Certificate Number: 1449-01

MOTOROLA

ACCREDITED

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

S.A.R. EME Compliance Test Report

Attention:	Federal Communication Commission
Date of Report:	July 12, 2002
Report Revision:	Rev. O
Device Manufacturer:	Motorola
Device Model:	P94ZRC90C2AA
Device Description:	450-474 MHz 16 CH 12.5K/25K; 1-4 Watts
FCC ID:	**ABZ99FT4073**

Test Period: 6/9/02 – 6/29/02

Test Engineer: Andy Gessner
EME Technician

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/ C.K. Chou — 7/15/02

C.K. Chou, Ph.D.
Chief EME Scientist
Director, Corporate EME Research Laboratory

Date Approved

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REVISION HISTORY

Date	Revision	Comments
7/12/02	O	Initial release

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 MFRL EME Test Lab for FCC ID: ABZ99FT4073.

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: ABZ99FT4073, operates using simplex frequency modulation transmission protocol. Normal transmission duty cycle is considered to be 5% transmit, 5% receive, and 90% standby. The intended use is by professionals in public safety agencies such as police, fire and medical emergency response. The intended operating positions are “at the face” with the microphone 1 to 2 inches from the mouth or “at the abdomen” secured to the user’s belt. Audio and PTT operation while the radio is at the abdomen is accomplished by means of optional remote accessories that connect to the radio. The maximum transmit duty cycle used to determine EME compliance is a conservative 50% and is controlled by the user via the PTT function.

FCC ID: ABZ99FT4073 is capable of operating in the 450-474 MHz band. The rated power is 1 to 4 watts with a maximum output capability of 5.3 watts as defined by the upper limit of the production line final test station.

FCC ID: ABZ99FT4073 is offered with the following options and accessories:

Batteries

HNN9049A	Standard 1200 mAH Battery, Nickel Cadmium
HNN9050	Fully Approved Factory Mutual Ni-Cd Battery (1200 mAH)
HNN9051	1600 mAH MiMH Ultra High Capacity Battery

Antennas:

NAE6483	6.5” Whip 450-474MHz ¼ wave -1.0 dBi
NAE6522	3.0” Helical 438-470MHz ¼ wave -2.0dBi

Body-Worn Accessories

HLN8255	Replacement 3” Spring Action Belt Clip
HLN9985	Waterproof Bag
HLN9416	Nylon Carry Case (Basic P1225 only)
HLN9417	Leather Carry Case With Belt Loop (Basic P1225 only)
HLN9323	Leather Carry Case With Swivel (Basic P1225 only)
RLN4804	DTMF Leather Carry Case with Swivel, Half Keypad (P1225•LS only)
RLN4805	DTMF Leather Carry Case with Belt Loop
HLN9238	DTMF Leather Carry Case with Swivel
HLN9239	DTMF Leather Carry Case with Belt Loop
HLN9973	Replacement Strap For Nylon & Leather Carry Cases
HLN9974	Replacement Strap for DTMF Leather Carry Cases
HLN9149	Swivel Belt Loop Adapter (for use with HLN9416 andHLN9417)
HLN8414	Chest Pack Carry Holder
HLN6602	Universal Chestpack with Radio Holder, Pen Holder & Velco Secured Pocket
1505596Z02	Replacement Strap for Universal Checkpack
NTN5243	Shoulder Strap (for all carry carry cases)
NTN8040	Replacement 3” Swivel Belt Loop
NTN8039	Replacement 2-1/2” Swivel Belt Loop

Audio/Optional Accessories:

HMN9013	Lightweight Headset II with Swivel Boom Microphone
RMN4016	Lightweight Headset w/Swivel Boom Mic & Inline PTT
RMN4016	Lightweight Headset with Single Muff
BDN6647	Medium Weight Headset with Swivel Boom Microphone
BDN6648	Heavy Duty Headset With Swivel Boom Microphone
HMN9021	Medium Weight Dual Muff Headset (over the head)
HMN9022	Medium Weight Dual Muff Headset (behind the head)
HMN9030	Remote Speaker Microphone
HMN9754	2-Piece Surveillance Microphone
BDN6646	Ear Microphone With PTT Interface
BDN6706	Ear Microphone With VOX Interface (P1225 only)
HMN9752	Earpiece With Volume Control
HMN9727	Earpiece Without Volume Control
BDN6720	Flexible Ear Receiver
NTN8370	Extreme Noise Earpiece Adapter
NTN8371	Low Noise Earpiece Adapter
0180358B38	Finger Push-to-Talk Switch
01-80300E83	Body Switch Push-to-Talk for Each Microphone
0180358B33	Medium Ear Holder for Ear Microphone

3.1 Test Signal

Test Signal mode

Test Mode	X	Base Station		Simulator	

Transmission Mode

CW	**X**
Native Transmission	
TDMA 1:8	
EGSM, DCS, PCS	

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 worst case battery offered for FCC ID: ABZ99FT4073 in this report. Appendix A also presents a shortened S.A.R. cube scan performed with the worst-case 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 SAR 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/SN1388. The system performance check was conducted daily and within 24 hours prior to testing. A copy of the DASY output files of the system performance test results and the probe calibration certificates are included in APPENDIX 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 SAR @ 1W (mW/g)	Test Date
1388	FCC Body	3/22/02	450-001	4.435 +/- 0.205	4.4 +/- 10%	6/9/02-6/28/02
1388	IEEE Head	3/22/02	450-001	4.340 +/- 0.09	4.3 +/- 10%	6/22/02 & 6/29/02

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 Body Phantom

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 69 cm x 26 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.

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

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
Body	Abdomen
Head	Face

4.3.2 Simulated Tissue Composition

		Ingredient %				
Tissue type	**Frequency (MHz)**	**Sugar**	**Water**	**Salt**	**HEC**	**Bact.**
FCC Body	450	46.5	50.53	1.87	1	0.1
IEEE Head	450	56	39.1	3.8	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**	**Conductivity – S/m**
450	56.7	0.94

	IEEE Head	
Frequency (MHz)	**Di-electric Constant**	**Conductivity – S/m**
450	43.5	0.87

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. The liquid depth in the phantom used for measurements was 15cm +/- 0.5cm. Additional precautions are routinely taken to ensure the stability of the simulated tissue such as covering the phantoms when scans are not actively in process in order to minimize evaporation. The lab environment is continuously monitored. The table below represents the average environmental conditions during the S.A.R. tests reported herein:

Ambient Temperature	22.61 °C
Relative Humidity	44.35 %
Tissue Temperature	22.10 °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. Figure 2 depicts an overall perspective of the system setup and support structure.

5.0 Description of Test Procedure

All options and accessories listed in section 3.0 were examined in order to determine which would be included in the S.A.R. test plan. The test matrix included all options and accessories containing unique metallic components and or connection mechanisms. The transmit power was set to the maximum possible output power for all test. Initial and end power was measured before and after each test. Measured S.A.R. results were scaled according to the formula presented in section 8.0. All tests were performed in CW mode. Each test was commenced with a fully charged battery. Compliance assessment of FCC ID ABZ99FT4073 was done according to the following procedures:

All test were performed first at the center frequency. Configurations with S.A.R. results at the center frequency that were within 3dB of the specification limit were also tested at the band edges.

All offered batteries were tested with each offered antenna and the standard Remote Speaker Microphone (RSM). The configuration that produced the highest S.A.R. results from above was used to assess the offered body worn accessories that have unique metallic components and separation dimensions. The configuration that produced the highest S.A.R. results from above was used to assess the applicable audio accessories. S.A.R. assessment at the face was performed with the antenna and battery that produced the highest S.A.R. results along with applicable audio accessories.

5.1 Test Positions

Figure 1 presents the highest S.A.R. test configuration.

5.1.1 Abdomen

A flat phantom containing simulated FCC body tissue consistent with applicable standards was used to assess S.A.R. performance of the device at the abdomen.

5.1.2 2.5cm Face and Abdomen

A flat phantom containing IEEE head tissue consistent with applicable standards was used to assess S.A.R. performance of the device at 2.5cm from the face.

Figure 1: Highest S.A.R. Test Configuration (Universal Chest pack)

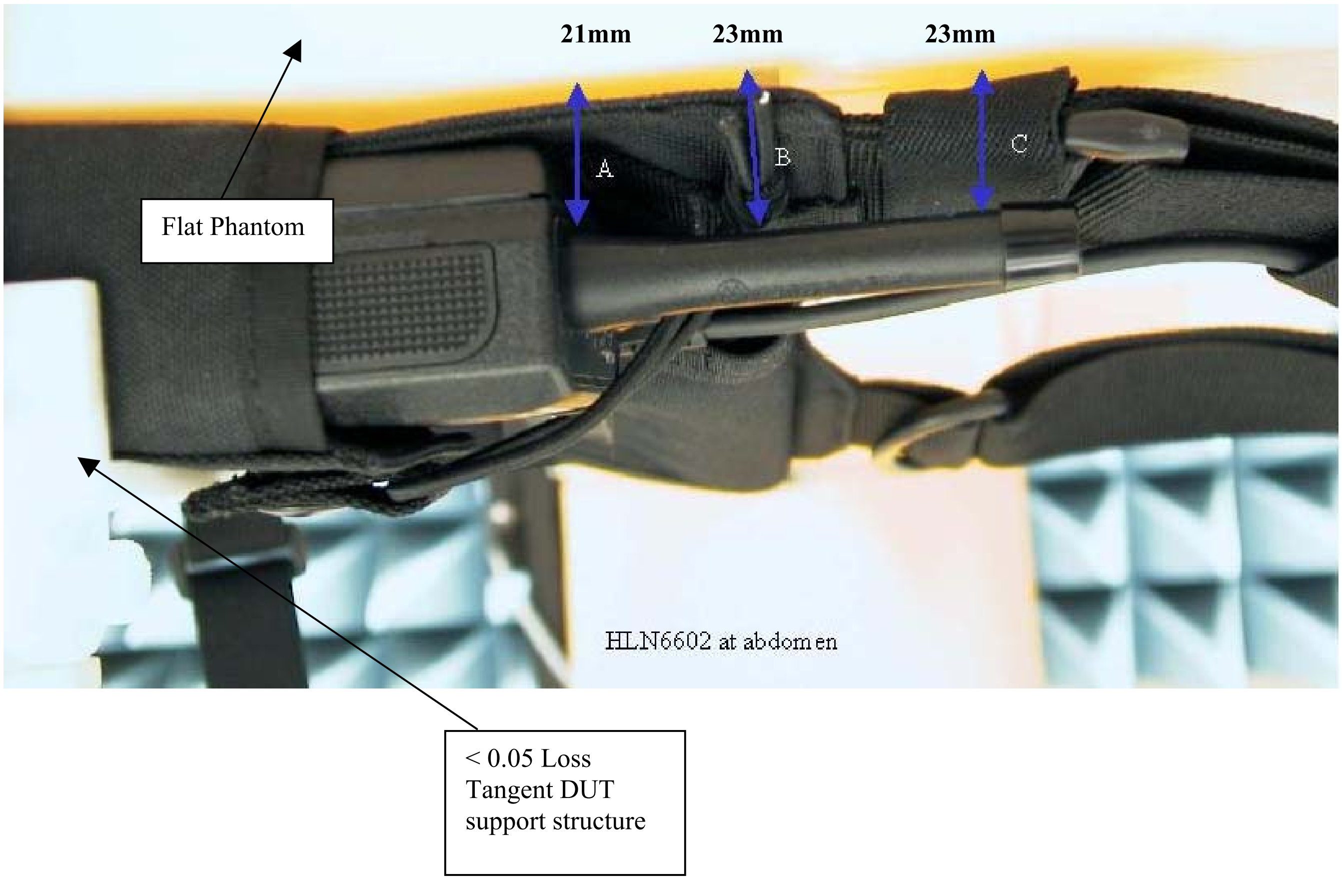
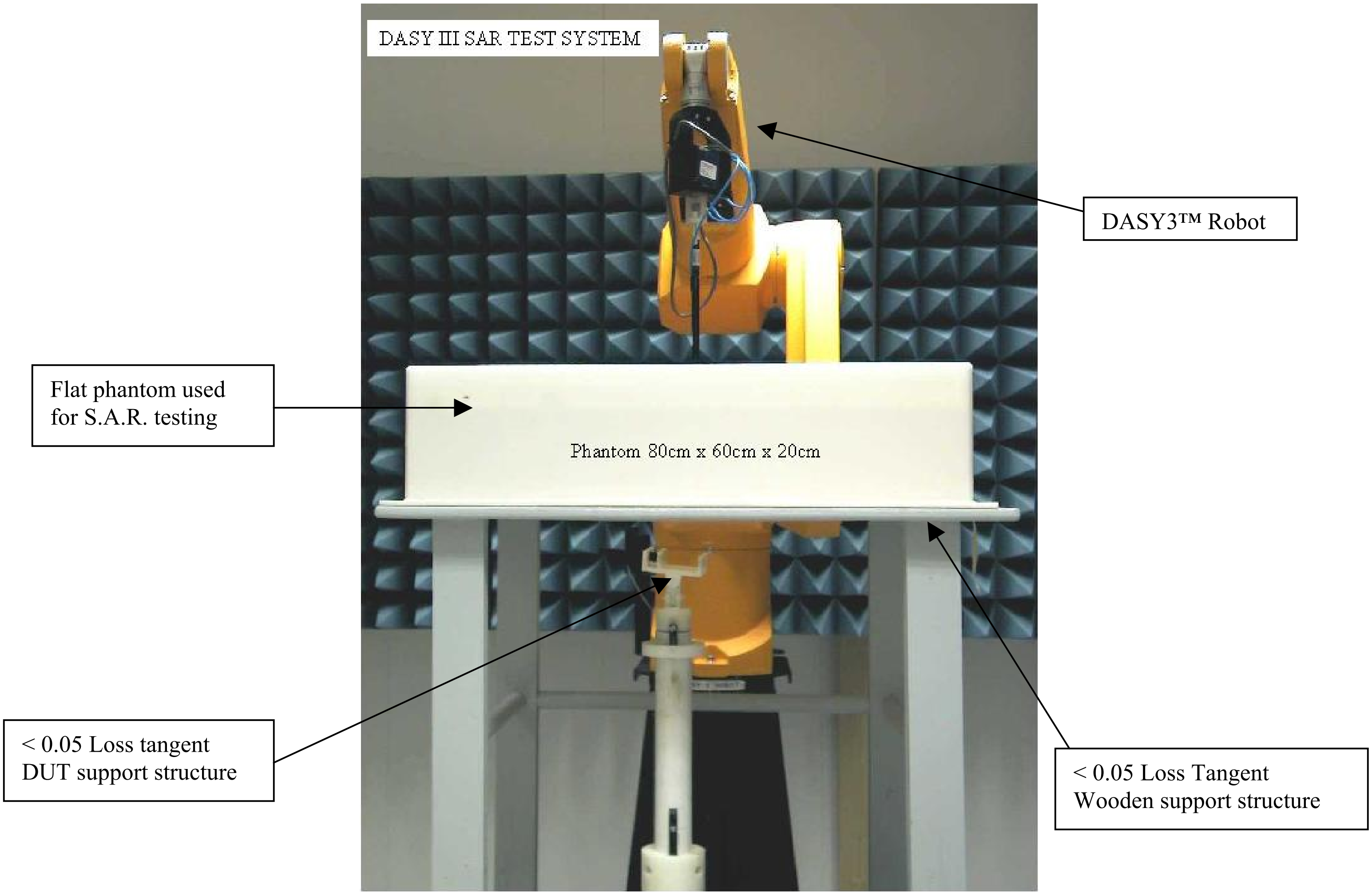


Figure 2: Robot Test System



5.2 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

The table below lists the uncertainty estimate of the possible errors that are associated with the measurement system.

Uncertainty Description	Standard Uncertainty
Probe Uncertainty	
- Axial Isotropy	± 2.4 %
- Spherical Isotropy	± 4.8 %
- Spatial Resolution	± 0.5 %
- Linearity Error	± 2.7 %
- Calibration Error	± 8 %
Evaluation Uncertainty	
- Data Acquisition Error	± 0.60 %
- ELF and RF Disturbances	± 0.25 %
- Conductivity Assessment	± 5 %
Spatial Peak S.A.R. Evaluation Uncertainty	
- Extrapolation and boundary effects	± 3%
- Probe positioning	± 1 %
- Integration and cube orientation	± 3 %
- Cube shape inaccuracies	± 1.2 %
- Device positioning	± 1.0 %

The Total Measurement Uncertainty is ± 12.1 %. The Expanded Measurement Uncertainty is ± 24.2 % (k=2)

Note: Per item #13 of the *OET 65 Supplement C EAB Part 22/24 S.A.R. Review Reminder Sheet 01/2002* handed out during the February and April, 2002 TCB council meeting the tabulated total measurement uncertainty is nominal until the IEEE Std 1528 is completed. Much of the required information has to be supplied by the equipment manufacturer, which has not yet been officially supplied. Other items are based on results of studies currently underway. Our work is scheduled to be complete by the time IEEE P1528 is ratified.

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 for each test configuration. DASY3™ S.A.R. measurement scans are provided in APPENDIX B for the highest observed S.A.R. results for each configuration.

7.1 S.A.R. results at the abdomen

Battery Assessment									
Run Number Unit S/N	**Freq. (MHz)**	**Antenna**	**Battery**	**Body Worn Acc.**	**Attached accessories**	**Initial Power (mW)**	**End Power (mW)**	**Meas. 1g S.A.R.**	**50% DC Max. Calc. 1g-S.A.R. (mW/g)**
S.A.R. assessment of battery with NAE6483A antenna.									
020609-02	462	NAE6483A	HNN9049A	HLN8255A	RSM9030A	5.1	4.7	5.25	2.96
020611-01	462	NAE6483A	HNN9050A	HLN8255A	RSM9030A	5.1	4.1	4.8	**3.10**
020611-02	462	NAE6483A	HNN9051A	HLN8255A	RSM9030A	5.25	4.75	5.5	3.07
S.A.R. assessment of battery with NAE6522A antenna									
020611-03	462	NAE6522A	HNN9049A	HLN8255A	RSM9030A	5.25	4.7	5.5	3.10
020611-04	462	NAE6522A	HNN9050A	HLN8255A	RSM9030A	4.95	4.1	4.83	**3.12**
020611-05	462	NAE6522A	HNN9051A	HLN8255A	RSM9030A	5.05	4.8	5.44	3.00

Body Worn Assessment									
Run Number Unit S/N	**Freq. (MHz)**	**Antenna**	**Battery**	**Body Worn Acc.**	**Attached accessories**	**Initial Power (mW)**	**End Power (mW)**	**Meas. 1g S.A.R.**	**50% DC Max. Calc. 1g-S.A.R. (mW/g)**
S.A.R. assessment of Body worn accessories with worst case configuration from Battery assessment									
020612-01	462	NAE6522A	HNN9049A	HLN9417	RSM9030A	5.3	4.7	3.73	2.10
020612-02	462	NAE6522A	HNN9050A	HLN9416	RSM9030A	5.15	4.6	3.77	2.17
020612-03	462	NAE6522A	HNN9051A	HLN9323	RSM9030A	5.3	4.6	1.25	0.72
020612-04	462	NAE6522A	HNN9049A	HLN9239A	RSM9030A	5.05	4.6	3.73	2.15
020612-05	462	NAE6522A	HNN9050A	RLN9238	RSM9030A	5.25	4.65	1.31	0.75

020613-01	462	NAE6522A	HNN9051A	HLN8414	RSM9030A	5.3	4.75	5.37	3.00
020613-02	462	NAE6522A	HNN9051A	HLN6602	RSM9030A	5.3	4.7	6.12	**3.45**

Audio Accessories assessment									
Run Number Unit S/N	**Freq. (MHz)**	**Antenna**	**Battery**	**Body Worn Acc.**	**Attached accessories**	**Initial Power (mW)**	**End Power (mW)**	**Meas. 1g S.A.R.**	**50% DC Max. Calc. 1g-S.A.R. (mW/g)**
S.A.R. assessment of Audio accessories with worst case configuration from the body worn assessment									
020626-01	450	NAE6522A	HNN9049A	HLN6602	HMN9013A	5.05	4.6	8.48	**4.89**
020619-01	462	NAE6522A	HNN9049A	HLN6602	HMN9013A	5.25	4.65	7.96	4.54
020626-02	470	NAE6522A	HNN9049A	HLN6602	HMN9013A	5.2	4.65	7.19	4.10
020626-03	450	NAE6522A	HNN9049A	HLN6602	RMN4016A	5.0	4.55	7.51	4.37
020619-02	462	NAE6522A	HNN9049A	HLN6602	RMN4016A	5.0	4.5	6.91	4.07
020628-01	470	NAE6522A	HNN9049A	HLN6602	RMN4016A	5.20	4.50	6.56	3.60
020626-05	450	NAE6522A	HNN9049A	HLN6602	BDN6647F	5.05	4.6	7.92	4.56
020619-03	462	NAE6522A	HNN9049A	HLN6602	BDN6647F	5.2	4.65	7.66	4.37
020626-06	470	NAE6522A	HNN9049A	HLN6602	BDN6647F	5.3	4.6	7.14	4.11
020626-07	450	NAE6522A	HNN9049A	HLN6602	BDN6648C	5.05	4.6	7.83	4.51
020619-04	462	NAE6522A	HNN9049A	HLN6602	BDN6648C	5.25	4.75	7.19	4.01
020626-08	470	NAE6522A	HNN9049A	HLN6602	BDN6648C	5.3	4.6	6.67	3.84
020628-02	450	NAE6522A	HNN9049A	HLN6602	HMN9021A	5.00	4.70	8.48	4.78
020620-01	462	NAE6522A	HNN9049A	HLN6602	HMN9021A	5.15	4.6	7.04	4.06
020627-02	470	NAE6522A	HNN9049A	HLN6602	HMN9021A	5.3	4.55	7.08	4.12
020627-03	450	NAE6522A	HNN9049A	HLN6602	HMN9022A	5.0	4.65	8.12	4.63
020620-02	462	NAE6522A	HNN9049A	HLN6602	HMN9022A	5.1	4.6	7.54	4.34
020627-04	470	NAE6522A	HNN9049A	HLN6602	HMN9022A	5.3	4.5	7.06	4.16
020627-05	450	NAE6522A	HNN9049A	HLN6602	HMN9754D	5.0	4.6	8.02	4.62

020620-03	462	NAE6522A	HNN9049A	HLN6602	HMN9754D	5.2	4.65	7.6	4.33
020627-06	470	NAE6522A	HNN9049A	HLN6602	HMN9754D	5.3	4.5	6.43	3.79
020627-07	450	NAE6522A	HNN9049A	HLN6602	BDN6646C w/0180358B38	5.0	4.6	7.69	4.43
020620-04	462	NAE6522A	HNN9049A	HLN6602	BDN6646C w/0180358B38	5.2	4.7	7.53	4.25
020627-08	470	NAE6522A	HNN9049A	HLN6602	BDN6646C w/0180358B38	5.3	4.6	6.53	3.76
020627-09	450	NAE6522A	HNN9049A	HLN6602	BDN6706B w/01-80300E83	5	4.6	7.72	4.45
020620-05	462	NAE6522A	HNN9049A	HLN6602	BDN6706B w/01-80300E83	5.25	4.6	7.29	4.20
020627-10	470	NAE6522A	HNN9049A	HLN6602	BDN6706B w/01-80300E83	5.3	4.55	6.35	3.70
020621-01	462	NAE6522A	HNN9049A	HLN6602	HMN9752B	5.15	4.6	6.91	3.98
020621-04	462	NAE6522A	HNN9049A	HLN9239A	RSM9030A w/NTN5243	5.1	4.65	4.52	2.58
020628-03	450	NAE6522A	HNN9049A	HLN6602	HMN9021A w/HLN9900A	5	4.65	7.92	4.51

7.2 S.A.R. results at the Face

Face Assessment									
Run Number Unit S/N	**Freq. (MHz)**	**Antenna**	**Battery**	**Body Worn Acc.**	**Attached accessories**	**Initial Power (mW)**	**End Power (mW)**	**Meas. 1g S.A.R.**	**50% DC Max. Calc. 1g-S.A.R. (mW/g)**
S.A.R. assessment at the face									
020622-01	462	NAE6522A	HNN9049A	NA	NA	5.1	4.7	4.25	2.40
020629-01	462	NAE6522A	HNN9049A	NA	BDN6702A	5.1	4.7	4.69	2.64
020629-02	462	NAE6522A	HNN9049A	NA	HMN9727A	5.2	4.7	3.95	2.23
020622-02	462	NAE6483A	HNN9049A	NA	NA	5.1	4.7	4.72	**2.66**

7.3 Peak S.A.R. location

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

8.0 Conclusion

The highest Operational calculated 1-gram average S.A.R. values found for FCC ID: ABZ99FT4073, model number P94ZRC90C2AA were **4.89 mW/g** at the abdomen and **2.66 mW/g** at the face. The following formulas where used:

Max. Calc. 1g S.A.R. = (Initial Power/End Power) * meas. 1g S.A.R. * 0.50

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 S.A.R. Scan

Power Slump Data

(HNN9049A – Highest S.A.R. producing Battery; HNN9050A – largest power slump battery)

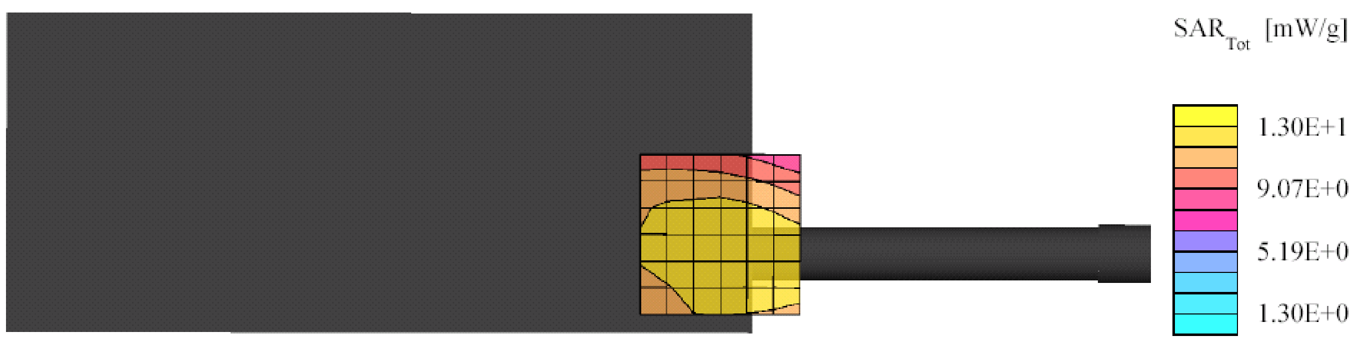
Battery Model # HNN9050A		Battery Model # HNN9049A	
Time (min.)	**Power (W)**	**Time (min.)**	**Power (W)**
0	5.10	0	4.99
2	4.51	2	4.65
4	4.16	4	4.60
6	3.98	6	4.56
8	3.94	8	4.53
10	3.79	10	4.49
12	3.72	12	4.45
14	3.67	14	4.41
16	3.59	16	4.35
18	3.59	18	4.27
20	3.48	20	4.10
22	3.38	22	4.00
24	3.26	24	3.80
6	3.08	6	3.68
28	3.26	28	3.49
30	3.08	30	3.35
32	2.97	32	3.09
34	2.80	34	2.71
36	2.53	36	2.00
38	2.33	38	1.10
40	1.60	40	0.98

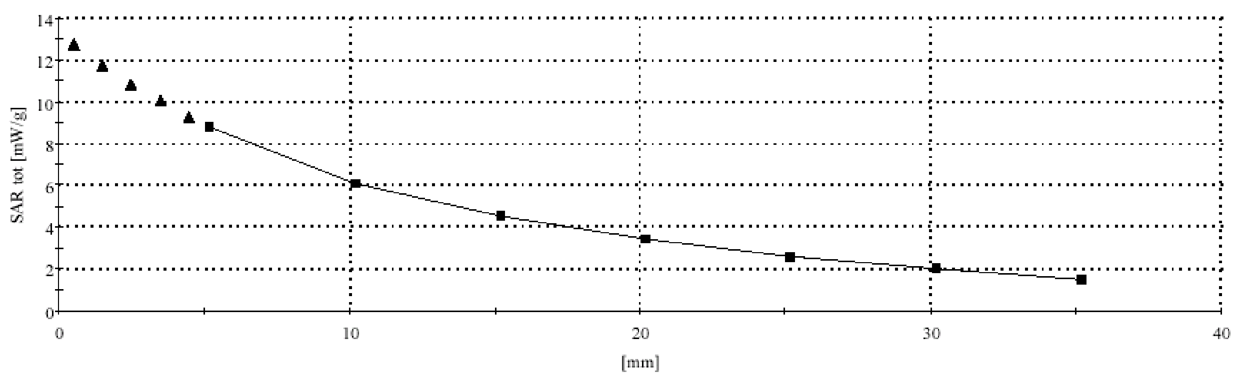
Shortened Scan of Highest S.A.R. Configuration

FCC ID: ABZ99FT4073; Test Date: 07/11/02
Motorola MFRL Lab
RUN NUMBER: 020711-01
MODEL NUMBER: P94ZRC90C2AA SERIAL NUMBER: 475FBU8257
TX FREQ: 450MHz

Test Duration: 11min
ACCESSORIES: Battery(HNN9049A), Audio Acc(HMN9013A),
Carry Acc(HLN6602), Antenna(NAE6522A)

PROBE CALIBRATION DATE:020322
Flat 80x60x20 Phantom; Center Origin Section; Position: (90°,0°);
Probe: ET3DV6 A2LA - SN1388; ConvF(7.70,7.70,7.70); Probe cal date: 22/03/02; Crest factor: 1.0; BODY 450: σ = 0.95mho/m ε = 56.6 ρ = 1.00 g/cm3 Cube 7x7x7: SAR (1g): 8.90 mW/g,



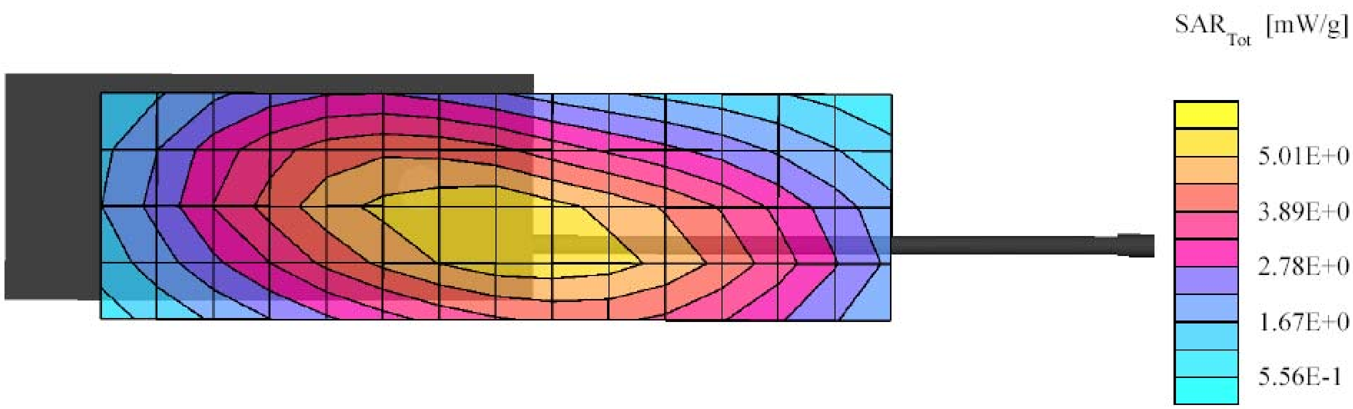


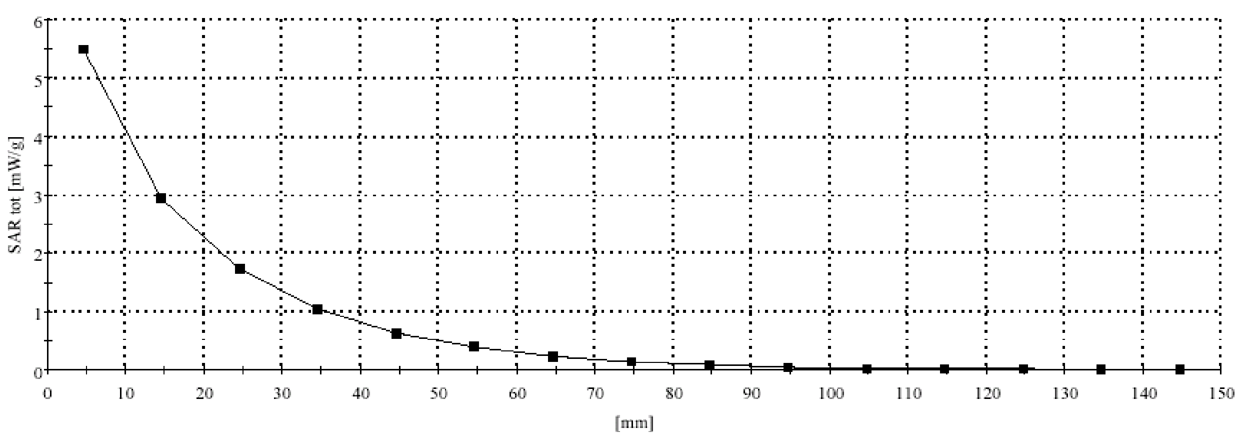
APPENDIX B
Data Results

FCC ID: ABZ99FT4073; Test Date: 06/11/02
Motorola MFRL Laboratory
RUN NUMBER: 020611-02
MODEL NUMBER: P94ZRC90C2AA SERIAL NUMBER: 475FBU8257
TX FREQ: 462MHz

ACCESSORIES:
Battery(HNN9051A), Carry Acc(HLN8255B), Antenna(NAE6483A), RSM(HMN9030A)

PROBE CALIBRATION DATE:020322
Flat 80x60x20 Phantom; Center Origin Section; Position: (90°,0°);
Probe: ET3DV6 A2LA - SN1388; ConvF(7.70,7.70,7.70); Probe cal date: 22/03/02; Crest factor: 1.0; BODY 450: σ = 0.91 mho/m ε = 59.4 ρ = 1.00 g/cm3
Cube 7x7x7: SAR (1g): 5.50 mW/g, SAR (10g): 3.94 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 105.0, 24.0, 4.7

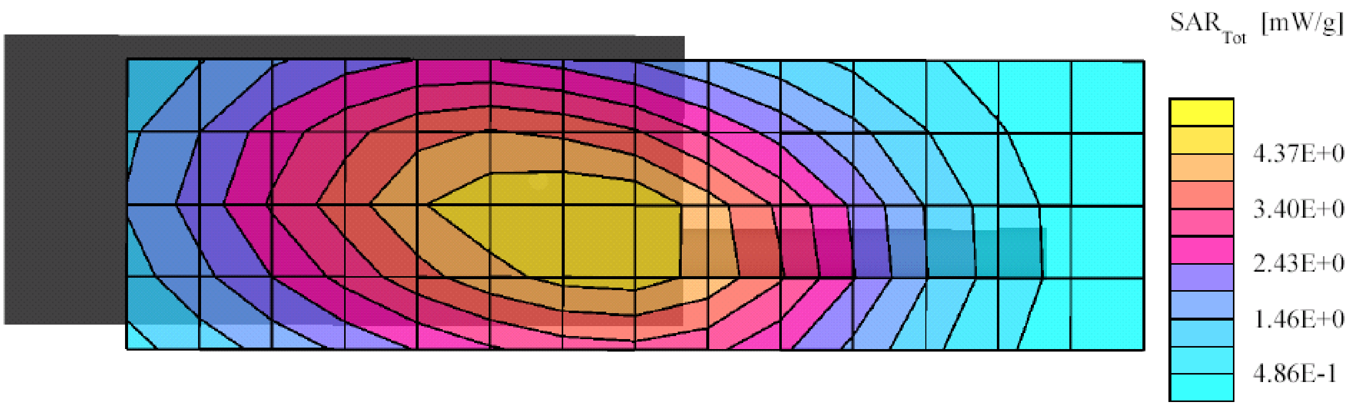


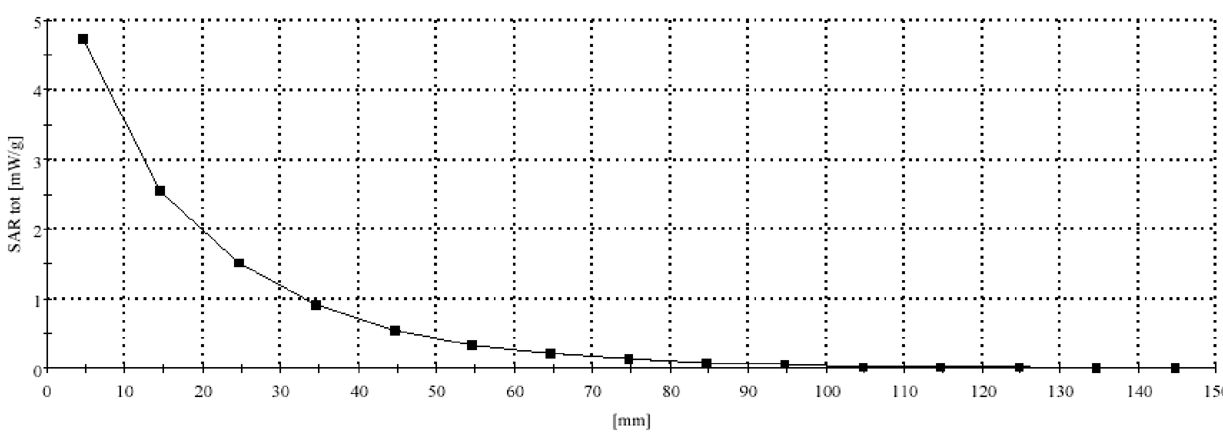


FCC ID: ABZ99FT4073; Test Date: 06/11/02
Motorola MFRL Laboratory
RUN NUMBER: 020611-04
MODEL NUMBER: P94ZRC90C2AA SERIAL NUMBER: 475FBU8257

ACCESSORIES: Battery(HNN9050A), Carry Acc(HLN8255B), Antenna(NAE6522A), RSM(HMN9030A)
PROBE CALIBRATION DATE:020322

Flat 80x60x20 Phantom; Center Origin Section; Position: (90°,0°);
Probe: ET3DV6 A2LA - SN1388; ConvF(7.70,7.70,7.70); Probe cal date: 22/03/02; Crest factor: 1.0; BODY 450: σ = 0.91 mho/m ε = 59.4 ρ = 1.00 g/cm3
Cube 7x7x7: SAR (1g): 4.83 mW/g, SAR (10g): 3.48 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 99.0, 25.5, 4.7

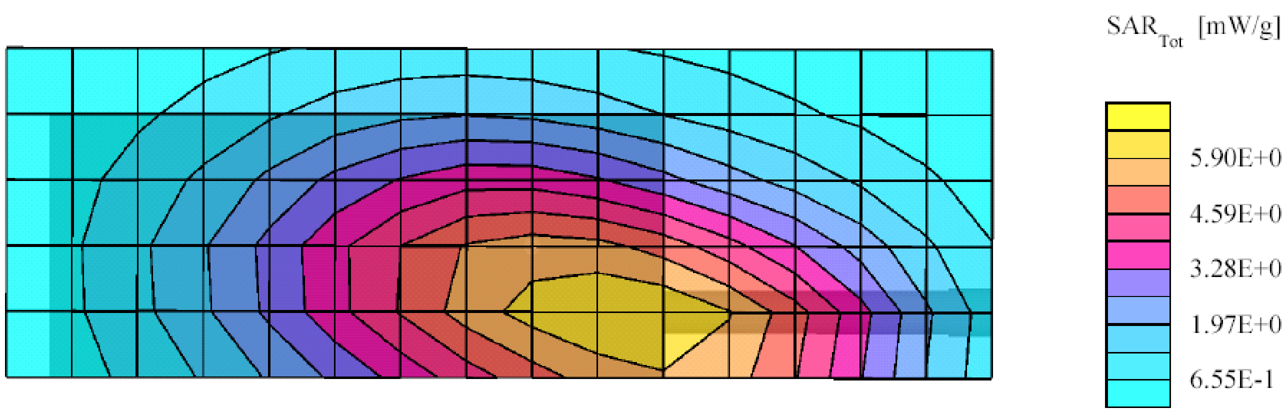


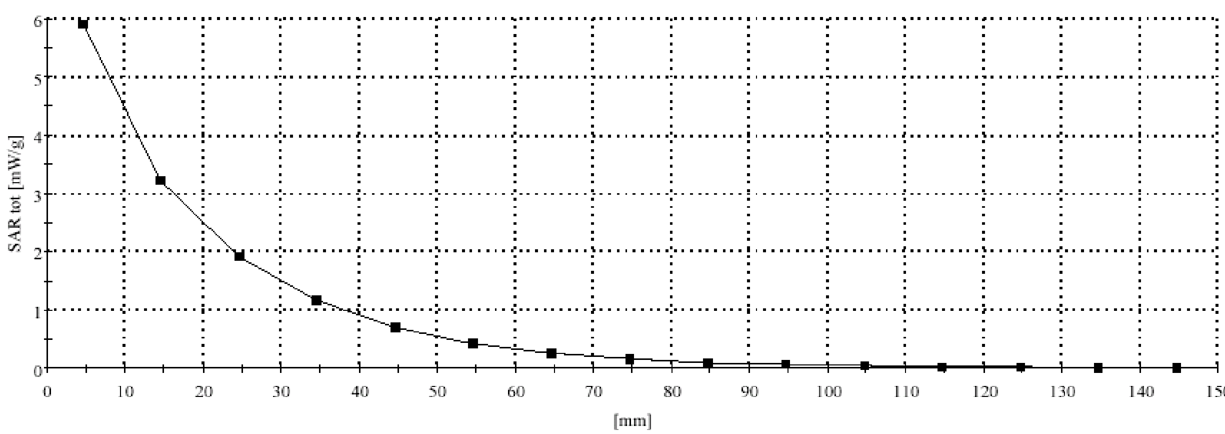


FCC ID: ABZ99FT4073; Test Date: 06/13/02
Motorola MFRL Laboratory
RUN NUMBER: 020613-02
MODEL NUMBER: P94ZRC90C2AA SERIAL NUMBER: 475FBU8257

Antenna Distance(mm): A-24 B-27 C-29
ACCESSORIES: Battery(HNN9049A), Carry Acc(HLN6602), Antenna(NAE6522A), RSM(HMN9030A)

PROBE CALIBRATION DATE:020322
Flat 80x60x20 Phantom; Center Origin Section; Position: (90°,0°);
Probe: ET3DV6 A2LA - SN1388; ConvF(7.70,7.70,7.70); Probe cal date: 22/03/02; Crest factor: 1.0; BODY 450: σ = 0.91 mho/m ε = 59.3 ρ = 1.00 g/cm3
Cube 7x7x7: SAR (1g): 6.12 mW/g, SAR (10g): 4.44 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 145.5, 12.0, 4.7

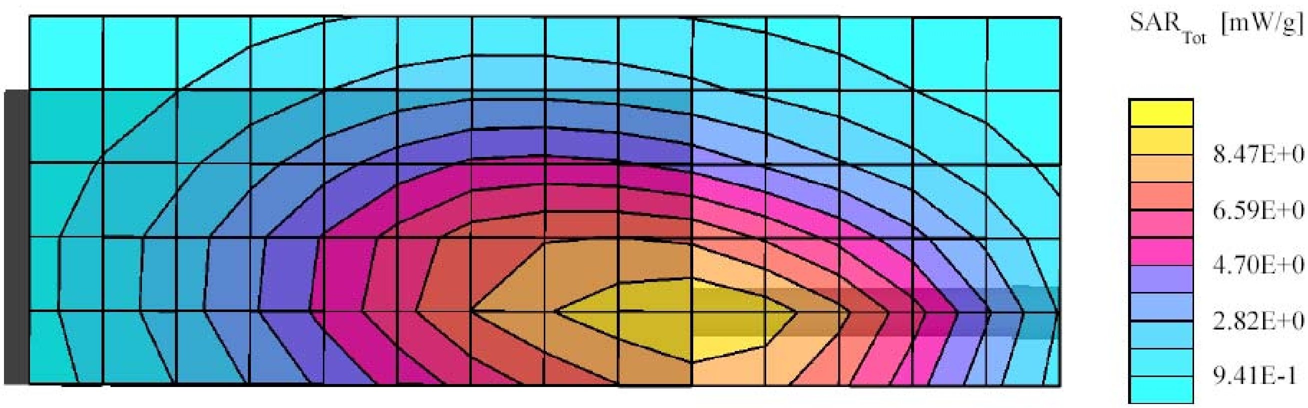


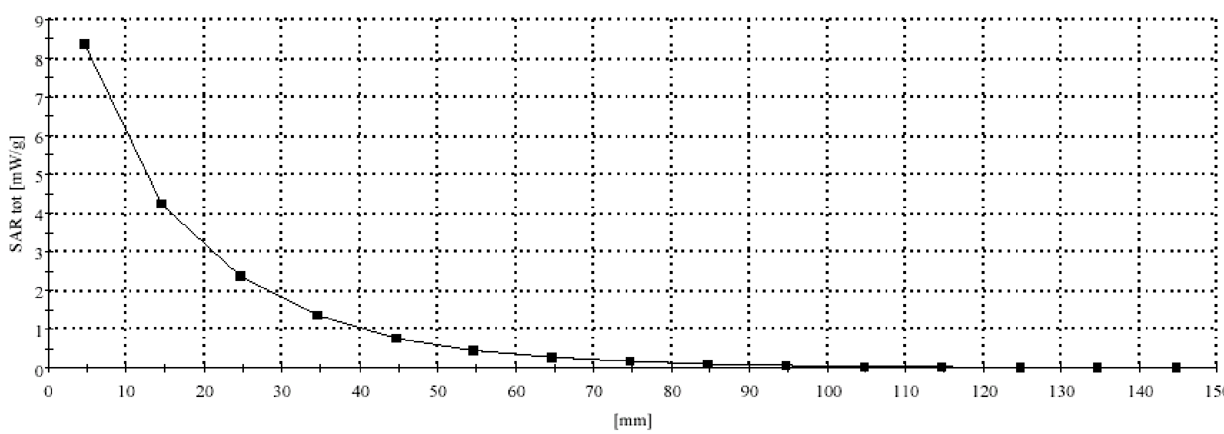


FCC ID: ABZ99FT4073; Test Date: 06/26/02
Motorola MFRL Laboratory
MODEL NUMBER: P94ZRC90C2AA SERIAL NUMBER: 475FBU8257
RUN NUMBER: 020626-01

ACCESSORIES:
Battery(HNN9049A), Audio Acc(HMN9013A), Carry Acc(HLN6602), Antenna(NAE6522A)

PROBE CALIBRATION DATE:020322
Flat 80x60x20 Phantom; Center Origin Section; Position: (90°,0°);
Probe: ET3DV6 A2LA - SN1388; ConvF(7.70,7.70,7.70); Probe cal date: 22/03/02; Crest factor: 1.0; BODY 450: $\sigma = 0.96$ mho/m $\varepsilon = 56.6$ $\rho = 1.00$ g/cm3
Cube 7x7x7: SAR (1g): 8.48 mW/g, SAR (10g): 5.96 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 138.0, 12.0, 4.7



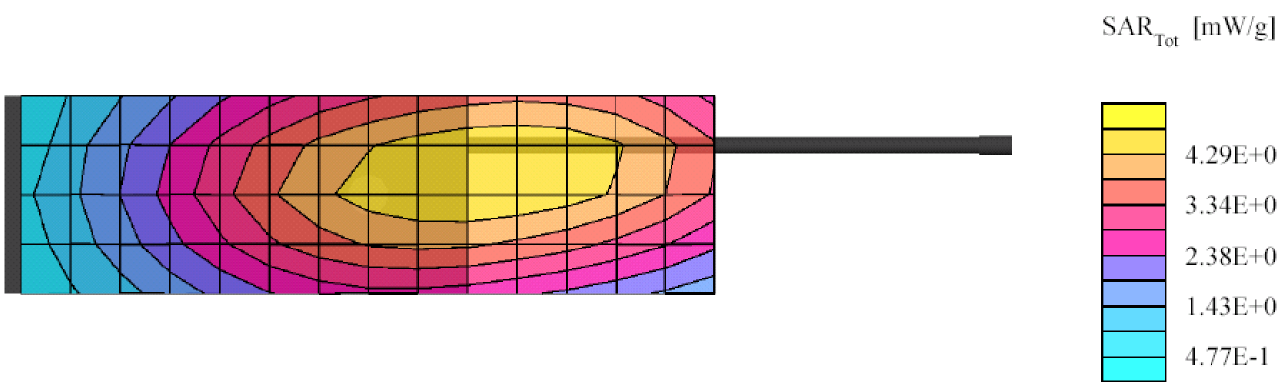


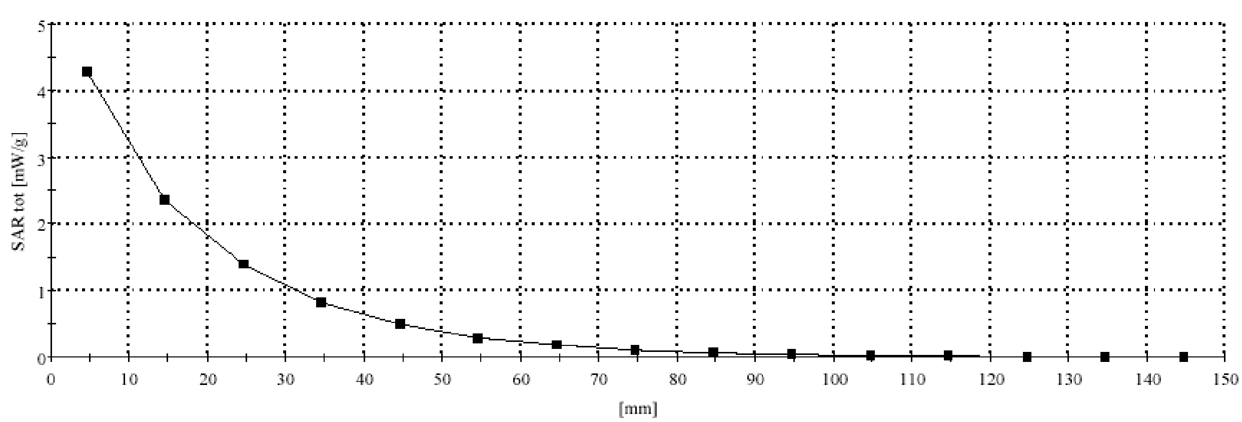
FCC ID: ABZ99FT4073; Test Date: 06/22/02
Motorola MFRL Laboratory
RUN NUMBER: 020622-02
MODEL NUMBER: P94ZRC90C2AA SERIAL NUMBER: 475FBU8257

ACCESSORIES:
Battery(HNN9049A), Antenna(NAE6483A)

Radio Mic placed 2.5 cm from surface of phantom

PROBE CALIBRATION DATE:020322
Flat 80x60x20 Phantom; GRAY Stand Section; Position: (90°,90°);
Probe: ET3DV6 A2LA - SN1388; ConvF(7.60,7.60,7.60); Probe cal date: 22/03/02; Crest factor: 1.0; Head 450: σ = 0.86 mho/m ε = 44.5 ρ = 1.00 g/cm3
Cube 7x7x7: SAR (1g): 4.72 mW/g, SAR (10g): 3.41 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 24.0, 141.0, 4.7

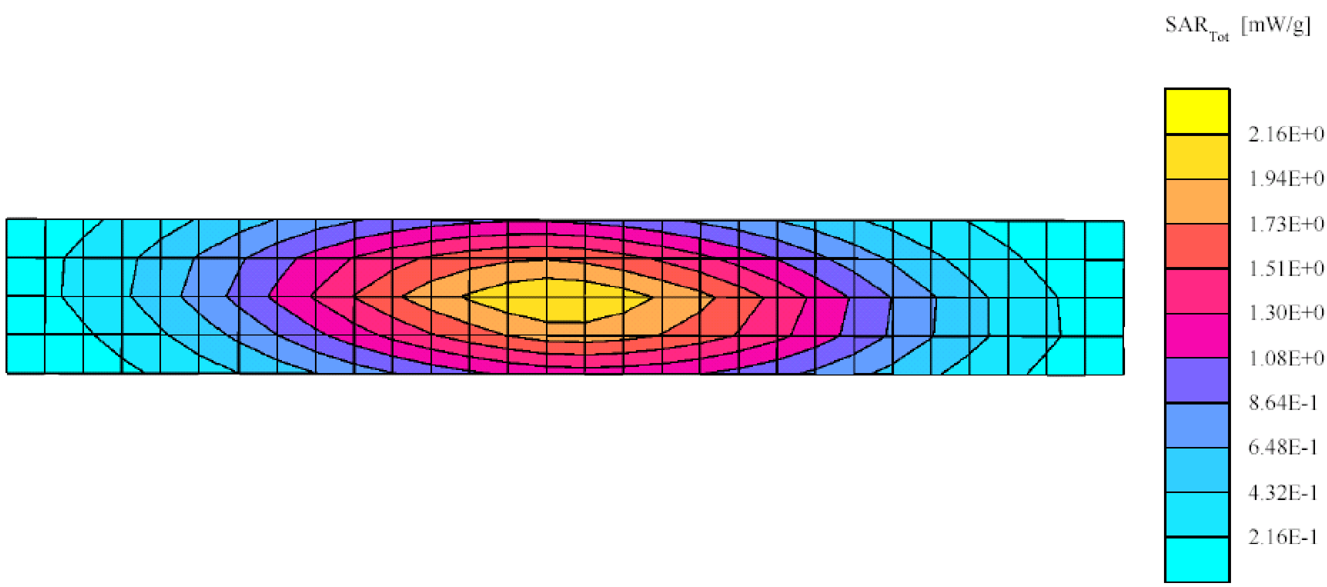




APPENDIX C
Dipole System Performance Check Results

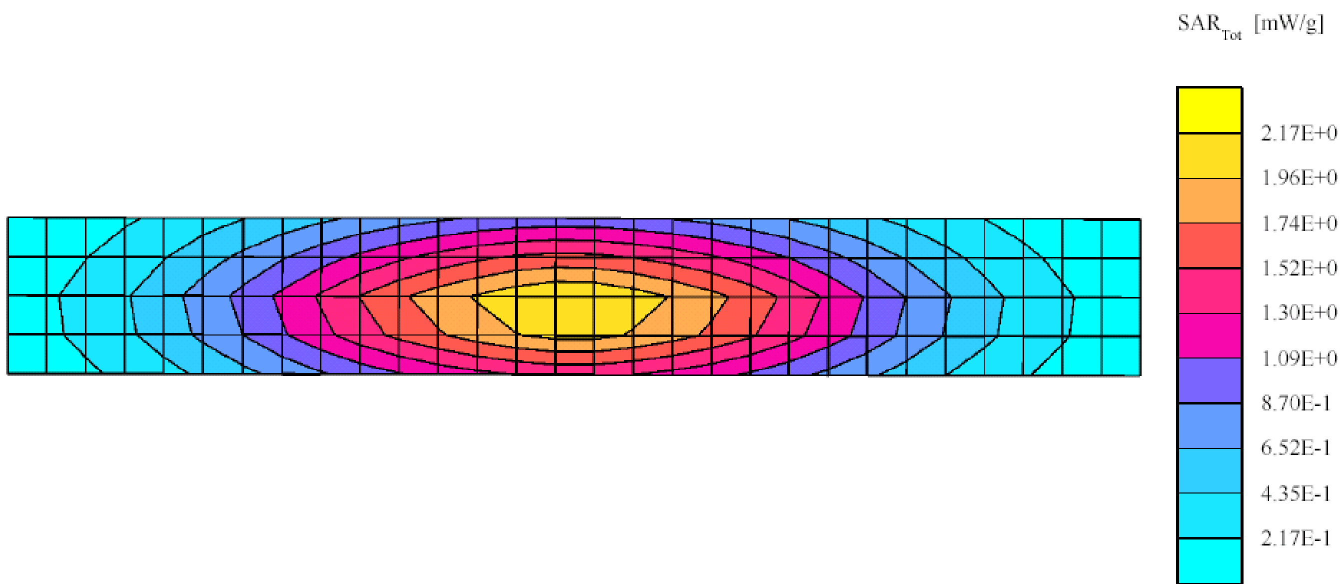
MFRL Dipole 450 MHz; SN 450-001; Test Date:06/09/02
Motorola MFRL Laboratory
Input power 500mW to dipole
Target SAR 4.4mW/g @1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.90 mho/m ε = 59.5 ρ = 1.00g/cm3
Cubes (2): Peak: 3.27 mW/g ± 0.06 dB, SAR (1g): 2.11 mW/g ± 0.07 dB, SAR (10g): 1.39 mW/g ± 0.07 dB, (Worst-case extrapolation)
Penetration depth: 12.8 (11.3, 14.7) [mm]
Power Drift: -0.01 dB



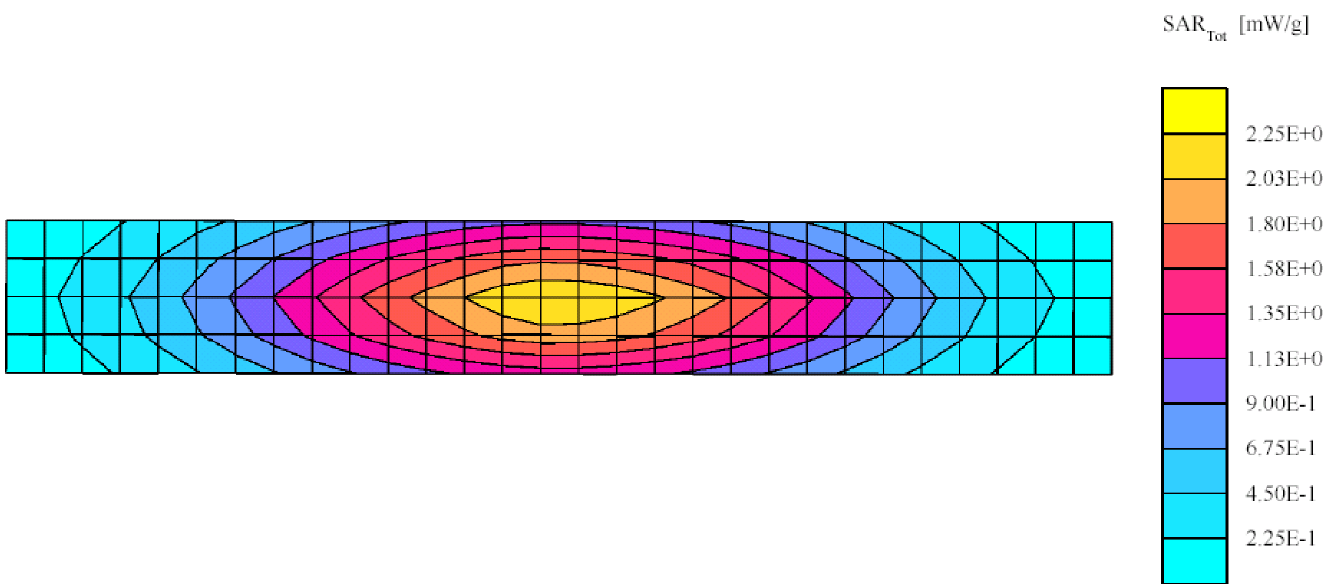
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/11/02
Motorola MFRL Laboratory
Input power 500mW to dipole
Target SAR 4.4mW/g @1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.90 mho/m ε = 59.5 ρ = 1.00g/cm3
Cube 7x7x7: Peak: 3.44 mW/g, SAR (1g): 2.22 mW/g, SAR (10g): 1.47 mW/g, (Worst-case extrapolation)
Penetration depth: 12.9 (11.4, 14.8) [mm]
Power drift: 0.01 dB



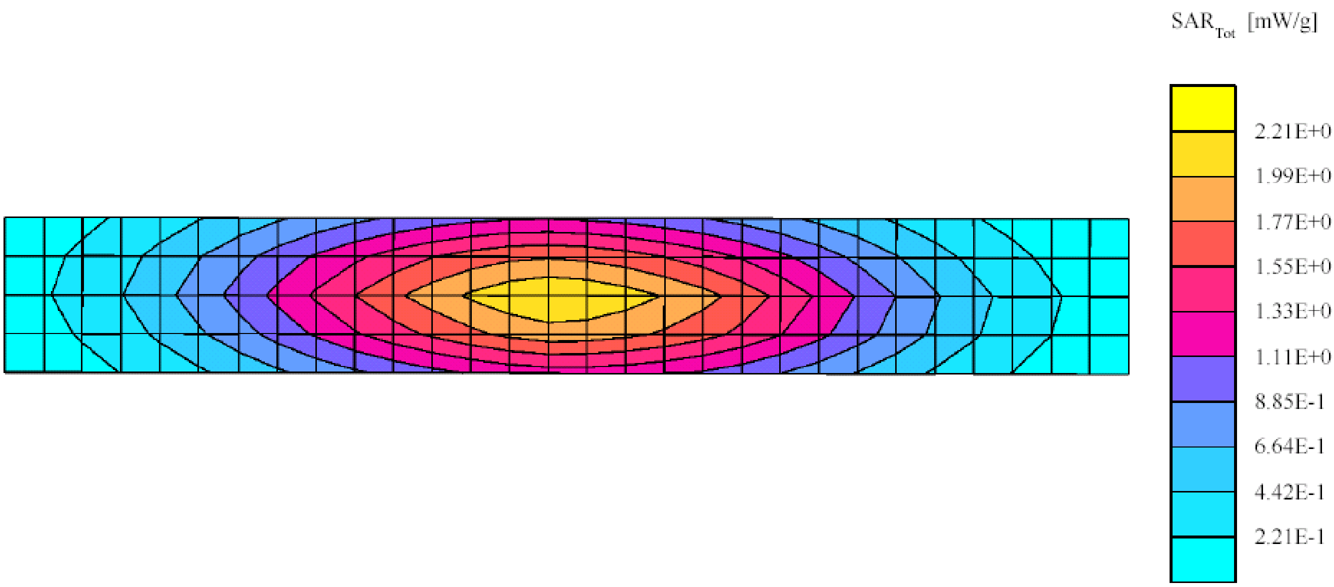
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/12/02
Motorola MFRL Laboratory
Input power 500mW to dipole
Target SAR 4.4mW/g @ 1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.90 mho/m ε = 59.4 ρ = 1.00g/cm3
Cube 7x7x7: Peak: 3.46 mW/g, SAR (1g): 2.25 mW/g, SAR (10g): 1.50 mW/g, (Worst-case extrapolation)
Penetration depth: 13.1 (11.6, 14.9) [mm]
Power drift: 0.02 dB



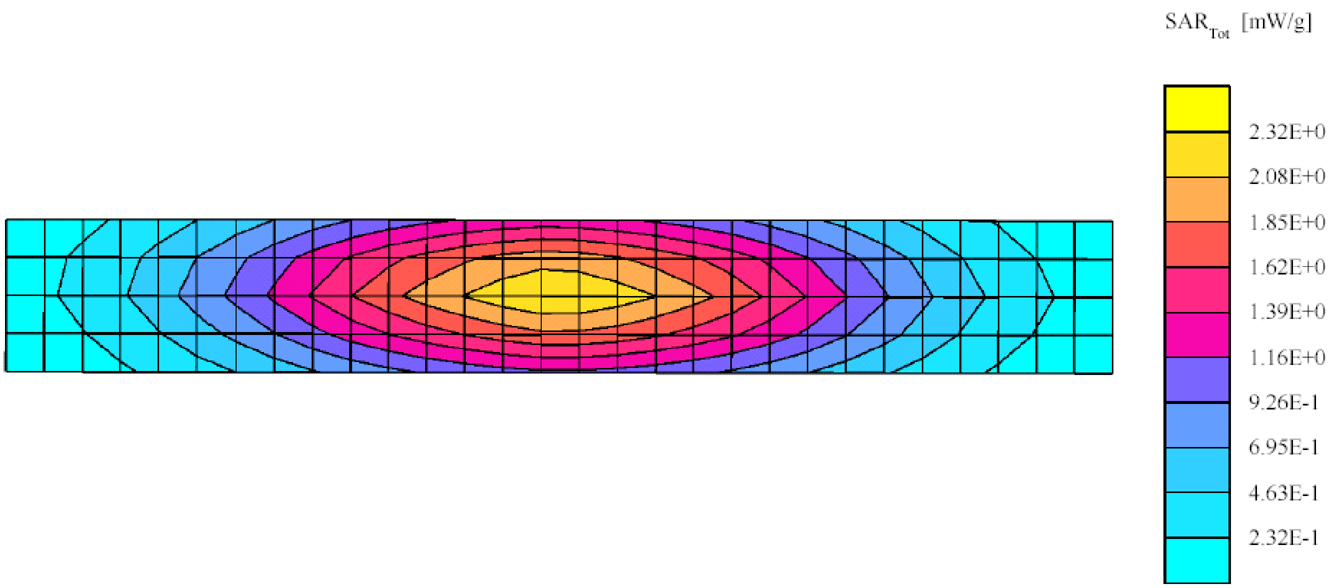
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/13/02
Motorola MFRL Laboratory
Input power 500mW to dipole
Target SAR 4.4mW/g @ 1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.91 mho/m ε = 59.3 ρ = 1.00g/cm3
Cube 7x7x7: Peak: 3.34 mW/g, SAR (1g): 2.18 mW/g, SAR (10g): 1.46 mW/g, (Worst-case extrapolation)
Penetration depth: 13.3 (11.8, 15.3) [mm]
Power drift: -0.03 dB



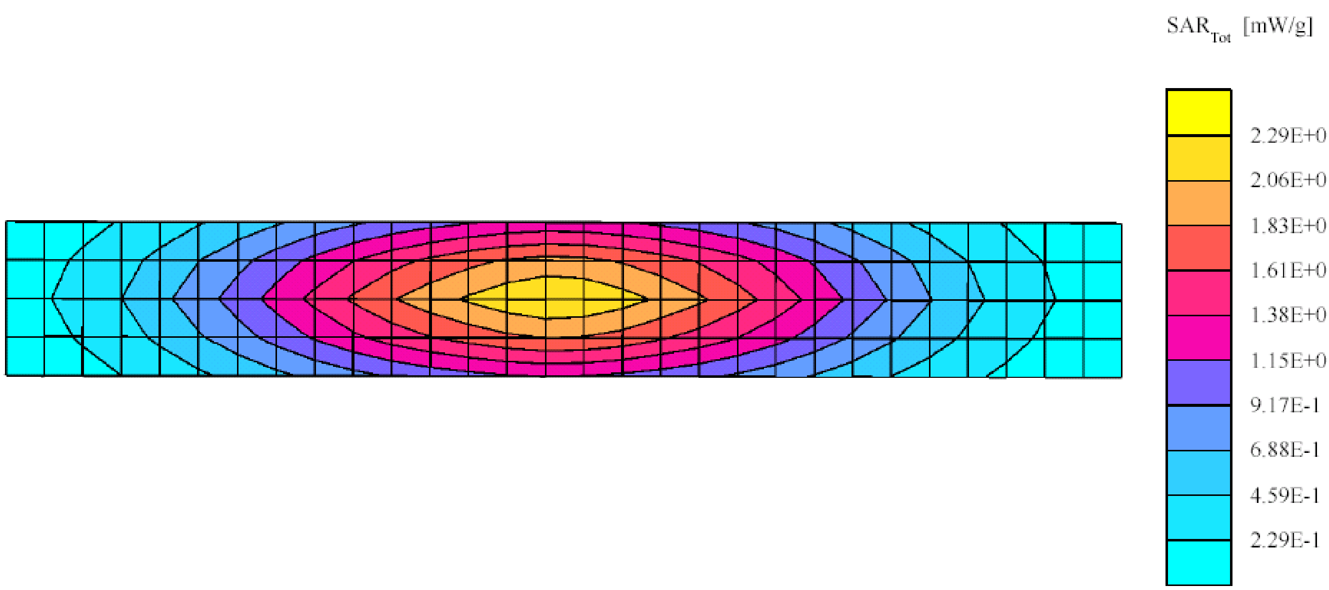
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/19/02
Motorola MFRL Laboratory
Input power 500mW to dipole
Target SAR 4.4mW/g @ 1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.95 mho/m ε = 56.5 ρ = 1.00g/cm3
Cube 7x7x7: Peak: 3.64 mW/g, SAR (1g): 2.32 mW/g, SAR (10g): 1.52 mW/g, (Worst-case extrapolation)
Penetration depth: 12.3 (11.0, 14.1) [mm]
Power drift: 0.00 dB



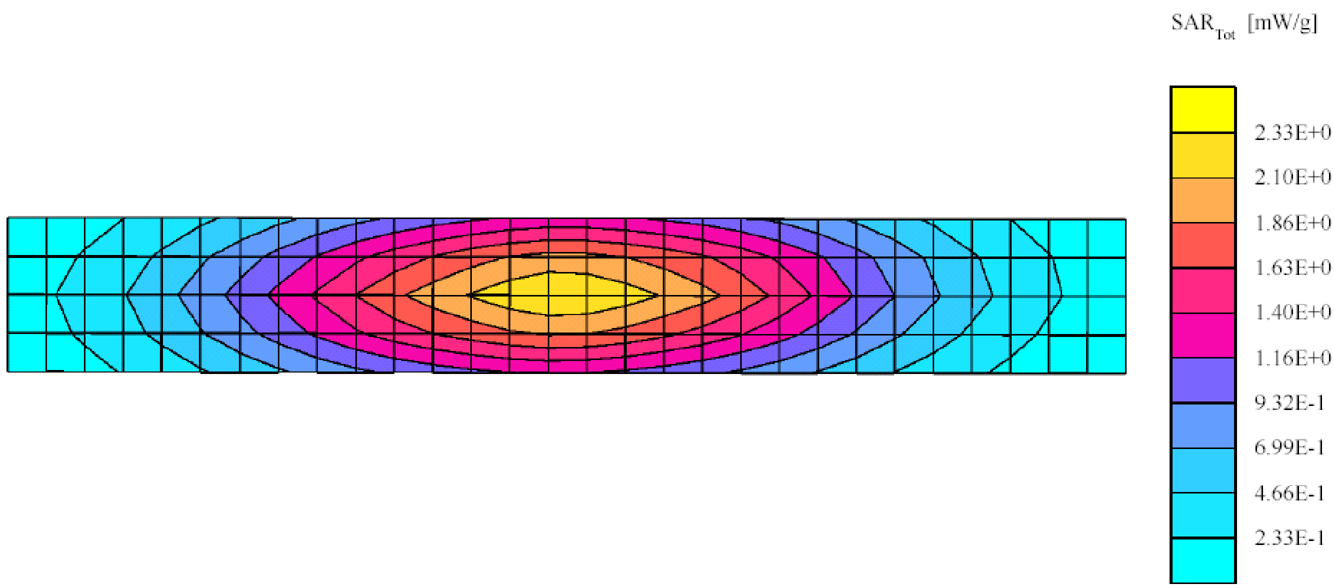
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/20/02
Motorola MFRL Laboratory
Input power 500mW to dipole
Target SAR 4.4mW/g @ 1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.94 mho/m ε = 56.4 ρ = 1.00g/cm^3
Cube 7x7x7: Peak: 3.59 mW/g, SAR (1g): 2.30 mW/g, SAR (10g): 1.51 mW/g, (Worst-case extrapolation)
Penetration depth: 12.4 (11.0, 14.2) [mm]
Power drift: 0.00 dB



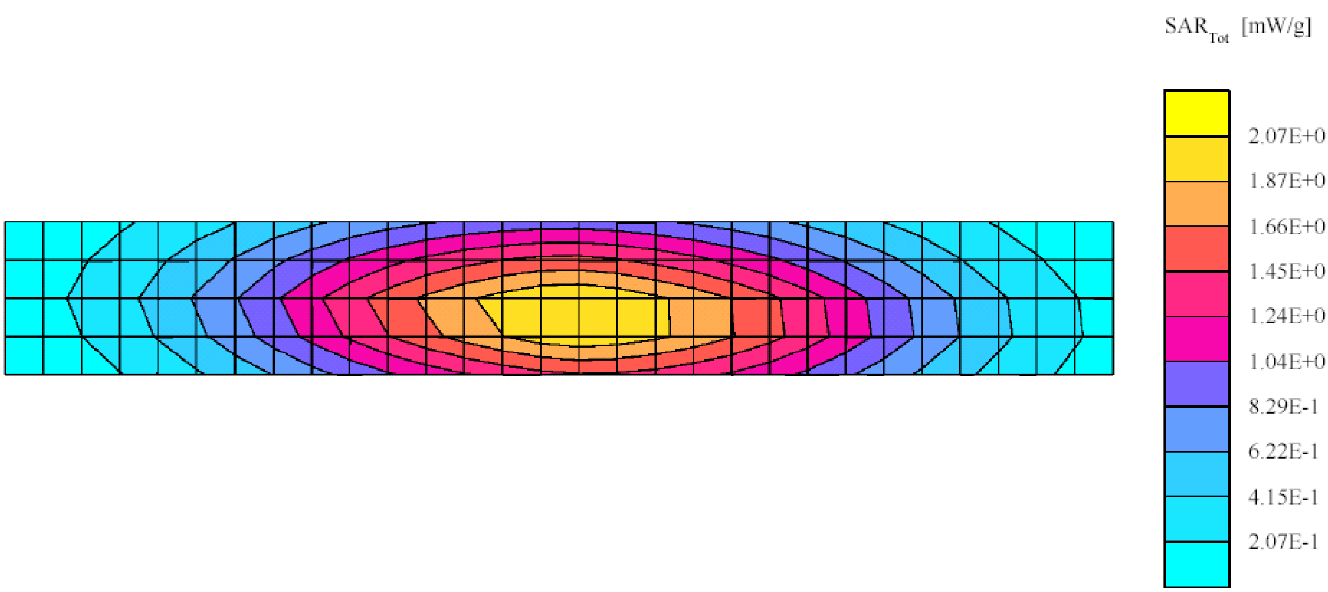
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/21/02
Motorola MFRL Laboratory
Input power 500mW to dipole
Target SAR 4.4mW/g @ 1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.95 mho/m ε = 56.5 ρ = 1.00g/cm3
Cube 7x7x7: Peak: 3.62 mW/g, SAR (1g): 2.31 mW/g, SAR (10g): 1.52 mW/g, (Worst-case extrapolation)
Penetration depth: 12.4 (11.1, 14.2) [mm]
Power drift: 0.01 dB



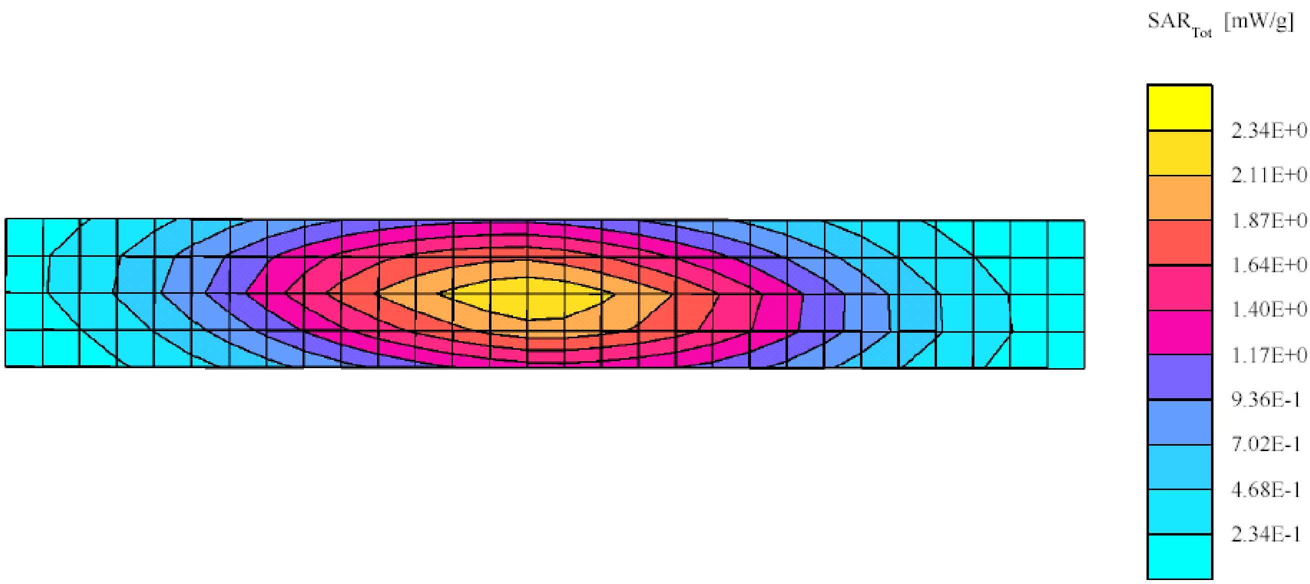
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/22/02
Motorola MFRL Laboratory
Input power 500mW to Dipole
Target SAR 4.3mW/g @ 1W

Flat 80x60x20; GRAY Stand
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.60,7.60,7.60); Crest factor: 1.0; Head 450: σ = 0.86 mho/m
ε = 44.5 ρ = 1.00g/cm^3
Cube 7x7x7: Peak: 3.30 mW/g, SAR (1g): 2.13 mW/g, SAR (10g): 1.41 mW/g, (Worst-case extrapolation)
Penetration depth: 12.7 (11.4, 14.3) [mm]
Power drift: 0.01 dB



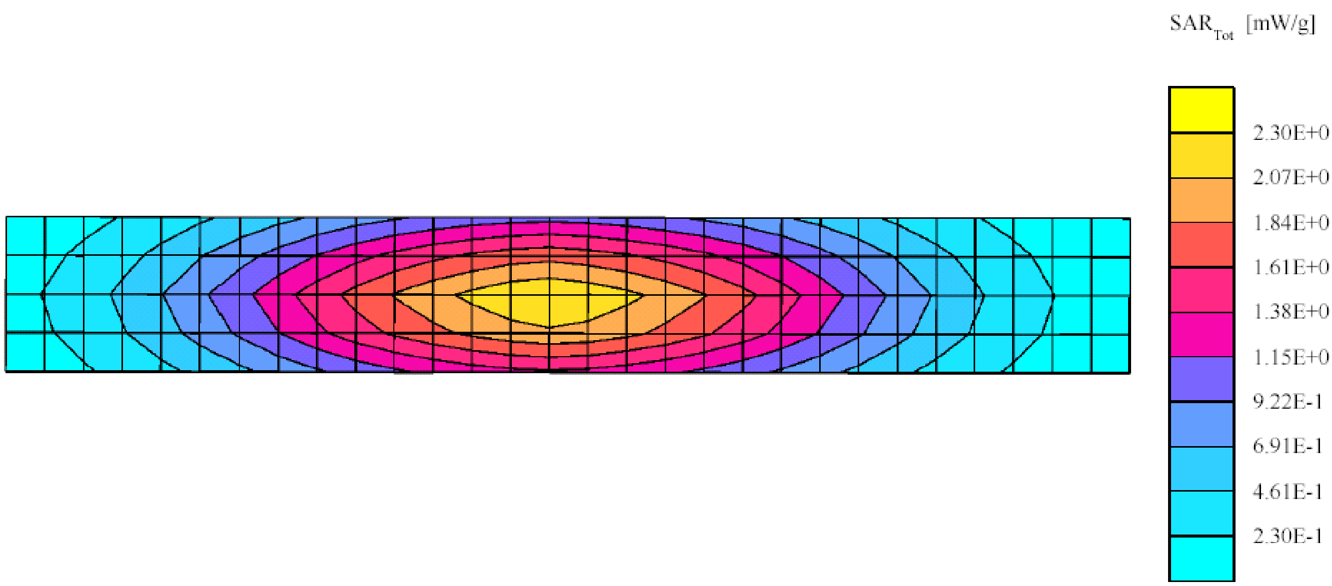
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/26/02
Motorola MFRL Laboratory
Input power 500mW to dipole
Target SAR 4.4mW/g @ 1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.95 mho/m ε = 56.7 ρ = 1.00g/cm3
Cube 7x7x7: Peak: 3.67 mW/g, SAR (1g): 2.33 mW/g, SAR (10g): 1.52 mW/g, (Worst-case extrapolation)
Penetration depth: 12.3 (10.9, 14.1) [mm]
Power drift: 0.02 dB



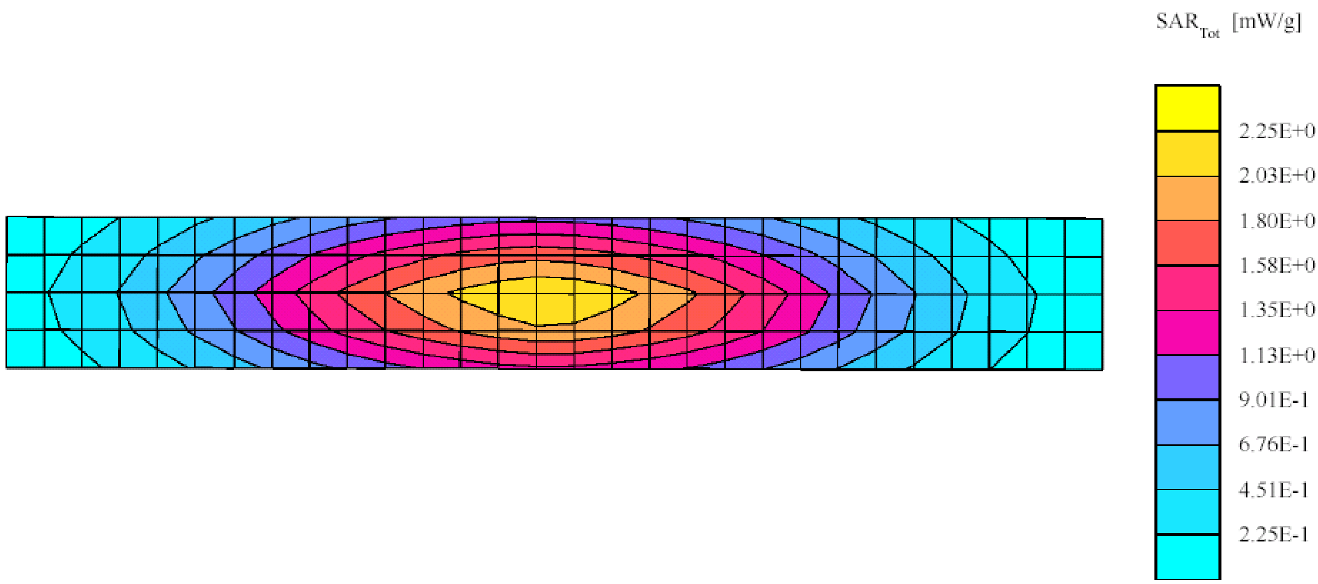
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/27/02
Motorola MFRL Laboratory
Input power 500mW to dipole
Target SAR 4.4mW/g @ 1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.96 mho/m ε = 56.7 ρ = 1.00g/cm3
Cube 7x7x7: Peak: 3.60 mW/g, SAR (1g): 2.30 mW/g, SAR (10g): 1.51 mW/g, (Worst-case extrapolation)
Penetration depth: 12.4 (11.0, 14.2) [mm]
Power drift: -0.01 dB



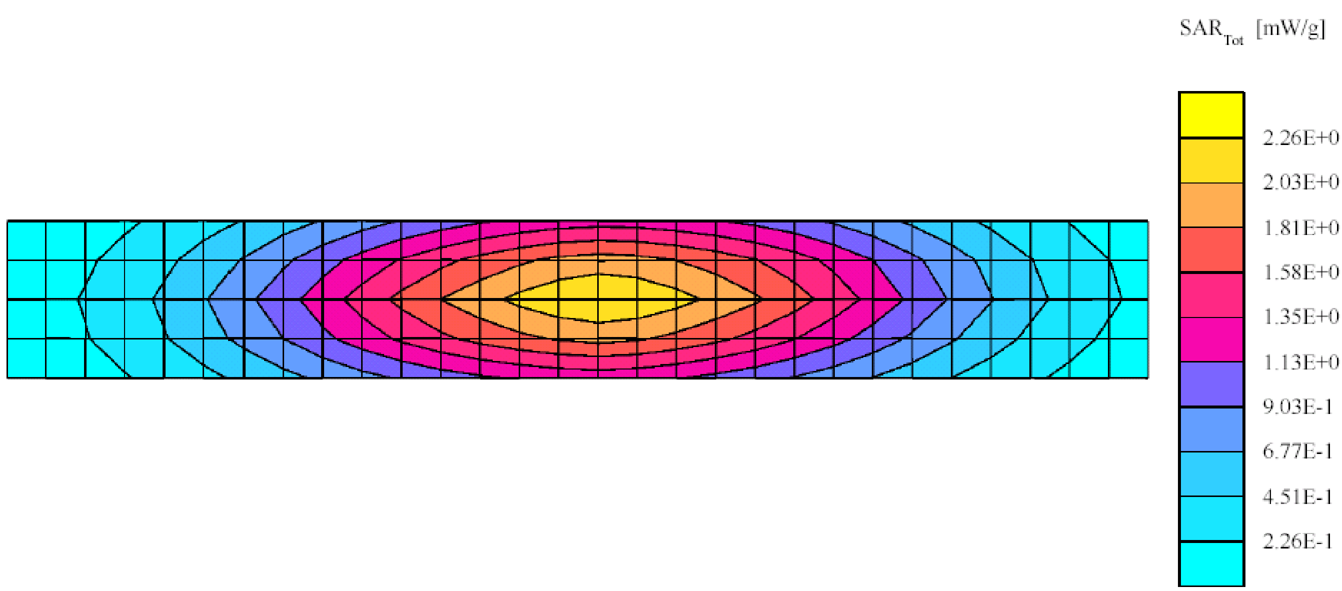
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/28/02
Motorola MFRL Laboratory
Input power 500mW to dipole
Target SAR 4.4mW/g @1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.94 mho/m ε = 56.9 ρ = 1.00g/cm3
Cube 7x7x7: Peak: 3.52 mW/g, SAR (1g): 2.25 mW/g, SAR (10g): 1.48 mW/g, (Worst-case extrapolation)
Penetration depth: 12.5 (11.0, 14.3) [mm]
Power drift: 0.03 dB



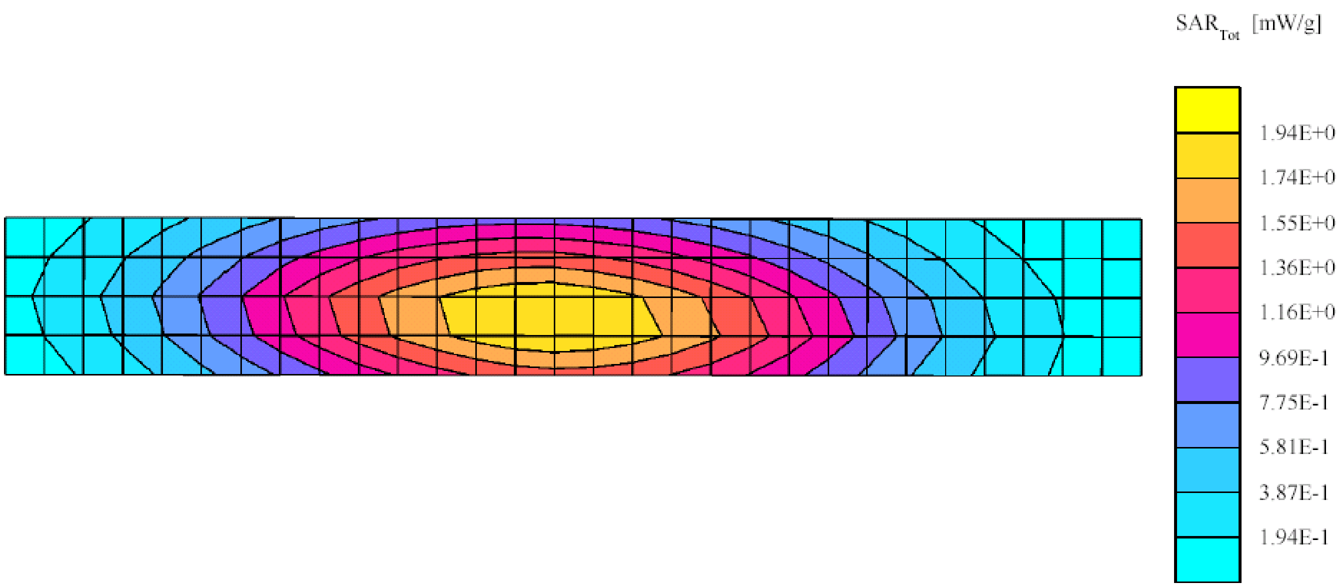
MFRL Dipole 450 MHz; SN 450-001; Test Date: 06/29/02
Motorola MFRL Laboratory
Input power 500 mW to dipole
Target SAR 4.3mW/g @ 1W

Flat 80x60x20; GRAY Stand
Probe: ET3DV6 A2LA - SN1388;Probe Cal Date: 22/03/02ConvF(7.20,7.20,7.20); Crest factor: 1.0; Head 450: σ = 0.86 mho/m ε= 45.0 ρ = 1.00g/cm3
Cube 7x7x7: Peak: 3.41 mW/g, SAR (1g): 2.23 mW/g, SAR (10g): 1.49 mW/g, (Worst-case extrapolation)
Penetration depth: 13.0 (11.7, 14.5) [mm]
Power drift: 0.03 dB
Motorola



MFRL Dipole 450 MHz; SN 450-001; Test Date: 07/11/02
Motorola MFRL Laboratory
Input power 500mW to the dipole
Target SAR 4.4mW/g @ 1W

Flat 80x60x20; Center Origin
Probe: ET3DV6 A2LA - SN1388; Probe Cal Date: 22/03/02ConvF(7.70,7.70,7.70); Crest factor: 1.0; BODY 450: σ = 0.95 mho/m ε = 56.6 ρ = 1.00g/cm3
Cube 7x7x7: Peak: 3.59 mW/g, SAR (1g): 2.30 mW/g, SAR (10g): 1.51 mW/g * Max outside, (Worst-case extrapolation)
Penetration depth: 12.7 (11.3, 14.7) [mm]
Power drift: 0.01 dB



APPENDIX D
Calibration Certificates

Schmid Partner
Engineering AG

Calibration Certificate

Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1388**
Place of Calibration:	**Zurich**
Date of Calibration:	**March 22, 2002**
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:	N. Vetterli
Approved by	Niels Kuster

Probe ET3DV6

SN:1388

Manufactured:	August 16, 1999
Last calibration:	March 16, 2001
Recalibrated:	March 22, 2002

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1388

Sensitivity in Free Space

NormX	**1.89** $\mu V/(V/m)^2$
NormY	**1.65** $\mu V/(V/m)^2$
NormZ	**1.78** $\mu V/(V/m)^2$

Diode Compression

DCP X	**95**	mV
DCP Y	**95**	
DCP Z	**95**	

Sensitivity in Tissue Simulating Liquid

Head	**900 MHz**	ε_r **= 41.5 ± 5%**	σ **= 0.97 ± 5% mho/m**
Head	**835 MHz**	ε_r **= 41.5 ± 5%**	σ **= 0.90 ± 5% mho/m**

ConvF X	**6.6**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.6**	± 9.5% (k=2)	Alpha	**0.55**
ConvF Z	**6.6**	± 9.5% (k=2)	Depth	**2.07**

Head	**1800 MHz**	ε_r **= 40.0 ± 5%**	σ **= 1.40 ± 5% mho/m**
Head	**1900 MHz**	ε_r **= 40.0 ± 5%**	σ **= 1.40 ± 5% mho/m**

ConvF X	**5.4**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.4**	± 9.5% (k=2)	Alpha	**0.59**
ConvF Z	**5.4**	± 9.5% (k=2)	Depth	**2.22**

Boundary Effect

Head **900 MHz** **Typical SAR gradient: 5 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	10.4	5.5
SAR_{be} [%]	With Correction Algorithm	0.2	0.5

Head **1800 MHz** **Typical SAR gradient: 10 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	12.5	7.8
SAR_{be} [%]	With Correction Algorithm	0.1	0.1

Sensor Offset

Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.7 ± 0.2**	mm

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:	1388
Place of Assessment:	Zurich
Date of Assessment:	**March 25, 2002**
Probe Calibration Date:	**March 22, 2002**

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: Pokovic Katja

Dosimetric E-Field Probe ET3DV6 SN:1388

Conversion factor (± standard deviation)

150 MHz	ConvF	**9.2 ± 8%**	**ε_r = 52.3 ±5%** **σ = 0.76 ±5% mho/m** (head tissue)
300 MHz	ConvF	**8.0 ± 8%**	**ε_r = 45.3 ±5%** **σ = 0.87 ±5% mho/m** (head tissue)
368 MHz	ConvF	**7.8 ± 8%**	**ε_r = 44.5 ±5%** **σ = 0.87 ±5% mho/m** (head tissue)
450 MHz	ConvF	**7.6 ± 8%**	**ε_r = 43.5 ±5%** **σ = 0.87 ±5% mho/m** (head tissue)
1750 MHz	ConvF	**5.5 ± 8%**	**ε_r = 40.0 ±5%** **σ = 1.37 ±5% mho/m** (head tissue)
1900 MHz	ConvF	**5.3 ± 8%**	**ε_r = 40.0 ±5%** **σ = 1.40 ±5% mho/m** (head tissue)
2000 MHz	ConvF	**5.2 ± 8%**	**ε_r = 37.0 ±5%** **σ = 1.40 ±5% mho/m** (head tissue)
2450 MHz	ConvF	**4.8 ± 8%**	**ε_r = 32.0 ±5%** **σ = 1.80 ±5% mho/m** (head tissue)

Dosimetric E-Field Probe ET3DV6 SN:1388

Conversion factor (± standard deviation)

35 MHz	ConvF	9.1 ± 15%	ε_r = 78.0 ±5% σ = 0.65 ±5% mho/m (body tissue)
75 MHz	ConvF	9.0 ± 10%	ε_r = 70.0 ±5% σ = 0.70 ±5% mho/m (body tissue)
150 MHz	ConvF	8.8 ± 8%	ε_r = 61.9 ±5% σ = 0.80 ±5% mho/m (body tissue)
300 MHz	ConvF	8.1 ± 8%	ε_r = 58.2 ±5% σ = 0.92 ±5% mho/m (body tissue)
368 MHz	ConvF	7.9 ± 8%	ε_r = 57.5 ±5% σ = 0.93 ±5% mho/m (body tissue)
450 MHz	ConvF	7.7 ± 8%	ε_r = 56.7 ±5% σ = 0.94 ±5% mho/m (body tissue)
835 MHz	ConvF	6.5 ± 8%	ε_r = 55.2 ±5% σ = 0.97 ±5% mho/m (body tissue)
900 MHz	ConvF	6.4 ± 8%	ε_r = 55.0 ±5% σ = 1.05 ±5% mho/m (body tissue)
925 MHz	ConvF	6.4 ± 8%	ε_r = 55.0 ±5% σ = 1.06 ±5% mho/m (body tissue)
1500 MHz	ConvF	5.4 ± 8%	ε_r = 53.9 ±5% σ = 1.33 ±5% mho/m (body tissue)

MOTOROLA

DIPOLE SAR VALIDATION CERTIFICATE

Frequency:	450	MHz
Dipole Serial Number:	450-001	
Simulated Tissue:	head	
Date of Validation:	August 17, 2001	
Validation Interval:	12 months	

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: J. Patrick Oliver

Approved by: 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 450***	
Targets for tissue characteristics:		
Dielectric Constant:	***43.5***	***+/- 5%***
Conductivity:	***0.87 S/m***	***+/- 5%***
Measurement values:		
Dielectric Constant:	***43.2***	
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:

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

MOTOROLA

DIPOLE SAR VALIDATION CERTIFICATE

Frequency:	*450*	*MHz*
Dipole Serial Number:	*450-001*	
Simulated Tissue:	*body*	
Date of Validation:	*August 16, 2001*	
Validation Interval:	*12 months*	

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:

J. Patrick Oliver

Approved by:

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 450***	
Targets for tissue characteristics:		
Dielectric Constant:	***56.7***	**+/- 5%**
Conductivity:	***0.94 S/m***	**+/- 5%**
Measurement values:		
Dielectric Constant:	***57.4***	
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:

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

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

APPENDIX E
Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the body-worn accessories used to assess S.A.R. compliance of FCC ID: ABZ99FT4073. The radio used in the following photos represents the radio used to obtain the results presented herein and was used in this section solely to demonstrate the different body-worn accessories.

Photo 1.
Back and side view of HLN9238A

Photo 2.
Front and back view of HLN9416A

Photo 3.
Front and side view of HLN9323A

Photo 4.
Back and side view of HLN8255B

Photo 5.
Front and side view of HLN6602 w/ HMN9021

Photo 6.
Front and side view of HLN8414

Photo 7.
Front view of HLN9239A and NTN5243

APPENDIX F
Justification for not testing accessory options

The following table provides justification for why specific body worn and audio accessories offered with FCC ID: ABZ99FT4073 were not included in the test matrix.

Body Worn

Model	Tested ?	Closest Ant. Base separation from phantom (mm)	Justification/ comments
HLN8255	Yes	28	NA
HLN9416	Yes	35	NA
HLN9417	Yes	38	NA
HLN9323	Yes	73	NA
HLN9238	Yes	74	NA
HLN9239	Yes	39	NA
HLN8414	Yes	32	NA
HLN6602	Yes	24	NA
NTN5243	Yes	NA	Shoulder strap for all body worn accessories
HLN9973	No	NA	Replacement strap tested with HLN9416
HLN9974	No	NA	Replacement strap tested with HLN9238 and HLN9239
HLN9149	Yes	NA	Tested with HLN9416 and HLN9417
1505596Z02	No	NA	Replacement strap tested with HLN6602
HLN9985	No	NA	Water proof bag
RLN4804	No	NA	Similar to HLN9238
RLN4805	No	NA	Similar to HLN9239
NTN8040	No	NA	Replacement 3” swivel belt loop
NTN8039	No	NA	Replacement 2.5” swivel belt loop

Audio Accessories

HMN9013	Yes	NA	NA
RMN4016	Yes	NA	NA
RMN4016	Yes	NA	NA
BDN6647	Yes	NA	NA
BDN6648	Yes	NA	NA
HMN9021	Yes	NA	NA
HMN9022	Yes	NA	NA
HMN9030	Yes	NA	NA
HMN9754	Yes	NA	NA

BDN6646	Yes	NA	NA
BDN6706	Yes	NA	NA
HMN9752	Yes	NA	NA
HMN9727	Yes	NA	NA
BDN6720	Yes	NA	NA
NTN8370	No	NA	Ear piece receiver adaptor only
NTN8371	No	NA	Ear piece receiver adaptor only
0180358B38	Yes	NA	Tested with BDN6646C
01-80300E83	Yes	NA	Tested with BDN6706B
0180358B33	Yes	NA	Ear holder for microphone