MOTOROLA

ACCREDITED

TESTING CERT # 2518.01

FCC ID: IHDT56KB1
DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 2

Government & Public Safety
EME Test Laboratory
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Fort Lauderdale, FL. 33322

Date of Report: **2/11/09**
Report Revision: **O**
Report ID: **i465 SAR rpt SR7064_090211**

Responsible Engineer:	Michael Sailsman (Senior Staff EME Eng.)
Report Author:	Michael Sailsman (Senior Staff EME Eng.)
Date/s Tested:	1/20/09-1/30/09
Manufacturer/Location:	Motorola, Plantation
Sector/Group/Div.:	Mobile Devices
Date submitted for test:	1/09/09
DUT Description:	TDMA: 236:310 WiDEN (76.1%), 81:120, 2:6, 1:12, and 1:6; 64QAM, 16QAM, and QPSK Modulations; 0.6 W Pulse Avg; MOTOtalk: 114:120 8FSK; 0.85 W nominal (GPS and Bluetooth Capable).
Test TX mode(s):	iDEN: 1:6, 1:3; WiDEN: 236:310; MOTOTalk: 114:120; BT: CW
Max. Power output:	0.640 W pulsed average(iDEN/Widen); 0.891 W(MotoTalk); 2.5 mW(BT)
Nominal Power:	0.600 W pulsed average(iDEN/Widen); 0.850 W(MotoTalk); 1.0 mW(BT)
Tx Frequency Bands:	806-825, 896-902 MHz (iDEN/WiDEN); 902-928 MHz (MOTOtalk); 2.402-2.480 GHz (Bluetooth)
Signaling type:	TDM - iDEN/WiDEN: QPSK, M16-QAM, M64-QAM, MotoTalk: 8FSK; BT: FHSS
Model(s) Tested:	H98XAH6JR7AN
Model(s) Certified:	H98XAH6JR7AN
Serial Number(s):	364VJYJS2P, 364VJYJS38
Classification:	General Population/Uncontrolled
Rule Part(s):	15 & 90

DUT Photo
(Refer to Exhibit 7B)

Approved Accessories:
Antenna(s):
85009105001-Internal (806-825 MHz, ¼ wave, -1.5dBi gain; 896-902 MHz, 1/4 , 1.0dBi; 902-928 MHz, ¼ wave, 1.0dBi), 85009104001- Internal (2402-2481 MHz, ¼ wave, 2.2dBi)
Battery(ies):
SNN5792A/NTN2517xxxA (BK70 Standard Li Ion/standard battery door), SNN5793A/NTN2518xxxA (BK10 Extended Li Ion/Extended battery door)
Body worn accessory(ies):
NNTN7627A (i465 swivel carry holster)
Audio/Data cable accessory(ies):
NNTN5330B (PTT Headset, earbud), NNTN5211B (2-wire Surveillance Headset), NNTN6312A (3-wire Surveillance Headset), SKN6238A (Micro USB Data Cable)

Max. Calc. : 1-g Avg. SAR: 1.41 W/kg (Body); 10-g Avg. SAR: 1.03 W/kg (Body)
Max. Calc. : 1-g Avg. SAR: 1.17W/kg (Head); 10-g Avg. SAR: 0.86 W/kg (Head)
Max. Calc. : 1-g Avg. SAR: 0.76W/kg (Face); 10-g Avg. SAR: 0.55 W/kg (Face)

The test results clearly demonstrate compliance with FCC General Population/Uncontrolled RF Exposure limits of 1.6W/kg per the requirements of 47 CFR 2.1093(d).
The test results clearly demonstrate compliance with ICNIRP (1998) Guidelines for limiting exposure in time-varying electric, magnetic, and electromagnetic fields (up to 300GHz), Health Physics 74, 494-522 RF Exposure limits of 2W/kg averaged over 10grams of contiguous tissue.

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.
I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements. This reporting format is consistent with the suggested 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 G&PS EME Lab Senior Resource Manager, Laboratory Director

Approval Date: 2/11/09

Certification Date: 2/11/09

Certification No.: L1090201P

Part 1 of 2

APPENDICES

Part 2 of 2

Report Revision History

Date	Revision	Comments
2/11/09	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 G&PS EME Test Lab for the model number H98XAH6JR7AN FCC ID: IHDT56KB1. 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)
- IEC62209-2 106/162/CDV (2008-10-03): Procedure to determine the specific absorption rate (SAR) for 91 wireless communication devices used in close proximity to the human 92 body (frequency range of 30 MHz to 6 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: IHDT56KB1 model H98XAH6JR7AN a digital multi-service data capable devices that employs time division multiplexing transmission technology with a duty cycle ranging from 16.67% to 33.33% using M16-QAM modulation for voice or circuit data transmission. There is a Split 1:3 mode that operates using a 16.67% transmission duty cycle, two 7.5ms pulses occur during the six time slots within the 90-msec frame format. This mode is available in both the 806-825MHz and 896-902MHz bands in the telephone interconnect mode only. Packet data transmission is supported up to a maximum duty cycle of 67.5% using quad QPSK modulation. This device incorporates WiDEN technology with a maximum transmission duty cycle of 236:310 (76.1%). WiDEN uses the standard iDEN modulation modes in 1 to 4 standard 25kHz iDEN channels. WiDEN25, 50, 75, and 100 uses 1, 2, 3, and 4 25kHz channels respectfully. The highest duty cycle is in the WiDEN 25kHz mode. This device also possesses MOTOTalk, which is a Part 15 service, employs Frequency Hopping Spread Spectrum technology in the 900 MHz ISM band. MOTOtalk emissions have a maximum duty cycle of 114:120 using 8 FSK modulation. MOTOTalk operates only in PTT mode in front of the face or at the abdomen with the applicable offered audio accessories. This device also incorporate a Class 2 Bluetooth device which is a Frequency Hopping Spread Spectrum (FHSS) technology. The Bluetooth radio modem is used to wireless link audio accessories. The maximum actual transmission duty cycle is imposed by the Bluetooth standard: for single-slot operation the Bluetooth device transmits 366 microsec out of 625 microsec. Packet Data and WiDEN operations are possible with and without connection to an external data device, via a data cable. This device is also GPS capable.

This device will be marketed to and used by the general population. This device may be used while held against the head in voice mode, in front of the face in PTT mode, and against the body in phone, dispatch, MOTOtalk, Data, and WiDEN modes.

FCC ID: IHDT56KB1 is capable of operating in the 806-825 MHz and 896-902MHz bands for iDEN and WiDEN modes, and operates in 902-928MHz for MOTOTalk mode. The rated conducted power is 0.60 watts pulsed averaged in 806-825MHz and 896-902MHz bands and 0.85 watts in the MOTOTalk band. The maximum conducted output power is 0.64 watts pulsed average and 0.891 watts respectively as defined by the upper limit of the production line final test station

FCC ID: IHDT56KB1 is being offered with the accessories 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 71 manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot, DAE3V1, and ET3DV6 E-Field probes. 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 Rectangular Flat Phantom

Phantom ID	Phantom Material	Phantom Dimensions (cm)	Support structure opening dimensions (cm)	Support structure material	Loss Tangent (wood)
NA	High Density Polyethylene (HDPE)	NA	NA	Wood	< 0.05

4.2.2 SAM Phantom

Phantom ID	Material Parameters	Material Thickness (mm)	Support structure material	Loss Tangent (wood)
SAMTP1022	200MHz -3GHz; Er = <5, Loss Tangent = 0.05	2mm +/- 0.2mm	Wood	< 0.05
SAMTP1208	200MHz -3GHz; Er = <5, Loss Tangent = 0.05	2mm +/- 0.2mm	Wood	< 0.05

4.2.3 Elliptical Flat Phantom

Phantom ID	Material Parameters	Material Thickness (mm)	Support structure material	Loss Tangent (wood)
OVAL1016	300MHz -6GHz; Er = 4+/- 1, 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 simulated tissue used is also compliant to that specified in IEC62209-1 (2005) and adopted by CENELEC as EN62209-1 (2006).
The sugar based simulated 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 similar type 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	835MHz		900MHz		2450MHz	
	Head	Body	Head	Body	Head	Body
Sugar	57.0	44.9	56.5	44.9	NA	NA
Diacetin	NA	NA	NA	NA	51.0	34.5
De ionized -Water	40.45	53.06	40.95	53.06	48.75	65.20
Salt	1.45	0.94	1.45	0.94	0.15	0.20
HEC	1.0	1.0	1.0	1.0	NA	NA
Bact.	0.1	0.1	0.1	0.1	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)	E4419B	MY45103725	9/8/2009
Power Meter (Agilent)	E4418B	US39251152	3/24/2009
Power Sensor (Agilent)	8482B	3318A06773	5/14/2009
Power Sensor (Agilent)	8482B	3318A07546	6/2/2009
Power Sensor (Agilent)	8482B	3318A06774	2/26/2009
Bi-Directional Coupler (NARDA)	3020A	40296	2/7/2010
Signal Generator (Agilent)	E4428C	MY47381119	7/14/2010
AMP (ComTech PST)	AR88258-10	M3Y6A00-	CNR
Dickson Temperature Recorder	TM320	7081356	7/28/2009
Omega Digital Thermometer with J Type TC Probe	HH202A	18800	10/27/2009
Omega Digital Thermometer with J Type	HH202A	18801	3/26/2009
Omega Digital Thermometer with J Type TC Probe	HH202A	18812	4/25/2009
Agilent PNA-L Network Analyzer	N5230A	MY45001092	5/22/2010
Dielectric Probe Kit (HP)	85070C	US99360076	CNR
Speag Dipole	D900V2	084	3/17/2010
Speag Dipole	D2450V2	704	11/18/2010

6.0 SAR Measurement System Verification

The SAR measurements were conducted with probe model/serial number ET3DV6/SN1545. 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 from SPEAG using head tissue equivalent medium are provided in APPENDIX C. The G&PS 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 G&PS 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.

Tissue Target Tolerances

FCC Body		
Frequency (MHz)	**Di-electric Constant Target**	**Conductivity Target S/m**
900/899	55.0 +/- 5%	1.05 +/- 5%
815.5	55.3 +/- 5%	0.97 +/- 5%
915	55.0 +/- 5%	1.06 +/- 5%
2441	52.7 +/- 5%	1.94 +/- 5%
2450	52.7 +/- 10%	1.95 +/- 10%

IEEE/IEC Head		
Frequency (MHz)	**Di-electric Constant Target**	**Conductivity Target S/m**
900/899	41.5 +/- 5%	0.97 +/- 5%
815.5	41.6 +/- 5%	0.90 +/-5%
915	41.5 +/- 5%	0.98 +/- 5%

6.2 System Check Test Results

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	Reference SAR @ 1W (mW/g)
1545	FCC Body	7/21/08	SPEAG D900V2 /084	11.75 +/- 10%
1545	IEEE Head	7/21/08	SPEAG D900V2 /084	11.27 +/- 10%
1545	FCC Body	7/21/08	SPEAG D2450V2/704	56.93 +/- 10%

Note: See APPENDIX D for an explanation of the reference SAR targets stated above.

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 EUT is a portable device with iDEN/WiDEN (QPSK, QAM, M64-QAM), and MOTOtalk (FHSS 8FSK) transmission signaling operational at the body, head, 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 an elliptical and a SAM phantom with the applicable simulated tissue to assess performance at the body, head and face respectively using the relevant transmission modes.
Note that a fast scan SAR evaluation methodology (applicable between 136-2484 MHz) 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 5x5x7 zoom scans.

Assessments at the Head (Phone mode 1:3) **Pages 12&13 of 55; Tables 1&2**

- Assessment in the 806-825MHz band of offered batteries using applicable test configurations at the head.
- Assessment at the 806-825MHz band edges using the worst case configuration from above.
- Assessment in the 896-902MHz band using the worst case battery from above, using applicable test configurations at the head.
- Assessment at the 896-902MHz band edges.

Assessments at the Face (PTT mode 1:6) **Page 14 of 55; Table 3**

- Assessment in the 806-825MHz band of the worst case battery from the head assessment above.
- Assessment in the 896-902MHz band of the worst case battery from the head assessment above.

Assessments at the Face (MOTOtalk mode 114:120) **Page 14 of 55; Table 3**

- Assessment in the 902-928MHz band with the offered batteries.
- Assessment in the 902-928MHz band of the band edge frequencies with the worst case battery from above.

Assessments at the Body (WiDEN/iDEN 236:310 & 1:3) **Pages 15&16 of 55; Table 4&5**

- Assessment in the 806-825MHz and 896-902MHz bands with and without the offered data cable.
- Assessment of the offered battery in the 806-825MHz and 896-902MHz bands using the worst case configurations from above.
- Assessment of the offered audio accessories in the 806-825MHz and 896-902MHz bands using the worst case configurations from above in the applicable transmission mode.
- Assessment at 2.5cm separation in the 806-825MHz and 896-902MHz bands using the worst case configuration from above.
- Assessment in the 806-825MHz and 896-902MHz bands of the band edge frequencies.

Assessments at the Body (iDEN MOTOtalk mode 114:120) **Page 17 of 55; Table 6**

- Assessment in the 902-928MHz band of the offered battery accessories using the body worn accessory and audio accessory NNTN5330B.
- Assessment in the 902-928MHz band of the other offered audio accessories using the worst case battery from above.
- Assessment at 2.5cm separation distance from the phantom in the 902-928MHz band using the worst case configuration from above.
- Assessment in the 902-928MHz band of the band edges using the worst configuration from above.

Assessments at the Body (BT mode CW) **Page 18 of 55; Table 7**

- Assessment at the center frequency of the 2.402-2.480 GHz band of the offered batteries using the worst case configuration overall from the body assessment above.
- Assessment at 2.5cm separation distance from the phantom in the 2.402-2.480 GHz band with the worst case battery from above.

Shortened scan assessment at the Body **Page 18 of 55; Table 8**

- 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' front and back sides separated 2.5cm from the phantom.

7.2.2 Head

The DUT was placed against the right and left heads of the SAM phantom in the cheek touch and tilt positions.

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^{o}C of the temperature at which the dielectric properties were determined. The liquid depth within the phantom used for measurements was at least 15cm. 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	18 - 25 ˚C	Range: 21.0-22.9˚C Avg. 21.80˚C
Relative Humidity	NA	Range: 23.2-58.0% Avg. 36.9%
Tissue Temperature	NA	Range: 19.5-21.7˚C Avg. 20.79 ˚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 fast scan SAR methodology, was utilized to ascertain the worst case test configuration for each body location per band (in bold with *). The worst case test configurations observed for each body location were assessed using the full DASY4^{TM} coarse and 5x5x7 zoom methodology and they are summarized in the worst case 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.

Table1

Assessments at the Head (Head tissue equivalent medium) (Phone mode 1:3) 802-825MHz 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)**
Assessment at the left ear - offered batteries; Touch and tilt positions												
JsT-Lear-090120-02/364VJYJS2P	Internal	815.5125	SNN5792A w/ NTN2517X XXA	Cheek touch	None	None	0.631	-0.139	0.934	0.645	0.99	0.69
JsT-Lear-090120-05/364VJYJS2P	Internal	815.5125	SNN5793A w/ NTN2518X XXA	Cheek touch	None	None	0.628	0.023	0.980	0.664	1.01	0.69
JsT-Lear-090120-06/364VJYJS2P	Internal	815.5125	SNN5793A w/ NTN2518X XXA	15º Tilt	None	None	0.629	0.032	0.532	0.369	0.55	0.38
Assessment at the left ear – Band edges												
JsT-Lear-090120-07/364VJYJS2P	Internal	806.0125	SNN5793A w/ NTN2518X XXA	Cheek touch	None	None	0.645	0.087	1.040	0.701	1.06	0.71
JsT-Lear-090120-08/364VJYJS2P	Internal	824.9875	SNN5793A w/ NTN2518X XXA	Cheek touch	None	None	0.638	-0.069	1.030	0.704	1.07	0.73
Assessment at the right ear - offered batteries; Touch and tilt positions (worst case battery from left ear)												
JsT-Rear-090120-09/364VJYJS2P	Internal	815.5125	SNN5793A w/ NTN2518X XXA	Cheek touch	None	None	0.629	-0.051	1.000	0.683	1.04	0.71
JsT-Rear-090120-10/364VJYJS2P	Internal	815.5125	SNN5793A w/ NTN2518X XXA	15º Tilt	None	None	0.629	0.069	0.550	0.382	0.57	0.39
Assessment at the right ear – Band edges												
MeC-Rear-090120-11/364VJYJS2P	Internal	806.0125	SNN5793A w/ NTN2518X XXA	Cheek touch	None	None	0.641	-0.072	1.040	0.713	1.07	0.74
***MeC-Rear-090120-12/364VJYJS2P**	Internal	824.9875	SNN5793A w/ NTN2518X XXA	Cheek touch	None	None	0.633	-0.089	1.050	0.715	1.10	0.75

Table 2

Assessments at the Head (Head tissue equivalent medium) (Phone mode 1:3) 896-902MHz 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)**
Assessment at the left ear - offered batteries; Touch and tilt positions												
MeC-Lear-090120-13/364VJYJS2P	Internal	898.99375	SNN5792A w/ NTN2517XXXA	Cheek touch	None	None	0.642	-0.171	0.753	0.517	0.80	0.55
MeC-Lear-090120-14/364VJYJS2P	Internal	898.99375	SNN5793A w/ NTN2518XXXA	Cheek touch	None	None	0.640	-0.144	0.836	0.568	0.88	0.60
MeC-Lear-090120-15/364VJYJS2P	Internal	898.99375	SNN5793A w/ NTN2518XXXA	15º Tilt	None	None	0.641	0.020	0.447	0.310	0.45	0.32
Assessment at the left ear – Band edges												
MeC-Lear-090120-16/364VJYJS2P	Internal	896.01875	SNN5793A w/ NTN2518XXXA	Cheek touch	None	None	0.659	-0.122	0.880	0.602	0.92	0.63
CM-Lear-090123-10/364VJYJS38	Internal	896.01875	SNN5793A w/ NTN2518XXXA	Cheek touch	None	None	0.641	0.154	0.909	0.606	0.92	0.62
MeC-Lear-090120-17/364VJYJS2P	Internal	901.98125	SNN5793A w/ NTN2518XXXA	Cheek touch	None	None	0.636	-0.025	0.787	0.535	0.81	0.55
Assessment at the right ear - offered batteries; Touch and tilt positions (worst case battery from left ear)												
MeC-Rear-090120-18/364VJYJS2P	Internal	898.99375	SNN5793A w/ NTN2518XXXA	Cheek touch	None	None	0.641	-0.034	0.808	0.546	0.83	0.56
MeC-Rear-090120-19/364VJYJS2P	Internal	898.99375	SNN5793A w/ NTN2518XXXA	15º Tilt	None	None	0.641	-0.094	0.508	0.353	0.53	0.37
Assessment at the right ear – Band edges												
JsT-Rear-090121-02/364VJYJS2P	Internal	896.01875	SNN5793A w/ NTN2518XXXA	Cheek touch	None	None	0.649	-0.231	0.846	0.570	0.91	0.61
JsT-Rear-090121-03/364VJYJS2P	Internal	901.98125	SNN5793A w/ NTN2518XXXA	Cheek touch	None	None	0.640	-0.048	0.709	0.482	0.73	0.50

Table 3

Assessments at the Face (Head tissue equivalent medium) 806-825MHz and 896-902MHz bands (Dispatch mode 1:6). 902-928MHz (MOTOTalk 114:120)												
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)**
Assessment across the band using worst case offered battery from 806-825Mhz band head assessment. 1:6 mode												
JsT-Face-090121-06/364VJYJS2P	Internal	815.5125	SNN5793A w/ NTN2518X XXA	DUT front 2.5cm	None	None	0.631	-0.128	0.199	0.142	0.10	0.07
JsT-Face-090121-07/364VJYJS2P	Internal	806.0125	SNN5793A w/ NTN2518X XXA	DUT front 2.5cm	None	None	0.645	0.105	0.223	0.159	0.11	0.08
JsT-Face-090121-08/364VJYJS2P	Internal	824.9875	SNN5793A w/ NTN2518X XXA	DUT front 2.5cm	None	None	0.637	0.072	0.189	0.135	0.10	0.07
Assessment across the 896-902MHz the band using worst case offered battery from 896-902MHz band head assessment. 1:6 mode												
JsT-Face-090121-09/364VJYJS2P	Internal	898.99375	SNN5793A w/ NTN2518X XXA	DUT front 2.5cm	None	None	0.645	0.073	0.138	0.098	0.07	0.05
JsT-Face-090121-10/364VJYJS2P	Internal	896.01875	SNN5793A w/ NTN2518X XXA	DUT front 2.5cm	None	None	0.650	-0.064	0.146	0.104	0.07	0.05
JsT-Face-090121-11/364VJYJS2P	Internal	901.98125	SNN5793A w/ NTN2518X XXA	DUT front 2.5cm	None	None	0.641	-0.040	0.131	0.093	0.07	0.05
Assessment of MOTOTalk mode 902-928Mhz band - Battery search												
JsT-Face-090121-12/364VJYJS2P	Internal	915.5250	SNN5792A w/ NTN2517X XXA	DUT front 2.5cm	None	None	0.865	0.049	1.22	0.860	0.63	0.44
CM-Face-090121-13/364VJYJS2P	Internal	915.5250	SNN5793A w/ NTN2518X XXA	DUT front 2.5cm	None	None	0.856	-0.015	1.23	0.868	0.64	0.45
Assessment of MOTOTalk mode 902-928Mhz band – Band edges												
***CM-Face-090121-14/364VJYJS2P**	Internal	902.5250	SNN5793A w/ NTN2518X XXA	DUT front 2.5cm	None	None	0.855	-0.056	1.460	1.030	0.77	0.54
CM-Face-090121-15	Internal	927.4750	SNN5793A w/ NTN2518X XXA	DUT front 2.5cm	None	None	0.854	-0.068	1.080	0.760	0.57	0.40

Table 4

Assessments at the Body (Body tissue equivalent medium) 806-825MHz (WiDEN/iDEN mode 236:310 & 1:3)												
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)**
Assessment of offered batteries and data cable. 236:310 mode												
CM-Ab-090121-17/364VJYJS2P	Internal	815.5125	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	None	0.624	-0.050	1.190	0.834	1.25	0.88
CM-Ab-090121-18/364VJYJS2P	Internal	815.5125	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	SKN6238A	0.624	-0.133	1.050	0.749	1.13	0.80
CM-Ab-090121-19/364VJYJS2P	Internal	815.5125	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	None	0.625	-0.928	0.792	0.560	1.02	0.72
Assessment of offered audio accessories with worst case battery from above. 1:3 mode												
JsT-Ab-090122-02/364VJYJS2P	Internal	815.5125	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	NNTN5330B	0.632	0.028	0.532	0.380	0.55	0.39
JsT-Ab-090122-03/364VJYJS2P	Internal	815.5125	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	NNTN5211B	0.630	-0.020	0.513	0.364	0.53	0.38
JsT-Ab-090122-04/364VJYJS2P	Internal	815.5125	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	NNTN6312A	0.631	-0.016	0.525	0.370	0.54	0.38
Assessment of band edges – with worst case configuration at the body from above. 236:310												
***JsT-Ab-090122-05/364VJYJS2P**	Internal	806.0125	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	None	0.646	-0.234	1.350	0.953	1.45	1.02
JsT-Ab-090122-06/364VJYJS2P	Internal	824.9875	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	None	0.634	-0.034	1.070	0.759	1.10	0.78
Assessment at 2.5cm separation distance with worst case configuration at the body from above. 236:310												
JsT-Ab-090122-07/364VJYJS2P	Internal	806.0125	SNN5792A w/ NTN2517X XXA	DUT Back 2.5cm	NNTN7627A	None	0.638	-0.146	0.943	0.665	0.99	0.70
JsT-Ab-090122-08/364VJYJS2P	Internal	806.0125	SNN5792A w/ NTN2517X XXA	DUT Front 2.5cm	NNTN7627A	None	0.639	-0.076	0.847	0.605	0.88	0.63

Table 5

Assessments at the Body (Body tissue equivalent medium) 896-902MHz (WiDEN/iDEN mode 236:310 & 1:3)												
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)**
Assessment of offered batteries and data cable. 236:310 mode												
JsT-Ab-090122-09/364VJYJS2P	Internal	898.99375	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	None	0.641	-0.188	0.560	0.396	0.59	0.42
JsT-Ab-090122-10/364VJYJS2P	Internal	898.99375	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	SKN6238A	0.639	-0.170	0.493	0.347	0.52	0.37
JsT-Ab-090122-11/364VJYJS2P	Internal	898.99375	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	None	0.639	-0.157	0.617	0.433	0.65	0.46
Assessment of offered audio accessories with worst case battery from above. 1:3 mode												
JsT-Ab-090122-12/364VJYJS2P	Internal	898.99375	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	NNTN5330B	0.641	-0.017	0.225	0.158	0.23	0.16
JsT-Ab-090122-13/364VJYJS2P	Internal	898.99375	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	NNTN5211B	0.642	-0.087	0.275	0.193	0.29	0.20
JsT-Ab-090122-14/364VJYJS2P	Internal	898.99375	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	NNTN6312A	0.641	-0.039	0.264	0.186	0.27	0.19
Assessment of band edges – with worst case configuration at the body from above. 236:310												
JsT-Ab-090122-15/364VJYJS2P	Internal	896.01875	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	None	0.647	-0.142	0.622	0.435	0.65	0.46
JsT-Ab-090122-16/364VJYJS2P	Internal	901.98125	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	None	0.638	-0.100	0.560	0.395	0.58	0.41
Assessment at 2.5cm separation distance with worst case configuration at the body from above. 236:310												
JsT-Ab-090122-17/364VJYJS2P	Internal	896.01875	SNN5793A w/ NTN2518X XXA	DUT Back 2.5cm	NNTN7627A	None	0.643	-0.161	0.492	0.349	0.52	0.37
MeC-Ab-090122-18/364VJYJS2P	Internal	896.01875	SNN5793A w/ NTN2518X XXA	DUT Front 2.5cm	NNTN7627A	None	0.642	-0.188	0.584	0.413	0.62	0.44

Table 6

Assessments at the Body (Body tissue equivalent medium) 902-928 MHz (MOTOTalk mode 114:120)												
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)**
Assessment of offered batteries												
MeC-Ab-090122-19/364VJYJS2P	Internal	915.5250	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	NNTN5330B	0.868	-0.022	1.120	0.786	0.58	0.41
MeC-Ab-090122-20/364VJYJS2P	Internal	915.5250	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	NNTN5330B	0.871	-0.061	1.300	0.913	0.67	0.47
Assessment of other offered audio accessories with worst case battery from above												
MeC-Ab-090122-21/364VJYJS2P	Internal	915.5250	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	NNTN5211B	0.862	-0.021	1.200	0.843	0.62	0.44
MeC-Ab-090122-22/364VJYJS2P	Internal	915.5250	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	NNTN6312A	0.860	-0.056	1.300	0.910	0.68	0.48
Assessment of band edges – with worst case configuration at the body from above												
MeC-Ab-090122-23/364VJYJS2P	Internal	902.5250	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	None	0.869	-0.051	1.500	1.060	0.78	0.55
MeC-Ab-090122-24/364VJYJS2P	Internal	927.4750	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	None	0.873	-0.084	1.140	0.802	0.59	0.42
Assessment at 2.5cm separation distance with worst case configuration at the body from above. 114:120												
CM-Ab-090123-02/364VJYJS2P	Internal	902.5250	SNN5793A w/ NTN2518X XXA	DUT Back 2.5cm	NNTN7627A	None	0.868	-0.151	1.050	0.741	0.56	0.39
CM-Ab-090123-03/364VJYJS2P	Internal	902.5250	SNN5793A w/ NTN2518X XXA	DUT Front 2.5cm	NNTN7627A	None	0.865	-0.020	1.250	0.880	0.65	0.46

Table 7

Assessments at the Body (Body tissue equivalent medium) 2.402-2.480 GHz (BT mode CW)												
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)**
Assessment of offered batteries with overall worst case configuration from body assessments												
MeC-Ab-090130-02/364VJYJS2P	Internal	2441	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	None	0.0025	0.077	0.005	0.002	0.005	0.002
***MeC-Ab-090130-06/ 364VJYJS38**	Internal	2441	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	None	0.0025	-0.147	0.005	0.002	0.005	0.002
MeC-Ab-090130-03/364VJYJS2P	Internal	2441	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	None	0.0025	0.546	0.004	0.002	0.004	0.002
Assessment at 2.5cm separation distances with worst case battery												
MeC-Ab-090130-04/364VJYJS2P	Internal	2441	SNN5793A w/ NTN2518X XXA	DUT Back 2.5cm	NNTN7627A	None	0.0025	-0.527	0.002	0.001	0.003	0.001
MeC-Ab-090130-05/364VJYJS2P	Internal	2441	SNN5793A w/ NTN2518X XXA	DUT Front 2.5cm	NNTN7627A	None	0.0025	-0.883	0.001	0.000	0.001	0.000

Table 8

***Worst case configuration per body location from above (including shortened scan) –using the DASY 4 full coarse and 5x5x7 cube scan measurements.**												
CM-Ab-090123-08/364VJYJS2P	Internal	806.0125	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	None	0.637	-0.365	1.170	0.867	1.30	0.96
CM-Ab-090123-09/364VJYJS2P (Shortened scan)	Internal	806.0125	SNN5792A w/ NTN2517X XXA	DUT against phantom	NNTN7627A	None	0.640	-0.270	1.310	0.954	1.41	1.03
MeC-Rear-090128-02 /364VJYJS2P	Internal	824.9875	SNN5793A w/ NTN2518X XXA	Cheek Touch	None	None	0.635	-0.147	1.110	0.811	1.17	0.86
MeC-Face-090128-03/364VJYJS2P	Internal	902.5250	SNN5793A w/ NTN2518X XXA	DUT Front 2.5cm	None	None	0.857	-0.202	1.390	1.010	0.76	0.55
MeC-Ab-090130-07/364VJYJS38	Internal	2441	SNN5793A w/ NTN2518X XXA	DUT against phantom	NNTN7627A	None	0.0025	-0.046	0.002	0.000	0.002	0.002

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 5x5x7 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:

Max. Calc. 1-g/10-g Avg. SAR = ((SAR meas. / (10^(Pdrift/10)))*(Pmax/Pint))* DC%
P_{max} = Maximum Power (W)
P_{int} = Initial Power (W)
Note: if Pint > Pmax then (Pmax/Pint)=1
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: IHDT56KB1 model H98XAH6JR7AN.

Max. Calc. : 1-g Avg. SAR: 1.41 W/kg (Body); 10-g Avg. SAR: 1.03 W/kg (Body)
Max. Calc. : 1-g Avg. SAR: 0.76 W/kg (Face); 10-g Avg. SAR: 0.55 W/kg (Face)
Max. Calc. : 1-g Avg. SAR: 1.17 W/kg (Head); 10-g Avg. SAR: 0.86 W/kg (Head)

The test results clearly demonstrate compliance with FCC General Population/Uncontrolled RF Exposure limits of **1.6 W/kg** per the requirements of 47 CFR 2.1093(d).

The EME measurements were performed in accordance with the applicable testing guidelines set forth in IEC62209-1 (2005) and adopted by CENELEC as EN62209-1 (2006) as well as in accordance with the applicable testing guidelines set forth in the latest Draft IEC62209-2. The highest SAR levels clearly demonstrate compliance to ICNIRP (1998) Guidelines for limiting exposure in time-varying electric, magnetic, and electromagnetic fields (up to 300GHz) RF Exposure limits of **2 W/kg** averaged over 10grams of contiguous tissue. The results also adhere to the **1.6 W/kg** averaged over 1 gram of tissue as stipulated in ANSI C95.1-2005.

Appendix A
Measurement Uncertainty

Table 1: Uncertainty Budget for Device Under Test: 30 – 3000 MHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**IEEE 1528 section**	**Tol. (± %)**	**Prob Dist**	**Div.**	**c_i (1 g)**	**c_i (10 g)**	**1 g u_i (±%)**	**10 g u_i (±%)**	**v_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)			*k*=2				22	22	

Table 2: Uncertainty Budget for System Validation: 30 – 3000 MHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**IEEE 1528 section**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i (1 g)**	**c_i (10 g)**	**1 g u_i (±%)**	**10 g u_i (±%)**	**v_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	9999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				18	17	

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) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - 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

S Schweizerischer Kalibrierdienst
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Swiss Calibration Service

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Accreditation No.: **SCS 108**

Client **Motorola CGISS**

Certificate No: **ET3-1545_Jul08**

CALIBRATION CERTIFICATE

Object	ET3DV6R - SN:1545
Calibration procedure(s)	QA CAL-01.v6, QA CAL-12.v5 and QA CAL-23.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	July 21, 2008
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 (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	1-Jul-08 (No. 217-00865)	Jul-09
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	1-Jul-08 (No. 217-00866)	Jul-09
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 660	3-Sep-07 (No. DAE4-660_Sep07)	Sep-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: July 21, 2008

ET3DV6R SN:1545 **July 21, 2008**

DASY - Parameters of Probe: ET3DV6R SN:1545

Sensitivity in Free Space[A] Diode Compression[B]

NormX	**2.09** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**93** mV
NormY	**2.20** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**91** mV
NormZ	**1.89** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**96** 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_{be} [%]	Without Correction Algorithm	10.7	6.3
SAR_{be} [%]	With Correction Algorithm	0.9	0.5

TSL **1810 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	9.9	5.7
SAR_{be} [%]	With Correction Algorithm	0.8	0.6

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%.

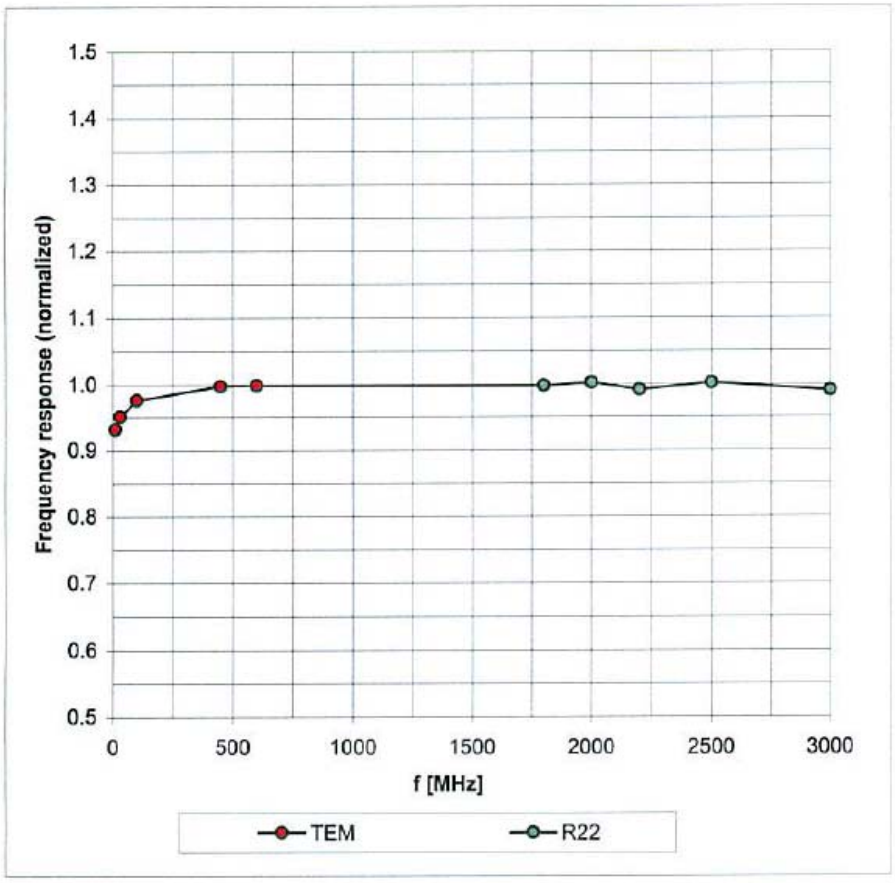
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

ET3DV6R SN:1545 July 21, 2008

Frequency Response of E-Field

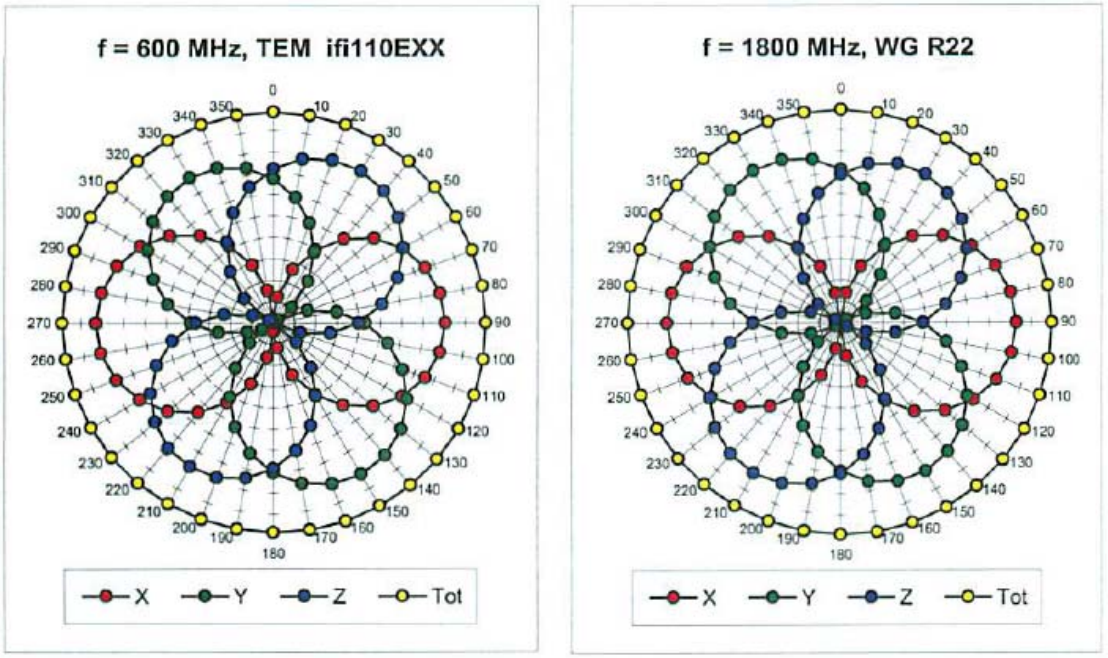
(TEM-Cell:ifi110 EXX, Waveguide: R22)

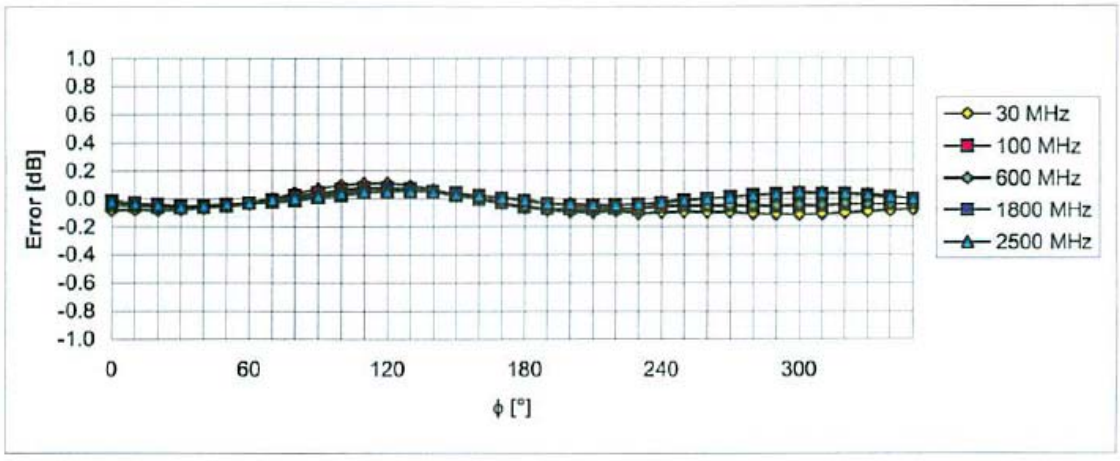


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ET3DV6R SN:1545 **July 21, 2008**

Receiving Pattern (ϕ), ϑ = 0°



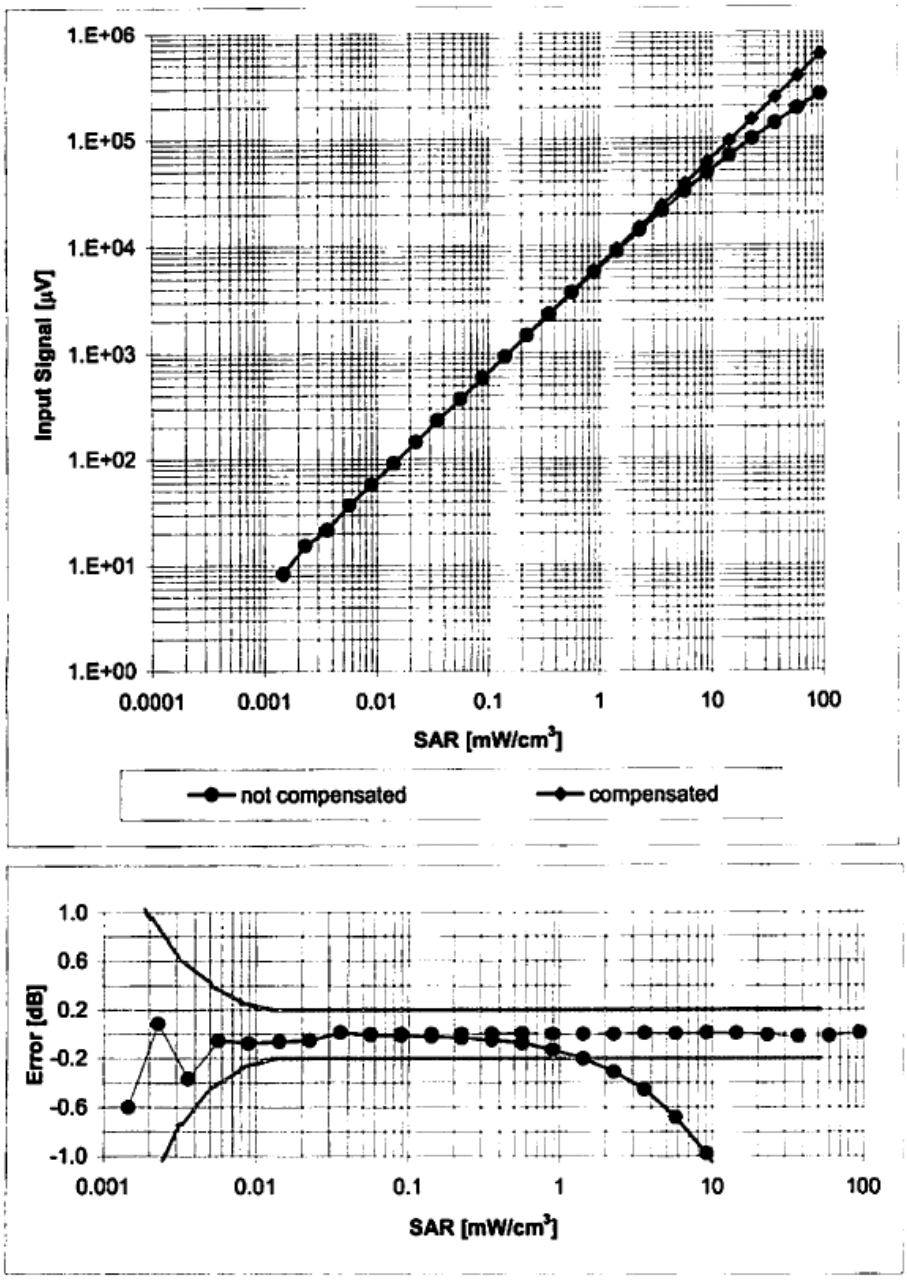


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

ET3DV6R SN:1545 July 21, 2008

Dynamic Range f(SAR_{head})

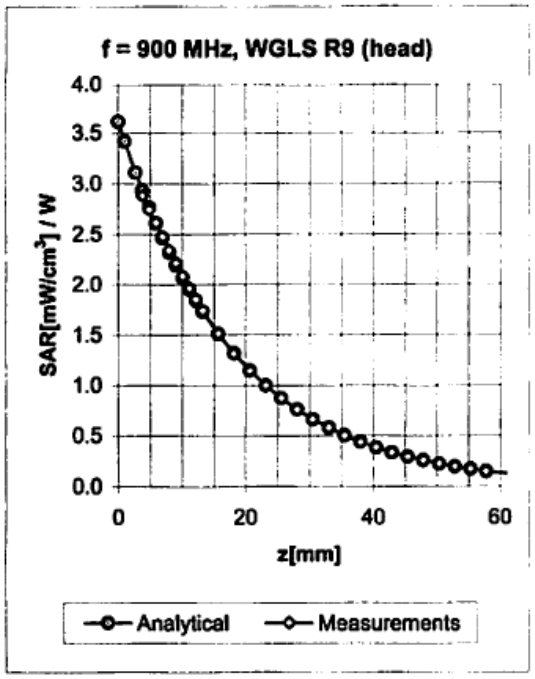
(Waveguide R22, f = 1800 MHz)

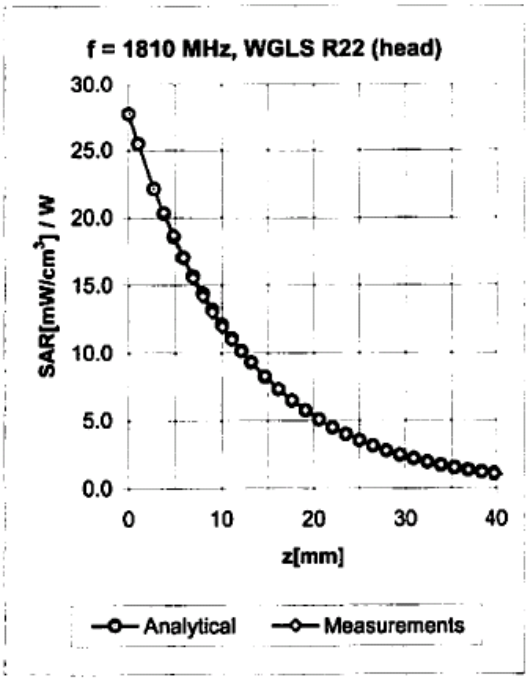


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

ET3DV6R SN:1545 **July 21, 2008**

Conversion Factor Assessment





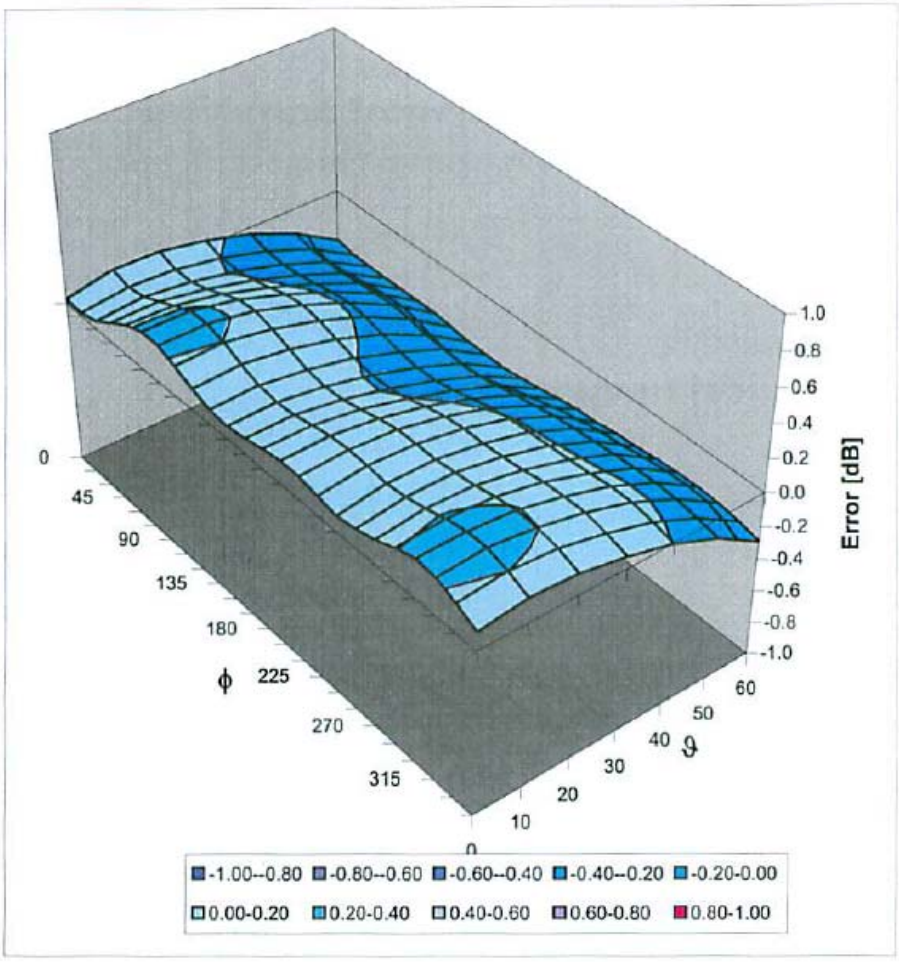
f [MHz]	Validity [MHz][c]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.37	1.84	6.82 ± 13.3% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.72	2.02	5.79 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.82	1.76	4.91 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.94	1.57	4.66 ± 11.0% (k=2)
2300	± 50 / ± 100	Head	39.4 ± 5%	1.71 ± 5%	0.90	1.29	4.54 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.90	1.24	4.26 ± 11.0% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.29	1.88	7.33 ± 13.3% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.87	1.78	5.58 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.79	1.91	4.37 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.85	1.76	4.30 ± 11.0% (k=2)
2300	± 50 / ± 100	Body	52.8 ± 5%	1.85 ± 5%	0.90	1.46	3.87 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.90	1.32	3.70 ± 11.0% (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.

ET3DV6R SN:1545 July 21, 2008

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

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Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6R**
Serial Number:	**1545**
Place of Assessment:	**Zurich**
Date of Assessment:	**July 23, 2008**
Probe Calibration Date:	**July 21, 2008**

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

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Dosimetric E-Field Probe ET3DV6R SN:1545

Conversion factor (± standard deviation)

150 MHz	*ConvF*	**7.9 ± 10%**	ε_r = 52.3 σ = 0.76 mho/m (head tissue)
250 MHz	*ConvF*	**7.2 ± 10%**	ε_r = 47.6 σ = 0.83 mho/m (head tissue)
300 MHz	*ConvF*	**7.1 ± 9%**	ε_r = 45.3 σ = 0.87 mho/m (head tissue)
750 MHz	*ConvF*	**6.0 ± 7%**	ε_r = 41.9 σ = 0.89 mho/m (head tissue)
150 MHz	*ConvF*	**7.6 ± 10%**	ε_r = 61.9 σ = 0.80 mho/m (body tissue)
250 MHz	*ConvF*	**7.2 ± 10%**	ε_r = 59.4 σ = 0.88 mho/m (body tissue)
300 MHz	*ConvF*	**7.1 ± 9%**	ε_r = 58.2 σ = 0.92 mho/m (body tissue)
750 MHz	*ConvF*	**5.8 ± 7%**	ε_r = 55.5 σ = 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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Accreditation No.: SCS 108

Client **Motorola CGISS** **Certificate No: D900V2-084_Mar08**

CALIBRATION CERTIFICATE

Object	D900V2 - SN: 084
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	March 17, 2008
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 EPM-442A	GB37480704	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference Probe ES3DV2	SN: 3025	01-Mar-08 (SPEAG, No. ES3-3025_Mar08)	Mar-09
DAE4	SN 909	03-Sep-07 (SPEAG, No. DAE4-909_Sep07)	Sep-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 17, 2008

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

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) 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
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) 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:

d) 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	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.97 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.7 ± 6 %	0.96 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C	—	—

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.66 mW / g
SAR normalized	normalized to 1W	10.6 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**10.6 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.72 mW / g
SAR normalized	normalized to 1W	6.88 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**6.84 mW /g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.2 Ω - 6.1 jΩ
Return Loss	- 24.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 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	September 20, 2000

DASY4 Validation Report for Head TSL

Date/Time: 17.03.2008 12:36:48

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:084

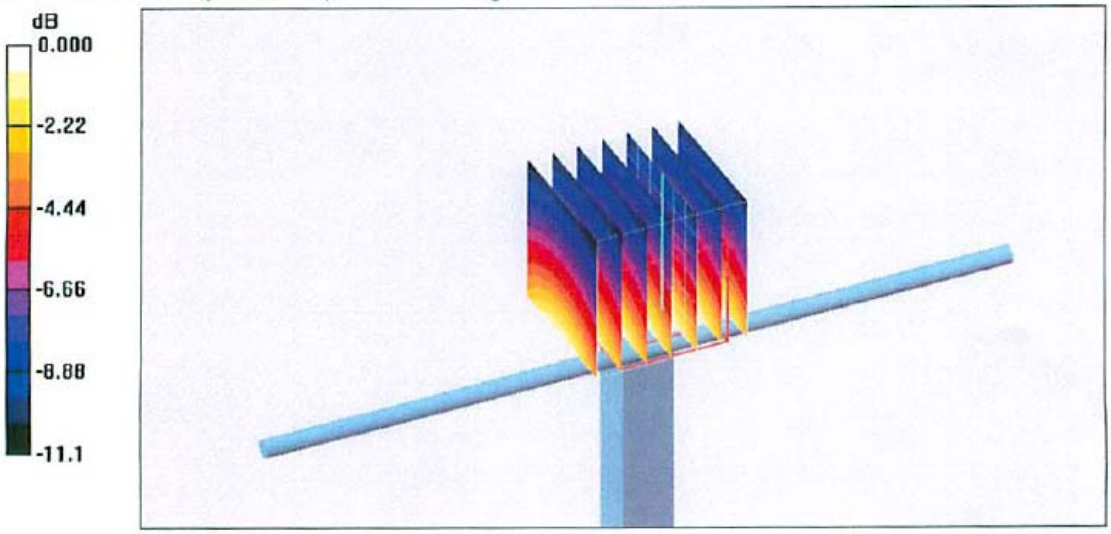
Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium: HSL 900 MHz;
Medium parameters used: f = 900 MHz; σ = 0.961 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.94, 5.94, 5.94); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn909; Calibrated: 03.09.2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

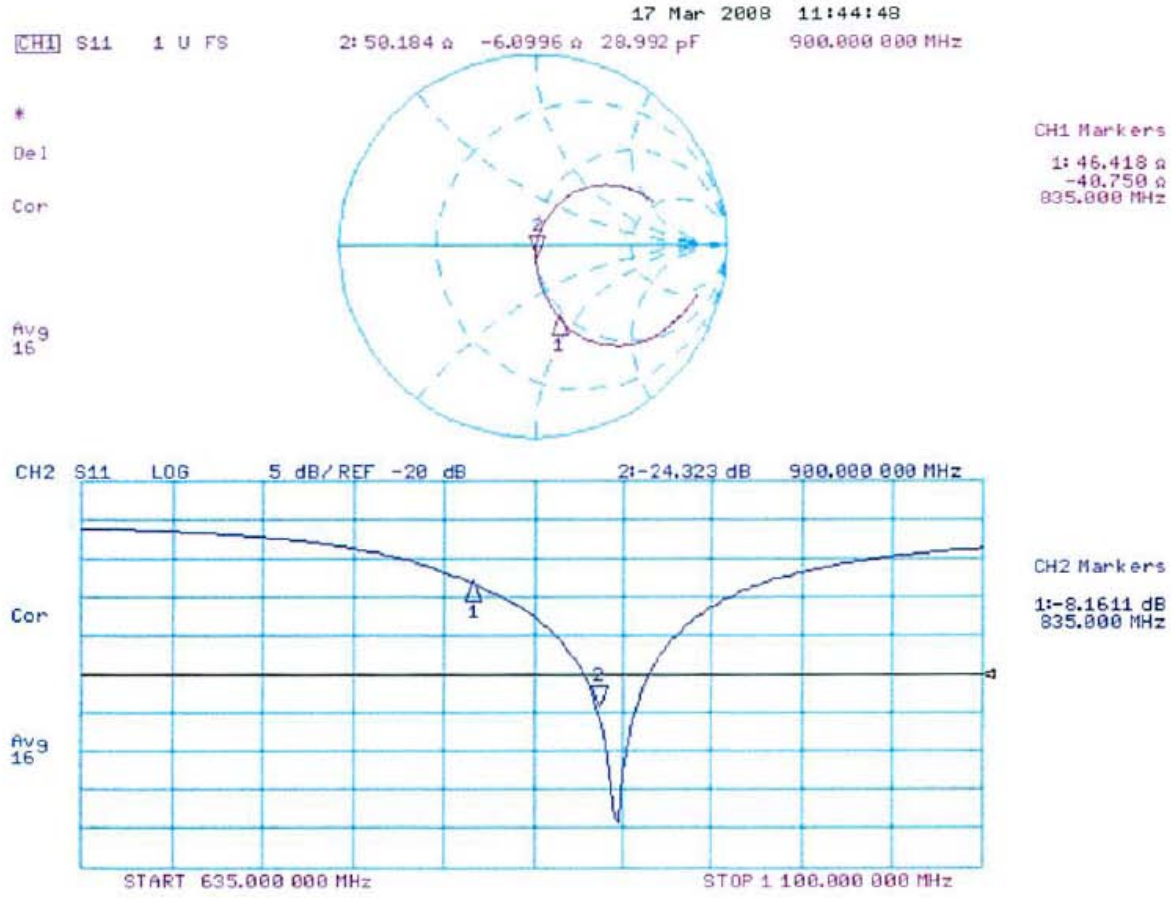
Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.2 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 3.94 W/kg
SAR(1 g) = 2.66 mW/g; SAR(10 g) = 1.72 mW/g
Maximum value of SAR (measured) = 3.02 mW/g



0 dB = 3.02mW/g

Impedance Measurement Plot for Head TSL



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Accreditation No.: SCS 108

Client **Motorola CGISS** Certificate No: **D2450V2-704_Nov08**

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 704
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	November 18, 2008
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 (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: S5086 (20g)	01-Jul-08 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 18, 2008

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) 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
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) 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:

d) DASY4/5 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	DASY5	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.4 ± 6 %	1.84 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.5 mW / g
SAR normalized	normalized to 1W	54.0 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**52.9 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.30 mW / g
SAR normalized	normalized to 1W	25.2 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**24.9 mW /g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.7 Ω + 0.8 jΩ
Return Loss	- 28.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.153 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, 2001

DASY5 Validation Report for Head TSL

Date/Time: 18.11.2008 12:27:36

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN704

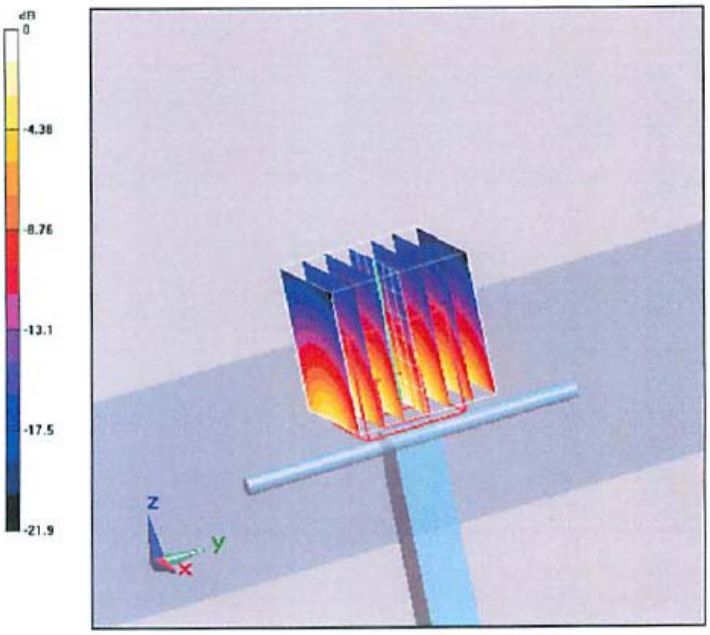
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL U10 BB
Medium parameters used: f = 2450 MHz; σ = 1.84 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.4, 4.4, 4.4); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

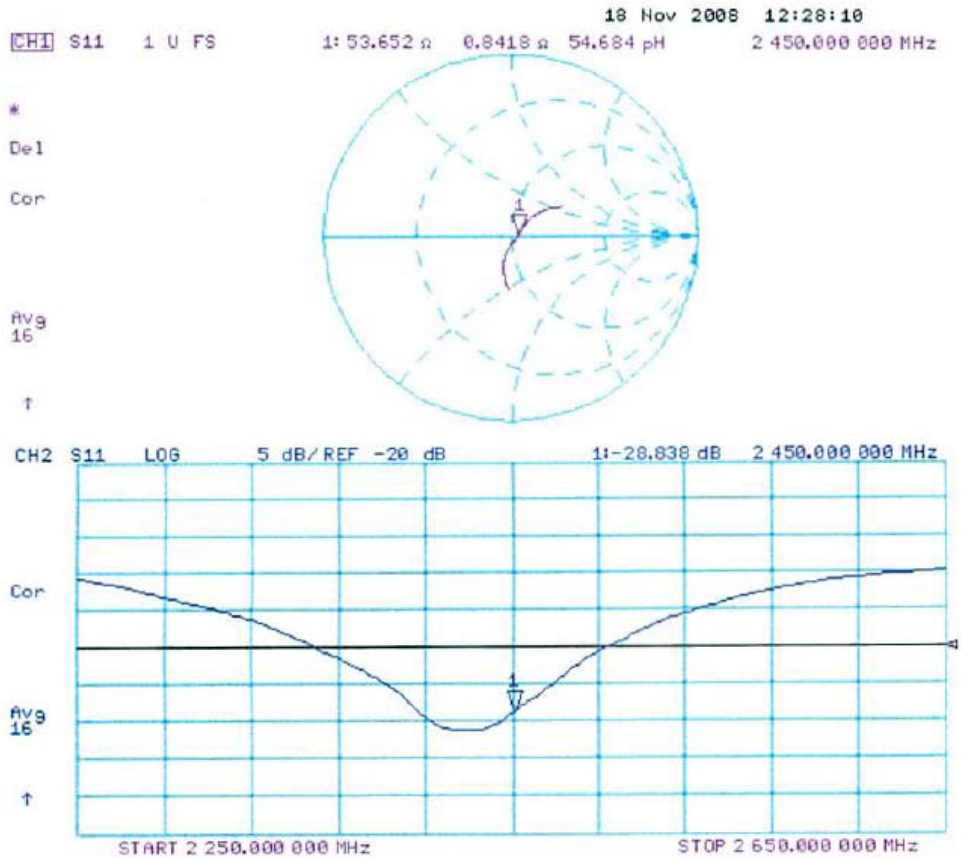
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.3 V/m; Power Drift = 0.028 dB
Peak SAR (extrapolated) = 28.4 W/kg
SAR(1 g) = 13.5 mW/g; SAR(10 g) = 6.3 mW/g
Maximum value of SAR (measured) = 16.3 mW/g



0 dB = 16.3mW/g

Impedance Measurement Plot for Head TSL



Appendix D
Test System Verification Scans

Dipole validation scans from SPEAG using head tissue equivalent medium are provided in APPENDIX C. G&PS' 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, a probe rotation was performed using the "Rotation (1D)" function in the DASY software with a measured isotropy tolerance of +/- 0.5dB.
The results obtained from each probe were then averaged together to determine the new measured SAR target.

Motorola Government & Public Safety EME Laboratory

Date/Time: 1/20/2009 9:35:28 AM

Robot# / Run#: DASY4-FL-1 / JsT-SYSP-900H-090120-01
Phantom# / Tissue Temp.: SAMTP1022 / 21.7 (C)
Dipole Model# / Serial#: D900V2 / 084
TX Freq. / Start power: 900 (MHz) / 250 (mW)

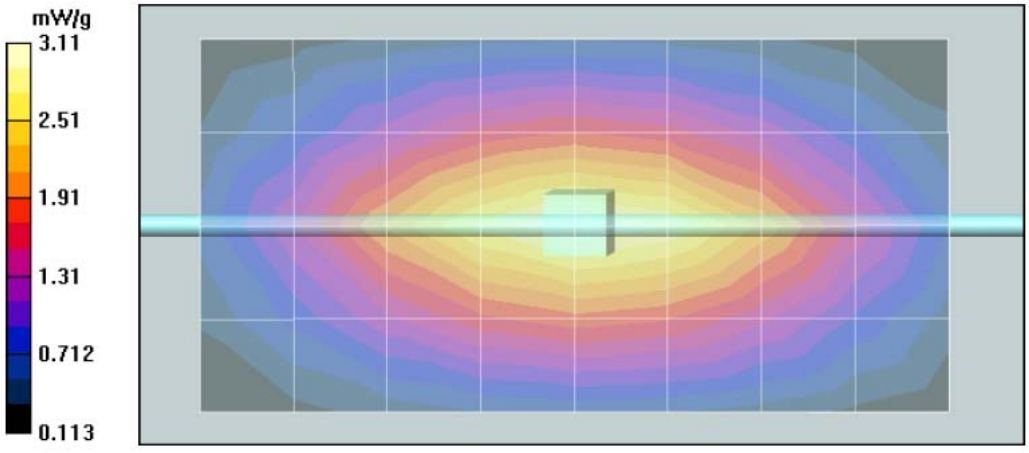
Target:	11.27 mW/g	(1g)
Calculated:	11.44 mW/g	(1g)
Percent from Target (+/-):	1.5 %	(1g)
Rotation (1D):	0.056 dB	

Probe: ET3DV6R - SN1545, Calibrated: 7/21/2008, ConvF(5.79, 5.79, 5.79)
Electronics: DAE3 Sn363, Calibrated: 4/22/2008
Duty Cycle: 1:1, Medium parameters used: f = 900 MHz; σ = 0.98 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 59.3 V/m; Power Drift = -0.00573 dB
Peak SAR (extrapolated) = 4.10 W/kg
SAR(1 g) = 2.86 mW/g; SAR(10 g) = 1.85 mW/g
Maximum value of SAR (measured) = 3.13 mW/g

System Performance Check/Dipole Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.11 mW/g

System Performance Check/Z-Axis Retraction (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm
Maximum value of SAR (measured) = 3.12 mW/g



Motorola Government & Public Safety EME Laboratory

Date/Time: 1/21/2009 6:27:32 AM

Robot# / Run#: DASY4-FL-1 / ErC-SYSP-900H-090121-01
Phantom# / Tissue Temp.: SAMTP1022 / 21.3 (C)
Dipole Model# / Serial#: D900V2 / 084
TX Freq. / Start power: 900 (MHz) / 250 (mW)

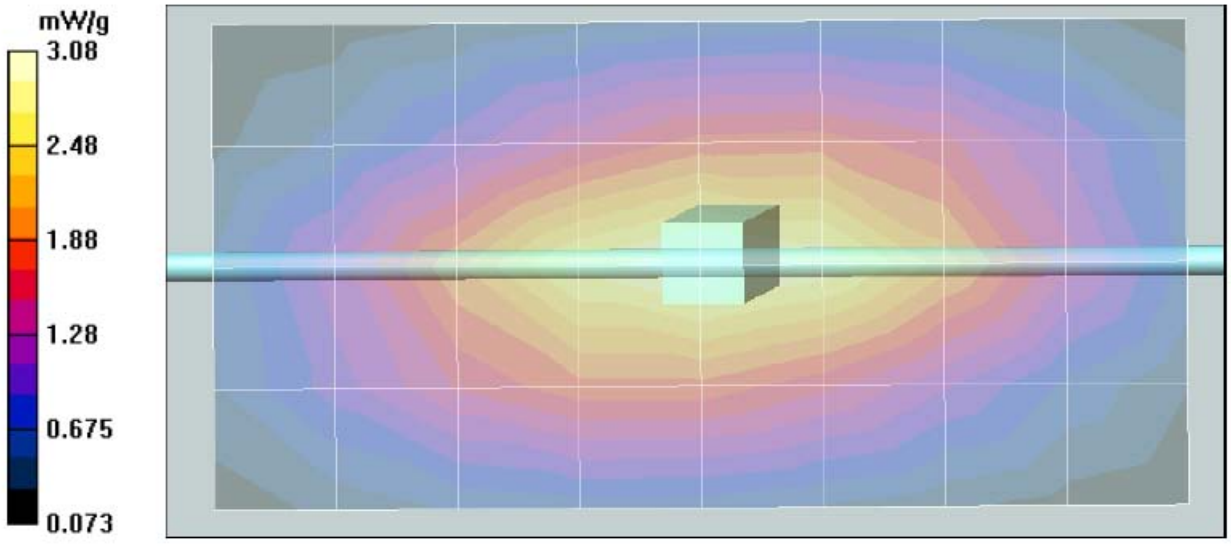
Target: 11.27 mW/g (1g)
Calculated: 11.44 mW/g (1g)
Percent from Target (+/-): 1.5 % (1g)
Rotation (1D): 0.074 dB

Probe: ET3DV6R - SN1545, Calibrated: 7/21/2008, ConvF(5.79, 5.79, 5.79)
Electronics: DAE3 Sn363, Calibrated: 4/22/2008
Duty Cycle: 1:1, Medium parameters used: f = 900 MHz; σ = 0.98 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 59.1 V/m; Power Drift = -0.0396 dB
Peak SAR (extrapolated) = 4.02 W/kg
SAR(1 g) = 2.82 mW/g; SAR(10 g) = 1.83 mW/g
Maximum value of SAR (measured) = 3.07 mW/g

System Performance Check/Dipole Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.08 mW/g

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



Motorola Government & Public Safety EME Laboratory

Date/Time: 1/22/2009 6:38:20 AM

Robot# / Run#: DASY4-FL-1 / JsT-SYSP-900B-090122-01
Phantom# / Tissue Temp.: OVAL1016 / 21.2 (C)
Dipole Model# / Serial#: D900V2 / 084
TX Freq. / Start power: 900 (MHz) / 250 (mW)

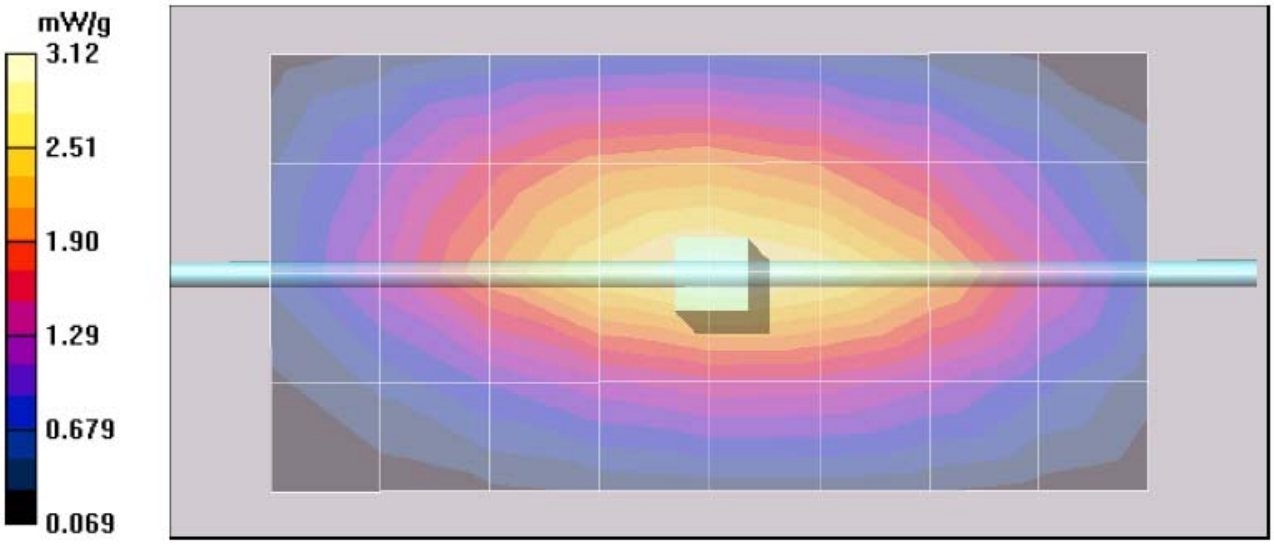
Target:	11.75 mW/g	(1g)
Calculated:	11.68 mW/g	(1g)
Percent from Target (+/-):	0.6 %	(1g)
Rotation (1D):	0.052 dB	

Probe: ET3DV6R - SN1545, Calibrated: 7/21/2008, ConvF(5.58, 5.58, 5.58)
Electronics: DAE3 Sn363, Calibrated: 4/22/2008
Duty Cycle: 1:1, Medium parameters used: f = 900 MHz; σ = 1.08 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 56.5 V/m; Power Drift = 0.00172 dB
Peak SAR (extrapolated) = 4.16 W/kg
SAR(1 g) = 2.92 mW/g; SAR(10 g) = 1.89 mW/g
Maximum value of SAR (measured) = 3.18 mW/g

System Performance Check/Dipole Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.12 mW/g

System Performance Check/Z-Axis Retraction (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm
Maximum value of SAR (measured) = 3.19 mW/g



Motorola Government & Public Safety EME Laboratory

Date/Time: 1/23/2009 7:36:57 AM

Robot# / Run#: DASY4-FL-1 / ErC-SYSP-900B-090123-01
Phantom# / Tissue Temp.: OVAL1016 / 21.1 (C)
Dipole Model# / Serial#: D900V2 / 084
TX Freq. / Start power: 900 (MHz) / 250 (mW)

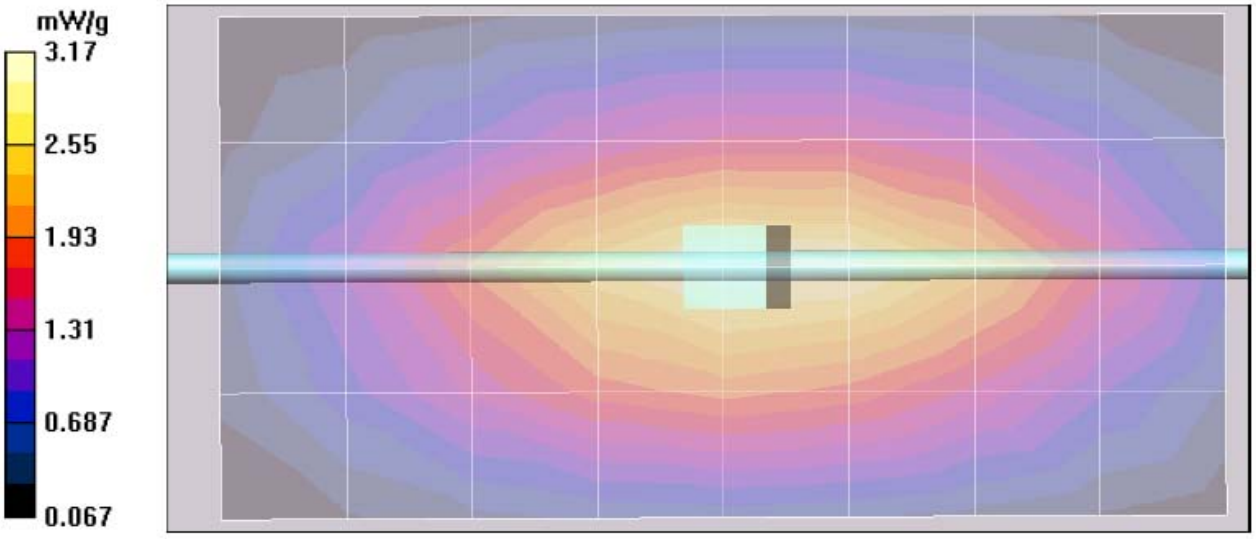
Target: 11.75 mW/g (1g)
Calculated: 11.68 mW/g (1g)
Percent from Target (+/-): 0.6 % (1g)
Rotation (1D): 0.075 dB

Probe: ET3DV6R - SN1545, Calibrated: 7/21/2008, ConvF(5.58, 5.58, 5.58)
Electronics: DAE3 Sn363, Calibrated: 4/22/2008
Duty Cycle: 1:1, Medium parameters used: f = 900 MHz; σ = 1.08 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 56.6 V/m; Power Drift = -0.0584 dB
Peak SAR (extrapolated) = 4.14 W/kg
SAR(1 g) = 2.92 mW/g; SAR(10 g) = 1.9 mW/g
Maximum value of SAR (measured) = 3.18 mW/g

System Performance Check/Dipole Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.17 mW/g

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



Motorola Government & Public Safety EME Laboratory

Date/Time: 1/28/2009 4:51:04 PM

Robot# / Run#: DASY4-FL-1 / MeC-SYSP-900B-090128-01
Phantom# / Tissue Temp.: OVAL1016 / 21.4 (C)
Dipole Model# / Serial#: D900V2 / 084
TX Freq. / Start power: 900 (MHz) / 250 (mW)

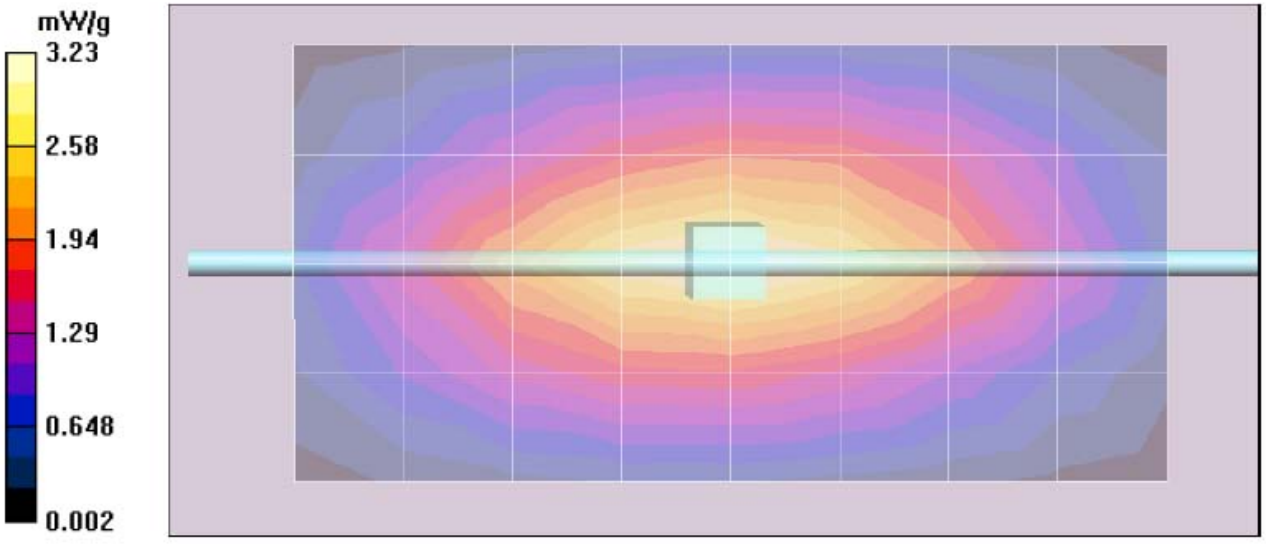
Target: 11.75 mW/g (1g)
Calculated: 11.92 mW/g (1g)
Percent from Target (+/-): 1.4 % (1g)
Rotation (1D): 0.062 dB

Probe: ET3DV6R - SN1545, Calibrated: 7/21/2008, ConvF(5.58, 5.58, 5.58)
Electronics: DAE3 Sn363, Calibrated: 4/22/2008
Duty Cycle: 1:1, Medium parameters used: f = 900 MHz; σ = 1.08 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 57.6 V/m; Power Drift = -0.0154 dB
Peak SAR (extrapolated) = 4.25 W/kg
SAR(1 g) = 2.98 mW/g; SAR(10 g) = 1.94 mW/g
Maximum value of SAR (measured) = 3.25 mW/g

System Performance Check/Dipole Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 57.6 V/m; Power Drift = -0.0154 dB
Motorola Fast SAR: SAR(1 g) = 3.03 mW/g; SAR(10 g) = 2.02 mW/g
Maximum value of SAR (interpolated) = 3.26 mW/g

System Performance Check/Z-Axis Retraction (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm
Maximum value of SAR (measured) = 3.23 mW/g



Motorola Government & Public Safety EME Laboratory

Date/Time: 1/30/2009 3:38:55 PM

Robot# / Run#: DASY4-FL-1 / MeC-SYSP-2450B-090130-01
Phantom# / Tissue Temp.: SAMTP1208 / 21.4 (C)
Dipole Model# / Serial#: D2450V2 / 704
TX Freq. / Start power: 2450 (MHz) / 250 (mW)

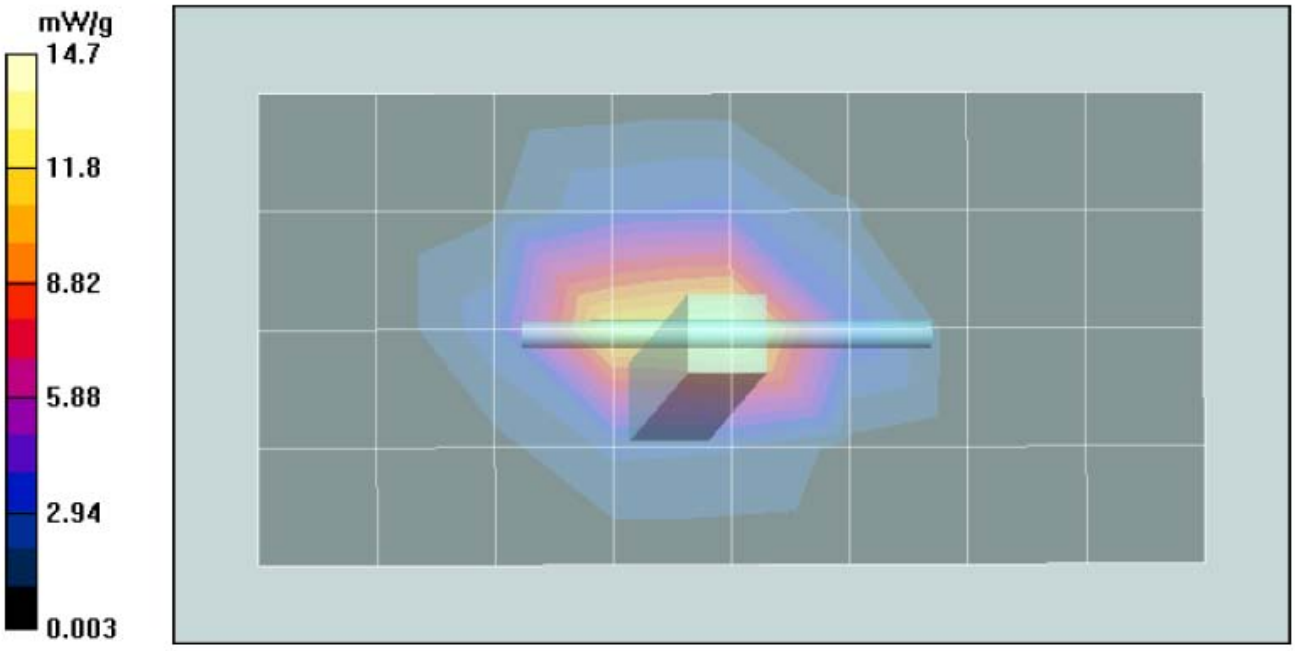
Target: 56.93 mW/g (1g)
Calculated: 54.40 mW/g (1g)
Percent from Target (+/-): 4.4 % (1g)
Rotation (1D): 0.11 dB

Probe: ET3DV6R - SN1545, Calibrated: 7/21/2008, ConvF(3.7, 3.7, 3.7)
Electronics: DAE3 Sn363, Calibrated: 4/22/2008
Duty Cycle: 1:1, Medium parameters used: f = 2450 MHz; σ = 2.03 mho/m; ε_r = 50.6; ρ = 1000 kg/m^3

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 80.8 V/m; Power Drift = 0.142 dB
Peak SAR (extrapolated) = 35.7 W/kg
SAR(1 g) = 13.6 mW/g; SAR(10 g) = 6.03 mW/g
Maximum value of SAR (measured) = 14.7 mW/g

System Performance Check/Dipole Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 80.8 V/m; Power Drift = 0.142 dB
Motorola Fast SAR: SAR(1 g) = 13 mW/g; SAR(10 g) = 5.41 mW/g
Maximum value of SAR (interpolated) = 16.4 mW/g

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



DIPOLE SAR TARGET - BODY

Date:	03/28/08	Frequency (MHz):	900
Lab Location:	(FL08/PG)-G&PS	Mixture Type:	FCC Body
DAE Serial #:	374	Ambient Temp.(°C):	22.1

Tissue Characteristics

Permitivity:	53.1	Phantom Type/SN:	80302002D-S15
Conductivity:	1.05	Distance (mm):	15
Tissue Temp.(°C):	20.2		

Reference Source:	Dipole	Power to Dipole:	250 mW
Reference SN:	84		

New Target:

Average Measured SAR Value: **11.75** mW/g(1g avg.),

Probe SN #s	1-G Cube	Diff from Ave	Robot
1547	11.64	-1.0%	R3
1393	11.70	-0.5%	R3
1383	11.92	1.4%	R3
		-100.0%	
		-100.0%	
Average	**11.7533**	New Measured SAR Value	

(normalized to 1.0 W)

Test performed by: **Gene Von Holten** Initial: HvH

Motorola Internal Use Only FCD-0733 Rev. 4

DIPOLE SAR TARGET - HEAD

Date:	03/28/08	Frequency (MHz):	900
Lab Location:	(FL08/PG)-G&PS	Mixture Type:	IEEE Head
DAE Serial #:	374	Ambient Temp.(°C):	21.8

Tissue Characteristics

Permitivity:	42.6	Phantom Type/SN:	80302002C-S9
Conductivity:	1.01	Distance (mm):	15
Tissue Temp.(°C):	20.1		

Reference Source:	Dipole	Power to Dipole:	250 mW
Reference SN:	84		

Target SAR Value: 10.8 mW/g (1g avg.), Difference from Target 4.32% (1g avg.)
(normalized to 1.0 W)

New Target:

Average Measured SAR Value: 11.27 mW/g (1g avg.), Passes K=2

Percent Difference From Target (MUST be within k=2 Uncertainty):

Probe SN #s	1-G Cube	Diff from Ave	Robot
1383	11.52	#DIV/0!	R3
1393	11.32	#DIV/0!	R3
1547	10.96	#DIV/0!	R3
		#DIV/0!	
		#DIV/0!	
Average	11.2667	New Measured SAR Value	

(normalized to 1.0 W)

Test performed by: Gene Von Holten Initial: HvH

Motorola Internal Use Only FCD-0733 Rev. 4

DIPOLE SAR TARGET - BODY

Date:	**12/23/08**	Frequency (MHz):	**2450**
Lab Location:	(FL08)-G&PS	Mixture Type:	**Body**
DAE Serial #:	850	Ambient Temp.(°C):	21.9

Tissue Characteristics

Permitivity:	50.8	Phantom Type/SN:	OVAL1018
Conductivity:	2.02	Distance (mm):	10
Tissue Temp.(°C):			

Reference Source:	Dipole	Power to Dipole:	100 mW
Reference SN:	**704**		

New Target:

Average Measured SAR Value: **56.93** mW/g(1g avg.),

Probe SN #s	1-G Cube	Diff from Ave	Robot
1545	58.50	2.8%	R2
1393	55.50	-2.5%	R2
1547	56.80	-0.2%	R2
		-100.0%	
		-100.0%	
Average	**56.9333**	New Measured SAR Value	

(normalized to 1.0 W)

Test performed by: **Ed Church** Initial: E, C

Motorola Internal Use Only FCD-0733 Rev. 5

DIPOLE SAR TARGET - HEAD

Date:	**12/23/08**	Frequency (MHz):	**2450**
Lab Location:	(FL08)-G&PS	Mixture Type:	**IEEE Head**
DAE Serial #:	850	Ambient Temp.(°C):	21.6
Tissue Characteristics			
Permitivity:	37.9	Phantom Type/SN:	SAMTP1208
Conductivity:	1.85	Distance (mm):	10
Tissue Temp.(°C):			
Reference Source:	Dipole	Power to Dipole:	100 mW
Reference SN:	**704**		

Target 1g-SAR Value (mW/g, normalized to 1.0 W): **52.4**

Difference from Target: **8.40%** **(1g-SAR)**

New Target:

Average 1g-SAR Value (mW/g):	**56.80**

Passes K=2

Percent Difference From Target (MUST be within k=2 Uncertainty):

Probe SN #s	1g-SAR (Cube)	Diff from Ave	Robot
1547	57.20	0.7%	R2
1393	55.50	-2.3%	R2
1545	57.70	1.6%	R2
		#DIV/0!	
		#DIV/0!	
Average	**56.8000**	New Measured SAR Value	

(normalized to 1.0 W)

Test performed by: **Ed Church** Initial: _____

Motorola Internal Use Only FCD-0733 Rev. 5