

 Testing and Engineering Services Lab	Date(s) of Evaluation	Test Report Serial No.	Test Report Revision No.	 Test Lab Certificate No. 2470.01
	June 06, 09-10, 2008	060608ALH-T910-S90U	Rev. 1.1 (2nd Release)	
Test Report Issue Date	August 29, 2008	Description of Test(s)	RF Exposure Category	Occupational (Controlled)

SAR TEST REPORT (FCC/IC)							
RF EXPOSURE EVALUATION		SPECIFIC ABSORPTION RATE					
APPLICANT	KENWOOD USA CORPORATION						
DEVICE UNDER TEST (DUT)	PORTABLE FM UHF PTT RADIO TRANSCEIVER (450-470 MHz)						
DEVICE MODEL(S)	TK-3102G-1						
DEVICE IDENTIFIER(S)	FCC ID: ALH30923110						
APPLICATION TYPE	Certification						
STANDARD(S) APPLIED	FCC 47 CFR §2.1093						
	Health Canada Safety Code 6						
PROCEDURE(S) APPLIED	FCC OET Bulletin 65, Supplement C (01-01)						
	Industry Canada RSS-102 Issue 2						
	IEEE 1528-2003						
FCC DEVICE CLASSIFICATION	Licensed Non-Broadcast Transmitter Held to Face (TNF)						
IC DEVICE CLASSIFICATION	Land Mobile Radio Transmitter/Receiver (27.41-960 MHz)						
RF EXPOSURE CATEGORY	Occupational / Controlled						
RF EXPOSURE EVALUATION(S)	Face-held & Body-worn						
DATE(S) OF EVALUATION(S)	June 06, 09-10, 2008						
TEST REPORT SERIAL NO.	060608ALH-T910-S90U						
TEST REPORT REVISION NO.	Revision 1.1	FCC ID Correction		August 29, 2008			
	Revision 1.0	Initial Release		June 19, 2008			
TEST REPORT SIGNATORIES	Testing Performed By			Test Report Prepared By			
	Josh Schlenker Celltech Labs Inc.			Jonathan Hughes Celltech Labs Inc.			
TEST LAB AND LOCATION	Celltech Compliance Testing and Engineering Lab						
	21-364 Lougheed Road, Kelowna, B.C. V1X 7R8 Canada						
TEST LAB CONTACT INFO.	Tel.: 250-765-7650			Fax: 250-765-7645			
	info@celltechlabs.com			www.celltechlabs.com			
TEST LAB ACCREDITATION(S)	 Test Lab Certificate No. 2470.01						

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Testing and Engineering Services Lab	Date(s) of Evaluation	Test Report Serial No.	Test Report Revision No.	 NAC-MRA
	June 06, 09-10, 2008	060608ALH-T910-S90U	Rev. 1.1 (2nd Release)	
Test Report Issue Date	August 29, 2008	Description of Test(s)	RF Exposure Category	Occupational (Controlled)
				Test Lab Certificate No. 2470.01

DECLARATION OF COMPLIANCE SAR RF EXPOSURE EVALUATION

Test Lab Information		Name	CELLTECH LABS INC.					
		Address	21-364 Lougheed Road, Kelowna, British Columbia V1X 7R8 Canada					
Applicant Information		Name	KENWOOD USA CORPORATION					
		Address	3975 John Creek Court, Suite 300, Suwanee, GA 30024 United States					
Standard(s) Applied		FCC	47 CFR §2.1093					
		IC	Health Canada Safety Code 6					
Procedure(s) Applied		FCC	OET Bulletin 65, Supplement C (Edition 01-01)					
		IC	RSS-102 Issue 2					
Device Classification(s)		IEEE	1528-2003					
		FCC	Licensed Non-Broadcast Transmitter Held to Face (TNF)					
Device RF Exposure Category		IC	Land Mobile Radio Transmitter/Receiver (27.41-960 MHz)					
		Portable	Occupational / Controlled Environment					
Device Identifier(s)		FCC ID:	ALH30923110					
		Model(s)	TK-3102G-1					
		Serial No.	00101248 (Identical Prototype)					
Device Description		Portable FM UHF Push-to-Talk (PTT) Radio Transceiver						
Transmit Frequency Range(s)		450 - 470 MHz						
Max. RF Output Power Tested		4.5 Watts	36.5 dBm	450 MHz	Low Channel			
		4.5 Watts	36.5 dBm	460 MHz	Mid Channel			
		4.5 Watts	36.5 dBm	470 MHz	High Channel			
Antenna Type(s) Tested		Stubby	450 - 490 MHz	Length: 80 mm	P/N: KRA-23M			
		Whip	440 - 490 MHz	Length: 149 mm	P/N: KRA-27M			
Battery Type(s) Tested		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			
Body-worn Accessories Tested		Belt-Clip	1.5 cm Spacing	Contains Plastic and Metal	P/N: KBH-10			
Audio Accessories Tested		Speaker-Microphone						
Max. SAR Level(s) Evaluated		Face-held	2.79 W/kg	1g	50% duty cycle			
		Body-worn	4.87 W/kg	1g	50% duty cycle			
FCC/IC Spatial Peak SAR Limit		Head/Body	8.0 W/kg	1g	Occupational / Controlled Exposure Environment			

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.

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.

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

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Test Report Approved By



Sean Johnston

Celltech Labs Inc.



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD					
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver								
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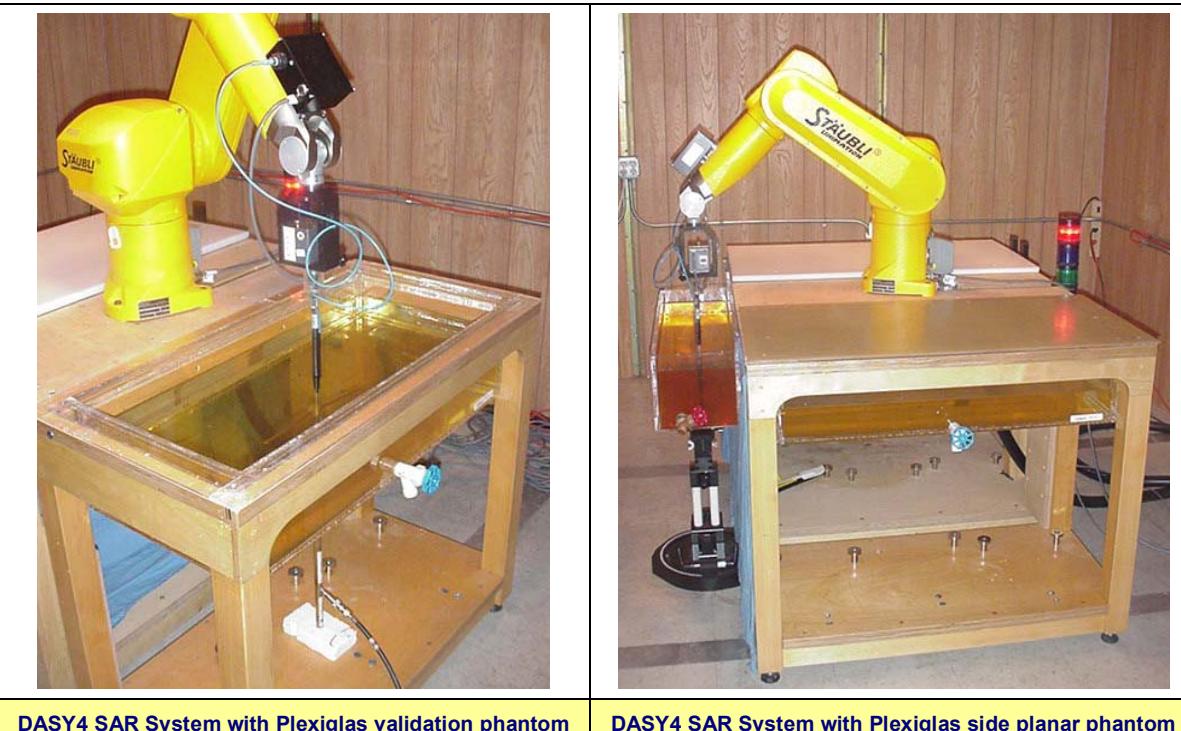
 Celltech Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

1.0 INTRODUCTION

This measurement report demonstrates that the Kenwood USA Corporation Model: TK-3102G-1 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.



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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Date(s) of Evaluation

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Test Report Revision No.

Rev. 1.1 (2nd Release)

Test Report Issue Date

August 29, 2008

Description of Test(s)

Specific Absorption Rate

RF Exposure Category

Occupational (Controlled)



Test Lab Certificate No. 2470.01

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								cm	Watts	100%	50%	dB	100%	50%																		
Face	Jun 10	460.0	Mid	CW	KRA-27M	NiCd 600	n/a	2.5	4.5	4.24	2.12	-0.580	4.85	2.42																				
Face	Jun 10	460.0	Mid	CW	KRA-27M	NiCd 1100	n/a	2.5	4.5	4.85	2.43	-0.608	5.58	2.79																				
Face	Jun 10	460.0	Mid	CW	KRA-27M	NiMH 1600	n/a	2.5	4.5	4.09	2.05	-0.490	4.58	2.29																				
Face	Jun 10	460.0	Mid	CW	KRA-27M	Alkaline AA	n/a	2.5	4.5	4.41	2.21	-0.890	5.41	2.71																				
Face	Jun 10	460.0	Mid	CW	KRA-23M	NiCd 600	n/a	2.5	4.5	4.0	2.0	-0.433	4.42	2.21																				
Face	Jun 10	460.0	Mid	CW	KRA-23M	NiCd 1100	n/a	2.5	4.5	4.36	2.18	-0.468	4.86	2.43																				
Face	Jun 10	460.0	Mid	CW	KRA-23M	NiMH 1600	n/a	2.5	4.5	4.15	2.08	-0.470	4.62	2.31																				
Face	Jun 10	460.0	Mid	CW	KRA-23M	Alkaline AA	n/a	2.5	4.5	4.21	2.11	-0.699	4.95	2.47																				
Body	Jun 9	460.0	Mid	CW	KRA-27M	NiCd 600	BC & SM	1.5	4.5	7.33	3.67	-0.612	8.44	4.22																				
Body	Jun 6	460.0	Mid	CW	KRA-27M	NiCd 1100	BC & SM	1.5	4.5	8.69	4.35	-0.496	9.74	4.87																				
Body	Jun 9	460.0	Mid	CW	KRA-27M	NiMH 1600	BC & SM	1.5	4.5	7.73	3.87	-0.598	8.87	4.44																				
Body	Jun 9	460.0	Mid	CW	KRA-27M	Alkaline AA	BC & SM	1.5	4.5	7.24	3.62	-0.856	8.82	4.41																				
Body	Jun 6	460.0	Mid	CW	KRA-23M	NiCd 600	BC & SM	1.5	4.5	7.24	3.62	-0.521	8.16	4.08																				
Body	Jun 6	460.0	Mid	CW	KRA-23M	NiCd 1100	BC & SM	1.5	4.5	7.62	3.81	-0.377	8.31	4.16																				
Body	Jun 9	460.0	Mid	CW	KRA-23M	NiMH 1600	BC & SM	1.5	4.5	6.98	3.49	-0.354	7.57	3.79																				
Body	Jun 9	460.0	Mid	CW	KRA-23M	Alkaline AA	BC & SM	1.5	4.5	6.92	3.46	-0.633	8.01	4.00																				
Body	Jun 9	450.0	Low	CW	KRA-27M	NiCd 1100	BC & SM	1.5	4.5	8.35	4.18	-0.649	9.70	4.85																				
Body	Jun 9	470.0	High	CW	KRA-27M	NiCd 1100	BC & SM	1.5	4.5	7.73	3.87	-0.508	8.69	4.34																				
SAR LIMIT(S)						BRAIN & BODY			SPATIAL PEAK			RF EXPOSURE CATEGORY																						
FCC 47 CFR 2.1093			Health Canada Safety Code 6			8.0 W/kg			averaged over 1 gram			Occupational / Controlled																						
Test Date(s)		June 10, 2008			June 06 & 09, 2008			Measurement Date		Jun 10	Jun 6	Jun 9	Unit																					
Fluid Type		450 MHz Brain			450 MHz Body			Atmospheric Pressure		100.9	101.1	101.2	kPa																					
Dielectric Constant ϵ_r	IEEE Target		Meas.	Dev.	IEEE Target		Date	Meas.	Dev.	Relative Humidity		33	32	32	%																			
	43.5	$\pm 5\%$	44.2	+1.6%	56.7	$\pm 5\%$	Jun 6	57.3	+1.1%	Ambient Temperature		23.8	23.3	24.0	°C																			
Conductivity σ (mho/m)	IEEE Target		Meas.	Dev.	IEEE Target		Date	Meas.	Dev.	Fluid Temperature		22.3	22.8	21.2	°C																			
	0.87	$\pm 5\%$	0.86	-1.1%	0.94	$\pm 5\%$	Jun 6	0.96	+2.2%	ρ (Kg/m ³)		1000			cm																			
	Jun 9		0.91		-3.1%																													
Note(s)																																		
1.	Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.																																	
2.	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.																																	
3.	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.																																	
4.	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.																																	

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	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)	

4.0 DETAILS OF SAR EVALUATION

The Kenwood USA Corporation Model: TK-3102G-1 Portable FM UHF PTT Radio Transceiver described in this report was compliant for localized Specific Absorption Rate (Occupational / Controlled Exposure) based on the test provisions and conditions described below. Detailed photographs of the test setup are shown in Appendix D.

Test Configuration(s)

1. The DUT was 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.
2. 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

3. 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.
4. 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.
5. 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

6. The fluid temperature was measured prior to and after the SAR evaluations to ensure the temperature remained within +/-2°C of the fluid temperature reported during the dielectric parameter measurements.
7. 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).
8. The SAR evaluations were performed within 24 hours of the system performance check.

5.0 EVALUATION PROCEDURES

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

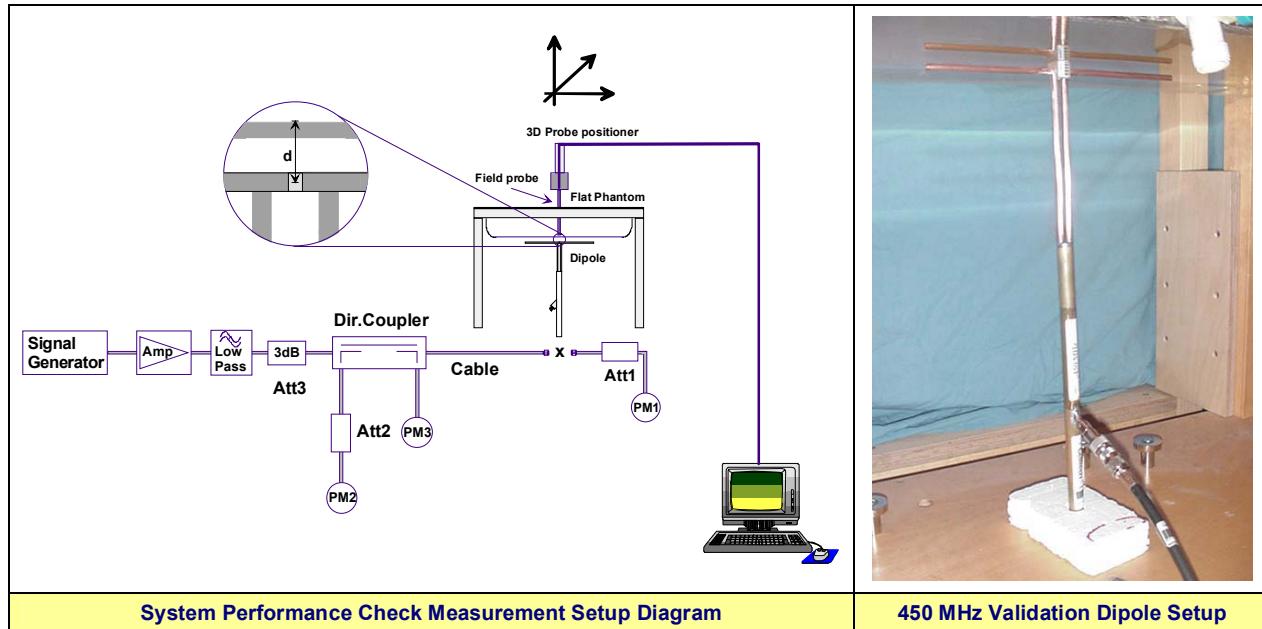
Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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6.0 SYSTEM PERFORMANCE CHECK

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 ϵ_r			Conductivity σ (mho/m)			ρ (Kg/m ³)	Amb. Temp. (°C)	Fluid Temp. (°C)	Fluid Depth (cm)	Humid. (%)	Barom. Press. (kPa)
		Freq. MHz	Sys. Val. Target	Meas.	Dev.	Sys. Val. Target	Meas.	Dev.	Sys. Val. Target	Meas.	Dev.					
			1.19 $\pm 10\%$	1.25	+5.0%	43.6 $\pm 5\%$	42.5	-2.5%	0.86 $\pm 5\%$	0.86	0.0%					
Jun 6	Brain 450	1.19 $\pm 10\%$	1.25	+5.0%	43.6 $\pm 5\%$	42.5	-2.5%	0.86 $\pm 5\%$	0.86	0.0%	1000	23.3	22.8	≥ 15	32	101.1
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	≥ 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	≥ 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 $+/-2^{\circ}\text{C}$ of the fluid temperature reported during the dielectric parameter measurements. 4. The SAR evaluations were performed within 24 hours of the system performance check.															



System Performance Check Measurement Setup Diagram

450 MHz Validation Dipole Setup

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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)	

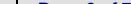
7.0 SIMULATED EQUIVALENT TISSUES

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	8.0 W/kg
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.			

Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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Test Report Issue Date	August 29, 2008	Description of Test(s)	RF Exposure Category	Occupational (Controlled)

Test Lab Certificate No. 2470.01

9.0 ROBOT SYSTEM SPECIFICATIONS

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

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	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)	

10.0 PROBE SPECIFICATION (ET3DV6)

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

11.0 SIDE PLANAR PHANTOM

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.

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>	
--	---

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>	
--	---

Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz		
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver				
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Test Report Issue Date	August 29, 2008	Description of Test(s)	RF Exposure Category	Occupational (Controlled)

Test Lab Certificate No. 2470.01

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
x	-Robot	00046	599396-01	NA	NA
x	-DAE4	00019	353	22Apr08	22Apr09
	-EX3DV4 E-Field Probe	00213	3600	19Apr08	19Apr09
x	-ET3DV6 E-Field Probe	00016	1387	22Apr08	22Apr09
	-300 MHz Validation Dipole	00023	135	30Apr08	30Apr09
x	-450 MHz Validation Dipole	00024	136	01May08	01May09
	-835 MHz Validation Dipole	00022	411	Body	02May08
	-900 MHz Validation Dipole	00020	054	Body	20May08
	-1800 MHz Validation Dipole	00021	247	Body	22May08
	-1900 MHz Validation Dipole	00032	151	Body	14May08
	-2450 MHz Validation Dipole	00025	150	Body	16Jun08
	5GHz Validation Dipole	-5200 MHz	00126	Body	21Apr08
		-5500 MHz		Body	21Apr08
		-5800 MHz		Brain	21Apr08
				Body	21Apr08
	-SAM Phantom V4.0C	00154	1033	NA	NA
	-Barski Planar Phantom	00155	03-01	NA	NA
x	-Plexiglas Side Planar Phantom	00156	161	NA	NA
x	-Plexiglas Validation Planar Phantom	00157	137	NA	NA
	ALS-PR-DIEL Dielectric Probe Kit	00160	260-00953	NA	NA
x	HP 85070C Dielectric Probe Kit	00033	US39240170	NA	NA
x	Gigatronics 8652A Power Meter	00007	1835272	23Apr08	23Apr09
x	Gigatronics 80701A Power Sensor	00014	1833699	23Apr08	23Apr09
x	HP 8753ET Network Analyzer	00134	US39170292	28Apr08	28Apr09
x	Rohde & Schwarz SMR20 Signal Generator	00006	100104	23Apr08	23Apr09
x	Amplifier Research 5S1G4 Power Amplifier	00106	26235	NR	NR
	Amplifier Research 10W1000C Power Amplifier	00041	27887	NR	NR
	Nextec NB00383 Microwave Amplifier	00151	0535	NR	NR
Notes	NA = Not Applicable				
	NR = Not Required				

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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15.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION						
Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	ci 1g	Uncertainty Value ±% (1g)	V_i or V_{eff}
Measurement System						
Probe calibration (450 MHz)	6.65	Normal	1	1	6.65	∞
Axial isotropy of the probe	4.7	Rectangular	1.732050808	0.7	1.9	∞
Spherical isotropy of the probe	9.6	Rectangular	1.732050808	0.7	3.9	∞
Spatial resolution	0	Rectangular	1.732050808	1	0.0	∞
Boundary effects	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	0.8	Rectangular	1.732050808	1	0.5	∞
Integration time	2.6	Rectangular	1.732050808	1	1.5	∞
RF ambient conditions	3	Rectangular	1.732050808	1	1.7	∞
Mech. constraints of robot	0.4	Rectangular	1.732050808	1	0.2	∞
Probe positioning	2.9	Rectangular	1.732050808	1	1.7	∞
Extrapolation & integration	1	Rectangular	1.732050808	1	0.6	∞
Test Sample Related						
Device positioning	2.9	Normal	1	1	2.9	12
Device holder uncertainty	3.6	Normal	1	1	3.6	8
Power drift	5	Rectangular	1.732050808	1	2.9	∞
Phantom and Setup						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	3.1	Normal	1	0.64	2.0	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	2.7	Normal	1	0.6	1.6	∞
Combined Standard Uncertainty					11.30	
Expanded Uncertainty (k=2)					22.59	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])						

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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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_i or V_{eff}
Measurement System						
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	∞
Dipole						
Dipole Positioning	2	Normal	1.732050808	1	1.2	∞
Power & Power Drift	4.7	Normal	1.732050808	1	2.7	∞
Phantom and Setup						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	3.5	Normal	1	0.64	2.2	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	2.5	Normal	1	0.6	1.5	∞
Combined Standard Uncertainty						
Expanded Uncertainty (k=2)						
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])						

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	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)	

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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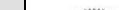
Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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APPENDIX A - SAR MEASUREMENT DATA

Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	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 - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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

RF Conducted Power: 4.5 Watts

RF Conducted Power: 1.5 Watts Communication System: FM (CW)

Frequency: 460 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 4.93 mW/g

Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 460 MHz

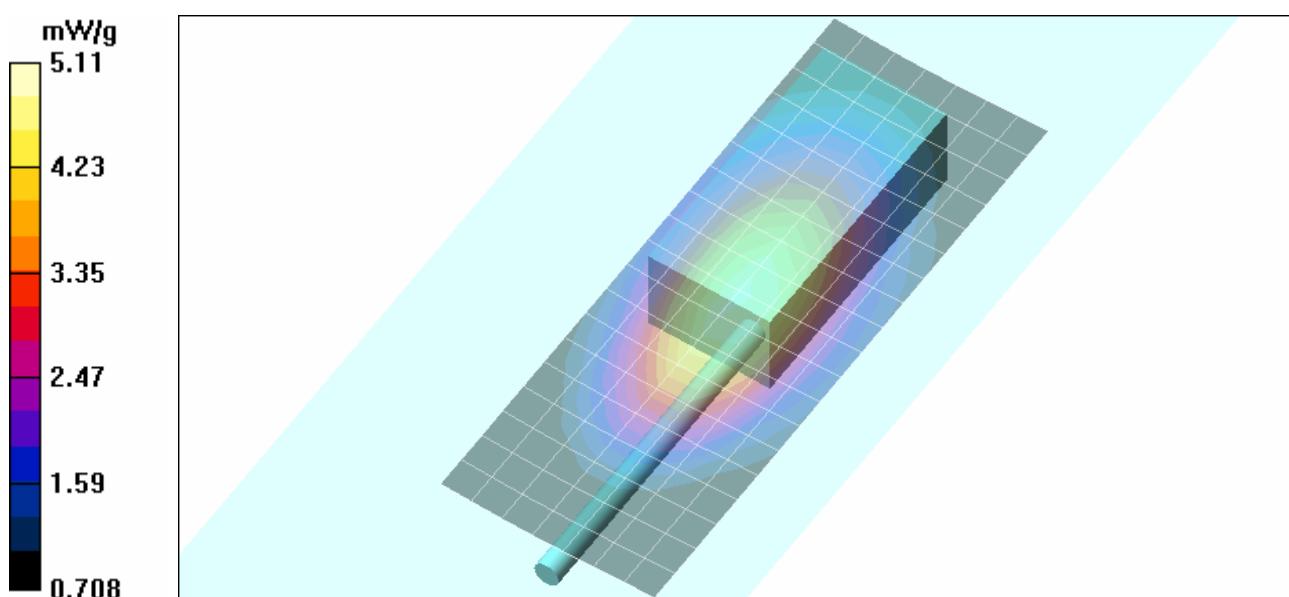
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 77.6 V/m; Power Drift = -0.608 dB

Peak SAR (extrapolated) = 6.81 W/kg

SAR(1 g) = 4.85 mW/g; SAR(10 g) = 3.53 mW/g

Maximum value of SAB (measured) = 5.11 mW/g

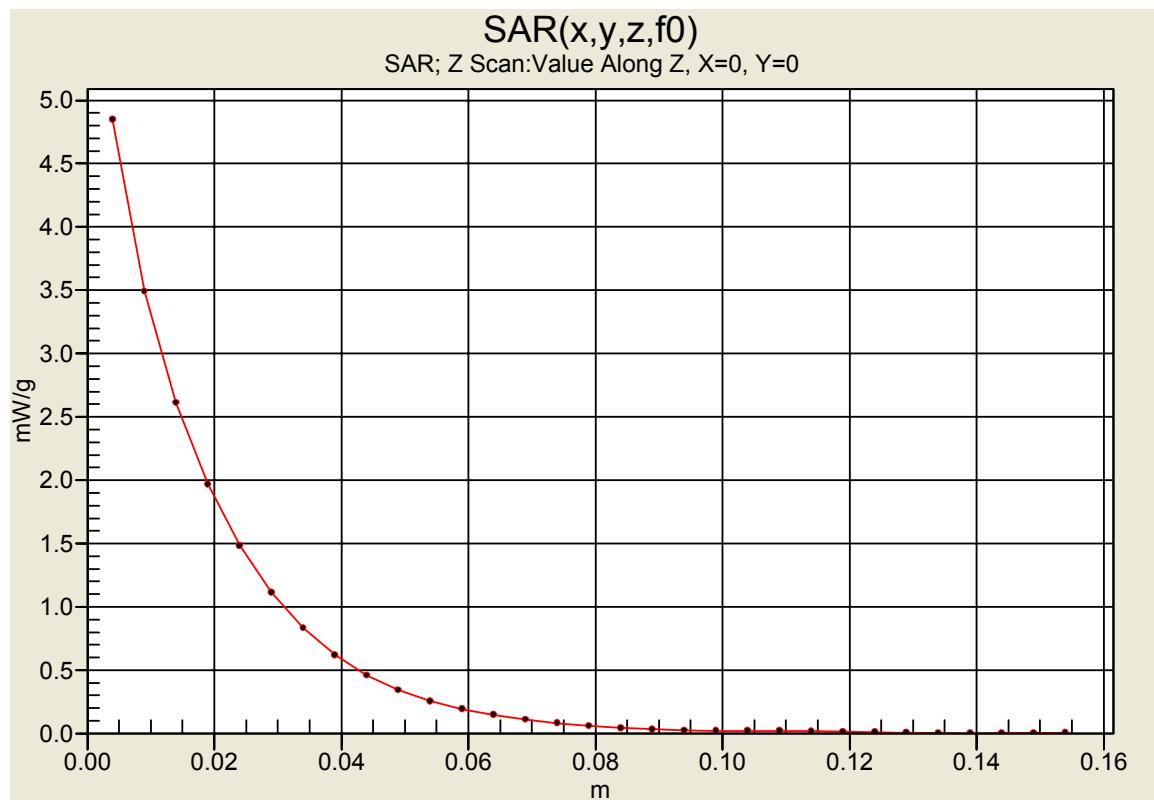


Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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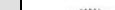
 Celltech Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)
	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)



Z-Axis Scan



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	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: 06/10/2008

Face-held SAR - KRA-27M Antenna - NiMH 1600mAh Battery - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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: 460 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 4.64 mW/g

Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 460 MHz

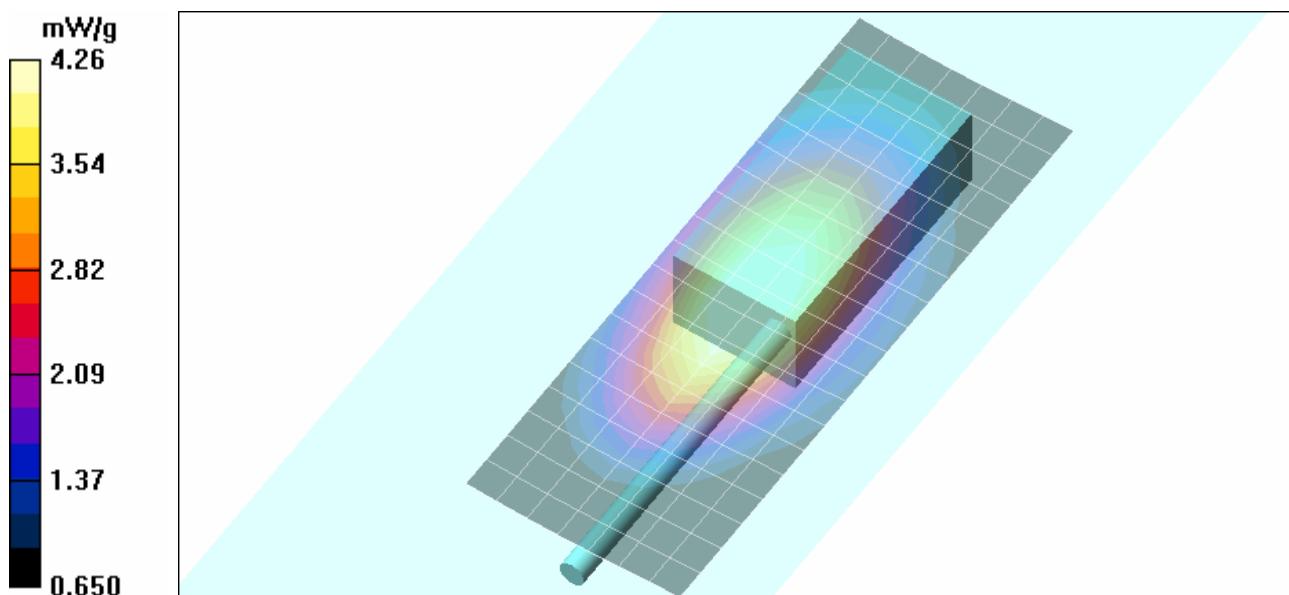
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

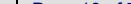
Reference Value = 72.4 V/m; Power Drift = -0.490 dB

Peak SAR (extrapolated) = 5.68 W/kg

SAR(1 g) = 4.09 mW/g; SAR(10 g) = 3.01 mW/g

Maximum value of SAR (measured) = 4.26 mW/q



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-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 - Alkaline AA Batteries - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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: 460 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

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

Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 460 MHz

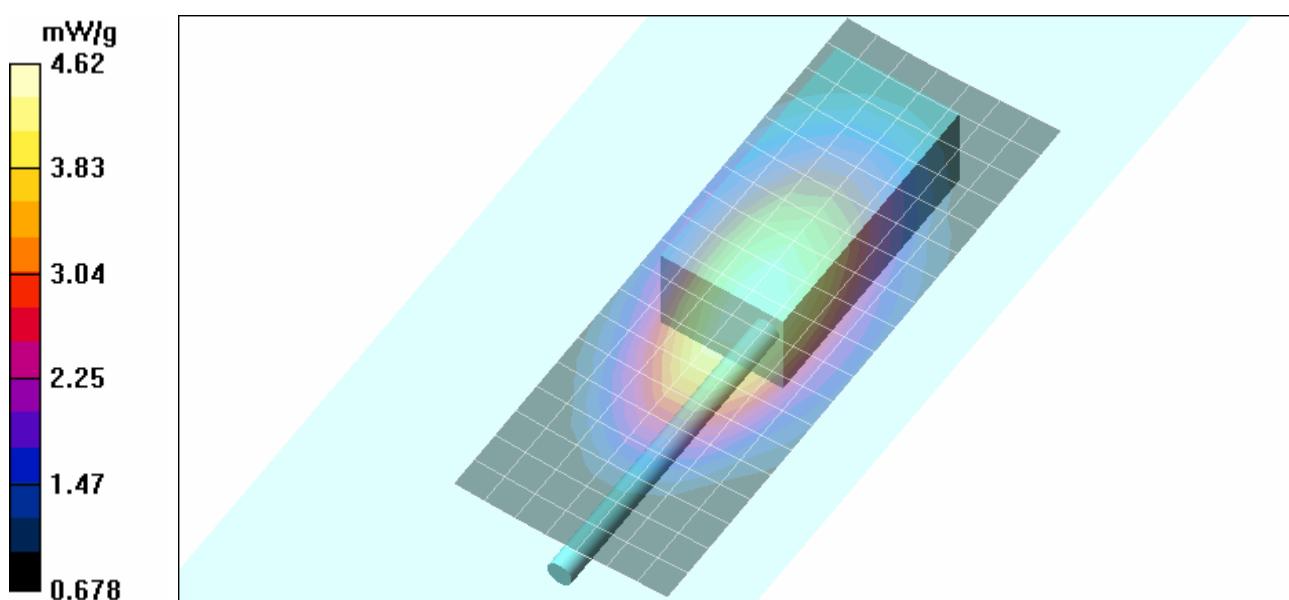
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 74.3 V/m; Power Drift = -0.890 dB

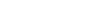
Peak SAR (extrapolated) = 6.13 W/kg

SAR(1 g) = 4.41 mW/g; SAR(10 g) = 3.22 mW/g

Maximum value of SAR (measured) = 4.62 mW/g



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech <small>Testing and Engineering Services Lab</small>	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 ILAC-MRA  ACREDITED
	<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-23M Antenna - NiCd 600mAh Battery - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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

RF Conducted Power: 4.5 Watts

At-Conducted Power to Water Communication System: FM (CW)

Frequency: 460 MHz; Duty Cycle: 1:1

Medium HSL450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

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

Maximum value of SAR (measured) = 3.86 mW/g

Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 460 MHz

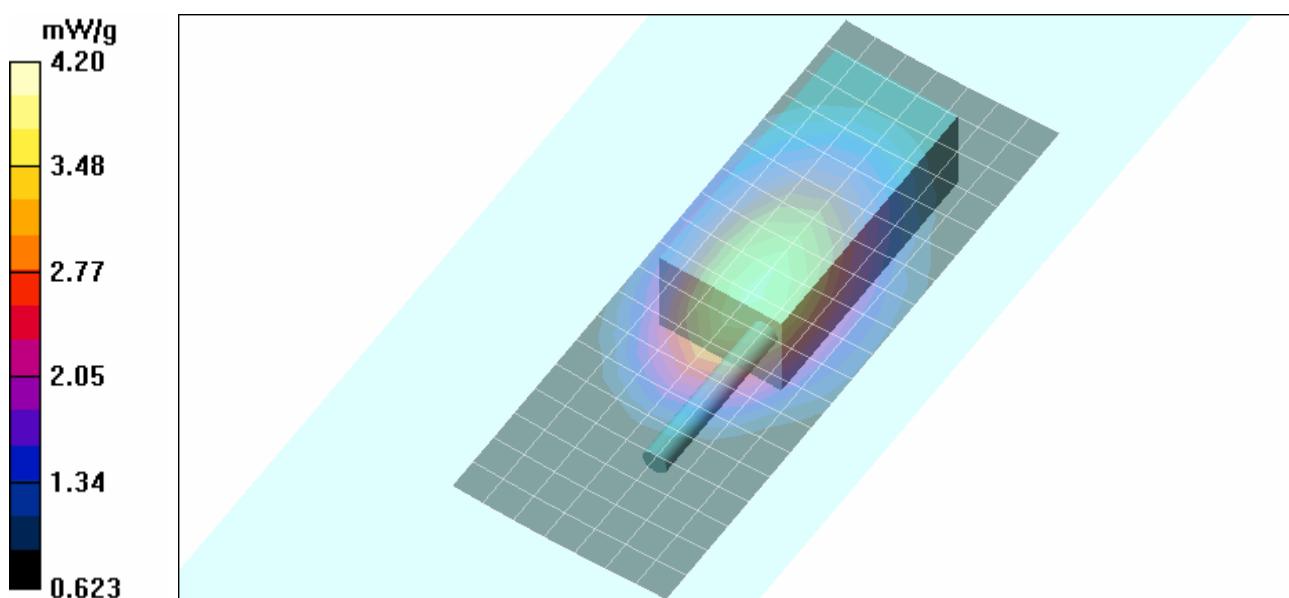
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 68.8 V/m; Power Drift = -0.433 dB

Peak SAR (extrapolated) = 5.56 W/kg

SAR(1 g) = 4 mW/g; SAR(10 g) = 2.93 mW/g

Maximum value of SAB (measured) = 4.20 mW/g



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	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: 06/10/2008

Face-held SAR - KRA-23M Antenna - NiCd 1100mAh Battery - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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

RF Conducted Power: 4.5 Watts

At-Conducted Power to Water Communication System: FM (CW)

Frequency: 460 MHz; Duty Cycle: 1:1

Medium HSL450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

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

Maximum value of SAR (measured) = 4.39 mW/g

Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 460 MHz

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

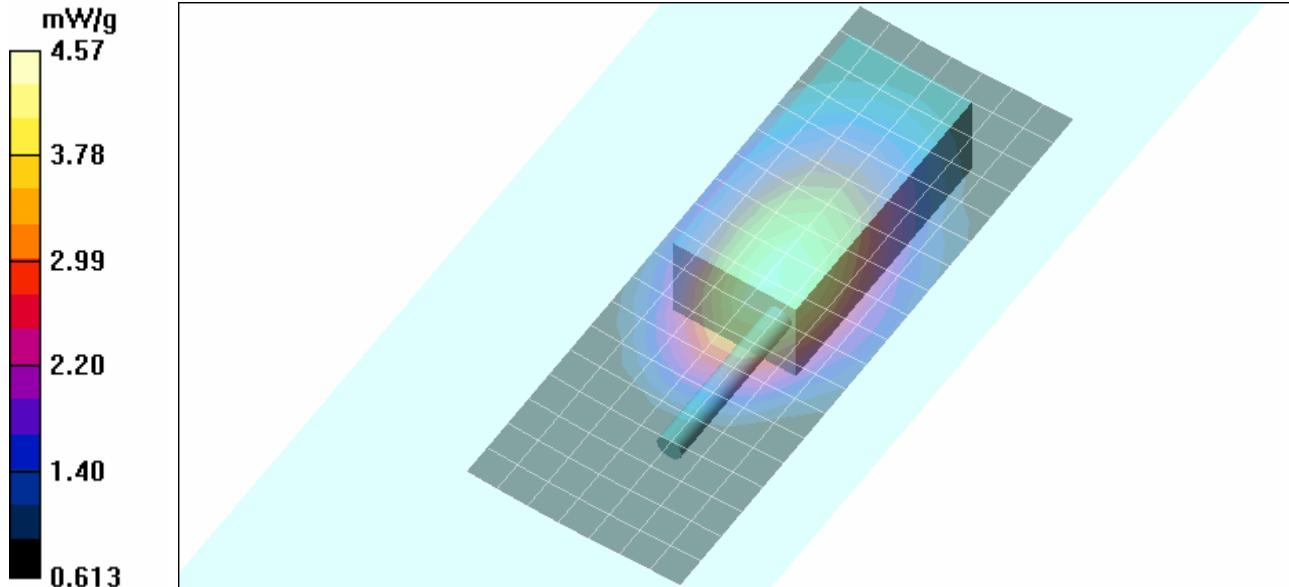
Reference Value = 73.4 V/m; Power Drift = -0.468 dB

Peak SAR (extrapolated) = 6.12 W/kg

SAR(1 g) = 4.36 mW/g; SAR(10 g) = 3.17 mW/g

Maximum value of SAB (measured) = 4.57 mW/g

Maximum value of SAR (measured) = 4.57 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech <small>Testing and Engineering Services Lab</small>	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 ILAC-MRA  ACREDITED
	<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-23M Antenna - NiMH 1600mAh Battery - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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

RF Conducted Power: 4.5 Watts

Conducted Power to Water Communication System: FM (CW)

Frequency: 460 MHz; Duty Cycle: 1:1

Medium HSL450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

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

Maximum value of SAR (measured) = 4.02 mW/g

Face-held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 460 MHz

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

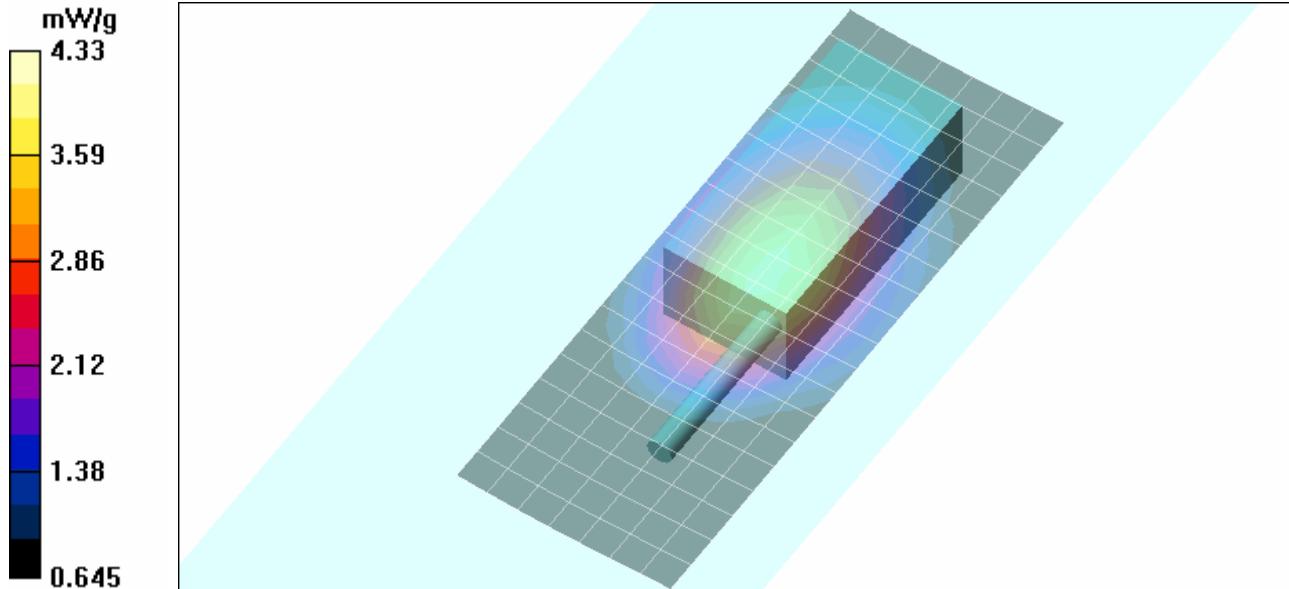
Reference Value = 69.8 V/m; Power Drift = -0.470 dB

Peak SAR (extrapolated) = 5.77 W/kg

SAR(1 g) = 4.15 mW/g; SAR(10 g) = 3.03 mW/g

Maximum value of SAB (measured) = 4.33 mW/g

Maximum value of SAR (measured) = 4.33 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	 KENWOOD
Model(s):	TK-3102G-1	Device Description:	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: 06/10/2008

Face-held SAR - KRA-23M Antenna - Alkaline AA Batteries - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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

RF Conducted Power: 4.5 Watts

At-Conducted Power to Water Communication System: FM (CW)

Frequency: 460 MHz; Duty Cycle: 1:1

Medium HSL450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

- 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 - 460 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 - 460 MHz

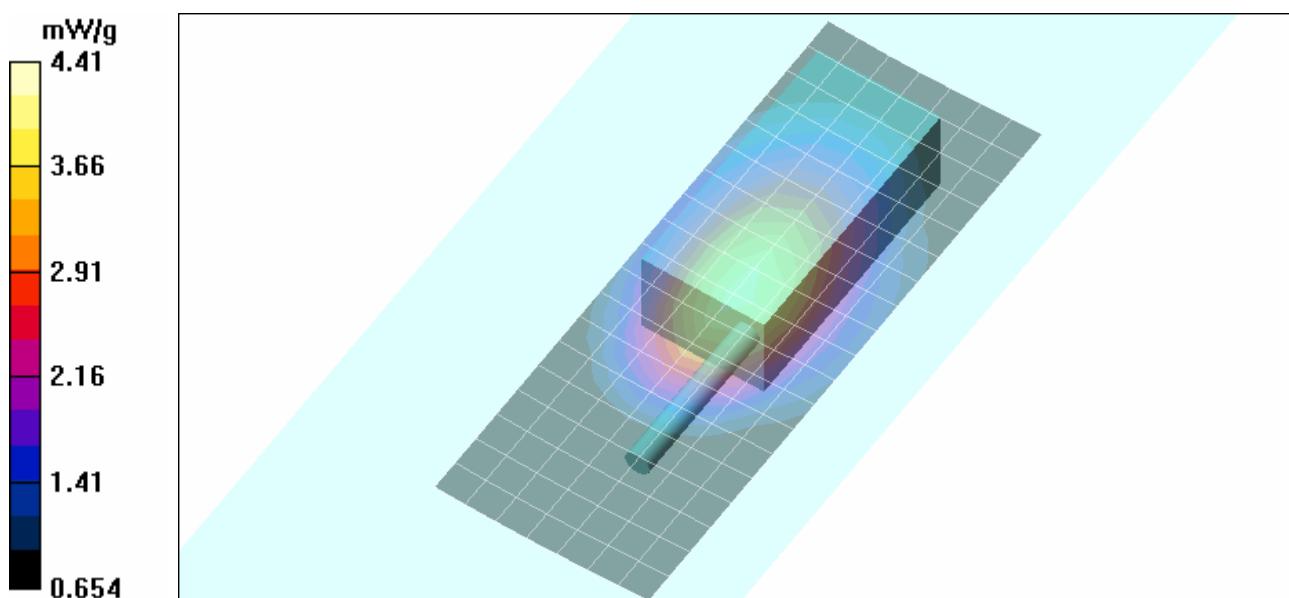
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

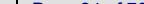
Reference Value = 71.4 V/m; Power Drift = -0.699 dB

Peak SAR (extrapolated) = 5.86 W/kg

SAR(1 g) = 4.21 mW/g; SAR(10 g) = 3.07 mW/g

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



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-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 600mAh Battery - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; **Type:** Portable FM UHF PTT Radio Transceiver; **Serial:** 00101248

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: 460 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 58.2$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 8.36 mW/g

Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 460 MHz

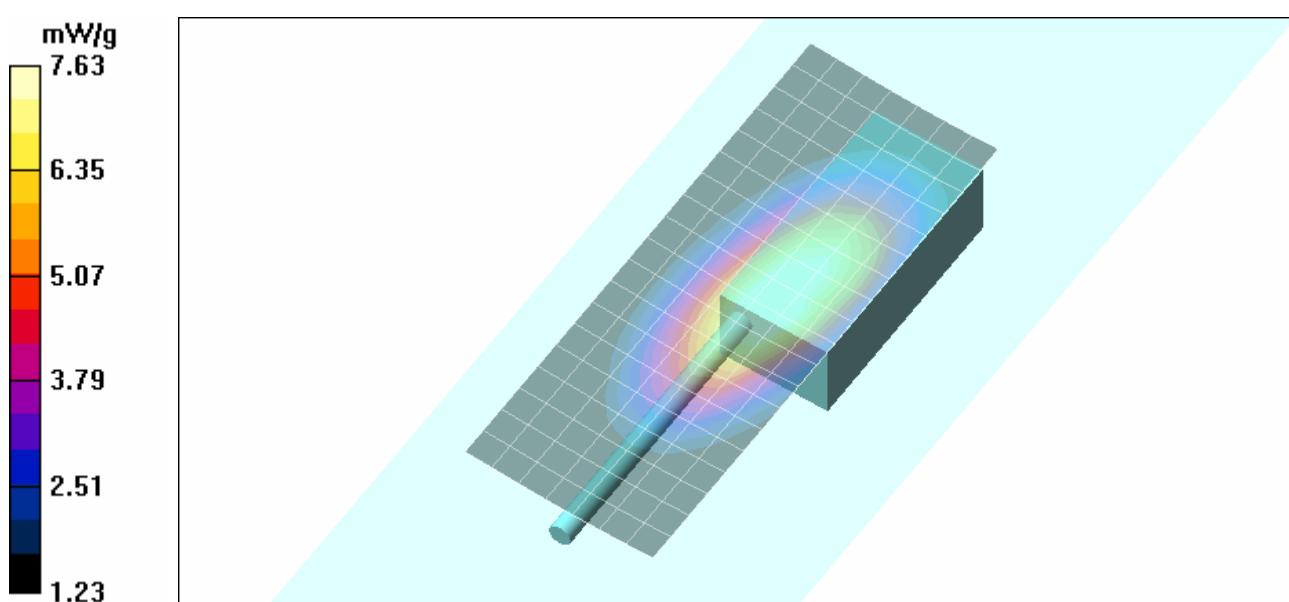
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 95.5 V/m; Power Drift = -0.612 dB

Peak SAR (extrapolated) = 10.7 W/kg

SAR(1 g) = 7.33 mW/g; SAR(10 g) = 5.24 mW/g

Maximum value of SAR (measured) = 7.63 mW/g



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD	
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver				
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 Celltech <small>Testing and Engineering Services Lab</small>	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 ILAC-MRA  ACREDITED
	<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: 06/06/2008

Body-worn SAR - KRA-27M Antenna - NiCd 1100mAh Battery - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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

Ambient Temp: 23.3°C; Fluid Temp: 22.8°C; Barometric Pressure: 101.1 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Frequency: 460 MHz; Duty Cycle:

Frequency: 400 MHz, Duty Cycle: Medium: M450 Medium parameter

Medium: M450 Medium parameters are

Medium: M450 Medium parameters used: $\nu = 480$ MHz, $\delta = 0.98$ mm δ /m, $\epsilon_r = 37.3$, $\rho = 1000$ kg/m δ

- Probe: E13DV6 - 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 - 460 MHz

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

Maximum value of SAR (measured) = 9.47 mW/g

Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 460 MHz

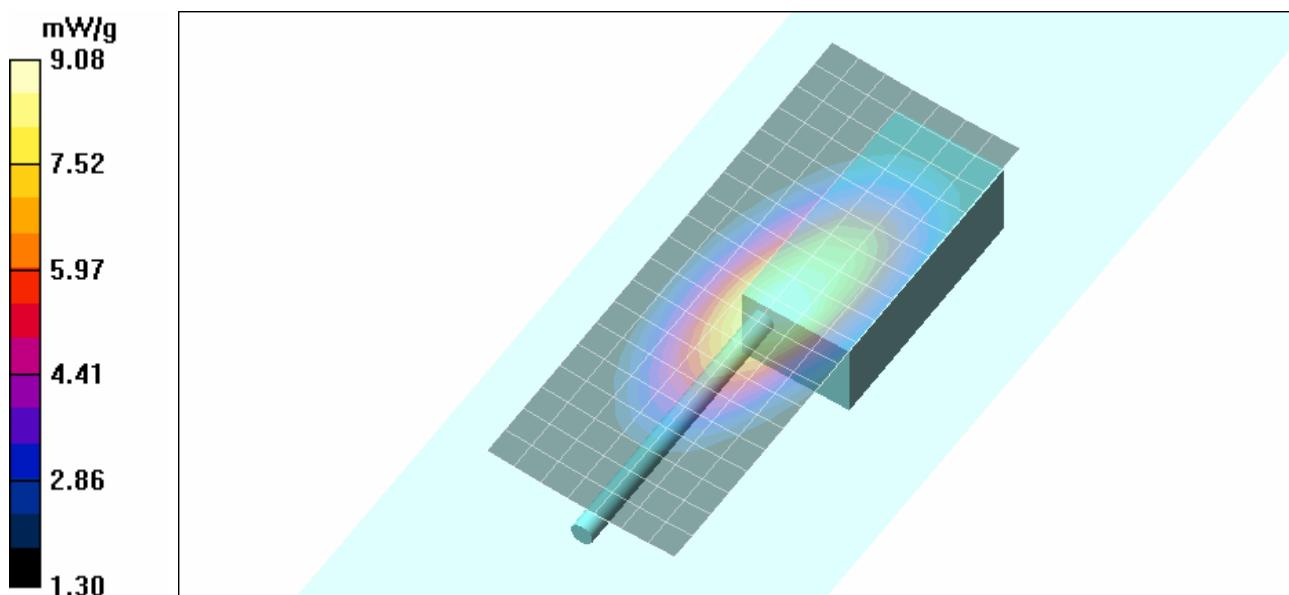
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 101.5 V/m; Power Drift = -0.496 dB

Peak SAR (extrapolated) = 12.6 W/kg

SAR(1 g) = 8.69 mW/g; SAR(10 g) = 6.24 mW/g

Maximum value of SAR (measured) = 9.08 mW/g

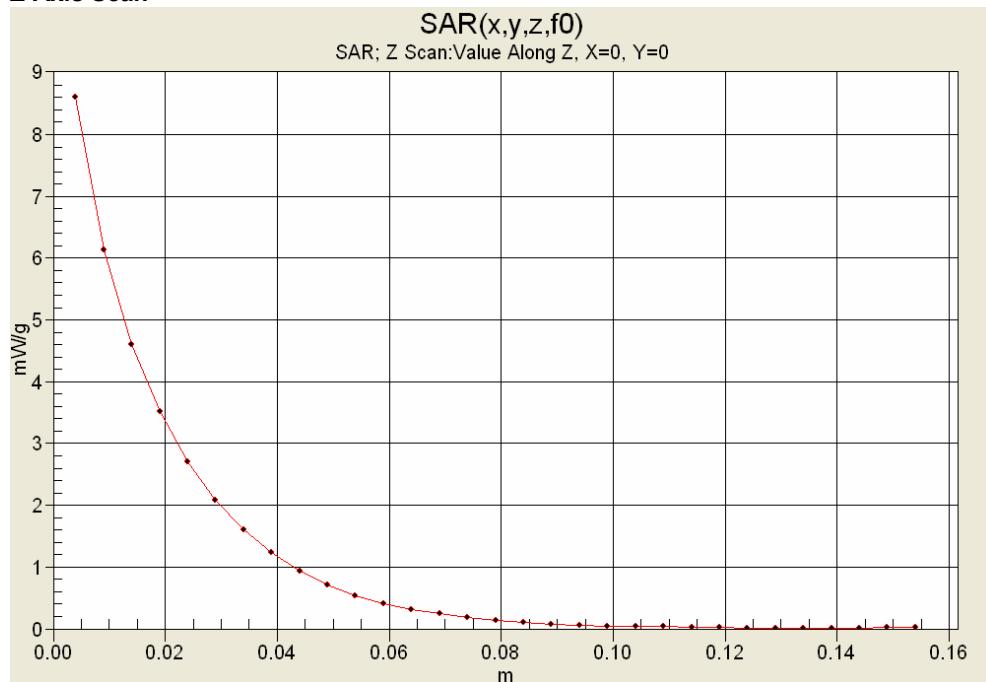


Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	 KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)



Z-Axis Scan



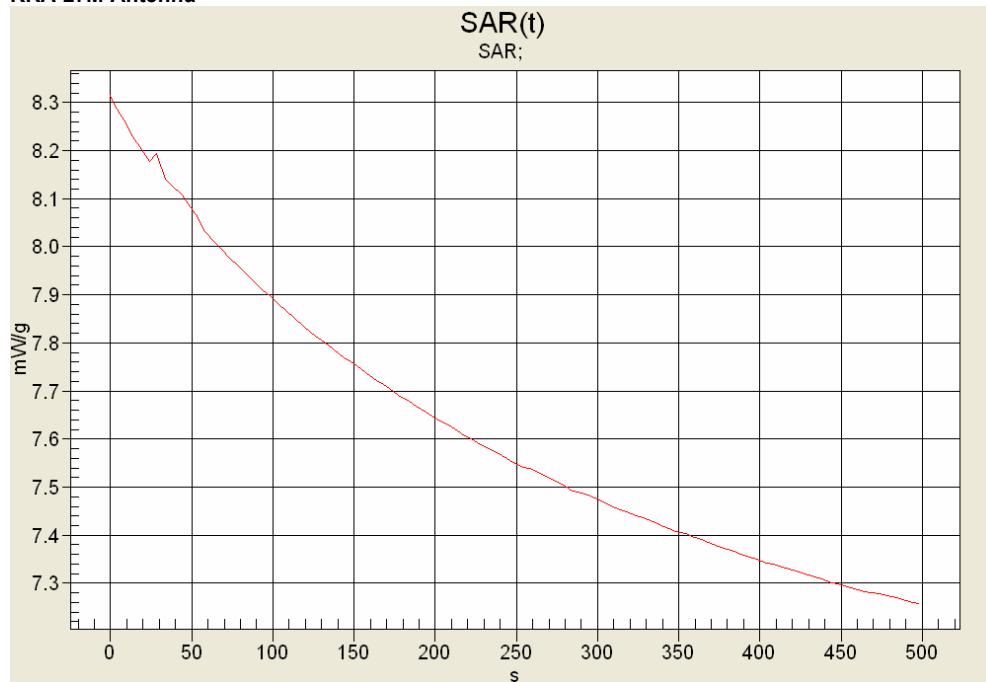
SAR-versus-Time Power Droop Evaluation

Body-worn Configuration

Mid Channel - 460.0 MHz

NiCd 1100mAh Battery

KRA-27M Antenna



Max SAR: 8.31 mW/g

Low SAR: 7.26 mW/g (-0.587 dB)

SAR after 340s: 7.42 mW/g (-0.492 dB)

(340s = Zoom Scan Duration)

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-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 - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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: 460 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 58.2$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 9.36 mW/g

Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 460 MHz

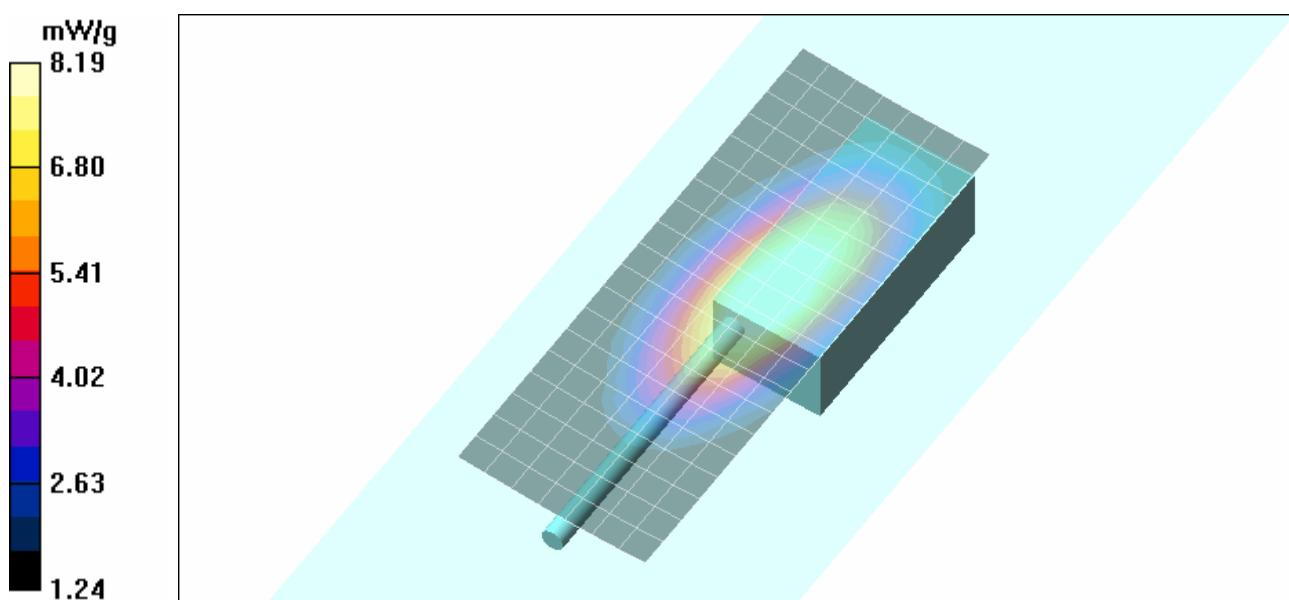
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 98.5 V/m; Power Drift = -0.598 dB

Peak SAR (extrapolated) = 11.4 W/kg

SAR(1 g) = 7.73 mW/g; SAR(10 g) = 5.49 mW/g

Maximum value of SAR (measured) = 8.19 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-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 - 460 MHz

DUT: Kenwood TK-3102G-1; **Type:** Portable FM UHF PTT Radio Transceiver; **Serial:** 00101248

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: 460 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 58.2$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 7.82 mW/g

Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 460 MHz

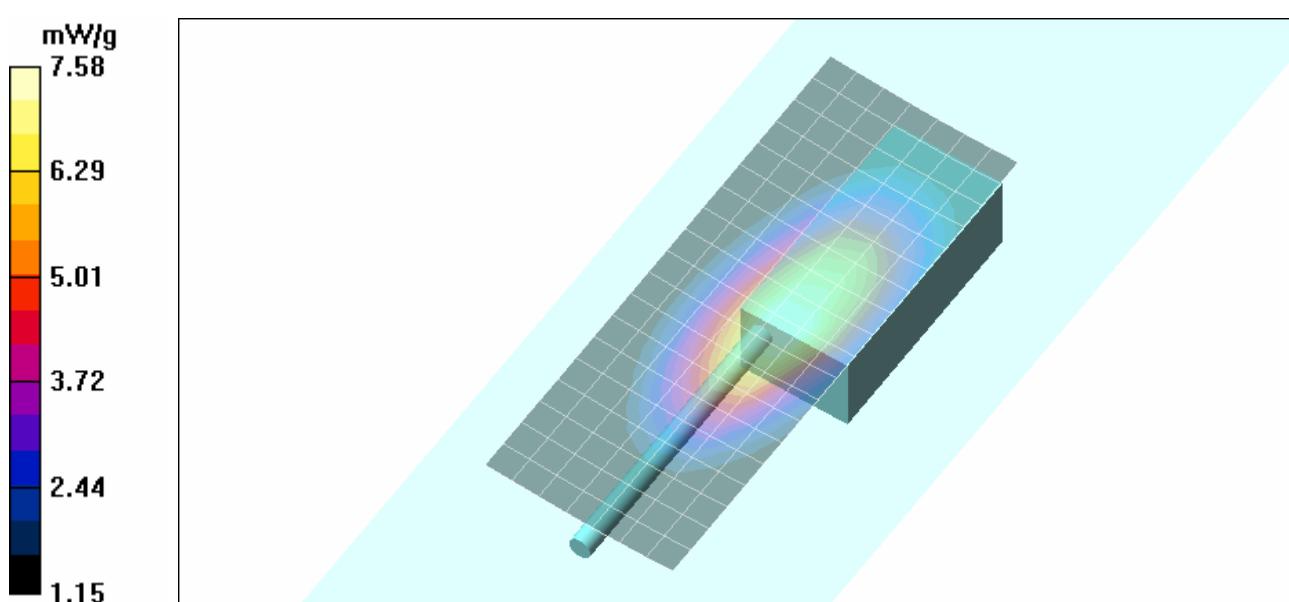
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 92.5 V/m; Power Drift = -0.856 dB

Peak SAR (extrapolated) = 10.6 W/kg

SAR(1 g) = 7.24 mW/g; SAR(10 g) = 5.09 mW/g

Maximum value of SAR (measured) = 7.58 mW/g



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-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: 06/06/2008

Body-worn SAR - KRA-23M Antenna - NiCd 600mAh Battery - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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

Ambient Temp: 23.3°C; Fluid Temp: 22.8°C; Barometric Pressure: 101.1 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 460 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.96$ mho/m; $\epsilon_r = 57.3$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 7.67 mW/g

Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 460 MHz

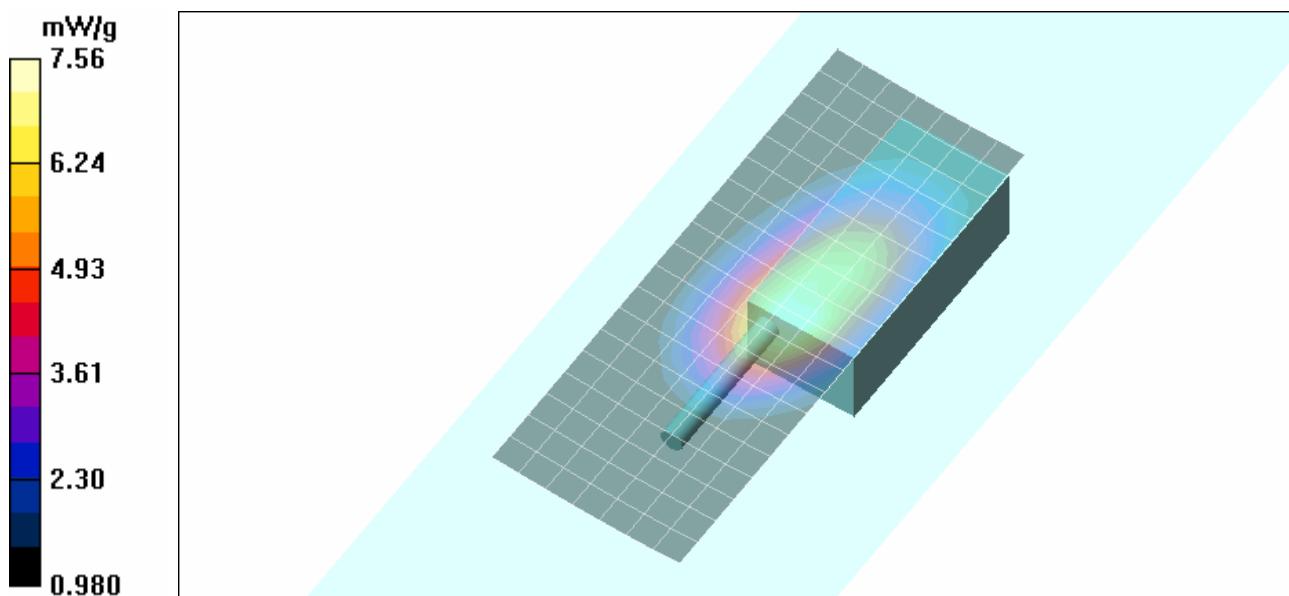
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 90.8 V/m; Power Drift = -0.521 dB

Peak SAR (extrapolated) = 10.8 W/kg

SAR(1 g) = 7.24 mW/g; SAR(10 g) = 5.06 mW/g

Maximum value of SAR (measured) = 7.56 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	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: 06/06/2008

Body-worn SAR - KRA-23M Antenna - NiCd 1100mAh Battery - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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

Ambient Temp: 23.3°C; Fluid Temp: 22.8°C; Barometric Pressure: 101.1 kPa; Humidity: 32%

RF Conducted Power: 4.5 Watts

Communication System: FM (CW)

Frequency: 460 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.96$ mho/m; $\epsilon_r = 57.3$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 7.63 mW/g

Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 460 MHz

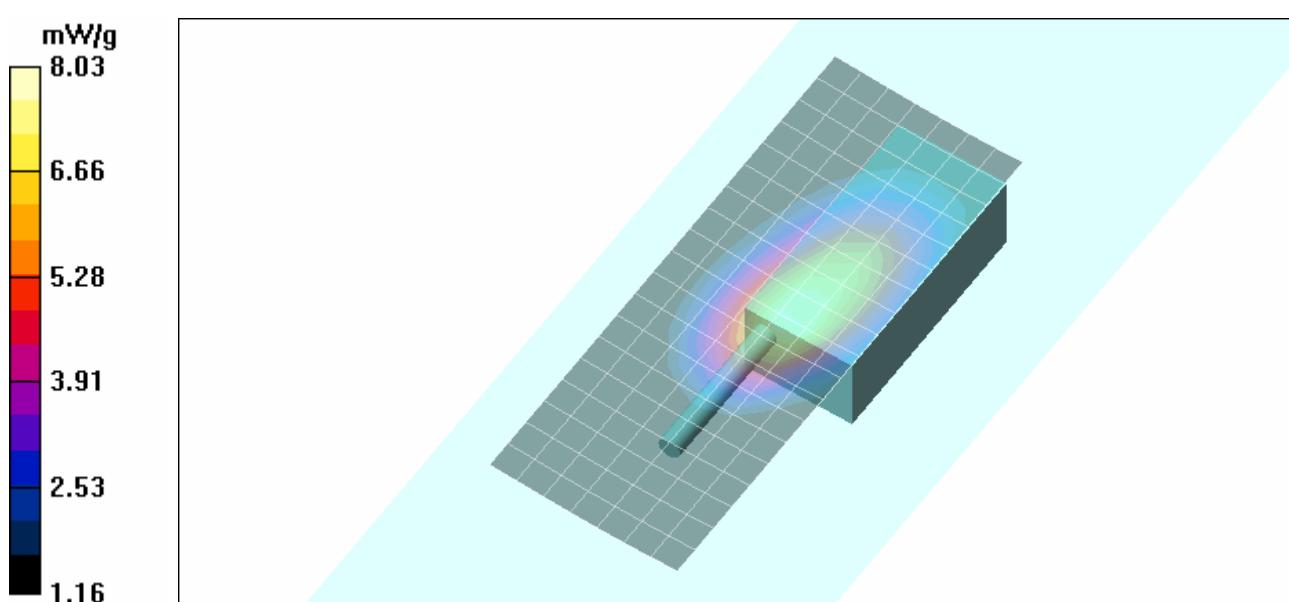
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 94.0 V/m; Power Drift = -0.377 dB

Peak SAR (extrapolated) = 11.1 W/kg

SAR(1 g) = 7.62 mW/g; SAR(10 g) = 5.4 mW/g

Maximum value of SAR (measured) = 8.03 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	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-23M Antenna - NiMH 1600mAh Battery - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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 (CV)
Frequency: 460 MHz; Duty Cycle

Frequency: 460 MHz, Duty Cycle: Medium: M150, Medium parameter:

Medium: M450 Medium parameters u

- 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 - 460 MHz Area Scan (8x20x1): Measurement grid: dx=1.5mm, dy=1.5mm

Area Scan (8x20x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (measured) = 8.24 mW/g

Maximum value of SAR (measured) = 8.34 mW/g

Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 460 MHz

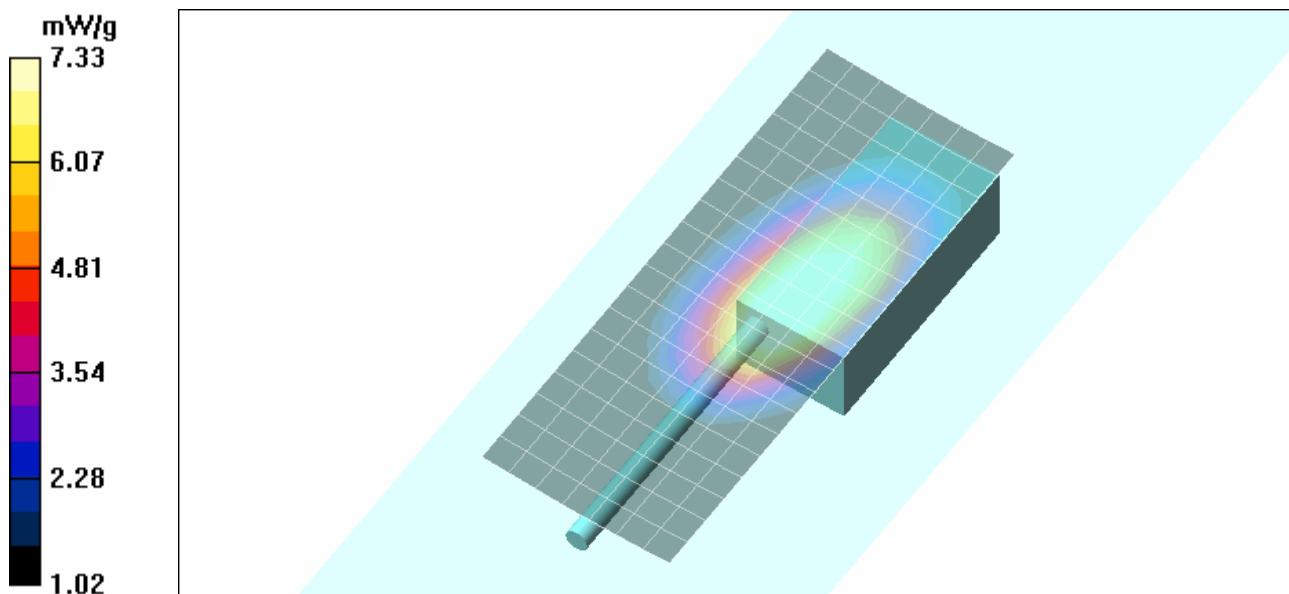
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 88.5 V/m; Power Drift = -0.354 dB

Peak SAR (extrapolated) = 10.2 W/kg

SAR(1 g) = 6.98 mW/g; SAR(10 g) = 4.96 mW/g

Maximum value of SAR (measured) = 7.33 mW/g



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	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-23M Antenna - Alkaline AA Batteries - Mid Channel - 460 MHz

DUT: Kenwood TK-3102G-1; **Type:** Portable FM UHF PTT Radio Transceiver; **Serial:** 00101248

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: 460 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used: $f = 460$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 58.2$; $\rho = 1000$ kg/m³

- 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 - 460 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 7.37 mW/g

Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 460 MHz

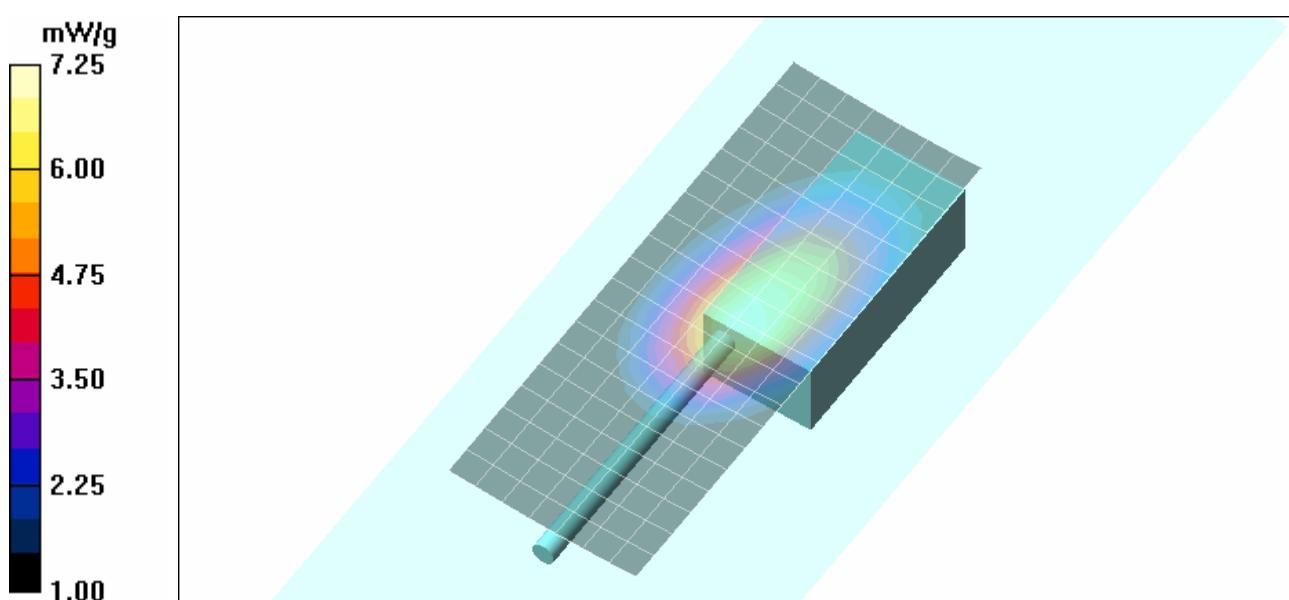
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 90.8 V/m; Power Drift = -0.633 dB

Peak SAR (extrapolated) = 10.0 W/kg

SAR(1 g) = 6.92 mW/g; SAR(10 g) = 4.96 mW/g

Maximum value of SAR (measured) = 7.25 mW/g



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	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 - Low Channel - 450 MHz

DUT: Kenwood TK-3102G-1; Type: Portable FM UHF PTT Radio Transceiver; Serial: 00101248

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: 450 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used: $f = 450$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 58.2$; $\rho = 1000$ kg/m³

- 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 - 450 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 9.38 mW/g

Body-worn SAR - 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Low Channel - 450 MHz

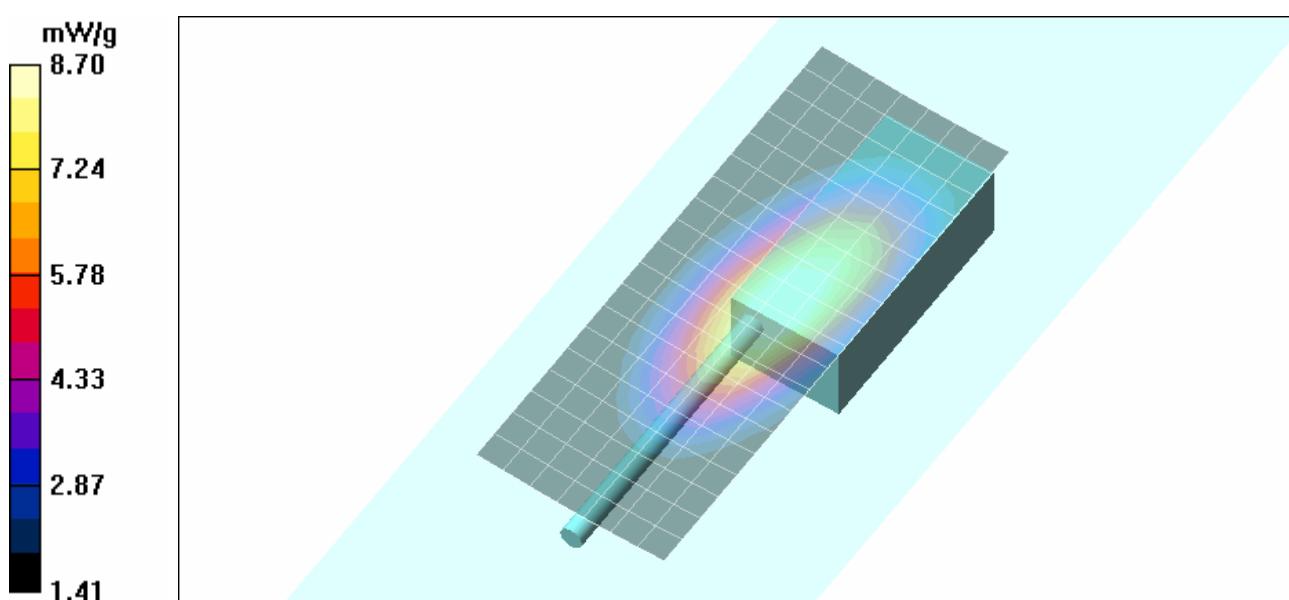
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 100.3 V/m; Power Drift = -0.649 dB

Peak SAR (extrapolated) = 12.0 W/kg

SAR(1 g) = 8.35 mW/g; SAR(10 g) = 6.04 mW/g

Maximum value of SAR (measured) = 8.70 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	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 - High Channel - 470 MHz

DUT: Kenwood TK-3102G-1; **Type:** Portable FM UHF PTT Radio Transceiver; **Serial:** 00101248

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: $f = 470$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 58.2$; $\rho = 1000$ kg/m³

- 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 - 470 MHz

Area Scan (8x20x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 8.64 mW/g

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

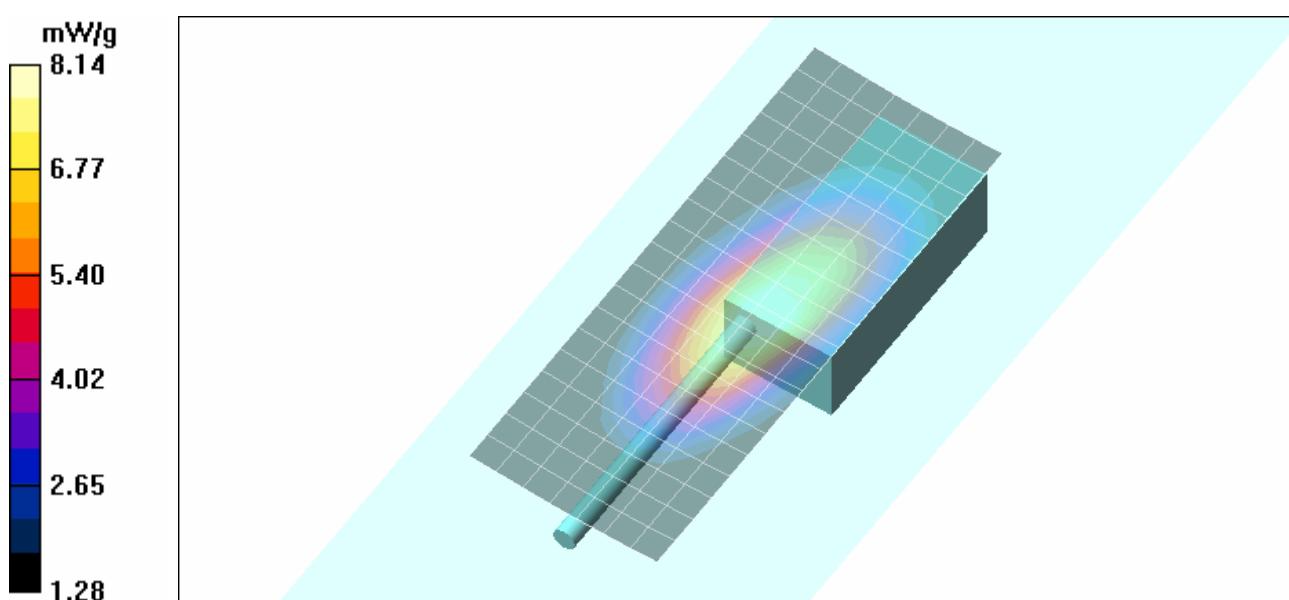
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 96.8 V/m; Power Drift = -0.508 dB

Peak SAR (extrapolated) = 11.3 W/kg

SAR(1 g) = 7.73 mW/g; SAR(10 g) = 5.5 mW/g

Maximum value of SAR (measured) = 8.14 mW/g



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	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)	

Test Lab Certificate No. 2470.01

APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	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: 06/06/2008

System Performance Check - 450 MHz Dipole - HSL

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

Ambient Temp: 23.3°C; Fluid Temp: 22.8°C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used: $f = 450$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 42.5$; $\rho = 1000$ kg/m³

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) = 1.30 mW/g

450 MHz Dipole - System Performance Check

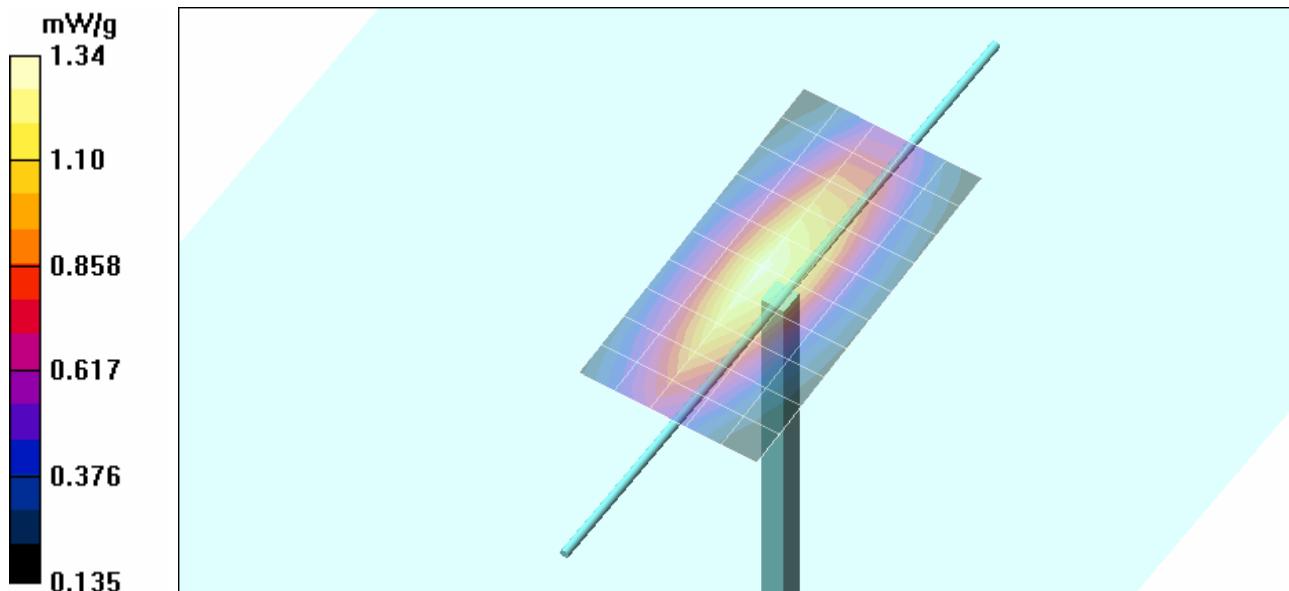
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 39.9 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 1.99 W/kg

SAR(1 g) = 1.25 mW/g; SAR(10 g) = 0.817 mW/g

Maximum value of SAR (measured) = 1.34 mW/g

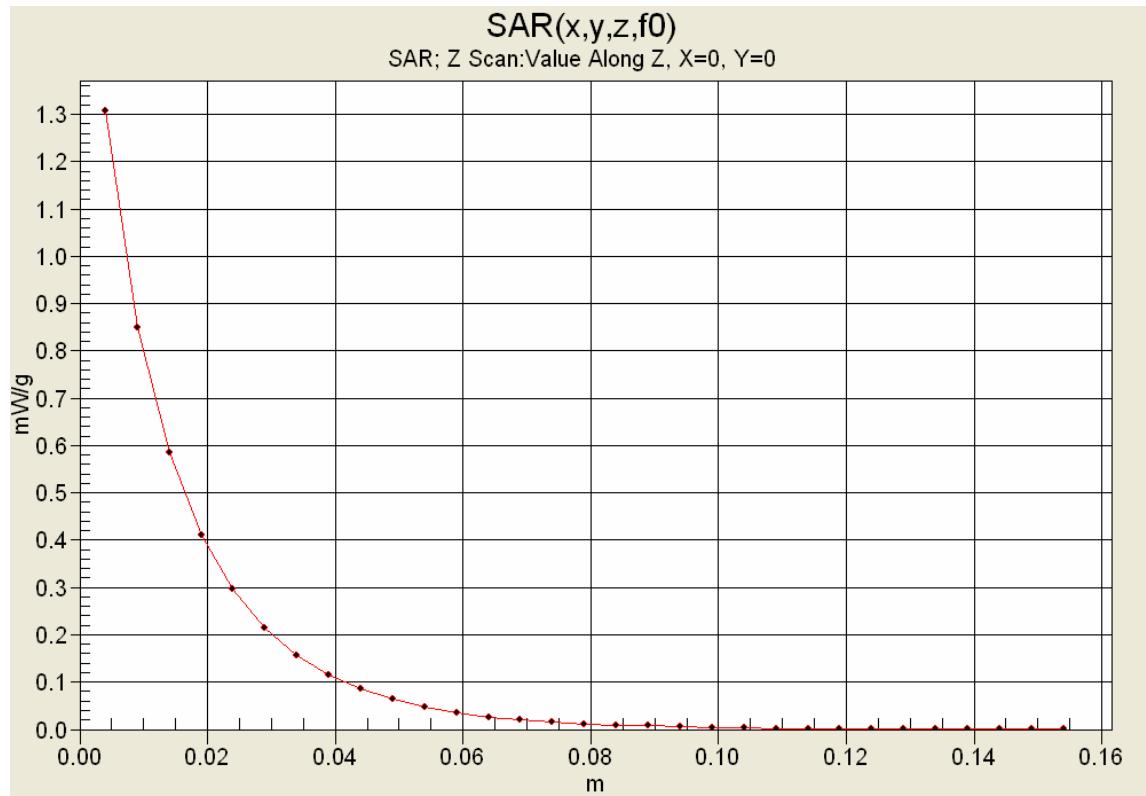


Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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	<u>Test Report Issue Date</u> August 29, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)



Z-Axis Scan



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	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

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: $f = 450$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 44.3$; $\rho = 1000$ kg/m³

- 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=15mm, dy=15mm

Maximum value of SAR (measured) = 1.24 mW/g

450 MHz Dipole - System Performance Check

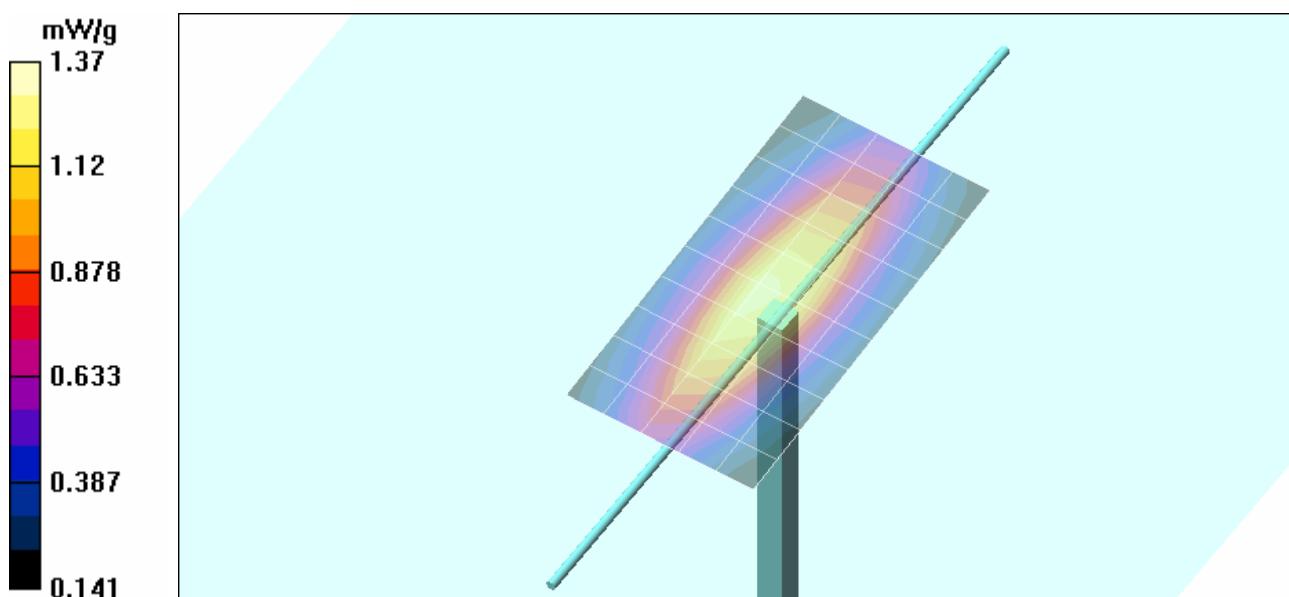
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

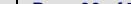
Reference Value = 39.9 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 2.01 W/kg

SAB(1 g) = 1.27 mW/g; SAB(10 g) = 0.834 mW/g

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

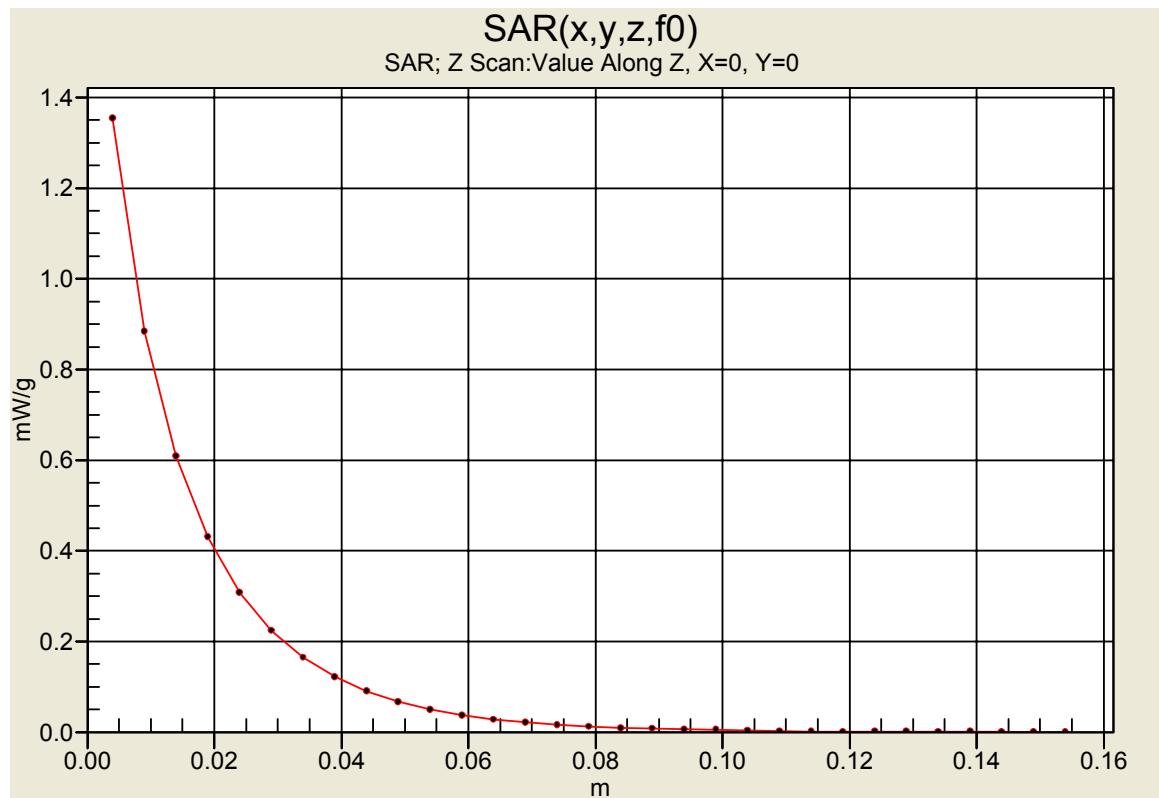


Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-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)



Z-Axis Scan



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech <small>Testing and Engineering Services Lab</small>	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 ILAC-MRA  ACREDITED
	<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: $f = 450$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

- 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=15mm, dy=15mm

Maximum value of SAR (measured) = 1.19 mW/g

450 MHz Dipole - System Performance Check

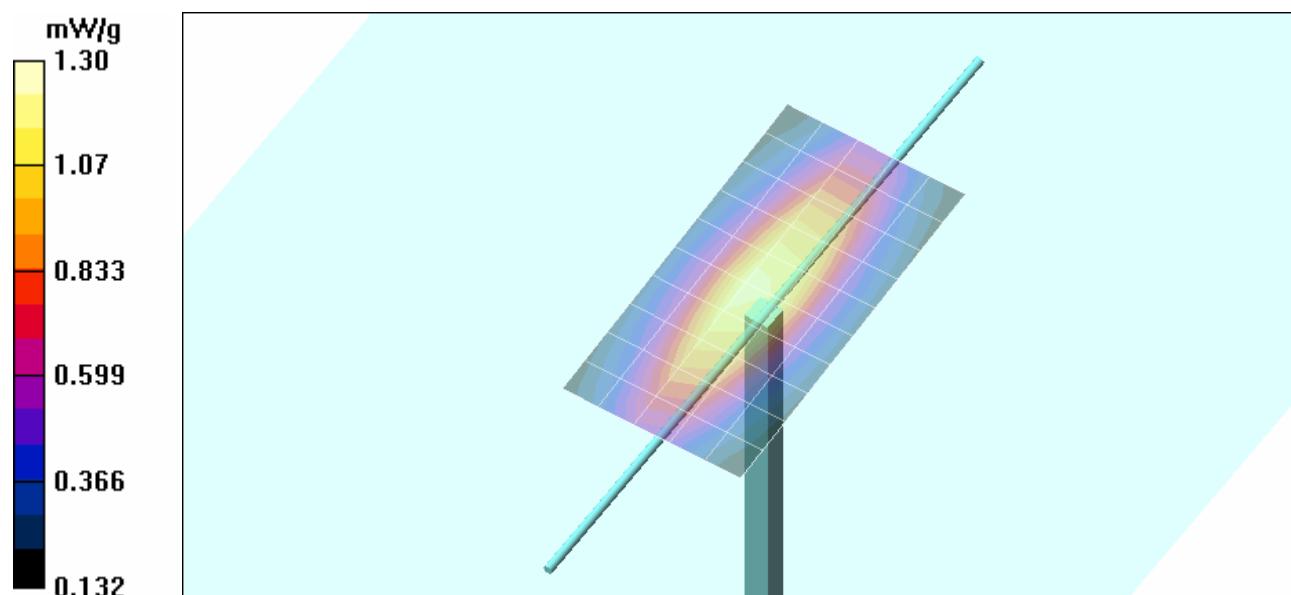
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

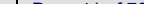
Reference Value = 39.6 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 1.92 W/kg

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

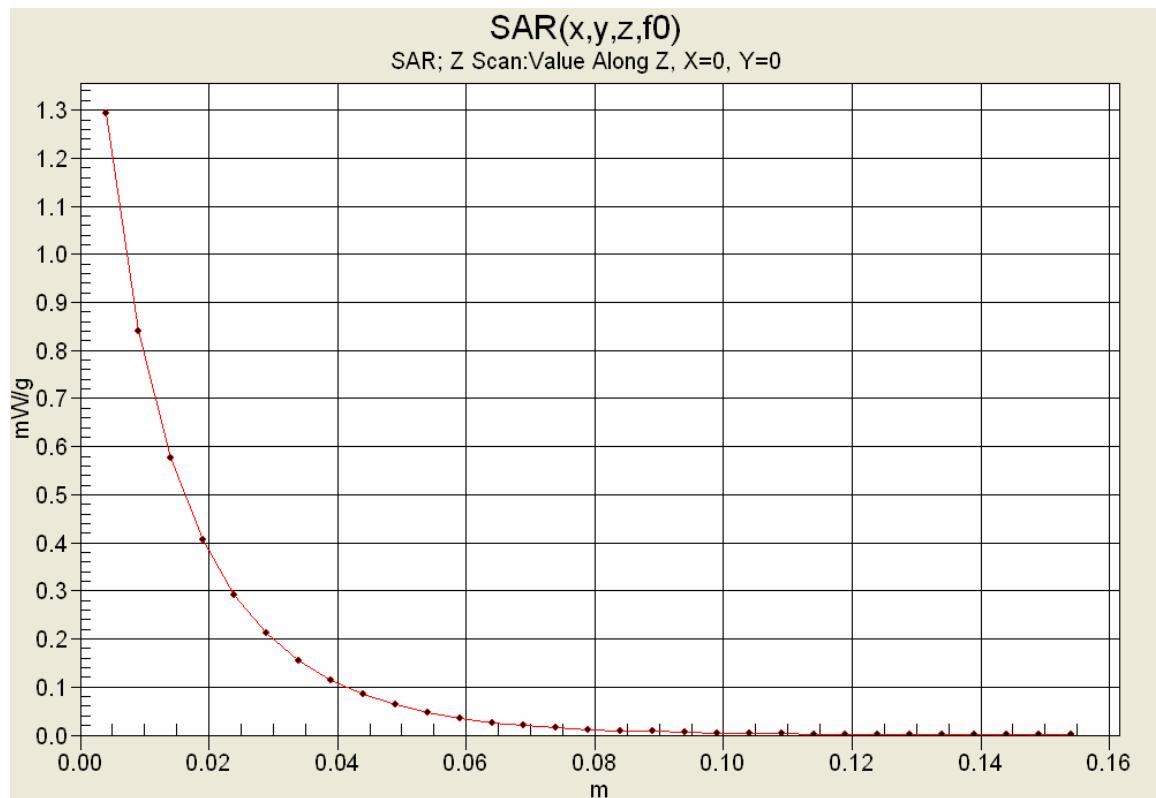
Maximum value of SAR (measured) = 1.30 mW/g



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-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)	

Z-Axis Scan



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD					
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver								
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 Celltech Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 NAC-MRA ACCREDITED
	<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)	

Test Lab Certificate No. 2470.01

APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech <small>Testing and Engineering Services Lab</small>	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 ILAC-MRA  ACCREDITED
	<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

Fri 06/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

Supplement 3 (June 2008)

Test s Sigma of UIM

Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.3500	44.70	0.87	45.21	0.77
0.3600	44.58	0.87	45.19	0.79
0.3700	44.46	0.87	44.60	0.78
0.3800	44.34	0.87	44.19	0.80
0.3900	44.22	0.87	44.49	0.81
0.4000	44.10	0.87	43.04	0.84
0.4100	43.98	0.87	43.26	0.82
0.4200	43.86	0.87	43.06	0.83
0.4300	43.74	0.87	42.61	0.85
0.4400	43.62	0.87	43.02	0.85
0.4500	43.50	0.87	42.48	0.86
0.4600	43.45	0.87	42.31	0.87
0.4700	43.40	0.87	41.36	0.87
0.4800	43.34	0.87	41.73	0.89
0.4900	43.29	0.87	41.16	0.91
0.5000	43.24	0.87	41.46	0.90
0.5100	43.19	0.87	41.03	0.90
0.5200	43.14	0.88	41.01	0.92
0.5300	43.08	0.88	40.54	0.92
0.5400	43.03	0.88	40.11	0.95
0.5500	42.98	0.88	40.49	0.94

Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-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_eHFCC_sH	Test_e	Test_s
0.3500	44.70	0.87	47.36
0.3600	44.58	0.87	46.68
0.3700	44.46	0.87	45.61
0.3800	44.34	0.87	46.20
0.3900	44.22	0.87	45.77
0.4000	44.10	0.87	46.06
0.4100	43.98	0.87	45.27
0.4200	43.86	0.87	45.62
0.4300	43.74	0.87	45.23
0.4400	43.62	0.87	44.90
0.4500	43.50	0.87	44.26
0.4600	43.45	0.87	44.15
0.4700	43.40	0.87	44.37
0.4800	43.34	0.87	44.33
0.4900	43.29	0.87	43.70
0.5000	43.24	0.87	43.42
0.5100	43.19	0.87	43.18
0.5200	43.14	0.88	43.31
0.5300	43.08	0.88	42.95
0.5400	43.03	0.88	43.25
0.5500	42.98	0.88	43.09

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech <small>Testing and Engineering Services Lab</small>	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-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 & DUT Evaluation (Brain)

Celltech Labs Inc.

Test Result for UIM Dielectric Parameter

Tue 10/Jun/2008

Frequency (GHz)

FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
 FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma

Test_e Epsilon of UIM

Test_s Sigma of UIM

Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.3500	44.70	0.87	46.10	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

Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 NAC-MRA ACCREDITED
	<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)	

Test Lab Certificate No. 2470.01

APPENDIX D - SAR TEST SETUP & DUT PHOTOGRAPHS

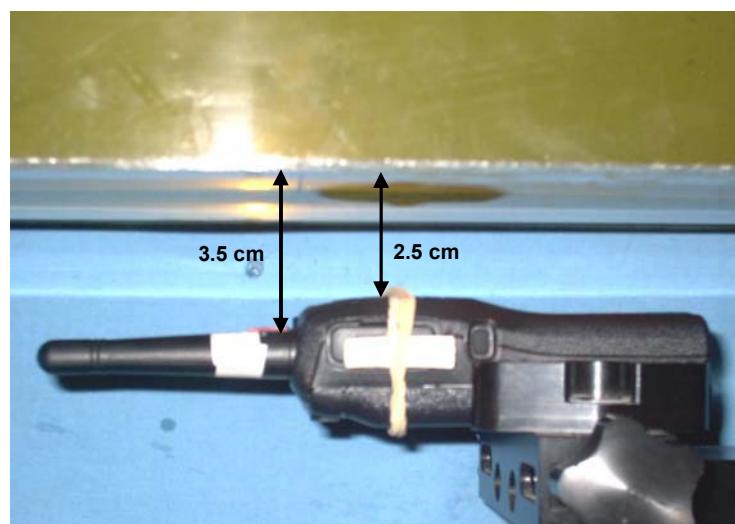
Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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FACE-HELD SAR TEST SETUP PHOTOGRAPHS
2.5 cm Spacing from Front Side of DUT to Planar Phantom
DUT with NiCd 600mAh Battery & KRA-23M Antenna



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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FACE-HELD SAR TEST SETUP PHOTOGRAPHS
2.5 cm Spacing from Front Side of DUT to Planar Phantom
DUT with NiCd 1100mAh Battery & KRA-23M Antenna





Date(s) of Evaluation
June 06, 09-10, 2008

Test Report Serial No.
060608ALH-T910-S90U

Test Report Revision No.
Rev. 1.1 (2nd Release)

Test Report Issue Date
August 29, 2008

Description of Test(s)
Specific Absorption Rate

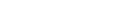
RF Exposure Category
Occupational (Controlled)



FACE-HELD SAR TEST SETUP PHOTOGRAPHS
2.5 cm Spacing from Front Side of DUT to Planar Phantom
DUT with NiMH 1600mAh Battery & KRA-23M Antenna



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech <small>Testing and Engineering Services Ltd</small>	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 ilac-MRA  ACCREDITED
	<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)	

FACE-HELD SAR TEST SETUP PHOTOGRAPHS

2.5 cm Spacing from Front Side of DUT to Planar Phantom DUT with Alkaline AA Battery Case & KRA-23M Antenna



Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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Date(s) of Evaluation
June 06, 09-10, 2008

Test Report Serial No.
060608ALH-T910-S90U

Test Report Revision No.
Rev. 1.1 (2nd Release)

Test Report Issue Date
August 29, 2008

Description of Test(s)
Specific Absorption Rate

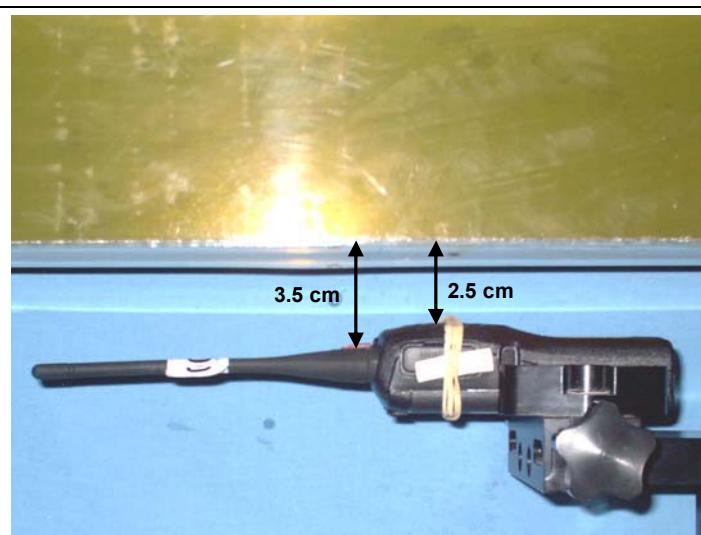
RF Exposure Category
Occupational (Controlled)



Test Lab Certificate No. 2470.01

FACE-HELD SAR TEST SETUP PHOTOGRAPHS

2.5 cm Spacing from Front Side of DUT to Planar Phantom
DUT with NiCd 600mAh Battery & KRA-27M Antenna



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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Date(s) of Evaluation
June 06, 09-10, 2008

Test Report Serial No.
060608ALH-T910-S90U

Test Report Revision No.
Rev. 1.1 (2nd Release)

Test Report Issue Date
August 29, 2008

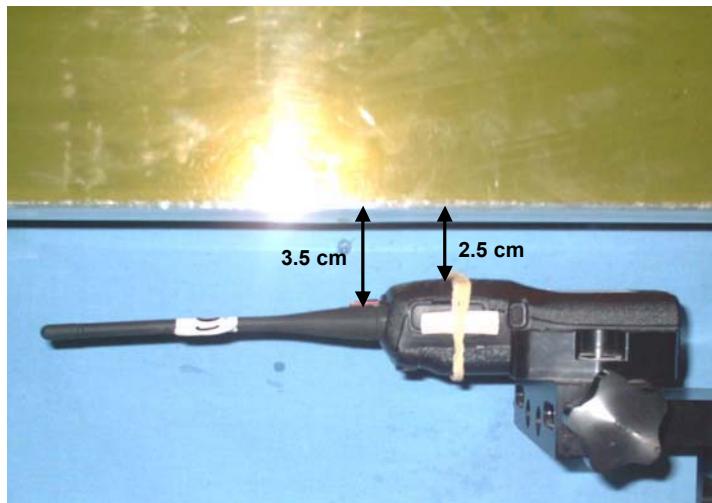
Description of Test(s)
Specific Absorption Rate

RF Exposure Category
Occupational (Controlled)



Test Lab Certificate No. 2470.01

FACE-HELD SAR TEST SETUP PHOTOGRAPHS
2.5 cm Spacing from Front Side of DUT to Planar Phantom
DUT with NiCd 1100mAh Battery & KRA-27M Antenna



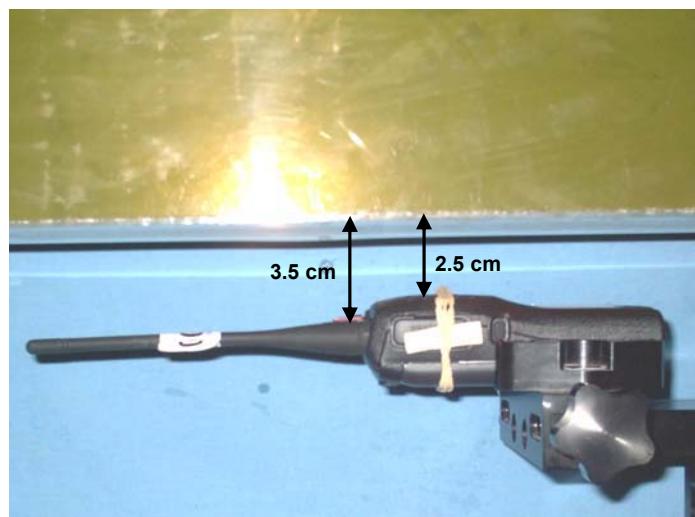
Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			

FACE-HELD SAR TEST SETUP PHOTOGRAPHS
2.5 cm Spacing from Front Side of DUT to Planar Phantom
DUT with NiMH 1600mAh Battery & KRA-27M Antenna



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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FACE-HELD SAR TEST SETUP PHOTOGRAPHS
2.5 cm Spacing from Front Side of DUT to Planar Phantom
DUT with Alkaline AA Battery Case & KRA-27M Antenna



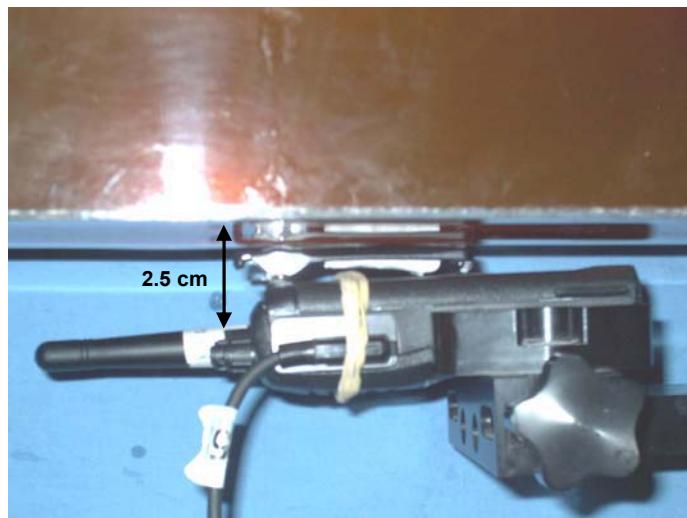
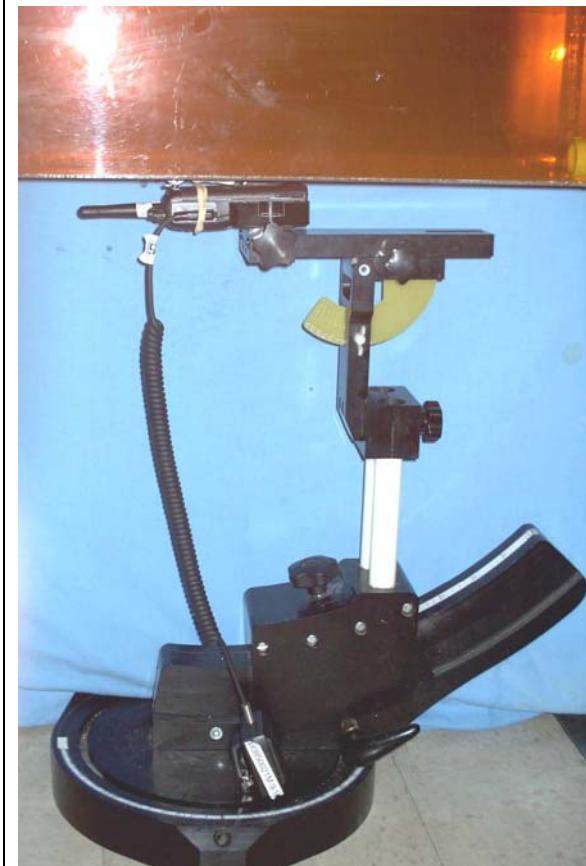
Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD					
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver								
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BODY-WORN SAR TEST SETUP PHOTOGRAPHS

1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom

DUT with Belt-Clip & Speaker-Microphone Audio Accessory

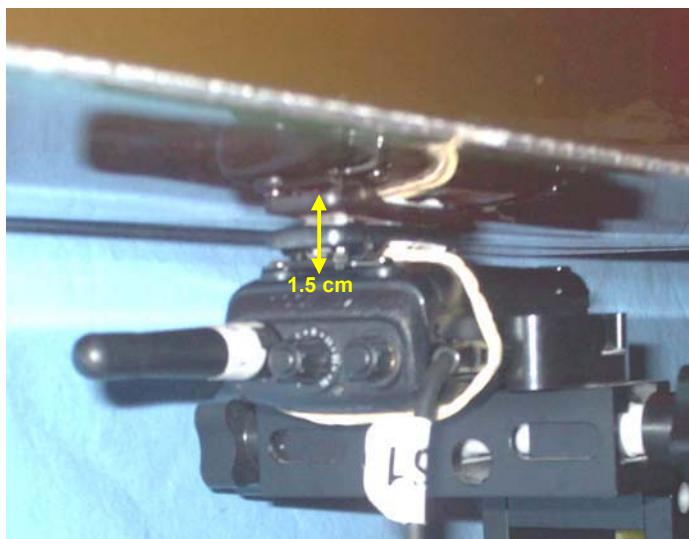
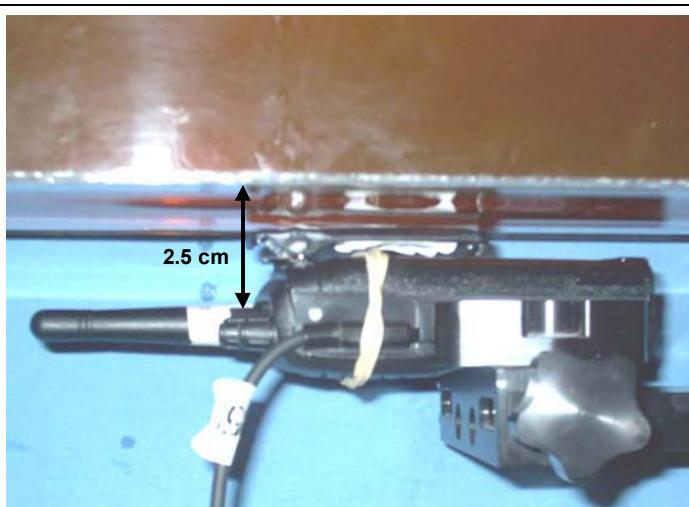
DUT with NiCd 600mAh Battery & KRA-23M Antenna



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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BODY-WORN SAR TEST SETUP PHOTOGRAPHS

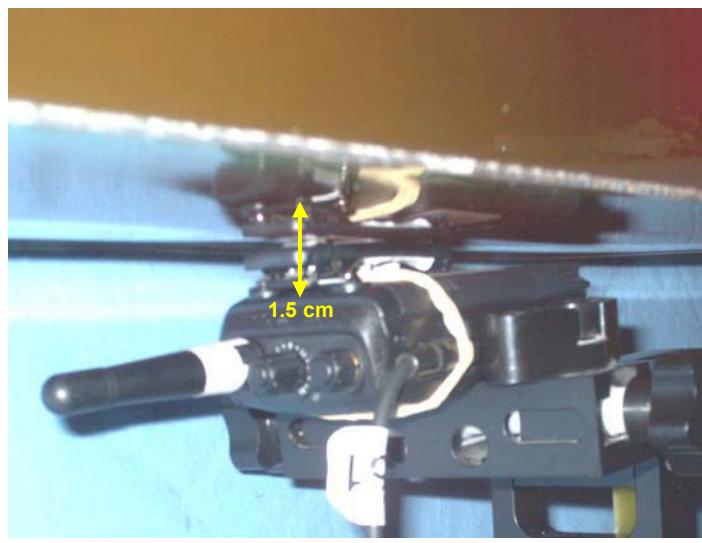
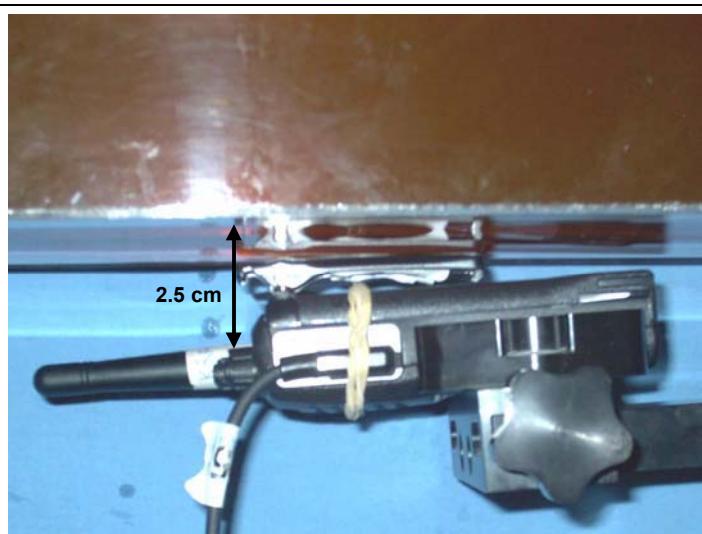
1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom
 DUT with Belt-Clip & Speaker-Microphone Audio Accessory
 DUT with NiCd 1100mAh Battery & KRA-23M Antenna



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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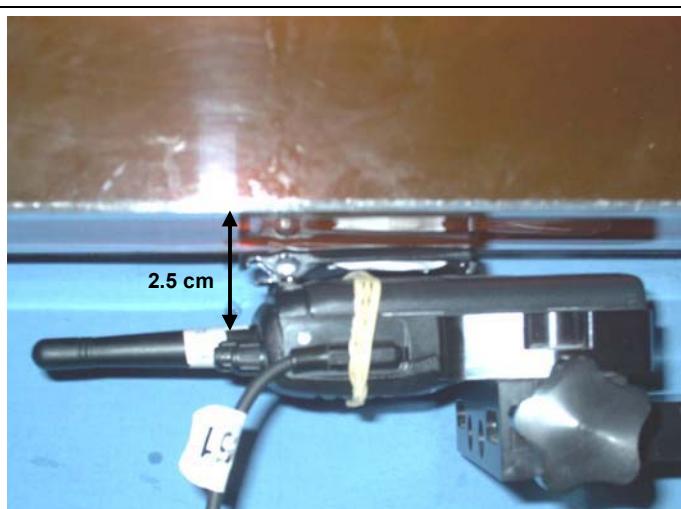
BODY-WORN SAR TEST SETUP PHOTOGRAPHS

1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom
DUT with Belt-Clip & Speaker-Microphone Audio Accessory
DUT with NiMH 1600mAh Battery & KRA-23M Antenna



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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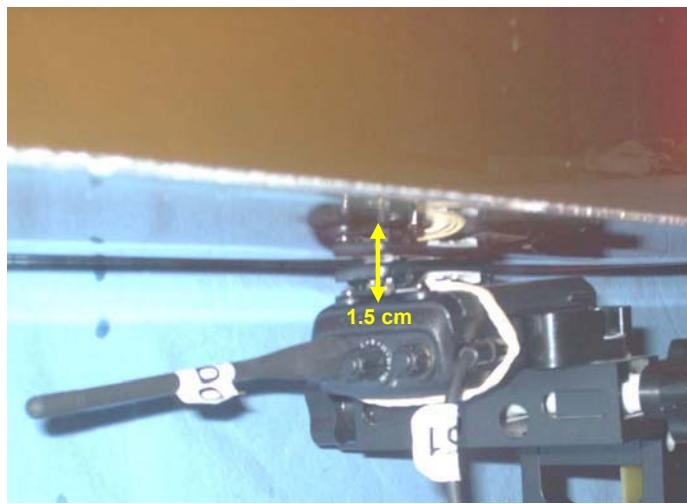
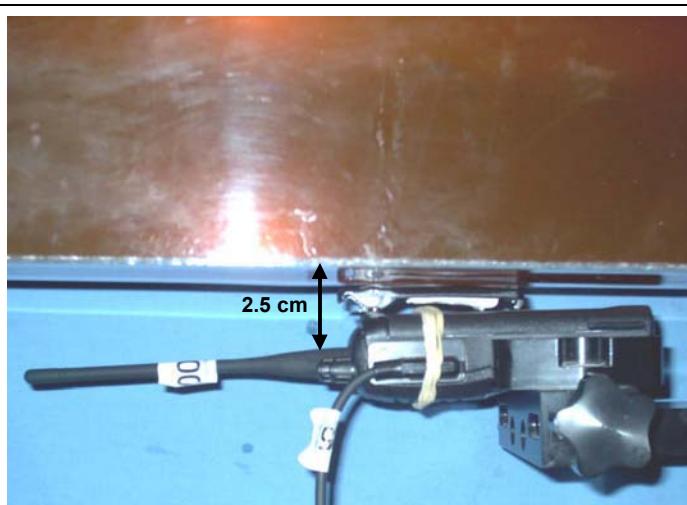
BODY-WORN SAR TEST SETUP PHOTOGRAPHS

 1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom
 DUT with Belt-Clip & Speaker-Microphone Audio Accessory
 DUT with Alkaline AA Battery Case & KRA-23M Antenna


Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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BODY-WORN SAR TEST SETUP PHOTOGRAPHS

1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom
DUT with Belt-Clip & Speaker-Microphone Audio Accessory
DUT with NiCd 600mAh Battery & KRA-27M Antenna



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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BODY-WORN SAR TEST SETUP PHOTOGRAPHS

1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom

DUT with Belt-Clip & Speaker-Microphone Audio Accessory

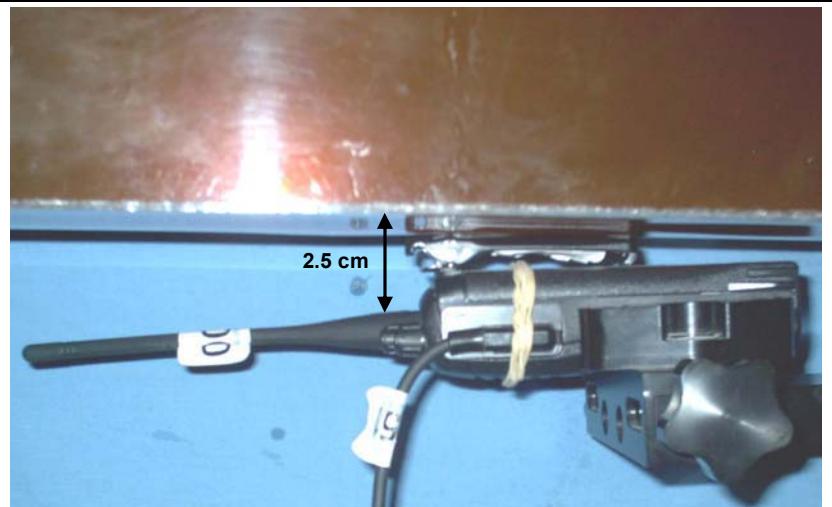
DUT with NiCd 1100mAh Battery & KRA-27M Antenna



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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BODY-WORN SAR TEST SETUP PHOTOGRAPHS

1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom
 DUT with Belt-Clip & Speaker-Microphone Audio Accessory
 DUT with NiMH 1600mAh Battery & KRA-27M Antenna



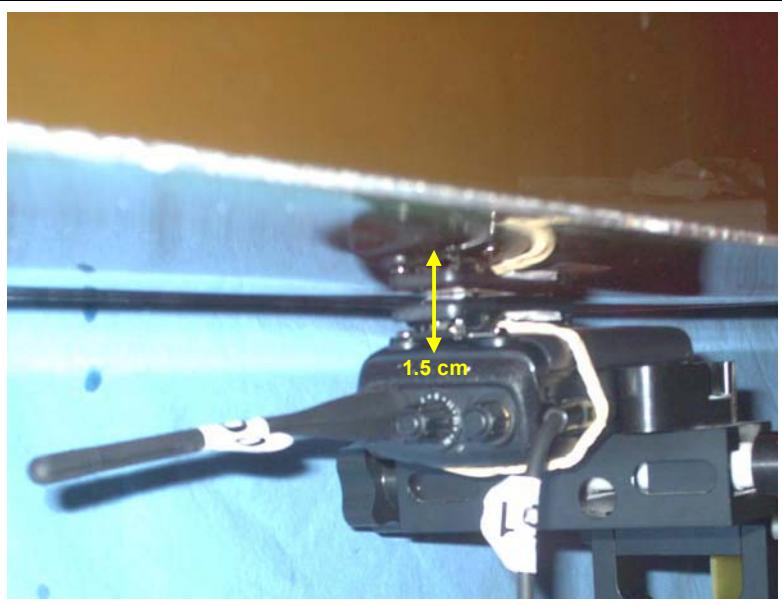
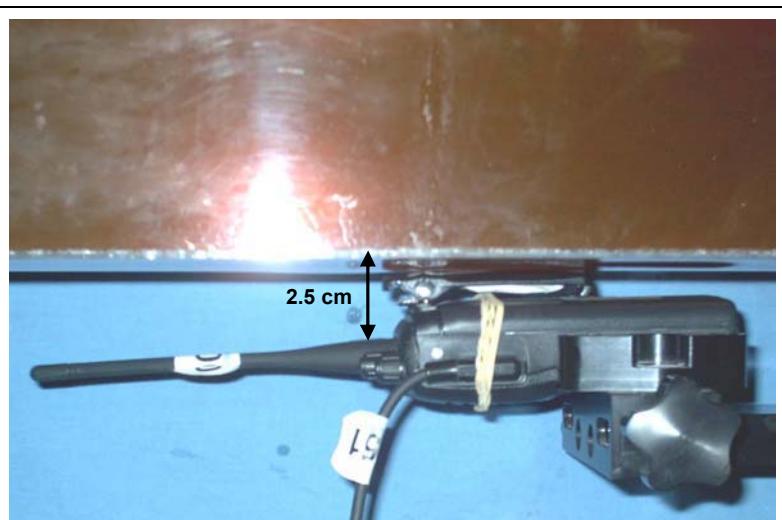
Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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BODY-WORN SAR TEST SETUP PHOTOGRAPHS

1.5 cm Belt-Clip Spacing from Back of DUT to Planar Phantom

DUT with Belt-Clip & Speaker-Microphone Audio Accessory

DUT with Alkaline AA Battery Case & KRA-27M Antenna



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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Date(s) of Evaluation
June 06, 09-10, 2008

Test Report Issue Date
August 29, 2008

Test Report Serial No.
060608ALH-T910-S90U

Test Report Revision No.
Rev. 1.1 (2nd Release)

Description of Test(s)
Specific Absorption Rate

RF Exposure Category
Occupational (Controlled)



Test Lab Certificate No. 2470.01

DUT PHOTOGRAPHS



Front of DUT with KRA-23M Stubby Antenna

Front of DUT with KRA-27M Whip Antenna



KRA-27M Whip Antenna



KRA-23M Stubby Antenna

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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Occupational (Controlled)



DUT PHOTOGRAPHS



Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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DUT PHOTOGRAPHS



Left Side of DUT with Belt-Clip and NiCd 600mAh Battery



Right Side of DUT with Belt-Clip and NiCd 600mAh Battery



Top end of DUT with Belt-Clip & NiCd 600mAh Battery



Bottom end of DUT w/ Belt-Clip & NiCd 600mAh Battery

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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DUT PHOTOGRAPHS



Left Side of DUT with Belt-Clip and NiCd 1100mAh Battery



Right Side of DUT with Belt-Clip and NiCd 1100mAh Battery



Top end of DUT with Belt-Clip & NiCd 1100mAh Battery



Bottom end of DUT w/ Belt-Clip & NiCd 1100mAh Battery

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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DUT PHOTOGRAPHS



Left Side of DUT with Belt-Clip and NiMH 1600mAh Battery



Right Side of DUT with Belt-Clip and NiMH 1600mAh Battery



Top end of DUT with Belt-Clip & NiMH 1600mAh Battery



Bottom end of DUT w/ Belt-Clip & NiMH 1600mAh Battery

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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DUT PHOTOGRAPHS



Left Side of DUT with Belt-Clip and Alkaline AA Battery Case



Right Side of DUT with Belt-Clip and Alkaline AA Battery Case



Top end of DUT with Belt-Clip & Alkaline AA Battery Case

Bottom end of DUT w/ Belt-Clip & Alkaline AA Battery Case

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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Date(s) of Evaluation
June 06, 09-10, 2008

Test Report Issue Date
August 29, 2008

Test Report Serial No.
060608ALH-T910-S90U

Test Report Revision No.
Rev. 1.1 (2nd Release)

Description of Test(s)
Specific Absorption Rate

RF Exposure Category
Occupational (Controlled)



Test Lab Certificate No. 2470.01

DUT PHOTOGRAPHS



NiCd 7.2V 600mAh Battery (P/N: KNB-14)

NiCd 7.2V 1100mAh Battery (P/N: KNB-15A)



NiCd 7.2V 600mAh Battery (P/N: KNB-14)

NiCd 7.2V 1100mAh Battery (P/N: KNB-15A)

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Testing and Engineering Services Lab	Date(s) of Evaluation	Test Report Serial No.	Test Report Revision No.	 NAC-MRA
	June 06, 09-10, 2008	060608ALH-T910-S90U	Rev. 1.1 (2nd Release)	
Test Report Issue Date	August 29, 2008	Description of Test(s)	RF Exposure Category	Test Lab Certificate No. 2470.01
		Specific Absorption Rate	Occupational (Controlled)	ACREDITED

DUT PHOTOGRAPHS



NiMH 7.2V 1600mAh Battery (P/N: KNB-20N)

Alkaline AA Battery Case (P/N: KBP-1)



NiMH 7.2V 1600mAh Battery (P/N: KNB-20N)

Alkaline AA Battery Case (P/N: KBP-1)

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD					
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver								
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	Page 73 of 76										



Date(s) of Evaluation
June 06, 09-10, 2008

Test Report Serial No.
060608ALH-T910-S90U

Test Report Revision No.
Rev. 1.1 (2nd Release)

Test Report Issue Date
August 29, 2008

Description of Test(s)
Specific Absorption Rate

RF Exposure Category
Occupational (Controlled)



Test Lab Certificate No. 2470.01

DUT PHOTOGRAPHS



Alkaline AA Battery Case (P/N: KBP-1)



Alkaline AA Battery Case (P/N: KBP-1) with Duracell Procell Batteries



DUT with Speaker-Microphone Audio Accessory (P/N: KMC-8A)

Applicant:	Kenwood USA Corporation	FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1	Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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 Celltech Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> June 06, 09-10, 2008	<u>Test Report Serial No.</u> 060608ALH-T910-S90U	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 NAC-MRA ACCREDITED
	<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)	

Test Lab Certificate No. 2470.01

APPENDIX E - SYSTEM VALIDATION

Applicant:	Kenwood USA Corporation		FCC ID:	ALH30923110	Frequency Range:	450 - 470 MHz	KENWOOD
Model(s):	TK-3102G-1		Device Description:	Portable FM UHF Push-To-Talk Radio Transceiver			
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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:	Brain

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:

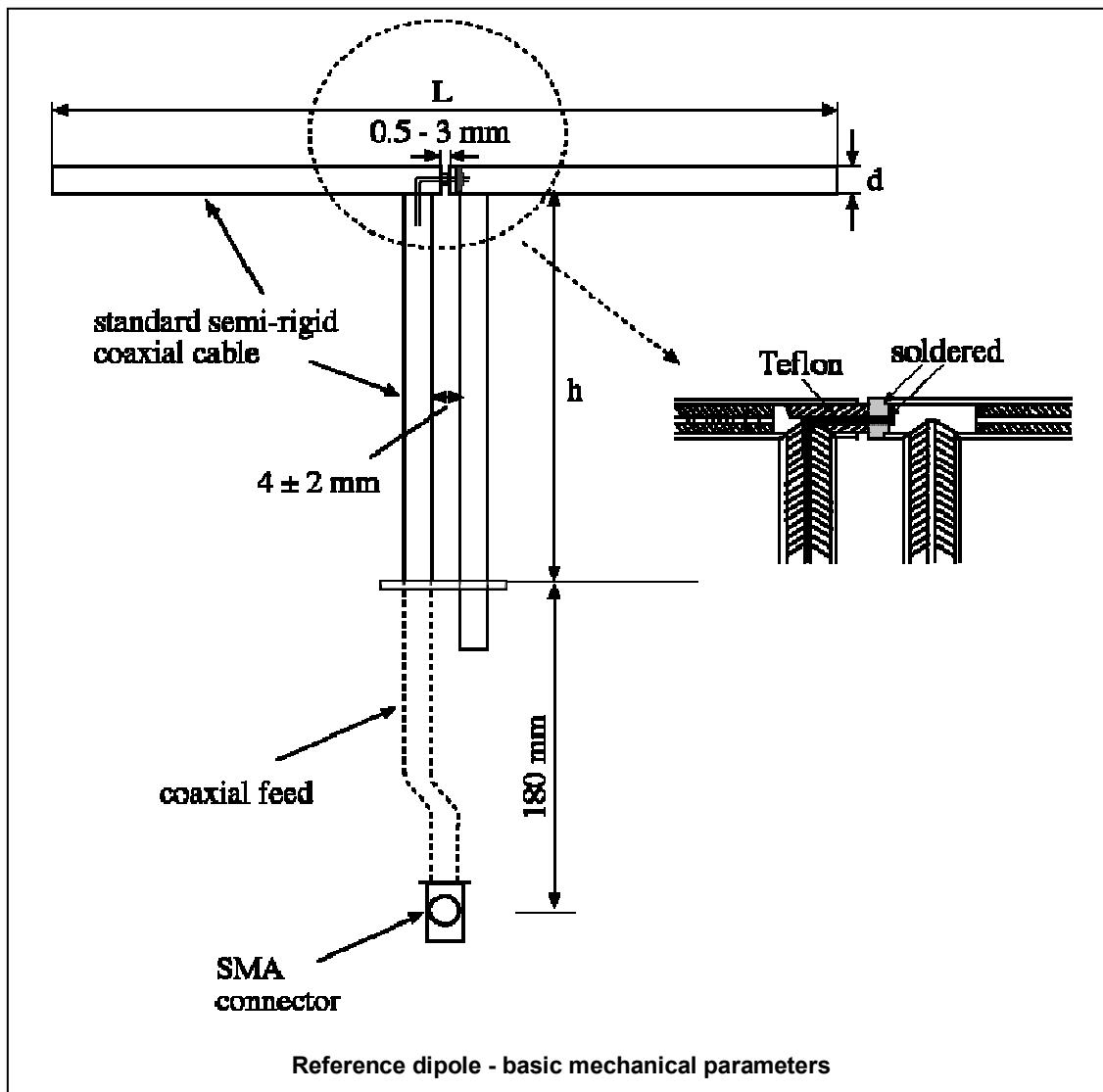
 Celltech <small>Testing and Engineering Services Ltd.</small>	Date of Evaluation:	May 01, 2008	Document Serial No.:	SV450B-050108-R1.1
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
			Fluid Type:	Brain

1. Dipole Construction & Electrical Characteristics

The validation dipole was constructed in accordance with the requirements specified in IEEE Standard 1528-2003 and International Standard IEC 62209-1:2005. The electrical properties were measured using an HP 8753ET Network Analyzer. The network analyzer was calibrated to the validation dipole N-type connector feed point using an HP85032E Type N calibration kit. The dipole was placed parallel to a planar phantom at a separation distance of 15.0 mm from the simulating fluid using a loss-less dielectric spacer. The measured input impedance is:

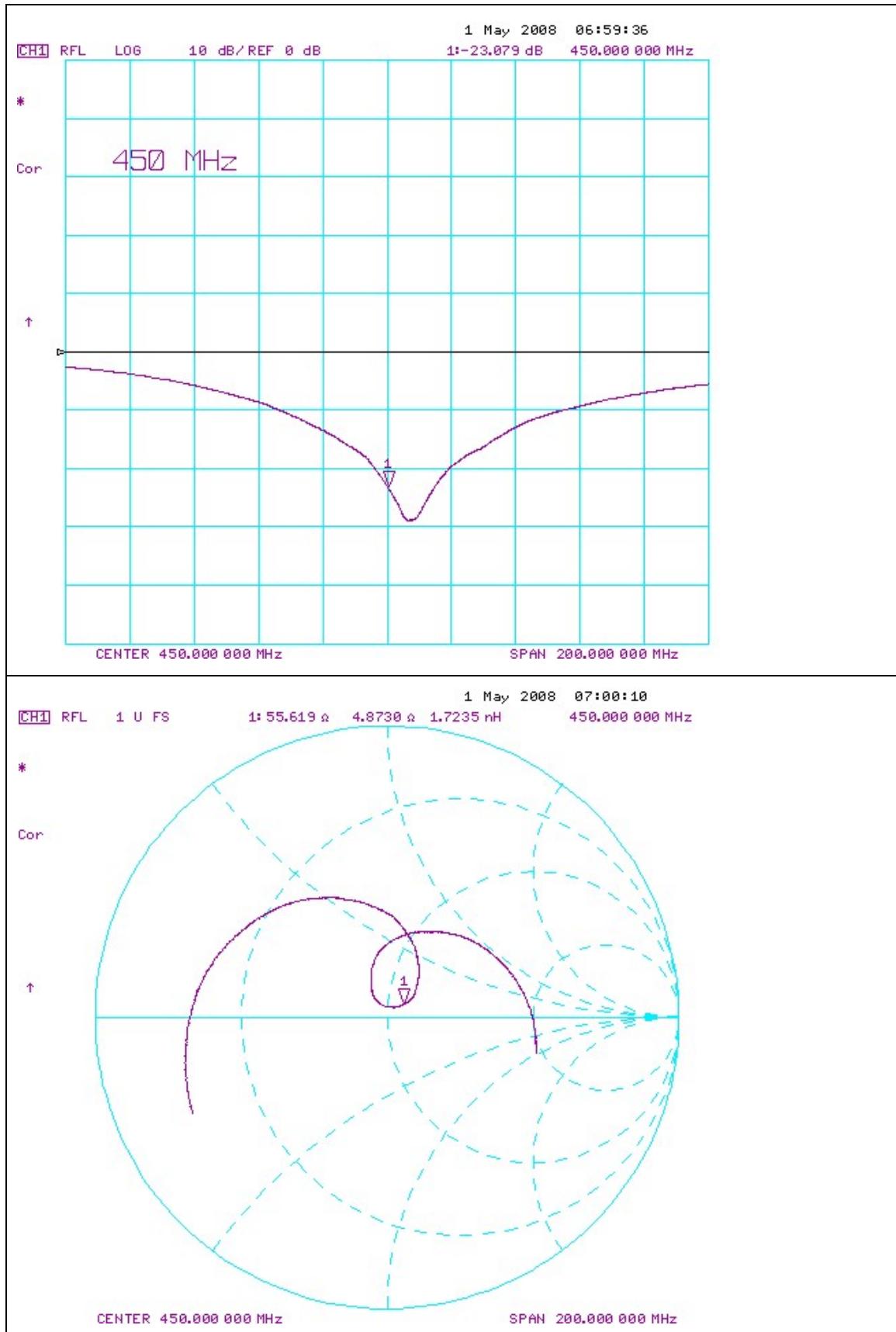
Feed point impedance at 450 MHz $\text{Re}\{Z\} = 55.619 \Omega$
 $\text{Im}\{Z\} = 4.8730 \Omega$

Return Loss at 450 MHz -23.079 dB



 Celltech <small>Testing and Engineering Services Ltd.</small>	Date of Evaluation:	May 01, 2008	Document Serial No.:	SV450B-050108-R1.1
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
Fluid Type:		Brain		

2. Validation Dipole VSWR Data



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

3. Validation Dipole Dimensions

Frequency (MHz)	L (mm)	h (mm)	d (mm)
300	396.0	250.0	6.0
450	270.0	167.0	6.0
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

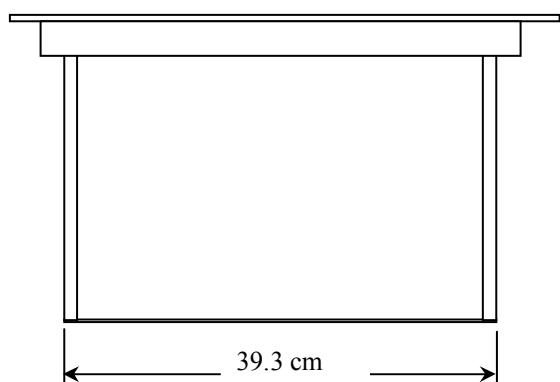
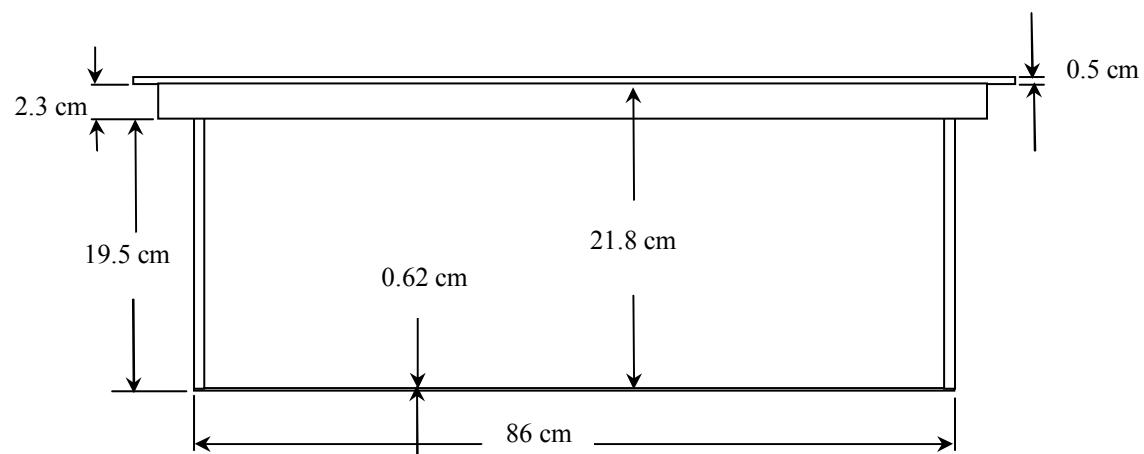
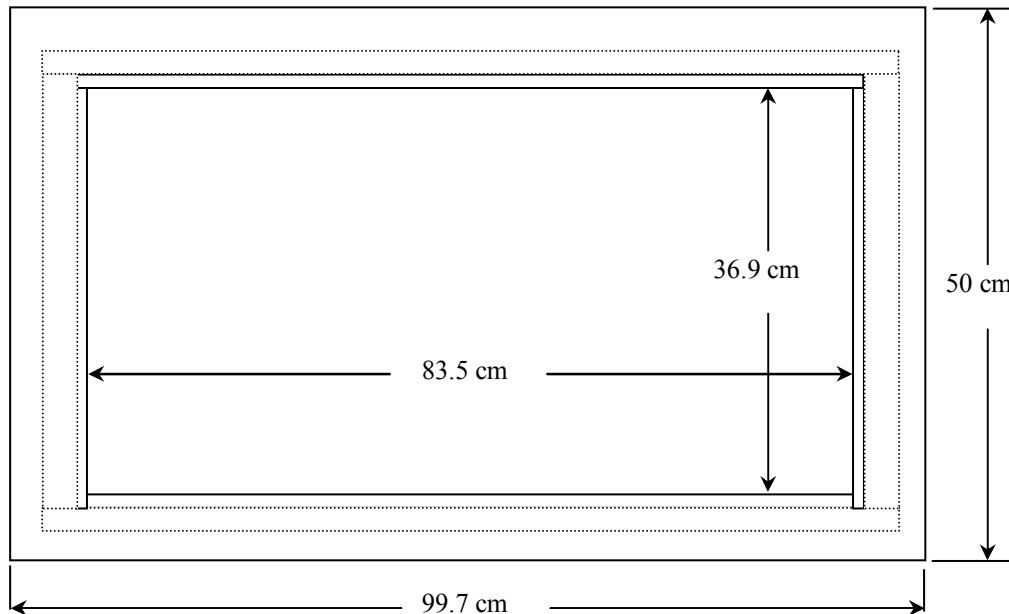
The bottom section of the validation phantom is constructed of 6.2 ± 0.1 mm Plexiglas.

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

 Celltech <small>Testing and Engineering Services Ltd.</small>	Date of Evaluation:	May 01, 2008	Document Serial No.:	SV450B-050108-R1.1
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
			Fluid Type:	Brain

6. Dimensions of Plexiglas Planar Phantom



Celltech Testing and Engineering Services LLC	Date of Evaluation:	May 01, 2008	Document Serial No.:	SV450B-050108-R1.1
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz

7. 450 MHz System Validation Setup



Celltech Testing and Engineering Services Ltd.	Date of Evaluation:	May 01, 2008	Document Serial No.:	SV450B-050108-R1.1
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz

8. 450 MHz Validation Dipole Setup

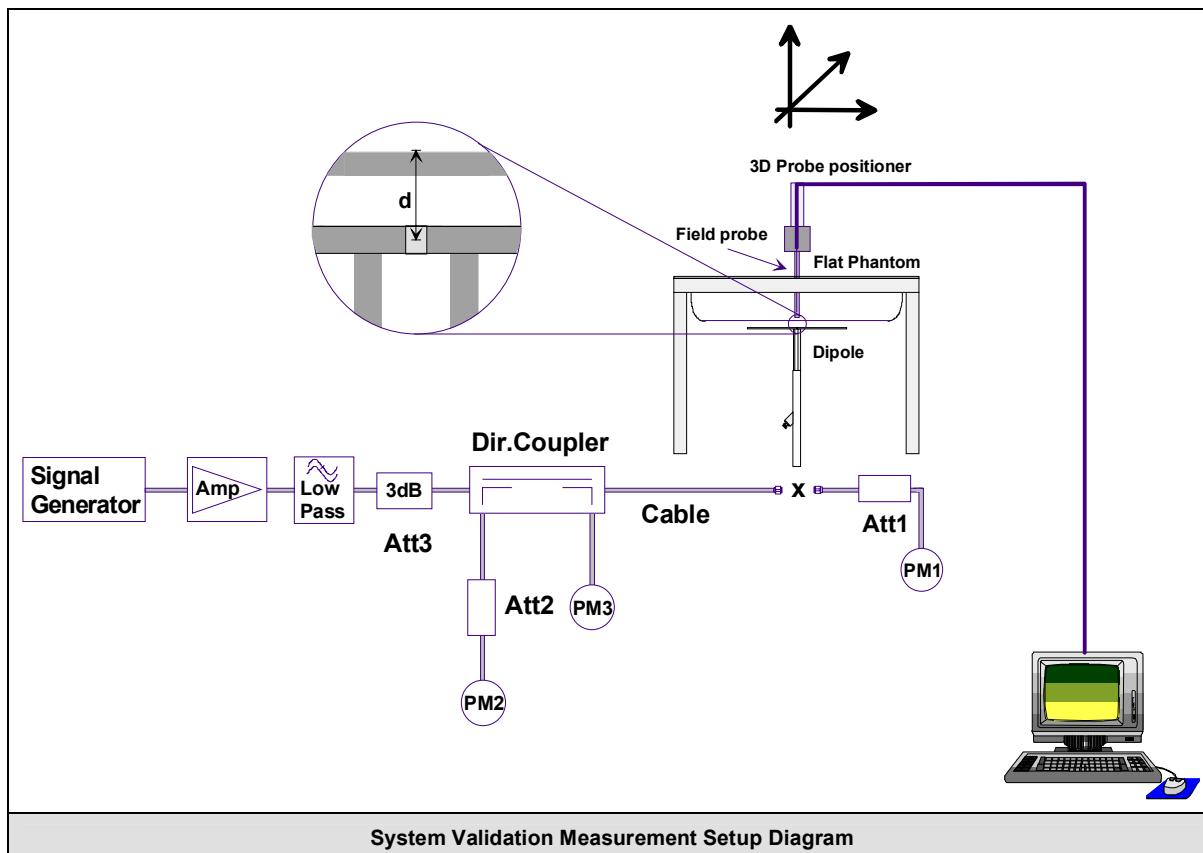


 Celltech <small>Testing and Engineering Services Ltd.</small>	Date of Evaluation:	May 01, 2008	Document Serial No.:	SV450B-050108-R1.1
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
			Fluid Type:	Brain

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.



 Celltech Testing and Engineering Services LLC	Date of Evaluation:	May 01, 2008		Document Serial No.:	SV450B-050108-R1.1	
	Evaluation Type:	System Validation		Validation Dipole:	450 MHz	Fluid Type:

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%
IEEE/IEC Target Dielectric Parameters (450 MHz):	$\epsilon_r = 43.5 (+/- 5\%)$
	$\sigma = 0.87 \text{ S/m (+/- 5\%)}$

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

 Celltech <small>Testing and Engineering Services Ltd</small>	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: $f = 450$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 43.6$; $\rho = 1000$ kg/m³

- 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=15mm, dy=15mm

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

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

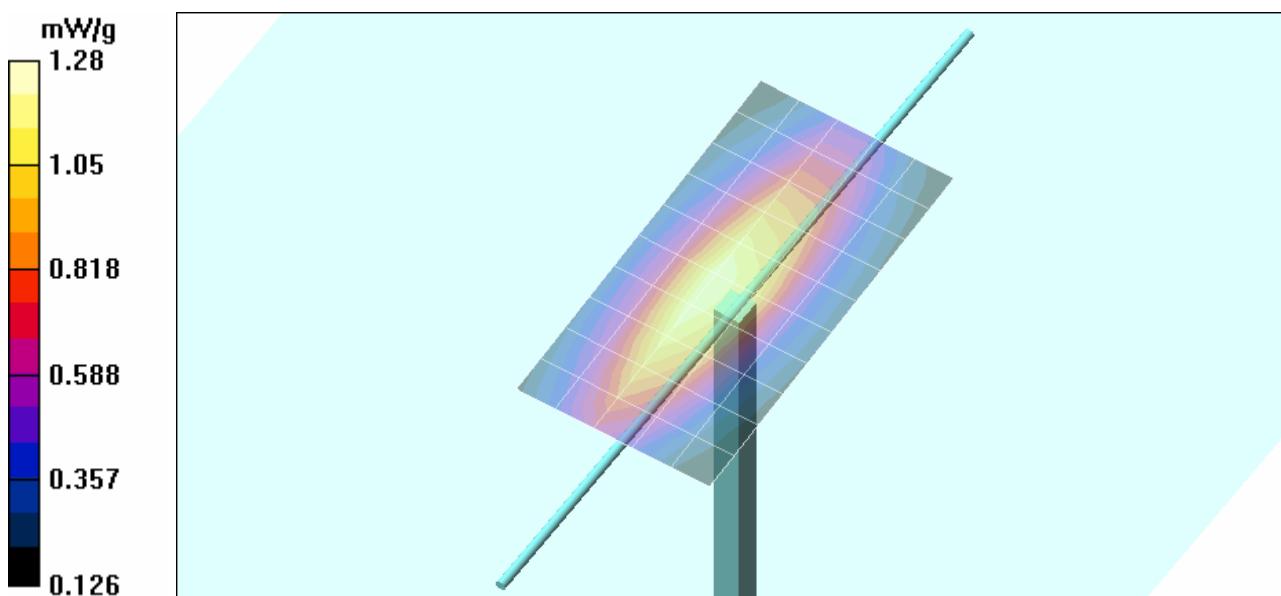
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

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

Peak SAR (extrapolated) = 1.90 W/kg

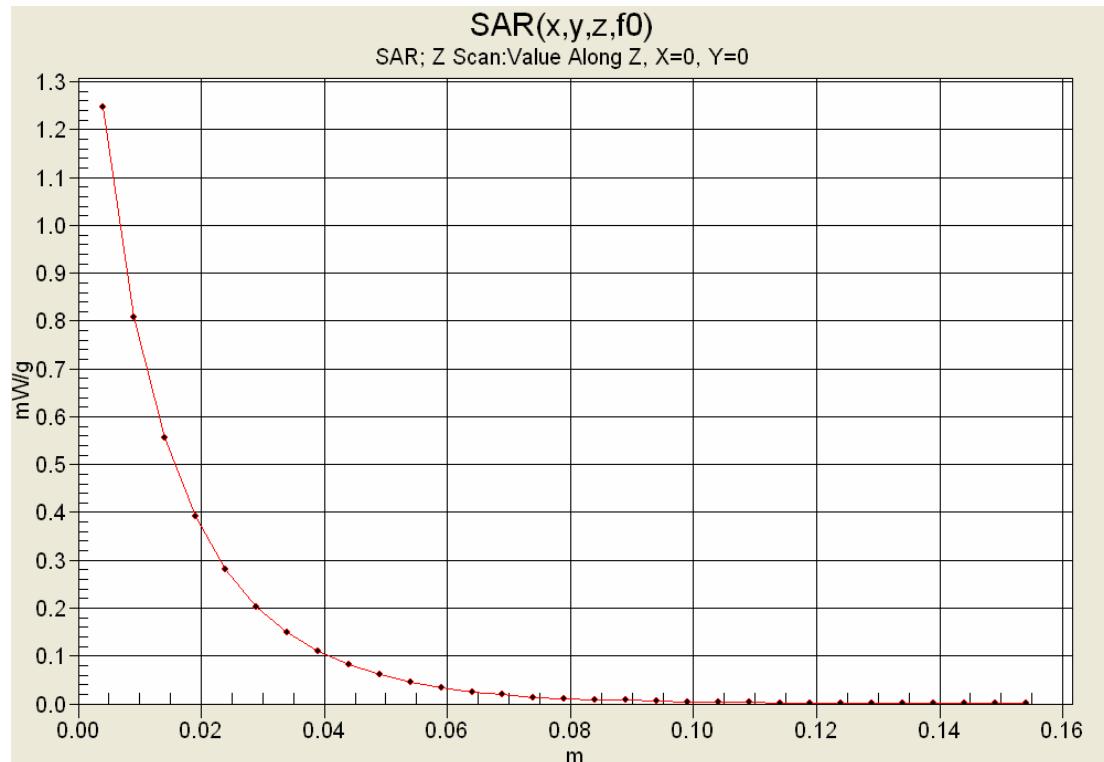
SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.776 mW/g

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



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

Z-Axis Scan



12. Measured Fluid Dielectric Parameters

System Validation - 450 MHz (Brain)

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

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

13. Measurement Uncertainties

UNCERTAINTY BUDGET FOR SYSTEM VALIDATION						
Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	ci 1g	Uncertainty Value ±% (1g)	V_i or V_{eff}
Measurement System						
Probe calibration (450 MHz)	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	∞
Dipole						
Dipole Positioning	2	Normal	1.732050808	1	1.2	∞
Power & Power Drift	4.7	Normal	1.732050808	1	2.7	∞
Phantom and Setup						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	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	∞
Combined Standard Uncertainty						
Expanded Uncertainty (k=2)						
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 and IEC Standard 62209-1:2005						