Certificate Number: 1449-02

MOTOROLA

ACCREDITED

CGISS EME Test Laboratory
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S.A.R. EME Compliance Test Report (Part 1 of 2)

Attention:	Federal Communication Commission
Date of Report:	June 25, 2002
Report Revision:	Rev. O
Device Manufacturer:	Motorola
Device Model:	H18KEH9PW7AN
Device Description:	VHF 1-6 Watts Digital Handheld Transceiver

Test Period:	4/30/02 – 6/12/02
Test Engineer:	Stephen Whalen Sr. Test Engineer
Author:	Michael Sailsman EME Regulatory Affairs Liaison

Note: Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 2.0 of this report.

/s/ Ken Enger — Senior Resource Manager, Product Safety and EME Director

6/27/02 — Date Approved

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REVISION HISTORY

Date	Revision	Comments
6/25/02	O	Initial release
6/27/02	A	Report split into part 1 and 2 to meet FCC's file size requirements

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 FCC ID: AZ489FT3804.

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: AZ489FT3804, operates using traditional simplex two-way radio transmission protocol. 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 side of the radio. The maximum transmit duty cycle is a conservative 50% and is controlled by the user via the PTT function.

FCC ID: AZ489FT3804 is capable of operating in the 136 to 174 MHz band. The rated power is 1 to 6 watts with a maximum output capability of 6.6watts as defined by the upper limit of the production line final test station.

FCC ID: AZ489FT3804 is offered with the following options and accessories:

Batteries

NNTN4435AR	1800 mAh NiMH smart non-FM
NTN8294B	1525 mAh NiCad high capacity
NTN8295A	1525 mAh NiCad high capacity FM Intrinsically Safe
NTN8297A	1525 mAh NiCad high capacity FM Intrinsically Safe, Rugged
NTN8299B	1750 mAh NiMH ultra capacity FM Intrinsically Safe
NTN8923A	1800 mAh NiMH ultra capacity
NTN8610B	1650 mAh LiIon
NTN9177A	Battery Holder, Clamshell Black
NTN9183A	Battery Holder, Clamshell Orange, same as NTN9177
HNN9031A	1525 mAh NiCad smart
HNN9032A	1525 mAh NiCad smart FM Intrinsically Safe
NTN9533A	2400 mAh LiIon smart
RNN4006AR	3000 mAh NiMH
RNN4007AR	3000 mAh NiMH FM Intrinsically Safe
NNTN4436AR	1750 mAh NiMH smart FM

Antennas:

NAD6563	8.0” Helical Wideband 136-174 MHz ¼ wave -6.5 dBi
NAD6566	7.6” Helical 136–151 MHz ¼ wave -9.2 dBi
NAD6567	7.0” Helical 151–162 MHz ¼ wave -8.3 dBi
NAD6568	6.5” Helica 162–174 MHz ¼ wav -6.4 dBi

Body-Worn Accessories

NTN8040B	3” Swivel Belt Loop
NTN8460A	Public Safety Belt Clip – metal
NTN8266B	2 ¼” Belt Clip Kit
NTN8725A	Nylon Carry Case with T Strap
NTN9179A	Hi Activity D Clip (NTN9212A) & Belt Loop (NTN9213A)Combo
NTN9212A	Swivel D Clip, High Activity
NTN9213A	2.5” Belt Loop, High Activity D Clip
NTN8381C	Carrying Case, High Activity, Includes 3” swivel Belt loop and T Strap. NiCad or NiMH
NTN9184A	Case, Carry with Belt loop for Clamshell Batt
NTN8382B	Case with Belt loop T Strap
NTN8383A	T-strap plain action snaps
NTN8384A	Case Leather T-Strap Hard Act
NTN8385B	Hard Leather Carry Case, High activity, includes 2.5"swivel belt loop and t-strap.
NTN8386B	Hard Leather Carry Case High activity includes 3.0" swivel belt loop and t-strap.
NTN8387A	Case w/Belt loop t-strap Model I
NTN8039B	2 1/2" swivel belt loop for leather cases for use with High Activity cases
NTN8380B	Hard Leather Carry Case High activity includes 2.5" swivel belt loop and t-strap.

Audio/Optional Accessories:

BDN6676D	Jedi Adapter
BDN6671B	PTT & VOX Interface Module for use with BDN6677B, BDN6678A & BDN6641A
BDN6708B	PTT Interface Module for use with BDN6677B, BDN6678A & BDN6641A
BDN6673B	Headset adapter cable for use with the BDN6645A, BDN6635B & BDN6673B
NMN6193C	Remote Speaker Microphone
NMN6193BSP03	Remote Speaker Microphone
NMN6193BSP04	Remote Speaker Microphone
NMN6250A	Public Safety Microphone with straight cord, 24”
NMN6251A	Public Safety Microphone with straight cord, 18”
NMN6247A	Public Safety Microphone with straight cord, 30”
NTN8327A	External RF switch
BDN6665A	Earpiece w/ XL Earphone
BDN6666A	Earpiece w/ Volume Control
BDN6667A	Earpiece, Mic & PTT Combo
BDN6668A	Earpiece, Mic & PTT Separate
BDN6780A	Earbud Single w/ Mic & PTT
NTN1624A	Commport w/ Palm PTT NTN8819A & NKN6510A
BDN6677B	Ear Microphone System part A
BDN6678A	Ear Microphone System part B
BDN6635B	Boom Mic Headset w/ Vox, (adapter BDN6673B)
BDN6636B	Throat Mic Headset w/ Vox (adapter , BDN6673B)
NMN6245A	Light Weight Headset
NMN6259A	Med. Weight Dual Headset w/ NC Mic
NMN1020A	Safety Helmet Headset (adapter BDN6676D) NKN6498A &NKN6050A
RMN4049A	Jedi “TEMCO” Temple Transducer
NMN6191C	RSM Noise Cancelling Includes: 6.0' coiled cord assembly , 3.5mm earjack, swivel clip, quick disconnect
NTN7660B	Tilt / Man Down Switch
BDN6664A	Earpiece with standard earpiece BEIGE
BDN6726A	Earpiece with standard earpiece BLACK
BDN6727A	Earpiece with extra loud earphone BLACK
BDN6728A	Earpiece with volume control BLACK
BDN6729A	Earpiece, Mic and PTT combined BLACK
BDN6730A	Earpiece, Mic and PTT separate BLACK
BDN6669A	Earpiece, Mic and PTT combined with extra loud earpiece BEIGE
BDN6731A	Earpiece, Mic and PTT combined with extra loud earpiece BLACK
BDN6670A	Earpiece, Mic and PTT separate with extra loud earpiece BEIGE
BDN6730A	Earpiece, Mic and PTT separate with extra loud earpiece BLACK
BDN6781A	Earbud, single, receive only, black
NTN1625A	Commport ear mic, with PTT for noise levels up to 100 db (ship w/ BDN6676 adapter)
NTN1663A	Commport ear mic, with Ring PTT for noise levels up to 100 db (ship w/ BDN6676 adapter)
NTN1736A	Commport ear mic, with Snap-On Side PTT for noise levels up to 100 db (ship w/ BDN6676 adapter)
BDN6641A	Ear mic, high noise level up to 105dB, grey (must order interface module)
0180300E83	Remote Push-To-Talk Body Switch
BDN6645A	Noise-Canceling Boom Mic Headset with PTT on earcup
NMN6246B	Ultralite Headset w/Boom Microphone
NMN6258A	Over the Head Headset w/ In Line PTT
NTN8613A	Keyload Adapter
ZMN6031A	SPKR MIC 3 PIECE
ZMN6032A	SPKR MIC 2 PIECE

ZMN6038A	SPKR MIC 2 PC XL
ZMN6039A	SPKR MIC 3 PC XL
NTN5243A	Shoulder Strap
PLN7737A	Hand Held Control Head used with vehicular adapter

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: AZ489FT3804 in this report. Appendix A also presents a shortened 6 minutes S.A.R. cube scan performed with the worst-case configuration to assess the validity of the calculated results presented herein.

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 S.A.R. measurements were conducted with probe model/serial number ET3DV6/SN1547. The system performance check was conducted daily and within 24 hours prior to testing. 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
1547	IEEE Head	11/06/01	SN300-02	2.95 +/- 0.12	2.94 +/- 10%	6/4/02-6/12/02
1547	FCC Body	11/06/01	SN300-02	2.92 +/- 0.1	2.93 +/- 10%	5/8/02-6/03/02
1545	IEEE Head	9/24/01	D835V2	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™.

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 white glycol resistant plastic and is mounted on a wooden supporting structure that has a loss tangent of < 0.05. The structure has a 68.58 cm x 25.4 cm opening at its center to allow positioning the DUT to the phantom's surface. The supporting structure is assembled with wooden pegs and glue. The table below shows the flat phantom dimensions.

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	136 - 174	56.00	37.50	5.40	1.00	0.10
IEEE Head	136 - 174	47.10	49.48	2.32	1.00	0.10

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**
156	52	0.76

	IEEE Head	
Frequency (MHz)	**Di-electric Constant**	**Conductivity – S/m**
156	61.8	0.80

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. 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	22.90 °C
Relative Humidity	50.10 %
Tissue Temperature	22.07 °C

The EME Lab RF environment uses a Spectrum Analyzer to monitor for extraneous large signal RF contaminants that could possibly affect the test results. If such unwanted signals are discovered the S.A.R. scans are repeated. However, the lab environment is sufficiently protected such that no S.A.R. impacting interference has been experienced to date.

5.0 Description of Test Procedure

All options and accessories listed in section 3.0 were considered in the S.A.R. test plan in order to assess the highest S.A.R. levels. 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 to account for battery power slump and a conservative operational duty cycle of 50% 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 DUT under FCC ID AZ489FT3804 was done in five phases.

In phase I each antenna was tested at the center of their respective operational band along with each battery, standard belt clip and a standard RSM audio accessory.

In phase II each antenna was tested at the center of their respective operational band using the worst-case battery found in Phase I, along with each body-worn accessory offered and a standard RSM audio accessory. Tests were then performed at the band edges of each antenna with the worst-case battery and body-worn accessory.

In phase III each audio accessory was tested with the worst-case configuration found in Phase II.

In phase IV the DUT (front and back side) was tested at 2.5cm with the worst–case battery and

audio accessory. In addition, compliance assessment was made of all Public Safety Microphone (PSM) with each antenna offered with the radio.

Phase V assessed hand-held compliance at the face using the highest capacity batteries from each offered chemistry, as well as the worst-case batteries from Phase I-IV, along with each antenna at the center their respective operational band. The worst-case battery was then used to test the band edges for each antenna.

5.1 Device Test Positions

Figure 1 presents the highest S.A.R. test configuration. Figure 4 depicts an overall perspective of the system setup and support structure.

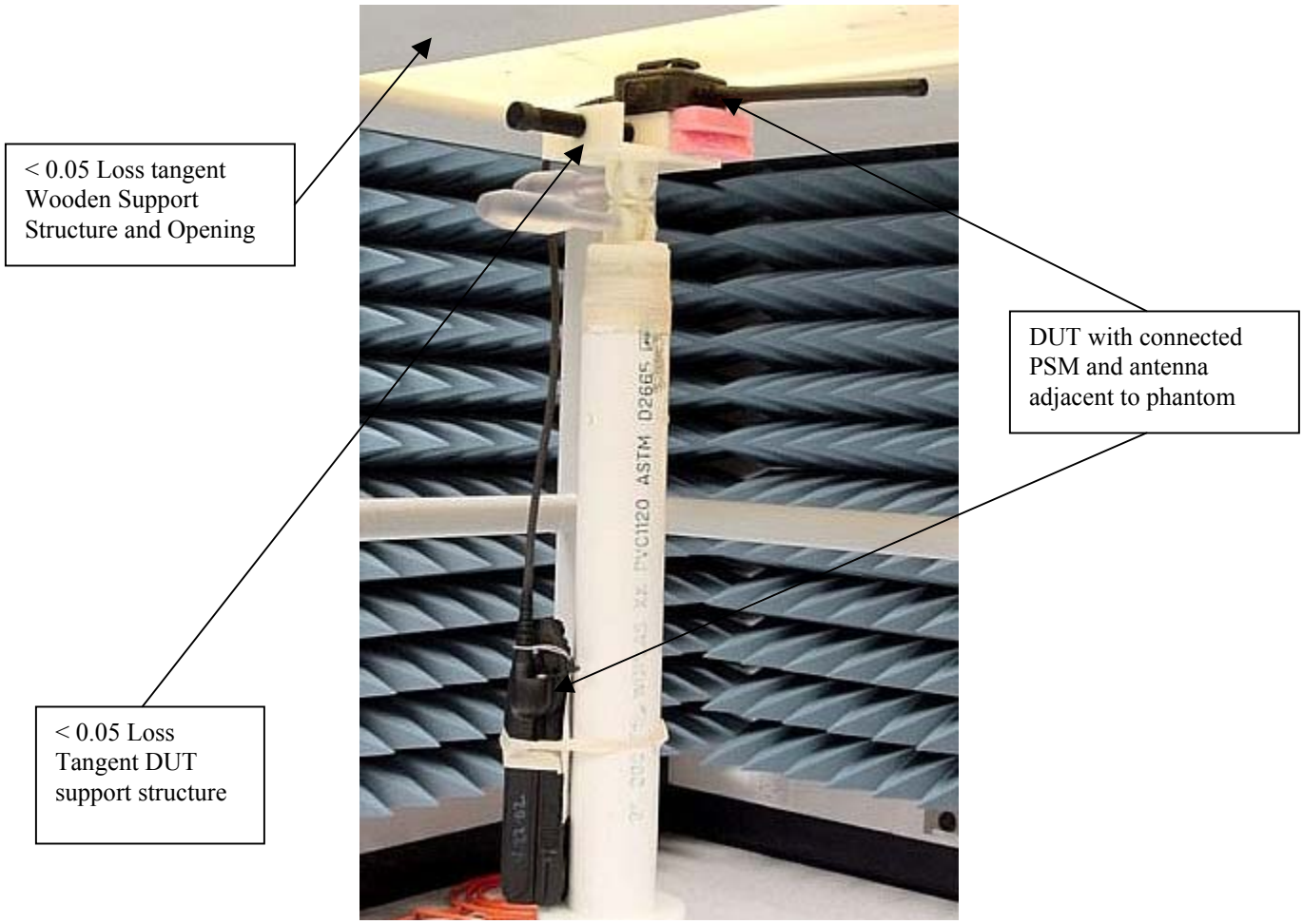
5.1.1 Abdomen

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 and shoulder.

5.1.2 2.5cm Face and Abdomen

A flat phantom containing simulated FCC body tissue and 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 for abdomen and face.

Figure 1: Highest S.A.R. Test Configuration (Shoulder test configuration with PSM)

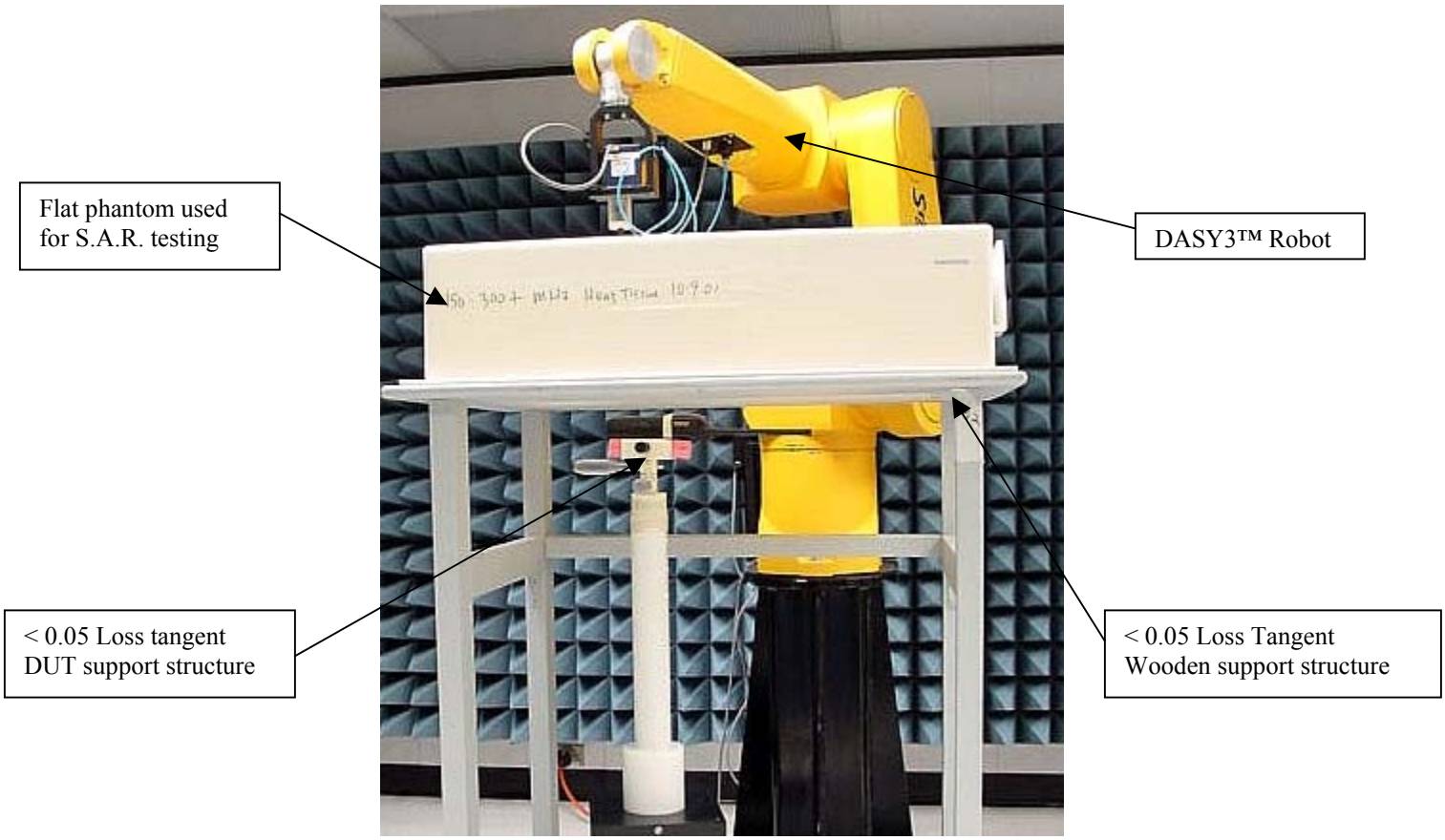


Additional Test Position Photos

Figure 2: Abdomen Test Position

Figure 3: Face and Abdomen Test Position with 2.5 cm separation

Figure 4: 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

Run Number Unit S/N	Freq. (MHz)	Antenna	Battery	Carry Case	Audio Acc.	Initial Power (mW)	End Power (mW)	Meas. 1g S.A.R.	Calc. 1g-S.A.R. 50% DC (mW/g)
Phase I									
S.A.R. assessment of offered batteries tested with antenna NAD6563 @ the abdomen									
Ab_R1_020502-02 Unit # 50	156	NAD6563	NTN8294B	NTN8266B	NMN6191C	6.36	6.13	0.91	0.47
Ab_R1_020508-02 Unit # 50	156	NAD6563	NTN8295A	NTN8266B	NMN6191C	6.33	6.03	0.90	0.47
Ab_R1_020502-07 Unit # 50	156	NAD6563	NTN8927A	NTN8266B	NMN6191C	6.31	5.44	0.83	0.48
Ab_R1_020502-08 Unit # 50	156	NAD6563	NTN8299A	NTN8266B	NMN6191C	6.3	5.72	0.80	0.44
Ab_R1_020502-09 Unit # 50	156	NAD6563	NTN8923A	NTN8266B	NMN6191C	6.32	6.13	0.83	0.43
Ab_R1_020502-10 Unit # 50	156	NAD6563	NNTN4435AR	NTN8266B	NMN6191C	6.32	6.32	0.78	0.40
Ab_R1_020502-11 Unit # 50	156	NAD6563	NNTN4436AR	NTN8266B	NMN6191C	6.31	6.12	0.89	0.46
Ab_R1_020503-02 Unit # 50	156	NAD6563	HNN9031A	NTN8266B	NMN6191C	6.33	6.15	0.73	0.38
Ab_R1_020503-03 Unit # 50	156	NAD6563	HNN9032A	NTN8266B	NMN6191C	6.31	6.12	0.86	0.44
Ab_R1_020503-04 Unit # 50	156	NAD6563	NTN9533A	NTN8266B	NMN6191C	6.33	6.22	**0.93**	**0.47**
Ab_R1_020503-05 Unit # 50	156	NAD6563	RNN4006AR	NTN8266B	NMN6191C	6.29	5.84	0.83	0.45
Ab_R1_020508-03 Unit # 50	156	NAD6563	NTN8610B	NTN8266B	NMN6191C	6.32	6.20	0.88	0.45
Ab_R1_020515-07 Unit # 50	156	NAD6563	NTN9177A	NTN8266B	NMN6191C	2.18	2.24	0.34	0.17
S.A.R. assessment of offered batteries tested with antenna model NAD6566 @ the abdomen									
Ab_R1_020508-04 Unit # 50	143	NAD6566	NTN8294A	NTN8266B	NMN6191C	6.34	6.07	**0.64**	**0.33**
Ab_R1_020509-02 Unit # 50	143	NAD6566	NTN8295A	NTN8266B	NMN6191C	6.34	6.04	0.59	0.31
Ab_R1_020509-03 Unit # 50	143	NAD6566	NTN8927A	NTN8266B	NMN6191C	6.36	5.98	0.60	0.32

Ab_R1_020508-07 Unit # 50	143	NAD6566	NTN8299A	NTN8266B	NMN6191C	6.32	5.87	0.63	0.34
Ab_R1_020509-04 Unit # 50	143	NAD6566	NTN8923A	NTN8266B	NMN6191C	6.35	6.12	0.62	0.32
Ab_R1_020509-05 Unit # 50	143	NAD6566	NNTN4435AR	NTN8266B	NMN6191C	6.37	6.06	0.49	0.26
Ab_R1_020509-06 Unit # 50	143	NAD6566	NNTN4436AR	NTN8266B	NMN6191C	6.36	6.06	0.58	0.31
Ab_R1_020509-07 Unit # 50	143	NAD6566	HNN9031A	NTN8266B	NMN6191C	6.37	6.00	0.56	0.30
Ab_R1_020509-08 Unit # 50	143	NAD6566	HNN9032A	NTN8266B	NMN6191C	6.36	6.06	0.51	0.31
Ab_R1_020509-09 Unit # 50	143	NAD6566	NTN9533A	NTN8266B	NMN6191C	6.34	6.12	0.57	0.30
Ab_R1_020510-02 Unit # 50	143	NAD6566	RNN4006AR	NTN8266B	NMN6191C	6.30	6.06	0.60	0.31
Ab_R1_020510-03 Unit # 50	143	NAD6566	NTN8610B	NTN8266B	NMN6191C	6.35	6.02	0.62	0.33
Ab_R1_020515-08 Unit # 50	143	NAD6566	NTN9177A	NTN8266B	NMN6191C	2.19	2.21	0.28	0.14
S.A.R. assessment of offered batteries tested with antenna model NAD6567 @ the abdomen									
Ab_R1_020510-04 Unit # 50	156	NAD6567	NTN8294A	NTN8266B	NMN6191C	6.33	6.16	0.53	0.27
Ab_R1_020510-05 Unit # 50	156	NAD6567	NTN8295A	NTN8266B	NMN6191C	6.32	6.04	0.51	0.27
Ab_R1_020510-06 Unit # 50	156	NAD6567	NTN8927A	NTN8266B	NMN6191C	6.32	6.12	0.53	0.27
Ab_R1_020510-07 Unit # 50	156	NAD6567	NTN8299A	NTN8266B	NMN6191C	6.3	6.16	0.50	0.26
Ab_R1_020510-08 Unit # 50	156	NAD6567	NTN8923A	NTN8266B	NMN6191C	6.29	6.17	0.55	0.28
Ab_R1_020510-09 Unit # 50	156	NAD6567	NNTN4435AR	NTN8266B	NMN6191C	6.33	6.18	0.47	0.24
Ab_R1_020510-10 Unit # 50	156	NAD6567	NNTN4436AR	NTN8266B	NMN6191C	6.33	6.15	0.51	0.26
Ab_R1_020510-11 Unit # 50	156	NAD6567	HNN9031A	NTN8266B	NMN6191C	6.34	6.17	0.41	0.21
Ab_R1_020513-02 Unit # 50	156	NAD6567	HNN9032A	NTN8266B	NMN6191C	6.33	6.16	0.51	0.26
Ab_R1_020513-03 Unit # 50	156	NAD6567	NTN9533A	NTN8266B	NMN6191C	6.33	6.10	0.49	0.25
Ab_R1_020513-04 Unit # 50	156	NAD6567	RNN4006AR	NTN8266B	NMN6191C	6.32	6.13	0.49	0.25
Ab_R1_020513-05 Unit # 50	156	NAD6567	NTN8610B	NTN8266B	NMN6191C	6.3	6.14	**0.55**	**0.28**
Ab_R1_020513-06 Unit # 50	156	NAD6567	NTN9177A	NTN8266B	NMN6191C	2.12	2.3	0.21	0.10

S.A.R. assessment of offered batteries tested with antenna model NAD6568 @ the abdomen									
Ab_R1_020513-09 Unit # 50	168	NAD6568	NTN8294A	NTN8266B	NMN6191C	6.37	6.36	**1.87**	**0.94**
Ab_R1_020513-10 Unit # 50	168	NAD6568	NTN8295A	NTN8266B	NMN6191C	6.39	6.12	1.08	0.56
Ab_R1_020514-02 Unit # 50	168	NAD6568	NTN8927A	NTN8266B	NMN6191C	6.33	6.11	0.73	0.38
Ab_R1_020514-03 Unit # 50	168	NAD6568	NTN8299A	NTN8266B	NMN6191C	6.37	5.83	0.76	0.42
Ab_R1_020514-04 Unit # 50	168	NAD6568	NTN8923A	NTN8266B	NMN6191C	6.40	6.44	1.85	0.93
Ab_R1_020514-05 Unit # 50	168	NAD6568	NNTN4435AR	NTN8266B	NMN6191C	6.37	6.44	1.28	0.64
Ab_R1_020514-06 Unit # 50	168	NAD6568	NNTN4436AR	NTN8266B	NMN6191C	6.41	6.15	0.71	0.37
Ab_R1_020514-07 Unit # 50	168	NAD6568	HNN9031A	NTN8266B	NMN6191C	6.42	6.44	1.36	0.68
Ab_R1_020514-08 Unit # 50	168	NAD6568	HNN9032A	NTN8266B	NMN6191C	6.42	6.25	1.04	0.53
Ab_R1_020515-03 Unit # 50	168	NAD6568	NTN9533A	NTN8266B	NMN6191C	6.37	6.39	0.90	0.45
Ab_R1_020515-04 Unit # 50	168	NAD6568	RNN4006AR	NTN8266B	NMN6191C	6.37	6.03	0.81	0.43
Ab_R1_020515-05 Unit # 50	168	NAD6568	NTN8610B	NTN8266B	NMN6191C	6.4	6.47	1.45	0.73
Ab_R1_020515-06 Unit # 50	168	NAD6568	NTN9177A	NTN8266B	NMN6191C	2.3	2.4	0.62	0.31
Phase II									
S.A.R. assessment of body worn accessories with antenna model NAD6563 and corresponding worst-case battery from Phase I.									
Ab_R1_020522-04 Unit # 50	156	NAD6563	NTN9533A	NTN8460A	NMN6191C	6.33	6.14	1.13	0.58
Ab_R1_020522-05 Unit # 50	156	NAD6563	NTN9533A	NTN8725A	NMN6191C	6.32	6.21	0.64	0.33
Ab_R1_020522-03 Unit # 50	156	NAD6563	NTN9533A	NTN9179A	NMN6191C	6.33	6.25	0.86	0.43
Ab_R1_020522-06 Unit # 50	156	NAD6563	NTN9533A	NTN9184A	NMN6191C	6.33	6.24	0.33	0.16
Ab_R1_020522-07 Unit # 50	156	NAD6563	NTN9533A	NTN8387A	NMN6191C	6.33	6.25	0.37	0.19
Ab_R1_020522-08 Unit # 50	156	NAD6563	NTN9533A	NTN8380B	NMN6191C	6.32	6.27	0.26	0.13
Ab_R1_020522-09 Unit # 50	156	NAD6563	NTN9533A	NTN5243A/ NTN8387A	NMN6191C	6.33	6.23	0.41	0.21
Ab_R1_020522-10 Unit # 50	146	NAD6563	NTN9533A	NTN8460A	NMN6191C	6.31	6.17	**1.20**	**0.61**
Ab_R1_020522-11 Unit # 50	173	NAD6563	NTN9533A	NTN8460A	NMN6191C	6.44	6.59	0.86	0.42

S.A.R. assessment of body worn accessories with antenna model NAD6566 and corresponding worst-case battery from Phase I.									
Ab_R1_020520-07 Unit # 50	143	NAD6566	NTN8294B	NTN8460A	NMN6191C	6.38	6.02	0.61	0.32
Ab_R1_020520-08 Unit # 50	143	NAD6566	NTN8294B	NTN8725A	NMN6191C	6.36	6.17	0.57	0.29
Ab_R1_020521-02 Unit # 50	143	NAD6566	NTN8294B	NTN9179A	NMN6191C	6.34	6.08	1.01	0.53
Ab_R1_020521-03 Unit # 50	143	NAD6566	NTN8294B	NTN9184A	NMN6191C	6.37	6.02	0.52	0.28
Ab_R1_020521-04 Unit # 50	143	NAD6566	NTN8294B	NTN8387A	NMN6191C	6.36	6.1	0.58	0.30
Ab_R1_020521-05 Unit # 50	143	NAD6566	NTN8294B	NTN8380B	NMN6191C	6.36	6.12	0.52	0.27
Ab_R1_020521-06 Unit # 50	143	NAD6566	NTN8294B	NTN5243A/ NTN8387A	NMN6191C	6.36	6.22	0.54	0.28
Ab_R1_020521-07 Unit # 50	136	NAD6566	NTN8294B	NTN9179A	NMN6191C	6.37	6.41	**2.35**	**1.17**
Ab_R1_020521-08 Unit # 50	151	NAD6566	NTN8294B	NTN9179A	NMN6191C	6.32	6.14	0.28	0.14
S.A.R. assessment of body worn accessories with antenna model NAD6567 and corresponding worst-case battery from Phase I.									
Ab_R1_020516-07 Unit # 50	156	NAD6567	NTN8610B	NTN8460A	NMN6191C	6.32	6.15	0.53	0.27
Ab_R1_020516-08 Unit # 50	156	NAD6567	NTN8610B	NTN8725A	NMN6191C	6.33	6.15	0.50	0.26
Ab_R1_020516-09 Unit # 50	156	NAD6567	NTN8610B	NTN9179A	NMN6191C	6.3	6.13	0.44	0.23
Ab_R1_020516-10 Unit # 50	156	NAD6567	NTN8610B	NTN9184A	NMN6191C	6.35	6.08	0.26	0.13
Ab_R1_020517-02 Unit # 50	156	NAD6567	NTN8610B	NTN8387A	NMN6191C	6.33	6.13	0.28	0.15
Ab_R1_020517-03 Unit # 50	156	NAD6567	NTN8610B	NTN8380B	NMN6191C	6.32	6.12	0.23	0.12
Ab_R1_020517-04 Unit # 50	156	NAD6567	NTN8610B	NTN5243A NTN8387A	NMN6191C	6.31	6.16	0.30	0.15
Ab_R1_020513-07 Unit # 50	151	NAD6567	NTN8610B	NTN8266B	NMN6191C	6.33	6.07	**1.17**	**0.61**
Ab_R1_020513-08 Unit # 50	162	NAD6567	NTN8610B	NTN8266B	NMN6191C	6.44	6.20	0.34	0.18
S.A.R. assessment of body worn accessories with antenna model NAD6568 and corresponding worst-case battery from Phase I.									
Ab_R1_020517-05 Unit # 50	168	NAD6568	NTN8294B	NTN8460A	NMN6191C	6.43	6.44	1.87	0.93
Ab_R1_020517-06 Unit # 50	168	NAD6568	NTN8294B	NTN8725A	NMN6191C	6.42	6.44	1.69	0.84
Ab_R1_020520-02 Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NMN6191C	6.39	6.41	**2.55**	**1.28**
Ab_R1_020517-08 Unit # 50	168	NAD6568	NTN8294B	NTN9184A	NMN6191C	6.41	6.36	1.27	0.64

Ab_R1_020517-09 Unit # 50	168	NAD6568	NTN8294B	NTN8387A	NMN6191C	6.42	6.41	1.38	0.69
Ab_R1_020520-03 Unit # 50	168	NAD6568	NTN8294B	NTN8380B	NMN6191C	6.41	6.23	1.09	0.56
Ab_R1_020520-04 Unit # 50	168	NAD6568	NTN8294B	NTN5243A NTN8387A	NMN6191C	6.43	6.38	1.52	0.77
Ab_R1_020520-05 Unit # 50	162	NAD6568	NTN8294B	NTN9179A	NMN6191C	6.38	6.10	1.02	0.53
Ab_R1_020520-06 Unit # 50	173	NAD6568	NTN8294B	NTN9179A	NMN6191C	6.52	6.53	1.33	0.67
Phase III **S.A.R. assessment of audio accessories with highest S.A.R. configuration from phase II**									
Ab_R1_020523-02 Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NMN6193C RSM	6.37	6.44	2.08	1.03
Ab_R1_020524-02JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NMN6193B SPO4 RSM	6.34	6.38	0.72	0.36
Ab_R1_020524-03JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NMN6258A headset	6.36	6.25	1.02	0.52
Ab_R1_020524-04JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	RMN4049A headset	6.34	6.38	0.95	0.47
Ab_R1_020524-05JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NMN6246B headset & BDN6676D	6.34	6.3	1.17	0.59
Ab_R1_020528-02JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	BDN6645A headset & BDN6673B	6.37	6.2	1.39	0.71
Ab_R1_020528-03JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	BDN6635B headset & BDN6673B	6.41	6.3	1.55	0.79
Ab_R1_020528-04JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	BDN6636B headset & BDN6673B	6.38	6.3	1.96	0.99
Ab_R1_020528-05JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NMN6245A headset & BDN6676D	6.36	6.3	1.87	0.94
Ab_R1_020529-02JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NMN6259A headset	6.37	6.33	1.18	0.59
Ab_R1_020529-03JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NMN1020A headset & BDN6676D	6.38	6.4	1.42	0.71
Ab_R1_020529-04JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	ZMN6031A ear piece & NTN8613A	6.39	6.35	1.01	0.51
Ab_R1_020529-05JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	ZMN6032A ear piece & NTN8613A	6.38	6.35	0.78	0.39
Ab_R1_020529-06JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	BDN6780A ear piece & BDN6676 adapter	6.37	6.32	0.90	0.45

Ab_R1_020529-07JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	BDN6726A ear piece & BDN6676D	6.41	6.3	1.38	0.70
Ab_R1_020529-08JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	BDN6728A ear piece & BDN6676D	6.38	6.35	0.97	0.49
Ab_R1_020529-09JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	BDN6729A ear piece & BDN6676D	6.41	6.33	0.90	0.46
Ab_R1_020529-10JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	BDN6730A ear piece & BDN6676D	6.44	6.35	0.59	0.30
Ab_R1_020530-02JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NTN1624A comport & BDN6676D	6.38	6.35	0.31	0.16
Ab_R1_020530-03JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NTN1625A comport & BDN6676D	6.42	6.3	1.65	0.84
Ab_R1_020530-04JF Unit # 50	168	NAD6568	NTN8294B	NTN9179A	NTN1663A comport & BDN6676D	6.45	6.3	0.92	0.47
Ab_R1_020530-05JF	168	NAD6568	NTN8294B	NTN9179A	NTN1736A comport & BDN6676D	6.42	6.25	**2.29**	**1.18**
Ab_R1_020530-06JF	168	NAD6568	NTN8294B	NTN9179A	BDN6671B & BDN6678A	6.39	6.3	1.35	0.68
Ab_R1_020530-07JF	168	NAD6568	NTN8294B	NTN9179A	BDN6708B & BDN6678A &0180300E 83	6.43	6.28	1.73	0.89
Ab_R1_020530-08JF	168	NAD6568	NTN8294B	NTN9179A	NTN7660B tilt/man down	6.42	6.18	2.12	1.10
Phase IV									
S.A.R. assessment at the abdomen 2.5cm separation									
Ab_R1_020530-09JF Unit # 50	168	NAD6568	NTN8294B	Back of radio facing phantom 2.5cm separation	NMN6191C RSM	6.38	6.20	**0.64**	**0.33**
Ab_R1_020530-10JF Unit # 50	168	NAD6568	NTN8294B	Front of radio facing phantom 2.5cm separation	NMN6191C RSM	6.40	6.18	0.24	0.12
S.A.R. assessment of Public Safety Microphone (PSM)									
Ab_R1_020531-02JF Unit # 50	156	NAD6563	NTN9533A	PSM clip	NMN6250A PSM & NTN8327A	6.2	5.87	0.47	0.25
Ab_R1_020531-03JF Unit # 50	156	NAD6563	NTN9533A	PSM clip	NMN6251A PSM &	6.2	6.10	0.31	0.16

					NTN8327A				
Ab_R1_020531-04JF Unit # 50	156	NAD6563	NTN9533A	PSM clip	NMN6247A PSM & NTN8327A	6.17	5.65	0.72	0.39
Ab_R1_020531-05JF Unit # 50	143	NAD6566	NTN8294B	PSM clip	NMN6250A PSM & NTN8327A	6.13	5.91	6.91	3.58
Ab_R1_020603-02JF Unit # 50	143	NAD6566	NTN8294B	PSM clip	NMN6251A PSM & NTN8327A	6.13	5.90	4.89	2.54
Ab_R1_020603-03JF Unit # 50	143	NAD6566	NTN8294B	PSM clip	NMN6247A PSM & NTN8327A	6.13	5.96	3.36	1.73
Ab_R1_020603-04JF Unit # 50	156	NAD6567	NTN8610B	PSM clip	NMN6250A PSM & NTN8327A	6.19	6.06	3.81	1.95
Ab_R1_020603-05JF Unit # 50	156	NAD6567	NTN8610B	PSM clip	NMN6251A PSM & NTN8327A	6.15	6.00	5.22	2.68
Ab_R1_020603-06JF Unit # 50	156	NAD6567	NTN8610B	PSM clip	NMN6247A PSM & NTN8327A	6.17	5.80	2.33	1.24
Ab_R1_020603-07JF Unit # 50	168	NAD6568	NTN8294B	PSM clip	NMN6250A PSM & NTN8327A	6.32	5.50	4.60	2.64
Ab_R1_020603-08JF Unit # 50	168	NAD6568	NTN8294B	PSM clip	NMN6251A PSM & NTN8327A	6.4	5.90	7.48	4.06
Ab_R1_020603-09JF Unit # 50	168	NAD6568	NTN8294B	PSM clip	NMN6247A PSM & NTN8327A	6.39	5.75	1.96	1.09
Ab_R1_020603-10JF Unit # 50	162	NAD6568	NTN8294B	PSM clip	NMN6251A PSM & NTN8327A	6.3	5.70	**9.01**	**4.98**
Ab_R1_020603-11JF Unit # 50	173	NAD6568	NTN8294B	PSM clip	NMN6251A PSM & NTN8327A	6.49	5.60	5.69	3.30
Phase V **S.A.R. assessment at face 2.5cm separation**									
Face_R1_020604-02JF Unit # 50	156	NAD6563	NTN8610B	None	None	6.35	6.28	0.538	0.272
Face_R1_020605-02JF Unit # 50	156	NAD6563	NTN9533A	None	None	6.37	6.28	0.542	0.275
Face_R1_020605-03JF Unit # 50	156	NAD6563	NTN8294B	None	None	6.36	6.27	0.521	0.264
Face_R1_020605-04JF Unit # 50	156	NAD6563	RNN4006AR	None	None	6.35	6.25	0.531	0.270
Face_R1_020605-05JF Unit # 50	156	NAD6563	NTN9177A	None	None	2.16	2.24	0.235	0.113
Face_R1_020610-03 Unit # 50	136	NAD6563	NTN9533A	None	None	6.42	6.41	**0.969**	**0.485**

Face_R1_020605-07JF Unit # 50	173	NAD6563	NTN9533A	None	None	6.45	6.51	0.589	0.292
Face_R1_020605-08JF Unit # 50	143	NAD6566	NTN8610B	None	None	6.37	6.08	2.22	1.16
Face_R1_020606-03JF Unit # 50	143	NAD6566	NTN9533A	None	None	6.37	6.06	2.20	1.16
Face_R1_020606-02aJF Unit # 50	143	NAD6566	NTN8294B	None	None	6.39	6.09	2.38	1.25
Face_R1_020606-04JF Unit # 50	143	NAD6566	RNN4006AR	None	None	6.37	5.90	2.04	1.10
Face_R1_020606-07JF Unit # 50	143	NAD6566	NTN9177A	None	None	2.17	2.36	1.21	0.56
Face_R1_020606-05JF Unit # 50	151	NAD6566	NTN8294BA	None	None	6.4	6.35	**0.85**	**0.43**
Face_R1_020606-06JF Unit # 50	162	NAD6566	NTN8294BA	None	None	6.35	6.05	0.50	0.26
Face_R1_020607-02JF Unit # 50	156	NAD6567	NTN8610B	None	None	6.33	6.1	1.68	0.87
Face_R1_020607-03JF Unit # 50	156	NAD6567	NTN9533A	None	None	6.35	6.1	1.42	0.74
Face_R1_020607-04JF Unit # 50	156	NAD6567	NTN8294B	None	None	6.34	6.05	1.83	0.96
Face_R1_020607-05JF Unit # 50	156	NAD6567	RNN4006AR	None	None	6.33	5.63	1.42	0.80
Face_R1_020606-08JF Unit # 50	156	NAD6567	NTN9177A	None	None	2.15	2.32	0.50	0.23
Face_R1_020607-06JF Unit # 50	151	NAD6567	NTN8294BA	None	None	6.37	6.06	**2.59**	**1.36**
Face_R1_020607-07JF Unit # 50	162	NAD6567	NTN8294BA	None	None	6.54	6.3	0.54	0.28
Face_R1_020607-11JF Unit # 50	168	NAD6568	NTN8610B	None	None	6.37	6.1	1.38	0.72
Face_R1_020607-08JF Unit # 50	168	NAD6568	NTN8294B	None	None	6.37	6.3	1.40	0.71
Face_R1_020607-09JF Unit # 50	168	NAD6568	NTN9533A	None	None	6.4	6.47	1.20	0.59
Face_R1_020607-10JF Unit # 50	168	NAD6568	RNN4006AR	None	None	6.38	5.7	1.20	0.67
Face_R1_020610-02 Unit # 50	168	NAD6568	NTN9177A	None	None	2.3	2.42	0.52	0.25
Face_R1_020612-02 Unit # 50	162	NAD6568	NTN8294B	None	None	6.38	5.82	**3.80**	**2.08**
Face_R1_020612-03 Unit # 50	173	NAD6568	NTN8294B	None	None	6.47	6.46	0.82	0.41

7.2 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 model number H18KEH9PW7AN were **4.98 mW/g** at the abdomen and **2.08 mW/g** at the face. The following formulas where used:

Calc. 1g S.A.R. = (Initial Power/End Power) * meas. 1g S.A.R. * 0.50
Calc. 1g S.A.R. = meas. 1g S.A.R. * 0.50 (where End Power is greater than Initial Power)

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)