



<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1
<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)





DECLARATION OF COMPLIANCE - SAR RF EXPOSURE EVALUATION (FCC/IC)

Test Lab Information	Name	CELLTECH LABS INC.			
	Address	21-364 Lougheed Road, Kelowna, B.C. V1X 7R8 Canada			
Test Lab Accreditation(s)	A2LA	ISO/IEC 17025:2005 (A2LA Test Lab Certificate No. 2470.01)			
Applicant Information	Name	KENWOOD USA CORPORATION			
	Address	3970 Johns Creek Court, Suite 100, Suwanee, GA 30024 United States			
Application Type(s)	FCC	TCB Certification	IC	CB Certification	
Standard(s) Applied	FCC	47 CFR §2.1093	IC	Health Canada Safety Code 6	
Procedure(s) Applied	FCC	KDB 447498 D01v05r01	FCC	KDB 643646 D01v01r01	
	IC	RSS-102 Issue 4	IEC	62209-2:2010	
Device Classification(s)	FCC	Licensed Non-Broadcast Transmitter Held to Face (TNF) - FCC Part 90			
	IC	Land Mobile Radio Transmitter/Receiver (27.41-960 MHz) - RSS-119			
Device Identifier(s)	FCC ID:	ALH468800	IC	282D-468800	
Device Model(s)	TK-5410D-K2 (4-keypad); TK-5410D-K3 (16-keypad) (Models are electrically identical and differ only in number of buttons on keypad)				
Device Model(s) Tested	TK-5410D-K2 (s/n: B3790005); TK-5410D-K3 (s/n: B3790077)				
Test Sample Revision No.s	Hardware	4.0	Firmware	D1.00	
Date of Sample Receipt	Aug. 14, 2013		Date(s) of SAR Evaluations	Aug. 20-22, Oct. 4-10, 2012	
Device Description	Portable FM UHF Push-To-Talk (PTT) Radio Transceiver				
Transmit Frequency Range	FCC	769-775 MHz	799-805 MHz	806-824 MHz	851-869 MHz
	IC	768-776 MHz	798-806 MHz	806-824 MHz	851-869 MHz
Manuf. Rated Output Power	3.0 W (Conducted)		Manuf. Tolerance Specification	+/- 0.5 W	
Antenna Type(s) Tested	See manufacturer's accessory listing (Section 5.0)				
Battery Type(s) Tested	See manufacturer's accessory listing (Section 5.0)				
Body-worn Accessories Tested	See manufacturer's accessory listing (Section 5.0)				
Audio Accessories Tested	See manufacturer's accessory listing (Section 5.0)				
Max. SAR Level(s) Evaluated	Face-held (FCC)	0.817 W/kg	1g	50% PTT duty cycle	Occupational / Controlled Exposure
	Face-held (IC)	0.969 W/kg			
	Body-worn (FCC)	2.24 W/kg			
	Body-worn (IC)	3.00 W/kg			
FCC Spatial Peak SAR Limit	Head/Body	8.0 W/kg	1g	50% PTT duty cycle	Occupational / Controlled Exposure
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 Safety Code 6 for the Occupational / Controlled Exposure environment. The device was tested in accordance with the measurement procedures specified in FCC KDB 447498 D01v05r01, Industry Canada RSS-102 Issue 4 and IEC International Standard 62209-2:2010. All measurements were performed in accordance with the SAR system manufacturer recommendations.					
I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.					
This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc.					
The results and statements contained in this report pertain only to the device(s) evaluated.					
Test Report Approved By			Mike Meaker	Engineering Technologist	Celltech Labs Inc.

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 1 of 66

TABLE OF CONTENTS	
1.0 INTRODUCTION	4
2.0 SAR MEASUREMENT SYSTEM	4
3.0 RF CONDUCTED OUTPUT POWER MEASUREMENTS	5
4.0 NO. OF TEST CHANNELS (N_c)	5
5.0 MANUFACTURER'S DISCLOSED ACCESSORY LISTING	6
6.0 FLUID DIELECTRIC PARAMETERS	7
7.0 SAR MEASUREMENT SUMMARY	9
8.0 SAR SCALING	14
9.0 DETAILS OF SAR EVALUATION	15
10.0 SAR EVALUATION PROCEDURES	15
11.0 SYSTEM VERIFICATION	16
12.0 SIMULATED EQUIVALENT TISSUES	17
13.0 SAR LIMITS	17
14.0 ROBOT SYSTEM SPECIFICATIONS	18
15.0 PROBE SPECIFICATION (ET3DV6)	19
16.0 PHANTOM	19
17.0 DEVICE HOLDER	19
18.0 TEST EQUIPMENT LIST	20
19.0 MEASUREMENT UNCERTAINTIES (IC)	21
20.0 REFERENCES	22
APPENDIX A - SAR MEASUREMENT PLOTS	23
APPENDIX B - SYSTEM PERFORMANCE CHECK PLOTS	43
APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS	48
APPENDIX D - SAR TEST SETUP & DUT PHOTOGRAPHS	51
APPENDIX E - DIPOLE CALIBRATION	64
APPENDIX F - PROBE CALIBRATION	65
APPENDIX G - PHANTOM CERTIFICATE OF CONFORMITY	66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	



REVISION HISTORY

REVISION NO.	DESCRIPTION	IMPLEMENTED BY	RELEASE DATE
1.0	Initial Release	Mike Meaker	Aug. 23, 2013
1.1	-Added revision to test standards listed on pg. 1	Mike Meaker	Aug. 30, 2013

TEST REPORT SIGN-OFF

DEVICE TESTED BY	REPORT PREPARED BY	QA REVIEW BY	REPORT APPROVED BY
Mike Meaker	Mike Meaker	Glen Westwell	Mike Meaker

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 3 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

1.0 INTRODUCTION

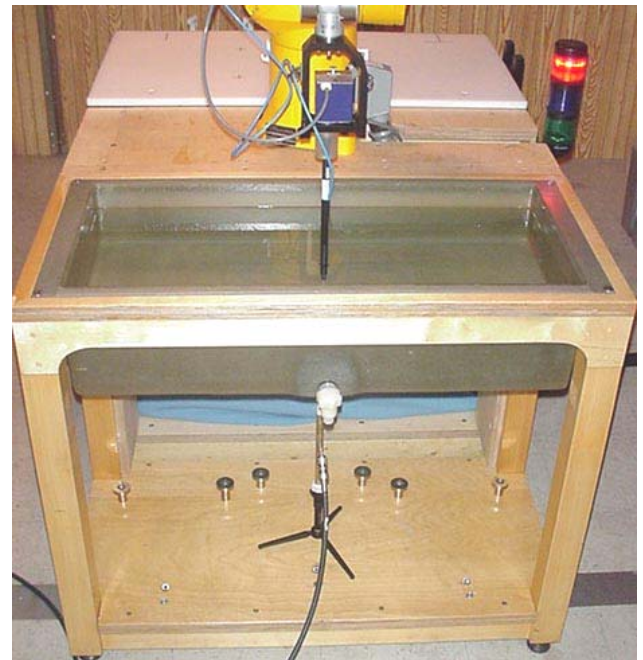
This measurement report demonstrates that the Kenwood USA Corporation Models: TK-5410D-K2 and TK-5410D-K3 Portable 700/800 PTT Radio Transceivers comply with the SAR (Specific Absorption Rate) RF exposure requirements FCC 47 CFR §2.1093 (see reference [1]) and Health Canada's Safety Code 6 (see reference [2]) for the Occupational / Controlled Exposure environment. The measurement procedures described in FCC KDB 865664 (see reference [3]), IC RSS-102 Issue 4 (see reference [4]), IEEE Standard 1528-2003 (see reference [5]) and IEC Standard 62209-2:2010 (see reference [6]) 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 head 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 a controller with a built in VME-bus computer.



DASY4 SAR Measurement System with Side Planar Phantom



DASY4 Measurement System with Barski Planar Phantom



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.	This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.					Page 4 of 66

3.0 RF CONDUCTED OUTPUT POWER MEASUREMENTS

MEASURED RF CONDUCTED OUTPUT POWER LEVELS						
Radio	Mode	Frequency Range	Test Freq.	Watts	dBm	Method
TK-5410D-K3	CW	768-776 MHz	769	2.7	34.3	Average Conducted
			775	2.7	34.3	
		798-806 MHz	799	2.7	34.3	
			805	2.7	34.3	
		806-824 MHz	806	2.9	34.6	
			824	3.0	34.7	
		851-869 MHz	851	3.0	34.7	
			869	3.0	34.7	
TK-5410D-K2	CW	768-776 MHz	769	2.8	34.5	Average Conducted
			775	2.8	34.5	
		798-806 MHz	799	2.8	34.5	
			805	2.8	34.5	
		806-824 MHz	806	3.0	34.7	
			824	3.1	34.9	
		851-869 MHz	851	3.1	34.9	
			869	3.1	34.9	
Notes						
1. The test channels were selected in accordance with the procedures specified in FCC KDB 447498 (see reference [8]).						
2. The RF conducted output power levels of the DUT were measured by Celltech Labs prior to the SAR evaluations using a Gigatronics 8652A Universal Power Meter at the external antenna connector of the radio in accordance with requirements of FCC 47 CFR §2.1046 (see reference [13]) and IC RSS-Gen (see reference [14]).						

4.0 NO. OF TEST CHANNELS (N_c)

Antenna Part No.	Antenna Freq. Range	Test Freq. Range	N_c	Test Frequencies (MHz)
1	KRA-32	768 - 869 MHz	8	769, 775, 799, 805, 806, 824, 851, 869
Note: The number of test channels (N_c) were calculated in accordance with the procedures specified in FCC KDB 447498 (see reference [8]).				

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

5.0 MANUFACTURER'S DISCLOSED ACCESSORY LISTING

Accessory ID # for Test Report	ACCESSORY CATEGORY: ANTENNA			
	Part Number	Description	SAR Evaluation	
1	KRA-32	Detachable Whip (700/800 MHz)	Yes	
Accessory ID # for Test Report	ACCESSORY CATEGORY: BATTERY			
	Part Number	Description	SAR Evaluation	
a	KNB-54N	NiMH (7.2V, 2500mAh)	Yes	
b	KNB-43L	Lithium Polymer (7.4V, 3300mAh)	Yes	
Accessory ID # for Test Report	ACCESSORY CATEGORY: BODY-WORN			
	Part Number	Description	SAR Evaluation	
1	KBH-11	Belt-clip (contains metal)	Yes	
2	KLH-133K2	Leather Case	Yes	
Accessory ID # for Test Report	ACCESSORY CATEGORY: AUDIO			
	Part Number	Description	Audio Accessory Grouping	SAR Evaluation
G1a	KMC-51	Speaker-Mic	Group 1 (Speaker-mic)	Yes
G1b	KMC-41	Noise Cancelling Speaker-Mic		No ¹
G2	KEP-1	Heavy Duty Earphone	Group 2 (Earphone)	No ¹
G3a	KHS-11BL	2-Wire Palm Mic w/ Earphone	Group 5 (Palm-Mic)	No ¹
G3b	KHS-12BL	3-Wire Lapel Microphone w/ Earpiece		No ¹
Accessory ID # for Test Report	ACCESSORY CATEGORY: OTHER			
	Part Number	Description	SAR Evaluation	
n/a	KCT-51	6pin Hirose Adapter	No ²	

Manufacturer's disclosed accessory listing information provided by Kenwood USA Corporation

Notes:

1. Audio accessories not evaluated for SAR in accordance with the procedures and provisions of FCC KDB 643646 D01v01r01 Page 10 Section 1).
2. The Hirose adapter is not tested for SAR because it is a passive connector only and will not affect SAR on its own.

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 6 of 66

6.0 FLUID DIELECTRIC PARAMETERS

FLUID DIELECTRIC PARAMETERS						
Date: 08/15-16/2013		Frequency: 835 MHz			Tissue: Head	
Freq	Test e	Test s	Target e	Target s	Deviation Permittivity	Deviation Conductivity
0.735	41.98	0.79	41.5	0.9	1.16%	-12.22%
0.745	41.74	0.8	41.5	0.9	0.58%	-11.11%
0.755	41.71	0.81	41.5	0.9	0.51%	-10.00%
0.765	41.65	0.82	41.5	0.9	0.36%	-8.89%
0.775	41.57	0.83	41.5	0.9	0.17%	-7.78%
0.785	41.56	0.84	41.5	0.9	0.14%	-6.67%
0.795	41.1	0.87	41.5	0.9	-0.96%	-3.33%
0.805	41.11	0.86	41.5	0.9	-0.94%	-4.44%
0.815	40.82	0.89	41.5	0.9	-1.64%	-1.11%
0.824*	41	0.89	41.5	0.9	-1.20%	-1.11%
0.825	41	0.89	41.5	0.9	-1.20%	-1.11%
0.835	40.77	0.89	41.5	0.9	-1.76%	-1.11%
0.845	40.69	0.91	41.5	0.9	-1.95%	1.11%
0.855	40.7	0.91	41.5	0.9	-1.93%	1.11%
0.865	40.66	0.92	41.5	0.9	-2.02%	2.22%
0.869*	40.5	0.92	41.5	0.9	-2.41%	2.22%
0.875	40.22	0.92	41.5	0.9	-3.08%	2.22%
0.885	40.3	0.94	41.5	0.9	-2.89%	4.44%
0.895	40.11	0.94	41.5	0.9	-3.35%	4.44%
0.905	40.08	0.97	41.5	0.9	-3.42%	7.78%
0.915	39.92	0.96	41.5	0.9	-3.81%	6.67%
0.925	40.06	1	41.5	0.9	-3.47%	11.11%
0.935	39.59	0.99	41.5	0.9	-4.60%	10.00%

*interpolated using DASY4 software




Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m ³)
Aug 15	835 Head	23.0°C	22.2°C	≥ 15 cm	101.1 kPa	34%	1000
Aug 16	835 Head	23.0°C	22.2°C	≥ 15 cm	101.1 kPa	34%	1000

FLUID DIELECTRIC PARAMETERS

Date: 08/19-20/2013						
Frequency: 835 MHz						
Tissue: Body						
Freq	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
0.735	55.23	0.89	55.2	0.97	0.05%	-8.25%
0.745	55.24	0.91	55.2	0.97	0.07%	-6.19%
0.755	55.01	0.9	55.2	0.97	-0.34%	-7.22%
0.765	55.1	0.92	55.2	0.97	-0.18%	-5.15%
0.775	54.77	0.93	55.2	0.97	-0.78%	-4.12%
0.785	54.71	0.94	55.2	0.97	-0.89%	-3.09%
0.795	54.8	0.94	55.2	0.97	-0.72%	-3.09%
0.805	54.64	0.95	55.2	0.97	-1.01%	-2.06%
0.815	54.61	0.97	55.2	0.97	-1.07%	0.00%
0.824*	54.7	0.97	55.2	0.97	-0.91%	0.00%
0.825	54.74	0.97	55.2	0.97	-0.83%	0.00%
0.835	54.64	0.97	55.2	0.97	-1.01%	0.00%
0.845	54	0.98	55.2	0.97	-2.17%	1.03%
0.855	54.16	1.01	55.2	0.97	-1.88%	4.12%
0.865	54.16	1.02	55.2	0.97	-1.88%	5.15%
0.869*	54	1.02	55.2	0.97	-2.17%	5.15%
0.875	53.86	1.02	55.2	0.97	-2.43%	5.15%
0.885	53.89	1.04	55.2	0.97	-2.37%	7.22%
0.895	53.91	1.05	55.2	0.97	-2.34%	8.25%
0.905	53.63	1.05	55.2	0.97	-2.84%	8.25%
0.915	53.71	1.06	55.2	0.97	-2.70%	9.28%
0.925	53.38	1.07	55.2	0.97	-3.30%	10.31%
0.935	53.64	1.09	55.2	0.97	-2.83%	12.37%

**interpolated using DASY4 software*

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	ρ (Kg/m ³)
Aug 19	835 Body	23.0°C	23.4°C	≥ 15 cm	101.5 kPa	33%	1000
Aug 20	835 Body	23.0°C	23.4°C	≥ 15 cm	101.5 kPa	33%	1000

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

7.0 SAR MEASUREMENT SUMMARY

Table 1 **FACE-HELD SAR EVALUATION RESULTS**

Device Under Test				TK-5410D-K3															
Test Dates				Aug. 16, 2013															
C				1	2	3	4	5	6	7	8								
R	Antenna	Test Freq. (MHz)	Cond. Pwr (W)	SAR W/kg 1g					SAR W/kg 1g										
				Battery a					Battery b (default)										
				100% ptt d/f	50% ptt d/f	Drift (dB)	50%+drift	100% ptt d/f	50% ptt d/f	Drift dB	50%+drift								
1	1	769	2.7	n/a					n/a										
2		775	2.7	n/a					F1	1.21	0.605	-0.945	0.752						
3		799	2.7	n/a					n/a										
4		805	2.7	n/a					F2	0.981	0.491	-1.02	0.620						
5		806	2.9	n/a					n/a										
6		824	3.0	F5	1.39	0.695	-0.302	0.745	F3	1.37	0.685	-0.159	0.711						
7		851	3.0	n/a					n/a										
8		869	3.0	n/a					F4	0.951	0.476	-1.15	0.620						
SAR LIMITS				HEAD				SPATIAL PEAK				RF EXPOSURE CATEGORY							
FCC 47 CFR 2.1093				Health Canada Safety Code 6				8.0 W/kg				1g averaging				Occupational / Controlled			
Notes																			
Test Mode = CW (Unmodulated Continuous Wave)								Phantom = Side Planar Phantom											
Front of DUT Distance to Planar Phantom (see Appendix D)								Shortest Antenna Distance to Planar Phantom (see Appendix D)											
2.5 cm								5.0 cm											
C = Column; R = Row				F1-Fx (F = Face) denotes the corresponding Face SAR Plot # as shown in Appendix A															
1. When test reduction applies, the slots for such configurations are denoted with N/A (Not Applicable).																			
2. When the SAR of an antenna tested on the highest output power channel using the default battery is ≤ 3.5 W/kg (50% PTT duty factor), testing of all other required channels is not necessary.																			
3. When the SAR for all antennas tested using the default battery is ≤ 4.0 W/kg, test additional batteries using the antenna and channel configuration that resulted in the highest SAR.																			

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 9 of 66

Table 2				FACE-HELD SAR EVALUATION RESULTS									
Device Under Test				TK-5410D-K2									
Test Dates				Aug. 16, 2013									
C				1	2	3	4	5	6	7	8		
R	Antenna	Test Freq. (MHz)	Cond. Pwr (W)	SAR W/kg 1g					SAR W/kg 1g				
				Battery a					Battery b (default)				
				100% ptt d/f	50% ptt d/f	Drift (dB)	50%+drift	100% ptt d/f	50% ptt d/f	Drift dB	50%+drift		
1	1	769	2.8	n/a					n/a				
2		775	2.8	n/a					n/a				
3		799	2.8	n/a					n/a				
4		805	2.8	n/a					n/a				
5		806	3.0	n/a					n/a				
6		824	3.1	F6	1.45	0.725	-0.400	0.795	n/a				
7		851	3.1	n/a					n/a				
8		869	3.1	n/a					n/a				
SAR LIMITS				HEAD			SPATIAL PEAK			RF EXPOSURE CATEGORY			
FCC 47 CFR 2.1093		Health Canada Safety Code 6		8.0 W/kg			1g averaging			Occupational / Controlled			
Notes													
Test Mode = CW (Unmodulated Continuous Wave)						Phantom = Side Planar Phantom							
Front of DUT Distance to Planar Phantom (see Appendix D)						Shortest Antenna Distance to Planar Phantom (see Appendix D)							
2.5 cm						5.0 cm							
C = Column; R = Row				F1-Fx (F = Face) denotes the corresponding Face SAR Plot # as shown in Appendix A									
1. The worst case configuration was repeated with the K2 model variant.													




	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Table 3				BODY-WORN SAR EVALUATION RESULTS											
Device Under Test				TK-5410D-K3											
Body-worn Accessory				1											
Audio Accessory				G1a											
Test Dates				Aug. 20, 2013											
C				1	2	3	4	5	6	7	8				
R	Antenna	Test Freq. (MHz)	Cond. Pwr (W)	SAR W/kg 1g					SAR W/kg 1g						
				Battery a					Battery b (default)						
				100% ptt d/f	50% ptt d/f	Drift (dB)	50%+drift	100% ptt d/f	50% ptt d/f	Drift dB	50%+drift				
1	1	769	2.7	n/a					n/a						
2		775	2.7	n/a					B1	3.37	1.69	-0.761	2.01		
3		799	2.7	n/a					n/a						
4		805	2.7	n/a					B2	2.40	1.20	-0.658	1.40		
5		806	2.9	n/a					n/a						
6		824	3.0	B5	3.43	1.72	-0.222	1.81	B3	3.38	1.69	-0.204	1.77		
7		851	3.0	n/a					n/a						
8		869	3.0	n/a					B4	2.43	1.22	-1.23	1.61		
SAR LIMITS				HEAD				SPATIAL PEAK			RF EXPOSURE CATEGORY				
FCC 47 CFR 2.1093		Health Canada Safety Code 6		8.0 W/kg				1g averaging			Occupational / Controlled				
Notes															
Test Mode = CW (Unmodulated Continuous Wave)						Phantom = Side Planar Phantom									
Front of DUT Distance to Planar Phantom (see Appendix D)						Shortest Antenna Distance to Planar Phantom (see Appendix D)									
2.0 cm						2.8 cm									
C = Column; R = Row			F1-Fx (F = Face) denotes the corresponding Face SAR Plot # as shown in Appendix A												
1. When test reduction applies, the slots for such configurations are denoted with N/A (Not Applicable).															
2. When the SAR of an antenna tested on the highest output power channel using the default battery is ≤ 3.5 W/kg (50% PTT duty factor), testing of all other required channels is not necessary.															
3. When the SAR for all antennas tested using the default battery is ≤ 4.0 W/kg, test additional batteries using the antenna and channel configuration that resulted in the highest SAR.															

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 11 of 66



	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Table 4

BODY-WORN SAR EVALUATION RESULTS

Device Under Test				TK-5410D-K3															
Body-worn Accessory				2															
Audio Accessory				G1a															
Test Dates				Aug. 20, 2013															
C				1	2		3		4		5		6		7		8		
R	Antenna	Test Freq. (MHz)	Cond. Pwr (W)	SAR W/kg 1g								SAR W/kg 1g							
				Battery a								Battery b (default)							
				100% ptt d/f	50% ptt d/f	Drift (dB)	50%+drift	100% ptt d/f	50% ptt d/f	Drift dB	50%+drift								
1	1	769	2.7	n/a								n/a							
2		775	2.7	B10	3.47	1.74	-1.28	2.33	B6	3.42	1.71	-0.886	2.10						
3		799	2.7	n/a								n/a							
4		805	2.7	n/a								B7	2.37	1.19	-0.791	1.42			
5		806	2.9	n/a								n/a							
6		824	3.0	n/a								B8	3.42	1.71	-0.290	1.83			
7		851	3.0	n/a								n/a							
8		869	3.0	n/a								B9	2.32	1.16	-1.24	1.54			
SAR LIMITS				HEAD				SPATIAL PEAK				RF EXPOSURE CATEGORY							
FCC 47 CFR 2.1093				Health Canada Safety Code 6				8.0 W/kg				1g averaging				Occupational / Controlled			
Notes																			
Test Mode = CW (Unmodulated Continuous Wave)								Phantom = Side Planar Phantom											
Front of DUT Distance to Planar Phantom (see Appendix D)								Shortest Antenna Distance to Planar Phantom (see Appendix D)											
2.0 cm								2.8 cm											
C = Column; R = Row				F1-Fx (F = Face) denotes the corresponding Face SAR Plot # as shown in Appendix A															
1. When test reduction applies, the slots for such configurations are denoted with N/A (Not Applicable).																			
2. When the SAR of an antenna tested on the highest output power channel using the default battery is ≤ 3.5 W/kg (50% PTT duty factor), testing of all other required channels is not necessary.																			
3. When the SAR for all antennas tested using the default battery is ≤ 4.0 W/kg, test additional batteries using the antenna and channel configuration that resulted in the highest SAR.																			

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 12 of 66



	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Table 5				BODY-WORN SAR EVALUATION RESULTS									
Device Under Test				TK-5410D-K2									
Body-worn Accessory				2									
Audio Accessory				G1a									
Test Dates				Aug. 20, 2013									
C				1	2	3	4	5	6	7	8		
R	Antenna	Test Freq. (MHz)	Cond. Pwr (W)	SAR W/kg 1g					SAR W/kg 1g				
				Battery a					Battery b (default)				
				100% ptt d/f	50% ptt d/f	Drift (dB)	50%+drift	100% ptt d/f	50% ptt d/f	Drift dB	50%+drift		
1	1	769	2.8	n/a					n/a				
2		775	2.8	B11	2.98	1.49	-1.30	2.01	n/a				
3		799	2.8	n/a					n/a				
4		805	2.8	n/a					n/a				
5		806	3.0	n/a					n/a				
6		824	3.1	n/a					n/a				
7		851	3.1	n/a					n/a				
8		869	3.1	n/a					n/a				
SAR LIMITS				HEAD			SPATIAL PEAK			RF EXPOSURE CATEGORY			
FCC 47 CFR 2.1093		Health Canada Safety Code 6		8.0 W/kg			1g averaging			Occupational / Controlled			
Notes													
Test Mode = CW (Unmodulated Continuous Wave)						Phantom = Side Planar Phantom							
Front of DUT Distance to Planar Phantom (see Appendix D)						Shortest Antenna Distance to Planar Phantom (see Appendix D)							
2.0 cm						2.8 cm							
C = Column; R = Row				F1-Fx (F = Face) denotes the corresponding Face SAR Plot # as shown in Appendix A									
1. The worst case configuration was repeated with the K2 model variant.													

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD	
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz			
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.					Page 13 of 66



<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1
<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)



8.0 SAR SCALING

SCALING OF MAXIMUM SAR LEVELS TO MANUFACTURER'S TUNE-UP TOLERANCE SPECIFICATION

Test Config.	Test Freq. (MHz)	Antenna	Battery	Body-worn Accessory ID #	Cond. Power	Drift	SAR Level 1g (50% PTT d/f)		Scaling up to Manuf. Upper Tol. Power Spec.	Scaled SAR (50% PTT d/f) 1g (W/kg)
					Watts		dB	W/kg		
FCC (scaled without drift)										
Face-Held	824	1	a	n/a	3.0	-0.302	0.695	F5	+0.7 dB	0.817
Face-Held	824	1	a	n/a	3.1	-0.400	0.725	F6	+0.5 dB	0.813
Body-worn	775	1	a	2	2.7	-1.28	1.74	B10	+1.1 dB	2.24
IC (scaled with drift)										
Face-Held	775	1	b	n/a	2.7	-0.945	0.616*	F1	+1.1 dB	0.969
Face-Held	824	1	a	n/a	3.1	-0.400	0.725	F6	+0.5 dB	0.892
Body-Worn	775	1	a	2	2.7	-1.28	1.74	B10	+1.1 dB	3.00

Notes:

1. Only the highest SAR values for face and body per frequency band are scaled.
2. The resulting value is the reported SAR.
3. The scaled SAR levels are below the FCC/IC Occupational SAR Limit of 8.0 W/kg.
4. IC requires that the reported SAR also be scaled for the measured drift, therefore the above table calculates the SAR separately for IC.
5. *F6 had a fluid deviation of greater than 5%, therefore the measured SAR was corrected according to the procedures of IEC 62209-2:2010 as shown below.



SCALING OF SAR LEVELS FOR FLUID DEVIATION CORRECTION (IC Only)

Test Config.	Date	Test Freq. (GHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	Measured SAR Level 50% d/f (W/kg)	Corrected SAR Level 50% d/f (W/kg)
Face	8/16	0.775	41.57	0.83	41.5	0.9	0.17%	-7.78%	0.605	0.616

Correction Factor:

SAR Plot#	B10
Frequency (GHz)	0.775
Ce	-0.2186
Cσ	0.7585
Δ E	-7.78%
Δσ	0.17%
ΔSAR	1.83%

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 14 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

9.0 DETAILS OF SAR EVALUATION

1. The number of test frequencies and the test channels evaluated for SAR were selected in accordance with the procedures described in FCC KDB 447498 (see reference [8]).
2. Each SAR evaluation was performed with a fully charged battery. Due to radio heat-up the battery was replaced and the radio allowed to cool between the area and zoom scan evaluations.
3. The SAR drift of the DUT was measured by the DASY4 system for the duration of the SAR evaluations. The measured SAR drift was added to the measured SAR levels to report scaled SAR levels as shown in the SAR test data tables.
4. A SAR-versus-Time power drift evaluation was performed (see Appendix A).
5. The fluid temperature was measured prior to and after the SAR evaluations. The fluid temperature remained within +/- 2°C during the SAR evaluations.
6. 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).
7. The DUT was tested at the maximum conducted output power level preset by the manufacturer in unmodulated continuous transmit operation (Continuous Wave mode at 100% duty cycle) with the transmit key constantly depressed. For a push-to-talk device the 50% duty cycle compensation reported assumes a transmit/receive cycle of equal time base.
8. The DUT was evaluated for SAR in accordance with the procedures described in FCC KDB 643646 D01v01 (see reference [9]).
 - a. Battery b was selected as the default battery because it has the highest capacity. Both batteries are of equal thickness.
 - b. Audio accessory G1a was selected as the default audio accessory.
 - c. Additional audio accessories do not require testing because the highest SAR is <3.5 W/kg.
 - d. The K2 model variant was tested in the worst case face and body-worn configurations from the K3 model testing.

10.0 SAR EVALUATION PROCEDURES

- a. (i) The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation, both the left and right ear positions were evaluated using the SAM phantom.
(ii) For body-worn and face-held devices a planar phantom was used.
- b. The SAR was determined by a pre-defined procedure within the DASY4 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface with a grid spacing of 15mm x 15mm.
An area scan was determined as follows:
 - c. Based on the defined area scan grid, a more detailed grid is created to increase the points by a factor of 10. The interpolation function then evaluates all field values between corresponding measurement points.
 - d. A linear search is applied to find all the candidate maxima. Subsequently, all maxima are removed that are >2 dB from the global maximum. The remaining maxima are then used to position the cube scans.
A 1g and 10g spatial peak SAR was determined as follows:
 - e. Extrapolation is used to find the points between the dipole center of the probe and the surface of the phantom. This data cannot be measured, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.4 mm (see probe calibration document in Appendix F). The extrapolation was based on trivariate quadratics computed from the previously calculated 3D interpolated points nearest the phantom surface.
 - f. Interpolated data is used to calculate the average SAR over 1g and 10g cubes by spatially discretizing the entire measured cube. The volume used to determine the averaged SAR is a 1mm grid (42875 interpolated points).
 - g. A zoom scan volume of 30 mm x 30 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:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.	This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.					Page 15 of 66

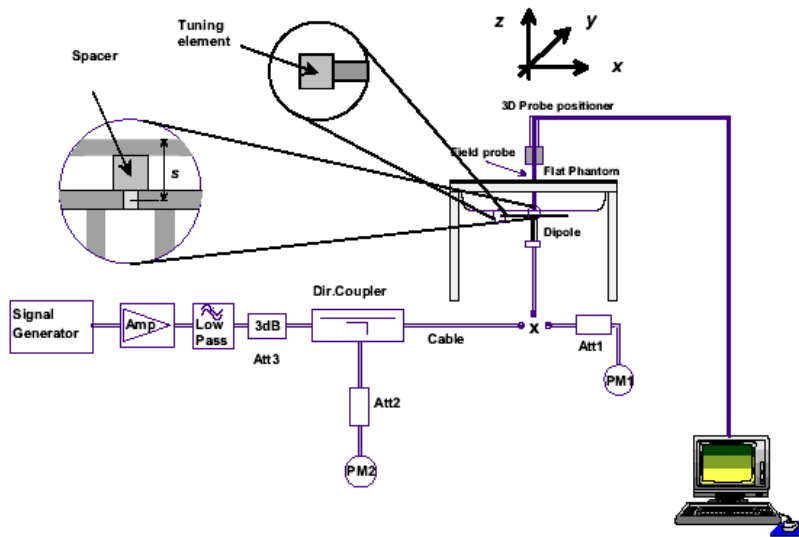
11.0 SYSTEM VERIFICATION

Prior to the SAR evaluations, system checks were performed with a planar phantom and SPEAG 835 MHz dipole (see Appendix B) in accordance with the procedures described in IEEE Standard 1528-2003 (see reference [5]) and IEC Standard 62209-2:2010 (see reference [6]). 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). A forward power of 250 mW was applied to the dipole and the system was verified to a tolerance of $\pm 10\%$ from the SAR system manufacturer's dipole calibration target SAR value (see Appendix E).

SYSTEM PERFORMANCE CHECK EVALUATIONS

Test Date	Equiv. Tissue Freq. (MHz)	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)
		SPEAG Target	Meas.	Dev.	SPEAG Target	Meas.	Dev.	SPEAG Target	Meas.	Dev.						
Aug 15	Head 835	2.36 $\pm 10\%$	2.38	+0.8%	41.5 $\pm 5\%$	40.8	-1.7%	0.90 $\pm 5\%$	0.89	-1.1%	1000	23.0	22.2	≥ 15	34	101.1
Aug 19	Body 835	2.47 $\pm 10\%$	2.39	-3.2%	55.2 $\pm 5\%$	54.6	-1.1%	0.97 $\pm 5\%$	0.97	0.0%	1000	23.0	23.4	≥ 15	33	101.5



Notes	1.	The target SAR values are the measured values from the SAR system manufacturer's dipole calibration (see Appendix E).
	2.	The target dielectric parameters are the nominal values from the SAR system manufacturer's dipole calibration (see Appendix E).
	3.	The fluid temperature was measured prior to and after the system performance check evaluations. The fluid temperature remained within $\pm 2^\circ\text{C}$ during the system performance check evaluations.
	4.	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).



System Performance Check Measurement Setup (IEEE Standard 1528-2003)



SPEAG 835 MHz Validation Dipole Setup

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

12.0 SIMULATED EQUIVALENT TISSUES



The simulated equivalent tissue recipes in the table below are derived from the SAR system manufacturer's suggested recipes in the DAS4 manual (see references [10] and [11]) in accordance with the procedures and requirements specified in IEEE Standard 1528-2003 (see reference [5]) and IEC Standard 62209-1:2005 (see reference [7]). The ingredient percentage may have been adjusted minimally in order to achieve the appropriate target dielectric parameters within the specified tolerance.

SIMULATED TISSUE MIXTURES					
INGREDIENT	Water	835 MHz Head Tissue Mixture	40.71 %	835 MHz Body Tissue Mixture	53.79 %
	Sugar		56.63 %		45.13 %
	Salt		1.48 %		0.98 %
	HEC		0.99 %		--
	Bactericide		0.19 %		0.10 %

13.0 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:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 17 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	


14.0 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 80
	Postprocessing Software: SEMCAD, V1.8 Build 186
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.	1590
Construction	Triangular core fiber optic detection system
Frequency	10 MHz to 6 GHz
Linearity	±0.2 dB (30 MHz to 3 GHz)
<u>Phantom 1</u>	
Type	SAM V4.0C
Shell Material	Fiberglass
Thickness	2.0 ±0.1 mm
Volume	Approx. 25 liters
<u>Phantom 2</u>	
Type	Side Planar Phantom
Shell Material	Plexiglass
Bottom Thickness	2.0 mm ± 0.1 mm
Inner Dimensions	72.6 cm (L) x 20.3 cm (W) x 20.3 cm (H)
<u>Phantom 3</u>	
Type	Barski Planar Phantom
Shell Material	Fiberglass
Thickness	2.0 ±0.1 mm
Volume	Approx. 70 liters

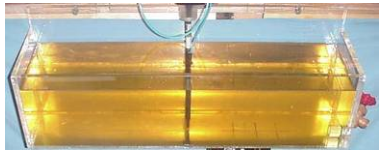


Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 18 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	


15.0 PROBE SPECIFICATION (ET3DV6)

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



16.0 PHANTOM

<p>The Side Planar Phantom is constructed of Plexiglas material with a 2.0 mm shell thickness for face-held and body-worn SAR evaluations of portable radio transceivers. The side planar phantom is mounted on the side of the DASY4 compact system table.</p>	
Plexiglas Side Planar Phantom	
<p>The Barski Planar Phantom is a fiberglass shell phantom with a 2.0 mm (+/- 0.2mm) thick device measurement area at the center of the phantom for SAR evaluations of devices with a larger surface area than the planar section of the SAM phantom. The planar phantom is integrated in a wooden table. The planar phantom is used for SAR evaluations and system performance check evaluations. See Appendix G for dimensions and specifications of the Barski planar phantom.</p>	
Barski Planar Phantom	
<p>The SAM Twin Phantom V4.0C is a fiberglass shell phantom with a 2.0 mm (+/- 0.2 mm) shell thickness for left and right head and flat planar area integrated in a wooden table. The shape of the fiberglass shell corresponds to the phantom defined by SCC34-SC2. The device holder positions are adjusted to the standard measurement positions in the three sections. See Appendix H for specifications of the SAM Twin Phantom V4.0C.</p>	
SAM Twin Phantom V4.0C	

17.0 DEVICE HOLDER

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



Applicant: Kenwood USA Corporation	FCC ID: ALH468800	IC ID: 282D-468800	KENWOOD
DUT Type: Portable 700/800 PTT Radio Transceiver	Models: TK-5410D-K2/K3	768-869 MHz	
2013 Celltech Labs Inc.	This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.		Page 19 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

18.0 TEST EQUIPMENT LIST

TEST EQUIPMENT		ASSET NO.	SERIAL NO.	DATE CALIBRATED	CALIBRATION INTERVAL
USED	DESCRIPTION				
x	Schmid & Partner DASY4 System	-	-	-	-
x	-DASY4 Measurement Server	00158	1078	CNR	CNR
x	-Robot	00046	599396-01	CNR	CNR
x	-DAE4	00019	353	19-Apr-12	Biennial
x	-ET3DV6 E-Field Probe	00017	1590	24-Apr-13	Annual
x	-D835V2 Validation Dipole	00217	4d075	20-Apr-12	Triennial
x	Side Planar Phantom	00156	161	CNR	CNR
	Barski Planar Phantom	00155	03-01	CNR	CNR
	SPEAG SAM Twin Phantom V4.0C	00154	1033	CNR	CNR
x	HP 85070C Dielectric Probe Kit	00033	none	CNR	CNR
x	Gigatronics 8652A Power Meter	00007	1835272	03-May-12	Biennial
x	Gigatronics 80701A Power Sensor	00014	1833542	03-May-12	Biennial
x	Gigatronics 80334A Power Sensor	-	1837001	03-May-12	Biennial
x	HP 8753ET Network Analyzer	00134	US39170292	26-Apr-12	Biennial
x	Rohde & Schwarz SMR20 Signal Generator	00006	100104	02-May-12	Biennial
x	Amplifier Research 5S1G4 Power Amplifier	00106	26235	CNR	CNR
Abbr.	CNR = Calibration Not Required				

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 20 of 66

	Date(s) of Evaluation Aug 16-20, 2013	Test Report Serial No. 081413ALH-1249S	Test Report Revision No. Rev. 1.1	
	Test Report Issue Date Aug. 23, 2013	Description of Test(s) Specific Absorption Rate	RF Exposure Category Occupational (Controlled)	

19.0 MEASUREMENT UNCERTAINTIES (IC)



UNCERTAINTY BUDGET FOR DEVICE EVALUATION (IEC 62209-2:2010)

Source of Uncertainty	IEC 62209-2 Section	Tolerance / Uncertainty ±%	Probability Distribution	Divisor	ci 1g	ci 10g	Standard Uncertainty ±% (1g)	Standard Uncertainty ±% (10g)	V _i or V _{eff}
Measurement System									
Probe Calibration (835 MHz)	7.2.2.1	6.0	Normal	1	1	1	6.0	6.0	∞
Isotropy	7.2.2.2	4.7	Rectangular	1.732050808	1	1	2.7	2.7	∞
Boundary Effect	7.2.2.6	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Linearity	7.2.2.3	4.7	Rectangular	1.732050808	1	1	2.7	2.7	∞
Detection Limits	7.2.2.5	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Readout Electronics	7.2.2.7	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	7.2.2.8	0.8	Rectangular	1.732050808	1	1	0.5	0.5	∞
Integration Time	7.2.2.9	2.6	Rectangular	1.732050808	1	1	1.5	1.5	∞
RF Ambient Conditions	7.2.4.5	3	Rectangular	1.732050808	1	1	1.7	1.7	∞
Probe Positioner Mechanical Restrictions	7.2.3.1	0.4	Rectangular	1.732050808	1	1	0.2	0.2	∞
Probe Positioning wrt Phantom Shell	7.2.3.3	2.9	Rectangular	1.732050808	1	1	1.7	1.7	∞
Post-processing	7.2.5	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	7.2.3.4.3	2.9	Normal	1	1	1	2.9	2.9	12
Device Holder Uncertainty	7.2.3.4.2	3.6	Normal	1	1	1	3.6	3.6	8
Drift of Output Power (meas. SAR drift)	7.2.2.10	0	Rectangular	1.732050808	1	1	0.0	0.0	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	7.2.3.2	4	Rectangular	1.732050808	1	1	2.3	2.3	∞
SAR Correction Algorithm for deviations in permittivity and conductivity	7.2.4.3	1.9	Normal	1	1	0.81	1.9	1.54	∞
Liquid Conductivity (measured)	7.2.4.3	7.78	Normal	1	0.78	0.71	6.1	5.5	∞
Liquid Permittivity (measured)	7.2.4.3	2.41	Normal	1	0.23	0.26	0.6	0.6	∞
Liquid Permittivity - temp. uncertainty	7.2.4.4	1	Rectangular	1.732050808	0.78	0.71	0.5	0.4	∞
Liquid Conductivity - temp. uncertainty	7.2.4.4	0.25	Rectangular	1.732050808	0.23	0.26	0.0	0.0	∞
Combined Standard Uncertainty	7.3.1		RSS				11.30	10.97	
Expanded Uncertainty (95% Confidence Interval)	7.3.2		k=2				22.61	21.94	

Measurement Uncertainty Table in accordance with International Standard IEC 62209-2:2010

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 21 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

20.0 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, Office of Engineering and Technology - "SAR Measurement Requirements for 100 MHz to 6 GHz"; KDB 865664 D01v01r01: May 2013.
- [4] Industry Canada - "Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)", Radio Standards Specification RSS-102 Issue 4: March 2010.
- [5] IEEE Standard 1528-2003 - "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques": December 2003.
- [6] International Standard IEC 62209-2 Edition 1.0 2010-03 - "Human exposure to radio frequency fields from hand-held & body-mounted wireless communication devices - Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)".
- [7] IEC International Standard 62209-1:2005 - "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures."
- [8] Federal Communications Commission, Office of Engineering and Technology - "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies"; KDB 447498 D01v05r01: May 2013.
- [9] Federal Communications Commission, Office of Engineering and Technology - "SAR Test Reduction Considerations for Occupational PTT Radios", KDB 643646 D01v01r01: April 2011.
- [10] Schmid & Partner Engineering AG - DASY4 Manual V4.6, Chapter 16 Application Note, Head Tissue Recipe: Sept. 2005.
- [11] Schmid & Partner Engineering AG - DASY4 Manual V4.6, Chapter 17 Application Note, Body Tissue Recipe: Sept. 2005.
- [12] ISO/IEC 17025 - "General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)."
- [13] Federal Communications Commission - "Measurements Required: RF Power Output"; Rule Part 47 CFR §2.1046.
- [14] Industry Canada - "General Requirements and Information for the Certification of Radiocommunication Equipment", Radio Standards Specification RSS-Gen Issue 3: December 2010.

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.	This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.					Page 22 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

APPENDIX A - SAR MEASUREMENT PLOTS

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.	This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.					Page 23 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

F1

Date/Time: 16/08/2013 10:21:25 AM

Face - Aug16

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 22.2C; Barometric Pressure: 101.1 kPa; Humidity: 34%

Procedure Notes:

Communication System: 700/800

Frequency: 775 MHz; Duty Cycle: 1:1

Medium: HSL835 Medium parameters used: $f = 775 \text{ MHz}$; $\sigma = 0.83 \text{ mho/m}$; $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.84, 6.84, 6.84); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Side Planar; Type: Plexiglass; Serial: 161
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

775 - Li-poly/Area Scan (7x24x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 1.20 mW/g

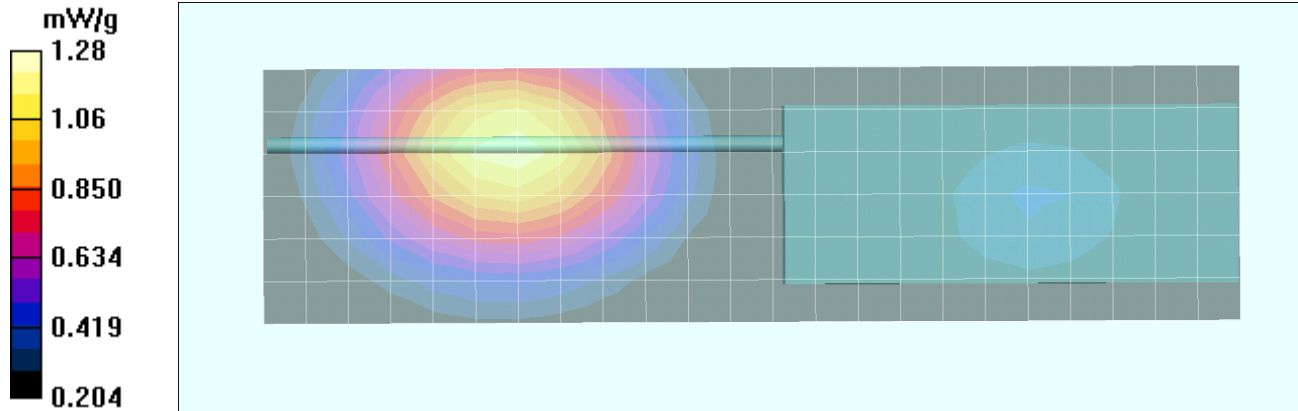
775 - Li-poly/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.8 V/m; Power Drift = -0.945 dB



Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.918 mW/g

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



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 24 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

F2

Date/Time: 16/08/2013 11:06:09 AM

Face - Aug16

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 22.2C; Barometric Pressure: 101.1 kPa; Humidity: 34%

Procedure Notes:

Communication System: 700/800

Frequency: 805 MHz; Duty Cycle: 1:1

Medium: HSL835 Medium parameters used: $f = 805 \text{ MHz}$; $\sigma = 0.86 \text{ mho/m}$; $\epsilon_r = 41.1$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.84, 6.84, 6.84); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Side Planar; Type: Plexiglass; Serial: 161
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

805 - Li-poly/Area Scan (7x24x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 1.00 mW/g

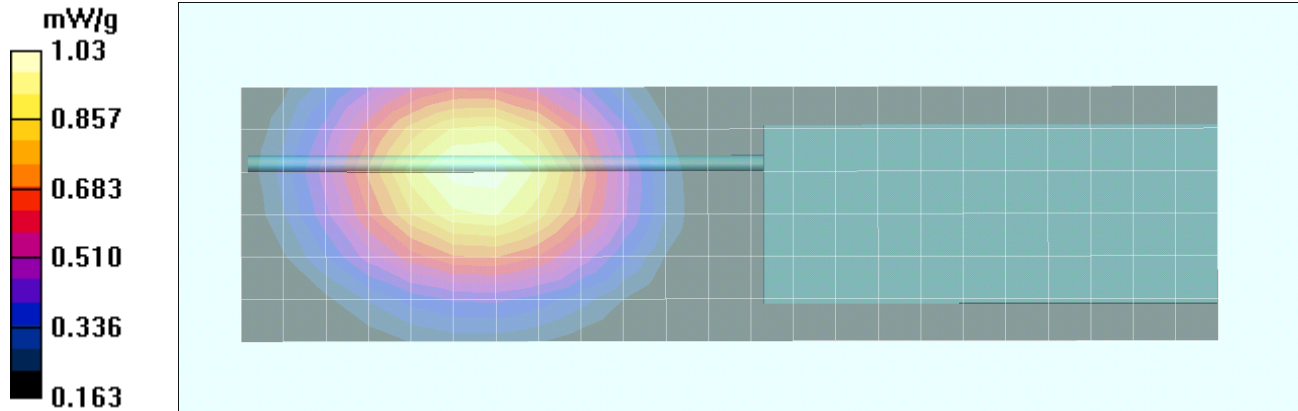
805 - Li-poly/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.80 V/m; Power Drift = -1.02 dB



Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.981 mW/g; SAR(10 g) = 0.734 mW/g

Maximum value of SAR (measured) = 1.03 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 25 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

F3

Date/Time: 16/08/2013 11:47:14 AM

Face - Aug16

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 22.2C; Barometric Pressure: 101.1 kPa; Humidity: 34%

Procedure Notes:

Communication System: 700/800

Frequency: 824 MHz; Duty Cycle: 1:1

Medium: HSL835 Medium parameters used (interpolated): $f = 824$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³

- Probe: ET3DV6 - SN1590; ConvF(6.84, 6.84, 6.84); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Side Planar; Type: Plexiglass; Serial: 161
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

824 - Li-poly/Area Scan (7x24x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.18 mW/g

824 - Li-poly/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

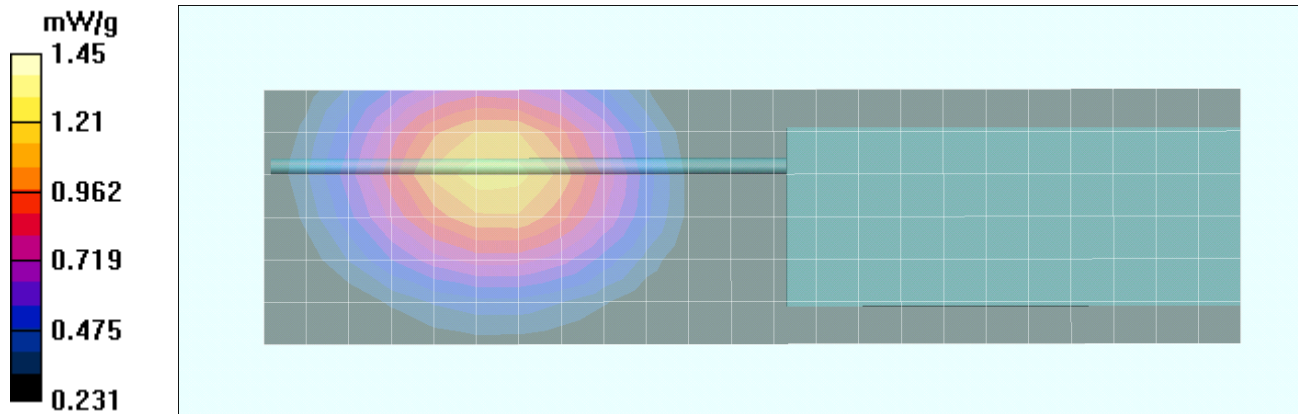
Reference Value = 8.05 V/m; Power Drift = -0.159 dB

Peak SAR (extrapolated) = 1.74 W/kg



SAR(1 g) = 1.37 mW/g; SAR(10 g) = 1.02 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.45 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 26 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

F4

Date/Time: 16/08/2013 12:40:13 PM

Face - Aug16

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 22.2C; Barometric Pressure: 101.1 kPa; Humidity: 34%

Procedure Notes:

Communication System: 700/800

Frequency: 869 MHz; Duty Cycle: 1:1

Medium: HSL835 Medium parameters used (interpolated): $f = 869$ MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 40.5$; $\rho = 1000$ kg/m³

- Probe: ET3DV6 - SN1590; ConvF(6.84, 6.84, 6.84); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Side Planar; Type: Plexiglass; Serial: 161
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

869 - Li-poly/Area Scan (7x24x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.993 mW/g

869 - Li-poly/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

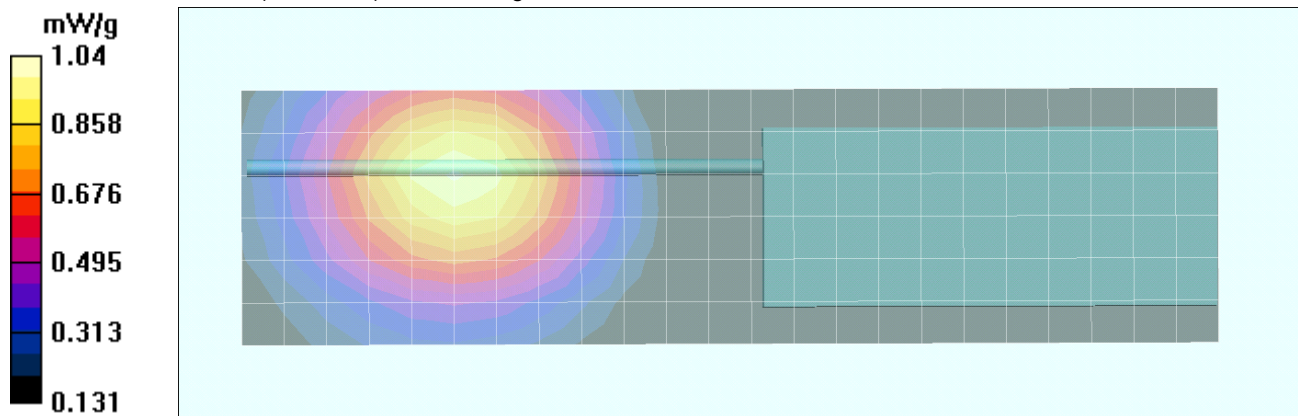
Reference Value = 6.83 V/m; Power Drift = -1.15 dB

Peak SAR (extrapolated) = 1.26 W/kg



SAR(1 g) = 0.951 mW/g; SAR(10 g) = 0.695 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.04 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 27 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

F5

Date/Time: 16/08/2013 1:17:48 PM

Face - Aug16

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 22.2C; Barometric Pressure: 101.1 kPa; Humidity: 34%

Procedure Notes:

Communication System: 700/800

Frequency: 824 MHz; Duty Cycle: 1:1

Medium: HSL835 Medium parameters used (interpolated): $f = 824$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³

- Probe: ET3DV6 - SN1590; ConvF(6.84, 6.84, 6.84); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Side Planar; Type: Plexiglass; Serial: 161
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

824 - NiMH/Area Scan (7x24x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.41 mW/g

824 - NiMH/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

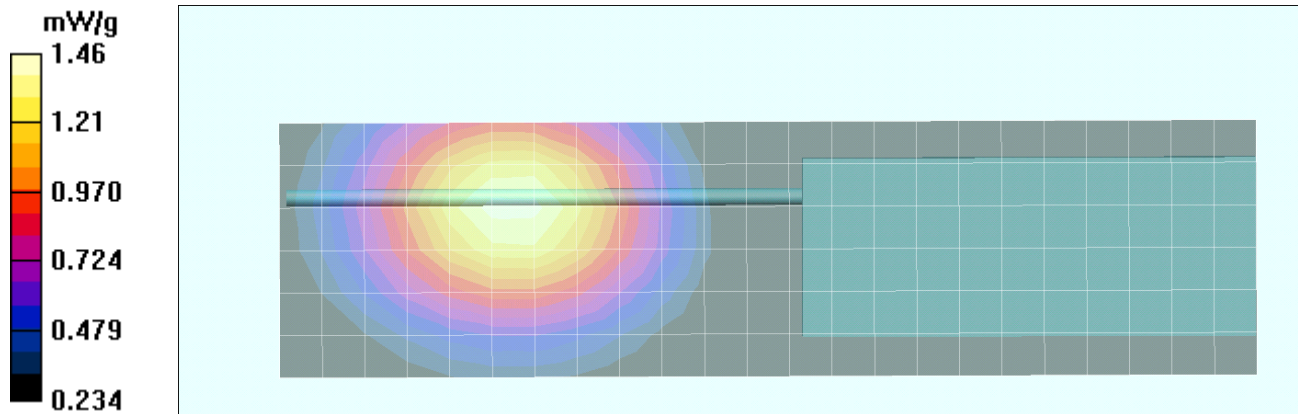
Reference Value = 8.55 V/m; Power Drift = -0.302 dB

Peak SAR (extrapolated) = 1.77 W/kg



SAR(1 g) = 1.39 mW/g; SAR(10 g) = 1.03 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.46 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 28 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

F6

Date/Time: 16/08/2013 1:48:41 PM

Face - Aug16

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 22.2C; Barometric Pressure: 101.1 kPa; Humidity: 34%

Procedure Notes:

Communication System: 700/800

Frequency: 824 MHz; Duty Cycle: 1:1

Medium: HSL835 Medium parameters used (interpolated): $f = 824$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³

- Probe: ET3DV6 - SN1590; ConvF(6.84, 6.84, 6.84); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Side Planar; Type: Plexiglass; Serial: 161
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

K2 - 824 - NiMH/Area Scan (7x24x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.54 mW/g

K2 - 824 - NiMH/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

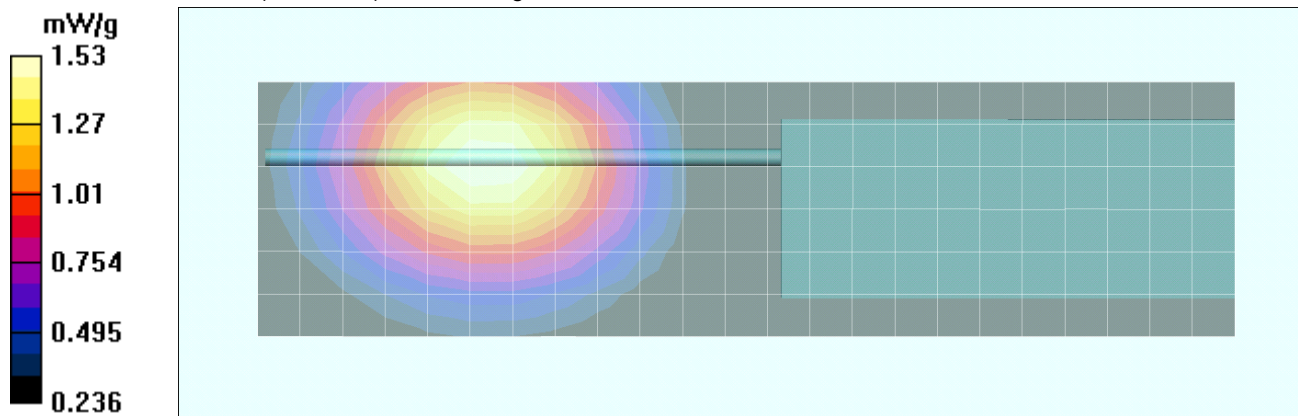
Reference Value = 8.11 V/m; Power Drift = -0.400 dB

Peak SAR (extrapolated) = 1.85 W/kg

SAR(1 g) = 1.45 mW/g; SAR(10 g) = 1.08 mW/g

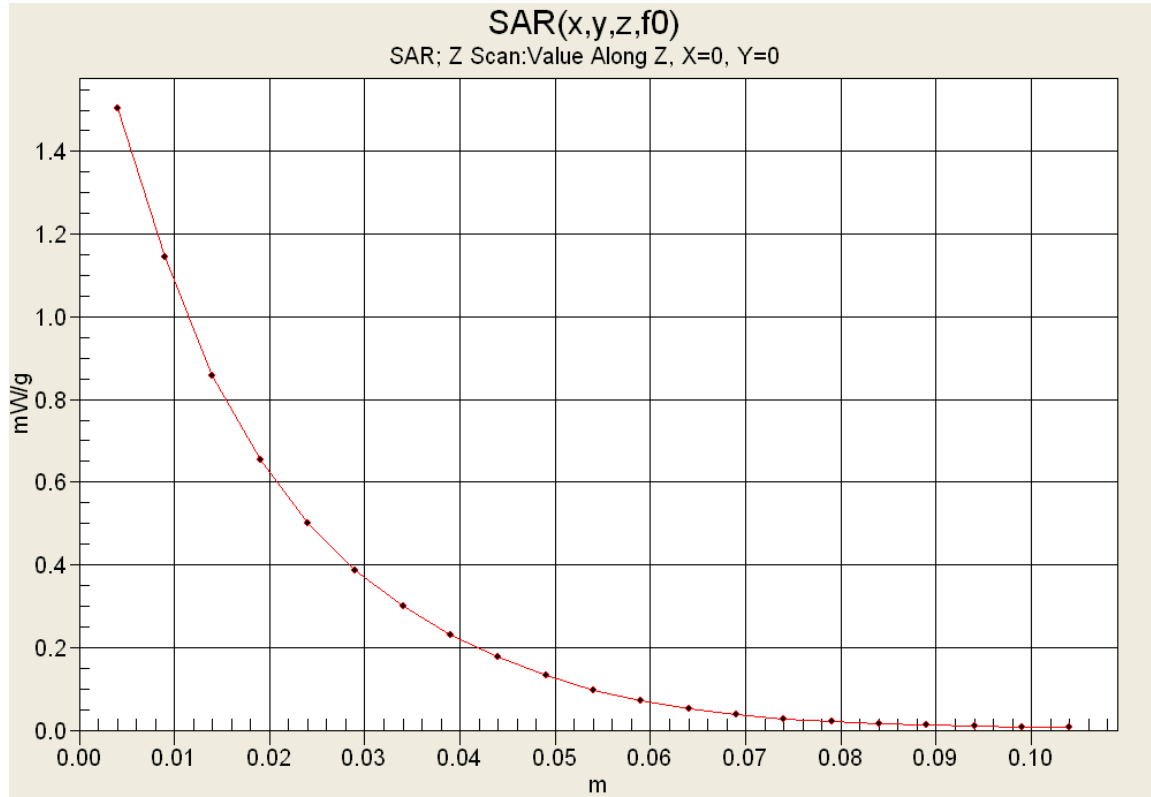
Info: Interpolated medium parameters used for SAR evaluation.



Maximum value of SAR (measured) = 1.53 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 29 of 66

Z-Axis Scan



	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B1

Date/Time: 20/08/2013 8:57:34 AM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

Frequency: 775 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used: $f = 775$ MHz; $\sigma = 0.93$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

775 - Li-poly - Belt-clip - KMC-51/Area Scan (7x24x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 3.59 mW/g

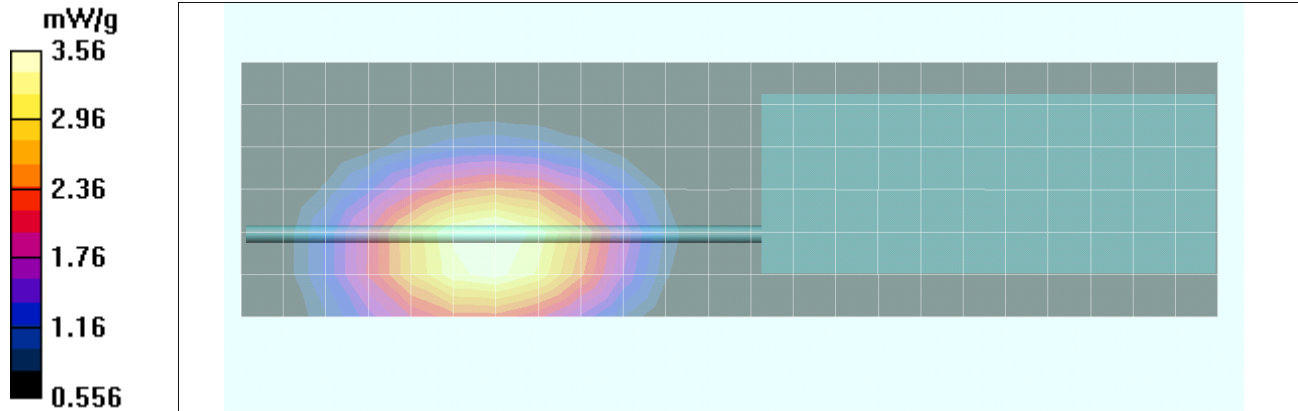
775 - Li-poly - Belt-clip - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.4 V/m; Power Drift = -0.761 dB



Peak SAR (extrapolated) = 4.29 W/kg

SAR(1 g) = 3.37 mW/g; SAR(10 g) = 2.47 mW/g

Maximum value of SAR (measured) = 3.56 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 31 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B2

Date/Time: 20/08/2013 9:30:50 AM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

Frequency: 805 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used: $f = 805 \text{ MHz}$; $\sigma = 0.95 \text{ mho/m}$; $\epsilon_r = 54.6$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

805 - Li-poly - Belt-clip - KMC-51/Area Scan (7x24x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 2.57 mW/g

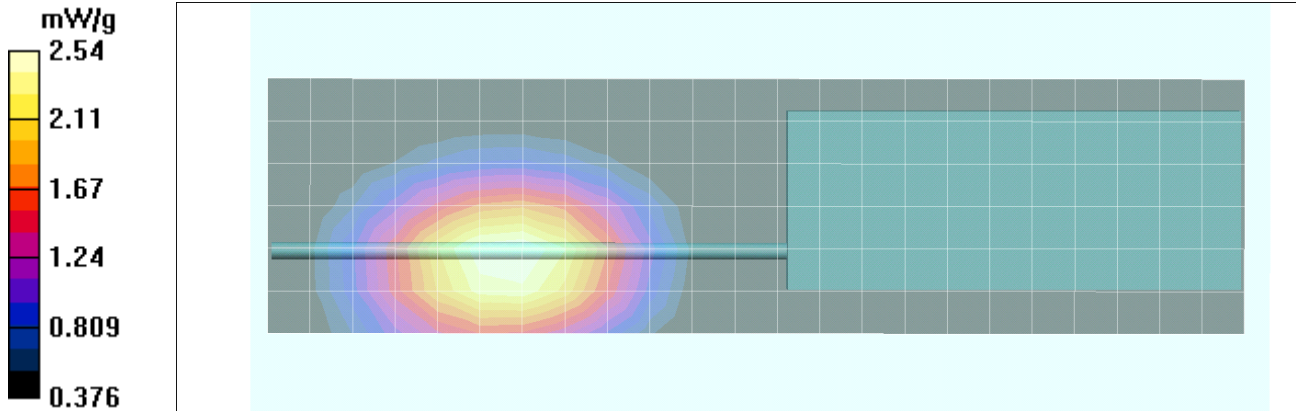
805 - Li-poly - Belt-clip - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.8 V/m; Power Drift = -0.658 dB



Peak SAR (extrapolated) = 3.07 W/kg

SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.75 mW/g

Maximum value of SAR (measured) = 2.54 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 32 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B3

Date/Time: 20/08/2013 10:09:21 AM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

Frequency: 824 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used (interpolated): $f = 824 \text{ MHz}$; $\sigma = 0.97 \text{ mho/m}$; $\epsilon_r = 54.7$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

824 - Li-poly - Belt-clip - KMC-51/Area Scan (7x24x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 3.55 mW/g

824 - Li-poly - Belt-clip - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

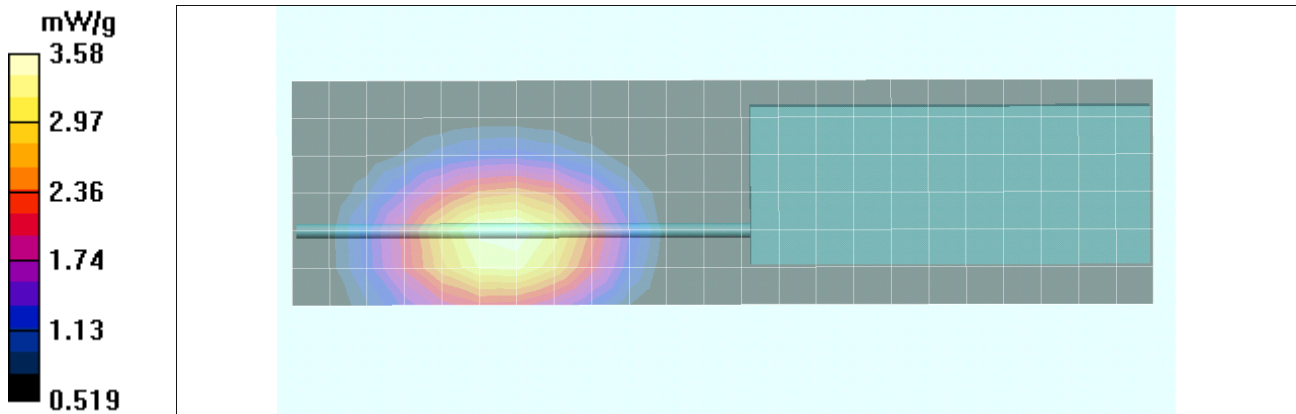
Reference Value = 11.0 V/m; Power Drift = -0.204 dB

Peak SAR (extrapolated) = 4.34 W/kg



SAR(1 g) = 3.38 mW/g; SAR(10 g) = 2.45 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 3.58 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 33 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B4

Date/Time: 20/08/2013 10:43:59 AM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

Frequency: 869 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used (interpolated): $f = 869$ MHz; $\sigma = 1.02$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

869 - Li-poly - Belt-clip - KMC-51/Area Scan (7x24x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 2.76 mW/g

869 - Li-poly - Belt-clip - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

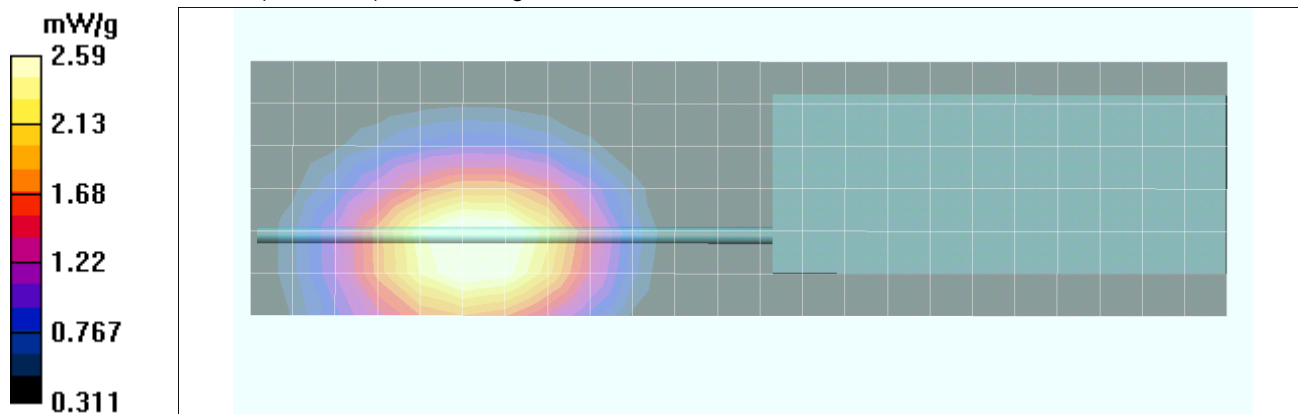
Reference Value = 12.6 V/m; Power Drift = -1.23 dB

Peak SAR (extrapolated) = 3.15 W/kg



SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.75 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 2.59 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 34 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B5

Date/Time: 20/08/2013 11:29:34 AM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

Frequency: 824 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used (interpolated): $f = 824 \text{ MHz}$; $\sigma = 0.97 \text{ mho/m}$; $\epsilon_r = 54.7$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

824 - NiMH - Belt-clip - KMC-51/Area Scan (7x24x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 3.71 mW/g

824 - NiMH - Belt-clip - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

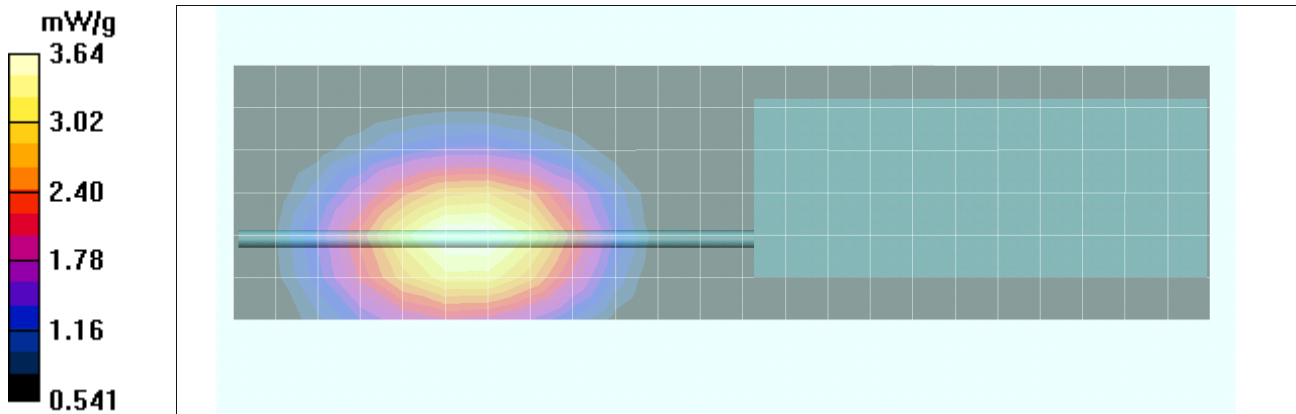
Reference Value = 11.6 V/m; Power Drift = -0.222 dB

Peak SAR (extrapolated) = 4.40 W/kg



SAR(1 g) = 3.43 mW/g; SAR(10 g) = 2.5 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 3.64 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 35 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B6

Date/Time: 20/08/2013 12:05:09 PM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

Frequency: 775 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used: $f = 775 \text{ MHz}$; $\sigma = 0.93 \text{ mho/m}$; $\epsilon_r = 54.8$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

775 - Li-poly - Leather Case - KMC-51/Area Scan (7x24x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 3.60 mW/g

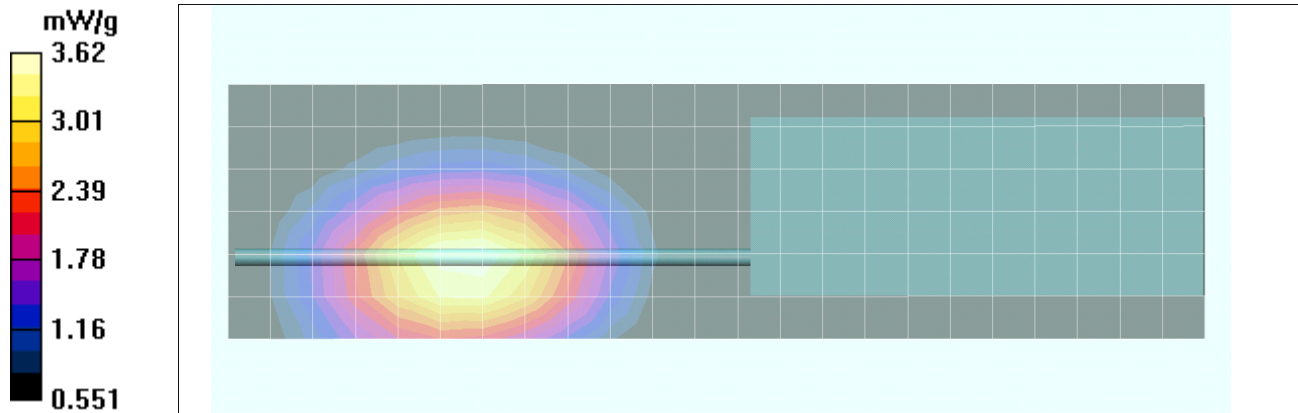
775 - Li-poly - Leather Case - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.9 V/m; Power Drift = -0.886 dB



Peak SAR (extrapolated) = 4.33 W/kg

SAR(1 g) = 3.42 mW/g; SAR(10 g) = 2.53 mW/g

Maximum value of SAR (measured) = 3.62 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 36 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B7

Date/Time: 20/08/2013 12:40:46 PM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

Frequency: 805 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used: $f = 805 \text{ MHz}$; $\sigma = 0.95 \text{ mho/m}$; $\epsilon_r = 54.6$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

805 - Li-poly - Leather Case - KMC-51/Area Scan (7x24x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 2.46 mW/g

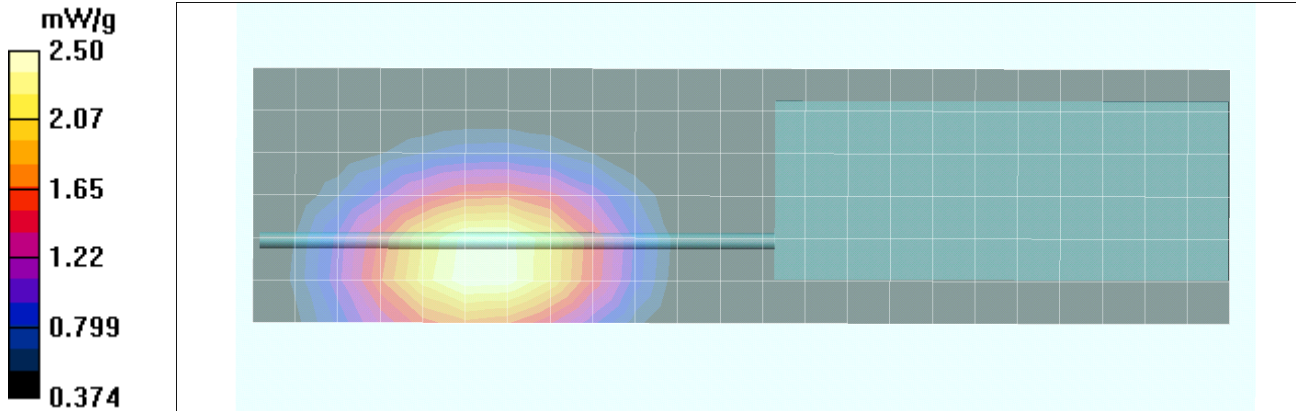
805 - Li-poly - Leather Case - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.2 V/m; Power Drift = -0.791 dB



Peak SAR (extrapolated) = 3.00 W/kg

SAR(1 g) = 2.37 mW/g; SAR(10 g) = 1.74 mW/g

Maximum value of SAR (measured) = 2.50 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 37 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B8

Date/Time: 20/08/2013 1:12:13 PM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

Frequency: 824 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used (interpolated): $f = 824 \text{ MHz}$; $\sigma = 0.97 \text{ mho/m}$; $\epsilon_r = 54.7$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

824 - Li-poly - Leather Case - KMC-51/Area Scan (7x24x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 3.53 mW/g

824 - Li-poly - Leather Case - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

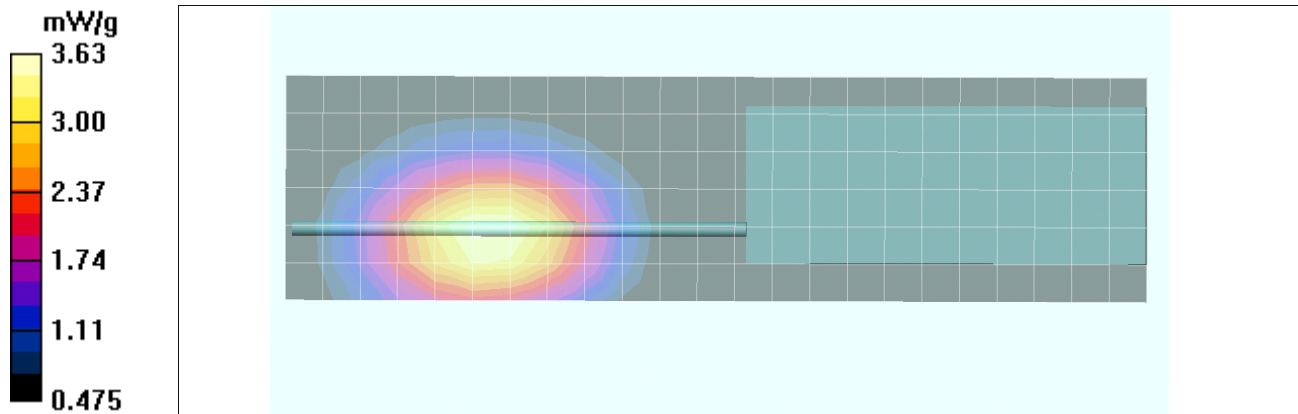
Reference Value = 9.84 V/m; Power Drift = -0.290 dB

Peak SAR (extrapolated) = 4.39 W/kg



SAR(1 g) = 3.42 mW/g; SAR(10 g) = 2.49 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 3.63 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 38 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B9

Date/Time: 20/08/2013 1:53:30 PM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

Frequency: 869 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used (interpolated): $f = 869 \text{ MHz}$; $\sigma = 1.02 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

869 - Li-poly - Leather Case - KMC-51/Area Scan (7x24x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 2.61 mW/g

869 - Li-poly - Leather Case - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

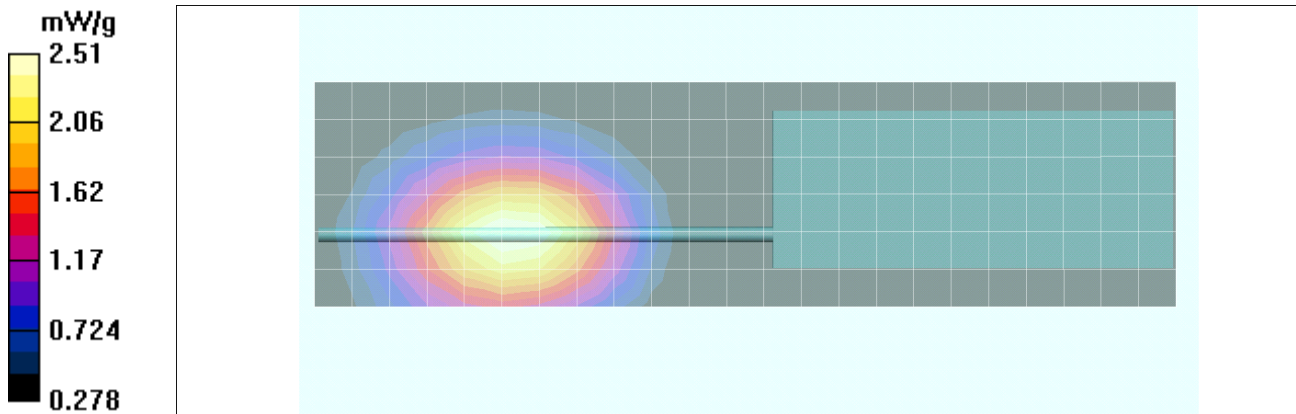
Reference Value = 10.7 V/m; Power Drift = -1.24 dB

Peak SAR (extrapolated) = 3.05 W/kg



SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.68 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 2.51 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 39 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B10

Date/Time: 20/08/2013 2:28:47 PM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

Frequency: 775 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used: $f = 775 \text{ MHz}$; $\sigma = 0.93 \text{ mho/m}$; $\epsilon_r = 54.8$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASy4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

775 - NiMH - Leather Case - KMC-51/Area Scan (7x24x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 3.54 mW/g

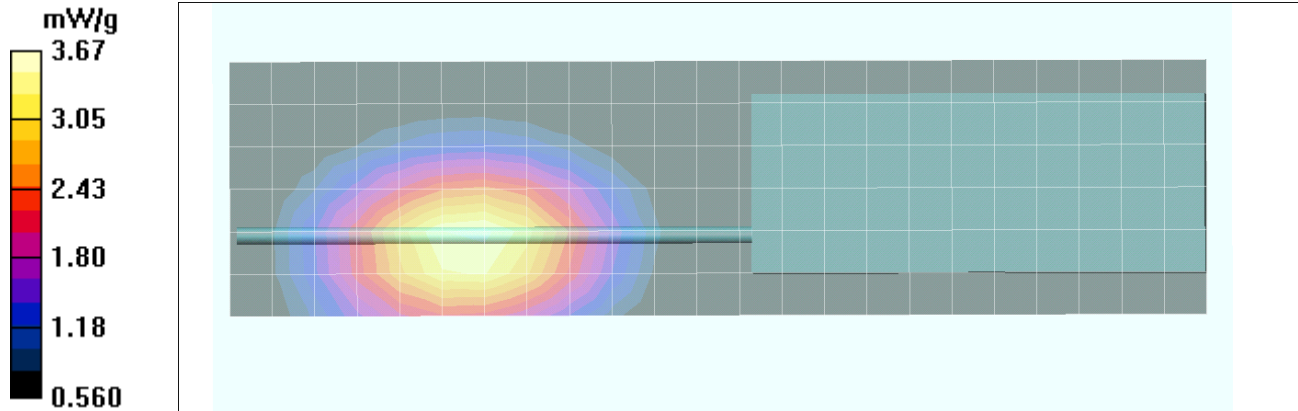
775 - NiMH - Leather Case - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.2 V/m; Power Drift = -1.28 dB

Peak SAR (extrapolated) = 4.41 W/kg

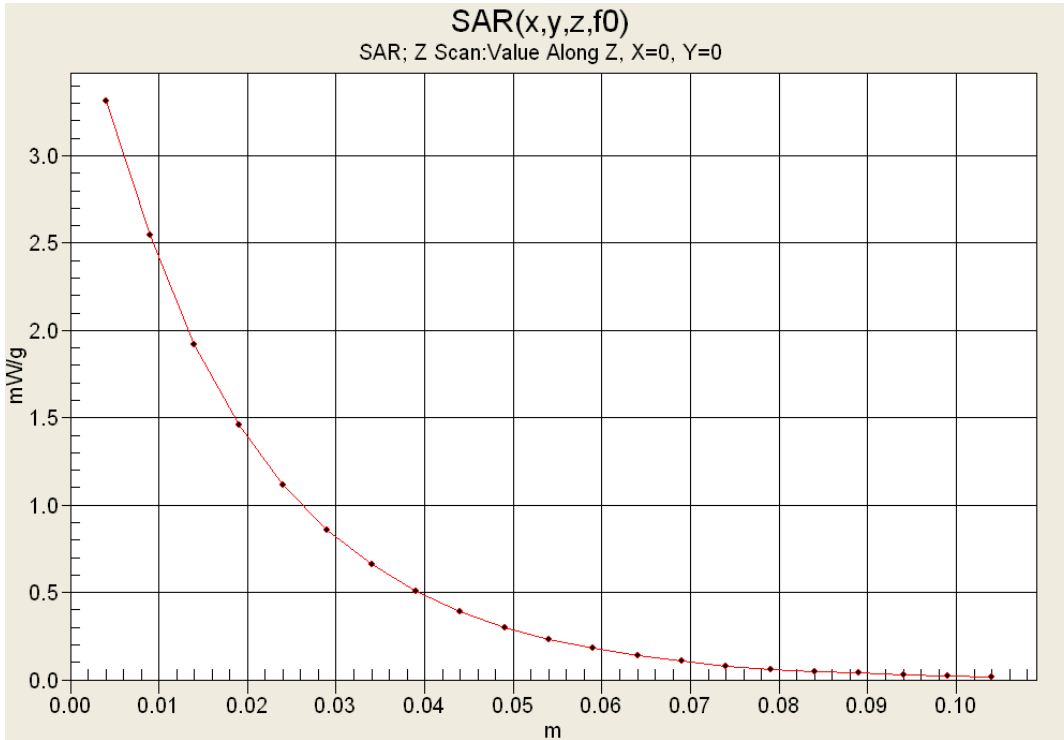
SAR(1 g) = 3.47 mW/g; SAR(10 g) = 2.56 mW/g

Maximum value of SAR (measured) = 3.67 mW/g

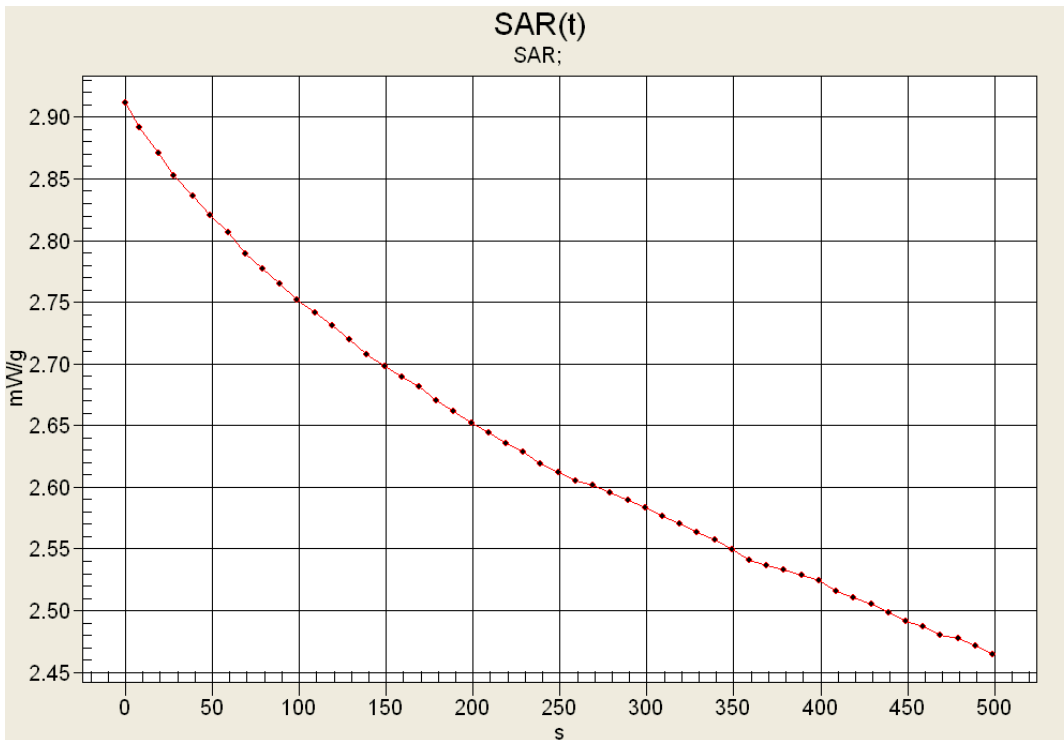




Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 40 of 66

Z-axis Scan



SAR vs. Time



	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

B11

Date/Time: 20/08/2013 3:01:07 PM

Body - Aug20

DUT: Kenwood TK-5410D-K2/3; Type: 700/800 PTT Radio; Serial: Not Specified

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: 700/800

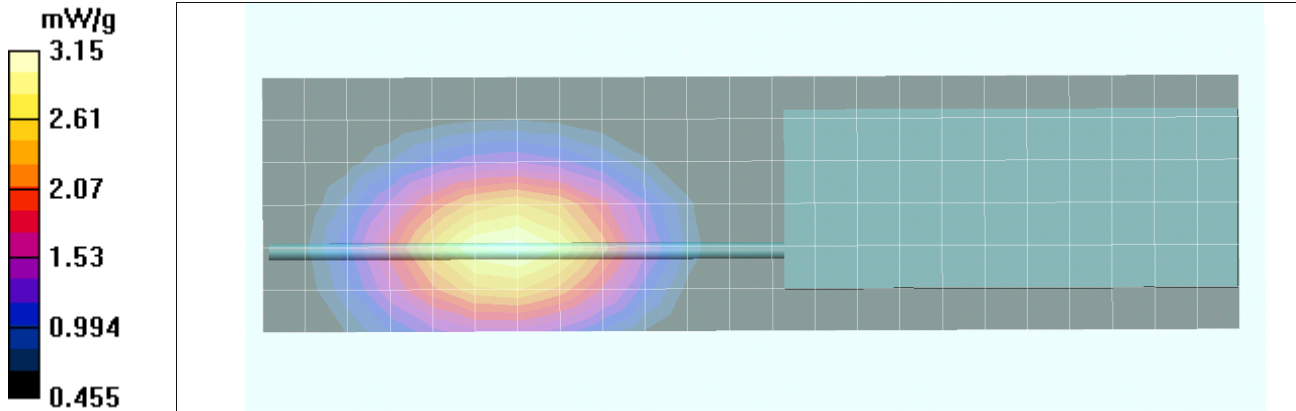
Frequency: 775 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used: $f = 775 \text{ MHz}$; $\sigma = 0.93 \text{ mho/m}$; $\epsilon_r = 54.8$; $\rho = 1000 \text{ kg/m}^3$



- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASy4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

K2 - 775 - NiMH - Leather Case - KMC-51/Area Scan (7x24x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (measured) = 3.09 mW/g

K2 - 775 - NiMH - Leather Case - KMC-51/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
Reference Value = 17.3 V/m; Power Drift = -1.30 dB
Peak SAR (extrapolated) = 3.76 W/kg
SAR(1 g) = 2.98 mW/g; SAR(10 g) = 2.2 mW/g
Maximum value of SAR (measured) = 3.15 mW/g





Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 42 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

APPENDIX B - SYSTEM PERFORMANCE CHECK PLOTS

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.	This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.					Page 43 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

System Performance Check - 835 MHz Head

Date/Time: 15/08/2013 2:25:36 PM

SPC - 835 Head - Aug15

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d075; Calibrated: 04/20/2012

Program Notes: Ambient Temp: 23C; Fluid Temp: 22.2C; Barometric Pressure: 101.1 kPa; Humidity: 34%

Procedure Notes:

Communication System: CW

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL835 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.89 \text{ mho/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.84, 6.84, 6.84); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head d=15mm Pin=250mW/Area Scan (6x10x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 2.52 mW/g

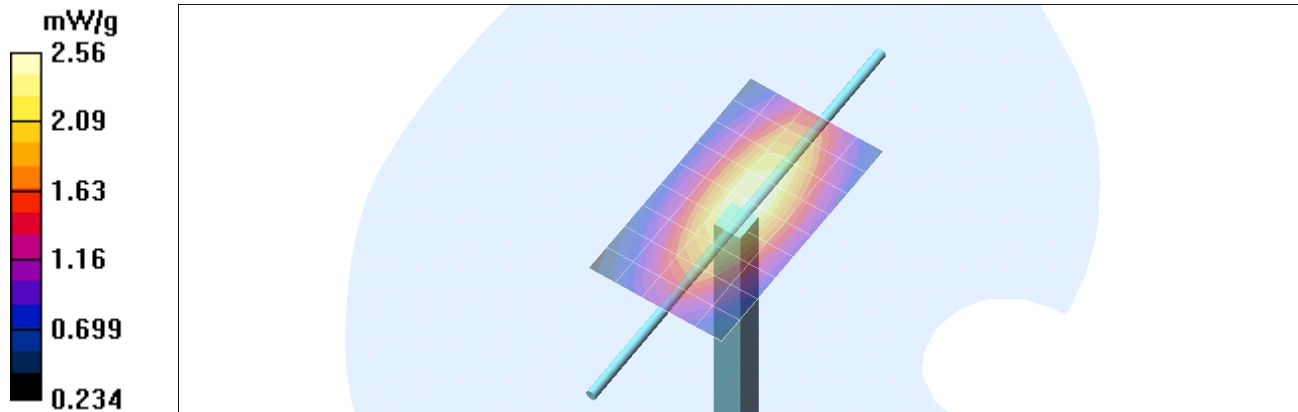
Head d=15mm Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.9 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 3.44 W/kg

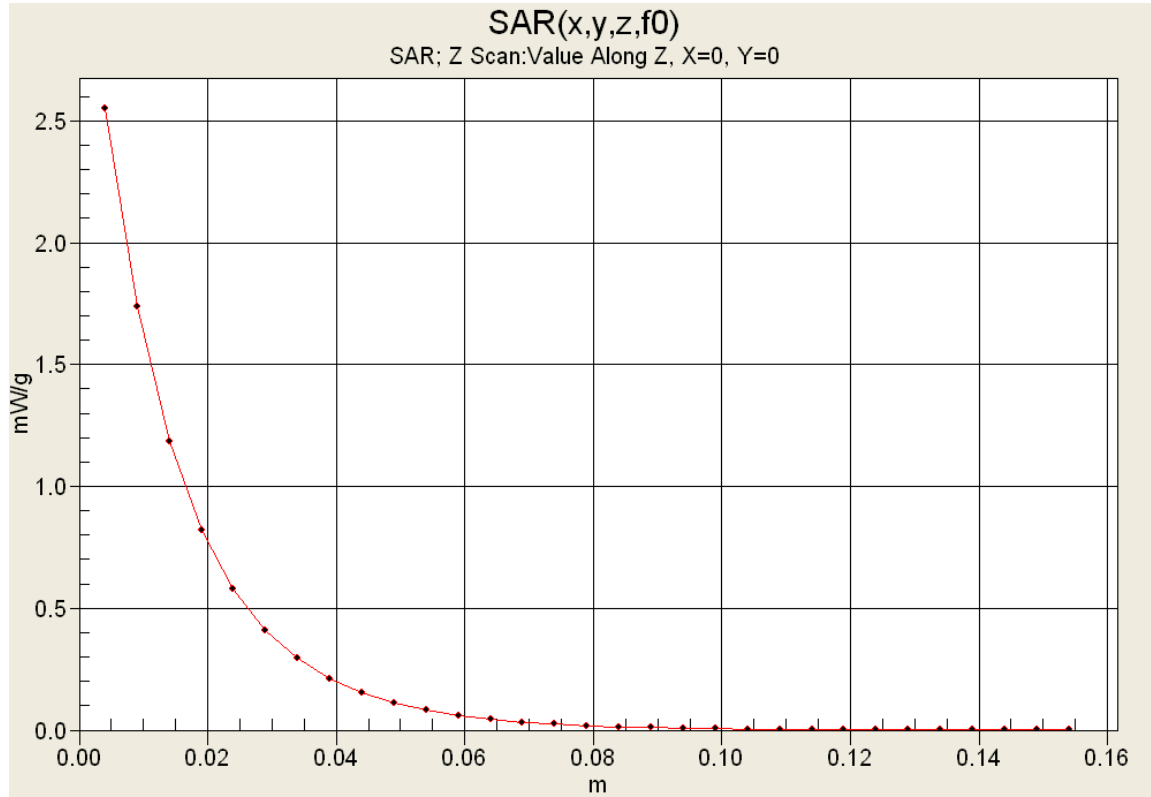
SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.56 mW/g



Maximum value of SAR (measured) = 2.56 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 44 of 66

Z-Axis Scan



	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

System Performance Check - 835 MHz Body

Date/Time: 19/08/2013 3:22:15 PM

SPC - 835 Body - Aug19

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d075; Calibrated: 04/20/2012

Program Notes: Ambient Temp: 23C; Fluid Temp: 23.4C; Barometric Pressure: 101.5 kPa; Humidity: 33%

Procedure Notes:

Communication System: CW

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: M835 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.97 \text{ mho/m}$; $\epsilon_r = 54.6$; $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(6.67, 6.67, 6.67); Calibrated: 24/04/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body d=15mm Pin=250mW/Area Scan (6x10x1): Measurement grid: dx=10mm, dy=10mm

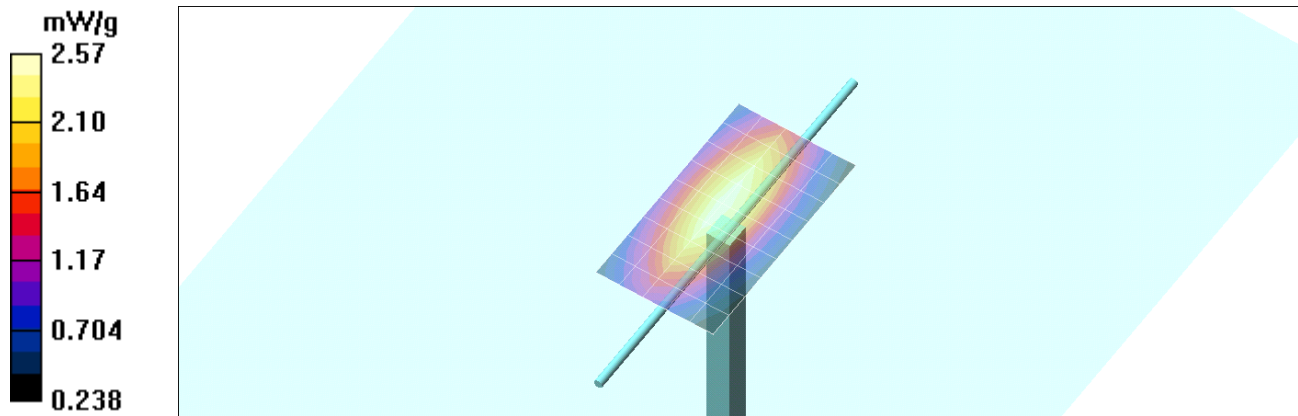
Maximum value of SAR (measured) = 2.57 mW/g

Body d=15mm Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.3 V/m; Power Drift = 0.010 dB

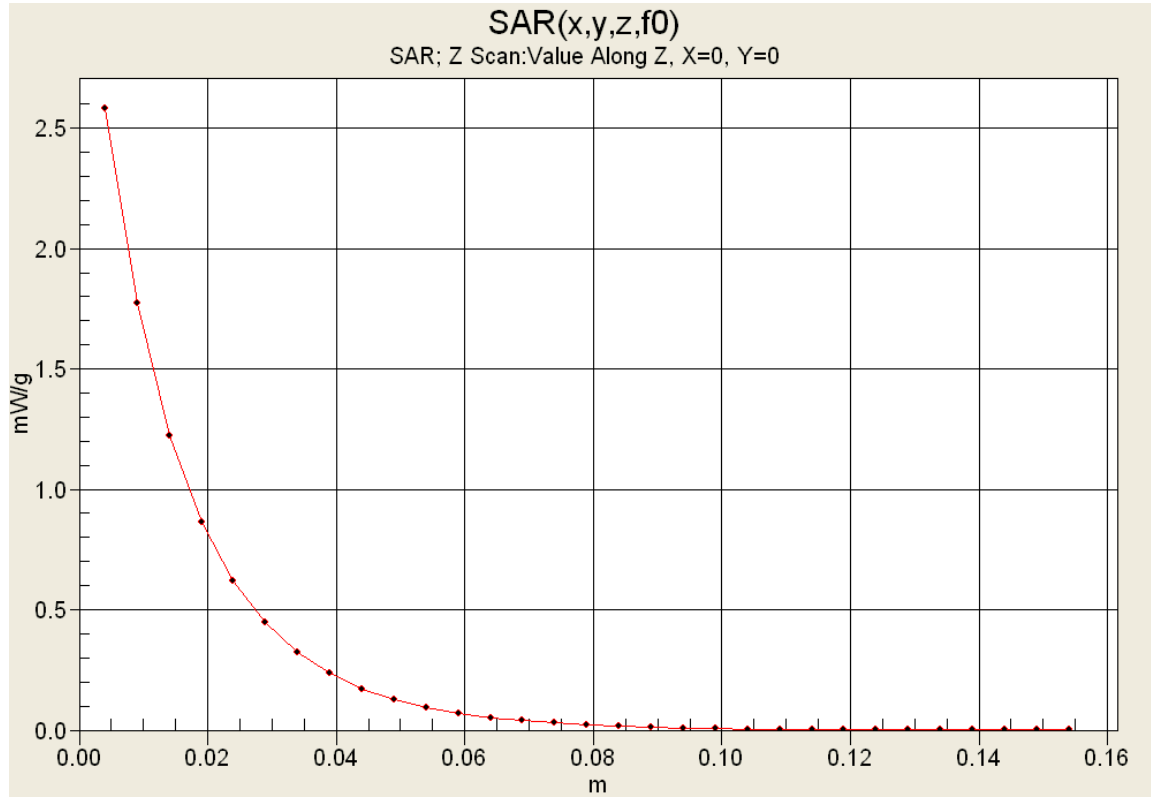
Peak SAR (extrapolated) = 3.43 W/kg



SAR(1 g) = 2.39 mW/g; SAR(10 g) = 1.58 mW/g



Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 46 of 66



Z-Axis Scan



	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.	This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.					Page 48 of 66



	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

835 MHz Head

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
15/Aug/2013
Freq 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
0.7350	42.02 0.89	41.98	0.79
0.7450	41.97 0.89	41.74	0.80
0.7550	41.92 0.89	41.71	0.81
0.7650	41.86 0.89	41.65	0.82
0.7750	41.81 0.90	41.57	0.83
0.7850	41.76 0.90	41.56	0.84
0.7950	41.71 0.90	41.10	0.87
0.8050	41.66 0.90	41.11	0.86
0.8150	41.60 0.90	40.82	0.89
0.8250	41.55 0.90	41.00	0.89
0.8350	41.50 0.90	40.77	0.89
0.8450	41.50 0.91	40.69	0.91
0.8550	41.50 0.92	40.70	0.91
0.8650	41.50 0.93	40.66	0.92
0.8750	41.50 0.94	40.22	0.92
0.8850	41.50 0.95	40.30	0.94
0.8950	41.50 0.96	40.11	0.94
0.9050	41.50 0.97	40.08	0.97
0.9150	41.50 0.98	39.92	0.96
0.9250	41.48 0.98	40.06	1.00
0.9350	41.46 0.99	39.59	0.99

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 49 of 66

	<u>Date(s) of Evaluation</u> Aug 16-20, 2013	<u>Test Report Serial No.</u> 081413ALH-1249S	<u>Test Report Revision No.</u> Rev. 1.1	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Aug. 23, 2013	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

835 MHz Body

Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
19/Aug/2013
Freq Frequency(GHz)
FCC_eB FCC Limits for Body Epsilon
FCC_sB FCC Limits for Body Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

Freq	FCC_eB	FCC_sB	Test_e	Test_s
0.7350	55.59	0.96	55.23	0.89
0.7450	55.55	0.96	55.24	0.91
0.7550	55.51	0.96	55.01	0.90
0.7650	55.47	0.96	55.10	0.92
0.7750	55.43	0.97	54.77	0.93
0.7850	55.39	0.97	54.71	0.94
0.7950	55.36	0.97	54.80	0.94
0.8050	55.32	0.97	54.64	0.95
0.8150	55.28	0.97	54.61	0.97
0.8250	55.24	0.97	54.74	0.97
0.8350	55.20	0.97	54.64	0.97
0.8450	55.17	0.98	54.00	0.98
0.8550	55.14	0.99	54.16	1.01
0.8650	55.11	1.01	54.16	1.02
0.8750	55.08	1.02	53.86	1.02
0.8850	55.05	1.03	53.89	1.04
0.8950	55.02	1.04	53.91	1.05
0.9050	55.00	1.05	53.63	1.05
0.9150	55.00	1.06	53.71	1.06
0.9250	54.98	1.06	53.38	1.07
0.9350	54.96	1.07	53.64	1.09

Applicant:	Kenwood USA Corporation	FCC ID:	ALH468800	IC ID:	282D-468800	KENWOOD
DUT Type:	Portable 700/800 PTT Radio Transceiver	Models:	TK-5410D-K2/K3	768-869 MHz		
2013 Celltech Labs Inc.		This document is not to be reproduced in whole or in part without the prior written permission of Celltech Labs Inc.				Page 50 of 66