




	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

<b>SAR TEST REPORT (FCC/IC)</b>			
<b>RF EXPOSURE EVALUATION</b>		<b>SPECIFIC ABSORPTION RATE</b>	
<b>APPLICANT</b>	<b>KENWOOD USA CORPORATION</b>		
<b>DEVICE UNDER TEST (DUT)</b>	<b>PORTABLE FM UHF PTT RADIO TRANSCEIVER (470-490 MHz)</b>		
<b>DEVICE MODEL(S)</b>	<b>TK-3102G-2</b>		
<b>DEVICE IDENTIFIER(S)</b>	<b>FCC ID: ALH30923120</b>		
<b>APPLICATION TYPE</b>	<b>Certification</b>		
<b>STANDARD(S) APPLIED</b>	<b>FCC 47 CFR §2.1093</b>		
	<b>Health Canada Safety Code 6</b>		
<b>PROCEDURE(S) APPLIED</b>	<b>FCC OET Bulletin 65, Supplement C (01-01)</b>		
	<b>Industry Canada RSS-102 Issue 2</b>		
	<b>IEEE 1528-2003</b>		
<b>FCC DEVICE CLASSIFICATION</b>	<b>Licensed Non-Broadcast Transmitter Held to Face (TNF)</b>		
<b>IC DEVICE CLASSIFICATION</b>	<b>Land Mobile Radio Transmitter/Receiver (27.41-960 MHz)</b>		
<b>RF EXPOSURE CATEGORY</b>	<b>Occupational / Controlled</b>		
<b>RF EXPOSURE EVALUATION(S)</b>	<b>Face-held &amp; Body-worn</b>		
<b>DATE(S) OF EVALUATION(S)</b>	<b>June 09-11, 2008</b>		
<b>TEST REPORT SERIAL NO.</b>	<b>060608ALH-T911-S90U</b>		
<b>TEST REPORT REVISION NO.</b>	<b>Revision 1.1</b>	<b>FCC ID Correction</b>	<b>August 29, 2008</b>
	<b>Revision 1.0</b>	<b>Initial Release</b>	<b>June 20, 2008</b>
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<b>TEST LAB ACCREDITATION(S)</b>	 Test Lab Certificate No. 2470.01		

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

## DECLARATION OF COMPLIANCE SAR RF EXPOSURE EVALUATION

<b>Test Lab Information</b>	<b>Name</b>	<b>CELLTECH LABS INC.</b>				
	<b>Address</b>	21-364 Lougheed Road, Kelowna, British Columbia V1X 7R8 Canada				
<b>Applicant Information</b>	<b>Name</b>	<b>KENWOOD USA CORPORATION</b>				
	<b>Address</b>	3975 John Creek Court, Suite 300, Suwanee, GA 30024 United States				
<b>Standard(s) Applied</b>	<b>FCC</b>	47 CFR §2.1093				
	<b>IC</b>	Health Canada Safety Code 6				
<b>Procedure(s) Applied</b>	<b>FCC</b>	OET Bulletin 65, Supplement C (Edition 01-01)				
	<b>IC</b>	RSS-102 Issue 2				
	<b>IEEE</b>	1528-2003				
<b>Device Classification(s)</b>	<b>FCC</b>	Licensed Non-Broadcast Transmitter Held to Face (TNF)				
	<b>IC</b>	Land Mobile Radio Transmitter/Receiver (27.41-960 MHz)				
<b>Device RF Exposure Category</b>	<b>Portable</b>	Occupational / Controlled Environment				
<b>Device Identifier(s)</b>	<b>FCC ID:</b>	ALH30923120				
	<b>Model(s)</b>	TK-3102G-2				
	<b>Serial No.</b>	00101581 (Identical Prototype)				
<b>Device Description</b>	Portable FM UHF Push-to-Talk (PTT) Radio Transceiver					
<b>Transmit Frequency Range(s)</b>	470 - 490 MHz					
<b>Max. RF Output Power Tested</b>	4.5 Watts	36.5 dBm	470 MHz	Low Channel	Conducted	
	4.5 Watts	36.5 dBm	480 MHz	Mid Channel	Conducted	
	4.5 Watts	36.5 dBm	490 MHz	High Channel	Conducted	
<b>Antenna Type(s) Tested</b>	Stubby	450 - 490 MHz	Length: 80 mm		P/N: KRA-23M	
	Whip	440 - 490 MHz	Length: 149 mm		P/N: KRA-27M	
<b>Battery Type(s) Tested</b>	Ni-MH	7.2 V	1600 mAh		P/N: KNB-20N	
	Ni-Cd	7.2 V	1100 mAh		P/N: KNB-15A	
	Ni-Cd	7.2 V	600 mAh		P/N: KNB-14	
	Alkaline AA (x6)	9.0 V	Duracell Procell		P/N: KBP-1	
<b>Body-worn Accessories Tested</b>	Belt-Clip	1.5 cm Spacing	Contains Plastic and Metal		P/N: KBH-10	
<b>Audio Accessories Tested</b>	Speaker-Microphone				P/N: KMC-8A	
<b>Max. SAR Level(s) Evaluated</b>	Face-held	<b>2.88 W/kg</b>	1g	50% duty cycle	Occupational / Controlled Exposure	
	Body-worn	<b>4.68 W/kg</b>	1g	50% duty cycle	Occupational / Controlled Exposure	
<b>FCC/IC Spatial Peak SAR Limit</b>	Head/Body	8.0 W/kg	1g	Occupational / Controlled Exposure Environment		
<p>Celltech Labs Inc. declares under its sole responsibility that this wireless portable device has demonstrated compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC 47 CFR §2.1093 and Health Canada's Safety Code 6 for the Occupational / Controlled Exposure environment. 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 1528-2003. All measurements were performed in accordance with the SAR system manufacturer recommendations.</p> <p>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.</p> <p>The results and statements contained in this report pertain only to the device(s) evaluated.</p> <p>This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc.</p>						
<b>Test Report Approved By</b>			<b>Sean Johnston</b>	<b>Celltech Labs Inc.</b>		
						

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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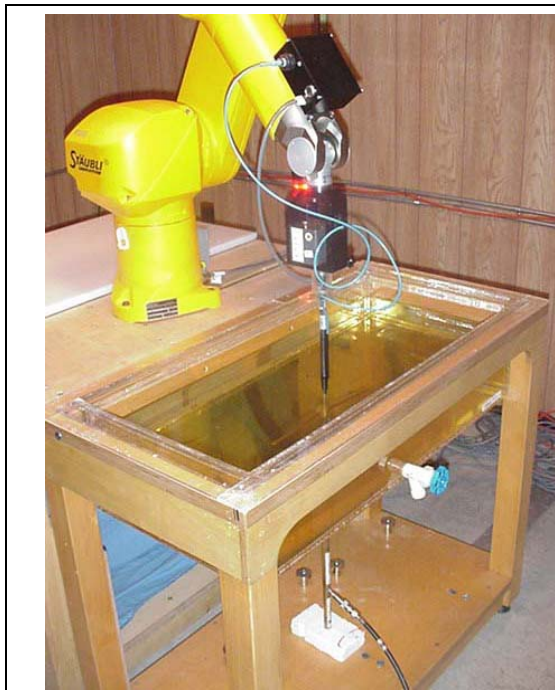
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	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

## 1.0 INTRODUCTION

This measurement report demonstrates that the Kenwood USA Corporation Model: TK-3102G-2 Portable 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]), IC RSS-102 Issue 2 (see reference [4]) and IEEE 1528-2003 (see reference [5]) 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 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 System with Plexiglas validation phantom**



**DASY4 SAR System with Plexiglas side planar phantom**

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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### 3.0 MEASUREMENT SUMMARY

#### SAR EVALUATION RESULTS

Test Type	Test Date	Freq.	Ch.	Test Mode	Antenna Part No.	Battery Type	Accessory Type(s)	Device Spacing to Planar Phantom	Cond. Power Before Test	Measured SAR 1g (W/kg)		SAR Drift During Test	Scaled SAR with droop 1g (W/kg)		
										Duty Cycle			Duty Cycle		
		MHz								100%	50%	100%	50%		
Face	Jun 10	480.0	Mid	CW	KRA-27M	NiCd 600	n/a	2.5	4.5	3.94	1.97	-0.826	4.77	2.38	
Face	Jun 10	480.0	Mid	CW	KRA-27M	NiCd 1100	n/a	2.5	4.5	4.13	2.07	-0.686	4.84	2.42	
Face	Jun 10	480.0	Mid	CW	KRA-27M	NiMH 1600	n/a	2.5	4.5	4.50	2.25	-0.664	5.24	2.62	
Face	Jun 11	480.0	Mid	CW	KRA-27M	Alkaline AA	n/a	2.5	4.5	4.46	2.23	-1.11	5.76	2.88	
Face	Jun 11	480.0	Mid	CW	KRA-23M	NiCd 600	n/a	2.5	4.5	4.24	2.12	-0.619	4.89	2.44	
Face	Jun 11	480.0	Mid	CW	KRA-23M	NiCd 1100	n/a	2.5	4.5	4.29	2.15	-0.534	4.85	2.43	
Face	Jun 11	480.0	Mid	CW	KRA-23M	NiMH 1600	n/a	2.5	4.5	4.28	2.14	-0.545	4.85	2.43	
Face	Jun 11	480.0	Mid	CW	KRA-23M	Alkaline AA	n/a	2.5	4.5	4.23	2.12	-0.671	4.94	2.47	
Body	Jun 9	480.0	Mid	CW	KRA-27M	NiCd 600	BC & SM	1.5	4.5	6.65	3.33	-0.800	8.00	4.00	
Body	Jun 9	480.0	Mid	CW	KRA-27M	NiCd 1100	BC & SM	1.5	4.5	7.59	3.80	-0.674	8.86	4.43	
Body	Jun 9	480.0	Mid	CW	KRA-27M	NiMH 1600	BC & SM	1.5	4.5	7.10	3.55	-0.468	7.91	3.95	
Body	Jun 9	480.0	Mid	CW	KRA-27M	Alkaline AA	BC & SM	1.5	4.5	7.01	3.51	-0.862	8.55	4.27	
Body	Jun 9	480.0	Mid	CW	KRA-23M	NiCd 600	BC & SM	1.5	4.5	6.57	3.29	-0.493	7.36	3.68	
Body	Jun 9	480.0	Mid	CW	KRA-23M	NiCd 1100	BC & SM	1.5	4.5	6.83	3.42	-0.298	7.32	3.66	
Body	Jun 9	480.0	Mid	CW	KRA-23M	NiMH 1600	BC & SM	1.5	4.5	6.92	3.46	-0.416	7.62	3.81	
Body	Jun 9	480.0	Mid	CW	KRA-23M	Alkaline AA	BC & SM	1.5	4.5	6.61	3.31	-0.751	7.86	3.93	
Body	Jun 9	470.0	Low	CW	KRA-27M	NiCd 1100	BC & SM	1.5	4.5	8.26	4.13	-0.545	9.36	4.68	
Body	Jun 9	490.0	High	CW	KRA-27M	NiCd 1100	BC & SM	1.5	4.5	7.29	3.65	-0.711	8.59	4.29	
<b>SAR LIMIT(S)</b>					<b>BRAIN &amp; BODY</b>			<b>SPATIAL PEAK</b>			<b>RF EXPOSURE CATEGORY</b>				
<b>FCC 47 CFR 2.1093</b>		<b>Health Canada Safety Code 6</b>			<b>8.0 W/kg</b>			<b>averaged over 1 gram</b>			<b>Occupational / Controlled</b>				
<b>Test Date(s)</b>	June 09, 2008				June 10 & 11, 2008				<b>Measurement Date</b>		<b>Jun 9</b>	<b>Jun 10</b>	<b>Jun 11</b>	<b>Unit</b>	
<b>Fluid Type</b>	<b>480 MHz Body</b>				<b>480 MHz Brain</b>				<b>Atmospheric Pressure</b>		101.2	100.9	101.1	kPa	
<b>Dielectric Constant <math>\epsilon_r</math></b>	<b>IEEE Target</b>		<b>Meas.</b>	<b>Dev.</b>	<b>IEEE Target</b>		<b>Date</b>	<b>Meas.</b>	<b>Dev.</b>	<b>Relative Humidity</b>		32	33	32	%
	56.6	$\pm 5\%$	58.1	+2.7%	43.3	$\pm 5\%$	Jun 10	42.5	-1.8%	<b>Ambient Temperature</b>		24.0	23.8	23.3	°C
							Jun 11	41.9	-3.2%	<b>Fluid Temperature</b>		21.2	22.3	22.7	°C
<b>Conductivity <math>\sigma</math> (mho/m)</b>	<b>IEEE Target</b>		<b>Meas.</b>	<b>Dev.</b>	<b>IEEE Target</b>		<b>Date</b>	<b>Meas.</b>	<b>Dev.</b>	<b>Fluid Depth</b>		$\geq 15$	$\geq 15$	$\geq 15$	cm
	0.94	$\pm 5\%$	0.92	-2.1%	0.87	$\pm 5\%$	Jun 10	0.89	+2.3%	<b><math>\rho</math> (Kg/m<sup>3</sup>)</b>		1000			
							Jun 11	0.88	+1.2%						

**Note(s)**

- Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
- The area scan evaluation was performed with a fully charged battery. After the area scan was completed the radio was cooled down and the battery was replaced with a fully charged battery prior to the zoom scan evaluation.
- The power droop of the DUT measured by the DASY4 system for the duration of the SAR evaluations was added to the measured SAR level to report scaled SAR results as shown in the above test data table.
- A SAR-versus-Time power droop evaluation was performed in the test configuration that reported the maximum scaled SAR level. See Appendix A (SAR Test Plots) for SAR-versus-Time power droop evaluation plot.

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## 4.0 DETAILS OF SAR EVALUATION

The Kenwood USA Corporation Model: TK-3102G-2 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)

- The DUT was evaluated in a face-held configuration with the front of the radio placed parallel to the outer surface of the planar phantom. A 2.5 cm spacing was maintained between the front side of the DUT and the outer surface of the planar phantom.
- The DUT was evaluated in a body-worn configuration with the back of the radio placed parallel to the outer surface of the planar phantom. The attached belt-clip accessory was touching the planar phantom and provided a 1.5 cm spacing from the back of the DUT to the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the customer-supplied speaker-microphone accessory connected to the audio port.

### Test Mode & Output Power

- 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.
- The area scan evaluation was performed with a fully charged battery. After the area scan was completed the radio was cooled down and the battery was replaced with a fully charged battery prior to the zoom scan evaluation.
- The conducted power levels were measured prior to the SAR evaluations at the antenna connector of the DUT using a Gigatronics 8652A Universal Power Meter in accordance with the procedures specified in FCC 47 CFR §2.1046 and IC RSS-Gen.

### Test Conditions

- The fluid temperature was measured prior to and after the SAR evaluations to ensure the temperature remained within  $\pm 2^{\circ}\text{C}$  of the fluid temperature reported during the dielectric parameter measurements.
- The dielectric parameters of the simulated tissue mixtures were measured prior to the SAR evaluations using a Dielectric Probe Kit and a Network Analyzer (see Appendix C).
- The SAR evaluations were performed within 24 hours of the system performance check.

## 5.0 EVALUATION PROCEDURES

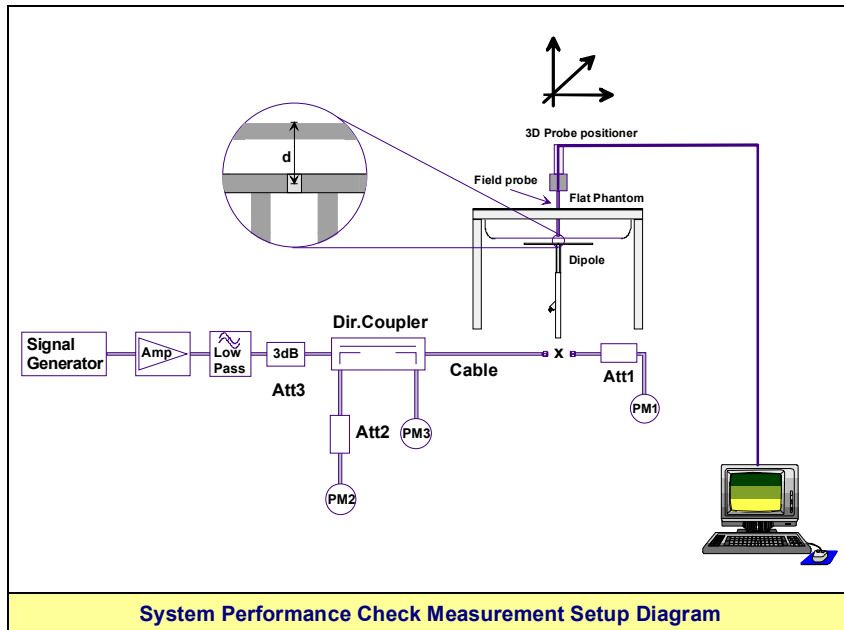
- The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation, both the left and right ear positions were evaluated using the SAM phantom.
  - For body-worn and face-held devices a planar phantom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



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<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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## 6.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluations a system check was performed using a Plexiglas planar phantom and 450 MHz dipole (see Appendix B for system performance check test plot). The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a 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  $\pm 10\%$  from the system validation target SAR value (see Appendix E for system validation procedures).

SYSTEM PERFORMANCE CHECK EVALUATIONS																
Test Date	Equiv. Tissue	SAR 1g (W/kg)			Dielectric Constant $\epsilon_r$			Conductivity $\sigma$ (mho/m)			$\rho$ (Kg/m <sup>3</sup> )	Amb. Temp. (°C)	Fluid Temp. (°C)	Fluid Depth (cm)	Humid. (%)	Barom. Press. (kPa)
		Sys. Val. Target	Meas.	Dev.	Sys. Val. Target	Meas.	Dev.	Sys. Val. Target	Meas.	Dev.						
		MHz														
Jun 9	Brain 450	1.19 $\pm 10\%$	1.27	+6.8%	43.6 $\pm 5\%$	44.3	+1.6%	0.86 $\pm 5\%$	0.89	+3.5%	1000	24.0	22.8	$\geq 15$	32	101.2
Jun 10	Brain 450	1.19 $\pm 10\%$	1.21	+1.7%	43.6 $\pm 5\%$	44.2	+1.4%	0.86 $\pm 5\%$	0.86	0.0%	1000	23.8	22.3	$\geq 15$	33	100.9
Note(s)		1. The target SAR value is referenced from the System Validation procedure performed by Celltech Labs Inc. (see Appendix E). 2. The target dielectric parameters are referenced from the System Validation procedure performed by Celltech Labs Inc. (see Appendix E). 3. The fluid temperature was measured prior to and after the system performance check to ensure the temperature remained within $\pm 2^\circ\text{C}$ of the fluid temperature reported during the dielectric parameter measurements. 4. The SAR evaluations were performed within 24 hours of the system performance check.														



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## 7.0 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 %

## 8.0 SAR LIMITS

SAR RF EXPOSURE LIMITS			
FCC 47 CFR 2.1093	Health Canada Safety Code 6	(General Population / Uncontrolled Exposure)	(Occupational / Controlled Exposure)
Spatial Average (averaged over the whole body)		0.08 W/kg	0.4 W/kg
Spatial Peak (averaged over any 1 g of tissue)		1.6 W/kg	<b>8.0 W/kg</b>
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)		4.0 W/kg	20.0 W/kg
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.			

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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## 9.0 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>Evaluation Phantom</u>	
<b>Type</b>	Side Planar Phantom
<b>Shell Material</b>	Plexiglas
<b>Bottom Thickness</b>	2.0 mm ± 0.1 mm
<b>Outer Dimensions</b>	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>	
<b>Type</b>	Planar Phantom
<b>Shell Material</b>	Plexiglas
<b>Bottom Thickness</b>	6.2 mm ± 0.1 mm
<b>Outer Dimensions</b>	86.0 cm (L) x 39.5 cm (W) x 21.8 cm (H)

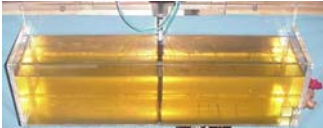
<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	KENWOOD
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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## 10.0 PROBE SPECIFICATION (ET3DV6)

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


## 11.0 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>	
<p><b>Plexiglas Side Planar Phantom</b></p>	



## 12.0 VALIDATION PLANAR PHANTOM

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

## 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 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>	
<p><b>Device Holder</b></p>	

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<b>Model(s):</b> TK-3102G-2	<b>Device Description:</b> Portable FM UHF Push-To-Talk Radio Transceiver		
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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	NA	NA	NA
x	-Robot	00046	599396-01	NA	NA	NA
x	-DAE4	00019	353	22Apr08	22Apr09	22Apr09
	-EX3DV4 E-Field Probe	00213	3600	19Apr08	19Apr09	19Apr09
x	-ET3DV6 E-Field Probe	00016	1387	22Apr08	22Apr09	22Apr09
	-300 MHz Validation Dipole	00023	135	30Apr08	30Apr09	30Apr09
x	-450 MHz Validation Dipole	00024	136	01May08	01May09	01May09
	-835 MHz Validation Dipole	00022	411	Body	02May08	02May09
	-900 MHz Validation Dipole	00020	054	Body	20May08	20May09
	-1800 MHz Validation Dipole	00021	247	Body	22May08	22May09
	-1900 MHz Validation Dipole	00032	151	Body	14May08	14May09
	-2450 MHz Validation Dipole	00025	150	Body	16Jun08	16Jun09
	5GHz Validation Dipole	00126	1031	Body	21Apr08	21Apr09
				Body	21Apr08	21Apr09
				Brain	21Apr08	21Apr09
				Body	21Apr08	21Apr09
	-SAM Phantom V4.0C	00154	1033	NA	NA	NA
	-Barski Planar Phantom	00155	03-01	NA	NA	NA
x	-Plexiglas Side Planar Phantom	00156	161	NA	NA	NA
x	-Plexiglas Validation Planar Phantom	00157	137	NA	NA	NA
	ALS-PR-DIEL Dielectric Probe Kit	00160	260-00953	NA	NA	NA
x	HP 85070C Dielectric Probe Kit	00033	US39240170	NA	NA	NA
x	Gigatronics 8652A Power Meter	00007	1835272	23Apr08	23Apr09	23Apr09
x	Gigatronics 80701A Power Sensor	00014	1833699	23Apr08	23Apr09	23Apr09
x	HP 8753ET Network Analyzer	00134	US39170292	28Apr08	28Apr09	28Apr09
x	Rohde & Schwarz SMR20 Signal Generator	00006	100104	23Apr08	23Apr09	23Apr09
x	Amplifier Research 5S1G4 Power Amplifier	00106	26235	NR	NR	NR
	Amplifier Research 10W1000C Power Amplifier	00041	27887	NR	NR	NR
	Nextec NB00383 Microwave Amplifier	00151	0535	NR	NR	NR
Notes	NA = Not Applicable					
	NR = Not Required					

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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## 15.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION						
Error Description	Uncertainty Value $\pm\%$	Probability Distribution	Divisor	$c_i$ 1g	Uncertainty Value $\pm\%$ (1g)	$V_i$ or $V_{eff}$
<b>Measurement System</b>						
Probe calibration (450 MHz)	6.65	Normal	1	1	6.65	$\infty$
Axial isotropy of the probe	4.7	Rectangular	1.732050808	0.7	1.9	$\infty$
Spherical isotropy of the probe	9.6	Rectangular	1.732050808	0.7	3.9	$\infty$
Spatial resolution	0	Rectangular	1.732050808	1	0.0	$\infty$
Boundary effects	0.9	Rectangular	1.732050808	1	0.5	$\infty$
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	0.8	Rectangular	1.732050808	1	0.5	$\infty$
Integration time	2.6	Rectangular	1.732050808	1	1.5	$\infty$
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>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	$\infty$
<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)	2.3	Normal	1	0.64	1.5	$\infty$
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	$\infty$
Liquid permittivity (measured)	3.2	Normal	1	0.6	1.9	$\infty$
<b>Combined Standard Uncertainty</b>					<b>11.26</b>	
<b>Expanded Uncertainty (k=2)</b>					<b>22.53</b>	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])						



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## MEASUREMENT UNCERTAINTIES (CONT.)

UNCERTAINTY BUDGET FOR SYSTEM VALIDATION						
Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	ci 1g	Uncertainty Value ±% (1g)	V <sub>i</sub> or V <sub>eff</sub>
<b>Measurement System</b>						
Probe calibration (450 MHz)	6.65	Normal	1	1	6.65	∞
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	0.9	Rectangular	1.732050808	1	0.5	∞
Probe linearity	4.7	Rectangular	1.732050808	1	2.7	∞
Detection limit	1	Rectangular	1.732050808	1	0.6	∞
Readout electronics	0.3	Normal	1	1	0.3	∞
Response time	0	Rectangular	1.732050808	1	0.0	∞
Integration time	0	Rectangular	1.732050808	1	0.0	∞
RF ambient conditions	3	Rectangular	1.732050808	1	1.7	∞
Mech. constraints of robot	0.4	Rectangular	1.732050808	1	0.2	∞
Probe positioning	2.9	Rectangular	1.732050808	1	1.7	∞
Extrapolation & integration	1	Rectangular	1.732050808	1	0.6	∞
<b>Dipole</b>						
Dipole Positioning	2	Normal	1.732050808	1	1.2	∞
Power & Power Drift	4.7	Normal	1.732050808	1	2.7	∞
<b>Phantom and Setup</b>						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	3.5	Normal	1	0.64	2.2	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	1.6	Normal	1	0.6	1.0	∞
<b>Combined Standard Uncertainty</b>					<b>9.60</b>	
<b>Expanded Uncertainty (k=2)</b>					<b>19.21</b>	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])						

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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## 16.0 REFERENCES

[1] Federal Communications Commission - "Radiofrequency radiation exposure evaluation: portable devices", Rule Part 47 CFR §2.1093.

[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.



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<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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**APPENDIX A - SAR MEASUREMENT DATA**

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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Date Tested: 06/10/2008

## Face-held SAR - KRA-27M Antenna - NiCd 600mAh Battery - Mid Channel - 480 MHz

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

Ambient Temp: 23.8°C; Fluid Temp: 22.3°C; Barometric Pressure: 100.9 kPa; Humidity: 33%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 480 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.89 \text{ mho/m}$ ;  $\epsilon_r = 42.5$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 3.70 mW/g

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

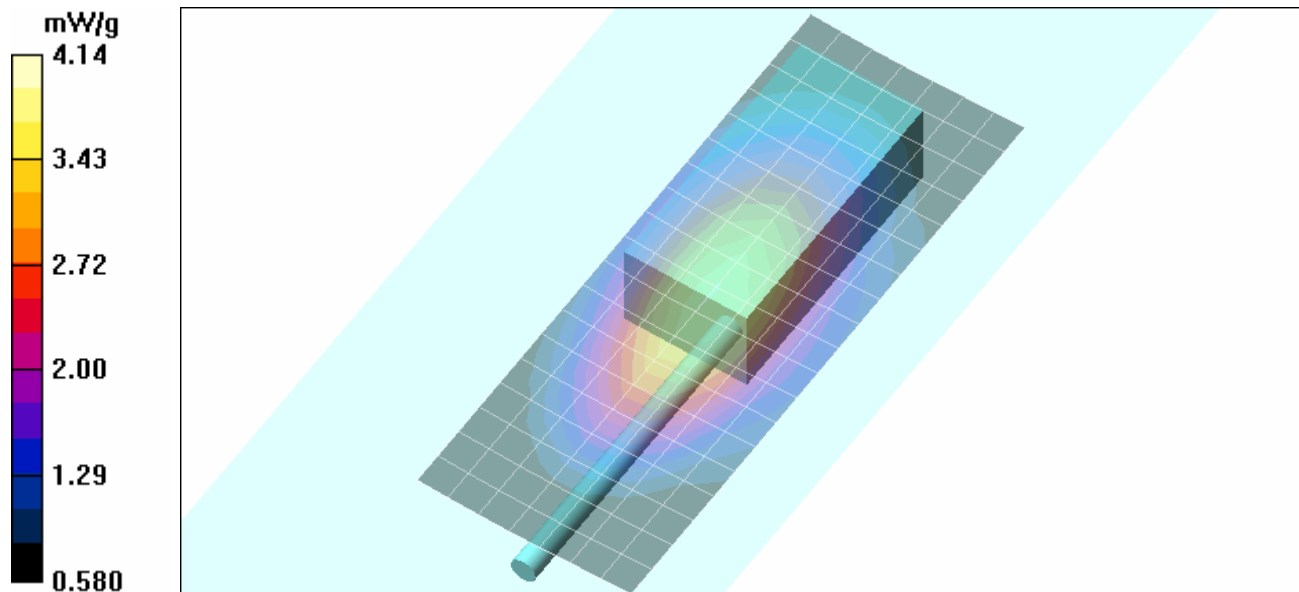
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 71.6 V/m; Power Drift = -0.826 dB



Peak SAR (extrapolated) = 5.51 W/kg

**SAR(1 g) = 3.94 mW/g; SAR(10 g) = 2.88 mW/g**

Maximum value of SAR (measured) = 4.14 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	KENWOOD
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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Date Tested: 06/10/2008

## Face-held SAR - KRA-27M Antenna - NiCd 1100mAh Battery - Mid Channel - 480 MHz

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

Ambient Temp: 23.8°C; Fluid Temp: 22.3°C; Barometric Pressure: 100.9 kPa; Humidity: 33%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 480 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.89 \text{ mho/m}$ ;  $\epsilon_r = 42.5$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008

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

- Electronics: DAE4 Sn353; Calibrated: 22/04/2008

- Phantom: Side Planar; Type: Plexiglas; Serial: 161

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

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 4.07 mW/g

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

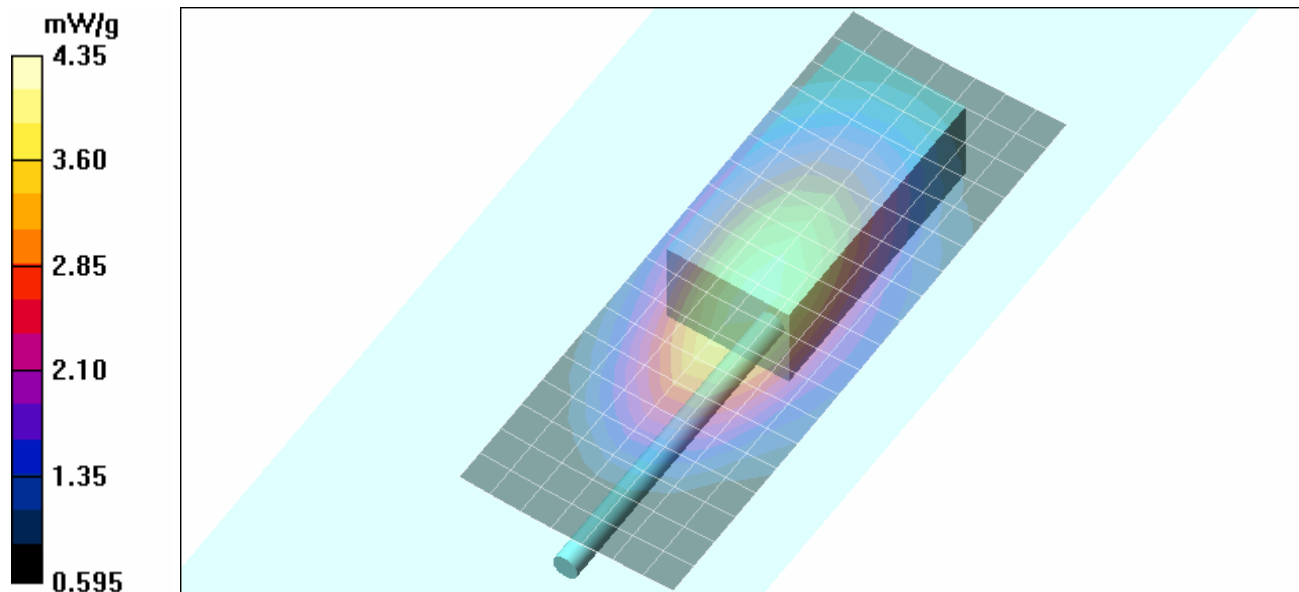
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 73.3 V/m; Power Drift = -0.686 dB



Peak SAR (extrapolated) = 5.80 W/kg

**SAR(1 g) = 4.13 mW/g; SAR(10 g) = 3.01 mW/g**

Maximum value of SAR (measured) = 4.35 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/10/2008

**Face-held SAR - KRA-27M Antenna - NiMH 1600mAh Battery - Mid Channel - 480 MHz**

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

Ambient Temp: 23.8°C; Fluid Temp: 22.3°C; Barometric Pressure: 100.9 kPa; Humidity: 33%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 480 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.89 \text{ mho/m}$ ;  $\epsilon_r = 42.5$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz**

**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 4.69 mW/g

**Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz**

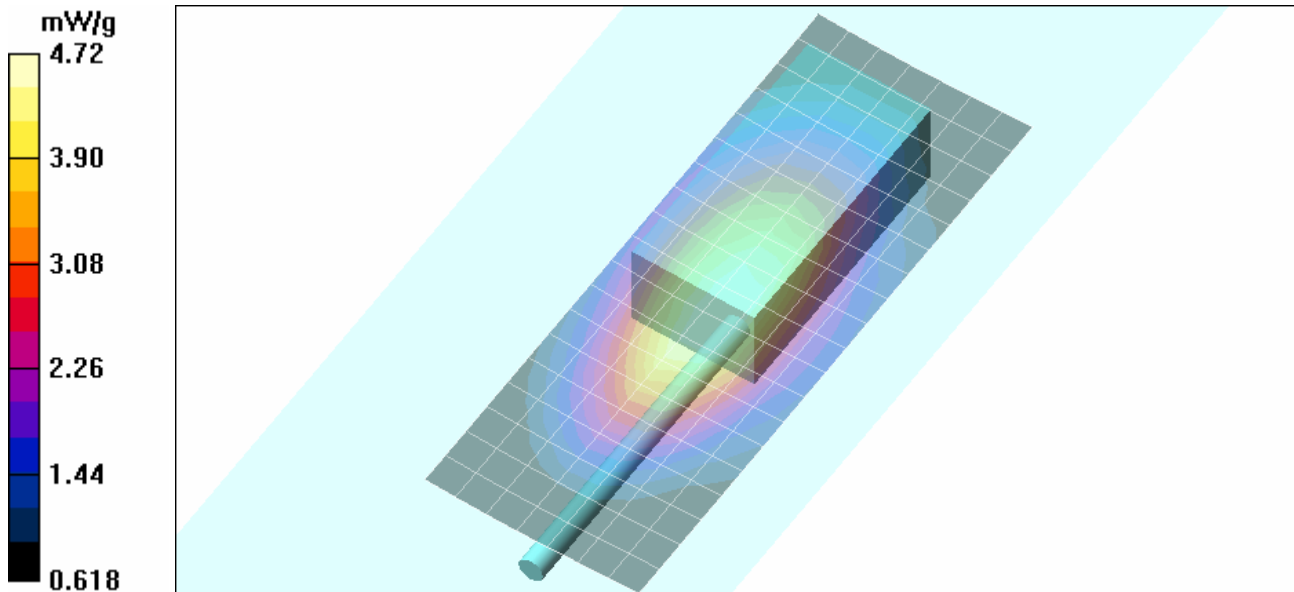
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 74.0 V/m; Power Drift = -0.664 dB

Peak SAR (extrapolated) = 6.30 W/kg

**SAR(1 g) = 4.5 mW/g; SAR(10 g) = 3.27 mW/g**

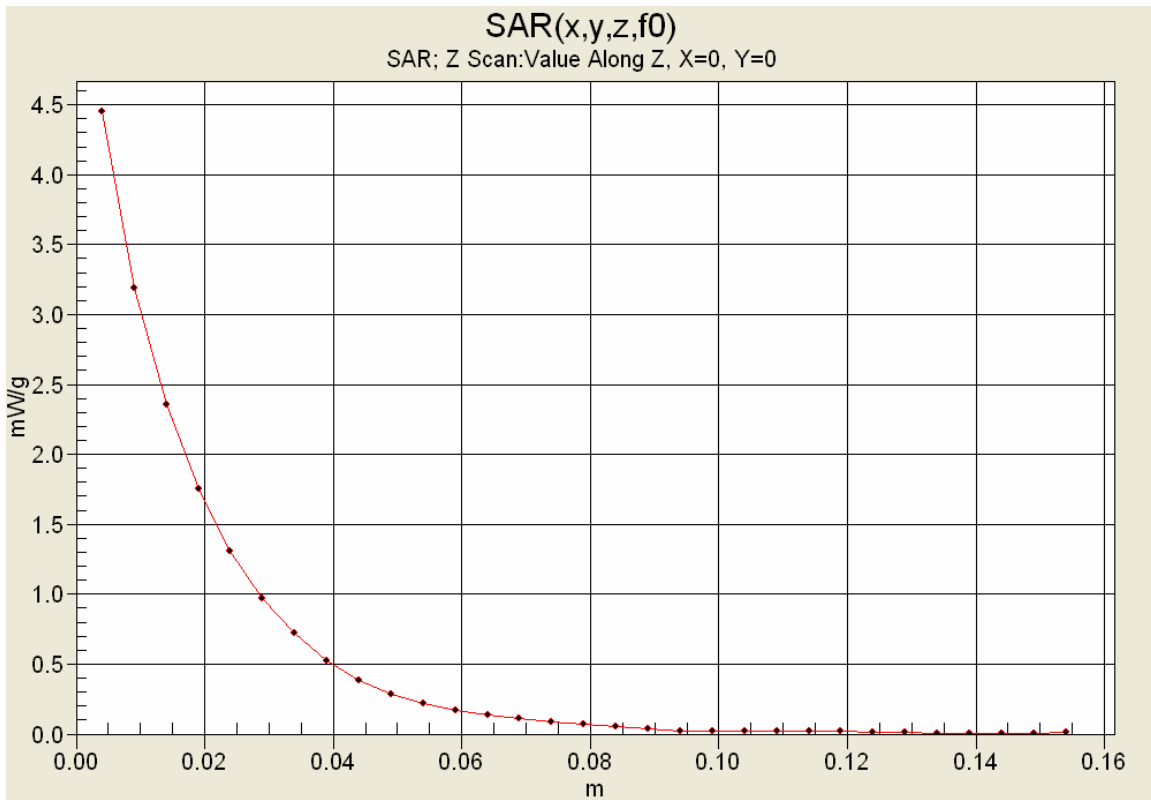
Maximum value of SAR (measured) = 4.72 mW/g





<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	KENWOOD
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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## Z-Axis Scan



	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/11/2008

## Face-held SAR - KRA-27M Antenna - Alkaline AA Batteries - Mid Channel - 480 MHz

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

Ambient Temp: 23.3°C; Fluid Temp: 22.7°C; Barometric Pressure: 101.1 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 480 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.88 \text{ mho/m}$ ;  $\epsilon_r = 41.9$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASy4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 4.38 mW/g

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

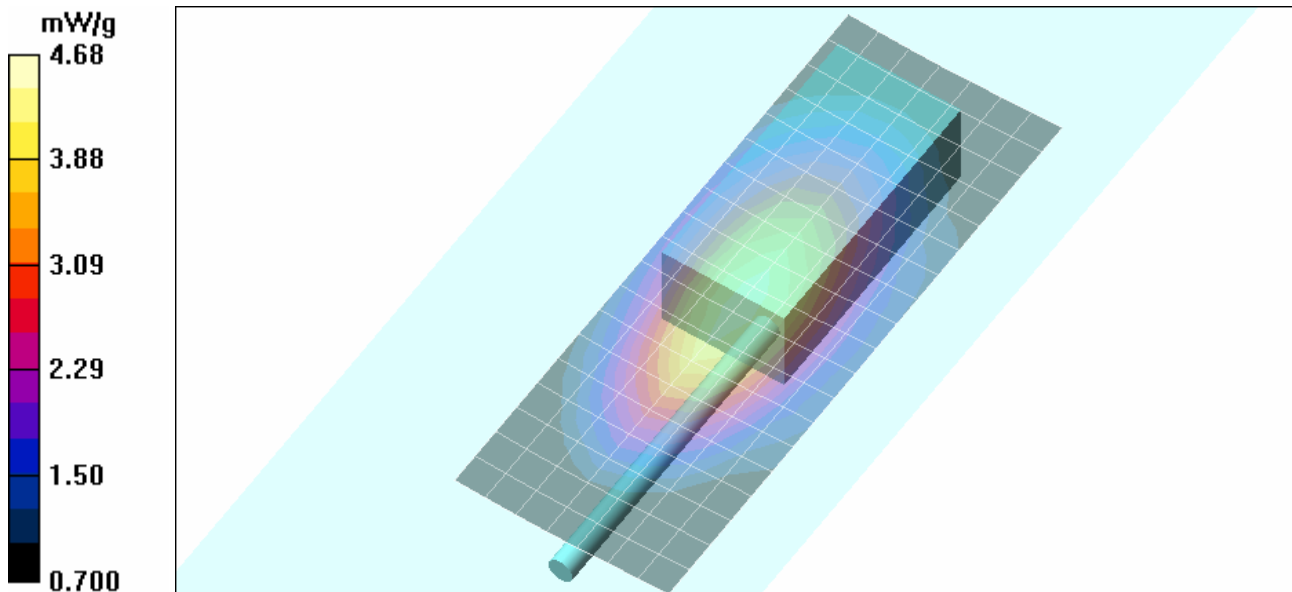
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 75.1 V/m; Power Drift = -1.11 dB

Peak SAR (extrapolated) = 6.24 W/kg

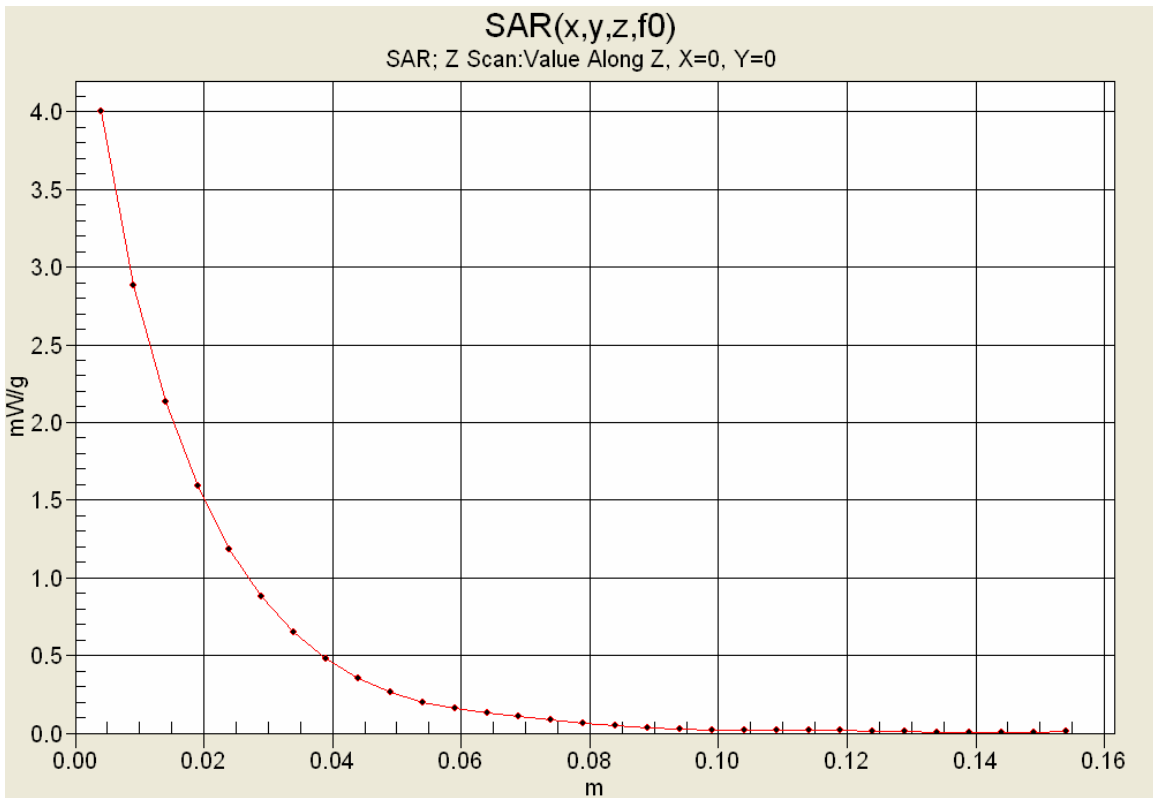
**SAR(1 g) = 4.46 mW/g; SAR(10 g) = 3.23 mW/g**



Maximum value of SAR (measured) = 4.68 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	KENWOOD
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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### Z-Axis Scan



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	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/11/2008

## Face-held SAR - KRA-23M Antenna - NiCd 600mAh Battery - Mid Channel - 480 MHz

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

Ambient Temp: 23.3°C; Fluid Temp: 22.7°C; Barometric Pressure: 101.1 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 480 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.88 \text{ mho/m}$ ;  $\epsilon_r = 41.9$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008

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

- Electronics: DAE4 Sn353; Calibrated: 22/04/2008

- Phantom: Side Planar; Type: Plexiglas; Serial: 161

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

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 4.41 mW/g

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

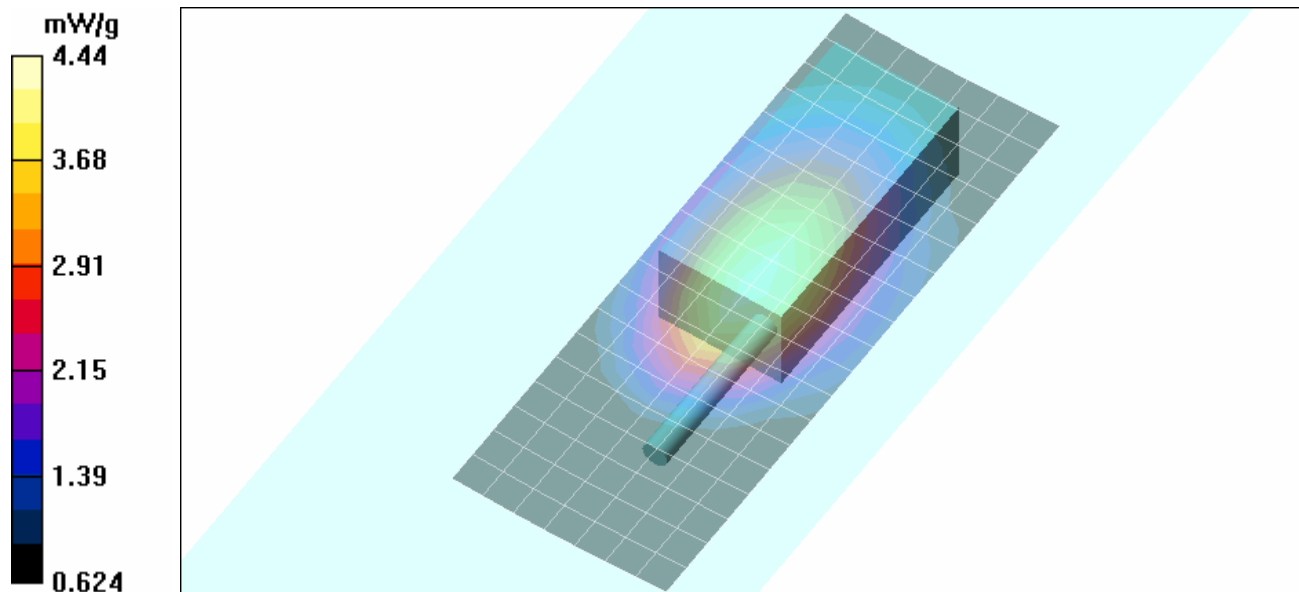
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 72.6 V/m; Power Drift = -0.619 dB



Peak SAR (extrapolated) = 5.94 W/kg

**SAR(1 g) = 4.24 mW/g; SAR(10 g) = 3.09 mW/g**

Maximum value of SAR (measured) = 4.44 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/11/2008

## Face-held SAR - KRA-23M Antenna - NiCd 1100mAh Battery - Mid Channel - 480 MHz

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

Ambient Temp: 23.3°C; Fluid Temp: 22.7°C; Barometric Pressure: 101.1 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 480 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.88 \text{ mho/m}$ ;  $\epsilon_r = 41.9$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 4.35 mW/g

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

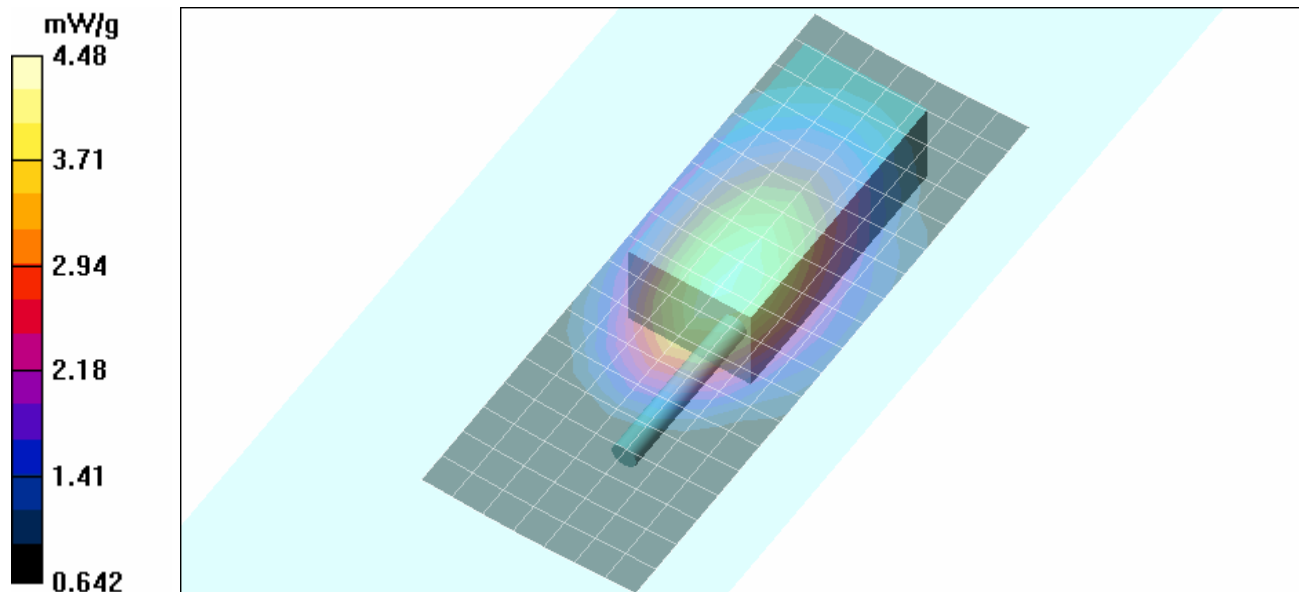
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 70.9 V/m; Power Drift = -0.534 dB

Peak SAR (extrapolated) = 5.98 W/kg



**SAR(1 g) = 4.29 mW/g; SAR(10 g) = 3.12 mW/g**

Maximum value of SAR (measured) = 4.48 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	KENWOOD
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/11/2008

## Face-held SAR - KRA-23M Antenna - NiMH 1600mAh Battery - Mid Channel - 480 MHz

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

Ambient Temp: 23.3°C; Fluid Temp: 22.7°C; Barometric Pressure: 101.1 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 480 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.88 \text{ mho/m}$ ;  $\epsilon_r = 41.9$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008

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

- Electronics: DAE4 Sn353; Calibrated: 22/04/2008

- Phantom: Side Planar; Type: Plexiglas; Serial: 161

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

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 4.15 mW/g

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

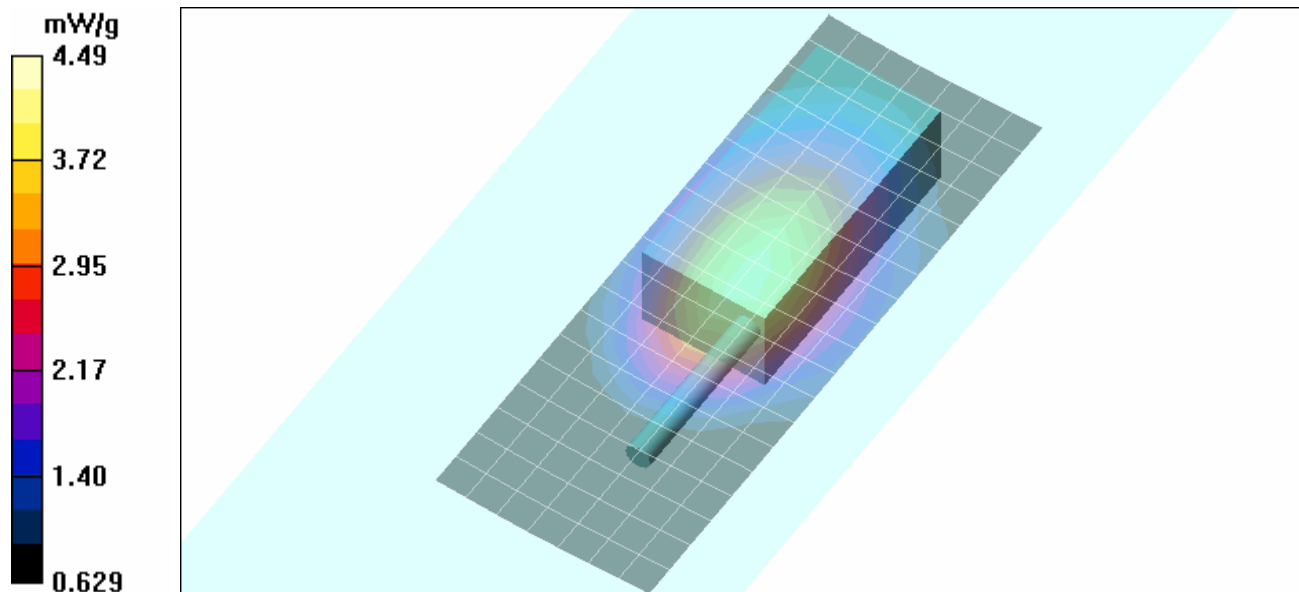
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 70.7 V/m; Power Drift = -0.545 dB



Peak SAR (extrapolated) = 6.00 W/kg

**SAR(1 g) = 4.28 mW/g; SAR(10 g) = 3.11 mW/g**

Maximum value of SAR (measured) = 4.49 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/11/2008

## Face-held SAR - KRA-23M Antenna - Alkaline AA Batteries - Mid Channel - 480 MHz

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

Ambient Temp: 23.3°C; Fluid Temp: 22.7°C; Barometric Pressure: 101.1 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 480 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.88 \text{ mho/m}$ ;  $\epsilon_r = 41.9$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008

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

- Electronics: DAE4 Sn353; Calibrated: 22/04/2008

- Phantom: Side Planar; Type: Plexiglas; Serial: 161

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

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 4.32 mW/g

### Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 480 MHz

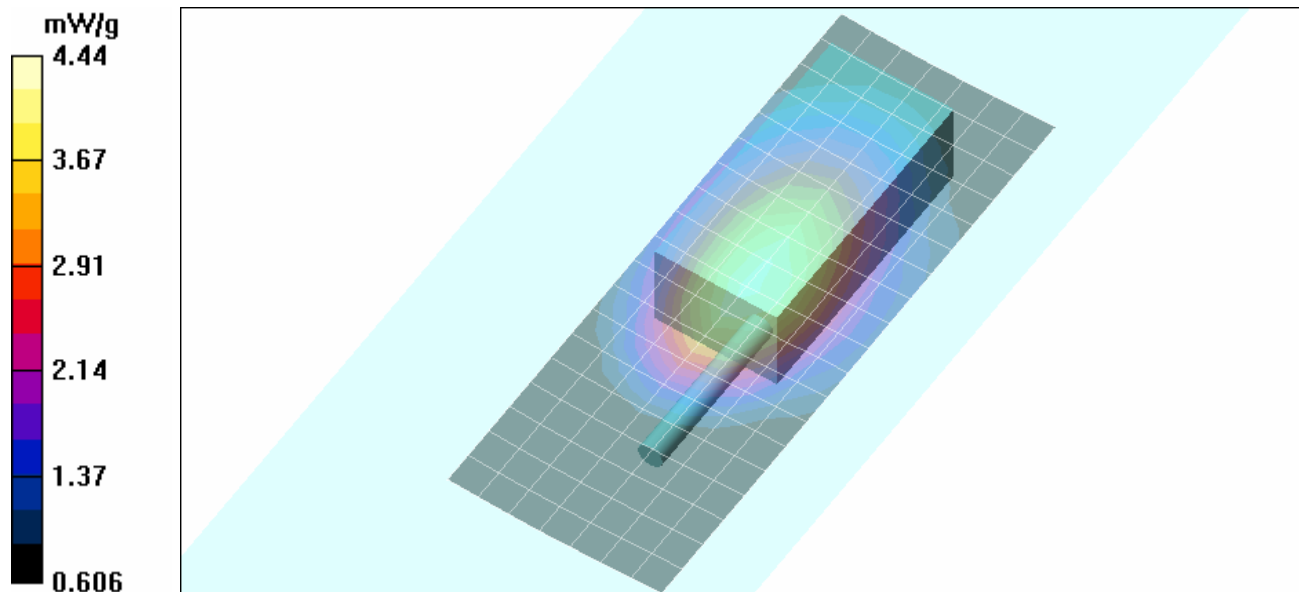
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 73.7 V/m; Power Drift = -0.671 dB



Peak SAR (extrapolated) = 5.95 W/kg

**SAR(1 g) = 4.23 mW/g; SAR(10 g) = 3.07 mW/g**

Maximum value of SAR (measured) = 4.44 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/09/2008

**Body-worn SAR - KRA-27M Antenna - NiCd 600mAh Battery - Mid Channel - 480 MHz**

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

**Body-worn Accessory: Belt-Clip (P/N: KRA-10); Audio Accessory: Speaker-Microphone (P/N: KMC-8A)**

Ambient Temp: 24.0°C; Fluid Temp: 21.2°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts  
 Communication System: FM (CW)  
 Frequency: 480 MHz; Duty Cycle: 1:1  
 Medium: M450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 58.1$ ;  $\rho = 1000 \text{ kg/m}^3$

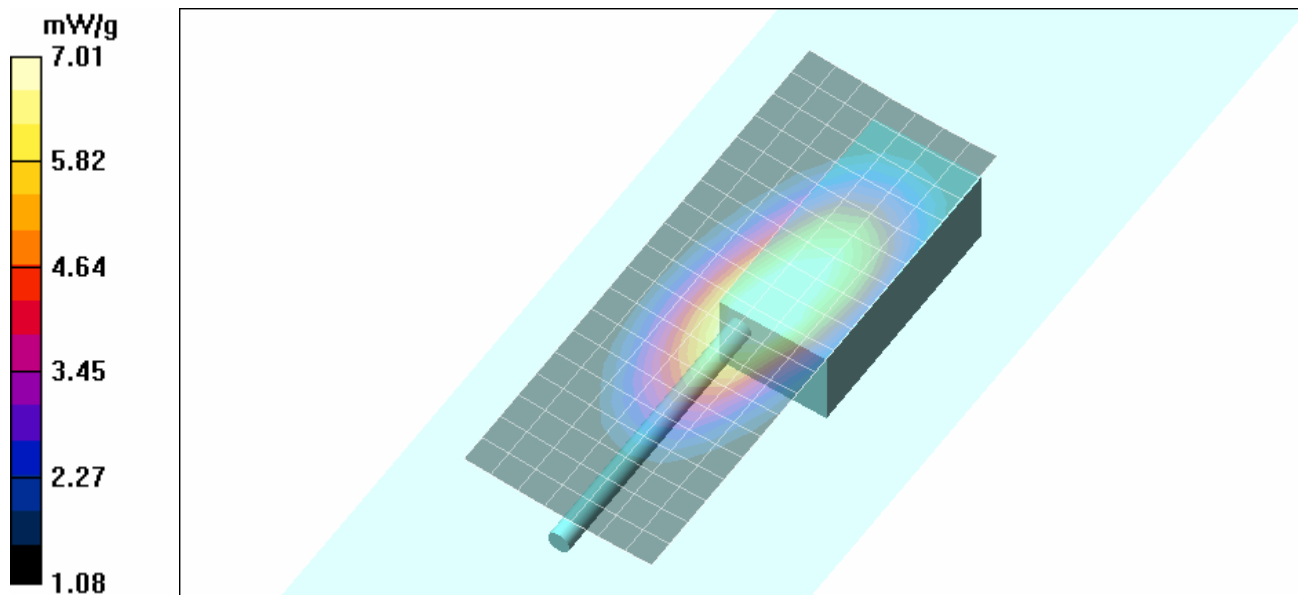
- Probe: ET3DV6 - SN1387; ConvF(7.76, 7.76, 7.76); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**



**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (measured) = 8.01 mW/g

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 93.3 V/m; Power Drift = -0.800 dB  
 Peak SAR (extrapolated) = 9.71 W/kg  
**SAR(1 g) = 6.65 mW/g; SAR(10 g) = 4.75 mW/g**  
 Maximum value of SAR (measured) = 7.01 mW/g



<b>Applicant:</b> Kenwood USA Corporation	<b>FCC ID:</b> ALH30923120	<b>Frequency Range:</b> 470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b> TK-3102G-2	<b>Device Description:</b> Portable FM UHF Push-To-Talk Radio Transceiver		
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	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/09/2008

**Body-worn SAR - KRA-27M Antenna - NiCd 1100mAh Battery - Mid Channel - 480 MHz**

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

**Body-worn Accessory: Belt-Clip (P/N: KRA-10); Audio Accessory: Speaker-Microphone (P/N: KMC-8A)**

Ambient Temp: 24.0°C; Fluid Temp: 21.2°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts  
 Communication System: FM (CW)  
 Frequency: 480 MHz; Duty Cycle: 1:1  
 Medium: M450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 58.1$ ;  $\rho = 1000 \text{ kg/m}^3$

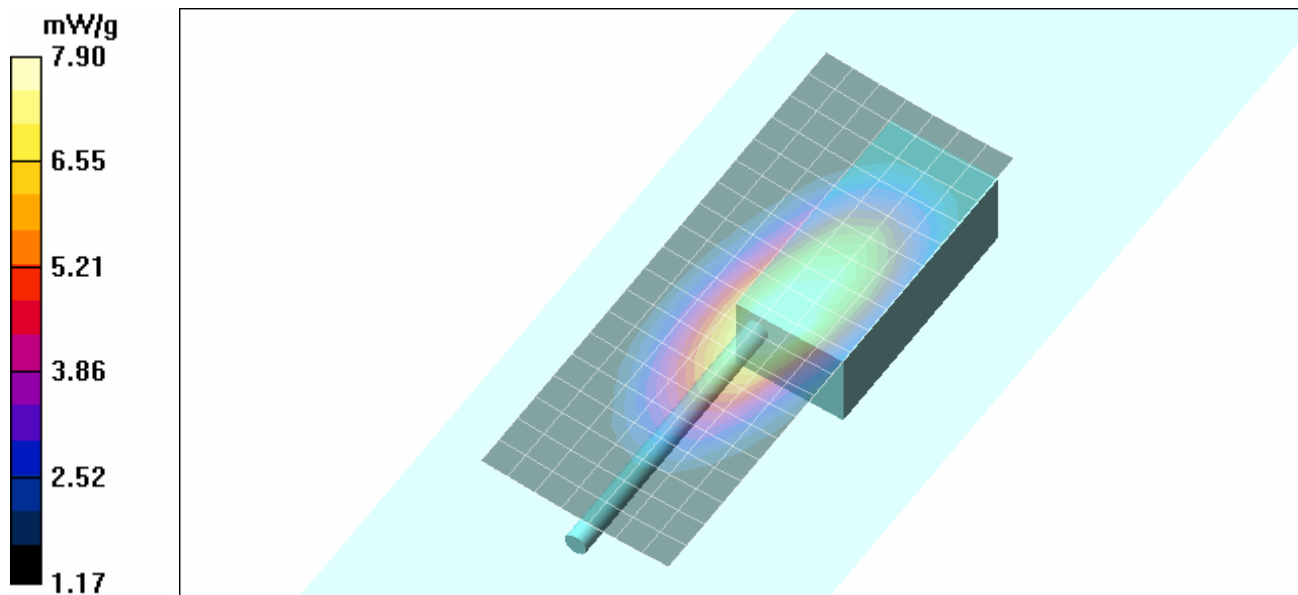
- Probe: ET3DV6 - SN1387; ConvF(7.76, 7.76, 7.76); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**



**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (measured) = 8.50 mW/g

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 95.7 V/m; Power Drift = -0.674 dB  
 Peak SAR (extrapolated) = 11.1 W/kg  
**SAR(1 g) = 7.59 mW/g; SAR(10 g) = 5.37 mW/g**  
 Maximum value of SAR (measured) = 7.90 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/09/2008

## Body-worn SAR - KRA-27M Antenna - NiMH 1600mAh Battery - Mid Channel - 480 MHz

DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581

Body-worn Accessory: Belt-Clip (P/N: KRA-10); Audio Accessory: Speaker-Microphone (P/N: KMC-8A)

Ambient Temp: 24.0°C; Fluid Temp: 21.2°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 480 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 58.1$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.76, 7.76, 7.76); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASy4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz

Area Scan (8x20x1): Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 7.68 mW/g

### Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz

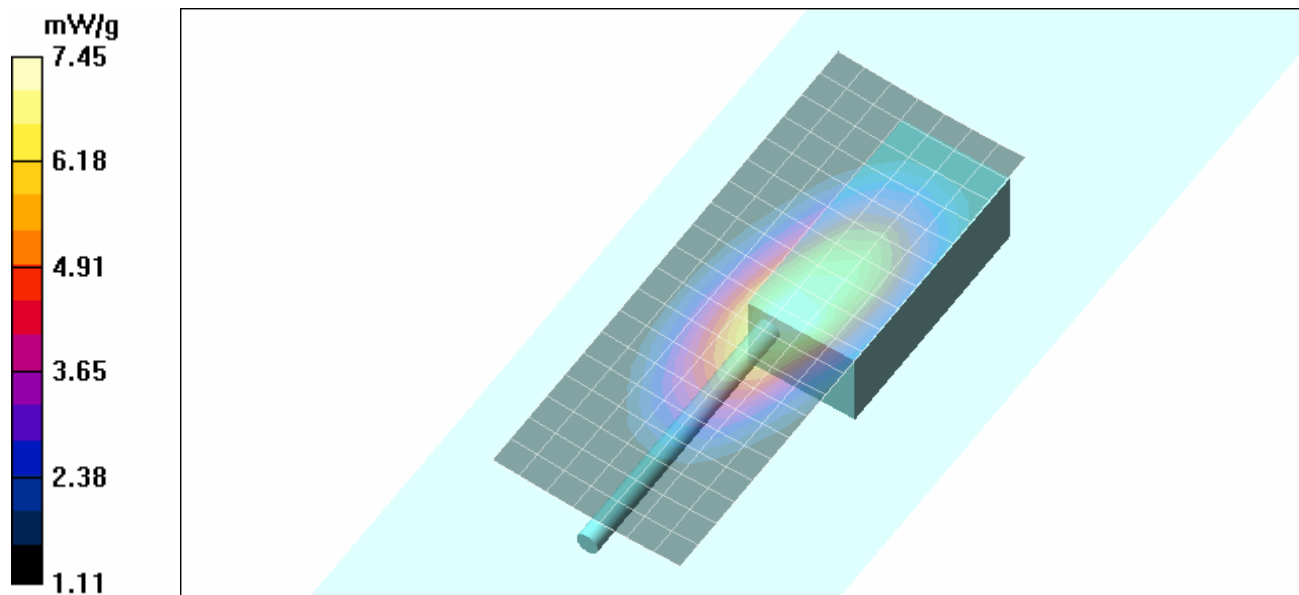
Zoom Scan (5x5x7)/Cube 0: Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 94.2 V/m; Power Drift = -0.468 dB



Peak SAR (extrapolated) = 10.4 W/kg

**SAR(1 g) = 7.1 mW/g; SAR(10 g) = 5.04 mW/g**

Maximum value of SAR (measured) = 7.45 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	KENWOOD
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/09/2008

### Body-worn SAR - KRA-27M Antenna - Alkaline AA Batteries - Mid Channel - 480 MHz

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

**Body-worn Accessory: Belt-Clip (P/N: KRA-10); Audio Accessory: Speaker-Microphone (P/N: KMC-8A)**

Ambient Temp: 24.0°C; Fluid Temp: 21.2°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 480 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 58.1$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.76, 7.76, 7.76); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASy4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz

**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 8.01 mW/g

### Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz

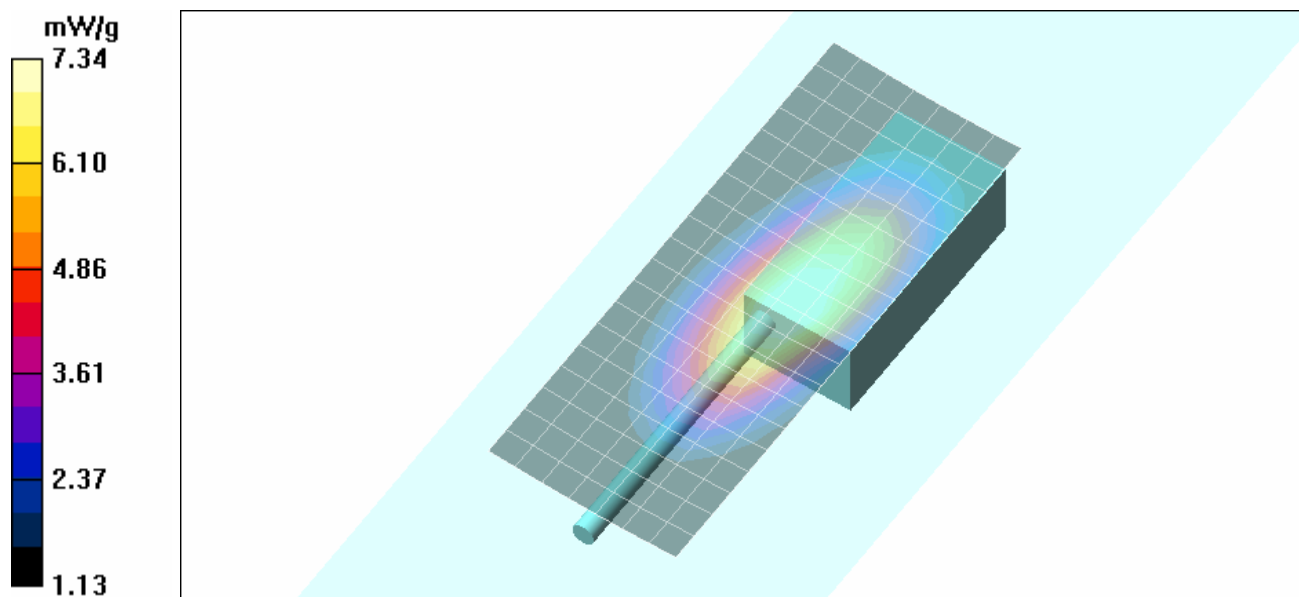
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 94.4 V/m; Power Drift = -0.862 dB

Peak SAR (extrapolated) = 10.3 W/kg



**SAR(1 g) = 7.01 mW/g; SAR(10 g) = 4.96 mW/g**

Maximum value of SAR (measured) = 7.34 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/09/2008

**Body-worn SAR - KRA-23M Antenna - NiCd 600mAh Battery - Mid Channel - 480 MHz**

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

**Body-worn Accessory: Belt-Clip (P/N: KRA-10); Audio Accessory: Speaker-Microphone (P/N: KMC-8A)**

Ambient Temp: 24.0°C; Fluid Temp: 21.2°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts  
 Communication System: FM (CW)  
 Frequency: 480 MHz; Duty Cycle: 1:1  
 Medium: M450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 58.1$ ;  $\rho = 1000 \text{ kg/m}^3$

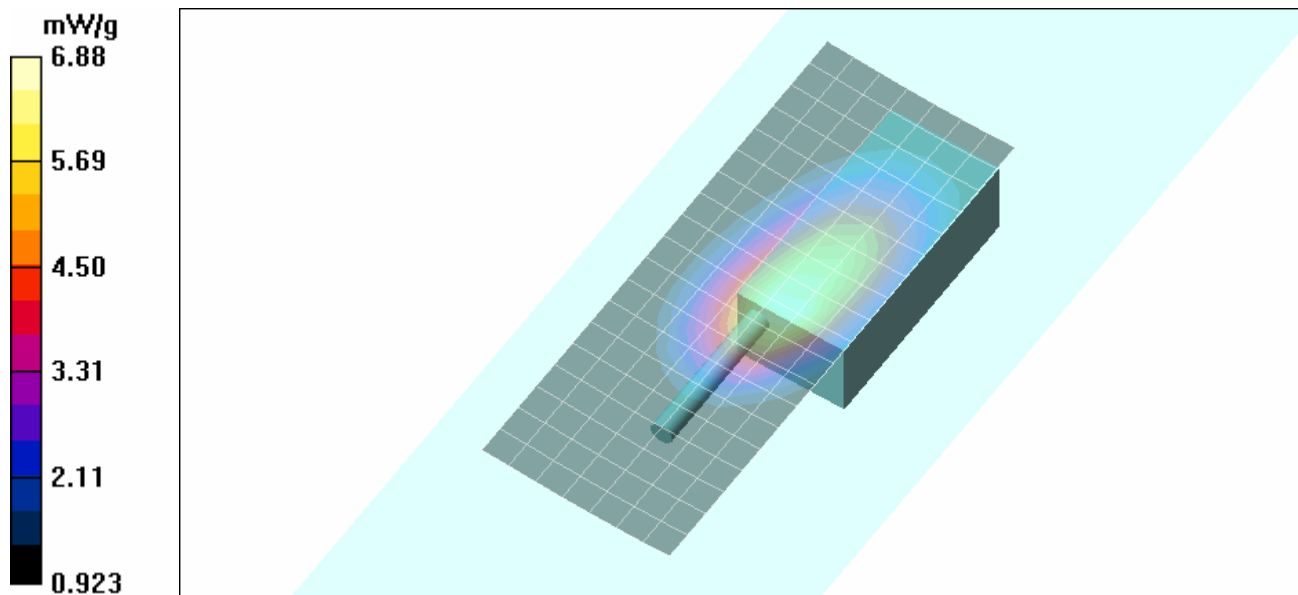
- Probe: ET3DV6 - SN1387; ConvF(7.76, 7.76, 7.76); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**



**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (measured) = 6.81 mW/g

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 88.9 V/m; Power Drift = -0.493 dB  
 Peak SAR (extrapolated) = 9.64 W/kg  
**SAR(1 g) = 6.57 mW/g; SAR(10 g) = 4.65 mW/g**  
 Maximum value of SAR (measured) = 6.88 mW/g



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/09/2008

**Body-worn SAR - KRA-23M Antenna - NiCd 1100mAh Battery - Mid Channel - 480 MHz**

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

**Body-worn Accessory: Belt-Clip (P/N: KRA-10); Audio Accessory: Speaker-Microphone (P/N: KMC-8A)**

Ambient Temp: 24.0°C; Fluid Temp: 21.2°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts  
 Communication System: FM (CW)  
 Frequency: 480 MHz; Duty Cycle: 1:1  
 Medium: M450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 58.1$ ;  $\rho = 1000 \text{ kg/m}^3$

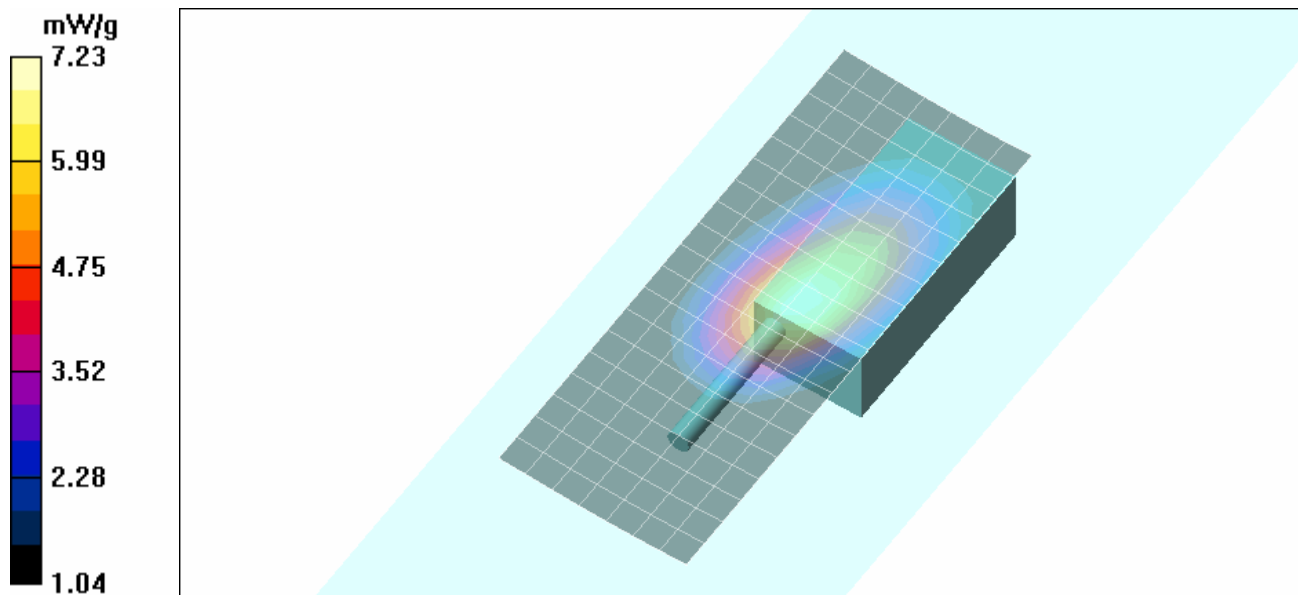
- Probe: ET3DV6 - SN1387; ConvF(7.76, 7.76, 7.76); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASy4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**



**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (measured) = 7.20 mW/g

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 88.6 V/m; Power Drift = -0.298 dB  
 Peak SAR (extrapolated) = 10.1 W/kg  
**SAR(1 g) = 6.83 mW/g; SAR(10 g) = 4.81 mW/g**  
 Maximum value of SAR (measured) = 7.23 mW/g



<b>Applicant:</b> Kenwood USA Corporation	<b>FCC ID:</b> ALH30923120	<b>Frequency Range:</b> 470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b> TK-3102G-2	<b>Device Description:</b> Portable FM UHF Push-To-Talk Radio Transceiver		
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/09/2008

**Body-worn SAR - KRA-23M Antenna - NiMH 1600mAh Battery - Mid Channel - 480 MHz**

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

**Body-worn Accessory: Belt-Clip (P/N: KRA-10); Audio Accessory: Speaker-Microphone (P/N: KMC-8A)**

Ambient Temp: 24.0°C; Fluid Temp: 21.2°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts  
 Communication System: FM (CW)  
 Frequency: 480 MHz; Duty Cycle: 1:1  
 Medium: M450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 58.1$ ;  $\rho = 1000 \text{ kg/m}^3$

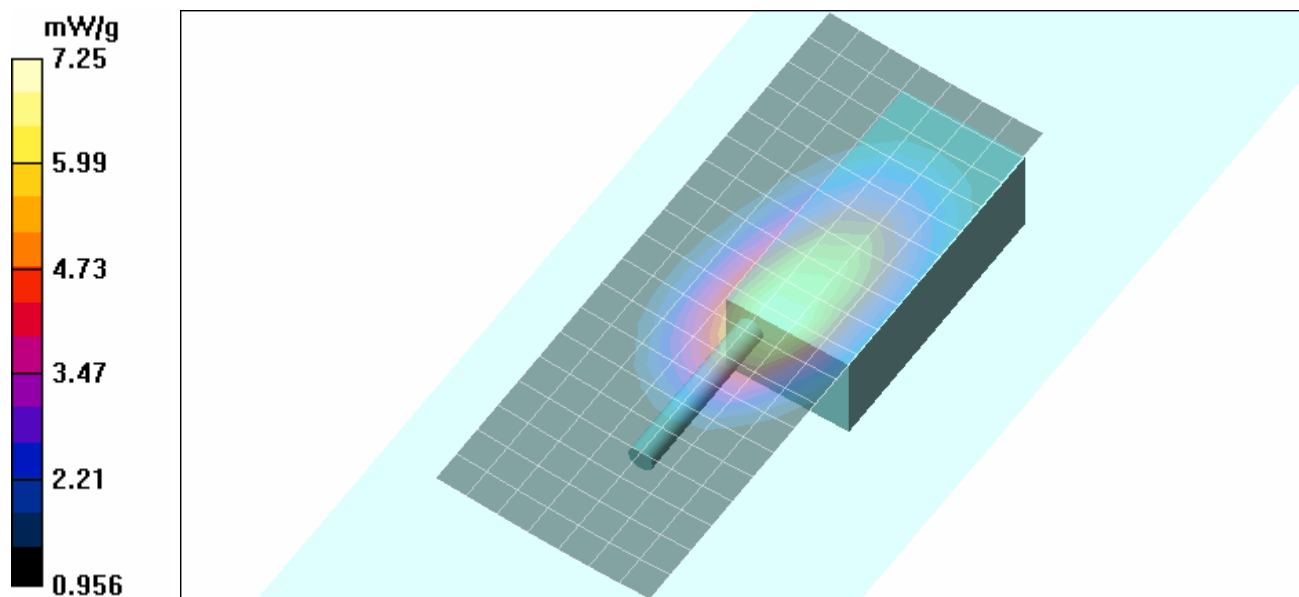
- Probe: ET3DV6 - SN1387; ConvF(7.76, 7.76, 7.76); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**



**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (measured) = 6.78 mW/g

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 89.8 V/m; Power Drift = -0.416 dB  
 Peak SAR (extrapolated) = 10.2 W/kg  
**SAR(1 g) = 6.92 mW/g; SAR(10 g) = 4.9 mW/g**  
 Maximum value of SAR (measured) = 7.25 mW/g



<b>Applicant:</b> Kenwood USA Corporation	<b>FCC ID:</b> ALH30923120	<b>Frequency Range:</b> 470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b> TK-3102G-2	<b>Device Description:</b> Portable FM UHF Push-To-Talk Radio Transceiver		
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested 06/09/2008

**Body-worn SAR - KRA-23M Antenna - Alkaline AA Batteries - Mid Channel - 480 MHz**

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

**Body-worn Accessory: Belt-Clip (P/N: KRA-10); Audio Accessory: Speaker-Microphone (P/N: KMC-8A)**

Ambient Temp: 24.0°C; Fluid Temp: 21.2°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts  
 Communication System: FM (CW)  
 Frequency: 480 MHz; Duty Cycle: 1:1  
 Medium: M450 Medium parameters used:  $f = 480 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 58.1$ ;  $\rho = 1000 \text{ kg/m}^3$

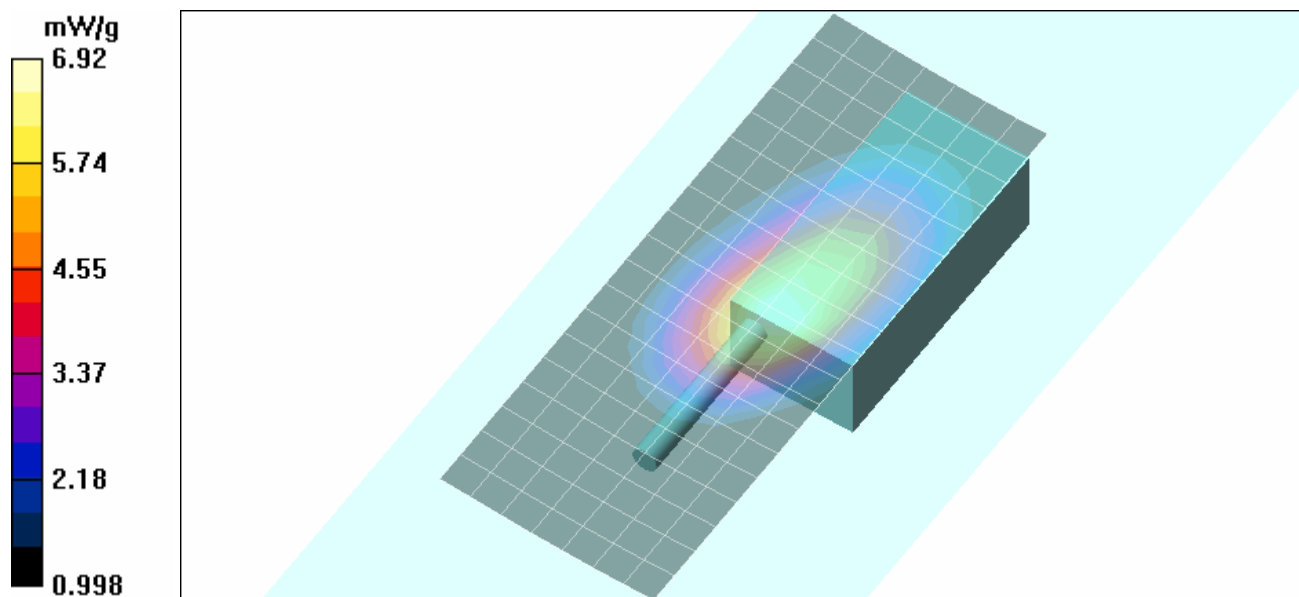
- Probe: ET3DV6 - SN1387; ConvF(7.76, 7.76, 7.76); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**



**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (measured) = 7.09 mW/g

**Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 480 MHz**

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 90.6 V/m; Power Drift = -0.751 dB  
 Peak SAR (extrapolated) = 9.78 W/kg  
**SAR(1 g) = 6.61 mW/g; SAR(10 g) = 4.7 mW/g**  
 Maximum value of SAR (measured) = 6.92 mW/g



<b>Applicant:</b> Kenwood USA Corporation	<b>FCC ID:</b> ALH30923120	<b>Frequency Range:</b> 470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b> TK-3102G-2	<b>Device Description:</b> Portable FM UHF Push-To-Talk Radio Transceiver		
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/09/2008

## Body-worn SAR - KRA-27M Antenna - NiCd 1100mAh Battery - Low Channel - 470 MHz

DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581

Body-worn Accessory: Belt-Clip (P/N: KRA-10); Audio Accessory: Speaker-Microphone (P/N: KMC-8A)

Ambient Temp: 24.0°C; Fluid Temp: 21.2°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 470 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 470 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 58.1$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.76, 7.76, 7.76); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASy4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Low Channel - 470 MHz

Area Scan (8x20x1): Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 9.02 mW/g

### Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Low Channel - 470 MHz

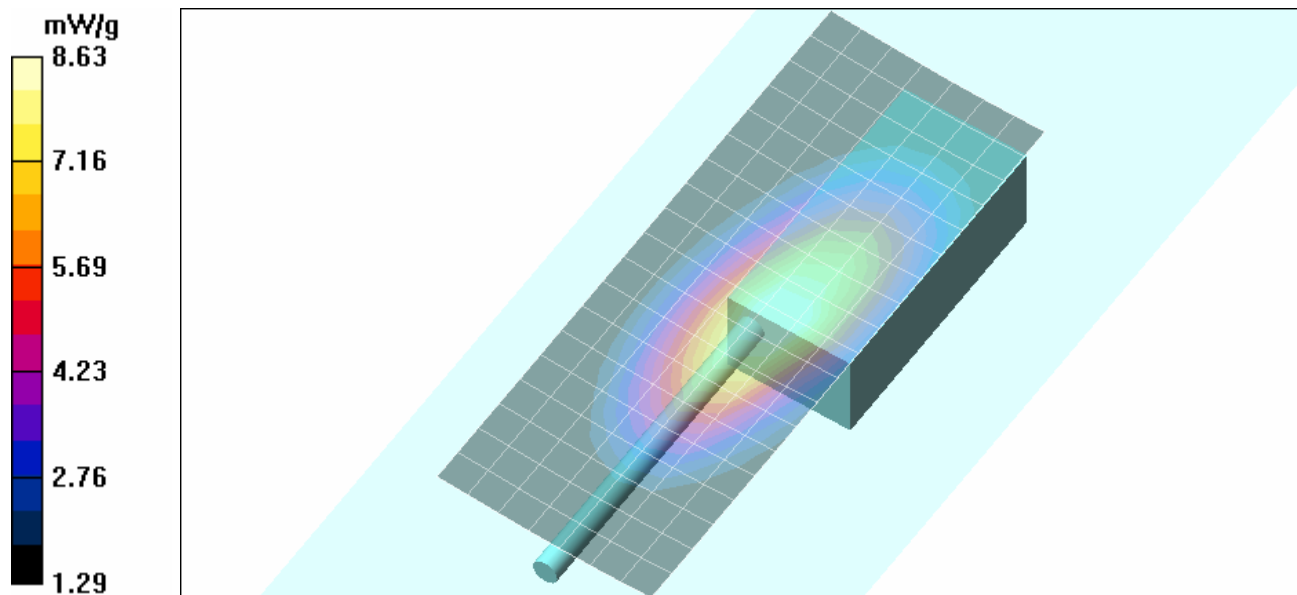
Zoom Scan (5x5x7)/Cube 0: Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 102.7 V/m; Power Drift = -0.545 dB

Peak SAR (extrapolated) = 12.1 W/kg

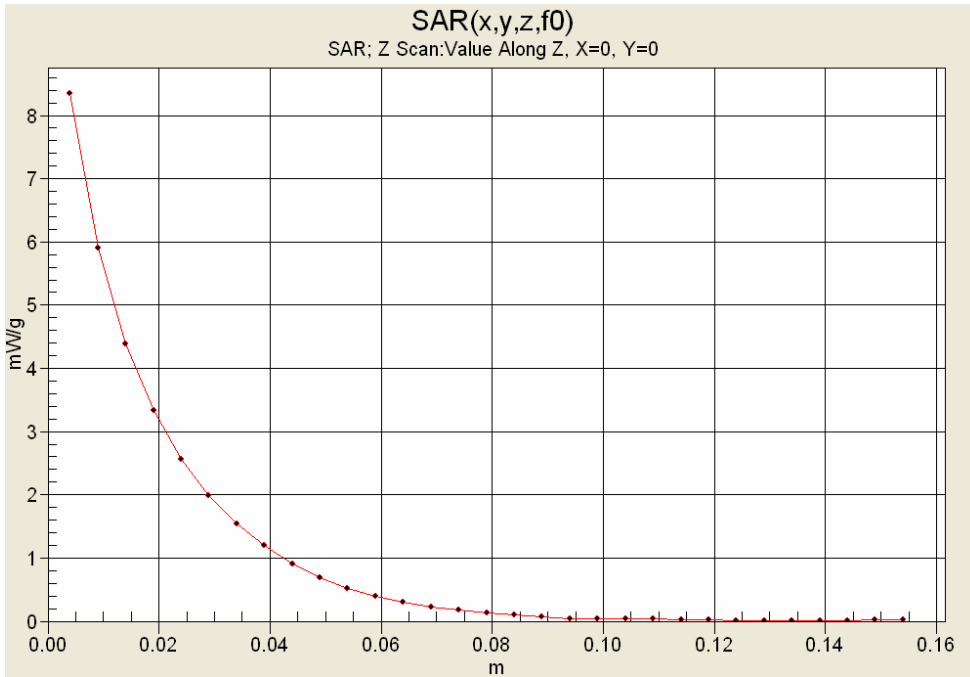
**SAR(1 g) = 8.26 mW/g; SAR(10 g) = 5.88 mW/g**

Maximum value of SAR (measured) = 8.63 mW/g



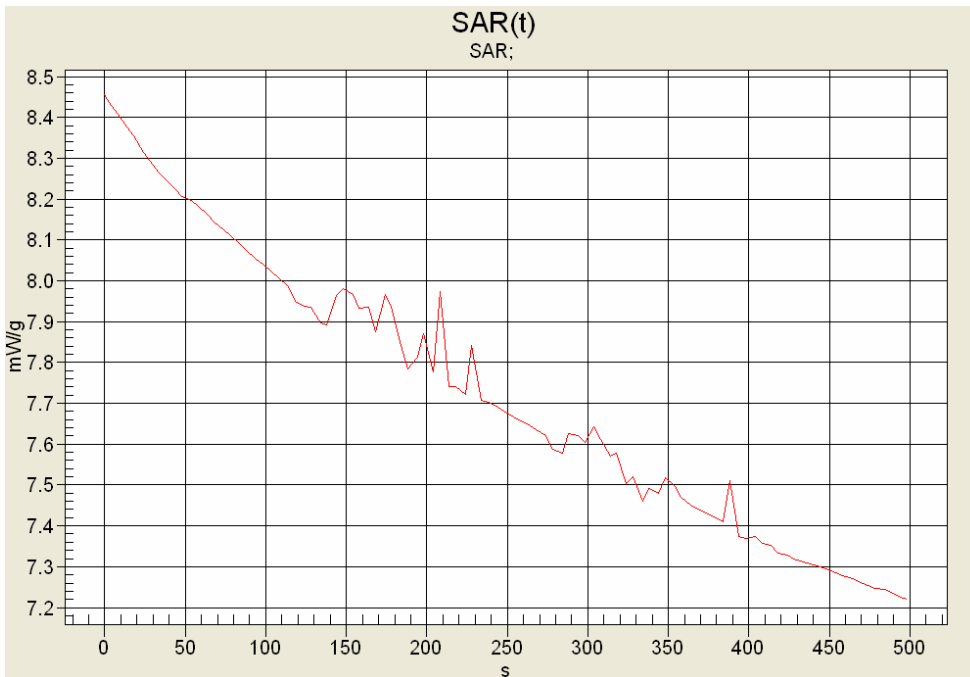
<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	KENWOOD
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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**Z-Axis Scan**



**SAR-versus-Time Power Droop Evaluation**



Body-worn Configuration  
Low Channel - 470.0 MHz  
KRA-27M Antenna



Max SAR: 8.46 mW/g  
Low SAR: 7.22 mW/g (-0.688 dB)  
SAR after 340s: 7.49 mW/g (-0.529 dB)  
(340s = Zoom Scan Duration)

<b>Applicant:</b> Kenwood USA Corporation	<b>FCC ID:</b> ALH30923120	<b>Frequency Range:</b> 470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b> TK-3102G-2	<b>Device Description:</b> Portable FM UHF Push-To-Talk Radio Transceiver		
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/09/2008

## Body-worn SAR - KRA-27M Antenna - NiCd 1100mAh Battery - High Channel - 490 MHz

**DUT: Kenwood TK-3102G-2; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101581**

**Body-worn Accessory: Belt-Clip (P/N: KRA-10); Audio Accessory: Speaker-Microphone (P/N: KMC-8A)**

Ambient Temp: 24.0°C; Fluid Temp: 21.2°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 490 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 490 \text{ MHz}$ ;  $\sigma = 0.92 \text{ mho/m}$ ;  $\epsilon_r = 58.1$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.76, 7.76, 7.76); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - High Channel - 490 MHz

**Area Scan (8x20x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 8.02 mW/g

### Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - High Channel - 490 MHz

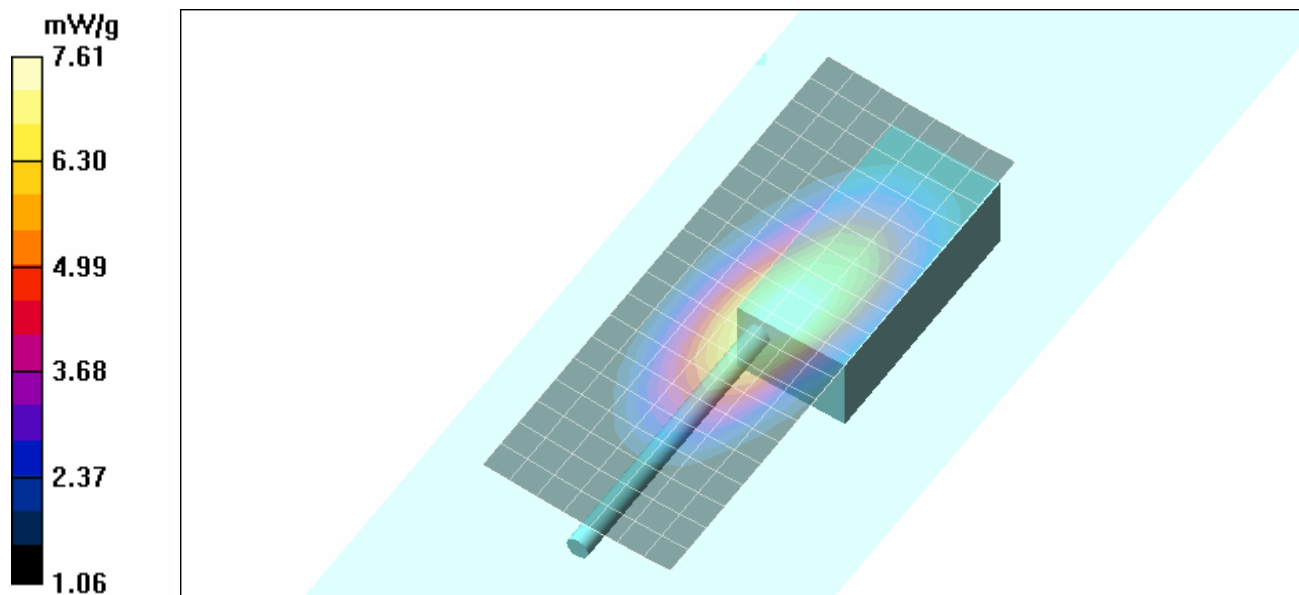
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 96.4 V/m; Power Drift = -0.711 dB



Peak SAR (extrapolated) = 10.6 W/kg

**SAR(1 g) = 7.29 mW/g; SAR(10 g) = 5.18 mW/g**

Maximum value of SAR (measured) = 7.61 mW/g





<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

**APPENDIX B - SYSTEM PERFORMANCE CHECK DATA**

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/09/2008

## System Performance Check - 450 MHz Dipole - HSL

**DUT: Dipole 450 MHz; Asset: 00024; Serial: 136; Validation: 05/01/2008**

Ambient Temp: 24.0°C; Fluid Temp: 22.8°C; Barometric Pressure: 101.2 kPa; Humidity: 32%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 450 \text{ MHz}$ ;  $\sigma = 0.89 \text{ mho/m}$ ;  $\epsilon_r = 44.3$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Validation Planar; Type: Plexiglas; Serial: TE#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) = 1.24 mW/g

### 450 MHz Dipole - System Performance Check

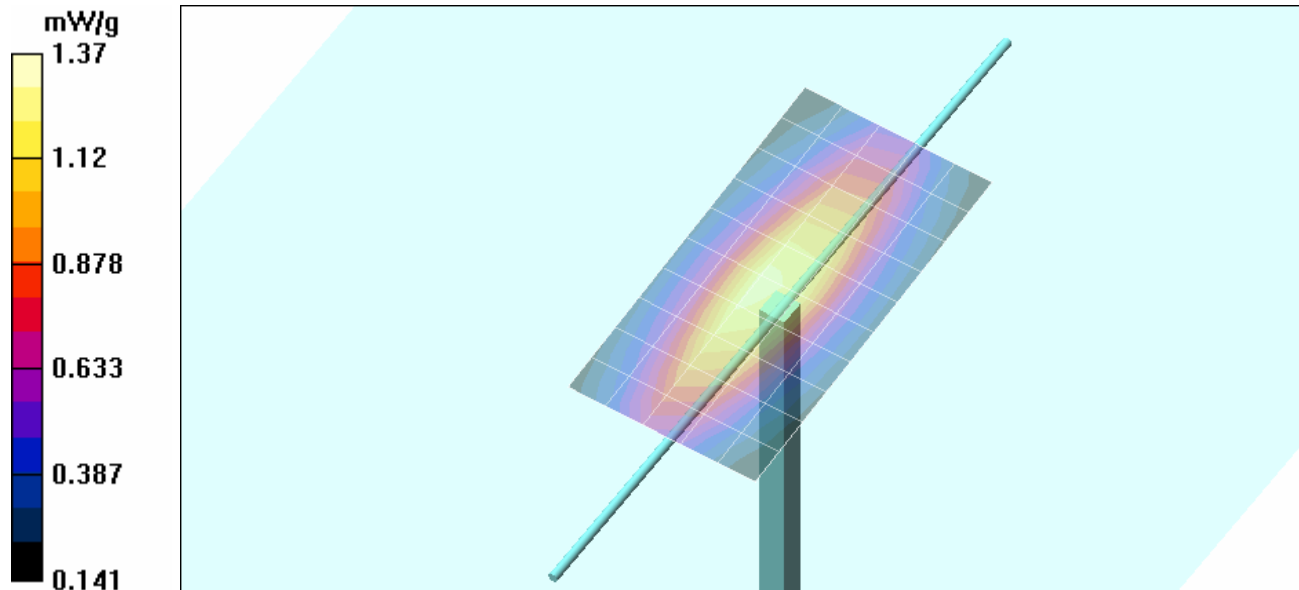
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 39.9 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 2.01 W/kg

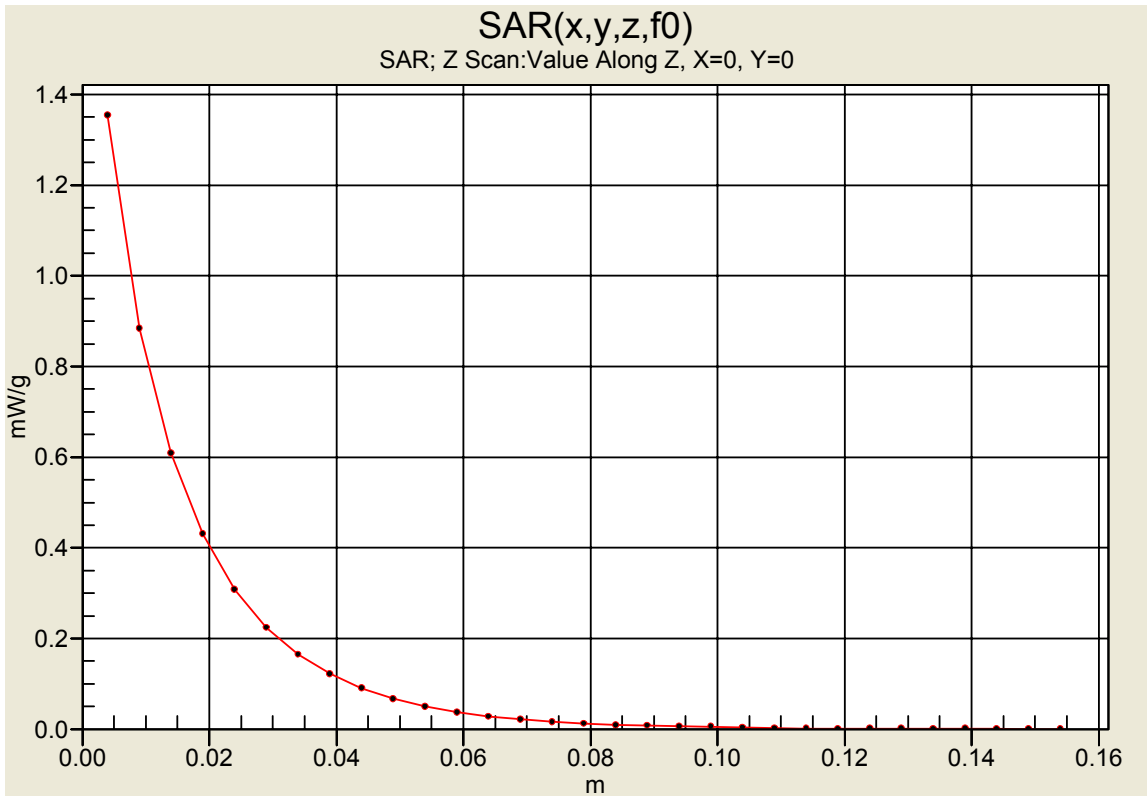
**SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.834 mW/g**



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



<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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### Z-Axis Scan



	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 06/10/2008

## System Performance Check - 450 MHz Dipole - HSL

**DUT: Dipole 450 MHz; Asset: 00024; Serial: 136; Validation: 05/01/2008**

Ambient Temp: 23.8°C; Fluid Temp: 22.3°C; Barometric Pressure: 100.9 kPa; Humidity: 33%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 450 \text{ MHz}$ ;  $\sigma = 0.86 \text{ mho/m}$ ;  $\epsilon_r = 44.2$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Validation Planar; Type: Plexiglas; Serial: TE#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) = 1.19 mW/g

### 450 MHz Dipole - System Performance Check

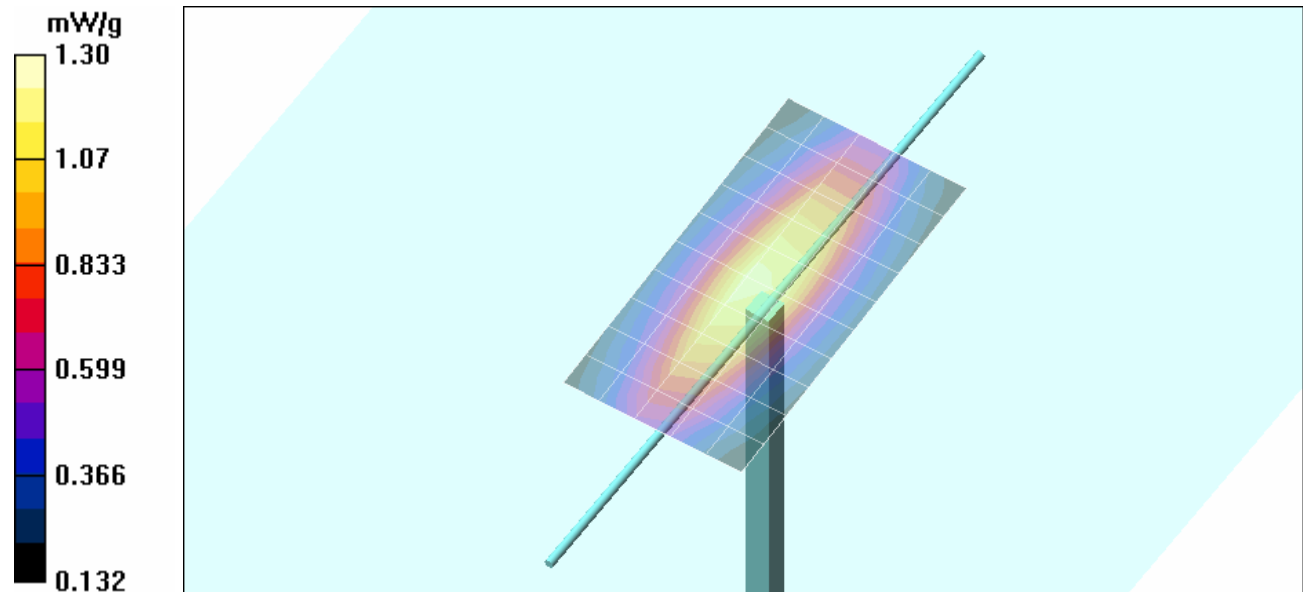
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 39.6 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 1.92 W/kg

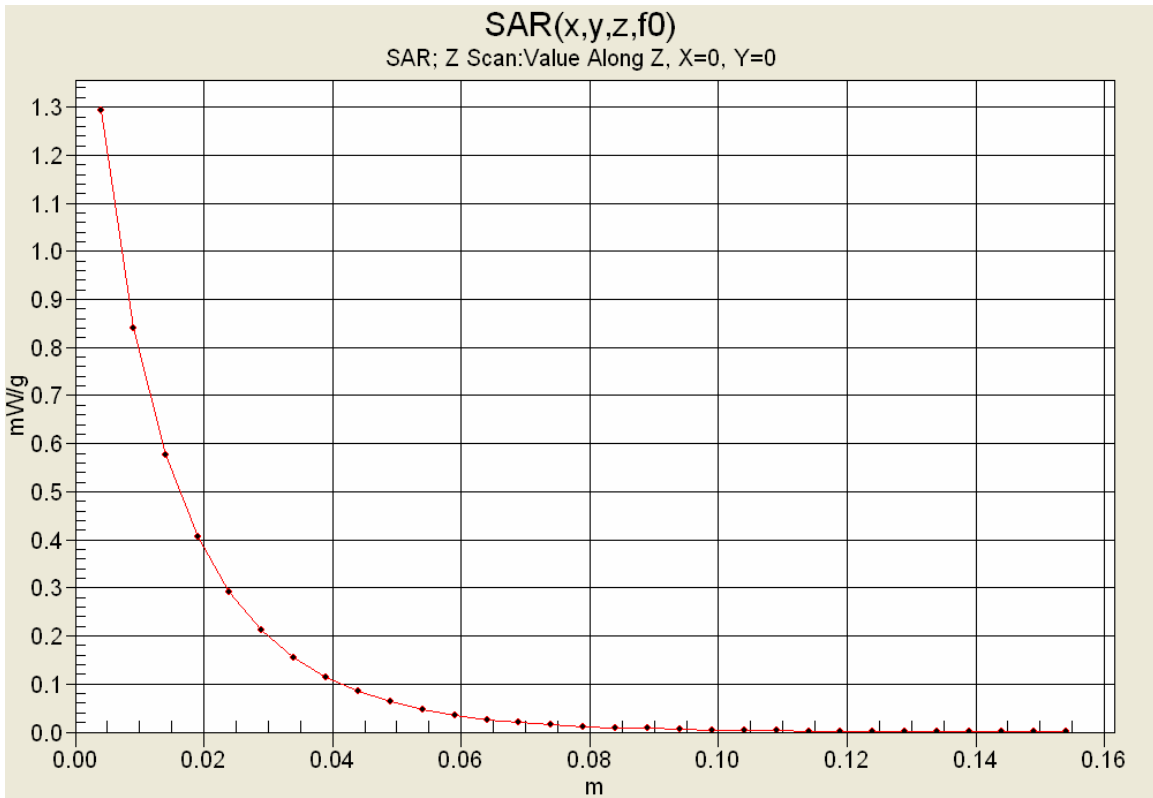
**SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.794 mW/g**

Maximum value of SAR (measured) = 1.30 mW/g





<b>Applicant:</b>	Kenwood USA Corporation	<b>FCC ID:</b>	ALH30923120	<b>Frequency Range:</b>	470 - 490 MHz	<b>KENWOOD</b>
<b>Model(s):</b>	TK-3102G-2	<b>Device Description:</b>	Portable FM UHF Push-To-Talk Radio Transceiver			
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### Z-Axis Scan







	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

**APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS**

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

### 450 MHz System Performance Check (Brain)



\*\*\*\*\*

Celltech Labs Inc,  
 Test Result for UIM Dielectric Parameter  
 Mon 09/Jun/2008  
 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_eHF	FCC_sH	Test_e	Test_s
0.3500	44.70	0.87	47.36	0.79
0.3600	44.58	0.87	46.68	0.80
0.3700	44.46	0.87	45.61	0.82
0.3800	44.34	0.87	46.20	0.83
0.3900	44.22	0.87	45.77	0.82
0.4000	44.10	0.87	46.06	0.83
0.4100	43.98	0.87	45.27	0.83
0.4200	43.86	0.87	45.62	0.85
0.4300	43.74	0.87	45.23	0.85
0.4400	43.62	0.87	44.90	0.87
0.4500	43.50	0.87	44.26	0.89
0.4600	43.45	0.87	44.15	0.89
0.4700	43.40	0.87	44.37	0.90
0.4800	43.34	0.87	44.33	0.91
0.4900	43.29	0.87	43.70	0.92
0.5000	43.24	0.87	43.42	0.91
0.5100	43.19	0.87	43.18	0.93
0.5200	43.14	0.88	43.31	0.93
0.5300	43.08	0.88	42.95	0.94
0.5400	43.03	0.88	43.25	0.96
0.5500	42.98	0.88	43.09	0.97

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

### 480 MHz DUT Evaluation (Body)



\*\*\*\*\*

Celltech Labs Inc.  
 Test Result for UIM Dielectric Parameter  
 Mon 09/Jun/2008  
 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	59.51	0.82
0.3600	57.60	0.93	59.17	0.83
0.3700	57.50	0.93	59.16	0.85
0.3800	57.40	0.93	59.95	0.86
0.3900	57.30	0.93	59.00	0.85
0.4000	57.20	0.93	59.77	0.87
0.4100	57.10	0.93	59.01	0.88
0.4200	57.00	0.94	59.32	0.89
0.4300	56.90	0.94	59.00	0.88
0.4400	56.80	0.94	59.15	0.88
0.4500	56.70	0.94	58.20	0.91
0.4600	56.66	0.94	58.20	0.91
0.4700	56.62	0.94	57.97	0.91
0.4800	56.58	0.94	58.14	0.92
0.4900	56.54	0.94	58.14	0.93
0.5000	56.51	0.94	57.54	0.93
0.5100	56.47	0.94	57.97	0.94
0.5200	56.43	0.95	58.11	0.95
0.5300	56.39	0.95	58.02	0.97
0.5400	56.35	0.95	58.05	0.96
0.5500	56.31	0.95	57.49	0.98

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

### 450 MHz System Performance Check & 480 MHz DUT Evaluation (Brain)



\*\*\*\*\*

Celltech Labs Inc.  
Test Result for UIM Dielectric Parameter  
Tue 10/Jun/2008  
Frequency (GHz)  
FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
Test\_e Epsilon of UIM  
Test\_s Sigma of UIM

\*\*\*\*\*

Freq	FCC_eHFCC_sH	Test_e	Test_s
0.3500	44.70	0.87	46.10 0.78
0.3600	44.58	0.87	45.64 0.79
0.3700	44.46	0.87	45.53 0.79
0.3800	44.34	0.87	45.00 0.82
0.3900	44.22	0.87	45.52 0.81
0.4000	44.10	0.87	44.52 0.82
0.4100	43.98	0.87	45.11 0.84
0.4200	43.86	0.87	43.87 0.84
0.4300	43.74	0.87	43.82 0.85
0.4400	43.62	0.87	43.83 0.84
0.4500	43.50	0.87	44.15 0.86
0.4600	43.45	0.87	43.34 0.88
0.4700	43.40	0.87	43.32 0.87
0.4800	43.34	0.87	42.53 0.89
0.4900	43.29	0.87	42.74 0.91
0.5000	43.24	0.87	42.61 0.91
0.5100	43.19	0.87	42.99 0.92
0.5200	43.14	0.88	41.94 0.91
0.5300	43.08	0.88	42.54 0.92
0.5400	43.03	0.88	41.81 0.93
0.5500	42.98	0.88	41.99 0.95

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

### 480 MHz DUT Evaluation (Brain)



\*\*\*\*\*

Celltech Labs Inc.  
 Test Result for UIM Dielectric Parameter  
 Wed 11/Jun/2008  
 Frequency (GHz)  
 FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
 FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
 Test\_e Epsilon of UIM  
 Test\_s Sigma of UIM

\*\*\*\*\*

Freq	FCC_eHFCC_sH	Test_e	Test_s
0.3500	44.70	0.87	45.81 0.76
0.3600	44.58	0.87	44.68 0.77
0.3700	44.46	0.87	44.65 0.78
0.3800	44.34	0.87	44.53 0.79
0.3900	44.22	0.87	44.55 0.80
0.4000	44.10	0.87	43.87 0.81
0.4100	43.98	0.87	44.07 0.82
0.4200	43.86	0.87	43.77 0.83
0.4300	43.74	0.87	43.98 0.84
0.4400	43.62	0.87	43.39 0.85
0.4500	43.50	0.87	43.11 0.85
0.4600	43.45	0.87	42.75 0.86
0.4700	43.40	0.87	42.68 0.86
0.4800	43.34	0.87	41.91 0.88
0.4900	43.29	0.87	42.19 0.88
0.5000	43.24	0.87	42.27 0.89
0.5100	43.19	0.87	41.74 0.90
0.5200	43.14	0.88	41.41 0.89
0.5300	43.08	0.88	41.60 0.91
0.5400	43.03	0.88	41.40 0.92
0.5500	42.98	0.88	41.05 0.92


<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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	<u>Date(s) of Evaluation</u> June 09-11, 2008	<u>Test Report Serial No.</u> 060608ALH-T911-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

**APPENDIX E - SYSTEM VALIDATION**

<b>Applicant:</b>	<b>Kenwood USA Corporation</b>	<b>FCC ID:</b>	<b>ALH30923120</b>	<b>Frequency Range:</b>	<b>470 - 490 MHz</b>	<b>KENWOOD</b>
<b>Model(s):</b>	<b>TK-3102G-2</b>	<b>Device Description:</b>	<b>Portable FM UHF Push-To-Talk Radio Transceiver</b>			
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	Date of Evaluation:	May 01, 2008	Document Serial No.:	SV450B-050108-R1.1	
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz	Fluid Type:

## 450 MHz SYSTEM VALIDATION

Type:

**450 MHz Validation Dipole**

Asset Number:

**00024**

Serial Number:

**136**

Place of Validation:

**Celltech Labs Inc.**

Date of Validation:

**May 01, 2008**

**Celltech Labs Inc. certifies that the 450 MHz System Validation was performed on the date indicated above.**

Validated by:

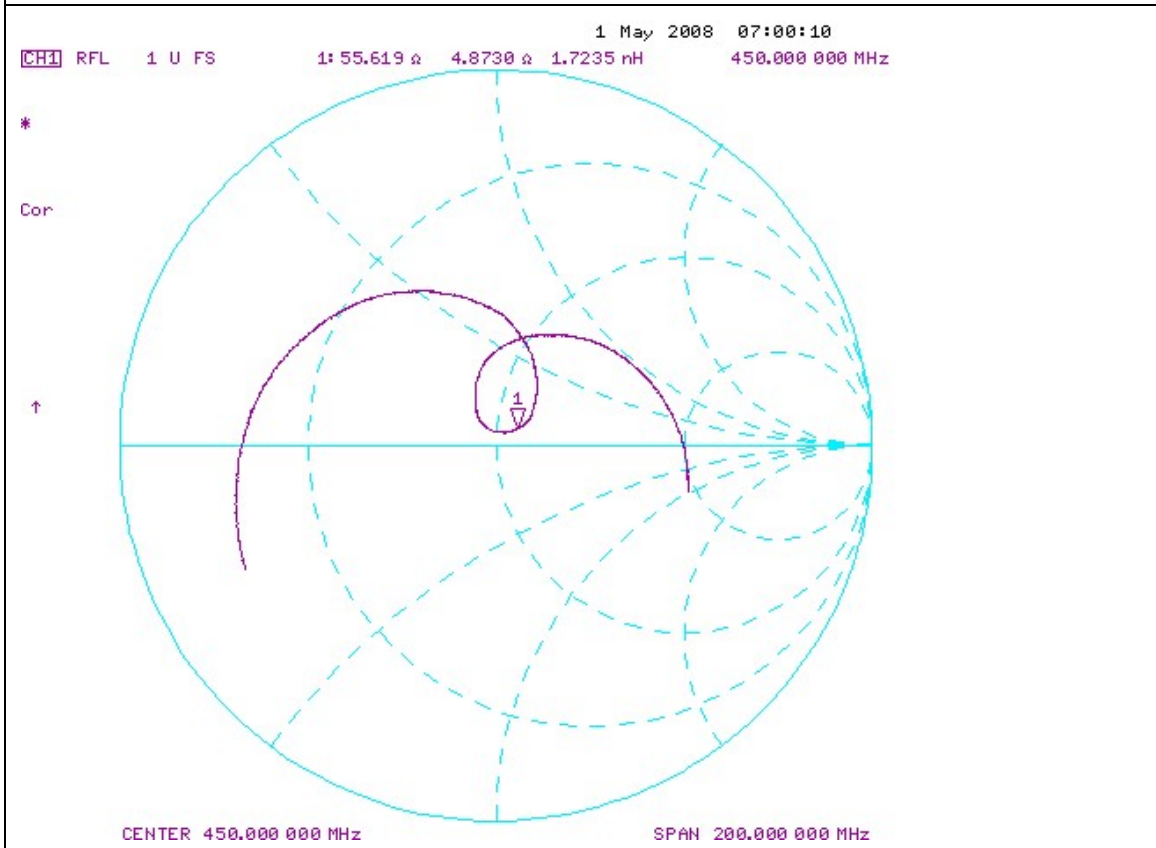
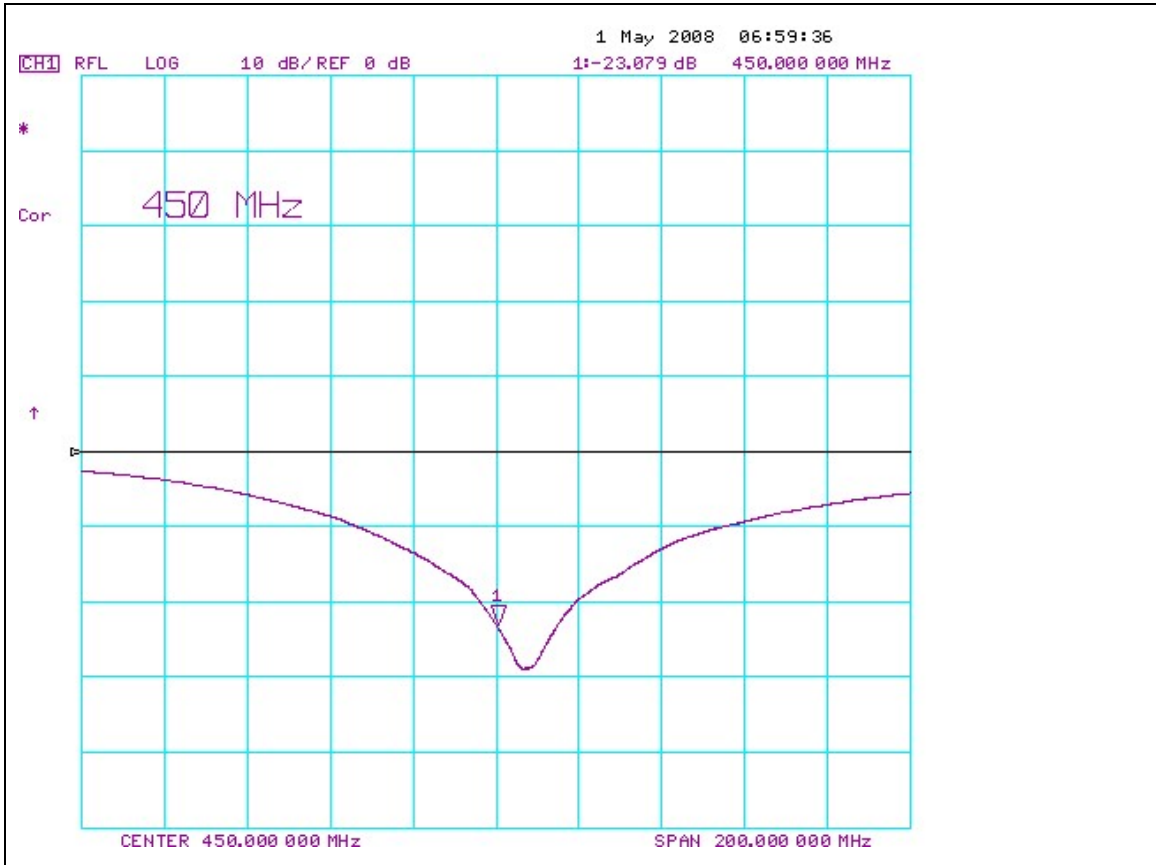
**Sean Johnston**

Signature:





## 2. Validation Dipole VSWR Data



### 3. Validation Dipole Dimensions

Frequency (MHz)	L (mm)	h (mm)	d (mm)
300	396.0	250.0	6.0
<b>450</b>	<b>270.0</b>	<b>167.0</b>	<b>6.0</b>
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	51.5	30.4	3.6
3000	41.5	25.0	3.6

### 4. Validation Phantom

The validation phantom (planar) was constructed using relatively low-loss tangent Plexiglas material.

The inner dimensions of the validation phantom are as follows:

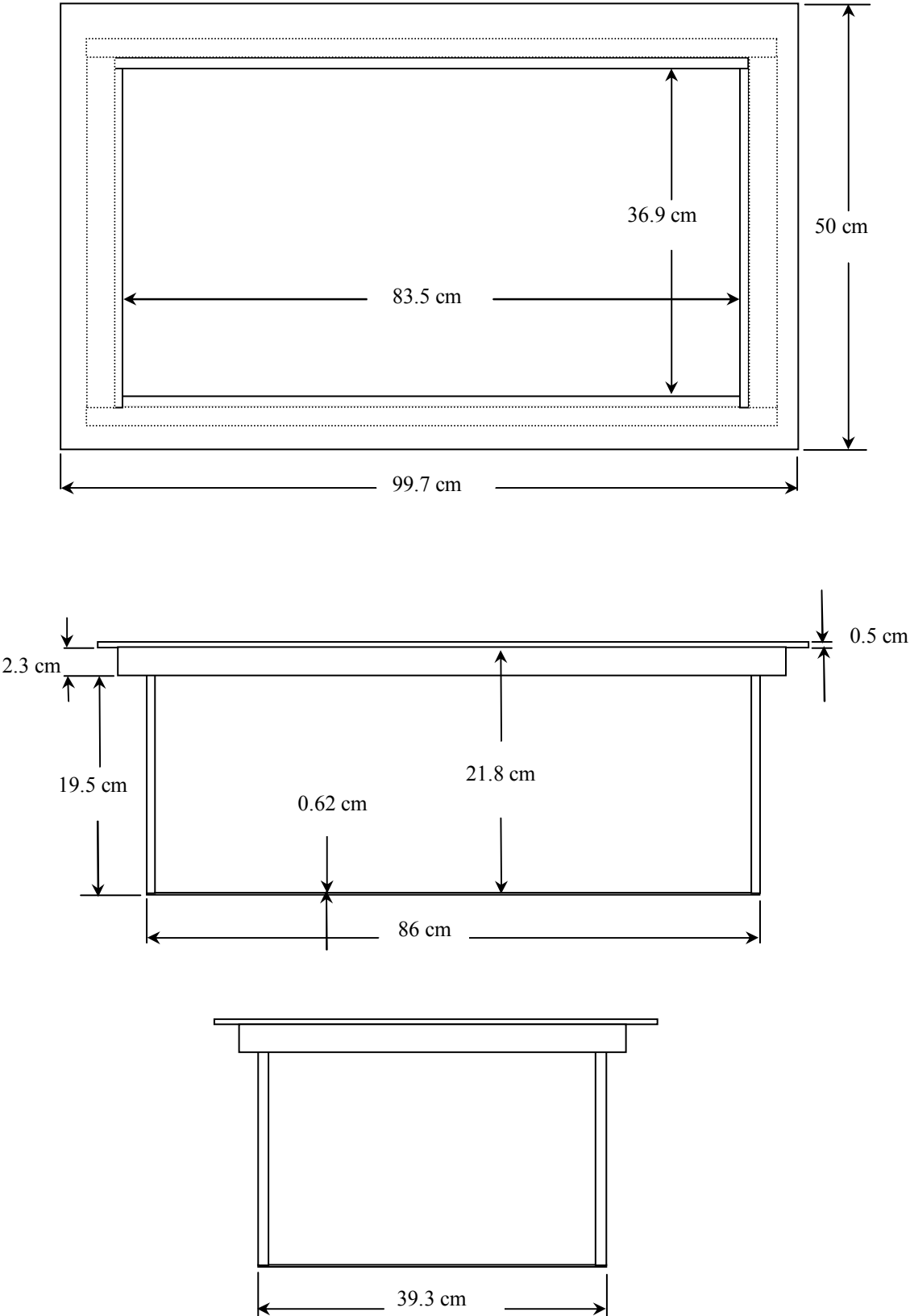
Length: 83.5 cm  
Width: 36.9 cm  
Height: 21.8 cm

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

### 5. Test Equipment List

TEST EQUIPMENT	ASSET NO.	SERIAL NO.	DATE OF CAL.	CAL. DUE DATE
SPEAG DASY4 Measurement Server	00158	1078	N/A	N/A
SPEAG Robot	00046	599396-01	N/A	N/A
SPEAG DAE4	00019	353	22Apr08	22Apr09
SPEAG ET3DV6 E-Field Probe	00016	1387	22Apr08	22Apr09
450 MHz Validation Dipole	00024	136	01May08	01May09
Plexiglas Validation Planar Phantom	00157	137	N/A	N/A
HP 85070C Dielectric Probe Kit	00033	US39240170	N/A	N/A
Gigatronics 8652A Power Meter	00007	1835272	23Apr08	23Apr09
Gigatronics 80701A Power Sensor	00014	1833699	23Apr08	23Apr09
HP 8753ET Network Analyzer	00134	US39170292	28Apr08	28Apr09
HP 8648D Signal Generator	00005	3847A00611	NCR	NCR
Amplifier Research 5S1G4 Power Amplifier	00106	26235	NCR	NCR

**6. Dimensions of Plexiglas Planar Phantom**



**7. 450 MHz System Validation Setup**



**8. 450 MHz Validation Dipole Setup**

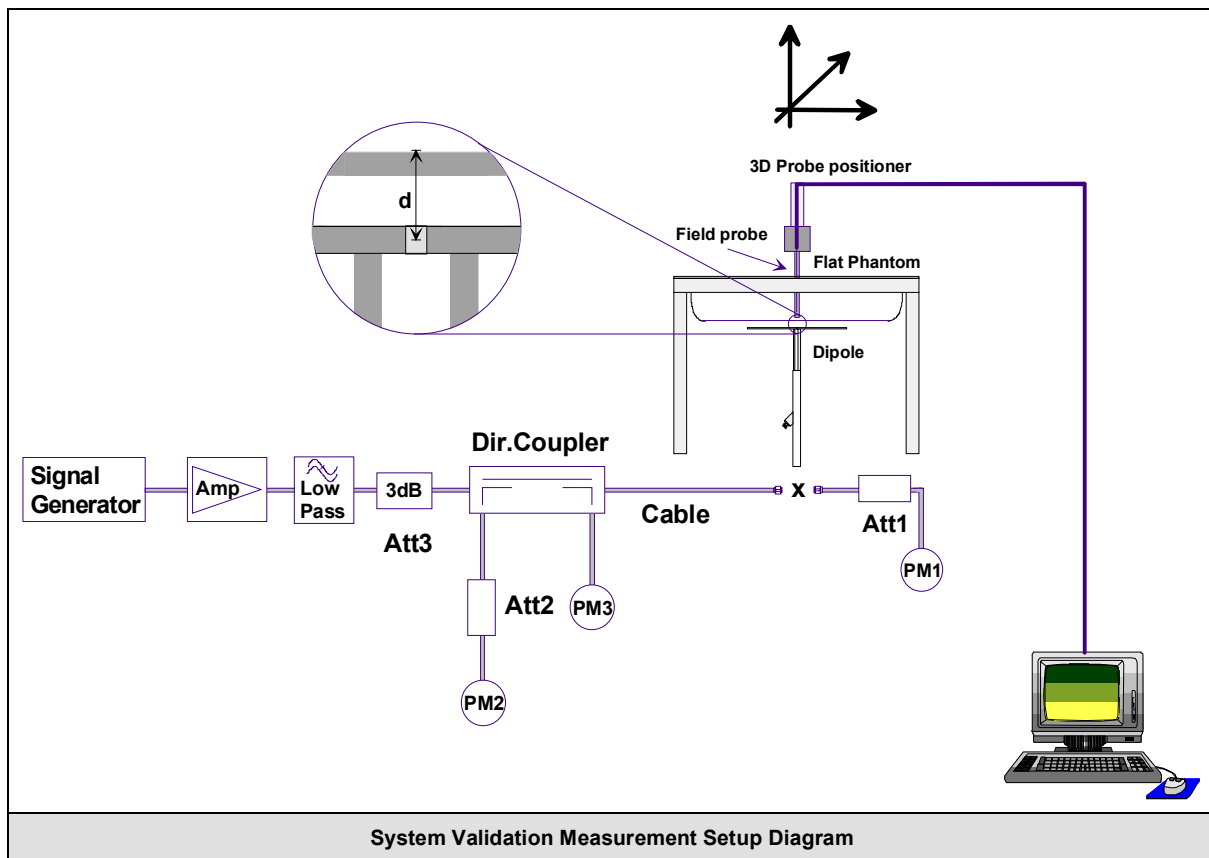




## 9. SAR Measurement

Measurements were made using a dosimetric E-field probe ET3DV6 (S/N: 1387, Conversion Factor 7.32). 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 procedures described below.

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



## 10. Measurement Conditions

The validation phantom was filled with 450 MHz Brain tissue simulant.

Relative Permittivity: 43.6 (+0.3% deviation from target)  
 Conductivity: 0.86 mho/m (-1.0% deviation from target)  
 Fluid Temperature: 21.5°C (Start of Test) / 21.5°C (End of Test)  
 Fluid Depth: ≥ 15.0 cm

Environmental Conditions:

Ambient Temperature: 22.5°C  
 Barometric Pressure: 101.1 kPa  
 Humidity: 35%

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

Ingredient	Percentage by weight	
Water	38.56%	
Sugar	56.32%	
Salt	3.95%	
HEC	0.98%	
Dowicil 75	0.19%	
<b>IEEE/IEC Target Dielectric Parameters (450 MHz):</b>	<b><math>\epsilon_r = 43.5</math> (+/- 5%)</b>	<b><math>\sigma = 0.87</math> S/m (+/- 5%)</b>


## 11. System Validation SAR Results

SAR @ 0.25W Input averaged over 1g (W/kg)				SAR @ 1W Input averaged over 1g (W/kg)			
IEEE/IEC Target	Measured	Deviation		IEEE/IEC Target	Measured	Deviation	
1.23	+/- 10%	1.19	-3.2%	4.9	+/- 10%	4.76	-2.8%
SAR @ 0.25W Input averaged over 10g (W/kg)				SAR @ 1W Input averaged over 10g (W/kg)			
IEEE/IEC Target	Measured	Deviation		IEEE/IEC Target	Measured	Deviation	
0.825	+/- 10%	0.776	-6.0%	3.3	+/- 10%	3.10	-6.0%

Frequency (MHz)	1 g SAR	10 g SAR	Local SAR at surface (above feed-point)	Local SAR at surface (y = 2 cm offset from feed-point) <sup>2</sup>
300	3.0	2.0	4.4	2.1
450	4.9	3.3	7.2	3.2
835	9.5	6.2	4.1	4.9
900	10.8	6.9	16.4	5.4
1450	29.0	16.0	50.2	6.5
1800	38.1	19.8	69.5	6.8
1900	39.7	20.5	72.1	6.6
2000	41.1	21.1	74.6	6.5
2450	52.4	24.0	104.2	7.7
3000	63.8	25.7	140.2	9.5

Numerical reference SAR values for reference dipole and flat phantom normalized to 1 W (IEEE 1528-2003; IEC 62209-1:2005)

	Date of Evaluation:	May 01, 2008	Document Serial No.:	SV450B-050108-R1.1
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
			Fluid Type:	Brain

Date Tested: 05/01/2008

## System Validation - 450 MHz Dipole - HSL

**DUT: Dipole 450 MHz; Asset: 00024; Serial: 136; Validation: 05/01/2008**

Ambient Temp: 22.5°C; Fluid Temp: 21.5°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 450 \text{ MHz}$ ;  $\sigma = 0.86 \text{ mho/m}$ ;  $\epsilon_r = 43.6$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1387; ConvF(7.32, 7.32, 7.32); Calibrated: 22/04/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 22/04/2008
- Phantom: Validation Planar; Type: Plexiglas; Serial: TE#137
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

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

Maximum value of SAR (measured) = 1.21 mW/g

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

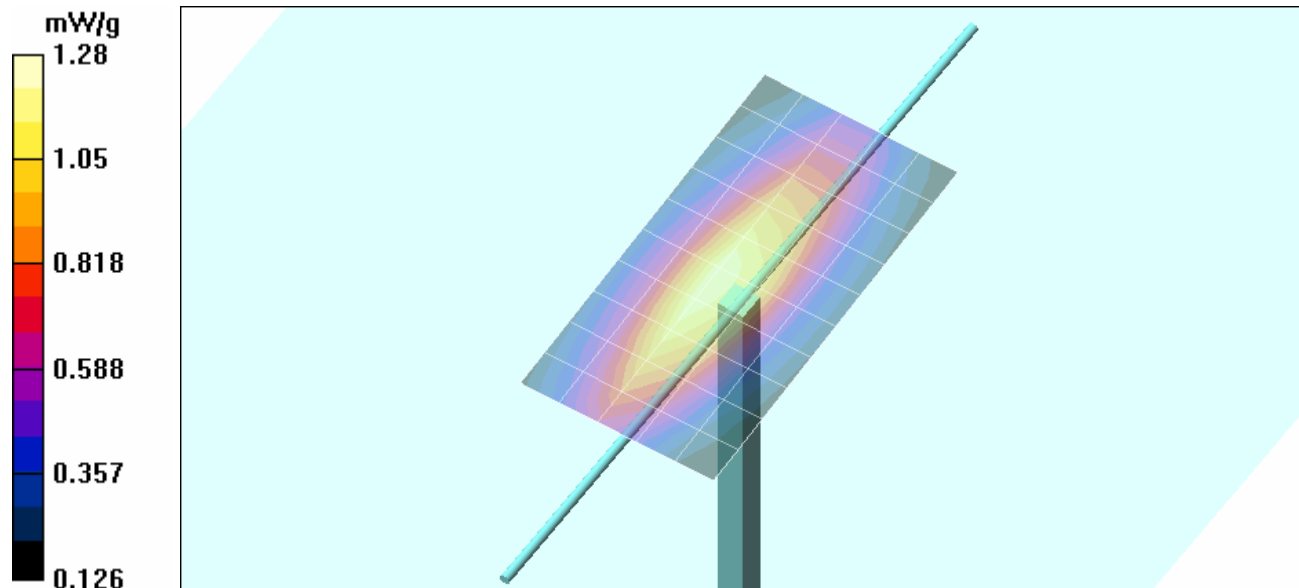
Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 38.9 V/m; Power Drift = 0.008 dB

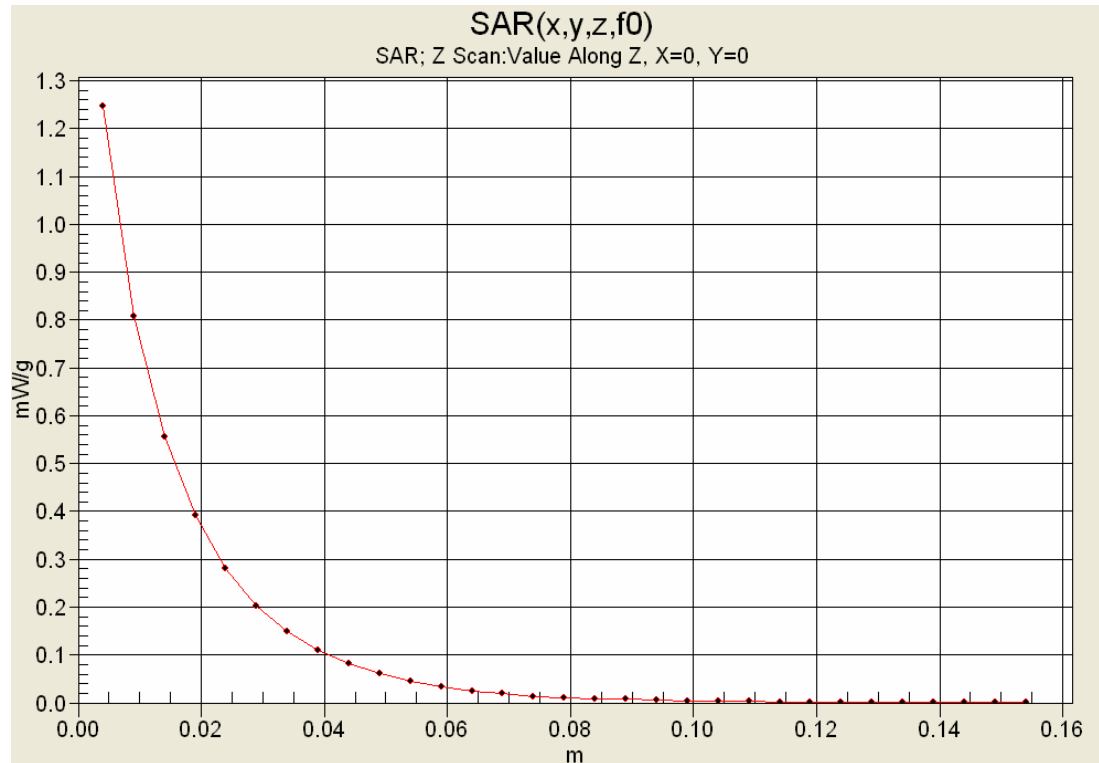
Peak SAR (extrapolated) = 1.90 W/kg

**SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.776 mW/g**

Maximum value of SAR (measured) = 1.28 mW/g



## Z-Axis Scan



## 12. Measured Fluid Dielectric Parameters

### System Validation - 450 MHz (Brain)

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Celltech Labs Inc.  
 Test Result for UIM Dielectric Parameter  
 Thu 01/May/2008  
 Frequency (GHz)  
 IEEE\_eH IEEE 1528-2003 Limits for Head Epsilon  
 IEEE\_sH IEEE 1528-2003 Limits for Head Sigma  
 Test\_e Epsilon of UIM  
 Test\_s Sigma of UIM  
 \*\*\*\*\*

Freq	IEEE_eH	IEEE_sH	Test_e	Test_s
0.3500	44.70	0.87	45.98	0.79
0.3600	44.58	0.87	46.26	0.79
0.3700	44.46	0.87	45.44	0.79
0.3800	44.34	0.87	45.32	0.80
0.3900	44.22	0.87	45.29	0.82
0.4000	44.10	0.87	44.75	0.83
0.4100	43.98	0.87	44.32	0.83
0.4200	43.86	0.87	44.49	0.85
0.4300	43.74	0.87	43.85	0.86
0.4400	43.62	0.87	44.09	0.85
0.4500	43.50	0.87	43.63	0.86
0.4600	43.45	0.87	42.89	0.87
0.4700	43.40	0.87	43.20	0.89
0.4800	43.34	0.87	43.31	0.90
0.4900	43.29	0.87	42.86	0.91
0.5000	43.24	0.87	42.42	0.91
0.5100	43.19	0.87	42.44	0.92
0.5200	43.14	0.88	42.03	0.92
0.5300	43.08	0.88	41.88	0.92
0.5400	43.03	0.88	41.95	0.94
0.5500	42.98	0.88	41.64	0.93

### 13. Measurement Uncertainties

UNCERTAINTY BUDGET FOR SYSTEM VALIDATION						
Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	ci 1g	Uncertainty Value ±% (1g)	V <sub>i</sub> or V <sub>eff</sub>
<b>Measurement System</b>						
Probe calibration (450 MHz)	6.65	Normal	1	1	6.65	∞
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	0.9	Rectangular	1.732050808	1	0.5	∞
Probe linearity	4.7	Rectangular	1.732050808	1	2.7	∞
Detection limit	1	Rectangular	1.732050808	1	0.6	∞
Readout electronics	0.3	Normal	1	1	0.3	∞
Response time	0	Rectangular	1.732050808	1	0.0	∞
Integration time	0	Rectangular	1.732050808	1	0.0	∞
RF ambient conditions	3	Rectangular	1.732050808	1	1.7	∞
Mech. constraints of robot	0.4	Rectangular	1.732050808	1	0.2	∞
Probe positioning	2.9	Rectangular	1.732050808	1	1.7	∞
Extrapolation & integration	1	Rectangular	1.732050808	1	0.6	∞
<b>Dipole</b>						
Dipole Positioning	2	Normal	1.732050808	1	1.2	∞
Power & Power Drift	4.7	Normal	1.732050808	1	2.7	∞
<b>Phantom and Setup</b>						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	1	Normal	1	0.64	0.6	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	0.3	Normal	1	0.6	0.2	∞
<b>Combined Standard Uncertainty</b>					<b>9.31</b>	
<b>Expanded Uncertainty (k=2)</b>					<b>18.62</b>	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 and IEC Standard 62209-1:2005						