Certificate Number: 1449-02

MOTOROLA

ACCREDITED

CGISS 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:	February 27, 2002
Report Revision:	Rev. O
Device Manufacturer:	Motorola
Device Description:	HT1250LS 5W Portable 217-222 MHz
FCC ID:	ABZ99FT3080
Device Model:	PMUD1761A

Test Period: 2/01/02 – 2/13/02

Test Engineer: ______________________
Kim Uong
Lead SAR 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.

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Ken Enger
Senior Resource Manager, Product Safety and EME Director

____
Date Approved

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REVISION HISTORY

Date	Revision	Comments
2/27/02	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 CGISS EME Test Lab for the HT1250LS, model PMUD1761A, FCC ID ABZ99FT3080.

The applicable exposure environment is Occupational/Controlled.

The test results included herein represent the highest SAR 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 HT1250LS, model PMUD1761A is a hand held portable radio. The intended use of the radio is as a hand-held Push-To-Talk (PTT) transceiver held one to two inches away from the users lips or with approved accessories.

The radio operates on traditional Trunked radio systems, PassPort trunked systems (an enhanced trunking protocol for wide area dispatch), LTR trunked systems (a transmission based trunking protocol for single site trunking) and Conventional radio systems (single channel unit to unit communications).

The transmit frequency bands for the HT1250LS is 217-222MHz. The rated power of the device is 5W with a maximum conducted power output of 6W.

The sample devices tested for this report represents identical prototypes to those intended for production.

The HTT1250LS radio is offered with the following options and accessories:

Batteries:

HNN9008AR	NiMH High Capacity Battery
HNN9009AR	NiMH Ultra High Capacity Battery
HNN9010AR	NiMH Ultra High Capacity Battery Factory Mutual
HNN9011AR	NiCd High Capacity Battery Factory Mutual
HNN9012AR	NiCd High Capacity Battery
HNN9013BR	Lithium Ion Battery

Body-Worn Accessory:

HLN9844A	Spring Belt Clip (for 1.5" belt loop)
HLN9714A	Spring Belt Clip
HLN9952A	Belt Clip Carry Holder
HLN9701B	Case, Nylon
HLN9690A	Case, Std Leather, Short, DTMF, Swivel, Thin Batt's
HLN9652A	Case, Std Leather, Short, Plain, Belt Loop, thin Batt's
HLN9665A	Case, Standard leather, Short, Plain, Belt Loop, Std Batt's
HLN9670A	Case, Standard Leather, Short, Plain, Swivel, Thin Battery
HLN9676A	Case, Standard Leather, Short, Plain, Swivel, Std Battery
HLN9677A	Case, Std Leather, Short, DTMF, Belt Loop, Thin Batt's
HLN9689A	Case, Std Leather, Short, DTMF, Belt Loop, Std Batt's
HLN9694A	Case, Std Leather, Short, DTMF, Swivel, Std Batt's
HLN9946A	Limited Keypad, Hard Leather, W/ Belt Loop, Std Battery
HLN9945A	Limited Keypad, Hard Leather, W/ Belt Loop, Thin Battery
HLN9955A	Limited Keypad, Hard Leather, W/ Swivel, Thin Battery
HLN9998A	Limited Keypad, Hard Leather, W/ Swivel, Std Battery
HLN9985B	Waterproof Bag
HLN6602A	Universal Chest Pack
RLN4815A	Fanny Pack Carry Accessory (Universal Radio Pack)
PMLN4280A	Carry Case (Full Thin Leather)
PMLN4281A	Carry Case (Basic Thin Leather)
NTN5243A	Carry Strap

Audio Accessories:

BDN6641A	Ear Microphone (Gray) requires AARMN4044 OR AARMN4045 Interface Module - FM Approved
BDN6677A	Ear Microphone (Black) requires AARMN4044 or AARMN4045 interface module
BDN6678A	Ear Microphone (Beige) requires AARMN4044 or AARMN4045 interface module)
ENLN4135A	PTT Module
ENMN4010A	Noise Com
ENMN4011A	Helmet Com
ENMN4012A	Breeze Headset with PTT

ENMN4013A	1 Wire Flexible Ear Receiver
ENMN4014A	3-Wire Min Lapel Kit, Black
ENMN4015A	Lightweight Headset
ENMN4016A	Medium Weight Behind-the-head Headset with PTT
ENMN4017A	3-Wire Min Lapel Kit, Beige
HLN9716B	Audio Accessory Adapter for GP300 accessories
HLN9717A	3.5 mm Accessory Adapter
HMN9052D	Remote Speaker Microphone (Standard)
HMN9053D	Noise Canceling Remote Speaker Microphone
NTN1722A	Integrated Ear Microphone/Receiver System with PTT
NTN1723A	Integrated Ear Microphone/Receiver System with Palm PT
NTN1724A	Integrated Ear Microphone/Receiver System with Ring PTT
NTN8370A	Extreme Noise Earpiece Adapter Kit (use with AARMN4021, AARMN4022, AARMN4028 & AARMN4029)
NTN8371A	Low Noise Earpiece Adapter Kit (use with AARMN4021, AARMN4022, AARMN4028 & AARMN4029)
PMLN4418A	Ear bud with PTT microphone
RKN4097A	In-Line PTT Adapter Cable for use with RMN4051, RMN4052 & RMN4053 Headsets
RLN4885A	Receive Only Ear bud with 3.5mm plug (for use with HMN9053)
RLN4922A	Completely Discrete Earpiece Kit (for use with 2 wire earpieces)
RLN4941A	Receive Earpiece with tube, rubber ear tip and 3.5mm plug (For use with HMN9053)
AARMN4017A	Ultra Light Headset with Streamlined Boom Microphone
AARMN4018B	Light Weight Headset W/Boom Mic and In-Line PTT
AARMN4019A	Medium Weight Over the Head Dual Muff Headset w/ Noise Canceling Mic & In-Line
AARMN4020A	Heavy Weight Headset, w/ boom microphone
AARMN4021A	Earpiece W/O Volume Control
AARMN4022A	2 Wire Earpiece W/ Mic and PTT
AARMN4028A	Ear piece W/O Volume Control
AARMN4029A	2 Wire Ear piece W/Mic and PTT
AARMN4031A	Lightweight Headset with Boom Microphone (no In-Line PTT) (VOX operational only on conventional channel)
RMN4044A	Ear Microphone Interface Module for PTT Only
RMN4045A	Ear Microphone System, Push to Talk w/ Voice
RMN4048A	Bone Vibrator Headset
RMN4051A	2-Way Hard-hat Mount Headset, Black - Noise Reduction
RMN4052A	Tactical Headband-Style Headset, Gray - Noise Reduction
RMN4053A	Tactical hard-hat Mount Headset, Gray - Noise Reduction
RMN4054A	Receive-Only Hard-hat Mount Headset with 3.5mm right angle plug – Noise Reduction Rating - 22dB
RMN4055A	Receive-Only Headband-Style Headset with 3.5mm right angle plug
WADN4190A	Flexible ear receiver w/ coiled cable For use with the HMN9053, HMN9054, & HMN9057 RSM and PSM
HKN9055A	Remote Speaker Microphone Replacement Cable
0180358B38	Finger Push to Talk for Ear Microphone FM Approved
0180300E83	Body Switch Push to Talk for Ear Microphone System

3.1 Test Signal

Test Signal mode:

Test Mode	X	Base Station		Simulator	

Transmission Mode:

CW	**X**
Native Transmission	
TDMA	
Other	

3.2 Test Output Power

The radio's output power was measured before and after each test. An HP E4418B power meter (calibration date 10/15/01) was used to measure the power output.

4.0 Description of Test Equipment

4.1.0 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 S.A.R. measurements were conducted with probe model/serial number ET3DV6/SN1545. The system performance check was conducted daily and within 24 hours prior to testing. DASY output files of the system performance test results, probe calibration, and dipole validation certificates are included in APPENDIX B and C. The table below summarizes the system performance check results normalized to 1W. Note that the reference S.A.R. values for the 835MHz dipole is taken from IEEE Std. 1528-200X table 7.1.

Note: To date SPEAG has not provided to Motorola validation dipoles for 300MHz that complies with the latest IEEE reference targets. A Motorola Florida Research Laboratory (MFRL) issued dipole was used for the system performance check at 300MHz. Dipole validation certificate and supporting target tissue parameters from MFRL is presented below. In addition, a dipole validation certificate from SPEAG at 835MHz is provided along with a table of the IEEE reference targets used to perform system performance check at 835MHz.

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	System Perf. Result when normalized to 1W (mW/g)	Reference SAR @ 1W (mW/g)	Test Date/s
1545	IEEE Head	9/24/01	SN300-002	3.0	2.8 +/- 10%	2/13/02
1545	FCC Body	9/24/01	SN300-002	2.89 +/- 0.06	2.7 +/- 10%	2/04 to 2/13 2002
1545	IEEE Head	9/24/01	D835V2/SN427	10.6	9.5 +/- 12%	2/01/02

The DASY3™ system is operated per the instructions in the DASY3™ Users Manual. The complete manual is available directly from SPEAG™.

4.2 Description of Phantom

4.2.1 Body and Face 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 .00031. The phantom is mounted on a wooden supporting structure that has a loss tangent of < 0.05. The structure has a 68.6 x 25.4 centimeter opening at its center to allow positioning the DUT to the flat 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

Ingredients (%) Frequency 219 MHz		
	Body	**Head**
De ionized -Water	49.48	37.5
Sugar	47.1	56.0
Salt	2.32	5.4
HEC	1.0	1.0
Dowicil75	0.1	0.1

Characterization of Simulated tissue materials and ambient conditions:

Simulated tissue prepared for SAR measurements is measured daily and within 24 hours prior to actual SAR testing to verify that the tissue is within 5% of target parameters at the center of the transmit band. This measurement is done using the Agilent (HP) probe kit model 85070C and a HP8753D Network Analyzer.

Target tissue parameters

Frequency (MHz)	Body		Head	
	Di-electric Constant	**Conductivity – S/m**	**Di-electric Constant**	**Conductivity – S/m**
219	60.20	0.86	49.08	0.81

4.4.0 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 SAR tests reported herein.

Ambient Temperature	21.5 °C
Relative Humidity	50.2%
Tissue Temperature	20.9°C

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

The S.A.R test matrix used for this radio included the body worn accessories listed in section 3.0 that offer the closest separation distance as well as those that contain unique metallic components. Also included in the test matrix were all audio accessories offered for this radio that were determined to be unique. The rationale for determining which audio and body worn accessories were included in the test matrix is described in Appendix D. Note that audio accessory model HLN9716B described in section 3.0 as an adaptor for the GP300 radio was included in the test matrix. A GP300 remote speaker microphone (the standard audio accessory for the GP300) was tested with the adaptor. This configuration was also used to assess S.A.R. performance of the radio at 2.5cm. The one antenna and all batteries offered for this product were included in the test matrix as well. The maximum power output of the HT1250LS radio is 6 watts. The transmit power of the tested radio was pre-adjusted to the maximum output allowed by the production alignment procedures. Power output measurements were taken before and after each S.A.R. scan. Each S.A.R. scan was taken with a fully charged battery. Measurements were performed at the center of the transmit band (219 MHz). Testing at only one frequency for this radio adheres to the guidelines in Appendix D of FCC Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01) for devices with a transmission band less than 10 MHz. The radio was operating in a continuous wave (CW) test mode for all measurements. The highest S.A.R. result reported herein is scaled. Refer to section 7.4 for an explanation of the scaling methodology.

5.1 Device Test Positions

Reference Figure 1 for the device orientation and position that exhibited the highest S.A.R. performance. Figure 2 depicts an overall perspective of the system setup and support structure.

5.1.0 Abdomen

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

5.1.1 Face

A flat phantom containing simulated head tissue consistent with applicable standards was used to assess S.A.R. performance of the radio at the face.

5.1.2 2.5cm

A flat phantom containing simulated abdomen tissue consistent with applicable standards was used to assess S.A.R. performance of the radio in the front and back positions at 2.5cm from the phantom.

Figure 1: Highest S.A.R. configuration

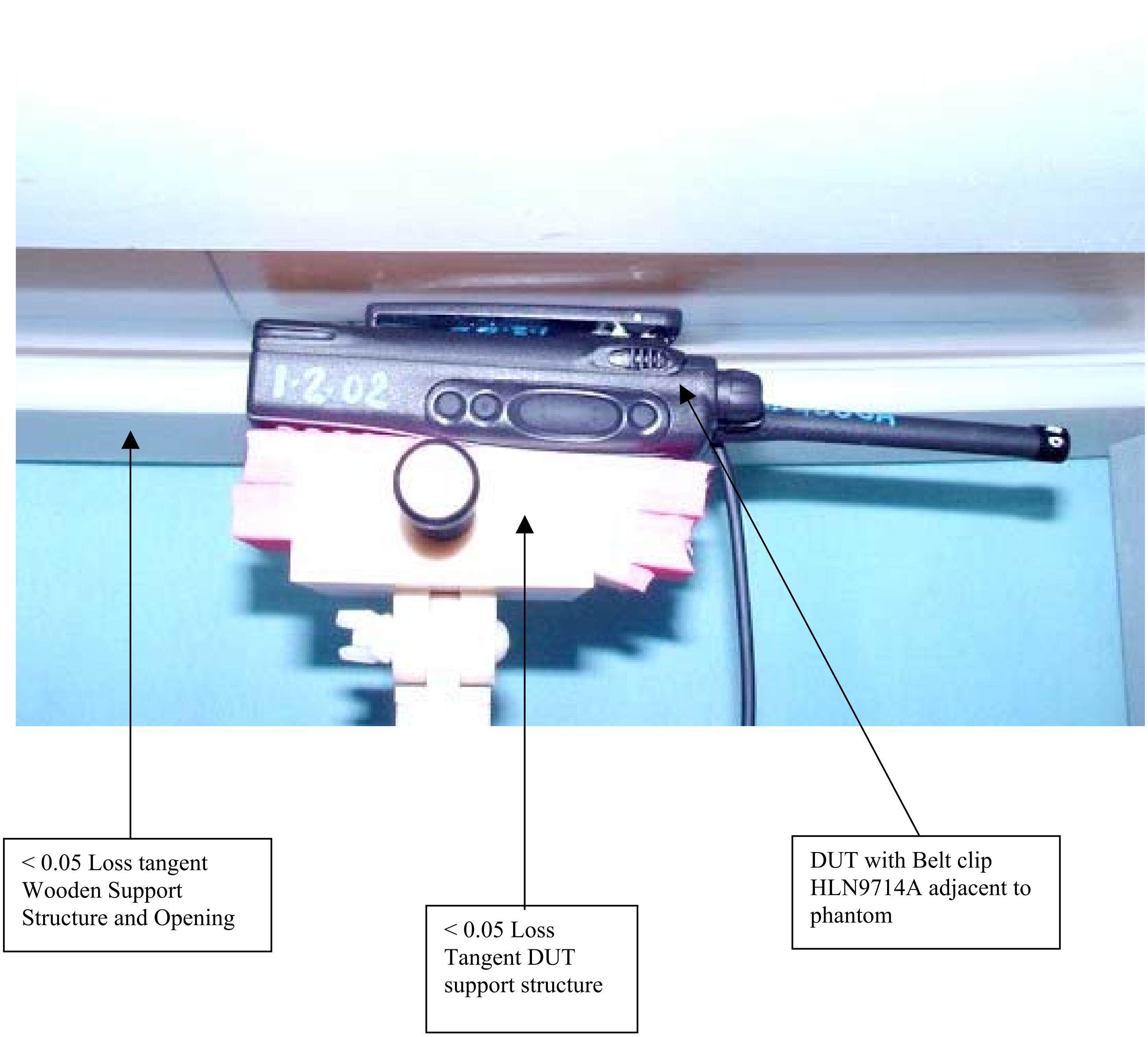
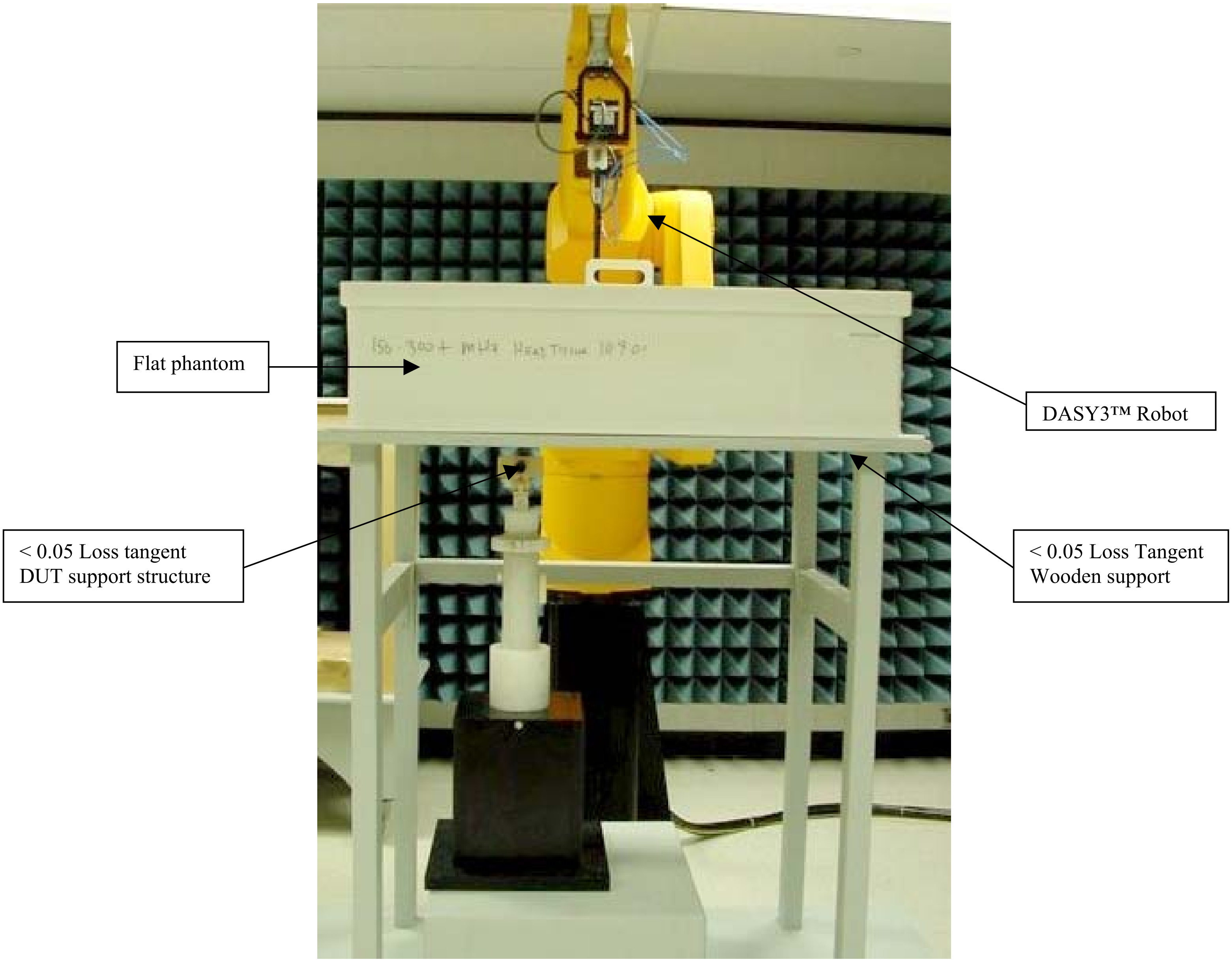


Figure 2: Robot Test System



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 SAR 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)

7.0 SAR 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 A for the highest observed S.A.R.

7.1 SAR results at the abdomen:

Run #/Radio S/N	Freq. (MHz)	Antenna	Battery	Body worn Acc.	Audio Acc.	Initial Power (mW)	End Power (mW)	Measured 1g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)
SAR performance assessment of Batteries									
R2-02020407/ WQDVT040	219	HKAD4000A	HNN9008A	HLN9714A	HMN9052D	5.7	5.6	3.04	1.63
R2-02020408/ WQDVT040	219	HKAD4000A	HNN9009A	HLN9714A	HMN9052D	5.8	5.8	3.65	1.89
R2-02020409/ WQDVT040	219	HKAD4000A	HNN9010A	HLN9714A	HMN9052D	5.8	5.35	3.89	2.18
R2-020204010/ WQDVT040	219	HKAD4000A	HNN9011A	HLN9714A	HMN9052D	5.8	5.2	4.21	2.43
R2-020204011/ WQDVT040	219	HKAD4000A	HNN9012A	HLN9714A	HMN9052D	5.8	5.6	4.22	2.26
R2-02021207a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	HMN9052D	5.8	4.9	4.46	**2.73**
SAR Performance assessment of body worn accessories with highest SAR configuration above									
R2-02020412a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9844A	HMN9052D	5.75	5	4.39	**2.63**
R2-02020502a/ WQDVT040	219	HKAD4000A	HNN9013B	PMLN4281A	HMN9052D	5.7	4.87	3.84	2.37
R2-02020503a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9701B	HMN9052D	5.7	5.07	3.81	2.25
R2-02020504a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9946A	HMN9052D	5.75	4.74	3.58	2.27
R2-02020505a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9690A	HMN9052D	5.7	5	1.84	1.10
R2-02020506a/ WQDVT040	219	HKAD4000A	HNN9013B	RLN4815A	HMN9052D	5.75	4.9	3.60	2.20
R2-02020602a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN6602A	None	5.7	5.1	2.63	1.55
SAR Performance assessment at 2.5cm									
R2-020201107a/ WQDVT040	219	HKAD4000A	HNN9013B	Back 2.5cm from antenna	HLN9716B w/HMN9725D	5.7	4.9	3.0	1.84
R2-02021203a/ WQDVT040	219	HKAD4000A	HNN9013B	Front 2.5cm from antenna	HLN9716B w/ HMN9725D	5.7	4.7	3.41	**2.18**

SAR performance assessment of Audio Accessories using the highest SAR configuration above									
R2-02020603/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4052A with RKN4097A	5.7	4.9	3.57	2.19
R2-02020604/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4051A with RKN4097A	5.8	4.7	3.76	2.40
R2-02020605/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4053A with RKN4097A	5.7	4.9	3.9	2.39
R2-02020606/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	ENMN4011A/ ENLN4135A	5.7	4.9	3.82	2.34
R2-02020607/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	ENMN4012A/ Breezed head Set	5.7	4.9	3.7	2.27
R2-02020608/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	ENMN4014A	5.7	4.7	4.18	2.67
R2-02020609/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	HLN9716B w/ HMN9725D	5.7	4.9	5.68	**3.48**
R2-02020702/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	HMN9053D w/ WADN4190A	5.7	4.95	4.98	3.02
R2-02020703/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	NTN1722A	5.7	4.9	3.79	2.32
R2-02020704/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	NTN1723A	5.7	4.9	4.34	2.66
R2-02020705/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	NTN1724A	5.75	4.9	3.98	2.44
R2-02020706/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	PMLN4418A	5.7	5	4.2	2.52
R2-02020707/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4018B	5.7	4.8	3.78	2.36
R2-02020708/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	AARMN4022A	5.7	4.8	4.12	2.58
R2-02020709/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4019A	5.75	4.78	4.42	2.77
R2-02020710/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4048A	5.8	4.85	3.86	2.39
R2-02020802a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4045A w/BDN6677 & 0180300E83	5.7	4.9	4.42	2.71
R2-02020803a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4044 w/BDN6641 & 0180358B38	5.7	4.9	4.29	2.63
R2-02020804a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	ENMN4016A	5.7	4.94	4.11	2.50
R2-02020805a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4020A	5.7	4.8	4.13	2.58
R2-02020806a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RLN4922A/EN MN4014A	5.7	4.9	4.22	2.58
R2-02020807a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	ENMN4015	5.7	4.88	3.81	2.34
R2-02020808a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	ENMN4010A	5.7	4.9	3.89	2.38

R2-02020809a/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	ENMN4013A	5.7	4.75	4.27	2.70
R2-020201102/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4031B	5.7	5	4.13	2.48
R2-020201103/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	AARMN4017A	5.7	4.9	4.43	2.71
R2-020201104/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4054A/HLN9716B	5.7	5	4.3	2.58
R2-020201105/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	RMN4055A/HLN9716B	5.7	4.9	4.15	2.54
R2-020201106/ WQDVT040	219	HKAD4000A	HNN9013B	HLN9714A	AARMN4028A	5.75	4.7	4.27	2.73

7.2 S.A.R. results at the Face

Run #/Radio S/N	Freq. (MHz)	Antenna	Battery	Initial Power (mW)	End Power (mW)	Measured 1g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)
R2-020201302/ WQDVT040	219	HKAD4000A	HNN9008A	5.7	5.15	3.6	2.10
R2-02021303/ WQDVT040	219	HKAD4000A	HNN9009A	5.7	5.7	3.47	1.83
R2-02021304/ WQDVT040	219	HKAD4000A	HNN9010A	5.75	5.25	3.46	1.98
R2-02021305/ WQDVT040	219	HKAD4000A	HNN9011A	5.7	4.95	3.62	**2.19**
R2-02021306/ WQDVT040	219	HKAD4000A	HNN9012A	5.7	5.5	3.54	1.93
R2-02021307/ WQDVT040	219	HKAD4000A	HNN9013B	5.7	4.9	3.55	2.17

7.3 Peak SAR location

The peak S.A.R. was observed near the base of the antenna. Refer to APPENDIX A for detailed S.A.R. scan distributions.

7.4 Maximum Calculated SAR

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 specified maximum power during the S.A.R. measurements. Scaling is also used to account for duty cycle differences between test mode and normal operation. For this device the Maximum Calculated 1-gram averaged peak S.A.R. becomes:

$$\text{Maximum Calculated 1-gram Average Peak SAR} = \frac{P_{max}}{P_{end}} \times D1 \times SAR_{meas.}$$

Abdomen

$$\text{Maximum Calculated 1-gram Average Peak SAR} = \frac{6W}{4.9W} \times .50 \times 5.68 = 3.48 \text{ mW/g}$$

Face

$$\text{Maximum Calculated 1-gram Average Peak SAR} = \frac{6W}{4.95W} \times .50 \times 3.62 = 2.19 \text{ mW/g}$$

P_{max} = Maximum Power (Factory upper limit)
P_{end} = Lowest measured power at end of SAR
$SAR_{meas.}$ = Measured 1 gram averaged peak SAR

D1 = the transmission mode duty cycle, i.e., the ratio of the service mode and the tested mode.

8.0 Conclusion

The highest Operational Maximum Calculated 1-gram average SAR values found for the two-way radio device model number PMUD1761A were:

At the abdomen: **3.48 mW/g**

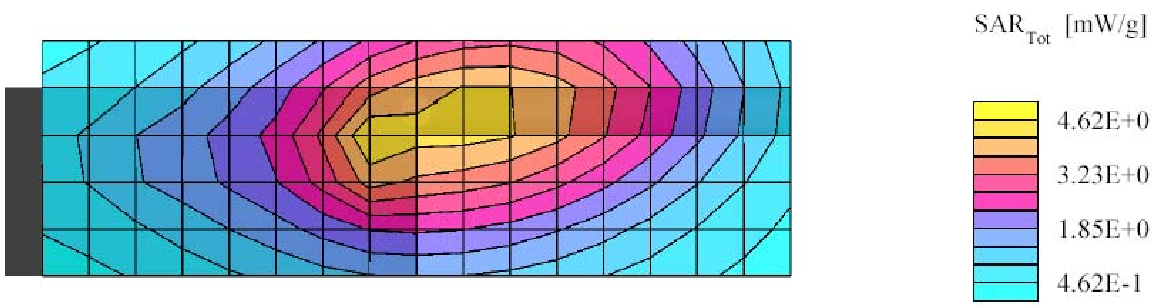
At the face: **2.19 mW/g**

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

DATA RESULTS

HT1250LS; Test Date: 02/12/02
Motorola CGISS EME Lab
Model #: PMUD1761A; S/N: WQDVT040
Run #: R2_02021207a
Tissue temp: 20.7 ºC
Tx freq: 219MHz
Antenna kit: HKAD4000A Battery kit: HNN9013B
Carry Accessories: HLN9714A Belt clip
Audio/data accessories: HMN9052D RSM
Flat Phantom; Flat_abdomen Section; Position: (90°,90°);
Probe: ET3DV6 - SN1545; ConvF(7.70,7.70,7.70); Probe cal date: 9/24/01; Crest factor: 1.0; FCC Body 219: σ = 0.84 mho/m ε = 57.8 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 7x7x7: SAR (1g): 4.46 mW/g, SAR (10g): 3.08 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 31.5, 108.0, 3.9

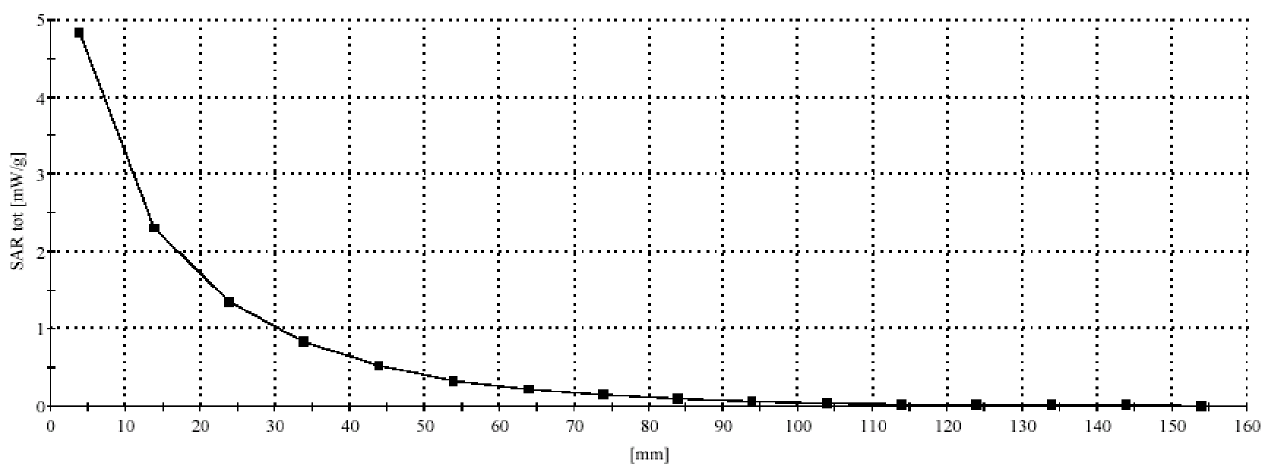


Motorola CGISS EME Lab

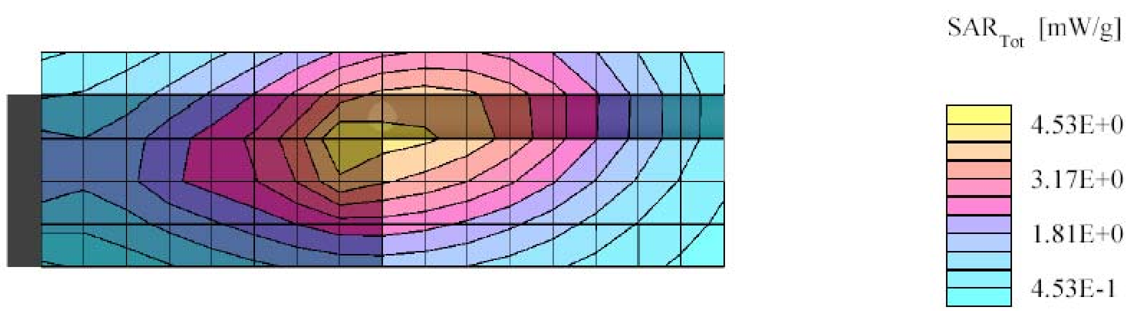
HT1250LS; **Date 02/12/02**

Motorola CGISS EME Lab

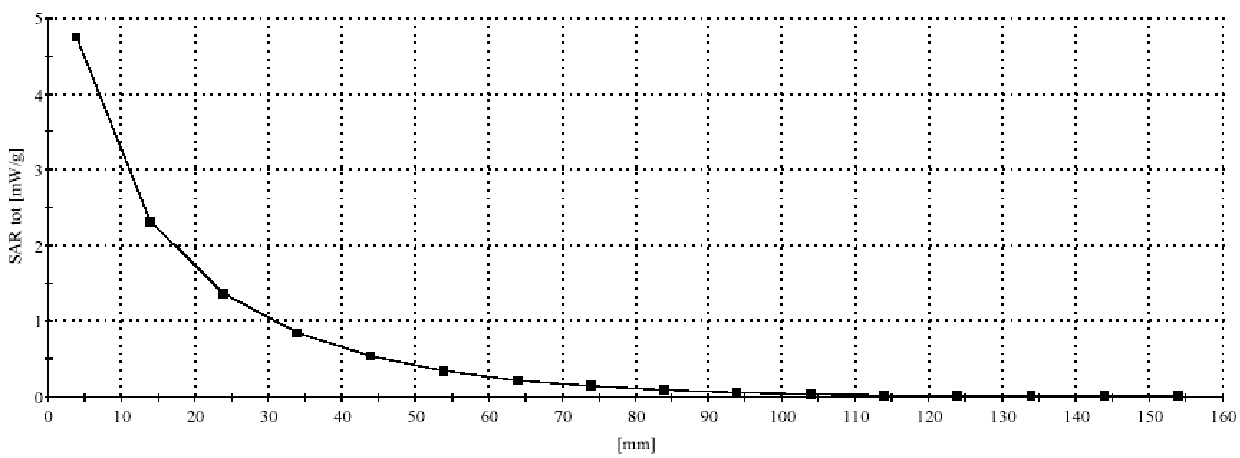
Model #: PMUD1761A S/N: WQDVT040
Run #: R2_02021207a
Tissue temp: 20.7 ºC
Tx freq: 219MHz
Antenna kit: HKAD4000A
Battery kit: HNN9013B
Carry Accessories: HLN9714A Belt clip
Audio/data accessories: HMN9052D RSM
Flat Phantom; Section; Position: ; Frequency: 219 MHz
Probe: ET3DV6 - SN1545; ConvF(7.70,7.70,7.70); Crest factor: 1.0; FCC Body 219: σ = 0.84 mho/m ε = 57.8 ρ = 1.00 g/cm3
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 10.0,



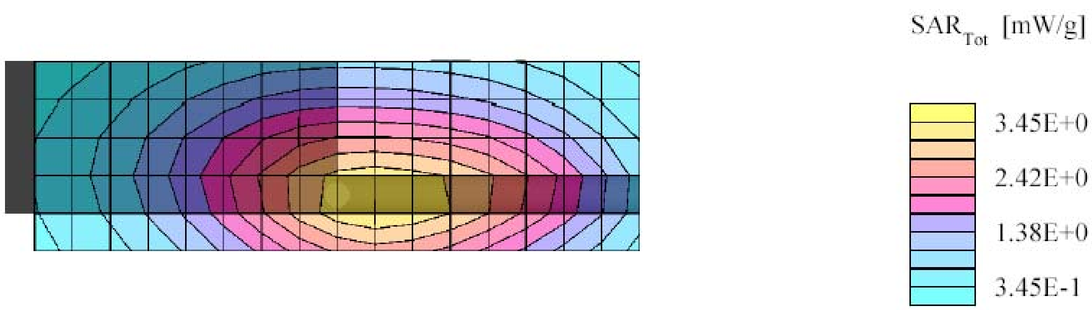
HT1250LS; Test Date: 02/04/02
Motorola CGISS EME Lab
Model #: PMUD1761A S/N: WQDVT040
Run #: R2_02020412a
Tissue temp: 21.0 ºC
Tx freq: 219MHz
Antenna kit: HKAD4000A
Battery kit: HNN9013B
Carry Accessories: HLN9844A Belt clip
Audio/data accessories: HMN9052D RSM.
Flat Phantom; Flat_abdomen Section; Position: (90°,90°);
Probe: ET3DV6 - SN1545; ConvF(7.70,7.70,7.70); Probe cal date: 9/24/01; Crest factor: 1.0; FCC Body 219: σ = 0.85 mho/m ε = 57.7 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 5x5x7: SAR (1g): 4.39 mW/g, SAR (10g): 3.05 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 33.0, 108.0, 3.9



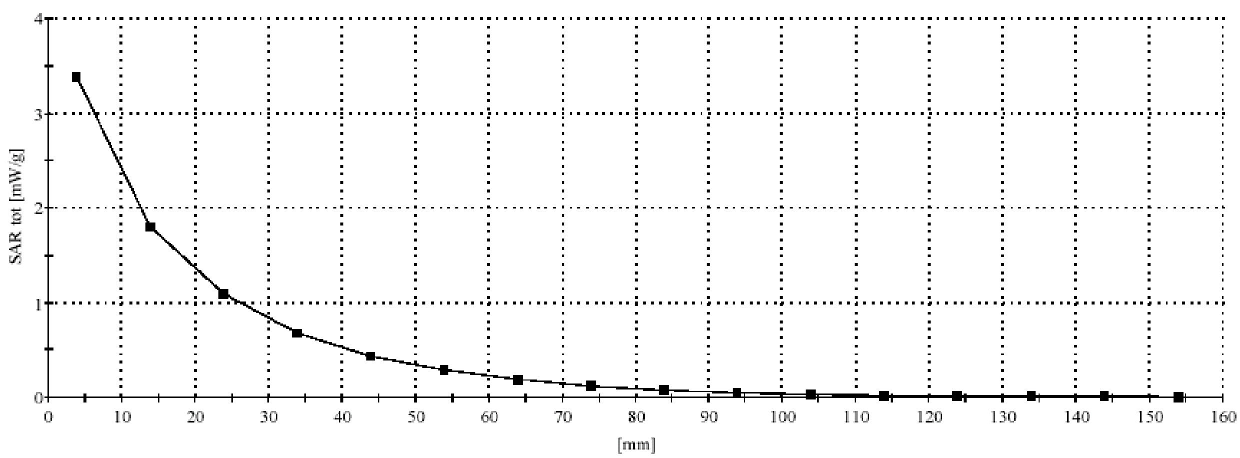
HT1250LS; Test Date 02/04/02
Motorola CGISS EME Lab
Model #: PMUD1761A S/N: WQDVT040
Run #: R2_02020412a
Tx freq: 219 MHz
Antenna kit: HKAD4000A
Battery kit: HNN9013B
Carry Accessories: HLN9844A Belt clip
Audio/data accessories: HMN9052D RSM.
Flat Phantom; Section; Position; Frequency: 219 MHz
Probe: ET3DV6 - SN1545; ConvF(7.70,7.70,7.70); Crest factor: 1.0; FCC Body 219: σ = 0.85 mho/m ε = 57.7 ρ = 1.00 g/cm3
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 10.0,



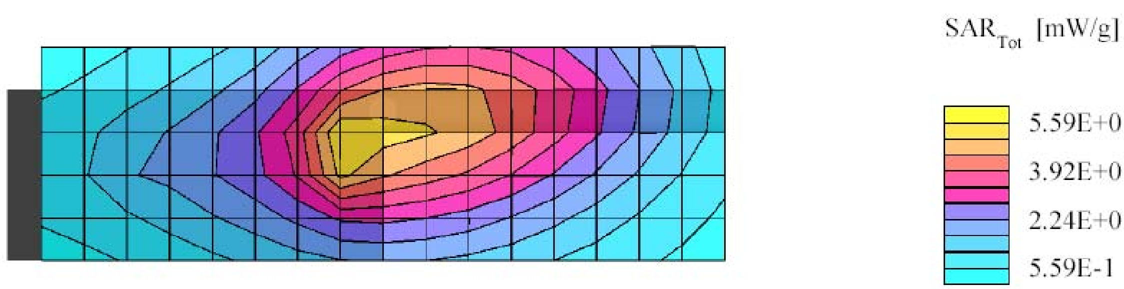
HT1250LS; Test Date: 02/12/02
Motorola CGISS EME Lab
Model #: PMUD1761A S/N: WQDVT040
Run #: R2_02021203a
Tissue temp: 20.7 ºC
Tx freq: 219 MHz
Antenna kit: HKAD4000A
Battery kit: HNN9013B
Carry Accessories: None, SAR measured at 2.5cm front
Audio/data accessories: HLN9716B GP300 audio adapter, HMN9725D GP300 RSM
Flat Phantom; Flat_abdomen Section; Position: (90°,90°);
Probe: ET3DV6 - SN1545; ConvF(7.70,7.70,7.70); Probe cal date: 9/24/01; Crest factor: 1.0; FCC Body 219: σ = 0.84 mho/m ε = 57.8 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 7x7x7: SAR (1g): 3.41 mW/g, SAR (10g): 2.45 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 55.5, 135.0, 3.9



HT1250LS; Date Tested 02/12/02
Motorola CGISS EME Lab
Model #: PMUD1761A S/N: WQDVT040
Run #: R2_02021203a
Tissue temp: 20.7 ºC
Tx freq: 219MHz
Antenna kit: HKAD4000A
Battery kit: HNN9013B
Carry Accessories: None, SAR measured at 2.5cm front
Audio/data accessories: HLN9716B GP300 audio adapter, HMN9725D GP300 RSM
Flat Phantom; Section; Position: ; Frequency: 219 MHz
Probe: ET3DV6 - SN1545; ConvF(7.70,7.70,7.70); Crest factor: 1.0; FCC Body 219: $\sigma = 0.84$ mho/m $\varepsilon = 57.8$ $\rho = 1.00$ g/cm3
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 10.0,

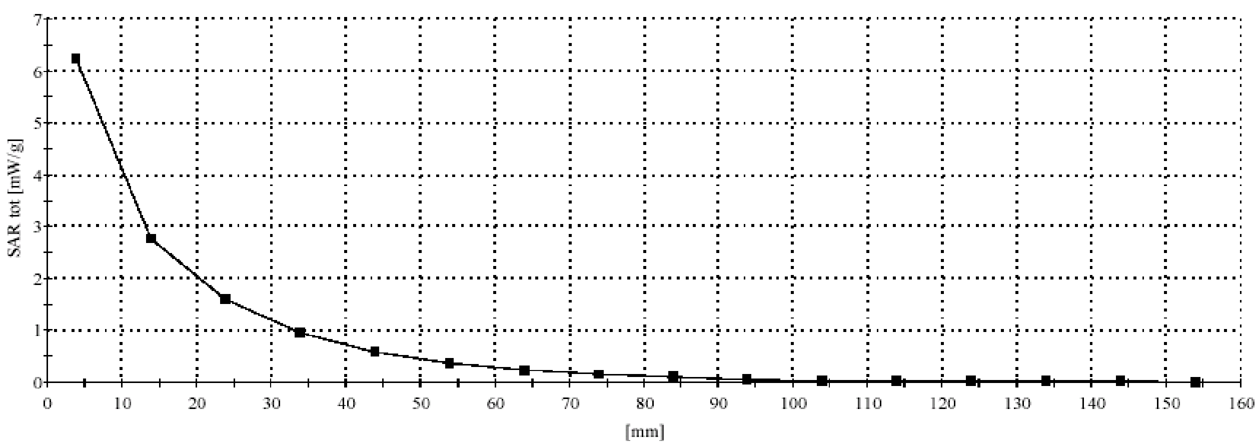


HT1250LS; Test Date: 02/06/02
Motorola CGISS EME Lab
Model #: PMUD1761A S/N: WQDVT040
Run #: R2_02020609
Tissue temp: 21.1 ºC
Tx freq: 219 MHz
Antenna kit: HKAD4000A
Battery kit: HNN9013B
Carry Accessories: HLN9714A Belt clip
Audio/data accessories:HLN9716B Audio adaptor to use w/ GP300 audio acc,
HMN9725D GP300 RSM
Flat Phantom; Flat_abdomen Section; Position: (90°,90°);
Probe: ET3DV6 - SN1545; ConvF(7.70,7.70,7.70); Probe cal date: 9/24/01; Crest factor: 1.0; FCC Body 219: σ = 0.87 mho/m ε = 57.7 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 7x7x7: SAR (1g): 5.68 mW/g, SAR (10g): 3.77 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 34.5, 108.0, 3.9



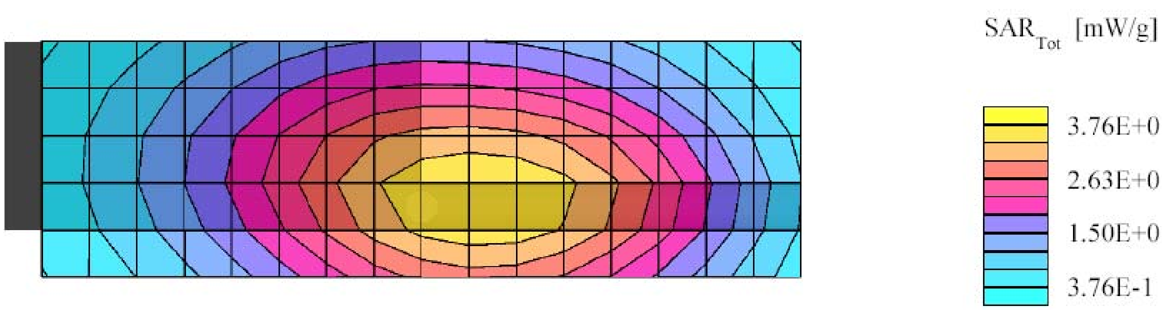
Motorola CGISS EME Lab

HT1250LS; 02/06/02
Motorola CGISS EME Lab
Model #: PMUD1761A S/N: WQDVT040
Run #: R2_02020609
Tissue temp: 21.1 C
Tx freq: 219 MHz
Antenna kit: HKAD4000A
Battery kit: HNN9013B
Carry Accessories: HLN9714A Belt clip
Audio/data accessories: HLN9716B Audio adaptor to use w/ GP300 audio acc,
HMN9725D GP300 RSM
Flat Phantom; Section; Position; Frequency: 219 MHz
Probe: ET3DV6 - SN1545; ConvF(7.70,7.70,7.70); Crest factor: 1.0; FCC Body 219: σ= 0.87 mho/m ε= 57.7 ρ= 1.00 g/cm3; Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 10.0,



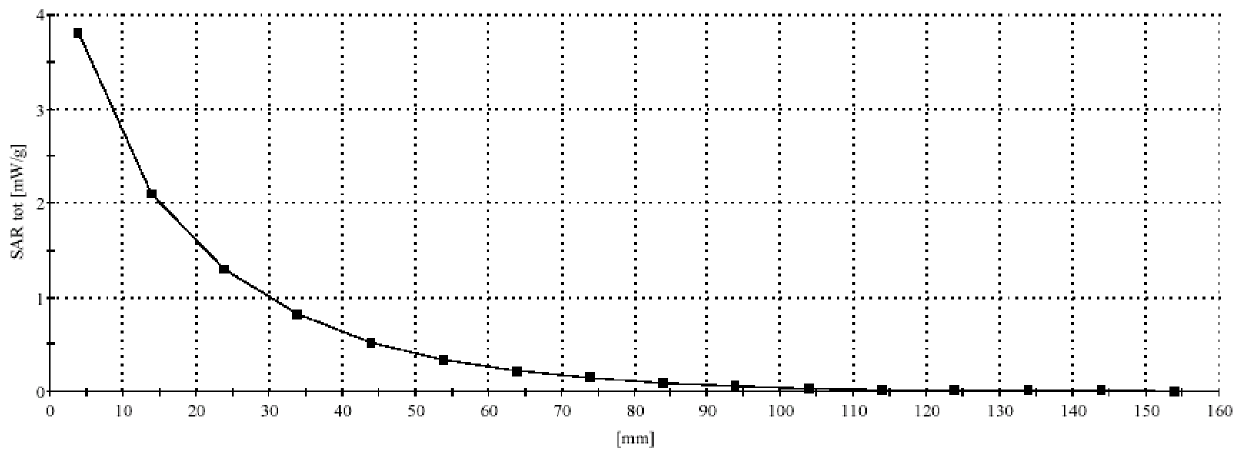
Motorola CGISS EME Lab

HT1250LS; Test Date: 02/13/02
Motorola CGISS EME Lab
Model #: PMUD1761A S/N: WQDVT040
Run #: R2_02021305
Tissue temp: 21.1 ºC
Tx freq: 219 MHz
Antenna kit: HKAD4000A
Battery kit: HNN9011A
Carry Accessories: None, 2.5cm from the mic
Audio/data accessories: None
Flat Phantom; Flat_Face Section; Position: (90°,90°);
Probe: ET3DV6 - SN1545; ConvF(7.90,7.90,7.90); Probe cal date: 9/24/01; Crest factor: 1.0; IEEE Head 219MHz: σ = 0.81 mho/m ε= 50.1 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 7x7x7: SAR (1g): 3.62 mW/g, SAR (10g): 2.66 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 49.5, 139.5, 3.9



Motorola CGISS EME Lab

HT1250LS; 02/13/02
Motorola CGISS EME Lab
Model #: PMUD1761A S/N: WQDVT040
Run #: R2_02021305
Tissue temp: 21.1 ºC
Tx freq: 219 MHz
Antenna kit: HKAD4000A
Battery kit: HNN9011A
Carry Accessories: None, 2.5cm from the mic
Audio/data accessories: None
Flat Phantom; Section; Position; Frequency: 219 MHz
Probe: ET3DV6 - SN1545; ConvF(7.90,7.90,7.90); Crest factor: 1.0; IEEE Head 219MHz: σ = 0.81 mho/m ε= 50.1 ρ = 1.00 g/cm3; Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 10.0,

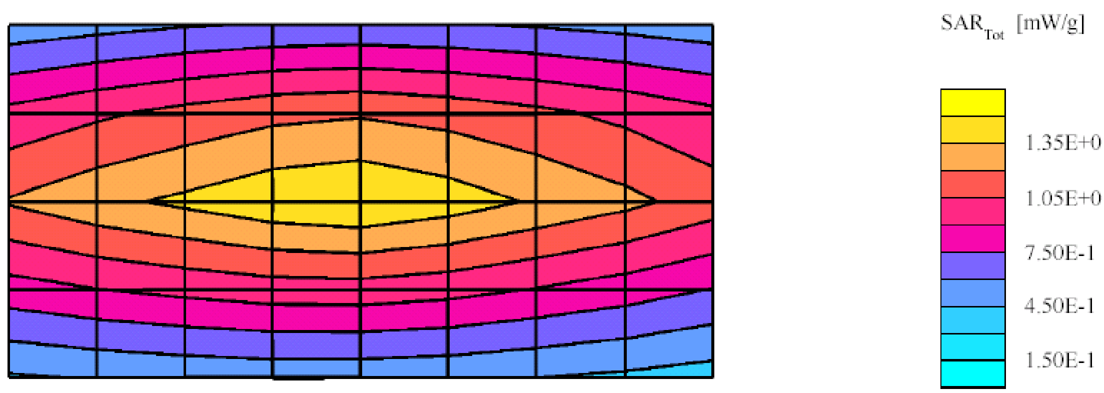


Motorola CGISS EME Lab

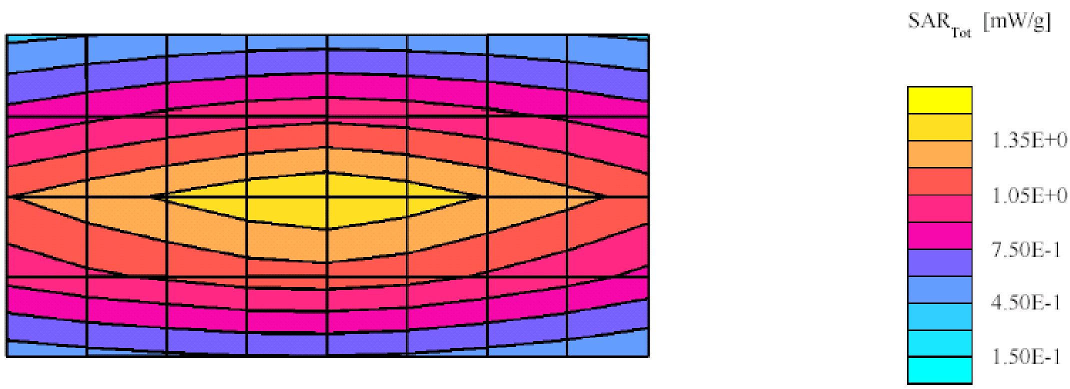
APPENDIX B

Dipole System Performance Check Results

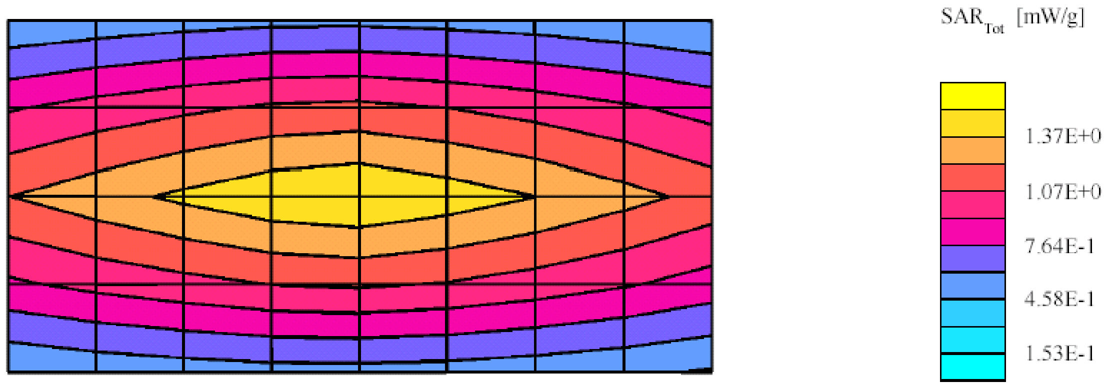
Dipole 300MHz SN300-002. Test Date:02/04/02
Motorola CGISS EME Lab
Run #: 02020401
Tx Freq: 300MHz
Input power: 500mW
Target: 2.7 mW/g normalized to 1W
Flat Phantom; Probe: ET3DV6 - SN1545;Probe Cal Date: 9/24/01; ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body 300: σ = 0.91 mho/m ε = 55.4 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cubes (2): Peak: 2.23 mW/g ± 0.07 dB, SAR (1g): 1.42 mW/g ± 0.06 dB, SAR (10g): 0.955 mW/g ± 0.06 dB, (Worst-case extrapolation); Penetration depth: 13.1 (11.0, 15.7) [mm]
Power drift: -0.07 dB



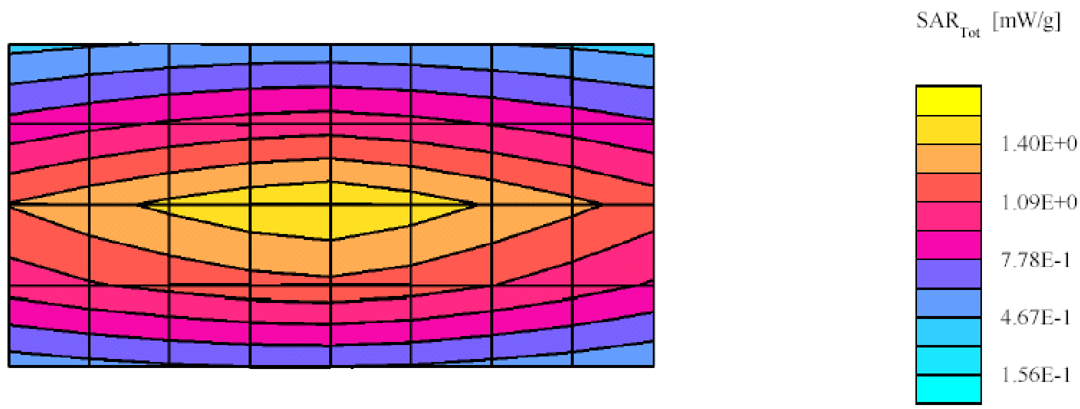
Dipole 300MHz SN300-002. Test Date:02/05/02
Motorola CGISS EME Lab
Run #: 02020501
Tx Freq: 300MHz
Input power: 500mW
Target: 2.7 mW/g normalized to 1W
Flat Phantom; Probe: ET3DV6 - SN1545;Probe Cal Date: 9/24/01; ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body 300: σ = 0.91 mho/m ε = 55.4 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cubes (2): Peak: 2.20 mW/g ± 0.00 dB, SAR (1g): 1.39 mW/g ± 0.00 dB, SAR (10g): 0.933 mW/g ± 0.00 dB, (Worst-case extrapolation); Penetration depth: 13.0 (10.9, 15.7) [mm]
Power drift: -0.08 dB



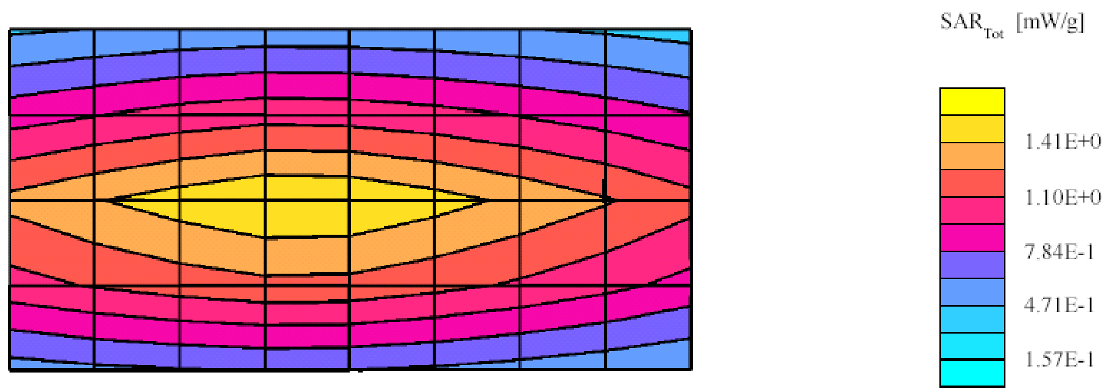
Dipole 300MHz SN300-002. Test Date:02/06/02
Motorola CGISS EME Lab
Run #: 02020601
Tx Freq: 300MHz
Input power: 500mW
Target: 2.7 mW/ normalized to 1W
Flat Phantom; Probe: ET3DV6 - SN1545;Probe Cal Date: 9/24/01; ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body 300: σ = 0.93 mho/m ε = 55.4 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 7x7x7: Peak: 2.23 mW/g, SAR (1g): 1.41 mW/g, SAR (10g): 0.950 mW/g, (Worst-case extrapolation)
Penetration depth: 13.0 (10.9, 15.8) [mm]
Power drift: -0.06 dB



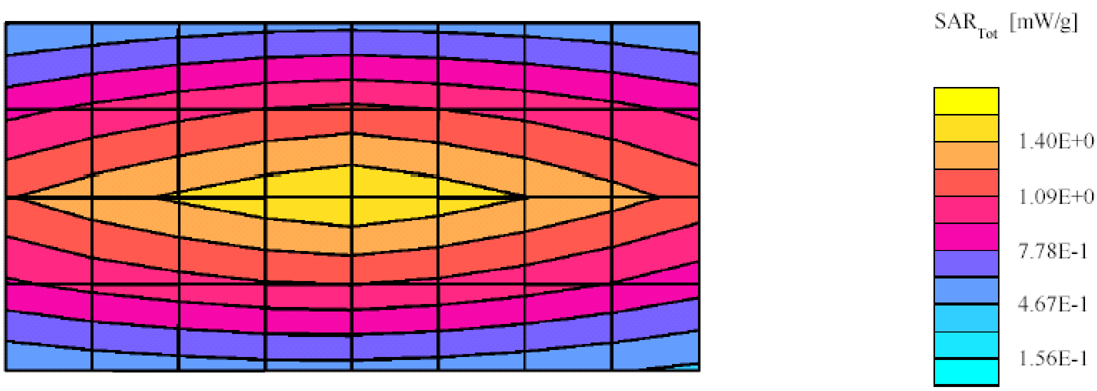
Dipole 300MHz SN300-002; Test date:02/07/02
Motorola CGISS EME Lab
Run #: 02020701
Tx Freq: 300MHz
Input power: 500mW
Target: 2.7 mW/g normalized to 1W
Flat Phantom; Probe: ET3DV6 - SN1545; Probe Cal Date: 9/24/01; ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body 300: σ = 0.94 mho/m ε = 56.3 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 7x7x7: Peak: 2.31 mW/g, SAR (1g): 1.45 mW/g, SAR (10g): 0.967 mW/g, (Worst-case extrapolation)
Penetration depth: 12.7 (10.7, 15.4) [mm]
Power drift: -0.03 dB



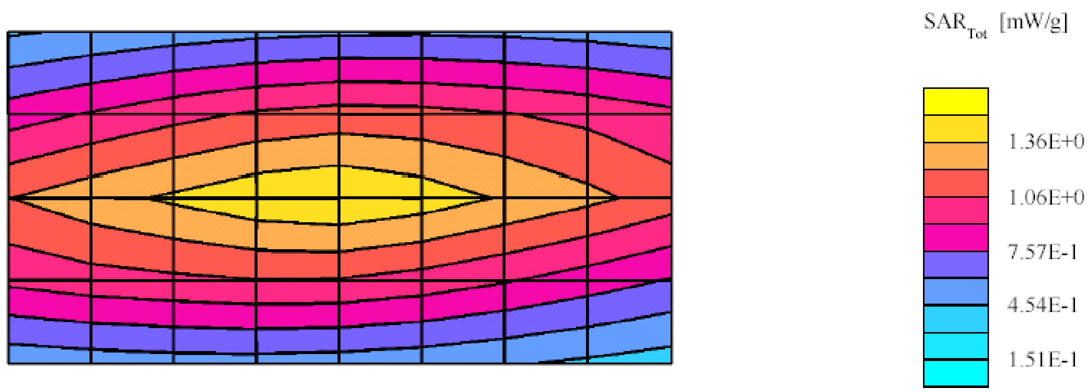
Dipole 300MHz SN300-002. Test Date:02/08/02
Motorola CGISS EME Lab
Run #: 02020801
Tx Freq: 300MHz
Input power: 500mW
Target: 2.7 normalized to 1W
Flat Phantom; Probe: ET3DV6 - SN1545;Probe Cal Date: 9/24/01; ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body 300: σ = 0.95 mho/m ε = 56.2 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cubes (2): Peak: 2.33 mW/g ± 0.01 dB, SAR (1g): 1.47 mW/g ± 0.01 dB, SAR (10g): 0.983 mW/g ± 0.01 dB, (Worst-case extrapolation); Penetration depth: 12.8 (10.8, 15.5) [mm]
Power drift: -0.02 dB



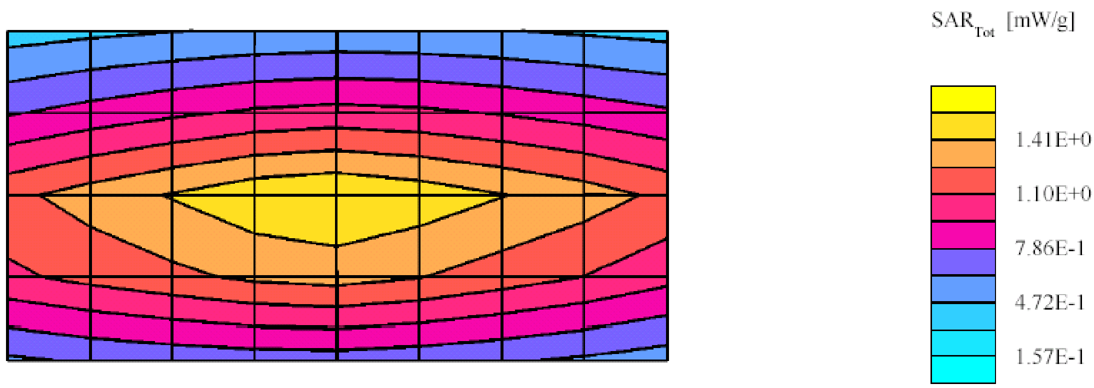
Dipole 300MHz SN300-002. Test Date:02/11/02
Motorola CGISS EME Lab
Run #: 02021101
Tx Freq: 300MHz
Input power: 500mW
Target: 2.7 mW/g normalized to 1W
Flat Phantom; Probe: ET3DV6 - SN1545;Probe Cal Date: 9/24/01; ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body 300: σ = 0.93 mho/m ε = 55.8 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 7x7x7: Peak: 2.28 mW/g, SAR (1g): 1.44 mW/g, SAR (10g): 0.965 mW/g, (Worst-case extrapolation)
Penetration depth: 12.9 (10.8, 15.6) [mm]
Power drift: -0.04 dB



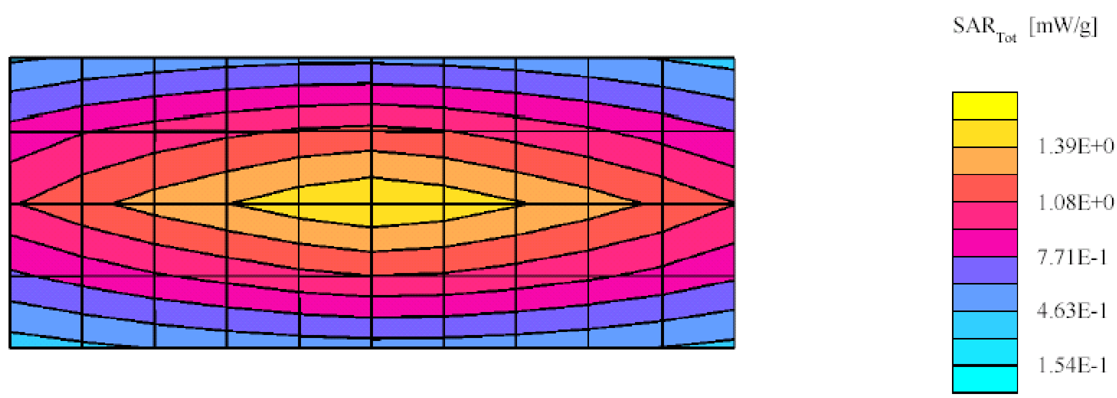
Dipole 300MHz SN300-002. Test Date:02/12/02
Motorola CGISS EME Lab
Run #: 02021201
Tx Freq: 300MHz
Input power: 500mW
Target: 2.7 mW/g normalized to 1W
Flat Phantom; Probe: ET3DV6 - SN1545;Probe Cal Date: 9/24/01; ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body 300: σ = 0.91 mho/m ε = 55.6 ρ = 1.00 g/cm^3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 7x7x7: Peak: 2.21 mW/g, SAR (1g): 1.41 mW/g, SAR (10g): 0.945 mW/g, (Worst-case extrapolation)
Penetration depth: 13.1 (11.0, 15.9) [mm]
Power drift: -0.05 dB



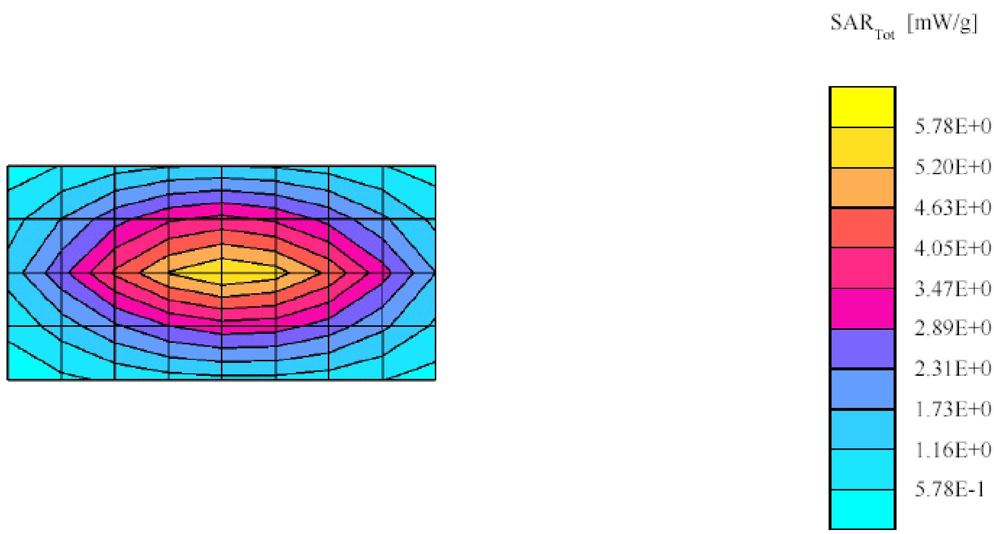
Dipole 300MHz SN300-002. Test Date:02/13/02
Motorola CGISS EME Lab
Run #: 02021301
Tx Freq: 300MHz
Input power: 500mW
Target: 2.8 mW/g normalized to 1W
Flat Phantom; Probe: ET3DV6 - SN1545;Probe Cal Date: 9/24/01; ConvF(7.50,7.50,7.50); Crest factor: 1.0; IEEE Head 300 MHz: σ = 0.89 mho/m ε = 47.0 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 7x7x7: Peak: 2.37 mW/g, SAR (1g): 1.49 mW/g, SAR (10g): 0.993 mW/g, (Worst-case extrapolation)
Penetration depth: 12.7 (10.7, 15.3) [mm]
Power drift: -0.04 dB



Dipole 300MHz SN300-002. Test Date:02/01/02
Run #: 02020102
Tx Freq: 300MHz
Input power: 500mW
Target:2.7 mW/g normalized to 1W
Flat Phantom; Probe: ET3DV6 - SN1545;Probe Cal Date: 9/24/01ConvF(7.60,7.60,7.60); Crest factor: 1.0; FCC Body 300: σ = 0.92 mho/m ε = 55.5 ρ = 1.00 g/cm3
Cubes (2): Peak: 2.29 mW/g, SAR (1g): 1.45 mW/g, SAR (10g): 0.970 mW/g, (Worst-case extrapolation)
Penetration depth: 13.0 (10.9, 15.7) [mm]
Power drift: -0.05 dB



Dipole D835V2 SN427. Test Date:02/01/02
Motorola CGISS EME Lab
Run #: 02020101
Tx Freq: 835MHz
Input power: 500mW
Target: 9.5 mW/g normalized to 1W (reference IEEE Std 1528-200X table 7.1)
Flat Phantom; Probe: ET3DV6 - SN1545;Probe Cal Date: 9/24/01; ConvF(6.40,6.40,6.40); Crest factor: 1.0; IEEE HEAD 835MHz: σ = 0.94 mho/m ε = 42.5 ρ = 1.00 g/cm3; DAE: DAE3 SN 401; DAE cal date: 10/15/01
Cube 5x5x7: Peak: 8.57 mW/g, SAR (1g): 5.31 mW/g, SAR (10g): 3.37 mW/g, (Worst-case extrapolation)
Penetration depth: 11.7 (10.3, 13.4) [mm]
Power drift: 0.01 dB



APPENDIX C

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:	**1545**
Place of Calibration:	**Zurich**
Date of Calibration:	**September 24, 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:	Nikolos E. Neviana
Approved by:	Alexis Katz

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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:	**1545**
Place of Assessment:	**Zurich**
Date of Assessment:	**September 25, 2001**
Probe Calibration Date:	**September 24, 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: Eduardo Ratja

Dosimetric E-Field Probe ET3DV6 SN:1545

Conversion factor (± standard deviation)

150 MHz	ConvF	7.9 ± 8%	ε_r = 61.9 σ = 0.80 mho/m (body tissue)
236 MHz	ConvF	7.7 ± 8%	ε_r = 59.8 σ = 0.87 mho/m (body tissue)
300 MHz	ConvF	7.6 ± 8%	ε_r = 58.2 σ = 0.92 mho/m (body tissue)
350 MHz	ConvF	7.5 ± 8%	ε_r = 57.7 σ = 0.93 mho/m (body tissue)
450 MHz	ConvF	7.3 ± 8%	ε_r = 56.7 σ = 0.94 mho/m (body tissue)
784 MHz	ConvF	6.3± 8%	ε_r = 55.4 σ = 0.97 mho/m (body tissue)
835 MHz	ConvF	6.2 ± 8%	ε_r = 55.2 σ = 0.97 mho/m (body tissue)
925 MHz	ConvF	6.1 ± 8%	ε_r = 55.0 σ = 1.06 mho/m (body tissue)
1450 MHz	ConvF	5.5± 8%	ε_r = 54.0 σ = 1.30 mho/m (body tissue)
1900 MHz	ConvF	4.8 ± 8%	ε_r = 53.3 σ = 1.52 mho/m (body tissue)
2450 MHz	ConvF	4.0 ± 8%	ε_r = 52.7 σ = 1.95 mho/m (body tissue)

Dosimetric E-Field Probe ET3DV6 SN:1545

Conversion factor (± standard deviation)

150 MHz	ConvF	8.7 ± 8%	ε_r = 52.3 σ = 0.76 mho/m (head tissue)
236 MHz	ConvF	7.9 ± 8%	ε_r = 48.3 σ = 0.82 mho/m (head tissue)
300 MHz	ConvF	7.5 ± 8%	ε_r = 45.3 σ = 0.87 mho/m (head tissue)
350 MHz	ConvF	7.4 ± 8%	ε_r = 44.7 σ = 0.87 mho/m (head tissue)
400 MHz	ConvF	7.3 ± 8%	ε_r = 44.4 σ = 0.87 mho/m (head tissue - CENELEC)
450 MHz	ConvF	7.2 ± 8%	ε_r = 43.5 σ = 0.87 mho/m (head tissue)
784 MHz	ConvF	6.5± 8%	ε_r = 41.8 σ = 0.90 mho/m (head tissue)
835 MHz	ConvF	6.4 ± 8%	ε_r = 41.5 σ = 0.90 mho/m (head tissue)
835 MHz	ConvF	6.5 ± 8%	ε_r = 42.5 σ = 0.98 mho/m (head tissue - CENELEC)
925 MHz	ConvF	6.3 ± 8%	ε_r = 41.5 σ = 0.98 mho/m (head tissue)
900 MHz	ConvF	6.3 ± 8%	ε_r = 42.3 σ = 0.99 mho/m (head tissue - CENELEC)

Dosimetric E-Field Probe ET3DV6 SN:1545

Conversion factor (± standard deviation)

1500 MHz	ConvF	**5.9 ± 8%**	**ε_r = 40.4** **σ = 1.23 mho/m** (head tissue)
1900 MHz	ConvF	**5.3 ± 8%**	**ε_r = 40.0** **σ = 1.40 mho/m** (head tissue)
2450 MHz	ConvF	**4.5± 8%**	**ε_r = 39.2** **σ = 1.80 mho/m** (head tissue)

DIPOLE SAR VALIDATION CERTIFICATE

Frequency:	***300***	***MHz***
Dipole Serial Number:	***300-002***	
Simulated Tissue:	***head***	
Date of Validation:	***August 22, 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 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 SAR VALIDATION CERTIFICATE

Frequency:	300	MHz
Dipole Serial Number:	300-002	
Simulated Tissue:	body	
Date of Validation:	August 24, 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 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.

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Calibration Certificate

835 MHz System Validation Dipole

Type:	**D835V2**
Serial Number:	**427**
Place of Calibration:	**Zurich**
Date of Calibration:	**Nov. 2, 2000**
Calibration Interval:	**24 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:	Pokovic Katja

Table 7.1 – Numerical reference SAR values for reference dipole and flat phantom. All values are normalized to a forward power of 1 W.

Frequency (MHz)	1 g SAR	10 g SAR	local SAR at surface (above feedpoint)	local SAR at surface (y=2cm offset from feedpoint)
300	3.0	2.0	4.4	2.1
450	4.9	3.3	7.2	3.2
835	9.5	6.2	14.1	4.9
900	10.8	6.9	16.4	5.4
1450	29.0	16.0	50.2	6.5
1800	38.1	19.8	69.5	6.8
1900	39.7	20.5	72.1	6.6
2000	41.1	21.1	74.6	6.5
2450	52.4	24.0	104.2	7.7
3000	63.8	25.7	140.2	9.5

APPENDIX D: Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the body worn carry accessories tested for the HT1250LS model PMUD1761A. The radio that was used in the following photos represents the device used to obtain the results presented herein.

Photo 1.
Model PMLN4281A
Basic Thin Leather
Front View

Photo 2.
Model PMLN4281A
Basic Thin Leather
Side view

Photo 3.
Model PMLN4281A
Basic Thin Leather
Back view

Photo 4.
Model HLN9690A
Standard Leather case with swivel
Front view

Photo 5.
Model HLN9690A
Standard Leather case with swivel
Side view

Photo 6.
Model HLN9690A
Standard Leather case with swivel
Back view

Photo 7.
Model HLN9701B
Nylon Case
Front view

Photo 8.
Model HLN9701B
Nylon Case
Side view

Photo 9.
Model HLN9701B
Nylon Case
Back view

Photo 10.
Model HLN9946A
Standard case w/
belt loop
Front view

Photo 11.
Model HLN9946A
Standard case w/
belt loop
Side view

Photo 12.
Model HLN9946A
Standard case w/
belt loop
Back view

Photo 13.
Model HLN9714A
Belt Clip
Side view

Photo 14.
Model HLN9844A
Belt clip
Side view

Photo 15.
Standard belt clip
User Position

Photo 16.
Model RLN4815A
Fanny Pack
Front view

Photo 17.
Model HLN6602A
Chest Pack
Side view

The following table provides information regarding the accessories offered for the HT1250LS. Justification for why specific accessories were not included in the test matrix is presented.

Accessories Type	Model	Comments	Justification for not including model in test plan	Separation distance - base of antenna to phantom surface. (mm)
Body-worn	HLN9946A	Tested	NA	30
Body-worn	HLN9690A	Tested	NA	55
Body-worn	HLN6602A	Tested	NA	19
Body-worn	HLN9701B	Tested	NA	29
Body-worn	HLN9714A	Tested	NA	23
Body-worn	HLN9844A	Tested	NA	25
Body-worn	HLN9952A	Not Tested	Plastic case – no metal components. Greater separation distance when used with HLN9714A or HLN9844	30
Body-worn	HLN9985B	Not Tested	Waterproof carry bag only. No Remote PTT operation	NA
Body-worn	NTN5243A	Tested w/ HLN9701B	NA	NA
Body-worn	PMLN4281A	Tested	NA	28
Body-worn	RLN4815A	Tested	NA	32
Body-worn	HLN9945A	Not Tested	Similar to HLN9946A. Contain same metallic components	36
Body-worn	HLN9689A	Not Tested	Similar to HLN9946A. Contain same metallic components	32

Body-worn	HLN9677A	Not Tested	Similar to HLN9946A. Contain same metallic components	36
Body-worn	HLN9665A	Not Tested	Similar to HLN9946A. Contain same metallic components	33
Body-worn	HLN9652A	Not Tested	Similar to HLN9946A. Contain same metallic components	38
Body-worn	HLN9670A	Not Tested	Similar to HLN9690A. Contain same metallic components	55
Body-worn	HLN9676A	Not Tested	Similar to HLN9690A. Contain same metallic components	55
Body-worn	HLN9694A	Not Tested	Similar to HLN9690A. Contain same metallic components	55
Body-worn	HLN9955A	Not Tested	Similar to HLN9690A. Contain same metallic components	55
Body-worn	HLN9998A	Not Tested	Similar to HLN9690A. Contain same metallic components	55
Body-worn	PMLN4280A	Not Tested	Similar to HLN9690A. Contain same metallic components	28
Audio	AARMN4017A	Tested	NA	NA
Audio	AARMN4028A	Tested	NA	NA
Audio	AARMN4031A	Tested	NA	NA
Audio	RMN4054A	Tested	NA	NA
Audio	RMN4055A	Tested	NA	NA
Audio	ENMN4013A	Tested	NA	NA
Audio	ENMN4010A	Tested	NA	NA
Audio	ENMN4015A	Tested	NA	NA

Audio	AARMN4021A	Not tested	Similar to AARMN4028A	NA
Audio	ENMN4016A	Tested	NA	NA
Audio	BDN6641A	Tested w/ RMN4044A	NA	NA
Audio	BDN6677A	Tested w/ RMN4045A	NA	NA
Audio	BDN6678A	Not Tested	Similar to BDN6677A (different color)	NA
Audio	ENLN4135A	Tested w/ ENMN4011A	NA	NA
Audio	ENMN4011A	Tested	NA	NA
Audio	ENMN4012A	Tested	NA	NA
Audio	ENMN4014A	Tested	NA	NA
Audio	ENMN4017A	Not Tested	Similar to ENMN4014A (different color)	NA
Audio	HLN9716B	Tested w/ HMN9725D	NA	NA
Audio	HLN9717A	Tested w/ NTN1722A/1723 A/1724A	NA	NA
Audio	HMN9052D	Tested	NA	NA
Audio	HMN9053D	Tested w/ WADN4190A	NA	NA
Audio	NTN1722A	Tested	NA	NA
Audio	NTN1723A	Tested	NA	NA
Audio	NTN1724A	Tested	NA	NA

Audio	NTN8370A	Not Tested	Similar to WADN4190A Receive only ear piece.	NA
Audio	NTN8371A	Not Tested	Similar to WADN4190A Receive only ear piece	NA
Audio	PMLN4418A	Tested	NA	NA
Audio	RKN4097A	Tested w/ RMN4051A/ 4052A/4053A	NA	NA
Audio	RLN4885A	Not Tested	Similar to WADN4190A (Receive only ear piece)	NA
Audio	RLN4922A	Tested w/ ENMN4014A	NA	NA
Audio	RLN4941A	Not Tested	Similar to WADN4190A (Receive only ear piece)	NA
Audio	AARMN4018B	Tested	NA	NA
Audio	AARMN4019A	Tested	NA	NA
Audio	AARMN4020A	Tested	NA	NA
Audio	AARMN4022A	Tested	NA	NA
Audio	AARMN4029A	Not Tested	Similar to AARMN4022A	NA
Audio	RMN4044A	Tested w/ 0180358B38 & BDN6641A	NA	NA
Audio	RMN4045A	Tested w/ 0180300E83 & BDN6677A	NA	NA
Audio	RMN4048A	Tested	NA	NA
Audio	RMN4051A	Tested	NA	NA
Audio	RMN4052A	Tested	NA	NA

Audio	RMN4053A	Tested	NA	NA
Audio	WADN4190A	Tested w/ HMN9053D	NA	NA
Audio	HKN9055A	Not Tested	Remote Speaker Mic. Replacement cable	NA
Audio	0180358B38	Tested w/ RMN4044A	NA	NA
Audio	0180300E83	Tested w/ RMN4045A	NA	NA