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|  | <u>Date(s) of Evaluation</u> June 13, 2007 | <u>Test Report Serial No.</u> 061207ALH-T836-S90U | <u>Report Revision No.</u> Revision 1.0 |  |
| | <u>Test Report Issue Date</u> June 20, 2007 | <u>Description of Test(s)</u> Specific Absorption Rate | <u>RF Exposure Category</u> Occupational (Controlled) | |

RF EXPOSURE EVALUATION

SPECIFIC ABSORPTION RATE

SAR TEST REPORT

FOR

KENWOOD USA CORPORATION

PORTABLE FM UHF PTT RADIO TRANSCEIVER

MODEL(S): TK-3230-K

| | |
|------------------------|--|
| IDENTIFIER(S): | FCC ID: ALH383200 |
| Test Procedure: | FCC OET Bulletin 65, Supplement C (01-01) |

Test Report Serial No.

061207ALH-T836-S90U

Test Report Revision No.


Revision 1.0 (Initial Release)



Test Lab and Location

**Celltech Compliance Testing & Engineering Lab
 (Celltech Labs Inc.)
 21-364 Lougheed Rd,
 Kelowna, B.C. V1X 7R8
 Canada**



| | |
|--|---|
| <u>Testing and Report By:</u> Cheri Frangiadakis Celltech Labs Inc. | <u>Test Report Reviewed By:</u> Jonathan Hughes Celltech Labs Inc. |
|--|---|

| | | | | | | |
|-------------------------|--|----------------------------------|------------------|----------------------|------------------|---|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 |  |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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DECLARATION OF COMPLIANCE SAR RF EXPOSURE EVALUATION

| | | | |
|---|--|--|--|
| <u>Test Lab and Location</u> CELLTECH LABS INCORPORATED Testing and Engineering Services 21-364 Lougheed Road Kelowna, B.C. V1X 7R8 Canada e-mail: info@celltechlabs.com web site: www.celltechlabs.com Phone: 250-765-7650 Fax: 250-765-7645 | | <u>Company Information</u> KENWOOD USA CORPORATION 3975 John Creek Court, Suite 300 Suwanee, GA 30024 United States | |
| FCC IDENTIFIER: | ALH383200 | | |
| Model No.(s): | TK-3230-K | | |
| Standard(s) Applied: | FCC 47 CFR §2.1093 | | |
| Procedure(s) Applied: | FCC OET Bulletin 65, Supplement C (Edition 01-01) | | |
| FCC Device Classification: | Licensed Non-Broadcast Transmitter Held to Face (TNF) | | |
| RF Exposure Category: | Occupational / Controlled Environment | | |
| Device Description: | Portable FM UHF PTT Radio Transceiver | | |
| Transmit Frequency Range(s): | 460 - 470 MHz | | |
| Max. RF Output Power Tested: | 2.29 Watts (33.6 dBm) ERP (460 MHz) 2.29 Watts (33.6 dBm) ERP (465 MHz) 2.24 Watts (33.5 dBm) ERP (469 MHz) | | |
| Antenna Type(s) Tested: | Fixed Stubby | | |
| Battery Type(s) Tested: | Lithium-ion 3.8 V (P/N: KNB-46L) | | |
| Body-worn Accessories Tested: | Plastic Belt-Clip with Metal Spring (P/N: J29-0736-XX) Nylon Belt-Pouch (P/N: KLH-113) | | |
| Audio Accessories Tested: | Speaker-Microphone (P/N: KMC-17) | | |
| Max. SAR Level(s) Evaluated: | Face-held: 1.17 W/kg (1g average) - 50% Duty Cycle Body-worn: 1.54 W/kg (1g average) - 50% Duty Cycle | | |

Celltech Labs Inc. declares under its sole responsibility that this wireless portable device has demonstrated compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC 47 CFR §2.1093. The device was tested in accordance with the measurement standards and procedures specified in FCC OET Bulletin 65, Supplement C (Edition 01-01) for the Occupational/Controlled 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.

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Test Report Approved By:

Jonathan Hughes
Celltech Labs Inc.



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|-------------------------|--|----------------------------------|------------------|----------------------|------------------|---|
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1.0 INTRODUCTION

This measurement report demonstrates that the KENWOOD USA CORPORATION Model(s): TK-3230-K Portable FM UHF PTT Radio Transceiver 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 Occupational / Controlled Exposure environment. The test procedures described in FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [3]) and IC RSS-102 Issue 2 (see reference [4]) were employed. A description of the device, 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)

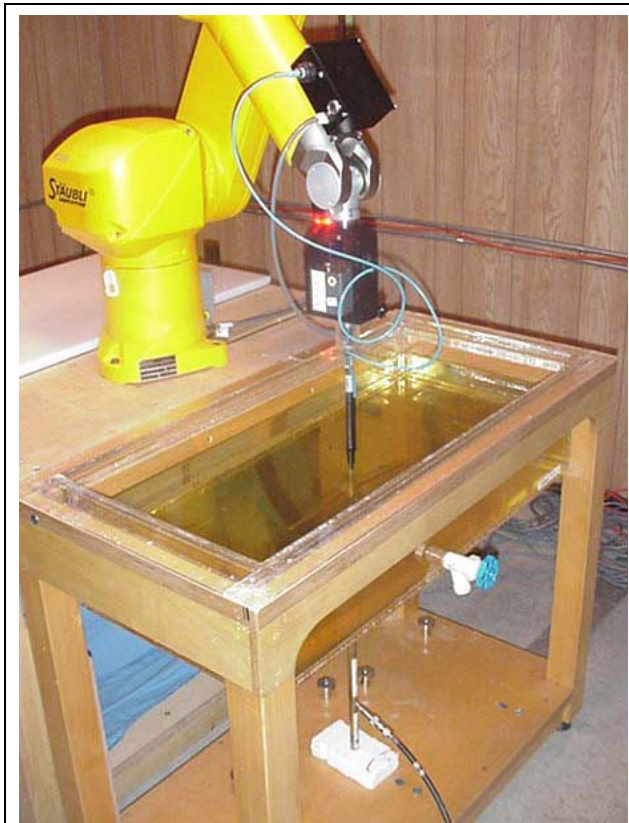
| | | | | |
|--|---|------------|---------------------|------------------|
| Standard(s) Applied | FCC Rule Part 47 CFR §2.1093 | | | |
| Procedure(s) Applied | FCC OET Bulletin 65, Supplement C (01-01) | | | |
| Device Classification(s) | FCC Licensed Non-Broadcast Transmitter Held to Face (TNF) | | | |
| Device Description | Portable FM UHF PTT Radio Transceiver | | | |
| RF Exposure Category | Occupational / Controlled Environment | | | |
| FCC IDENTIFIER | ALH383200 | | | |
| Device Model(s) | TK-3230-K | | | |
| Serial No. Tested | None | | Identical Prototype | |
| Transmit Frequency Range(s) | 460 - 470 MHz | | | |
| Max. RF Output Power Tested | 460 MHz | 2.29 Watts | 33.6 dBm | ERP |
| | 465 MHz | 2.29 Watts | 33.6 dBm | ERP |
| | 469 MHz | 2.24 Watts | 33.5 dBm | ERP |
| Antenna Type(s) Tested | Fixed Stubby | | | |
| Battery Type(s) Tested | Lithium-ion | 3.8 V | | P/N: KNB-46L |
| Body-Worn Accessories Tested | Plastic Belt-Clip with Metal Spring | | | P/N: J29-0736-XX |
| | Nylon Belt-Pouch | | | P/N: KLH-113 |
| Audio Accessories Tested | Speaker-Microphone | | | P/N: KMC-17 |
| Additional Audio Accessories (Addit. SAR Evaluations Not Required) | Speaker-Microphone | | | P/N: KMC-21 |
| | Headset with Boom Microphone | | | P/N: KHS-21 |
| | Behind-the-Head Headset with Boom Microphone | | | P/N: KHS-22 |
| | 2-wire Clip Microphone | | | P/N: KHS-23 |
| | D-Ring Earhanger with Boom Microphone | | | P/N: KHS-25 |
| | D-Ring Earhanger with Clip Microphone | | | P/N: KHS-27 |
| | Headset | | | P/N: KHS-28F |
| | Headset with Boom Microphone & PTT | | | P/N: HMC-3 |
| | Clip Microphone with Earbud | | | P/N: EMC-3 |
| Clip Microphone with Earbud | | | P/N: EMC-6 | |

| | | | | | | |
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3.0 SAR MEASUREMENT SYSTEM

Celltech Labs Inc. SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 measurement system is comprised of the measurement server, robot controller, computer, near-field probe, probe alignment sensor, specific anthropomorphic mannequin (SAM) phantom, and various planar phantoms for brain and/or body SAR evaluations. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the DASY4 measurement server. The DAE4 utilizes a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the DASY4 measurement server is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. The sensor systems are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.





DASY4 SAR Measurement System with Plexiglas validation phantom



DASY4 SAR Measurement System with Plexiglas side planar phantom


| | | | | | | |
|-------------------------|--|----------------------------------|------------------|----------------------|------------------|----------------|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 | KENWOOD |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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4.0 SAR MEASUREMENT SUMMARY

FACE-HELD SAR EVALUATION RESULTS

| Freq. MHz | Chan. | Test Mode | Battery Type | DUT Position to Planar Phantom | DUT Spacing to Planar Phantom cm | DUT Start Power (ERP) dBm | Measured SAR 1g (W/kg) | | SAR Drift During Test dB | Scaled SAR with droop 1g (W/kg) | |
|---|-------|--|--------------|---|-------------------------------------|---|--|-------|-----------------------------|---------------------------------|------|
| | | | | | | | Duty Cycle | | | Duty Cycle | |
| | | | | | | | 100% | 50% | | 100% | 50% |
| 460.25 | Low | CW | Li-ion | Front Side | 2.5 | 33.6 | 1.71 | 0.855 | -0.910 | 2.11 | 1.05 |
| 465.25 | Mid | CW | Li-ion | Front Side | 2.5 | 33.6 | 1.89 | 0.945 | -0.920 | 2.34 | 1.17 |
| 469.75 | High | CW | Li-ion | Front Side | 2.5 | 33.5 | 1.81 | 0.905 | -0.464 | 2.01 | 1.01 |
| ANSI / IEEE C95.1: 2005 - SAFETY LIMIT | | | | BRAIN: 8.0 W/kg (averaged over 1 gram) | | | Spatial Peak - Controlled Exposure / Occupational | | | | |
| Test Date(s) | | June 13, 2007 | | | | Relative Humidity | | 31 | | % | |
| Measured Fluid Type | | 450 MHz Brain | | | | Atmospheric Pressure | | 96.9 | | kPa | |
| Dielectric Constant ϵ_r | | IEEE Target | | Measured | Deviation | Ambient Temperature | | 24.0 | | °C | |
| | | 43.5 | ± 5% | 44.5 | +2.3% | Fluid Temperature | | 21.9 | | °C | |
| Conductivity σ (mho/m) | | IEEE Target | | Measured | Deviation | Fluid Depth | | ≥ 15 | | Cm | |
| | | 0.87 | ± 5% | 0.91 | +4.6% | ρ (Kg/m³) | | 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 power droops measured by the DASY4 system for the duration of the SAR evaluations were added to the measured SAR levels to report scaled SAR results as shown in the above test data table. | | | | | | | | | |
| | | 3. The area scan evaluation was performed with a fully charged battery. After the area scan evaluation was completed the battery was replaced with a fully charged battery prior to the zoom scan evaluation. | | | | | | | | | |
| | | 4. The fluid temperature was measured prior to and after the SAR evaluations to ensure the temperature remained within +/-2°C of the fluid temperature reported during the dielectric parameter measurements. | | | | | | | | | |
| | | 5. 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). | | | | | | | | | |
| | | 6. The SAR measurements were performed within 24 hours of the system performance check. | | | | | | | | | |

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SAR MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

| Freq. | Chan. | Test Mode | Battery Type | DUT Position to Planar Phantom | Accessories | | | DUT Start Power (ERP) | Measured SAR 1g (W/kg) | | SAR Drift During Test | Scaled SAR with droop 1g (W/kg) | |
|---|-------|--------------------|---|--|------------------|---|-----------------------------|--|------------------------|------|-----------------------|---------------------------------|------|
| | | | | | Body-Worn | Spacing | Audio | | Duty Cycle | | | Duty Cycle | |
| MHz | | | | | | | dBm | 100% | 50% | dB | 100% | 50% | |
| 465.25 | Mid | CW | Li-ion | Back Side | Belt-Clip | 1.5 cm | Speaker-Mic | 33.6 | 2.38 | 1.19 | 0.119 | - | - |
| 465.25 | Mid | CW | Li-ion | Back Side | Belt-Pouch | 0.5 cm | Speaker-Mic | 33.6 | 2.79 | 1.40 | -0.0544 | 2.82 | 1.41 |
| 460.25 | Low | CW | Li-ion | Back Side | Belt-Pouch | 0.5 cm | Speaker-Mic | 33.6 | 2.77 | 1.39 | -0.449 | 3.07 | 1.54 |
| 469.75 | High | CW | Li-ion | Back Side | Belt-Pouch | 0.5 cm | Speaker-Mic | 33.5 | 2.38 | 1.19 | -0.943 | 2.96 | 1.48 |
| ANSI / IEEE C95.1: 2005 - SAFETY LIMIT | | | | BODY: 8.0 W/kg (averaged over 1 gram) | | | | Spatial Peak - Controlled Exposure / Occupational | | | | | |
| Test Date(s) | | June, 13, 2007 | | | | | Relative Humidity | | 30 | % | | | |
| Measure Fluid Type | | 450 MHz Body | | | | | Atmospheric Pressure | | 96.7 | kPa | | | |
| Dielectric Constant ϵ_r | | IEEE Target | | Measured | Deviation | Ambient Temperature | | 24.4 | | | | | |
| | | 56.7 | $\pm 5\%$ | 56.6 | -0.1% | Fluid Temperature | | 21.9 | | | | | |
| Conductivity σ (mho/m) | | IEEE Target | | Measured | Deviation | Fluid Depth | | ≥ 15 | | | | | |
| | | 0.94 | $\pm 5\%$ | 0.93 | -1.0% | ρ (Kg/m³) | | 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 power droops measured by the DASY4 system for the duration of the SAR evaluations were added to the measured SAR levels to report scaled SAR results as shown in the above test data table. | | | | | | | | | | |
| | | 3. | A SAR-versus-Time power droop evaluation was performed in the test configuration that reported the maximum droop. See Appendix A (SAR Test Plots) for the SAR-versus-Time power droop evaluation plot. | | | | | | | | | | |
| | | 4. | The area scan evaluation was performed with a fully charged battery. After the area scan evaluation was completed the battery was replaced with a fully charged battery prior to the zoom scan evaluation. | | | | | | | | | | |
| | | 5. | The fluid temperature was measured prior to and after the SAR evaluations to ensure the temperature remained within +/-2°C of the fluid temperature reported during the dielectric parameter measurements. | | | | | | | | | | |
| | | 6. | 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). | | | | | | | | | | |
| | | 7. | The SAR measurements were performed within 24 hours of the system performance check. | | | | | | | | | | |

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| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 | KENWOOD |
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5.0 DETAILS OF SAR EVALUATION

The KENWOOD USA CORPORATION Model(s): TK-3230-K Portable FM UHF PTT Radio Transceiver described in this report was compliant for localized Specific Absorption Rate (Occupational / Controlled Exposure) based on the test provisions and conditions described below. Detailed photographs of the test setup are shown in Appendix D.

Test Configuration(s)

1. The DUT was tested in a face-held configuration with the front side of the radio placed parallel to the outer surface of the planar phantom. A spacing of 2.5 cm was maintained between the front side of the DUT and the outer surface of the planar phantom.
2. The DUT was tested in a body-worn configuration with the back side of the radio placed parallel to the outer surface of the planar phantom. The attached belt-clip accessory (P/N: J29-0736-XX) was touching the planar phantom and provided a 1.5 cm spacing from the back of the DUT to the planar phantom. The SAR evaluation was performed with the speaker-microphone audio accessory (P/N: KMC-17) connected to the DUT.
3. The DUT was tested in a body-worn configuration placed inside the nylon belt-pouch accessory (P/N: KLH-113), which provided a 0.5 cm spacing from the back of the DUT to the outer surface of the planar phantom. The SAR evaluation was performed with the speaker-microphone audio accessory (P/N: KMC-17) connected to the DUT.

Power Setting(s) and Test Mode(s)

4. The RF conducted output power of the DUT could not be measured due to a non-detachable antenna. The DUT was evaluated for SAR at the maximum conducted power level preset by the manufacturer.
5. The maximum ERP reference power level(s) reported were measured by Flom Test Lab.
6. The test channel and power setting were selected using the radio keypad.
7. The DUT was tested in unmodulated continuous transmit operation (Continuous Wave mode at 100% duty cycle) with the transmit key constantly depressed. For a push-to-talk device the 50% duty cycle compensation reported assumes a transmit/receive cycle of equal time base.

6.0 EVALUATION PROCEDURES

- (i) The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation, both the left and right ear positions were evaluated using the SAM phantom.
- (ii) For body-worn and face-held devices a planar phantom was used.
- The SAR was determined by a pre-defined procedure within the DASy4 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface with a grid spacing of 15mm x 15mm.
An area scan was determined as follows:
 - Based on the defined area scan grid, a more detailed grid is created to increase the points by a factor of 10. The interpolation function then evaluates all field values between corresponding measurement points.
 - A linear search is applied to find all the candidate maxima. Subsequently, all maxima are removed that are >2 dB from the global maximum. The remaining maxima are then used to position the cube scans.
A 1 g and 10 g spatial peak SAR was determined as follows:
 - Extrapolation is used to find the points between the dipole center of the probe and the surface of the phantom. This data cannot be measured, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.4 mm (see probe calibration document in Appendix F). The extrapolation was based on trivariate quadratics computed from the previously calculated 3D interpolated points nearest the phantom surface.
 - Interpolated data is used to calculate the average SAR over 1 g and 10 g cubes by spatially discretizing the entire measured cube. The volume used to determine the averaged SAR is a 1mm grid (42875 interpolated points).
 - A zoom scan volume of 32 mm x 32 mm x 30 mm (5 x 5 x 7 points) centered at the peak SAR location determined from the area scan is used for all zoom scans for devices with a transmit frequency < 800 MHz. Depending on the device type under evaluation, zoom scans for frequencies ≥ 800 MHz are typically determined with a scan volume of 30 mm x 30 mm x 30 mm (7 x 7 x 7) to ensure complete capture of the peak spatial-average SAR.

| | | | | | | |
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| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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7.0 SYSTEM PERFORMANCE CHECK

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

| SYSTEM PERFORMANCE CHECK EVALUATION | | | | | | | | | | | | | | | | |
|-------------------------------------|---------------|--|-------------|-------|----------------------------------|-------------|-------|-------------------------------|-------------|-------|-----------------------------|-----------------|------------------|------------------|------------|---------------------|
| Test Date | Equiv. Tissue | SAR 1g (W/kg) | | | Dielectric Constant ϵ_r | | | Conductivity σ (mho/m) | | | ρ (Kg/m ³) | Amb. Temp. (°C) | Fluid Temp. (°C) | Fluid Depth (cm) | Humid. (%) | Barom. Press. (kPa) |
| | | 450 MHz | IEEE Target | Meas. | Dev. | IEEE Target | Meas. | Dev. | IEEE Target | Meas. | | | | | | |
| Jun-13 | Brain | 1.23 $\pm 10\%$ | 1.30 | +5.7% | 43.5 $\pm 5\%$ | 44.5 | +2.3% | 0.87 $\pm 5\%$ | 0.91 | +4.6% | 1000 | 24.2 | 23.0 | ≥ 15 | 31 | 97.0 |
| Note(s) | | 1. The fluid temperature was measured prior to and after the system performance checks to ensure the temperature remained within $\pm 2^\circ\text{C}$ of the fluid temperature reported during the dielectric parameter measurements. 2. The SAR evaluations were performed within 24 hours of the system performance check. | | | | | | | | | | | | | | |

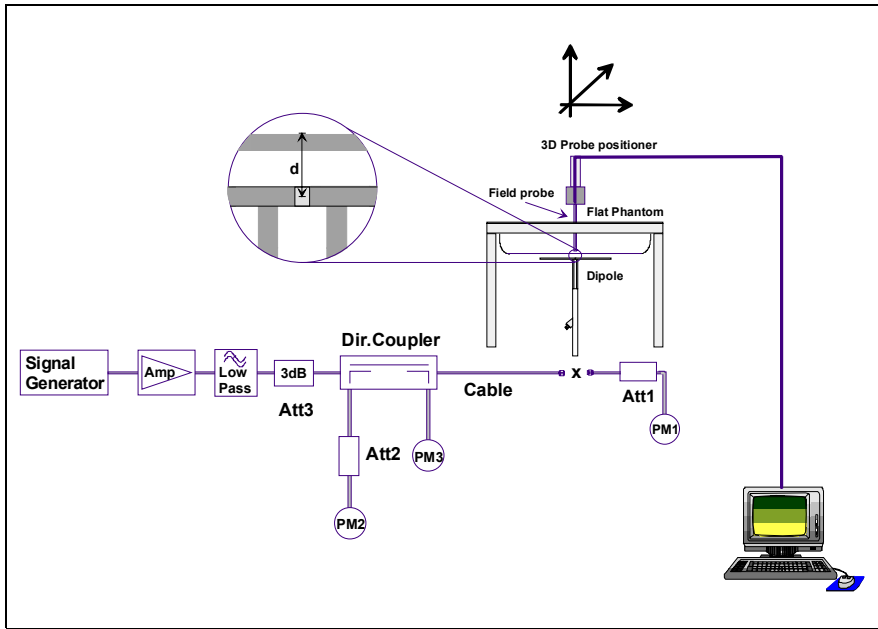




Figure 1. System Performance Check Setup Diagram



450 MHz Validation Dipole Setup

| | | | | |
|--|--|---|--|--|
|  | <u>Date(s) of Evaluation</u> June 13, 2007 | <u>Test Report Serial No.</u> 061207ALH-T836-S90U | <u>Report Revision No.</u> Revision 1.0 |  |
| | <u>Test Report Issue Date</u> June 20, 2007 | <u>Description of Test(s)</u> Specific Absorption Rate | <u>RF Exposure Category</u> Occupational (Controlled) | |

8.0 SIMULATED EQUIVALENT TISSUES



The simulated tissue mixtures consisted of a viscous gel using hydroxethylcellulose (HEC) gelling agent and saline solution. Preservation with a bactericide was added and visual inspection made to ensure air bubbles were not trapped during the mixing process. The fluid was prepared according to standardized procedures and measured for dielectric parameters (permittivity and conductivity).

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

9.0 SAR SAFETY LIMITS


| EXPOSURE LIMITS | SAR (W/kg) | |
|--|--|--|
| | (General Population / Uncontrolled Exposure Environment) | (Occupational / Controlled Exposure Environment) |
| Spatial Average (averaged over the whole body) | 0.08 | 0.4 |
| Spatial Peak (averaged over any 1 g of tissue) | 1.60 | 8.0 |
| Spatial Peak (hands/wrists/feet/ankles averaged over 10 g) | 4.0 | 20.0 |
| The Spatial Average value of the SAR averaged over the whole body. | | |
| The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time. | | |
| The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time. | | |
| Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure. | | |
| Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure. | | |



| | | | | | | |
|-------------------------|--|----------------------------------|------------------|----------------------|------------------|----------------|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 | KENWOOD |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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| | | | | |
|--|--|---|--|--|
|  | <u>Date(s) of Evaluation</u> June 13, 2007 | <u>Test Report Serial No.</u> 061207ALH-T836-S90U | <u>Report Revision No.</u> Revision 1.0 |  |
| | <u>Test Report Issue Date</u> June 20, 2007 | <u>Description of Test(s)</u> Specific Absorption Rate | <u>RF Exposure Category</u> Occupational (Controlled) | |


10.0 ROBOT SYSTEM SPECIFICATIONS

| | |
|--|---|
| <u>Specifications</u> | |
| Positioner | Stäubli Unimation Corp. Robot Model: RX60L |
| Repeatability | 0.02 mm |
| No. of axis | 6 |
| <u>Data Acquisition Electronic (DAE) System</u> | |
| <u>Cell Controller</u> | |
| Processor | AMD Athlon XP 2400+ |
| Clock Speed | 2.0 GHz |
| Operating System | Windows XP Professional |
| <u>Data Converter</u> | |
| Features | Signal Amplifier, multiplexer, A/D converter, and control logic |
| Software | Measurement Software: DASY4, V4.7 Build 44 |
| | Postprocessing Software: SEMCAD, V1.8 Build 171 |
| Connecting Lines | Optical downlink for data and status info.; Optical uplink for commands and clock |
| <u>DASY4 Measurement Server</u> | |
| Function | Real-time data evaluation for field measurements and surface detection |
| Hardware | PC/104 166MHz Pentium CPU; 32 MB chipdisk; 64 MB RAM |
| Connections | COM1, COM2, DAE, Robot, Ethernet, Service Interface |
| <u>E-Field Probe</u> | |
| Model | ET3DV6 |
| Serial No. | 1387 |
| Construction | Triangular core fiber optic detection system |
| Frequency | 10 MHz to 6 GHz |
| Linearity | ±0.2 dB (30 MHz to 3 GHz) |
| <u>Phantom(s)</u> | |
| <u>Evaluation Phantom</u> | |
| Type | Side Planar Phantom |
| Shell Material | Plexiglas |
| Bottom Thickness | 2.0 mm ± 0.1 mm |
| Outer Dimensions | 75.0 cm (L) x 22.5 cm (W) x 20.5 cm (H); Back Plane: 25.7 cm (H) |
| <u>Validation Phantom (≤ 450MHz)</u> | |
| Type | Planar Phantom |
| Shell Material | Plexiglas |
| Bottom Thickness | 6.2 mm ± 0.1 mm |
| Outer Dimensions | 86.0 cm (L) x 39.5 cm (W) x 21.8 cm (H) |

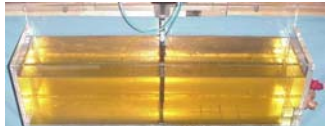
| | | | | | | |
|-------------------------|--|----------------------------------|-----------|----------------|-----------|---|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 |  |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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| | | | | |
|--|--|---|--|--|
|  | <u>Date(s) of Evaluation</u> June 13, 2007 | <u>Test Report Serial No.</u> 061207ALH-T836-S90U | <u>Report Revision No.</u> Revision 1.0 |  |
| | <u>Test Report Issue Date</u> June 20, 2007 | <u>Description of Test(s)</u> Specific Absorption Rate | <u>RF Exposure Category</u> Occupational (Controlled) | |

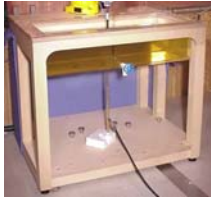
11.0 PROBE SPECIFICATION (ET3DV6)

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


12.0 SIDE PLANAR PHANTOM

| | |
|---|--|
| <p>The side planar phantom is constructed of Plexiglas material with a 2.0 mm shell thickness for face-held and body-worn SAR evaluations of portable radio transceivers. The side planar phantom is mounted on the side of the DASY4 compact system table.</p> |  |
| | Plexiglas Side Planar Phantom |

13.0 VALIDATION PLANAR PHANTOM

| | |
|---|---|
| <p>The validation planar phantom is constructed of Plexiglas material with a 6.0 mm shell thickness for system validations at 450 MHz and below. The validation planar phantom is mounted to the table of the DASY4 compact system.</p> |  |
| | Plexiglas Validation Planar Phantom |

14.0 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 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.</p> |  |
| | Device Holder |

| | | | | | | |
|-------------------------|--|----------------------------------|------------------|----------------------|------------------|----------------|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 | KENWOOD |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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15.0 TEST EQUIPMENT LIST

| USED | TEST EQUIPMENT | | ASSET NO. | SERIAL NO. | DATE CALIBRATED | | CALIBRATION DUE DATE |
|------|---|----------|-----------|------------|-----------------|---------|----------------------|
| | DESCRIPTION | | | | Brain | Body | |
| x | Schmid & Partner DASy4 System | | - | - | - | - | - |
| x | -DASy4 Measurement Server | | 00158 | 1078 | N/A | N/A | N/A |
| x | -Robot | | 00046 | 599396-01 | N/A | N/A | N/A |
| x | -DAE4 | | 00019 | 353 | 21Jun06 | 21Jun07 | 21Jun07 |
| | -DAE3 | | 00018 | 370 | 13Mar07 | 13Mar08 | 13Mar08 |
| x | -ET3DV6 E-Field Probe | | 00016 | 1387 | 16Mar07 | 16Mar08 | 16Mar08 |
| | -EX3DV4 E-Field Probe | | 00213 | 3600 | 24Jan07 | 24Jan08 | 24Jan08 |
| | -300 MHz Validation Dipole | | 00023 | 135 | 08Jun07 | 08Jun08 | 08Jun08 |
| x | -450 MHz Validation Dipole | | 00024 | 136 | 07Jun07 | 07Jun08 | 07Jun08 |
| | -835 MHz Validation Dipole | | 00022 | 411 | Brain | 07Jun07 | 07Jun08 |
| | | | | | Body | 07Jun07 | 07Jun08 |
| | -900 MHz Validation Dipole | | 00020 | 054 | Brain | 07Jun07 | 07Jun08 |
| | | | | | Body | 07Jun07 | 07Jun08 |
| | -1640 MHz Validation Dipole | | 00212 | 0175 | Brain | 14Aug06 | 14Aug07 |
| | -1800 MHz Validation Dipole | | 00021 | 247 | Brain | 06Jun07 | 06Jun08 |
| | | | | | Body | 06Jun07 | 06Jun08 |
| | -1900 MHz Validation Dipole | | 00032 | 151 | Brain | 06Jun07 | 06Jun08 |
| | | | | | Body | 06Jun07 | 06Jun08 |
| | -2450 MHz Validation Dipole | | 00025 | 150 | Brain | 08Jun07 | 08Jun08 |
| | | | | | Body | 08Jun07 | 08Jun08 |
| | 5 GHz Validation Dipole | 5200 MHz | 00126 | 1031 | Body | 18May07 | 18May08 |
| | | 5500 MHz | | | Body | 22May07 | 22May08 |
| | | 5800 MHz | | | Brain | 09May07 | 09May08 |
| | | | | | Body | 10May07 | 10May08 |
| | -SAM Phantom V4.0C | | 00154 | 1033 | N/A | N/A | N/A |
| | -Barski Planar Phantom | | 00155 | 03-01 | N/A | N/A | N/A |
| x | -Plexiglas Side Planar Phantom | | 00156 | 161 | N/A | N/A | N/A |
| x | -Plexiglas Validation Planar Phantom | | 00157 | 137 | N/A | N/A | N/A |
| x | ALS-PR-DIEL Dielectric Probe Kit | | 00160 | 260-00953 | N/A | N/A | N/A |
| x | Gigatronics 8652A Power Meter | | 00007 | 1835272 | 26Mar07 | 26Mar08 | 26Mar08 |
| | Gigatronics 8652A Power Meter | | 00008 | 1835267 | 22Jan07 | 22Jan08 | 22Jan08 |
| | Gigatronics 80701A Power Sensor | | 00012 | 1834350 | 22Jan07 | 22Jan08 | 22Jan08 |
| x | Gigatronics 80701A Power Sensor | | 00014 | 1833699 | 22Jan07 | 22Jan08 | 22Jan08 |
| x | Gigatronics 80701A Power Sensor | | 00109 | 1834366 | 26Mar07 | 26Mar08 | 26Mar08 |
| x | HP 8753ET Network Analyzer | | 00134 | US39170292 | 20Apr07 | 20Apr08 | 20Apr08 |
| x | HP 8648D Signal Generator | | 00005 | 3847A00611 | NCR | NCR | NCR |
| | Rohde & Schwarz SMR20 Signal Generator | | 00006 | 100104 | NCR | NCR | NCR |
| x | Amplifier Research 5S1G4 Power Amplifier | | 00106 | 26235 | NCR | NCR | NCR |
| | Amplifier Research 10W1000C Power Amplifier | | 00041 | 27887 | NCR | NCR | NCR |
| | HP E4408B Spectrum Analyzer | | 00015 | US39240170 | 05Feb07 | 05Feb08 | 05Feb08 |

16.0 MEASUREMENT UNCERTAINTIES



| UNCERTAINTY BUDGET FOR DEVICE EVALUATION | | | | | | |
|--|-------------------------|--------------------------|-------------|----------|------------------------------|------------------------------------|
| Error Description | Uncertainty Value ±% | Probability Distribution | Divisor | ci 1g | Uncertainty Value ±% (1g) | V _i or V _{eff} |
| Measurement System | | | | | | |
| Probe calibration (450 MHz) | 8.0 | Normal | 1 | 1 | 8.0 | ∞ |
| Axial isotropy of the probe | 4.7 | Rectangular | 1.732050808 | 0.7 | 1.9 | ∞ |
| Spherical isotropy of the probe | 9.6 | Rectangular | 1.732050808 | 0.7 | 3.9 | ∞ |
| Spatial resolution | 0 | Rectangular | 1.732050808 | 1 | 0.0 | ∞ |
| Boundary effects | 1 | Rectangular | 1.732050808 | 1 | 0.6 | ∞ |
| Probe linearity | 4.7 | Rectangular | 1.732050808 | 1 | 2.7 | ∞ |
| Detection limit | 1 | Rectangular | 1.732050808 | 1 | 0.6 | ∞ |
| Readout electronics | 0.3 | Normal | 1 | 1 | 0.3 | ∞ |
| Response time | 0.8 | Rectangular | 1.732050808 | 1 | 0.5 | ∞ |
| Integration time | 2.6 | Rectangular | 1.732050808 | 1 | 1.5 | ∞ |
| RF ambient conditions | 3 | Rectangular | 1.732050808 | 1 | 1.7 | ∞ |
| Mech. constraints of robot | 0.4 | Rectangular | 1.732050808 | 1 | 0.2 | ∞ |
| Probe positioning | 2.9 | Rectangular | 1.732050808 | 1 | 1.7 | ∞ |
| Extrapolation & integration | 1 | Rectangular | 1.732050808 | 1 | 0.6 | ∞ |
| Test Sample Related | | | | | | |
| 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 | ∞ |
| Phantom and Setup | | | | | | |
| Phantom uncertainty | 4 | Rectangular | 1.732050808 | 1 | 2.3 | ∞ |
| Liquid conductivity (target) | 5 | Rectangular | 1.732050808 | 0.64 | 1.8 | ∞ |
| Liquid conductivity (measured) | 5 | Normal | 1 | 0.64 | 3.2 | ∞ |
| Liquid permittivity (target) | 5 | Rectangular | 1.732050808 | 0.6 | 1.7 | ∞ |
| Liquid permittivity (measured) | 5 | Normal | 1 | 0.6 | 3.0 | ∞ |
| Combined Standard Uncertainty | | | | | 12.65 | |
| Expanded Uncertainty (k=2) | | | | | 25.31 | |

Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [3])

MEASUREMENT UNCERTAINTIES (Cont.)


| UNCERTAINTY BUDGET FOR SYSTEM VALIDATION | | | | | | |
|--|-------------------------|--------------------------|-------------|----------|------------------------------|------------------------------------|
| Error Description | Uncertainty Value ±% | Probability Distribution | Divisor | ci 1g | Uncertainty Value ±% (1g) | V _i or V _{eff} |
| Measurement System | | | | | | |
| Probe calibration (450 MHz) | 8.0 | Normal | 1 | 1 | 8.0 | ∞ |
| Axial isotropy of the probe | 4.7 | Rectangular | 1.732050808 | 1 | 2.7 | ∞ |
| Spherical isotropy of the probe | 0 | Rectangular | 1.732050808 | 1 | 0.0 | ∞ |
| Spatial resolution | 0 | Rectangular | 1.732050808 | 1 | 0.0 | ∞ |
| Boundary effects | 1 | Rectangular | 1.732050808 | 1 | 0.6 | ∞ |
| Probe linearity | 4.7 | Rectangular | 1.732050808 | 1 | 2.7 | ∞ |
| Detection limit | 1 | Rectangular | 1.732050808 | 1 | 0.6 | ∞ |
| Readout electronics | 0.3 | Normal | 1 | 1 | 0.3 | ∞ |
| Response time | 0 | Rectangular | 1.732050808 | 1 | 0.0 | ∞ |
| Integration time | 0 | Rectangular | 1.732050808 | 1 | 0.0 | ∞ |
| RF ambient conditions | 3 | Rectangular | 1.732050808 | 1 | 1.7 | ∞ |
| Mech. constraints of robot | 0.4 | Rectangular | 1.732050808 | 1 | 0.2 | ∞ |
| Probe positioning | 2.9 | Rectangular | 1.732050808 | 1 | 1.7 | ∞ |
| Extrapolation & integration | 1 | Rectangular | 1.732050808 | 1 | 0.6 | ∞ |
| Test Sample Related | | | | | | |
| Dipole Positioning | 2 | Normal | 1.732050808 | 1 | 1.2 | ∞ |
| Power & Power Drift | 4.7 | Normal | 1.732050808 | 1 | 2.7 | ∞ |
| Phantom and Setup | | | | | | |
| Phantom uncertainty | 4 | Rectangular | 1.732050808 | 1 | 2.3 | ∞ |
| Liquid conductivity (target) | 5 | Rectangular | 1.732050808 | 0.64 | 1.8 | ∞ |
| Liquid conductivity (measured) | 5 | Normal | 1 | 0.64 | 3.2 | ∞ |
| Liquid permittivity (target) | 5 | Rectangular | 1.732050808 | 0.6 | 1.7 | ∞ |
| Liquid permittivity (measured) | 5 | Normal | 1 | 0.6 | 3.0 | ∞ |
| Combined Standard Uncertainty | | | | | 11.20 | |
| Expanded Uncertainty (k=2) | | | | | 22.39 | |



Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [3])

| | | | | |
|--|--|---|--|--|
|  | <u>Date(s) of Evaluation</u> June 13, 2007 | <u>Test Report Serial No.</u> 061207ALH-T836-S90U | <u>Report Revision No.</u> Revision 1.0 |  |
| | <u>Test Report Issue Date</u> June 20, 2007 | <u>Description of Test(s)</u> Specific Absorption Rate | <u>RF Exposure Category</u> Occupational (Controlled) | |

17.0 REFERENCES



- [1] Federal Communications Commission - "Radiofrequency radiation exposure evaluation: portable devices", Rule Part 47 CFR §2.1093: 1999.
- [2] Federal Communications Commission - "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.
- [3] 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.
- [4] ANSI/IEEE C95.1-2005 - "American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz", New York: IEEE, April 2006.

| | | | | | | |
|-------------------------|--|----------------------------------|------------------|----------------------|------------------|---|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 |  |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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| | | | | |
|--|--|---|--|--|
|  | <u>Date(s) of Evaluation</u> June 13, 2007 | <u>Test Report Serial No.</u> 061207ALH-T836-S90U | <u>Report Revision No.</u> Revision 1.0 |  |
| | <u>Test Report Issue Date</u> June 20, 2007 | <u>Description of Test(s)</u> Specific Absorption Rate | <u>RF Exposure Category</u> Occupational (Controlled) | |

APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

| | | | | | | |
|-------------------------|--|----------------------------------|------------------|----------------------|------------------|----------------|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 | KENWOOD |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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| | | | | |
|--|--|---|--|--|
|  | <u>Date(s) of Evaluation</u> June 13, 2007 | <u>Test Report Serial No.</u> 061207ALH-T836-S90U | <u>Report Revision No.</u> Revision 1.0 |  |
| | <u>Test Report Issue Date</u> June 20, 2007 | <u>Description of Test(s)</u> Specific Absorption Rate | <u>RF Exposure Category</u> Occupational (Controlled) | |

Date Tested: 06/13/2007

System Performance Check - 450 MHz Dipole

DUT: Dipole 450 MHz; Asset: 00024; Serial: 136; Validation: 06/07/2007

Ambient Temp: 24.2°C; Fluid Temp: 23.0°C; Barometric Pressure: 97.0 kPa; Humidity: 31%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used: $f = 450 \text{ MHz}$; $\sigma = 0.91 \text{ mho/m}$; $\epsilon_r = 44.5$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7, 7, 7); Calibrated: 16/03/2007

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

- Electronics: DAE4 Sn353; Calibrated: 21/06/2006

- Phantom: Validation Planar; Type: Plexiglas; Serial: 137

- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

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

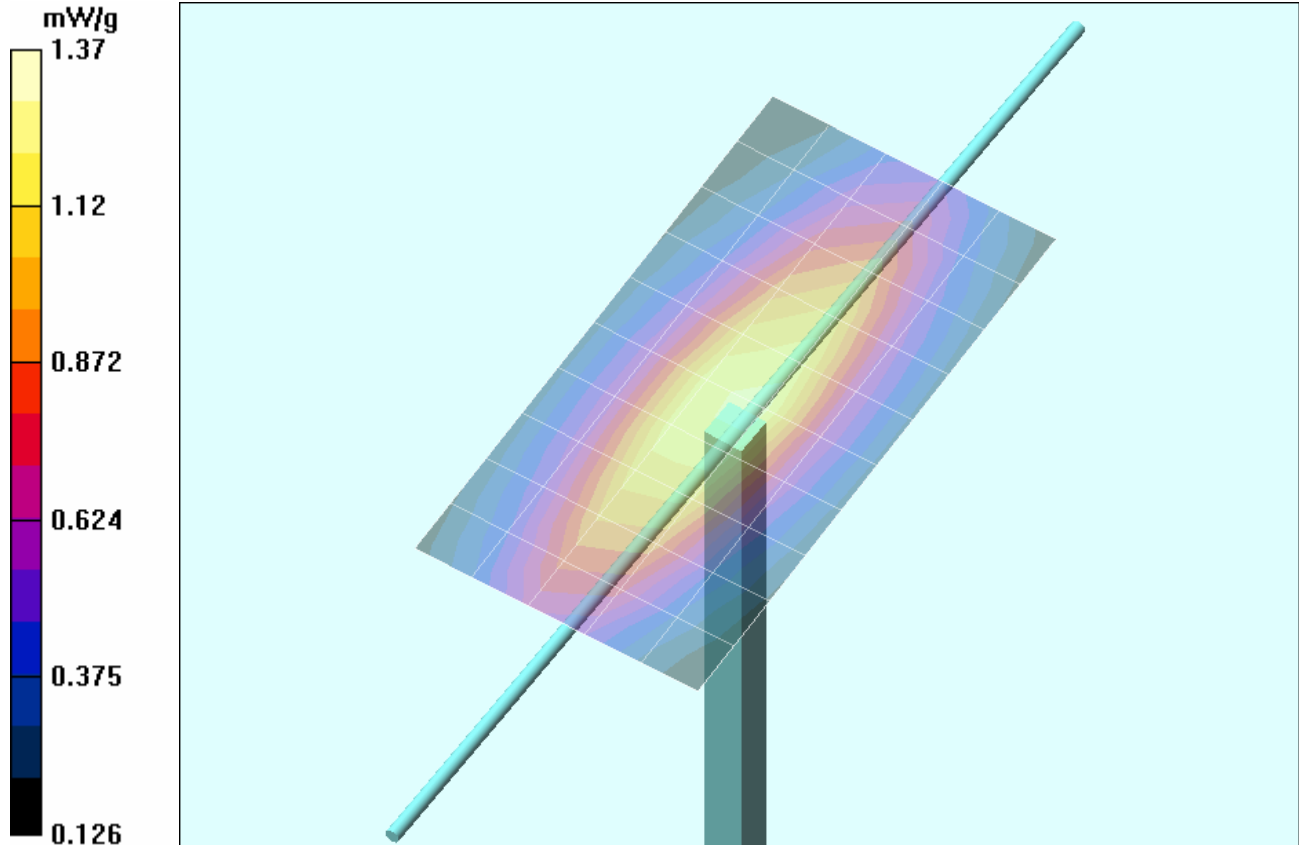
Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$


Reference Value = 38.6 V/m; Power Drift = 0.059 dB

Peak SAR (extrapolated) = 2.30 W/kg

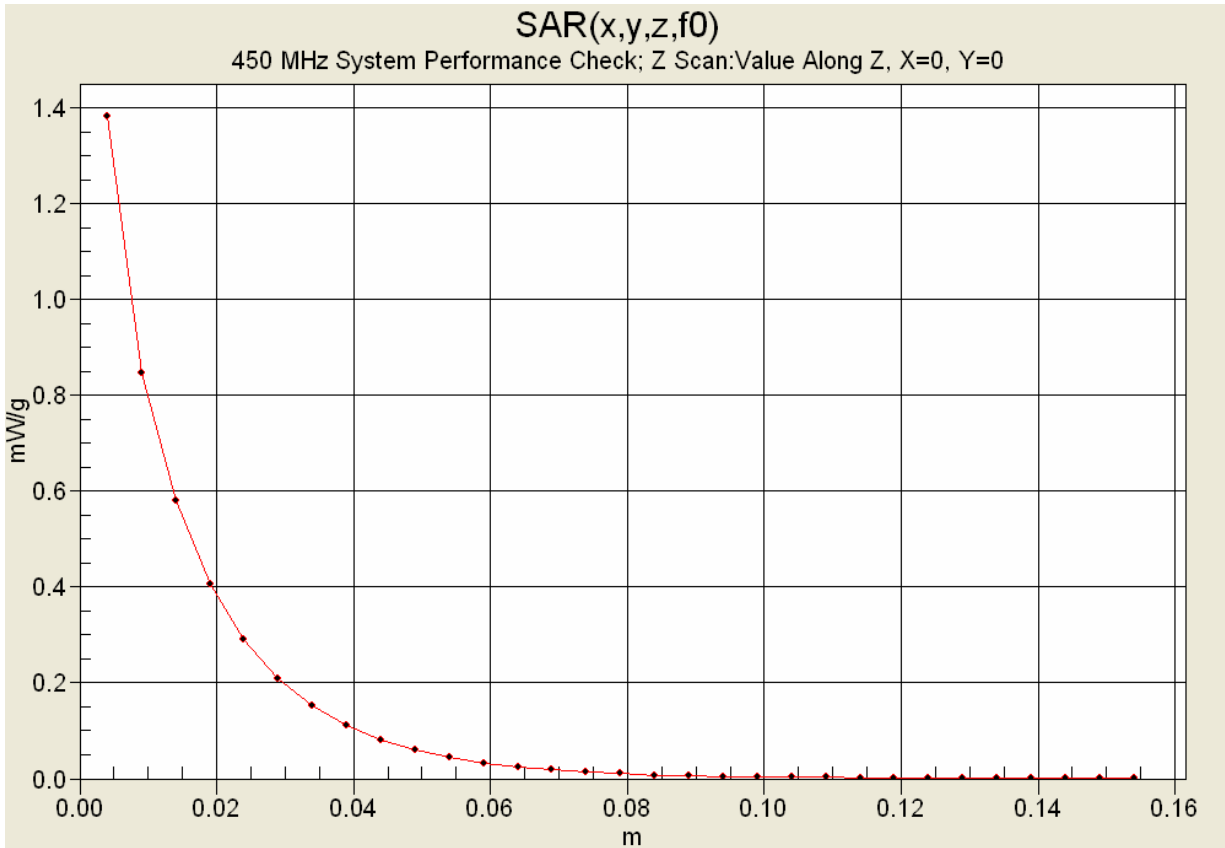
SAR(1 g) = 1.30 mW/g; SAR(10 g) = 0.832 mW/g



Maximum value of SAR (measured) = 1.37 mW/g



| | | | | | | |
|-------------------------|--|----------------------------------|---------------|----------------|-----------|---|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 |  |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | 460 - 470 MHz | | | |
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Z-Axis Scan



| | | | | |
|--|--|---|--|--|
|  | <u>Date(s) of Evaluation</u> June 13, 2007 | <u>Test Report Serial No.</u> 061207ALH-T836-S90U | <u>Report Revision No.</u> Revision 1.0 |  |
| | <u>Test Report Issue Date</u> June 20, 2007 | <u>Description of Test(s)</u> Specific Absorption Rate | <u>RF Exposure Category</u> Occupational (Controlled) | |

APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS


| | | | | | | |
|-------------------------|--|----------------------------------|------------------|----------------------|------------------|----------------|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 | KENWOOD |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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|--|--|---|--|--|
|  | <u>Date(s) of Evaluation</u> June 13, 2007 | <u>Test Report Serial No.</u> 061207ALH-T836-S90U | <u>Report Revision No.</u> Revision 1.0 |  |
| | <u>Test Report Issue Date</u> June 20, 2007 | <u>Description of Test(s)</u> Specific Absorption Rate | <u>RF Exposure Category</u> Occupational (Controlled) | |

450 MHz System Performance Check & DUT Evaluation (Brain)

Celltech Labs Inc.
 Test Result for UIM Dielectric Parameter
 Wed 13/Jun/2007
 Frequency (GHz)
 FCC_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
 FCC_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma
 Test_e Epsilon of UIM
 Test_s Sigma of UIM

| Freq | FCC_eHFCC | sHFCC | Test_e | Test_s |
|--------|-----------|-------|--------|--------|
| 0.3500 | 44.70 | 0.87 | 46.99 | 0.83 |
| 0.3600 | 44.58 | 0.87 | 46.64 | 0.83 |
| 0.3700 | 44.46 | 0.87 | 46.36 | 0.84 |
| 0.3800 | 44.34 | 0.87 | 45.86 | 0.85 |
| 0.3900 | 44.22 | 0.87 | 45.77 | 0.86 |
| 0.4000 | 44.10 | 0.87 | 45.78 | 0.87 |
| 0.4100 | 43.98 | 0.87 | 45.38 | 0.88 |
| 0.4200 | 43.86 | 0.87 | 45.19 | 0.88 |
| 0.4300 | 43.74 | 0.87 | 44.97 | 0.89 |
| 0.4400 | 43.62 | 0.87 | 44.83 | 0.90 |
| 0.4500 | 43.50 | 0.87 | 44.46 | 0.91 |
| 0.4600 | 43.45 | 0.87 | 44.35 | 0.92 |
| 0.4700 | 43.40 | 0.87 | 44.07 | 0.92 |
| 0.4800 | 43.34 | 0.87 | 43.95 | 0.93 |
| 0.4900 | 43.29 | 0.87 | 43.61 | 0.94 |
| 0.5000 | 43.24 | 0.87 | 43.54 | 0.95 |
| 0.5100 | 43.19 | 0.87 | 43.20 | 0.96 |
| 0.5200 | 43.14 | 0.88 | 43.09 | 0.97 |
| 0.5300 | 43.08 | 0.88 | 42.82 | 0.98 |
| 0.5400 | 43.03 | 0.88 | 42.82 | 0.98 |
| 0.5500 | 42.98 | 0.88 | 42.54 | 0.99 |


| | | | | | | |
|-------------------------|--|----------------------------------|------------------|----------------------|------------------|---|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 |  |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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| | | | | |
|--|--|---|--|--|
|  | <u>Date(s) of Evaluation</u> June 13, 2007 | <u>Test Report Serial No.</u> 061207ALH-T836-S90U | <u>Report Revision No.</u> Revision 1.0 |  |
| | <u>Test Report Issue Date</u> June 20, 2007 | <u>Description of Test(s)</u> Specific Absorption Rate | <u>RF Exposure Category</u> Occupational (Controlled) | |

450 MHz DUT Evaluation (Body)

Celltech Labs Inc.
 Test Result for UIM Dielectric Parameter
 Wed 13/Jun/2007
 Frequency (GHz)
 FCC_eHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon
 FCC_sHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
 FCC_eB FCC Limits for Body Epsilon
 FCC_sB FCC Limits for Body Sigma
 Test_e Epsilon of UIM
 Test_s Sigma of UIM

| Freq | FCC_eB | FCC_sB | Test_e | Test_s |
|---------------|--------------|-------------|--------------|-------------|
| 0.3500 | 57.70 | 0.93 | 58.21 | 0.86 |
| 0.3600 | 57.60 | 0.93 | 57.95 | 0.87 |
| 0.3700 | 57.50 | 0.93 | 57.86 | 0.88 |
| 0.3800 | 57.40 | 0.93 | 57.58 | 0.88 |
| 0.3900 | 57.30 | 0.93 | 57.50 | 0.89 |
| 0.4000 | 57.20 | 0.93 | 57.52 | 0.89 |
| 0.4100 | 57.10 | 0.93 | 57.17 | 0.90 |
| 0.4200 | 57.00 | 0.94 | 57.02 | 0.91 |
| 0.4300 | 56.90 | 0.94 | 56.83 | 0.92 |
| 0.4400 | 56.80 | 0.94 | 56.95 | 0.93 |
| 0.4500 | 56.70 | 0.94 | 56.60 | 0.93 |
| 0.4600 | 56.66 | 0.94 | 56.55 | 0.94 |
| 0.4700 | 56.62 | 0.94 | 56.42 | 0.95 |
| 0.4800 | 56.58 | 0.94 | 56.33 | 0.96 |
| 0.4900 | 56.54 | 0.94 | 56.06 | 0.96 |
| 0.5000 | 56.51 | 0.94 | 56.03 | 0.96 |
| 0.5100 | 56.47 | 0.94 | 55.91 | 0.98 |
| 0.5200 | 56.43 | 0.95 | 55.97 | 0.99 |
| 0.5300 | 56.39 | 0.95 | 55.61 | 0.99 |
| 0.5400 | 56.35 | 0.95 | 55.57 | 1.00 |
| 0.5500 | 56.31 | 0.95 | 55.30 | 1.01 |

| | | | | | | |
|-------------------------|--|----------------------------------|------------------|----------------------|------------------|---|
| Company: | Kenwood USA Corporation | Model(s): | TK-3230-K | FCC ID: | ALH383200 |  |
| DUT Type: | Portable FM UHF PTT Radio Transceiver | Transmit Frequency Range: | | 460 - 470 MHz | | |
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