Certificate Number: 1449-02

ACCREDITED

MOTOROLA

CGISS EME Test Laboratory
8000 West Sunrise Blvd
Fort Lauderdale, FL. 33322

S.A.R. EME Compliance Test Report

Attention:	FCC
Date of Report:	September 11, 2002
Report Revision:	Rev. O
Manufacturer:	Motorola
Product Description:	Portable 146-174MHz 1-5W 16 Channel
FCC ID:	**ABZ99FT3045**
Device Model:	AAH50KDC9AA2AN

Test Period:	8/12/02 – 9/6/02
Test Engineer:	Stephen Whalen Sr. Test Engineer
Author:	Michael Sailsman EME Regulatory Affairs Liaison

Note: 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.

/s/ Ken Enger — *9/13/02*

Ken Enger
Senior Resource Manager, Laboratory Director, CGISS EME Lab

Date Approved

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REVISION HISTORY

Date	Revision	Comments
9/11/02	O	Initial release Prototype results

1.0 Introduction

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (S.A.R.) measurements performed at the CGISS EME Test Lab for model number AAH50KDC9AA2AN, FCC ID: ABZ99FT3045.

The applicable exposure environment is Occupational/Controlled.

The test results included herein represent the highest S.A.R. levels applicable to this product and clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of 8.0 mW/g per the requirements of 47 CFR 2.1093(d).

2.0 Reference Standards and Guidelines

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

- United States Federal Communications Commission, Code of Federal Regulations; 47CFR part 2 sub-part J
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Terminal frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz, 1999
- Australian Communications Authority Terminal communications (Electromagnetic Radiation - Human Exposure) Standard 2001
- ANATEL, Brazil Regulatory Authority, Resolution 256 (April 11, 2001) "additional requirements for SMR, cellular and PCS product certification."

3.0 Description of Test Sample

The portable handheld transceiver, FCC ID: ABZ99FT3045, operates using frequency modulation (FM) and incorporates traditional simplex two-way radio transmission protocol. This product is intended for land mobile business users. The intended operating positions are “at the face” with the microphone 1 to 2 inches from the mouth, and “at the abdomen” by means of the offered body-worn accessories. Audio and PTT operation while the radio is at the abdomen is accomplished by means of optional remote accessories that connect to the radio.

FCC ID: ABZ99FT3045 is capable of operating in the 146-174 MHz band. The rated power is 1-5 watts with a maximum output capability of 5.8 watts as defined by the upper limit of the production line final test station.

FCC ID: ABZ99FT3045 is offered with the following options and accessories:

Antenna

NAD6502AR	Heliflex	146-174MHz ¼ wave; -8.0 dBi
HAD9742A	Stubby	146-162MHz ¼ wave; -11dBi
HAD9743A	Stubby	162-174MHz ¼ wave; -11dBi

Batteries

NNTN4497AR	Lithium Ion Battery 1800 mAh
NNTN4496AR	NiCd Battery 1100 mAh

Body-worn Accessories

HLN6602A	Universal Chest Pack
1505596Z02	Replacement Strap for HLN6602 Universal Chest Pack
RLN4570A	Break-A-Way Chest Pack
RLN4815A	Universal Radio Pak
4280384F89	Replacement Belt Lengthener for RLN4815
NTN5243A	Shoulder Carry Strap, attaches to D-Shaped Rings on Carry Case
PMLN4124A	2.5 inch Spring Belt Clip
HLN8255B	3 inch Spring Action Belt Clip
HLN9701B	Nylon Carry Case with Belt Loop and D-Shaped Rings
RLN5383A	Leather Carry Case with Belt Loop and D-Shaped Rings
RLN5384A	Leather Carry Case with High Activity 2.5" Swivel Belt Loop
RLN5385A	Leather Carry Case with High Activity 3" Swivel Belt Loop

Other attachments

HMN9030A	Remote Speaker Microphone
HMN9727B	Earpiece without Volume Control - 1 Wire (Beige)
RLN4894A	Earpiece without Volume Control – 1 wire (Black)
HMN9752B	Earpiece with Volume Control - 1 Wire (Beige)
HMN9754D	Earpiece with Microphone & PTT Combined - 2 Wire (Beige)
RLN4895A	Earpiece with Microphone & PTT Combined – 2 Wire (Black)
HMN9036A	Earbud with Microphone & PTT Combined
HLN9132A	Earbud Single Wire Receive Only
RLN5198AP	2 Wire Surveillance Kit w/ Clear Comfortable Acoustic Tube Included (includes HMN9754 and NTN8371)
BDN6720A	Flexible Ear Receiver
PMMN4001A	Ultra-Lite Earset with Mic and PTT
HMN9013A	Lightweight Headset
RMN4016A	Lightweight Headset with In-Line PTT
RLN5238A	Lightweight Headset with In-Line PTT, NFL style
HMN9021A	Medium Weight Over-The-Head Dual Muff Headset

HMN9022A	Medium Weight Behind-The-Head Dual Muff Headset
BDN6647F	Medium Weight Single Speaker Headset
BDN6648C	Heavy Duty, Dual Muff Headset with Noise Canceling Mic
RMN5015A	Heavy Duty, Dual Muff, Racing Headset (requires RKN4090 Headset Adapter Cable)
RKN4090A	In-Line PTT Adapter (Use with RMN5015)
RLN5411A	Ultra-Lite Breeze Behind the Head Headset

3.1 Test Signal

Test Signal mode:

Test Mode	X	Base Station		Simulator	

Transmission Mode:

CW	**X**
Native Transmission	
TDM:	
Other	

3.2 Test Output Power

Output power was measured before and after each test. A characteristic power slump table is provided in Appendix A for the battery producing the highest S.A.R. results. Appendix A also presents a shortened S.A.R. cube scan performed with the highest S.A.R. producing configuration to assess the validity of the calculated results presented herein.
Note that the results of the shortened cube scans presented in Appendix A demonstrate that the scaling methodology used to determine the calculated S.A.R. results presented herein are valid.

4.0 Description of Test Equipment

4.1 Descriptions of S.A.R. Measurement System

The laboratory utilizes a Dosimetric Assessment System (DASY3™) S.A.R. measurement system manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot with an ET3DV6 E-Field probe. Please reference the following websites for detailed specifications of the robot and E-Field probe: http://www.speag.com/robot_acc.html, http://www.speag.com/probes.html.
The S.A.R. measurements were conducted with probe model/serial number ET3DV6/SN1547. The system performance check was conducted daily and within 24 hours prior to testing. DASY output files of the system performance test results and the probe/dipole calibration certificates are included in appendices C and D respectively. The table below summarizes the system performance check results normalized to 1W.

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	System Perf. Result when normalized to 1W (mW/g)	Reference S.A.R @ 1W (mW/g)	Test Date
1547	FCC Body	11/16/01	CGISS 300 /002	3.060 +/- 0.08	3.13 +/- 10%	8/12/02-9/4/02 (16 test days)
1547	IEEE Head	11/16/01	CGISS 300 /002	3.055 +/- 0.015	3.17+/- 10%	9/5/02, 9/6/02

The DASY3™ system is operated per the instructions in the DASY3™ Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess EME S.A.R. compliance was calibrated according to 17025 A2LA guidelines.

4.2 Description of Phantom

4.2.1 Flat Phantom

A rectangular shaped box made of high-density polyethylene (HDPE) with a dielectric constant of 2.26 and a loss tangent of less than 0.00031. The phantom is mounted on a wooden supporting structure that has a loss tangent of < 0.05. The structure has a 68.58 cm x 25.4 cm opening at its center to allow positioning the DUT to the phantom's surface. The supporting structure is assembled with wooden pegs and glue. The table below shows the flat phantom dimensions used for S.A.R. performance assessment.

Length	80cm
Width	60cm
Height	20cm
Surface Thickness	0.2cm

4.2.2 SAM Phantom

SAM Phantom assessment was not applicable for this filing.

4.3 Simulated Tissue Properties

4.3.1 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).

Simulated Tissue	Body Position
FCC Body	Abdomen
IEEE Head	Face

4.3.2 Simulated Tissue Composition

Tissue Ingredient (%) @ 300MHz		
	Head	**Body**
Sugar	56	47.1
DGBE (Glycol)	-	-
De ionized -Water	37.5	49.48
Salt	5.4	2.32
HEC	1.0	1.0
Bact.	0.1	0.1

Characterization of Simulated tissue materials and ambient conditions:

Simulated tissue prepared for S.A.R. measurements is measured daily and within 24 hours prior to actual S.A.R. 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 Agilent (HP) probe kit model 85070C and a HP8753D Network Analyzer.

Target tissue parameters

FCC Body				
Frequency (MHz)	**Di-electric Constant Target**	**Di-electric Constant Meas. (Range)**	**Conductivity Target S/m**	**Conductivity Meas. (Range) S/m**
300	58.2	55.3 - 56.4	0.92	0.88 - 0.92
160	61.6	59.0 - 60.5	0.81	0.78 - 0.81

IEEE Head				
Frequency (MHz)	**Di-electric Constant Target**	**Di-electric Constant Meas. (Range)**	**Conductivity Target S/m**	**Conductivity Meas. S/m**
300	45.3	46.1 - 46.4	0.87	0.84
160	51.8	52.7 – 52.9	0.77	0.74

4.4 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. 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 S.A.R. tests reported herein:

	Target	Measured
Ambient Temperature	20 - 25 ˚C	Range: 21.3 - 25.7˚C Avg. 22.6 ˚C
Relative Humidity	30 - 70 %	Range: 44.7 - 56.0% Avg. 48.7%
Tissue Temperature	NA	Range: 20.0 - 21.9˚C Avg. 21.21˚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 S.A.R scans are repeated. However, the lab environment is sufficiently protected such that no S.A.R. impacting interference has been experienced to date.

5.0 Description of Test Procedure

All options and accessories listed in section 3.0 were considered in order to develop the S.A.R. test plan for this product. S.A.R. measurements were performed using a flat phantom to assess performance at the abdomen and face. All assessments were done using the flat phantom with the DUT in CW mode.

To determine the antenna and battery that exhibited the highest S.A.R. results at the abdomen, each of the offered batteries and antennas were tested at the center of the respective antenna transmit band. The measurements were performed with the carry case that provided the minimum separation distance from the phantom and offered the best positioning repeatability. The standard remote speaker microphone (RSM) was also included in this assessment.

Using the battery that produced the highest S.A.R. results from above, the DUT was assessed at the center of the transmit band of each respective antenna along with the applicable carry case accessories as well as with the standard RSM. The DUT was assessed at the band edges of each respective antenna using the configuration that produced the highest S.A.R. results from the center of the band assessment.

The DUT was assessed at the abdomen with the applicable offered audio accessories using the configuration from above that produced the highest S.A.R. results.

The back and front of the DUT was assessed at 2.5 cm separation distance from the flat phantom using the antenna and battery that produced the highest S.A.R. from above along with RMN4016A audio headset.

The DUT was assessed at the face with the offered batteries and antennas at the center of the transmit band of each respective antenna. Band edge assessments at the face were performed using the battery that produced the highest S.A.R. results for each respective antenna.

5.1 Device Test Positions

Reference figure 1 for the device orientation and position which exhibited the highest S.A.R. performance.

5.1.1 Abdomen

The DUT was positioned such that it was centered against the flat phantom with the applicable body-worn accessories or with 2.5cm separation distance from the phantom.

5.1.2 Head

Assessments at the head was not applicable for this filing

5.1.3 Face

The DUT was positioned with 2.5cm separation distance from the center of the flat phantom.

5.2 Test Position Photographs

Figure 1: Highest S.A.R. Test Position
(DUT with Universal Chest Pack model HLN6602A
and attached headset model RMN4016A against the flat phantom)

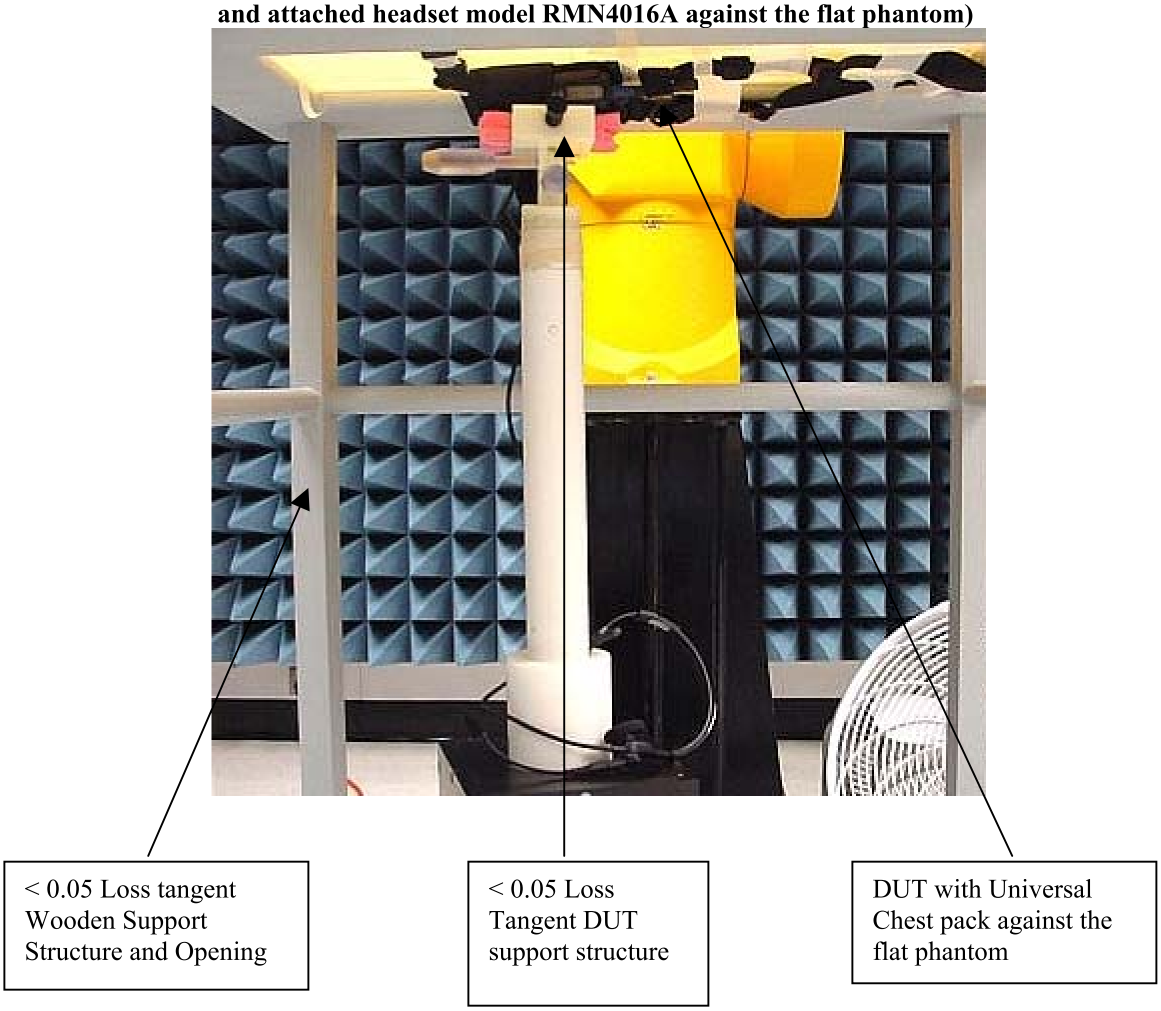


Figure 2. Assessment @ the face; DUT 2.5cm separation distance

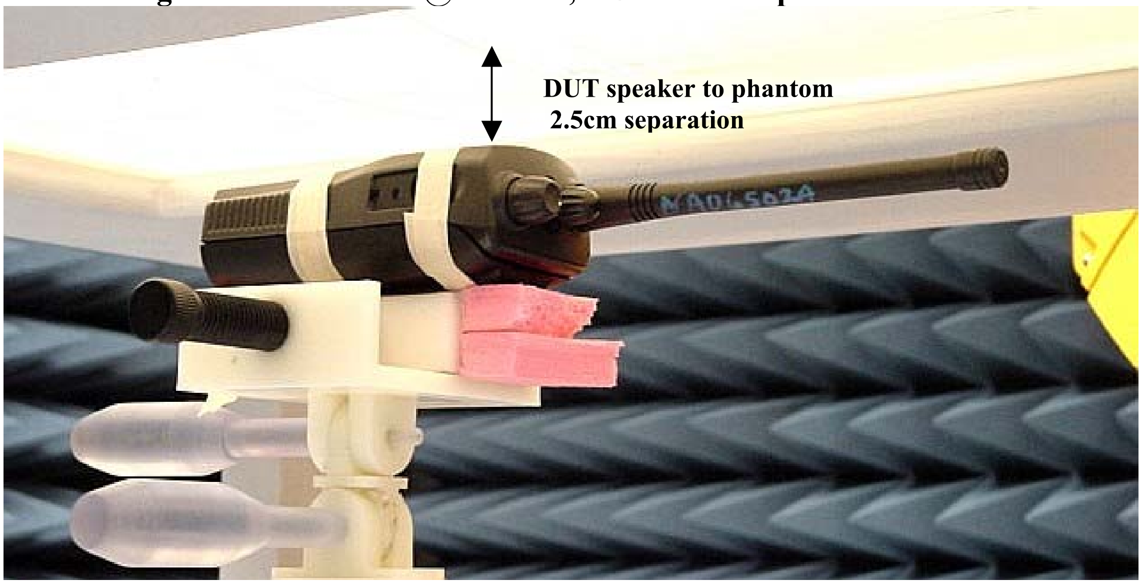


Figure 3. Assessment @ the Abdomen; DUT 2.5cm separation distance
With attached RMN4016A Headset

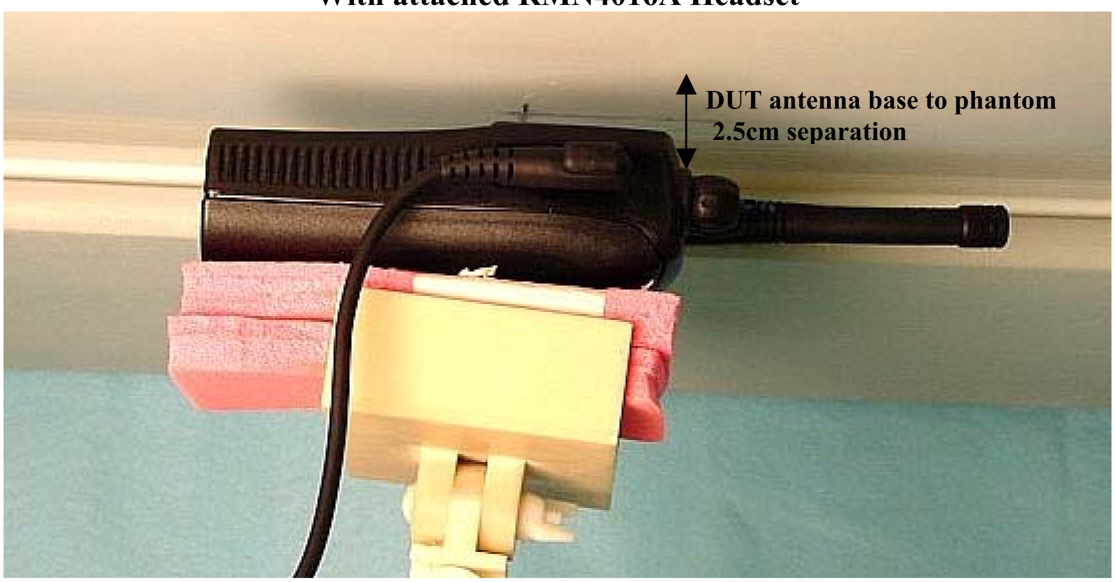
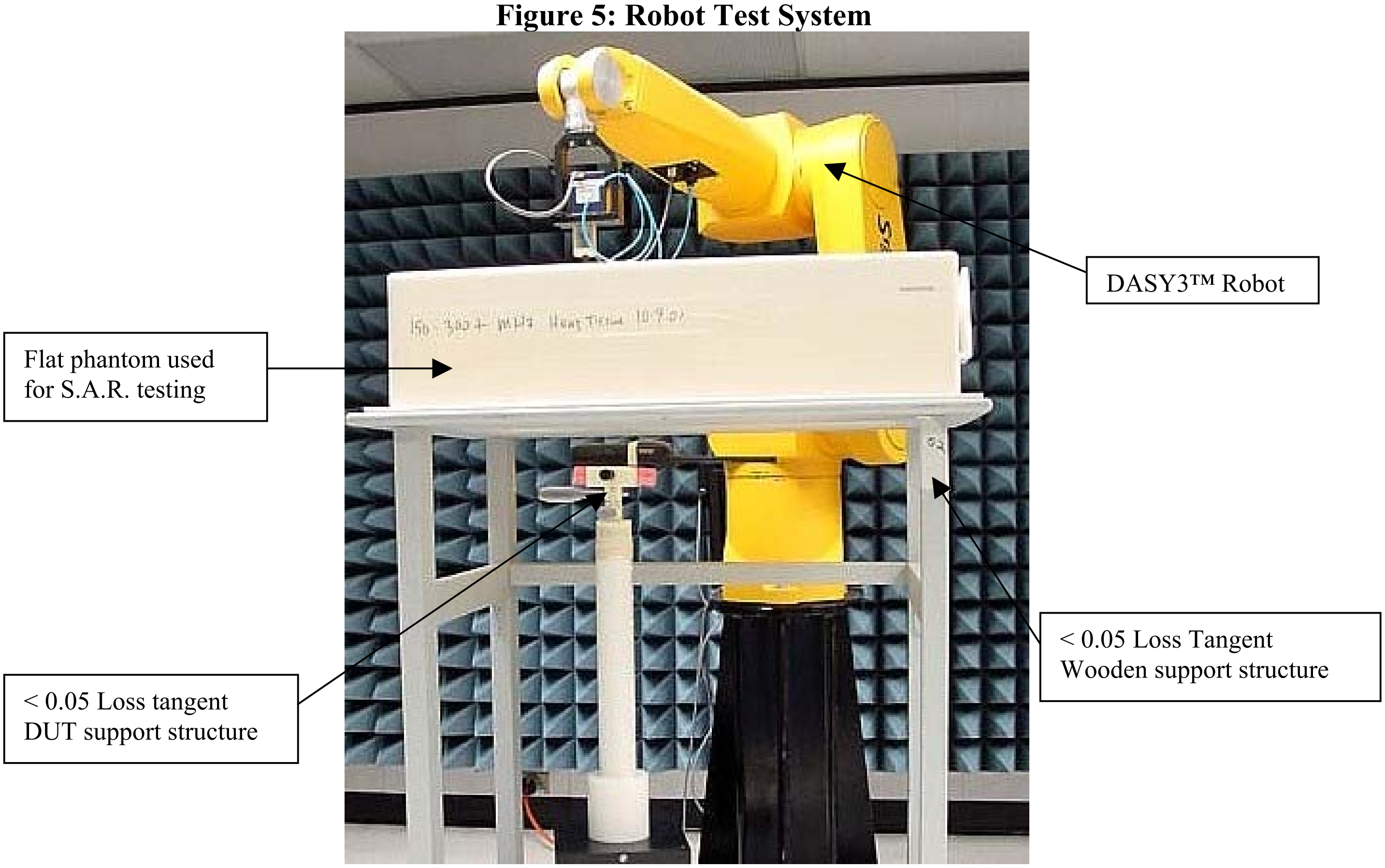


Figure 4. Assessment @ Abdomen; DUT w/ carry case model RLN5383A, NTN5243A, NAD6502A, and HMN9030A against the flat phantom

Figure 5: Robot Test System



5.3 Probe Scan Procedures

The E-field probe is first scanned in a coarse grid over a large area inside the phantom in order to locate the interpolated maximum S.A.R. 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.

6.0 Measurement Uncertainty

Table 1: Uncertainty Budget for Device Under Test

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**Section of IEEE P1528**	**Tol. (± %)**	**Prob. Dist.**	**Divisor**	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	4.8	N	1.00	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	5.8	R	1.73	1	1	3.3	3.3	∞
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	1.0	N	1.00	1	1	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	∞
Integration Time	E.2.8	1.3	R	1.73	1	1	0.8	0.8	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.3	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	1.1	R	1.73	1	1	0.6	0.6	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.6	N	1.00	1	1	3.6	3.6	29
Device Holder Uncertainty	E.4.1	2.8	N	1.00	1	1	2.8	2.8	8
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	10.0	R	1.73	0.64	0.43	3.7	2.5	∞
Liquid Permittivity - deviation from target values	E.3.2	10.0	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity - measurement uncertainty	E.3.3	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Combined Standard Uncertainty			RSS				11.72	11.09	1363
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				22.98	21.75	

Table 2: Uncertainty Budget for System Performance Check

a	*b*	*c*	*d*	*e* = *f(d,k)*	*f*	*g*	*h* = *c x f / e*	*i* = *c x g / e*	*k*
Uncertainty Component	**Section of IEEE P1528**	**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	4.8	N	1.00	1	1	4.8	4.8	∞
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	5.8	R	1.73	1	1	3.3	3.3	∞
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	1.0	N	1.00	1	1	1.0	1.0	∞
Response Time	E.2.7	0.0	R	1.73	1	1	0.0	0.0	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.3	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	1.1	R	1.73	1	1	0.6	0.6	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	1.0	R	1.73	1	1	0.6	0.6	∞
Input Power and SAR Drift Measurement	8, 6.6.2	4.7	R	1.73	1	1	2.7	2.7	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	10.0	R	1.73	0.64	0.43	3.7	2.5	∞
Liquid Permittivity - deviation from target values	E.3.2	10.0	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity - measurement uncertainty	E.3.3	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Combined Standard Uncertainty			RSS				10.16	9.43	∞
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				19.92	18.48	

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.

7.0 S.A.R. Test Results

All S.A.R. results obtained by the tests described in Section 5.0 are listed in section 7.1 below. The bolded result indicates the highest observed S.A.R. performance. DASY3™ S.A.R. measurement scans are provided in APPENDIX B for the highest observed S.A.R.

7.1 S.A.R. results

Compliance assessment at the abdomen CW mode										
Run Number/ SN	**Freq. (MHz)**	**Antenna**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (mW)**	**End Power (mW)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**
Search for highest S.A.R. producing Battery /Antenna										
Ab-R1-020814-05/ VP2BA10	160	NAD6502AR	NNTN4496AR	Against	HLN8255B belt clip	HMN9030A RSM	6.00	4.45	1.13	0.74
Ab-R1-020813-04/ VP2BA10	160	NAD6502AR	NNTN4497AR	Against	HLN8255B belt clip	HMN9030A RSM	6.08	4.48	1.04	0.62
Ab-R1-020815-02/ VP2BA10	154	HAD9742A	NNTN4497AR	Against	HLN8255B belt clip	HMN9030A RSM	6.03	5.20	0.22	0.12
Ab-R1-020815-03/ VP2BA10	154	HAD9742A	NNTN4496AR	Against	HLN8255B belt clip	HMN9030A RSM	6.06	4.56	0.24	0.15
Ab-R1-020815-04/ VP2BA10	168	HAD9743A	NNTN4497AR	Against	HLN8255B belt clip	HMN9030A RSM	6.03	5.25	0.67	0.37
Ab-R1-020815-05/ VP2BA10	168	HAD9743A	NNTN4496AR	Against	HLN8255B belt clip	HMN9030A RSM	6.02	5.00	0.65	0.38
Assessment of Carry case Accessories w/ NAD6502AR antenna										
Ab-R1-020826-02/ VP2BA10	160	NAD6502AR	NNTN4496AR	Against	PMLN4124A beltclip	HMN9030A RSM	6.06	4.39	1.26	0.83
Ab-R1-020815-07/ VP2BA10	160	NAD6502AR	NNTN4496AR	Against	HLN9701B nylon	HMN9030A RSM	6.08	4.50	0.83	0.53
Ab-R1-020816-02/ VP2BA10	160	NAD6502AR	NNTN4496AR	Against	RLN5383A leather	HMN9030A RSM	6.06	4.18	1.23	0.85
Ab-R1-020816-03/ VP2BA10	160	NAD6502AR	NNTN4496AR	Against	RLN5385A leather	HMN9030A RSM	6.05	4.57	0.51	0.32
Ab-R1-020816-04/ VP2BA10	160	NAD6502AR	NNTN4496AR	Against	NTN5243A RLN5383A	HMN9030A RSM	6.08	4.52	1.12	0.72
Ab-R1-020821-05/ VP2BA10	160	NAD6502AR	NNTN4496AR	Against	RLN4815A radio pak	HMN9030A RSM	6.06	4.82	0.84	0.51
Ab-R1-020827-06/ VP2BA10	160	NAD6502AR	NNTN4496AR	Against	HLN6602A chest pak	HMN9030A RSM	6.06	4.51	1.73	**1.11**
Ab-R1-020827-07/ VP2BA10	146	NAD6502AR	NNTN4496AR	Against	HLN6602A chest pak	HMN9030A RSM	5.82	4.95	1.66	0.97
Ab-R1-020827-08/ VP2BA10	174	NAD6502AR	NNTN4496AR	Against	HLN6602A chest pak	HMN9030A RSM	6.01	4.52	0.75	0.48
Assessment of Carry case Accessories w/ HAD9742A antenna										
Ab-R1-020816-05/ VP2BA10	154	HAD9742A	NNTN4496AR	Against	PMLN4124A beltclip	HMN9030A RSM	6.08	5.05	0.22	0.13

Ab-R1-020816-06/ VP2BA10	154	HAD9742A	NNTN4496AR	Against	HLN9701B nylon	HMN9030A RSM	6.06	4.97	0.18	0.11
Ab-R1-020816-07/ VP2BA10	154	HAD9742A	NNTN4496AR	Against	RLN5383A leather	HMN9030A RSM	6.07	4.99	0.21	0.12
Ab-R1-020816-08/ VP2BA10	154	HAD9742A	NNTN4496AR	Against	RLN5385A leather	HMN9030A RSM	6.07	4.79	0.28	0.17
Ab-R1-020819-02/ VP2BA10	154	HAD9742A	NNTN4496AR	Against	NTN5243A RLN5385A	HMN9030A RSM	6.08	4.75	0.25	0.15
Ab-R1-020821-04/ VP2BA10	154	HAD9742A	NNTN4496AR	Against	RLN4815A radio pak	HMN9030A RSM	6.00	4.85	0.16	0.09
Ab-R1-020826-05/ VP2BA10	154	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	HMN9030A RSM	6.07	5.05	0.30	0.17
Ab-R1-020826-06/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	HMN9030A RSM	5.79	5.13	2.89	**1.63**
Ab-R1-020826-07/ VP2BA10	162	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	HMN9030A RSM	6.08	5.02	0.32	0.19
Assessment of Carry case Accessories w/ HAD9743A antenna										
Ab-R1-020819-03/ VP2BA10	168	HAD9743A	NNTN4496AR	Against	PMLN4124A beltclip	HMN9030A RSM	6.02	5.08	0.64	0.36
Ab-R1-020819-04/ VP2BA10	168	HAD9743A	NNTN4496AR	Against	HLN9701B nylon	HMN9030A RSM	6.07	5.13	0.54	0.31
Ab-R1-020819-05/ VP2BA10	168	HAD9743A	NNTN4496AR	Against	RLN5383A leather	HMN9030A RSM	6.06	5.02	0.59	0.34
Ab-R1-020819-06/ VP2BA10	168	HAD9743A	NNTN4496AR	Against	RLN5385A leather	HMN9030A RSM	6.06	4.95	0.33	0.19
Ab-R1-020821-02/ VP2BA10	168	HAD9743A	NNTN4496AR	Against	NTN5243A RLN5383A	HMN9030A RSM	6.06	4.94	0.56	0.33
Ab-R1-020821-03/ VP2BA10	168	HAD9743A	NNTN4496AR	Against	RLN4815A radio pak	HMN9030A RSM	6.07	4.93	0.53	0.31
Ab-R1-020826-08/ VP2BA10	168	HAD9743A	NNTN4496AR	Against	HLN6602A chest pak	HMN9030A RSM	6.08	5.24	0.61	0.34
Ab-R1-020827-04/ VP2BA10	162	HAD9743A	NNTN4496AR	Against	HLN8255B beltclip	HMN9030A RSM	6.07	4.54	1.23	**0.79**
Ab-R1-020827-05/ VP2BA10	174	HAD9743A	NNTN4496AR	Against	HLN8255B beltclip	HMN9030A RSM	6.04	4.55	0.32	0.21
Assessment of applicable audio accessories										
Ab-R1-020830-10/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	HMN9754D ear piece	5.77	5.22	3.15	1.75
Ab-R1-020903-02/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	PMMN4001 A earset	5.84	5.28	2.86	1.57
Ab-R1-020903-03/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	BDN6647F headset	5.78	5.12	3.06	1.73
Ab-R1-020830-09/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	RMN5015A & RKN4090A	5.76	5.27	3.17	1.74
Ab-R1-020903-04/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	RLN5238A headset	5.78	5.18	2.95	1.65
Ab-R1-020829-04/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	HMN9013A headset	5.81	5.24	2.05	1.13

Ab-R1-020830-02/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	RLN5411A headset	5.83	5.35	1.12	0.61
Ab-R1-020830-03/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	RMN4016A headset	5.79	5.30	3.87	**2.12**
Ab-R1-020903-06/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	HMN9021A headset	5.78	5.23	3.23	1.79
Ab-R1-020830-05/ VP2BA10	146	HAD9742A	NNTN4496AR	Against	HLN6602A chest pak	BDN6648C headset	5.76	5.29	3.31	1.81
Assessment at 2.5 cm separation distance from phantom										
Ab-R1-020904-02/ VP2BA10	146	HAD9742A	NNTN4496AR	Back of radio w/ ant. 2.5cm	None	RMN4016A headset	5.82	5.16	1.39	0.78
Ab-R1-020904-03/ VP2BA10	146	HAD9742A	NNTN4496AR	Font of radio w/ ant. 2.5cm	None	RMN4016A headset	5.78	5.13	1.67	**0.94**

Compliance assessment at the Face (Flat phantom); CW mode										
Run Number/ SN	**Freq. (MHz)**	**Antenna**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (mW)**	**End Power (mW)**	**Measured 1g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. 50% DC (mW/g)**
Face-R1-020904-04/ VP2BA10	160	NAD6502AR	NNTN4497AR	2.5cm distance	None	None	6.04	4.97	1.42	0.83
Face-R1-020905-05/ VP2BA10	160	NAD6502AR	NNTN4496AR	2.5cm distance	None	None	5.96	4.53	1.45	**0.93**
Face-R1-020905-04/ VP2BA10	146	NAD6502AR	NNTN4496AR	2.5cm distance	None	None	5.72	5.07	0.68	0.39
Face-R1-020905-05/ VP2BA10	174	NAD6502AR	NNTN4496AR	2.5cm distance	None	None	5.92	5.09	0.73	0.41
Face-R1-020904-06/ VP2BA10	154	HAD9742A	NNTN4497AR	2.5cm distance	None	None	6.07	5.33	0.34	0.18
Face-R1-020904-07/ VP2BA10	154	HAD9742A	NNTN4496AR	2.5cm distance	None	None	6.04	5.05	0.33	0.19
Face-R1-020904-08/ VP2BA10	146	HAD9742A	NNTN4496AR	2.5cm distance	None	None	5.71	5.14	1.20	0.68
Face-R1-020904-09/ VP2BA10	162	HAD9742A	NNTN4496AR	2.5cm distance	None	None	5.92	4.79	0.23	0.14
Face-R1-020904-10/ VP2BA10	168	HAD9743A	NNTN4497AR	2.5cm distance	None	None	5.75	5.17	1.05	0.59
Face-R1-020904-11/ VP2BA10	168	HAD9743A	NNTN4496AR	2.5cm distance	None	None	5.98	4.89	0.98	0.58
Face-R1-020905-02/ VP2BA10	162	HAD9743A	NNTN4497AR	2.5cm distance	None	None	6.04	5.20	1.26	0.70
Face-R1-020905-03/ VP2BA10	174	HAD9743A	NNTN4497AR	2.5cm distance	None	None	5.74	5.18	0.48	0.27

7.2 Peak S.A.R. location

Refer to APPENDIX B for detailed S.A.R. scan distributions.

7.3 Highest S.A.R. results calculation methodology

The calculated maximum 1-gram averaged S.A.R. value is determined by scaling the measured S.A.R. to account for power leveling variations and power output slump below the reported maximum power during the S.A.R. measurements. For this device the Maximum Calculated 1-gram averaged peak S.A.R. is calculated using the following formula:

Max. Calc. 1-g Avg. SAR = (Pmax/Pint) x ((Pint/Pend) x DC % x S.A.R. meas.)
P_{max} = Maximum Power (W)
P_{int} = Initial Power (W)
P_{end} = End Power (W)
$SAR_{meas.}$ = Measured 1 gram averaged peak S.A.R. (mW/g)
DC % = Transmission mode duty cycle in % where applicable

Highest Max. Calc. 1-g Avg. SAR = (5.8/5.79) x ((5.79/5.30) x 0.50 x 3.87) = 2.12 mW/g

8.0 Conclusion

The highest Operational Maximum Calculated 1-gram average S.A.R. values found for FCC ID: ABZ99FT3045

At the abdomen: 2.12 mW/g
At the Face: 0.93 mW/g
At the Head: N/A

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

APPENDIX A

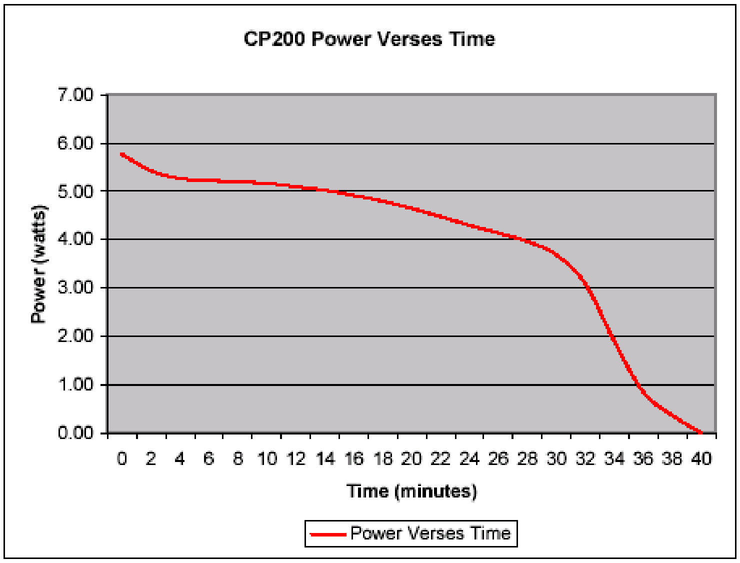
Power Slump Data/Shortened Scan

DUT Power versus time data

Start Date and Time:9/10/2002 9:29:27 AM
Stop Date and Time: 9/10/2002 10:09:31 AM

CP 200 power slump
NNTN4496AR

	Time	
9:29:30 AM	0	5.77
9:31:30 AM	2	5.43
9:33:30 AM	4	5.27
9:35:30 AM	6	5.23
9:37:30 AM	8	5.20
9:39:30 AM	10	5.17
9:41:30 AM	12	5.10
9:43:31 AM	14	5.03
9:45:31 AM	16	4.92
9:47:31 AM	18	4.80
9:49:31 AM	20	4.65
9:51:31 AM	22	4.48
9:53:31 AM	24	4.30
9:55:31 AM	26	4.14
9:57:31 AM	28	3.96
9:59:31 AM	30	3.69
10:01:31 AM	32	3.08
10:03:31 AM	34	1.89
10:05:31 AM	36	0.85
10:07:31 AM	38	0.37
10:09:31 AM	40	0.00



Shortened Scan Results

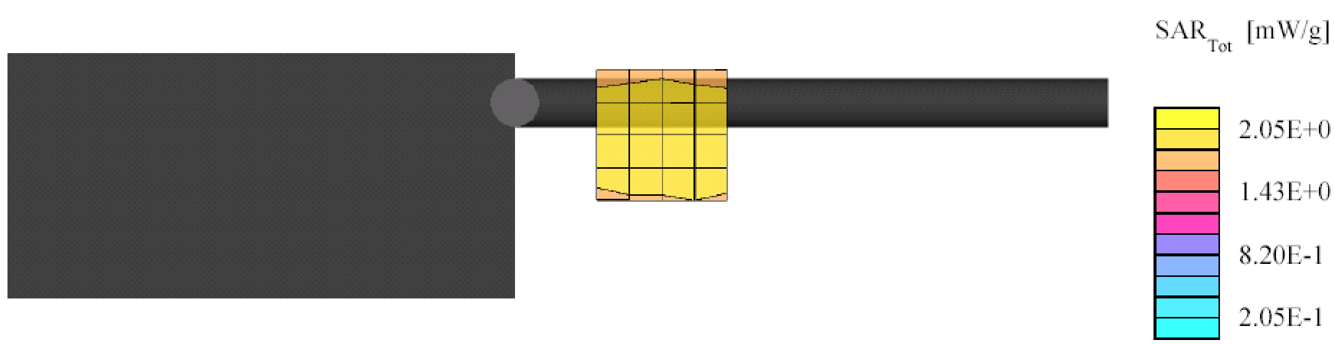
FCC ID: ABZ99FT3045; Test Date: 09/05/02
Motorola CGISS EME Laboratory

Run #: Face-R1-020906-02
Model #: AAH50KDC9AA2AN SN:VP2BA10
TX Freq: 160MHz
Sim Tissue Temp: 20.9 (Celsius)

- Accessories -
Antenna: NAD6502A
Battery Kit: NNTN4496A
Carry: radio @ 2.5cm
Audio Acc. None

Shortened scan reflect highest S.A.R. producing configuration at the face
Run time 6 minutes
Representative "normal" scan run time was 22 minutes (measured 1-g S.A.R. = 1.39mW/g); See pg. 29

Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1547; ConvF(8.60,8.60,8.60); Probe cal date: 11/16/01; Crest factor: 1.0; IEEE Head_160 MHz: σ = 0.74 mho/m ε = 52.7 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 1.47 mW/g, SAR (10g): 1.12 mW/g, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0;

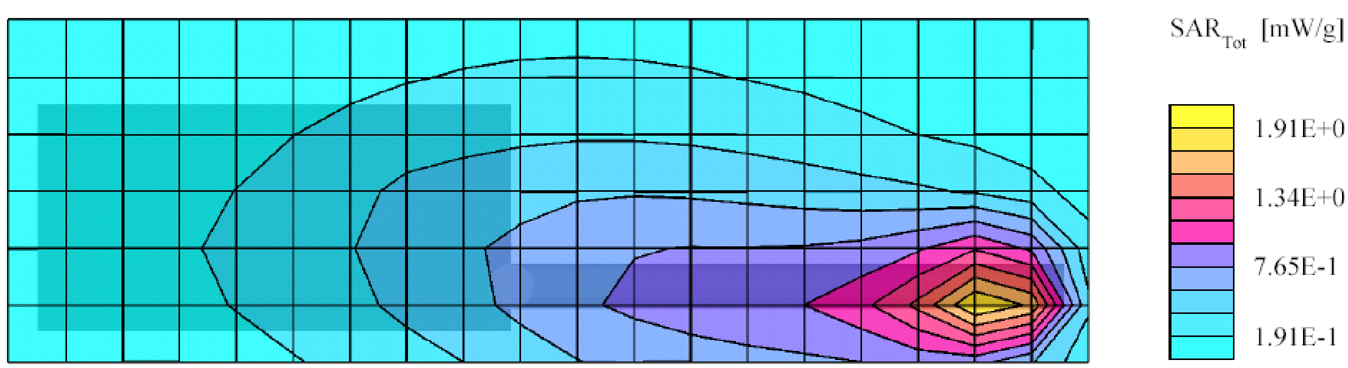


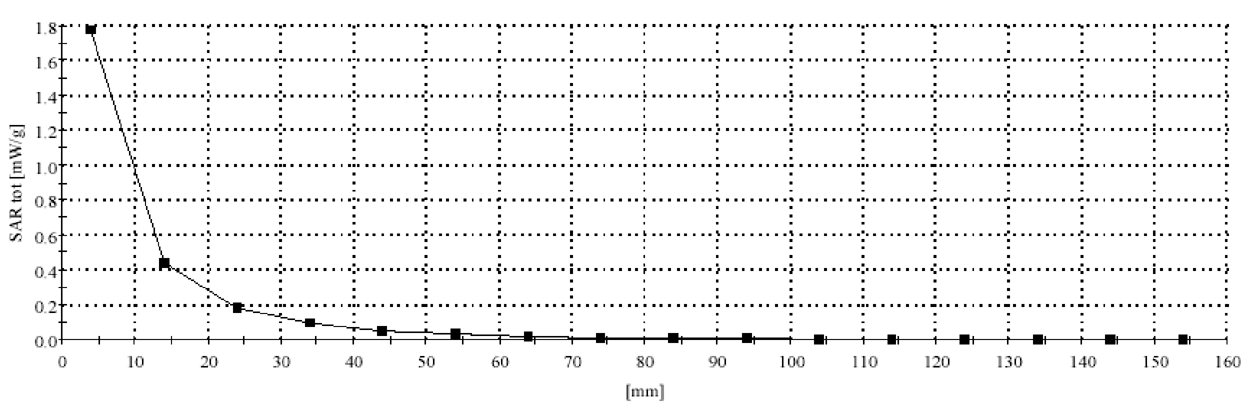
APPENDIX B
Data Results

FCC ID: ABZ99FT3045; Test Date: 08/27/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-020827-06
Model #: AAH50KDC9AA2AN SN:VP2BA10
TX Freq: 160MHz
Sim Tissue Temp: 21.0 (Celsius)

- Accessories -
Antenna: NAD6502A
Battery Kit: NNTN4496A
Carry: HLN6602A chest pak
Audio Acc. HMN9030A RSM

DUT against the flat phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1547; ConvF(7.90,7.90,7.90); Probe cal date: 11/16/01; Crest factor: 1.0; FCC Body_160MHz: σ = 0.78 mho/m ε = 59.8 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 7x7x7: SAR (1g): 1.73 mW/g, SAR (10g): 0.905 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 76.5, 259.5, 4.0

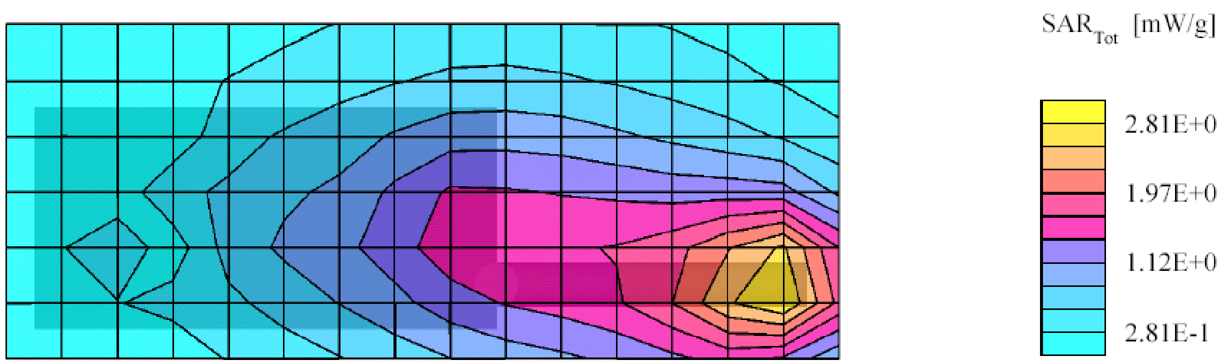


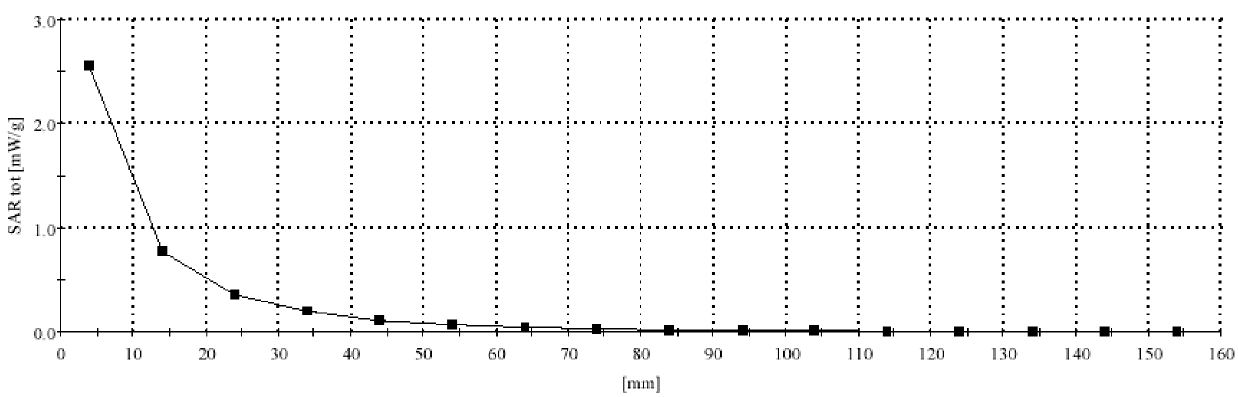


FCC ID: ABZ99FT3045; Test Date: 08/26/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-020826-06
Model #: AAH50KDC9AA2AN SN:VP2BA10
TX Freq: 146MHz
Sim Tissue Temp: 21.3 (Celsius)

- Accessories -
Antenna: HAD9742A
Battery Kit: NNTN4496A
Carry: HLN6602A chest pak
Audio Acc. HMN9030A RSM

DUT against the flat phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1547; ConvF(7.90,7.90,7.90); Probe cal date: 11/16/01; Crest factor: 1.0; FCC Body_160MHz: σ = 0.79 mho/m ε = 59.5 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 7x7x7: SAR (1g): 2.89 mW/g, SAR (10g): 1.59 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 69.0, 210.0, 4.0

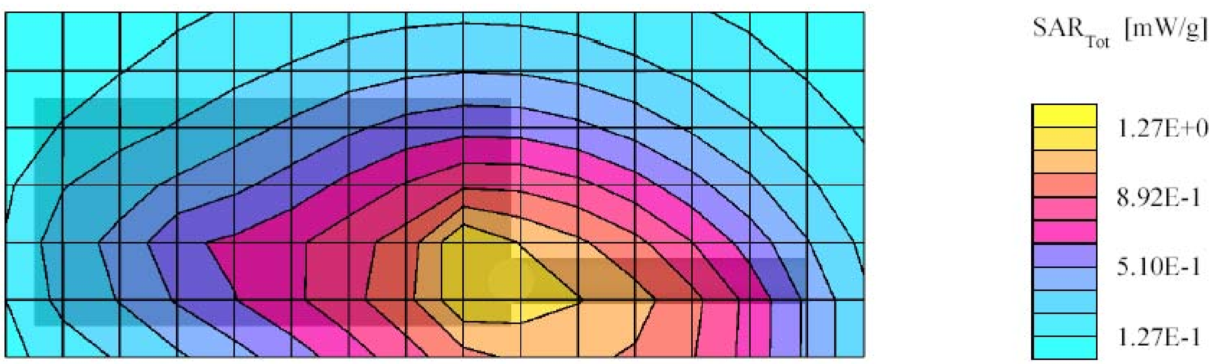


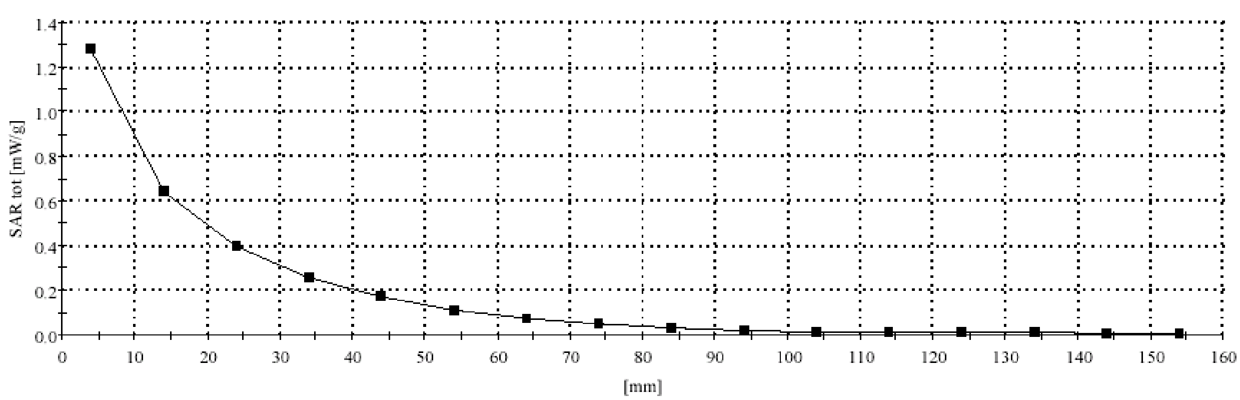


FCC ID: ABZ99FT3045; Test Date: 08/27/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-020827-04
Model #: AAH50KDC9AA2AN SN:VP2BA10
TX Freq: 162MHz
Sim Tissue Temp: 21.0 (Celsius)

- Accessories -
Antenna: HAD9743A
Battery Kit: NNTN4496A
Carry: HLN8255B belt clip
Audio Acc. HMN9030A RSM

DUT against the flat phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1547; ConvF(7.90,7.90,7.90); Probe cal date: 11/16/01; Crest factor: 1.0; FCC Body_160MHz: σ = 0.78 mho/m ε = 59.8 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 7x7x7: SAR (1g): 1.23 mW/g, SAR (10g): 0.858 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 66.0, 123.0, 4.0

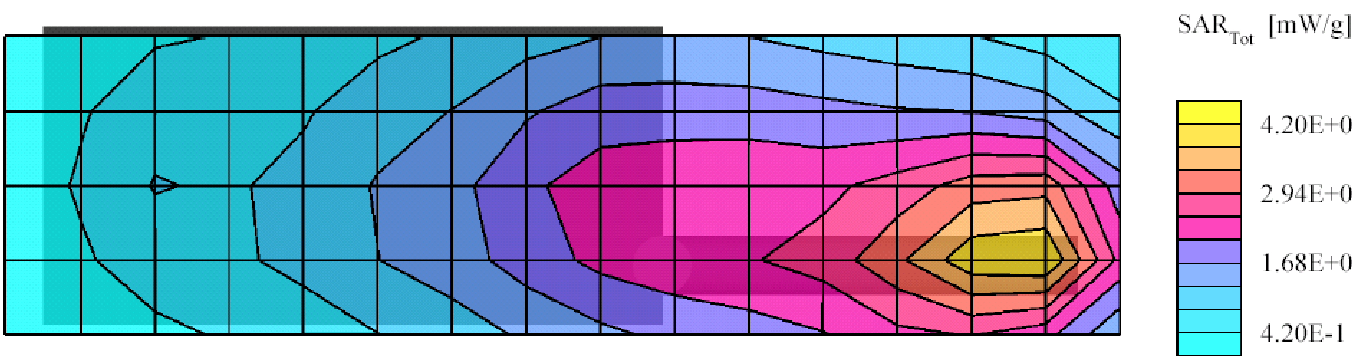


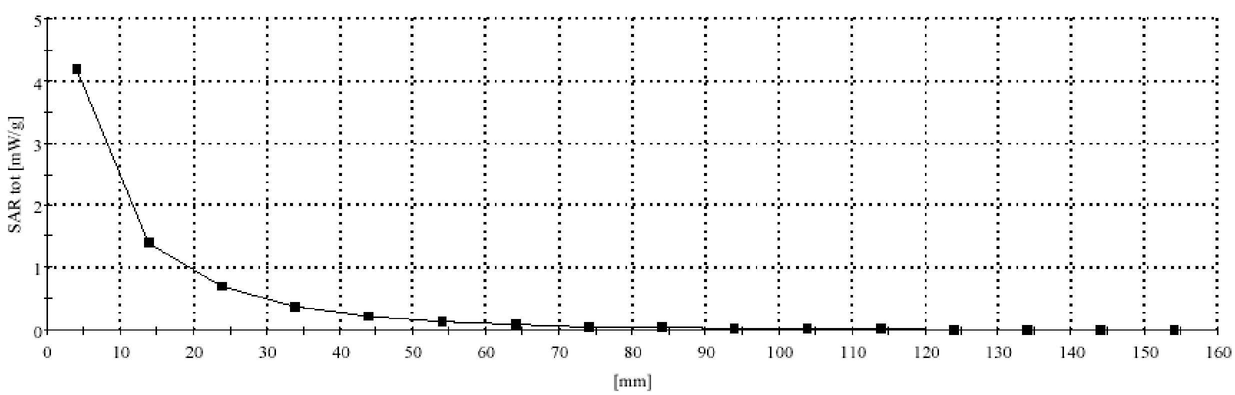


FCC ID: ABZ99FT3045; Test Date: 08/30/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-020830-03
Model #: AAH50KDC9AA2AN SN:VP2BA10
TX Freq: 146MHz
Sim Tissue Temp: 21.3 (Celsius)

Antenna: HAD9742A
Battery Kit: NNTN4496A
Carry: HLN6602A chest pak
Audio Acc. RMN4016A head set

DUT against the flat phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1547; ConvF(7.90,7.90,7.90); Probe cal date: 11/16/01; Crest factor: 1.0; FCC Body_160MHz: σ = 0.79 mho/m ε = 60.1 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 3.87 mW/g, SAR (10g): 2.33 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 45.0, 204.0, 4.0

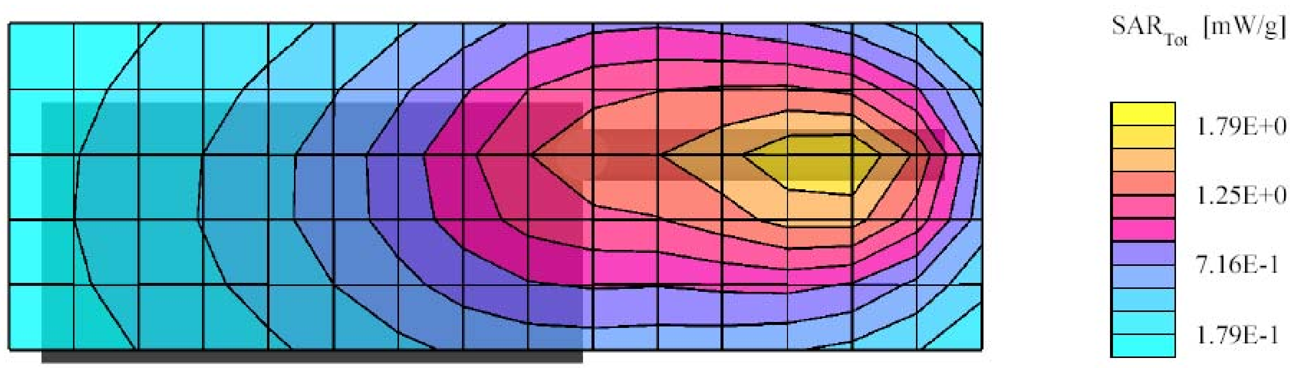


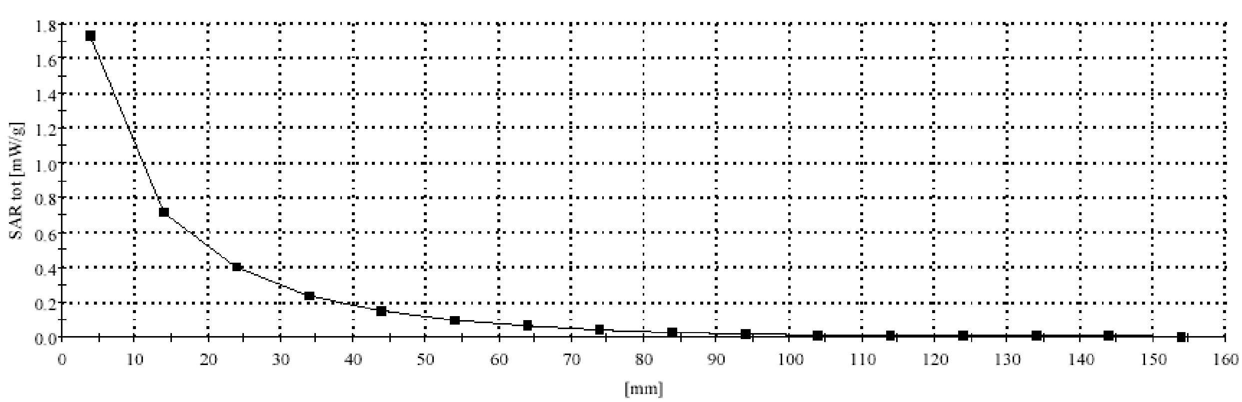


FCC ID: ABZ99FT3045; Test Date: 09/04/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-020904-03
Model #: AAH50KDC9AA2AN SN:VP2BA10
TX Freq: 146MHz
Sim Tissue Temp: 20.8 (Celsius)

- Accessories -
Antenna: HAD9742A
Battery Kit: NNTN4496A
Carry: front of radio, antenna @ 2.5cm
Audio Acc. RMN4016A headset

DUT antenna 2.5cm separation from the flat phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1547; ConvF(7.90,7.90,7.90); Probe cal date: 11/16/01; Crest factor: 1.0; FCC Body_160MHz: σ = 0.78 mho/m ε = 59.8 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 1.67 mW/g, SAR (10g): 1.11 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 31.5, 190.5, 4.0

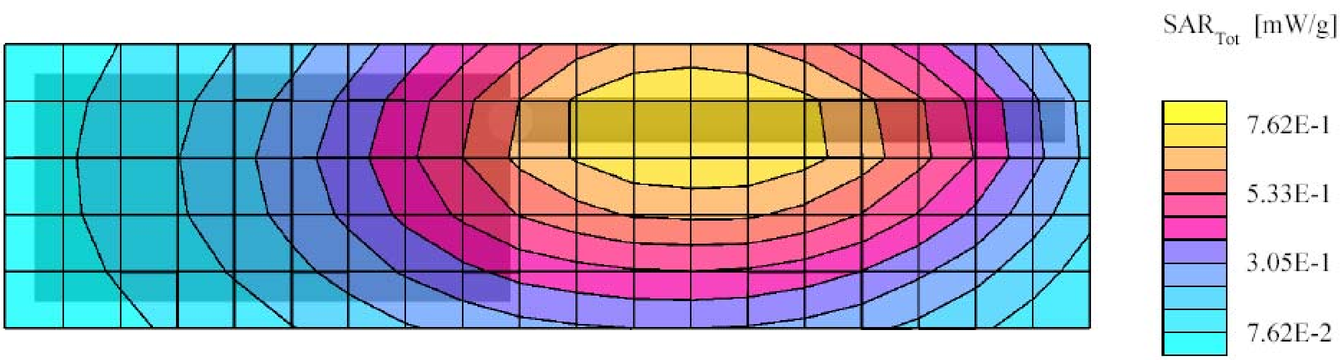


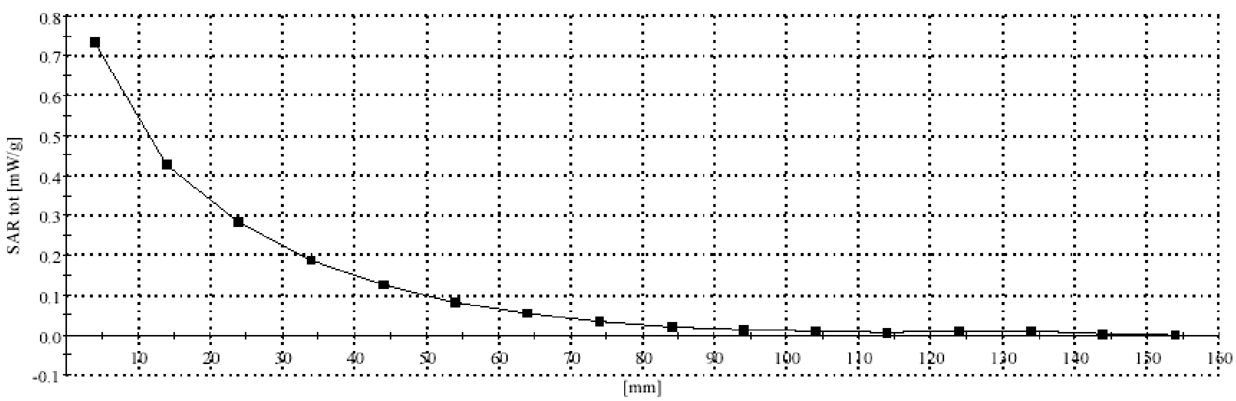


FCC ID: ABZ99FT3045; Test Date: 09/05/02
Motorola CGISS EME Laboratory
Run #: Face-R1-020905-05
Model #: AAH50KDC9AA2AN SN:VP2BA10
TX Freq: 174MHz
Sim Tissue Temp: 21.3 (Celsius)

- Accessories -
Antenna: NAD6502A
Battery Kit: NNTN4496A
Carry: radio @ 2.5cm
Audio Acc. None

Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1547; ConvF(8.60,8.60,8.60); Probe cal date: 11/16/01; Crest factor: 1.0; IEEE Head_160 MHz: σ = 0.74 mho/m ε = 52.9 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 0.726 mW/g, SAR (10g): 0.549 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 22.5, 183.0, 4.0





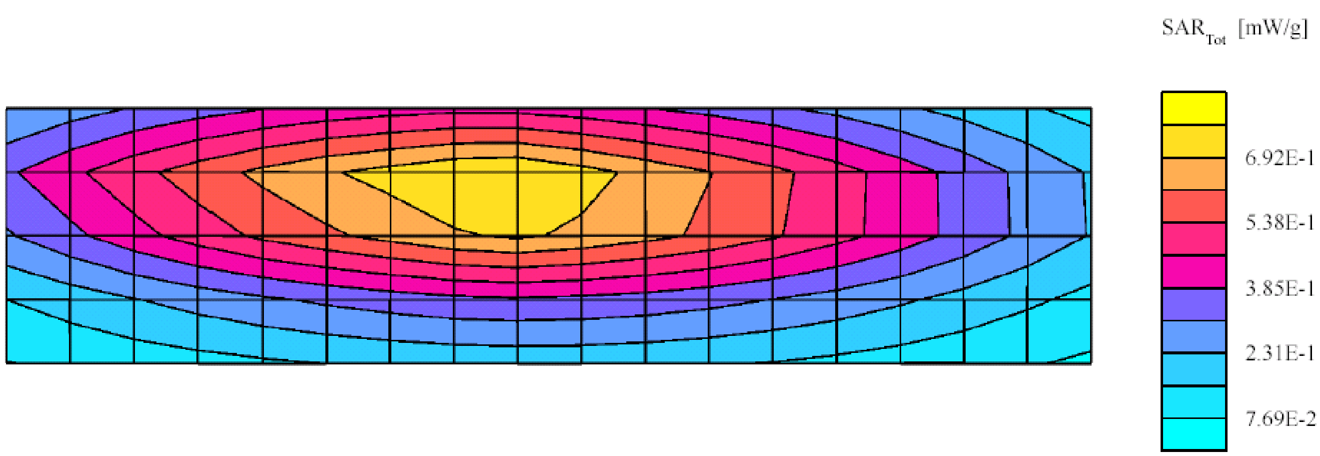
APPENDIX C

Dipole System Performance Check Results

CGISS 300MHz Dipole; SN-002; Test Date:08/12/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020812-01
Model #: 300 SN: 002
TX Freq: 300 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.05mW/g, Percent from target (including drift) for 1g is 2.6%

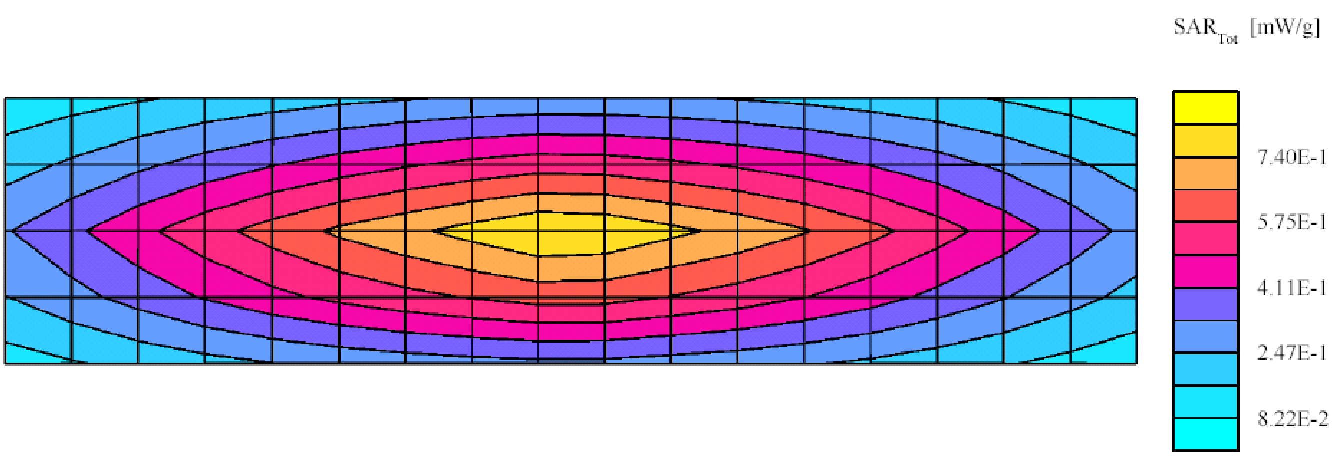
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.91 mho/m ε = 55.9 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.21 mW/g ± 0.04 dB, SAR (1g): 0.762 mW/g ± 0.04 dB, SAR (10g): 0.507 mW/g ± 0.04 dB, (Worst-case extrapolation) Penetration depth: 12.8 (10.8, 15.5) [mm]
Power drift: -0.00 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/13/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020813-01
Model #: 300 SN: 002
TX Freq: 300 MHz
Sim Tissue Temp: 21.5 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.09mW/g, Percent from target (including drift) for 1g is 1.4%

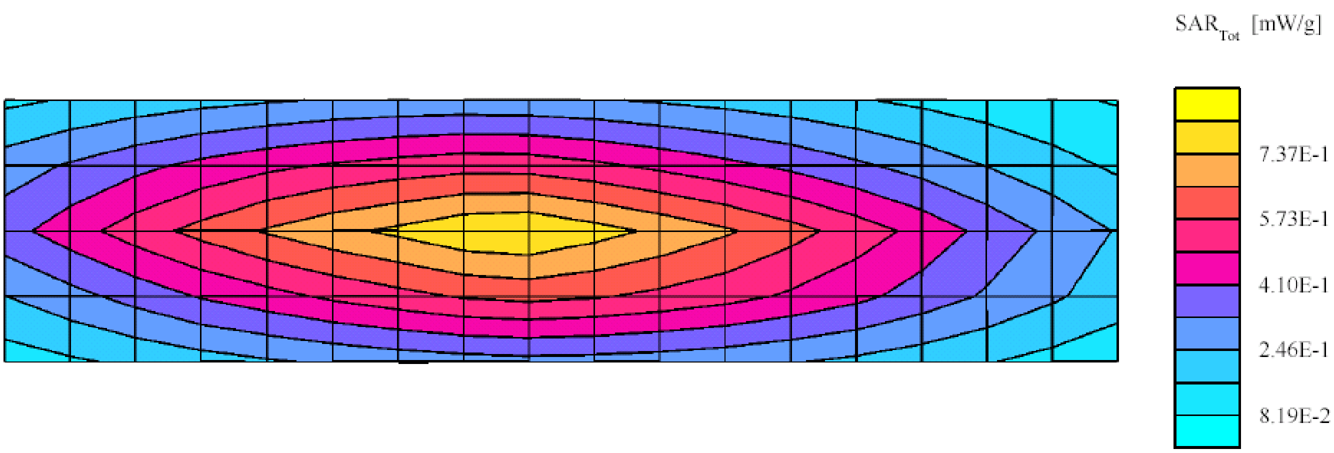
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.92 mho/m ε = 55.8 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.22 mW/g ± 0.01 dB, SAR (1g): 0.768 mW/g ± 0.03 dB, SAR (10g): 0.510 mW/g ± 0.03 dB, (Worst-case extrapolation) Penetration depth: 12.8 (10.8, 15.4) [mm]
Power drift: -0.02 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/14/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020814-01
Model #: 300 SN: 002
TX Freq: 300 MHz
Sim Tissue Temp: 21.8 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.08mW/g, Percent from target (including drift) for 1g is 1.5%

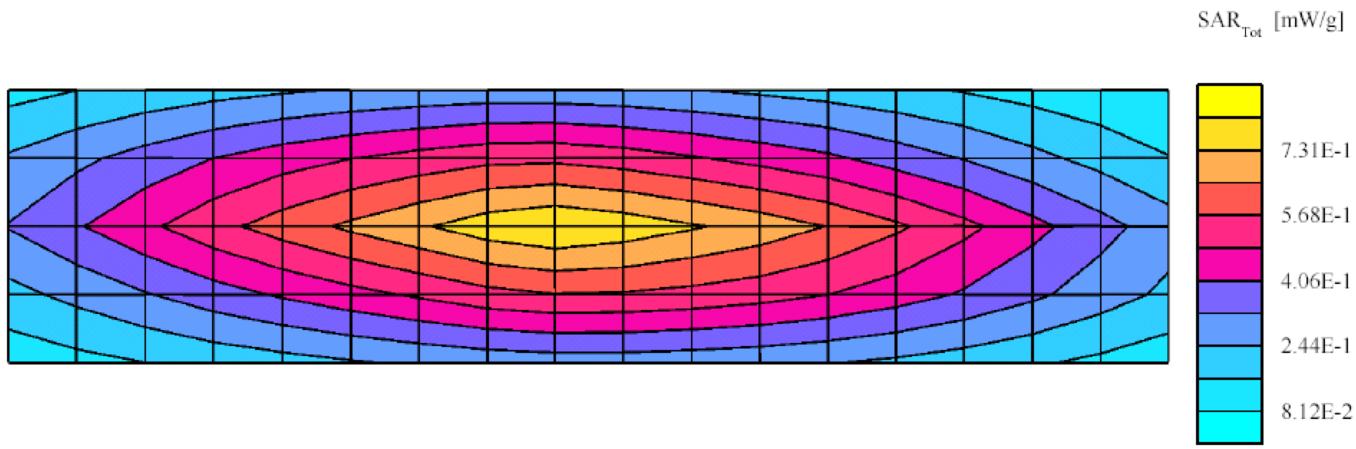
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.91 mho/m ε = 55.6 ρ =1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.22 mW/g ± 0.02 dB, SAR (1g): 0.765 mW/g ± 0.03 dB, SAR (10g): 0.507 mW/g ± 0.03 dB, (Worst-case extrapolation) Penetration depth: 12.7 (10.7, 15.4) [mm]
Power drift: -0.03 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/15/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020815-01
TX Freq: 300 MHz
Sim Tissue Temp: 21.7 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.02mW/g, Percent from target (including drift) for 1g is 3.6%

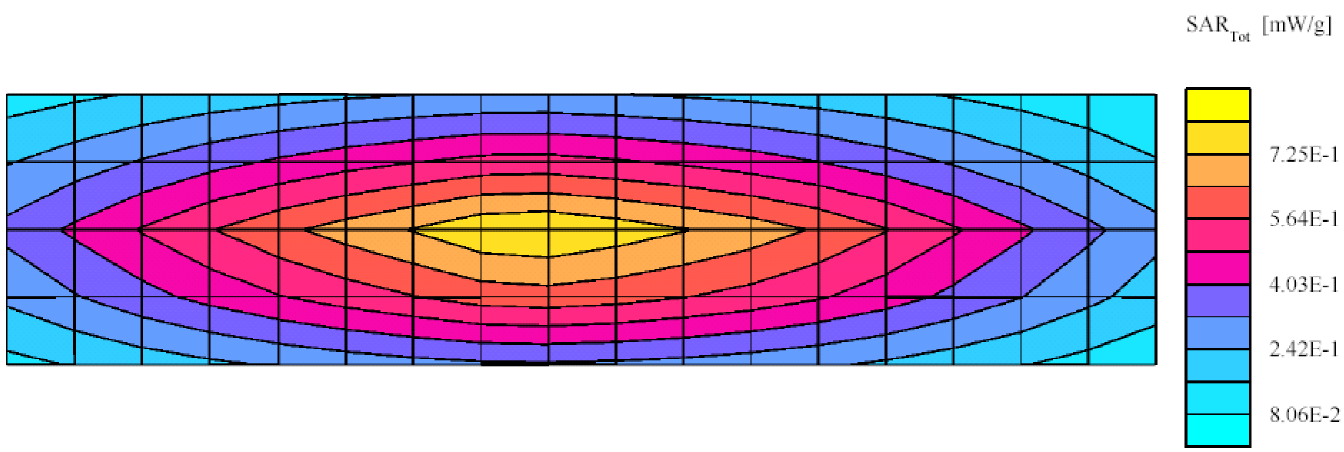
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.89 mho/m ε = 55.5 ρ = 1.00 g/cm^3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.19 mW/g ± 0.04 dB, SAR (1g): 0.749 mW/g ± 0.03 dB, SAR (10g): 0.497 mW/g ± 0.03 dB, (Worst-case extrapolation) Penetration depth: 12.7 (10.8, 15.3) [mm]
Power drift: -0.03 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/16/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020816-01
Model #: 300 SN: 002
TX Freq: 300 MHz
Sim Tissue Temp: 21.8 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.04mW/g, Percent from target (including drift) for 1g is 2.7%

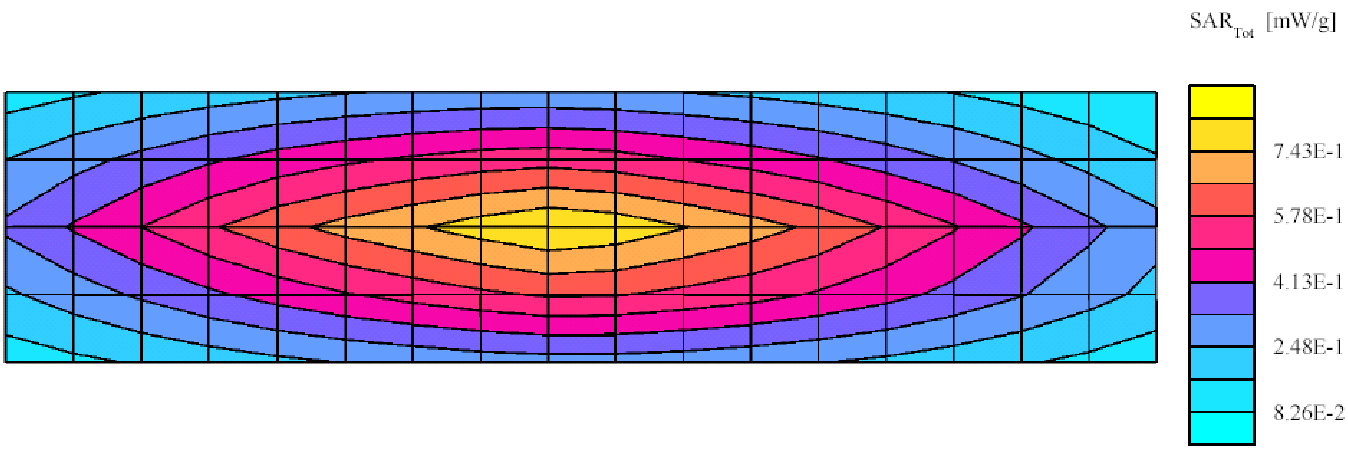
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.90 mho/m ε = 55.3 ρ =1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.20 mW/g ± 0.02 dB, SAR (1g): 0.756 mW/g ± 0.03 dB, SAR (10g): 0.502 mW/g ± 0.03 dB, (Worst-case extrapolation)
Penetration depth: 12.8 (10.8, 15.4) [mm]
Power drift: -0.03 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/19/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020819-01
TX Freq: 300 MHz
Sim Tissue Temp: 21.9 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.06mW/g, Percent from target (including drift) for 1g is 2.3%

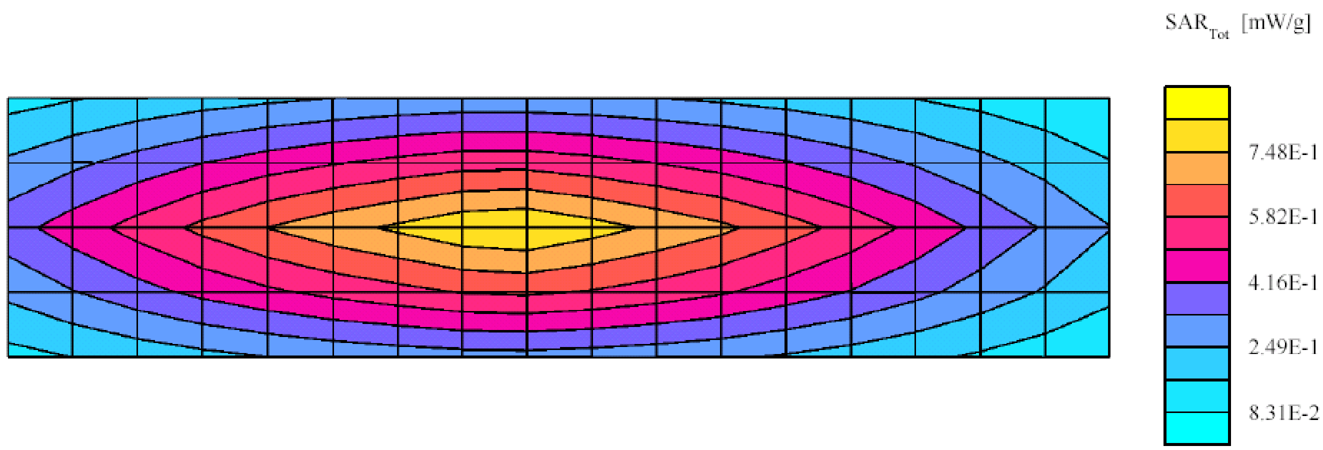
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.90 mho/m ε = 55.4 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.22 mW/g ± 0.03 dB, SAR (1g): 0.766 mW/g ± 0.03 dB, SAR (10g): 0.507 mW/g ± 0.04 dB, (Worst-case extrapolation) Penetration depth: 12.7 (10.7, 15.4) [mm]
Power drift: 0.01 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/21/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020821-01
Model #: 300 SN: 002
TX Freq: 300 MHz
Sim Tissue Temp: 21.3 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.10mW/g, Percent from target (including drift) for 1g is 1.1%

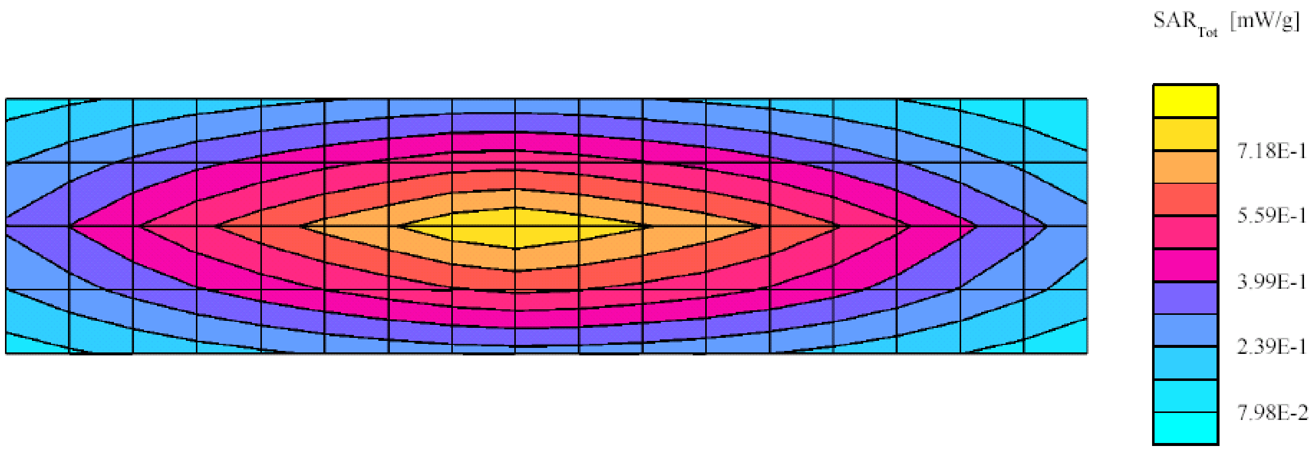
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.91 mho/m ε = 55.4 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.23 mW/g ± 0.02 dB, SAR (1g): 0.772 mW/g ± 0.03 dB, SAR (10g): 0.512 mW/g ± 0.04 dB, (Worst-case extrapolation) Penetration depth: 12.8 (10.8, 15.4) [mm]
Power drift: -0.01 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/26/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020826-01
TX Freq: 300 MHz
Sim Tissue Temp: 21.3 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.02mW/g, Percent from target (including drift) for 1g is 3.3%

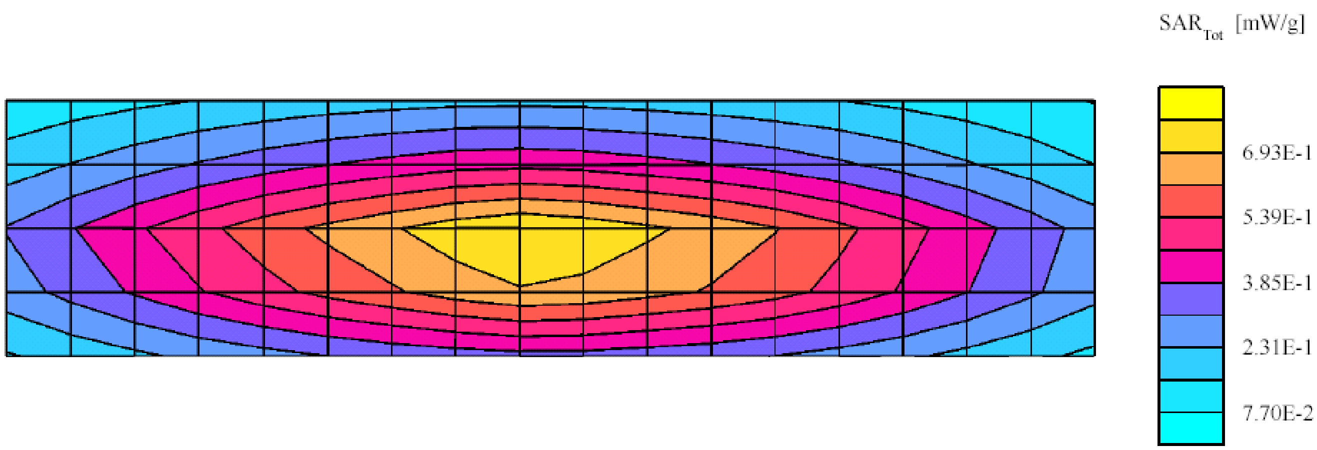
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.90 mho/m ε = 55.7 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.19 mW/g ± 0.02 dB, SAR (1g): 0.751 mW/g ± 0.03 dB, SAR (10g): 0.498 mW/g ± 0.03 dB, (Worst-case extrapolation) Penetration depth: 12.8 (10.7, 15.5) [mm]
Power drift: -0.03 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/27/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020827-01
Model #: 300 SN: 002
TX Freq: 300 MHz Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.05mW/g, Percent from target (including drift) for 1g is 2.4%

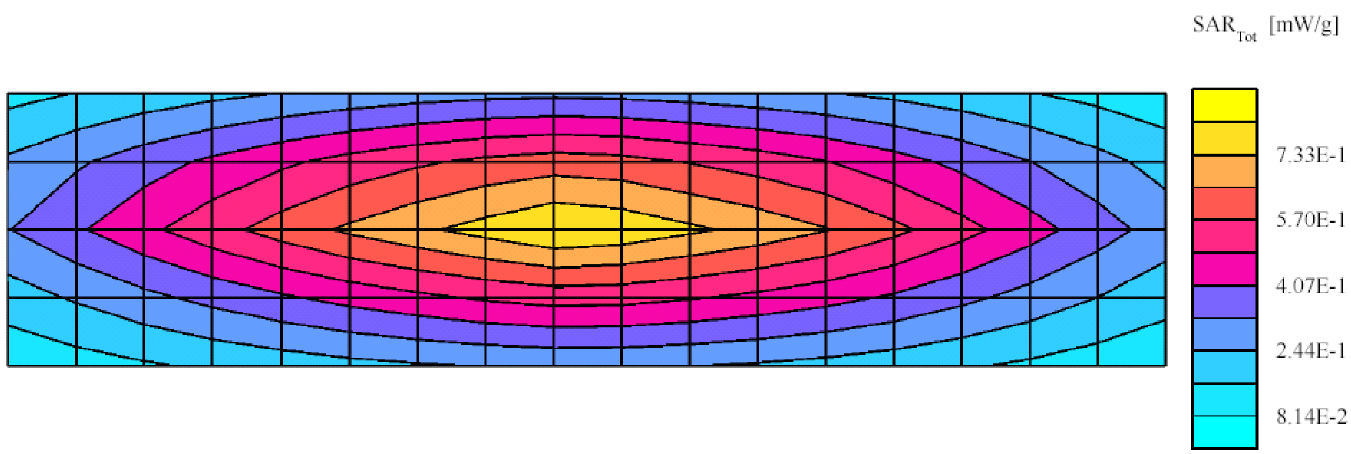
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.89 mho/m ε = 55.6 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.20 mW/g ± 0.04 dB, SAR (1g): 0.755 mW/g ± 0.03 dB, SAR (10g): 0.501 mW/g ± 0.03 dB, (Worst-case extrapolation) Penetration depth: 12.7 (10.6, 15.4) [mm]
Power drift: -0.05 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/28/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020828-01
TX Freq: 300 MHz
Sim Tissue Temp: 20.9 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.04mW/g, Percent from target (including drift) for 1g is 2.9%

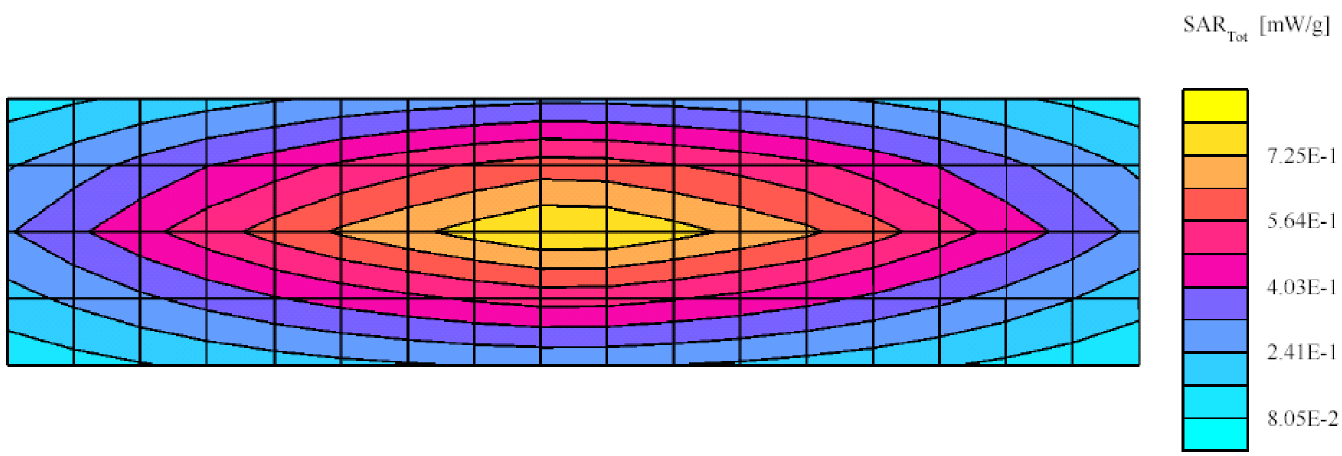
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.90 mho/m ε = 56.4 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.20 mW/g ± 0.03 dB, SAR (1g): 0.756 mW/g ± 0.03 dB, SAR (10g): 0.502 mW/g ± 0.04 dB, (Worst-case extrapolation) Penetration depth: 12.8 (10.8, 15.5) [mm]
Power drift: -0.02 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/29/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020829-01 Phantom #: 80602002A / S1
TX Freq: 300 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.02mW/g, Percent from target (including drift) for 1g is 3.5%

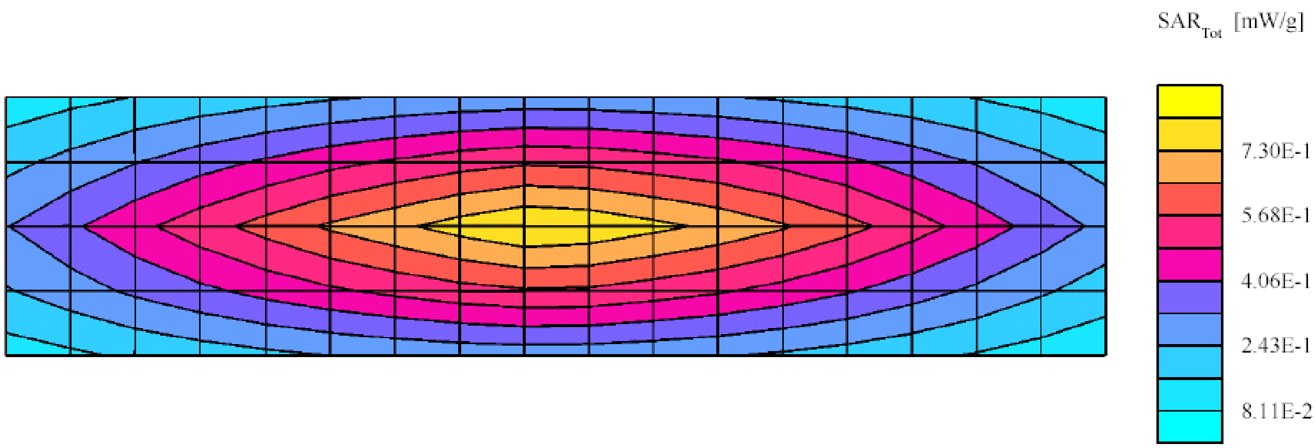
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.89 mho/m ε = 56.0 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.20 mW/g ± 0.05 dB, SAR (1g): 0.755 mW/g ± 0.05 dB, SAR (10g): 0.500 mW/g ± 0.04 dB, (Worst-case extrapolation) Penetration depth: 12.7 (10.7, 15.4) [mm]
Power drift: -0.00 dB



CGISS 300MHz Dipole; SN-002; Test Date:08/30/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020830-01
TX Freq: 300 MHz
Sim Tissue Temp: 21.3 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 3.01mW/g, Percent from target (including drift) for 1g is 3.9%

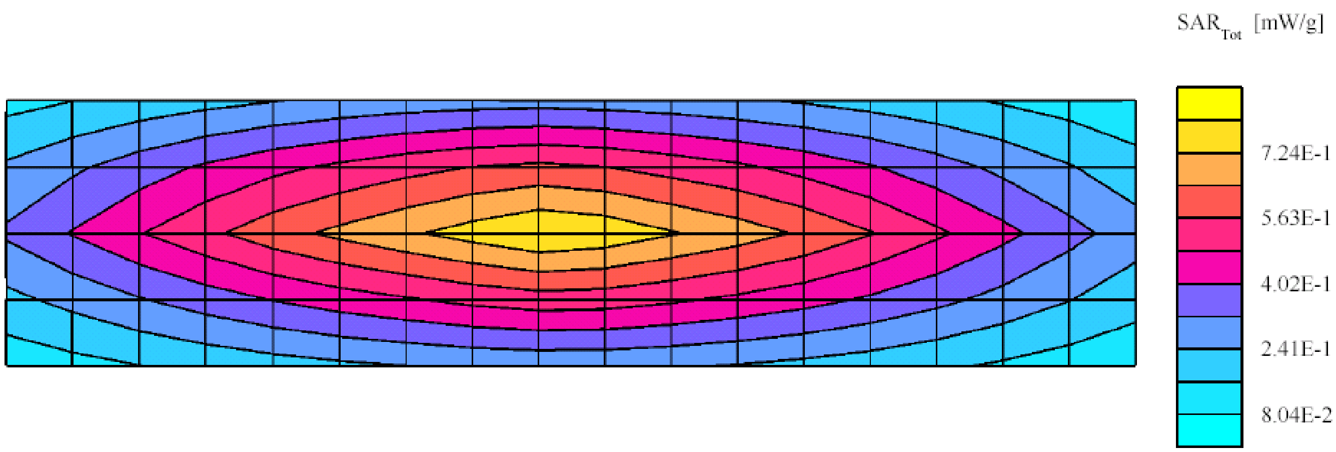
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.90 mho/m ε = 56.1 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.19 mW/g ± 0.05 dB, SAR (1g): 0.750 mW/g ± 0.04 dB, SAR (10g): 0.498 mW/g ± 0.04 dB, (Worst-case extrapolation) Penetration depth: 12.8 (10.7, 15.5) [mm]
Power drift: -0.01 dB



CGISS 300MHz Dipole; SN-002; Test Date:09/03/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020903-01
TX Freq: 300 MHz
Sim Tissue Temp: 21.2 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.13 (including drift) (1g)
SAR calculated is 2.98mW/g, Percent from target (including drift) for 1g is 4.9%

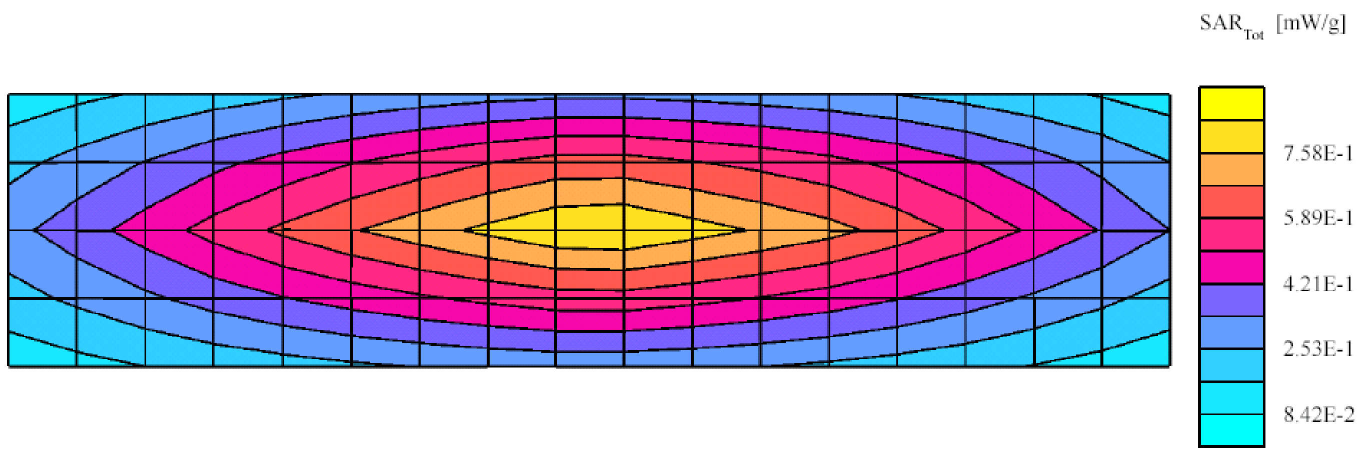
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body_300 MHz: σ = 0.88 mho/m ε = 55.7 ρ =1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.18 mW/g ± 0.04 dB, SAR (1g): 0.744 mW/g ± 0.04 dB, SAR (10g): 0.494 mW/g ± 0.03 dB, (Worst-case extrapolation) Penetration depth: 12.8 (10.7, 15.5) [mm]
Power drift: -0.00 dB



CGISS 300MHz Dipole; SN-002; Test Date:09/04/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020904-04
TX Freq: 300 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.17 (including drift) (1g)
SAR calculated is 3.19mW/g, Percent from target (including drift) for 1g is 0.7%

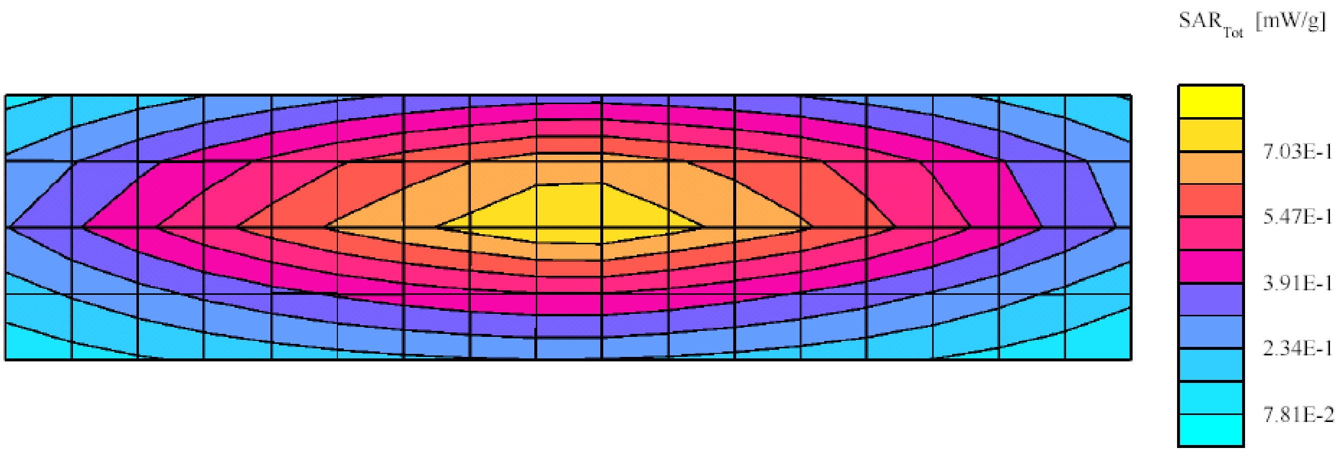
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.40,7.40,7.40); Crest factor: 1.0; IEEE Head_300 MHz: σ = 0.87 mho/m ε = 46.8 ρ = 1.00 g/cm^3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.27 mW/g ± 0.02 dB, SAR (1g): 0.798 mW/g ± 0.02 dB, SAR (10g): 0.527 mW/g ± 0.01 dB, (Worst-case extrapolation) Penetration depth: 12.6 (10.6, 15.1) [mm]
Power drift: -0.00 dB



CGISS 300MHz Dipole; SN-002; Test Date:09/05/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020905-01
TX Freq: 300 MHz
Sim Tissue Temp: 21.3 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.17 (including drift) (1g)
SAR calculated is 3.07mW/g, Percent from target (including drift) for 1g is 3.3%

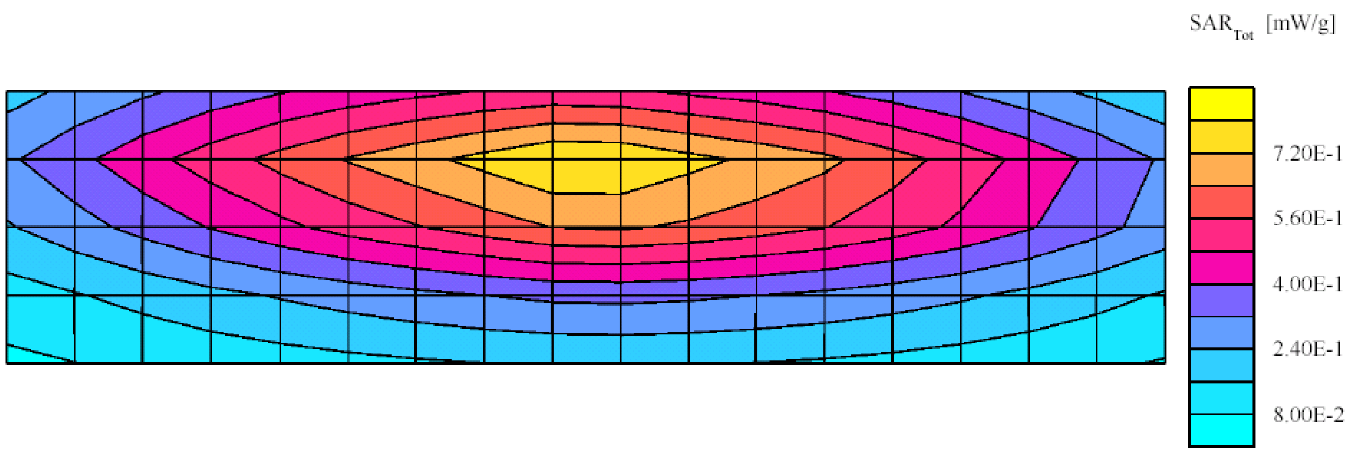
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.40,7.40,7.40); Crest factor: 1.0; IEEE Head_300 MHz: σ = 0.84 mho/m ε = 46.4 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.20 mW/g ± 0.01 dB, SAR (1g): 0.761 mW/g ± 0.01 dB, SAR (10g): 0.505 mW/g ± 0.01 dB, (Worst-case extrapolation) Penetration depth: 12.8 (10.9, 15.3) [mm]
Power drift: -0.03 dB



CGISS 300MHz Dipole; SN-002; Test Date:09/06/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020906-01
TX Freq: 300 MHz
Sim Tissue Temp: 20.9 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 3.17 (including drift) (1g)
SAR calculated is 3.04mW/g, Percent from target (including drift) for 1g is 4.13%

Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(7.40,7.40,7.40); Crest factor: 1.0; IEEE Head_300 MHz: σ = 0.84 mho/m ε = 46.1 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.21 mW/g ± 0.02 dB, SAR (1g): 0.765 mW/g ± 0.02 dB, SAR (10g): 0.509 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 12.9 (10.9, 15.5) [mm]
Power drift: 0.03 dB



SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	7/1/2002	Frequency (MHz):	300
Lab Location:	CGISS	Mixture Type:	IEEE Head
Robot System:	CGISS 2	Ambient Temp.(°C):	22.8
Probe Serial #:	1383	Tissue Temp.(°C):	21.7
DAE Serial #:	374		

Tissue Characteristics

Permitivity: 46.7

Conductivity: 0.88

Phantom Type/SN: **80602002B**

Distance (mm): 15 Tissue/center of dipole

Reference Source: MFRL-300 (Dipole)

Reference SN: 002

Power to Dipole: 250 mW

Measured SAR Value: 0.795 mW/g, 0.518 mW/g (10g avg.)

Power Drift: 0.02 dB

New Target/Measured SAR Value: (normalized to 1.0 W, with drift compensation) 3.17 mW/g, 2.06 mW/g (10g avg.)

Test performed by: Kim Uong Initial: ku

Dipole 300MHz SN300-002; Test date:07/01/02

Run #: 02070104 Phantom #:80602002B
Model#: MFRL dipole 300-002
Robot#: CGISS-2 DAE: DAE3V1 SN374 (2/11/02) Tester: Kim Uong
Tx Freq: 300MHz Simulated tissue temp: 21.7 C
Humidity: 47.2 % Room Temp:22.8C
Start power: 250mW
Distance from phantom to antenna surface:11.5mm, distance from tissue to center of ant:15mm
Flat; Probe: ET3DV6 - SN1383; ConvF(7.90,7.90,7.90); Crest factor: 1.0; IEEE Head 300 MHz: σ = 0.88 mho/m ϵ_r = 46.7 ρ = 1.00 g/cm^3
Cubes (2): Peak: 1.30 mW/g ± 0.00 dB, SAR (1g): 0.795 mW/g ± 0.01 dB, SAR (10g): 0.518 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 12.0 (10.0, 14.8) [mm]
Powerdrift: 0.02 dB

Motorola CGISS EME Lab

SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	7/1/2002	Frequency (MHz):	300
Lab Location:	CGISS	Mixture Type:	FCC Body
Robot System:	CGISS 2	Ambient Temp.(^{o}C):	22.9
Probe Serial #:	1383	Tissue Temp.(^{o}C):	21.7
DAE Serial #:	374		

Tissue Characteristics
Permitivity: 55.5
Conductivity: 0.90

Phantom Type/SN: 80602002A
Distance (mm): 15 Tissue/center of dipole

Reference Source: MFRL-300 (Dipole)
Reference SN: 002

Power to Dipole: 250 mW

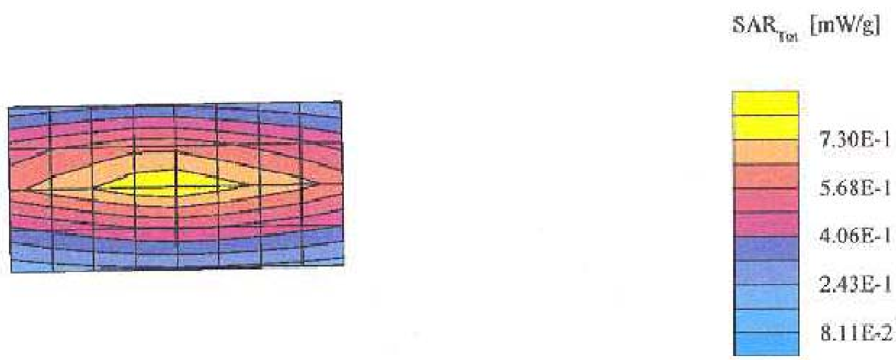
Measured SAR Value: 0.771 mW/g, 0.506 mW/g (10g avg.)
Power Drift: -0.06 dB

New Target/Measured SAR Value: (normalized to 1,0 W, with drift compensation) 3.13 mW/g, 2.05 mW/g (10g avg.)

Test performed by: Kim Uong Initial: KU

Dipole 300MHz SN300-002; Test date:07/01/02

Run #: 02070102 Phantom #:80602002a
Model#: MFRL dipole 300-002
Robot#: CGISS-2 DAE: DAE3V1 SN374 (2/11/02) Tester: Kim Uong
Tx Freq: 300MHz Simulated tissue temp: 21.7 C
Humidity: 50.0 % Room Temp:22.9C
Start power: 250mW
Distance from phantom to antenna surface:11.5mm, distance from tissue to center of ant:15mm
Flat; Probe: ET3DV6 - SN1383; ConvF(8.00,8.00,8.00); Crest factor: 1.0; FCC Body 300: σ = 0.90 mho/m ε_r = 55.5 ρ = 1.00 g/cm^3
Cubes (2): Peak: 1.24 mW/g ± 0.01 dB, SAR (1g): 0.771 mW/g ± 0.00 dB, SAR (10g): 0.506 mW/g ± 0.00 dB, (Worst-case extrapolation)
Penetration depth: 12.4 (10.4, 15.1) [mm]
Powerdrift: -0.06 dB



Motorola CGISS EME Lab

SYSTEM VALIDATION

Date:	__07/01/02__	Frequency (MHz):	__835______
Lab Location:	__CGISS__	Mixture Type:	__IEEE_____
Robot System:	__CGISS 2__	Ambient Temp.(°C):	__22.9_____
Probe Serial #:	__1383 ____	Tissue Temp.(°C):	__21.6_____
DAE Serial #:	__374 ____		

Tissue Characteristics		Phantom Type/SN:	_SAMTP10079 ___
Permitivity:	__39.7 _____	Distance (mm):	15mm__________
Conductivity:	__0.89______		

Reference Source: __Dipole___(Dipole/Handset)
Reference SN: __426_____

Power to Dipole: __250_______ mW
Power Output (radio): ____________ mW

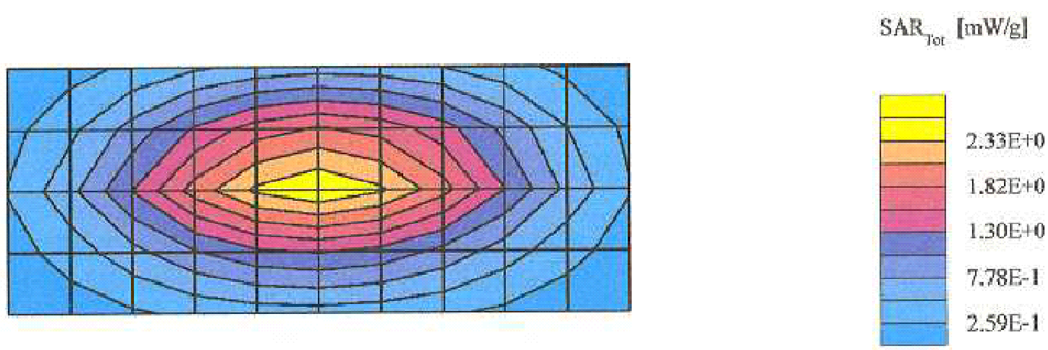
Target SAR Value: (normalized to 1.0 W)	_9.5_____ mW/g,	__6.2_____ mW/g (10g avg.)
Measured SAR Value:	__2.45_ mW/g,	__1.56__ mW/g (10g avg.)
Power Drift:	__-0.01 dB	
Measured SAR Value: (normalized to 1.0 W, with drift compensation)	__9.82_ mW/g,	__6.25_____ mW/g (10g avg.)

Percent Difference From Target (must be within System Uncertainty): __3.4____ % (1g avg)
__0.8___ % (10g avg)

Test performed by: ____K. Uong________________________ Initial: KU

Dipole D835V2 SN426; Test date:07/01/02

Run #: 02070101 Phantom #:SAMTP1079
Model#: SPEAG dipole D835V2 SN426
Robot#: CGISS-2 DAE: DAE3V1 SN374 (2/11/02) Tester: Kim Uong
Tx Freq: 835MHz Simulated tissue temp: 21.6 C
Humidy:49.6% Room Temp:22.9C
Start power: 250mW
Target:
9.5 mW/g +/- 12.1% per IEEE draft standard dated August 20, 2001
SAM; Probe: ET3DV6 - SN1383; ConvF(6.70,6.70,6.70); Crest factor: 1.0; IEEE Head 835MHz : σ = 0.89 mho/m ϵ_r = 39.7 ρ = 1.00 g/cm^3
Cubes (2): Peak: 3.96 mW/g ± 0.03 dB, SAR (1g): 2.45 mW/g ± 0.02 dB, SAR (10g): 1.56 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 11.7 (10.3, 13.6) [mm]
Powerdrift: -0.01 dB



Motorola CGISS EME Lab

APPENDIX D

Calibration Certificates

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate

Dosimetric E-Field Probe

Type	**ET3DV6**
Serial Number:	**1547**
Place of Calibration:	**Zurich**
Date of Calibration:	**November 16, 2001**
Calibration Interval	**12 months**

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:	Nikoloski Neviana
Approved by	[signature]

DASY3 - Parameters of Probe: ET3DV6 SN:1547

Sensitivity in Free Space

NormX	1.37 $\mu V/(V/m)^2$
NormY	1.25 $\mu V/(V/m)^2$
NormZ	1.24 $\mu V/(V/m)^2$

Diode Compression

DCP X	**92** mV
DCP Y	**92** mV
DCP Z	**92** mV

Sensitivity in Tissue Simulating Liquid

Head **450 MHz** **ε_r = 43.5 ± 5%** **σ = 0.87 ± 10% mho/m**

ConvF X	**6.86** extrapolated		Boundary effect:	
ConvF Y	**6.86** extrapolated		Alpha	**0.33**
ConvF Z	**6.86** extrapolated		Depth	**2.54**

Head **800 - 1000 MHz** **ε_r = 39.0 - 43.5** **σ = 0.80 - 1.10 mho/m**

ConvF X	**6.30** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**6.30** ± 9.5% (k=2)		Alpha	**0.41**
ConvF Z	**6.30** ± 9.5% (k=2)		Depth	**2.45**

Head **1500 MHz** **ε_r = 40.4 ± 5%** **σ = 1.23 ± 10% mho/m**

ConvF X	**5.54** interpolated		Boundary effect:	
ConvF Y	**5.54** interpolated		Alpha	**0.52**
ConvF Z	**5.54** interpolated		Depth	**2.33**

Head **1700 - 1910 MHz** **ε_r = 39.5 - 41.0** **σ = 1.20 - 1.55 mho/m**

ConvF X	**5.17** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**5.17** ± 9.5% (k=2)		Alpha	**0.57**
ConvF Z	**5.17** ± 9.5% (k=2)		Depth	**2.27**

Sensor Offset

Probe Tip to Sensor Center	**2.7**
Optical Surface Detection	**1.4 ± 0.2**

Schmid & **Partner**
Engineering **AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	ET3DV6
Serial Number:	1547
Place of Assessment:	Zurich
Date of Assessment:	November 17, 2001
Probe Calibration Date:	November 16, 2001

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 1800 MHz.

Assessed by:

Dosimetric E-Field Probe ET3DV6 SN:1547

Conversion factor (± standard deviation)

Frequency		ConvF	Tissue parameters
150 MHz	ConvF	**7.9 ± 8%**	ε_r = 61.9 σ = 0.80 mho/m (muscle tissue)
236 MHz	ConvF	**7.7 ± 8%**	ε_r = 59.8 σ = 0.87 mho/m (muscle tissue)
300 MHz	ConvF	**7.6 ± 8%**	ε_r = 58.2 σ = 0.92 mho/m (muscle tissue)
350 MHz	ConvF	**7.4 ± 8%**	ε_r = 57.7 σ = 0.93 mho/m (muscle tissue)
450 MHz	ConvF	**7.2 ± 8%**	ε_r = 56.7 σ = 0.94 mho/m (muscle tissue)
784 MHz	ConvF	**6.3 ± 8%**	ε_r = 55.4 σ = 0.97 mho/m (muscle tissue)
835 MHz	ConvF	**6.2 ± 8%**	ε_r = 55.2 σ = 0.97 mho/m (muscle tissue)
925 MHz	ConvF	**6.0 ± 8%**	ε_r = 55.0 σ = 1.06 mho/m (muscle tissue)
1450 MHz	ConvF	**5.5 ± 8%**	ε_r = 54.0 σ = 1.30 mho/m (muscle tissue)
1900 MHz	ConvF	**4.8 ± 8%**	ε_r = 53.3 σ = 1.52 mho/m (muscle tissue)
2450 MHz	ConvF	**4.0 ± 8%**	ε_r = 52.7 σ = 1.95 mho/m (muscle tissue)

Dosimetric E-Field Probe ET3DV6 SN:1547

Conversion factor (± standard deviation)

150 MHz	ConvF	8.6 ± 8%	$\varepsilon_r = 52.3$ $\sigma = 0.76$ mho/m (head tissue)
236 MHz	ConvF	7.8 ± 8%	$\varepsilon_r = 48.3$ $\sigma = 0.82$ mho/m (head tissue)
300 MHz	ConvF	7.4 ± 8%	$\varepsilon_r = 45.3$ $\sigma = 0.87$ mho/m (head tissue)
350 MHz	ConvF	7.3 ± 8%	$\varepsilon_r = 44.7$ $\sigma = 0.87$ mho/m (head tissue)
400 MHz	ConvF	7.2 ± 8%	$\varepsilon_r = 44.4$ $\sigma = 0.87$ mho/m (head tissue - CENELEC)
450 MHz	ConvF	7.1 ± 8%	$\varepsilon_r = 43.5$ $\sigma = 0.87$ mho/m (head tissue)
784 MHz	ConvF	6.5 ± 8%	$\varepsilon_r = 41.8$ $\sigma = 0.90$ mho/m (head tissue)
835 MHz	ConvF	6.4 ± 8%	$\varepsilon_r = 41.5$ $\sigma = 0.90$ mho/m (head tissue)
835 MHz	ConvF	6.4 ± 8%	$\varepsilon_r = 42.5$ $\sigma = 0.98$ mho/m (head tissue - CENELEC)
925 MHz	ConvF	6.2 ± 8%	$\varepsilon_r = 41.5$ $\sigma = 0.98$ mho/m (head tissue)
900 MHz	ConvF	6.3 ± 8%	$\varepsilon_r = 42.3$ $\sigma = 0.99$ mho/m (head tissue - CENELEC)

Dosimetric E-Field Probe ET3DV6 SN:1547

Conversion factor (± standard deviation)

1500 MHz	ConvF	**5.8 ± 8%**	ε_r = 40.4 σ = 1.23 mho/m (head tissue)
1900 MHz	ConvF	**5.2 ± 8%**	ε_r = 40.0 σ = 1.40 mho/m (head tissue)
2450 MHz	ConvF	**4.4 ± 8%**	ε_r = 39.2 σ = 1.80 mho/m (head tissue)

MOTOROLA

DIPOLE SAR VALIDATION CERTIFICATE

Frequency:	*300*	*MHz*
Dipole Serial Number:	*300-002*	
Simulated Tissue:	*body*	
Date of Validation:	*August 24, 2001*	
Validation Interval:	~~*12*~~ *months* 24 CK	

Motorola Florida Research Laboratory hereby certifies, that the System Validation was performed on the date indicated above. The System Validation was performed in accordance with specifications and procedures of Motorola Florida Research Laboratory.

Calibrated by: [signature]

J. Patrick Oliver

Approved by: [signature]

C. K. Chou

Motorola Florida Research Laboratory - 8000 West Sunrise Blvd. Ft. Lauderdale, Florida 33322

Purpose:

To provide a method to check the validity of the SAR measurement system prior to testing

Tissue Simulate:

Name:	***Body 300***	
Targets for tissue characteristics:		
Dielectric Constant:	***58.2***	**+/- 5%**
Conductivity:	***0.92 S/m***	**+/- 5%**
Measurement values:		
Dielectric Constant:	***59.7***	
Conductivity:	***0.92***	

Validation setup:

Set up for the validation using constant forward power as shown in Figure 1. The total distance from the simulated tissue to the top of the dipole elements is 16 mm.

Use 1.0 for the density of the simulated tissue.

Target for SAR validation:

The target is specified in terms of peak SAR averaged over 1 cm^3 (1 gram) of tissue.

The target is normalized to 1 watt based on a constant forward input power of 500 mW.

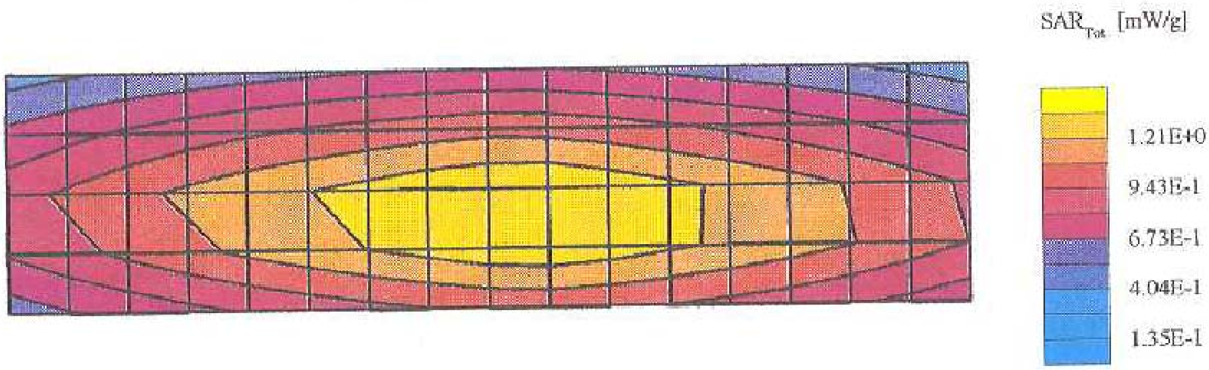
Peak SAR, at 1 watt, averaged over 1 cm^3 (1 gram) of tissue:

2.7 mW/g	**+/- 10%**

The SAR scan is shown in Figure 2.

dipole 300; Test Date:08/24/01

dipole 300-002, body, constant forward power = 500 mW
9x16 inch flat Phantom; Section; Position: ;
Probe: - SN1418; ConvF(7.10,7.10,7.10); Crest factor: 1.0; BODY 300: σ = 0.92 mho/m ϵ_r = 59.7 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 1.36 mW/g ± 0.01 dB, SAR (10g): 0.916 mW/g ± 0.02 dB, (Worst-case extrapolation), Peak: 2.08 mW/g ± 0.00 dB, Max at 87.0, 16.0, 4.5
Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0
Powerdrift: -0.19 dB



Motorola Florida Research Lab

MOTOROLA

DIPOLE SAR VALIDATION CERTIFICATE

Frequency:	*300*	*MHz*
Dipole Serial Number:	*300-002*	
Simulated Tissue:	*head*	
Date of Validation:	*August 22, 2001*	
Validation Interval:	~~*12*~~ 24 *months* CK	

Motorola Florida Research Laboratory hereby certifies, that the System Validation was performed on the date indicated above. The System Validation was performed in accordance with specifications and procedures of Motorola Florida Research Laboratory.

Calibrated by: [signature]
J. Patrick Oliver

Approved by: [signature]
C. K. Chou

Motorola Florida Research Laboratory - 8000 West Sunrise Blvd. Ft. Lauderdale, Florida 33322

Purpose:

To provide a method to check the validity of the SAR measurement system prior to testing

Tissue Simulate:

Name:	***Head 300***	
Targets for tissue characteristics:		
Dielectric Constant:	***45.3***	***+/- 5%***
Conductivity:	***0.87 S/m***	***+/- 5%***
Measurement values:		
Dielectric Constant:	***44.7***	
Conductivity:	***0.84***	

Validation setup:

Set up for the validation using constant forward power as shown in Figure 1. The total distance from the mixture to the top of the dipole tips is 16 mm.

Use 1.0 for the density of the simulated tissue.

Target for SAR validation:

The target is specified in terms of peak SAR averaged over 1 cm^3 (1 gram) of tissue.

The target is normalized to 1 watt based on a constant forward input power of 500 mW.

Peak SAR, at 1 watt, averaged over 1 cm^3 (1 gram) of tissue:

2.8 mW/g	***+/- 10%***

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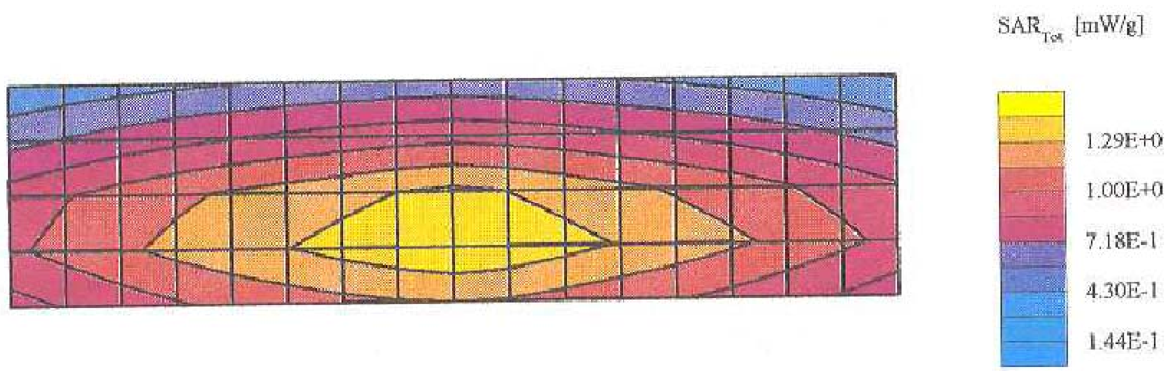
dipole 300; Test Date:08/22/01

dipole 300-002, head, constant forward power = 500 mW
9x16 inch flat Phantom; Section; Position: ;
Probe: - SN1418; ConvF(7.00,7.00,7.00); Crest factor: 1.0; head 300: σ = 0.84 mho/m ε_r = 44.7 ρ = 1.00 g/cm³
Cubes (2): SAR (1g): 1.39 mW/g ± 0.08 dB, SAR (10g): 0.935 mW/g ± 0.09 dB, (Worst-case extrapolation), Peak: 2.14 mW/g ± 0.08 dB,Max at 81.0, 12.0, 4.5
Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0
Powerdrift: 0.00 dB



Motorola Florida Research Lab

APPENDIX E
Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the body-worn carry accessories for FCC ID: ABZ99FT3045. The sample that was used in the following photos represents the product used to obtain the results presented herein and was used in section to demonstrate the different body-worn accessories.

Photo 1.
Model HLN8255A
Back View

Photo 2.
Model HLN8255A
Side View

Photo 3.
Model HLN9701B
Back View

Photo 4.
Model HLN9701B
Front View

Photo 5.
Model HLN9701B
Side View

Photo 6.
Model PLMN4124A
Back View

Photo 7.
Model PLMN4124A
Side View

Photo 8.
Model RLN5383A
Back View

Photo 9.
Model RLN5383A
Front View

Photo 10.
Model RLN5383A
Side View

Photo 11.
Model RLN5384A
Back View

Photo 12.
Model RLN5384A
Front View

Photo 13.
Model RLN5384A
Side View

Photo 13.
Model RLN5385A
Back View

Photo 14.
Model RLN5385A
Front View

Photo 15.
Model RLN5385A
Side View

Photo 16.
RLN4815A
Universal Radio Pack

Photo 17.
HLN6602A
Universal Chest Pack

Photo 18.
NTN5243A
Shoulder Carry Strap

Appendix F
Accessories and options test status and separation distances

The following table summarizes the body spacing distance provided by each of the body-worn accessories:

Carry Case Model	Tested ?	Separation distance between device and phantom surface. (mm)	Comments
HLN6602A	Yes	26	NA
1505596Z02	No	-	No metallic parts
RLN4570A	No	-	Similar to HLN6602A
RLN4815A	Yes	45	NA
4280384F89	No	-	No metallic parts
NTN5243A	Yes	50	Tested with carry case
PMLN4124A	Yes	39	NA
HLN8255B	Yes	38	NA
HLN9701B	Yes	45	NA
RLN5383A	Yes	50	NA
RLN5384A	No	-	Similar to RLN5385A
RLN5385A	Yes	62	NA

Audio Acc. Model	Tested ?	Separation distance between device and phantom surface. (mm)	Comments
HMN9030A	Yes	NA	NA
HMN9727B	No	NA	Receive only
RLN4894A	No	NA	Receive only
HMN9752B	No	NA	Receive only
HMN9754D	Yes	NA	NA
RLN4895A	No	NA	Similar to HMN9754D
HMN9036A	No	NA	Similar to HMN9754D
HLN9132A	No	NA	Receive only
RLN5198AP	No	NA	Similar to HMN9754D
BDN6720A	No	NA	Receive only
PMMN4001A	Yes	NA	NA
HMN9013A	Yes	NA	NA
RMN4016A	Yes	NA	NA
RLN5238A	Yes	NA	NA
HMN9021A	Yes	NA	NA
HMN9022A	No	NA	Similar HMN9021A
BDN6647F	Yes	NA	NA
BDN6648C	Yes	NA	NA
RMN5015A	Yes	NA	NA
RKN4090A	Yes	NA	tested with RMN5015A
RLN5411A	Yes	NA	NA