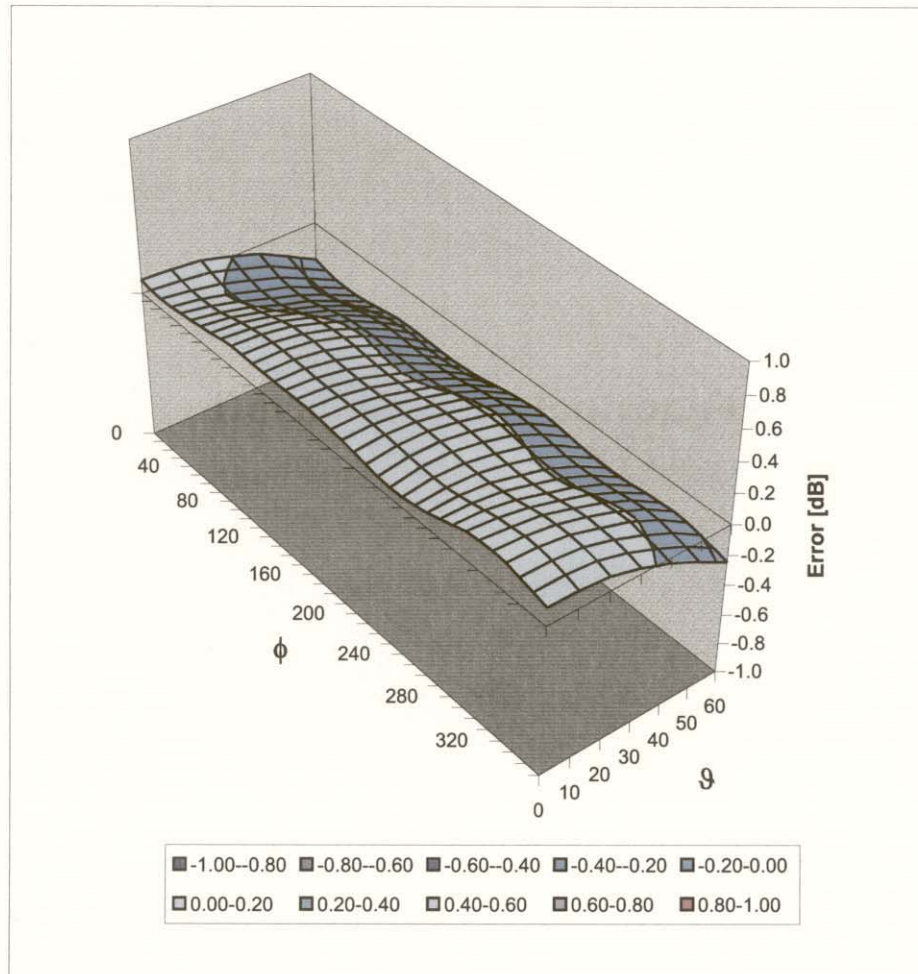


| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 5%    | 0.62  | 1.86  | 6.35 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Body | 55.0 ± 5%    | 1.05 ± 5%    | 0.59  | 1.97  | 6.04 ± 11.0% (k=2) |

<sup>c</sup> The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

## Deviation from Isotropy in HSL

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



Uncertainty of Spherical Isotropy Assessment:  $\pm 2.6\%$  ( $k=2$ )

## **Additional Conversion Factors**

**for Dosimetric E-Field Probe**

Type:

**ET3DV6**

Serial Number:

**1387**

Place of Assessment:

**Zurich**

Date of Assessment:

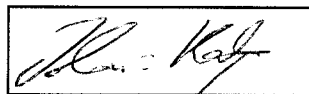
**March 18, 2006**

Probe Calibration Date:

**March 16, 2006**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1800 MHz.

Assessed by:



## Dosimetric E-Field Probe ET3DV6 SN:1387

Conversion factor ( $\pm$  standard deviation)

|                   |       |               |                                                                               |
|-------------------|-------|---------------|-------------------------------------------------------------------------------|
| 150 $\pm$ 50 MHz  | ConvF | 8.6 $\pm$ 10% | $\epsilon_r = 52.3 \pm 5\%$<br>$\sigma = 0.76 \pm 5\%$ mho/m<br>(head tissue) |
| 150 $\pm$ 50 MHz  | ConvF | 8.2 $\pm$ 10% | $\epsilon_r = 61.9 \pm 5\%$<br>$\sigma = 0.80 \pm 5\%$ mho/m<br>(body tissue) |
| 300 $\pm$ 50 MHz  | ConvF | 7.8 $\pm$ 9%  | $\epsilon_r = 45.3 \pm 5\%$<br>$\sigma = 0.87 \pm 5\%$ mho/m<br>(head tissue) |
| 450 $\pm$ 50 MHz  | ConvF | 7.4 $\pm$ 8%  | $\epsilon_r = 43.5 \pm 5\%$<br>$\sigma = 0.87 \pm 5\%$ mho/m<br>(head tissue) |
| 450 $\pm$ 50 MHz  | ConvF | 7.3 $\pm$ 8%  | $\epsilon_r = 56.7 \pm 5\%$<br>$\sigma = 0.94 \pm 5\%$ mho/m<br>(body tissue) |
| 750 $\pm$ 50 MHz  | ConvF | 6.6 $\pm$ 7%  | $\epsilon_r = 41.8 \pm 5\%$<br>$\sigma = 0.89 \pm 5\%$ mho/m<br>(head tissue) |
| 750 $\pm$ 50 MHz  | ConvF | 6.4 $\pm$ 7%  | $\epsilon_r = 55.4 \pm 5\%$<br>$\sigma = 0.96 \pm 5\%$ mho/m<br>(body tissue) |
| 1925 $\pm$ 50 MHz | ConvF | 5.0 $\pm$ 7%  | $\epsilon_r = 39.8 \pm 5\%$<br>$\sigma = 1.48 \pm 5\%$ mho/m<br>(head tissue) |
| 1925 $\pm$ 50 MHz | ConvF | 4.7 $\pm$ 7%  | $\epsilon_r = 53.2 \pm 5\%$<br>$\sigma = 1.60 \pm 5\%$ mho/m<br>(body tissue) |

### Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.  
 Please see also Section 4.7 of the DASY4 Manual.