Certificate Number: 1449-02

MOTOROLA

ELECTROMAGNETIC EXPOSURE (EME) TESTING LABORATORY

8000 West Sunrise Blvd
Fort Lauderdale, Florida

S.A.R. TEST REPORT

FCC ID: AZ489FT5804
H46UCH9PW7AN

August 31, 2001 - Rev. A

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REVISION HISTORY

Date	Revision	Comments
8/23/01	O	Original release.
8/31/01	A	Editorial changes on pages 5, 8, and 9

1.0 Introduction

This report details the test setup, test equipment, and test results of the Specific Absorption Rate (SAR) measurement performed at the Motorola CGISS EME laboratory for XTS2500 Portable Radio Product, model number H46UCH9PW7AN (FCC ID: AZ489FT5804).

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 W/kg 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; 47 CFR 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
- National Council on Radiation Protection and Measurements (NCRP) of the United States, Report 86, 1986
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz, 1999
- Australian Communications Authority Radiocommunications (Electromagnetic Radiation - Human Exposure) Standard 1999 (applicable to wireless phones only).

3.0 Description of Test Sample

The XTS2500 Portable Radio, Model number H46UCH9PW7AN is a handheld transceiver which operates as a traditional simplex 2-way radio. It will be marketed to and used by employees solely for work - related operations, such as public safety agencies, e.g. police, fire and emergency medical. User training is the responsibility of these agencies, who can be expected to employ the usage instructions, safety information and operational cautions set forth in the user's manual, instructional sessions or other means. Motorola also makes available to its customers training classes on the proper use of two - way radios.

The intended use positions are "at the face" with the microphone 1 to 2 inches from the mouth or "at the waist or abdomen" secured to the user's belt. When operated at the waist or abdomen, the audio and push-to-talk functions are routed to a remote accessory which connects to the side of the radio. The transmit duty cycle, 50% maximum for this type of device, is controlled by the user via the push – to - talk button.

The transmitter is capable of operating in the following bands: 764-767, 773-776, 794-797, 803-806 MHz and 806-825, 851-870 MHz. For the purpose of this evaluation, the device transmit bands are grouped as follows: 764-776, 794-825 MHz, and 851-870 MHz with a rated conducted power of 3.0 watts. The maximum conducted power, as defined by the production line final test station upper limit, is 3.6 watts.

The sample unit tested for this report is an identical prototype to intended production units.

The XTS2500 product is offered with various antennas, and accessories, listed below. (Refer to appendix D for a complete illustration of Body - worn accessories.)

Antenna:

NAF5080A ½ wave 6.5 inch whip, frequency range 762 - 870MHz
NAF5042A ¼ wave 3.0 inch stubby, frequency range 806 - 870MHz
NAF5037A ½ wave 6.5 inch whip, frequency range 806 - 870MHz

Battery:

NTN9816A 1525 mAh NiCad high capacity FM Intrinsically Safe
NTN9815A 1525 mAh NiCad high capacity (identical to NTN9816A except for label)
NTN9857A 1800 mAh NMH ultra high capacity FM Intrinsically Safe
NTN9858A 1800 mAh NMH ultra high capacity (identical to NTN9857A except for label)

Body-worn accessory:

HLN9844A 2" belt clip kit
HLN6853A 2.25" belt clip kit (same as HLN9844A except 0.5 cm longer)
NTN8036B Case carrying, includes 2.5" swivel belt loop

Audio/push-to-talk:

Many different audio/push – to - talk accessories are available. They can generally be grouped into categories of 1) microphones, 2) earpieces, and 3) headsets depending on how they are used relative to the body. Representative samples were chosen as being typical within each group:

NMN6193C Remote speaker microphone
NMN6259A Medium weight dual headset with NC microphone
BDN6668A Earpiece, microphone, PTT, and BMD6676D adapter
NTN1624A CommPort with palm PTT (NTN8819A and NKN6510A) and BMD6676D adapter

For clarification, CommPort, NTN1624A, is a device worn on the ear which contains an integrated microphone and earpiece connected to the radio via a cable and interface module. The other accessories are self explanatory.

3.1 Test Signal

Test Signal Source:

Test Mode [ ] Base Station [ ] Simulator [ ] Native Transmission Mode [X]

Signal Modulation:

CW	**X**
TDMA	
Other	

3.2 Test Output Power

The conducted output power was measured before and after each SAR scan using a Agilent (HP) power meter model E4419B.

4.0 Description of Test Equipment

4.1 Descriptions of SAR Measurement System

The laboratory utilizes a Dosimetric Assessment System (DASY™) SAR measurement system manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The SAR measurements were conducted with the probe ET3DV6 serial number 1383. The system performance check was conducted daily and within 24 hours prior to testing. Copy of the probe calibration certificates are included in appendix C, and the DASY output files of all of the system performance test results are included in appendix B. The table below summarizes the average and range of all system performance checks.

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	System Perf. Result when normalized to 1W (mW/g)	Reference SAR @ 1W (mW/g)
1383	Body	May 23, 2001	835-002	8.56 ±4.7 %	8.88 ±10%
1383	Head	May 23, 2001	835-002	8.38 ±2.14 %	8.0 ±10%

The DASY™ system is operated per the instructions in the DASY™ Users Manual. The entire 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 plexi - glass and mounted on a supporting non-metallic structure that has an opening at the center for positioning the device.

Length	40.5 cm
Width	23.6 cm
Bottom Shell Thickness	0.2 cm

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

	Tissue Composition	
	Body	**Head**
Di-Water	53.06 %	40.45 %
Sugar	44.9 %	57 %
Salt	0.94 %	1.45 %
HEC	1.0 %	1.0 %
Dowicil75	0.1 %	0.1 %

Note: HEC (HYDROXYETHYL CELLULOSE) is a gelling agent and Dowicil 75 is anti bacterial compound.

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 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

	Body		Head	
Frequency(MHz)	**Di-electric Constant**	**Conductivity – S/m**	**Di-electric Constant**	**Conductivity – S/m**
769	55.46	0.96	41.84	0.89
809	55.30	0.97	41.64	0.90
860	55.12	1.00	41.50	0.93

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°C of the temperature at which the dielectric properties were determined. Additional precautions are routinely taken to ensure the stability of the simulated tissue such as covering the phantoms when scans are not actively in process in order to minimize evaporation. The lab environment is continuously monitored and the table below represents the environmental conditions during the SAR tests reported herein:

Ambient Temperature	22.25 ± 1.25°C
Relative Humidity	46.5 ± 9.5 %
Tissue Temperature	20.5 ± 0.5°C

The EME Lab RF environment is monitored with a Spectrum Analyzer to preclude 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 that no SAR impacting interference has ever been experienced.

5.0 Description of Test Procedure

All antennas, batteries, and accessories listed in section 3.0, with the exception of the 3 kits noted below, were included in the SAR test plan in order to determine the highest SAR levels. The transmit power of the test sample was pre-adjusted, per production alignment procedures, to the maximum transmit power, defined as the production line final test station upper limit, which in this case is 3.6 watts. Measured SAR results are scaled to 3.6 watts to account for power slump during the scan. This scaling is described in section 7.4. The radio was always placed in continuous transmit mode (100% duty cycle) for the duration of the scan and each SAR scan was initiated with a fully charged battery. The NTN9815A and NTN9858A batteries were not tested since they are identical to the tested batteries except for label. The HLN6853A belt clip was not tested since it is the same as the tested belt clip except 5 mm longer.

5.0.1 Abdomen

At the abdomen each combination of antenna, battery, and body-worn accessory was tested at the center of each transmit sub-band. If the transmit sub-band exceeded 25 MHz then each combination was also tested at the band ends. Each antenna was also tested at its specified center and band end frequencies using the combination of battery and carry case that resulted in the highest SAR.

The combination of antenna, battery, body - worn accessory, and frequency resulting in the highest SAR was repeated without the body-worn accessory and with the antenna spaced 2.5 cm from the flat phantom surface.

All abdomen tests were conducted with an audio/push - to - talk accessory connected to the radio. All of the scans described above incorporated the NMN6193C Remote Speaker Microphone. Next the highest SAR combination of antenna, battery, body-worn accessory, and frequency was re-tested using 3 additional audio accessories. Although SAR is not expected to be influenced by different audio accessories these additional tests were included to cover the different categories of audio accessories: microphones, earpieces, and headsets. Engineering judgment concludes that any SAR variation observed when testing different audio accessories is due to repeatability and well within the system uncertainty; hence testing representative samples of audio accessories is more than adequate to demonstrate compliance.

5.0.2 Face

At the face each combination of antenna and battery was tested at the center of each transmit sub - band. If the transmit sub-band exceeded 25 MHz then each combination was also tested at the band ends. Each antenna was also tested at its specified center and band end frequencies in combination with the battery that resulted in the highest SAR.

5.1 Device Test Positions

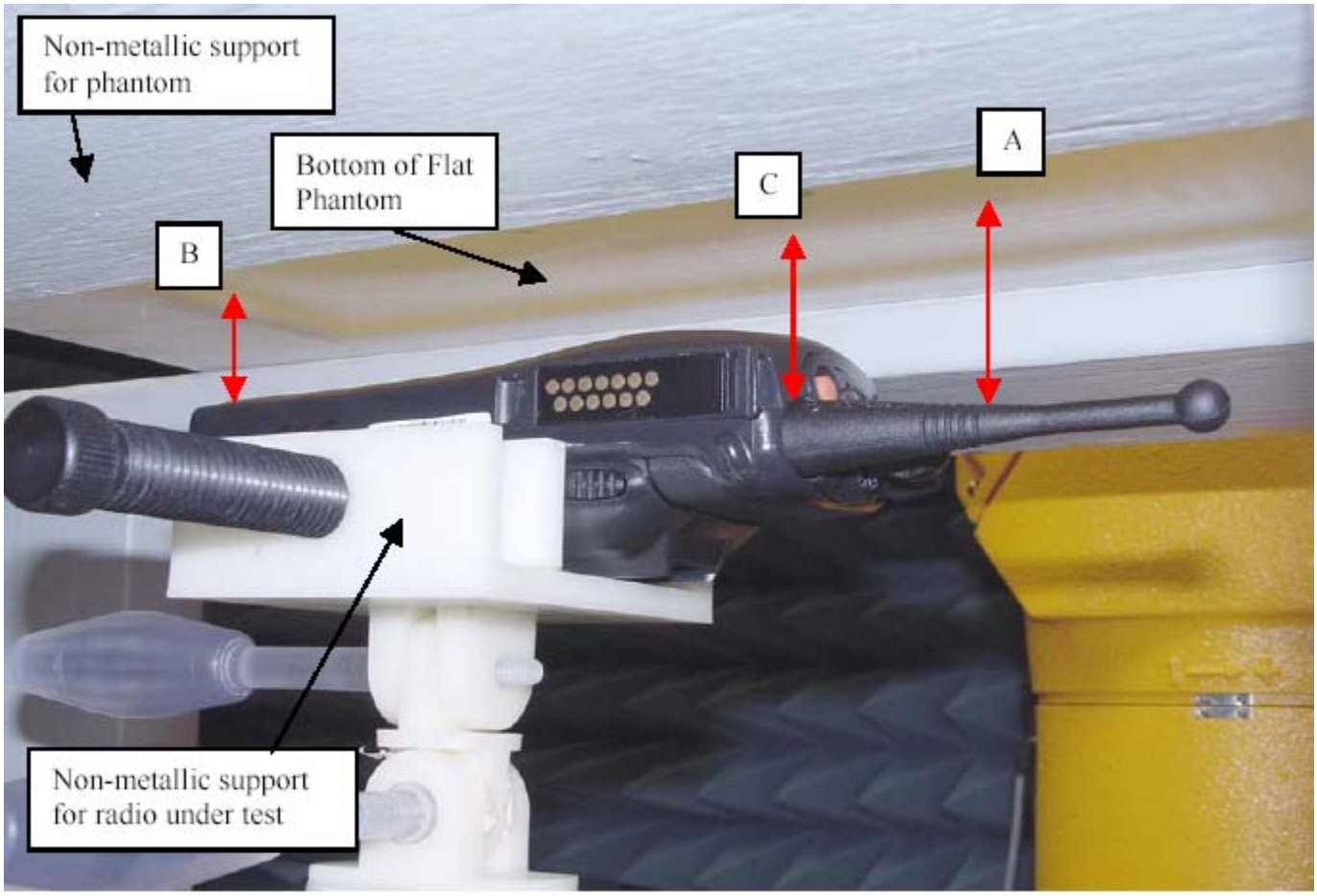
Abdomen - The test sample is positioned in a body - worn accessory and positioned under a flat phantom with the back of the body - worn accessory adjacent and parallel to the phantom. An audio/push-to-talk accessory and cable is connected to the radio with the cable routed orthogonal to and away from the radio at the point of connection to the radio.

For the 2.5 cm tests the test sample is positioned under a flat phantom and parallel to the phantom with the base of the antenna spaced 2.5 cm from the phantom surface.

Face - The test sample is positioned under a flat phantom with radio housing parallel to the phantom with the radio's microphone spaced 2.5cm from the bottom of the phantom surface.

Reference figures 1 and 2 for portable radio antenna orientation and distances relative to phantoms. Figure 3 provides an overall perspective of the phantom and support structure

Figure 1: Facial Position



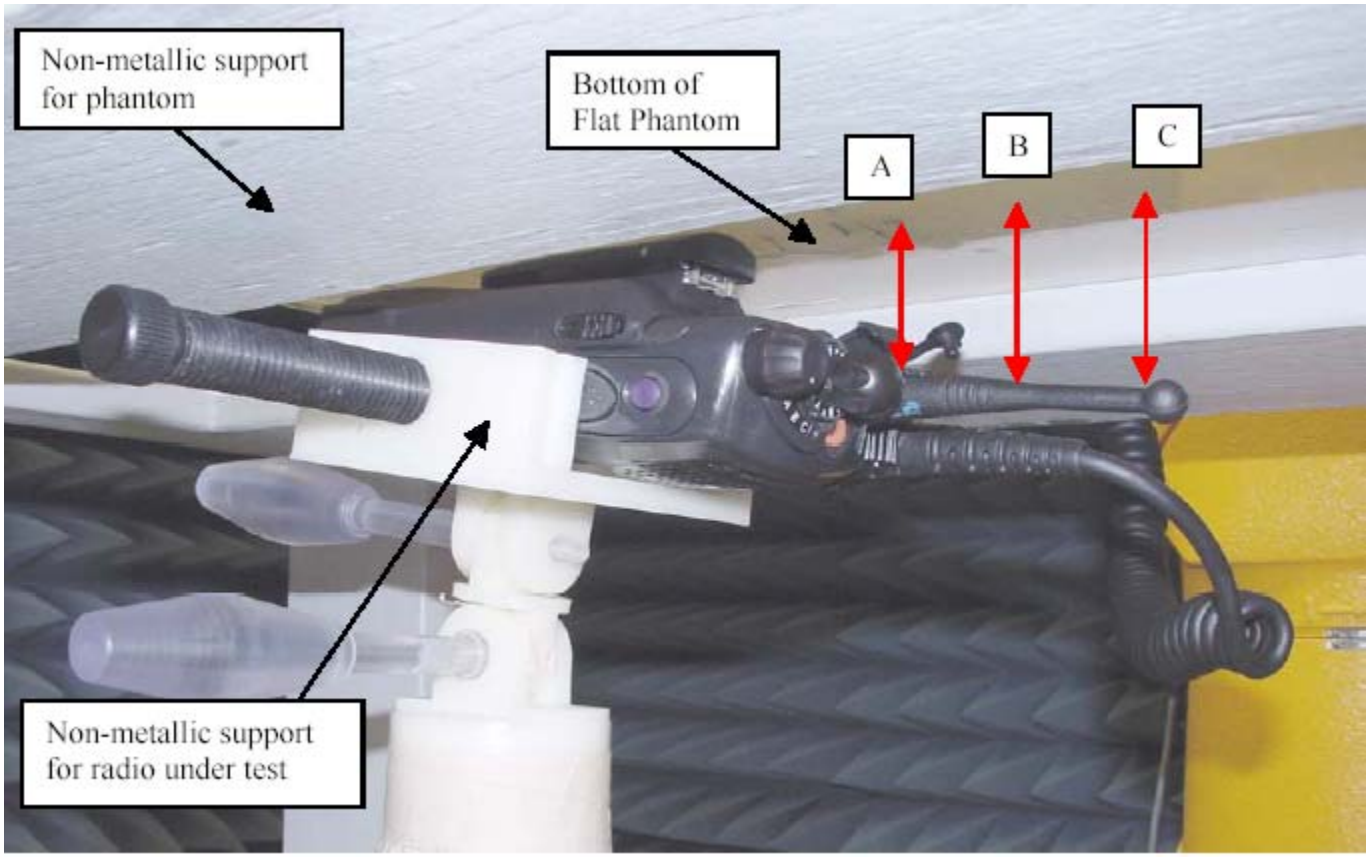
DIM A = Distance from center of antenna surface to phantom = 46 mm

DIM B = Closest distance between bottom of radio to phantom = 25 mm

DIM C = Closest distance between base of antenna to phantom = 41 mm

Note: Radio is positioned with microphone 2.5cm from the bottom surface of the flat phantom.

Figure 2: Abdominal Position (Shown with HLN9844A belt clip carry accessory)

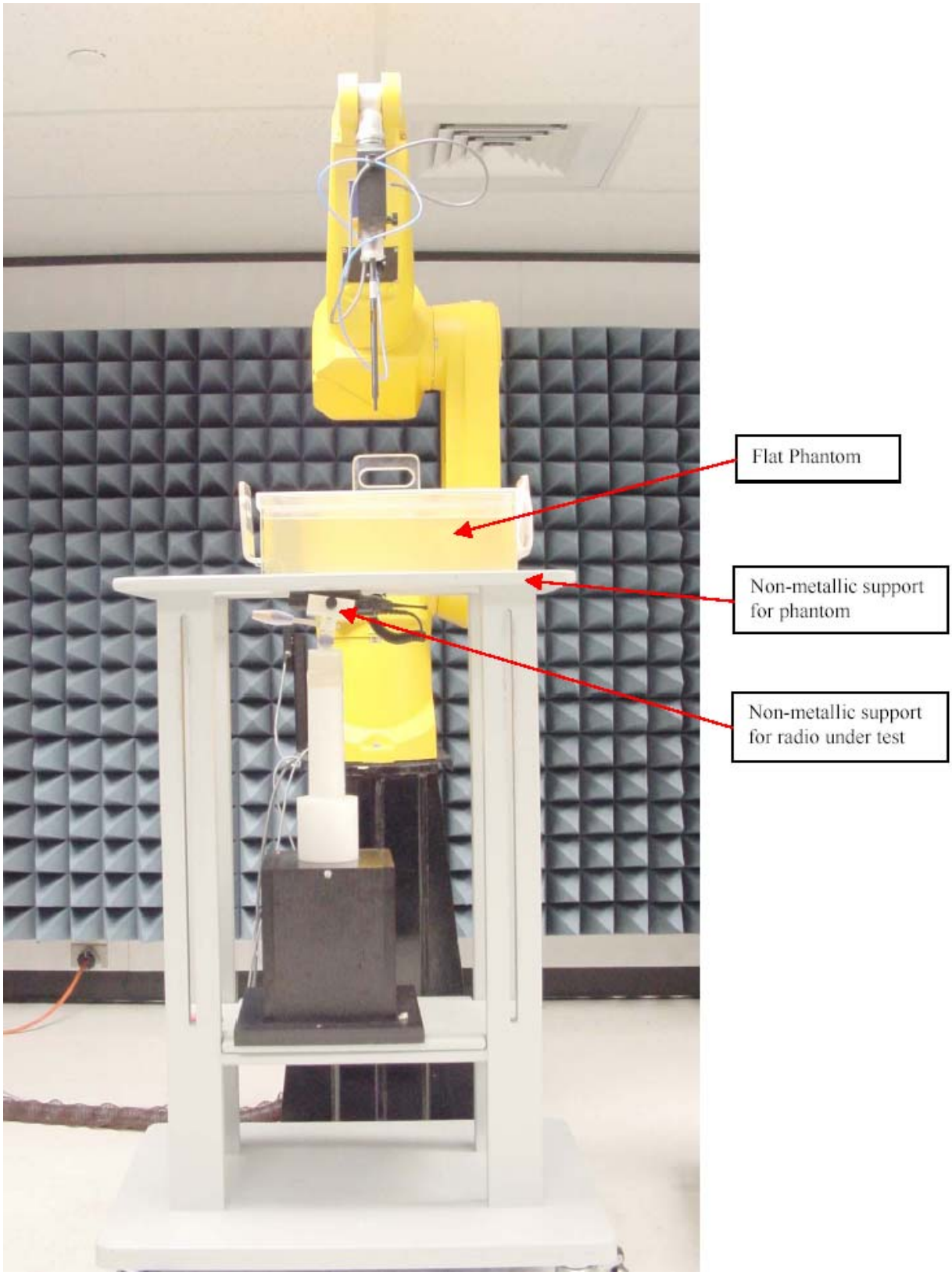


Dim A = Distance from surface of antenna base to phantom surface = 33 mm

Dim B= Distance from surface of antenna center to phantom surface = 40 mm

Dim C= Distance from antenna surface tip to phantom surface = 43 mm

Figure 3: 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 SAR distribution. After the coarse scan measurement, the probe is automatically moved to a position at the interpolated maximum. The subsequent scan can directly use this position for 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 SAR results yielded by the tests described in Section 5.0 are listed in the tables below for each body position. The DASY™ measurement system's output files for bolded data indicated in tables below are provided in appendix A.

7.1 SAR results at the abdomen:

Antenna/ Run Number	Freq. (MHz)	Battery	Carry Acc	Audio Acc	Initial Power (W)	End Power (W)	Measured 1g-SAR 100% duty cycle (mW/g)	Max Cal 1g-SAR 50% duty cycle (mW/g)
NAF5042A/ 010815-04	806	NTN9816A	HLN9844A	NMN6193C	3.50	3.48	7.74	4.00
NAF5042A/ 010815-03	809	NTN9816A	HLN9844A	NMN6193C	3.49	3.47	8.17	4.24
NAF5042A/ 010815-02	815	NTN9816A	HLN9844A	NMN6193C	3.52	3.48	8.51	**4.40**
NAF5042A/ 010806-06	824	NTN9816A	HLN9844A	NMN6193C	3.6	3.51	5.86	3.01
NAF5042A/ 010807-05	851	NTN9816A	HLN9844A	NMN6193C	3.5	3.52	5.51	2.82
NAF5042A/ 010814-10	860	NTN9816A	HLN9844A	NMN6193C	3.45	3.45	5.90	3.08
NAF5042A/ 010806-08	869	NTN9816A	HLN9844A	NMN6193C	3.57	3.45	5.51	2.87
NAF5042A/ 010807-13	806	NTN9816A	NTN8036B	NMN6193C	3.57	3.49	2.79	1.44
NAF5042A/ 010814-06	809	NTN9816A	NTN8036B	NMN6193C	3.48	3.43	2.64	1.39
NAF5042A/ 010807-12	815	NTN9816A	NTN8036B	NMN6193C	3.50	3.51	3.14	**1.61**
NAF5042A/ 010807-11	824	NTN9816A	NTN8036B	NMN6193C	3.50	3.53	2.85	1.45
NAF5042A/ 010815-05	851	NTN9816A	NTN8036B	NMN6193C	3.50	3.48	2.47	1.28
NAF5042A/ 010807-07	860	NTN9816A	NTN8036B	NMN6193C	3.52	3.44	1.99	1.04
NAF5042A/ 010809-03	869	NTN9816A	NTN8036B	NMN6193C	3.48	3.48	1.98	1.02
NAF5080A/ 010810-10	764	NTN9816A	HLN9844A	NMN6193C	3.50	3.44	1.28	0.67
NAF5080A/ 010810-11	773	NTN9816A	HLN9844A	NMN6193C	3.52	3.45	1.36	0.71
NAF5080A/ 010810-12	776	NTN9816A	HLN9844A	NMN6193C	3.50	3.51	1.65	0.85
NAF5080A/ 010807-01	794	NTN9816A	HLN9844A	NMN6193C	3.49	3.50	2.00	1.03
NAF5080A/ 010807-02	806	NTN9816A	HLN9844A	NMN6193C	3.58	3.49	2.44	**1.26**

Antenna/ Run Number	Freq. (MHz)	Battery	Carry Acc	Audio Acc	Initial Power (W)	End Power (W)	Measured 1g-SAR 100% duty cycle (mW/g)	Max Cal 1g-SAR 50% duty cycle (mW/g)
NAF5080A/ 010810-13	809	NTN9816A	HLN9844A	NMN6193C	3.49	3.47	2.31	1.20
NAF5080A/ 010806-13	815	NTN9816A	HLN9844A	NMN6193C	3.60	3.49	2.24	1.16
NAF5080A/ 010809-04	824	NTN9816A	HLN9844A	NMN6193C	3.60	3.55	2.18	1.11
NAF5080A/ 010807-14	851	NTN9816A	HLN9844A	NMN6193C	3.54	3.20	1.73	0.97
NAF5080A/ 010806-11	860	NTN9816A	HLN9844A	NMN6193C	3.46	3.45	1.55	0.81
NAF5080A/ 010806-10	869	NTN9816A	HLN9844A	NMN6193C	3.60	3.46	1.25	0.65
NAF5080A/ 010810-14	764	NTN9816A	NTN8036B	NMN6193C	3.52	3.47	0.262	0.136
NAF5080A/ 010810-15	773	NTN9816A	NTN8036B	NMN6193C	3.52	3.51	0.250	0.128
NAF5080A/ 010810-18	776	NTN9816A	NTN8036B	NMN6193C	3.51	3.47	0.241	0.125
NAF5080A/ 010814-02	794	NTN9816A	NTN8036B	NMN6193C	3.48	3.45	0.282	0.147
NAF5080A/ 010808-03	806	NTN9816A	NTN8036B	NMN6193C	3.52	3.50	0.312	0.160
NAF5080A/ 010808-12	809	NTN9816A	NTN8036B	NMN6193C	3.5	3.48	0.297	0.154
NAF5080A/ 010808-04	815	NTN9816A	NTN8036B	NMN6193C	3.55	3.51	0.301	0.154
NAF5080A/ 010808-05	824	NTN9816A	NTN8036B	NMN6193C	3.5	3.52	0.326	0.167
NAF5080A/ 010808-06	851	NTN9816A	NTN8036B	NMN6193C	3.55	3.52	0.310	0.159
NAF5080A/ 010809-02	860	NTN9816A	NTN8036B	NMN6193C	3.6	3.49	0.33	**0.170**
NAF5080A/ 010808-09	869	NTN9816A	NTN8036B	NMN6193C	3.46	3.48	0.261	0.135
NAF5037A/ 010811-01	806	NTN9816A	HLN9844A	NMN6193C	3.48	3.50	2.03	1.04
NAF5037A/ 010814-09	809	NTN9816A	HLN9844A	NMN6193C	3.52	3.45	2.53	**1.32**
NAF5037A/ 010811-02	815	NTN9816A	HLN9844A	NMN6193C	3.52	3.49	2.39	1.23
NAF5037A/ 010811-03	824	NTN9816A	HLN9844A	NMN6193C	3.50	3.51	2.34	1.20
NAF5037A/ 010811-04	851	NTN9816A	HLN9844A	NMN6193C	3.45	3.30	1.78	0.97
NAF5037A/ 010811-05	860	NTN9816A	HLN9844A	NMN6193C	3.47	3.45	1.50	0.78
NAF5037A/ 010811-06	869	NTN9816A	HLN9844A	NMN6193C	3.46	3.46	1.25	0.65

Antenna/ Run Number	Freq. (MHz)	Battery	Carry Acc	Audio Acc	Initial Power (W)	End Power (W)	Measured 1g-SAR 100% duty cycle (mW/g)	Max Cal 1g-SAR 50% duty cycle (mW/g)
NAF5037A/ 010811-07	806	NTN9816A	NTN8036B	NMN6193C	3.48	3.49	0.310	0.160
NAF5037A/ 010814-03	809	NTN9816A	NTN8036B	NMN6193C	3.45	3.45	0.267	0.139
NAF5037A/ 010811-08	815	NTN9816A	NTN8036B	NMN6193C	3.50	3.49	0.331	0.170
NAF5037A/ 010811-09	824	NTN9816A	NTN8036B	NMN6193C	3.50	3.51	0.359	**0.184**
NAF5037A/ 010814-04	851	NTN9816A	NTN8036B	NMN6193C	3.47	3.51	0.279	0.143
NAF5037A/ 010814-05	860	NTN9816A	NTN8036B	NMN6193C	3.46	3.46	0.249	0.130
NAF5037A/ 010814-08	869	NTN9816A	NTN8036B	NMN6193C	3.45	3.44	0.258	0.135
NAF5042A/ 010808-10	806	NTN9816A	HLN9844A	NMN6259A	3.60	3.52	7.53	**3.85**
NAF5042A/ 010814-12	806	NTN9816A	HLN9844A	BDN6668A	3.46	3.51	6.71	3.44
NAF5042A/ 010814-11	806	NTN9816A	HLN9844A	NTN1624A	3.50	3.50	7.40	3.81
NAF5042A/ 010817-21	806	NTN9857	HLN9844A	NMN6193C	3.47	3.51	7.51	3.85
NAF5042A/ 010817-20	809	NTN9857	HLN9844A	NMN6193C	3.50	3.49	7.74	3.99
NAF5042A/ 010814-13	815	NTN9857	HLN9844A	NMN6193C	3.45	3.51	8.36	**4.29**
NAF5042A/ 010817-19	824	NTN9857	HLN9844A	NMN6193C	3.50	3.53	8.10	4.13
NAF5042A/ 010817-18	851	NTN9857	HLN9844A	NMN6193C	3.53	3.54	4.54	2.31
NAF5042A/ 010817-17	860	NTN9857	HLN9844A	NMN6193C	3.45	3.19	5.58	3.15
NAF5042A/ 010817-16	869	NTN9857	HLN9844A	NMN6193C	3.45	3.39	5.12	2.72
NAF5042A/ 010817-09	806	NTN9857	NTN8036B	NMN6193C	3.45	3.45	3.06	1.60
NAF5042A/ 010817-10	809	NTN9857	NTN8036B	NMN6193C	3.45	3.43	2.52	1.32
NAF5042A/ 010817-11	815	NTN9857	NTN8036B	NMN6193C	3.5	3.47	3.25	**1.69**
NAF5042A/ 010817-12	824	NTN9857	NTN8036B	NMN6193C	3.48	3.46	2.35	1.22
NAF5042A/ 010817-13	851	NTN9857	NTN8036B	NMN6193C	3.45	3.48	2.19	1.13
NAF5042A/ 010817-14	860	NTN9857	NTN8036B	NMN6193C	3.45	3.42	1.96	1.03
NAF5042A/ 010817-15	869	NTN9857	NTN8036B	NMN6193C	3.45	3.42	1.88	0.99

Antenna/ Run Number	Freq. (MHz)	Battery	Carry Acc	Audio Acc	Initial Power (W)	End Power (W)	Measured 1g-SAR 100% duty cycle (mW/g)	Max Cal 1g-SAR 50% duty cycle (mW/g)
NAF5080A/ 010816-02	764	NTN9857	HLN9844A	NMN6193C	3.59	3.46	1.38	0.72
NAF5080A/ 010816-03	773	NTN9857	HLN9844A	NMN6193C	3.44	3.45	1.41	0.74
NAF5080A/ 010816-04	776	NTN9857	HLN9844A	NMN6193C	3.45	3.43	1.54	0.81
NAF5080A/ 010816-05	794	NTN9857	HLN9844A	NMN6193C	3.45	3.43	1.95	1.02
NAF5080A/ 010816-06	806	NTN9857	HLN9844A	NMN6193C	3.45	3.42	2.42	**1.27**
NAF5080A/ 010816-07	809	NTN9857	HLN9844A	NMN6193C	3.43	3.44	2.31	1.21
NAF5080A/ 010816-08	815	NTN9857	HLN9844A	NMN6193C	3.46	3.45	2.26	1.18
NAF5080A/ 010816-09	824	NTN9857	HLN9844A	NMN6193C	3.48	3.48	2.24	1.16
NAF5080A/ 010816-10	851	NTN9857	HLN9844A	NMN6193C	3.44	3.46	1.79	0.93
NAF5080A/ 010816-11	860	NTN9857	HLN9844A	NMN6193C	3.45	3.46	1.48	0.77
NAF5080A/ 010818-02	869	NTN9857	HLN9844A	NMN6193C	3.44	3.43	1.40	0.73
NAF5080A/ 010816-12	764	NTN9857	NTN8036B	NMN6193C	3.45	3.40	0.255	0.135
NAF5080A/ 010816-13	773	NTN9857	NTN8036B	NMN6193C	3.46	3.45	0.263	0.137
NAF5080A/ 010816-14	776	NTN9857	NTN8036B	NMN6193C	3.49	3.46	0.254	0.132
NAF5080A/ 010816-15	794	NTN9857	NTN8036B	NMN6193C	3.48	3.46	0.253	0.132
NAF5080A/ 010816-16	806	NTN9857	NTN8036B	NMN6193C	3.50	3.45	0.274	0.143
NAF5080A/ 010816-17	809	NTN9857	NTN8036B	NMN6193C	3.45	3.43	0.293	0.154
NAF5080A/ 010816-18	815	NTN9857	NTN8036B	NMN6193C	3.45	3.47	0.302	**0.157**
NAF5080A/ 010816-19	824	NTN9857	NTN8036B	NMN6193C	3.48	3.48	0.286	0.148
NAF5080A/ 010816-20	851	NTN9857	NTN8036B	NMN6193C	3.46	3.48	0.273	0.141
NAF5080A/ 010816-21	860	NTN9857	NTN8036B	NMN6193C	3.45	3.44	0.263	0.138
NAF5080A/ 010816-22	869	NTN9857	NTN8036B	NMN6193C	3.45	3.43	0.240	0.126

Antenna/ Run Number	Freq. (MHz)	Battery	Carry Acc	Audio Acc	Initial Power (W)	End Power (W)	Measured 1g-SAR 100% duty cycle (mW/g)	Max Cal 1g-SAR 50% duty cycle (mW/g)
NAF5037A/ 010817-22	806	NTN9857	HLN9844A	NMN6193C	3.56	3.51	2.18	**1.12**
NAF5037A/ 010817-23	809	NTN9857	HLN9844A	NMN6193C	3.45	3.48	2.10	1.09
NAF5037A/ 010817-24	815	NTN9857	HLN9844A	NMN6193C	3.52	3.53	2.06	1.05
NAF5037A/ 010817-25	824	NTN9857	HLN9844A	NMN6193C	3.53	3.54	2.02	1.03
NAF5037A/ 010817-26	851	NTN9857	HLN9844A	NMN6193C	3.51	3.54	1.74	0.88
NAF5037A/ 010818-03	860	NTN9857	HLN9844A	NMN6193C	3.44	3.45	1.69	0.88
NAF5037A/ 010818-04	869	NTN9857	HLN9844A	NMN6193C	3.54	3.46	1.29	0.67
NAF5037A/ 010817-02	806	NTN9857	NTN8036B	NMN6193C	3.56	3.45	0.266	0.139
NAF5037A/ 010817-03	809	NTN9857	NTN8036B	NMN6193C	3.44	3.43	0.314	**0.165**
NAF5037A/ 010817-04	815	NTN9857	NTN8036B	NMN6193C	3.54	3.47	0.266	0.138
NAF5037A/ 010817-05	824	NTN9857	NTN8036B	NMN6193C	3.50	3.49	0.279	0.144
NAF5037A/ 010817-06	851	NTN9857	NTN8036B	NMN6193C	3.52	3.50	0.257	0.132
NAF5037A/ 010817-07	860	NTN9857	NTN8036B	NMN6193C	3.44	3.44	0.231	0.121
NAF5037A/ 010817-08	869	NTN9857	NTN8036B	NMN6193C	3.45	3.44	0.212	0.111
NAF5042A/ 010818-05	815	NTN9816A	@ 2.5 cm		3.48	3.47	5.18	**2.69**
NAF5042A/ 010811-14	815	NTN9857	@ 2.5 cm		3.45	3.51	4.24	2.17

7.2 SAR results at the Face:

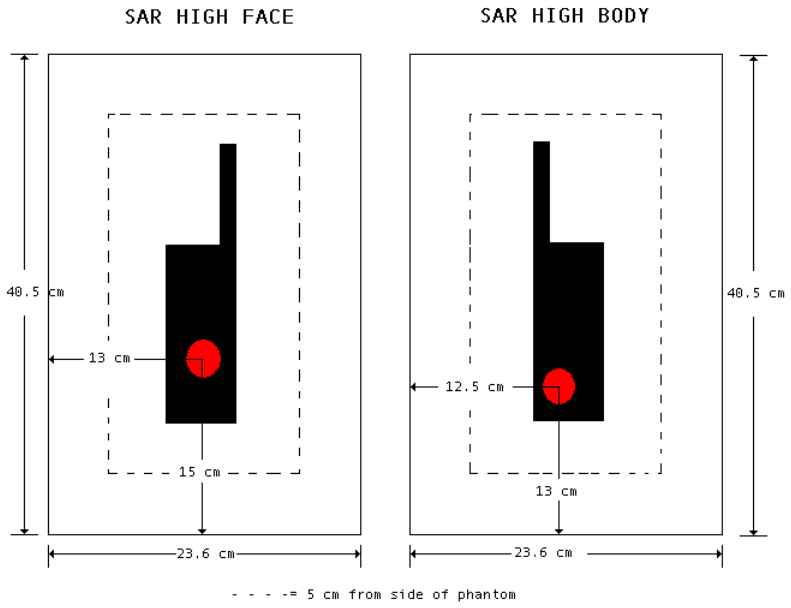
Antenna/ Run Number	Freq.	Battery	Initial Power (W)	End Power (W)	Measured 1g-SAR 100% duty cycle (mW/g)	Max Cal 1g-SAR 50% duty cycle (mW/g)
NAF5042A/ 010809-12	806	NTN9816A	3.51	3.40	3.03	1.60
NAF5042A/ 010809-11	809	NTN9816A	3.49	3.41	3.12	1.65
NAF5042A/ 010809-10	815	NTN9816A	3.53	3.49	3.35	1.73
NAF5042A/ 010809-09	824	NTN9816A	3.53	3.53	3.63	1.85
NAF5042A/ 010809-08	851	NTN9816A	3.49	3.53	4.54	2.32
NAF5042A/ 010809-07	860	NTN9816A	3.48	3.48	4.57	2.36
NAF5042A/ 010809-06	869	NTN9816A	3.50	3.47	4.64	**2.41**
NAF5080A/ 010813-02	764	NTN9816A	3.52	3.49	1.96	1.01
NAF5080A/ 010813-03	773	NTN9816A	3.52	3.51	2.16	1.11
NAF5080A/ 010813-04	776	NTN9816A	3.49	3.47	2.10	1.09
NAF5080A/ 010810-02	794	NTN9816A	3.57	3.51	2.51	1.29
NAF5080A/ 010813-05	806	NTN9816A	3.50	3.50	3.03	1.56
NAF5080A/ 010813-06	809	NTN9816A	3.50	3.47	3.15	**1.63**
NAF5080A/ 010813-07	815	NTN9816A	3.51	3.49	3.14	1.62
NAF5080A/ 010813-08	824	NTN9816A	3.50	3.51	2.99	1.53
NAF5080A/ 010813-09	851	NTN9816A	3.48	3.47	2.44	1.27
NAF5080A/ 010813-10	860	NTN9816A	3.45	3.46	2.18	1.13
NAF5080A/ 010813-11	869	NTN9816A	3.45	3.42	1.70	0.89

Antenna/ Run Number	Freq.	Battery	Initial Power (W)	End Power (W)	Measured 1g-SAR 100% duty cycle (mW/g)	Max Cal 1g-SAR 50% duty cycle (mW/g)
NAF5037A/ 010810-03	806	NTN9816A	3.55	3.51	3.07	1.57
NAF5037A/ 010810-04	809	NTN9816A	3.60	3.49	2.83	1.46
NAF5037A/ 010810-05	815	NTN9816A	3.55	3.51	3.31	**1.70**
NAF5037A/ 010810-06	824	NTN9816A	3.54	3.53	2.88	1.47
NAF5037A/ 010810-07	851	NTN9816A	3.51	3.47	2.36	1.22
NAF5037A/ 010810-08	860	NTN9816A	3.49	3.49	1.94	1.00
NAF5037A/ 010813-12	869	NTN9816A	3.45	3.46	1.72	0.89
NAF5042A/ 010820-03	806	NTN9857	3.47	3.40	2.88	1.52
NAF5042A/ 010820-04	809	NTN9857	3.42	3.38	2.91	1.55
NAF5042A/ 010820-05	815	NTN9857	3.45	3.41	2.97	1.57
NAF5042A/ 010820-06	824	NTN9857	3.46	3.44	3.36	1.76
NAF5042A/ 010820-08	851	NTN9857	3.47	3.46	4.57	2.38
NAF5042A/ 010820-07	860	NTN9857	3.52	3.44	4.60	**2.41**
NAF5042A/ 010813-13	869	NTN9857	3.45	3.45	4.42	2.31
NAF5080A/ 010820-09	764	NTN9857	3.48	3.43	1.90	1.00
NAF5080A/ 010820-10	773	NTN9857	3.46	3.45	2.08	1.09
NAF5080A/ 010820-11	776	NTN9857	3.45	3.43	2.07	1.09
NAF5080A/ 010820-12	794	NTN9857	3.47	3.46	2.92	1.52
NAF5080A/ 010820-13	806	NTN9857	3.46	3.47	2.47	1.28
NAF5080A/ 010820-14	809	NTN9857	3.46	3.46	2.96	1.54
NAF5080A/ 010820-15	815	NTN9857	3.46	3.48	2.91	1.51
NAF5080A/ 010820-16	824	NTN9857	3.46	3.48	3.07	**1.68**
NAF5080A/ 010820-17	851	NTN9857	3.50	3.43	2.02	1.06
NAF5080A/ 010820-18	860	NTN9857	3.45	3.44	1.98	1.04

Antenna/ Run Number	Freq.	Battery	Initial Power (W)	End Power (W)	Measured 1g-SAR 100% duty cycle (mW/g)	Max Cal 1g-SAR 50% duty cycle (mW/g)
NAF5080A/ 010820-19	869	NTN9857	3.45	3.42	1.64	0.86
NAF5037A/ 010820-26	806	NTN9857	3.50	3.49	3.36	1.73
NAF5037A/ 010820-25	809	NTN9857	3.47	3.47	3.43	**1.78**
NAF5037A/ 010820-24	815	NTN9857	3.47	3.48	3.13	1.62
NAF5037A/ 010820-23	824	NTN9857	3.50	3.48	2.74	1.42
NAF5037A/ 010820-22	851	NTN9857	3.45	3.46	2.86	1.49
NAF5037A/ 010820-21	860	NTN9857	3.47	3.47	2.39	1.24
NAF5037A/ 010820-20	869	NTN9857	3.45	3.44	2.01	1.05

7.3 Peak SAR location

The following figures illustrate the peak SAR location relative to the flat phantom and the test sample for the abdomen and face scans which resulted in the highest SAR. Refer to Appendix A for the detailed SAR scan distributions.



7.4 Maximum Calculated SAR

The calculated maximum 1-gram averaged SAR value is determined by scaling up the measured SAR to adjust for (1) imperfect power leveling and power slump during the SAR scan below the maximum power and (2) duty cycle differences between test mode and normal operation. Therefore the Maximum Calculated 1-gram averaged peak SAR becomes:

$$\text{Maximum Calculated 1-gram Average Peak SAR} = \frac{P_{max}}{P_{end}} \times (D1 \times D2) \times SAR_{meas.}$$

Abdomen

$$\text{Maximum Calculated 1-gram Average Peak SAR} = \frac{3.60}{3.48} \times (1 \times 0.5) \times 8.51 = 4.40 \text{ mW/g}$$

Face

$$\text{Maximum Calculated 1-gram Average Peak SAR} = \frac{3.60}{3.44} \times (1 \times 0.5) \times 4.60 = 2.41 \text{ mW/g}$$

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.

D2 = the Push To Talk duty cycle.
For two-way radio (dispatch) = 0.5,

8.0 Conclusion

The highest Operational Maximum Calculated 1-gram average SAR values found for the portable radio model number H46UCH9PW7AN were:
At the abdomen: 4.40 mW/g
At the face: 2.41 mW/g

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