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|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        |  |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                    |

Certificate No. 2470.01

## RF EXPOSURE EVALUATION

## SPECIFIC ABSORPTION RATE

### **SAR TEST REPORT**

FOR

**PLANTRONICS INC.**

**WIRELESS HEADSET ADAPTOR (Remote Unit with PTT)**

**MODEL: CA12CD (Remote)**

**FCC ID: AL8CA12CDYYYY**

| TEST STANDARD(S) & PROCEDURE(S) APPLIED   |
|-------------------------------------------|
| FCC OET Bulletin 65, Supplement C (01-01) |
| Industry Canada RSS-102 Issue 2           |
| IEEE 1528-2003                            |

Test Report Serial No.

090106AL8-T771-S15R

Test Report Revision No.

Revision 1.0 (Initial Release)

Revision 1.1 (Device photos removed for short-term confidentiality)

Test 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:                | Plantronics Inc. | FCC ID:                                                                                                              | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)  | Device:                                                                                                              | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                  |                                                    |                                                           |                                                   | Certificate No. 2470.01                                                            |

## DECLARATION OF COMPLIANCE SAR RF EXPOSURE EVALUATION

### Test Lab and Location

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### Company Information

**PLANTRONICS INC.**  
345 Encinal Street  
Santa Cruz, CA 95060  
United States

**FCC ID:** AL8CA12CDYYYY  
**Model(s):** CA12CD (Remote)

**Test Standard(s):** FCC 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  
IEEE 1528-2003  
**FCC Device Classification:** Part 15 Unlicensed PCS Portable Tx worn on body (PUT)  
**IC Device Classification:** 2 GHz Licence-exempt Personal Communications Service Device (LE-PCS)

**Device Description:** Wireless Headset Adaptor (Remote Unit with PTT)  
**Mode(s) of Operation:** TDMA/TDD  
**Transmit Frequency Range:** 1921.536 - 1928.448 MHz  
**RF Output Power Tested:** 1.7 dBm (1.48 mW) Conducted  
**Max. Duty Cycle Tested:** 8.3 % Source-Based Time-Averaged (Crest Factor: 1:12.05)  
**Battery Type(s) Tested:** Li-ion 3.8 V, 190 mAh (P/N: 65358-01)  
**Antenna Type(s) Tested:** Internal

**Body-Worn Accessories:** Integral Metal Belt-Clip  
**Audio Accessories Tested:** Plantronics Supraplus Headset (Model: H251)  
Plantronics Monaural Ultra Headset (Model: H91)  
Plantronics Supra Monaural Headset (Model: H51/A)

**Max. SAR Level(s) Evaluated:** Body: 0.007 W/kg (Peak SAR measured from Area Scan)

Celltech Labs Inc. declares under its sole responsibility that this wireless portable device is compliant 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), Industry Canada RSS-102 Issue 2 and IEEE Standard 1528-2003 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:                | Plantronics Inc. | FCC ID:                                                                                                              | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)  | Device:                                                                                                              | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                 | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                              |

## 1.0 INTRODUCTION

This measurement report demonstrates that the PLANTRONICS Model: CA12CD Wireless Headset Adaptor (Remote Unit with PTT) complies 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]), IC RSS-102 Issue 2 (see reference [4]), and IEEE Standard 1528-2003 (see reference [5]) were employed. A description of the product, operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used, and the various provisions of the rules are included within this test report.

## 2.0 DESCRIPTION OF DEVICE UNDER TEST (DUT)

|                              |                                                                      |                             |                            |                       |
|------------------------------|----------------------------------------------------------------------|-----------------------------|----------------------------|-----------------------|
| Test Standard(s)             | FCC                                                                  | 47 CFR §2.1093              |                            |                       |
|                              | IC                                                                   | Health Canada Safety Code 6 |                            |                       |
| Device Classification(s)     | Part 15 Unlicensed PCS Portable Tx worn on body (PUT)                |                             |                            | FCC §15(D)            |
|                              | 2 GHz Licence-exempt Personal Communications Service Device (LE-PCS) |                             |                            | IC RSS-213            |
| Measurement Procedure(s)     | FCC OET Bulletin 65, Supplement C (01-01)                            |                             |                            |                       |
|                              | Industry Canada RSS-102 Issue 2                                      |                             |                            |                       |
|                              | IEEE Standard 1528-2003                                              |                             |                            |                       |
| Device Description           | Wireless Headset Adaptor (Remote Unit with PTT)                      |                             |                            |                       |
| RF Exposure Category         | General Population / Uncontrolled Environment                        |                             |                            |                       |
| FCC ID                       | AL8CA12CDYYYY                                                        |                             |                            |                       |
| Model(s)                     | CA12CD (Remote)                                                      |                             |                            |                       |
| Serial No.(s) Tested         | 230                                                                  |                             | Production Unit            |                       |
| Transmit Frequency Range     | 1921.536 - 1928.448 MHz                                              |                             | UPCS Band                  |                       |
| Mode(s) of Operation         | TDMA (Time Division Multiple Access)                                 |                             | TDD (Time Division Duplex) |                       |
| Maximum Duty Cycle Tested    | 8.3 %                                                                | Source-Based Time-Averaged  |                            | Crest Factor: 1:12.05 |
| Max. RF Output Power Tested  | 1.7 dBm                                                              | 1.48 mW                     | 1924.992 MHz               | Conducted             |
| Battery Type(s) Tested       | Li-ion                                                               | 3.8 V                       | 190 mAh                    | P/N: 65358-01         |
| Antenna Type(s) Tested       | Internal                                                             |                             |                            |                       |
| Body-Worn Accessories Tested | Integral Metal Belt-Clip                                             |                             |                            |                       |
| Audio Accessories Tested     | Plantronics Headset #1                                               | Monaural Ultra              |                            | Model: H91            |
|                              | Plantronics Headset #2                                               | Supraplus                   |                            | Model: H251           |
|                              | Plantronics Headset #3                                               | Supra Monaural              |                            | Model: H51/A          |

|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                 | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                   |
| 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 Measurement System with SAM Phantom and device holder



DASY4 Measurement System with SAM Phantom and validation dipole

|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                                                          | Report Issue Date<br>October 05, 2006       | Description of Test(s)<br>Specific Absorption Rate | RF Exposure Category<br>General Population |                                                                                                               |

## 4.0 MEASUREMENT SUMMARY

| BODY-WORN SAR EVALUATION RESULTS      |       |                    |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |                                   |                                                         |                         |                                  |
|---------------------------------------|-------|--------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|---------------------------------------------------------|-------------------------|----------------------------------|
| Freq. (MHz)                           | Chan. | Test Mode          | Battery Type | Accessories                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                        | Device Position to Planar Phantom | Separation Distance to Planar Phantom                   | Cond. Power Before Test | Peak SAR Measured from Area Scan |
|                                       |       |                    |              | Body-Worn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Audio                  |                                   |                                                         |                         |                                  |
| 1924.992                              | Mid   | TDMA/TDD           | Li-ion       | Belt-Clip                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Supraplus Headset      | Left Side                         | 3 mm Belt-Clip                                          | 1.7 dBm                 | 0.002 W/kg                       |
| 1924.992                              | Mid   | TDMA/TDD           | Li-ion       | Belt-Clip                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Supraplus Headset      | Right Side                        | 3 mm Belt-Clip                                          | 1.7 dBm                 | 0.007 W/kg                       |
| 1924.992                              | Mid   | TDMA/TDD           | Li-ion       | Belt-Clip                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Monaural Headset       | Right Side                        | 3 mm Belt-Clip                                          | 1.7 dBm                 | 0.006 W/kg                       |
| 1924.992                              | Mid   | TDMA/TDD           | Li-ion       | Belt-Clip                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Supra Monaural Headset | Right Side                        | 3 mm Belt-Clip                                          | 1.7 dBm                 | 0.004 W/kg                       |
| ANSI / IEEE C95.1 1999 - SAFETY LIMIT |       |                    |              | BODY: 1.6 W/kg (averaged over 1 gram)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                                   | Spatial Peak Uncontrolled Exposure / General Population |                         |                                  |
| Test Date(s)                          |       | September 06, 2006 |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        | Relative Humidity                 |                                                         | 33                      | %                                |
| Measured Fluid Type                   |       | 1920 MHz Body      |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        | Atmospheric Pressure              |                                                         | 101.2                   | kPa                              |
| Dielectric Constant $\epsilon_r$      |       | IEEE Target        |              | Measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Deviation              | Ambient Temperature               |                                                         | 24.2                    | °C                               |
|                                       |       | 53.3               | ± 5%         | 51.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -3.2%                  | Fluid Temperature                 |                                                         | 23.8                    | °C                               |
| Conductivity $\sigma$ (mho/m)         |       | IEEE Target        |              | Measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Deviation              | Fluid Depth                       |                                                         | ≥ 15                    | cm                               |
|                                       |       | 1.52               | ± 5%         | 1.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -1.3%                  | $\rho$ (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 mid channel data only is reported (per FCC OET Bulletin 65, Supplement C, Edition 01-01 - see reference [3]).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                        |                                   |                                                         |                         |                                  |
|                                       |       |                    | 3.           | The SAR levels measured were the Peak SAR level measured from the area scan. The 1g-averaged SAR was not measured because the peak SAR values from the area scan evaluations were less than 1% of the 1g average limit. The peak SAR value measured during the area scan evaluation is reported. The mathematical formula used to extrapolate the SAR value at the surface from the zoom scan SAR values measured at 5 mm steps leading away from the surface assumes a curving slope (i.e. the SAR values gradually decrease as the probe moves away from the surface). When the peak SAR of a device is so low that the RF noise level is competing with the SAR level, the zoom scan measurements leading away from the surface are no longer a curving slope and the extrapolation formula cannot accurately estimate the 1g average SAR. In this manner we have reported the peak values from the area scan in place of the 1g averaged SAR values whenever the peak values are less than 1% of the average limit. This avoids gross uncertainties in the 1g average SAR calculation while maintaining a conservative estimation of the SAR level. |                        |                                   |                                                         |                         |                                  |
|                                       |       |                    | 4.           | The power drifts were measured by the DASY4 system during the SAR evaluations at the reference point of the phantom with low SAR. The drift levels were inaccurate due to the SAR value at the reference point is close to the measurement noise floor and therefore are not reported.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                        |                                   |                                                         |                         |                                  |
|                                       |       |                    | 5.           | The DUT battery was fully charged prior to the SAR evaluations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |                                   |                                                         |                         |                                  |
|                                       |       |                    | 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 mixture were measured prior to the SAR evaluations using an ALS-PR-DIEL Dielectric Probe Kit and an HP 8753ET Network Analyzer (see Appendix C for measured fluid dielectric parameters).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                        |                                   |                                                         |                         |                                  |
|                                       |       |                    | 8.           | The SAR measurements were performed within 24 hours of the system performance check.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |                                   |                                                         |                         |                                  |

|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

## 5.0 DETAILS OF SAR EVALUATION

The PLANTRONICS Model: CA12CD Wireless Headset Adaptor (Remote Unit with PTT) was compliant for localized Specific Absorption Rate (SAR) based on the test provisions and conditions described below. The detailed test setup photographs are shown in Appendix D.

- 1) The DUT was tested for body-worn SAR with the left belt-clip side of the DUT facing parallel to, and touching, the outer surface of the SAM phantom (planar section). The integrated metal belt-clip provided a 3 mm spacing from the left side of the DUT to the outer surface of the SAM phantom (planar section). The DUT was evaluated for body-worn SAR with the headset audio accessory connected to the audio port.
- 2) The DUT was tested for body-worn SAR with the right belt-clip side of the DUT facing parallel to, and touching, the outer surface of the SAM phantom (planar section). The integrated metal belt-clip provided a 3 mm spacing from the right side of the DUT to the outer surface of the SAM phantom (planar section). The DUT was evaluated for body-worn SAR with the headset audio accessory connected to the audio port.
- 3) The DUT was tested at maximum power in TDMA/TDD mode with a source-based time-averaged duty cycle of 8.3% (crest factor = 1:12.05).
- 4) The DUT battery was fully charged prior to the SAR evaluations.
- 5) The conducted power level(s) of the DUT were measured prior to the SAR evaluations by Plantronics using a Rohde & Schwarz CMD60 digital radiocommunication tester (Unit No. 5212J, calibrated February 24, 2006).
- 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 mixture were measured prior to the SAR evaluations using an ALS-PR-DIEL Dielectric Probe Kit and an HP 8753ET Network Analyzer (see Appendix C for measured fluid dielectric parameters).
- 8) The SAR measurements were performed within 24 hours of the system performance check.

## 6.0 EVALUATION PROCEDURES

- a. (i) The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation, both the left and right ear positions were evaluated using the SAM phantom.  
(ii) For body-worn and face-held devices a planar phantom was used.
- b. 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:
  - c. 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.
  - d. 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:
- e. 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.
- f. 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).
- g. A zoom scan volume of 32 mm x 32 mm x 30 mm (5x5x7 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 (7x7x7 points) to ensure complete capture of the peak spatial-average SAR.

|                         |                         |                                                                                                                      |                                                        |                                |                                                                                       |
|-------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------|
| <b>Company:</b>         | <b>Plantronics Inc.</b> | <b>FCC ID:</b>                                                                                                       | <b>AL8CA12CDYYYY</b>                                   | <b>1921.536 - 1928.448 MHz</b> |  |
| <b>Model(s):</b>        | <b>CA12CD (Remote)</b>  | <b>Device:</b>                                                                                                       | <b>Wireless Headset Adaptor (Remote Unit with PTT)</b> |                                |                                                                                       |
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## 8.0 SIMULATED EQUIVALENT TISSUES

The 1900/1920MHz simulated equivalent tissue mixture consisted of Glycol-monobutyl, water, and salt. The fluids were prepared according to standardized procedures and measured for dielectric parameters (permittivity and conductivity).

| 1900/1920 MHz SIMULATED TISSUE MIXTURES |                          |                |
|-----------------------------------------|--------------------------|----------------|
| INGREDIENT                              | 1900 MHz Body            | 1920 MHz Body  |
|                                         | System Performance Check | DUT Evaluation |
| Water                                   | 69.85 %                  | 69.85 %        |
| Glycol Monobutyl                        | 29.89 %                  | 29.89 %        |
| Salt                                    | 0.26 %                   | 0.26 %         |

## 9.0 SAR SAFETY LIMITS

| EXPOSURE LIMITS                                                                                                                                                                                | SAR (W/kg)                                                     |                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------|
|                                                                                                                                                                                                | (General Population /<br>Uncontrolled Exposure<br>Environment) | (Occupational /<br>Controlled Exposure<br>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. |                                                                |                                                        |

## 10.0 ROBOT SYSTEM SPECIFICATIONS

| <u>Specifications</u>                           |                                                                                   |
|-------------------------------------------------|-----------------------------------------------------------------------------------|
| <b>Positioner</b>                               | Stäubli Unimation Corp. Robot Model: RX60L                                        |
| <b>Repeatability</b>                            | 0.02 mm                                                                           |
| <b>No. of axis</b>                              | 6                                                                                 |
| <u>Data Acquisition Electronic (DAE) System</u> |                                                                                   |
| <u>Cell Controller</u>                          |                                                                                   |
| <b>Processor</b>                                | AMD Athlon XP 2400+                                                               |
| <b>Clock Speed</b>                              | 2.0 GHz                                                                           |
| <b>Operating System</b>                         | Windows XP Professional                                                           |
| <u>Data Converter</u>                           |                                                                                   |
| <b>Features</b>                                 | Signal Amplifier, multiplexer, A/D converter, and control logic                   |
| <b>Software</b>                                 | Measurement Software: DASY4, V4.7 Build 44                                        |
|                                                 | Postprocessing Software: SEMCAD, V1.8 Build 171                                   |
| <b>Connecting Lines</b>                         | Optical downlink for data and status info.; Optical uplink for commands and clock |
| <u>DASY4 Measurement Server</u>                 |                                                                                   |
| <b>Function</b>                                 | Real-time data evaluation for field measurements and surface detection            |
| <b>Hardware</b>                                 | PC/104 166MHz Pentium CPU; 32 MB chipdisk; 64 MB RAM                              |
| <b>Connections</b>                              | COM1, COM2, DAE, Robot, Ethernet, Service Interface                               |
| <u>E-Field Probe</u>                            |                                                                                   |
| <b>Model</b>                                    | ET3DV6                                                                            |
| <b>Serial No.</b>                               | 1387                                                                              |
| <b>Construction</b>                             | Triangular core fiber optic detection system                                      |
| <b>Frequency</b>                                | 10 MHz to 6 GHz                                                                   |
| <b>Linearity</b>                                | ±0.2 dB (30 MHz to 3 GHz)                                                         |
| <u>Phantom(s)</u>                               |                                                                                   |
| <b>Type</b>                                     | SAM V4.0C                                                                         |
| <b>Shell Material</b>                           | Fiberglass                                                                        |
| <b>Thickness</b>                                | 2.0 ±0.1 mm                                                                       |
| <b>Volume</b>                                   | Approx. 25 liters                                                                 |

|                                                                                  |                                                    |                                                           |                                                   |                                                                                                               |
|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

## 11.0 PROBE SPECIFICATION (ET3DV6)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <p>Construction: Symmetrical design with triangular core<br/>Built-in shielding against static charges<br/>PEEK enclosure material (resistant to organic solvents, glycol)</p> <p>Calibration: In air from 10 MHz to 2.5 GHz<br/>In brain simulating tissue at frequencies of 900 MHz and 1.8 GHz (accuracy <math>\pm 8\%</math>)</p> <p>Frequency: 10 MHz to <math>&gt; 6</math> GHz; Linearity: <math>\pm 0.2</math> dB (30 MHz to 3 GHz)</p> <p>Directivity: <math>\pm 0.2</math> dB in brain tissue (rotation around probe axis)<br/><math>\pm 0.4</math> dB in brain tissue (rotation normal to probe axis)</p> <p>Dynamic Range: 5 <math>\mu</math>W/g to <math>&gt; 100</math> mW/g; Linearity: <math>\pm 0.2</math> dB</p> <p>Surface Detect: <math>\pm 0.2</math> mm repeatability in air and clear liquids over diffuse reflecting surfaces</p> <p>Dimensions: Overall length: 330 mm<br/>Tip length: 16 mm<br/>Body diameter: 12 mm<br/>Tip diameter: 6.8 mm<br/>Distance from probe tip to dipole centers: 2.7 mm</p> <p>Application: General dosimetry up to 3 GHz<br/>Compliance tests of mobile phone</p> |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>ET3DV6 E-Field Probe</b>                                                         |

## 12.0 SAM PHANTOM V4.0C

|                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <p>The SAM phantom V4.0C is a fiberglass shell phantom with a 2.0 mm (<math>\pm 0.2</math> mm) shell thickness for left and right head and flat planar area integrated in a wooden table. The shape of the fiberglass shell corresponds to the phantom defined by SCC34-SC2. The device holder positions are adjusted to the standard measurement positions in the three sections (see Appendix G for specifications of the SAM phantom V4.0C).</p> |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>SAM Phantom V4.0C</b>                                                              |

## 13.0 DEVICE HOLDER

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <p>The DASY4 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of <math>65^\circ</math>. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.</p> |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Device Holder</b>                                                                  |

|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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## 14.0 TEST EQUIPMENT LIST

| TEST EQUIPMENT |                                          | ASSET NO. | SERIAL NO. | DATE CALIBRATED |         | CALIBRATION DUE DATE |
|----------------|------------------------------------------|-----------|------------|-----------------|---------|----------------------|
| USED           | DESCRIPTION                              |           |            |                 |         |                      |
| 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              |
|                | -450MHz Validation Dipole                | 00024     | 136        | 25Oct05         |         | 25Oct06              |
|                | -835MHz Validation Dipole                | 00022     | 411        | Brain           | 28Mar06 | 28Mar07              |
|                |                                          |           |            | Body            | 27Mar06 | 27Mar07              |
|                | -900MHz Validation Dipole                | 00020     | 054        | Brain           | 06Jun06 | 06Jun07              |
|                |                                          |           |            | Body            | 06Jun06 | 06Jun07              |
|                | -1640MHz Validation Dipole               | 00212     | 0175       | Brain           | 07Aug06 | 07Aug07              |
|                | -1800MHz Validation Dipole               | 00021     | 247        | Brain           | 08Jun06 | 08Jun07              |
|                |                                          |           |            | Body            | 09Jun06 | 09Jun07              |
|                | -1900MHz Validation Dipole               | 00032     | 151        | Brain           | 09Jun06 | 09Jun07              |
| x              |                                          |           |            | Body            | 12Jun06 | 12Jun07              |
|                | -2450MHz Validation Dipole               | 00025     | 150        | Brain           | 20Sep05 | 20Sep06              |
|                |                                          |           |            | Body            | 24Apr06 | 24Apr07              |
|                | -5800MHz Validation Dipole               | 00126     | 1031       | Brain           | 15Mar06 | 15Mar07              |
| x              | -SAM Phantom V4.0C                       | 00154     | 1033       | N/A             |         | N/A                  |
|                | -Barski Planar Phantom                   | 00155     | 03-01      | N/A             |         | N/A                  |
|                | -Plexiglas Side Planar Phantom           | 00156     | 161        | N/A             |         | N/A                  |
|                | -Plexiglas Validation Planar Phantom     | 00157     | 137        | N/A             |         | N/A                  |
| x              | ALS-PR-DIEL Dielectric Probe Kit         | 00160     | 260-00953  | N/A             |         | N/A                  |
|                | Gigatronics 8652A Power Meter            | 00110     | 1835801    | 12Apr06         |         | 12Apr07              |
| x              | Gigatronics 8652A Power Meter            | 00007     | 1835272    | 03Feb06         |         | 03Feb07              |
|                | Gigatronics 80701A Power Sensor          | 00011     | 1833542    | 03Feb06         |         | 03Feb07              |
| x              | Gigatronics 80701A Power Sensor          | 00012     | 1834350    | 12Sep05         |         | 12Sep06              |
| 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                  |

## 15.0 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 (1920 MHz)             | 3.5                     | Normal                   | 1           | 1        | 3.5                          | ∞                                  |
| 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>9.69</b>                  |                                    |
| <b>Expanded Uncertainty (k=2)</b>        |                         |                          |             |          | <b>19.39</b>                 |                                    |

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

## MEASUREMENT UNCERTAINTIES (CONT.)

| UNCERTAINTY BUDGET FOR SYSTEM VALIDATION |                           |                          |             |       |                                |                    |
|------------------------------------------|---------------------------|--------------------------|-------------|-------|--------------------------------|--------------------|
| Error Description                        | Uncertainty Value $\pm\%$ | Probability Distribution | Divisor     | ci 1g | Uncertainty Value $\pm\%$ (1g) | $V_i$ or $V_{eff}$ |
| <b>Measurement System</b>                |                           |                          |             |       |                                |                    |
| Probe calibration                        | 3.5                       | Normal                   | 1           | 1     | 3.5                            | $\infty$           |
| Axial isotropy of the probe              | 4.7                       | Rectangular              | 1.732050808 | 1     | 2.7                            | $\infty$           |
| Spherical isotropy of the probe          | 0                         | Rectangular              | 1.732050808 | 1     | 0.0                            | $\infty$           |
| Spatial resolution                       | 0                         | Rectangular              | 1.732050808 | 1     | 0.0                            | $\infty$           |
| Boundary effects                         | 1                         | Rectangular              | 1.732050808 | 1     | 0.6                            | $\infty$           |
| Probe linearity                          | 4.7                       | Rectangular              | 1.732050808 | 1     | 2.7                            | $\infty$           |
| Detection limit                          | 1                         | Rectangular              | 1.732050808 | 1     | 0.6                            | $\infty$           |
| Readout electronics                      | 0.3                       | Normal                   | 1           | 1     | 0.3                            | $\infty$           |
| Response time                            | 0                         | Rectangular              | 1.732050808 | 1     | 0.0                            | $\infty$           |
| Integration time                         | 0                         | Rectangular              | 1.732050808 | 1     | 0.0                            | $\infty$           |
| RF ambient conditions                    | 3                         | Rectangular              | 1.732050808 | 1     | 1.7                            | $\infty$           |
| Mech. constraints of robot               | 0.4                       | Rectangular              | 1.732050808 | 1     | 0.2                            | $\infty$           |
| Probe positioning                        | 2.9                       | Rectangular              | 1.732050808 | 1     | 1.7                            | $\infty$           |
| Extrapolation & integration              | 1                         | Rectangular              | 1.732050808 | 1     | 0.6                            | $\infty$           |
| <b>Dipole</b>                            |                           |                          |             |       |                                |                    |
| Dipole Positioning                       | 2                         | Normal                   | 1.732050808 | 1     | 1.2                            | $\infty$           |
| Power & Power Drift                      | 4.7                       | Normal                   | 1.732050808 | 1     | 2.7                            | $\infty$           |
| <b>Phantom and Setup</b>                 |                           |                          |             |       |                                |                    |
| Phantom uncertainty                      | 4                         | Rectangular              | 1.732050808 | 1     | 2.3                            | $\infty$           |
| Liquid conductivity (target)             | 5                         | Rectangular              | 1.732050808 | 0.64  | 1.8                            | $\infty$           |
| Liquid conductivity (measured)           | 2.5                       | Normal                   | 1           | 0.64  | 1.6                            | $\infty$           |
| Liquid permittivity (target)             | 5                         | Rectangular              | 1.732050808 | 0.6   | 1.7                            | $\infty$           |
| Liquid permittivity (measured)           | 2.5                       | Normal                   | 1           | 0.6   | 1.5                            | $\infty$           |
| <b>Combined Standard Uncertainty</b>     |                           |                          |             |       | <b>7.69</b>                    |                    |
| <b>Expanded Uncertainty (k=2)</b>        |                           |                          |             |       | <b>15.39</b>                   |                    |

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

|                                                                                  |                                                    |                                                           |                                                   |                                                                                                               |
|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

## 16.0 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.
- [6] Schmid & Partner Engineering AG - "DASY4 Manual", V4.5: March 2005.

|                         |                         |                                                                                                                      |                                                        |                                |                                                                                       |
|-------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------|
| <b>Company:</b>         | <b>Plantronics Inc.</b> | <b>FCC ID:</b>                                                                                                       | <b>AL8CA12CDYYYY</b>                                   | <b>1921.536 - 1928.448 MHz</b> |  |
| <b>Model(s):</b>        | <b>CA12CD (Remote)</b>  | <b>Device:</b>                                                                                                       | <b>Wireless Headset Adaptor (Remote Unit with PTT)</b> |                                |                                                                                       |
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|                                                                                  |                                                    |                                                           |                                                   |                                                                                    |
|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        |  |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 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:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                  |                                             |                                                    |                                            |                                                                                    |
|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------|
|  | Date(s) of Evaluation<br>September 06, 2006 | Test Report Serial No.<br>090106AL8-T771-S15R      | Report Revision No.<br>Revision 1.1        |  |
|                                                                                  | Report Issue Date<br>October 05, 2006       | Description of Test(s)<br>Specific Absorption Rate | RF Exposure Category<br>General Population |                                                                                    |
|                                                                                  |                                             |                                                    |                                            | Certificate No. 2470.01                                                            |

Date Tested: 09/06/2006

## Body-Worn SAR - Left Belt-Clip Side of DUT with H251 Headset - 1924.992 MHz - Mid Channel

**DUT:** Plantronics Inc. Model: CA12CD; Type: Wireless Headset Adaptor (Remote Unit with PTT); Serial: 230

**Body-Worn Accessory:** Integrated Metal Belt-Clip; **Audio Accessory:** Plantronics Supraplus Headset (H251)

Ambient Temp: 24.2°C; Fluid Temp: 23.8°C; Barometric Pressure: 101.2 kPa; Humidity: 33%

Communication System: TDMA/TDD

Lithium-ion Battery (3.8 V, 190 mAh)

RF Output Power: 1.7 dBm (Conducted)

Frequency: 1924.992 MHz; Duty Cycle: 1:12.05

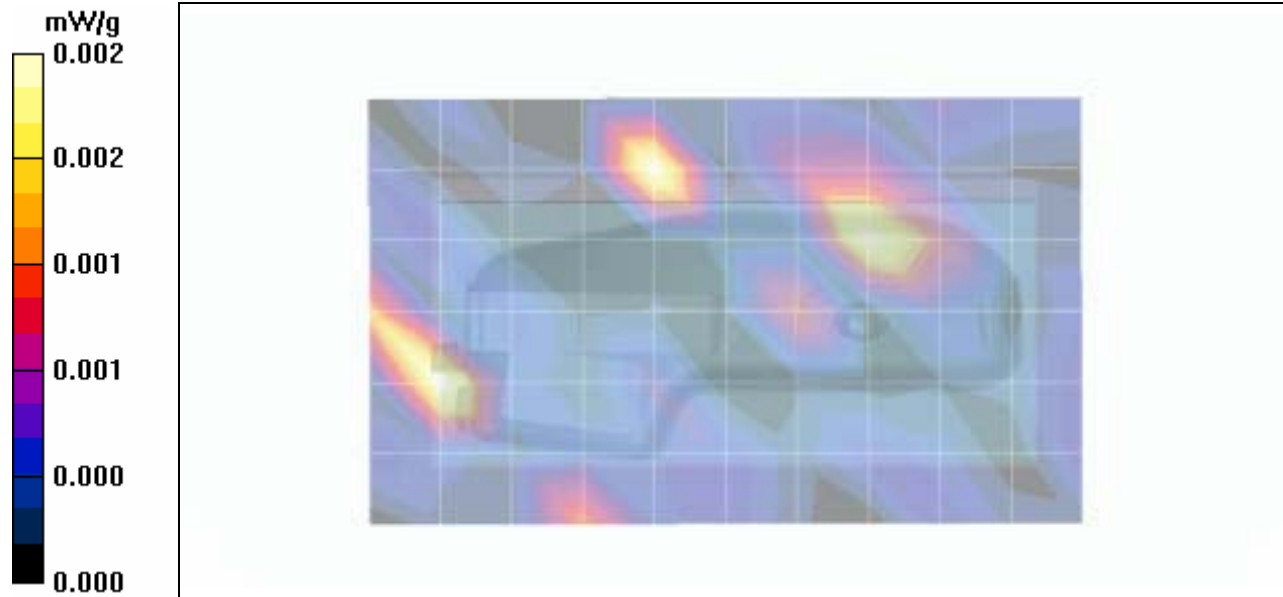
Medium: MSL1920 ( $\sigma = 1.50$  mho/m;  $\epsilon_r = 51.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>)

- Probe: ET3DV6 - SN1387; ConvF(4.7, 4.7, 4.7); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

## Body-Worn SAR - Left Belt-Clip Side of DUT Touching Planar Phantom (3 mm Belt-Clip Spacing) - Mid Channel

**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

**Maximum Peak Value of SAR (measured) = 0.002 mW/g**



|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                  |                                             |                                                    |                                            |                                                                                                               |
|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  | Date(s) of Evaluation<br>September 06, 2006 | Test Report Serial No.<br>090106AL8-T771-S15R      | Report Revision No.<br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                  | Report Issue Date<br>October 05, 2006       | Description of Test(s)<br>Specific Absorption Rate | RF Exposure Category<br>General Population |                                                                                                               |

Date Tested: 09/06/2006

## Body-Worn SAR - Right Belt-Clip Side of DUT with H251 Headset - 1924.992 MHz - Mid Channel

**DUT:** Plantronics Inc. Model: CA12CD; Type: Wireless Headset Adaptor (Remote Unit with PTT); Serial: 230

**Body-Worn Accessory:** Integrated Metal Belt-Clip; **Audio Accessory:** Plantronics Supraplus Headset (H251)

Ambient Temp: 24.2°C; Fluid Temp: 23.8°C; Barometric Pressure: 101.2 kPa; Humidity: 33%

Communication System: TDMA/TDD

Lithium-ion Battery (3.8 V, 190 mAh)

RF Output Power: 1.7 dBm (Conducted)

Frequency: 1924.992 MHz; Duty Cycle: 1:12.05

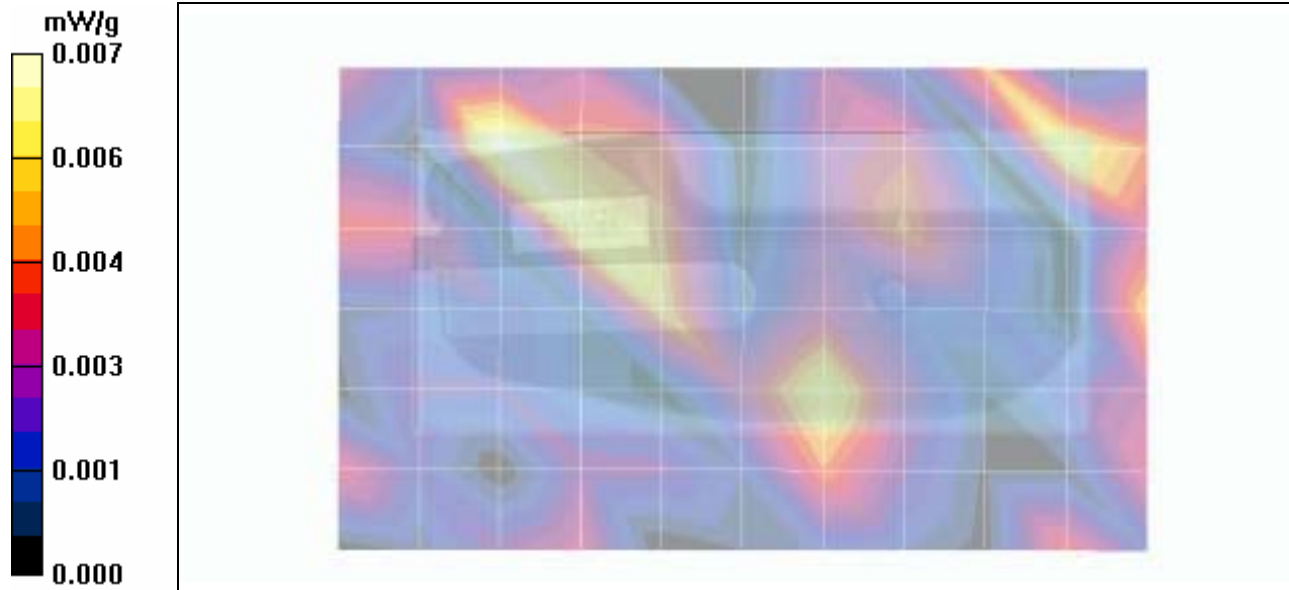
Medium: MSL1920 ( $\sigma = 1.50$  mho/m;  $\epsilon_r = 51.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>)

- Probe: ET3DV6 - SN1387; ConvF(4.7, 4.7, 4.7); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

## Body-Worn SAR - Right Belt-Clip Side of DUT Touching Planar Phantom (3 mm Belt-Clip Spacing) - Mid Channel

**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

**Maximum Peak Value of SAR (measured) = 0.007 mW/g**



|                         |                  |                                                                                                                      |                                                 |                         |                                                                                       |
|-------------------------|------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc. | FCC ID:                                                                                                              | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)  | Device:                                                                                                              | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                  |                                             |                                                    |                                            |                                                                                                               |
|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  | Date(s) of Evaluation<br>September 06, 2006 | Test Report Serial No.<br>090106AL8-T771-S15R      | Report Revision No.<br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                  | Report Issue Date<br>October 05, 2006       | Description of Test(s)<br>Specific Absorption Rate | RF Exposure Category<br>General Population |                                                                                                               |

Date Tested: 09/06/2006

## Body-Worn SAR - Right Belt-Clip Side of DUT with H91 Headset - 1924.992 MHz - Mid Channel

**DUT:** Plantronics Inc. Model: CA12CD; Type: Wireless Headset Adaptor (Remote Unit with PTT); Serial: 230

**Body-Worn Accessory:** Integrated Metal Belt-Clip; **Audio Accessory:** Plantronics Monaural Ultra Headset (H91)

Ambient Temp: 24.2°C; Fluid Temp: 23.8°C; Barometric Pressure: 101.2 kPa; Humidity: 33%

Communication System: TDMA/TDD

Lithium-ion Battery (3.8 V, 190 mAh)

RF Output Power: 1.7 dBm (Conducted)

Frequency: 1924.992 MHz; Duty Cycle: 1:12.05

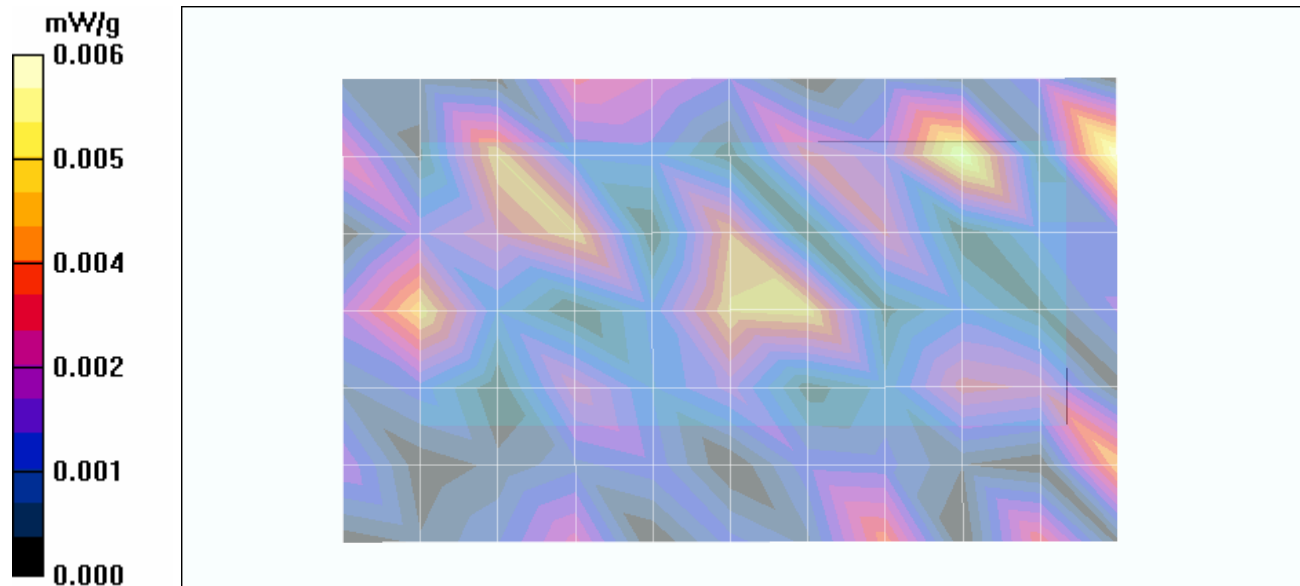
Medium: MSL1920 ( $\sigma = 1.50$  mho/m;  $\epsilon_r = 51.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>)

- Probe: ET3DV6 - SN1387; ConvF(4.7, 4.7, 4.7); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

## Body-Worn SAR - Right Belt-Clip Side of DUT Touching Planar Phantom (3 mm Belt-Clip Spacing) - Mid Channel

**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

**Maximum Peak Value of SAR (measured) = 0.006 mW/g**



|                         |                  |                                                                                                                      |                                                 |                         |                                                                                       |
|-------------------------|------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc. | FCC ID:                                                                                                              | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)  | Device:                                                                                                              | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                                                         |                                                    |                                                           |                                                   |                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <br>Testing and Engineering Services Lab | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                                                         | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                              |

Date Tested: 09/06/2006

## Body-Worn SAR - Right Belt-Clip Side of DUT with H51/A Headset - 1924.992 MHz - Mid Channel

**DUT:** Plantronics Inc. Model: CA12CD; Type: Wireless Headset Adaptor (Remote Unit with PTT); Serial: 230

**Body-Worn Accessory:** Integrated Metal Belt-Clip; **Audio Accessory:** Plantronics Supra Monaural Headset (H51/A)

Ambient Temp: 24.2°C; Fluid Temp: 23.8°C; Barometric Pressure: 101.2 kPa; Humidity: 33%

Communication System: TDMA/TDD

Lithium-ion Battery (3.8 V, 190 mAh)

RF Output Power: 1.7 dBm (Conducted)

Frequency: 1924.992 MHz; Duty Cycle: 1:12.05

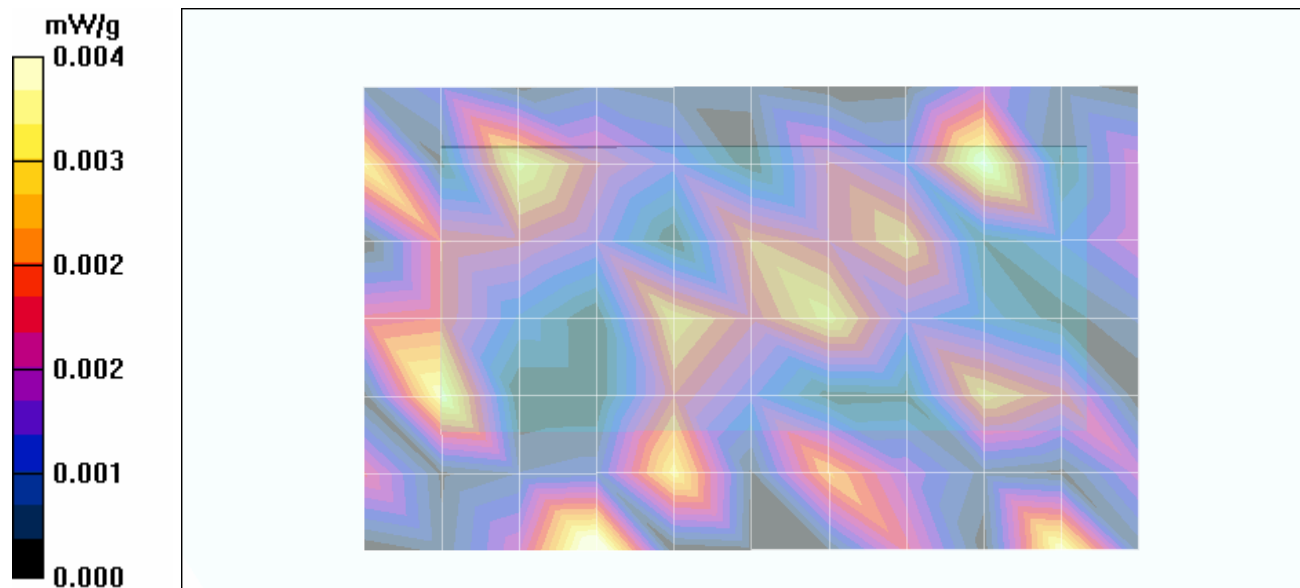
Medium: MSL1920 ( $\sigma = 1.50$  mho/m;  $\epsilon_r = 51.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>)

- Probe: ET3DV6 - SN1387; ConvF(4.7, 4.7, 4.7); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

## Body-Worn SAR - Right Belt-Clip Side of DUT Touching Planar Phantom (3 mm Belt-Clip Spacing) - Mid Channel

**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

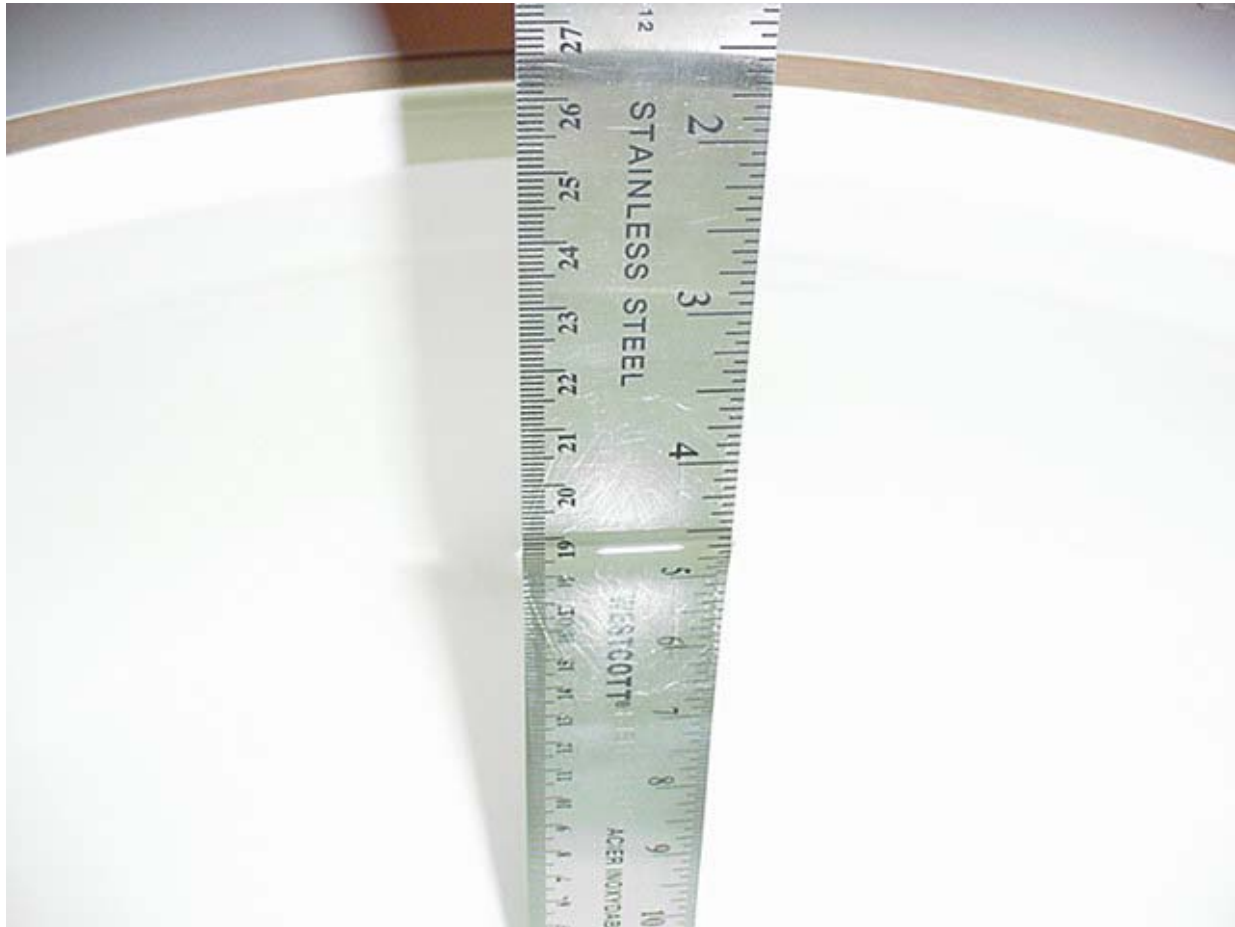
**Maximum Peak Value of SAR (measured) = 0.004 mW/g**



|                         |                  |                                                                                                                      |                                                 |                         |                                                                                       |
|-------------------------|------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc. | FCC ID:                                                                                                              | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)  | Device:                                                                                                              | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                  |                                                    |                                                           |                                                   |                                                                                                               |
|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

## Fluid Depth (>15cm)



|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                  |                                                    |                                                           |                                                   |                                                                                                               |
|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

## APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                  |                                             |                                                    |                                            |                                                                                    |
|----------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------|
|  | Date(s) of Evaluation<br>September 06, 2006 | Test Report Serial No.<br>090106AL8-T771-S15R      | Report Revision No.<br>Revision 1.1        |  |
|                                                                                  | Report Issue Date<br>October 05, 2006       | Description of Test(s)<br>Specific Absorption Rate | RF Exposure Category<br>General Population |                                                                                    |
|                                                                                  |                                             |                                                    |                                            | Certificate No. 2470.01                                                            |

Date Tested: 09/06/2006

## System Performance Check (Body) - 1900 MHz Dipole

**DUT: Dipole 1900 MHz; Model: D1900V2; Serial: 151; Validation: 06/12/2006**

Ambient Temp: 24.2°C; Fluid Temp: 23.8°C; Barometric Pressure: 101.2 kPa; Humidity: 33%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: MSL1900 Medium ( $\sigma = 1.49$  mho/m;  $\epsilon_r = 51.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>)

- Probe: ET3DV6 - SN1387; ConvF(4.7, 4.7, 4.7); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### 1900 MHz Dipole - System Performance Check/Area Scan (5x8x1):

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

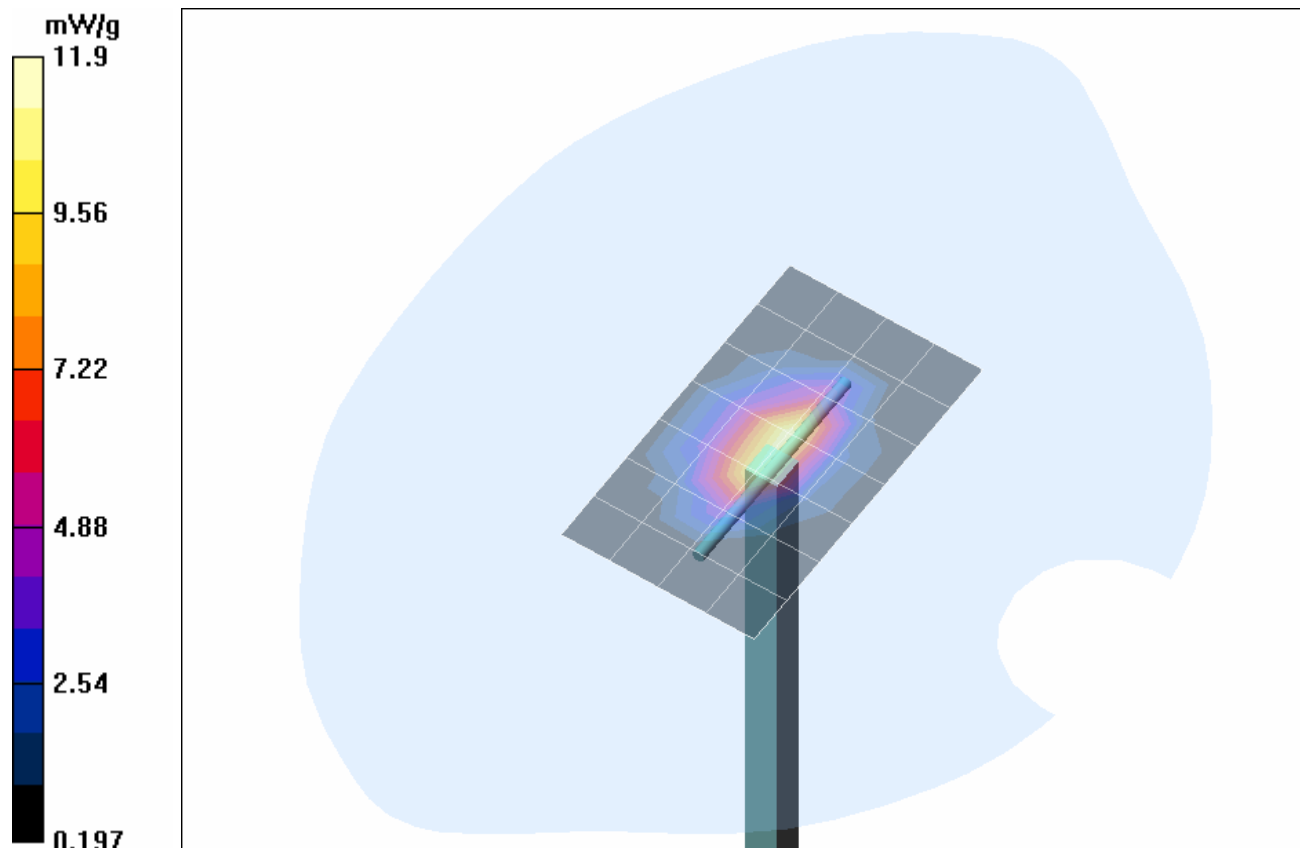
### 1900 MHz Dipole - System Performance Check/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 89.0 V/m; Power Drift = -0.026 dB

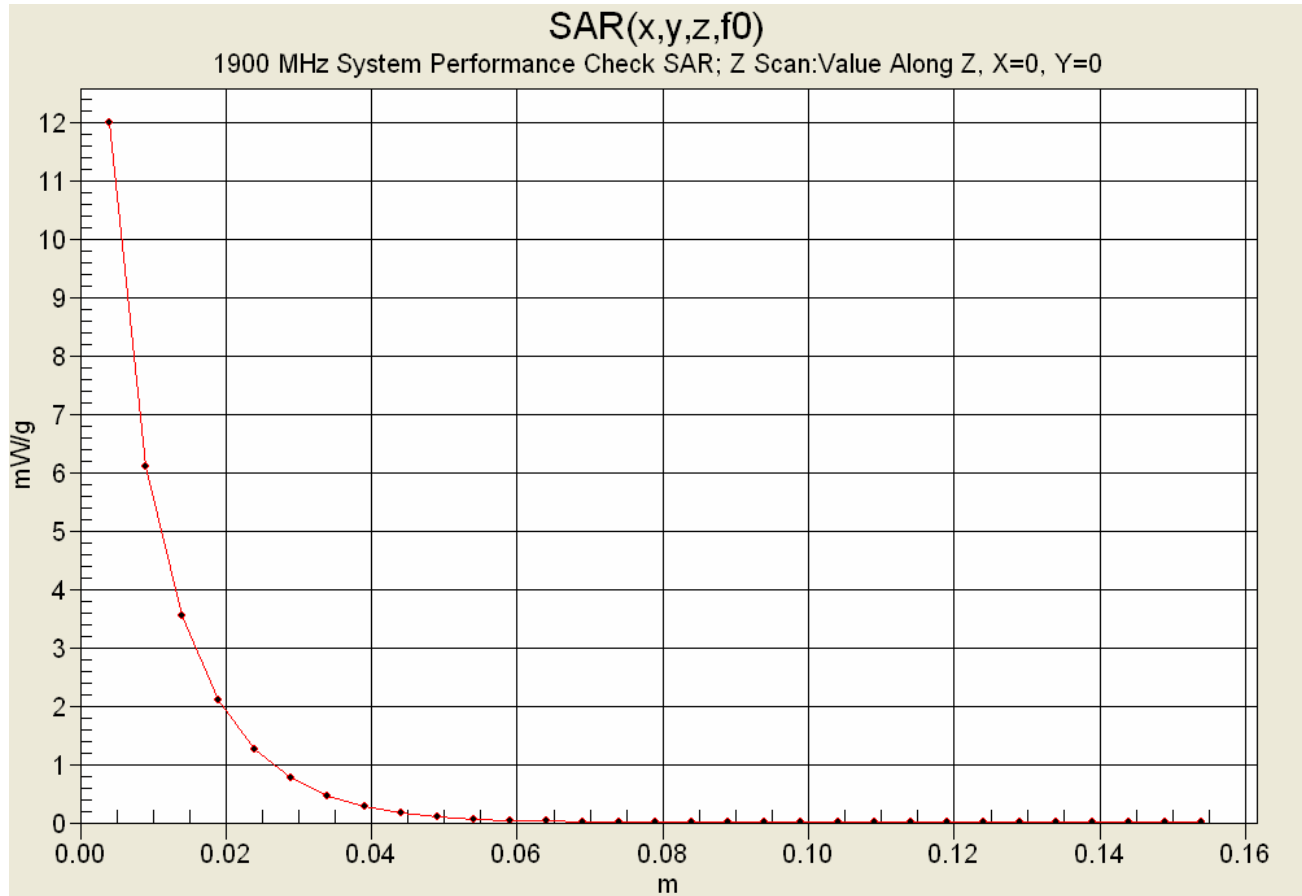
Peak SAR (extrapolated) = 24.2 W/kg

**SAR(1 g) = 10.9 mW/g; SAR(10 g) = 5.42 mW/g**



|                         |                  |                                                                                                                      |                                                 |                         |                                                                                       |
|-------------------------|------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc. | FCC ID:                                                                                                              | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)  | Device:                                                                                                              | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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## Z-Axis Scan



|                                                                                  |                                                    |                                                           |                                                   |                                                                                                               |
|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

## APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                  |                                                    |                                                           |                                                   |                                                                                    |
|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        |  |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                    |
|                                                                                  |                                                    |                                                           |                                                   | Certificate No. 2470.01                                                            |

## 1900 MHz System Performance Check & 1920 MHz DUT Evaluation (Body)

\*\*\*\*\*

Celltech Labs Inc.  
Test Result for UIM Dielectric Parameter  
Wed 06/Sep/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 |
|--------|--------|--------|--------|--------|
| 1.8000 | 53.30  | 1.52   | 51.86  | 1.40   |
| 1.8100 | 53.30  | 1.52   | 51.99  | 1.41   |
| 1.8200 | 53.30  | 1.52   | 51.85  | 1.41   |
| 1.8300 | 53.30  | 1.52   | 51.82  | 1.41   |
| 1.8400 | 53.30  | 1.52   | 51.66  | 1.42   |
| 1.8500 | 53.30  | 1.52   | 51.56  | 1.44   |
| 1.8600 | 53.30  | 1.52   | 51.62  | 1.44   |
| 1.8700 | 53.30  | 1.52   | 51.57  | 1.45   |
| 1.8800 | 53.30  | 1.52   | 51.50  | 1.47   |
| 1.8900 | 53.30  | 1.52   | 51.42  | 1.48   |
| 1.9000 | 53.30  | 1.52   | 51.50  | 1.49   |
| 1.9100 | 53.30  | 1.52   | 51.47  | 1.50   |
| 1.9200 | 53.30  | 1.52   | 51.60  | 1.50   |
| 1.9300 | 53.30  | 1.52   | 51.52  | 1.53   |
| 1.9400 | 53.30  | 1.52   | 51.40  | 1.53   |
| 1.9500 | 53.30  | 1.52   | 51.40  | 1.53   |
| 1.9600 | 53.30  | 1.52   | 51.45  | 1.55   |
| 1.9700 | 53.30  | 1.52   | 51.34  | 1.56   |
| 1.9800 | 53.30  | 1.52   | 51.26  | 1.58   |
| 1.9900 | 53.30  | 1.52   | 51.15  | 1.59   |
| 2.0000 | 53.30  | 1.52   | 51.30  | 1.61   |

|                         |                  |                                                                                                                      |                                                 |                         |                                                                                       |
|-------------------------|------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc. | FCC ID:                                                                                                              | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)  | Device:                                                                                                              | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                  |                                                    |                                                           |                                                   |                                                                                                               |
|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

## APPENDIX E - SYSTEM VALIDATION

|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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|                                                                                   |                     |                   |                     |                     |      |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|---------------------|------|
|  | Date of Evaluation: | June 12, 2006     | Document Issue No.: | SV1900B-061206-R1.0 |      |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 1900 MHz            | Body |

## 1900 MHz SYSTEM VALIDATION

Type:

**1900 MHz Validation Dipole**

Asset Number:

**00032**

Serial Number:

**151**

Place of Validation:

**Celltech Labs Inc.**

Date of Validation:

**June 12, 2006**

Celltech Labs Inc. certifies that the 1900 MHz System Validation (Body) was performed on the date indicated above.

Performed by:

**Sean Johnston**

Approved by:

**Spencer Watson**

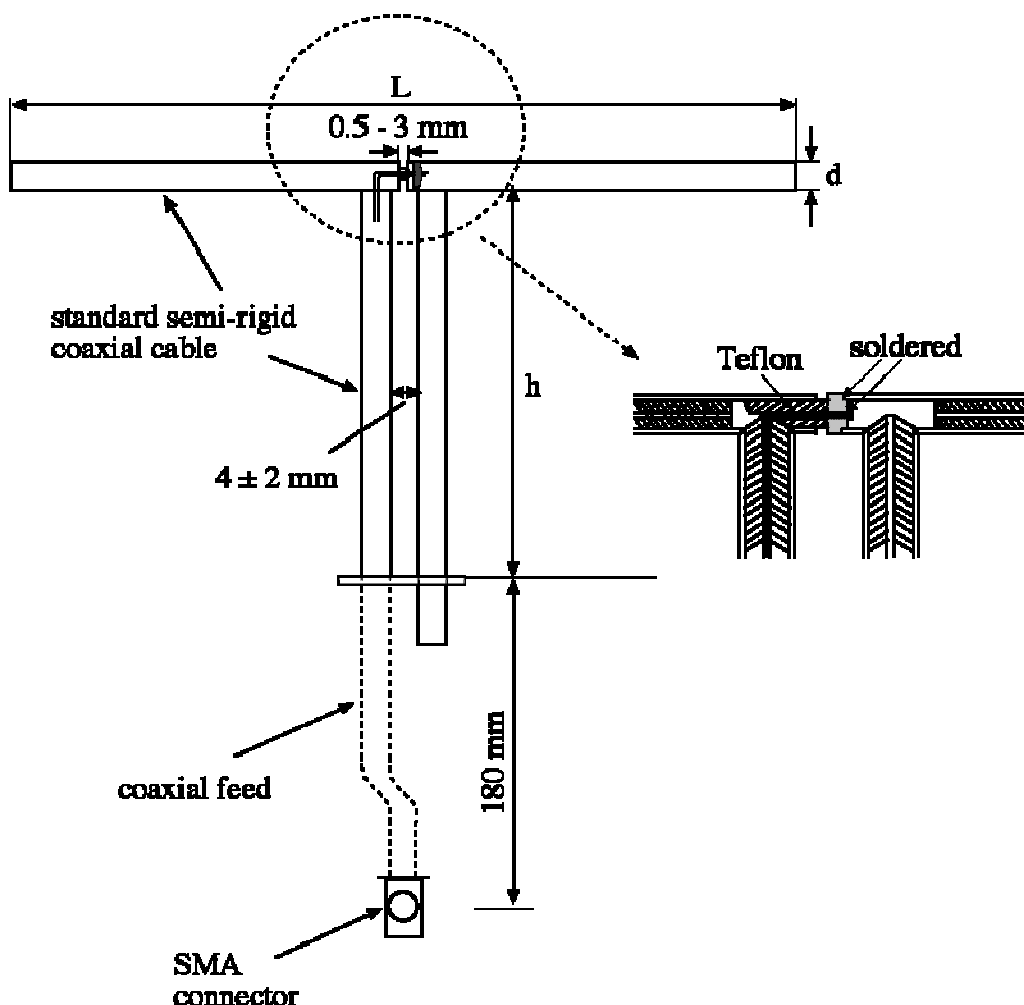
|                                                                                   |                     |                   |                     |                     |      |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|---------------------|------|
|  | Date of Evaluation: | June 12, 2006     | Document Issue No.: | SV1900B-061206-R1.0 |      |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 1900 MHz            | Body |

## 1. Dipole Construction & Electrical Characteristics

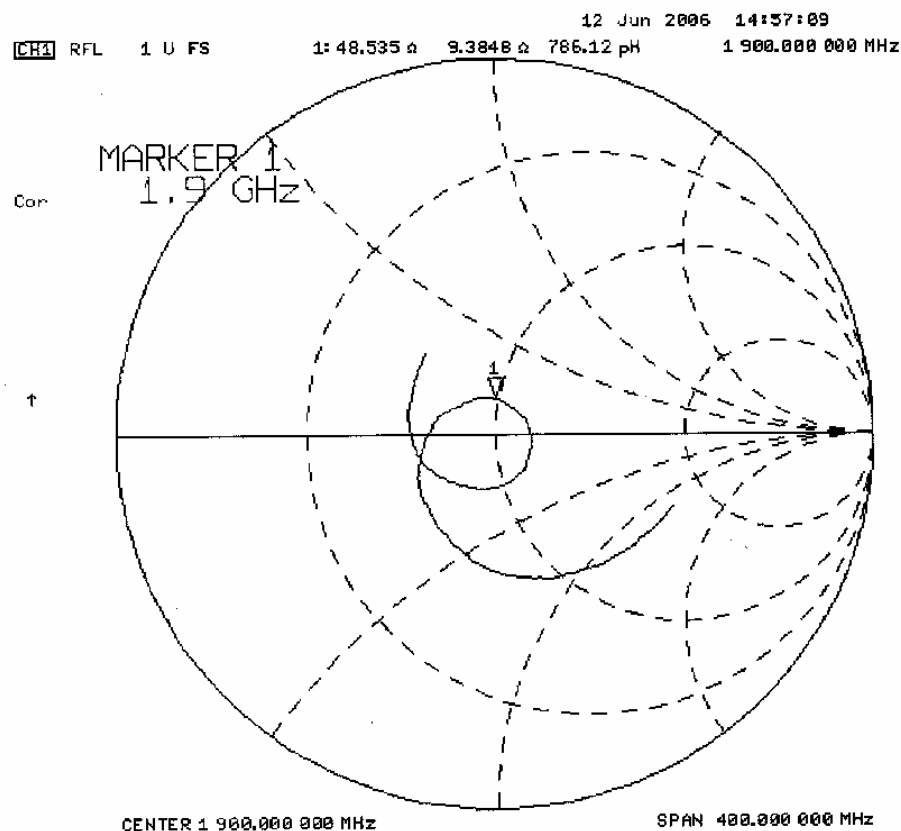
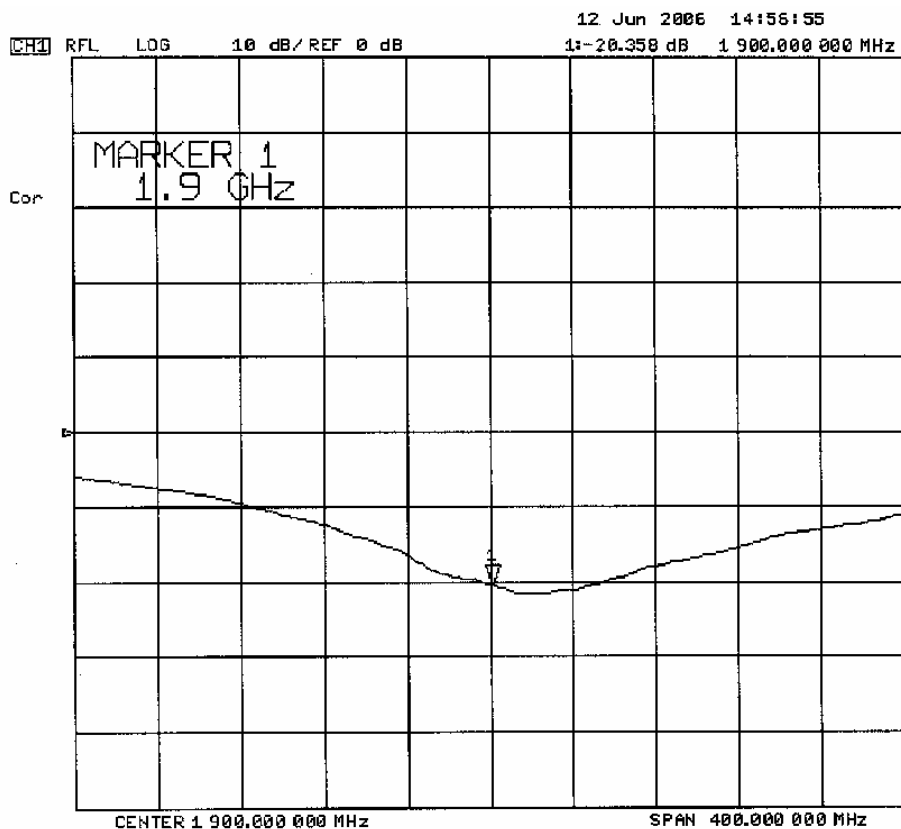
The validation dipole was constructed in accordance with the IEEE Standard “Annex G (informative) Reference dipoles for use in system validation”. The electrical properties were measured using an HP 8753ET Network Analyzer. The network analyzer was calibrated to the validation dipole N-type connector feed point using an HP85032E Type N calibration kit. The dipole was placed parallel to a planar phantom at a separation distance of 10.0mm from the simulating fluid using a loss-less dielectric spacer. The measured input impedance is:

Feed point impedance at 1900MHz       $\text{Re}\{Z\} = 48.535\Omega$   
 $\text{Im}\{Z\} = 9.3848\Omega$

Return Loss at 1900MHz                      -20.358dB



## 2. Validation Dipole VSWR Data



### 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 is the SAM (Specific Anthropomorphic Mannequin) phantom manufactured by Schmid & Partner Engineering AG. The SAM phantom is a Fiberglass shell integrated in a wooden table. The shape of the shell corresponds to the phantom defined by SCC34-SC2. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

**Shell Thickness:** 2.0 ± 0.1 mm  
**Filling Volume:** Approx. 25 liters  
**Dimensions:** 50 cm (W) x 100 cm (L)

|                                                                                   |                     |                   |                     |                     |      |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|---------------------|------|
|  | Date of Evaluation: | June 12, 2006     | Document Issue No.: | SV1900B-061206-R1.0 |      |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 1900 MHz            | Body |

## 5. 1900 MHz System Validation Setup



|                                                                                   |                     |                   |                     |                     |      |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|---------------------|------|
|  | Date of Evaluation: | June 12, 2006     | Document Issue No.: | SV1900B-061206-R1.0 |      |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 1900 MHz            | Body |

## 6. 1900 MHz Dipole Setup



|                                                                                   |                     |                   |                     |                     |      |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|---------------------|------|
|  | Date of Evaluation: | June 12, 2006     | Document Issue No.: | SV1900B-061206-R1.0 |      |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 1900 MHz            | Body |

## 7. Measurement Conditions

The phantom was filled with 1900 MHz Body tissue simulant.

Relative Permittivity: 51.4 (-3.5% deviation from target)  
 Conductivity: 1.51 mho/m (-0.5% deviation from target)  
 Fluid Temperature: 23.5 °C  
 Fluid Depth:  $\geq 15.0$  cm

Environmental Conditions:

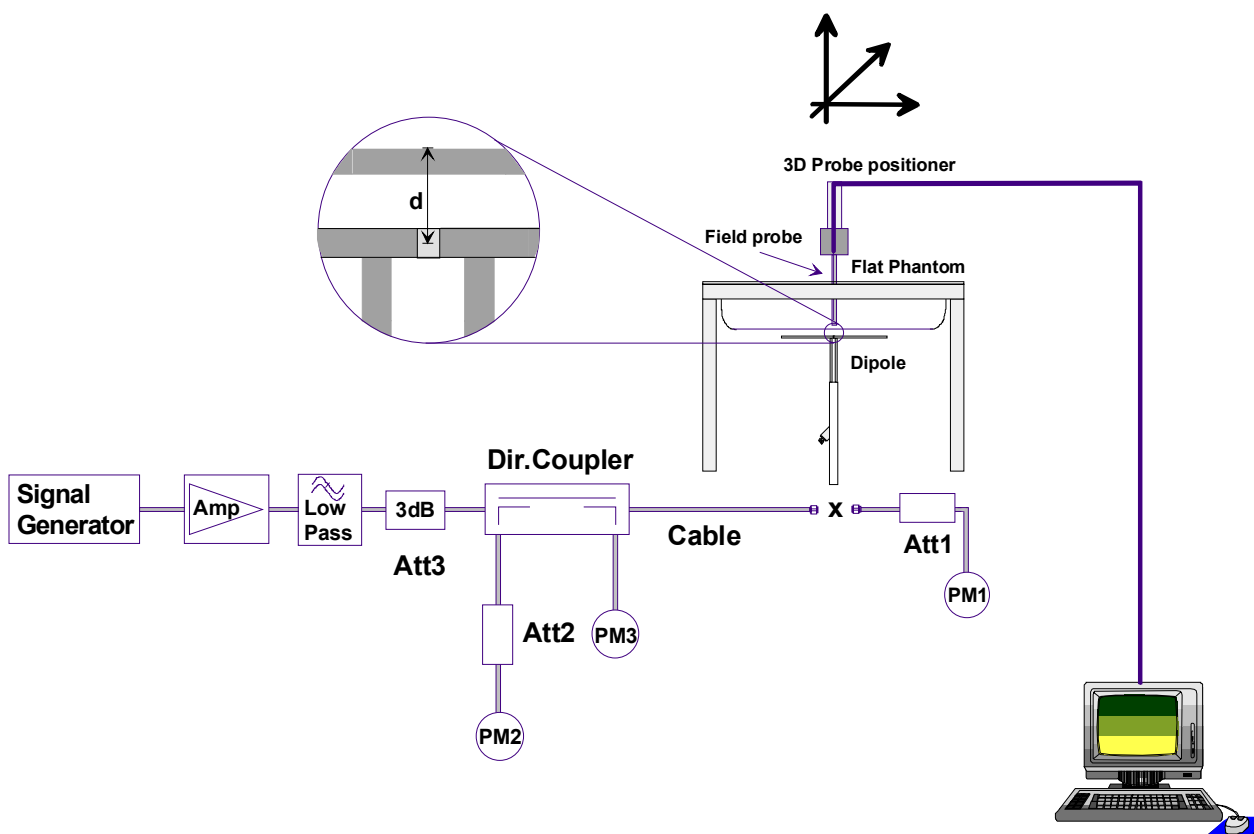
Ambient Temperature: 23.2 °C  
 Barometric Pressure: 101.2 kPa  
 Humidity: 44%

The 1900 MHz Body tissue simulant consisted of the following ingredients:

| Ingredient                               | Percentage by weight                                       |
|------------------------------------------|------------------------------------------------------------|
| Water                                    | 69.85%                                                     |
| Glycol                                   | 29.89%                                                     |
| Salt                                     | 0.26%                                                      |
| Target Dielectric Parameters<br>at 25 °C | $\epsilon_r = 53.3$ (+/-5%)<br>$\sigma = 1.52$ S/m (+/-5%) |

## 8. 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 50dB below the forward power.

## 9. 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                 | 10.50                              | 42.00                           | 5.40                                | 21.60                            | 11.90                  |
| Test 2                 | 10.40                              | 41.60                           | 5.37                                | 21.48                            | 11.80                  |
| Test 3                 | 10.40                              | 41.60                           | 5.37                                | 21.48                            | 11.80                  |
| Test 4                 | 10.60                              | 42.40                           | 5.47                                | 21.88                            | 12.00                  |
| Test 5                 | 10.30                              | 41.20                           | 5.30                                | 21.20                            | 11.60                  |
| Test 6                 | 10.20                              | 40.80                           | 5.28                                | 21.12                            | 11.60                  |
| Test 7                 | 10.20                              | 40.80                           | 5.27                                | 21.08                            | 11.60                  |
| Test 8                 | 10.30                              | 41.20                           | 5.34                                | 21.36                            | 11.70                  |
| Test 9                 | 10.30                              | 41.20                           | 5.31                                | 21.24                            | 11.60                  |
| Test 10                | 10.30                              | 41.20                           | 5.32                                | 21.28                            | 11.70                  |
| <b>Average</b>         | <b>10.35</b>                       | <b>41.40</b>                    | <b>5.34</b>                         | <b>21.37</b>                     | <b>11.73</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 (%) |
|-------------------------------------------------------|---------|---------------------------------------------------------|---------------------------|---------------------------------------------------------|---------|-----------------------------------------------------------|---------------------------|
| 39.8                                                  | +/- 10% | 41.40                                                   | +4.02                     | 20.8                                                    | +/- 10% | 21.37                                                     | +2.74                     |

| Dipole Type | Distance [mm] | Frequency [MHz] | SAR (1g) [W/kg] | SAR (10g) [W/kg] | SAR (peak) [W/kg] |
|-------------|---------------|-----------------|-----------------|------------------|-------------------|
| D300V2      | 15            | 300             | 3.02            | 2.06             | 4.36              |
| D450V2      | 15            | 450             | 5.01            | 3.36             | 7.22              |
| D835V2      | 15            | 835             | 9.71            | 6.38             | 14.1              |
| D900V2      | 15            | 900             | 11.1            | 7.17             | 16.3              |
| D1450V2     | 10            | 1450            | 29.6            | 16.6             | 49.8              |
| D1500V2     | 10            | 1500            | 30.8            | 17.1             | 52.1              |
| D1640V2     | 10            | 1640            | 34.4            | 18.7             | 59.4              |
| D1800V2     | 10            | 1800            | 38.5            | 20.3             | 67.5              |
| D1900V2     | 10            | 1900            | 39.8            | 20.8             | 69.6              |
| D2000V2     | 10            | 2000            | 40.9            | 21.2             | 71.5              |
| D2450V2     | 10            | 2450            | 51.2            | 23.7             | 97.6              |
| D3000V2     | 10            | 3000            | 61.9            | 24.8             | 136.7             |

Table 32.1: Numerical reference SAR values for SPEAG dipoles and flat phantom filled with body-tissue simulating liquid. Note: All SAR values normalized to 1 W forward power.

|                                                                                   |                     |                   |                     |                     |      |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|---------------------|------|
|  | Date of Evaluation: | June 12, 2006     | Document Issue No.: | SV1900B-061206-R1.0 |      |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 1900 MHz            | Body |

## System Validation (Body) - 1900 MHz Dipole - June 12, 2006

Dipole: 1900 MHz; Serial: 151

Ambient Temp: 23.2 °C; Fluid Temp: 23.5°C; Barometric Pressure: 101.2 kPa; Humidity: 44%

Communication System: CW

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: M1900 ( $\sigma = 1.51$  mho/m;  $\epsilon_r = 51.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>)

- Probe: EX3DV4 - SN3547; ConvF(7.84, 7.84, 7.84); Calibrated: 14/02/2006

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn370; Calibrated: 08/02/2006

- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**1900 MHz System Validation/Area Scan (5x8x1):** Measurement grid: dx=15mm, dy=15mm

**1900 MHz System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.7 V/m; Power Drift = -0.024 dB

**SAR(1 g) = 10.5 mW/g; SAR(10 g) = 5.4 mW/g**

Maximum value of SAR (measured) = 11.9 mW/g

**1900 MHz System Validation/Zoom Scan 2 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.7 V/m; Power Drift = -0.033 dB

**SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.37 mW/g**

Maximum value of SAR (measured) = 11.8 mW/g

**1900 MHz System Validation/Zoom Scan 3 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.5 V/m; Power Drift = -0.011 dB

**SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.37 mW/g**

Maximum value of SAR (measured) = 11.8 mW/g

**1900 MHz System Validation/Zoom Scan 4 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 90.3 V/m; Power Drift = 0.003 dB

**SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.47 mW/g**

Maximum value of SAR (measured) = 12.0 mW/g

**1900 MHz System Validation/Zoom Scan 5 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.9 V/m; Power Drift = -0.004 dB

**SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.3 mW/g**

Maximum value of SAR (measured) = 11.6 mW/g

**1900 MHz System Validation/Zoom Scan 6 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.9 V/m; Power Drift = -0.007 dB

**SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.28 mW/g**

Maximum value of SAR (measured) = 11.6 mW/g

**1900 MHz System Validation/Zoom Scan 7 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.6 V/m; Power Drift = -0.008 dB

**SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.27 mW/g**

Maximum value of SAR (measured) = 11.6 mW/g

**1900 MHz System Validation/Zoom Scan 8 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.3 V/m; Power Drift = -0.006 dB

**SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.34 mW/g**

Maximum value of SAR (measured) = 11.7 mW/g

**1900 MHz System Validation/Zoom Scan 9 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.9 V/m; Power Drift = -0.019 dB

**SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.31 mW/g**

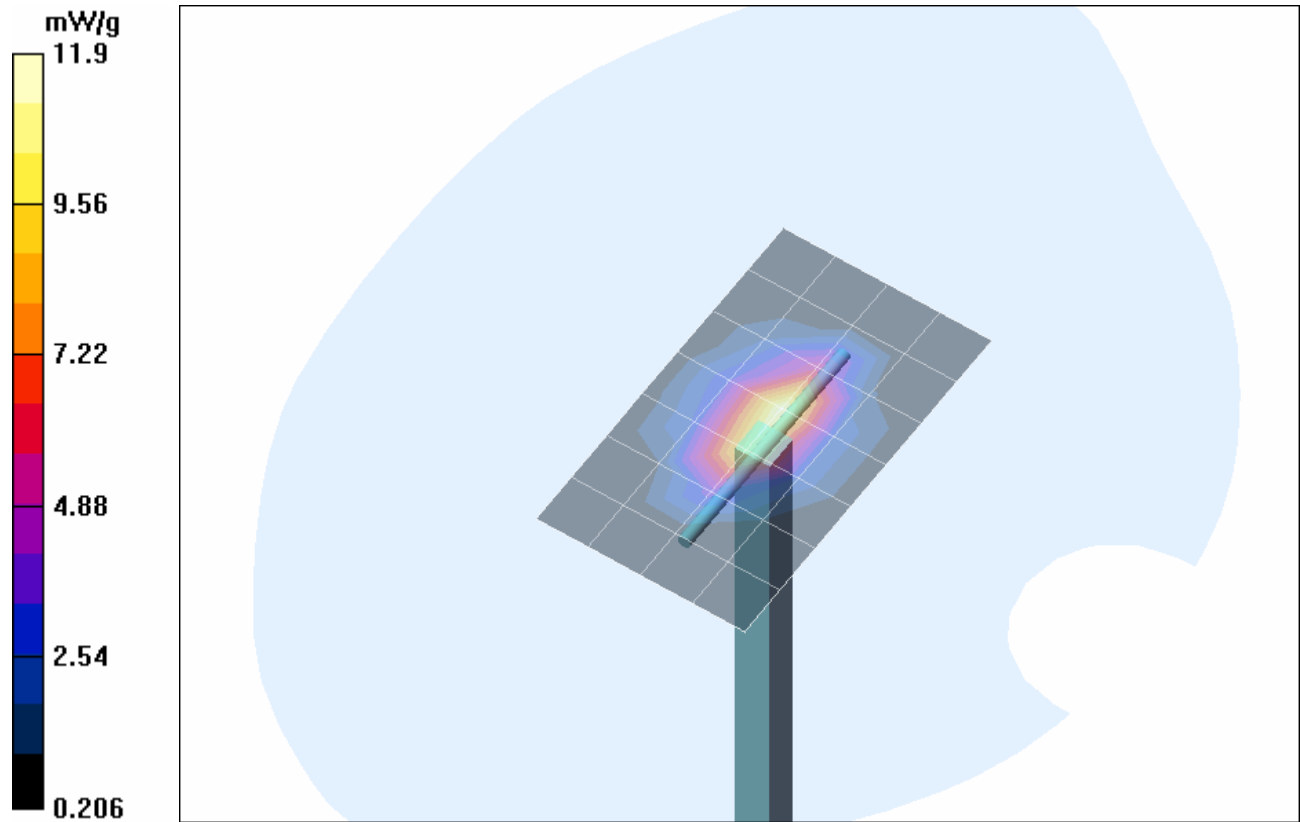
Maximum value of SAR (measured) = 11.6 mW/g

**1900 MHz System Validation/Zoom Scan 10 (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

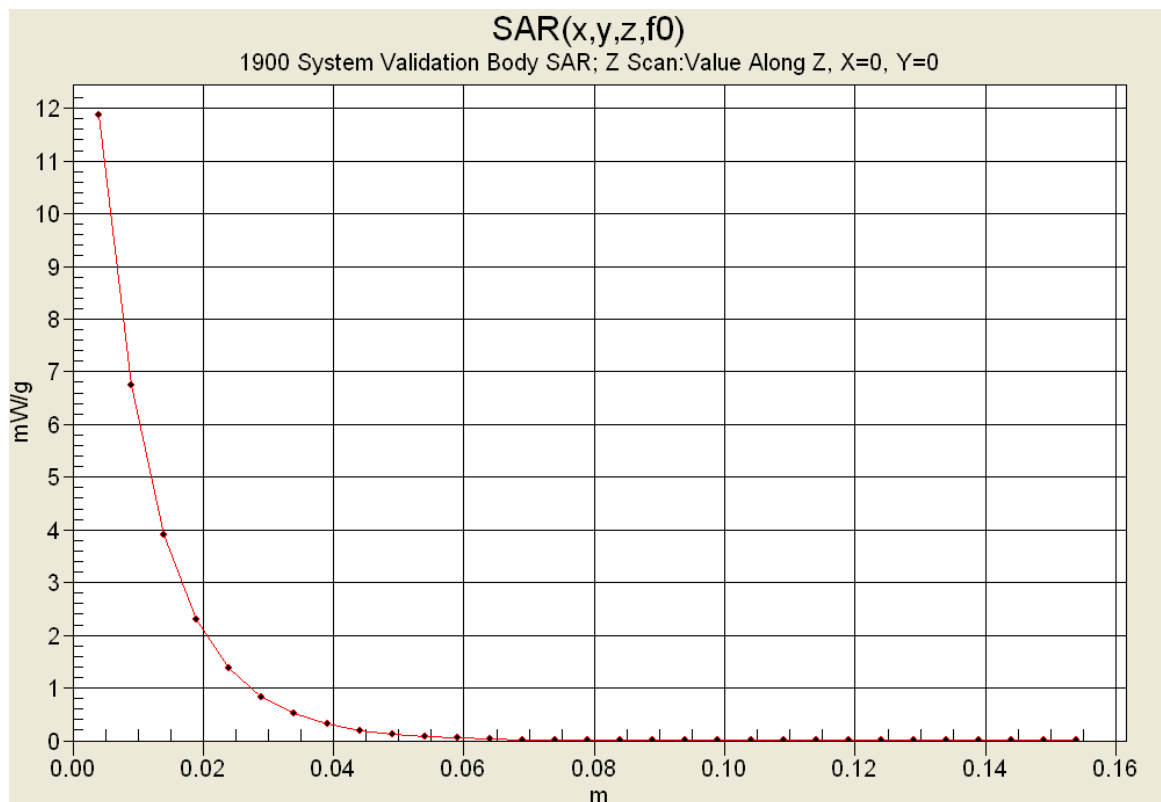
Reference Value = 89.2 V/m; Power Drift = -0.013 dB

**SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.32 mW/g**

Maximum value of SAR (measured) = 11.7 mW/g



1 g average of 10 measurements: 10.35 mW/g  
10 g average of 10 measurements: 5.34 mW/g



|                                                                                   |                     |                   |                     |                     |      |
|-----------------------------------------------------------------------------------|---------------------|-------------------|---------------------|---------------------|------|
|  | Date of Evaluation: | June 12, 2006     | Document Issue No.: | SV1900B-061206-R1.0 |      |
|                                                                                   | Evaluation Type:    | System Validation | Validation Dipole:  | 1900 MHz            | Body |

## 10. Measured Fluid Dielectric Parameters

### 1900 MHz Dipole System Validation (Body)

\*\*\*\*\*

Celltech Labs Inc.

Test Result for UIM Dielectric Parameter

Mon 12/Jun/2006

Frequency(GHz)

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

FCC\_sH FCC 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 |
|--------|--------|--------|--------|--------|
| 1.8000 | 53.30  | 1.52   | 51.68  | 1.43   |
| 1.8100 | 53.30  | 1.52   | 51.72  | 1.44   |
| 1.8200 | 53.30  | 1.52   | 51.59  | 1.44   |
| 1.8300 | 53.30  | 1.52   | 51.60  | 1.45   |
| 1.8400 | 53.30  | 1.52   | 51.57  | 1.46   |
| 1.8500 | 53.30  | 1.52   | 51.47  | 1.46   |
| 1.8600 | 53.30  | 1.52   | 51.50  | 1.48   |
| 1.8700 | 53.30  | 1.52   | 51.46  | 1.49   |
| 1.8800 | 53.30  | 1.52   | 51.51  | 1.49   |
| 1.8900 | 53.30  | 1.52   | 51.37  | 1.52   |
| 1.9000 | 53.30  | 1.52   | 51.36  | 1.51   |
| 1.9100 | 53.30  | 1.52   | 51.28  | 1.54   |
| 1.9200 | 53.30  | 1.52   | 51.23  | 1.54   |
| 1.9300 | 53.30  | 1.52   | 51.23  | 1.55   |
| 1.9400 | 53.30  | 1.52   | 51.25  | 1.56   |
| 1.9500 | 53.30  | 1.52   | 51.31  | 1.57   |
| 1.9600 | 53.30  | 1.52   | 51.16  | 1.59   |
| 1.9700 | 53.30  | 1.52   | 51.21  | 1.59   |
| 1.9800 | 53.30  | 1.52   | 51.19  | 1.61   |
| 1.9900 | 53.30  | 1.52   | 51.12  | 1.62   |
| 2.0000 | 53.30  | 1.52   | 51.13  | 1.63   |

|                                                                                  |                                                    |                                                           |                                                   |                                                                                                               |
|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

## APPENDIX F - PROBE CALIBRATION

|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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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**

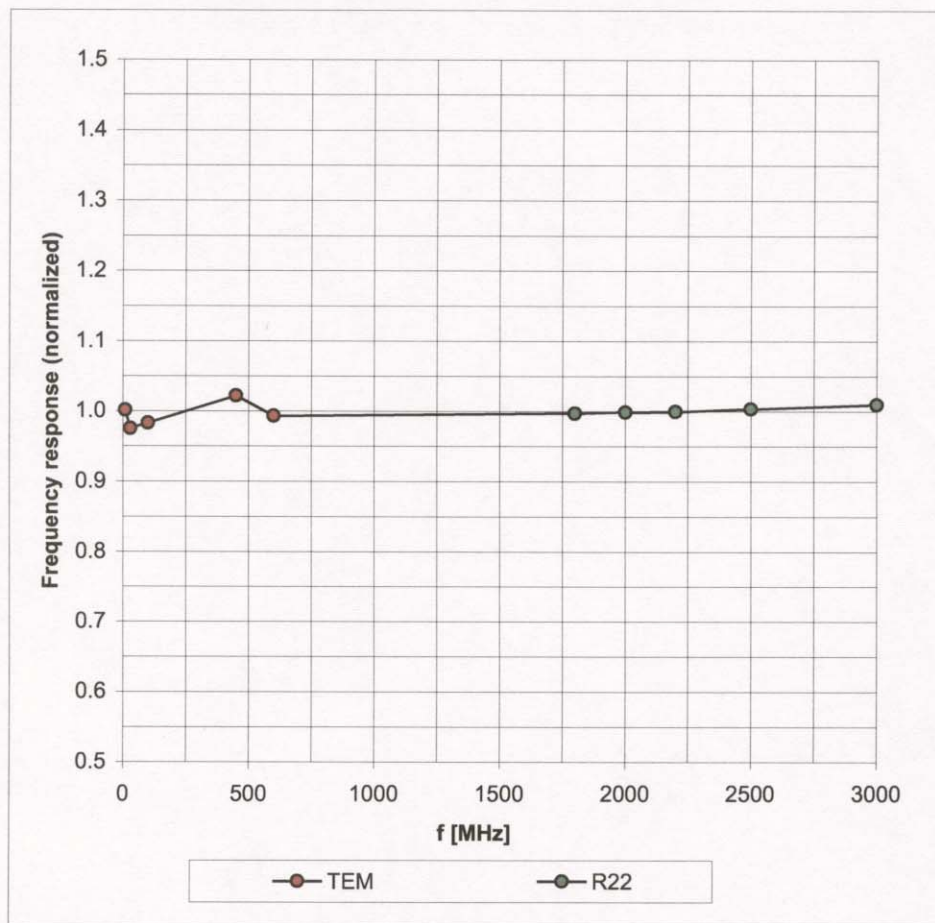
**The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.**

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

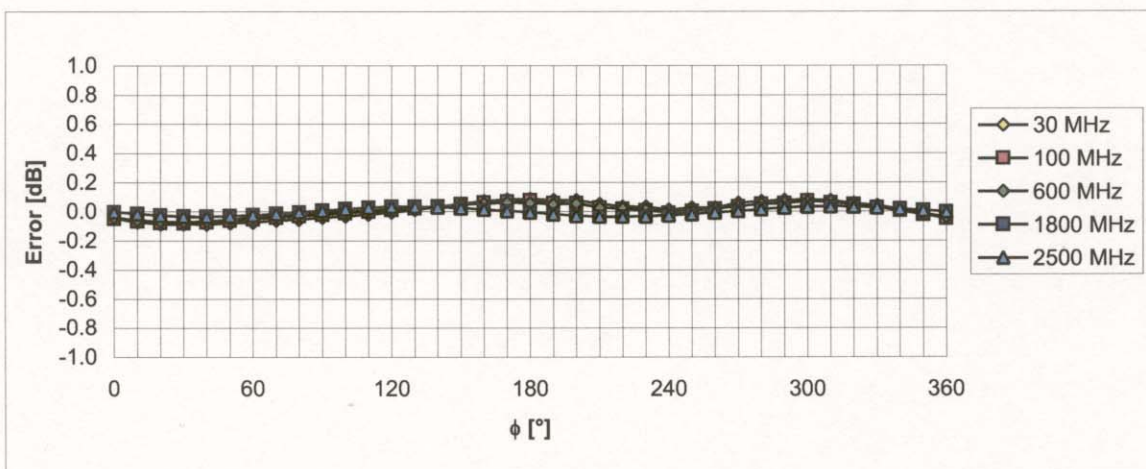
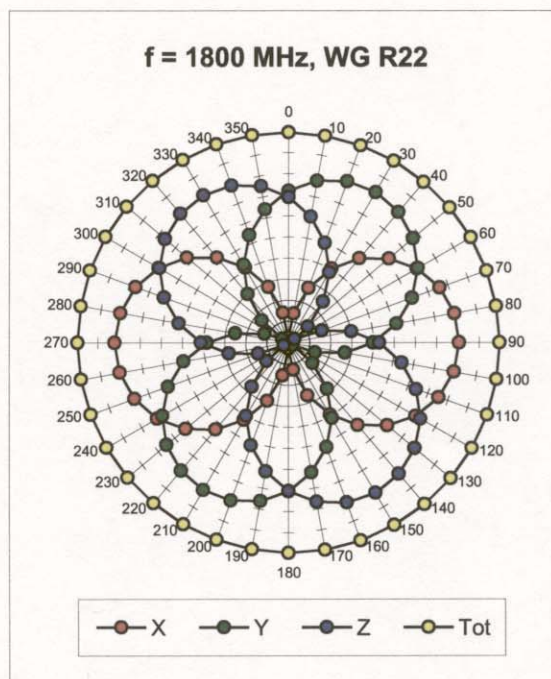
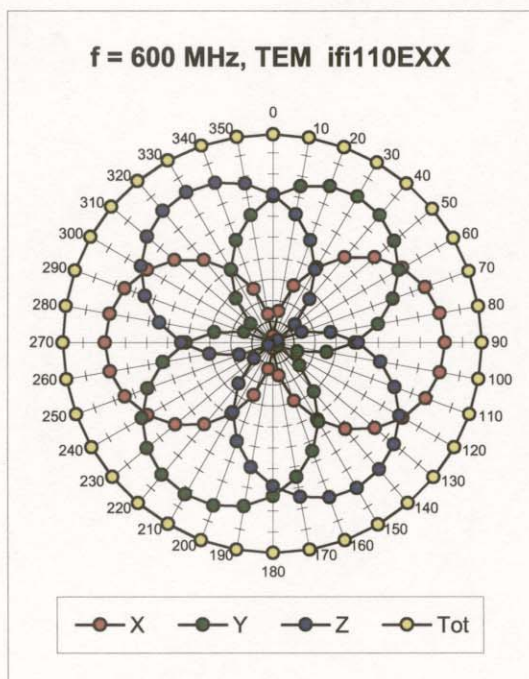
<sup>B</sup> Numerical linearization parameter: uncertainty not required.

## Frequency Response of E-Field

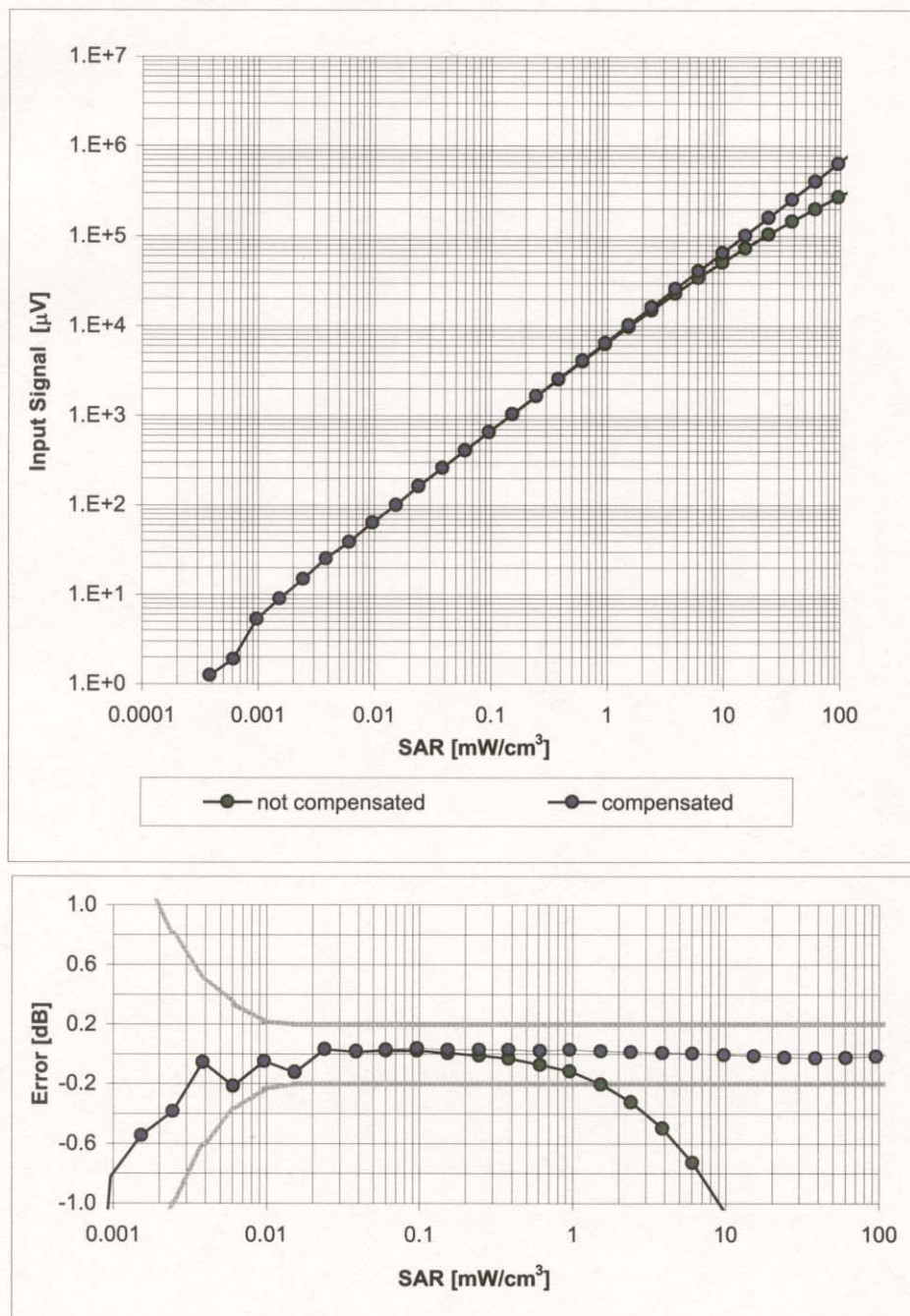
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

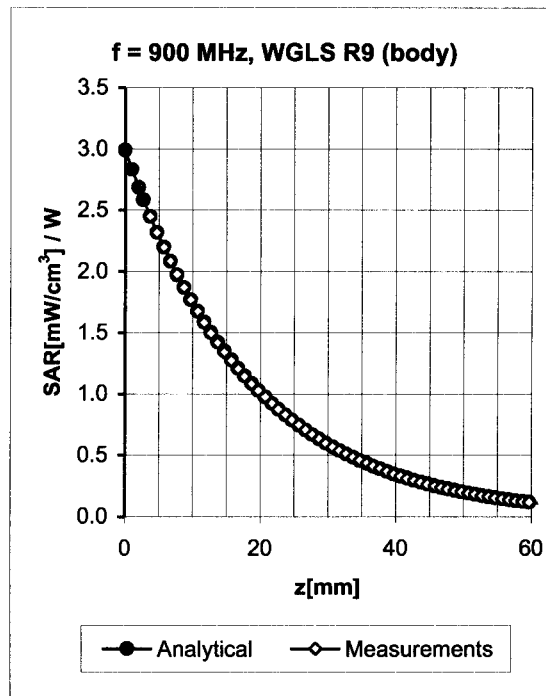
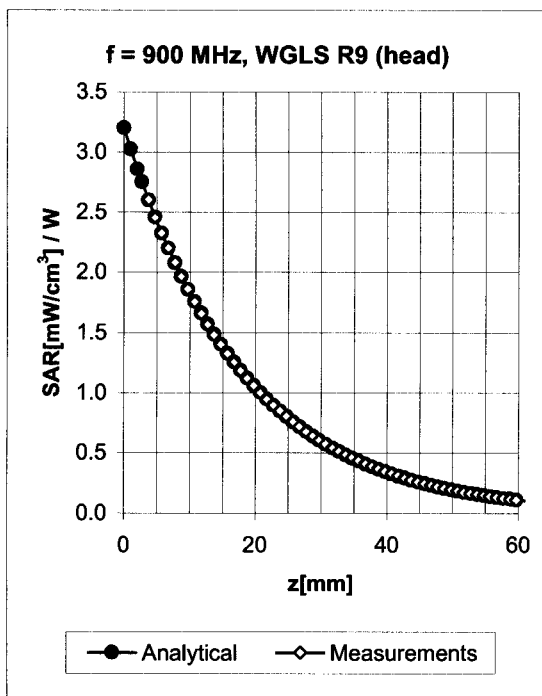
Receiving Pattern ( $\phi$ ),  $\vartheta = 0^\circ$ Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

# 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

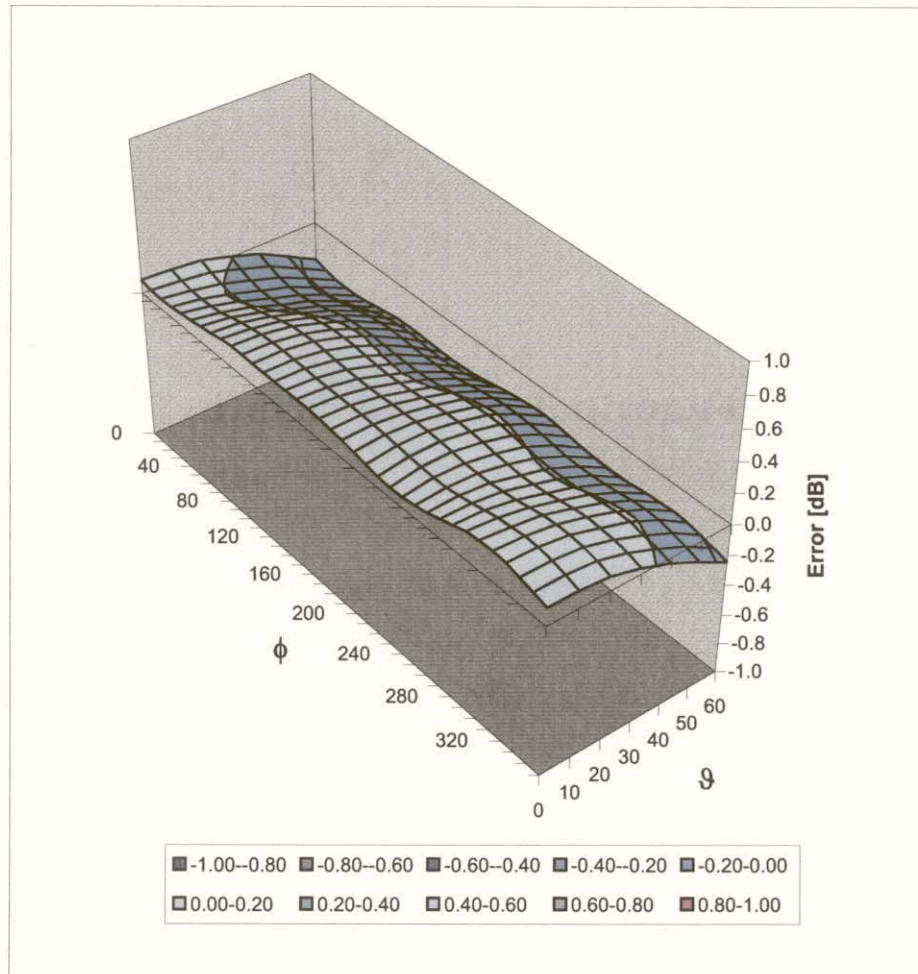


| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 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:

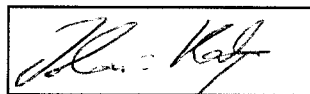
**March 18, 2006**

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.

|                                                                                  |                                                    |                                                           |                                                   |                                                                                                               |
|----------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  | <u>Date(s) of Evaluation</u><br>September 06, 2006 | <u>Test Report Serial No.</u><br>090106AL8-T771-S15R      | <u>Report Revision No.</u><br>Revision 1.1        | <br>Certificate No. 2470.01 |
|                                                                                  | <u>Report Issue Date</u><br>October 05, 2006       | <u>Description of Test(s)</u><br>Specific Absorption Rate | <u>RF Exposure Category</u><br>General Population |                                                                                                               |

## APPENDIX G - SAM PHANTOM CERTIFICATE OF CONFORMITY

|                         |                                                                                                                      |         |                                                 |                         |                                                                                       |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Company:                | Plantronics Inc.                                                                                                     | FCC ID: | AL8CA12CDYYYY                                   | 1921.536 - 1928.448 MHz |  |
| Model(s):               | CA12CD (Remote)                                                                                                      | Device: | Wireless Headset Adaptor (Remote Unit with PTT) |                         |                                                                                       |
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# Schmid & Partner Engineering AG

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## Certificate of conformity / First Article Inspection

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

### Tests

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

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

### Standards

- [1] CENELEC EN 50361
- [2] IEEE P1528-200x draft 6.5
- [3] IEC PT 62209 draft 0.9

(\*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

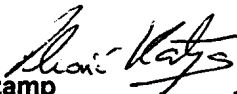
### Conformity

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

Date

18.11.2001

Signature / Stamp



**Schmid & Partner  
Engineering AG**



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