

 MOTOROLA	 ACCREDITED Certificate Number: 2518.01
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FCC ID: AZ489FT4880
DECLARATION OF COMPLIANCE SAR ASSESSMENT

Networks & Enterprise EME Test Laboratory 8000 West Sunrise Blvd Fort Lauderdale, FL. 33322	Date of Report: 11/15/06 Report Revision: Rev O Report ID: CPI110 RLN6173A_Rev O_061115 SR4522
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<p>Responsible Engineer: Stephen C. Whalen (Sr. Staff EME Engineer) Date/s Tested: 11/6/06-11/8/06 Manufacturer/Location: Motorola – China Sector/Group/Div.: RBR Date submitted for test: 10/19/06 DUT Description: UHF RBR, 2 CH, removable antenna, 2.0 watts, Black, Li-Ion Test TX mode(s): CW Max. Power output: 2.35 W Nominal Power: 2.00 W Tx Frequency Bands: 451.1875MHz - 469.5625MHz Signaling type: FM Model(s) Tested: RLN6173A Model(s) Certified: RLN6173A Serial Number(s): 003 & 004 Classification: Occupational/Controlled Rule Part(s): 90</p> <p>Approved Accessories: Antenna(s): RAN4031 (450-470MHz removable ¼ wave antenna, 5.15dBi) Battery(ies): 6080384X63 (7.2V Li Ion - RLN) Body worn accessory(ies): 4280383X62 (Spring Action belt clip); RLN6301A (leather carry case) Audio/Data cable accessory(ies): HMN9026D (RSM), HMN9025D (Ear bud w/ PTT Mic), NTN9159F (Lightweight headset), ENMN4002B (Headset w/ Boom Mic), HCSN4000D (earpiece w/ PTT Mic), HMN9039E (Earpiece w/ Boom Mic), HCSN4001C (Earpiece), HMN9038A (Headset w/ swivel Boom Mic), RLN5714B (Earpiece w/ Inline Mic), PMMN4001A (Earsset w/ PTT Mic), PMLN4658A (D-style Mic Earset W/ Vox), HMN9036A (Earbud W/ PTT Mic), RLN5317A (Earpiece W/ PTT Mic Bge), HMN9030A (RSM), HMN9013B (Light Weight headset), PMLN5011A (Temple transducer headset), RLN5411A (Light Weight headset W/ Boom Mic PTT), RMN4016A (Light Weight headset W/ swivel Boom Mic), RLN5318A (Earpiece Surveillance Mic), HMN9754D (Earpiece Surveillance Mic Bge), BDN6720A (Earpiece W/ GP300 connector), HMN9727B (Earpiece W/o Vol Control), HLN9132A (Earpiece), HMN9752B (Earpiece Bge), HMN9021A (Mid tier Headset), RMN5047A (NFL style heavy duty headset), RLN5238B (NFL style lightweight headset), BDN6646C (Ear mic, GP300 PTT Adaptor)</p> <p style="text-align: center;">Max. Calc. : 1-g Avg. SAR: 2.70 W/kg (Body); 10-g Avg. SAR: 2.03 W/kg (Body) Max. Calc. : 1-g Avg. SAR: 1.91 W/kg (Face); 10-g Avg. SAR: 1.41 W/kg (Face)</p>	
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Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 2.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola EME Laboratory.

This reporting format is consistent with the test report guidelines of the TIA TSB-150 December 2004
 The results and statements contained in this report pertain only to the device(s) evaluated.

Signature on file Deanna Zakharia N&E EME Lab Senior Resource Manager, Laboratory Director Approval Date: 11/15/2006	Certification Date: Certification No.:
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Report Revision History

Date	Revision	Comments
11/15/06	O	Initial release

1.0 Introduction and Overview

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (SAR) measurements performed at the N&E EME Test Lab for the model number RLN6173A of FCC ID: AZ489FT4880. The results herein reflect initial test results.

2.0 Referenced Standards and Guidelines

This product is designed to comply with the following applicable national and international standards and guidelines.

- IEC62209-1(2005) Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)
- United States Federal Communications Commission, Code of Federal Regulations; Rule Part 47CFR § 2.1093 sub-part J:1999
- Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.
- IEEE 1528, 2003 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques"
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-2005 Edition
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz, 1999
- Australian Communications Authority Radiocommunications (Electromagnetic Radiation - Human Exposure) Standard 2003
- ANATEL, Brazil Regulatory Authority, Resolution No. 303 of July 2, 2002 "Regulation of the limitation of exposure to electrical, magnetic, and electromagnetic fields in the radio frequency range between 9KHz and 300 GHz." and "Attachment to resolution # 303 from July 2, 2002"

2.1 SAR Limits

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average - ANSI - (averaged over the whole body)	0.08	0.4
Spatial Peak - ANSI - (averaged over any 1-g of tissue)	1.60	8.0
Spatial Peak – ICNIRP/ANSI - (hands/wrists/feet/ankles averaged over 10-g)	4.0	20.0
Localized SAR - ICNIRP - (Head and Trunk 10-g)	2.0	10.0

3.0 Description of Device Under Test (DUT)

FCC ID: AZ489FT4880 is a UHF two-way radio incorporating Zero IF technology with analog FM based on the FP99 audio processing chip set.

This device will be marketed to and used in professional business environments. Intended users are explicitly informed by the user guide that a license is required and is given information on how to obtain the required applicable licenses prior to operating the device.

This device may be used while held at least 1 inch in front of the face in PTT mode, and against the body via the offered body worn and audio accessories
 FCC ID: AZ489FT4880 is capable of operating in the 451.1875MHz – 469.5625MHz band. The rated conducted power is 2.0 watts. The maximum conducted output power is 2.35 watts as defined by the upper limit of the production line final test station.

FCC ID: AZ489FT4880 is offered with the options and accessories listed on the coversheet of this report.

Test Output Power

A table of the characteristic power slump versus time is provided in Appendix F.

4.0 Description of Test System



4.1 Descriptions of Robotics/probes/Readout Electronics

The laboratory utilizes a Dosimetric Assessment System (DASY4™) SAR measurement system Version 4.7 build 44 manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot, DAE3V1, and ET3DV6 E-Field probe. Please reference the SPEAG user manual and application notes for detailed probe, robot, and SAR computational procedures. Section 5.0 presents relevant test equipment information. Appendices B and C present the applicable calibration certificates. The E-field probe first scans a coarse grid over a large area inside the phantom in order to locate the interpolated maximum SAR distribution. After the coarse scan measurement, the probe is automatically moved to a position at the interpolated maximum. The subsequent scan can directly use this position as reference for the cube evaluations.

4.2 Description of Phantom(s)

4.2.1 Flat Phantom

Phantom Type	Phantom Material	Phantom Dimensions (cm)	Support structure opening dimensions (cm)	Support structure material	Loss Tangent (wood)
Flat	High Density Polyethylene (HDPE)	80x30x20x0.2	68.58x20.32	Wood	< 0.05

4.2.2 SAM Phantom

Phantom Type	Material Parameters	Material Thickness (mm)	Support structure material	Loss Tangent (wood)
NA	200MHz -3GHz; Er = <5, Loss Tangent = <0.05	2mm +/- 0.2mm	Wood	< 0.05

4.3 Description of Equivalent tissues

Type of Simulated Tissue

The simulated tissue used is compliant to that specified in FCC Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01) and IEEE 1528, 2003 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

The sugar based simulate tissue is produced by placing the correct measured amount of De-ionized water into a large container. Each of the dried ingredients are weighed and added to the water carefully to avoid clumping. If the solution has a high sugar concentration the water is pre-heated to aid in dissolving the ingredients. For Diacetin and Glycol based simulates, sugar and HEC ingredients are not needed. The solution is mixed thoroughly, covered, and allowed to sit overnight prior to use.

Simulated Tissue Composition

% of listed ingredients	450MHz	
	Head	Body
Sugar	56.0	46.5
DGBE (Glycol)	NA	NA
Diacetin	NA	NA
De ionized -Water	39.10	50.53
Salt	3.80	1.87
HEC	1.0	1.0
Bact.	0.1	0.1

Reference section 6.1 for target parameters

5.0 Additional Test Equipment

Equipment Type	Model Number	Serial Number	Calibration Due Date
Power Meter (Agilent)	E4418B	GB40206553	4/21/2007
Power Meter (Agilent)	E4418B	GB40206480	11/30/2006
Power Meter (HP)	E4418B	US39251150	4/20/2007
Power Sensor (HP)	8482B	3318A07392	5/17/2007
Power Sensor (HP)	8482B	3318A07393	3/27/2007
Power Sensor (HP)	8482B	3318A07546	10/17/2007
Bi-Directional Coupler (NARDA)	3020A	40295	6/6/2008
Signal Generator (HP)	E4421B	US39270649	8/16/2008
AMP (Amplifier Research)	10W1000	5924	CNR
Agilent PNA-L Network Analyzer	N5230A	MY45001092	5/22/2007
Dielectric Probe Kit (HP)	85070C	US99360076	CNR
Speag Dipole	D450V2	1001	5/25/2008

6.0 SAR Measurement System Verification

The SAR measurements were conducted with probe model/serial number ET3DV6/SN1393. The system performance check was conducted daily and within 24 hours prior to testing. DASY output files of the probe/dipole calibration certificates and system performance test results are included in appendices B, C, D respectively. The table below summarizes the system performance check results normalized to 1W.

Dipole validation scans at the head from SPEAG are provided in APPENDIX D. The N&E EME lab validated the dipole to the applicable IEEE system performance targets. Within the same day system validation was performed using FCC body tissue parameters to generate the system performance target values for body at the applicable frequency. The results of the N&E EME system performance validation are provided herein.

6.1 Equivalent Tissue Test Results

Simulated tissue prepared for SAR measurements is measured daily and within 24 hours prior to actual SAR testing to verify that the tissue is within +/- 5% of target parameters at the center of the transmit band. This measurement is done using the applicable equipment indicated in section 5.0.

Actual versus Target tissue parameters (11/6/06 – 11/8/06)

FCC Body				
Frequency (MHz)	Di-electric Constant Target	Di-electric Constant Meas. (Range)	Conductivity Target S/m	Conductivity Meas. (Range) S/m
450	56.7	56.4-56.6	0.94	0.90-0.92
460.4	56.7	56.2-56.5	0.94	0.91-0.92

IEEE Head				
Frequency (MHz)	Di-electric Constant Target	Di-electric Constant Meas. (Range)	Conductivity Target S/m	Conductivity Meas. (Range) S/m
450	43.5	42.9	0.87	0.85
460.4	43.4	42.7	0.87	0.86

6.2 System Check Test Results

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	System Perf. Result when normalized to 1W (mW/g)	Reference SAR @ 1W (mW/g)	Test Date(s)
1393	FCC Body	5/02/06	SPEAG D450V2 /1001	4.28 +/- 0.075	4.43 +/- 10%	11/06/06-11/07/06
1393	IEEE Head	5/02/06	SPEAG D450V2 /1001	4.62	5.11 +/- 10%	11/08/06

Note: See APPENDIX D for an explanation of the reference SAR targets stated above.
 (System performance results reflects the median performance +/- ½ of the test date(s) performance ranges)

The DASY4™ system is operated per the instructions in the DASY4™ Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess EME SAR compliance was calibrated according to 17025 A2LA guidelines.

7.0 DUT Test Strategy and Methodology

7.1 DUT Configuration(s)

The DUT is a portable two-way device with FM transmission signaling operational at the body and face using the offered accessories. The device is placed in the test positions presented in Appendix G.

Test Plan

All options and accessories listed on the cover page of this report were considered in order to develop the SAR test plan for this product. SAR measurements were performed using a flat phantom with the applicable simulated tissue to assess performance at the body and face respectively using the relevant transmission modes.

Note that a coarse-to-cube approximation methodology was utilized to determine the worst-case SAR performance configuration for each applicable body location. The test configurations that produced the highest SAR results for each body position using the coarse-to-cube approximation methodology were assessed using the full DASY4™ coarse and 7x7x7 cube scans.

Assessments at the Body [Pages 10-11 of 51; Table 1]

- Assessment at the center of the band with the audio accessory kit HMN9026D along with the offered body worn accessories.
- Assessment of the other offered audio accessories with the worst case configuration from above.
- Assessment of the band edge frequencies using the worst case configuration from above.
- Assessment of 2.5cm separation distance without any body worn accessory using the worst case configuration from above.

Assessments at the Face [Page 12 of 51; Table 2]

- Assessment at the center of the band with the offered battery with and with out the offered applicable audio accessories.
- Assessment at the band edges with the worst case configuration from above.

Shortened scan assessment [Page 12 of 51; Table 3]

- A “shortened” scan was performed using the offered battery and test configuration that produced the highest SAR results overall. Note that the shortened scan is obtained by first running a coarse scan to find the peak area and then, using a newly charged battery, a cube scan only was performed. The shortened scan represents the cube scan performance results.

7.2 Device Positioning Procedures

Reference Appendix G for photos of the DUT tested positions.

7.2.1 Body

The DUT was positioned in normal use configuration against the phantom with the offered body worn accessory.
 The DUT was positioned with its' back towards the phantom and antenna separated 2.5cm from the phantom as well as with the front sides separated 2.5cm from the phantom.

7.2.2 Head

NA

7.2.3 Face

The DUT was positioned with its' front side separated 2.5cm from the phantom.

8.0 Environmental Test Conditions

The EME Laboratory ambient environment is well controlled resulting in very stable simulated tissue temperature and therefore stable dielectric properties. Simulated tissue temperature is measured prior to each scan to insure it is within +/- 2°C of the temperature at which the dielectric properties were determined. The liquid depth within the phantom used for measurements was 15cm +/- 0.5cm. Additional precautions are routinely taken to ensure the stability of the simulated tissue such as covering the phantoms when scans are not actively in process in order to minimize evaporation. The lab environment is continuously monitored. The table below presents the range and average environmental conditions during the SAR tests reported herein:

	Target	Measured
Ambient Temperature	20 - 25 °C	Range: 21.8-22.7°C Avg. 22.4°C
Relative Humidity	30 - 70 %	Range: 49.2-68.0% Avg. 58.1%
Tissue Temperature	NA	Range: 20.6-21.7°C Avg. 21.2°C

The EME Lab RF environment uses a Spectrum Analyzer to monitor for extraneous large signal RF contaminants that could possibly affect the test results. If such unwanted signals are discovered the SAR scans are repeated.

9.0 Test Results Summary

All SAR results obtained by the tests described in Section 7.1 are listed below. As noted in section 7.1, a coarse-to-cube approximation methodology, was utilized to ascertain the worst-case test configuration for each body location. The worst case test configurations observed for each body location (in bold with *) were then assessed using the full DASy4™ coarse and 7x7x7 cube methodology, and they are presented in the worst case configuration table below. The associated SAR plots are provided in APPENDIX E. Appendix E also presents shortened SAR cube scans to assess the validity of the calculated results presented herein. Note: The results of the shortened cube scans presented in Appendix E demonstrate that the scaling methodology used to determine the calculated SAR results presented herein are valid.

Table 1

Assessments at the Body (CW) 451.1875 – 469.5625MHz band												
Run Number/ SN	Antenna Pos.	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)
Center frequency, offered battery, body worn, and audio accessory kit HMN9026D												
JsT-Ab-061106-05/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	HMN9026D	2.43	-0.216	3.49	2.56	1.83	1.35
JsT-Ab-061106-06/004	RAN4031	461.1875	6080384X63	Against the phantom	RLN6301A	HMN9026D	2.45	-0.244	2.97	2.13	1.57	1.13
Worst case configuration above with other audio accessories												
JsT-Ab-061106-07/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	HMN9025D	2.44	-0.261	3.48	2.55	1.85	1.35
MeC-AB-061106-08/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	NTN9159F	2.45	-0.221	3.49	2.56	1.84	1.35
MeC-AB-061106-09/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	ENMN4002B	2.43	-0.213	3.71	2.73	1.95	1.43
MeC-AB-061106-10/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	HCSN4000D	2.44	-0.250	3.74	2.75	1.98	1.46
MeC-AB-061106-11/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	HMN9039E	2.45	-0.229	3.53	2.60	1.86	1.37
MeC-AB-061106-12/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	HCSN4001C	2.44	-0.238	3.59	2.63	1.90	1.39
MeC-AB-061106-13/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	HMN9038A	2.45	-0.224	3.16	2.32	1.66	1.22
MeC-AB-061106-14/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	RLN5714B	2.44	-0.273	3.64	2.68	1.94	1.43
JsT-Ab-061107-02/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	PMMN4001A	2.45	-0.414	3.36	2.47	1.85	1.36
JsT-Ab-061107-03/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	PMLN4658A	2.42	-0.257	3.35	2.45	1.78	1.30

Table 1 (continued)

Assessments at the Body (CW) 451.1875 – 469.5625MHz band												
Run Number/ SN	Antenna Pos.	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)
Worst case configuration above with other audio accessories (continued)												
JsT-Ab-061107-04/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	HMN9036A	2.43	-0.199	3.03	2.23	1.59	1.17
JsT-Ab-061107-05/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	HMN9030A	2.43	-0.235	3.44	2.52	1.82	1.33
JsT-Ab-061107-07/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	HMN9013B	2.44	-0.225	3.46	2.54	1.82	1.34
JsT-Ab-061107-08/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	PMLN5011A	2.41	-0.212	3.26	2.39	1.71	1.25
JsT-Ab-061107-09/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	RLN5411A	2.41	-0.227	3.46	2.54	1.82	1.34
JsT-Ab-061107-10/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	RMN4016B	2.40	-0.241	3.06	2.25	1.62	1.19
JsT-Ab-061107-11/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	RLN5318A	2.43	-0.222	3.32	2.44	1.75	1.28
JsT-Ab-061107-12/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	HMN9021A	2.42	-0.207	3.33	2.44	1.75	1.28
MeC-AB-061107-13/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	RMN5047A	2.43	-0.208	3.30	2.43	1.73	1.27
MeC-AB-061107-14/004	RAN4031	461.1875	6080384X63	Against the phantom	4280383X62	BDN6646C	2.44	-0.300	2.88	2.11	1.54	1.13
Band edges with worst case configuration from above												
MeC-AB-061107-15/004	RAN4031	451.1875	6080384X63	Against the phantom	4280383X62	HCSN4000D	2.47	-0.148	3.24	2.38	1.68	1.23
MeC-AB-061107-16/004	RAN4031	469.5625	6080384X63	Against the phantom	4280383X62	HCSN4000D	2.36	-0.391	3.86	2.84	2.11	1.55
2.5 cm assessment												
*MeC-AB-061107-17/004	RAN4031	469.5625	6080384X63	DUT back w/ ant 2.5cm	None	HCSN4000D	2.38	-0.324	5.17	3.79	2.79	2.04
MeC-AB-061107-19/004	RAN4031	469.5625	6080384X63	DUT front 2.5cm	None	HCSN4000D	2.36	-0.372	3.00	2.21	1.63	1.20

Table 2

Assessments at the Face (CW) 451.1875 – 469.5625MHz band												
Run Number/ SN	Antenna Pos.	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)
Center of the band with and without applicable audio accessories												
JsT-Face-061108-02/004	RAN4031	461.1875	6080384X63	DUT front 2.5cm	None	None	2.43	-0.289	3.08	2.28	1.65	1.22
JsT-Face-061108-03/004	RAN4031	461.1875	6080384X63	DUT front 2.5cm	None	BDN6720A	2.40	-0.203	2.86	2.11	1.50	1.11
JsT-Face-061108-04/004	RAN4031	461.1875	6080384X63	DUT front 2.5cm	None	HMN9727B	2.43	-0.232	2.79	2.06	1.47	1.09
JsT-Face-061108-05/004	RAN4031	461.1875	6080384X63	DUT front 2.5cm	None	HLN9132A	2.43	-0.226	2.71	2.00	1.43	1.05
MeC-FACE-061108-06/004	RAN4031	461.1875	6080384X63	DUT front 2.5cm	None	HMN9752B	2.44	-0.312	2.70	1.99	1.45	1.07
Band edges												
MeC-FACE-061108-07/004	RAN4031	451.1875	6080384X63	DUT front 2.5cm	None	None	2.43	-0.181	2.89	2.14	1.51	1.12
MeC-FACE-061108-08/004	RAN4031	469.5625	6080384X63	DUT front 2.5cm	None	None	2.37	-0.357	3.31	2.44	1.80	1.32
*MeC-FACE-061108-09/003	RAN4031	469.5625	6080384X63	DUT front 2.5cm	None	None	2.36	-0.330	3.53	2.61	1.90	1.41

Table 3

*Worst case configuration per body location and mode from above – using the DASY 4 full coarse and 7x7x7 cube scan measurements.												
MeC-AB-061107-22/004	RAN4031	469.5625	6080384X63	Against the phantom	DUT back w/ ant 2.5cm	HCSN4000D	2.35	-0.517	4.79	3.61	2.70	2.03
MeC-AB-061107-23/004 (shorten scan)	RAN4031	469.5625	6080384X63	Against the phantom	DUT back w/ ant 2.5cm	HCSN4000D	2.36	-0.148	4.95	3.72	2.56	1.92
MeC-FACE-061108-10/003	RAN4031	469.5625	6080384X63	DUT front 2.5cm	None	None	2.37	-0.533	3.38	2.50	1.91	1.41

9.1 Highest SAR results calculation methodology

The calculated maximum 1-gram and 10-gram averaged SAR results reported herein for the full DASY™ coarse and 7x7x7 cube measurements are determined by scaling the measured SAR to account for power leveling variations and power slump. For this device the Maximum Calculated 1-gram and 10-gram averaged peak SAR is calculated using the following formula:

$$\text{Max. Calc. 1-g/10-g Avg. SAR} = ((\text{SAR meas.} / (10^{(\text{Pdrift}/10)})) * (\text{Pmax}/\text{Pint})) * \text{DC\%}$$

P_{max} = Maximum Power (W)

P_{int} = Initial Power (W)

Pdrift = DASY drift results (dB) - (for conservative results positive drifts are not accounted for)

SAR_{meas.} = Measured 1-g/10-g Avg. SAR (mW/g)

DC % = Transmission mode duty cycle in % where applicable

50% duty cycle is applied for PTT operation.

10.0 Conclusion

The highest Operational Maximum Calculated 1-gram and 10-gram average SAR values found for FCC ID: AZ489FT4880 models RLN6173A.

Max. Calc. : 1-g Avg. SAR: 2.70 W/kg (Body); 10-g Avg. SAR: 2.03 W/kg (Body)
Max. Calc. : 1-g Avg. SAR: 1.91 W/kg (Face); 10-g Avg. SAR: 1.41 W/kg (Face)

These test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of **8.0W/kg** per the requirements of 47 CFR 2.1093(d).

APPENDIX A
Measurement Uncertainty

Uncertainty Budget for Device Under Test, for 30 MHz to 3 GHz

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e = f(d,k)</i>	<i>f</i>	<i>g</i>	<i>h = c x f / e</i>	<i>i = c x g / e</i>	<i>k</i>
Uncertainty Component	IEEE 1528 section	Tol. (± %)	Prob. Dist.	Div.	<i>c_i</i> (1 g)	<i>c_i</i> (10 g)	1 g <i>u_i</i> (±%)	10 g <i>u_i</i> (±%)	<i>v_i</i>
Measurement System									
Probe Calibration	E.2.1	5.9	N	1.00	1	1	5.9	5.9	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	1.1	R	1.73	1	1	0.6	0.6	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mech. Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.2	N	1.00	1	1	3.2	3.2	29
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0	8
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	N	1.00	0.64	0.43	2.1	1.4	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	N	1.00	0.6	0.49	1.1	0.9	∞
Combined Standard Uncertainty			RSS				11	11	411
Expanded Uncertainty (95% CONFIDENCE LEVEL)			<i>k</i> =2				22	22	

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Notes for Tables 1 and 2

- a) Column headings *a-k* are given for reference.
- b) Tol. - tolerance in influence quantity.
- c) Prob. Dist. – Probability distribution
- d) N, R - normal, rectangular probability distributions
- e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
- f) *c_i* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
- g) *u_i* – SAR uncertainty
- h) *v_i* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty.

Uncertainty Budget for System Validation (dipole & flat phantom) for 30 MHz to 3 GHz

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e = f(d,k)</i>	<i>f</i>	<i>g</i>	<i>h = c x f / e</i>	<i>i = c x g / e</i>	<i>k</i>
Uncertainty Component	IEEE 1528 section	Tol. (± %)	Prob. Dist.	Div.	<i>c_i</i> (1 g)	<i>c_i</i> (10 g)	1 g <i>u_i</i> (±%)	10 g <i>u_i</i> (±%)	<i>v_i</i>
Measurement System									
Probe Calibration	E.2.1	5.9	N	1.00	1	1	5.9	5.9	∞
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0	0	0.0	0.0	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t. Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	2.0	R	1.73	1	1	1.2	1.2	∞
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	R	1.73	0.64	0.43	1.2	0.8	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	R	1.73	0.6	0.49	0.6	0.5	∞
Combined Standard Uncertainty			RSS				9	9	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			<i>k</i> =2				18	17	

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Notes for Tables 1 and 2

- a) Column headings *a-k* are given for reference.
- b) Tol. - tolerance in influence quantity.
- c) Prob. Dist. – Probability distribution
- d) N, R - normal, rectangular probability distributions
- e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
- f) *c_i* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
- g) *u_i* – SAR uncertainty
- h) *v_i* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty.

Appendix B
Probe Calibration Certificates

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



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The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola CGISS**

Certificate No: **ET3-1393_May06**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN: 1393**

Calibration procedure(s) **QA CAL-01.v5 and QA CAL-12.v4
Calibration procedure for dosimetric E-field probes**

Calibration date: **May 2, 2006**

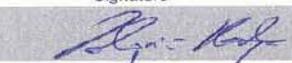
Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference 30 dB Attenuator	SN: S5129 (30b)	11-Aug-05 (METAS, No. 251-00500)	Aug-06
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG, No. ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	2-Feb-06 (SPEAG, No. DAE4-654_Feb06)	Feb-07
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-05)	In house check: Nov 06

Calibrated by: **Katja Pokovic** (Name) **Technical Manager** (Function)  (Signature)

Approved by: **Niels Kuster** (Name) **Quality Manager** (Function)  (Signature)

Issued: May 3, 2006

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



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Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
Polarization ϕ	ϕ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * *frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

ET3DV6 SN:1393

May 2, 2006

Probe ET3DV6

SN:1393

Manufactured:	October 1, 1999
Last calibrated:	May 20, 2005
Recalibrated:	May 2, 2006

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1393

May 2, 2006

DASY - Parameters of Probe: ET3DV6 SN:1393

Sensitivity in Free Space^A

Diode Compression^B

NormX	1.85 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	93 mV
NormY	1.52 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	93 mV
NormZ	1.81 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	93 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL 900 MHz Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{ba} [%]	Without Correction Algorithm	7.8	4.3
SAR _{ba} [%]	With Correction Algorithm	0.1	0.2

TSL 1810 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{ba} [%]	Without Correction Algorithm	7.0	3.9
SAR _{ba} [%]	With Correction Algorithm	0.3	0.3

Sensor Offset

Probe Tip to Sensor Center 2.7 mm

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

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).

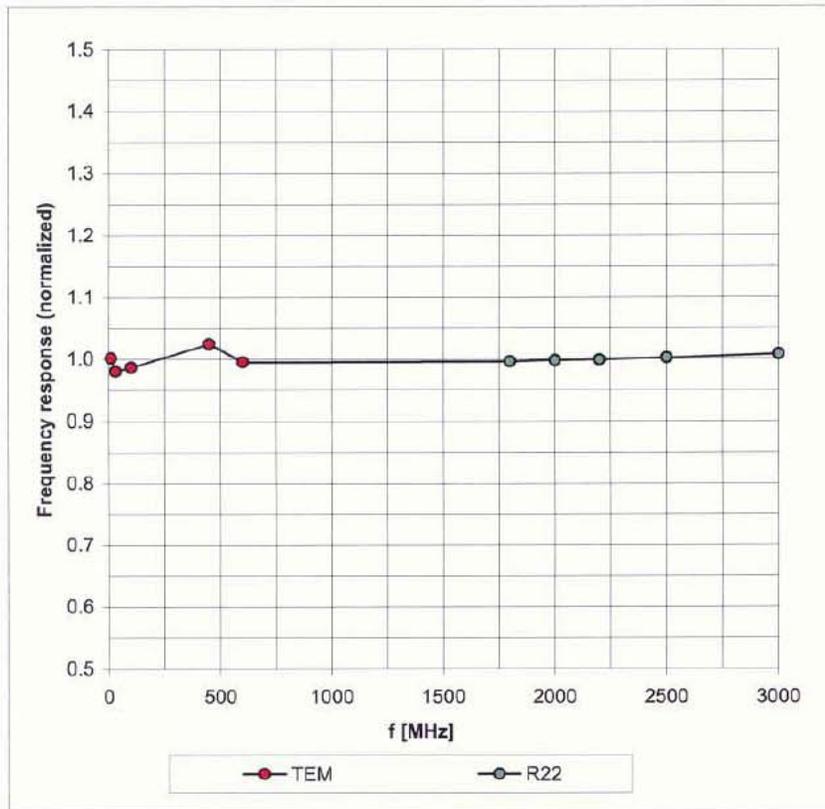
^B Numerical linearization parameter: uncertainty not required.

ET3DV6 SN:1393

May 2, 2006

Frequency Response of E-Field

(TEM-Cell:ifi1110 EXX, Waveguide: R22)

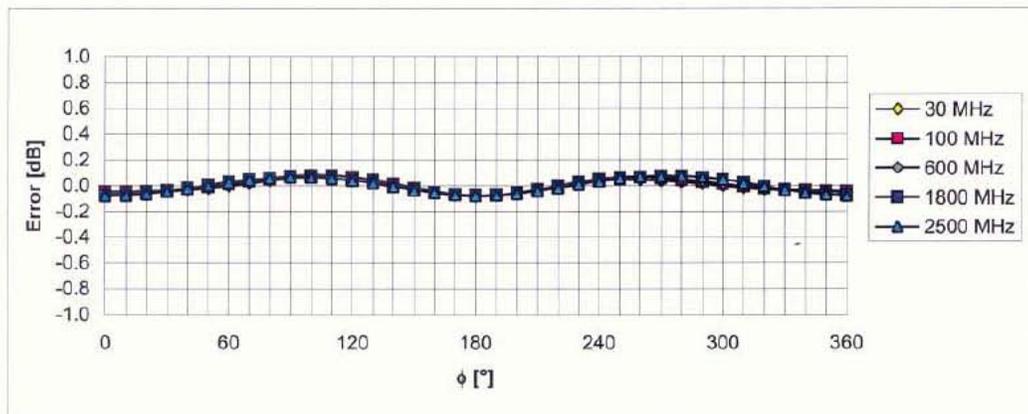
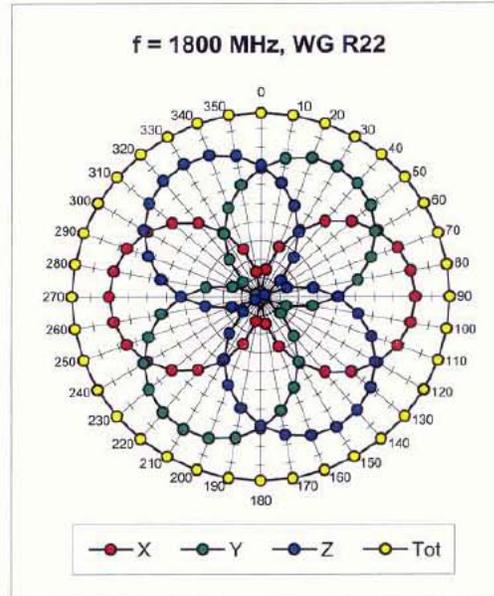
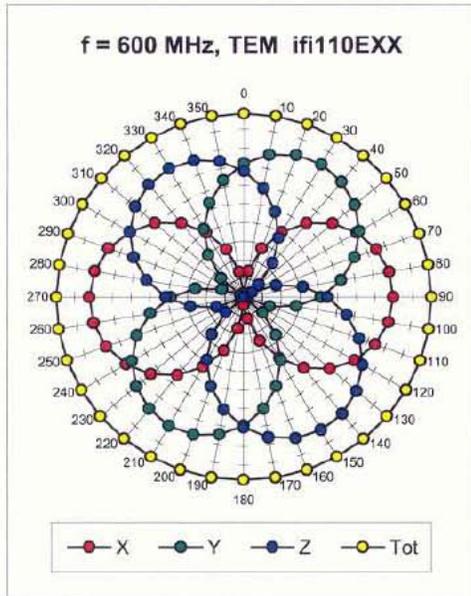


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

ET3DV6 SN:1393

May 2, 2006

Receiving Pattern (ϕ), $\vartheta = 0^\circ$

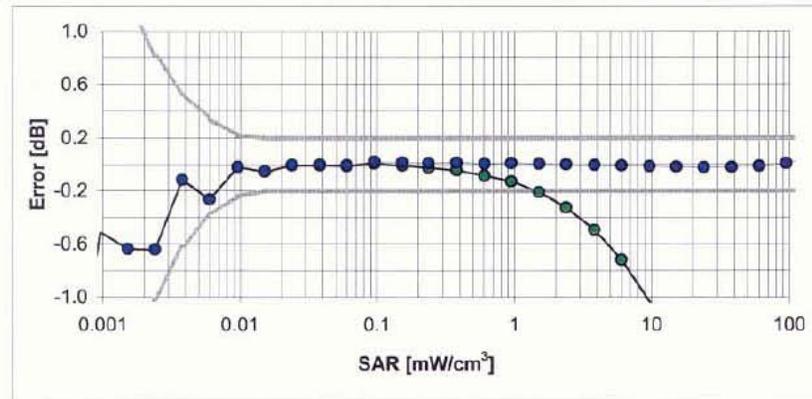
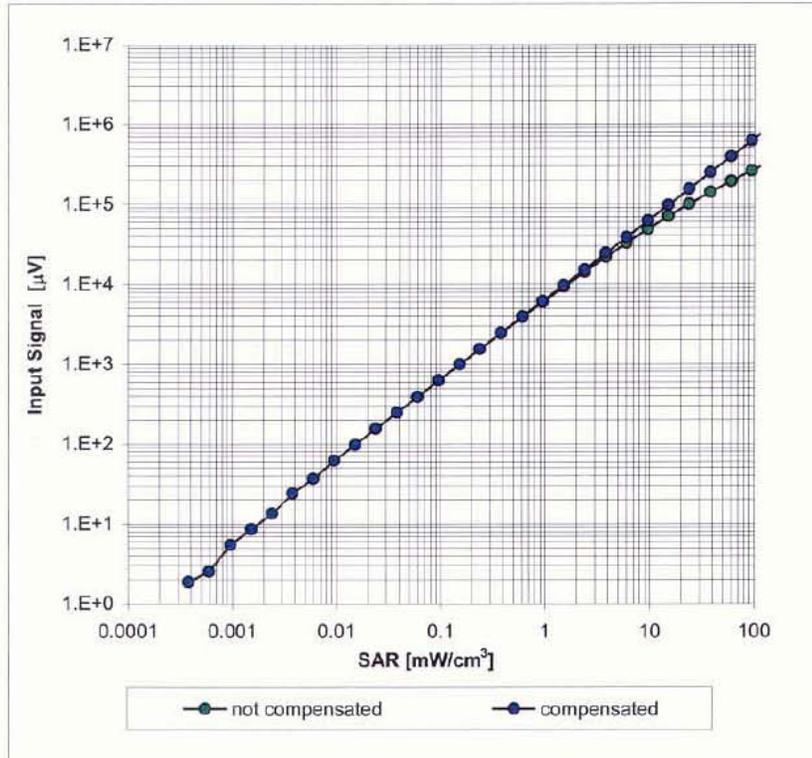


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

ET3DV6 SN:1393

May 2, 2006

Dynamic Range $f(SAR_{head})$ (Waveguide R22, $f = 1800$ MHz)

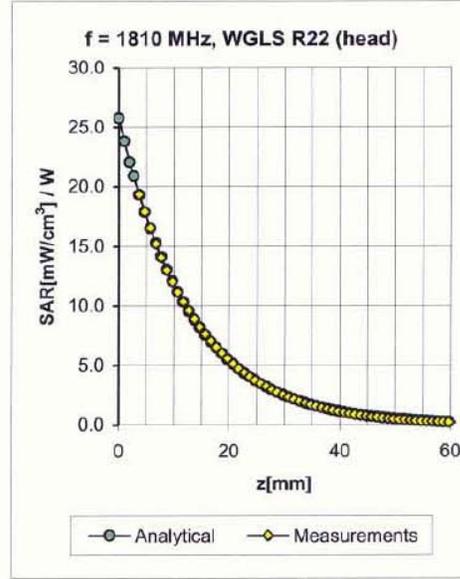
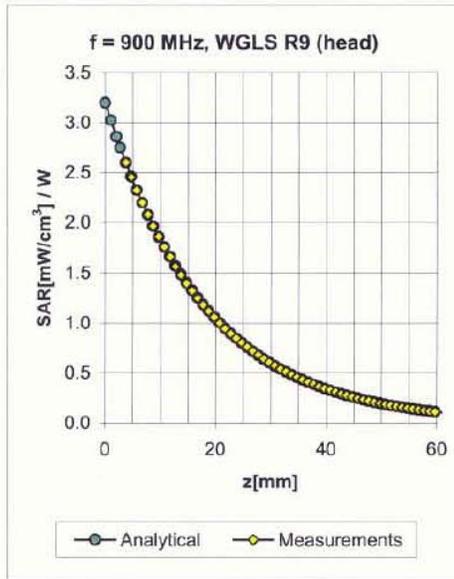


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

ET3DV6 SN:1393

May 2, 2006

Conversion Factor Assessment



f [MHz]	Validity [MHz] ^C	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.25	2.93	7.24 ± 13.3% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.47	1.97	6.50 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.43	2.87	5.26 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.51	2.31	4.49 ± 11.8% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.24	4.51	7.59 ± 13.3% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.44	2.16	6.22 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.57	2.56	4.76 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.48	2.09	4.15 ± 11.8% (k=2)

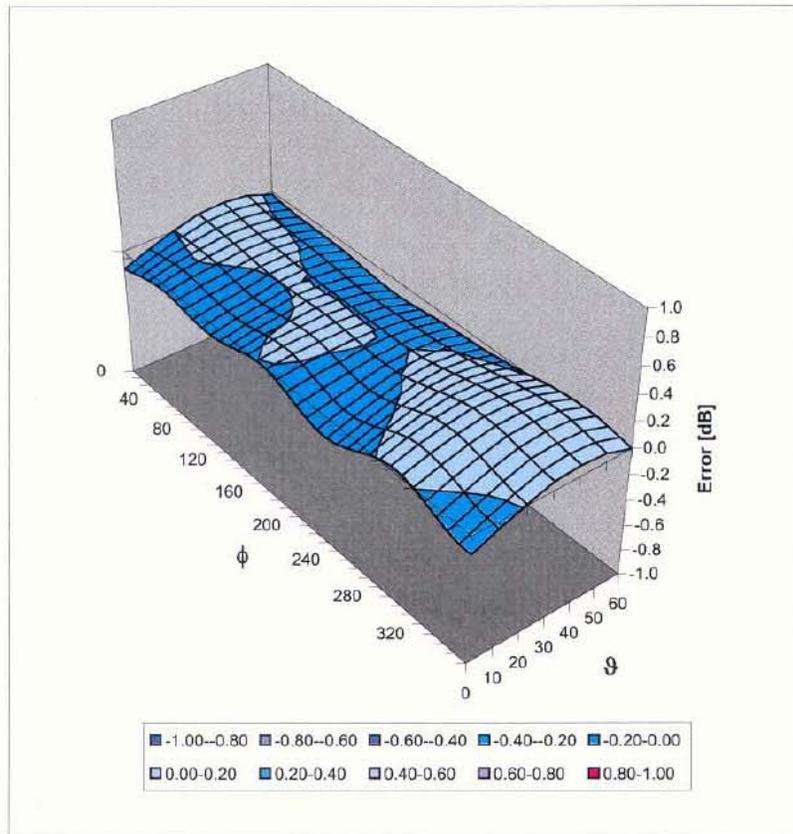
^C The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ET3DV6 SN:1393

May 2, 2006

Deviation from Isotropy in HSL

Error (ϕ, θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Additional Conversion Factors for Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1393

Place of Assessment:

Zurich

Date of Assessment:

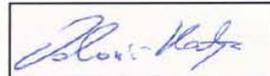
May 5, 2006

Probe Calibration Date:

May 2, 2006

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1810 MHz.

Assessed by:



Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
 Phone +41 1 245 9700, Fax +41 1 245 9779
 info@speag.com, http://www.speag.com

Dosimetric E-Field Probe ET3DV6 SN:1393

Conversion factor (\pm standard deviation)

150 MHz	<i>ConvF</i>	8.8 \pm 10%	$\epsilon_r = 52.3$ $\sigma = 0.76$ mho/m (head tissue)
250 MHz	<i>ConvF</i>	8.0 \pm 10%	$\epsilon_r = 47.6$ $\sigma = 0.83$ mho/m (head tissue)
300 MHz	<i>ConvF</i>	7.9 \pm 9%	$\epsilon_r = 45.3$ $\sigma = 0.87$ mho/m (head tissue)
750 MHz	<i>ConvF</i>	6.8 \pm 7%	$\epsilon_r = 41.9$ $\sigma = 0.89$ mho/m (head tissue)
150 MHz	<i>ConvF</i>	8.5 \pm 10%	$\epsilon_r = 61.9$ $\sigma = 0.80$ mho/m (body tissue)
250 MHz	<i>ConvF</i>	8.1 \pm 10%	$\epsilon_r = 59.4$ $\sigma = 0.88$ mho/m (body tissue)
300 MHz	<i>ConvF</i>	8.0 \pm 9%	$\epsilon_r = 58.2$ $\sigma = 0.92$ mho/m (body tissue)
750 MHz	<i>ConvF</i>	6.6 \pm 7%	$\epsilon_r = 55.5$ $\sigma = 0.96$ mho/m (body tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also Section 4.7 of the DASY4 Manual.

Appendix C
Dipole Calibration Certificates

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



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Accredited by the Swiss Federal Office of Metrology and Accreditation
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola CGISS**

Certificate No: **D450V2-1001_May06**

CALIBRATION CERTIFICATE

Object **D450V2 - SN: 1001**

Calibration procedure(s) **QA CAL-15.v4
Calibration Procedure for dipole validation kits below 800 MHz**

Calibration date: **May 25, 2006**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference Probe ET3DV6	SN 1507	11-Jul-05 (SPEAG, No. ET3-1507_Jul05)	Jul-06
DAE4	SN 601	15-Dec-05 (SPEAG, No. DAE4-601_Dec05)	Dec-06

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-05)	In house check: Nov 06

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Fin Bomholt	R&D Director	

Issued: May 25, 2006

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



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S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY4	V4.6
Extrapolation	Advanced Extrapolation	
Phantom	Flat Phantom V4.4	Shell thickness: 6 ± 0.2 mm
Distance Dipole Center - TSL	15 mm	with Spacer
Area Scan resolution	dx, dy = 15 mm	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	43.5	0.87 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	43.6 ± 6 %	0.86 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	398 mW input power	2.00 mW / g
SAR normalized	normalized to 1W	5.03 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	5.06 mW / g ± 18.1 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	398 mW input power	1.35 mW / g
SAR normalized	normalized to 1W	3.39 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	3.40 mW / g ± 17.6 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.0 Ω - 9.6 jΩ
Return Loss	- 20.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.343 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 22, 2002

DASY4 Validation Report for Head TSL

Date/Time: 25.05.2006 13:20:31

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2 - SN:1001

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450;

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

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (LF); ConvF (6.59, 6.59, 6.59); Calibrated: 11.07.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 4.4; Type: Flat Phantom 4.4
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

d=15mm, Pin=398mW/Area Scan (61x201x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.14 mW/g

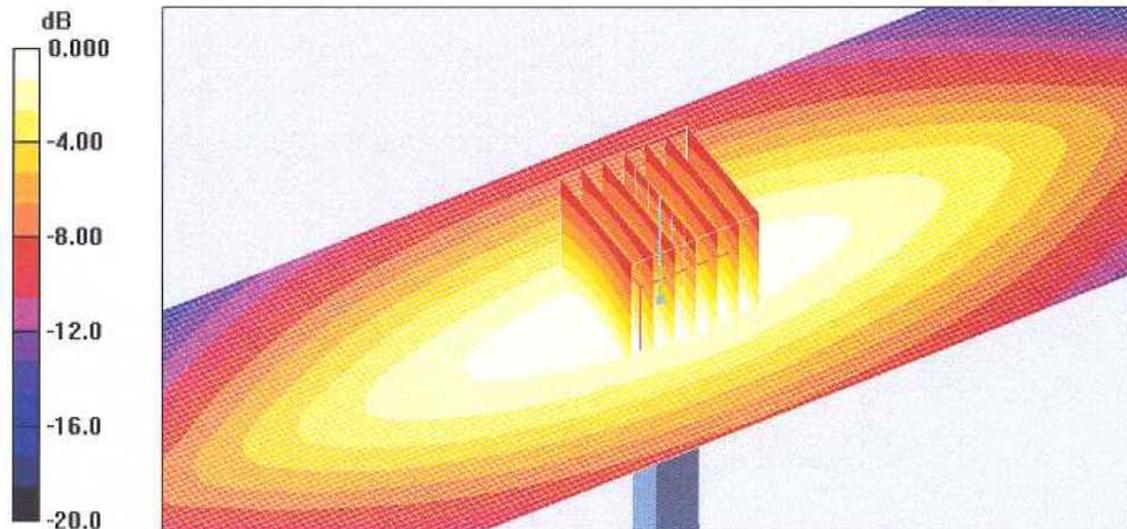
d=15mm, Pin=398mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.1 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 2.85 W/kg

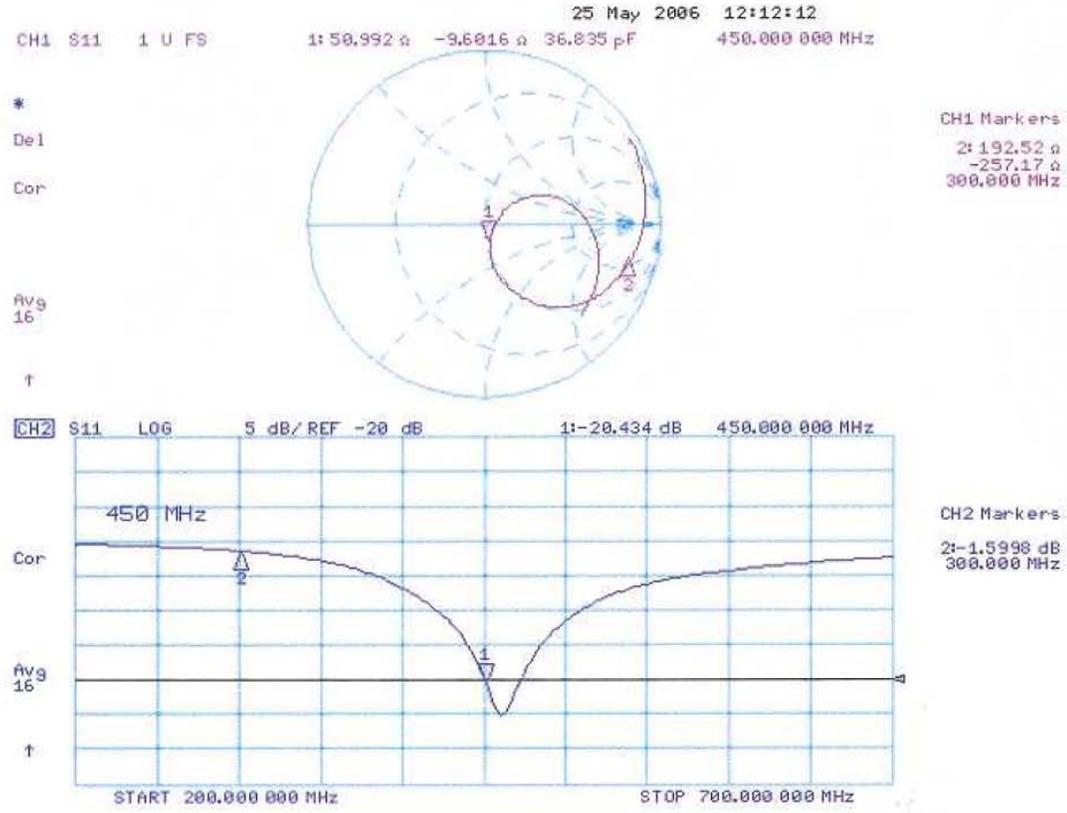
SAR(1 g) = 2 mW/g; SAR(10 g) = 1.35 mW/g

Maximum value of SAR (measured) = 2.14 mW/g



0 dB = 2.14mW/g

Impedance Measurement Plot for Head TSL



Appendix D

Test System Verification Scans

Dipole validation scans at the head from SPEAG are provided in APPENDIX C. NE's EME lab validates its' dipole(s) to the applicable IEEE system performance targets. A system validation was performed using FCC body tissue parameters to generate the system performance target values for body at the applicable frequency. Dipoles are assessed using multiple probes and measurements were performed using the isotropic assessment procedure mentioned below.

To assess the isotropic characteristics of the measurement probe, two system performance zoom scans (0 and 90 degrees) were measured. The results were averaged together and adjusted to account for the power drift in order to obtain the final calculated 1 and 10 gram results. The results obtained from each probe were then averaged together to determine the new measured SAR target.

Motorola NE EME Lab

DUT: Dipole 450 MHz; Date/Time: 11/6/2006 12:06:54 PM
 Run #: JsT-SYSP-450B-061106-01 Sim.Tissue Temp: 21.8 (C)
 Robot GEMS-2 Phantom #: 80302002D-S15
 Model #: D450V2 S/N: 1001
 TX Freq: 450 (MHz) Start power: 250 (mW)

Target:
 4.43 mW/g for 1g SAR 2.96 mW/g for 10g SAR
 4.13 mW/g calculated 1g-SAR; -6.80% from target (including drift)
 2.84 mW/g calculated 10g-SAR; -4.12% from target (including drift)

Probe: ET3DV6 - SN1393, Calibrated: 5/2/2006, ConvF(7.59, 7.59, 7.59)

Duty Cycle: 1:1, Medium: 450 MHz FCC Body, Medium parameters used: f = 450 MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 56.6$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn401, Calibrated: 8/23/2006

System Performance/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 36.9 V/m; Power Drift = -0.00919 dB

Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.720 mW/g

Maximum value of SAR (measured) = 1.12 mW/g

System Performance/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 36.9 V/m; Power Drift = -0.00919 dB

Peak SAR (extrapolated) = 1.38 W/kg

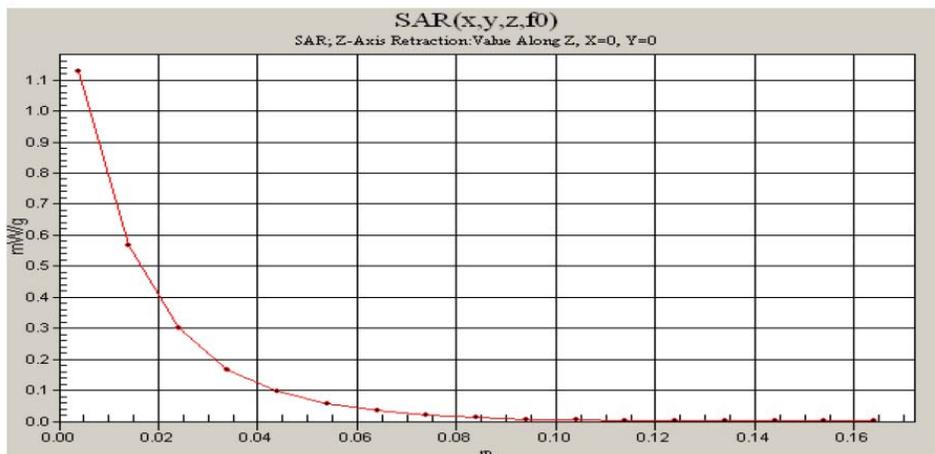
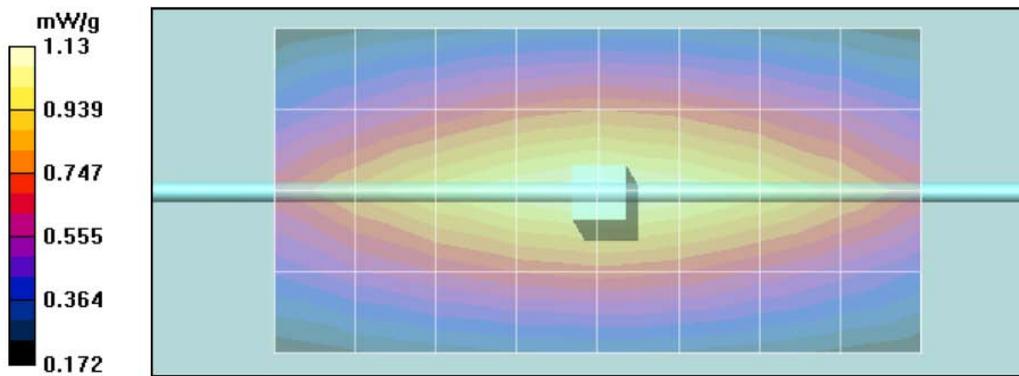
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.695 mW/g

Maximum value of SAR (measured) = 1.09 mW/g

System Performance/Dipole Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.13 mW/g

System Performance/Z-Axis Retraction (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm



Motorola NE EME Lab

DUT: Dipole 450 MHz; Date/Time: 11/7/2006 8:16:30 AM
 Run #: JsT-SYSP-450B-061107-01 Sim.Tissue Temp: 21.8 (C)
 Robot GEMS-2 Phantom #: 80302002D-S15
 Model #: D450V2 S/N: 1001
 TX Freq: 450 (MHz) Start power: 250 (mW)

Target:
 4.43 mW/g for 1g SAR 2.96 mW/g for 10g SAR
 4.03 mW/g calculated 1g-SAR: -9.03% from target (including drift)
 2.79 mW/g calculated 10g-SAR: -5.84% from target (including drift)

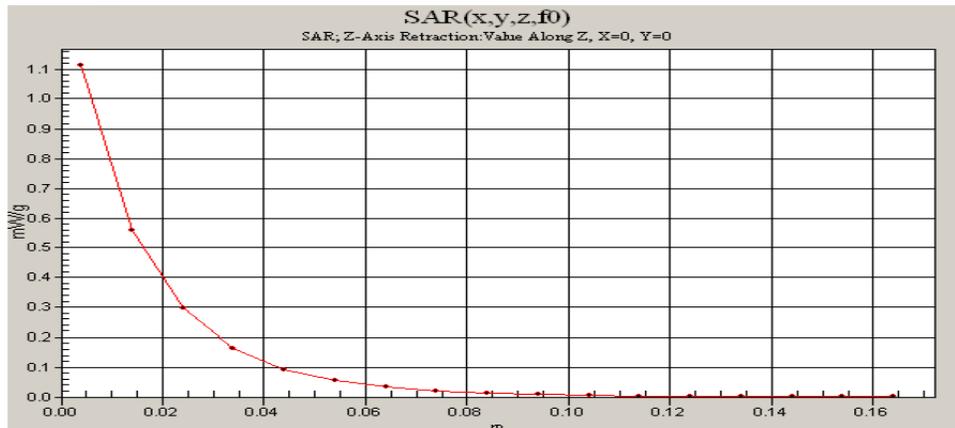
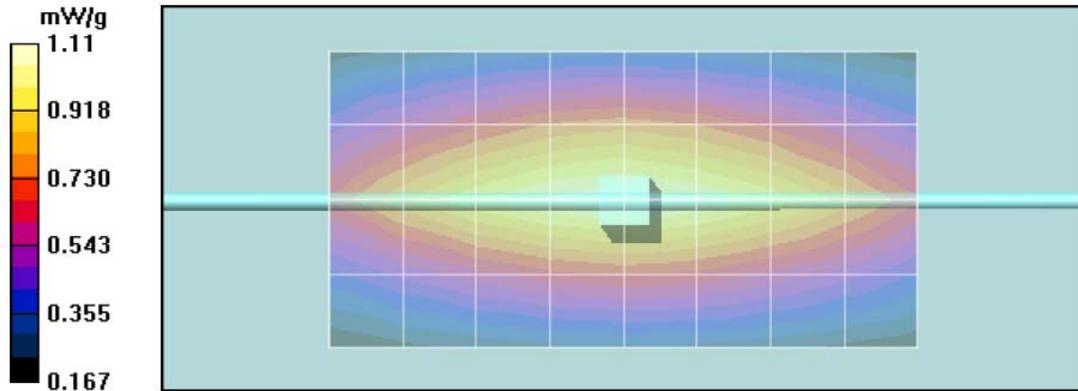
Probe: ET3DV6 - SN1393, Calibrated: 5/2/2006, ConvF(7.59, 7.59, 7.59)
 Duty Cycle: 1:1, Medium: 450 MHz FCC Body, Medium parameters used: $f = 450$ MHz; $\sigma = 0.9$ mho/m; $\epsilon_r = 56.4$; $\rho = 1000$ kg/m³
 Electronics: DAE3 Sn401, Calibrated: 8/23/2006

System Performance/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
 Reference Value = 37.1 V/m; Power Drift = 0.0323 dB
 Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.713 mW/g
 Maximum value of SAR (measured) = 1.11 mW/g

System Performance/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
 Reference Value = 37.1 V/m; Power Drift = 0.0323 dB
 Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 1 mW/g; SAR(10 g) = 0.691 mW/g
 Maximum value of SAR (measured) = 1.08 mW/g

System Performance/Dipole Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm

System Performance/Z-Axis Retraction (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm



Motorola NE EME Lab

DUT: Dipole 450 MHz; Date/Time: 11/8/2006 8:27:25 AM
 Run #: JsT-SYSP-450H-061108-01 Sim.Tissue Temp: 21.5 (C)
 Robot GEMS-2 Phantom #: 80302002B-S8
 Model #: D450V2 S/N: 1001
 TX Freq: 450 (MHz) Start power: 250 (mW)

Target:
 5.11 mW/g for 1g SAR 3.34 mW/g for 10g SAR
 4.62 mW/g calculated 1g-SAR; -9.55% from target (including drift)
 3.09 mW/g calculated 10g-SAR; -7.35% from target (including drift)

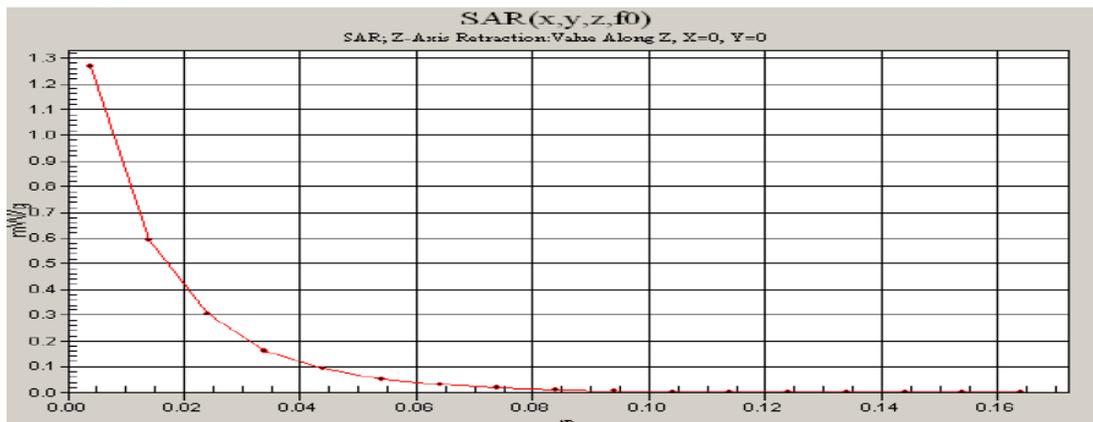
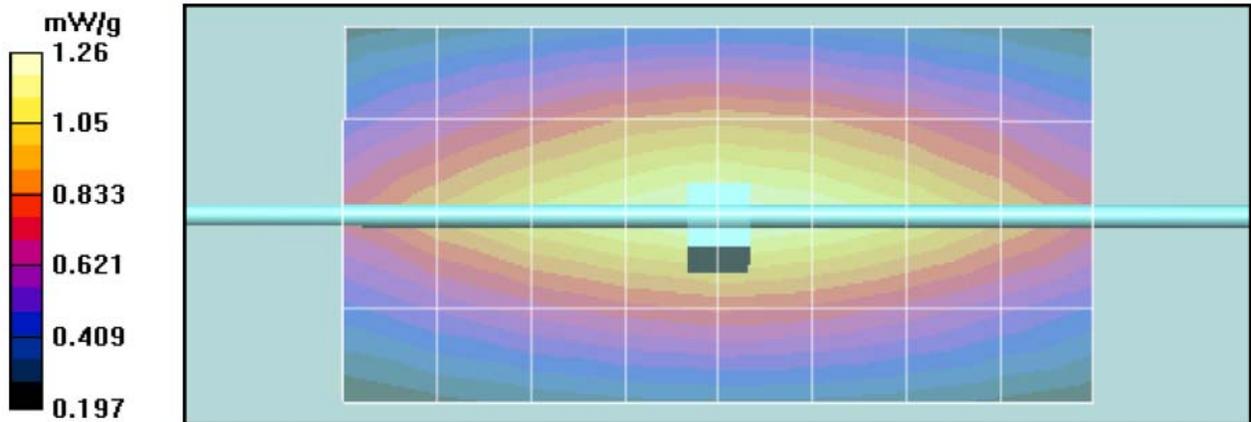
Probe: ET3DV6 - SN1393, Calibrated: 5/2/2006, ConvF(7.24, 7.24, 7.24)
 Duty Cycle: 1:1, Medium: 450 IEEE Head, Medium parameters used: f = 450 MHz; $\sigma = 0.85$ mho/m; $\epsilon_r = 42.9$; $\rho = 1000$ kg/m³
 Electronics: DAE3 Sn401, Calibrated: 8/23/2006

System Performance/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
 Reference Value = 39.8 V/m; Power Drift = -0.0206 dB
 Peak SAR (extrapolated) = 1.75 W/kg
 SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.783 mW/g
 Maximum value of SAR (measured) = 1.27 mW/g

System Performance/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
 Reference Value = 39.8 V/m; Power Drift = -0.0206 dB
 Peak SAR (extrapolated) = 1.70 W/kg
 SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.756 mW/g
 Maximum value of SAR (measured) = 1.21 mW/g

System Performance/Dipole Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (measured) = 1.26 mW/g

System Performance/Z-Axis Retraction (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm



DIPOLE SAR TARGET - BODY

Date: 06/17/06 Frequency (MHz): 450
 Lab Location: NE Mixture Type: FCC Body
 DAE Serial #: 363 Ambient Temp.(°C): 22.7

Tissue Characteristics

Permittivity: 56.5 Phantom Type/SN: 80302002C-S9
 Conductivity: 0.92 Distance (mm): 15
 Tissue Temp.(°C): 21.4

Reference Source: Dipole Power to Dipole: 250 mW
 Reference SN: 1001

New Target:

Average Measured SAR Value: 4.43 mW/g(1g avg.), 2.96 mW/g (10g avg.)

Test performed by: Ed Church Initial: ERC

Probe SN #s	1-G Cube	Diff from Ave	10-G Cube	Diff from Ave	Robot
1383	4.22	-4.7%	2.87	-3.1%	R3
1384	4.23	-4.5%	2.89	-2.4%	R3
193	4.09	-7.7%	2.81	-5.1%	R3
1545	4.79	8.1%	3.11	5.0%	R3
1547	4.82	8.8%	3.13	5.7%	R3
Average	4.4300		2.9620		New Measured SAR Value
(nomalized to 1.0 W, including drift)					

DIPOLE SAR TARGET - HEAD

Date: 06/17/06 Frequency (MHz): 450
 Lab Location: NE Mixture Type: IEEE Head
 DAE Serial #: 363 Ambient Temp.(°C): 22.6

Tissue Characteristics
 Permittivity: 45.2 Phantom Type/SN: 80302002B-S8
 Conductivity: 0.91 Distance (mm): 15
 Tissue Temp.(°C): 21.9

Reference Source: Dipole Power to Dipole: 250 mW
 Reference SN: 1001

Target SAR Value: 4.9 mW/g (1g avg.), 3.3 mW/g (10g avg.)
 (normalized to 1.0 W)

New Target:

Average Measured SAR Value: 5.11 mW/g (1g avg.), 3.34 mW/g (10g avg.)

Percent Difference From Target (MUST be within k=2 Uncertainty): 4.33% (1g ave)
1.33% (10g ave)

Test performed by: Ed Church Initial: Σ, C

Probe SN #s	1-G Cube	Diff from Ave	10-G Cube	Diff from Ave	Robot
1383	5.02	-1.80%	3.33	-0.42%	R3
1384	4.89	-4.34%	3.20	-4.31%	R3
1393	4.77	-6.69%	3.18	-4.90%	R3
1545	5.37	5.05%	3.46	3.47%	R3
1547	5.51	7.79%	3.55	6.16%	R3
Average	5.1120		3.3440		New Measured SAR Value
(normalized to 1.0 W, including drift)					

Appendix E
DUT Scans (Shortened Scans and Highest SAR configurations)

Shortened Scan Results

Motorola NE EME Laboratory

Run #: MeC-Ab-061107-23	Sim. Tissue Temp: 21.6 (C)
Robot #: GEMS-2	Phantom #: 80302002D-S15
Model #: RLN6173A	SN: 004
Antenna: RAN4031	TX Freq: 469.5625 MHz
Battery: 6080384X63	Start power: 2.36 W
Carry acc.: None	Audio/Data acc.: HCSN4000D

Comments: Back of radio antenna @ 2.5 cm from phantom. SHORTEN SCAN

Shortened scan reflect highest SAR. producing configuration; Run time 7 minutes.

Representative "normal" scan run time was 24 minutes

"Shortened" scan max calculated SAR. using SAR. drift: 1-g Avg. = 2.56mW/g; 10-g Avg. = 1.92mW/g

"Normal" scan max calculated SAR. using SAR. drift: 1-g Avg. = 2.70mW/g; 10-g Avg. = 2.03mW/g

(see section 9.0 run # MeC-AB-061107-22)

Probe: ET3DV6 - SN1393, Calibrated: 5/2/2006, ConvF(7.59, 7.59, 7.59)

Duty Cycle: 1:1, Medium: 460.375 MHz FCC Body, Medium parameters used: $f = 460.375$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 56.2$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn401, Calibrated: 8/23/2006

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

Reference Value = 80.6 V/m; Power Drift = -0.148 dB

Peak SAR (extrapolated) = 6.09 W/kg

SAR(1 g) = 4.95 mW/g; SAR(10 g) = 3.72 mW/g

Maximum value of SAR (measured) = 5.23 mW/g

Ab Scan/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm

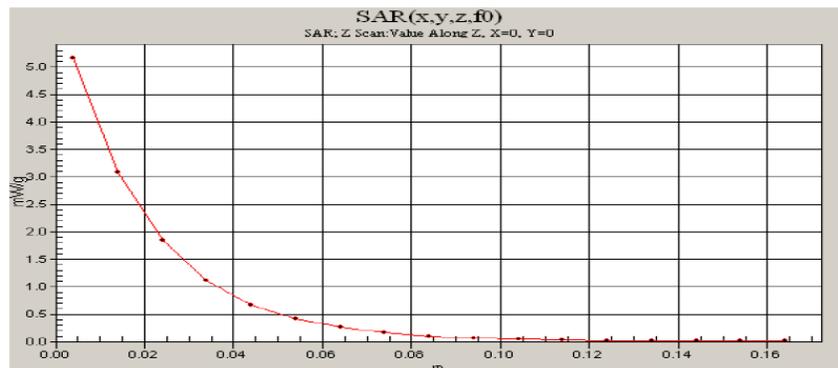
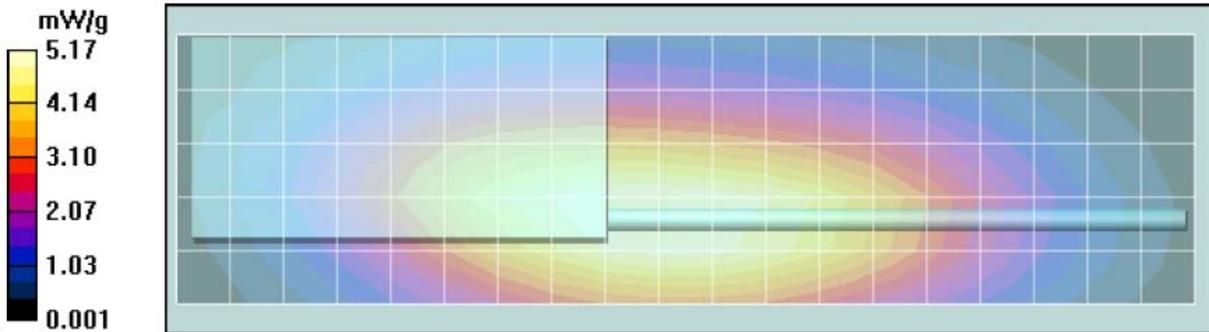
Reference Value = 82.2 V/m; Power Drift = -0.148 dB

Motorola Fast SAR: SAR(1 g) = 5.13 mW/g; SAR(10 g) = 3.76 mW/g

Maximum value of SAR (interpolated) = 5.40 mW/g

Ab Scan/Z Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 5.17 mW/g



Highest SAR Configurations Results

Motorola NE EME Laboratory

Run #: MeC-Ab-061107-22	Sim. Tissue Temp: 21.6 (C)
Robot #: GEMS-2	Phantom #: 80302002D-S15
Model #: RLN6173A	SN: 004
Antenna: RAN4031	TX Freq: 469.5625 MHz
Battery: 6080384X63	Start power: 2.35 W
Carry acc.: None	Audio/Data acc.: HCSN4000D

Comments: Back of radio antenna @ 2.5 cm from phantom. FULL SCAN

Probe: ET3DV6 - SN1393, Calibrated: 5/2/2006, ConvF(7.59, 7.59, 7.59)

Duty Cycle: 1:1, Medium: 460.375 MHz FCC Body, Medium parameters used: $f = 460.375$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 56.2$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn401, Calibrated: 8/23/2006

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

Reference Value = 82.1 V/m; Power Drift = -0.517 dB

Peak SAR (extrapolated) = 5.92 W/kg

SAR(1 g) = 4.79 mW/g; SAR(10 g) = 3.61 mW/g

Maximum value of SAR (measured) = 5.08 mW/g

Ab Scan/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm

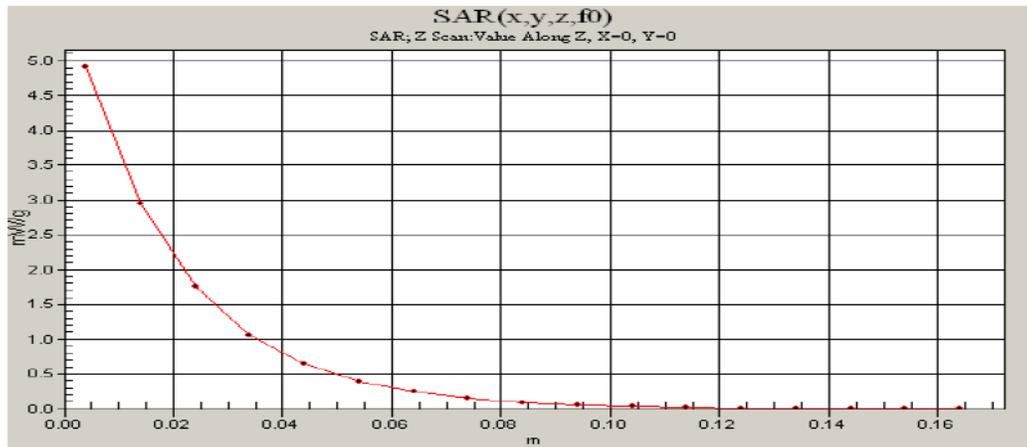
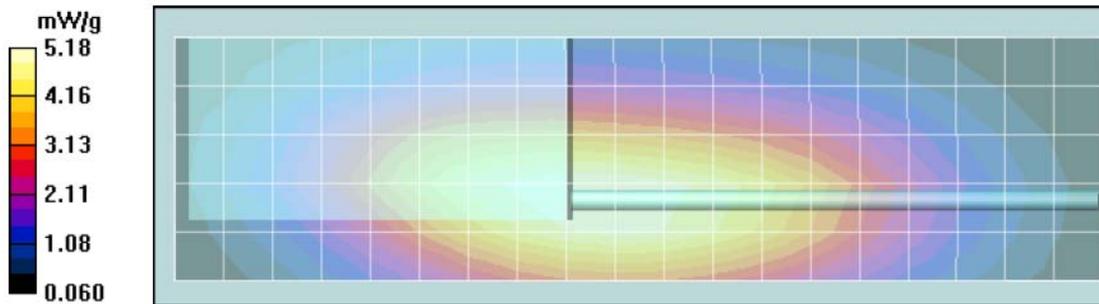
Reference Value = 82.1 V/m; Power Drift = -0.517 dB

Motorola Fast SAR: SAR(1 g) = 5.08 mW/g; SAR(10 g) = 3.73 mW/g

Maximum value of SAR (interpolated) = 5.36 mW/g

Ab Scan/Z Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 4.91 mW/g



Motorola NE EME Laboratory

Run #: MeC-Face-061108-10	Sim. Tissue Temp: 21.3 (C)
Robot #: GEMS-2	Phantom #: 80302002B-S8
Model #: RLN6173A	SN: 003
Antenna: RAN4031	TX Freq: 469.5625 MHz
Battery: 6080384X63	Start power: 2.44 W
Carry acc.: None	Audio/Data acc.: None

Comments: Unit front @ 2.5cm. FULL SCAN

Probe: ET3DV6 - SN1393, Calibrated: 5/2/2006, ConvF(7.24, 7.24, 7.24)

Duty Cycle: 1:1, Medium: 460.375 MHz IEEE Head , Medium parameters used: $f = 460.375$ MHz; $\sigma = 0.86$ mho/m; $\epsilon_r = 42.7$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn401, Calibrated: 8/23/2006

Face Template/7x7x7 Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 67.5 V/m; Power Drift = -0.533 dB

Peak SAR (extrapolated) = 4.47 W/kg

SAR(1 g) = 3.38 mW/g; SAR(10 g) = 2.5 mW/g

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

Face Template/Area Scan (51x191x1): Measurement grid: dx=15mm, dy=15mm

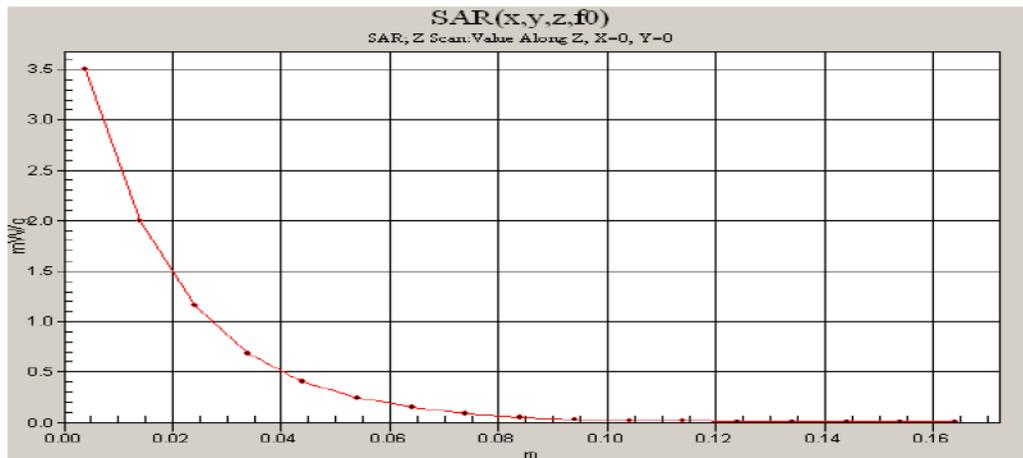
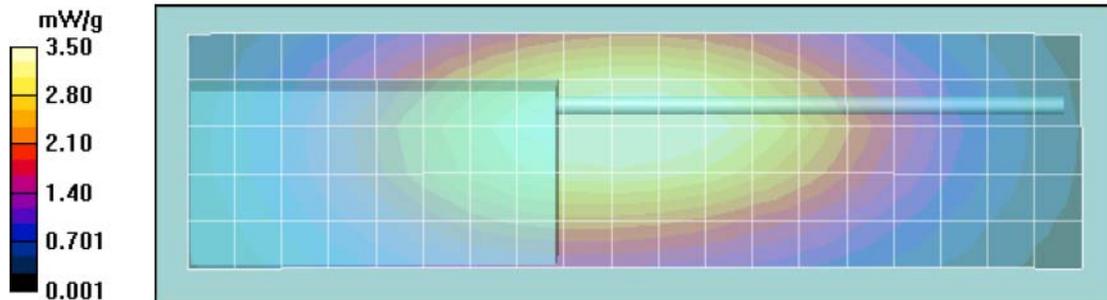
Reference Value = 67.5 V/m; Power Drift = -0.533 dB

Motorola Fast SAR: SAR(1 g) = 3.53 mW/g; SAR(10 g) = 2.61 mW/g

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

Face Template/Z Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 3.50 mW/g



APPENDIX F
DUT Supplementary Data (Power slump)

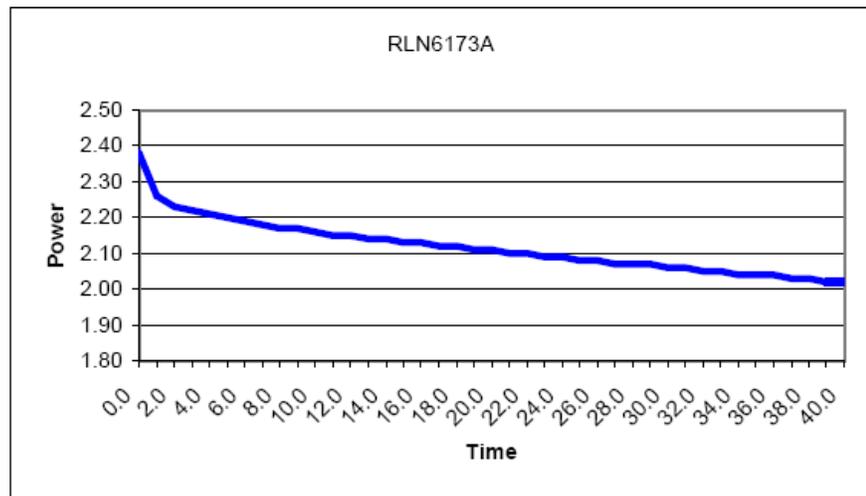
**Model RLN6173A
Serial #004**

Battery 6080384X63
Frequency 469.5625 MHz
Date 11/9/2006

Transmit Mode CW
Audio Accessory HCSN4000D

TX TIME **Measured Power**
(minutes) **(Watts)**

0.0	2.38
1.0	2.26
2.0	2.23
3.0	2.22
4.0	2.21
5.0	2.20
6.0	2.19
7.0	2.18
8.0	2.17
9.0	2.17
10.0	2.16
11.0	2.15
12.0	2.15
13.0	2.14
14.0	2.14
15.0	2.13
16.0	2.13
17.0	2.12
18.0	2.12
19.0	2.11
20.0	2.11
21.0	2.10
22.0	2.10
23.0	2.09
24.0	2.09
25.0	2.08
26.0	2.08
27.0	2.07
28.0	2.07
29.0	2.07
30.0	2.06
31.0	2.06
32.0	2.05
33.0	2.05
34.0	2.04
35.0	2.04
36.0	2.04
37.0	2.03
38.0	2.03
39.0	2.02
40.0	2.02



Appendix G DUT Test Position Photos

Figure 1: Highest SAR Test Position (Body)
DUT back towards the phantom with antenna separated 2.5cm
Worst case audio accessory kit HCSN4000D attached
(same position used for all other audio accessories)

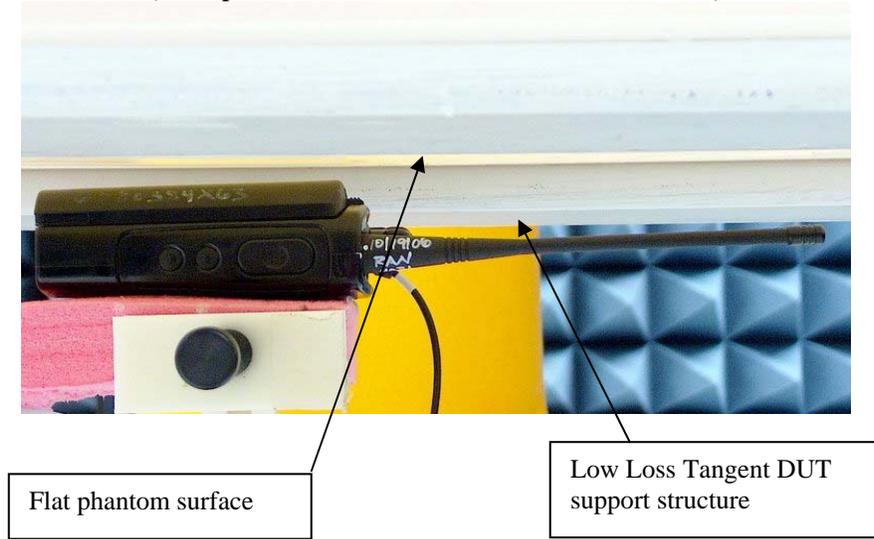


Figure 2: Highest SAR Test Position (Face)
DUT front side separated 2.5cm from the phantom
(same position used for all applicable audio accessories)

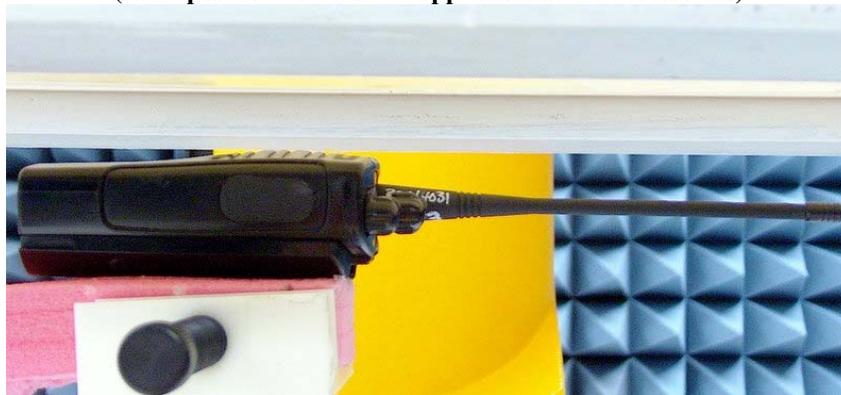


Figure 3: Body assessment
DUT w/ belt clip kit # 4280383X62 against the phantom
with audio accessory kit HCSN4000D attached



Figure 4: Body assessment
DUT w/ leather carry case kit # RLN6301A against the phantom
with audio accessory kit HCSN4000D attached



Figure 5: Body assessment
DUT front separated 2.5cm
with audio accessory kit HCSN4000D attached



Appendix H DUT and Body worn Accessory Photos

The purpose of this appendix is to illustrate the offered body-worn carry accessory(ies). The sample that was used in the following photos represents the product used to obtain the results presented herein.



Photo 1.
Model 4280383X62
Back View



Photo 2.
Model 4280383X62
Side View



Photo 3.
Model RLN6301A
Back View



Photo 4.
Model RLN6301A
Front View



Photo 5.
Model RLN6301A
Side View

Appendix I

DUT Antenna Separation Distances and Offered Accessory Test Status

The following table(s) summarizes the separation distances and test status provided by each of the applicable body-worn accessory(ies):

Carry Case Models	Tested ?	Min. Separation distances between DUT antenna and phantom surface. (mm)	Comments
4280383X62	Yes	32-43	NA
RLN6301A	Yes	41-59	NA

Audio Acc. Models	Tested ?	Separation distances between DUT antenna and phantom surface. (mm)	Comments
HMN9026D	Yes	NA	NA
HMN9025D	Yes	NA	NA
NTN9159F	Yes	NA	NA
ENMN4002B	Yes	NA	NA
HCSN4000D	Yes	NA	NA
HMN9039E	Yes	NA	NA
HCSN4001C	Yes	NA	NA
HMN9038A	Yes	NA	NA
RLN5714B	Yes	NA	NA
PMMN4001A	Yes	NA	NA
PMLN4658A	Yes	NA	NA
HMN9036A	Yes	NA	NA
HMN9030A	Yes	NA	NA
HMN9013B	Yes	NA	NA
PMLN5011A	Yes	NA	NA
RLN5411A	Yes	NA	NA
RMN4016B	Yes	NA	NA
RLN5318A	Yes	NA	NA
HMN9021A	Yes	NA	NA
RMN5047A	Yes	NA	NA
BDN6646C	Yes	NA	NA
BDN6720A	Yes	NA	NA
HMN9727B	Yes	NA	NA
HLN9132A	Yes	NA	NA
HMN9752B	Yes	NA	NA
HMN9754D	No	NA	Similar to RLN5318A
RLN5317A	No	NA	Similar to RLN5318A
RLN5238B	No	NA	Similar to RMN5047A